NAVFAC
Naval Facilities Engineering Command

Off-Base Drinking Water Sample Results, Combined Level 2 and Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, and the Sample Location Figure, SDG 320-17376-1

Naval Weapons Station Earle
Colts Neck, New Jersey

July 2019

N60478.SF.001879
NWS EARLE
5090.3c

LABORATORY DATA PACKAGE, 320-17376-1, NWS EARLE, NJ
03/03/2016
TESTAMERICA LABORATORIES, INC

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

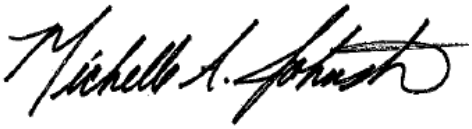
ANALYTICAL REPORT

Job Number: 320-17376-1

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
3/3/2016 11:28 AM

Michelle A Johnston, Project Manager II
4955 Yarrow Street, Arvada, CO, 80002
(303)736-0110
michelle.johnston@testamericainc.com
03/03/2016

cc: Ms. 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
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation

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: 320-17376-1

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 2/23/2016 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.1ºC and 1.4ºC.

The job description was revised to "Ensafe-NWS-Earle, NJ PFCs Potable Water" per client project.

The chain of custody does not list collection times for samples BC_2_20_16 (320-17376-1) and DW-3 (320-17376-6). The laboratory logged these samples with the default collection time of 00:00 (12:00AM). The client was notified on 2/23/2016. In accordance with the client's instructions provided on 2/24/2016, the collection time for sample DW-3 (320-17376-6) was changed to 11:56.

The chain of custody does not indicate a sample type, sample matrix, or requested analysis for samples DW-84 (320-17376-10) and DW-84FB (320-17376-11). The laboratory logged the samples as outlined below:

Sample Type = grab per all other sample types indicated on the chain of custody
Sample Matrix = aqueous per visual inspection of volume received
Analysis = PFOS, PFOA, PFNA, PFHxS, PFHpA & PFBS per predetermined scope of work

The client was notified on 2/23/2016.

No other anomalies were encountered during sample receipt.

Perfluorinated Hydrocarbons (PFCs)

Samples BC_2_20_16 (320-17376-1), DW-29 (320-17376-2), DW-29FB (320-17376-3), DW-13 (320-17376-4), DW-13FB (320-17376-5), DW-3 (320-17376-6), DW-3FB (320-17376-7), DW-71 (320-17376-8), DW-71FB (320-17376-9), DW-84 (320-17376-10), DW-84FB (320-17376-11), DW-91 (320-17376-12), DW-91FB (320-17376-13) and DUP022016 (320-17376-14) were analyzed for Perfluorinated Hydrocarbons (PFC) in accordance with WS-LC-0025. The samples were prepared on 02/25/2016 and analyzed on 02/26/2016 and 02/27/2016.

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

MS/MSD analyses for prep batch 280-118602 were not requested.

The level 1 standard from the ICAL (ICV 320-101820/10) 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: 320-17376-1

Client Sample ID: BC_2_20_16 — Lab Sample ID: 320-17376-1

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorononanoic acid (PFNA)	0.67	J	2.2	1.8	0.58	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: DW-29 — Lab Sample ID: 320-17376-2

No Detections.

Client Sample ID: DW-29FB — Lab Sample ID: 320-17376-3

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	1.7	J	2.3	1.8	0.84	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: DW-13 — Lab Sample ID: 320-17376-4

No Detections.

Client Sample ID: DW-13FB — Lab Sample ID: 320-17376-5

No Detections.

Client Sample ID: DW-3 — Lab Sample ID: 320-17376-6

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	1.4	J	2.3	1.8	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.97	J	2.3	1.8	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.87	J	2.3	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	16		3.6	2.7	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	2.0	J	2.3	1.8	0.68	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: DW-3FB — Lab Sample ID: 320-17376-7

No Detections.

Client Sample ID: DW-71 — Lab Sample ID: 320-17376-8

No Detections.

Client Sample ID: DW-71FB — Lab Sample ID: 320-17376-9

No Detections.

Client Sample ID: DW-84 — Lab Sample ID: 320-17376-10

No Detections.

Client Sample ID: DW-84FB — Lab Sample ID: 320-17376-11

No Detections.

This Detection Summary does not include radiochemical test results.

Detection Summary

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

TestAmerica Job ID: 320-17376-1

Client Sample ID: DW-91 — Lab Sample ID: 320-17376-12

No Detections.

Client Sample ID: DW-91FB — Lab Sample ID: 320-17376-13

No Detections.

Client Sample ID: DUP022016 — Lab Sample ID: 320-17376-14

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: BC_2_20_16
Lab Sample ID: 320-17376-1

Date Collected: 02/20/16 00:00
Matrix: Water

Date Received: 02/23/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.2	1.8	0.82	ng/L		02/26/16 21:41	1
Perfluoroheptanoic acid (PFHpA)	1.8	U	2.2	1.8	0.72	ng/L		02/26/16 21:41	1
Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.2	1.8	0.78	ng/L		02/26/16 21:41	1
Perfluorononanoic acid (PFNA)	**0.67**	**J**	2.2	1.8	0.58	ng/L		02/26/16 21:41	1
Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	1.1	ng/L		02/26/16 21:41	1
Perfluorooctanoic acid (PFOA)	1.8	U	2.2	1.8	0.67	ng/L		02/26/16 21:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*112*		*25 - 150*	*02/25/16 10:17*	*02/26/16 21:41*	*1*
13C4 PFOA	*107*		*25 - 150*	*02/25/16 10:17*	*02/26/16 21:41*	*1*
13C4 PFOS	*144*		*25 - 150*	*02/25/16 10:17*	*02/26/16 21:41*	*1*
13C4-PFHpA	*116*		*25 - 150*	*02/25/16 10:17*	*02/26/16 21:41*	*1*
13C5 PFNA	*108*		*25 - 150*	*02/25/16 10:17*	*02/26/16 21:41*	*1*
18O2 PFHxS	*112*		*25 - 150*	*02/25/16 10:17*	*02/26/16 21:41*	*1*

Client Sample ID: DW-29
Lab Sample ID: 320-17376-2

Date Collected: 02/20/16 13:41
Matrix: Water

Date Received: 02/23/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.3	1.8	0.83	ng/L		02/26/16 22:03	1
Perfluoroheptanoic acid (PFHpA)	1.8	U	2.3	1.8	0.73	ng/L		02/26/16 22:03	1
Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.3	1.8	0.79	ng/L		02/26/16 22:03	1
Perfluorononanoic acid (PFNA)	1.8	U	2.3	1.8	0.59	ng/L		02/26/16 22:03	1
Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	1.2	ng/L		02/26/16 22:03	1
Perfluorooctanoic acid (PFOA)	1.8	U	2.3	1.8	0.68	ng/L		02/26/16 22:03	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*97*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:03*	*1*
13C4 PFOA	*96*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:03*	*1*
13C4 PFOS	*145*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:03*	*1*
13C4-PFHpA	*99*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:03*	*1*
13C5 PFNA	*87*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:03*	*1*
18O2 PFHxS	*124*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:03*	*1*

Client Sample ID: DW-29FB
Lab Sample ID: 320-17376-3

Date Collected: 02/20/16 13:22
Matrix: Water

Date Received: 02/23/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**1.7**	**J**	2.3	1.8	0.84	ng/L		02/26/16 22:24	1
Perfluoroheptanoic acid (PFHpA)	1.8	U	2.3	1.8	0.73	ng/L		02/26/16 22:24	1
Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.3	1.8	0.79	ng/L		02/26/16 22:24	1
Perfluorononanoic acid (PFNA)	1.8	U	2.3	1.8	0.60	ng/L		02/26/16 22:24	1
Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	1.2	ng/L		02/26/16 22:24	1
Perfluorooctanoic acid (PFOA)	1.8	U	2.3	1.8	0.68	ng/L		02/26/16 22:24	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*98*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:24*	*1*
13C4 PFOA	*101*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:24*	*1*
13C4 PFOS	*119*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:24*	*1*
13C4-PFHpA	*102*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:24*	*1*
13C5 PFNA	*96*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:24*	*1*
18O2 PFHxS	*104*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:24*	*1*

Client Sample ID: DW-13
Lab Sample ID: 320-17376-4

Date Collected: 02/20/16 12:56
Matrix: Water

Date Received: 02/23/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.2	1.8	0.81	ng/L		02/26/16 22:45	1
Perfluoroheptanoic acid (PFHpA)	1.8	U	2.2	1.8	0.71	ng/L		02/26/16 22:45	1
Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.2	1.8	0.77	ng/L		02/26/16 22:45	1
Perfluorononanoic acid (PFNA)	1.8	U	2.2	1.8	0.58	ng/L		02/26/16 22:45	1
Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.5	2.7	1.1	ng/L		02/26/16 22:45	1
Perfluorooctanoic acid (PFOA)	1.8	U	2.2	1.8	0.66	ng/L		02/26/16 22:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*70*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:45*	*1*
13C4 PFOA	*59*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:45*	*1*
13C4 PFOS	*131*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:45*	*1*
13C4-PFHpA	*65*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:45*	*1*
13C5 PFNA	*49*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:45*	*1*
18O2 PFHxS	*122*		*25 - 150*	*02/25/16 10:17*	*02/26/16 22:45*	*1*

Client Sample ID: DW-13FB
Lab Sample ID: 320-17376-5

Date Collected: 02/20/16 12:37
Matrix: Water
Date Received: 02/23/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.3	1.8	0.84	ng/L		02/26/16 23:06	1
Perfluoroheptanoic acid (PFHpA)	1.8	U	2.3	1.8	0.73	ng/L		02/26/16 23:06	1
Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.3	1.8	0.79	ng/L		02/26/16 23:06	1
Perfluorononanoic acid (PFNA)	1.8	U	2.3	1.8	0.60	ng/L		02/26/16 23:06	1
Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	1.2	ng/L		02/26/16 23:06	1
Perfluorooctanoic acid (PFOA)	1.8	U	2.3	1.8	0.68	ng/L		02/26/16 23:06	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*109*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:06*	*1*
13C4 PFOA	*114*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:06*	*1*
13C4 PFOS	*118*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:06*	*1*
13C4-PFHpA	*114*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:06*	*1*
13C5 PFNA	*109*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:06*	*1*
18O2 PFHxS	*112*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:06*	*1*

Client Sample ID: DW-3
Lab Sample ID: 320-17376-6

Date Collected: 02/20/16 11:56
Matrix: Water
Date Received: 02/23/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**1.4**	**J**	2.3	1.8	0.83	ng/L		02/26/16 23:27	1
Perfluoroheptanoic acid (PFHpA)	1.8	U	2.3	1.8	0.73	ng/L		02/26/16 23:27	1
Perfluorohexanesulfonic acid (PFHxS)	**0.97**	**J**	2.3	1.8	0.79	ng/L		02/26/16 23:27	1
Perfluorononanoic acid (PFNA)	**0.87**	**J**	2.3	1.8	0.59	ng/L		02/26/16 23:27	1
Perfluorooctanesulfonic acid (PFOS)	**16**		3.6	2.7	1.2	ng/L		02/26/16 23:27	1
Perfluorooctanoic acid (PFOA)	**2.0**	**J**	2.3	1.8	0.68	ng/L		02/26/16 23:27	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*91*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:27*	*1*
13C4 PFOA	*95*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:27*	*1*
13C4 PFOS	*115*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:27*	*1*
13C4-PFHpA	*107*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:27*	*1*
13C5 PFNA	*86*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:27*	*1*
18O2 PFHxS	*112*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:27*	*1*

Client Sample ID: DW-3FB
Lab Sample ID: 320-17376-7

Date Collected: 02/20/16 11:37
Matrix: Water

Date Received: 02/23/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.3	1.8	0.83	ng/L		02/26/16 23:48	1
Perfluoroheptanoic acid (PFHpA)	1.8	U	2.3	1.8	0.72	ng/L		02/26/16 23:48	1
Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.3	1.8	0.79	ng/L		02/26/16 23:48	1
Perfluorononanoic acid (PFNA)	1.8	U	2.3	1.8	0.59	ng/L		02/26/16 23:48	1
Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	1.2	ng/L		02/26/16 23:48	1
Perfluorooctanoic acid (PFOA)	1.8	U	2.3	1.8	0.68	ng/L		02/26/16 23:48	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*108*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:48*	*1*
13C4 PFOA	*112*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:48*	*1*
13C4 PFOS	*117*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:48*	*1*
13C4-PFHpA	*116*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:48*	*1*
13C5 PFNA	*112*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:48*	*1*
18O2 PFHxS	*107*		*25 - 150*	*02/25/16 10:17*	*02/26/16 23:48*	*1*

Client Sample ID: DW-71
Lab Sample ID: 320-17376-8

Date Collected: 02/20/16 11:26
Matrix: Water

Date Received: 02/23/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.7	U	2.2	1.7	0.79	ng/L		02/27/16 00:31	1
Perfluoroheptanoic acid (PFHpA)	1.7	U	2.2	1.7	0.69	ng/L		02/27/16 00:31	1
Perfluorohexanesulfonic acid (PFHxS)	1.7	U	2.2	1.7	0.75	ng/L		02/27/16 00:31	1
Perfluorononanoic acid (PFNA)	1.7	U	2.2	1.7	0.57	ng/L		02/27/16 00:31	1
Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	2.6	1.1	ng/L		02/27/16 00:31	1
Perfluorooctanoic acid (PFOA)	1.7	U	2.2	1.7	0.65	ng/L		02/27/16 00:31	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*25 - 150*	*02/25/16 10:17*	*02/27/16 00:31*	*1*
13C4 PFOA	*78*		*25 - 150*	*02/25/16 10:17*	*02/27/16 00:31*	*1*
13C4 PFOS	*100*		*25 - 150*	*02/25/16 10:17*	*02/27/16 00:31*	*1*
13C4-PFHpA	*82*		*25 - 150*	*02/25/16 10:17*	*02/27/16 00:31*	*1*
13C5 PFNA	*82*		*25 - 150*	*02/25/16 10:17*	*02/27/16 00:31*	*1*
18O2 PFHxS	*106*		*25 - 150*	*02/25/16 10:17*	*02/27/16 00:31*	*1*

Client Sample ID: DW-71FB
Lab Sample ID: 320-17376-9
Date Collected: 02/20/16 11:11
Matrix: Water
Date Received: 02/23/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.3	1.9	0.85	ng/L		02/27/16 00:52	1
Perfluoroheptanoic acid (PFHpA)	1.9	U	2.3	1.9	0.74	ng/L		02/27/16 00:52	1
Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.3	1.9	0.81	ng/L		02/27/16 00:52	1
Perfluorononanoic acid (PFNA)	1.9	U	2.3	1.9	0.61	ng/L		02/27/16 00:52	1
Perfluorooctanesulfonic acid (PFOS)	2.8	U	3.7	2.8	1.2	ng/L		02/27/16 00:52	1
Perfluorooctanoic acid (PFOA)	1.9	U	2.3	1.9	0.69	ng/L		02/27/16 00:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*82*		*25 - 150*	*02/25/16 10:17*	*02/27/16 00:52*	*1*
13C4 PFOA	*95*		*25 - 150*	*02/25/16 10:17*	*02/27/16 00:52*	*1*
13C4 PFOS	*99*		*25 - 150*	*02/25/16 10:17*	*02/27/16 00:52*	*1*
13C4-PFHpA	*93*		*25 - 150*	*02/25/16 10:17*	*02/27/16 00:52*	*1*
13C5 PFNA	*92*		*25 - 150*	*02/25/16 10:17*	*02/27/16 00:52*	*1*
18O2 PFHxS	*115*		*25 - 150*	*02/25/16 10:17*	*02/27/16 00:52*	*1*

Client Sample ID: DW-84
Lab Sample ID: 320-17376-10
Date Collected: 02/20/16 11:01
Matrix: Water
Date Received: 02/23/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.2	1.8	0.81	ng/L		02/27/16 01:13	1
Perfluoroheptanoic acid (PFHpA)	1.8	U	2.2	1.8	0.71	ng/L		02/27/16 01:13	1
Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.2	1.8	0.77	ng/L		02/27/16 01:13	1
Perfluorononanoic acid (PFNA)	1.8	U	2.2	1.8	0.58	ng/L		02/27/16 01:13	1
Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	2.6	1.1	ng/L		02/27/16 01:13	1
Perfluorooctanoic acid (PFOA)	1.8	U	2.2	1.8	0.66	ng/L		02/27/16 01:13	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*73*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:13*	*1*
13C4 PFOA	*66*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:13*	*1*
13C4 PFOS	*85*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:13*	*1*
13C4-PFHpA	*79*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:13*	*1*
13C5 PFNA	*50*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:13*	*1*
18O2 PFHxS	*100*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:13*	*1*

Client Sample ID: DW-84FB
Lab Sample ID: 320-17376-11
Date Collected: 02/20/16 10:37
Matrix: Water
Date Received: 02/23/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.2	1.8	0.82	ng/L		02/27/16 01:34	1
Perfluoroheptanoic acid (PFHpA)	1.8	U	2.2	1.8	0.72	ng/L		02/27/16 01:34	1
Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.2	1.8	0.78	ng/L		02/27/16 01:34	1
Perfluorononanoic acid (PFNA)	1.8	U	2.2	1.8	0.59	ng/L		02/27/16 01:34	1
Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	1.1	ng/L		02/27/16 01:34	1
Perfluorooctanoic acid (PFOA)	1.8	U	2.2	1.8	0.67	ng/L		02/27/16 01:34	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*113*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:34*	*1*
13C4 PFOA	*109*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:34*	*1*
13C4 PFOS	*95*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:34*	*1*
13C4-PFHpA	*114*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:34*	*1*
13C5 PFNA	*111*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:34*	*1*
18O2 PFHxS	*100*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:34*	*1*

Client Sample ID: DW-91
Lab Sample ID: 320-17376-12

Date Collected: 02/20/16 10:26
Matrix: Water

Date Received: 02/23/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.3	1.8	0.85	ng/L		02/27/16 01:56	1
Perfluoroheptanoic acid (PFHpA)	1.8	U	2.3	1.8	0.74	ng/L		02/27/16 01:56	1
Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.3	1.8	0.80	ng/L		02/27/16 01:56	1
Perfluorononanoic acid (PFNA)	1.8	U	2.3	1.8	0.60	ng/L		02/27/16 01:56	1
Perfluorooctanesulfonic acid (PFOS)	2.8	U	3.7	2.8	1.2	ng/L		02/27/16 01:56	1
Perfluorooctanoic acid (PFOA)	1.8	U	2.3	1.8	0.69	ng/L		02/27/16 01:56	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*86*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:56*	*1*
13C4 PFOA	*87*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:56*	*1*
13C4 PFOS	*99*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:56*	*1*
13C4-PFHpA	*93*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:56*	*1*
13C5 PFNA	*72*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:56*	*1*
18O2 PFHxS	*105*		*25 - 150*	*02/25/16 10:17*	*02/27/16 01:56*	*1*

Client Sample ID: DW-91FB
Lab Sample ID: 320-17376-13
Date Collected: 02/20/16 10:06
Matrix: Water
Date Received: 02/23/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.2	1.8	0.80	ng/L		02/27/16 02:17	1
Perfluoroheptanoic acid (PFHpA)	1.8	U	2.2	1.8	0.70	ng/L		02/27/16 02:17	1
Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.2	1.8	0.76	ng/L		02/27/16 02:17	1
Perfluorononanoic acid (PFNA)	1.8	U	2.2	1.8	0.57	ng/L		02/27/16 02:17	1
Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	2.6	1.1	ng/L		02/27/16 02:17	1
Perfluorooctanoic acid (PFOA)	1.8	U	2.2	1.8	0.66	ng/L		02/27/16 02:17	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*110*		*25 - 150*	*02/25/16 10:17*	*02/27/16 02:17*	*1*
13C4 PFOA	*116*		*25 - 150*	*02/25/16 10:17*	*02/27/16 02:17*	*1*
13C4 PFOS	*100*		*25 - 150*	*02/25/16 10:17*	*02/27/16 02:17*	*1*
13C4-PFHpA	*116*		*25 - 150*	*02/25/16 10:17*	*02/27/16 02:17*	*1*
13C5 PFNA	*115*		*25 - 150*	*02/25/16 10:17*	*02/27/16 02:17*	*1*
18O2 PFHxS	*108*		*25 - 150*	*02/25/16 10:17*	*02/27/16 02:17*	*1*

Client Sample ID: DUP022016
Lab Sample ID: 320-17376-14

Date Collected: 02/20/16 10:26
Matrix: Water

Date Received: 02/23/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.3	1.9	0.86	ng/L		02/27/16 02:38	1
Perfluoroheptanoic acid (PFHpA)	1.9	U	2.3	1.9	0.75	ng/L		02/27/16 02:38	1
Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.3	1.9	0.81	ng/L		02/27/16 02:38	1
Perfluorononanoic acid (PFNA)	1.9	U	2.3	1.9	0.61	ng/L		02/27/16 02:38	1
Perfluorooctanesulfonic acid (PFOS)	2.8	U	3.7	2.8	1.2	ng/L		02/27/16 02:38	1
Perfluorooctanoic acid (PFOA)	1.9	U	2.3	1.9	0.70	ng/L		02/27/16 02:38	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*87*		*25 - 150*	*02/25/16 10:17*	*02/27/16 02:38*	*1*
13C4 PFOA	*99*		*25 - 150*	*02/25/16 10:17*	*02/27/16 02:38*	*1*
13C4 PFOS	*91*		*25 - 150*	*02/25/16 10:17*	*02/27/16 02:38*	*1*
13C4-PFHpA	*94*		*25 - 150*	*02/25/16 10:17*	*02/27/16 02:38*	*1*
13C5 PFNA	*86*		*25 - 150*	*02/25/16 10:17*	*02/27/16 02:38*	*1*
18O2 PFHxS	*107*		*25 - 150*	*02/25/16 10:17*	*02/27/16 02:38*	*1*

Default Detection Limits

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

TestAmerica Job ID: 320-17376-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

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: 320-17376-1

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 PFO/ (25-150)	3C4 PFOS (25-150)	3C4-PFHp (25-150)	3C5 PFN/ (25-150)	3O2 PFHx (25-150)		
320-17376-1	BC_2_20_16	112	107	144	116	108	112		
320-17376-2	DW-29	97	96	145	99	87	124		
320-17376-3	DW-29FB	98	101	119	102	96	104		
320-17376-4	DW-13	70	59	131	65	49	122		
320-17376-5	DW-13FB	109	114	118	114	109	112		
320-17376-6	DW-3	91	95	115	107	86	112		
320-17376-7	DW-3FB	108	112	117	116	112	107		
320-17376-8	DW-71	80	78	100	82	82	106		
320-17376-9	DW-71FB	82	95	99	93	92	115		
320-17376-10	DW-84	73	66	85	79	50	100		
320-17376-11	DW-84FB	113	109	95	114	111	100		
320-17376-12	DW-91	86	87	99	93	72	105		
320-17376-13	DW-91FB	110	116	100	116	115	108		
320-17376-14	DUP022016	87	99	91	94	86	107		
LCS 320-101543/2-A	Lab Control Sample	103	99	134	108	100	106		
LCSD 320-101543/3-A	Lab Control Sample Dup	106	101	150	110	109	109		
MB 320-101543/1-A	Method Blank	114	116	141	110	109	113		

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 320-101543/1-A
Matrix: Water
Analysis Batch: 101820

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 101543

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		02/26/16 20:38	1
Perfluoroheptanoic acid (PFHpA)	2.0	U	2.5	2.0	0.80	ng/L		02/26/16 20:38	1
Perfluorohexanesulfonic acid (PFHxS)	2.0	U	2.5	2.0	0.87	ng/L		02/26/16 20:38	1
Perfluorononanoic acid (PFNA)	2.0	U	2.5	2.0	0.65	ng/L		02/26/16 20:38	1
Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.3	ng/L		02/26/16 20:38	1
Perfluorooctanoic acid (PFOA)	2.0	U	2.5	2.0	0.75	ng/L		02/26/16 20:38	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*114*		*25 - 150*	*02/25/16 10:17*	*02/26/16 20:38*	*1*
13C4 PFOA	*116*		*25 - 150*	*02/25/16 10:17*	*02/26/16 20:38*	*1*
13C4 PFOS	*141*		*25 - 150*	*02/25/16 10:17*	*02/26/16 20:38*	*1*
13C4-PFHpA	*110*		*25 - 150*	*02/25/16 10:17*	*02/26/16 20:38*	*1*
13C5 PFNA	*109*		*25 - 150*	*02/25/16 10:17*	*02/26/16 20:38*	*1*
18O2 PFHxS	*113*		*25 - 150*	*02/25/16 10:17*	*02/26/16 20:38*	*1*

Lab Sample ID: LCS 320-101543/2-A
Matrix: Water
Analysis Batch: 101820

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 101543

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanesulfonic acid (PFBS)	35.4	42.3		ng/L		120	50 - 150
Perfluoroheptanoic acid (PFHpA)	40.0	36.8		ng/L		92	60 - 140
Perfluorohexanesulfonic acid (PFHxS)	37.8	30.7		ng/L		81	60 - 140
Perfluorononanoic acid (PFNA)	40.0	40.7		ng/L		102	60 - 140
Perfluorooctanesulfonic acid (PFOS)	38.2	28.7		ng/L		75	60 - 140
Perfluorooctanoic acid (PFOA)	40.0	40.6		ng/L		101	60 - 140

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*103*		*25 - 150*
13C4 PFOA	*99*		*25 - 150*
13C4 PFOS	*134*		*25 - 150*
13C4-PFHpA	*108*		*25 - 150*
13C5 PFNA	*100*		*25 - 150*
18O2 PFHxS	*106*		*25 - 150*

Lab Sample ID: LCSD 320-101543/3-A
Matrix: Water
Analysis Batch: 101820

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 101543

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanesulfonic acid (PFBS)	35.4	40.8		ng/L		115	50 - 150	4	30
Perfluoroheptanoic acid (PFHpA)	40.0	34.5		ng/L		86	60 - 140	6	30
Perfluorohexanesulfonic acid (PFHxS)	37.8	30.8		ng/L		81	60 - 140	0	30
Perfluorononanoic acid (PFNA)	40.0	39.2		ng/L		98	60 - 140	4	30

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

Lab Sample ID: LCSD 320-101543/3-A
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 101820
Prep Batch: 101543

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)			38.2	27.5		ng/L		72	60 - 140	4	30
Perfluorooctanoic acid (PFOA)			40.0	39.1		ng/L		98	60 - 140	4	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*106*		*25 - 150*
13C4 PFOA	*101*		*25 - 150*
13C4 PFOS	*150*		*25 - 150*
13C4-PFHpA	*110*		*25 - 150*
13C5 PFNA	*109*		*25 - 150*
18O2 PFHxS	*109*		*25 - 150*

LCMS

Prep Batch: 101543

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-17376-1	BC_2_20_16	Total/NA	Water	3535	
320-17376-2	DW-29	Total/NA	Water	3535	
320-17376-3	DW-29FB	Total/NA	Water	3535	
320-17376-4	DW-13	Total/NA	Water	3535	
320-17376-5	DW-13FB	Total/NA	Water	3535	
320-17376-6	DW-3	Total/NA	Water	3535	
320-17376-7	DW-3FB	Total/NA	Water	3535	
320-17376-8	DW-71	Total/NA	Water	3535	
320-17376-9	DW-71FB	Total/NA	Water	3535	
320-17376-10	DW-84	Total/NA	Water	3535	
320-17376-11	DW-84FB	Total/NA	Water	3535	
320-17376-12	DW-91	Total/NA	Water	3535	
320-17376-13	DW-91FB	Total/NA	Water	3535	
320-17376-14	DUP022016	Total/NA	Water	3535	
LCS 320-101543/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-101543/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-101543/1-A	Method Blank	Total/NA	Water	3535	

Analysis Batch: 101820

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-17376-1	BC_2_20_16	Total/NA	Water	WS-LC-0025	101543
320-17376-2	DW-29	Total/NA	Water	WS-LC-0025	101543
320-17376-3	DW-29FB	Total/NA	Water	WS-LC-0025	101543
320-17376-4	DW-13	Total/NA	Water	WS-LC-0025	101543
320-17376-5	DW-13FB	Total/NA	Water	WS-LC-0025	101543
320-17376-6	DW-3	Total/NA	Water	WS-LC-0025	101543
320-17376-7	DW-3FB	Total/NA	Water	WS-LC-0025	101543
320-17376-8	DW-71	Total/NA	Water	WS-LC-0025	101543
320-17376-9	DW-71FB	Total/NA	Water	WS-LC-0025	101543
320-17376-10	DW-84	Total/NA	Water	WS-LC-0025	101543
320-17376-11	DW-84FB	Total/NA	Water	WS-LC-0025	101543
320-17376-12	DW-91	Total/NA	Water	WS-LC-0025	101543
320-17376-13	DW-91FB	Total/NA	Water	WS-LC-0025	101543
320-17376-14	DUP022016	Total/NA	Water	WS-LC-0025	101543
LCS 320-101543/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	101543
LCSD 320-101543/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	101543
MB 320-101543/1-A	Method Blank	Total/NA	Water	WS-LC-0025	101543

Lab Chronicle

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

TestAmerica Job ID: 320-17376-1

Client Sample ID: BC_2_20_16
Date Collected: 02/20/16 00:00
Date Received: 02/23/16 09:45

Lab Sample ID: 320-17376-1
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			559.7 mL	1.00 mL	101543	02/25/16 10:17	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	559.7 mL	1.00 mL	101820	02/26/16 21:41	JRB	TAL SAC
	Instrument ID: A4									

Client Sample ID: DW-29
Date Collected: 02/20/16 13:41
Date Received: 02/23/16 09:45

Lab Sample ID: 320-17376-2
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			553 mL	1.00 mL	101543	02/25/16 10:17	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	553 mL	1.00 mL	101820	02/26/16 22:03	JRB	TAL SAC
	Instrument ID: A4									

Client Sample ID: DW-29FB
Date Collected: 02/20/16 13:22
Date Received: 02/23/16 09:45

Lab Sample ID: 320-17376-3
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			548.3 mL	1.00 mL	101543	02/25/16 10:17	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	548.3 mL	1.00 mL	101820	02/26/16 22:24	JRB	TAL SAC
	Instrument ID: A4									

Client Sample ID: DW-13
Date Collected: 02/20/16 12:56
Date Received: 02/23/16 09:45

Lab Sample ID: 320-17376-4
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			565.8 mL	1.00 mL	101543	02/25/16 10:17	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	565.8 mL	1.00 mL	101820	02/26/16 22:45	JRB	TAL SAC
	Instrument ID: A4									

Client Sample ID: DW-13FB
Date Collected: 02/20/16 12:37
Date Received: 02/23/16 09:45

Lab Sample ID: 320-17376-5
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			549 mL	1.00 mL	101543	02/25/16 10:17	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	549 mL	1.00 mL	101820	02/26/16 23:06	JRB	TAL SAC
	Instrument ID: A4									

Client Sample ID: DW-3
Date Collected: 02/20/16 11:56
Date Received: 02/23/16 09:45

Lab Sample ID: 320-17376-6
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			551.7 mL	1.00 mL	101543	02/25/16 10:17	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	551.7 mL	1.00 mL	101820	02/26/16 23:27	JRB	TAL SAC
	Instrument ID: A4									

Client Sample ID: DW-3FB
Date Collected: 02/20/16 11:37
Date Received: 02/23/16 09:45

Lab Sample ID: 320-17376-7
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			554 mL	1.00 mL	101543	02/25/16 10:17	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	554 mL	1.00 mL	101820	02/26/16 23:48	JRB	TAL SAC
	Instrument ID: A4									

Client Sample ID: DW-71
Date Collected: 02/20/16 11:26
Date Received: 02/23/16 09:45

Lab Sample ID: 320-17376-8
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			578.2 mL	1.00 mL	101543	02/25/16 10:17	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	578.2 mL	1.00 mL	101820	02/27/16 00:31	JRB	TAL SAC
	Instrument ID: A4									

Client Sample ID: DW-71FB
Date Collected: 02/20/16 11:11
Date Received: 02/23/16 09:45

Lab Sample ID: 320-17376-9
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			538.8 mL	1.00 mL	101543	02/25/16 10:17	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	538.8 mL	1.00 mL	101820	02/27/16 00:52	JRB	TAL SAC
	Instrument ID: A4									

Client Sample ID: DW-84
Date Collected: 02/20/16 11:01
Date Received: 02/23/16 09:45

Lab Sample ID: 320-17376-10
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			567 mL	1.00 mL	101543	02/25/16 10:17	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	567 mL	1.00 mL	101820	02/27/16 01:13	JRB	TAL SAC
	Instrument ID: A4									

Lab Chronicle

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

TestAmerica Job ID: 320-17376-1

Client Sample ID: DW-84FB
Date Collected: 02/20/16 10:37
Date Received: 02/23/16 09:45

Lab Sample ID: 320-17376-11
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			558.7 mL	1.00 mL	101543	02/25/16 10:17	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	558.7 mL	1.00 mL	101820	02/27/16 01:34	JRB	TAL SAC
	Instrument ID: A4									

Client Sample ID: DW-91
Date Collected: 02/20/16 10:26
Date Received: 02/23/16 09:45

Lab Sample ID: 320-17376-12
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			541.5 mL	1.00 mL	101543	02/25/16 10:17	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	541.5 mL	1.00 mL	101820	02/27/16 01:56	JRB	TAL SAC
	Instrument ID: A4									

Client Sample ID: DW-91FB
Date Collected: 02/20/16 10:06
Date Received: 02/23/16 09:45

Lab Sample ID: 320-17376-13
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			570.3 mL	1.00 mL	101543	02/25/16 10:17	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	570.3 mL	1.00 mL	101820	02/27/16 02:17	JRB	TAL SAC
	Instrument ID: A4									

Client Sample ID: DUP022016
Date Collected: 02/20/16 10:26
Date Received: 02/23/16 09:45

Lab Sample ID: 320-17376-14
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			535.6 mL	1.00 mL	101543	02/25/16 10:17	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	535.6 mL	1.00 mL	101820	02/27/16 02:38	JRB	TAL SAC
	Instrument ID: A4									

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

Certification Summary

Client: Earth Toxics, Inc
TestAmerica Job ID: 320-17376-1
Project/Site: Ensafe--NWS-Earle, NJ PFCs Potable Water

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
TestAmerica Job ID: 320-17376-1
Project/Site: Ensafe--NWS-Earle, NJ PFCs Potable Water

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: 320-17376-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-17376-1	BC_2_20_16	Water	02/20/16 00:00	02/23/16 09:45
320-17376-2	DW-29	Water	02/20/16 13:41	02/23/16 09:45
320-17376-3	DW-29FB	Water	02/20/16 13:22	02/23/16 09:45
320-17376-4	DW-13	Water	02/20/16 12:56	02/23/16 09:45
320-17376-5	DW-13FB	Water	02/20/16 12:37	02/23/16 09:45
320-17376-6	DW-3	Water	02/20/16 11:56	02/23/16 09:45
320-17376-7	DW-3FB	Water	02/20/16 11:37	02/23/16 09:45
320-17376-8	DW-71	Water	02/20/16 11:26	02/23/16 09:45
320-17376-9	DW-71FB	Water	02/20/16 11:11	02/23/16 09:45
320-17376-10	DW-84	Water	02/20/16 11:01	02/23/16 09:45
320-17376-11	DW-84FB	Water	02/20/16 10:37	02/23/16 09:45
320-17376-12	DW-91	Water	02/20/16 10:26	02/23/16 09:45
320-17376-13	DW-91FB	Water	02/20/16 10:06	02/23/16 09:45
320-17376-14	DUP022016	Water	02/20/16 10:26	02/23/16 09:45

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFCSU_00027	08/19/16	02/19/16	Methanol, Lot Baker 115491	5 mL	LCM2PFHxDA_00003	0.1 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.1 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.1 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.1 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00007	0.1 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.1 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.1 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.1 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.1 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.1 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.1 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00008	0.1 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00010	0.1 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.1 mL	13C2 PFUnA	1 ug/mL
.LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
.LCM8FOSA_00007	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00008	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00010	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC-L1_00018	06/29/16	12/30/15	MeOH/H2O, Lot 90285	5 mL	LCMPFCSU_00024	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_00040	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.: 320-17376-1

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)	0.473 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)	0.478 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_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFCSP_00040	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFCSP_00039	0.5 mL	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)	0.0946 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)	0.0956 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_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(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.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
...LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
...LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
...LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L2_00018	06/29/16	12/30/15	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00024	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_00040	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)	0.946 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

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)	0.956 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_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00040	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFCSP_00039	0.5 mL	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.: 320-17376-1

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)	0.0946 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)	0.0956 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_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(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_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
...LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
...LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L3_00016	06/29/16	12/30/15	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00024	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_00040	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)	4.73 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctandecanoic acid	5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.78 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.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00040	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFCSP_00039	0.5 mL	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)	0.0946 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)	0.0956 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

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_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(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_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
...LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
...LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
...LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L4_00017	06/29/16	12/30/15	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00024	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_00039	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)	18.92 ng/mL
							Perfluorononanoic acid (PFNA)	20 ng/mL
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctandecanoic acid	20 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	19.12 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_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(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_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
..LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L5_00016	06/29/16	12/30/15	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00024	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_00039	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)	47.3 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.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	47.8 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_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(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_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
..LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L6_00015	06/29/16	12/30/15	MeOH/H2O, Lot 090285	2 mL	LCMPFCSU_00024	100 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.: 320-17376-1

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_00039	400 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)	189.2 ng/mL
							Perfluorononanoic acid (PFNA)	200 ng/mL
							Perfluorooctanoic acid (PFOA)	200 ng/mL
							Perfluorooctandecanoic acid	200 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	191.2 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_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(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_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
..LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L7_00015	06/29/16	12/30/15	MeOH/H2O, Lot 090285	2 mL	LCMPFCSU_00024	100 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_00039	800 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)	378.4 ng/mL
							Perfluorononanoic acid (PFNA)	400 ng/mL
							Perfluorooctanoic acid (PFOA)	400 ng/mL
							Perfluorooctandecanoic acid	400 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	382.4 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_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(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_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
..LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFCIC_00014	03/15/16	09/15/15	MeOH/H2O, Lot 09285	5 mL	LCMPFCSU_00018	250 uL	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_00006	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_00018	03/15/16	09/15/15	Methanol, Lot Fisher 153635	10 mL	LCM2PFTeDA_00002	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00002	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00003	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00003	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00005	0.2 mL	13C2 PFDA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFDoA_00003	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00006	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00003	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00007	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00004	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFTeDA_00002	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00002	12/10/18	Wellington Laboratories, Lot M4PFHpA1213			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00003	03/21/18	Wellington Laboratories, Lot M5PFPeA0313			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00003	01/22/18	Wellington Laboratories, Lot MPFBA0113			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00005	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00003	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00006	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00003	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00007	10/09/19	Wellington Laboratories, Lot MPFOS1014			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00004	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFACMXB_00006	01/08/18	Wellington Laboratories, Lot PFACMXB0312			(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_00041	08/11/16	02/11/16	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00003	0.1 mL	Perfluorobutane Sulfonate	0.884 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDoS_00003	0.1 mL	PFDoS (Perflouro-1-dodecanesulfonate)	0.968 ug/mL
					LCPFDS_00003	0.1 mL	Perfluorodecane Sulfonate	0.964 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00005	0.1 mL	Perfluoroheptane Sulfonate	0.952 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS_00003	0.1 mL	Perfluorohexane Sulfonate	0.946 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00002	0.1 mL	PFNS (Perflouro-1-nonanesulfonate)	0.96 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFPeS_00002	0.1 mL	PFPeS (Perflouro-1-pentanesulfonate)	0.938 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
.LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(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_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
.LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
.LCPFDoS_00003	10/06/16	Wellington Laboratories, Lot LPFDoS1011			(Purchased Reagent)		PFDoS (Perflouro-1-dodecanesulfonate)	48.4 ug/mL
.LCPFDS_00003	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
.LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
.LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpS_00005	01/28/19	Wellington Laboratories, Lot LPFHpS0114			(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
.LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
.LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
.LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS_00003	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexane Sulfonate	47.3 ug/mL
.LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
.LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(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_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
.LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
.LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
.LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(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_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
.LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL

Reagent

LCM2PFHxDA_00003

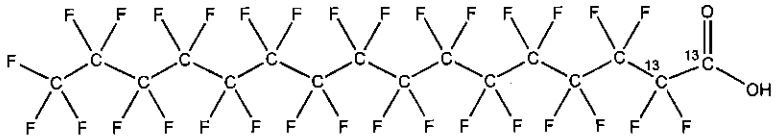
r: 12/9/15 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFHxDA
LOT NUMBER: M2PFHxDA1112
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid

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) 11/29/2012
EXPIRY DATE: (mm/dd/yyyy) 11/29/2017
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.
- 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: _____ **Date:** 04/01/2015 (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

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:

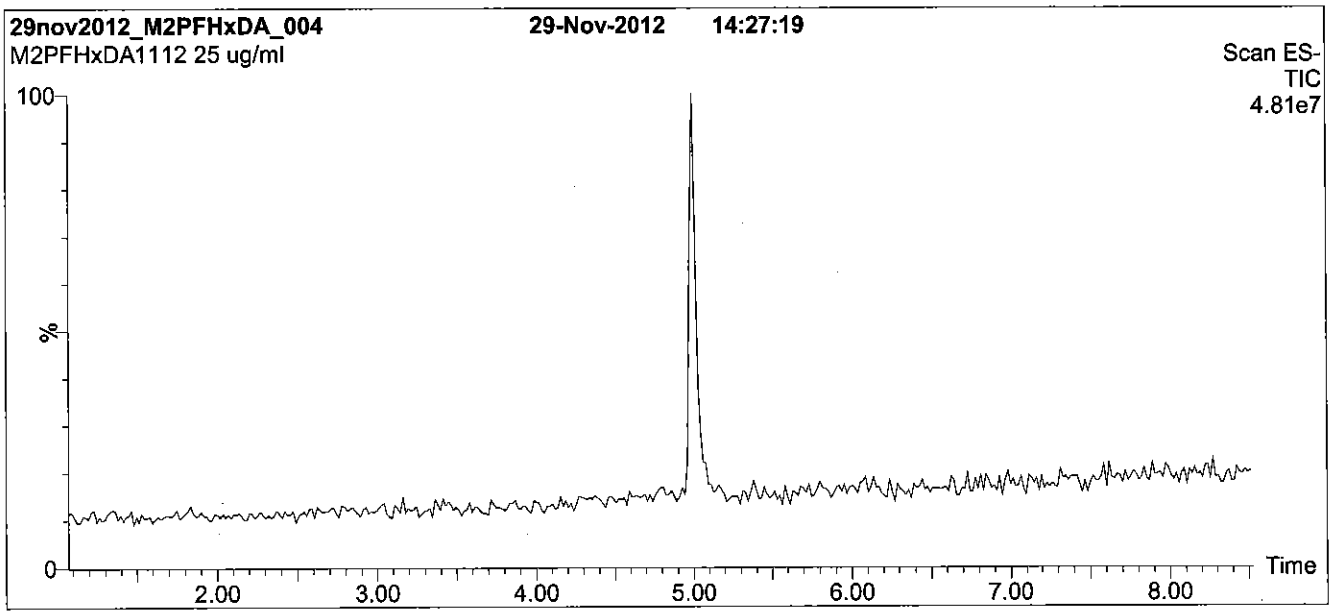
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

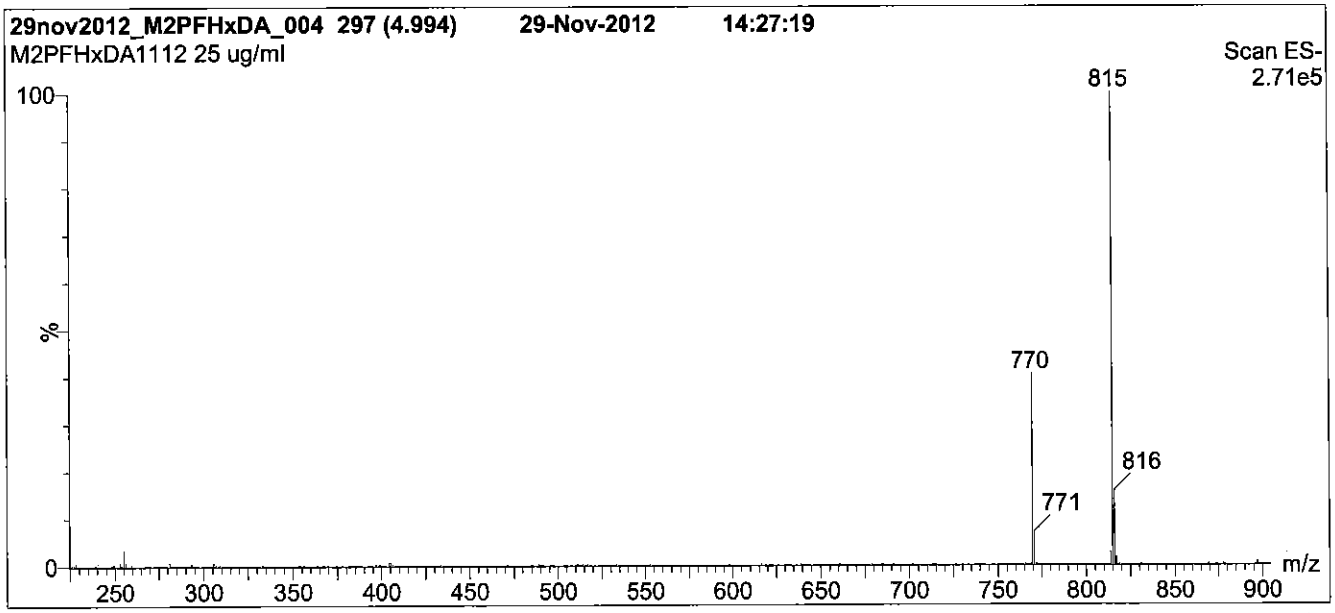
CALA Testing Accreditation No. A 1226

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

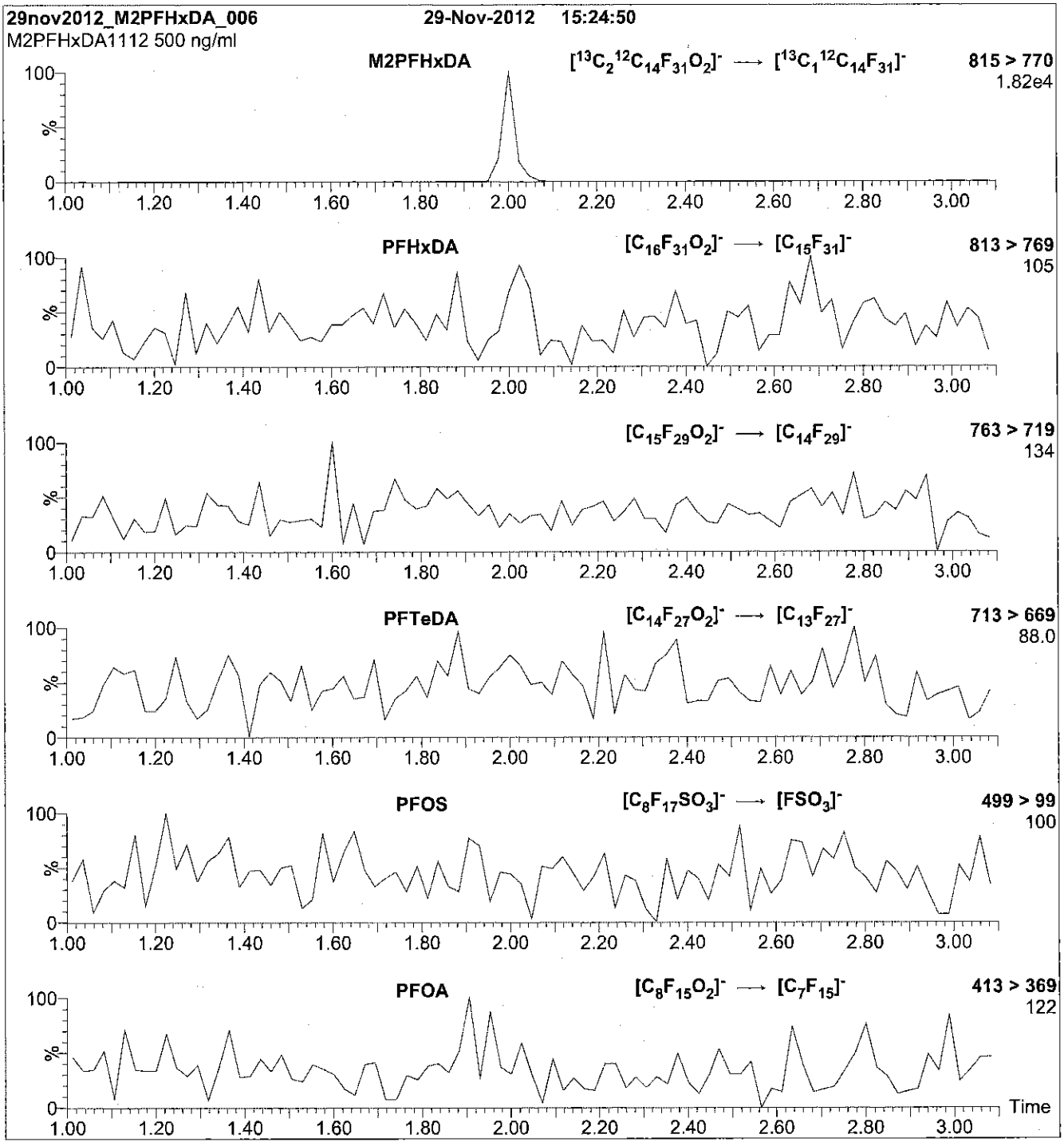
Flow: 300 µl/min

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_00002

Rec: 8/14/14 SKV

Scanned: 8/18/14 SK

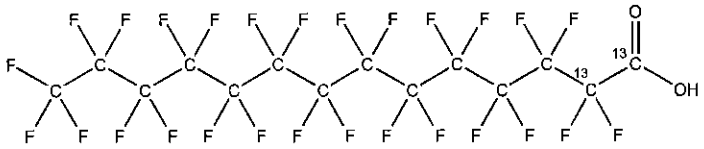
318142
ID: LCM2PFTeDA_00002
Exp: 11/29/17 Prpd: SKV
13C2-PFTeDA at 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFTeDA
LOT NUMBER: M2PFTeDA1112
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)	11/29/2012		
EXPIRY DATE: (mm/dd/yyyy)	11/29/2017		
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.
- 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:** 01/10/2013 (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).

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:

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 $x_1, x_2, \ldots x_n$ 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 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:

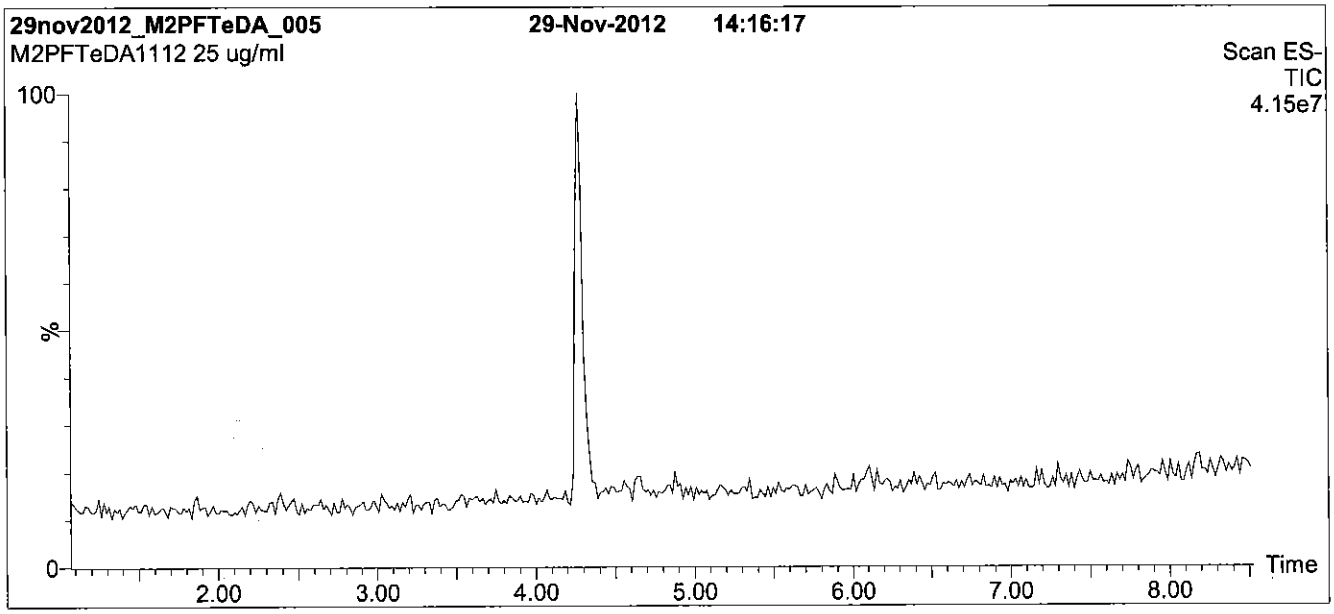
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

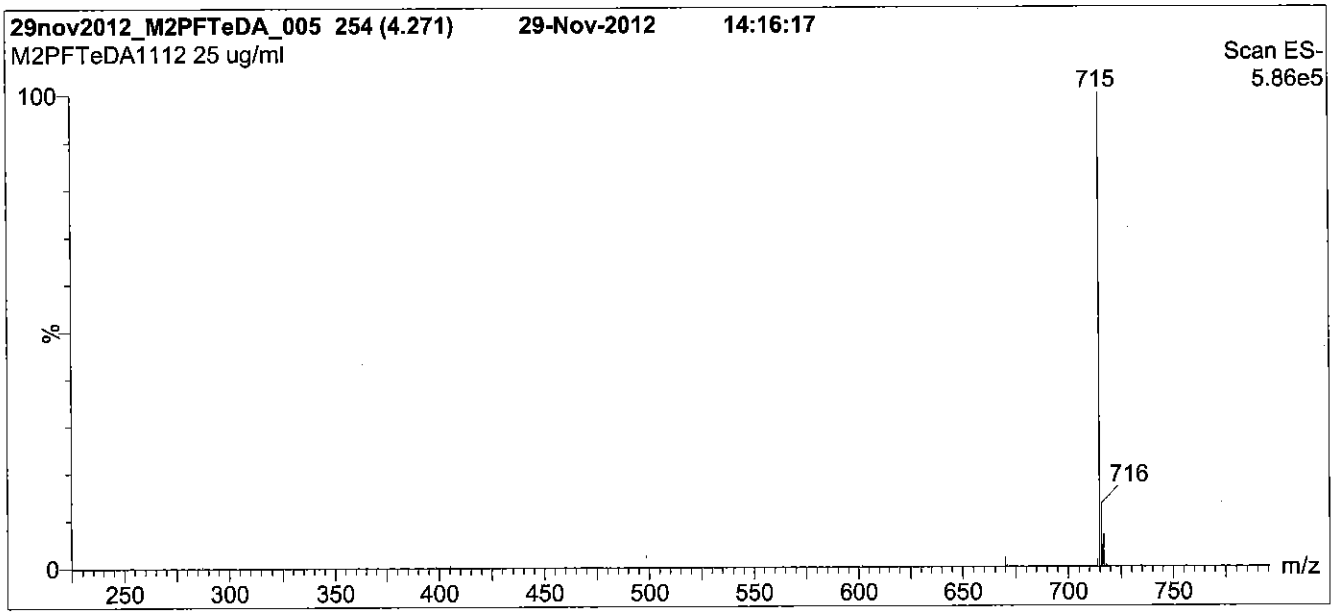
CALA Testing Accreditation No. A1226

ACLASS 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: **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: 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

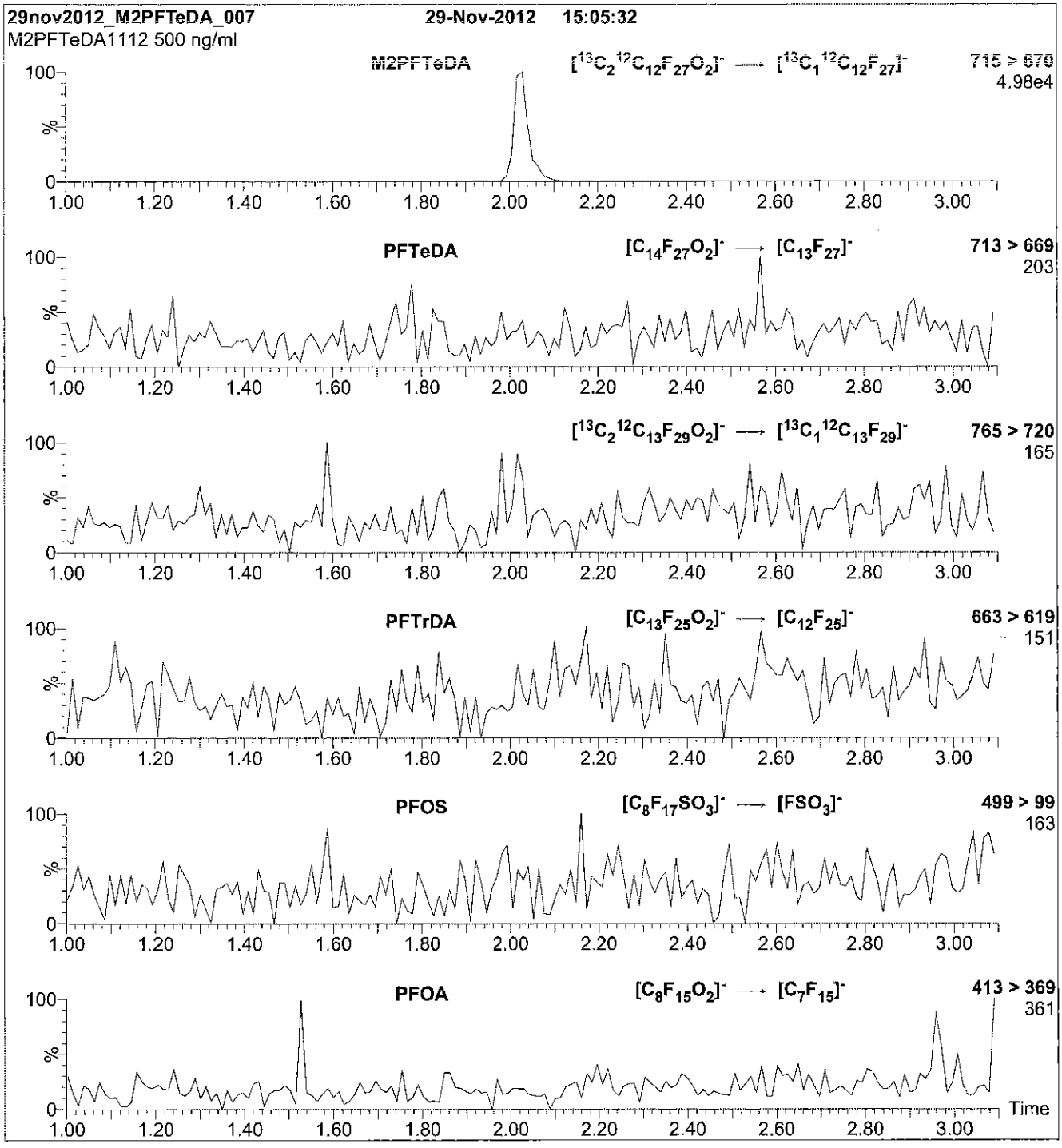
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 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) = 3.66e-3
Collision Energy (eV) = 14

Reagent

LCM2PFTeDA_00003

WELLINGTON LABORATORIES

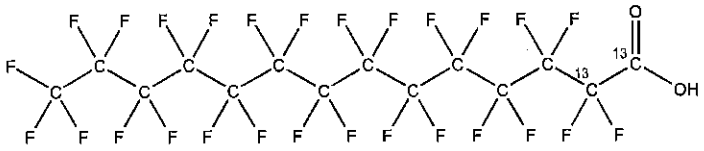
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFTeDA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid

LOT NUMBER: M2PFTeDA1112

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)	11/29/2012		
EXPIRY DATE: (mm/dd/yyyy)	11/29/2017		
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.
- 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:

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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:

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:

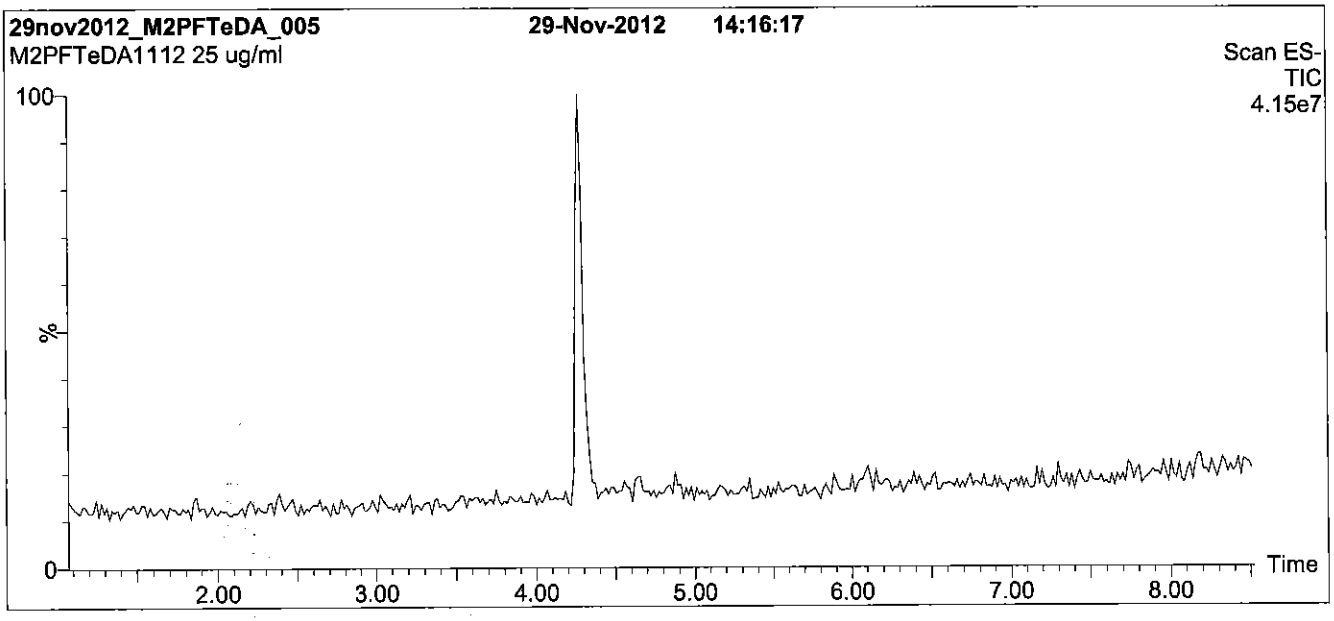
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

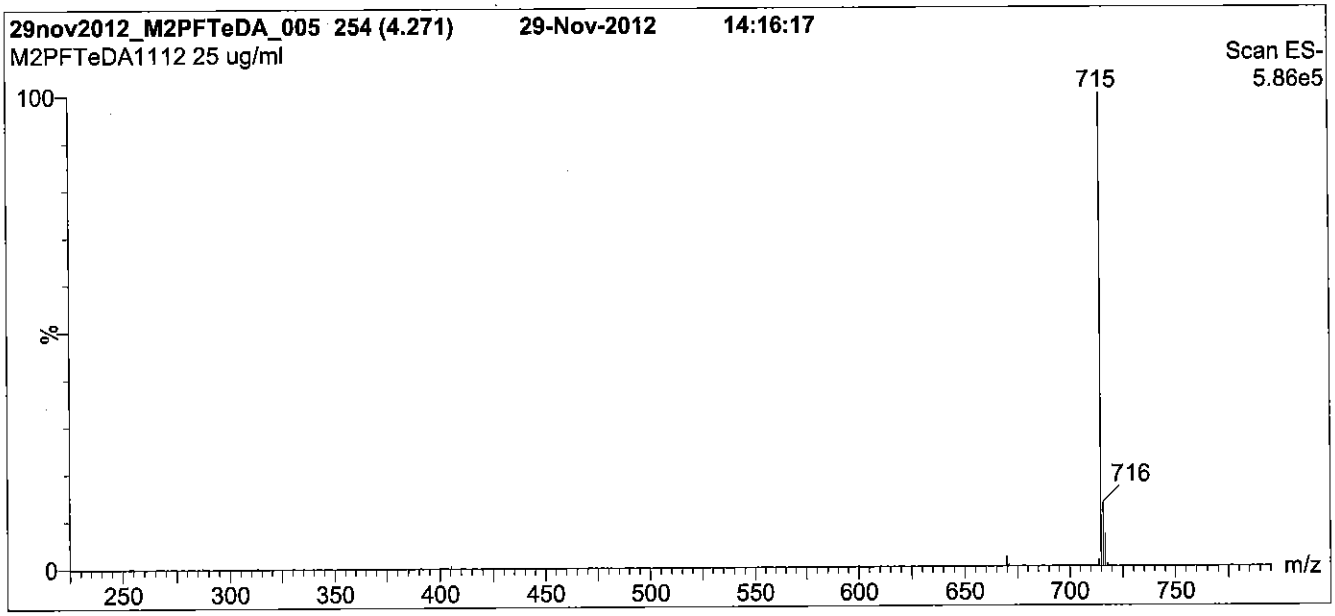
CALA Testing Accreditation No. A 1226

ANAB ACCREDITED 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: **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: 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

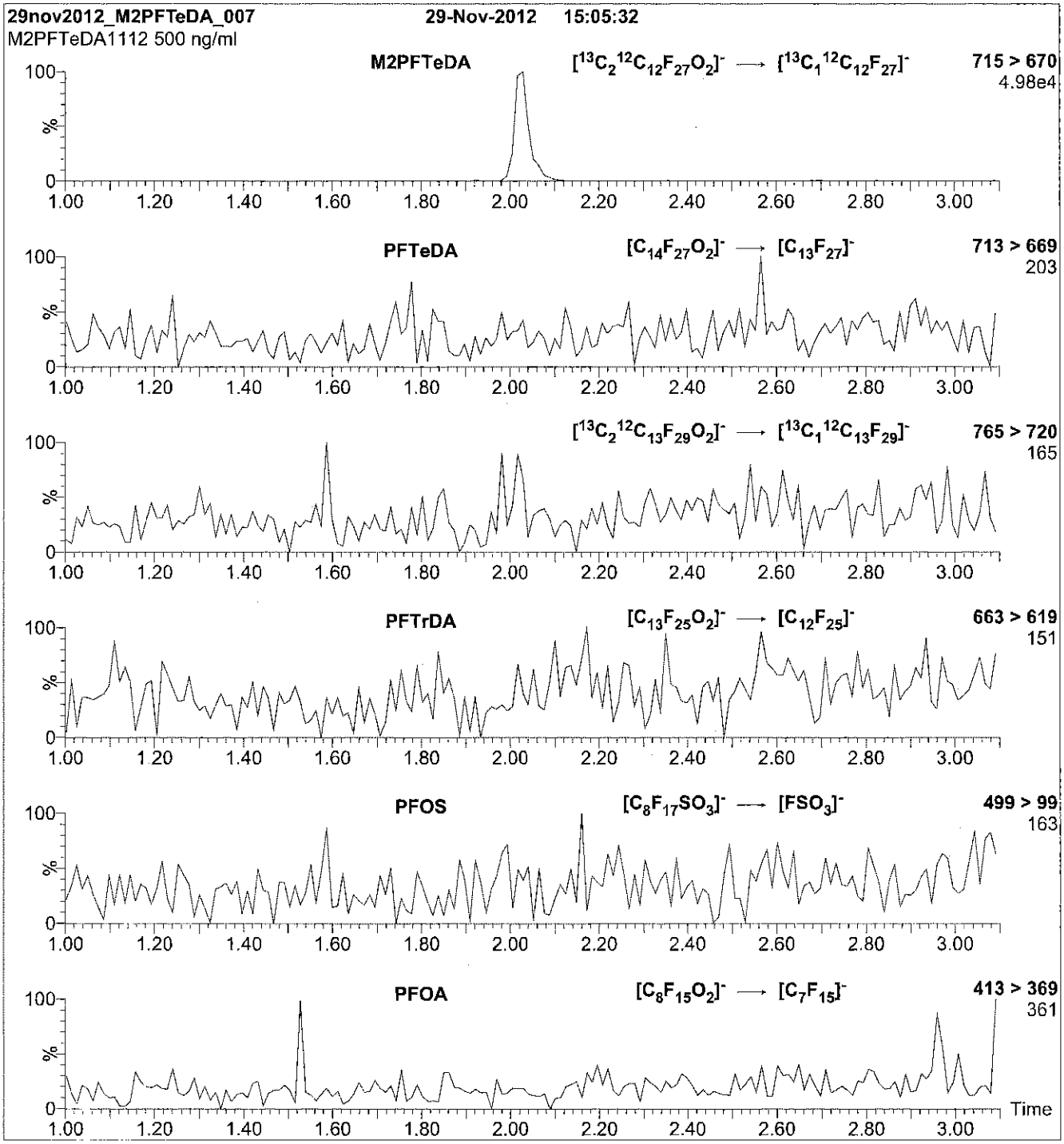
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 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) = 3.66e-3
Collision Energy (eV) = 14

Reagent

LCM4PFHPA_00002

Scanned 8/18/14 SKV
Rec: 8/14/14 SKV
Scanned 8/18/14 SKV

318185
ID: LCM4PFHPA_00002
Exp: 12/10/18 Prpd: SKV
13C4-Perfluoroheptanoic a

WELLINGTON LABORATORIES

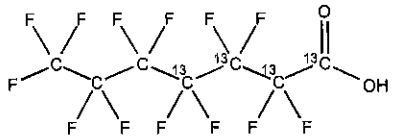
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: M4PFHpA1213

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)	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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/11/2013 (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).

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.

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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:

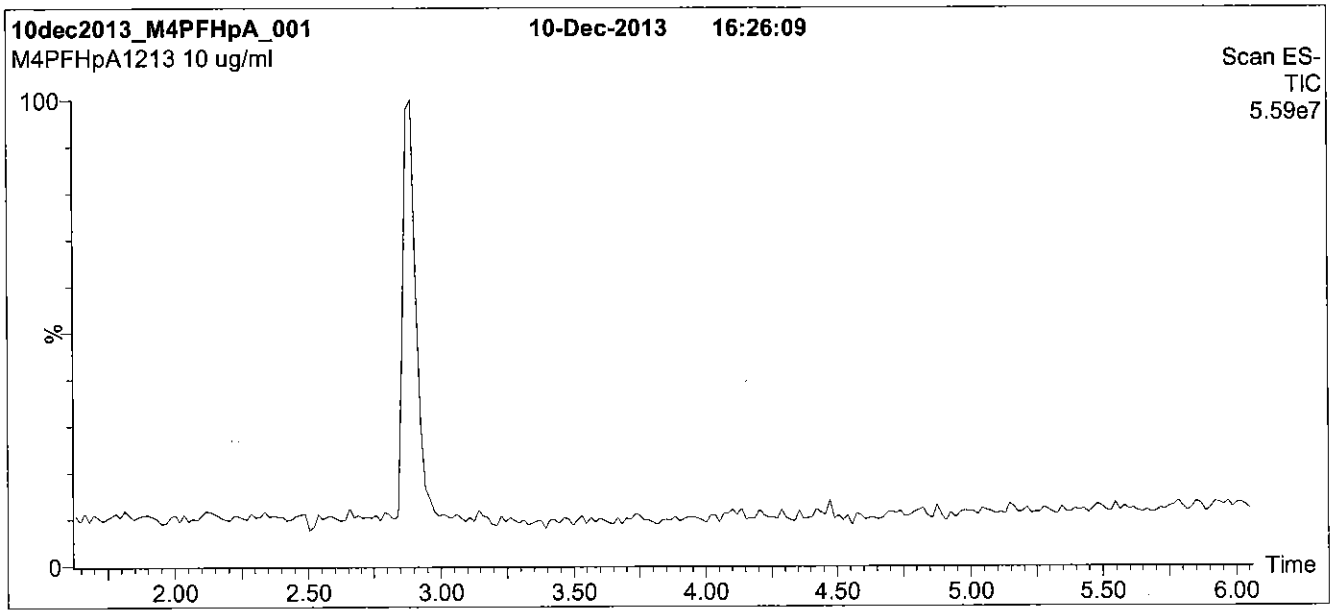
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

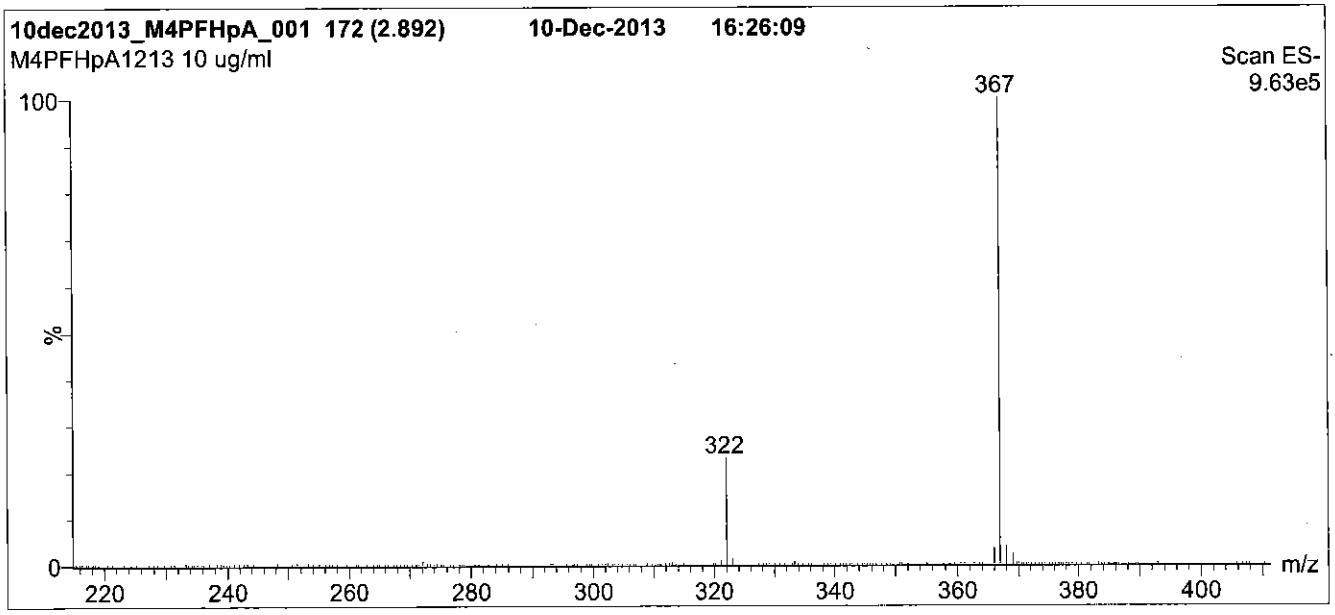
CALA Testing Accreditation No. A1226

ACLASS 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: **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: 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 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

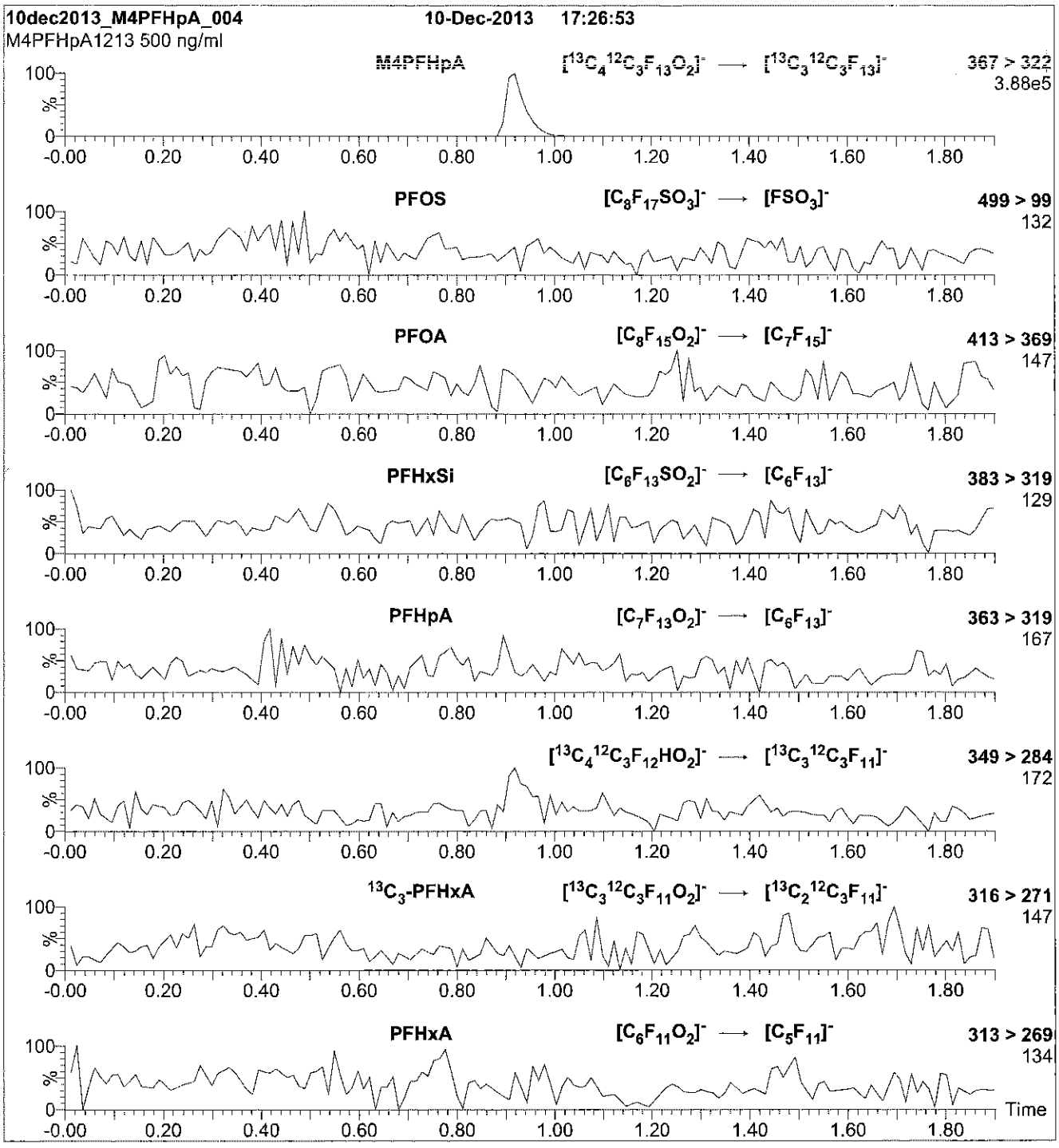
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (215 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 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) = 3.39e-3
Collision Energy (eV) = 11

Reagent

LCM4PFHPA_00003

r: 11/10/15 SRV

WELLINGTON LABORATORIES

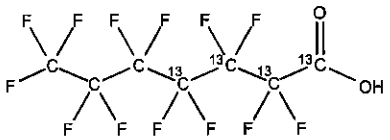
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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)
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ADDITIONAL INFORMATION:

- See page 2 for further details.
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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

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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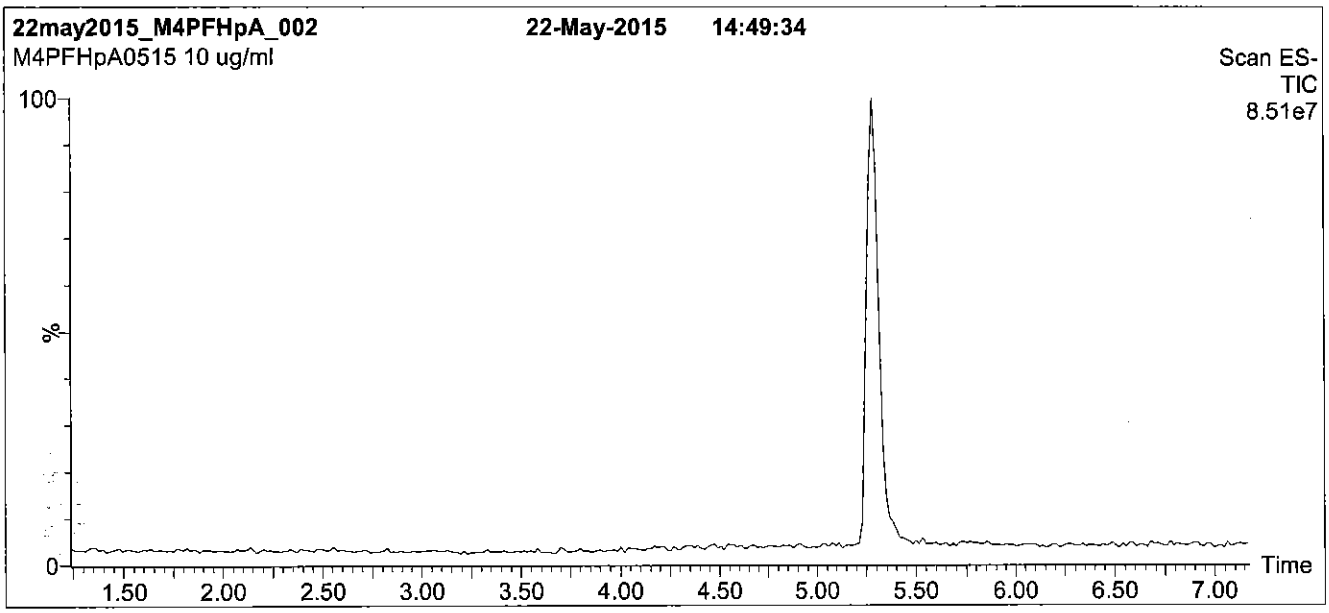
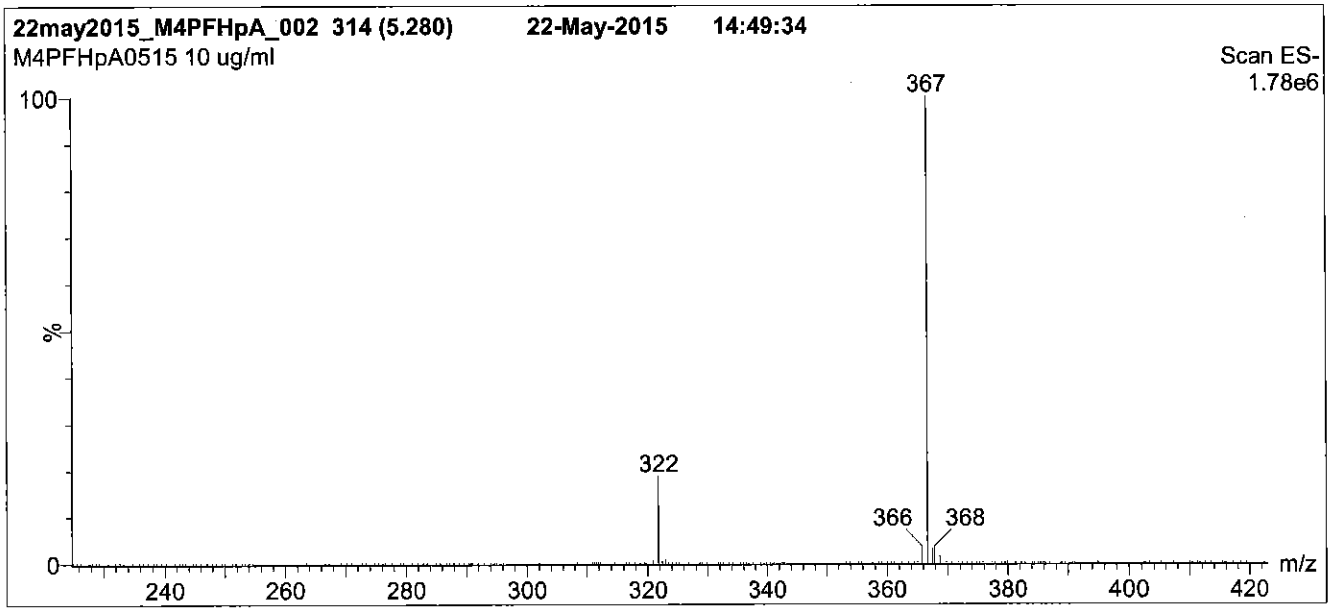
Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





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

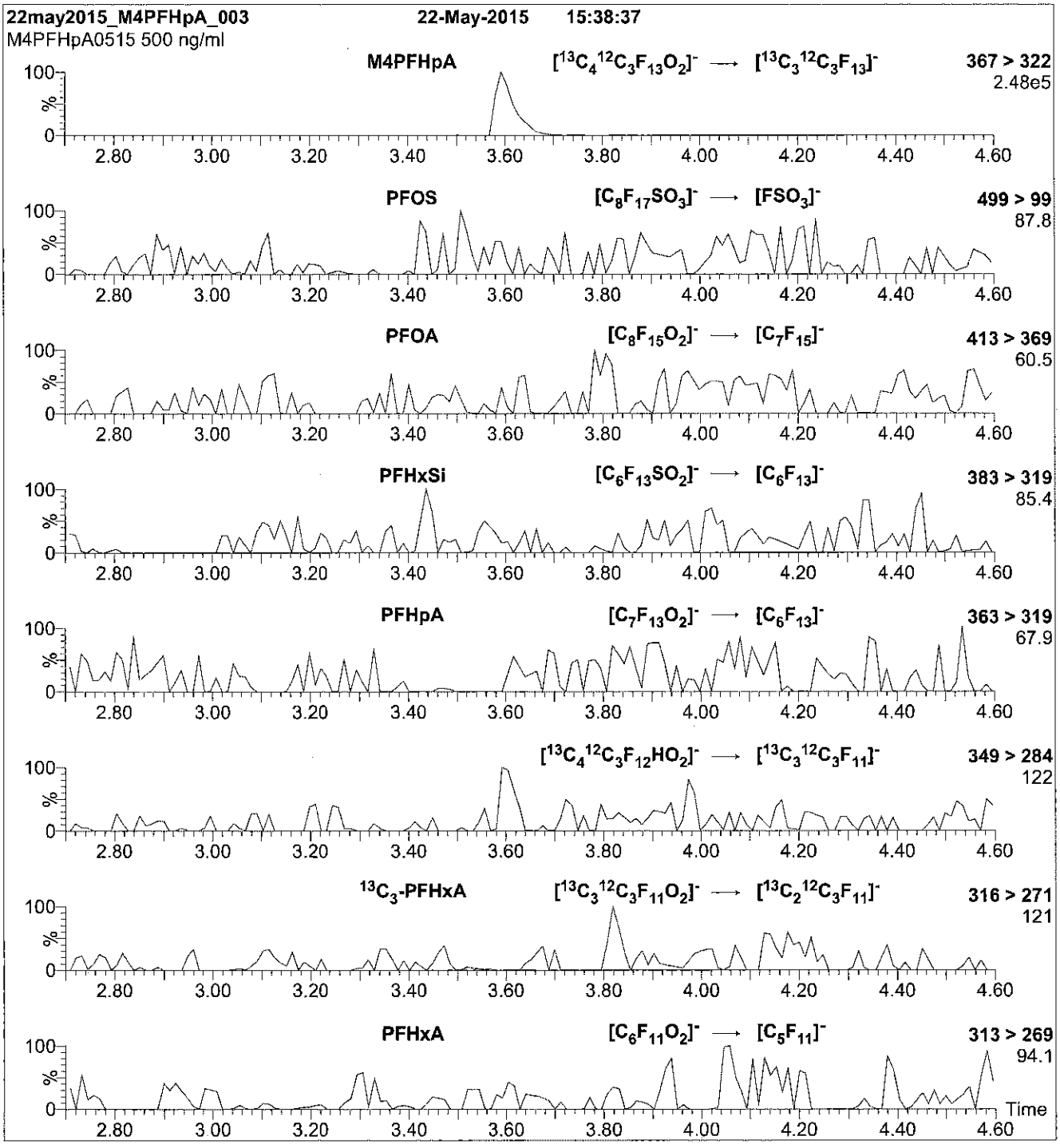
Flow: 300 µl/min

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_00003

Rec 5/14/14 SFV

WELLINGTON LABORATORIES

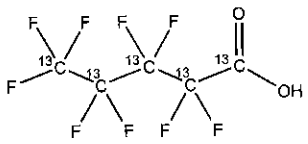
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M5PFPeA
COMPOUND: Perfluoro-n-[$^{13}C_5$]pentanoic acid

LOT NUMBER: M5PFPeA0313

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_5HF_9O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 269.01
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 03/21/2013
EXPIRY DATE: (mm/dd/yyyy) 03/21/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C ($^{13}C_5$)

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: B.G. Chittim **Date:** 03/26/2013 (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

Form#:27, Issued 2004-11-10
Revision#:2, Revised 2012-06-13

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:

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 $x_1, x_2, \ldots x_n$ 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 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:

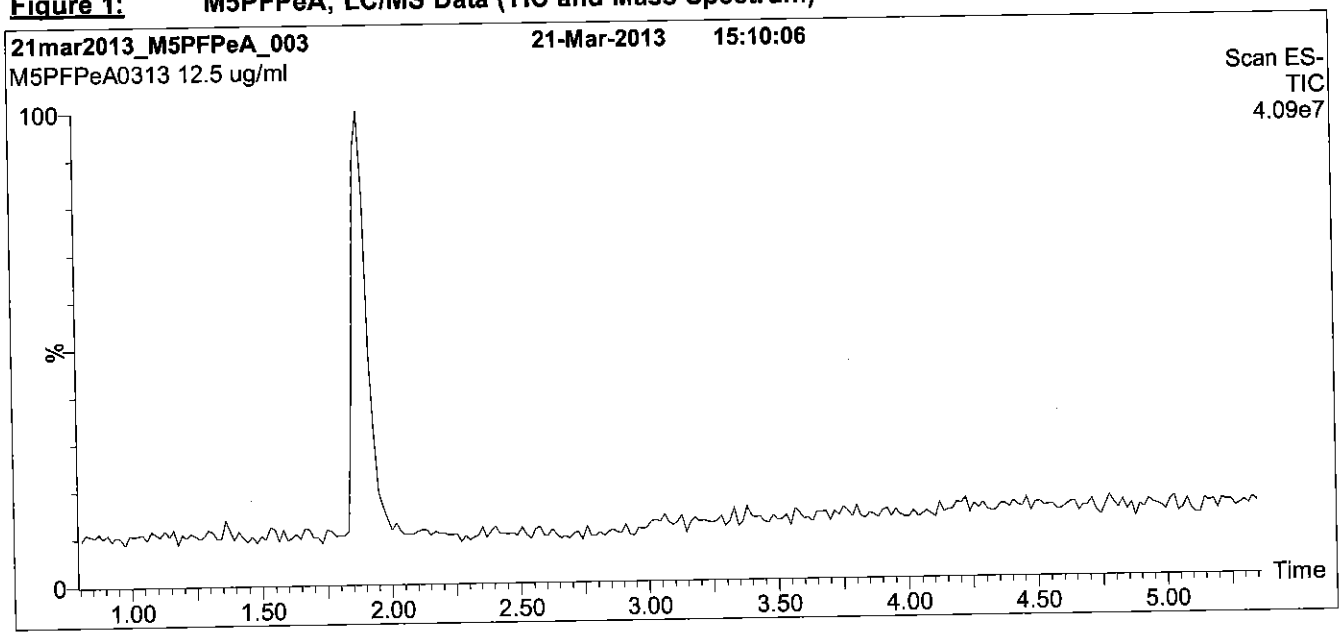
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

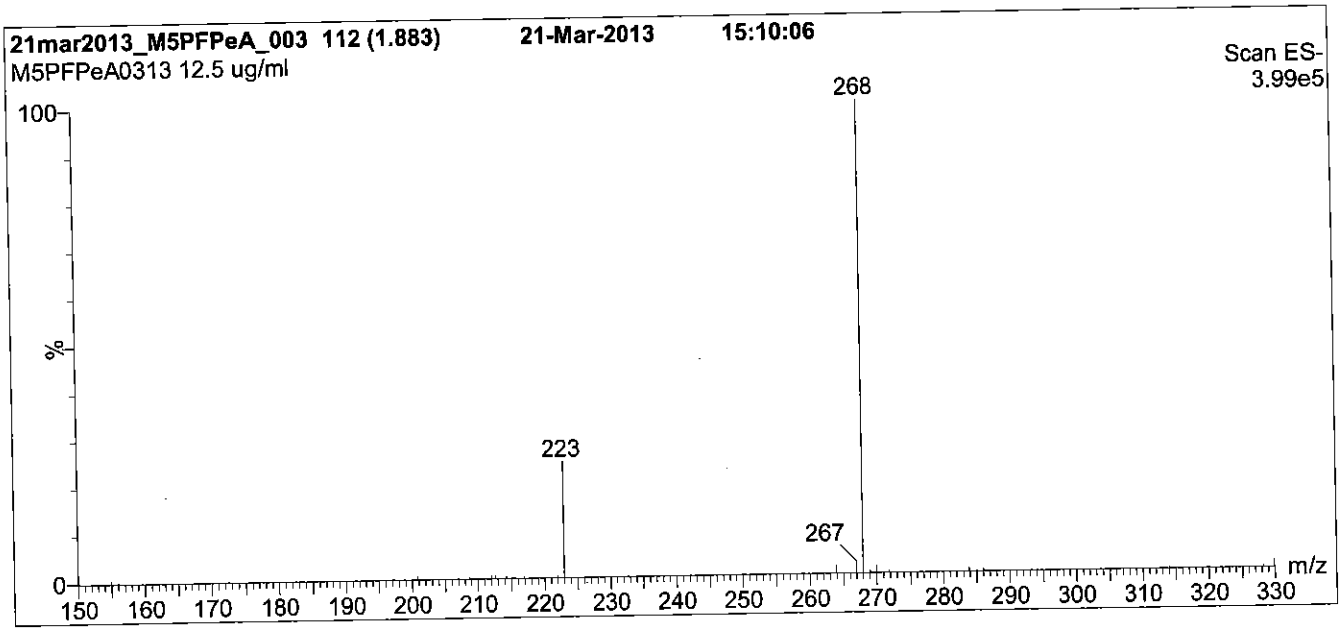
CALA Testing Accreditation No. A1226

ACLASS 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: **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
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

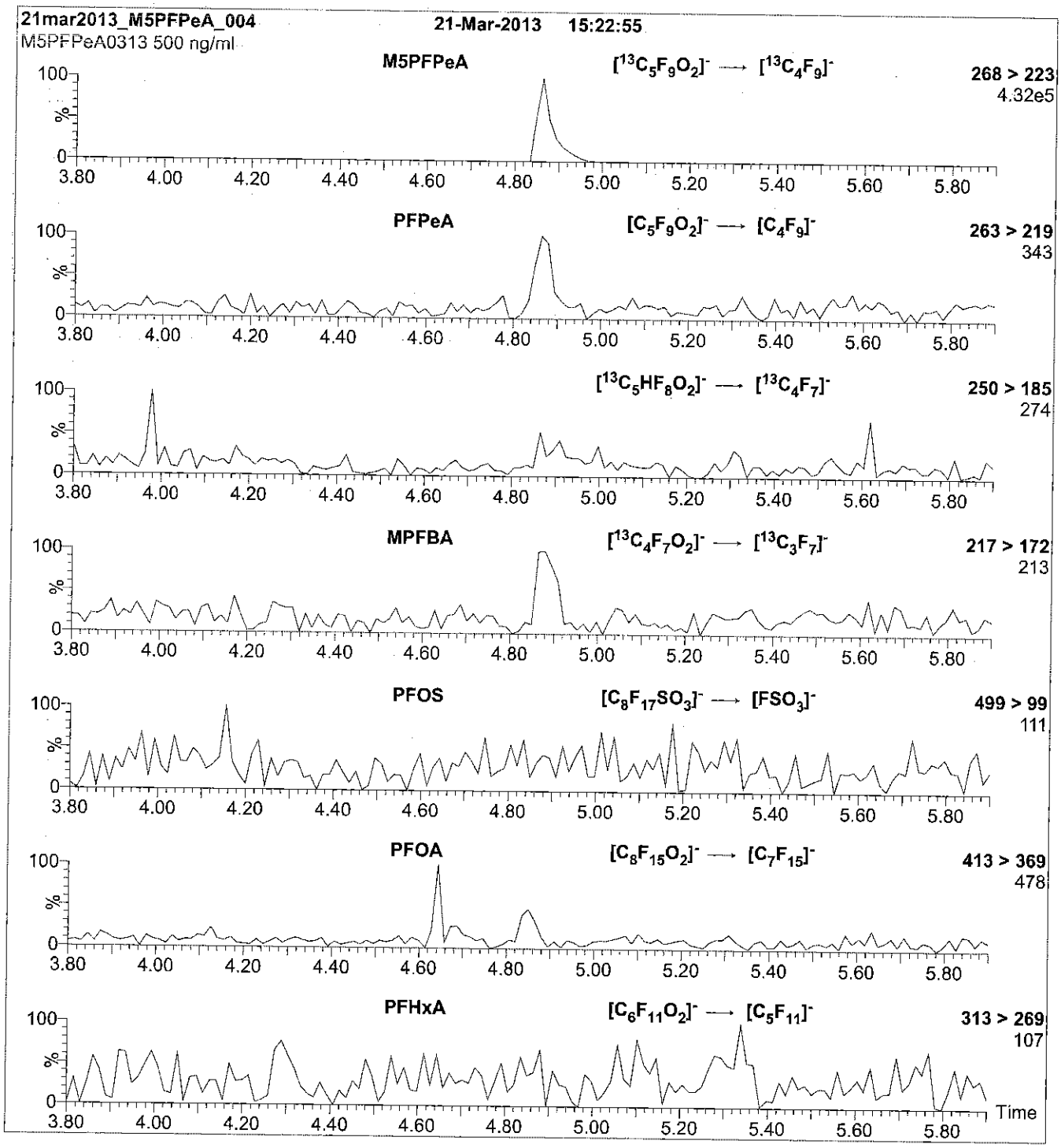
Flow: 300 µl/min

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) = 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 60% (80:20 MeOH:ACN) / 40% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 9

Reagent

LCM5PFPEA_00004

V1 11/10/15 SRA

WELLINGTON LABORATORIES

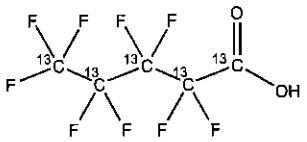
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M5PFPeA
COMPOUND: Perfluoro-n-[$^{13}C_5$]pentanoic acid

LOT NUMBER: M5PFPeA0515

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: 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:

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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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:

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

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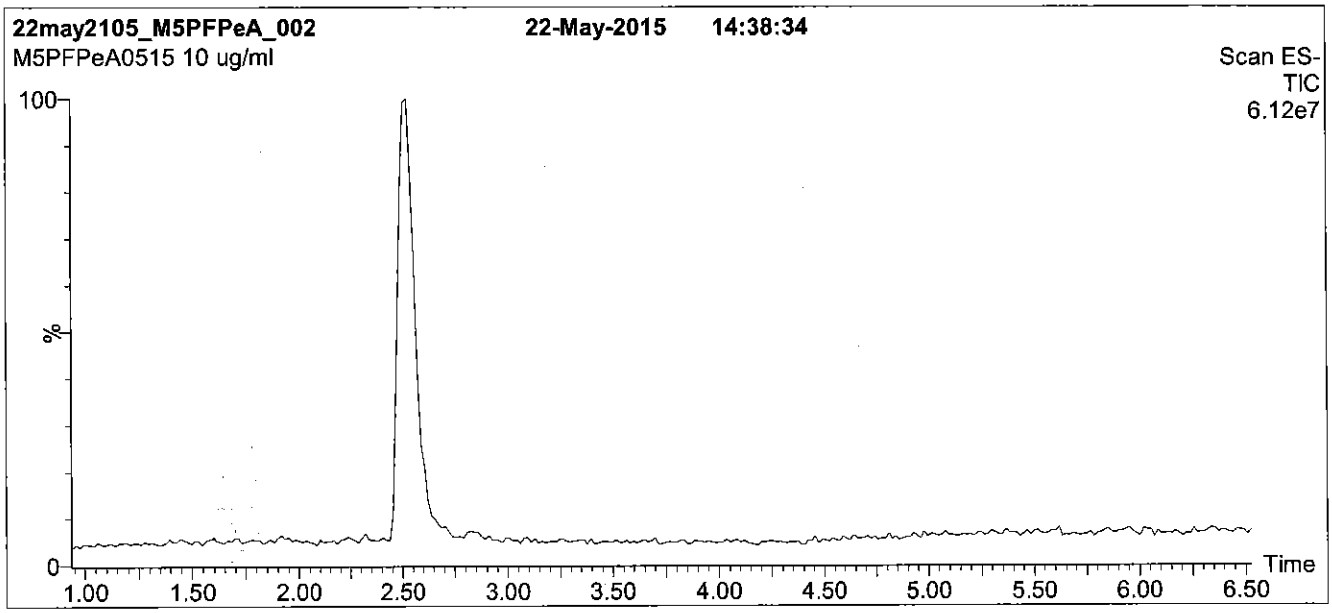
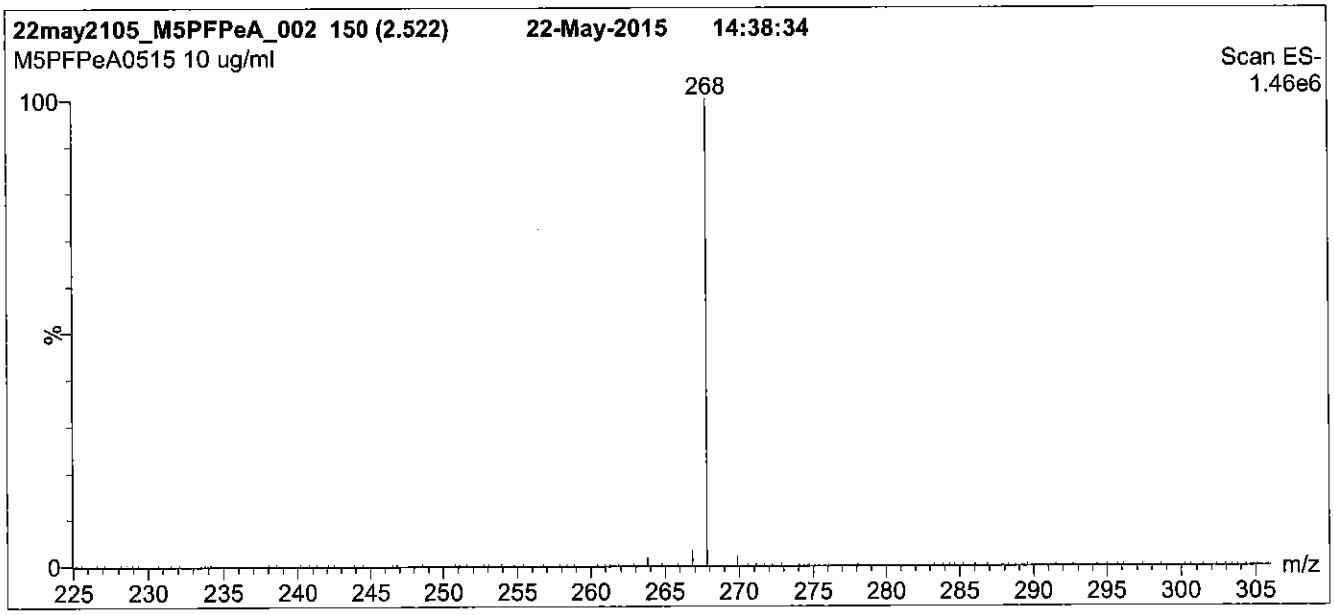
Figure 1: **M5PFPeA; LC/MS Data (TIC and Mass Spectrum)**





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

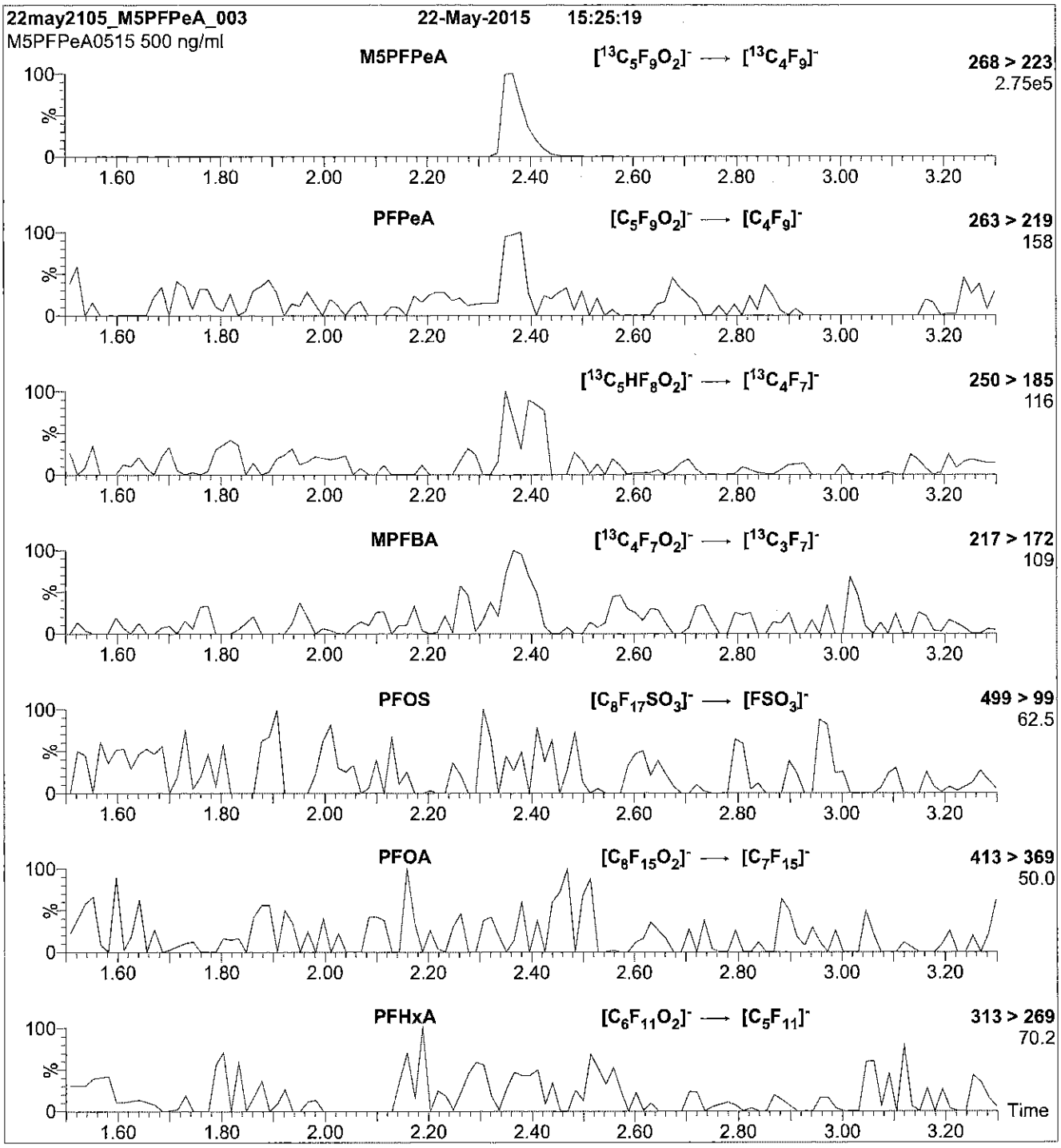
Flow: 300 µl/min

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_00006

Rec: 9/15/15 SV

WELLINGTON LABORATORIES

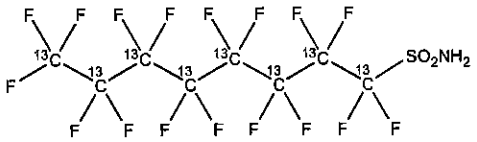
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: M8FOSA1214I

CAS #: Not available

STRUCTURE:



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)	12/15/2014		
EXPIRY DATE: (mm/dd/yyyy)	12/15/2016		
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:** 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

Form#:27, Issued 2004-11-10
Revision#:3, Revised 2015-03-24

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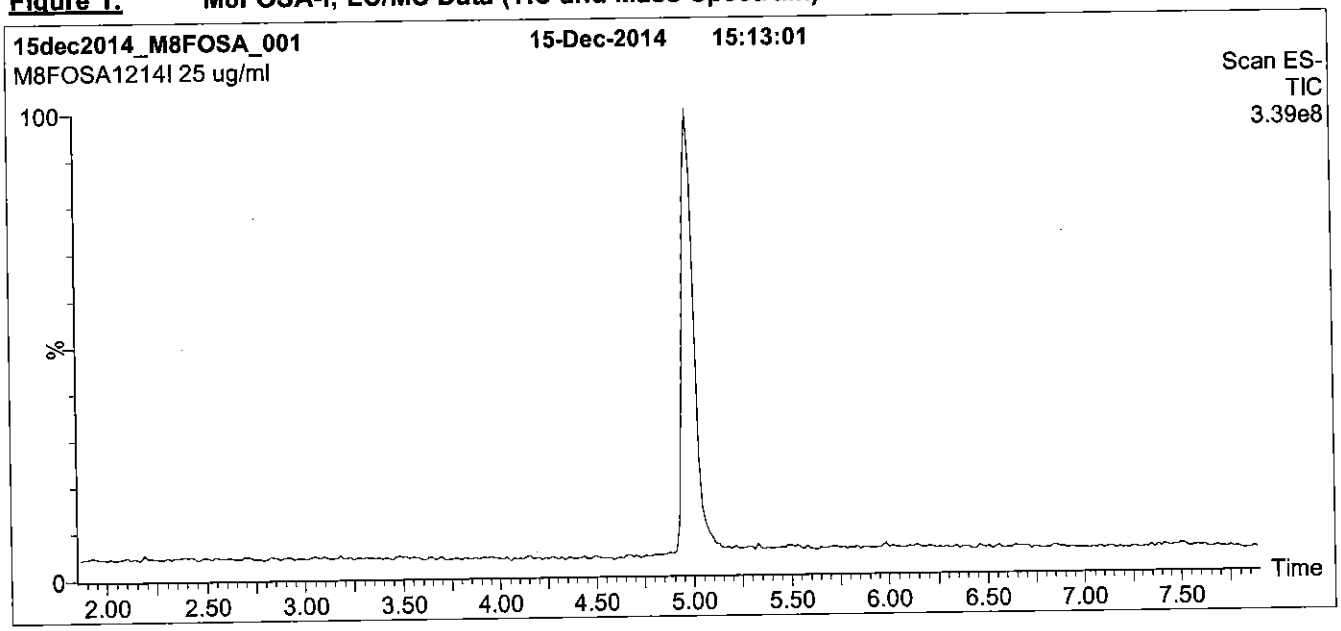
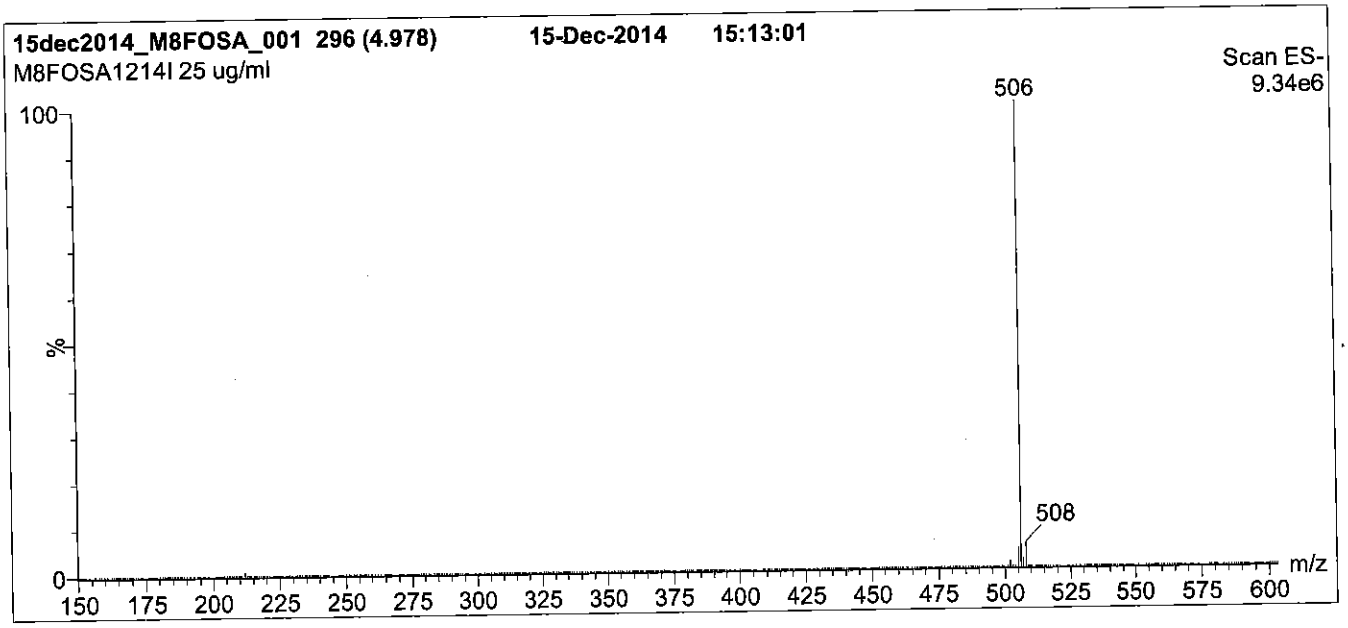
CALA Testing Accreditation No. A1226

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





Condltions for Figure 1:

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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 7.5 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

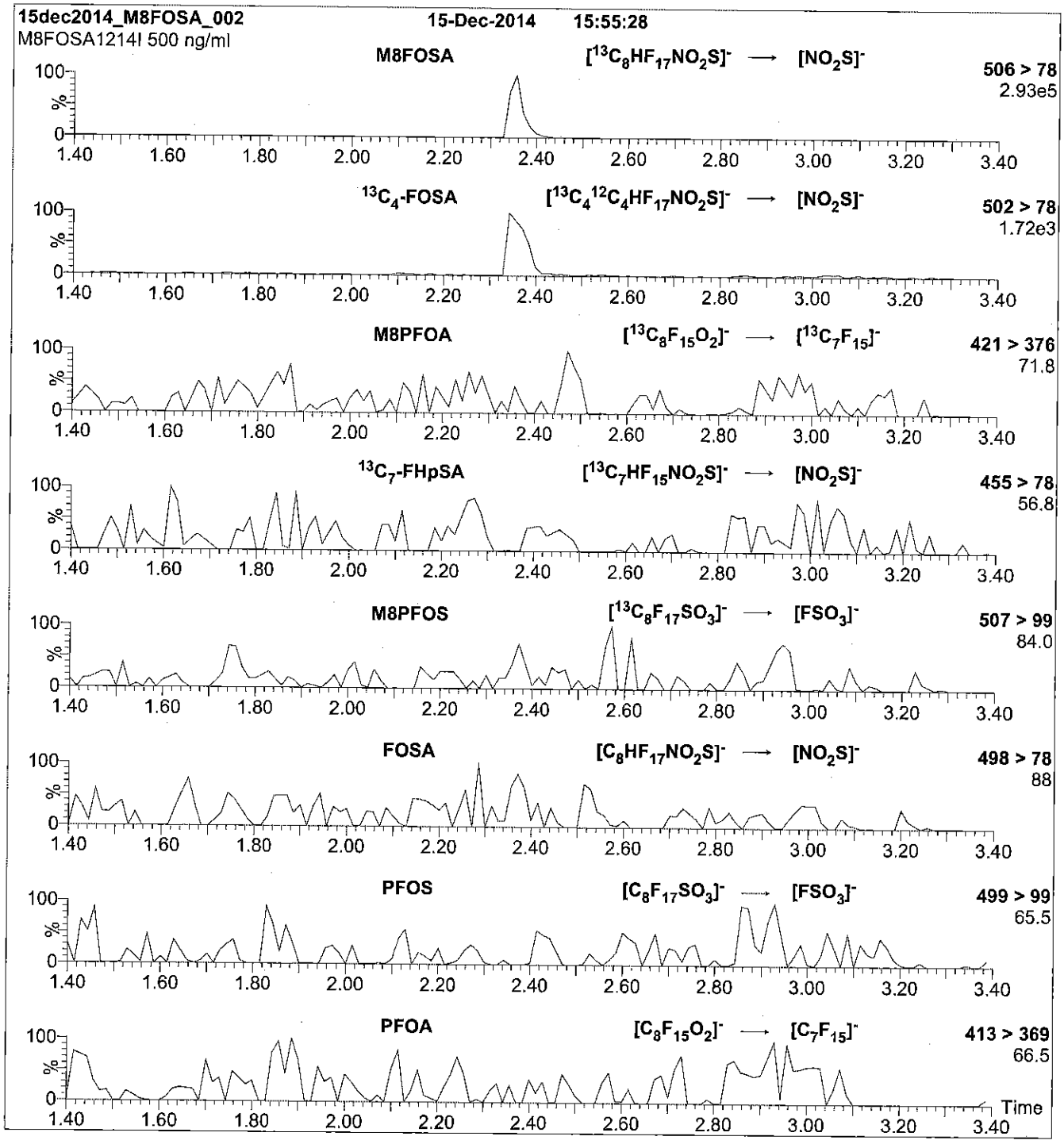
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
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) = 3.31e-3
Collision Energy (eV) = 30

Reagent

LCM8FOSA_00007

572887
ID: LCM8FOSA_00007
Exp. 12/15/16 Prpd: CBW
13C8-Perfluorooctanesulfo

R: 1/25/16
S:

WELLINGTON LABORATORIES

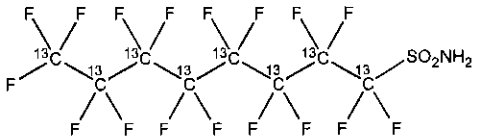
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: M8FOSA1214I

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)	12/15/2014		
EXPIRY DATE: (mm/dd/yyyy)	12/15/2016		
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:** 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.

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:

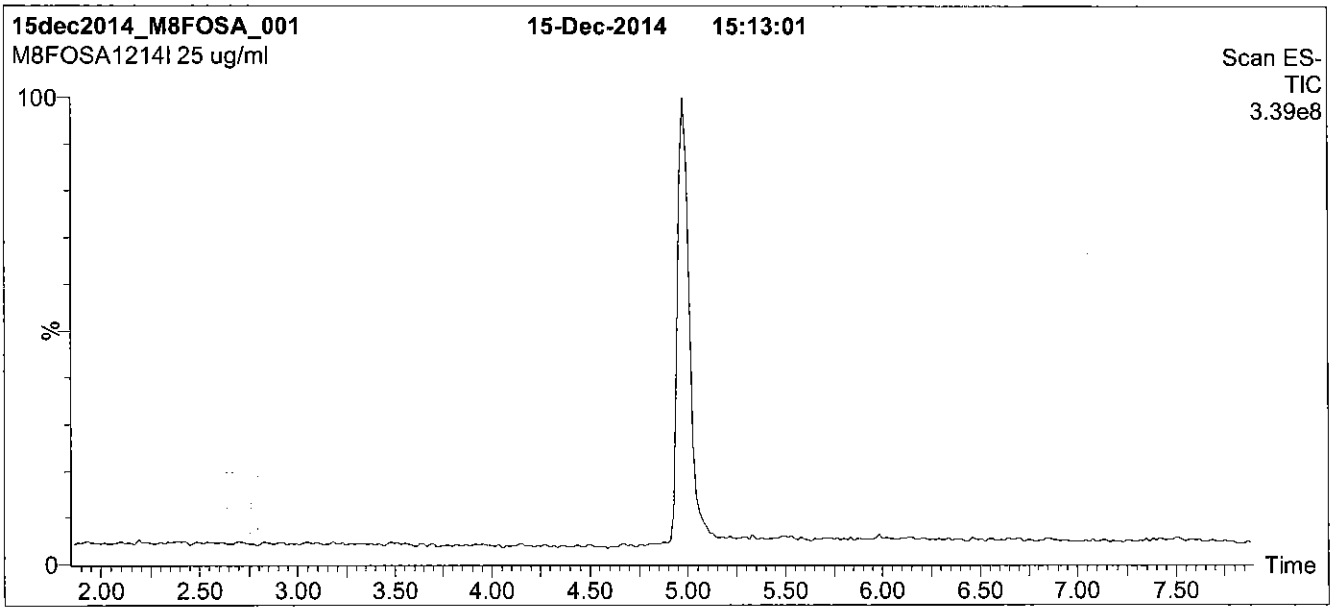
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

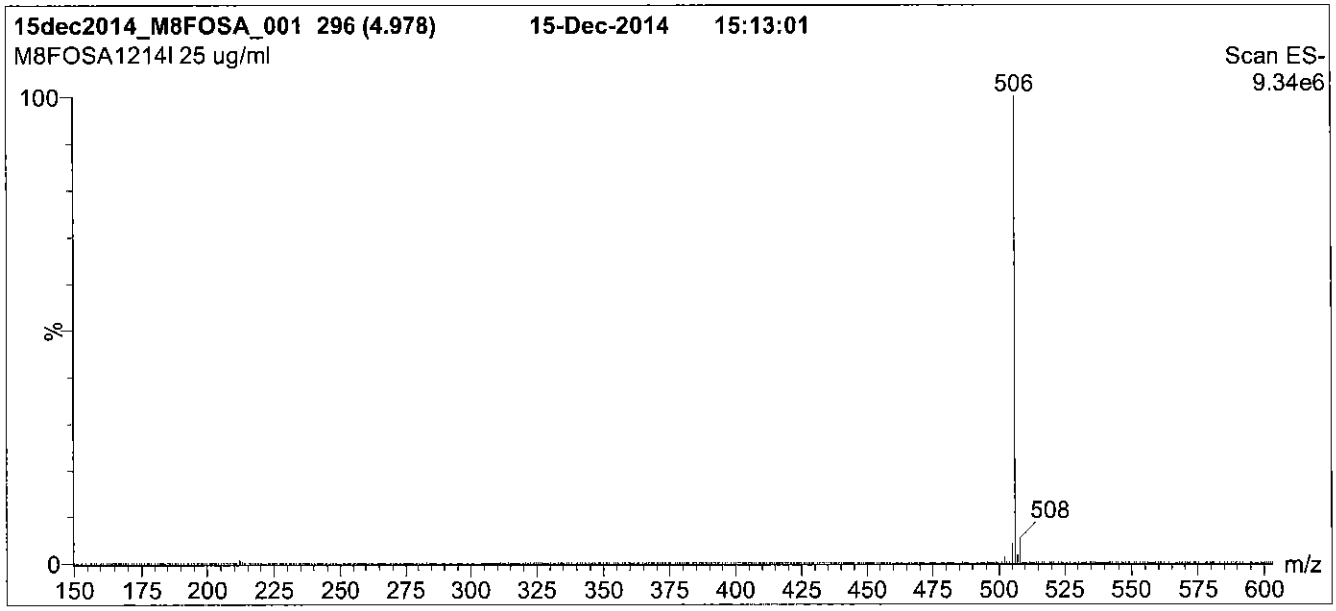
CALA Testing Accreditation No. A 1226

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: 55% (80:20 MeOH:ACN) / 45% 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

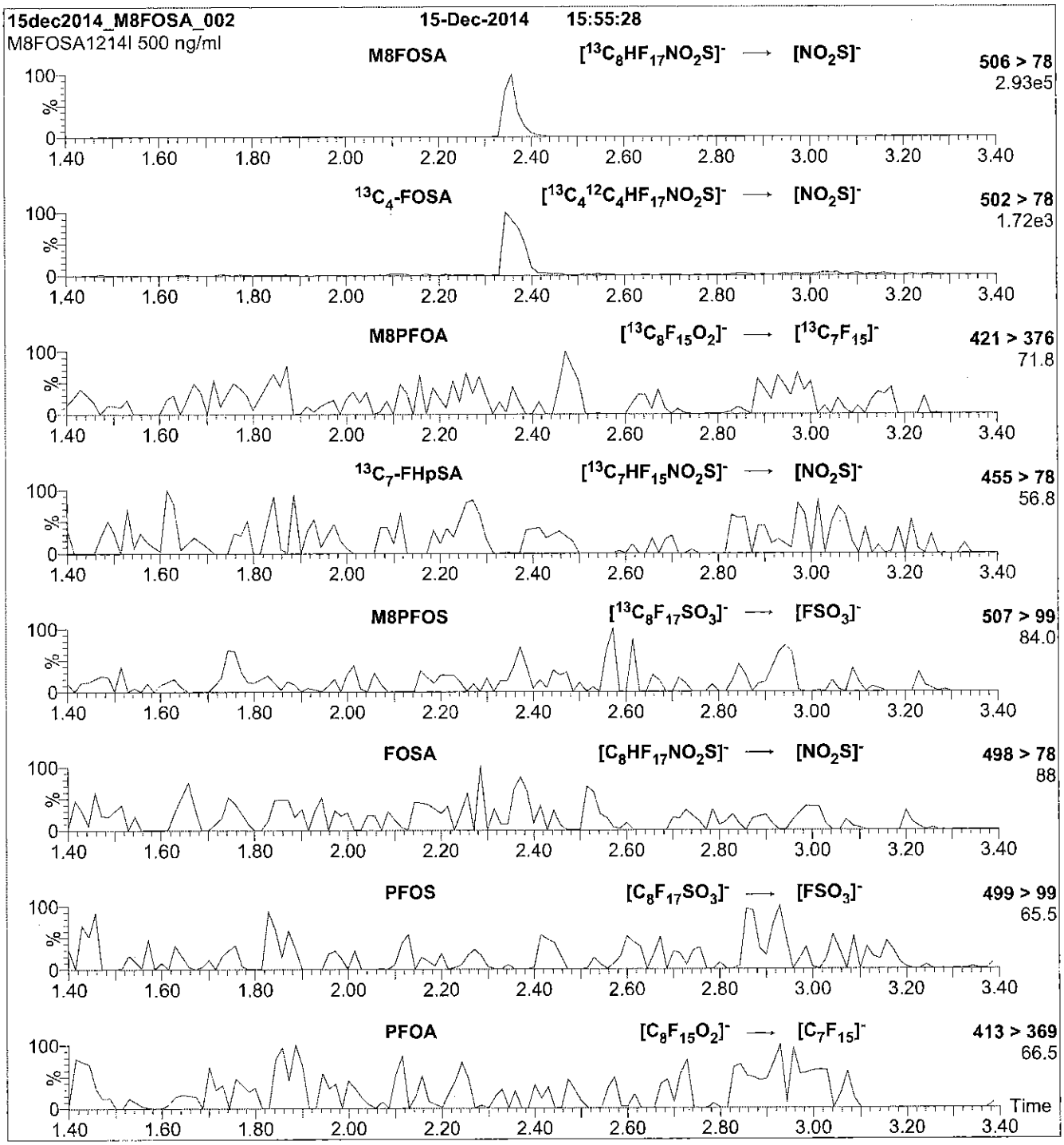
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
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) = 3.31e-3
Collision Energy (eV) = 30

Reagent

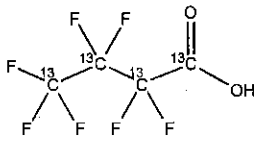
LCMPFBA_00003

V: 2/11/15 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFBA
LOT NUMBER: MPFBA0113
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) 01/22/2013
EXPIRY DATE: (mm/dd/yyyy) 01/22/2018
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/28/2013 (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).

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:

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 $x_1, x_2, \ldots x_n$ 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 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:

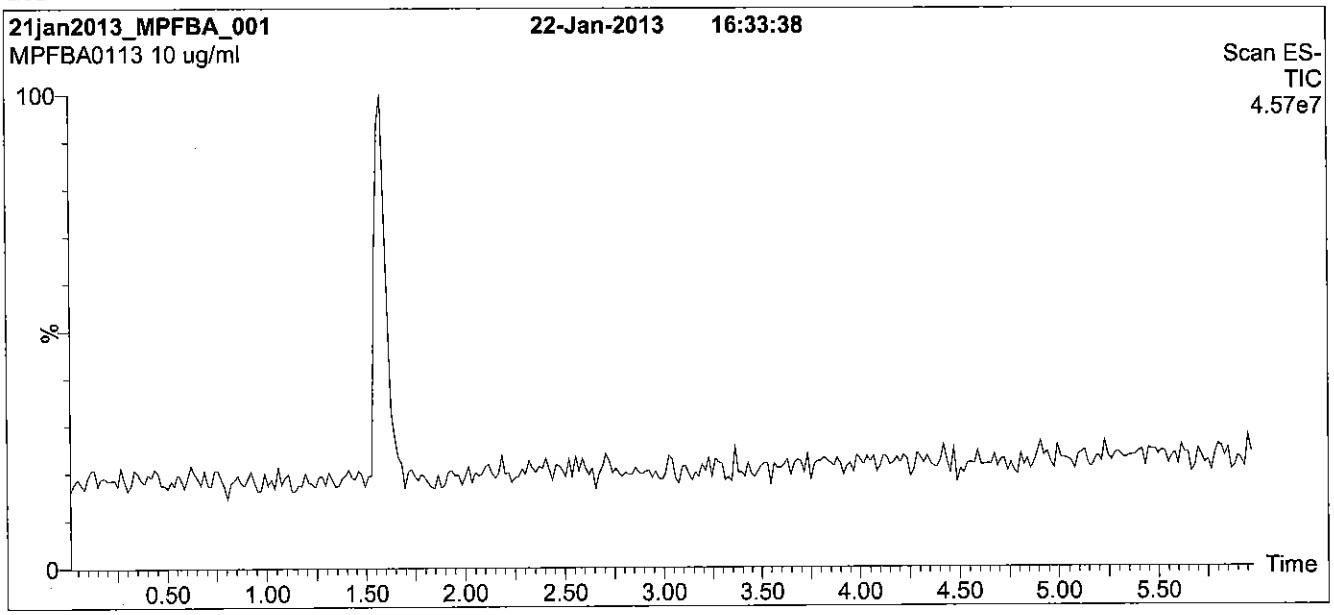
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

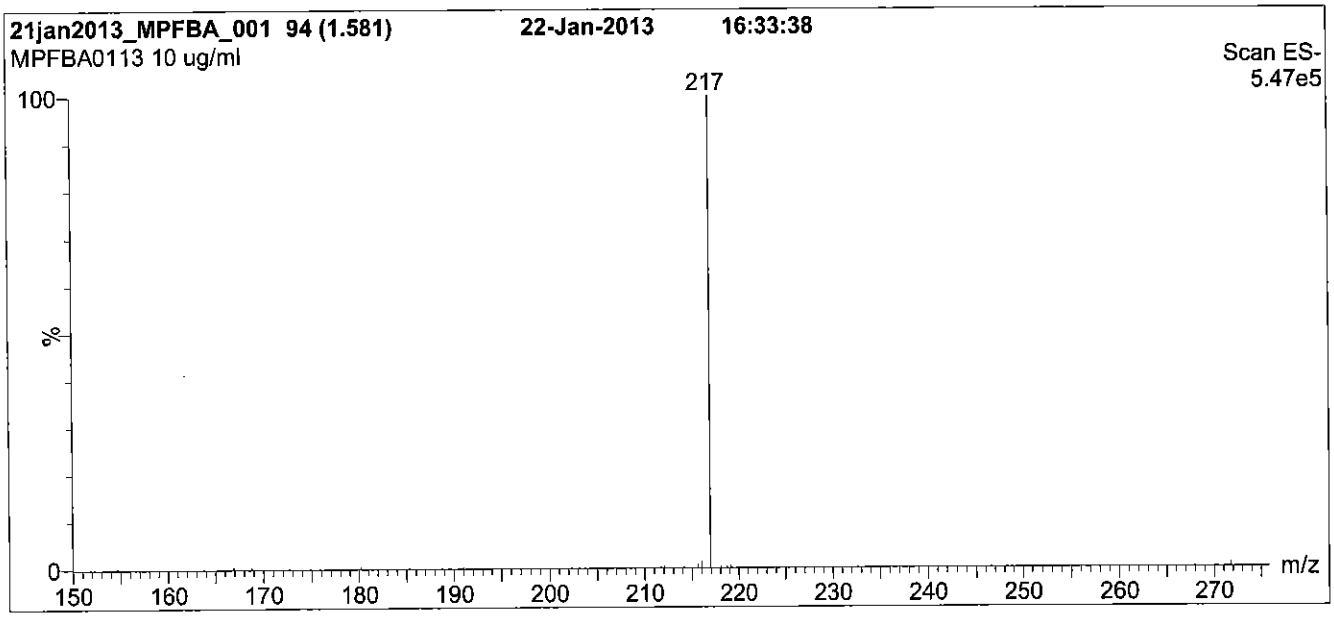
CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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: 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

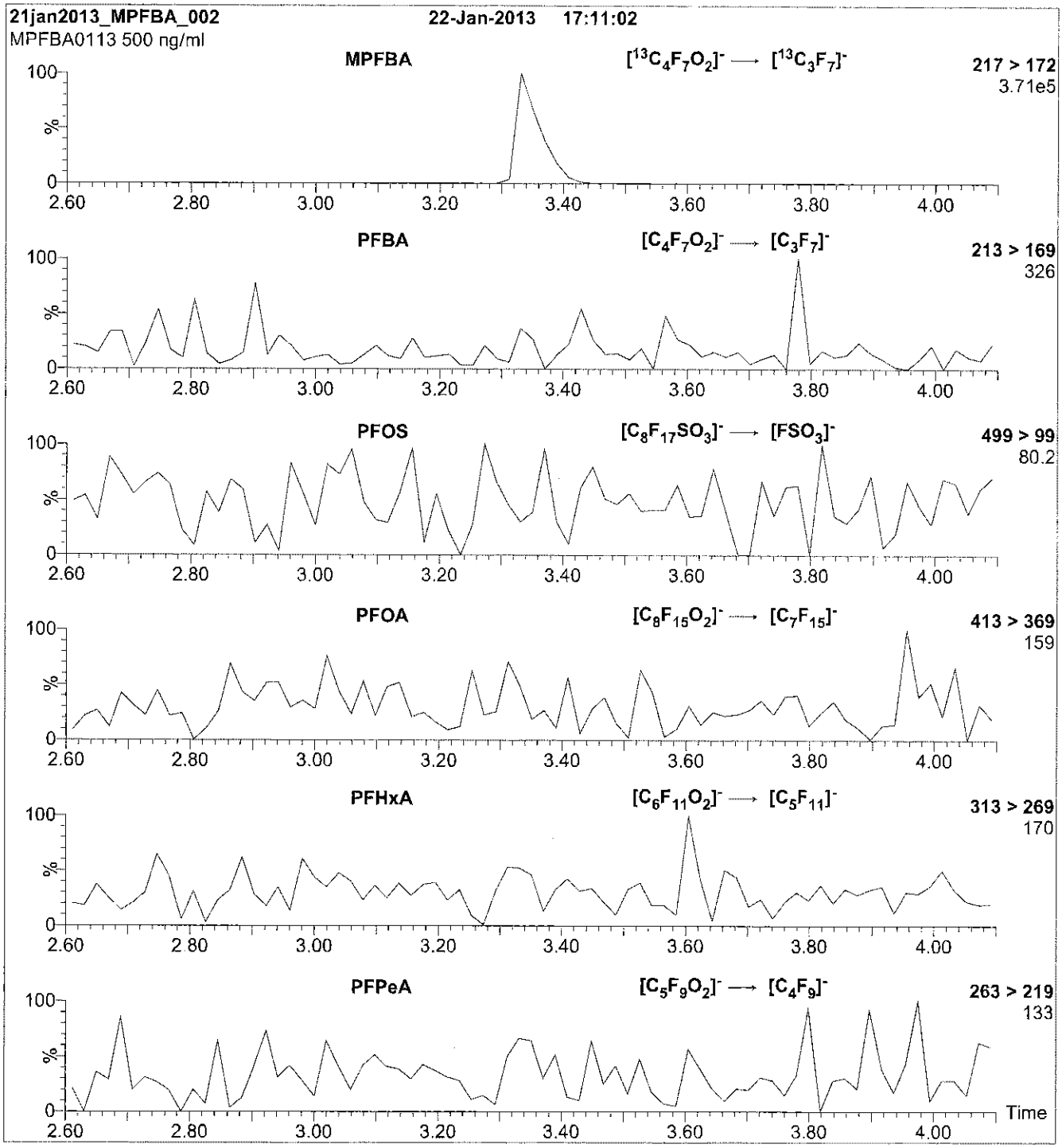
Flow: 300 µl/min

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: **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) = 3.24e-3
Collision Energy (eV) = 10

Reagent

LCMPFBA_00004

P: 12/9/15 SEJ

WELLINGTON LABORATORIES

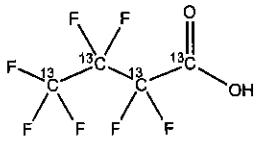
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFBA1014

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

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

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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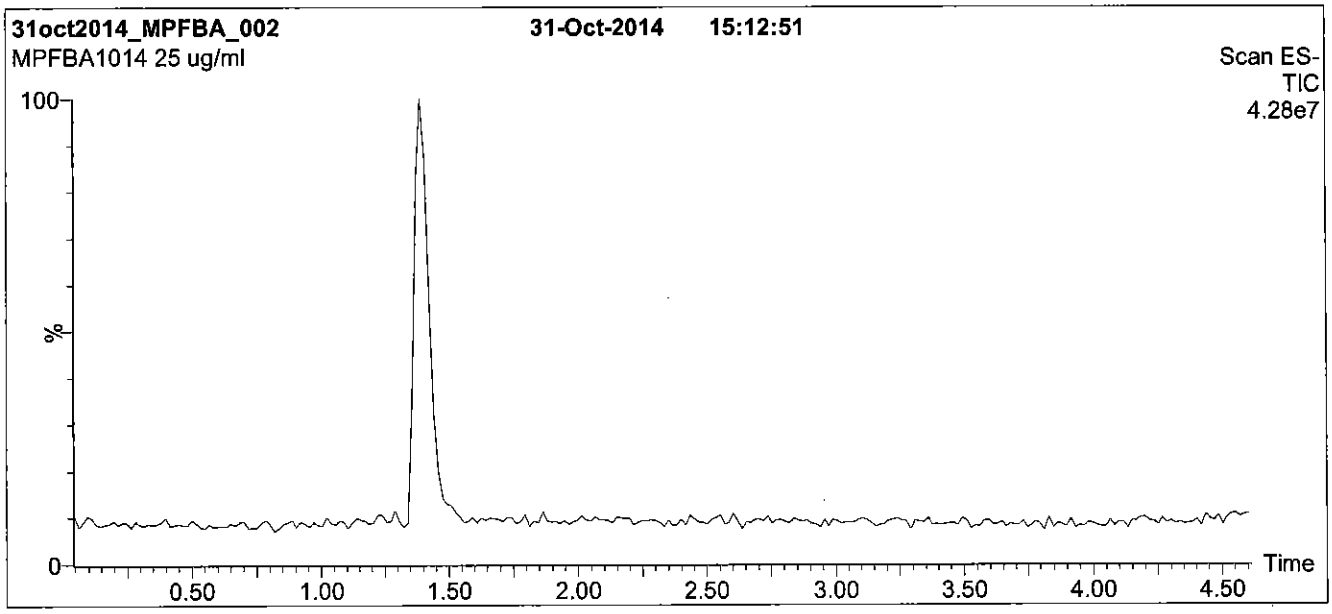
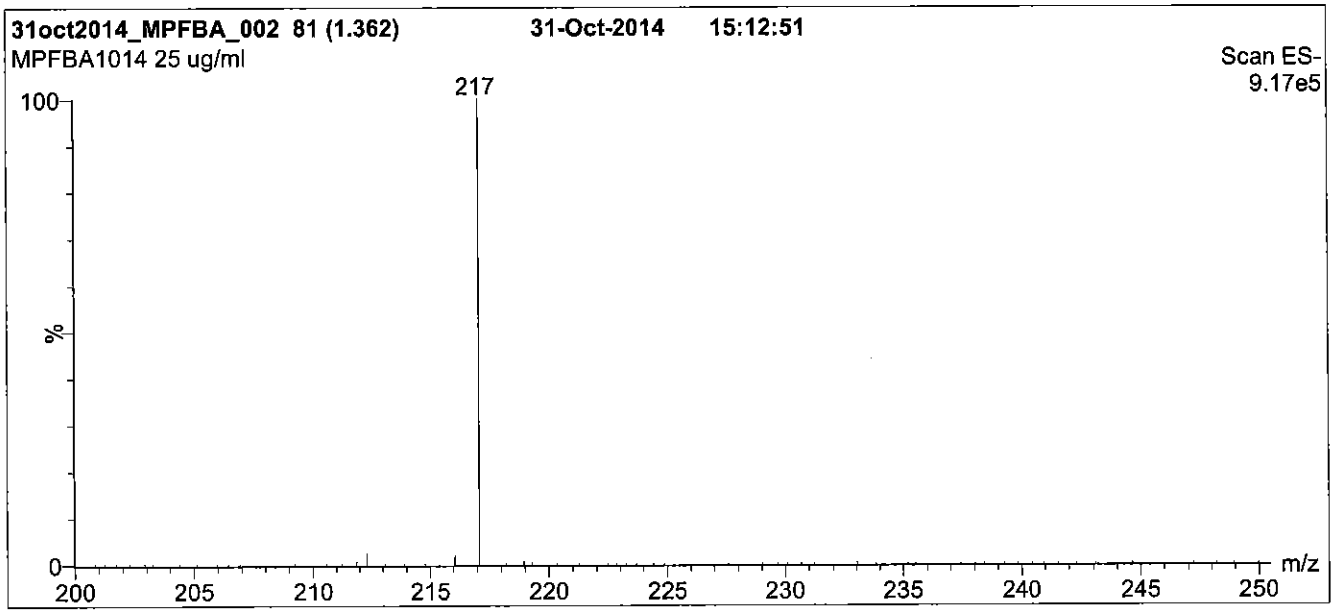
Figure 1: **MPFBA; LC/MS Data (TIC and Mass Spectrum)**





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

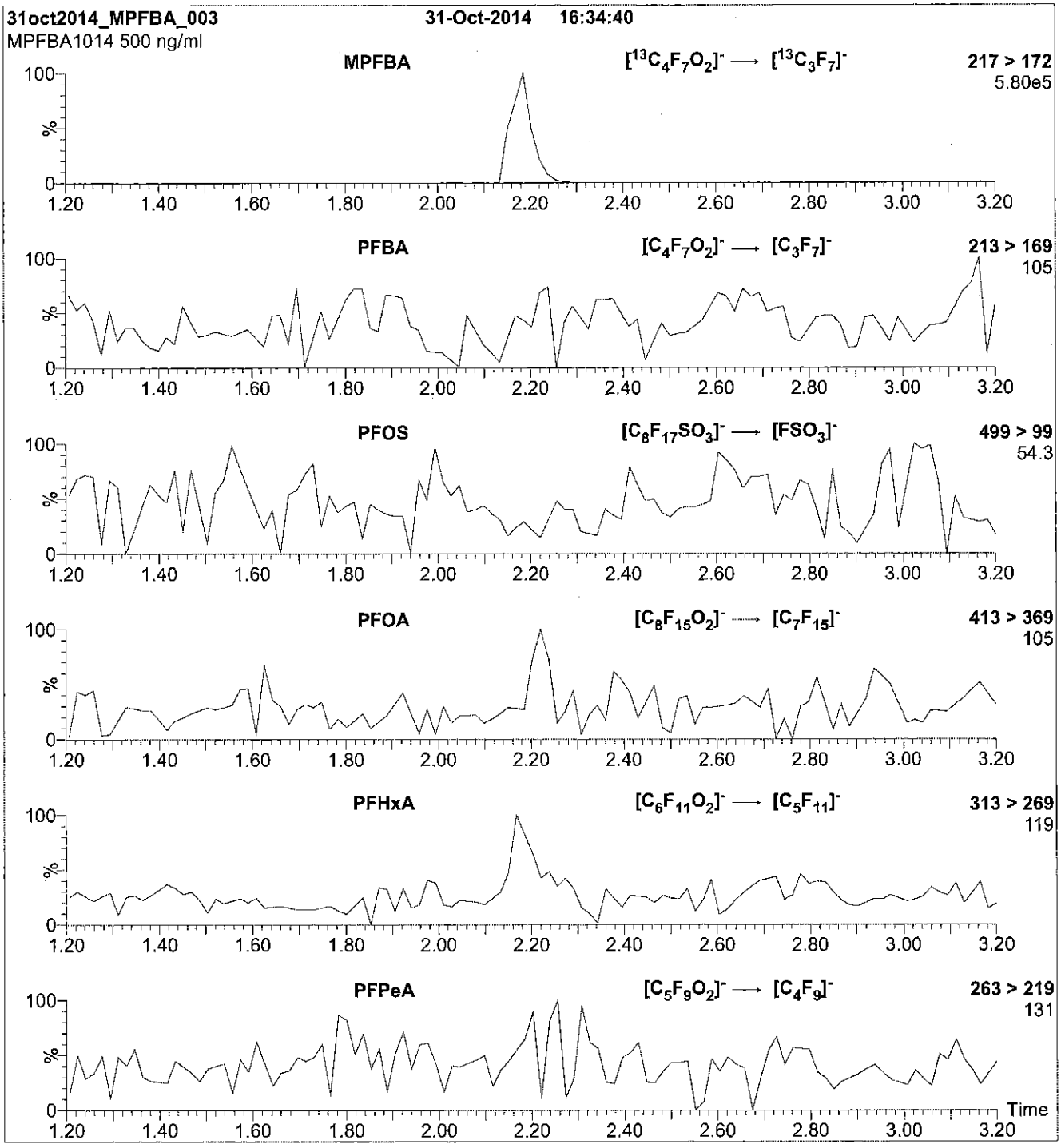
Flow: 300 µl/min

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_00004

R: 10-20-2011 (was 2012)

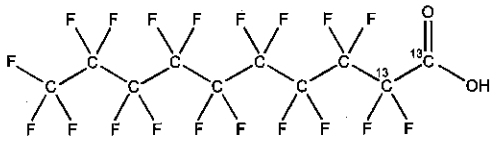
Rec. 10-20-2011

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

12LCMS0262
LCMPFDA_00001

PRODUCT CODE: MPFDA
LOT NUMBER: MPFDA0411
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) 04/07/2011
EXPIRY DATE: (mm/dd/yyyy) 04/07/2014
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:** 04/19/2011 (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

Form#:27, Issued 2004-11-10
Revision#:1, Revised 2010-07-26

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:

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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:

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

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:

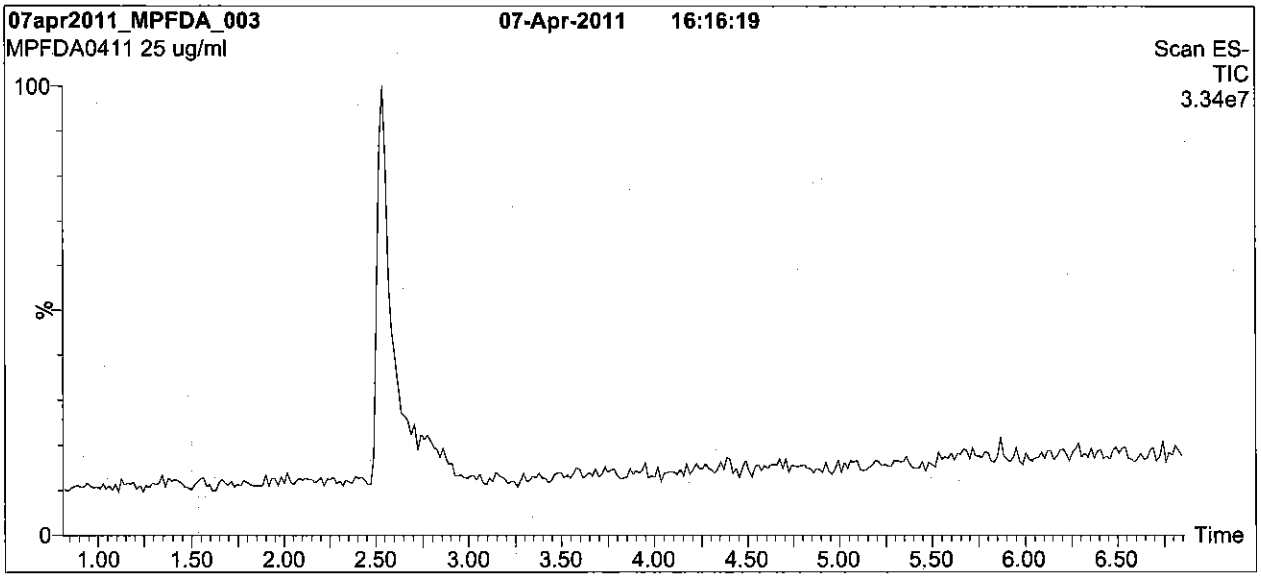
Ongoing stability studies of this product have demonstrated stability in its composition and concentration for the period of time specified by the expiry date in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

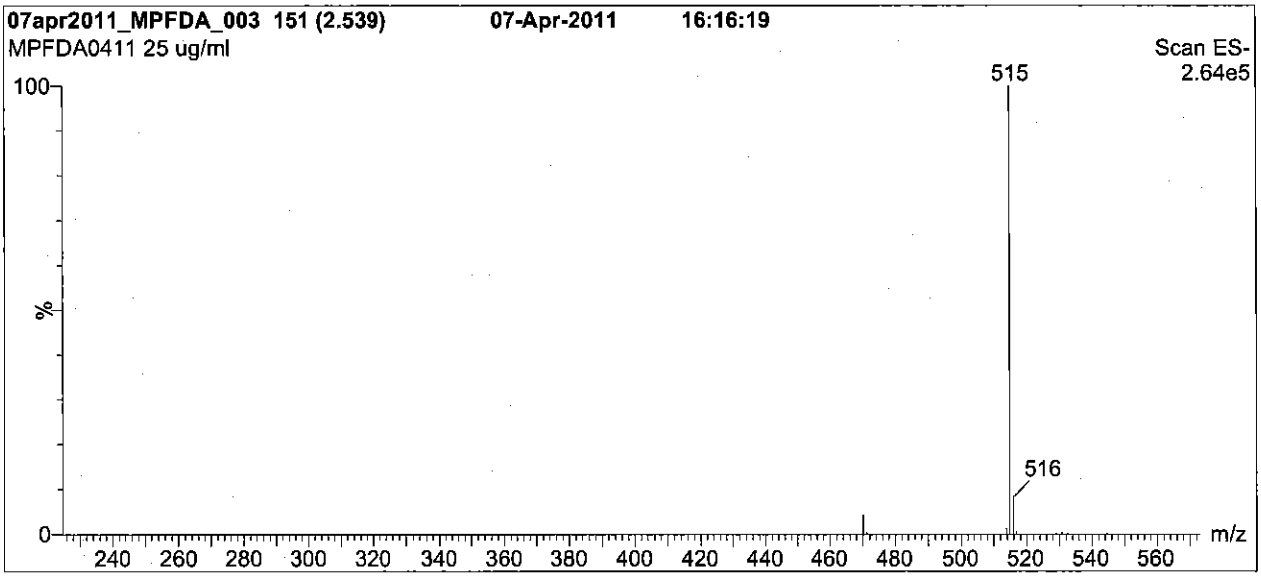
LIMITED WARRANTY:

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.

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: **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: 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

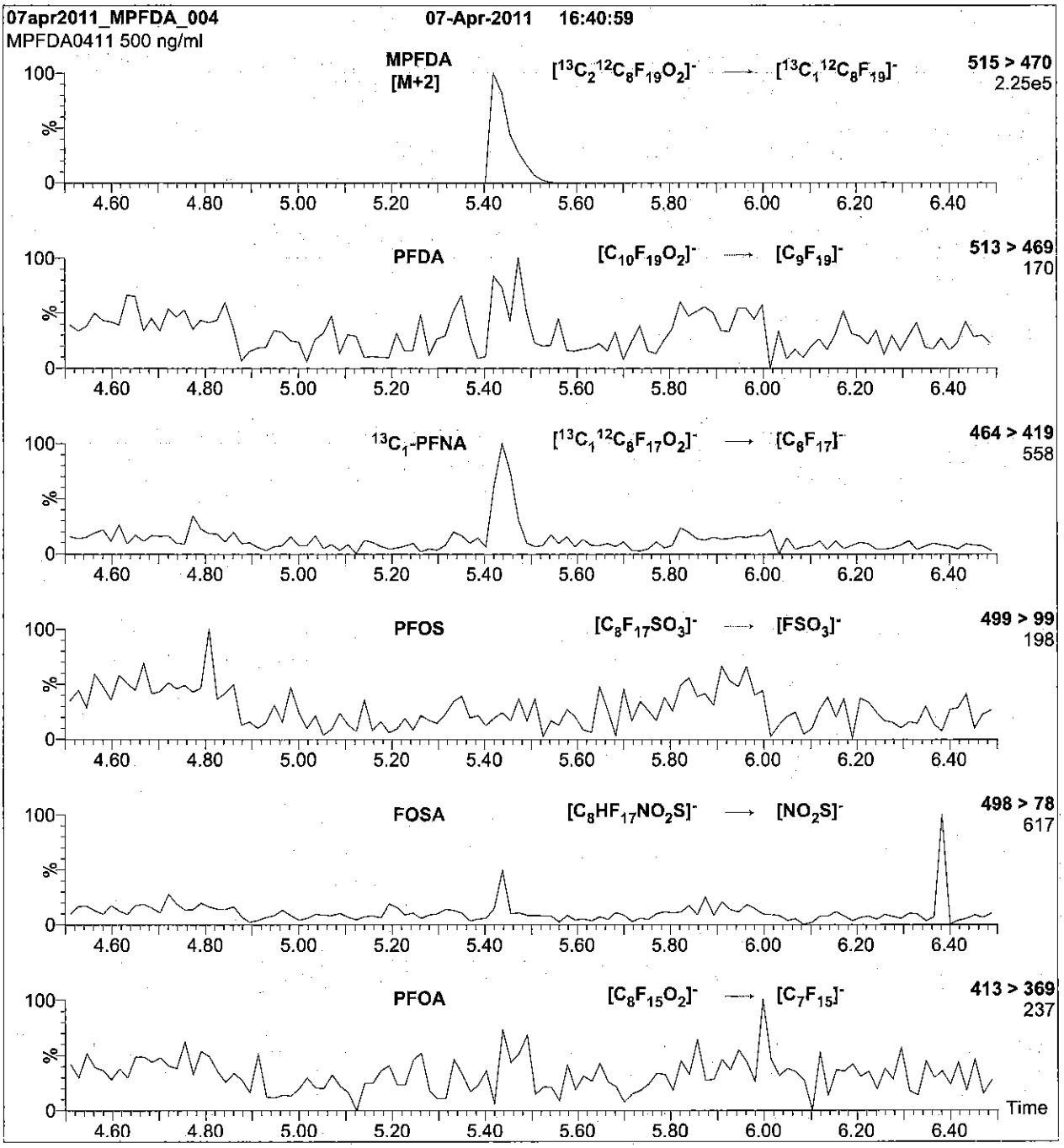
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
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 70% (80:20 MeOH:ACN) / 30% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 13

Reagent

LCMPFDA_00005

R: 4/15/15 SKV

WELLINGTON LABORATORIES

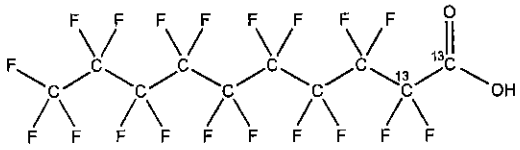
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFDA0414

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8HF_{19}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 516.07
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
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

ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)

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: _____ **Date:** 04/15/2014 (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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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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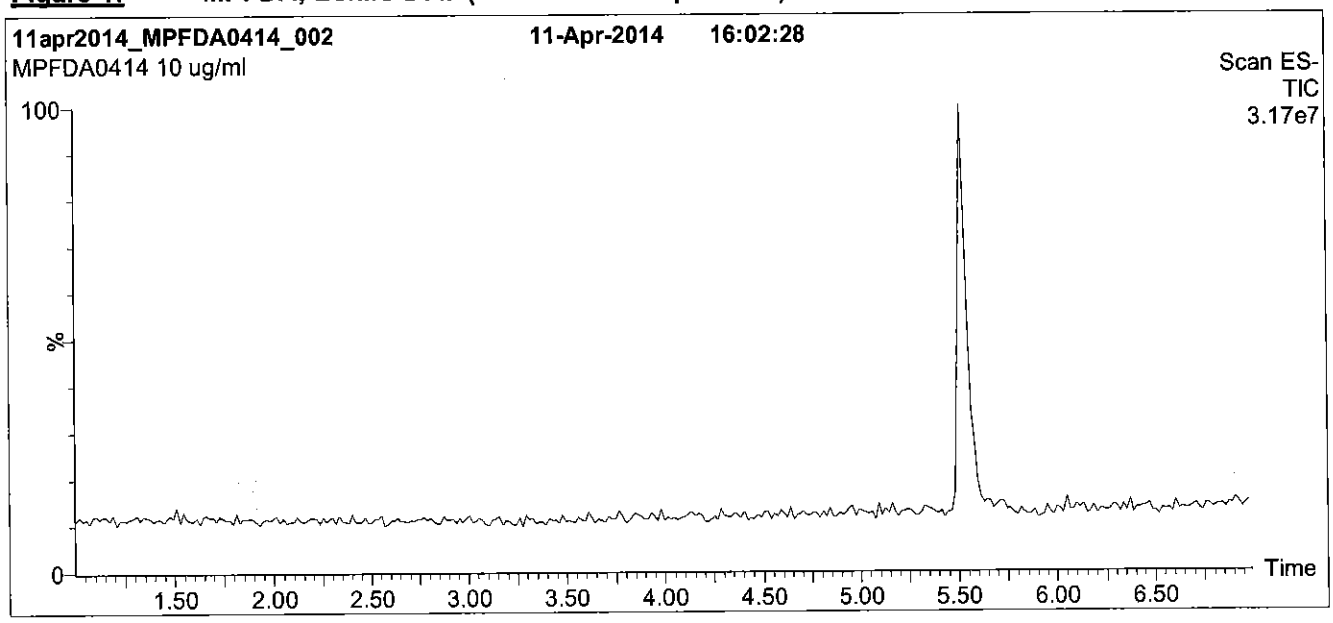
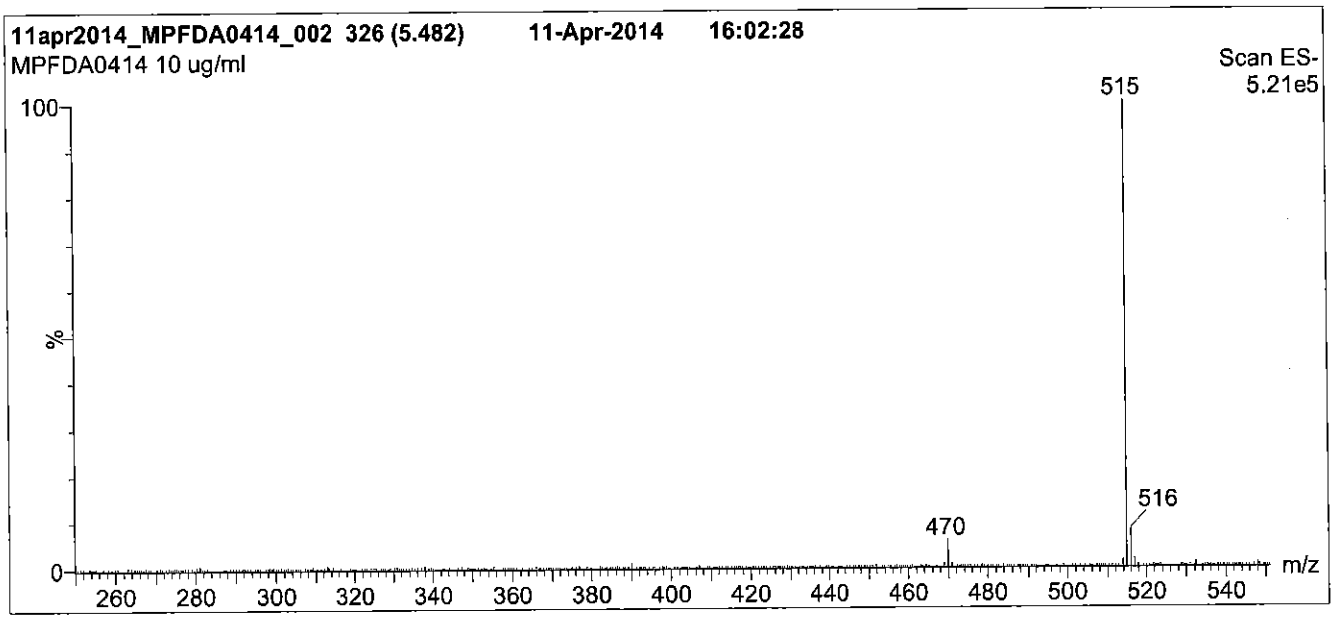




Conditions for Figure 1:

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

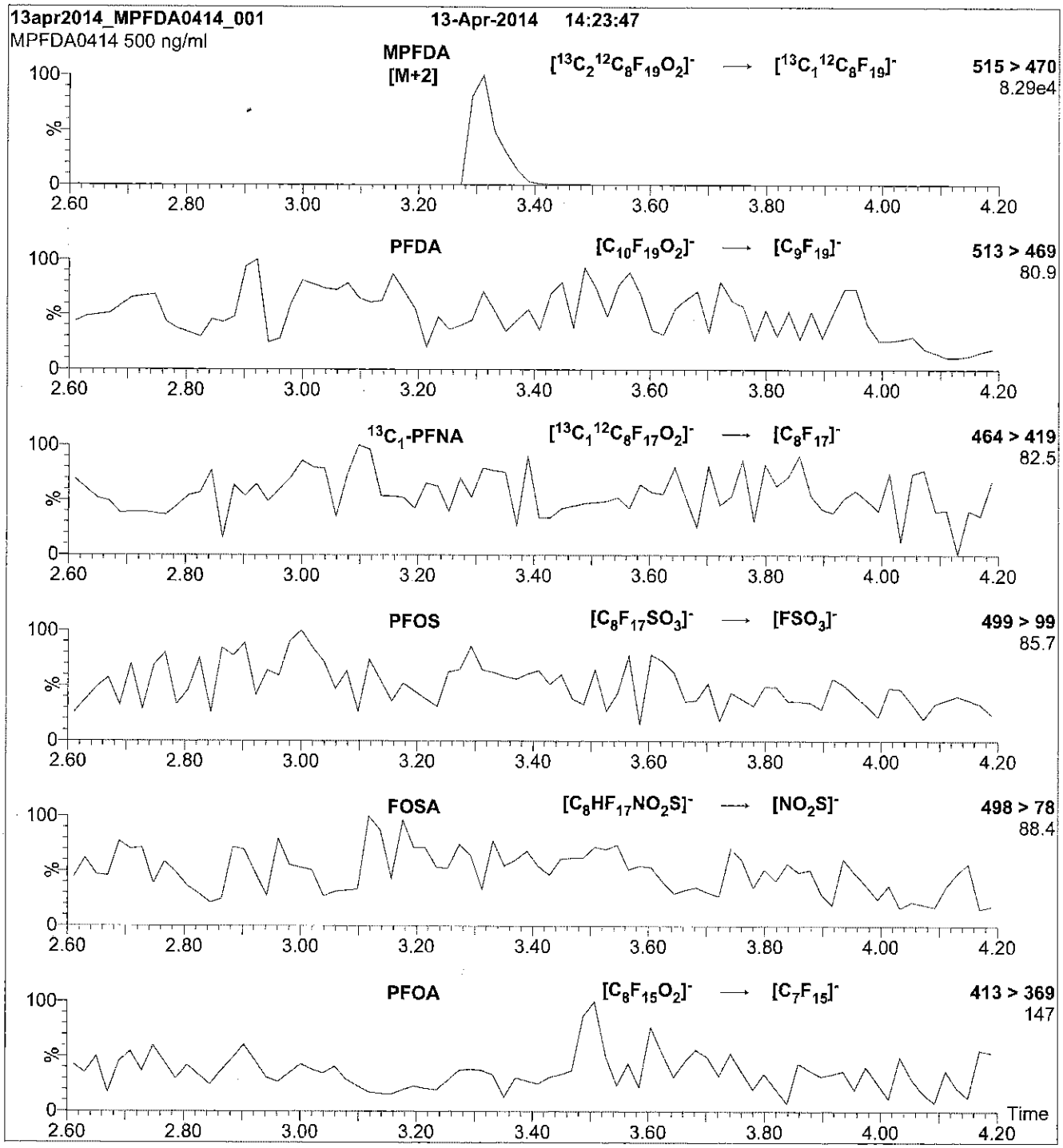
Flow: 300 µl/min

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: **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) = 3.31e-3
Collision Energy (eV) = 13

Reagent

LCMPFDoA_00003

P. 2/11/15 SRV

WELLINGTON LABORATORIES

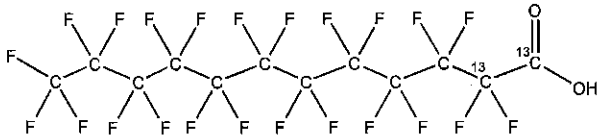
CERTIFICATE OF ANALYSIS DOCUMENTATION

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: _____ **Date:** 07/21/2014 (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. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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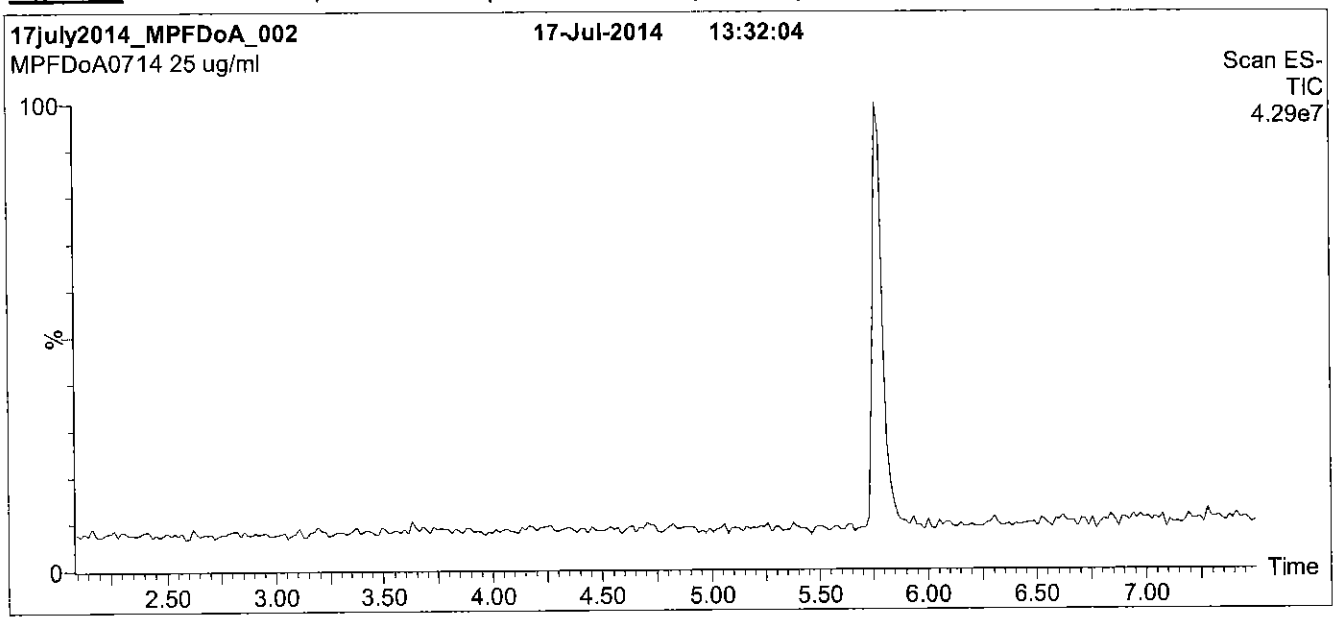
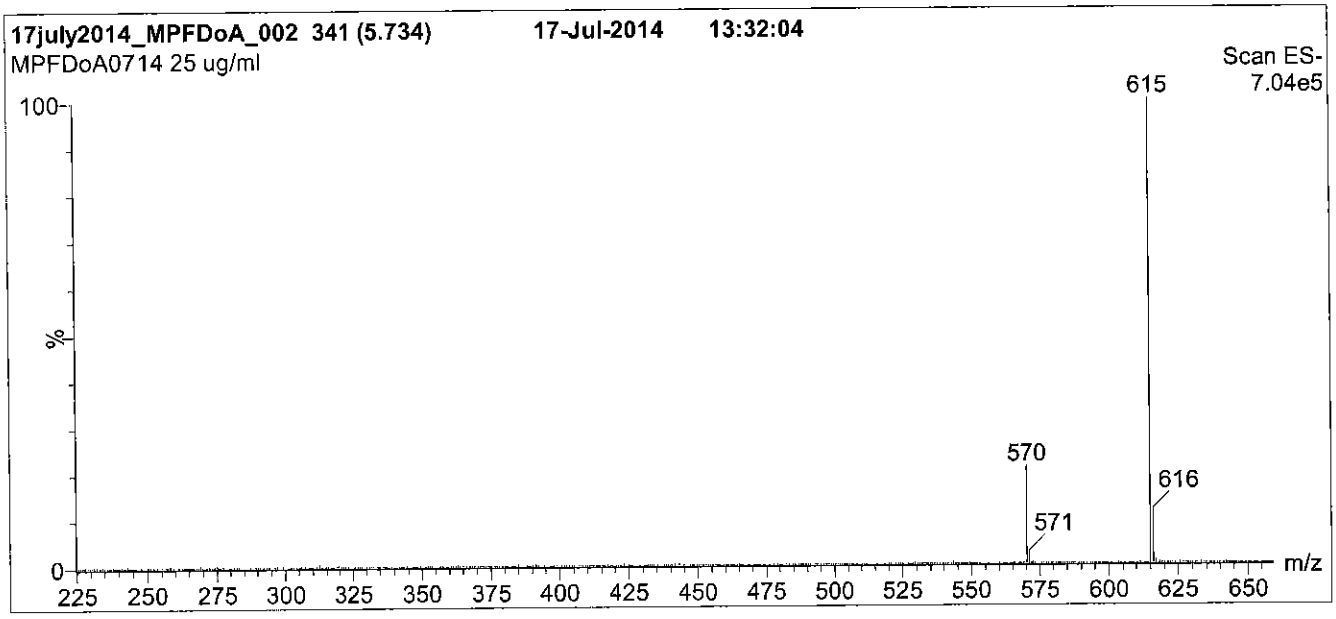
Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





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

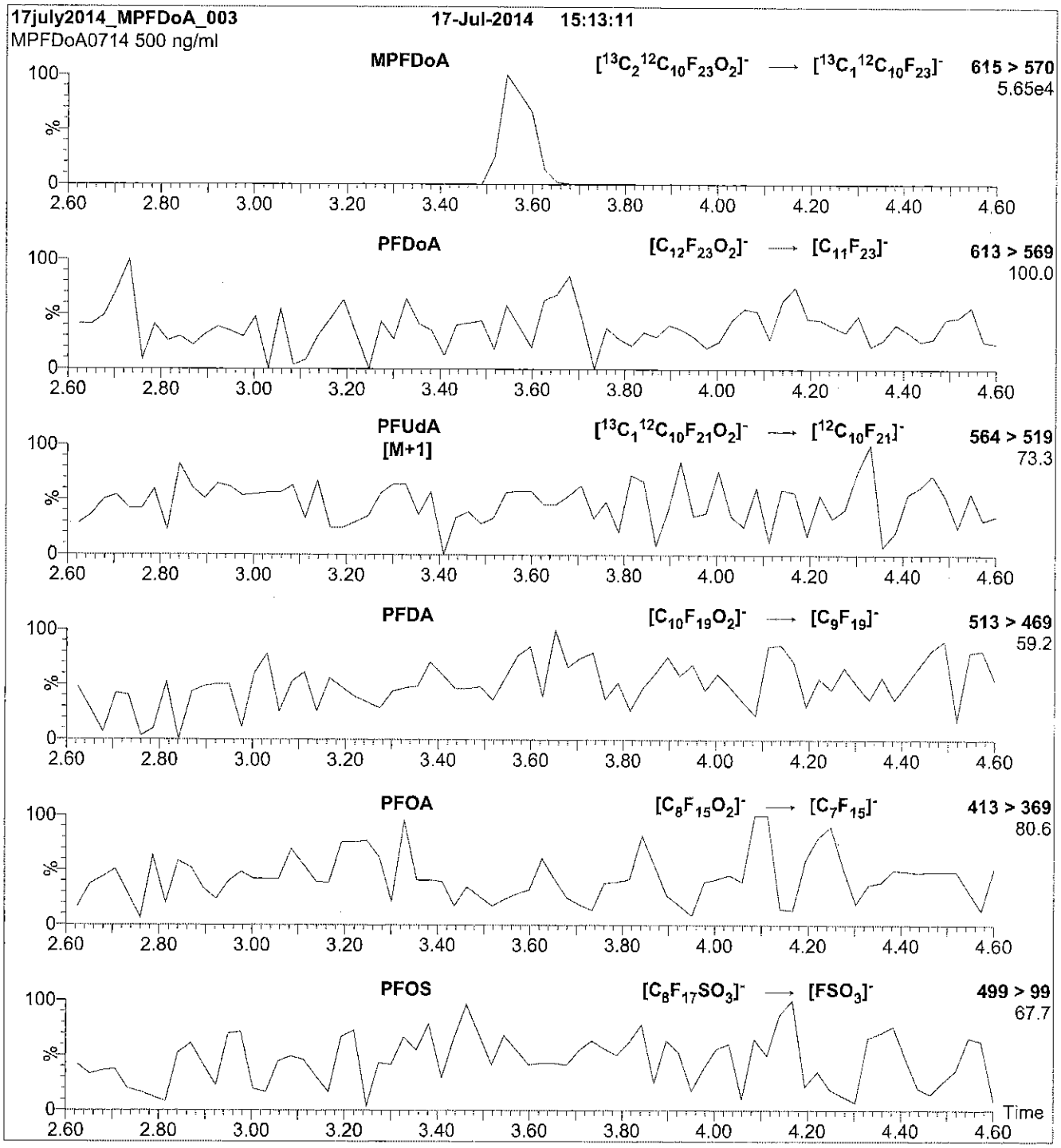
Flow: 300 µl/min

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)**



Conditions 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

LCMPFDoA_00004

V : 14/10/15 JKV

WELLINGTON LABORATORIES

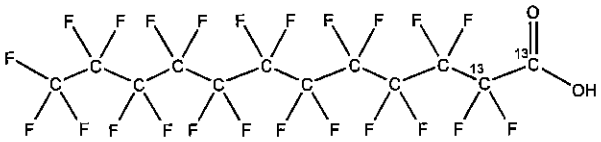
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFDoA0714

STRUCTURE:

CAS #: Not available



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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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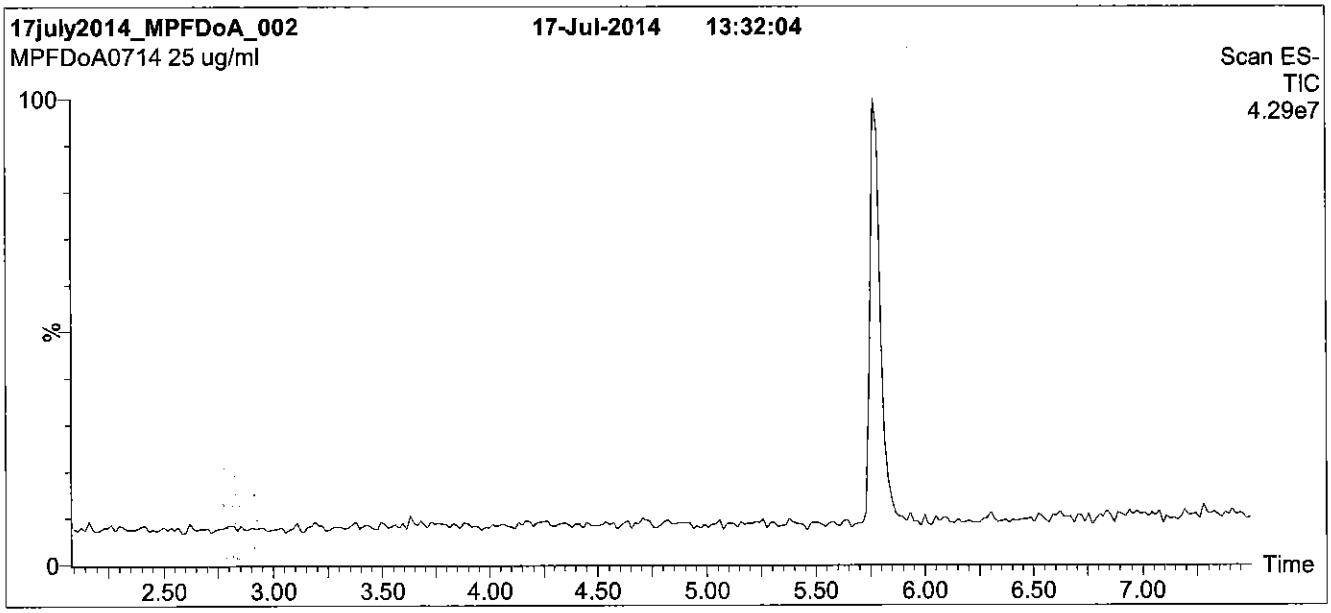
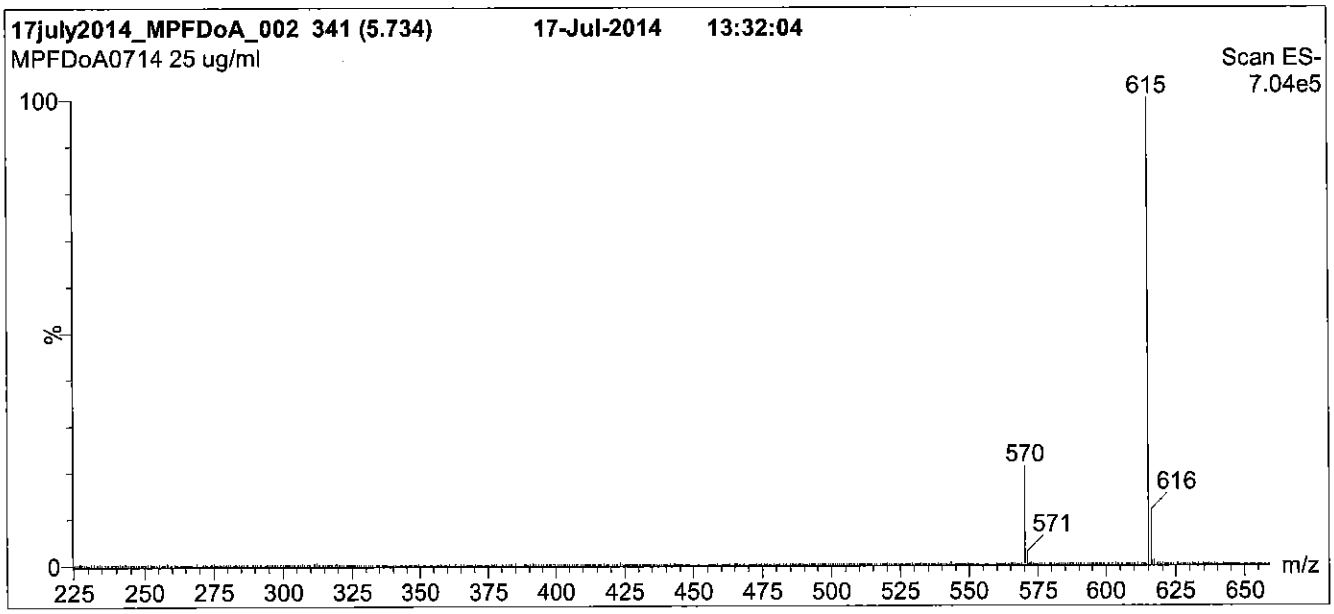
Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





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

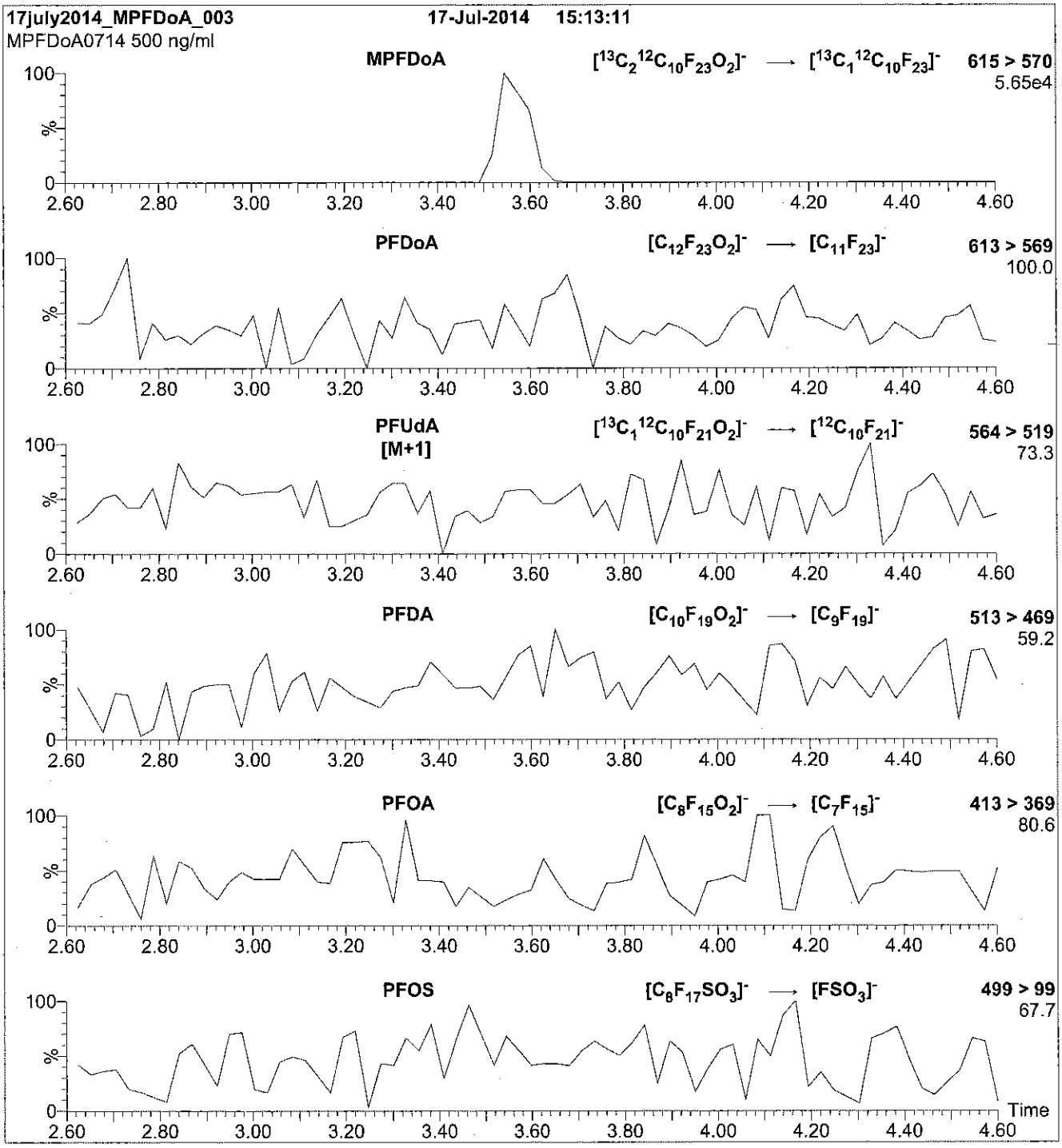
Flow: 300 µl/min

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)**



Conditions 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_00006

P: 4/15/15 SKV

WELLINGTON LABORATORIES

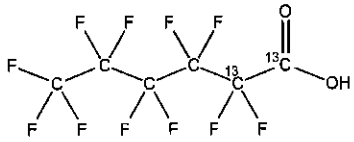
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFHxA0414

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_4HF_{11}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 316.04
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
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

ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)

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:** 04/15/2014 (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:

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:

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

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CALA Testing Accreditation No. A 0226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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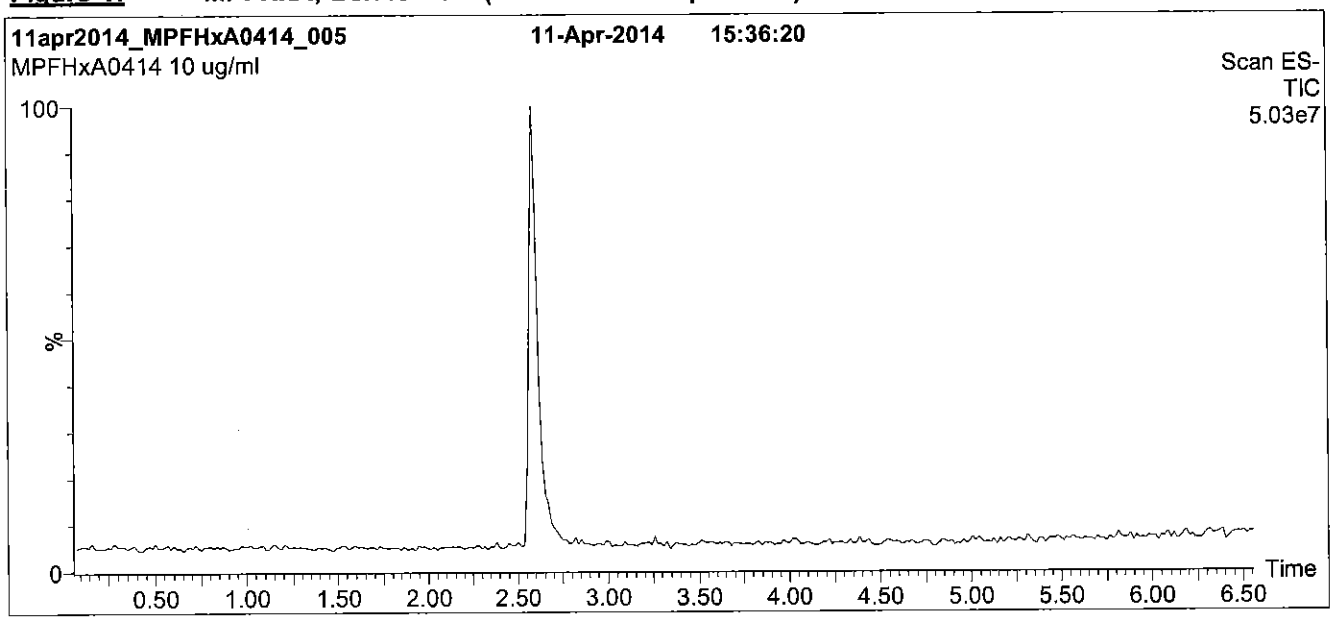
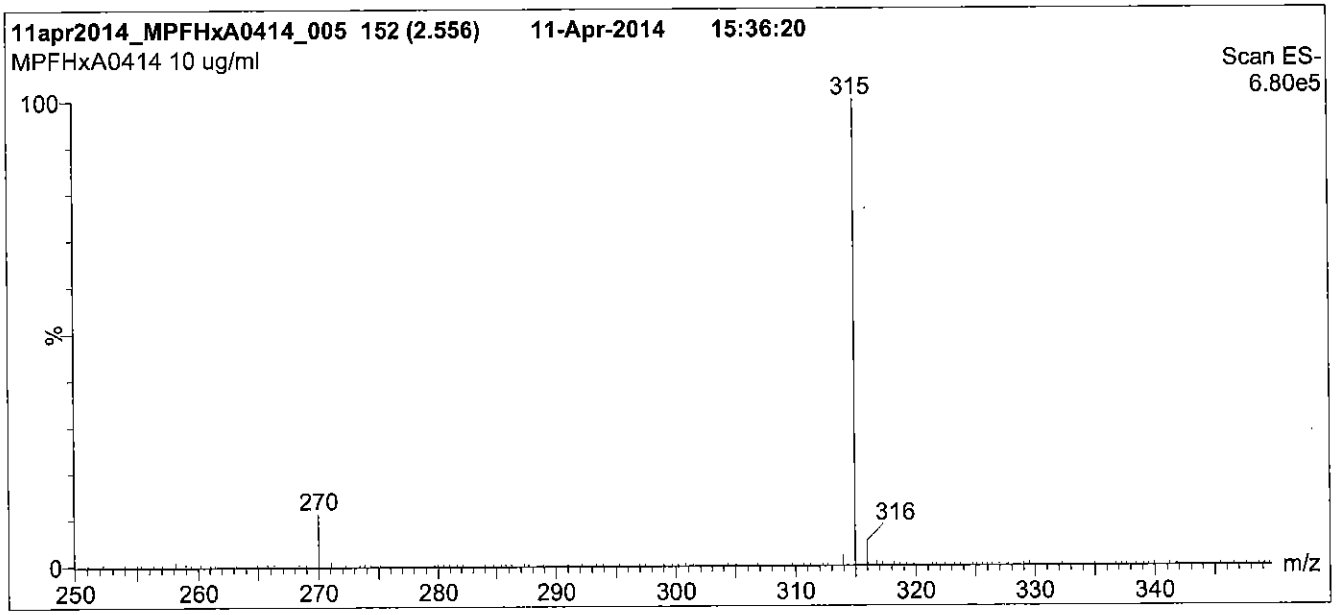




Conditions for Figure 1:

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: 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

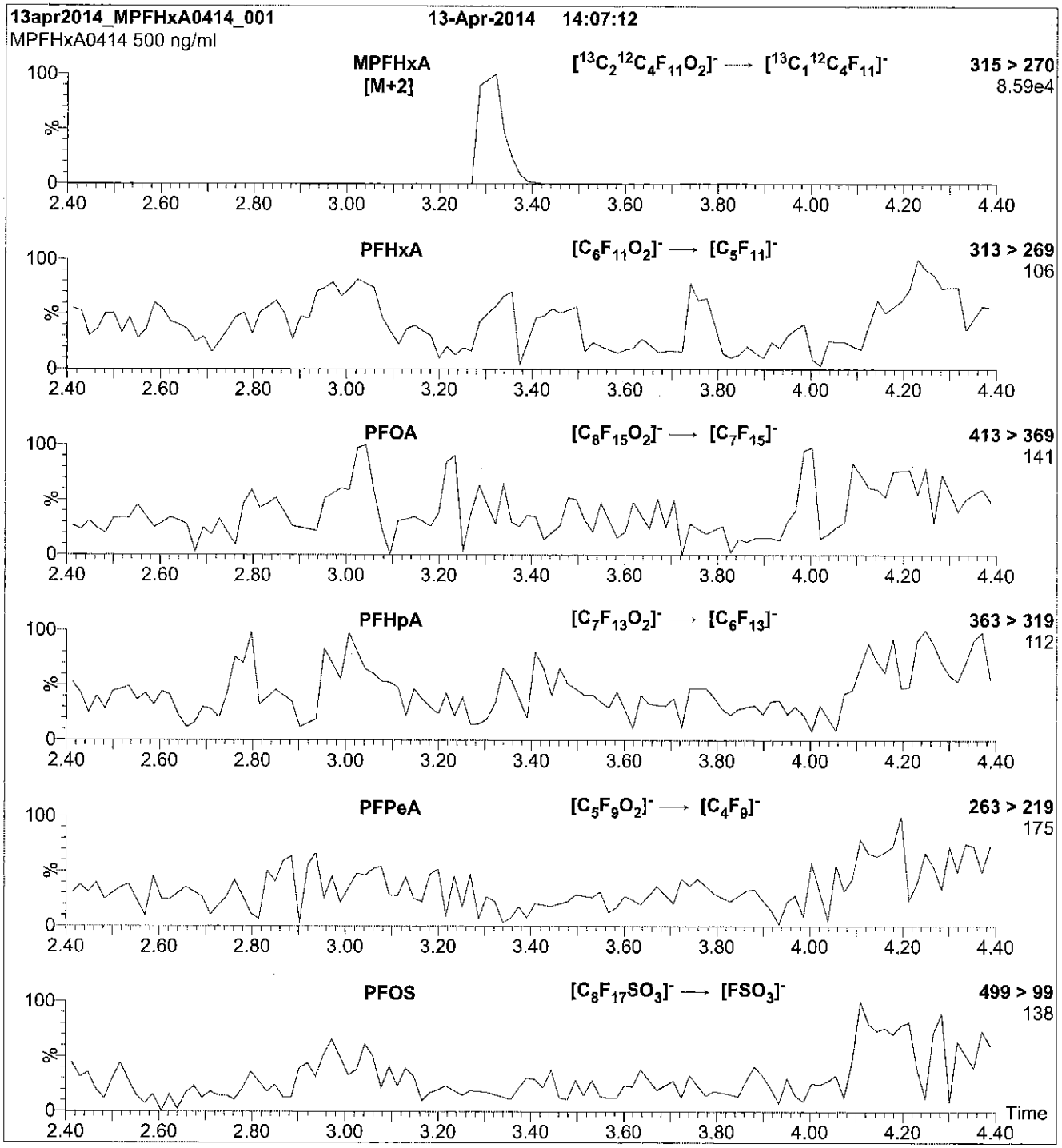
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 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) = 3.43e-3
Collision Energy (eV) = 10

Reagent

LCMPFHxS_00003

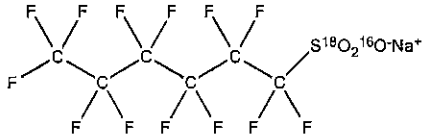
v. 21115 SV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFHxS
LOT NUMBER: MPFHxS0713
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) 47.3 ± 2.4 µg/ml (MPFHxS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	>94% ($^{18}O_2$)
LAST TESTED: (mm/dd/yyyy)	07/25/2013		
EXPIRY DATE: (mm/dd/yyyy)	07/25/2018		
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.
- 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 ($C_6F_{13}S^{16}O_3^-$) 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.

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Certified By: _____ **Date:** 04/15/2014 (mm/dd/yyyy)
B.G. Chittim

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CALA Testing Accreditation No. A1226

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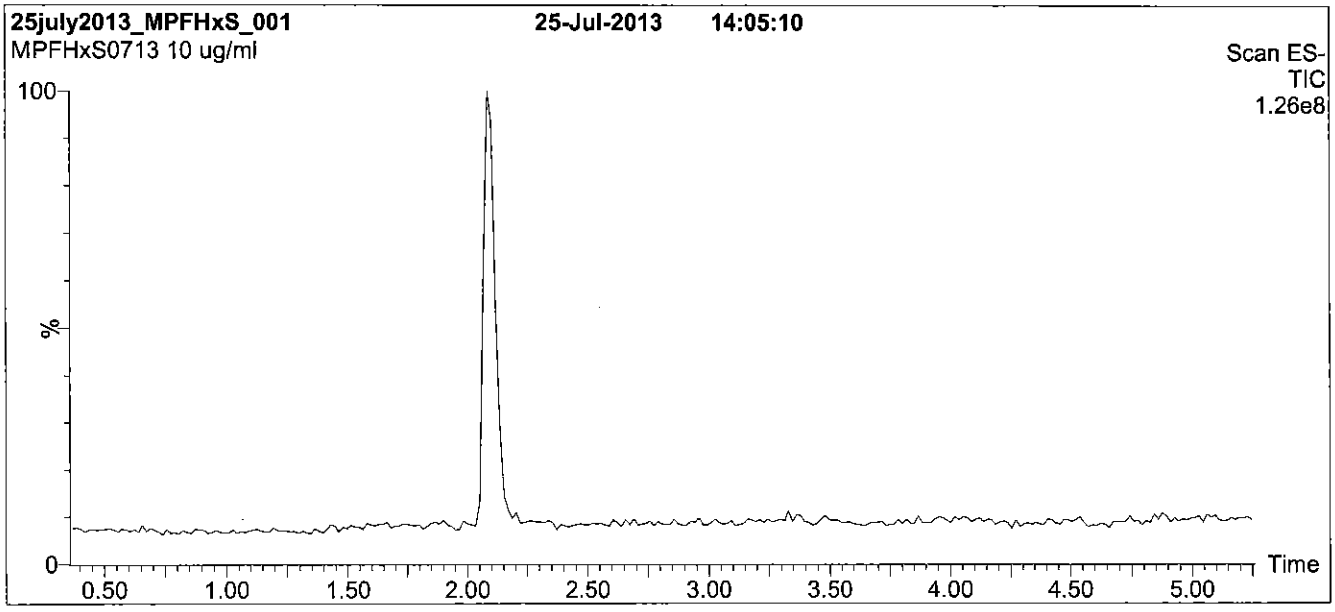

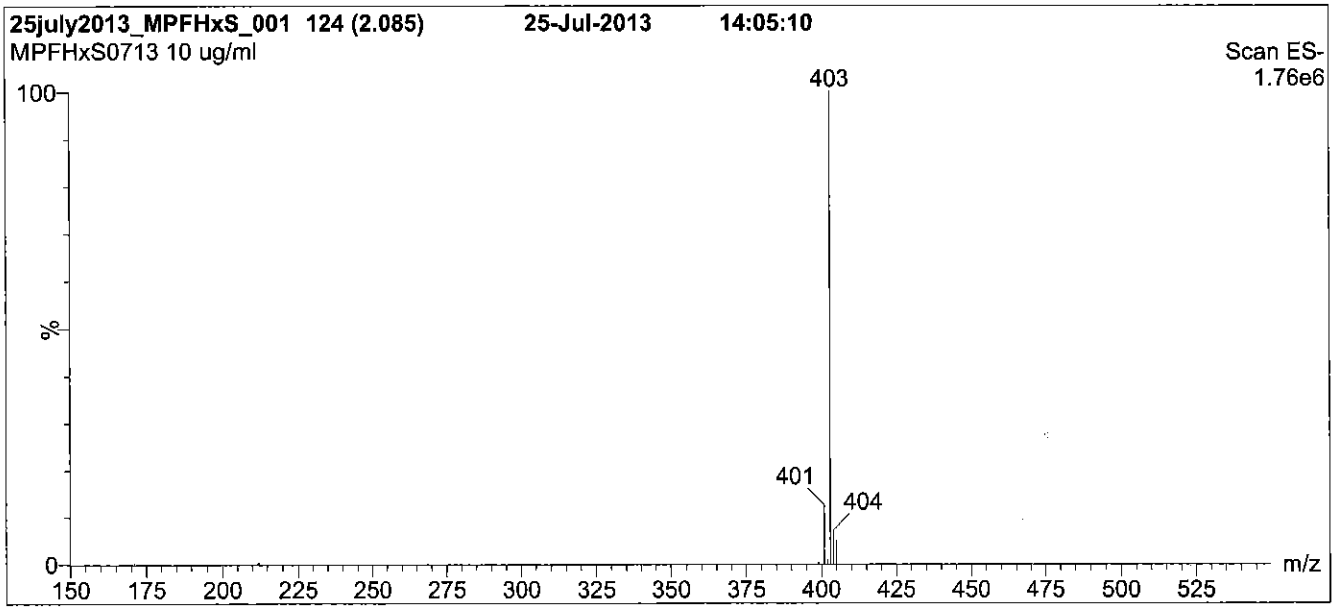

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Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

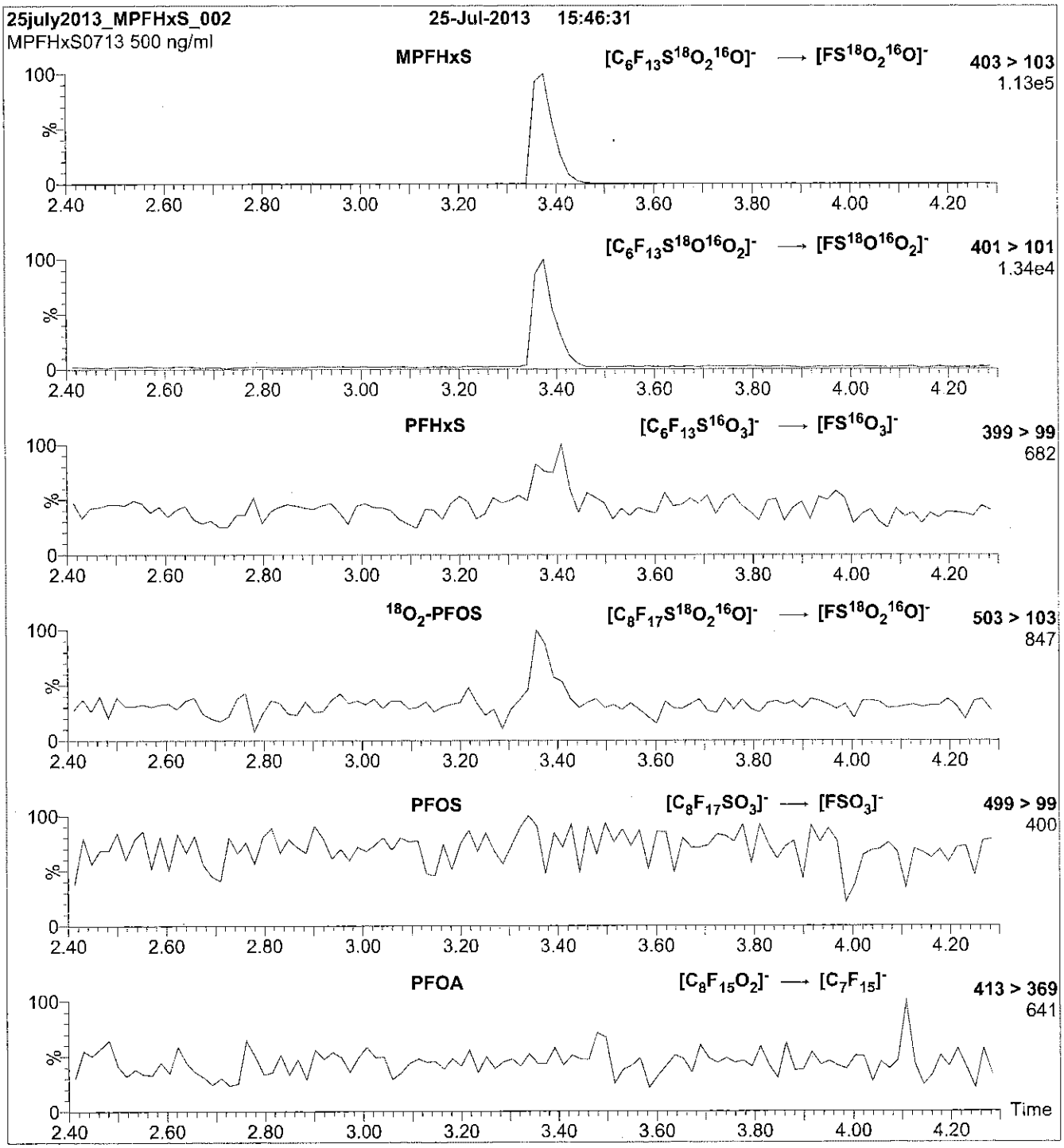
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 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) = 3.58e-3
Collision Energy (eV) = 30

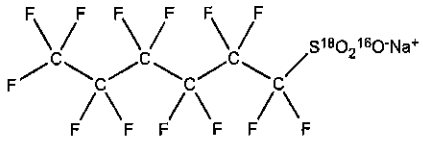
Reagent

LCMPFHxS_00004

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFHxS	**LOT NUMBER:**	MPFHxS0713
COMPOUND:	Sodium perfluoro-1-hexane[$^{18}O_2$]sulfonate		
STRUCTURE:		**CAS #:**	Not available



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B.G. Chittim

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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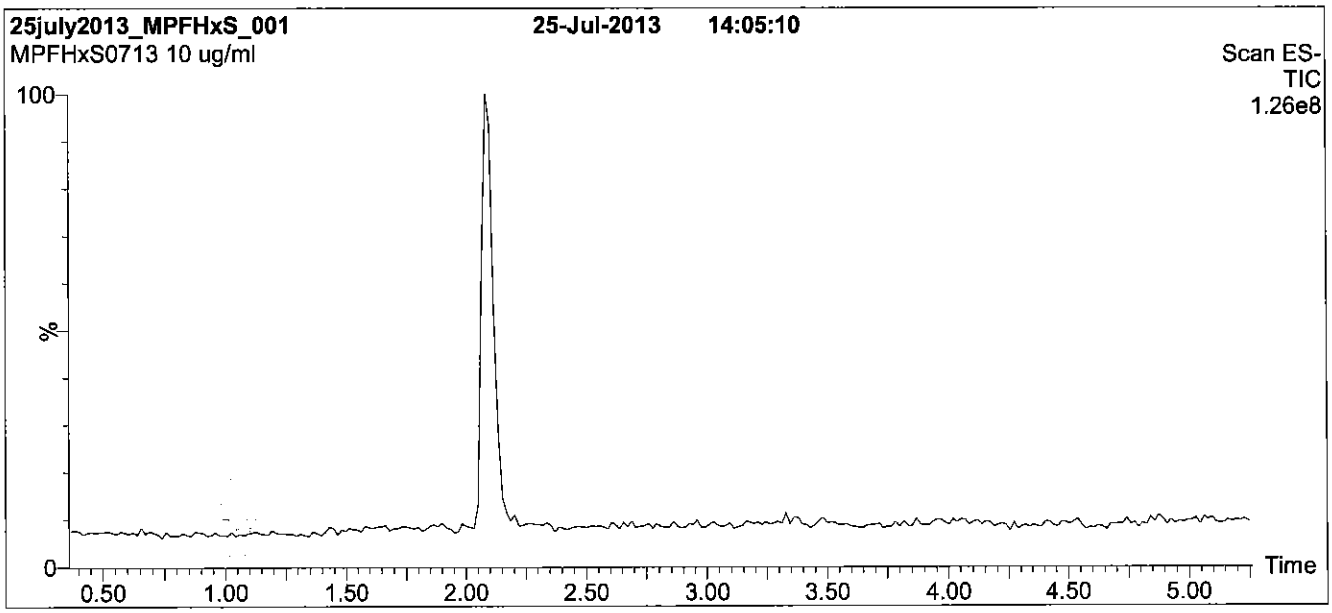
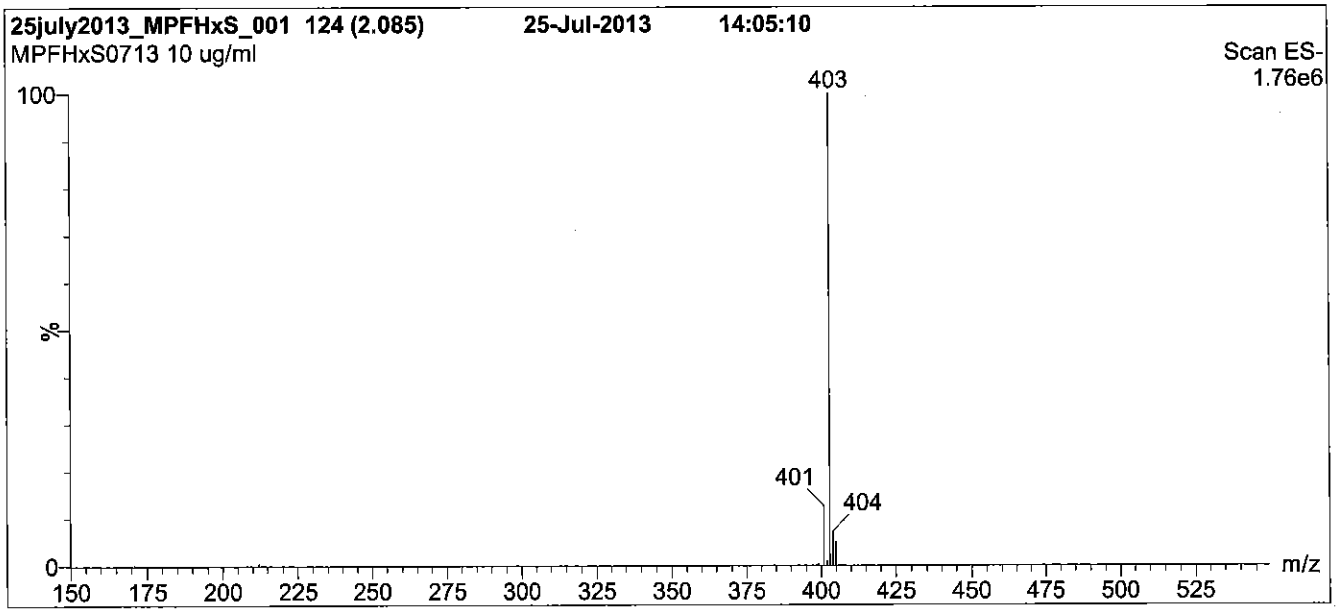
Figure 1: **MPFHxS; LC/MS Data (TIC and Mass Spectrum)**





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 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

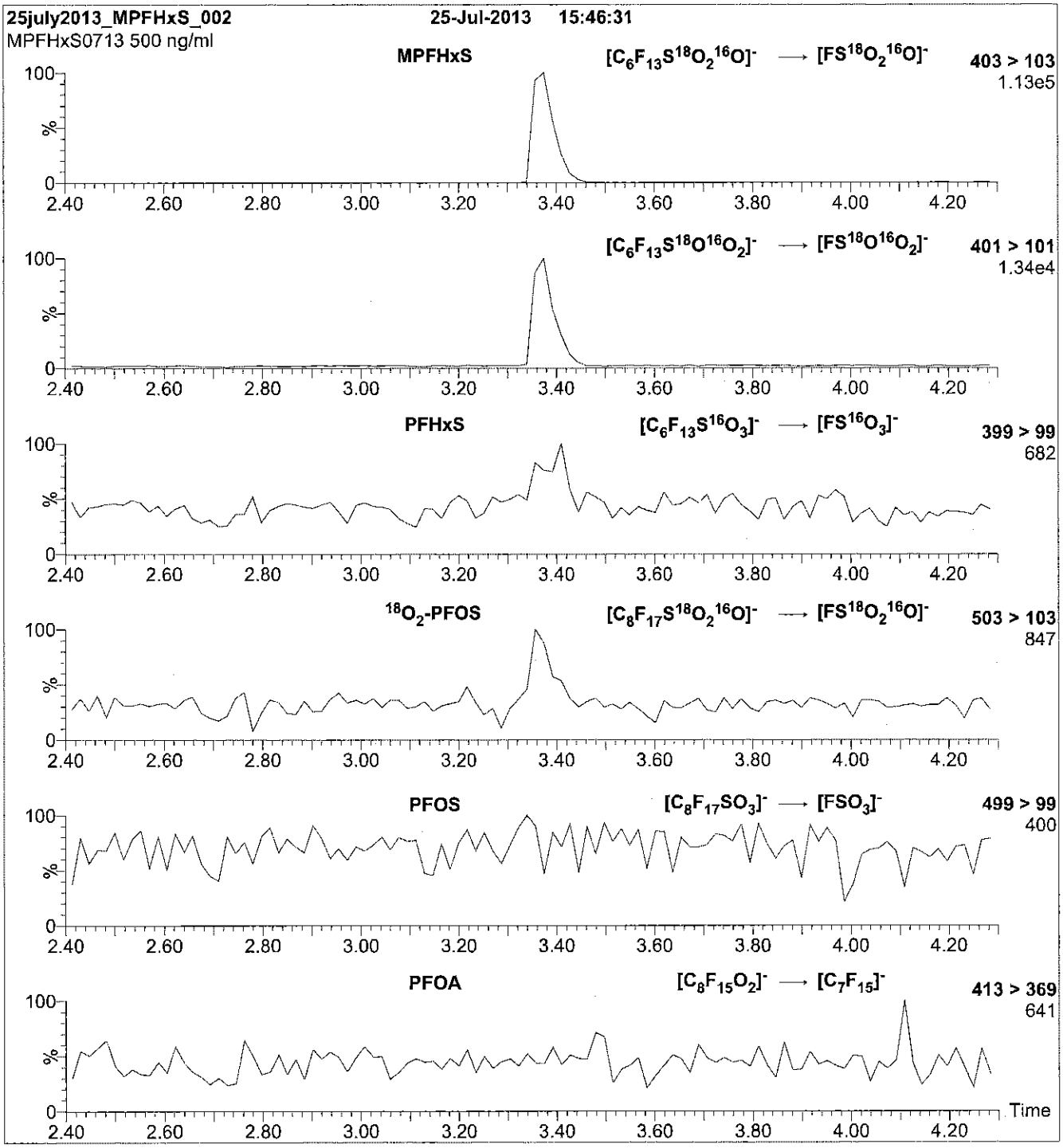
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 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) = 3.58e-3
Collision Energy (eV) = 30

Reagent

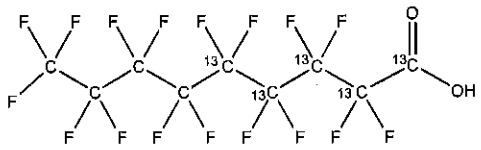
LCMPFNA_00003

V 2/11/15 SV

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)
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:** 04/13/2014 (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:

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:

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 $x_1, x_2, \ldots x_n$ 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 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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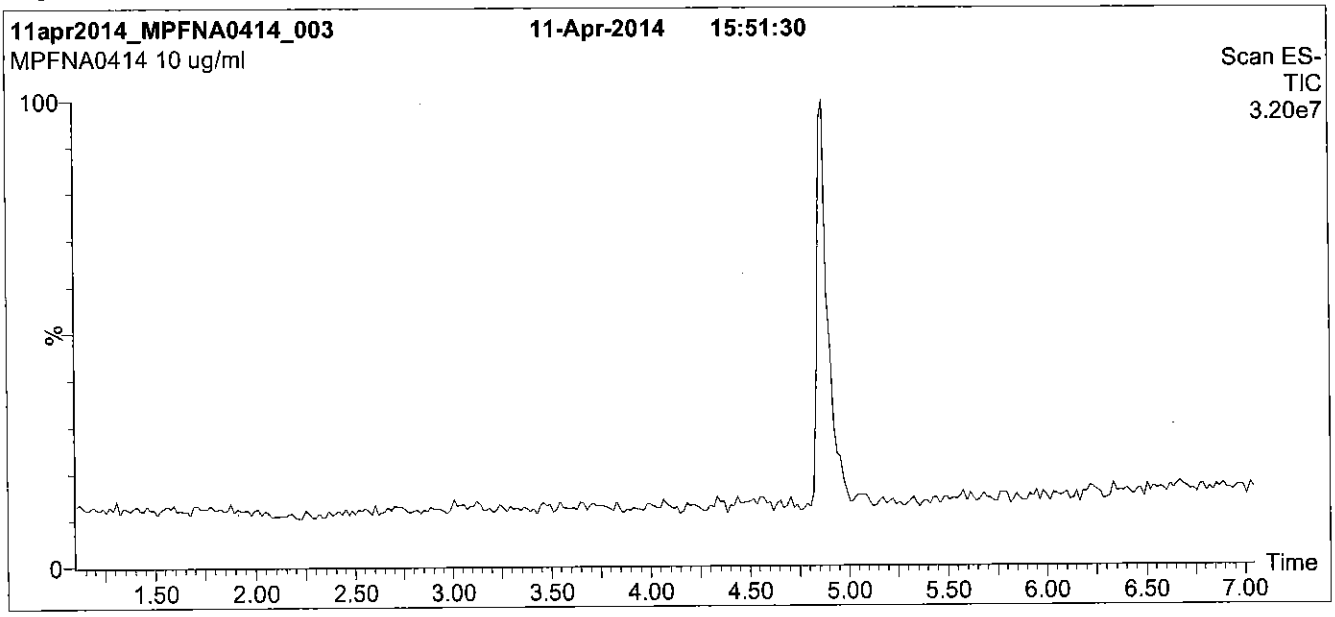

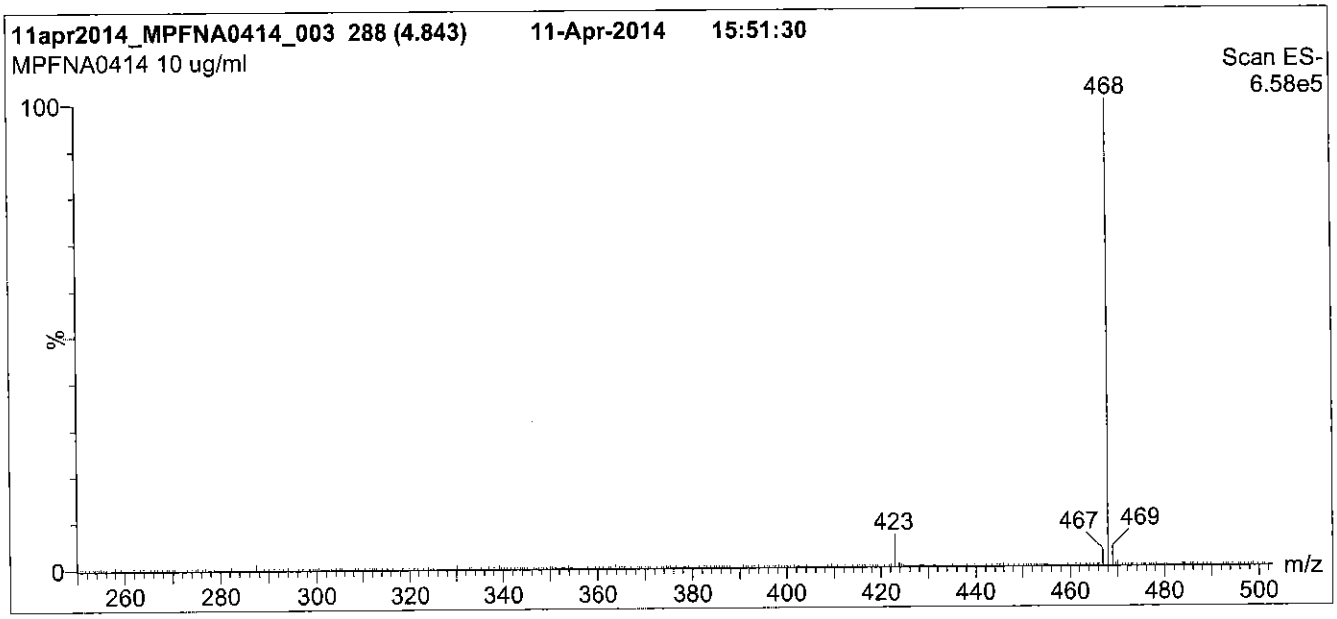

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Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

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

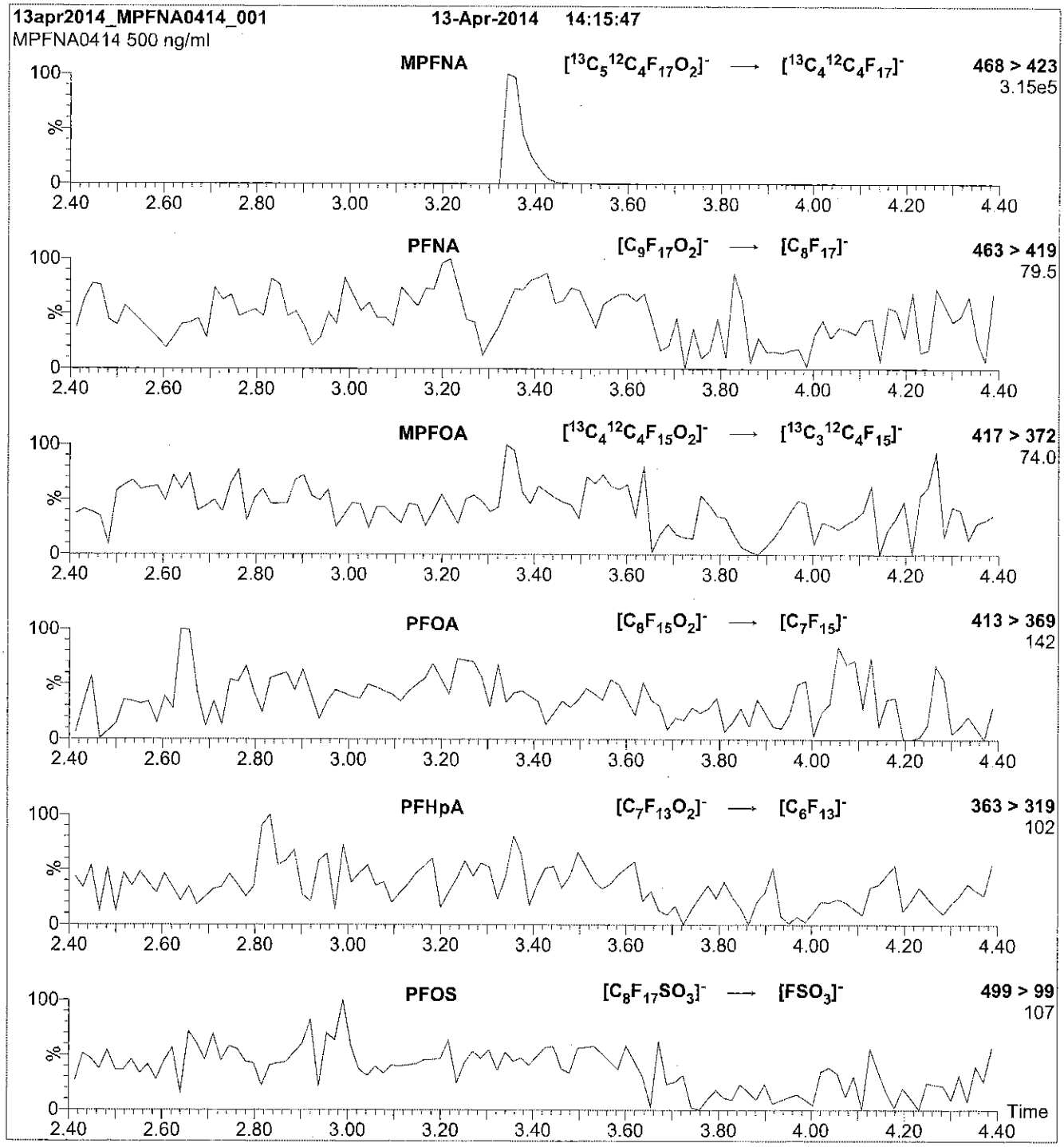
Flow: 300 µl/min

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_00007

V: 9/15/15 BV

WELLINGTON LABORATORIES

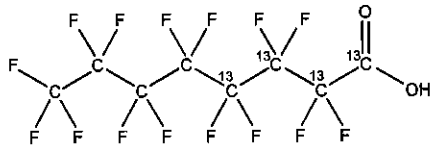
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFOA0415

STRUCTURE:

CAS #: Not available



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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/10/2015
EXPIRY DATE: (mm/dd/yyyy) 04/10/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

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

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:** 04/10/2015 (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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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.

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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:

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 GUIDE 34 REFERENCE MATERIAL PRODUCER

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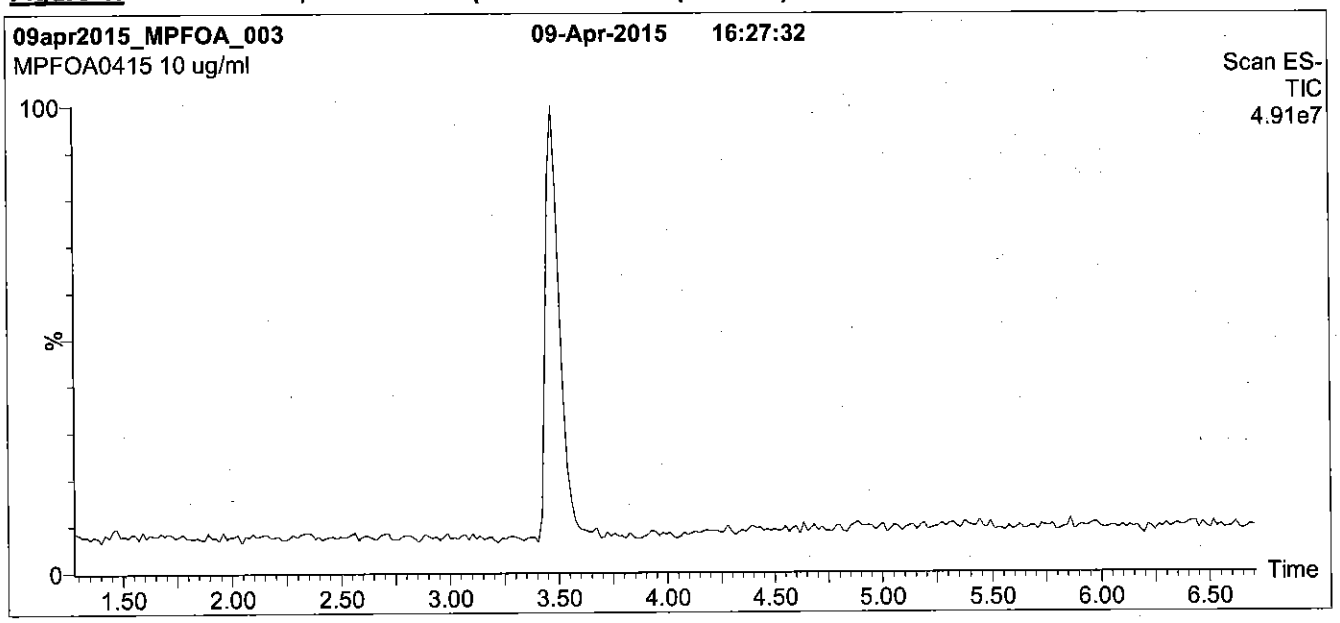
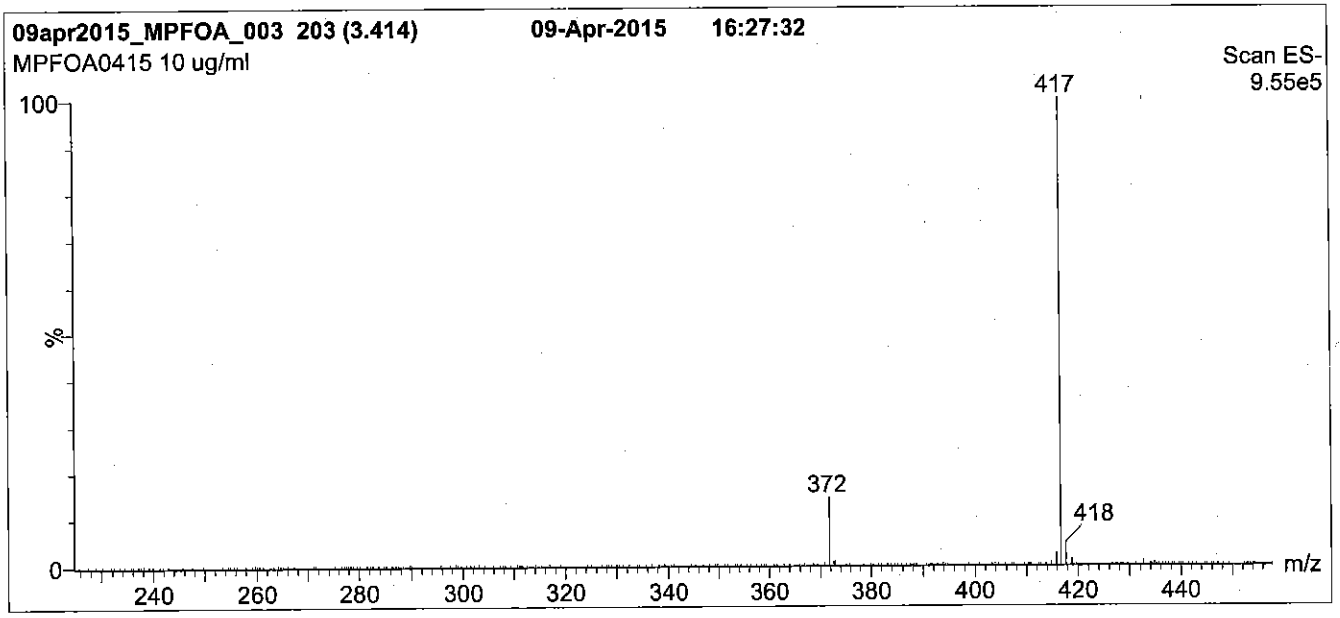
Figure 1: **MPFOA; LC/MS Data (TIC and Mass Spectrum)**





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

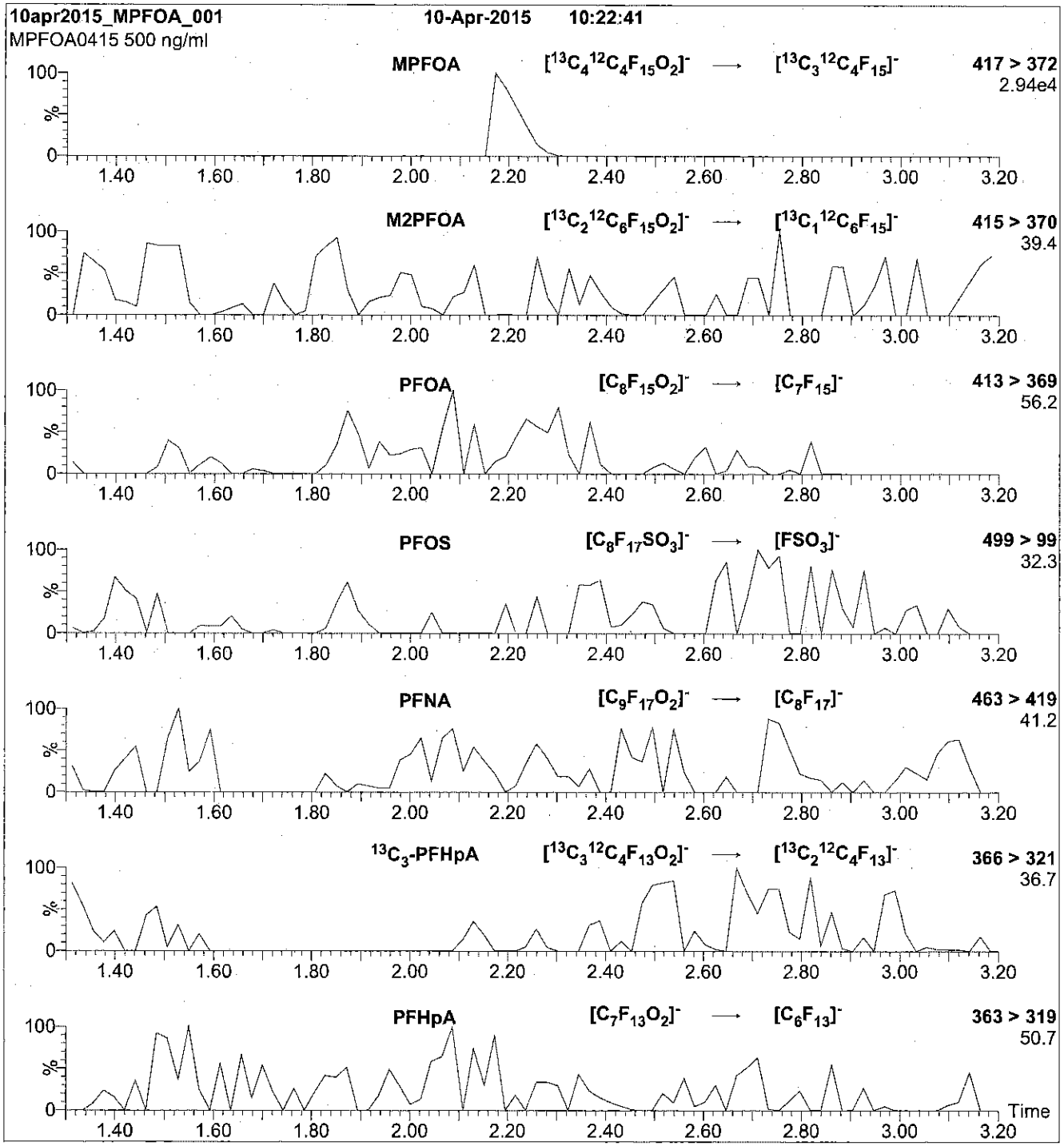
Flow: 300 µl/min

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) = 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) = 3.24e-3
Collision Energy (eV) = 11

Reagent

LCMPFOA_00008

572885
ID: LCMPFOA_00008
Exp 04/10/20 Prpd: CBW
13C4-Perfluorooctanoic ac

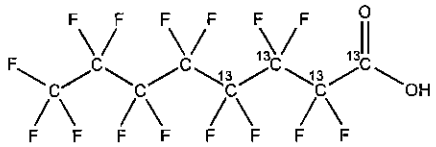
R: 1/25/16
S:

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOA
LOT NUMBER: MPFOA0415
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]octanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4HF_{15}O_2$	**MOLECULAR WEIGHT:**	418.04
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)	04/10/2015		
EXPIRY DATE: (mm/dd/yyyy)	04/10/2020		
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.
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CALA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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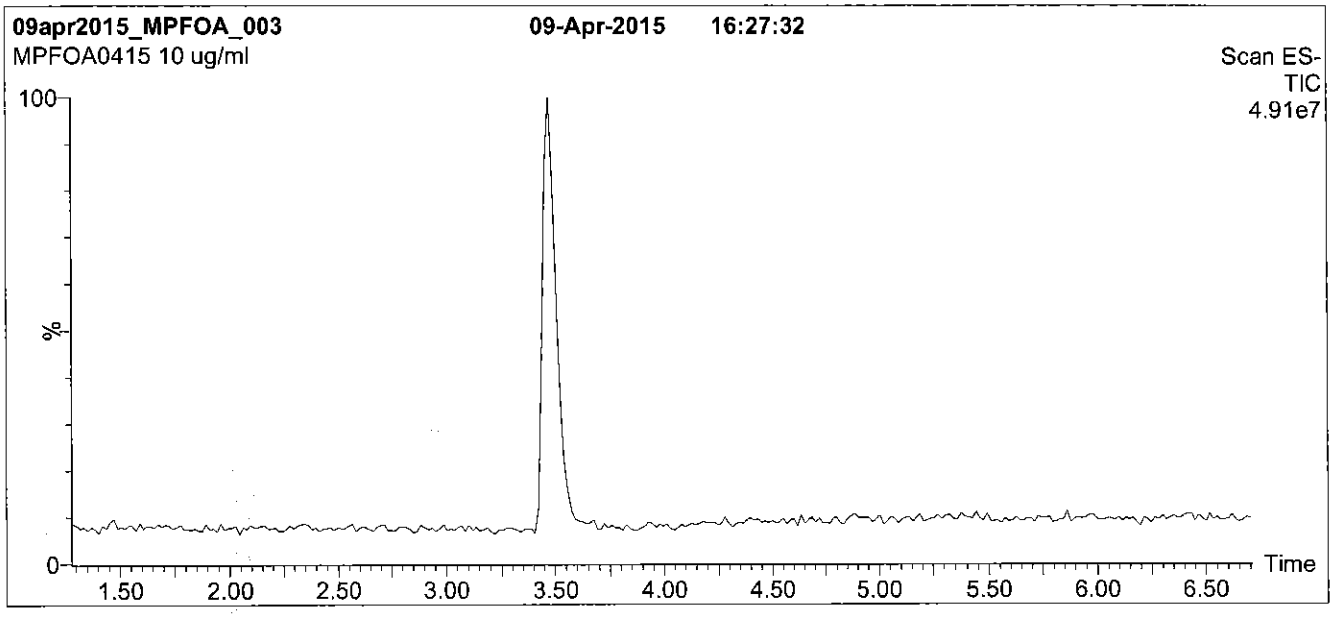

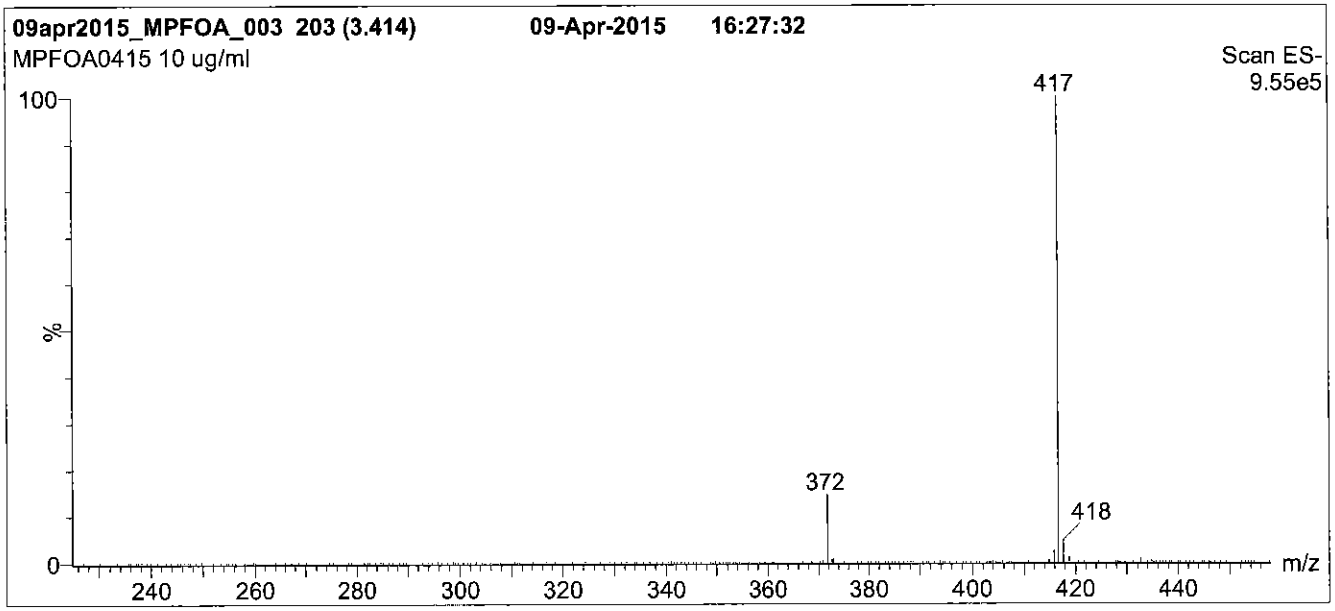

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MS: **Micromass Quattro *micro* API MS**

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1.7 µm, 2.1 x 100 mm

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before returning to initial conditions in 0.5 min.
Time: 10 min

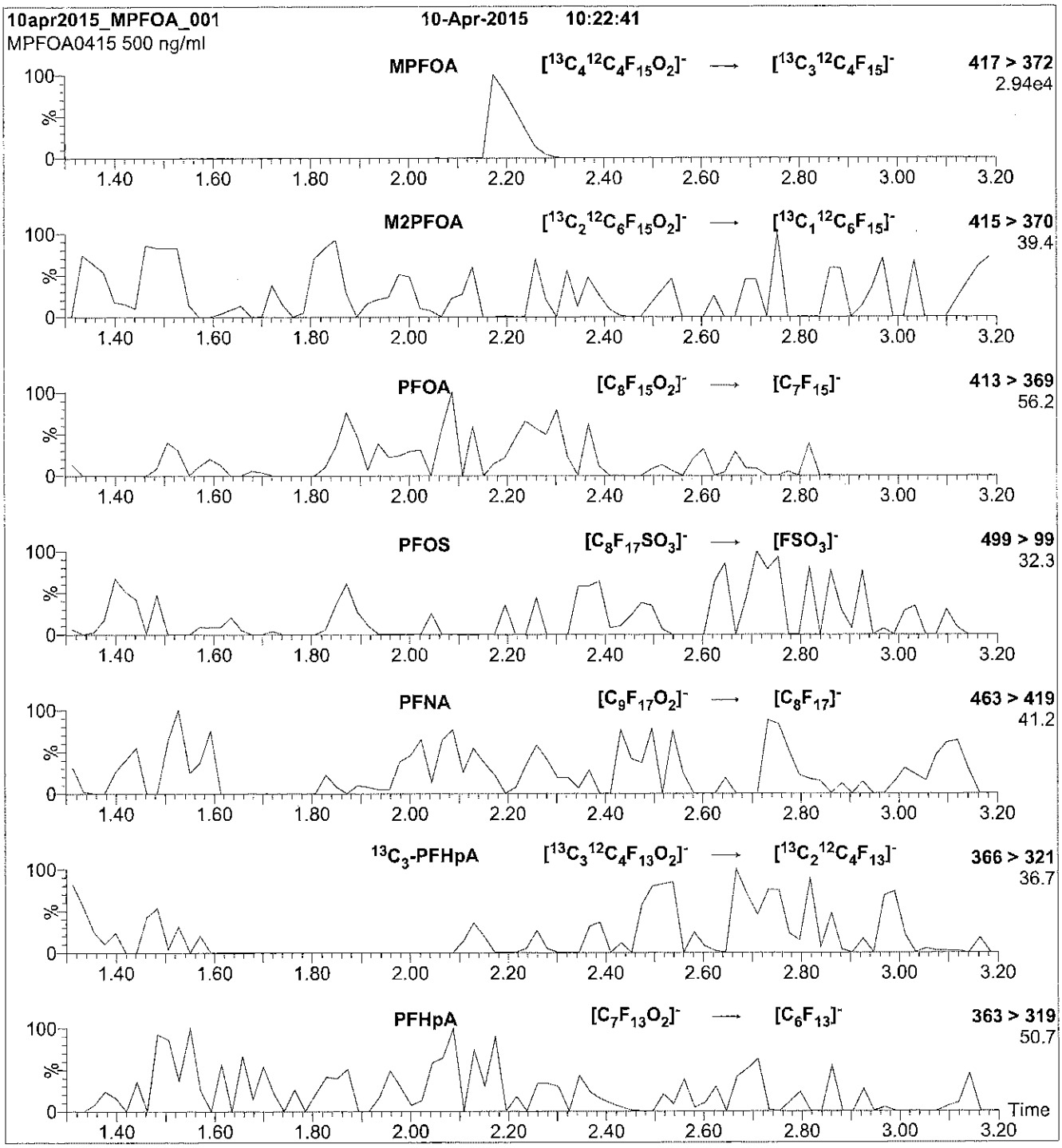
Flow: 300 µl/min

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) = 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) = 3.24e-3
Collision Energy (eV) = 11

Reagent

LCMPFOS_00007

r: 2/10/15 SV

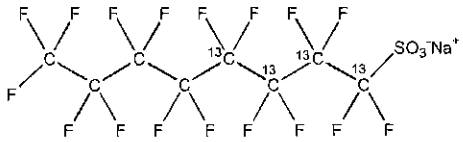
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS1014

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 ($1,2,3,4$-$^{13}C_4$)
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.
- 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:** 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:

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:

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:

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:

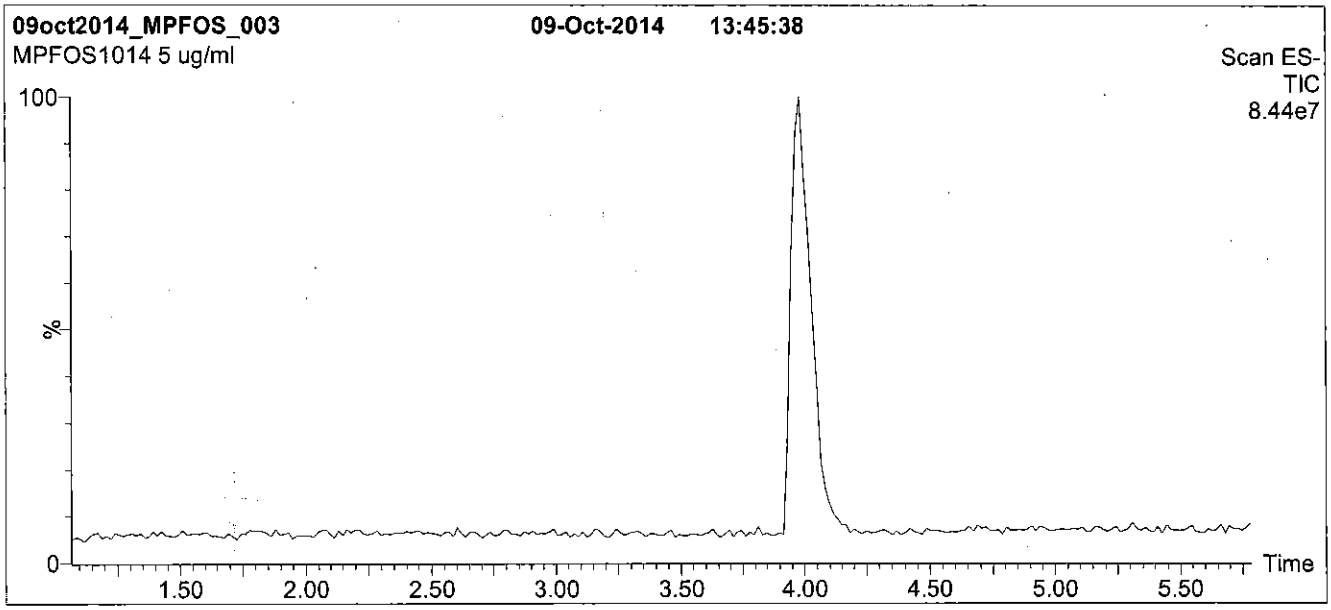
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

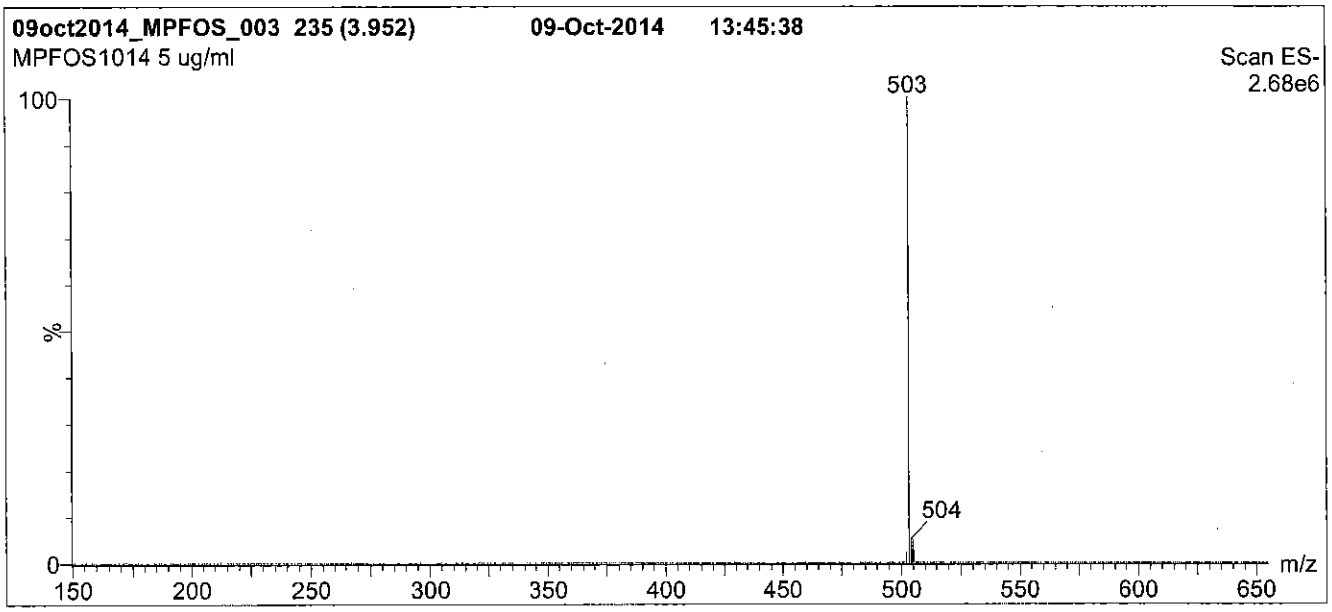
CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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: **MPFOS; 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

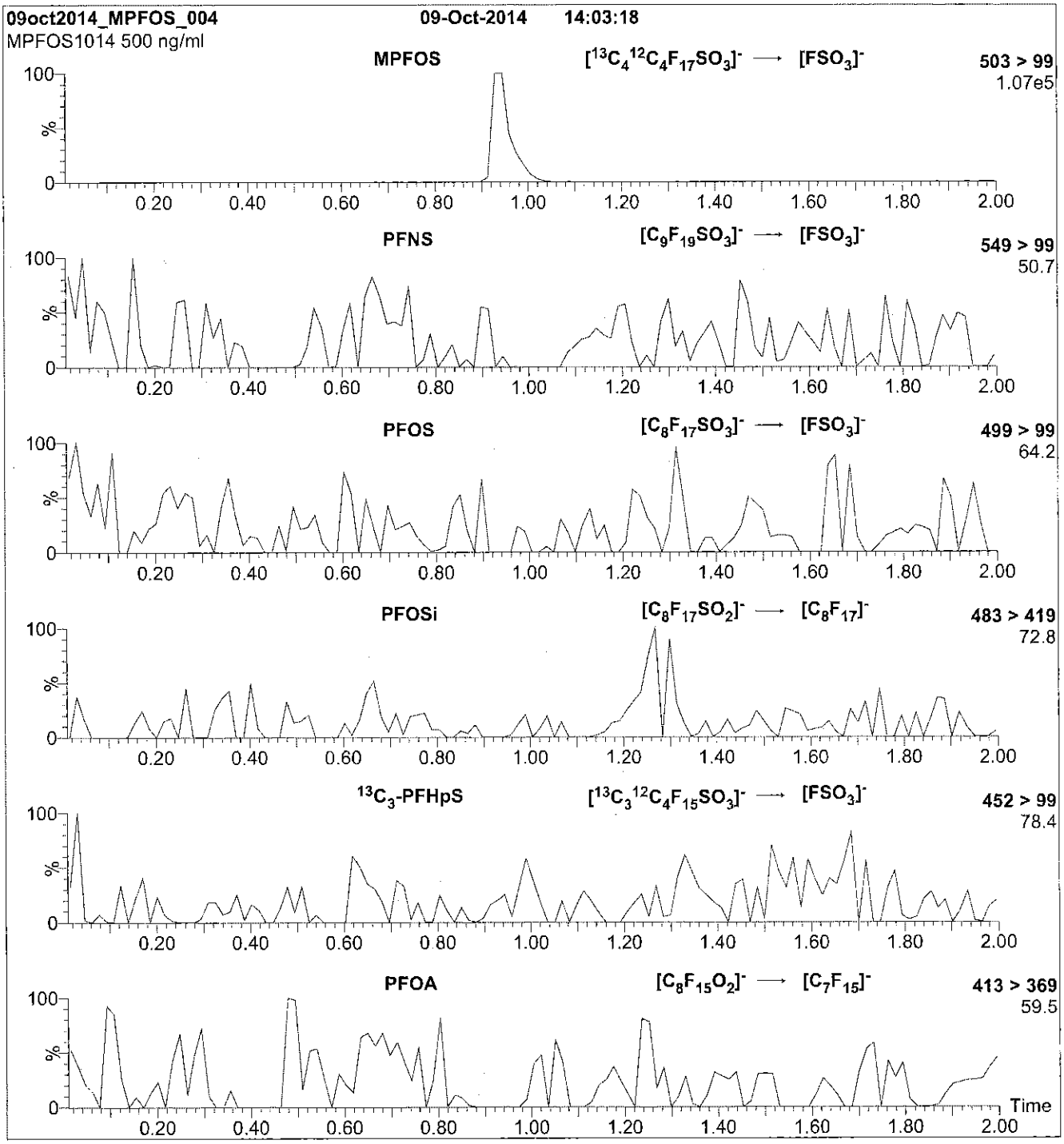
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 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) = 3.43e-3
Collision Energy (eV) = 40

Reagent

LCMPFOS_00009

V: 9/15/15 GV

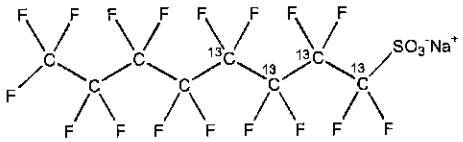
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0515

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 ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	05/15/2015		
EXPIRY DATE: (mm/dd/yyyy)	05/15/2020		
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 ~ 0.8% 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:** 05/28/2015 (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

Form#:27, Issued 2004-11-10
Revision#:3, Revised 2015-03-24

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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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.: A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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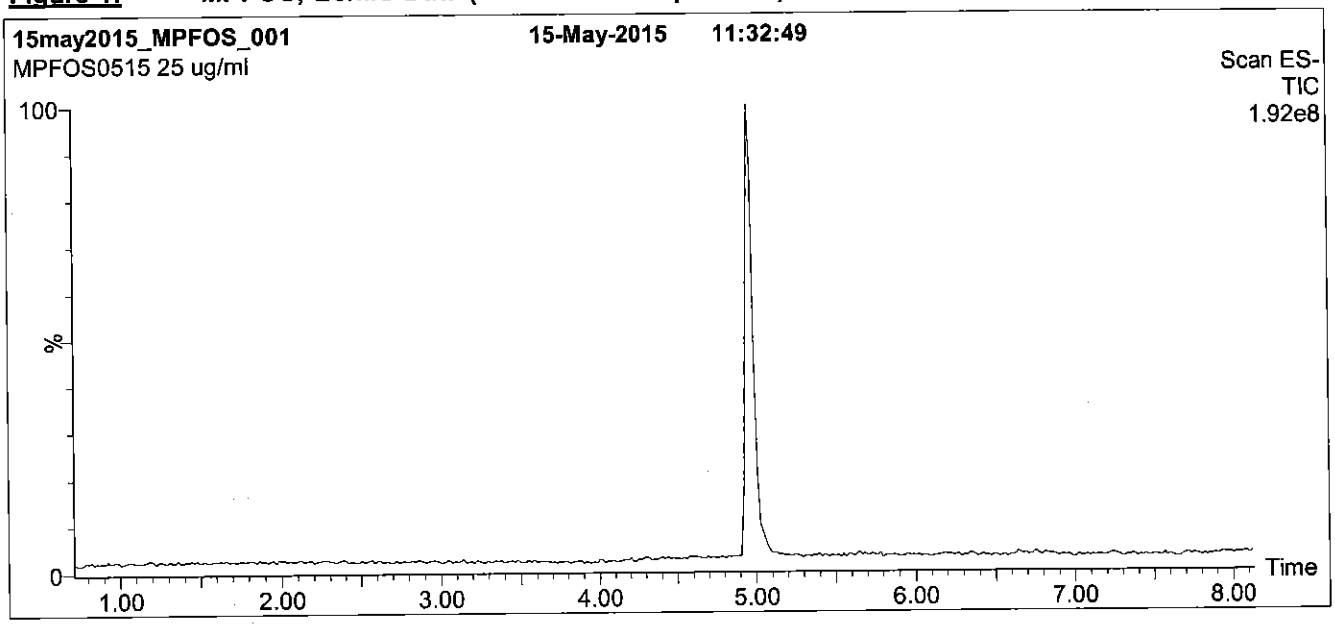
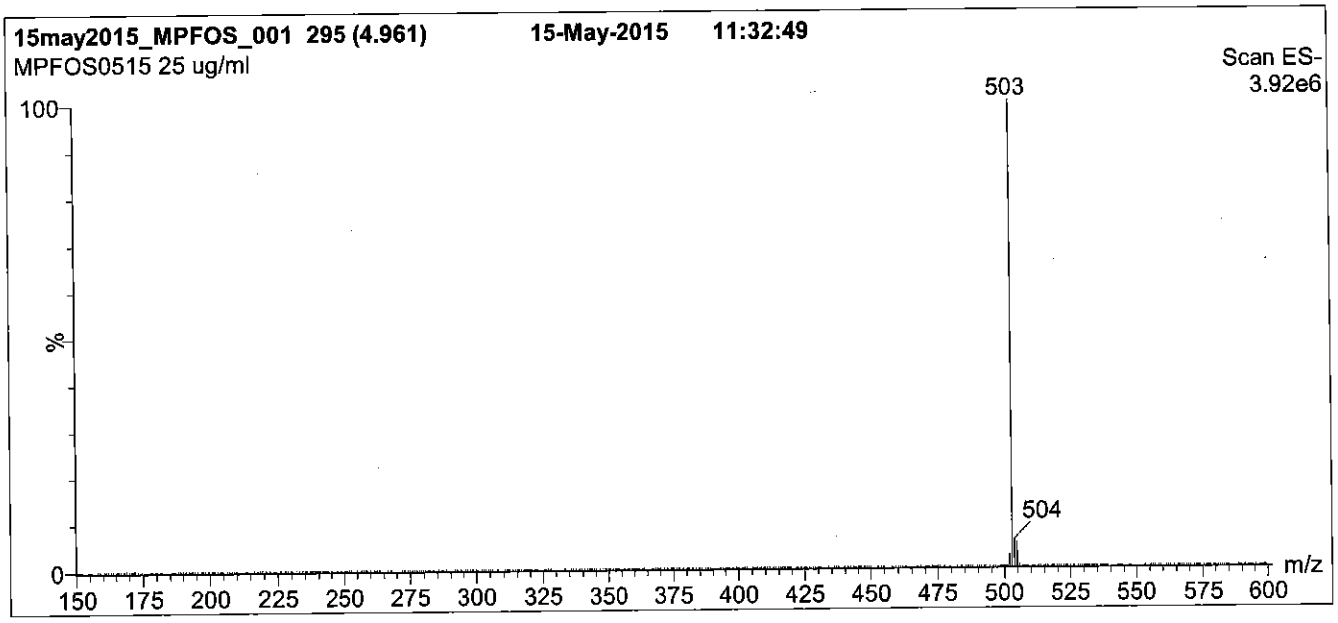
Figure 1: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





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 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

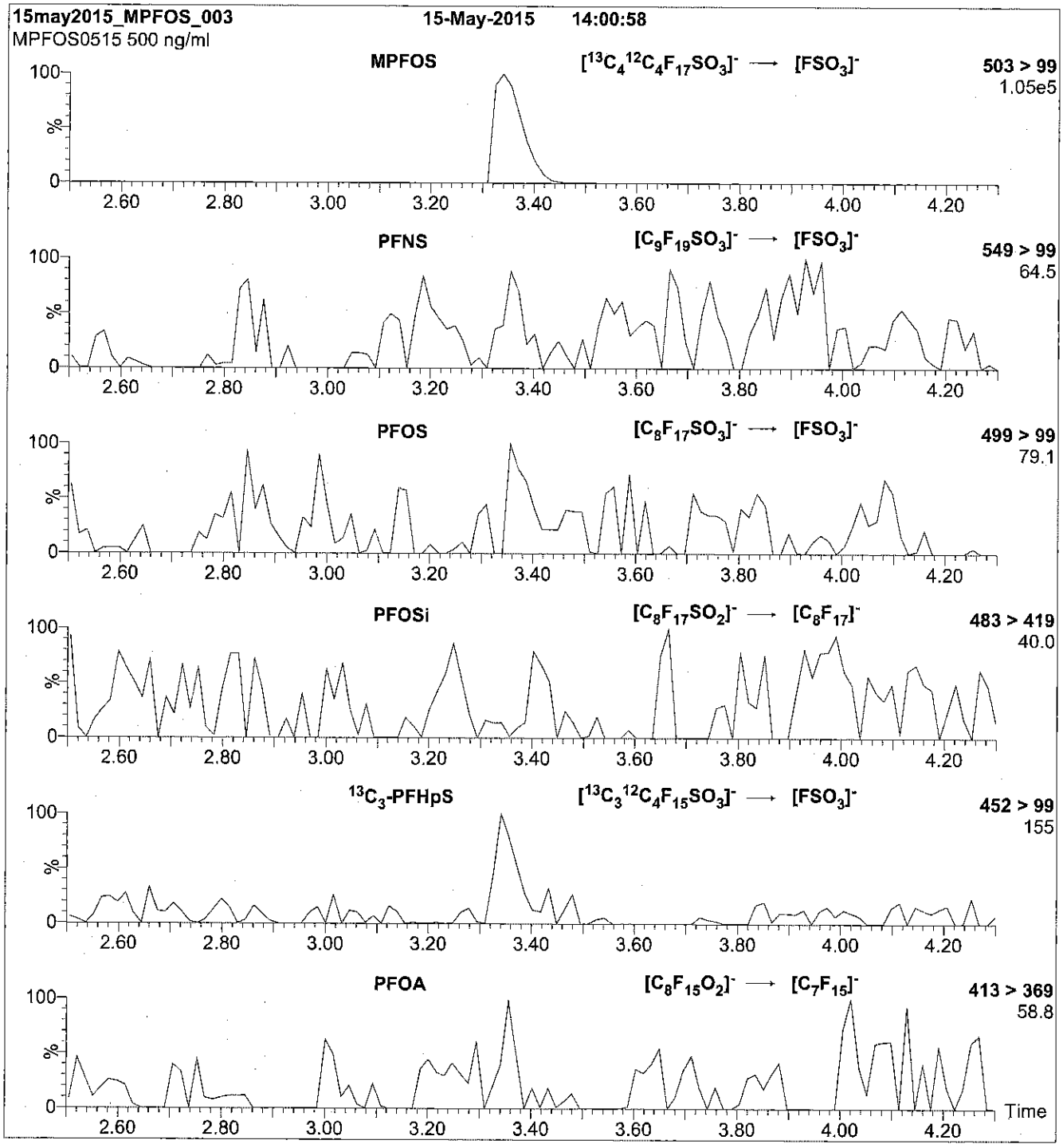
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 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) = 3.35e-3
Collision Energy (eV) = 40

Reagent

LCMPFOS_00010

572886
ID: LCMPFOS_00010
Exp: 05/15/20 Prpd: CBW
13C4-Perfluorooctanesullo

R: 1/25/16
S:

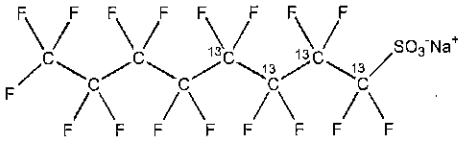
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0515

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

STRUCTURE: **CAS #:** Not available



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LAST TESTED: (mm/dd/yyyy)	05/15/2015		
EXPIRY DATE: (mm/dd/yyyy)	05/15/2020		
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 ~ 0.8% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

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Certified By: B.G. Chittim **Date:** 05/28/2015 (mm/dd/yyyy)

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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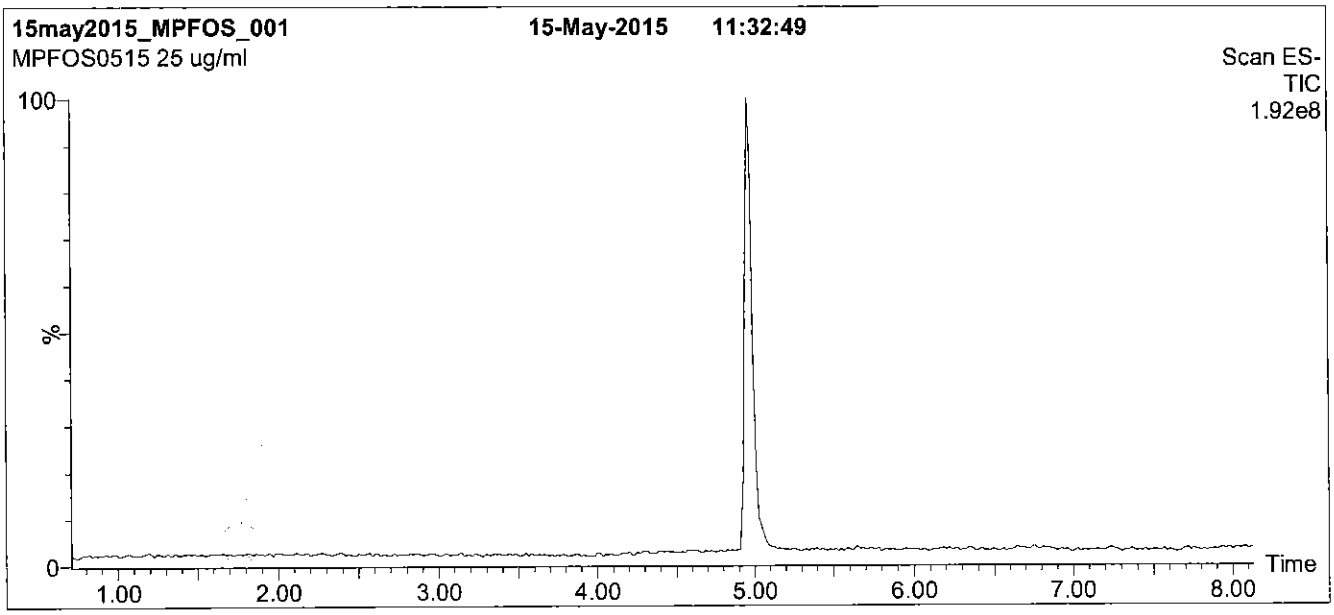

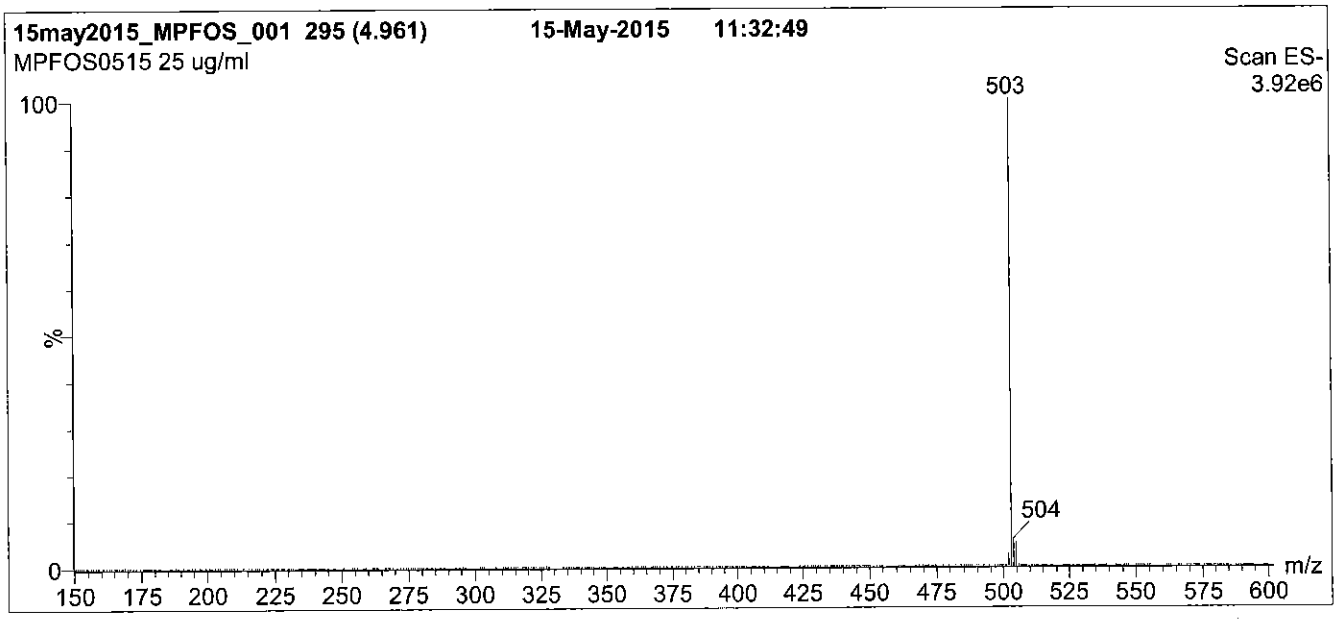

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1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
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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)
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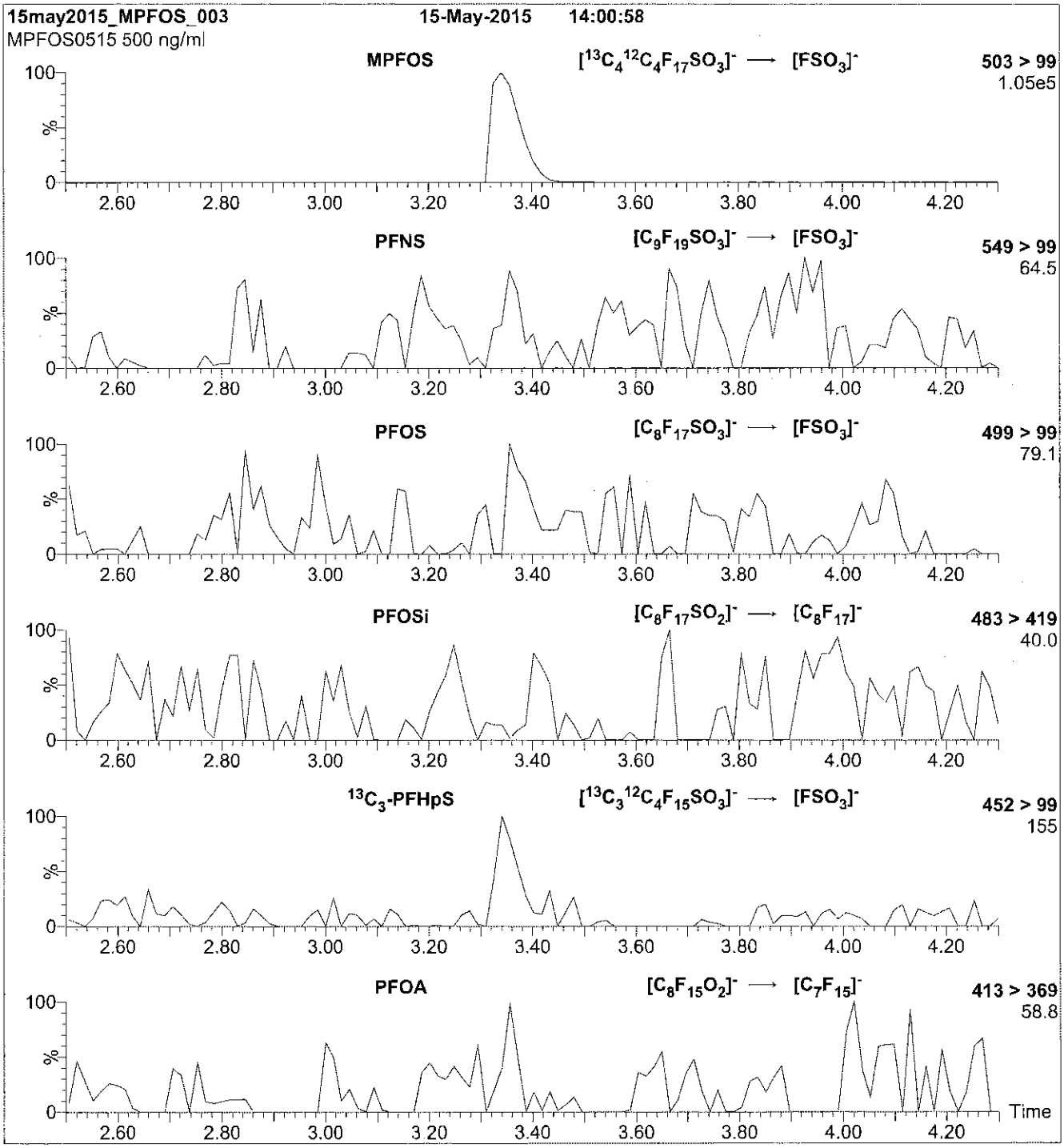
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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) = 3.35e-3
Collision Energy (eV) = 40

Reagent

LCMPFUdA_00004

R: 4/15/15 SKU

WELLINGTON LABORATORIES

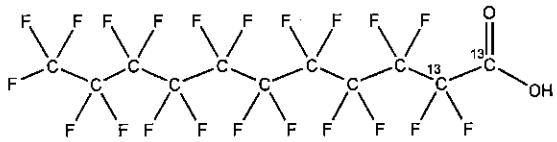
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFUdA1014

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_9HF_{21}O_2$	**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-$^{13}C_2$)
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:** 11/03/2014 (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:

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:

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 $x_1, x_2, \ldots x_n$ 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 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:

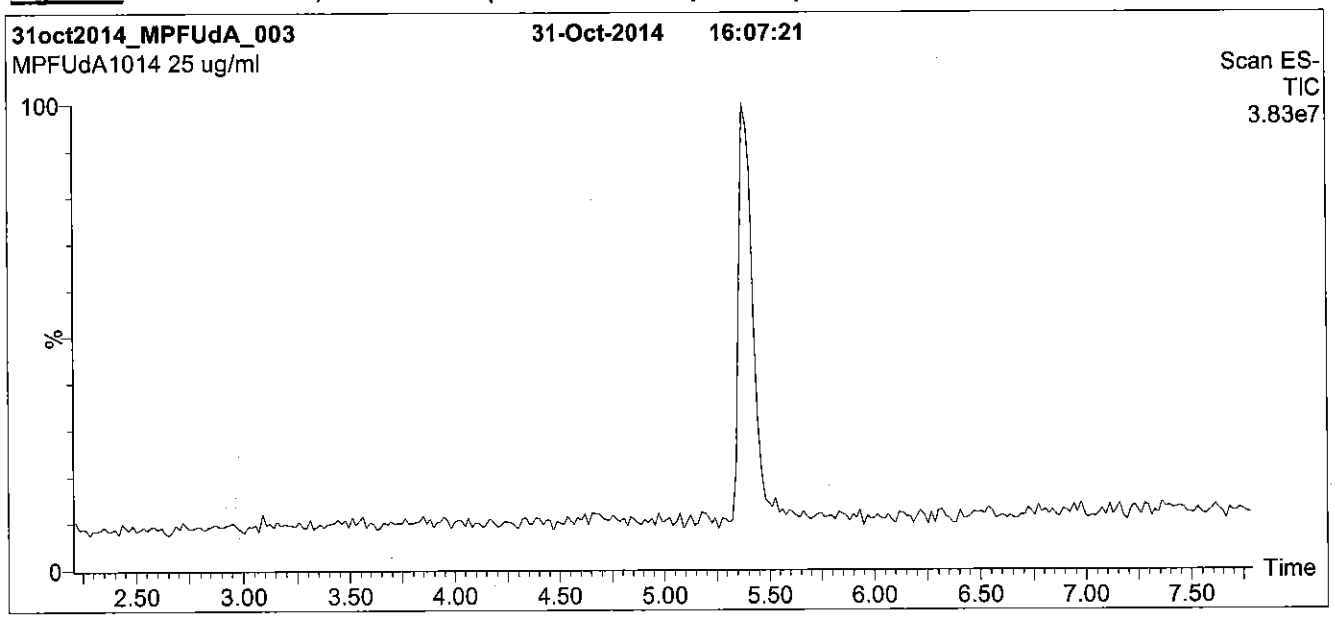
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

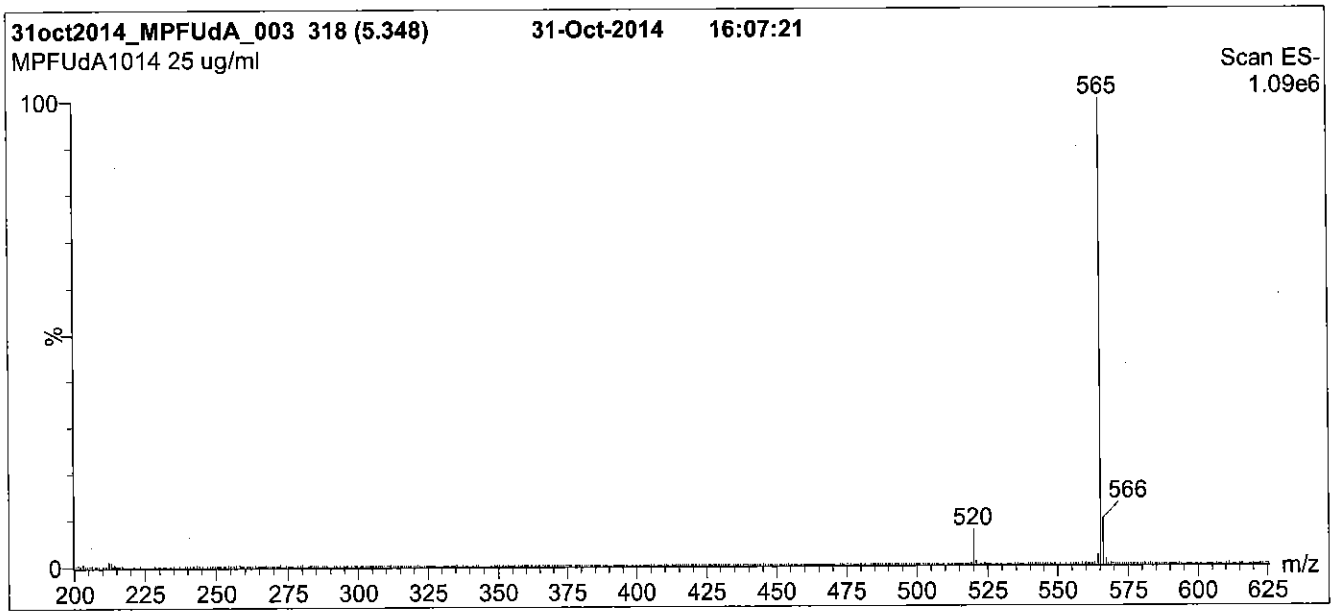
CALA Testing Accreditation No. A1226

ACLASS 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: **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

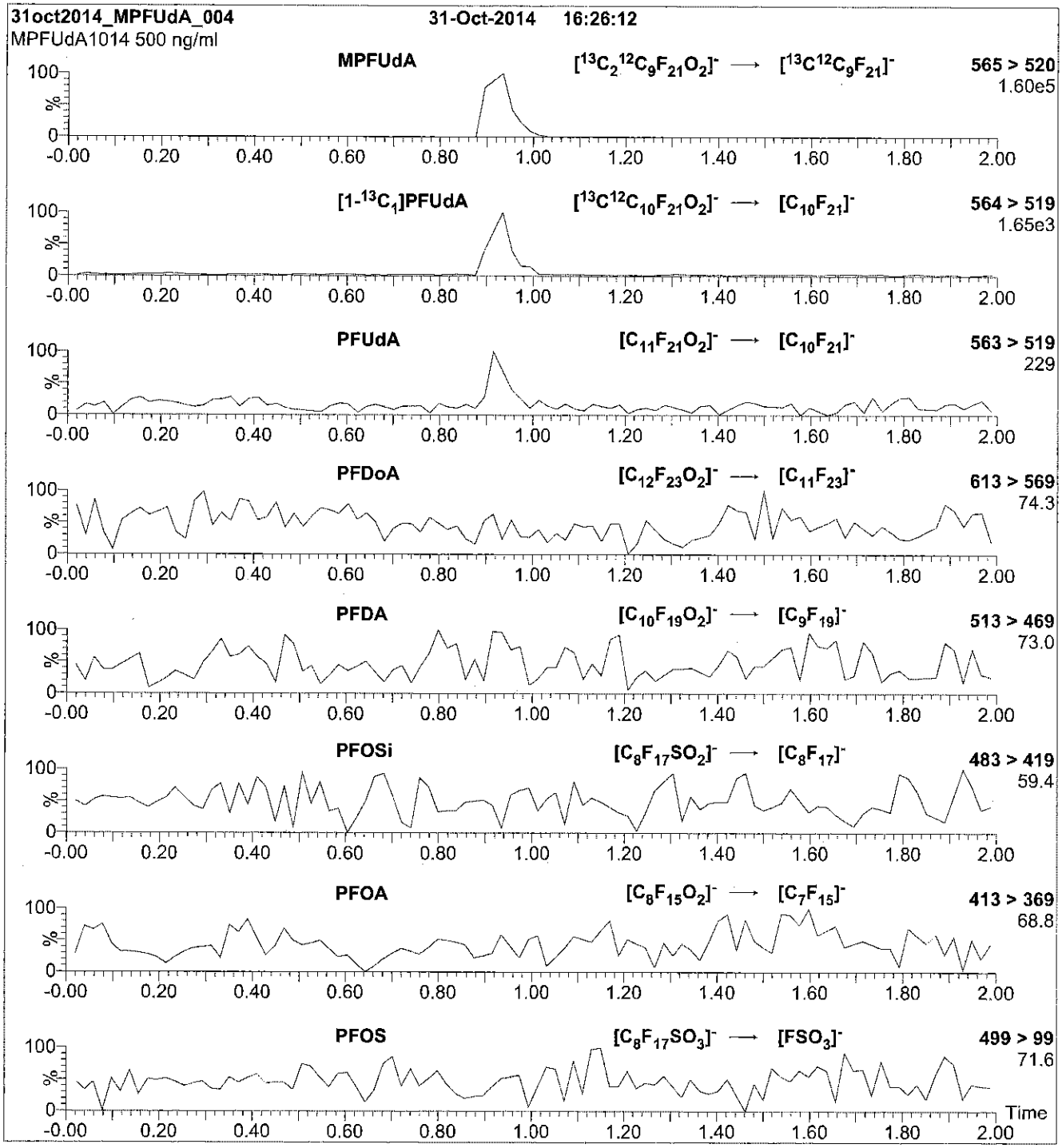
Flow: 300 µl/min

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

LCMPFUdA_00005

V: 12/9/15 SEV

WELLINGTON LABORATORIES

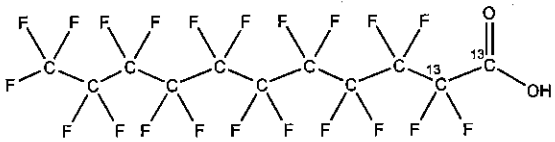
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFUdA1014

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_9HF_{21}O_2$	**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		

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- See page 2 for further details.
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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.

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

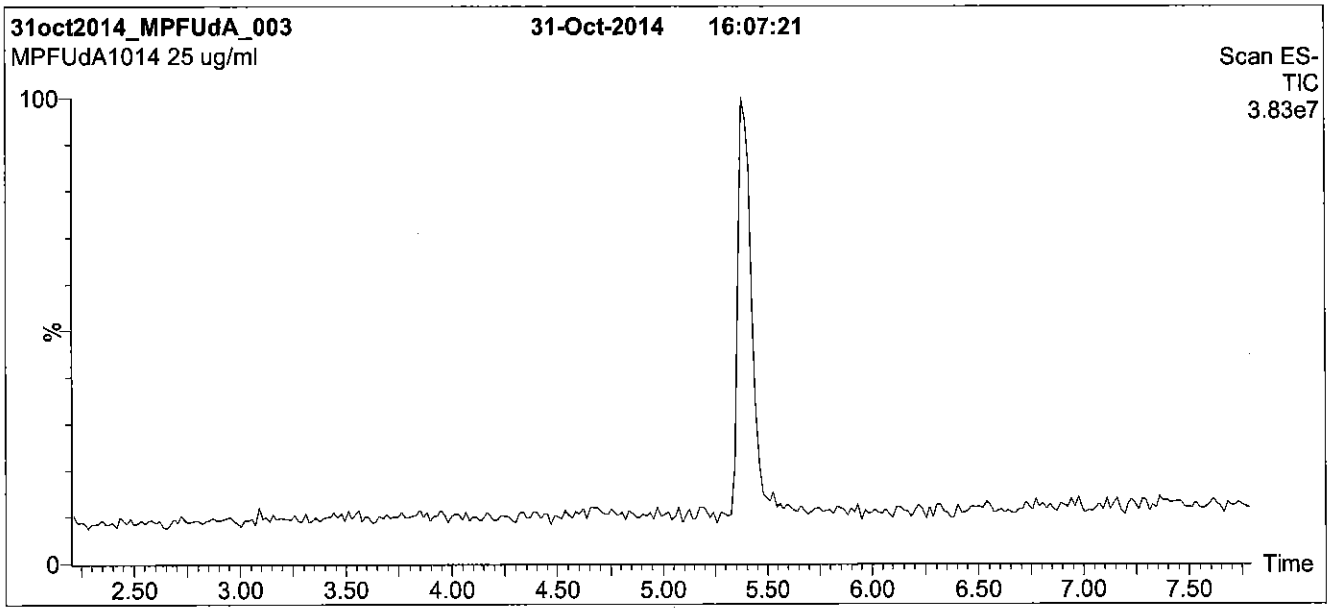
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

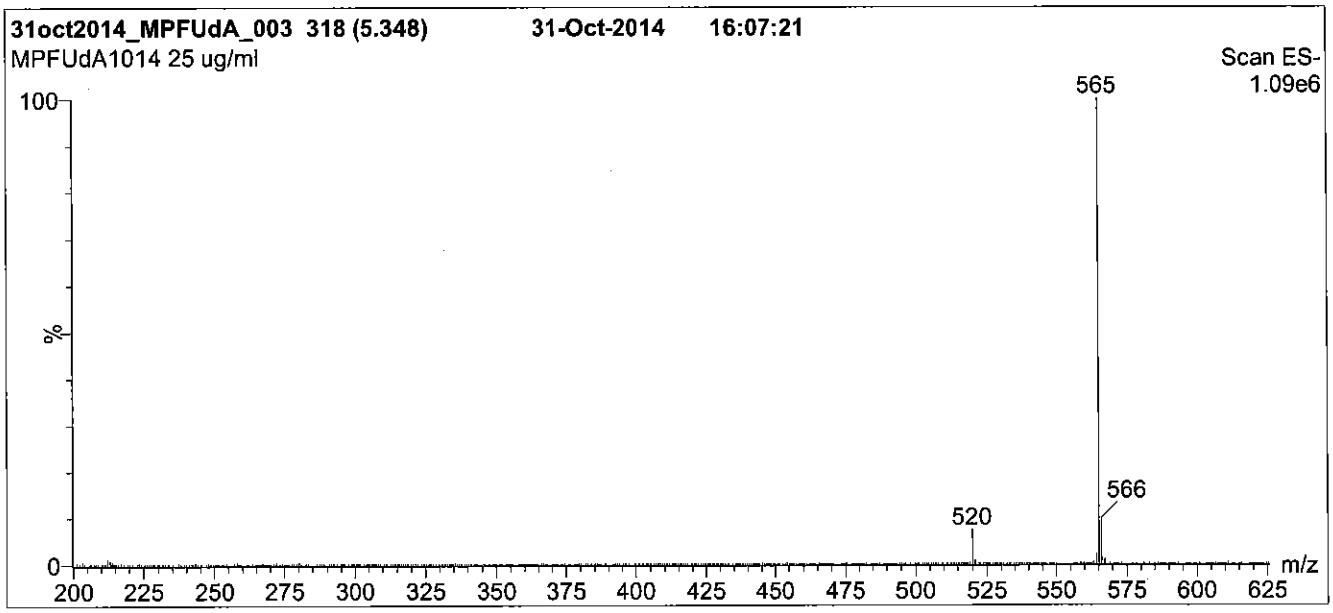
CALA Testing Accreditation No. A1226

ANAB ACCREDITED Certificate No. AR-1523 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: **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

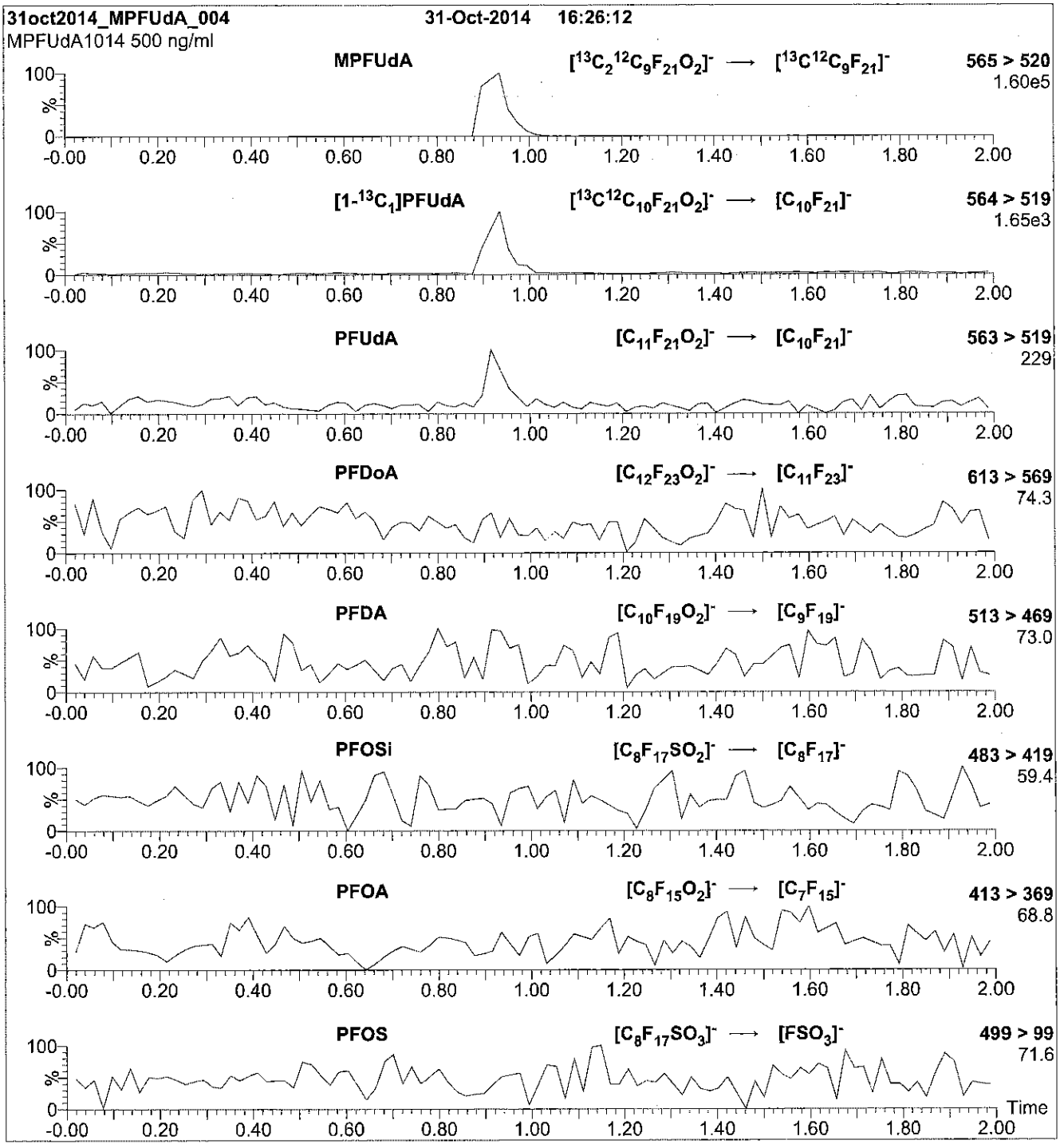
Flow: 300 µl/min

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

LCPFBA_00003

rec 7/15/14

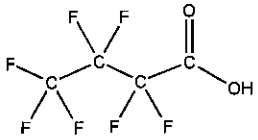
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFBA
LOT NUMBER: PFBA0313
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) 03/05/2013
EXPIRY DATE: (mm/dd/yyyy) 03/05/2018
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/06/2013 (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

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CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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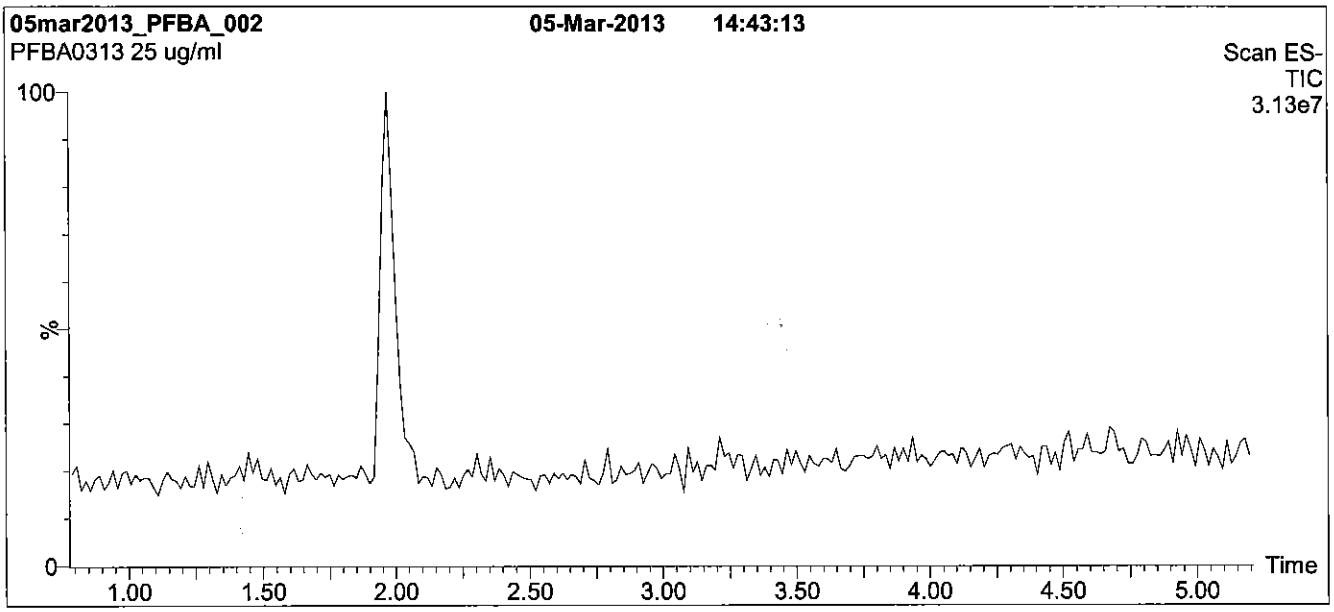
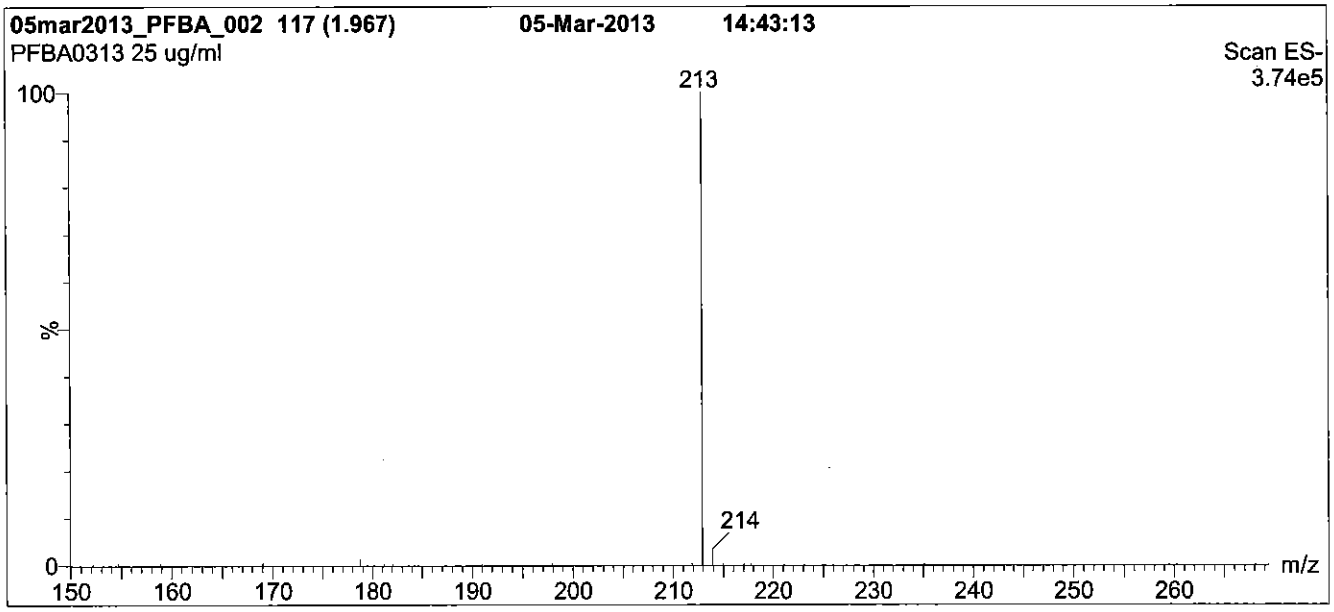
Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





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: 25% (80:20 MeOH:ACN) / 75% 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

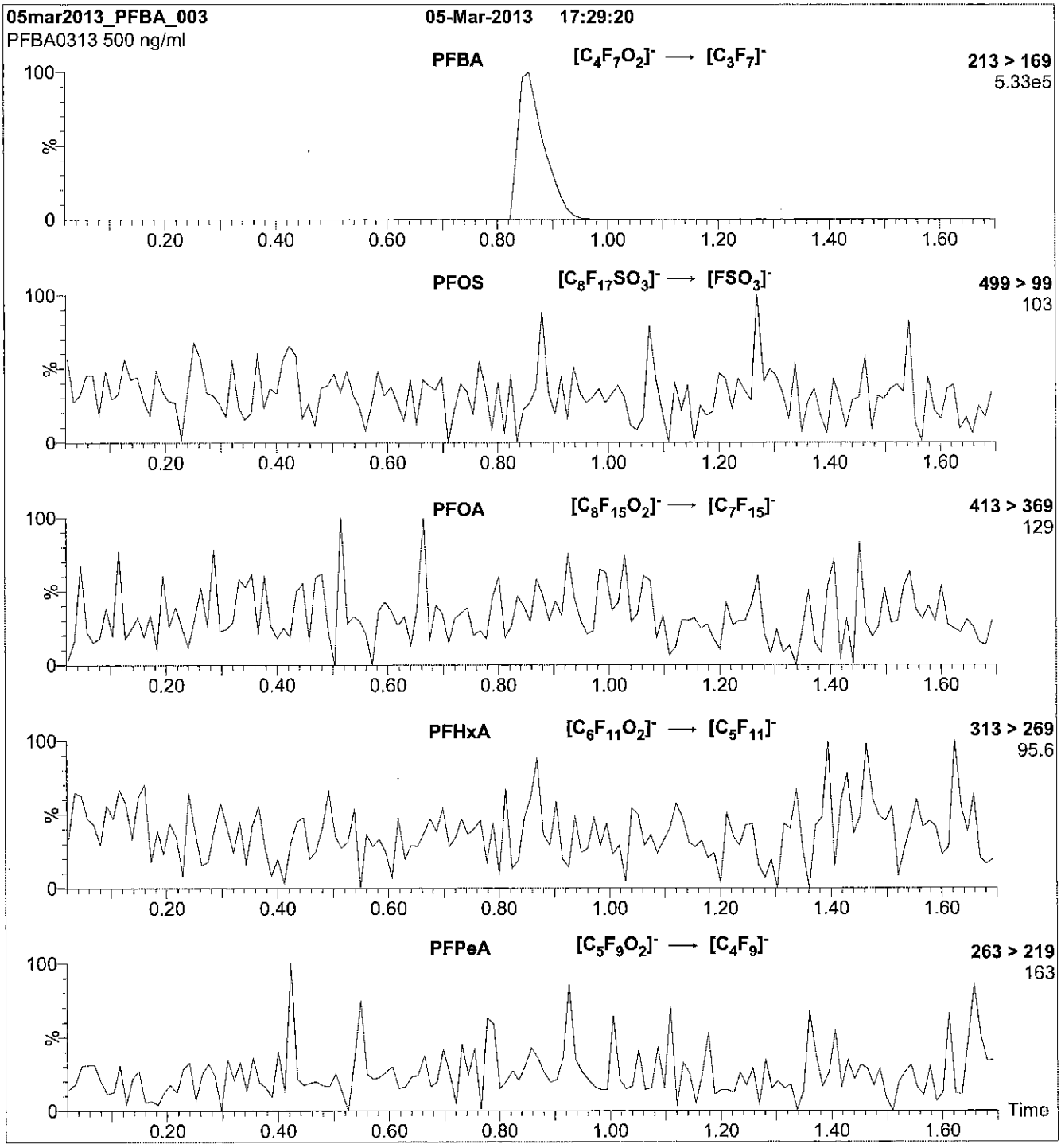
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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) = 3.70e-3
Collision Energy (eV) = 10

Reagent

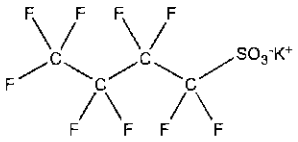
LCPFBS_00003

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)	**SOLVENT(S):**	Methanol
	44.2 ± 2.2 µg/ml (PFBS anion)		
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.

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

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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:

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.

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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:

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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 our products.

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CALA Testing Accreditation No: A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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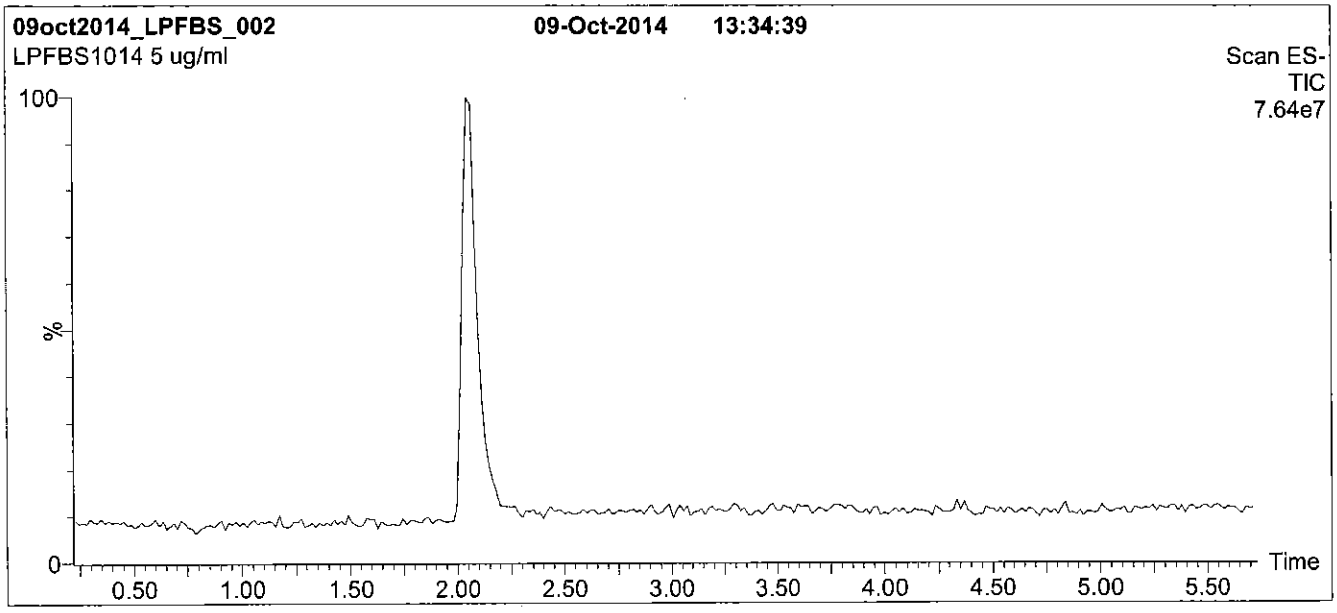
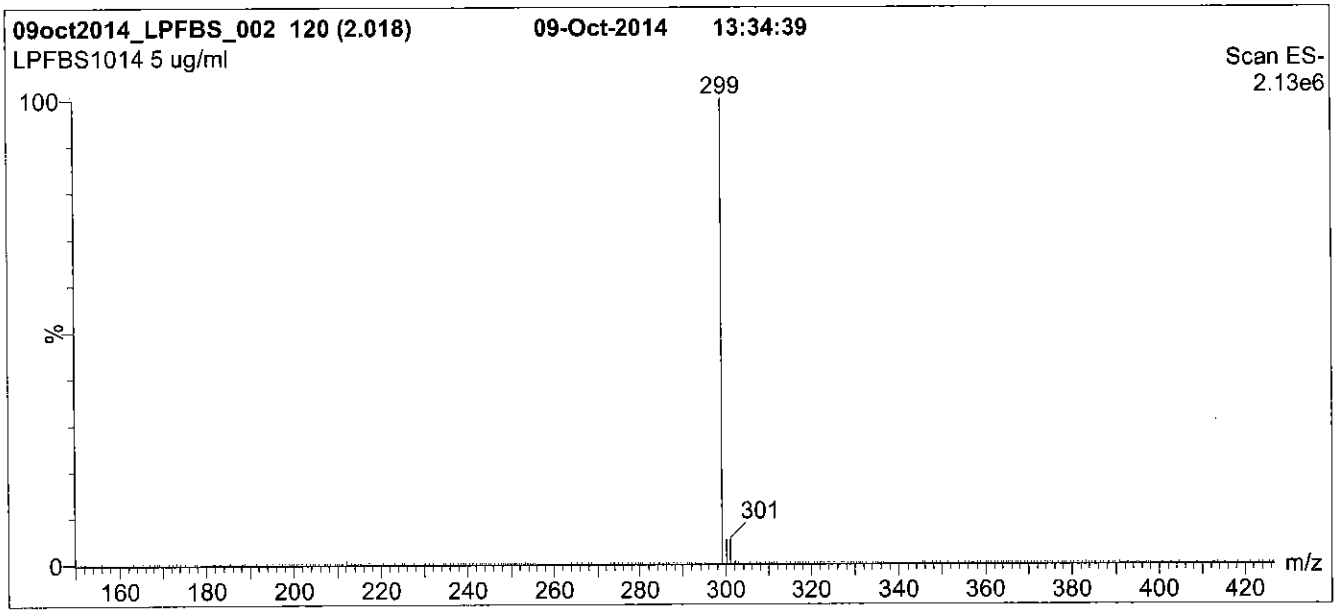
Figure 1: **L-PFBS; LC/MS Data (TIC and Mass Spectrum)**





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

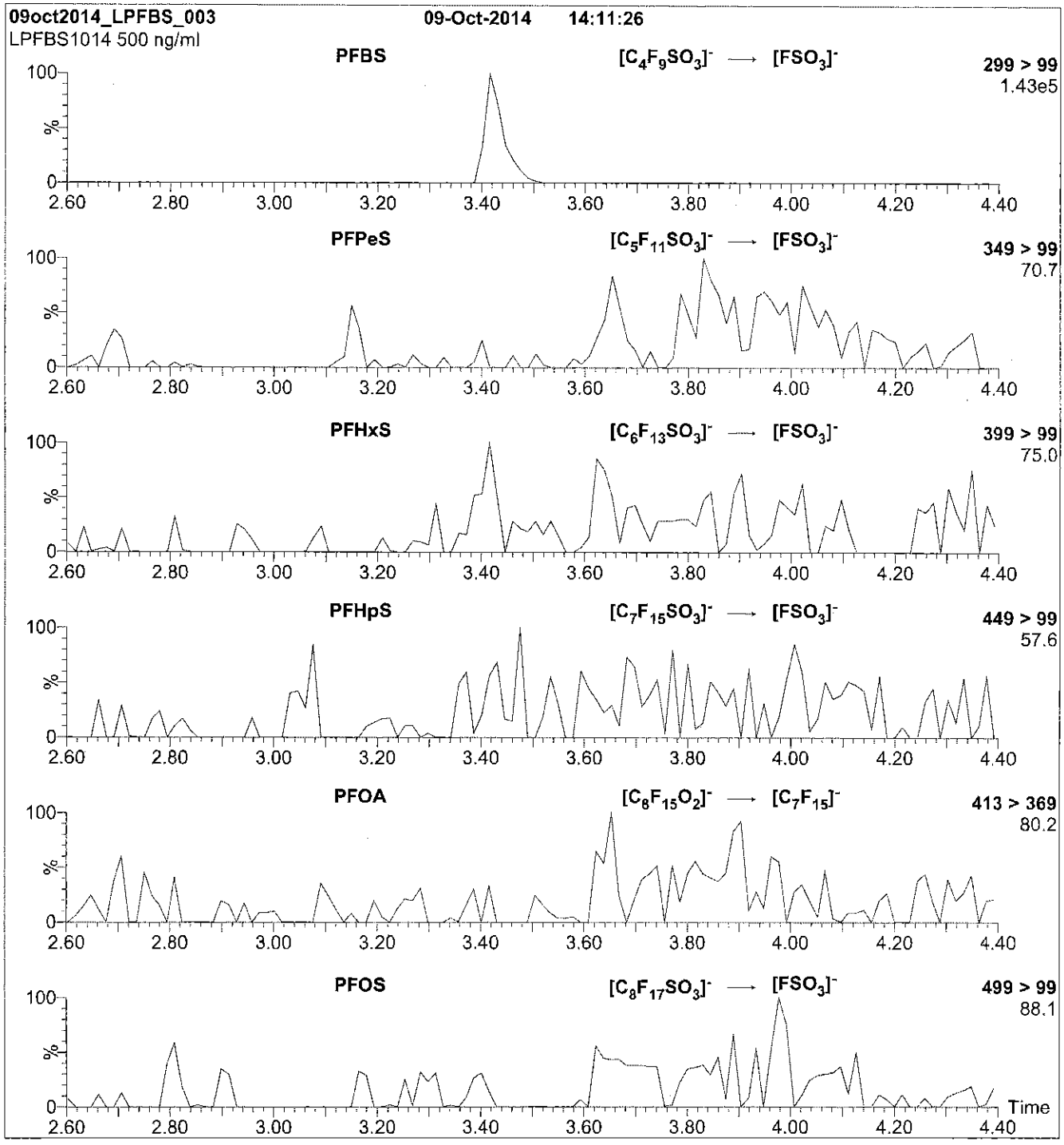
Flow: 300 µl/min

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_00003

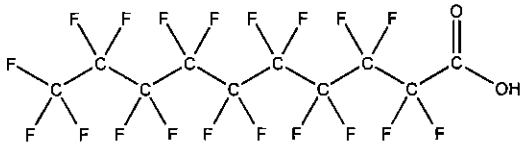
rec 7/16/14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFDA
COMPOUND: Perfluoro-n-decanoic acid
LOT NUMBER: PFDA0613

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) 06/19/2013
EXPIRY DATE: (mm/dd/yyyy) 06/19/2018
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 ~ 0.4% PFNA and ~ 0.1% PFOA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/03/2013 (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

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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.

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CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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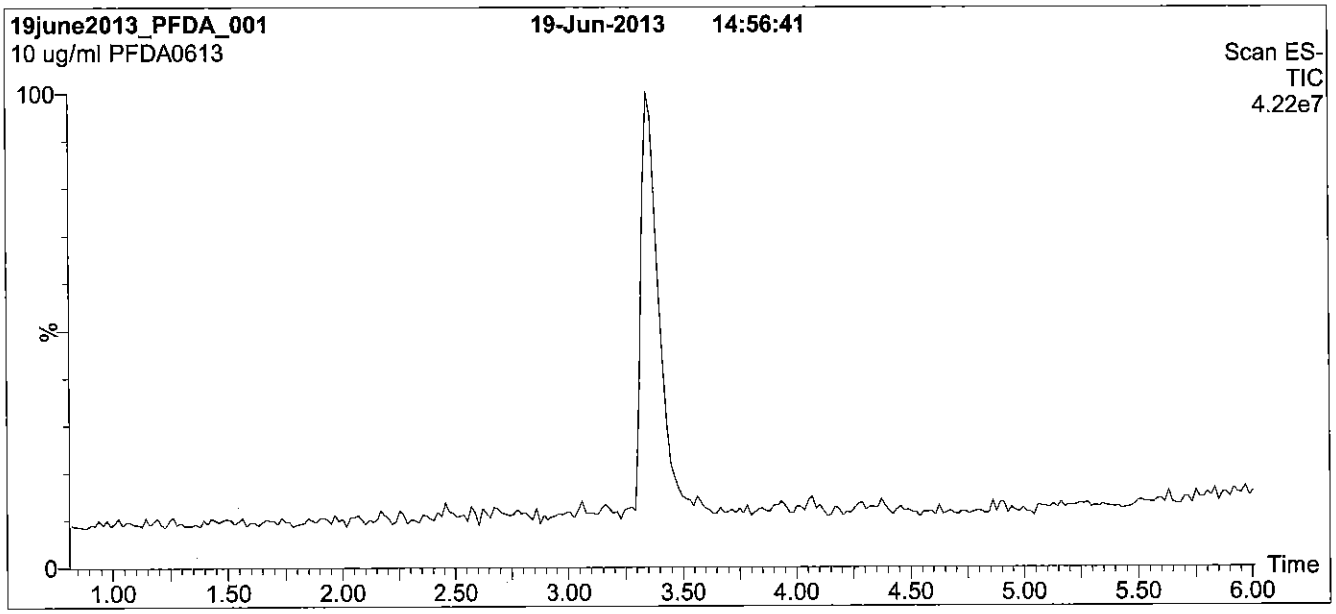
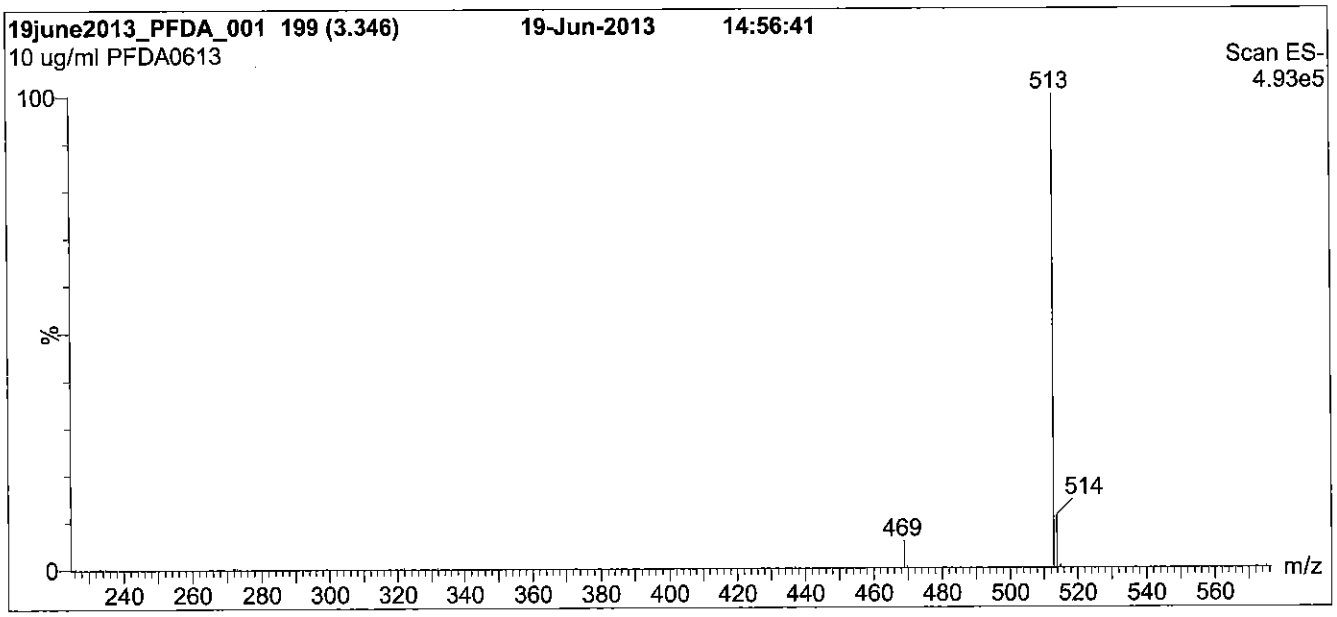
Figure 1: **PFDA; LC/MS Data (TIC and Mass Spectrum)**





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: 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

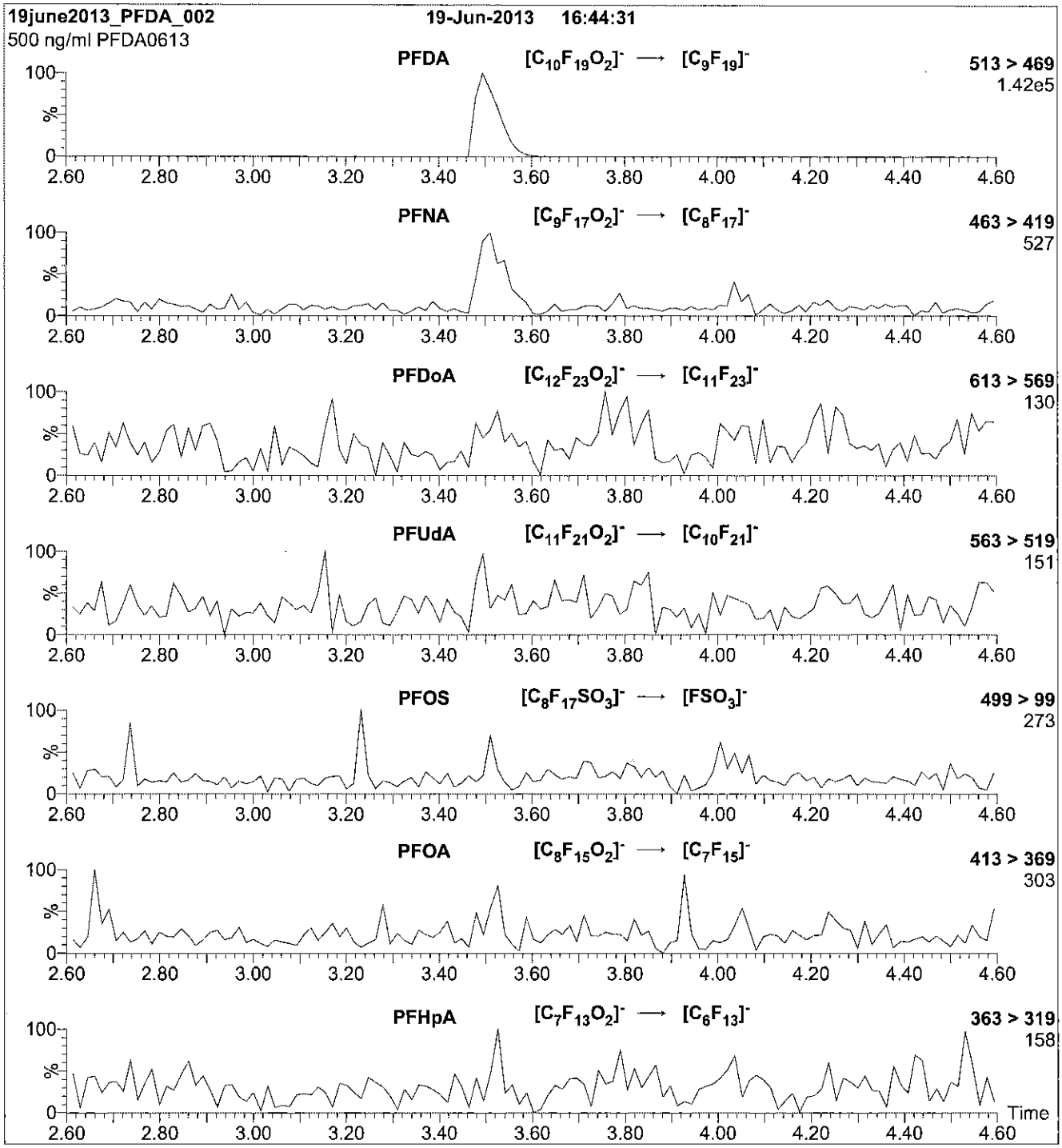
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
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) = 3.58e-3
Collision Energy (eV) = 13

Reagent

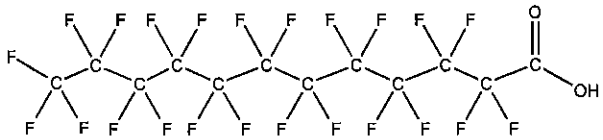
LCPFDoA_00003

Rec 7/14/15

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFDoA	**LOT NUMBER:**	PFDoA0113
COMPOUND:	Perfluoro-n-dodecanoic acid		
STRUCTURE:		**CAS #:**	307-55-1



MOLECULAR FORMULA:	$C_{12}HF_{23}O_2$	**MOLECULAR WEIGHT:**	614.10
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	01/03/2013		
EXPIRY DATE: (mm/dd/yyyy)	01/03/2018		
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:

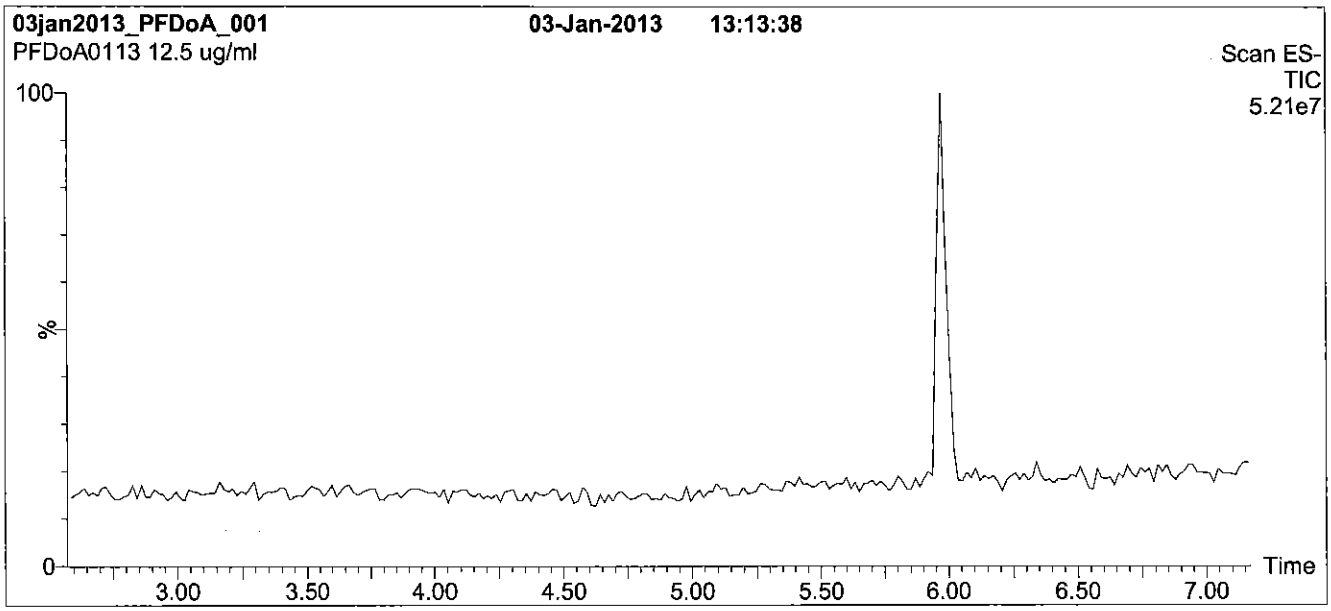
- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

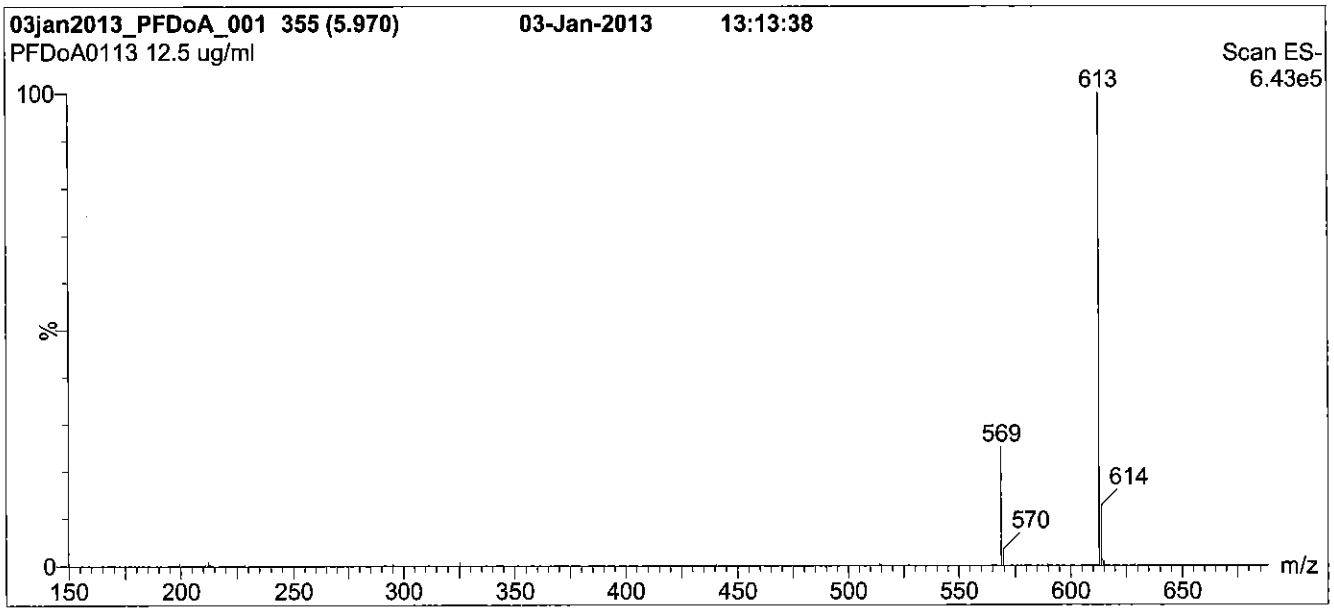
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/01/2013 (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

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: 40% (80:20 MeOH:ACN) / 60% H_2O
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Ramp to 90% organic over 7 min and hold for 2 min.
Return 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) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Reagent

LCPFDoS_00003

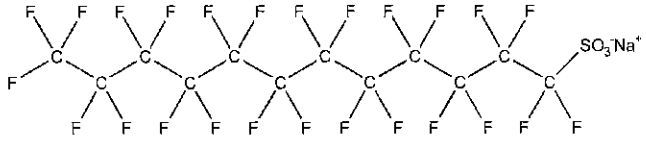
Y. 2/11/15 BV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFDoS
LOT NUMBER: LPFDoS1011
COMPOUND: Sodium perfluoro-1-dodecanesulfonate

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$C_{12}F_{25}SO_3Na$	**MOLECULAR WEIGHT:**	722.14
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.4 ± 2.4 µg/ml (PFDoS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	10/06/2011		
EXPIRY DATE: (mm/dd/yyyy)	10/06/2016		
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 ~ 0.3% of sodium perfluoro-1-tetradecanesulfonate and ~ 0.8% of perfluoro-n-dodecanoic acid (PFDoA).

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

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CALA Testing Accreditation No. A 1226

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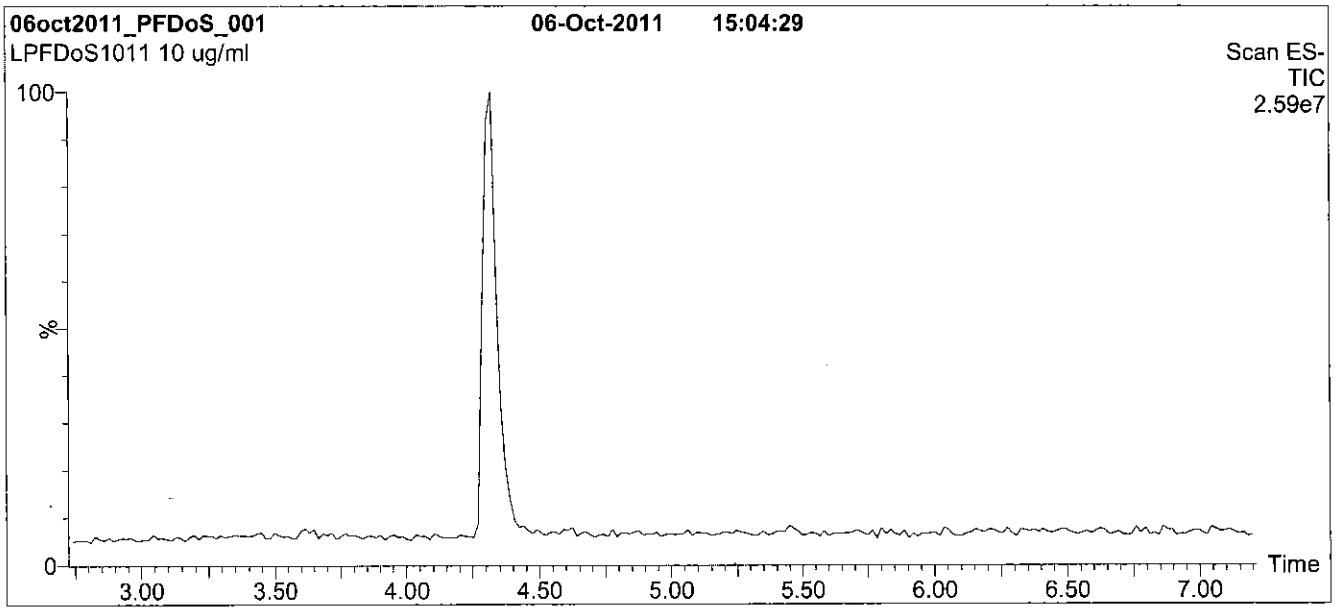

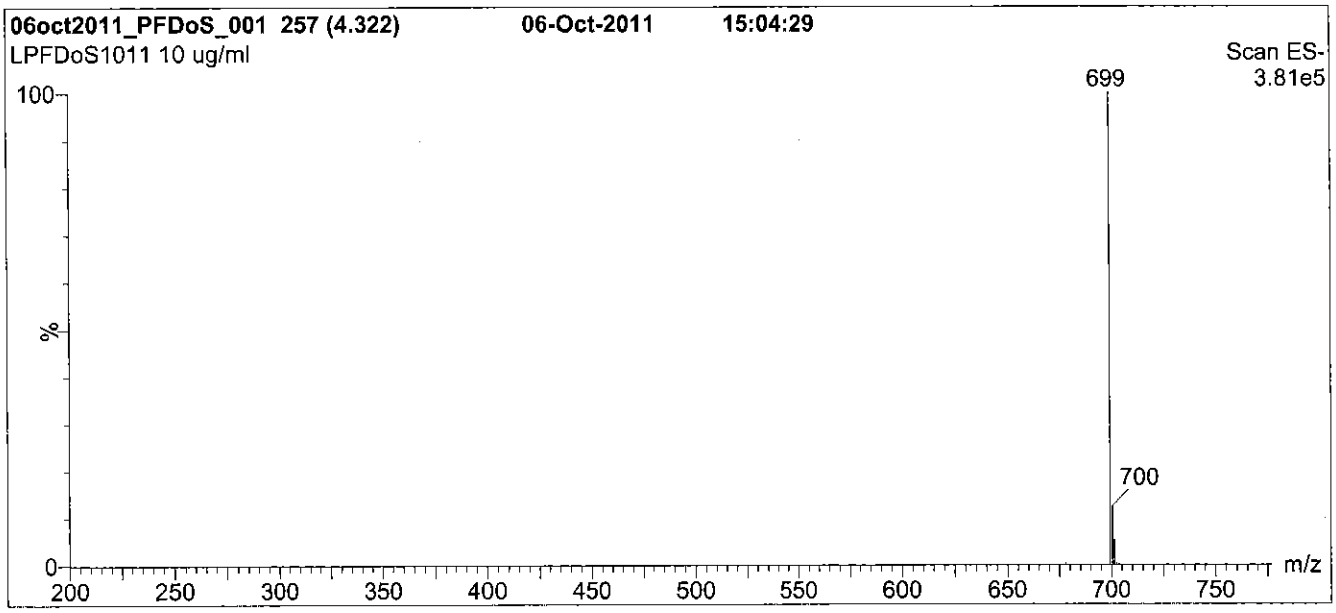

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Ramp to 90% organic over 7 min and hold for 2 min
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Time: 10 min

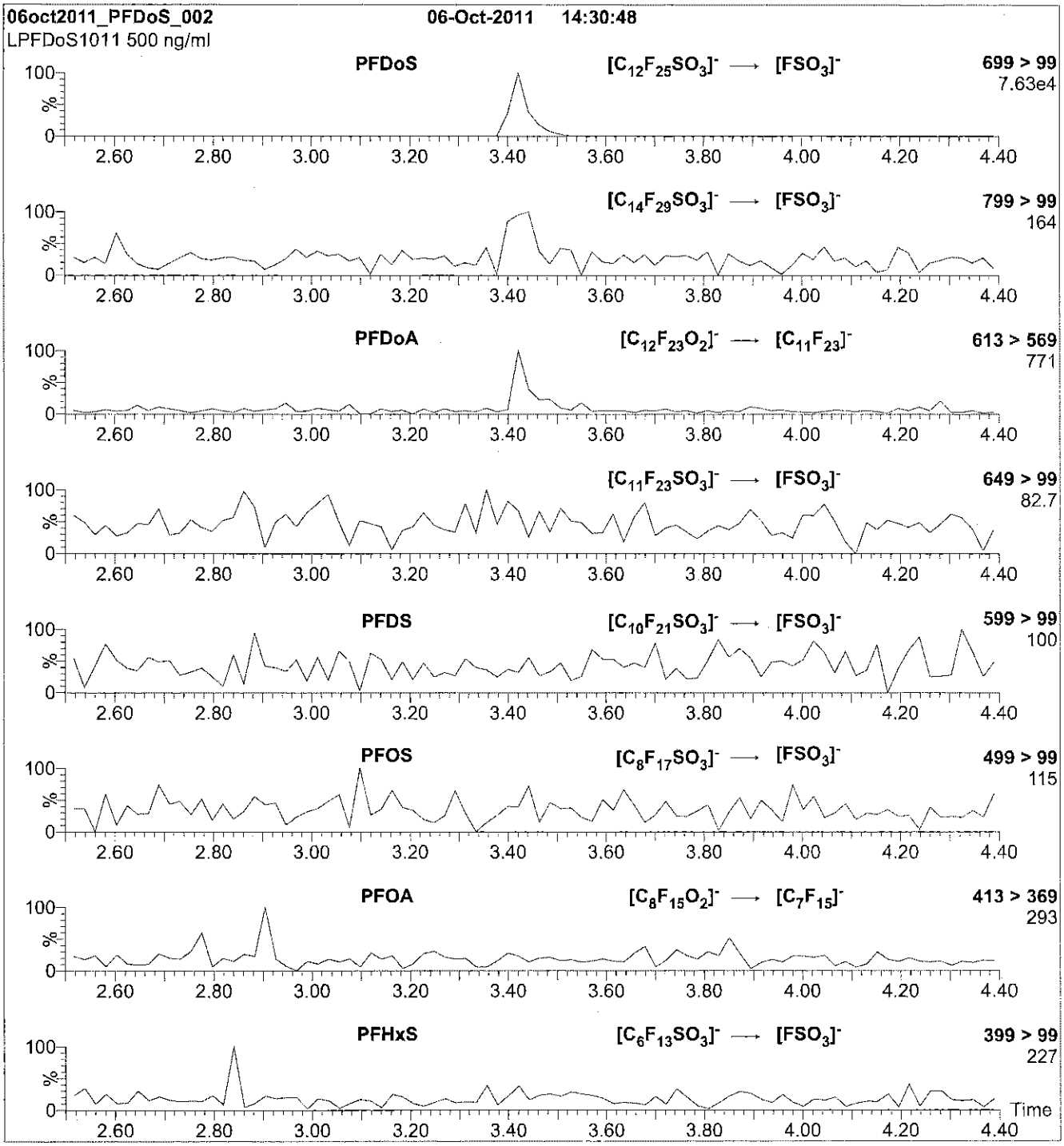
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (200 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 80.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 65% (80:20 MeOH:ACN) / 35% 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

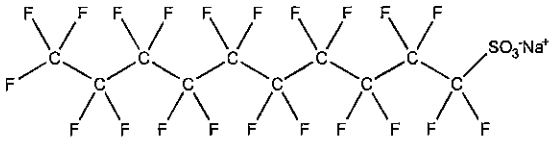
LCPFDS_00003

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFDS
LOT NUMBER: LPFDS0913
COMPOUND: Sodium perfluoro-1-decanesulfonate

STRUCTURE:



CAS #: Not available

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)	09/13/2013		
EXPIRY DATE: (mm/dd/yyyy)	09/13/2018		
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 09/23/2013 (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).

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:

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:

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

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:

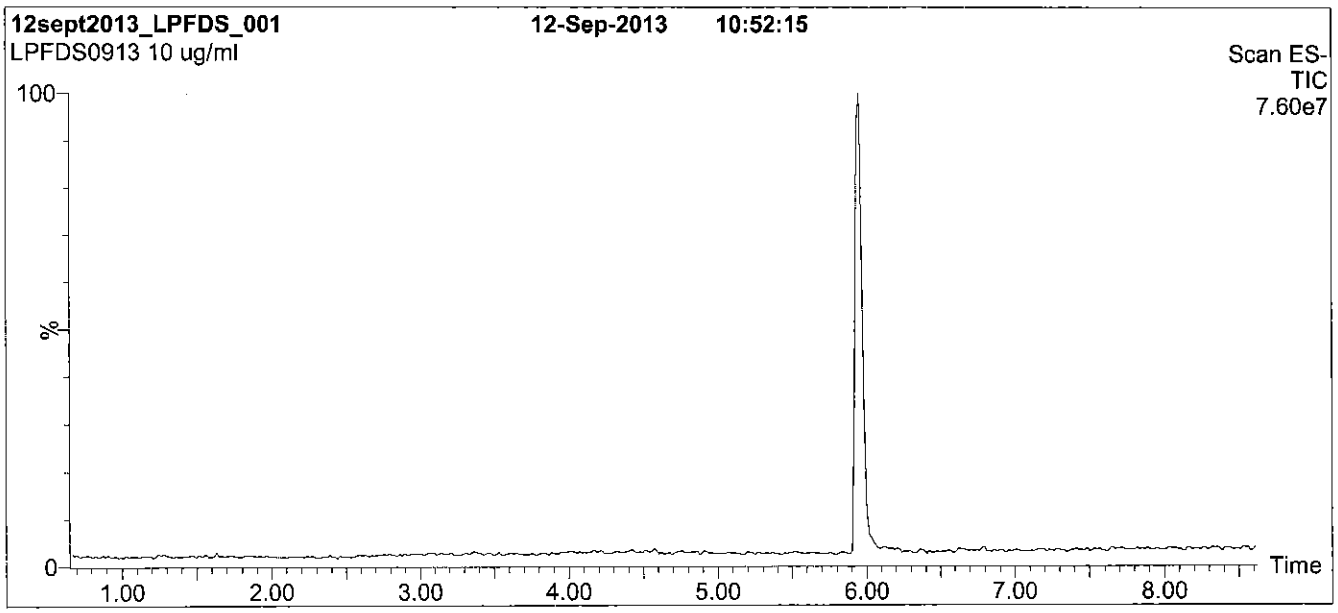
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

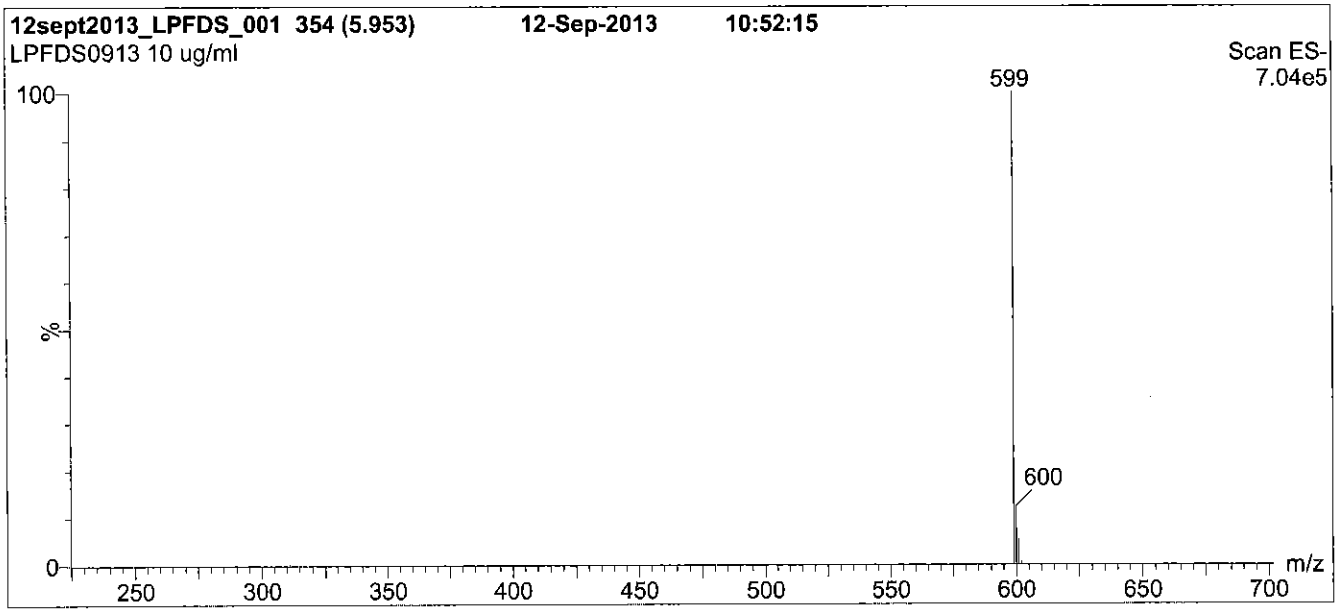
CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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: **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: 45% (80:20 MeOH:ACN) / 55% 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: 11 min

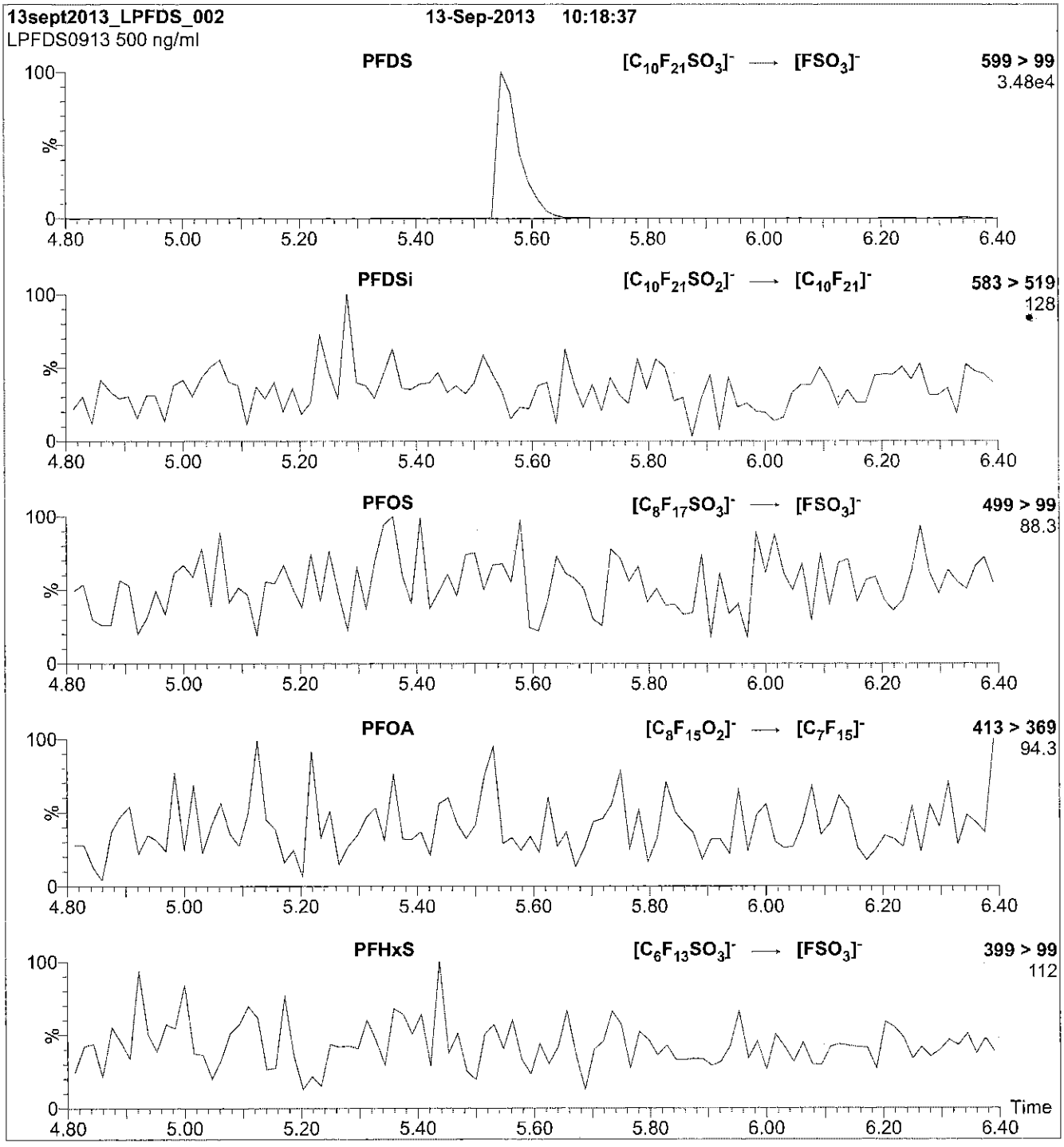
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 70.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

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) = 3.78e-3
Collision Energy (eV) = 50

Reagent

LCPFHpA_00004

WELLINGTON LABORATORIES

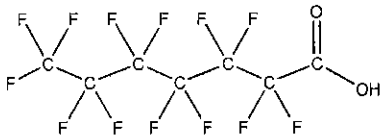
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: PFHpA0514

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) 05/09/2014
EXPIRY DATE: (mm/dd/yyyy) 05/09/2019
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.
- 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:** 05/22/2014 (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:

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:

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:

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

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:

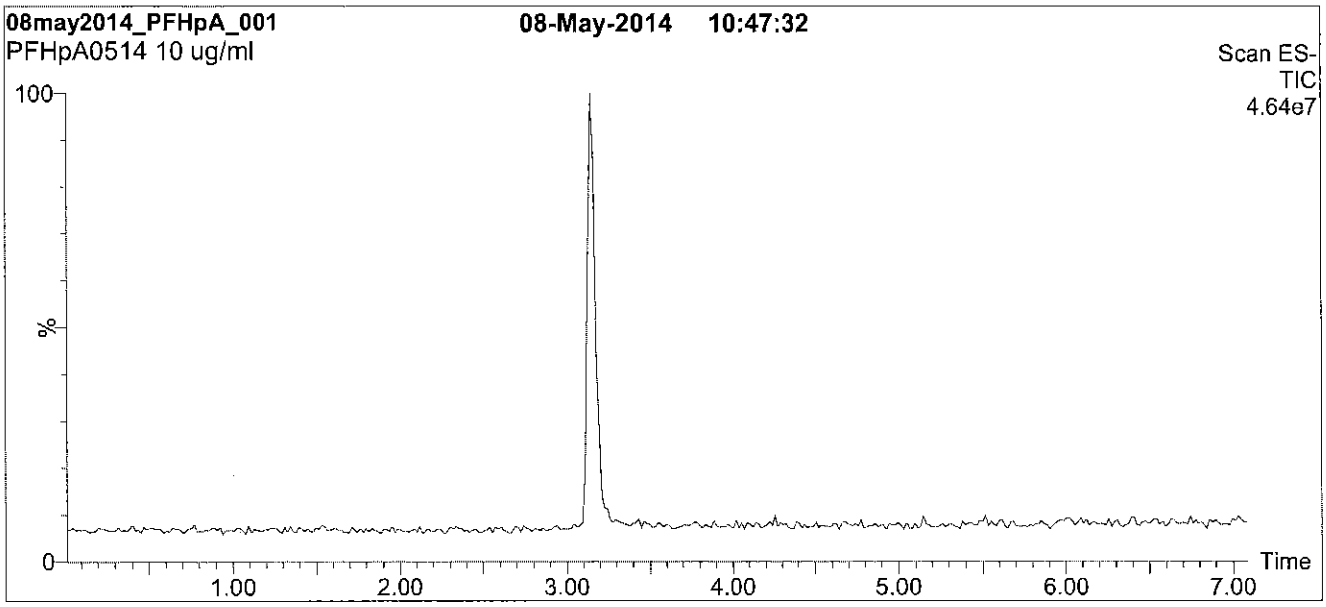
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

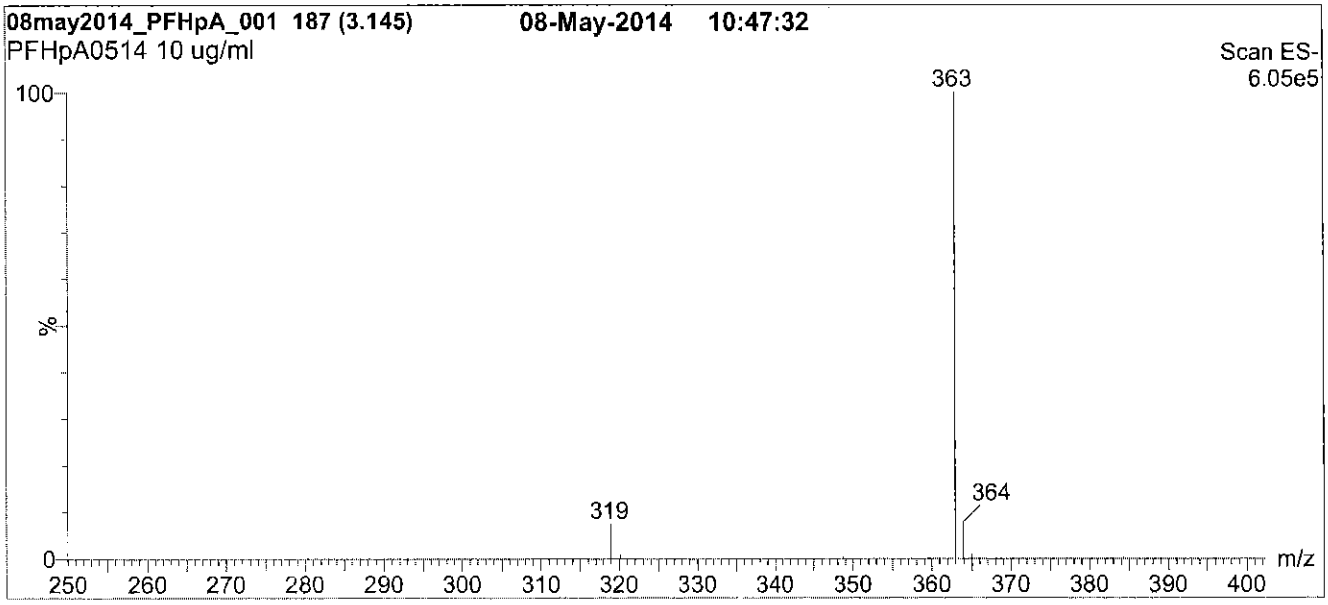
CALA Testing Accreditation No. A1226

ACLASS 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: **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 C_{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

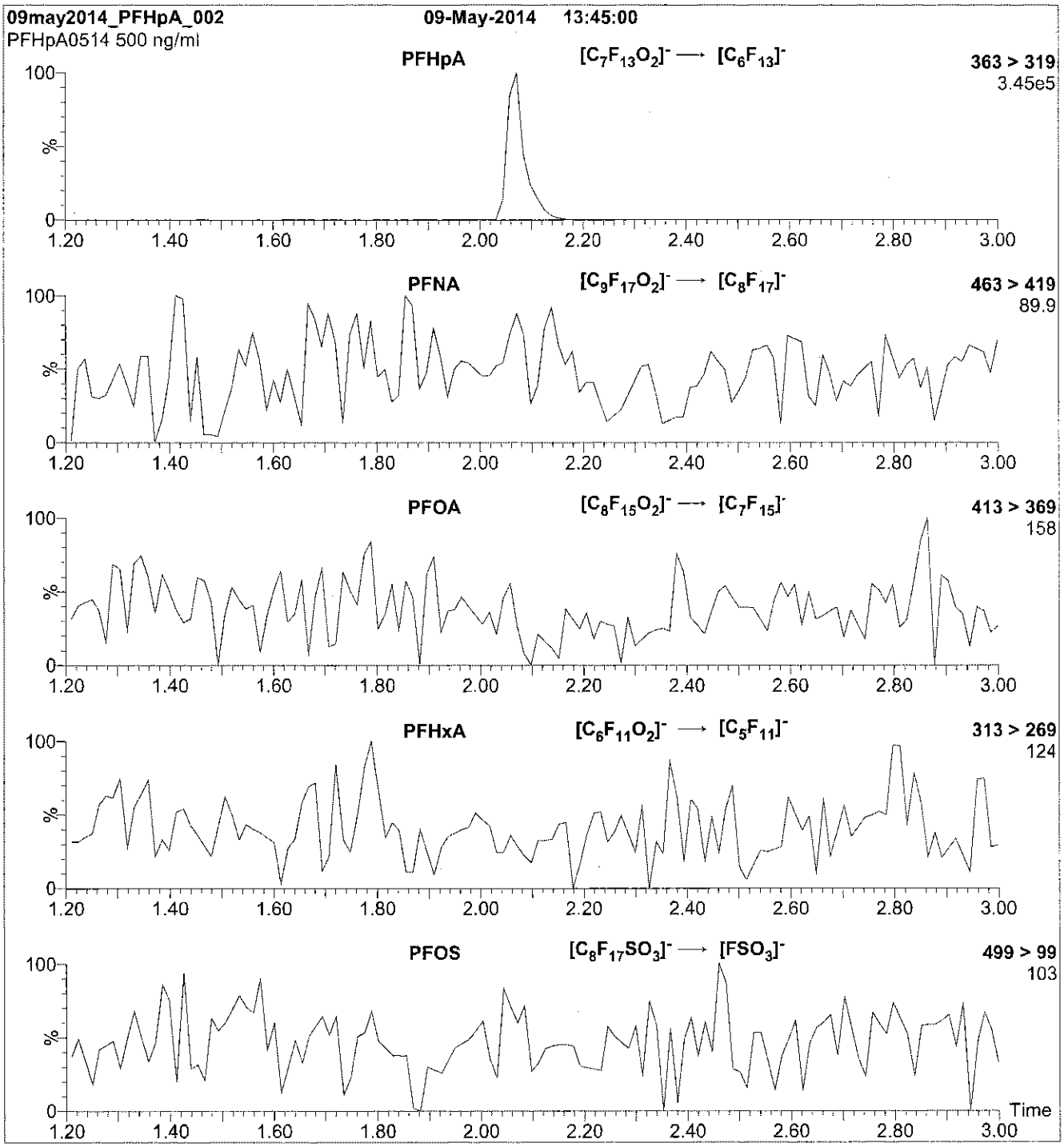
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 950 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) = 3.24e-3
Collision Energy (eV) = 11

Reagent

LCPFHpS_00005

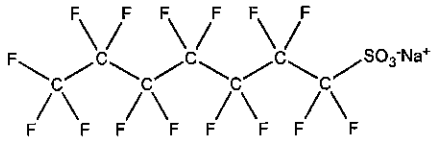
R: 4/15/15 SK

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: L-PFHpS
COMPOUND: Sodium perfluoro-1-heptanesulfonate
LOT NUMBER: LPFHpS0114

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$C_7F_{15}SO_3Na$	**MOLECULAR WEIGHT:**	472.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.6 ± 2.4 µg/ml (PFHpS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	01/28/2014		
EXPIRY DATE: (mm/dd/yyyy)	01/28/2019		
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 ~ 0.1% of L-PFHxS ($C_6F_{13}SO_3Na$) and ~ 0.2% of L-PFOS ($C_8F_{17}SO_3Na$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/27/2015 (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:

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

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

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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:

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:

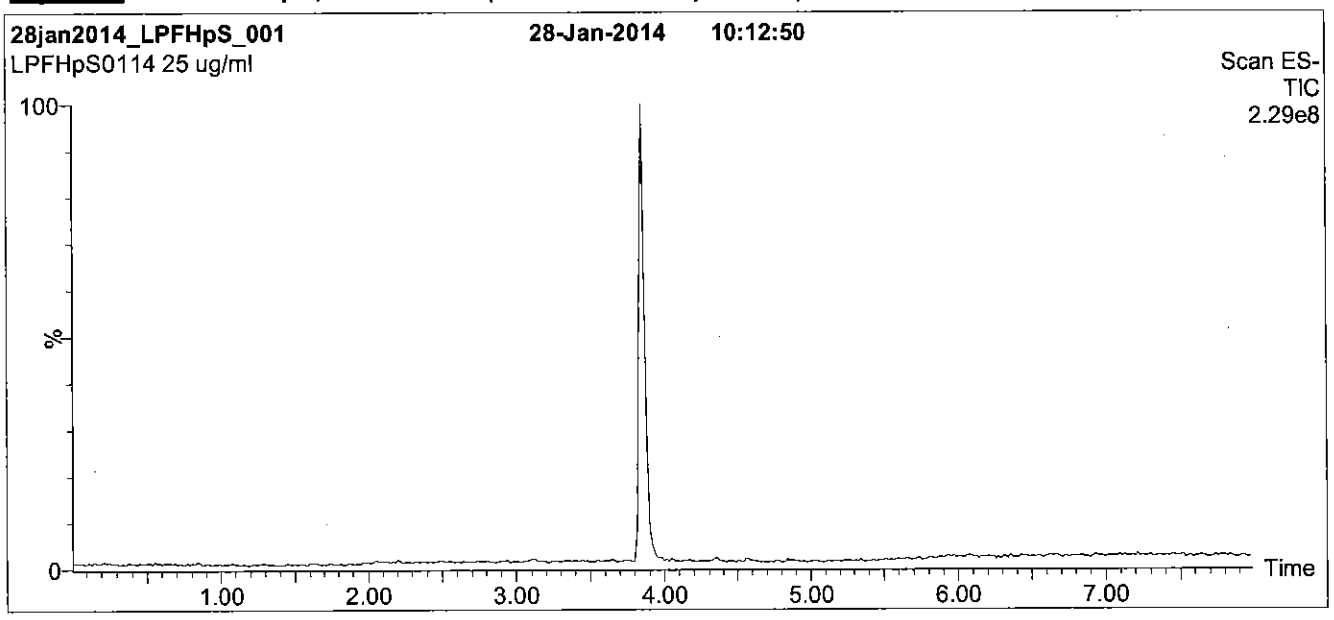
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

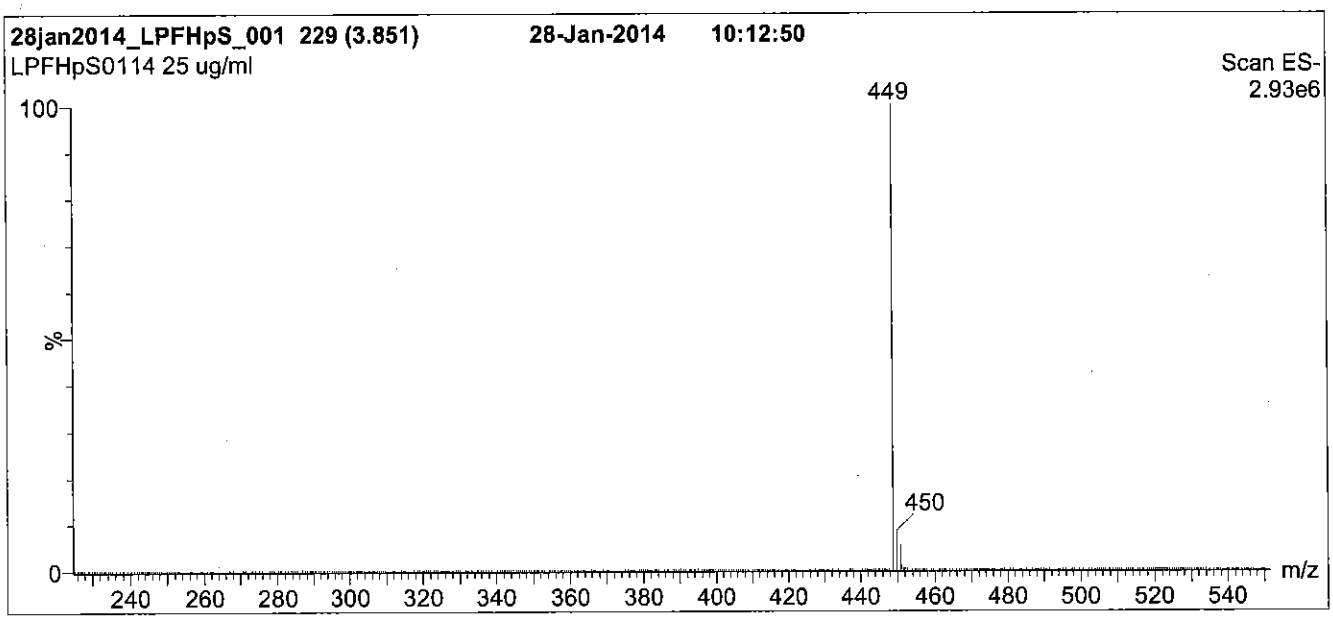
CALA Testing Accreditation No: A1226

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: **L-PFHpS; 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
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

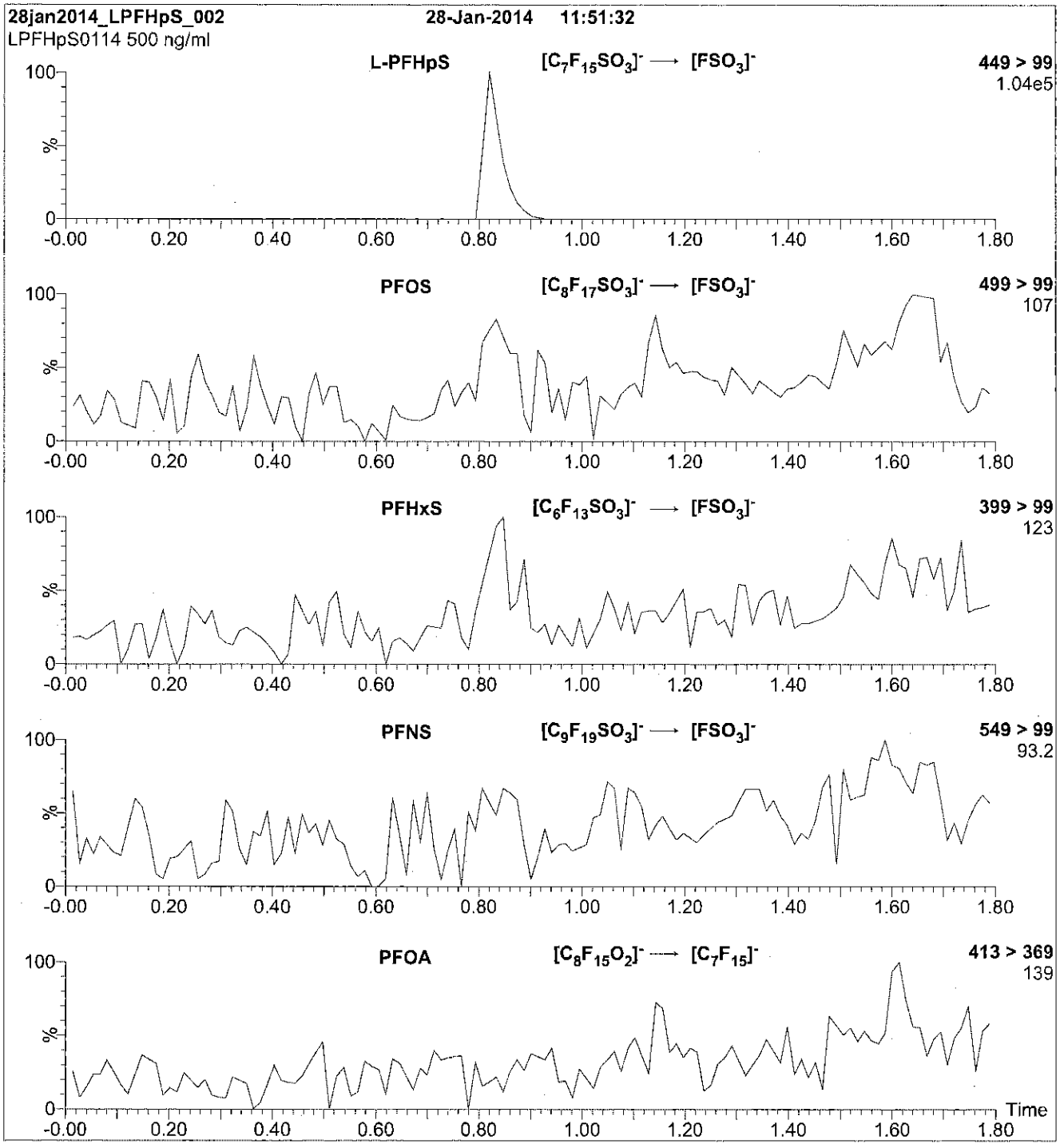
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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) = 35

Reagent

LCPFHxA_00003

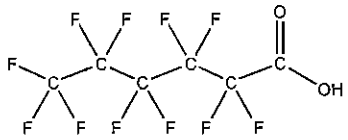
V: 2/11/15 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxA
COMPOUND: Perfluoro-n-hexanoic acid
LOT NUMBER: PFHxA0514

STRUCTURE:
CAS #: 307-24-4



MOLECULAR FORMULA: $C_6HF_{11}O_2$
MOLECULAR WEIGHT: 314.05
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/09/2014
EXPIRY DATE: (mm/dd/yyyy) 05/09/2019
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.
- 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:** 05/22/2014 (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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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:

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HOMOGENEITY:

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

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.

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CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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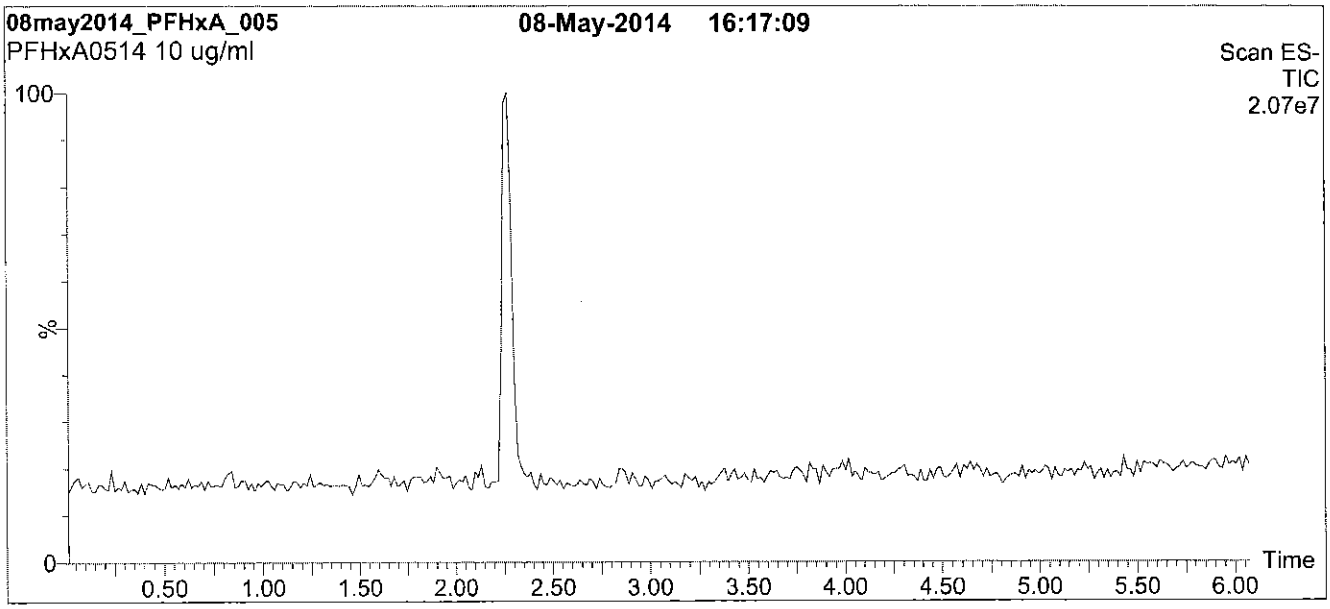
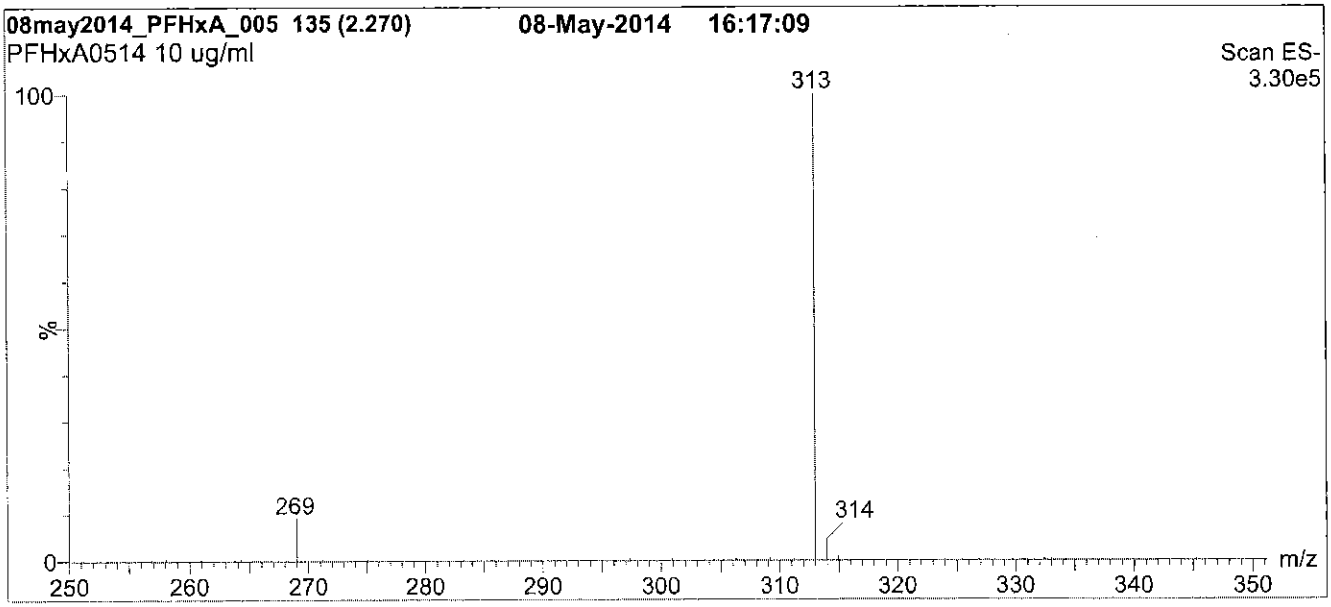
Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH C_{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

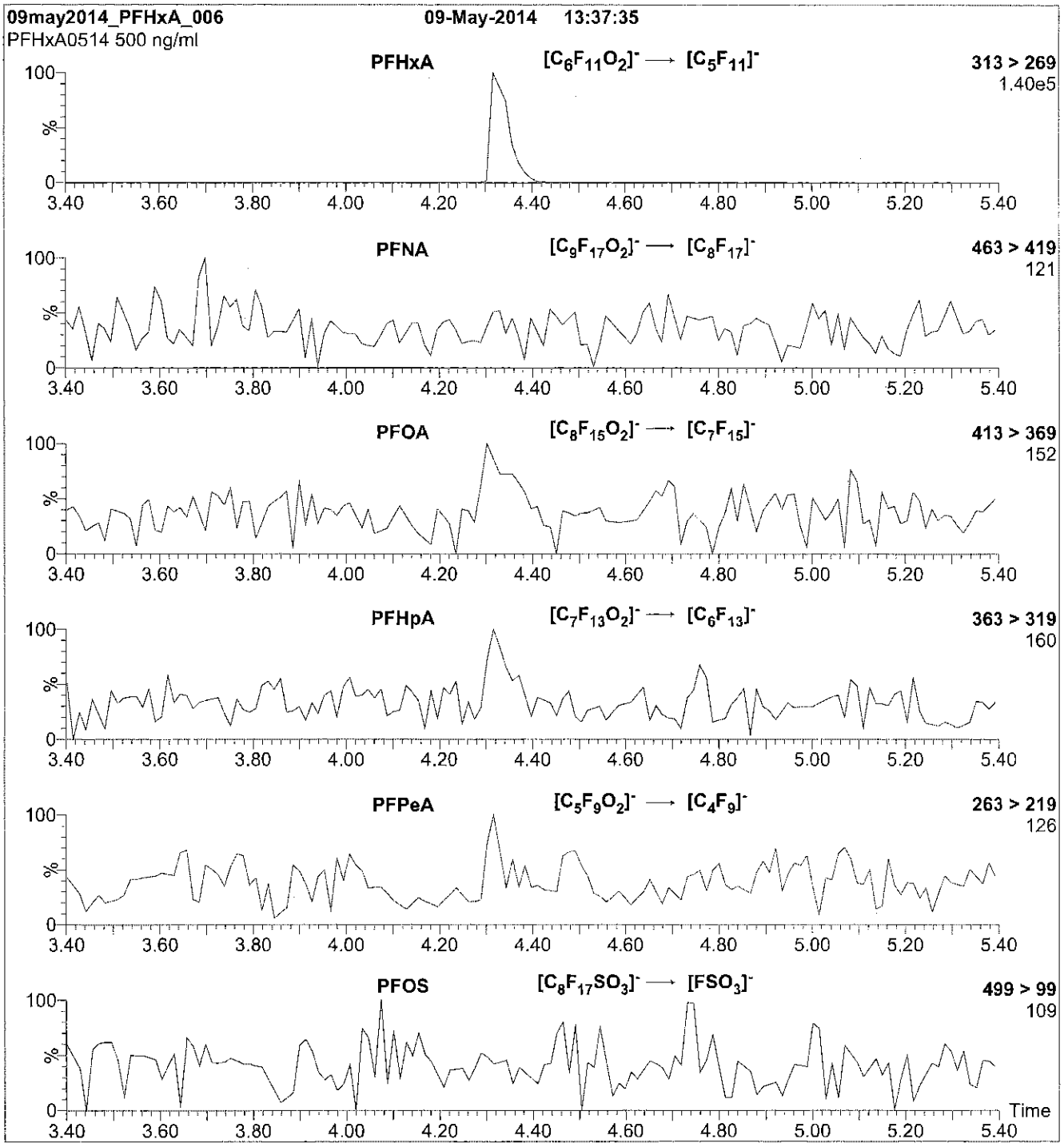
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 950 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) = 3.24e-3
Collision Energy (eV) = 10

Reagent

LCPFHxS_00003

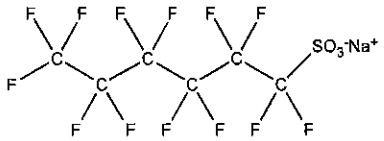
VR 2/11/15 GV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFHxS
LOT NUMBER: LPFHxS0514
COMPOUND: Sodium perfluoro-1-hexanesulfonate

STRUCTURE:
CAS #: 82382-12-5



MOLECULAR FORMULA:	$C_6F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	422.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.3 ± 2.4 µg/ml (PFHxS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/09/2014		
EXPIRY DATE: (mm/dd/yyyy)	05/09/2019		
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:** 05/16/2014 (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

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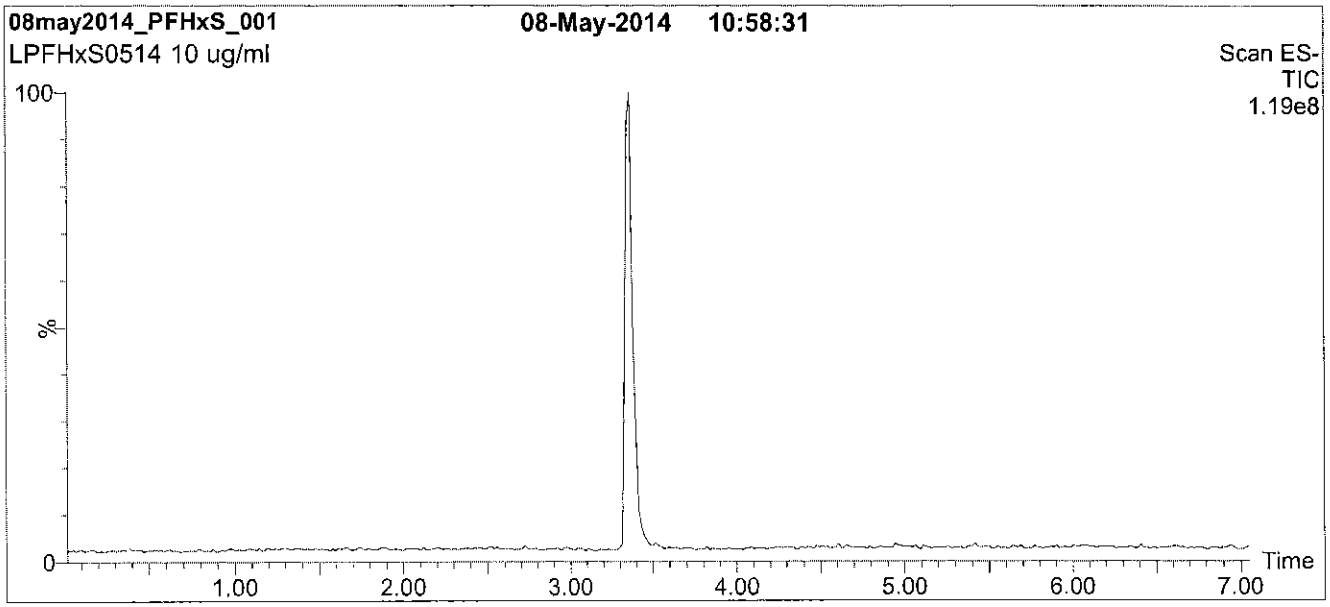
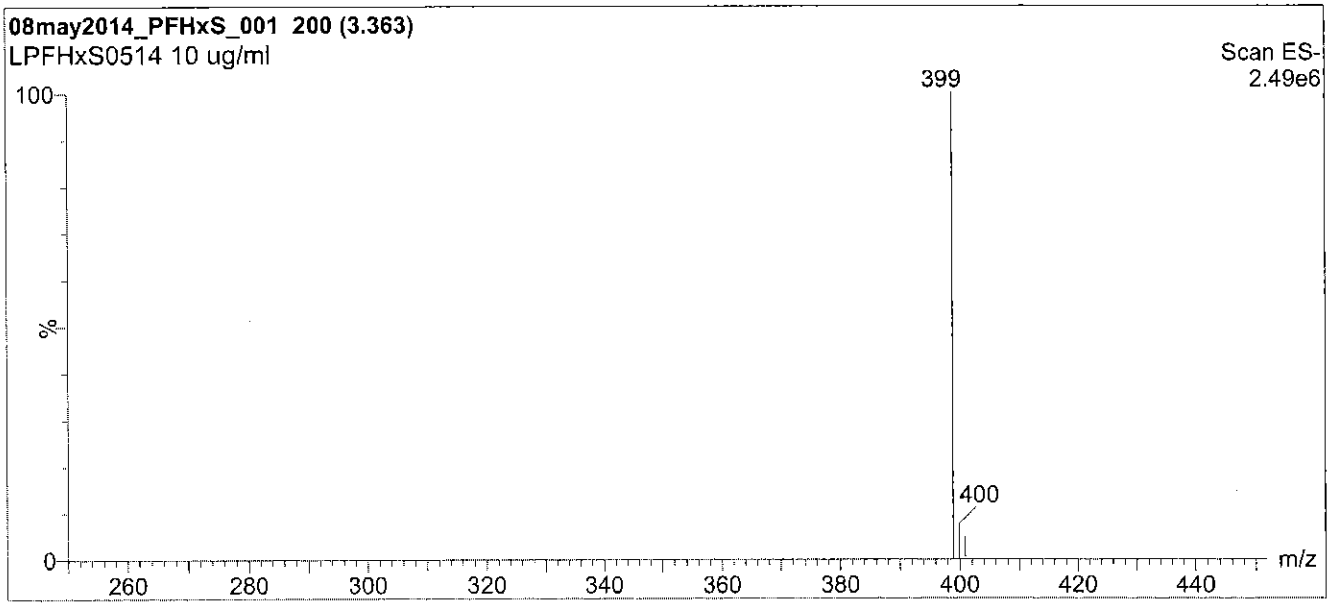
Figure 1: **L-PFHxS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH C_{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

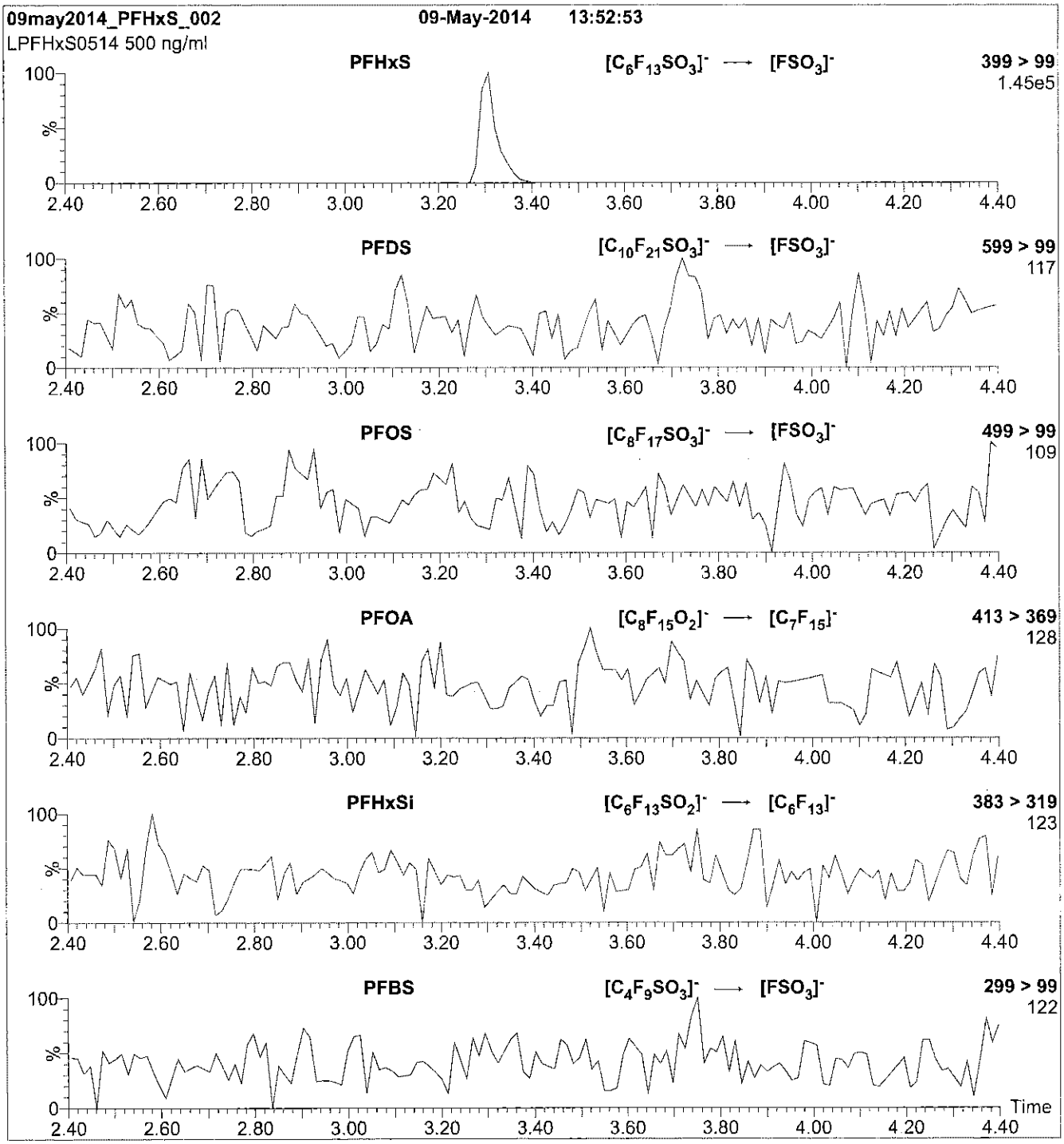
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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) = 30

Reagent

LCPFNA_00004

P: 3/27/15 sn

S:

WELLINGTON LABORATORIES

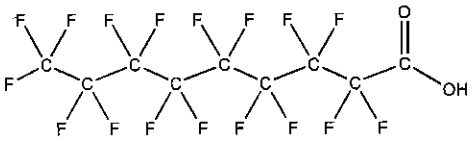
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: PFNA0514

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) 05/09/2014
EXPIRY DATE: (mm/dd/yyyy) 05/09/2019
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.
- 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:** 05/22/2014 (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

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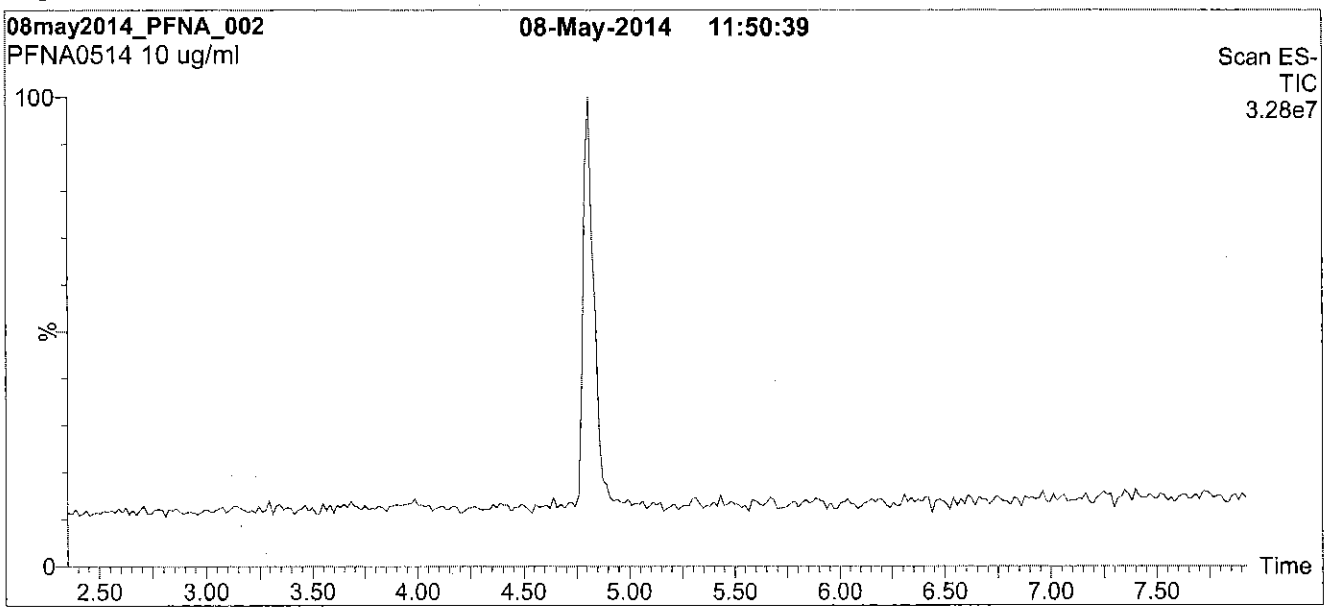

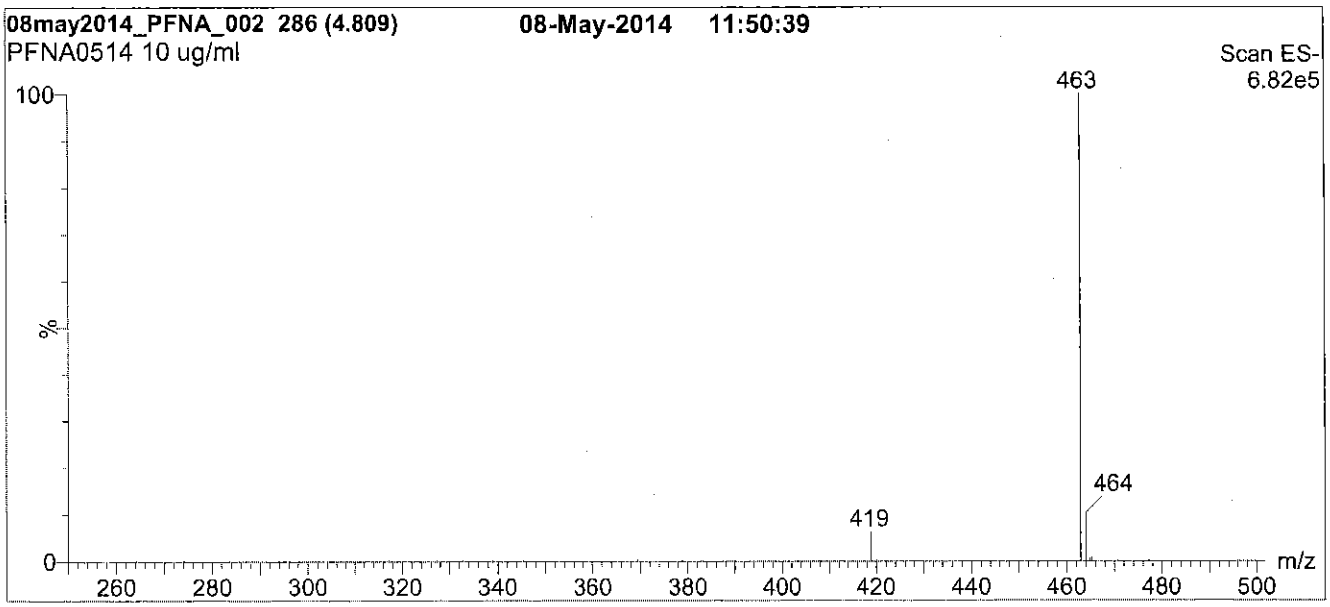

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MS: **Micromass Quattro *micro* API MS**

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Column: Acquity UPLC BEH C_{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

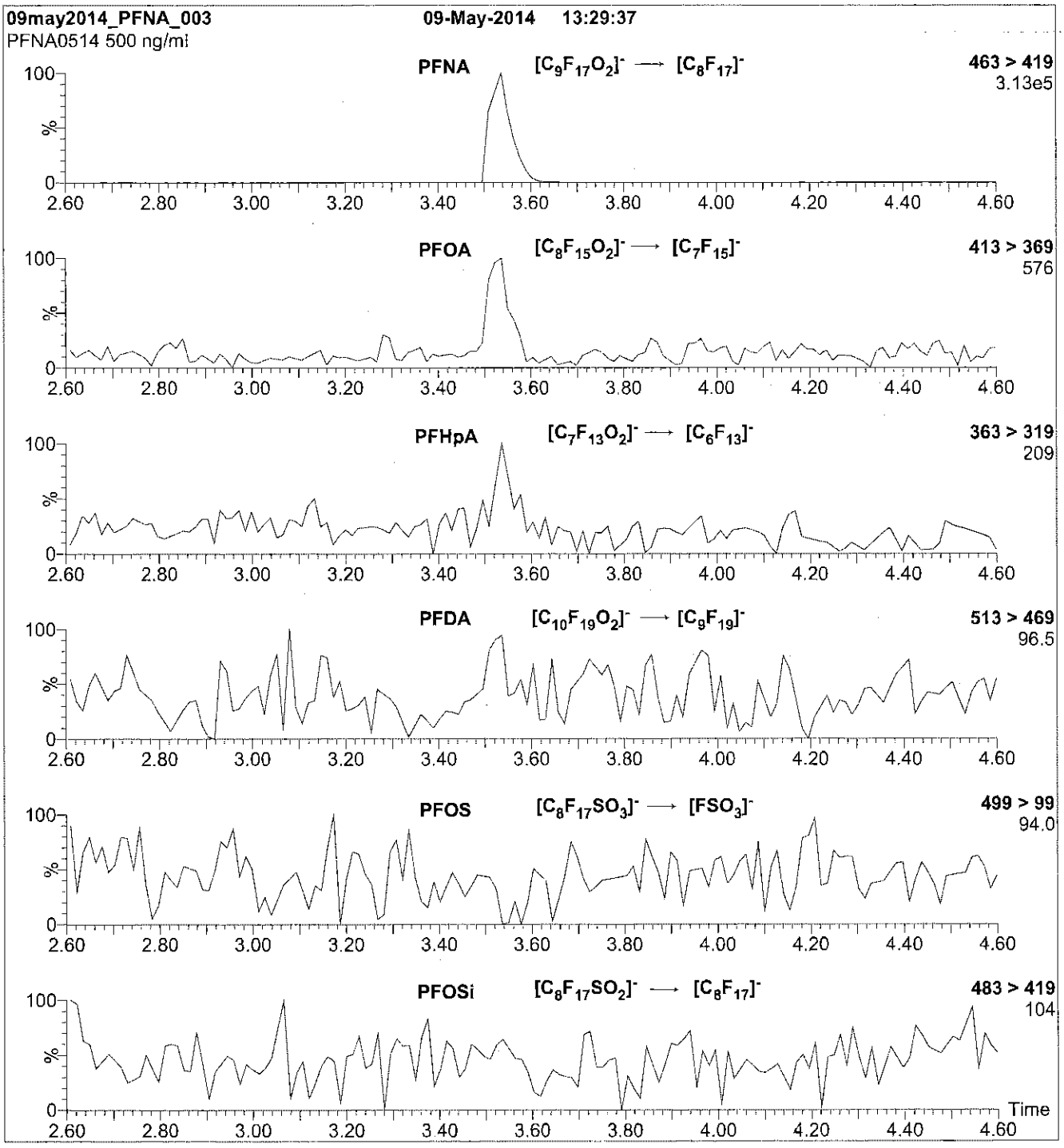
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 950 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) = 3.17e-3
Collision Energy (eV) = 11

Reagent

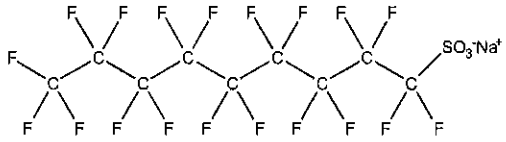
LCPFNS_00002

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFNS
LOT NUMBER: LPFNS0712
COMPOUND: Sodium perfluoro-1-nonanesulfonate

STRUCTURE:
CAS #: 98789-57-2



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		

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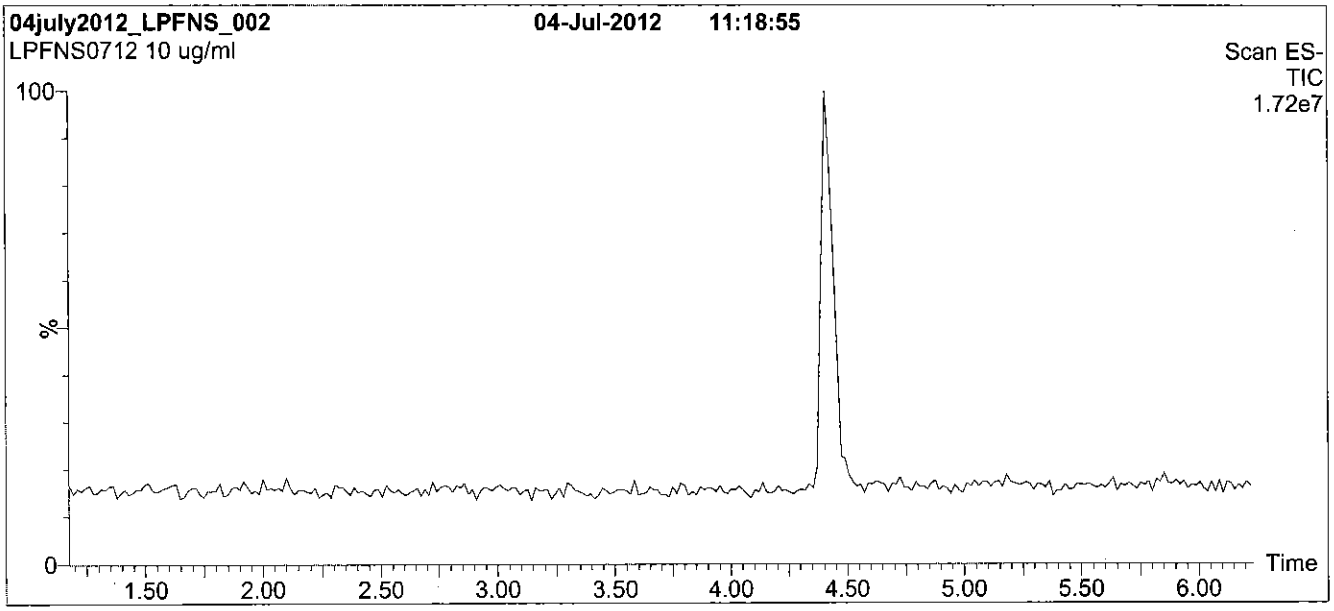
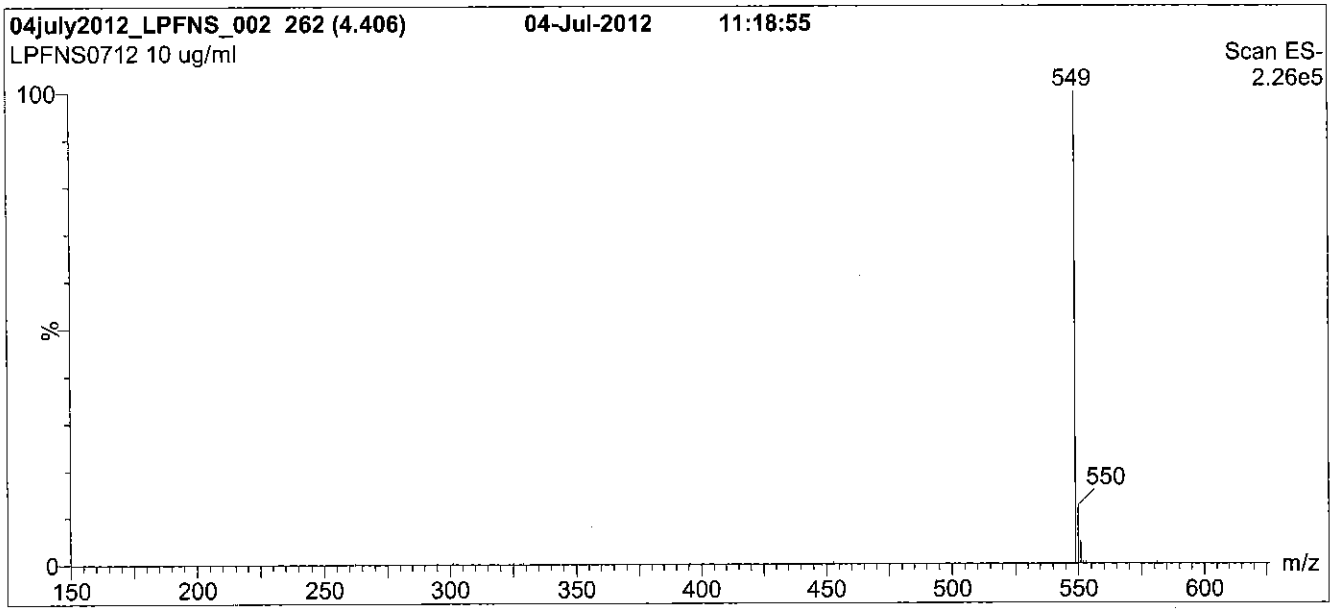
Figure 1: **L-PFNS; LC/MS Data (TIC and Mass Spectrum)**





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

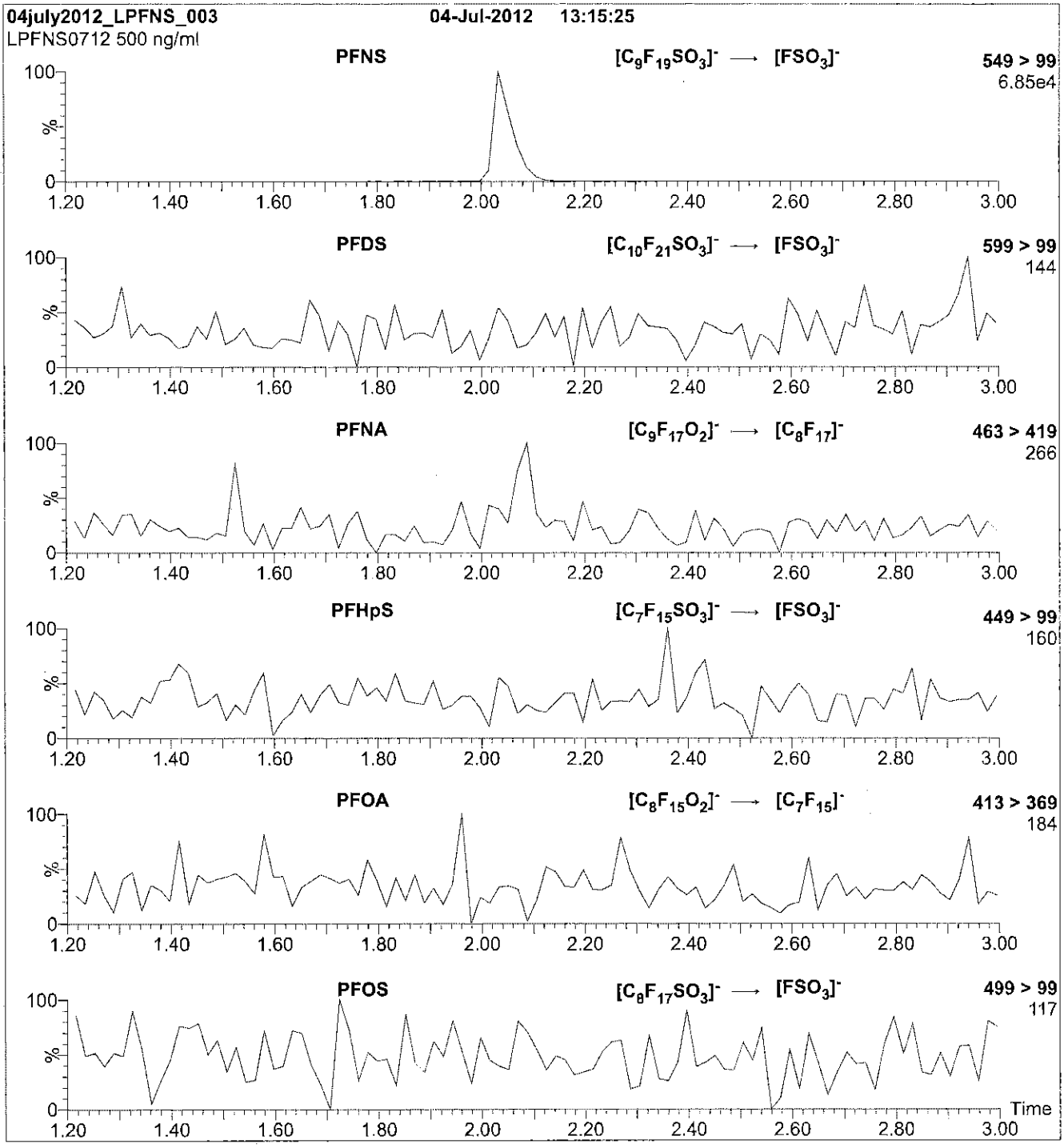
Flow: 300 µl/min

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_00004

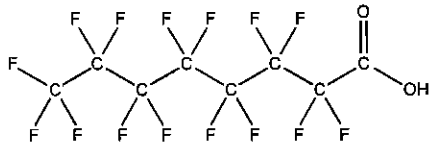
Rec 7/15/14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFOA
COMPOUND: Perfluoro-n-octanoic acid
LOT NUMBER: PFOA1013

STRUCTURE:
CAS #: 335-67-1



MOLECULAR FORMULA: $C_8HF_{15}O_2$
MOLECULAR WEIGHT: 414.07
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/11/2013
EXPIRY DATE: (mm/dd/yyyy) 10/11/2018
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/18/2013 (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:

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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:

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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.

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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

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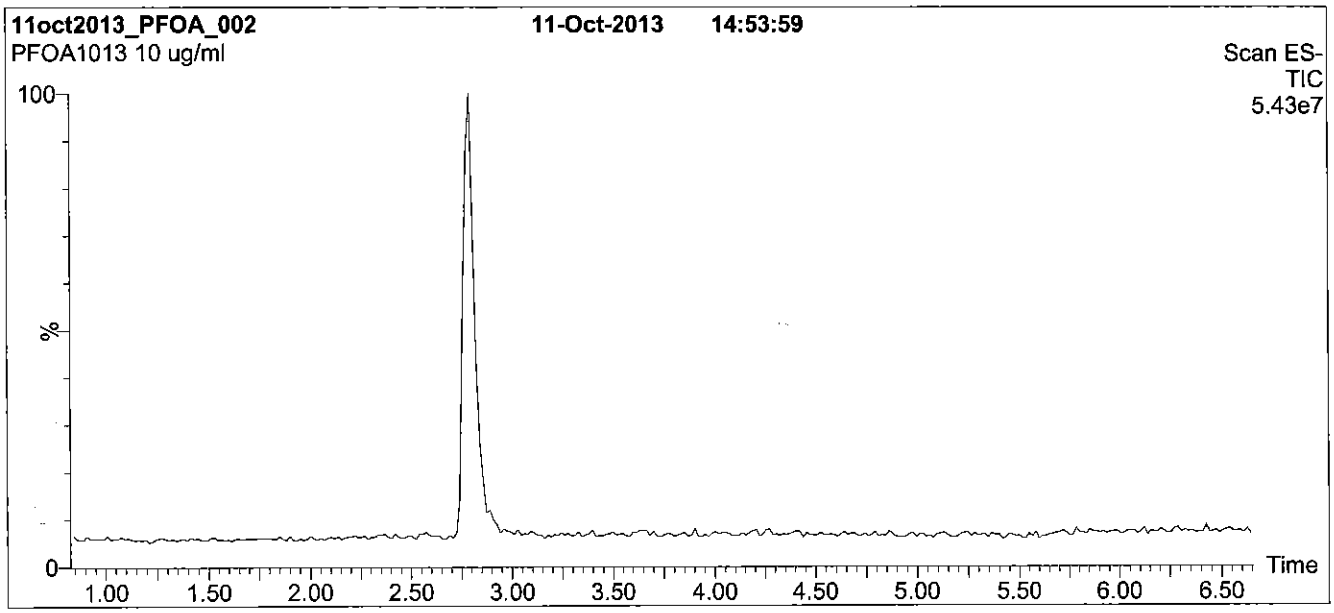
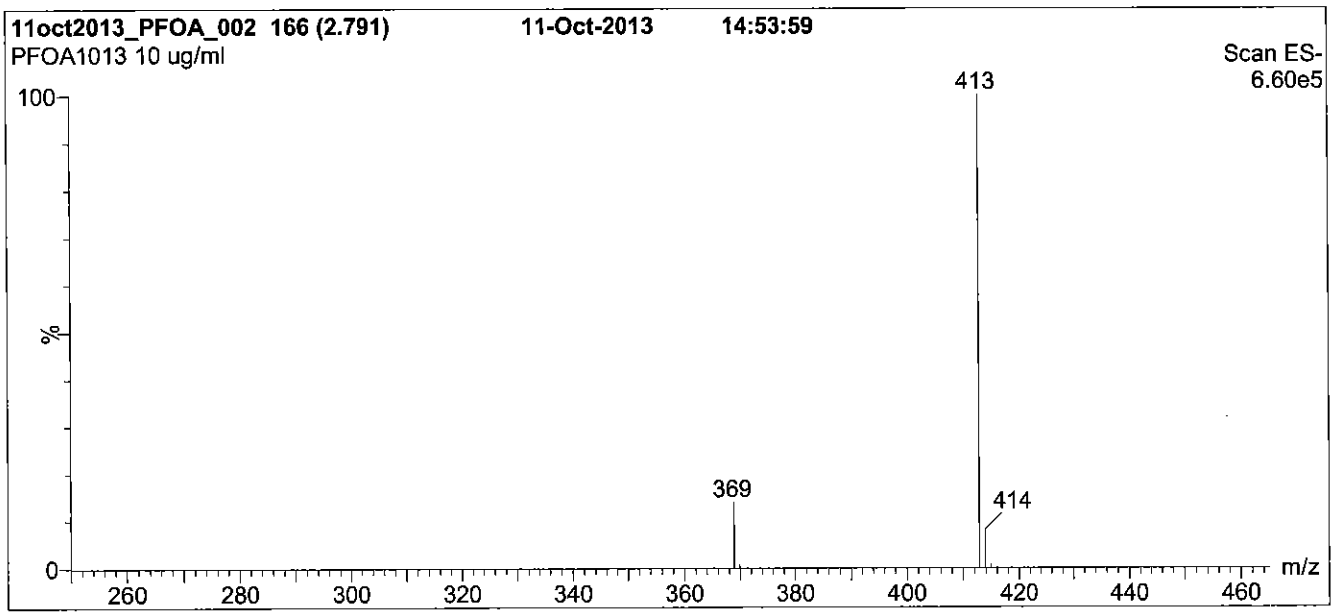
Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





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: 55% (80:20 MeOH:ACN) / 45% 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

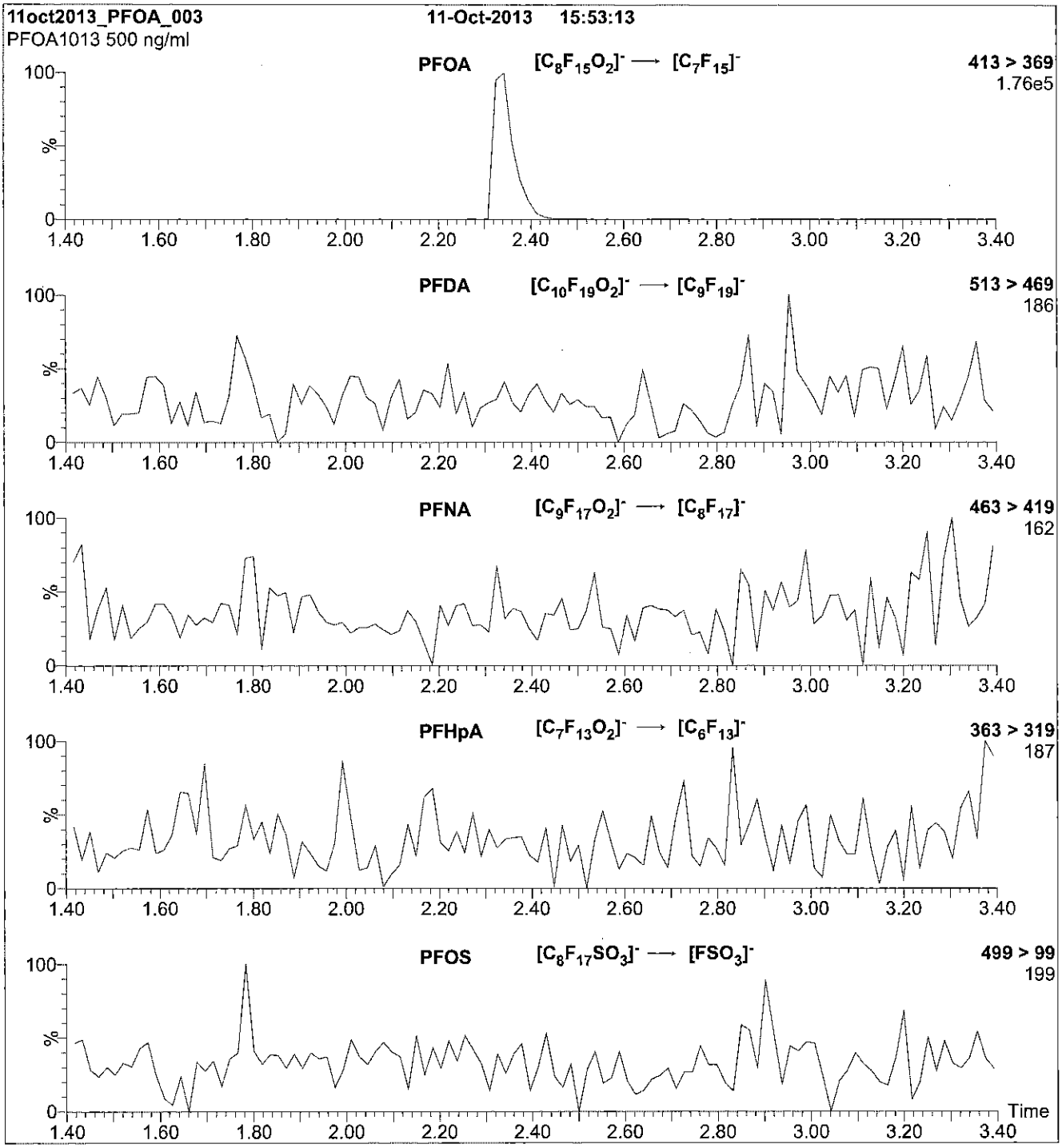
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 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: **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) = 3.28e-3
Collision Energy (eV) = 11

Reagent

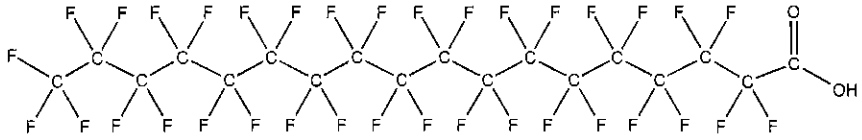
LCPFODA_00004

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFODA
COMPOUND: Perfluoro-n-octadecanoic acid
LOT NUMBER: PFODA0807

STRUCTURE:
CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
MOLECULAR WEIGHT: 914.15
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (4%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/25/2014
EXPIRY DATE: (mm/dd/yyyy) 04/25/2017
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.
- 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:** 04/28/2014 (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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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

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.

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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.

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CALA Testing Accredited Mobile No. A1226

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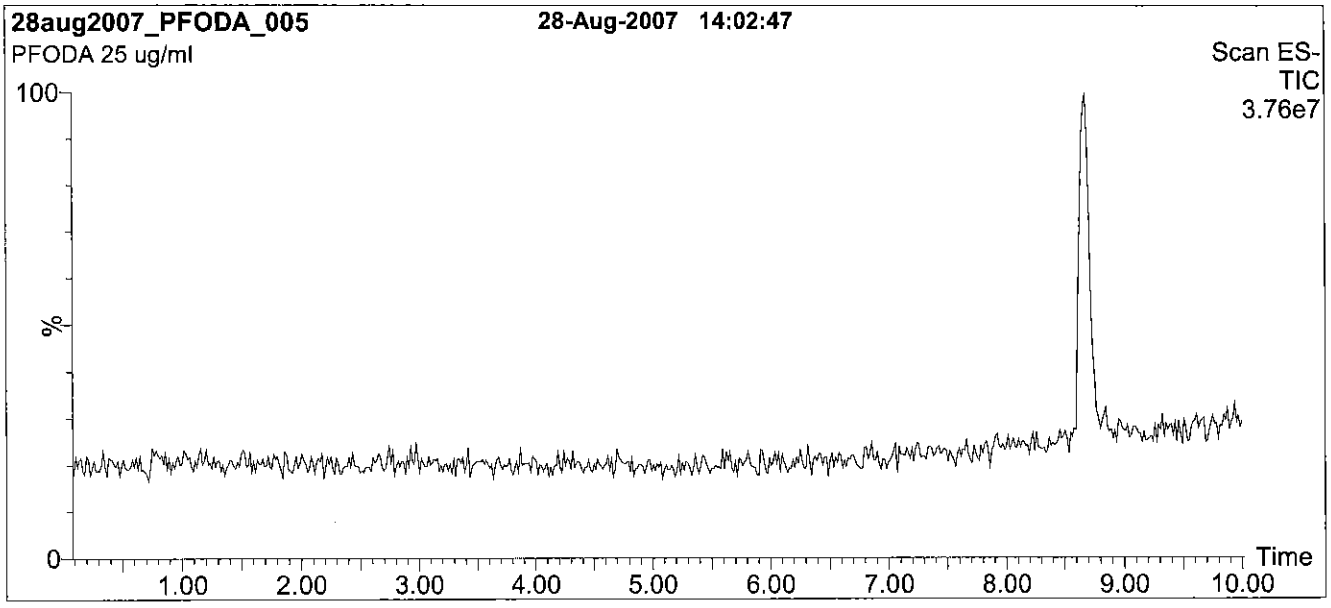
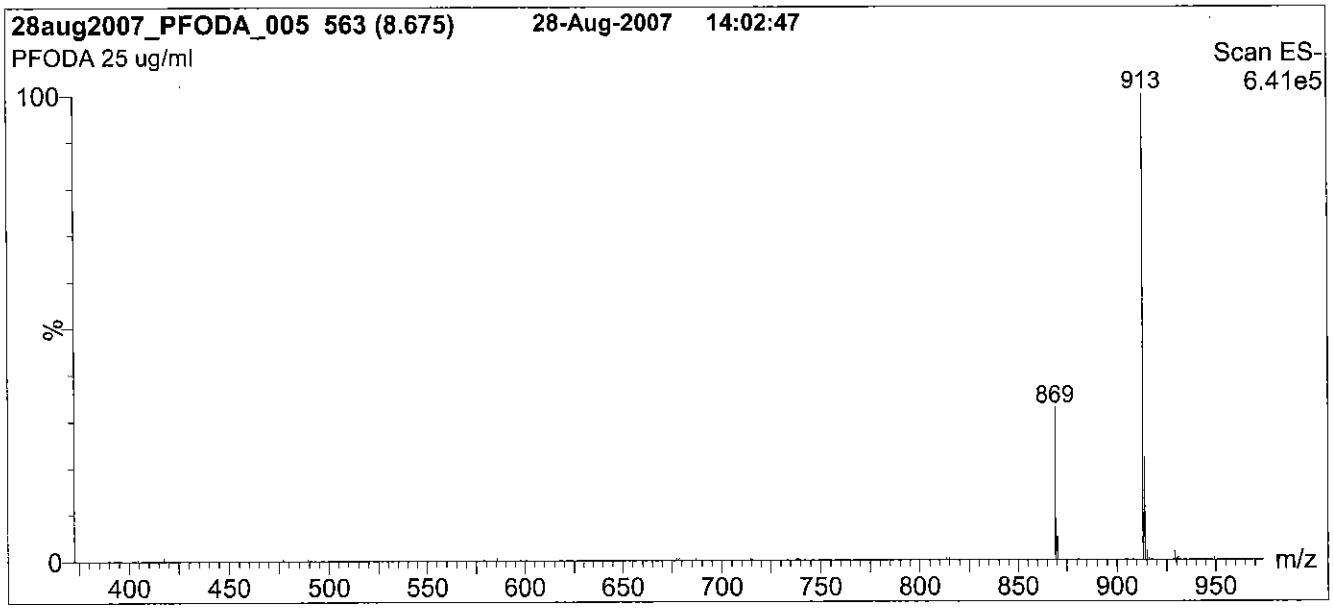
Figure 1: **PFODA; LC/MS Data (TIC and Mass Spectrum)**





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: 75% (80:20 MeOH:ACN) / 25% H_2O
(both with 10 mM NH_4OAc buffer)
Hold 5 min. Ramp to 100% organic over 6 min.
Hold 3 min before returning to initial conditions.
Time: 16 min

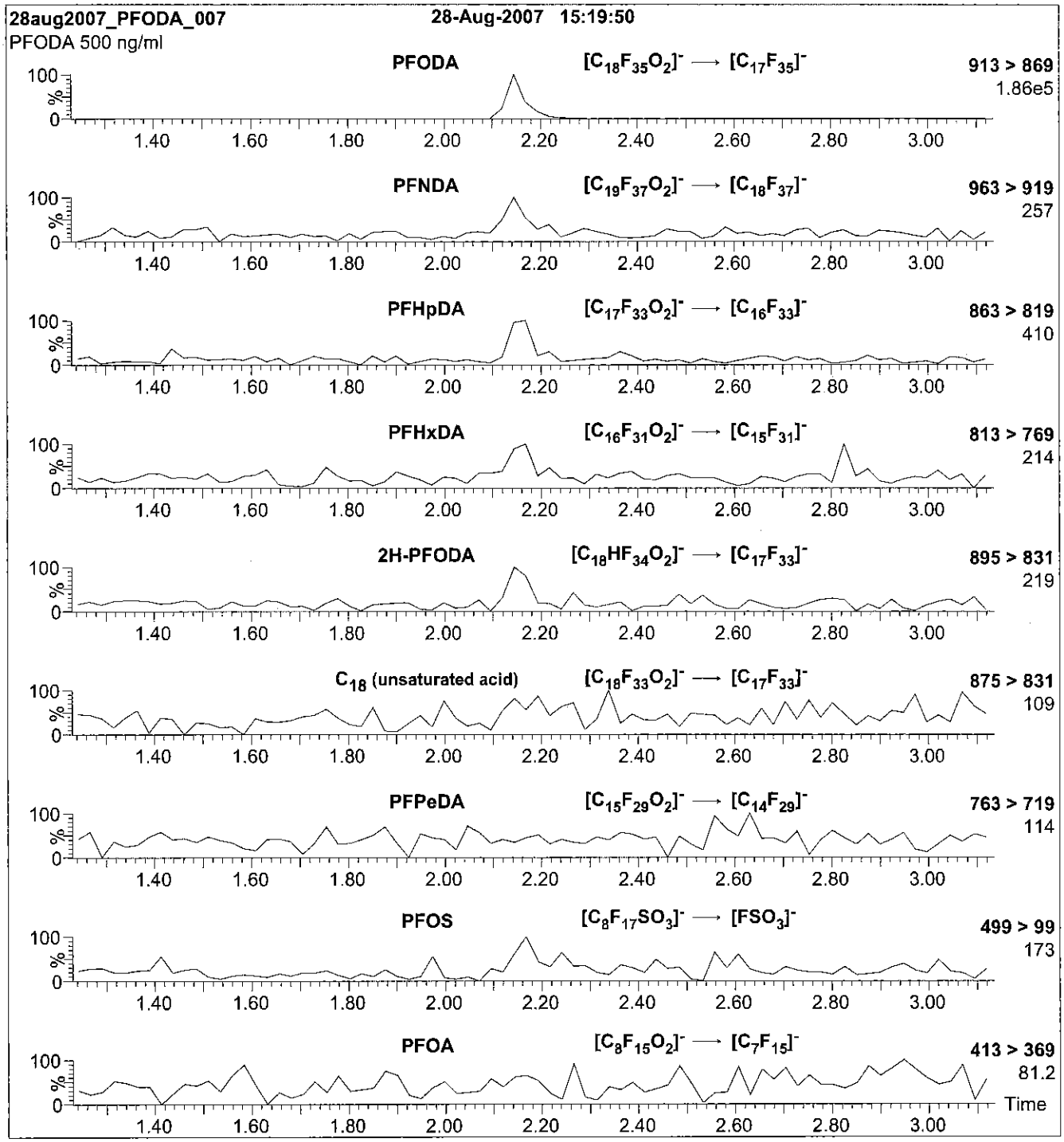
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1100 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) = 650

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 75% (80:20 MeOH:ACN) / 25% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.58e-3
Collision Energy (eV) = 15

Reagent

LCPFOS_00004

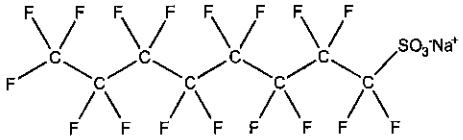
C 3/17/15 SV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFOS
LOT NUMBER: LPFOS0614
COMPOUND: Sodium perfluoro-1-octanesulfonate

STRUCTURE:



CAS #: 4021-47-0

MOLECULAR FORMULA:	$C_8F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	522.11
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (PFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	06/20/2014		
EXPIRY DATE: (mm/dd/yyyy)	06/20/2019		
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.

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Certified By: _____ **Date:** 10/27/2014 (mm/dd/yyyy)
B.G. Chittim

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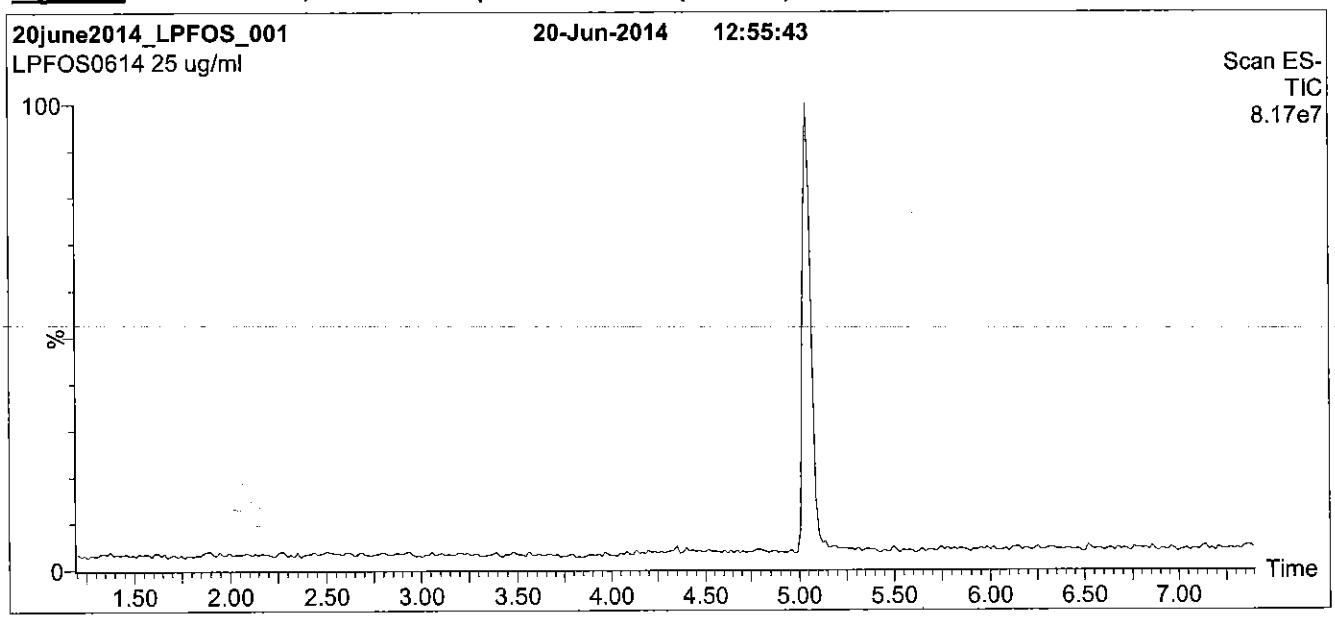

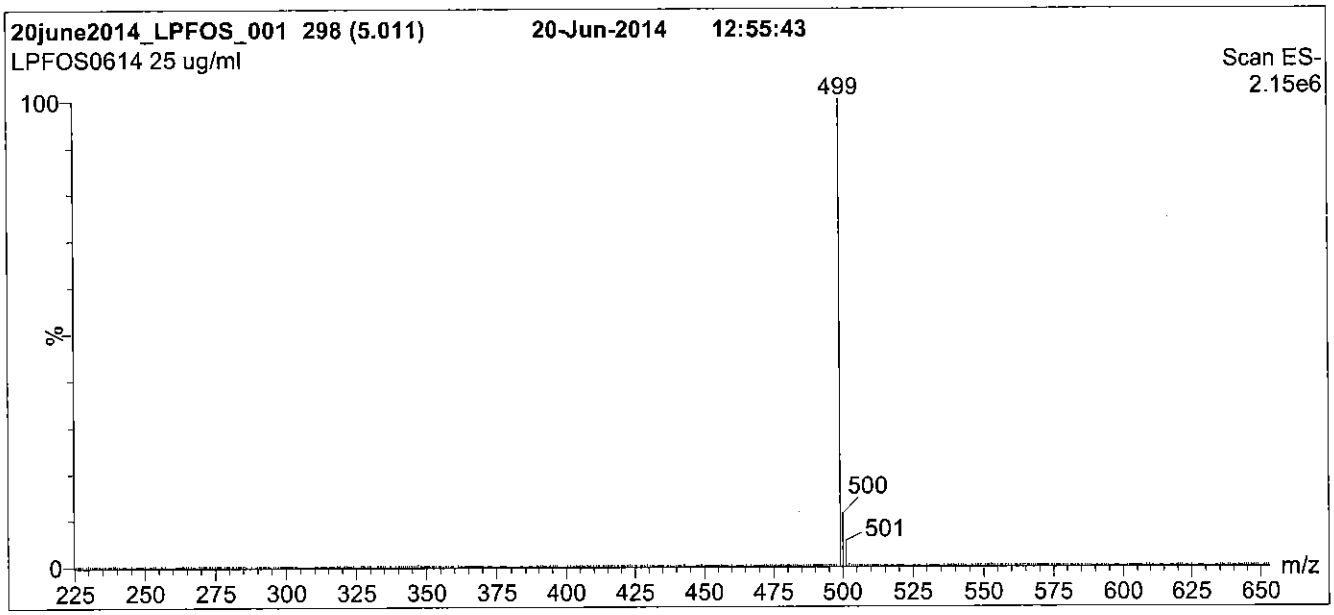

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MS: **Micromass Quattro *micro* API MS**

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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 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

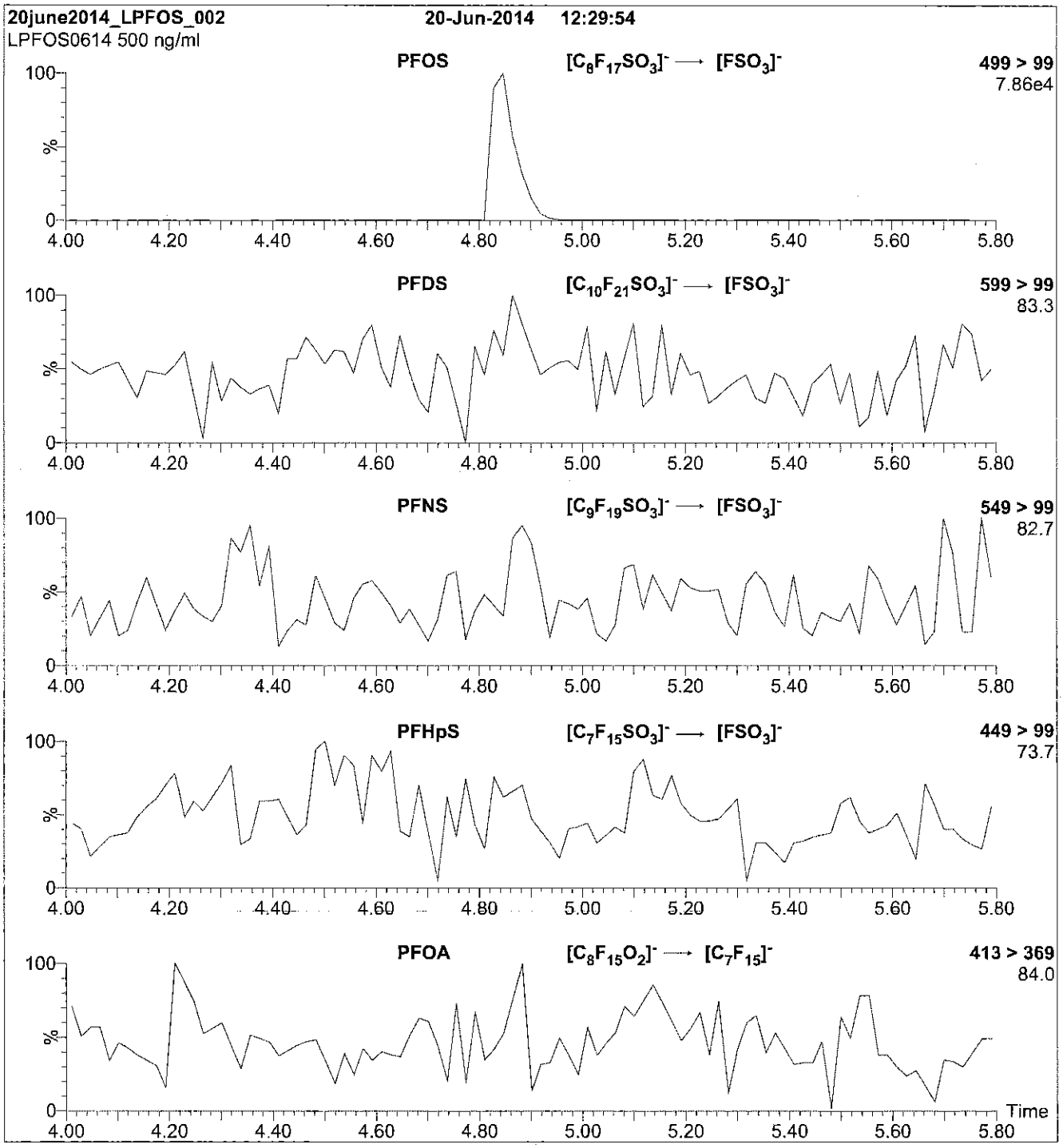
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 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: **L-PFOS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

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) = 40

Reagent

LCPFOSA_00005

WELLINGTON LABORATORIES

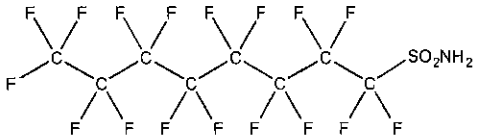
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FOSA-I
COMPOUND: Perfluoro-1-octanesulfonamide

LOT NUMBER: FOSA0714I

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)	07/31/2014		
EXPIRY DATE: (mm/dd/yyyy)	Stability studies ongoing		
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:** 08/05/2014 (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:

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:

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:

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

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

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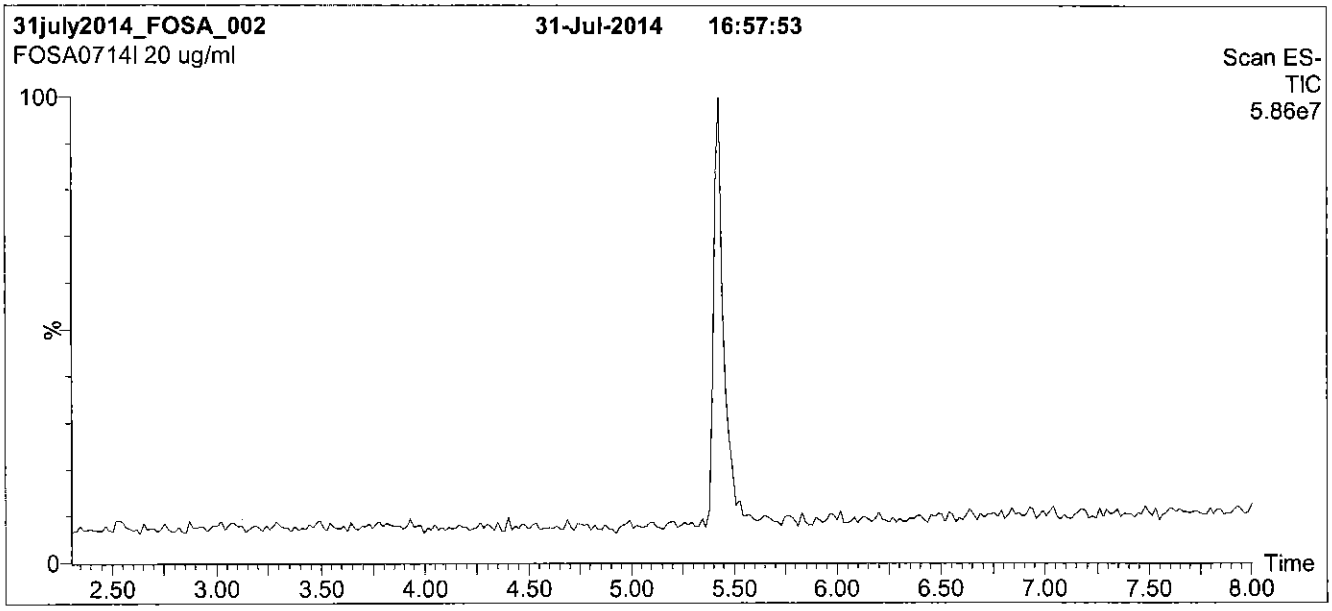
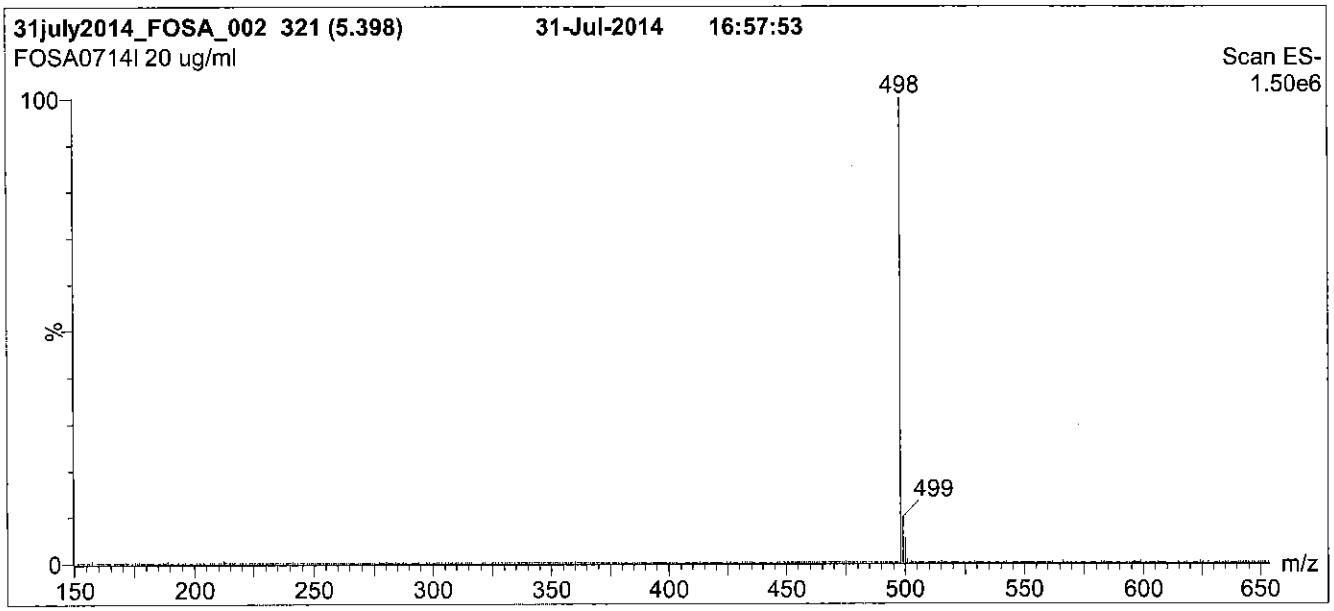
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **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 C_{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

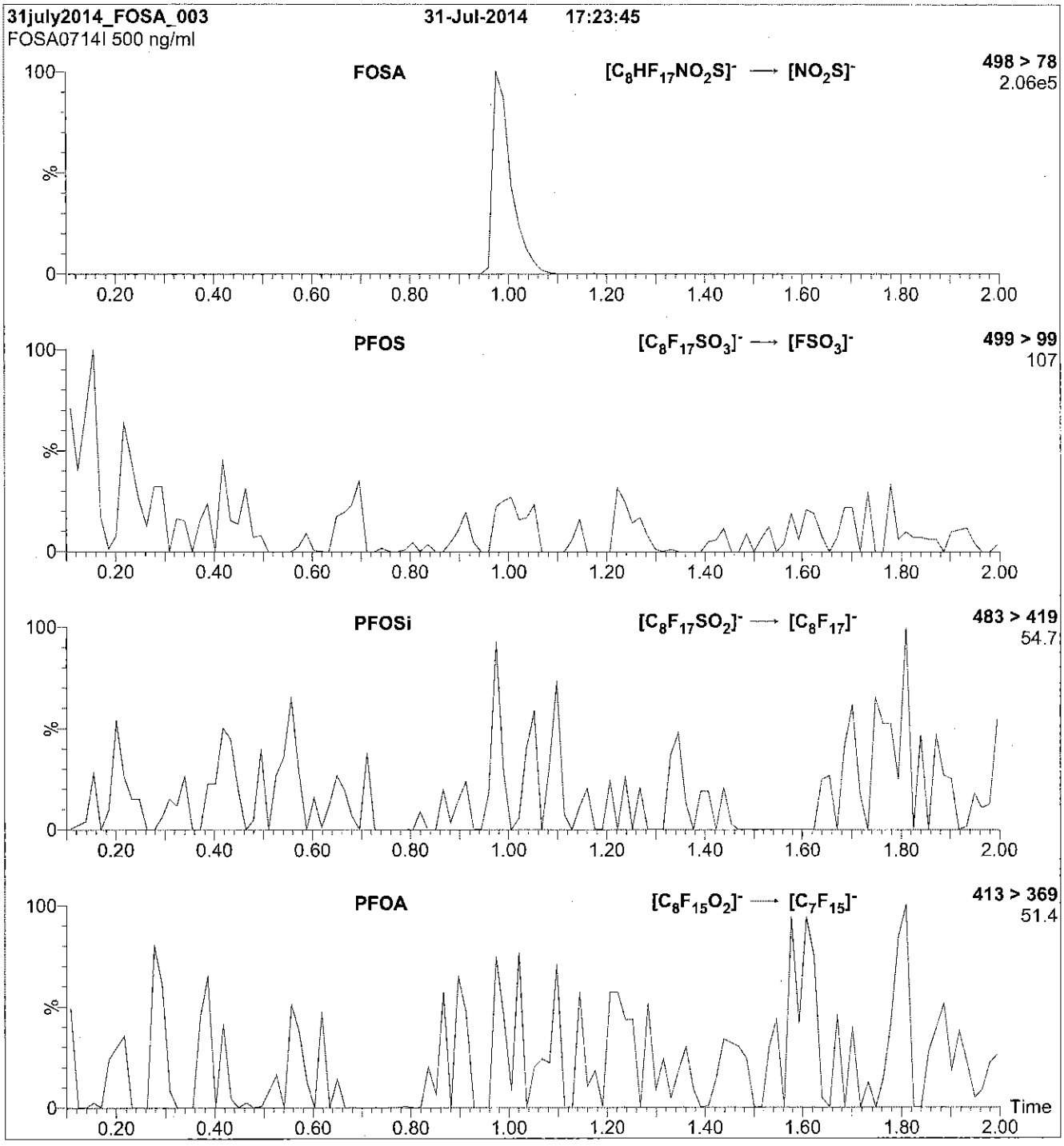
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 950 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) = 3.58e-3
Collision Energy (eV) = 30

Reagent

LCPFPeA_00003

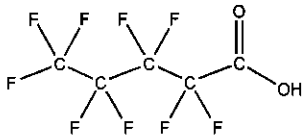
Rec 7/15/14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFPeA
LOT NUMBER: PFPeA0113
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) 01/03/2013
EXPIRY DATE: (mm/dd/yyyy) 01/03/2018
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 ~ 0.3% 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: B.G. Chittim **Date:** 01/14/2013 (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).

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:

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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.

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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 our products.

TRACEABILITY:

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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:

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CALA Testing Accreditation No. A 1226

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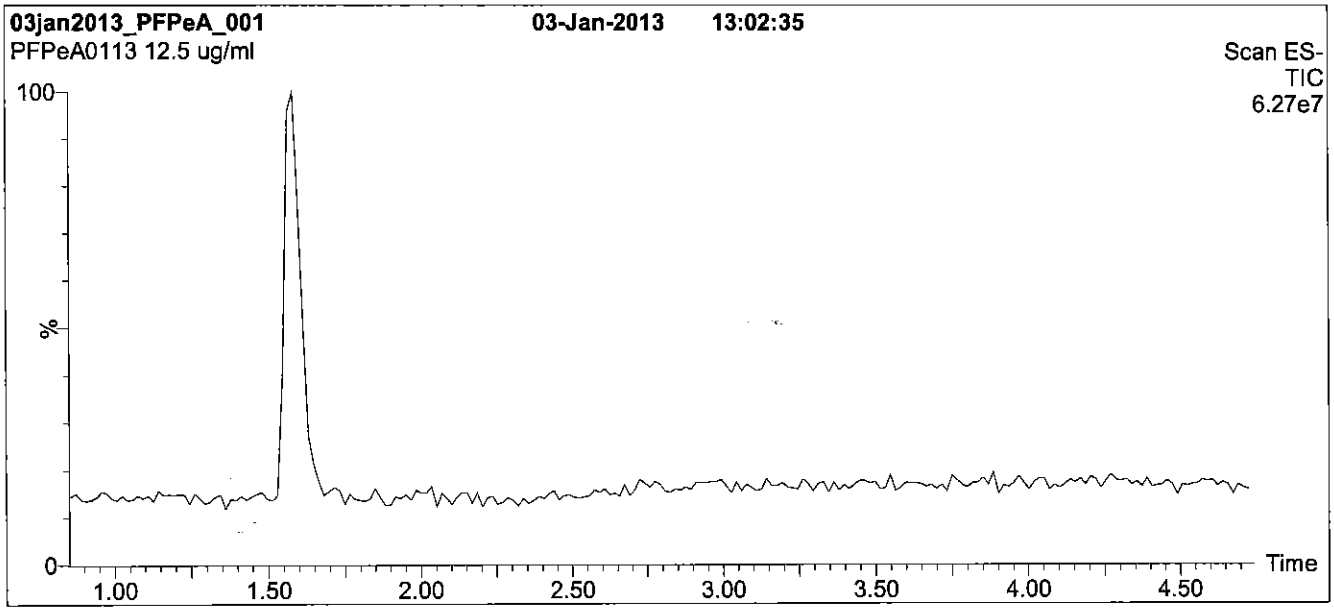
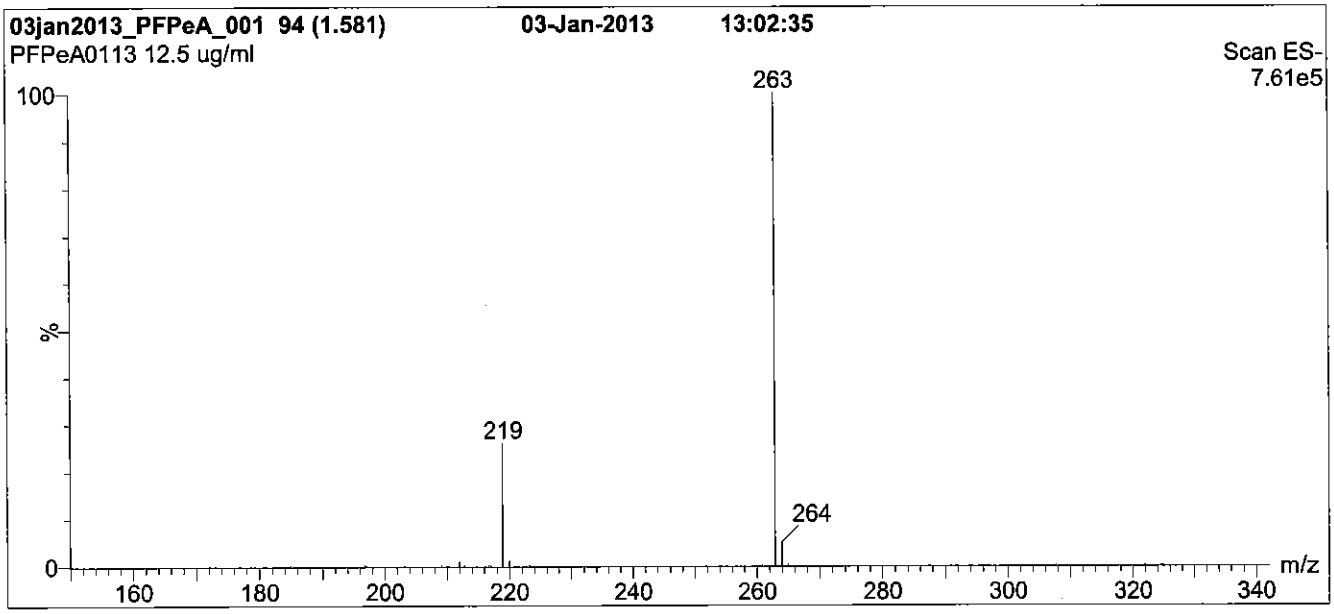
Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





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: 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 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

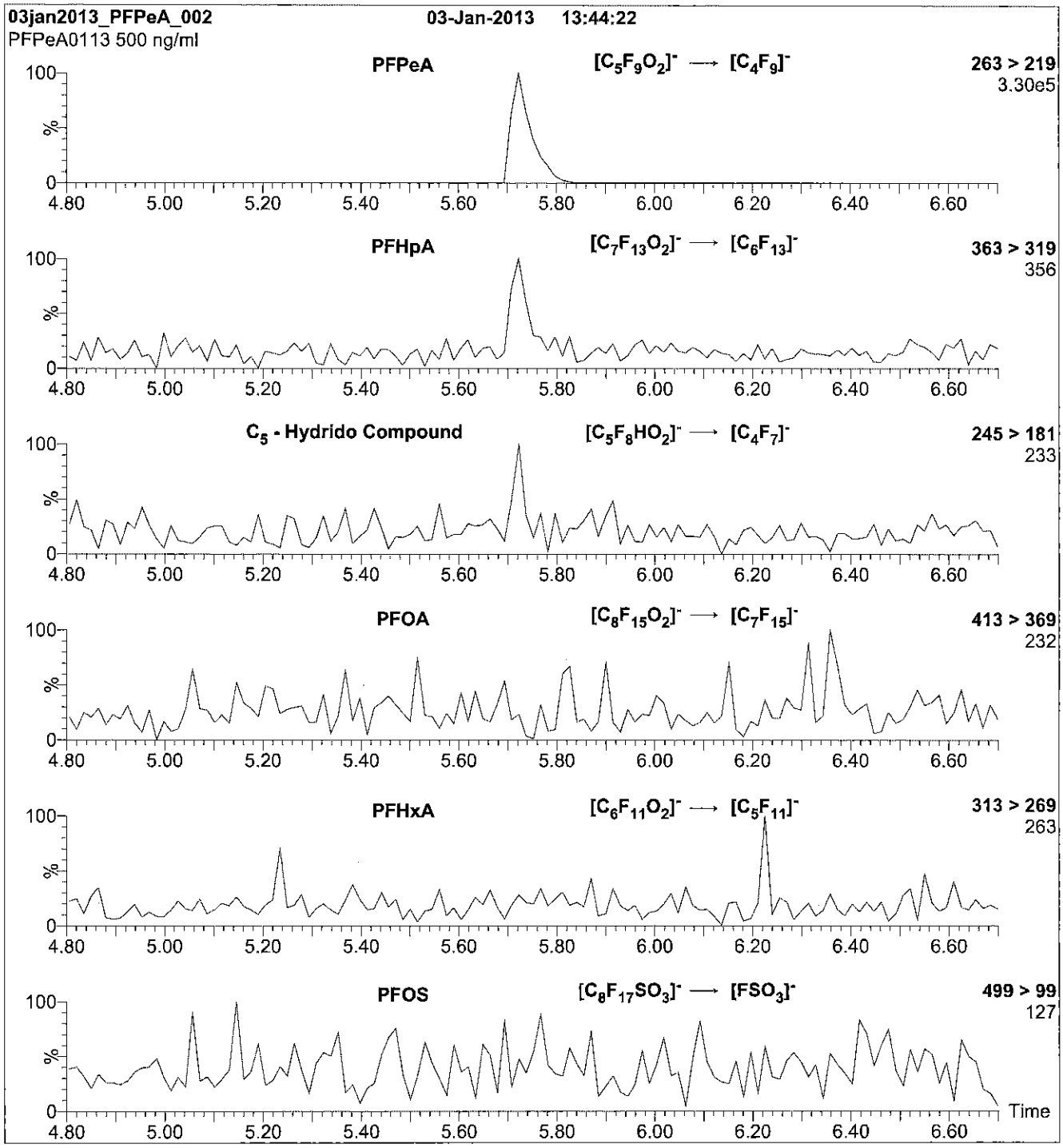
Flow: 300 µl/min

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) = 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 70% (80:20 MeOH:ACN) / 30% 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

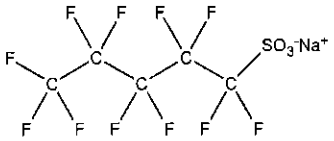
R 2415 W

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFPeS
LOT NUMBER: LPFPeS0712
COMPOUND: Sodium perfluoro-1-pentanesulfonate

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 (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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HOMOGENEITY:

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

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

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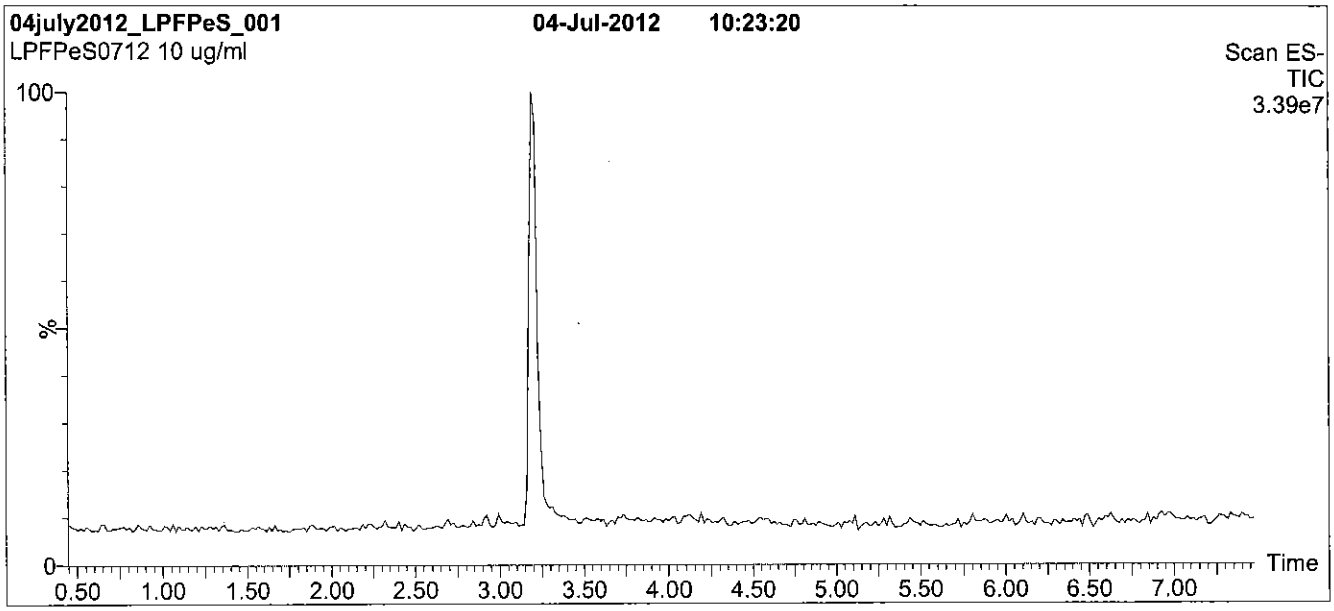
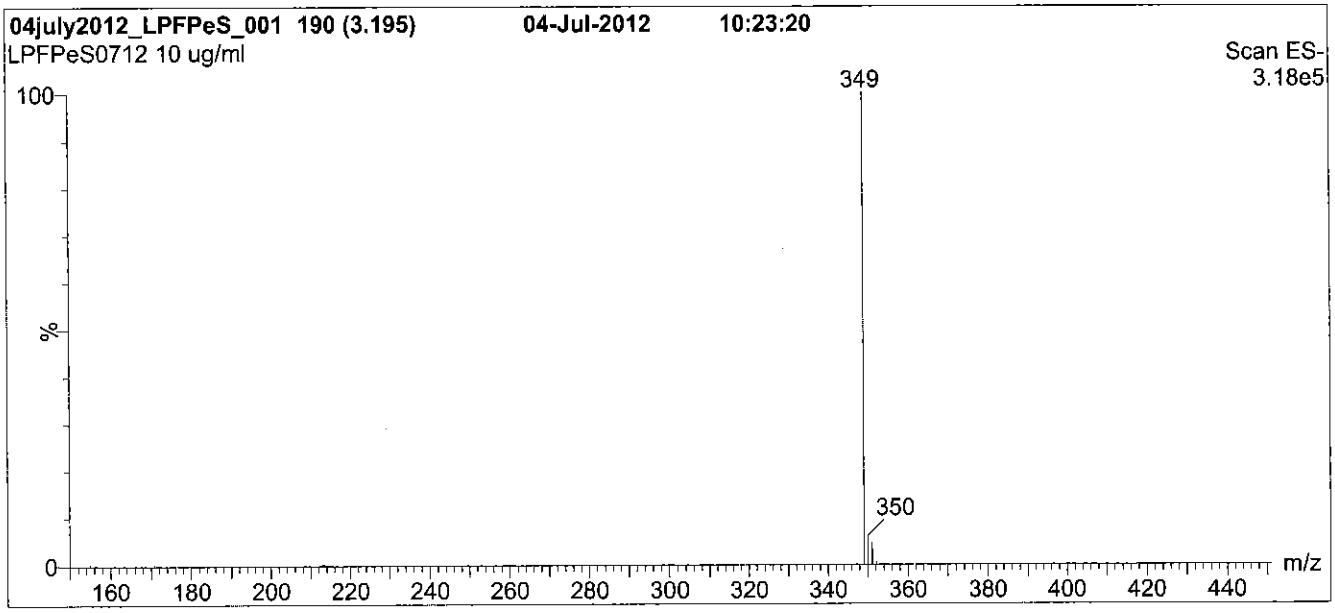
Figure 1: **L-PFPeS; LC/MS Data (TIC and Mass Spectrum)**





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

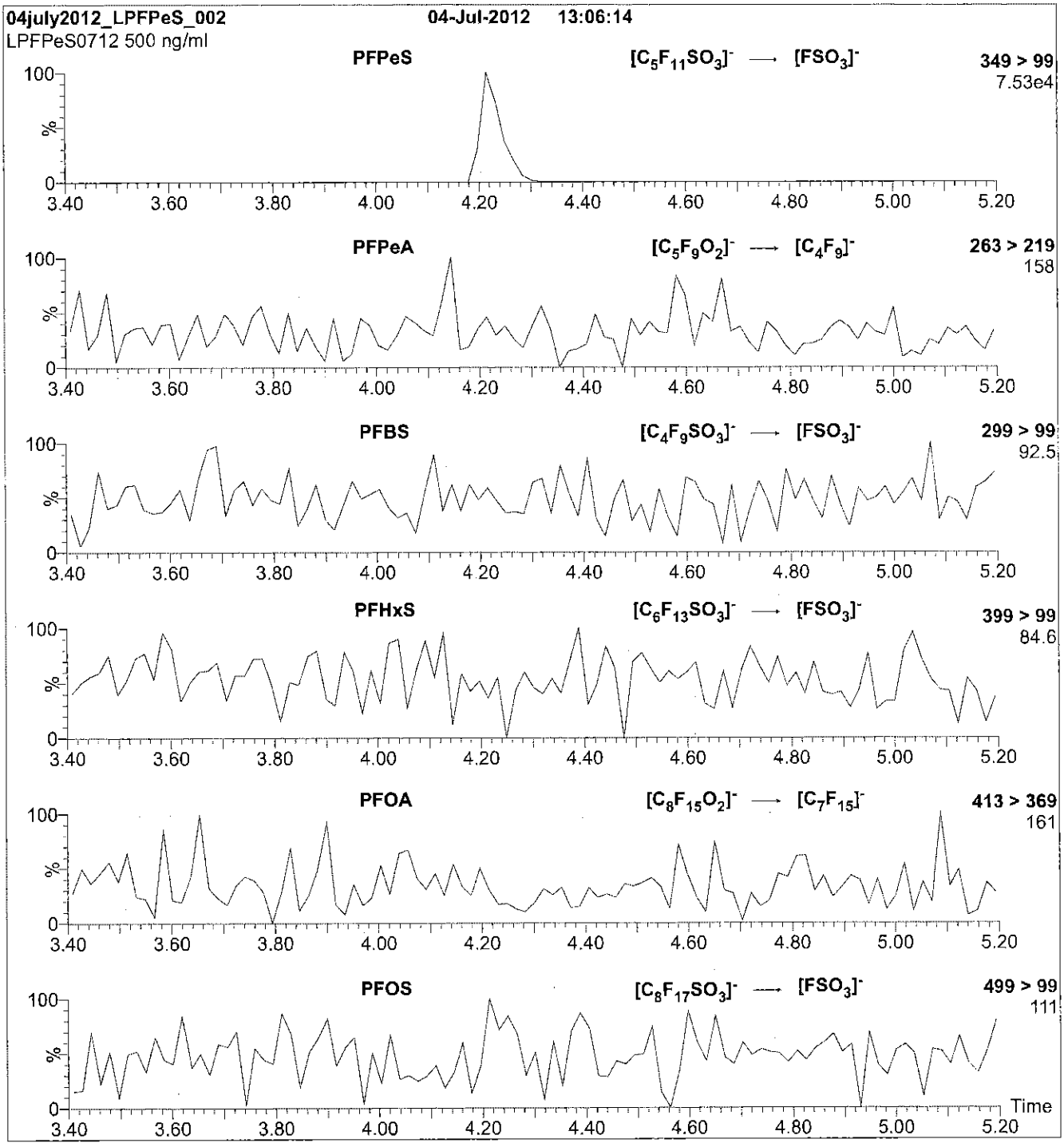
Flow: 300 µl/min

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_00003

V: 2/11/15 SRV

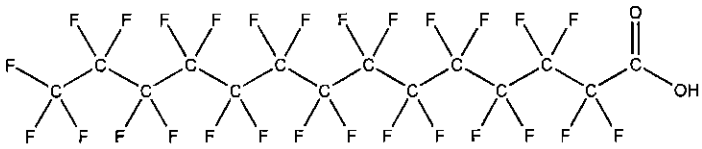
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTeDA
LOT NUMBER: PFTeDA0613
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) 06/19/2013
EXPIRY DATE: (mm/dd/yyyy) 06/19/2018
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 ~ 0.2% 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:** 07/17/2013 (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

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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 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 Accredited Laboratory No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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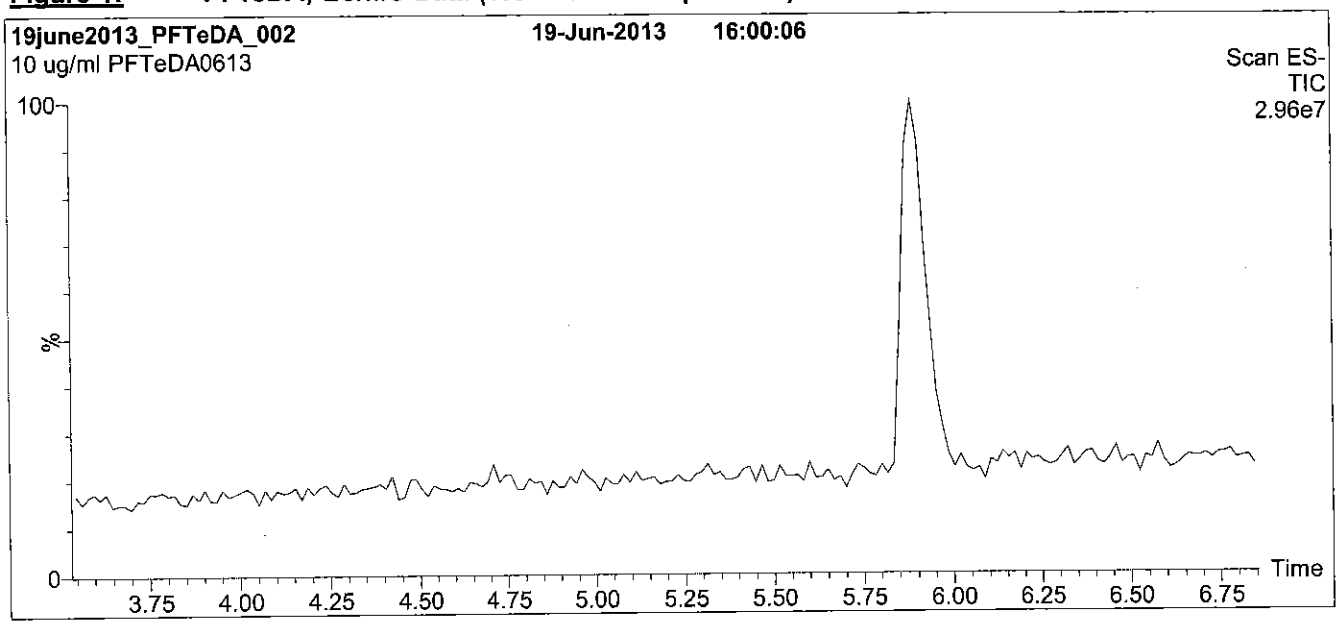
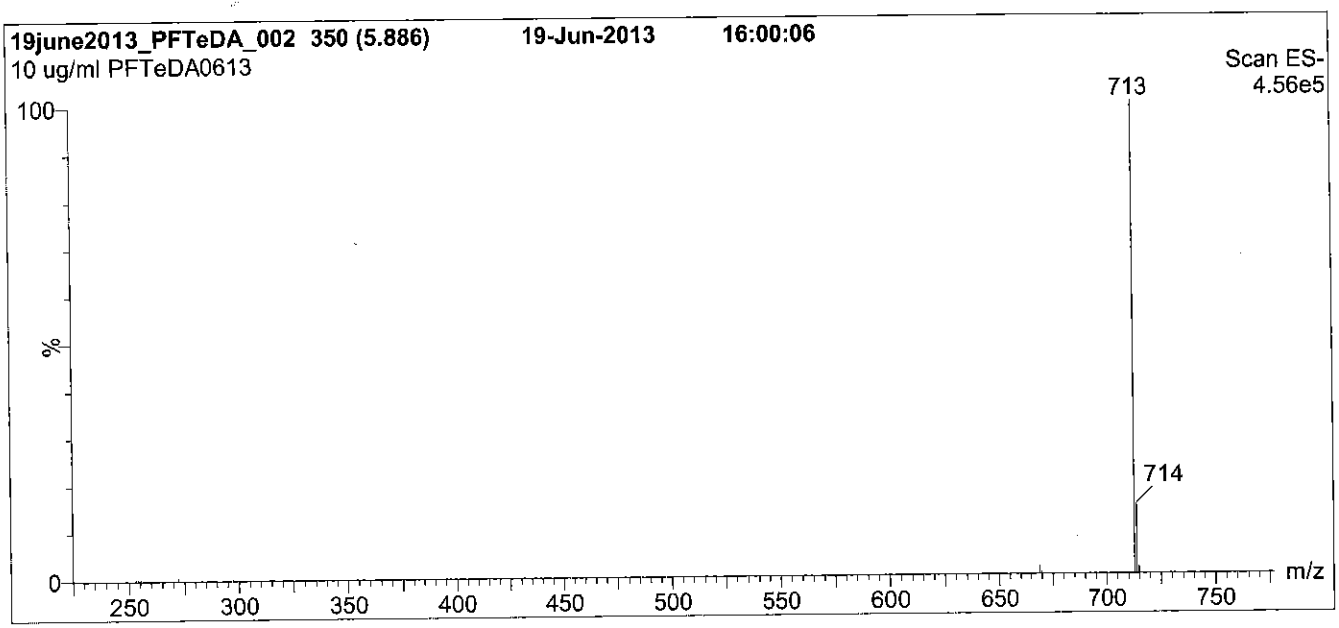
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





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: 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 0.50 min.
Time: 10 min

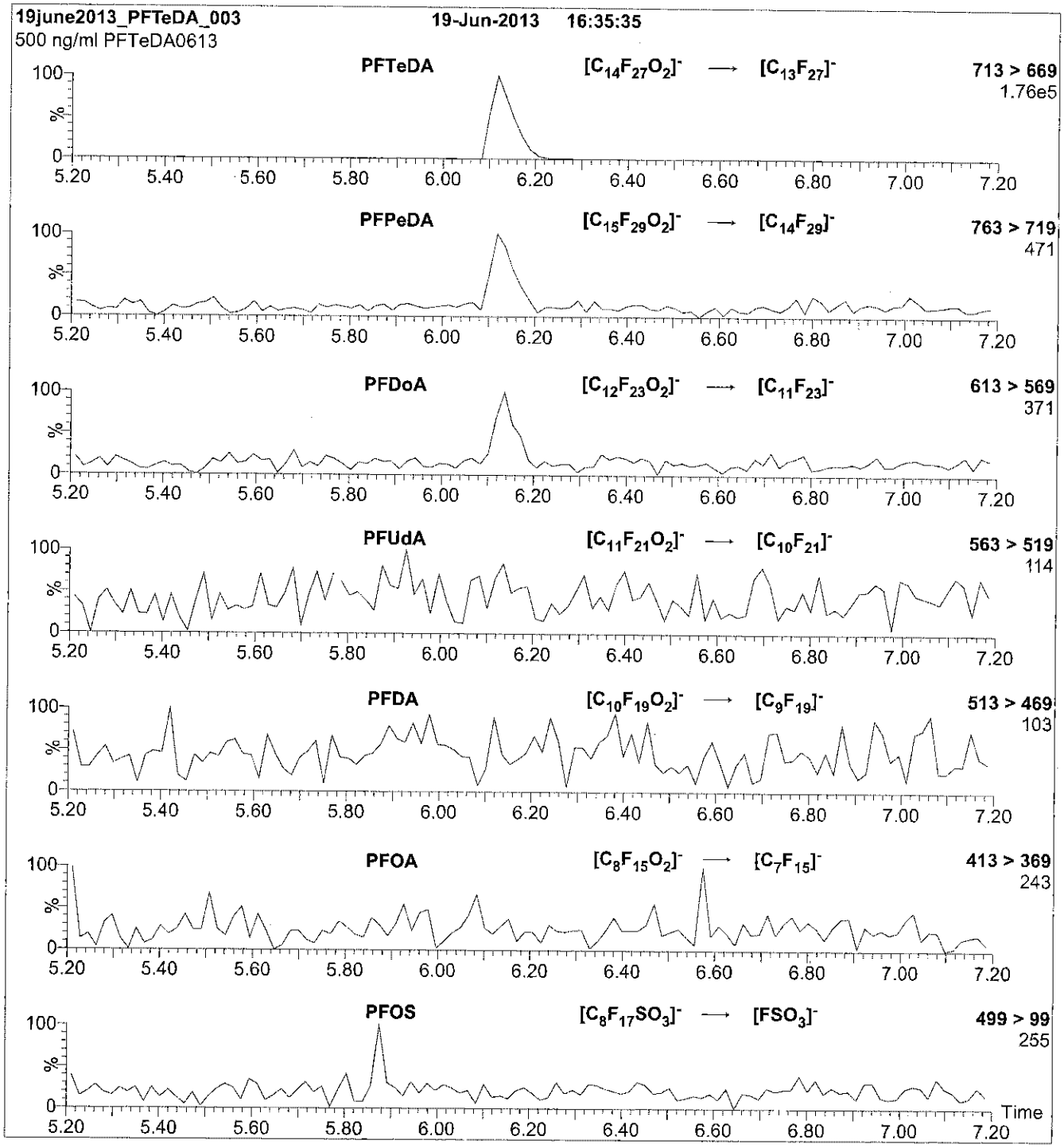
Flow: 300 µl/min

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: **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) = 3.50e-3
Collision Energy (eV) = 14

Reagent

LCPFTrDA_00003

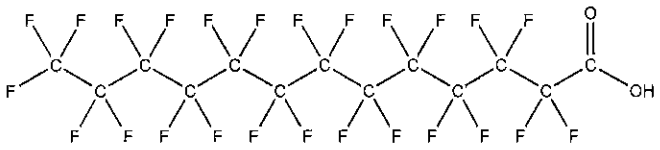
V. 2/11/15 CTN

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:** 12/11/2013 (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:

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HAZARDS:

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CALA Testing

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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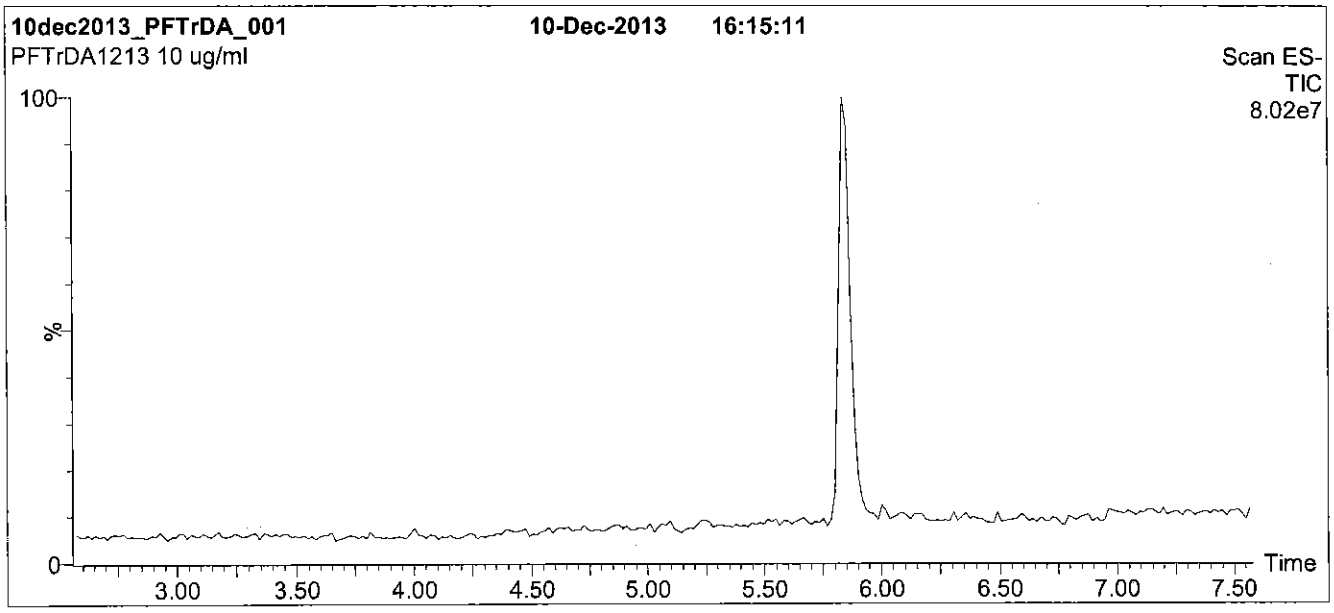
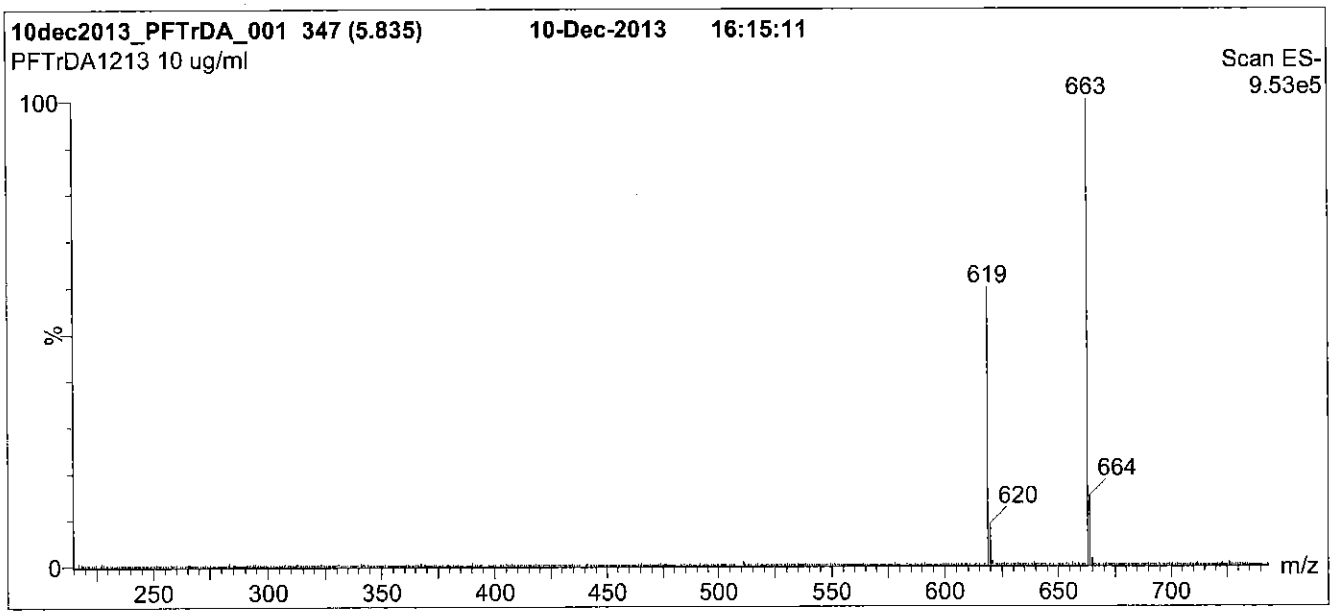
Figure 1: **PFTrDA; LC/MS Data (TIC and Mass Spectrum)**





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

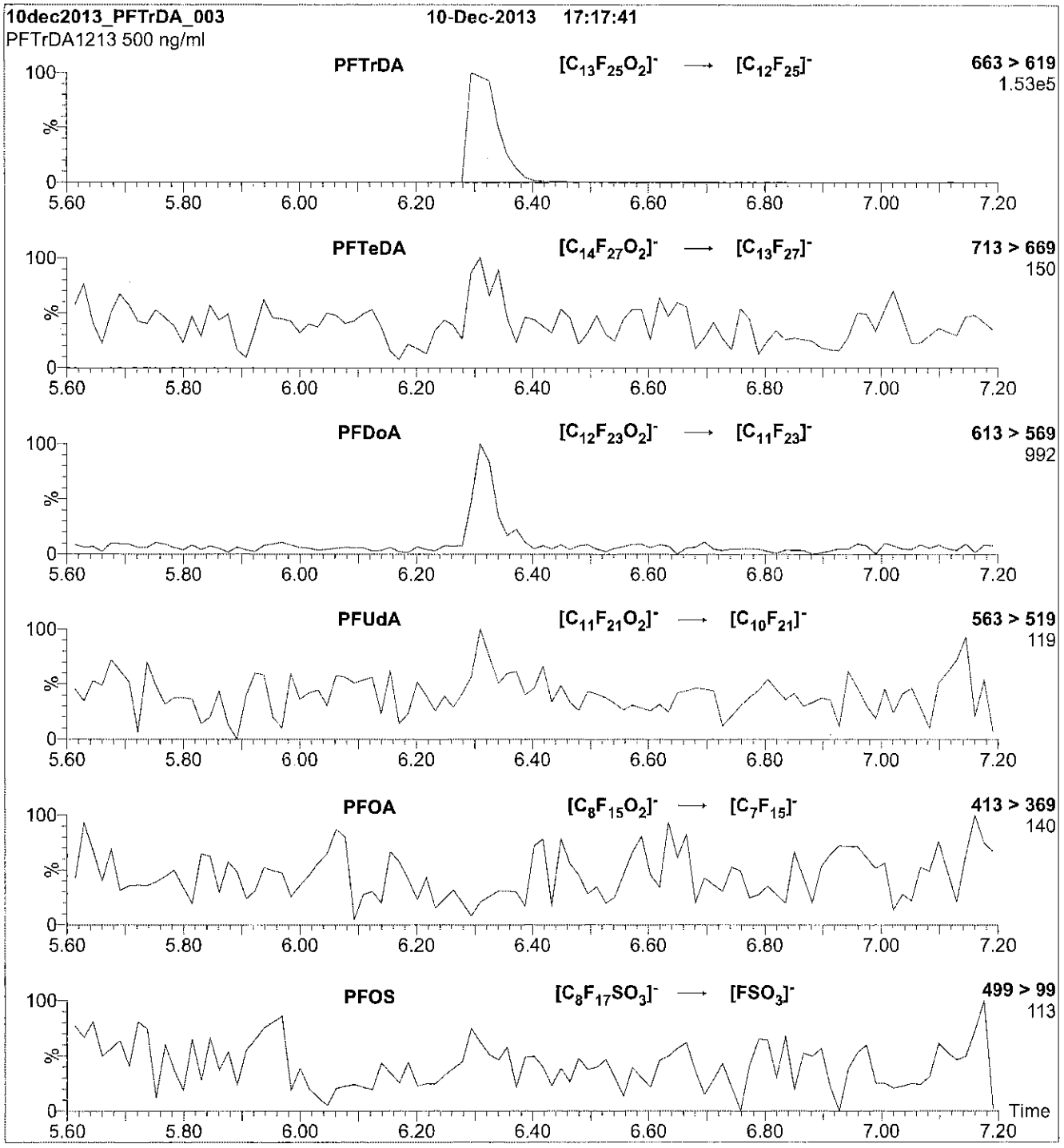
Flow: 300 µl/min

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

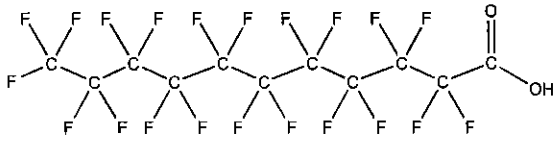
LCPFUdA_00003

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFUdA
LOT NUMBER: PFUdA0613
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) 06/19/2013
EXPIRY DATE: (mm/dd/yyyy) 06/19/2018
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/03/2013 (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

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CALA Testing Accreditation No. A1226

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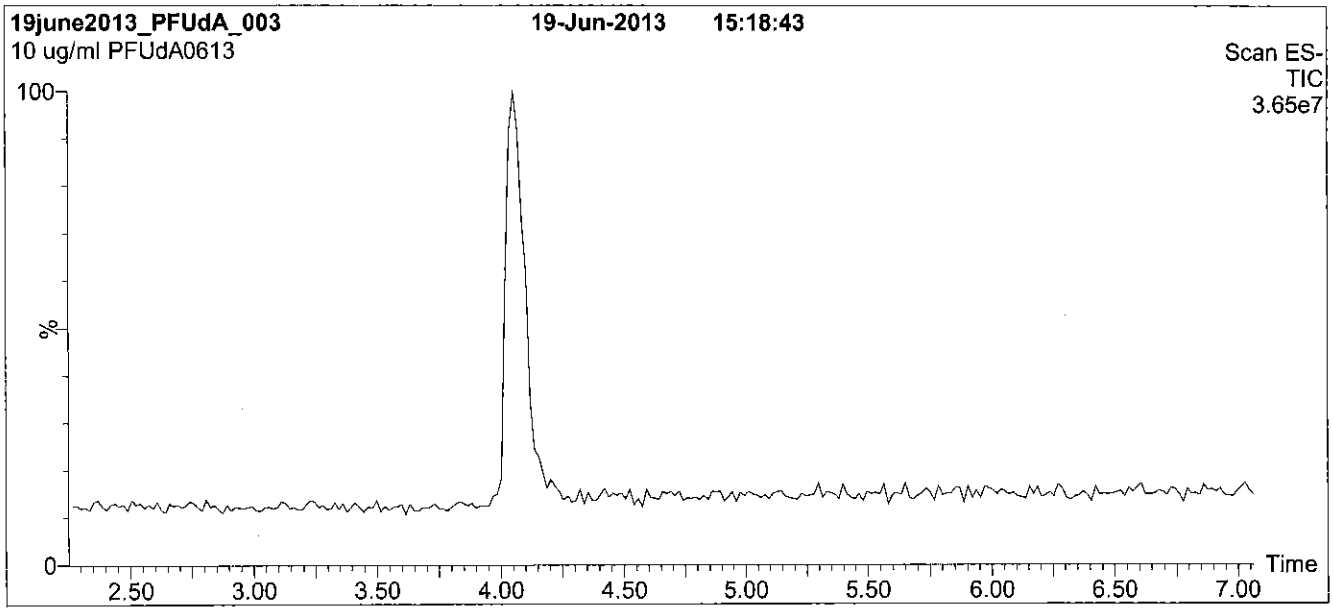
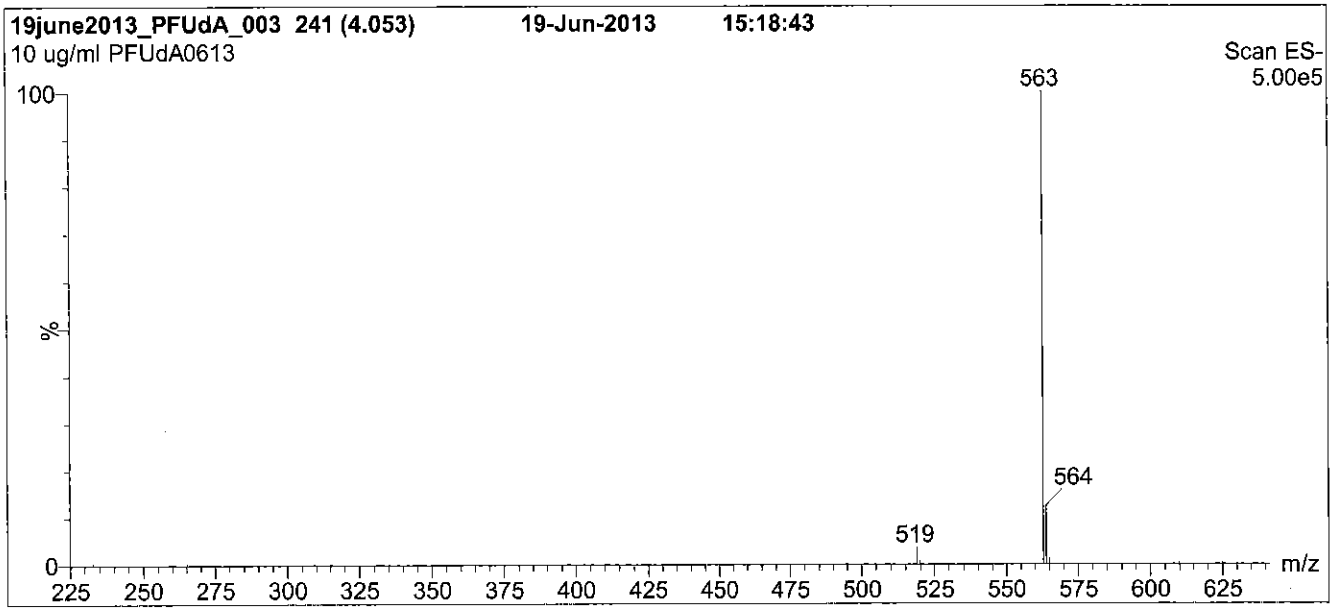
Figure 1: **PFUdA; LC/MS Data (TIC and Mass Spectrum)**





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: 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

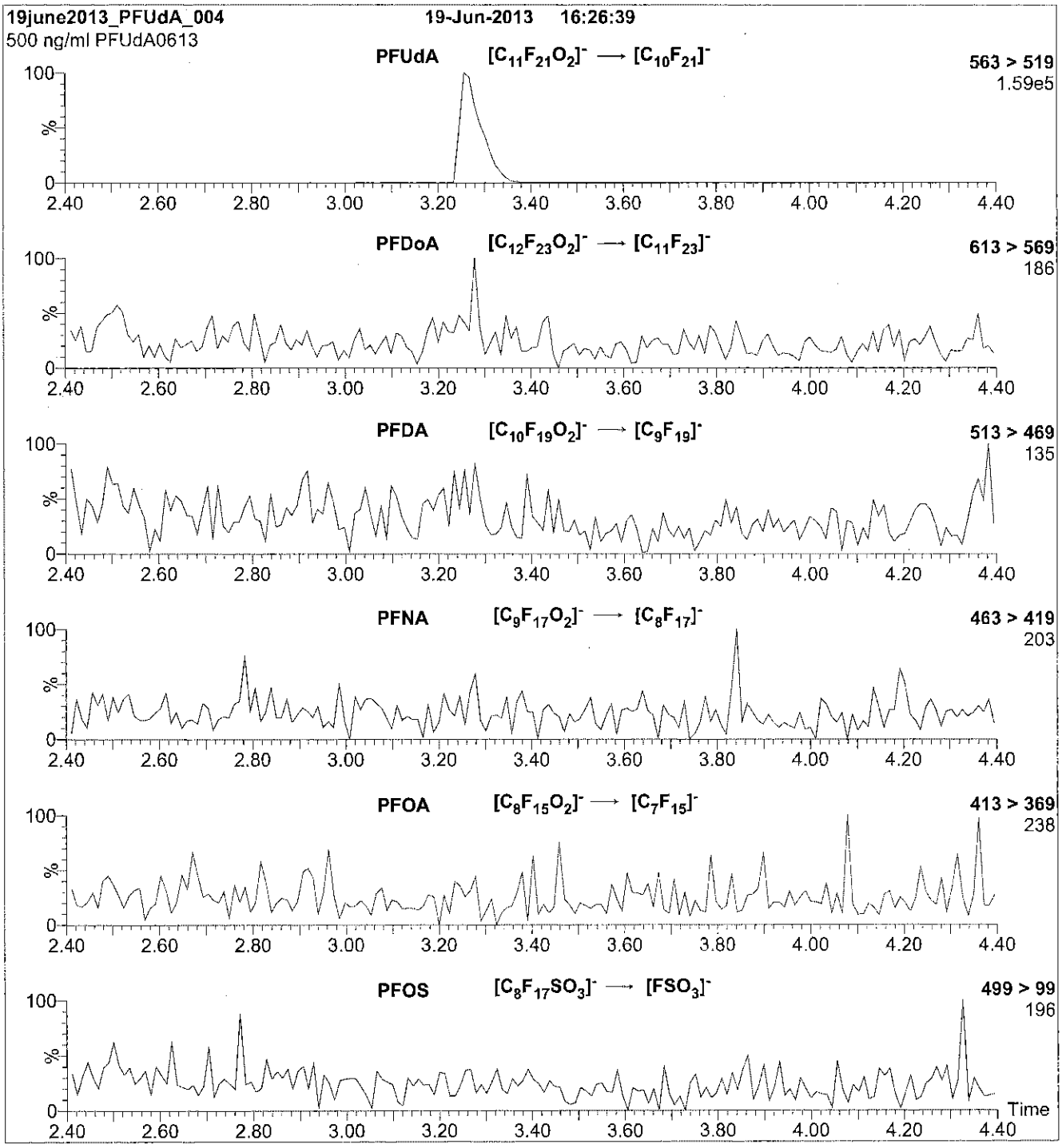
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 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) = 3.46e-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.: 320-17376-1

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 #
BC_2_20_16	320-17376-1	112	116	112	107	144	108
DW-29	320-17376-2	97	99	124	96	145	87
DW-29FB	320-17376-3	98	102	104	101	119	96
DW-13	320-17376-4	70	65	122	59	131	49
DW-13FB	320-17376-5	109	114	112	114	118	109
DW-3	320-17376-6	91	107	112	95	115	86
DW-3FB	320-17376-7	108	116	107	112	117	112
DW-71	320-17376-8	80	82	106	78	100	82
DW-71FB	320-17376-9	82	93	115	95	99	92
DW-84	320-17376-10	73	79	100	66	85	50
DW-84FB	320-17376-11	113	114	100	109	95	111
DW-91	320-17376-12	86	93	105	87	99	72
DW-91FB	320-17376-13	110	116	108	116	100	115
DUP022016	320-17376-14	87	94	107	99	91	86
	MB 320-101543/1-A	114	110	113	116	141	109
	LCS 320-101543/2-A	103	108	106	99	134	100
	LCSD 320-101543/3-A	106	110	109	101	150	109

	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.: 320-17376-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 26FEB2016A4A_016.d

Lab ID: LCS 320-101543/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
13C2 PFHxA	100	103	103	25-150	
13C4 PFOA	100	99.5	99	25-150	
13C4 PFOS	95.6	128	134	25-150	
13C4-PFHpA	100	108	108	25-150	
13C5 PFNA	100	100	100	25-150	
18O2 PFHxS	94.6	100	106	25-150	
Perfluorobutanesulfonic acid (PFBS)	35.4	42.3	120	50-150	
Perfluoroheptanoic acid (PFHpA)	40.0	36.8	92	60-140	
Perfluorohexanesulfonic acid (PFHxS)	37.8	30.7	81	60-140	
Perfluorononanoic acid (PFNA)	40.0	40.7	102	60-140	
Perfluorooctanesulfonic acid (PFOS)	38.2	28.7	75	60-140	
Perfluorooctanoic acid (PFOA)	40.0	40.6	101	60-140	

Column to be used to flag recovery and RPD values

FORM III WS-LC-0025

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 26FEB2016A4A_017.d

Lab ID: LCSD 320-101543/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
13C2 PFHxA	100	106	106			25-150	
13C4 PFOA	100	101	101			25-150	
13C4 PFOS	95.6	143	150			25-150	
13C4-PFHpA	100	110	110			25-150	
13C5 PFNA	100	109	109			25-150	
18O2 PFHxS	94.6	103	109			25-150	
Perfluorobutanesulfonic acid (PFBS)	35.4	40.8	115	4	30	50-150	
Perfluoroheptanoic acid (PFHpA)	40.0	34.5	86	6	30	60-140	
Perfluorohexanesulfonic acid (PFHxS)	37.8	30.8	81	0	30	60-140	
Perfluorononanoic acid (PFNA)	40.0	39.2	98	4	30	60-140	
Perfluorooctanesulfonic acid (PFOS)	38.2	27.5	72	4	30	60-140	
Perfluorooctanoic acid (PFOA)	40.0	39.1	98	4	30	60-140	

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.: 320-17376-1

SDG No.:

Lab File ID: 26FEB2016A4A_015.d Lab Sample ID: MB 320-101543/1-A

Matrix: Water Date Extracted: 02/25/2016 10:17

Instrument ID: A4 Date Analyzed: 02/26/2016 20:38

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-101543/2-A	26FEB2016A4A_016.d	02/26/2016 20:59
	LCSD 320-101543/3-A	26FEB2016A4A_017.d	02/26/2016 21:20
BC_2_20_16	320-17376-1	26FEB2016A4A_018.d	02/26/2016 21:41
DW-29	320-17376-2	26FEB2016A4A_019.d	02/26/2016 22:03
DW-29FB	320-17376-3	26FEB2016A4A_020.d	02/26/2016 22:24
DW-13	320-17376-4	26FEB2016A4A_021.d	02/26/2016 22:45
DW-13FB	320-17376-5	26FEB2016A4A_022.d	02/26/2016 23:06
DW-3	320-17376-6	26FEB2016A4A_023.d	02/26/2016 23:27
DW-3FB	320-17376-7	26FEB2016A4A_024.d	02/26/2016 23:48
DW-71	320-17376-8	26FEB2016A4A_026.d	02/27/2016 00:31
DW-71FB	320-17376-9	26FEB2016A4A_027.d	02/27/2016 00:52
DW-84	320-17376-10	26FEB2016A4A_028.d	02/27/2016 01:13
DW-84FB	320-17376-11	26FEB2016A4A_029.d	02/27/2016 01:34
DW-91	320-17376-12	26FEB2016A4A_030.d	02/27/2016 01:56
DW-91FB	320-17376-13	26FEB2016A4A_031.d	02/27/2016 02:17
DUP022016	320-17376-14	26FEB2016A4A_032.d	02/27/2016 02:38

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17376-1

SDG No.:

Client Sample ID: BC_2_20_16 | Lab Sample ID: 320-17376-1

Matrix: Water | Lab File ID: 26FEB2016A4A_018.d

Analysis Method: WS-LC-0025 | Date Collected: 02/20/2016 00:00

Extraction Method: 3535 | Date Extracted: 02/25/2016 10:17

Sample wt/vol: 559.7(mL) | Date Analyzed: 02/26/2016 21:41

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.: 101820 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.2	1.8	0.82
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	U	2.2	1.8	0.72
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.2	1.8	0.78
375-95-1	Perfluorononanoic acid (PFNA)	0.67	J	2.2	1.8	0.58
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	1.1
335-67-1	Perfluorooctanoic acid (PFOA)	1.8	U	2.2	1.8	0.67

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	112		25-150
STL00990	13C4 PFOA	107		25-150
STL00991	13C4 PFOS	144		25-150
STL01892	13C4-PFHpA	116		25-150
STL00995	13C5 PFNA	108		25-150
STL00994	18O2 PFHxS	112		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_018.d
Lims ID: 320-17376-A-1-A Lab Sample ID: 320-17376-1
Client ID: BC_2_20_16
Sample Type: Client
Inject. Date: 26-Feb-2016 21:41:55 ALS Bottle#: 4 Worklist Smp#: 14
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17376-A-1-A
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:18:18 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:30:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 6 13C2 PFHxA										
314.6 > 269.7	9.042	8.604	0.438		4503185	55.9		112	12334	
D 8 13C4-PFHpA										
366.6 > 321.6	10.284	9.856	0.428		3922828	57.8		116	6089	
9 Perfluoroheptanoic acid										
362.8 > 318.7	10.276	9.859	0.417	1.000	8055	0.2338			16.4	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	10.301	9.892	0.409	1.000	6918	0.1674				
D 11 18O2 PFHxS										
402.5 > 83.6	10.310	9.892	0.418		1927691	53.1		112	4134	
D 12 13C4 PFOA										
416.5 > 371.6	11.346	10.958	0.388		4186311	53.4		107	7214	
13 Perfluorooctanoic acid										
412.8 > 368.8	11.346	10.958	0.388	1.000	11678	0.2655			7.3	
D 16 13C4 PFOS										
502.4 > 79.7	12.220	11.876	0.344		1120951	68.8		144	2820	
D 17 13C5 PFNA										
467.5 > 422.6	12.246	11.898	0.348		3494134	53.9		108	5804	
18 Perfluorononanoic acid										
462.5 > 418.6	12.246	11.899	0.347	1.000	7754	0.3749			10.5	

Report Date: 29-Feb-2016 10:18:45 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_018.d

Injection Date: 26-Feb-2016 21:41:55 Instrument ID: A4

Lims ID: 320-17376-A-1-A Lab Sample ID: 320-17376-1

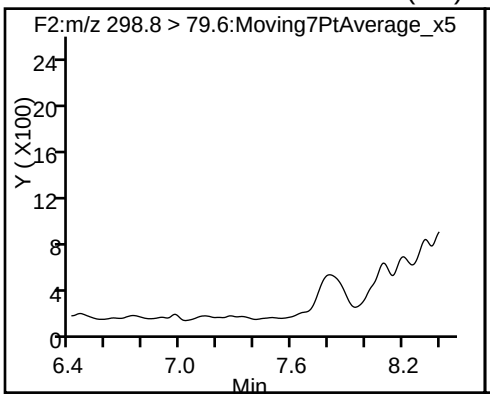
Client ID: BC_2_20_16

Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 14

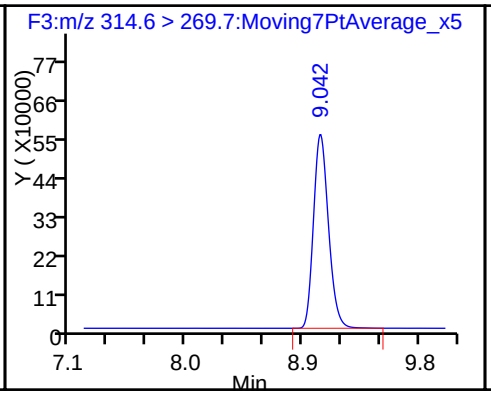
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

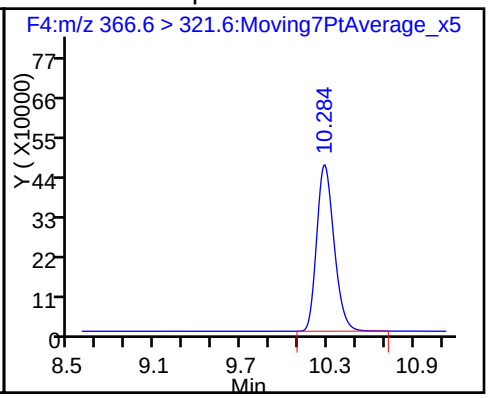
51 Perfluorobutanesulfonic acid (ND)



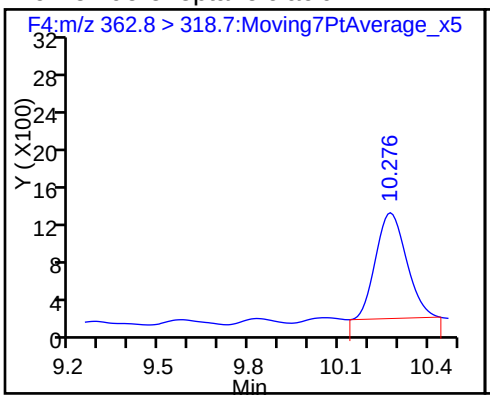
D 6 13C2 PFHxA



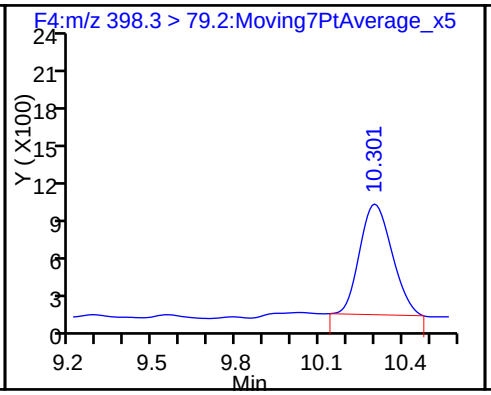
D 8 13C4-PFHpA



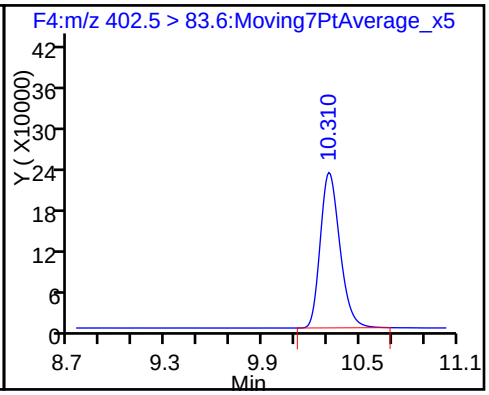
9 Perfluoroheptanoic acid



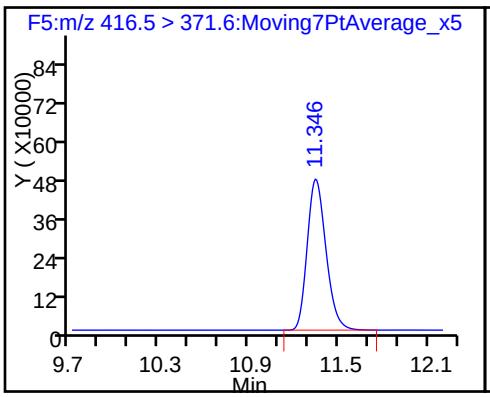
58 Perfluorohexanesulfonic acid



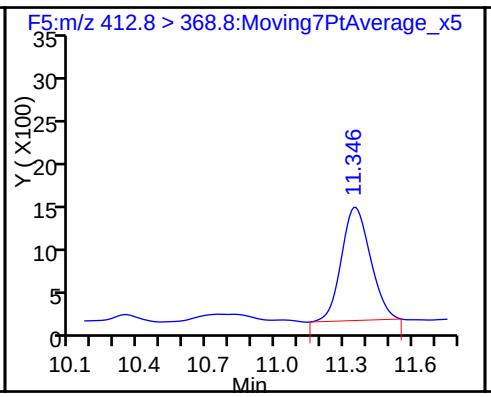
D 11 18O2 PFHxS



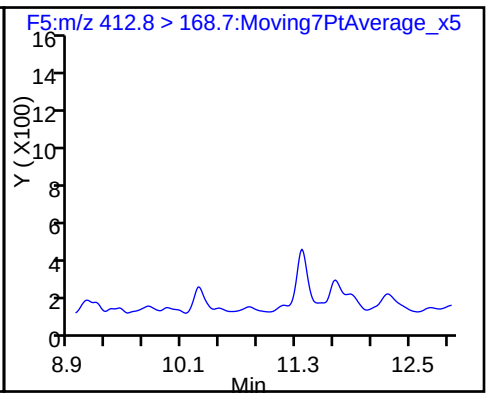
D 12 13C4 PFOA



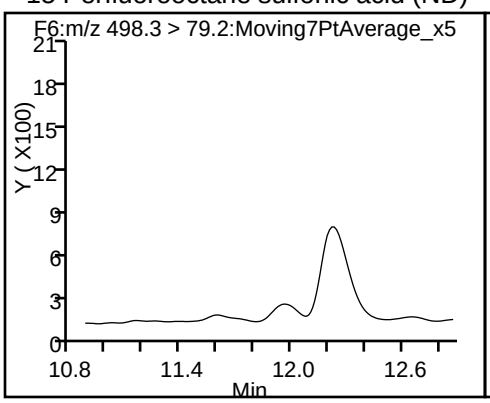
13 Perfluorooctanoic acid



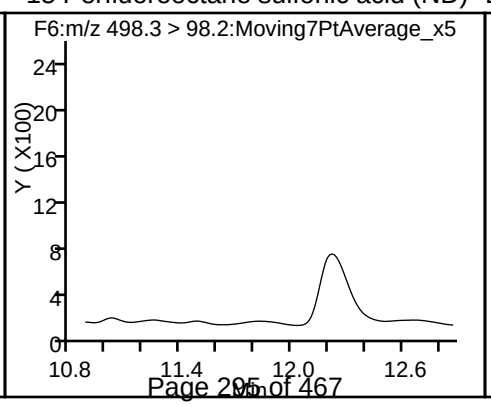
13 Perfluorooctanoic acid



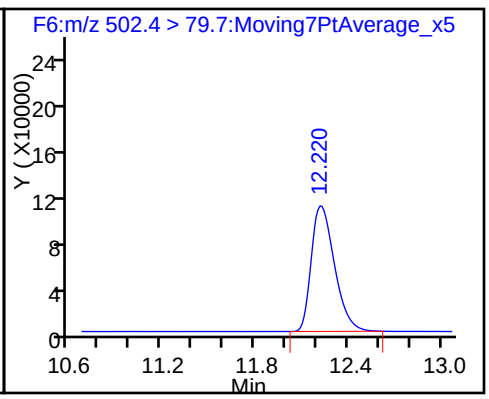
15 Perfluorooctane sulfonic acid (ND)



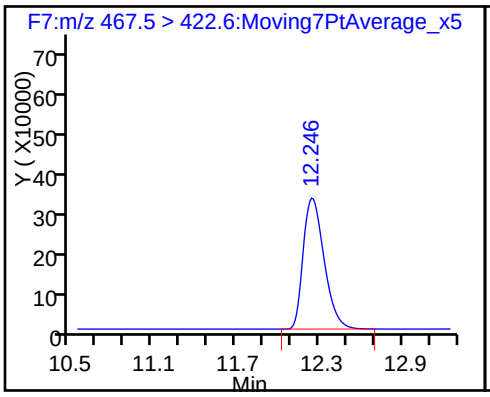
15 Perfluorooctane sulfonic acid (ND)



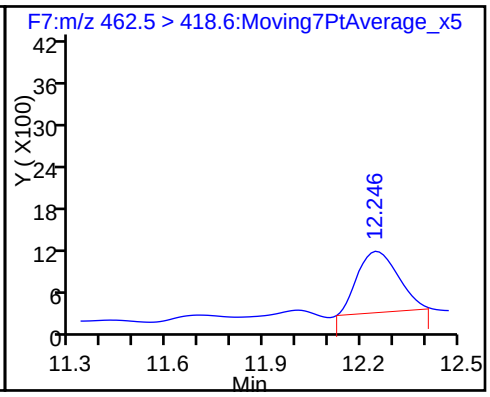
D 16 13C4 PFOS



D 17 13C5 PFNA



18 Perfluorononanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17376-1

SDG No.:

Client Sample ID: DW-29 | Lab Sample ID: 320-17376-2

Matrix: Water | Lab File ID: 26FEB2016A4A_019.d

Analysis Method: WS-LC-0025 | Date Collected: 02/20/2016 13:41

Extraction Method: 3535 | Date Extracted: 02/25/2016 10:17

Sample wt/vol: 553(mL) | Date Analyzed: 02/26/2016 22:03

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.: 101820 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.3	1.8	0.83
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	U	2.3	1.8	0.73
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.3	1.8	0.79
375-95-1	Perfluorononanoic acid (PFNA)	1.8	U	2.3	1.8	0.59
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	1.8	U	2.3	1.8	0.68

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		25-150
STL00990	13C4 PFOA	96		25-150
STL00991	13C4 PFOS	145		25-150
STL01892	13C4-PFHpA	99		25-150
STL00995	13C5 PFNA	87		25-150
STL00994	18O2 PFHxS	124		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_019.d
Lims ID: 320-17376-B-2-A Lab Sample ID: 320-17376-2
Client ID: DW-29
Sample Type: Client
Inject. Date: 26-Feb-2016 22:03:06 ALS Bottle#: 5 Worklist Smp#: 15
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17376-B-2-A
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:18:18 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:33:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.830	7.404	0.426	1.000	3508	0.1305				
D 6 13C2 PFHxA										
314.6 > 269.7	9.073	8.604	0.469		3921466	48.7		97.3	7102	
D 8 13C4-PFHpA										
366.6 > 321.6	10.310	9.856	0.454		3357551	49.4		98.9	5567	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	10.344	9.892	0.452	1.000	6609	0.1453				
D 11 18O2 PFHxS										
402.5 > 83.6	10.335	9.892	0.443		2121515	58.5		124	3784	
D 12 13C4 PFOA										
416.5 > 371.6	11.364	10.958	0.406		3754590	47.9		95.8	7256	
D 16 13C4 PFOS										
502.4 > 79.7	12.232	11.876	0.356		1129818	69.3		145	2621	
D 17 13C5 PFNA										
467.5 > 422.6	12.259	11.898	0.361		2825505	43.6		87.2	4420	

Report Date: 29-Feb-2016 10:18:55 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_019.d

Injection Date: 26-Feb-2016 22:03:06 Instrument ID: A4

Lims ID: 320-17376-B-2-A Lab Sample ID: 320-17376-2

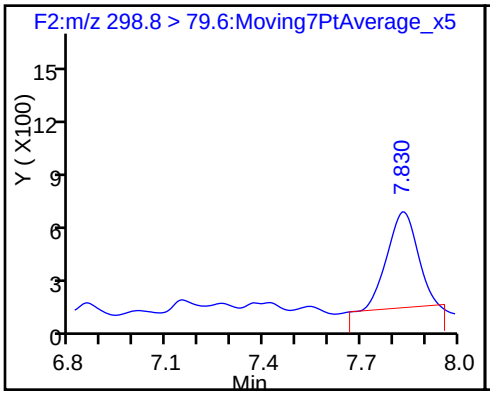
Client ID: DW-29

Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 15

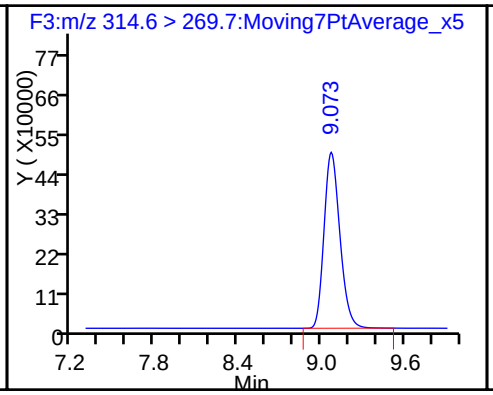
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

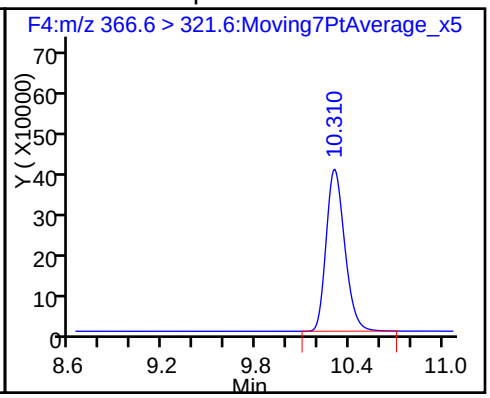
51 Perfluorobutanesulfonic acid



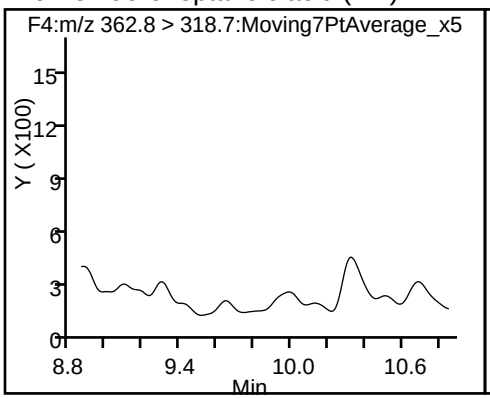
D 6 13C2 PFHxA



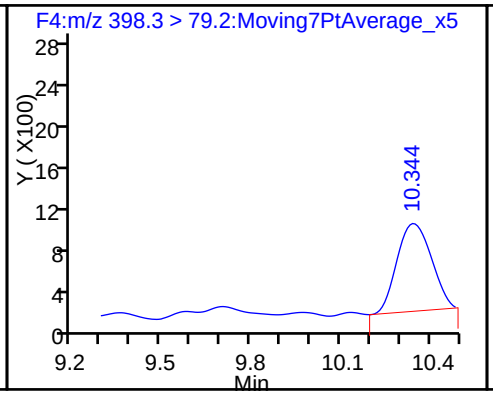
D 8 13C4-PFHpA



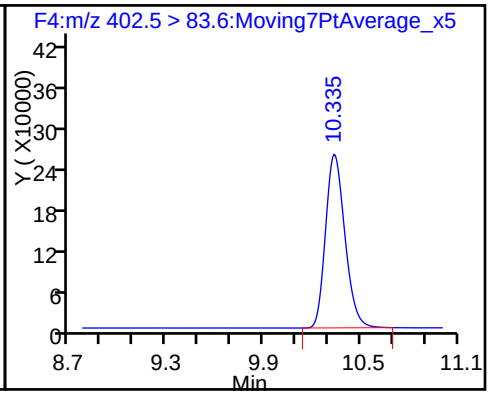
9 Perfluoroheptanoic acid (ND)



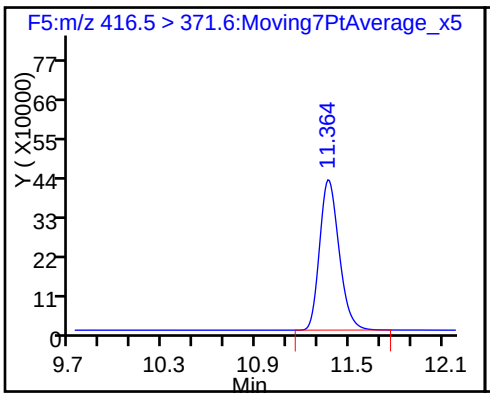
58 Perfluorohexanesulfonic acid



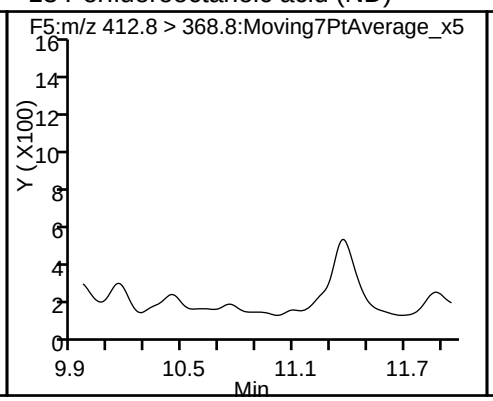
D 11 18O2 PFHxS



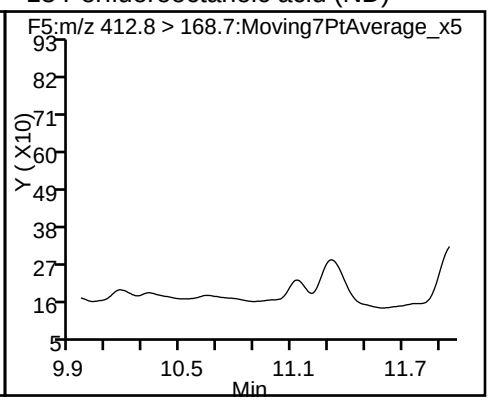
D 12 13C4 PFOA



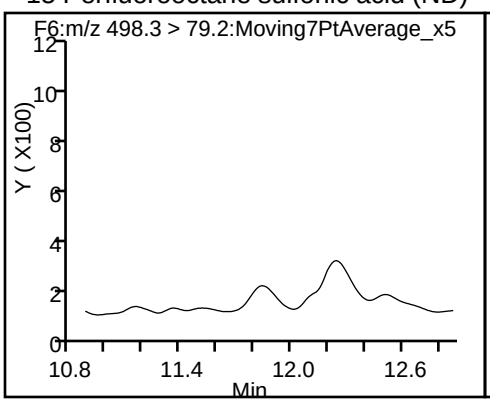
13 Perfluorooctanoic acid (ND)



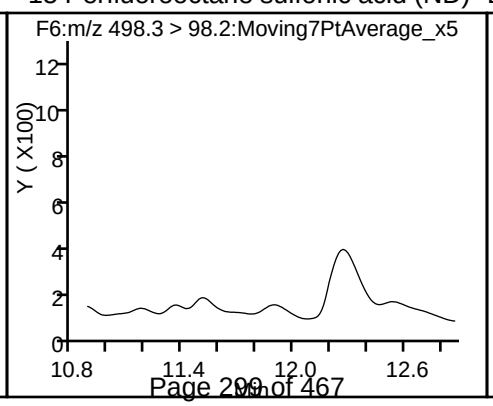
13 Perfluorooctanoic acid (ND)



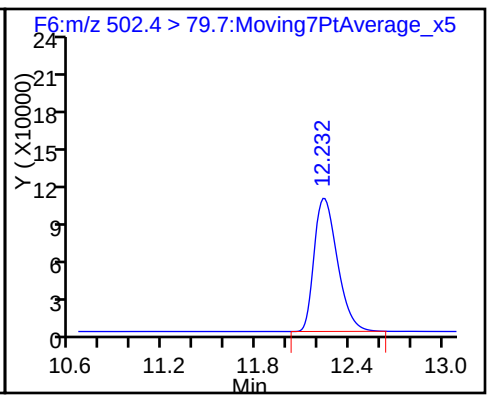
15 Perfluorooctane sulfonic acid (ND)



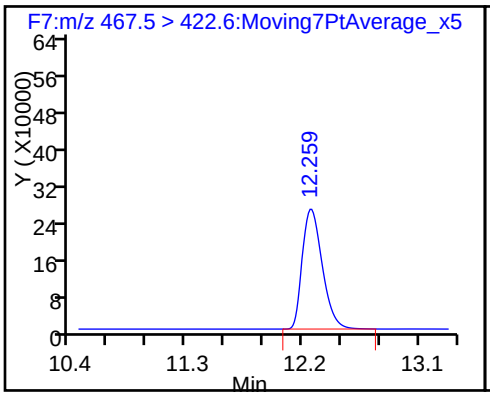
15 Perfluorooctane sulfonic acid (ND)



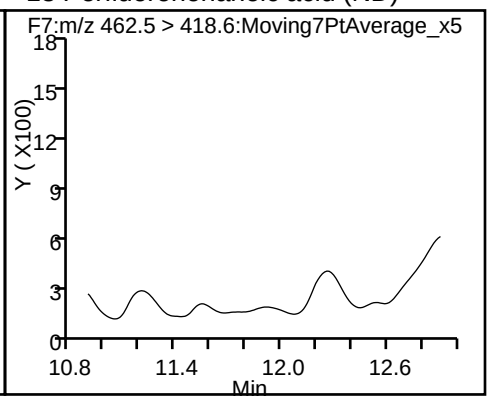
D 16 13C4 PFOS



D 17 13C5 PFNA



18 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17376-1

SDG No.:

Client Sample ID: DW-29FB | Lab Sample ID: 320-17376-3

Matrix: Water | Lab File ID: 26FEB2016A4A_020.d

Analysis Method: WS-LC-0025 | Date Collected: 02/20/2016 13:22

Extraction Method: 3535 | Date Extracted: 02/25/2016 10:17

Sample wt/vol: 548.3(mL) | Date Analyzed: 02/26/2016 22:24

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.: 101820 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.7	J	2.3	1.8	0.84
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	U	2.3	1.8	0.73
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.3	1.8	0.79
375-95-1	Perfluorononanoic acid (PFNA)	1.8	U	2.3	1.8	0.60
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	1.8	U	2.3	1.8	0.68

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		25-150
STL00990	13C4 PFOA	101		25-150
STL00991	13C4 PFOS	119		25-150
STL01892	13C4-PFHpA	102		25-150
STL00995	13C5 PFNA	96		25-150
STL00994	18O2 PFHxS	104		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_020.d
Lims ID: 320-17376-B-3-A Lab Sample ID: 320-17376-3
Client ID: DW-29FB
Sample Type: Client
Inject. Date: 26-Feb-2016 22:24:18 ALS Bottle#: 6 Worklist Smp#: 16
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17376-B-3-A
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:18:18 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:33:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.830	7.404	0.426	1.000	21291	0.9422				
D 6 13C2 PFHxA										
314.6 > 269.7	9.050	8.604	0.446		3957674	49.1		98.2	5995	
D 8 13C4-PFHpA										
366.6 > 321.6	10.276	9.856	0.420		3446771	50.8		102	5379	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	10.318	9.892	0.426	1.000	9549	0.2498				
D 11 18O2 PFHxS										
402.5 > 83.6	10.301	9.892	0.409		1783099	49.2		104	4403	
D 12 13C4 PFOA										
416.5 > 371.6	11.328	10.958	0.370		3944796	50.3		101	8938	
D 16 13C4 PFOS										
502.4 > 79.7	12.194	11.876	0.318		930498	57.1		119	2362	
D 17 13C5 PFNA										
467.5 > 422.6	12.221	11.898	0.323		3110067	48.0		96.0	5278	

Report Date: 29-Feb-2016 10:19:02 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_020.d

Injection Date: 26-Feb-2016 22:24:18 Instrument ID: A4

Lims ID: 320-17376-B-3-A Lab Sample ID: 320-17376-3

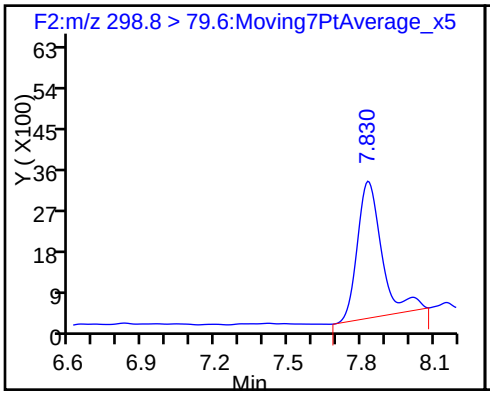
Client ID: DW-29FB

Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 16

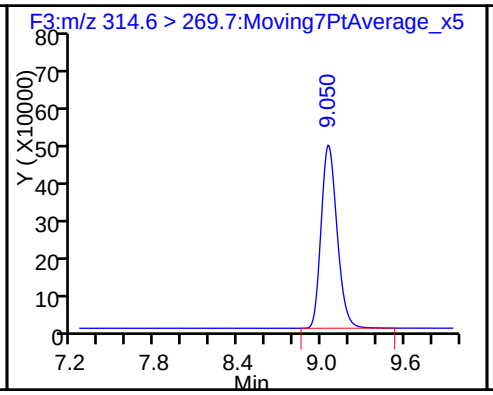
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

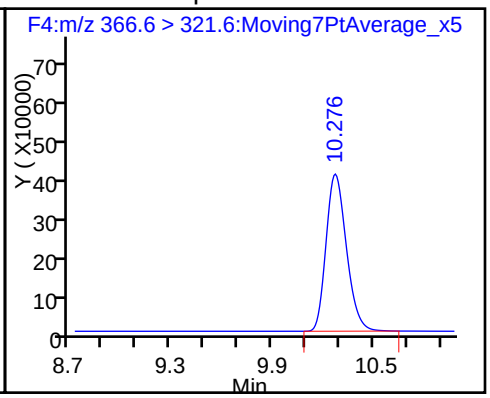
51 Perfluorobutanesulfonic acid



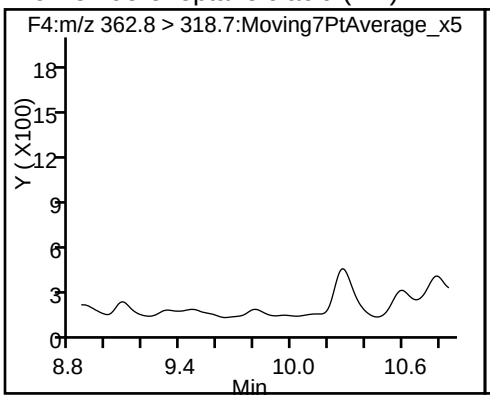
D 6 13C2 PFHxA



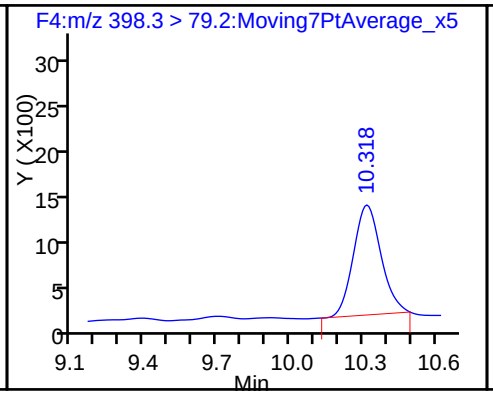
D 8 13C4-PFHpA



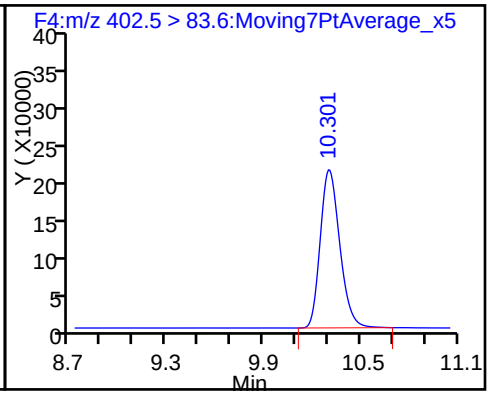
9 Perfluoroheptanoic acid (ND)



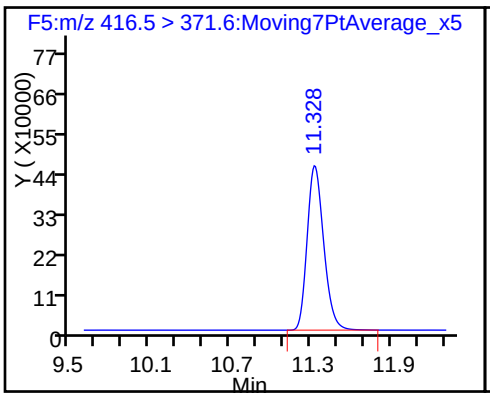
58 Perfluorohexanesulfonic acid



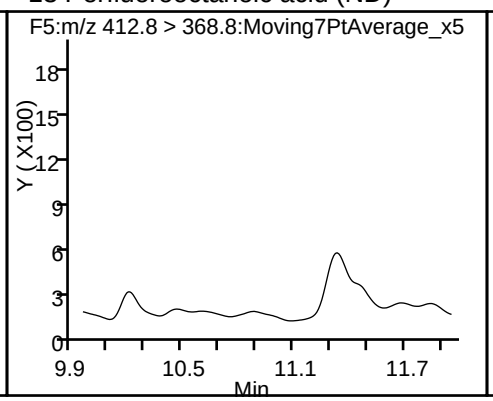
D 11 18O2 PFHxS



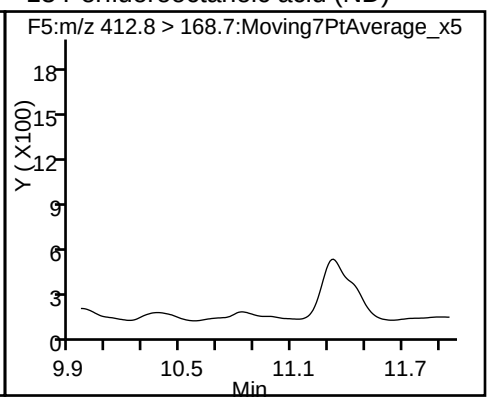
D 12 13C4 PFOA



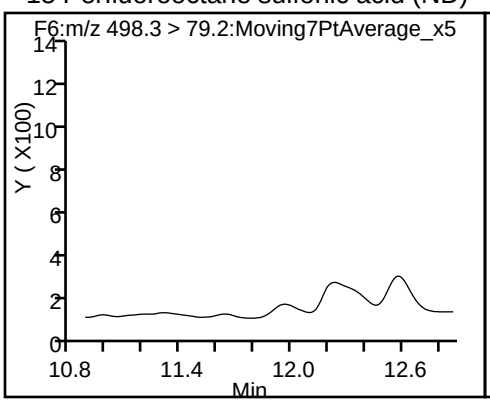
13 Perfluorooctanoic acid (ND)



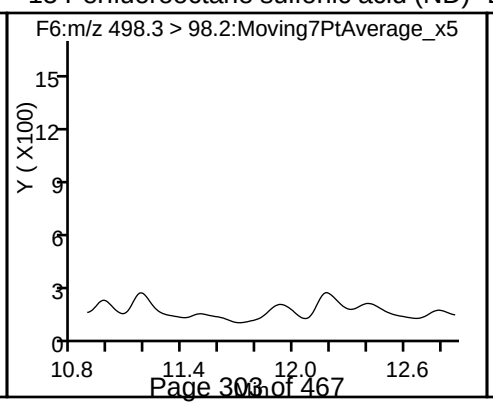
13 Perfluorooctanoic acid (ND)



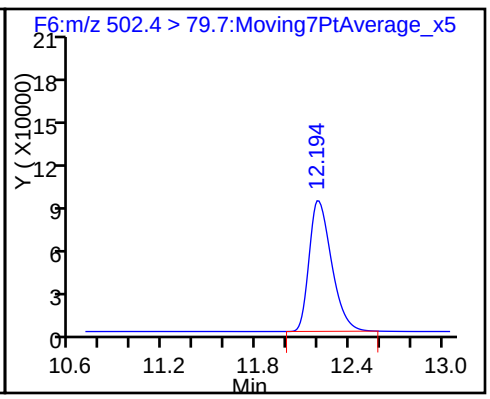
15 Perfluorooctane sulfonic acid (ND)



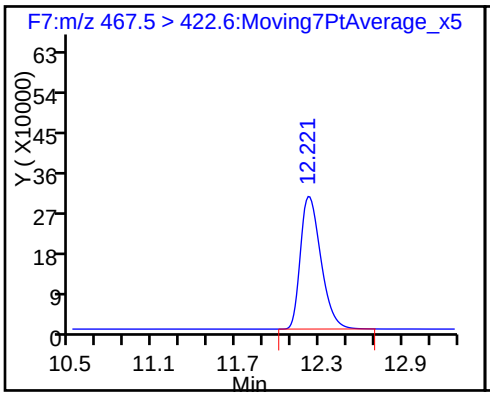
15 Perfluorooctane sulfonic acid (ND)



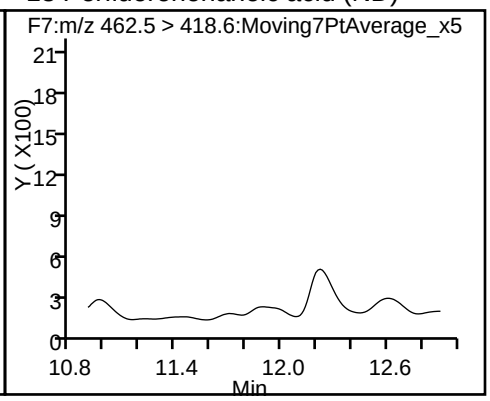
D 16 13C4 PFOS



D 17 13C5 PFNA



18 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17376-1

SDG No.:

Client Sample ID: DW-13 | Lab Sample ID: 320-17376-4

Matrix: Water | Lab File ID: 26FEB2016A4A_021.d

Analysis Method: WS-LC-0025 | Date Collected: 02/20/2016 12:56

Extraction Method: 3535 | Date Extracted: 02/25/2016 10:17

Sample wt/vol: 565.8(mL) | Date Analyzed: 02/26/2016 22:45

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.: 101820 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.2	1.8	0.81
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	U	2.2	1.8	0.71
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.2	1.8	0.77
375-95-1	Perfluorononanoic acid (PFNA)	1.8	U	2.2	1.8	0.58
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.5	2.7	1.1
335-67-1	Perfluorooctanoic acid (PFOA)	1.8	U	2.2	1.8	0.66

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	70		25-150
STL00990	13C4 PFOA	59		25-150
STL00991	13C4 PFOS	131		25-150
STL01892	13C4-PFHpA	65		25-150
STL00995	13C5 PFNA	49		25-150
STL00994	18O2 PFHxS	122		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_021.d
Lims ID: 320-17376-B-4-A Lab Sample ID: 320-17376-4
Client ID: DW-13
Sample Type: Client
Inject. Date: 26-Feb-2016 22:45:29 ALS Bottle#: 7 Worklist Smp#: 17
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17376-B-4-A
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:18:18 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 6 13C2 PFHxA										
314.6 > 269.7	9.026	8.604	0.422		2833718	35.2		70.3	7540	
D 8 13C4-PFHpA										
366.6 > 321.6	10.267	9.856	0.411		2205696	32.5		65.0	3865	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	10.284	9.892	0.392	1.000	9368	0.2094				
D 11 18O2 PFHxS										
402.5 > 83.6	10.301	9.892	0.409		2086365	57.5		122	4614	
D 12 13C4 PFOA										
416.5 > 371.6	11.337	10.958	0.379		2320808	29.6		59.2	5108	
D 16 13C4 PFOS										
502.4 > 79.7	12.220	11.876	0.344		1019451	62.5		131	2745	
D 17 13C5 PFNA										
467.5 > 422.6	12.233	11.898	0.335		1575209	24.3		48.6	2951	

Report Date: 29-Feb-2016 10:19:12 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_021.d

Injection Date: 26-Feb-2016 22:45:29 Instrument ID: A4

Lims ID: 320-17376-B-4-A Lab Sample ID: 320-17376-4

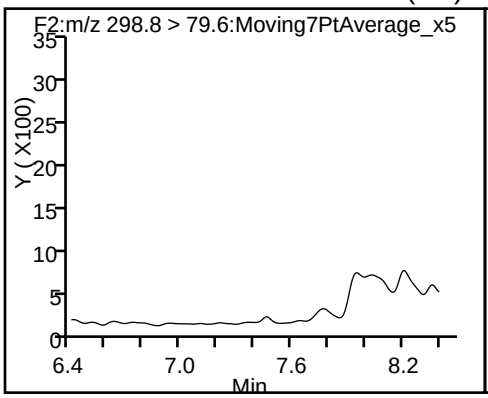
Client ID: DW-13

Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 17

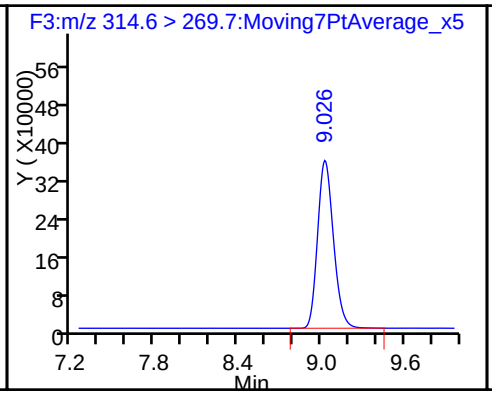
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

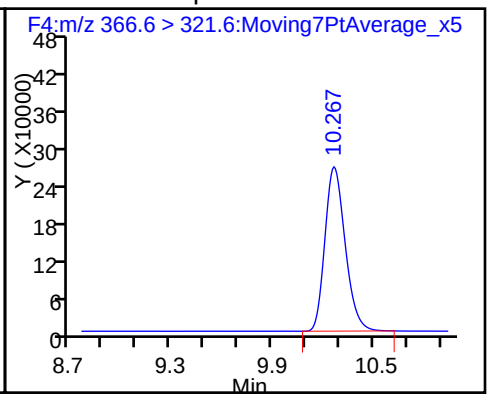
51 Perfluorobutanesulfonic acid (ND)



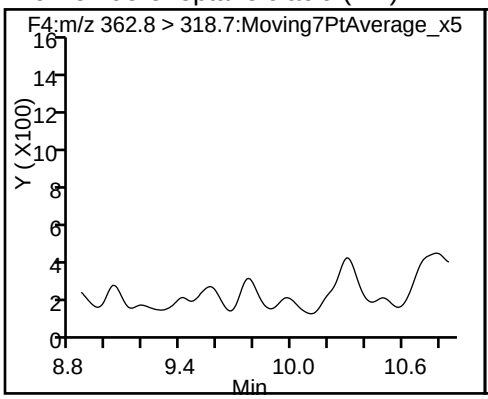
D 6 13C2 PFHxA



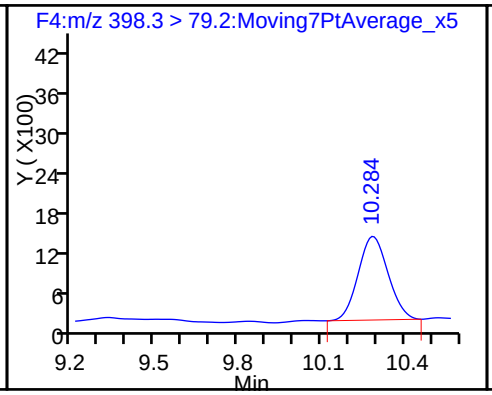
D 8 13C4-PFHpA



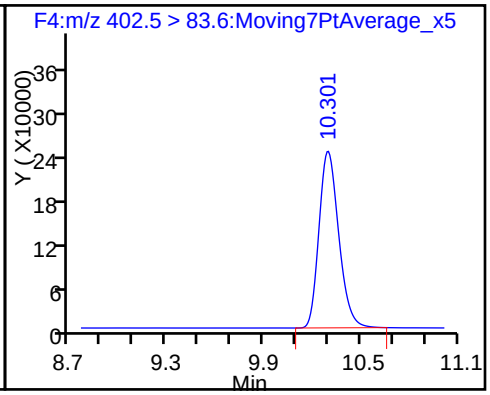
9 Perfluoroheptanoic acid (ND)



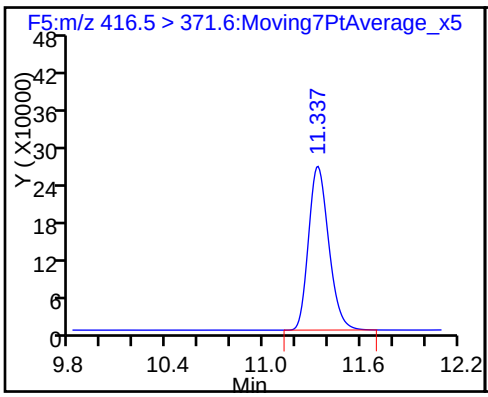
58 Perfluorohexanesulfonic acid



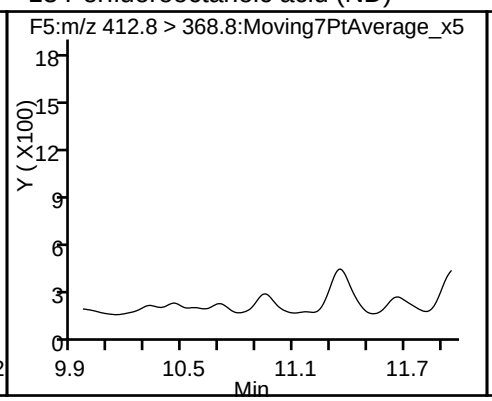
D 11 18O2 PFHxS



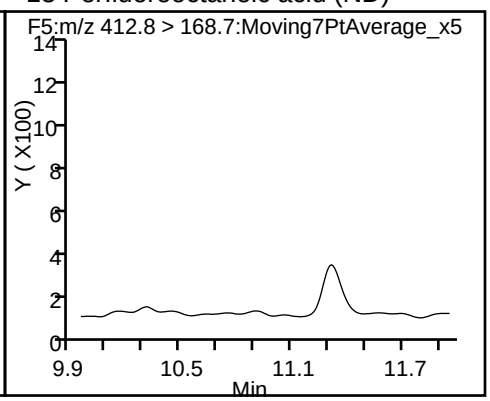
D 12 13C4 PFOA



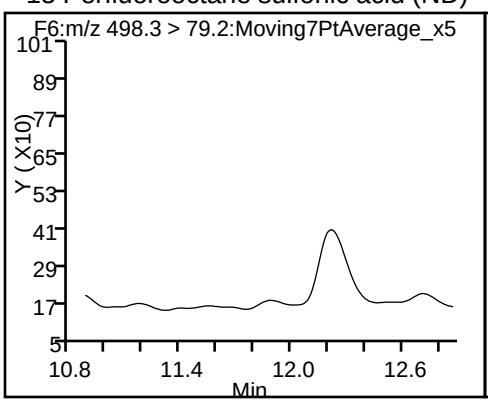
13 Perfluorooctanoic acid (ND)



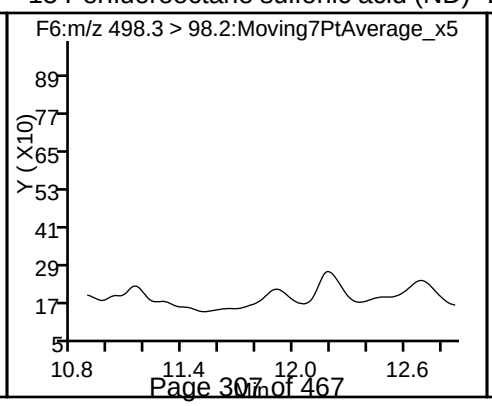
13 Perfluorooctanoic acid (ND)



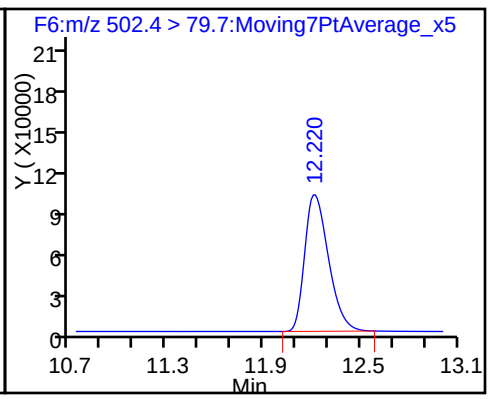
15 Perfluorooctane sulfonic acid (ND)



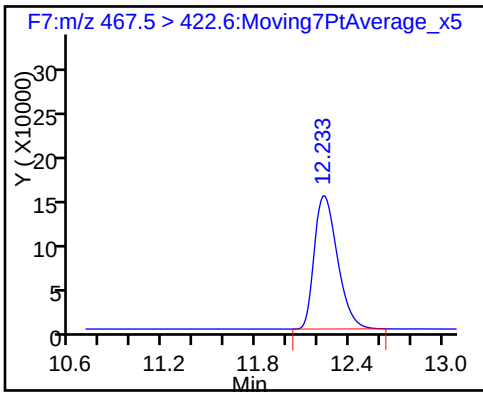
15 Perfluorooctane sulfonic acid (ND)



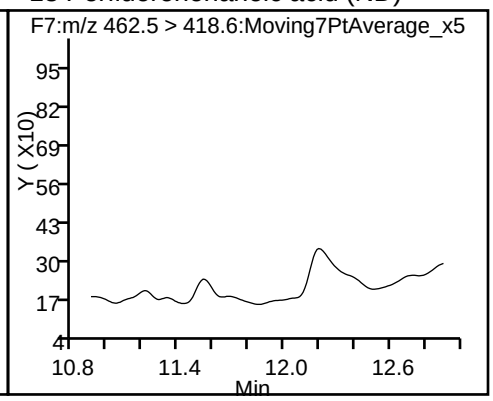
D 16 13C4 PFOS



D 17 13C5 PFNA



18 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17376-1

SDG No.:

Client Sample ID: DW-13FB | Lab Sample ID: 320-17376-5

Matrix: Water | Lab File ID: 26FEB2016A4A_022.d

Analysis Method: WS-LC-0025 | Date Collected: 02/20/2016 12:37

Extraction Method: 3535 | Date Extracted: 02/25/2016 10:17

Sample wt/vol: 549(mL) | Date Analyzed: 02/26/2016 23:06

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.: 101820 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.3	1.8	0.84
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	U	2.3	1.8	0.73
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.3	1.8	0.79
375-95-1	Perfluorononanoic acid (PFNA)	1.8	U	2.3	1.8	0.60
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	1.8	U	2.3	1.8	0.68

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	109		25-150
STL00990	13C4 PFOA	114		25-150
STL00991	13C4 PFOS	118		25-150
STL01892	13C4-PFHpA	114		25-150
STL00995	13C5 PFNA	109		25-150
STL00994	18O2 PFHxS	112		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_022.d
Lims ID: 320-17376-A-5-A Lab Sample ID: 320-17376-5
Client ID: DW-13FB
Sample Type: Client
Inject. Date: 26-Feb-2016 23:06:39 ALS Bottle#: 8 Worklist Smp#: 18
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17376-A-5-A
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:18:18 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 6 13C2 PFHxA										
314.6 > 269.7	9.081	8.604	0.477		4400657	54.6		109	8480	
D 8 13C4-PFHpA										
366.6 > 321.6	10.318	9.856	0.462		3862541	56.9		114	7639	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	10.344	9.892	0.452	1.000	5664	0.1369				
D 11 18O2 PFHxS										
402.5 > 83.6	10.352	9.892	0.460		1930184	53.2		112	4248	
D 12 13C4 PFOA										
416.5 > 371.6	11.374	10.958	0.416		4450844	56.8		114	9018	
13 Perfluorooctanoic acid										
412.8 > 368.8	11.374	10.958	0.416	1.000	6439	0.1377			5.1	
D 16 13C4 PFOS										
502.4 > 79.7	12.245	11.876	0.369		919062	56.4		118	2196	
D 17 13C5 PFNA										
467.5 > 422.6	12.271	11.898	0.373		3532113	54.5		109	4185	

Report Date: 29-Feb-2016 10:19:20 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_022.d

Injection Date: 26-Feb-2016 23:06:39 Instrument ID: A4

Lims ID: 320-17376-A-5-A Lab Sample ID: 320-17376-5

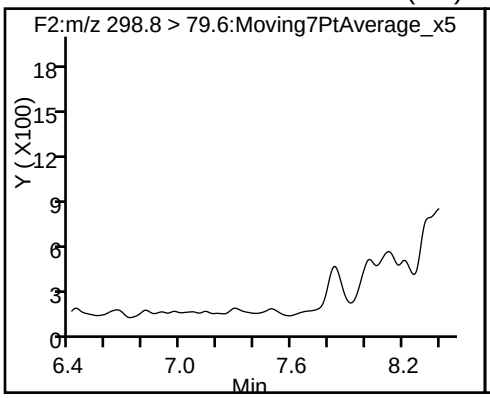
Client ID: DW-13FB

Operator ID: JRB ALS Bottle#: 8 Worklist Smp#: 18

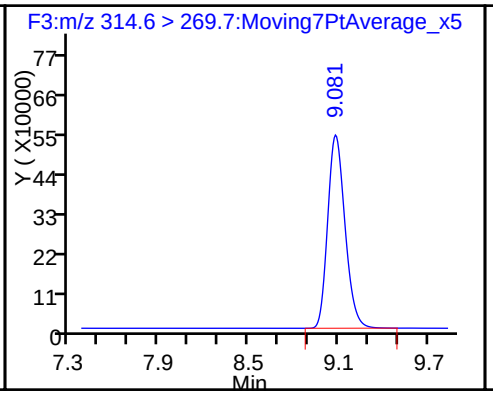
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

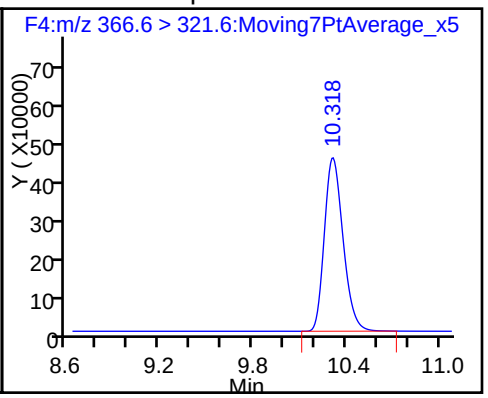
51 Perfluorobutanesulfonic acid (ND)



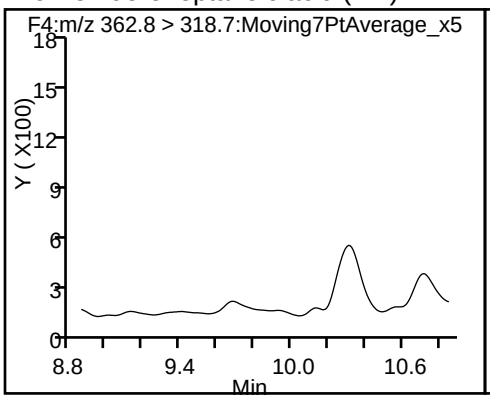
D 6 13C2 PFHxA



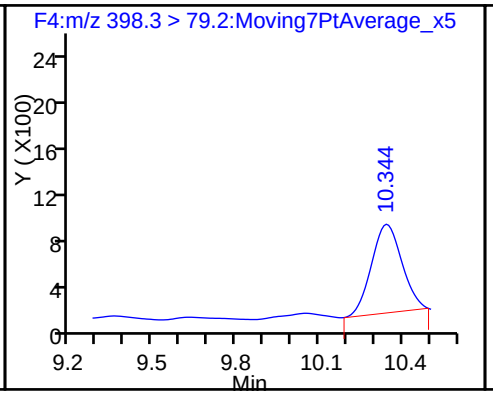
D 8 13C4-PFHpA



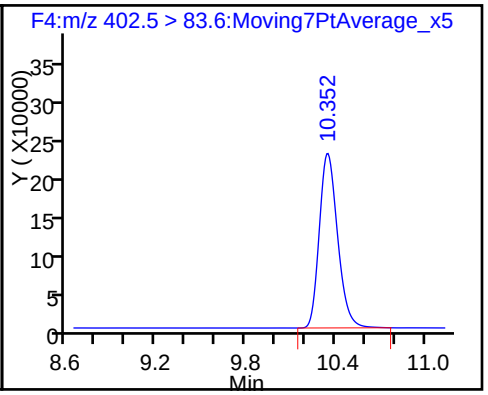
9 Perfluoroheptanoic acid (ND)



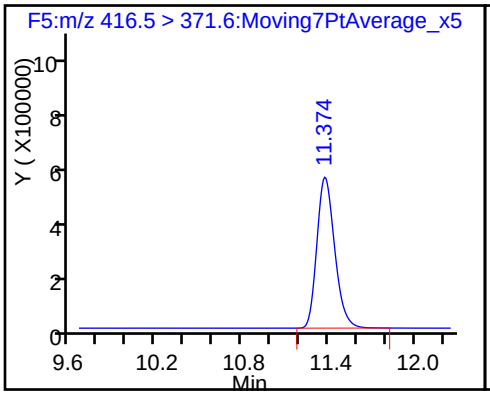
58 Perfluorohexanesulfonic acid



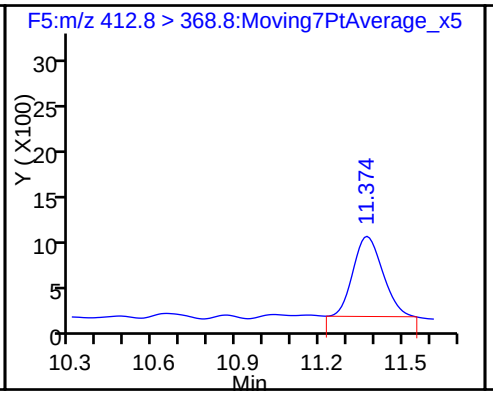
D 11 18O2 PFHxS



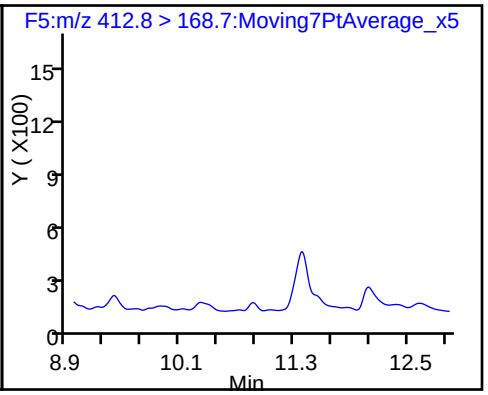
D 12 13C4 PFOA



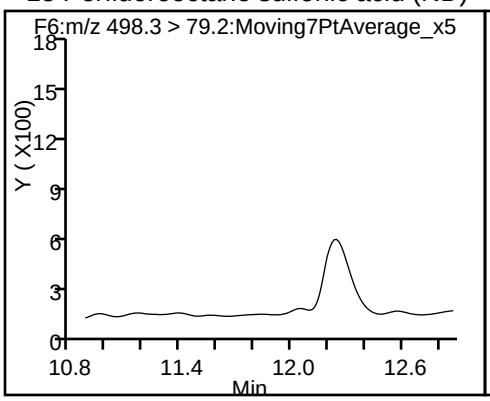
13 Perfluorooctanoic acid



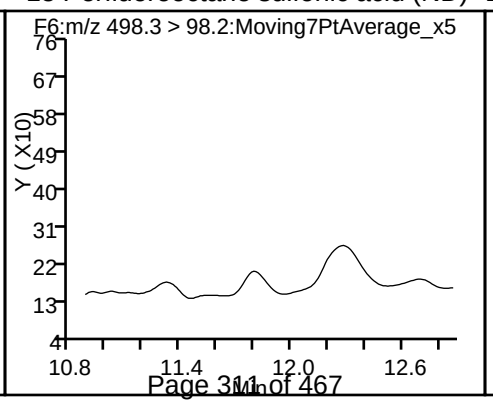
13 Perfluorooctanoic acid



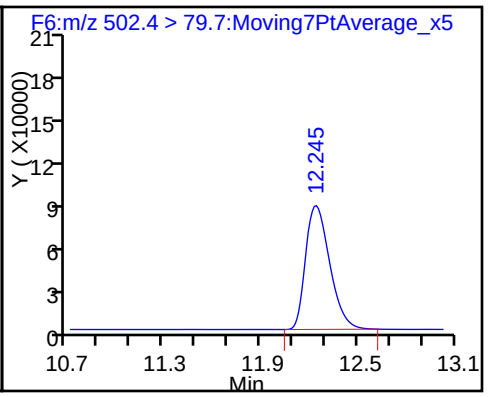
15 Perfluorooctane sulfonic acid (ND)



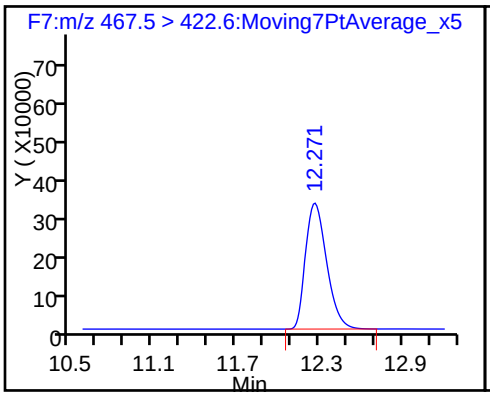
15 Perfluorooctane sulfonic acid (ND)



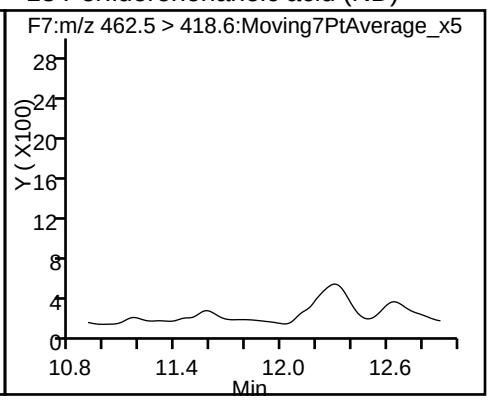
D 16 13C4 PFOS



D 17 13C5 PFNA



18 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17376-1

SDG No.:

Client Sample ID: DW-3 | Lab Sample ID: 320-17376-6

Matrix: Water | Lab File ID: 26FEB2016A4A_023.d

Analysis Method: WS-LC-0025 | Date Collected: 02/20/2016 11:56

Extraction Method: 3535 | Date Extracted: 02/25/2016 10:17

Sample wt/vol: 551.7(mL) | Date Analyzed: 02/26/2016 23:27

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.: 101820 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.4	J	2.3	1.8	0.83
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	U	2.3	1.8	0.73
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.97	J	2.3	1.8	0.79
375-95-1	Perfluorononanoic acid (PFNA)	0.87	J	2.3	1.8	0.59
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16		3.6	2.7	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	J	2.3	1.8	0.68

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	91		25-150
STL00990	13C4 PFOA	95		25-150
STL00991	13C4 PFOS	115		25-150
STL01892	13C4-PFHpA	107		25-150
STL00995	13C5 PFNA	86		25-150
STL00994	18O2 PFHxS	112		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_023.d
Lims ID: 320-17376-A-6-A Lab Sample ID: 320-17376-6
Client ID: DW-3
Sample Type: Client
Inject. Date: 26-Feb-2016 23:27:50 ALS Bottle#: 9 Worklist Smp#: 19
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17376-A-6-A
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:18:18 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.738	7.404	0.334	1.000	18518	0.7571				
D 6 13C2 PFHxA										
314.6 > 269.7	9.035	8.604	0.431		3655443	45.4		90.7	7963	
D 8 13C4-PFHpA										
366.6 > 321.6	10.355	9.856	0.499		3643562	53.7		107	5830	
9 Perfluoroheptanoic acid										
362.8 > 318.7	10.100	9.859	0.241	1.000	2612	0.1095			0.6	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	10.091	9.892	0.199	1.000	22182	0.5361				
D 11 18O2 PFHxS										
402.5 > 83.6	10.389	9.892	0.497		1929847	53.2		112	3759	
D 12 13C4 PFOA										
416.5 > 371.6	11.450	10.958	0.492		3712503	47.4		94.7	5887	
13 Perfluorooctanoic acid										
412.8 > 368.8	11.201	10.958	0.243	1.000	42933	1.10			3.6	
412.8 > 168.7	11.192	10.958	0.234	0.999	16995		2.53(0.00-0.00)		4.0	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	12.030	11.874	0.156	1.000	616463	8.83			63.1	
498.3 > 98.2	12.069	11.874	0.195	1.003	156763		3.93(0.00-0.00)		29.2	
D 16 13C4 PFOS										
502.4 > 79.7	12.337	11.876	0.461		893272	54.8		115	1682	
D 17 13C5 PFNA										
467.5 > 422.6	12.364	11.898	0.466		2774833	42.8		85.7	4890	
18 Perfluorononanoic acid										
462.5 > 418.6	12.159	11.899	0.260	1.000	12206	0.4778			3.9	

Report Date: 29-Feb-2016 10:19:27 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_023.d

Injection Date: 26-Feb-2016 23:27:50 Instrument ID: A4

Lims ID: 320-17376-A-6-A Lab Sample ID: 320-17376-6

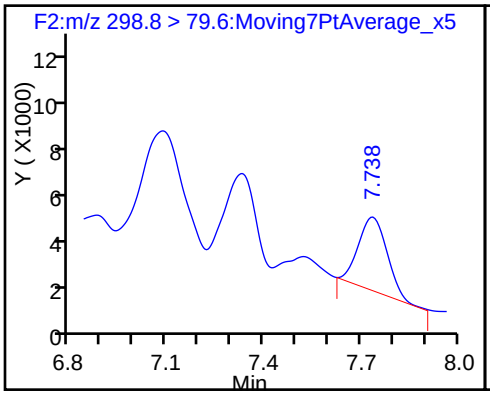
Client ID: DW-3

Operator ID: JRB ALS Bottle#: 9 Worklist Smp#: 19

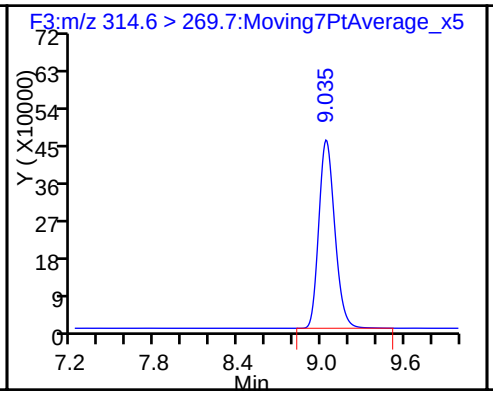
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

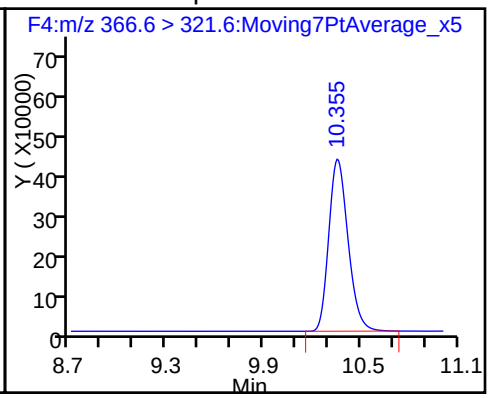
51 Perfluorobutanesulfonic acid



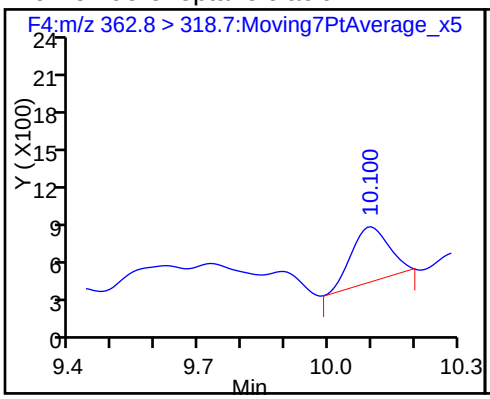
D 6 13C2 PFHxA



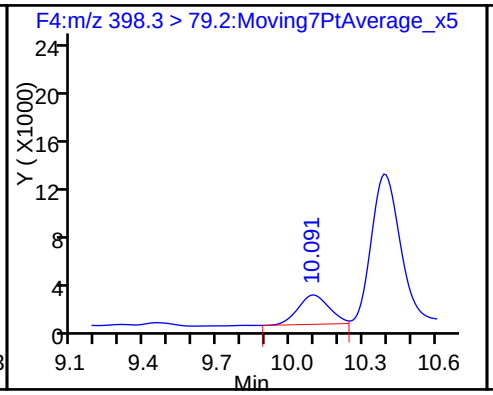
D 8 13C4-PFHpA



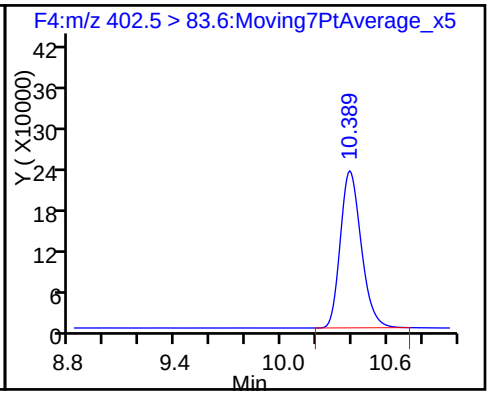
9 Perfluoroheptanoic acid



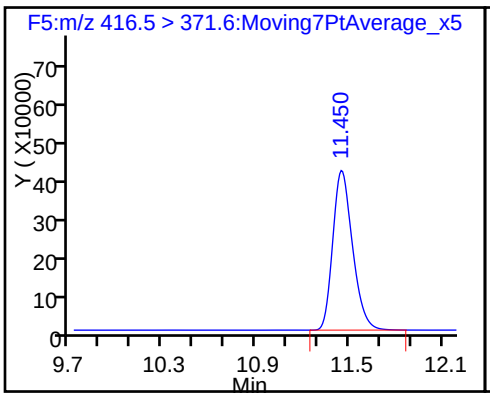
58 Perfluorohexanesulfonic acid



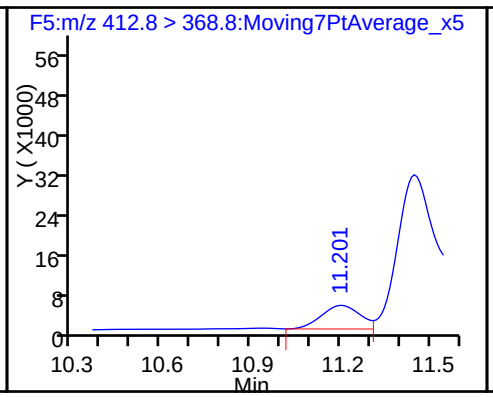
D 11 18O2 PFHxS



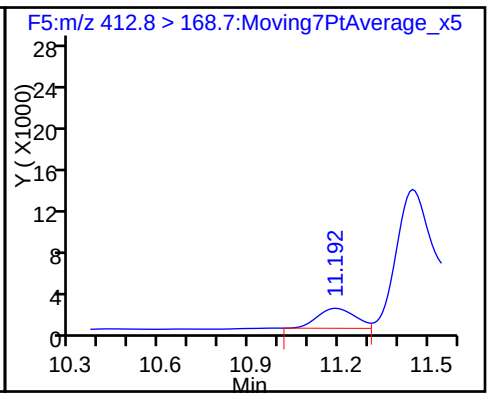
D 12 13C4 PFOA



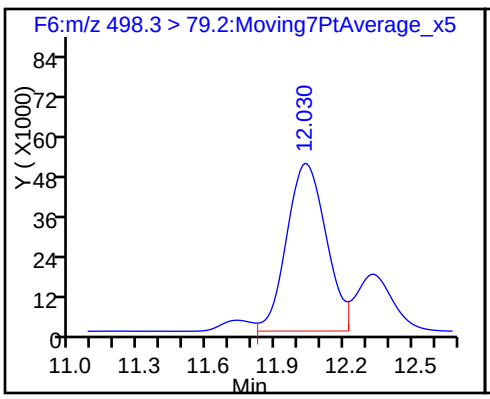
13 Perfluorooctanoic acid



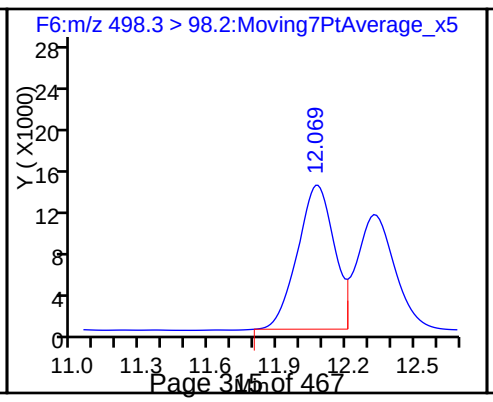
13 Perfluorooctanoic acid



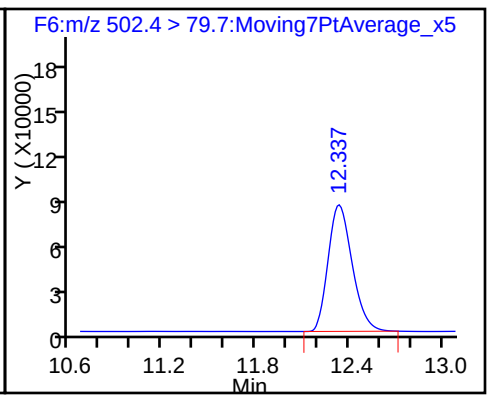
15 Perfluorooctane sulfonic acid



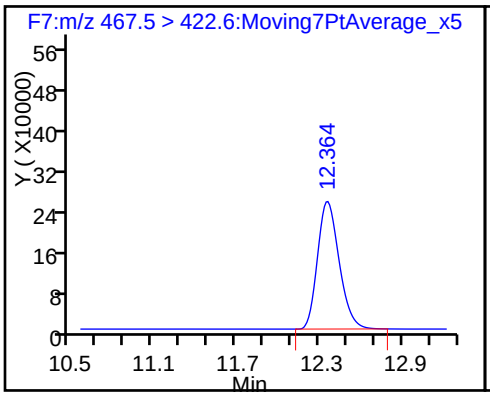
15 Perfluorooctane sulfonic acid



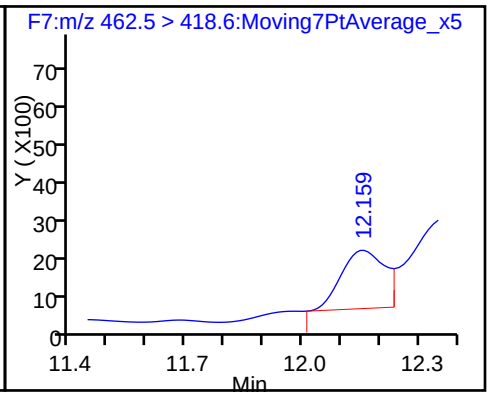
D 16 13C4 PFOS



D 17 13C5 PFNA



18 Perfluorononanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17376-1

SDG No.:

Client Sample ID: DW-3FB | Lab Sample ID: 320-17376-7

Matrix: Water | Lab File ID: 26FEB2016A4A_024.d

Analysis Method: WS-LC-0025 | Date Collected: 02/20/2016 11:37

Extraction Method: 3535 | Date Extracted: 02/25/2016 10:17

Sample wt/vol: 554(mL) | Date Analyzed: 02/26/2016 23:48

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.: 101820 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.3	1.8	0.83
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	U	2.3	1.8	0.72
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.3	1.8	0.79
375-95-1	Perfluorononanoic acid (PFNA)	1.8	U	2.3	1.8	0.59
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	1.8	U	2.3	1.8	0.68

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	108		25-150
STL00990	13C4 PFOA	112		25-150
STL00991	13C4 PFOS	117		25-150
STL01892	13C4-PFHpA	116		25-150
STL00995	13C5 PFNA	112		25-150
STL00994	18O2 PFHxS	107		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_024.d
Lims ID: 320-17376-A-7-A Lab Sample ID: 320-17376-7
Client ID: DW-3FB
Sample Type: Client
Inject. Date: 26-Feb-2016 23:48:59 ALS Bottle#: 10 Worklist Smp#: 20
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17376-A-7-A
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:18:18 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:44:21

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 6 13C2 PFHxA										
314.6 > 269.7	9.269	8.604	0.665		4353789	54.0		108	10146	
D 8 13C4-PFHpA										
366.6 > 321.6	10.506	9.856	0.650		3933432	57.9		116	5339	
D 11 18O2 PFHxS										
402.5 > 83.6	10.543	9.892	0.651		1833961	50.6		107	3922	
D 12 13C4 PFOA										
416.5 > 371.6	11.554	10.958	0.596		4393871	56.1		112	7345	
D 16 13C4 PFOS										
502.4 > 79.7	12.410	11.876	0.534		915303	56.1		117	2359	
D 17 13C5 PFNA										
467.5 > 422.6	12.436	11.898	0.538		3643434	56.2		112	4809	

Report Date: 29-Feb-2016 10:19:34 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_024.d

Injection Date: 26-Feb-2016 23:48:59 Instrument ID: A4

Lims ID: 320-17376-A-7-A Lab Sample ID: 320-17376-7

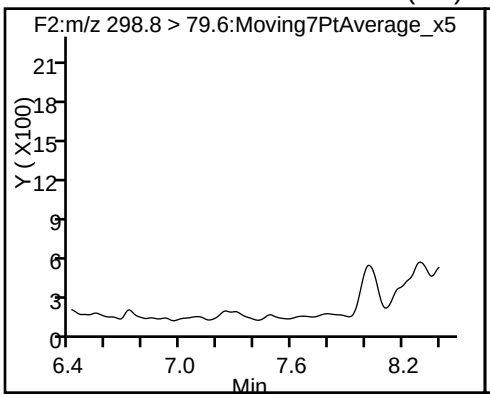
Client ID: DW-3FB

Operator ID: JRB ALS Bottle#: 10 Worklist Smp#: 20

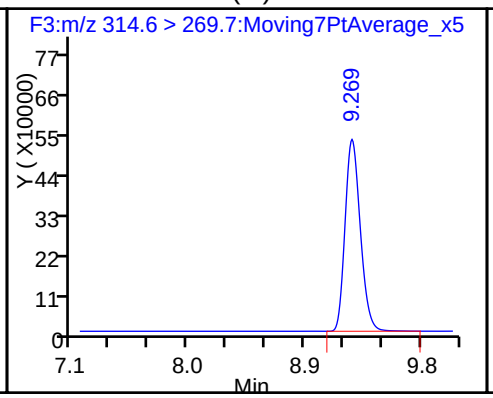
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

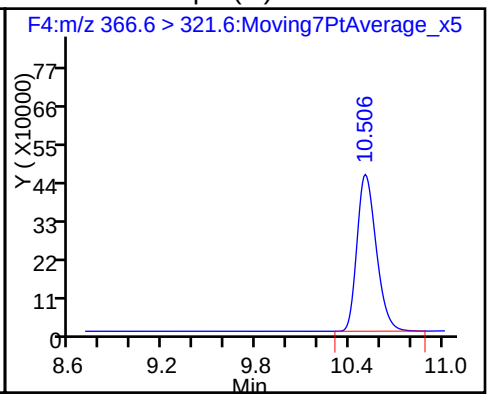
51 Perfluorobutanesulfonic acid (ND)



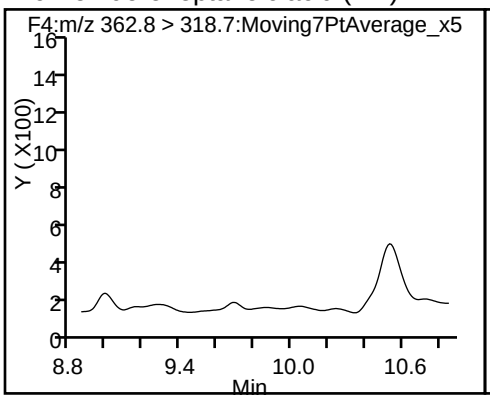
D 6 13C2 PFHxA (M)



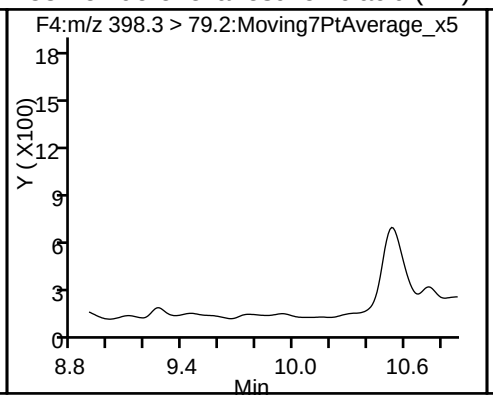
D 8 13C4-PFHpA (M)



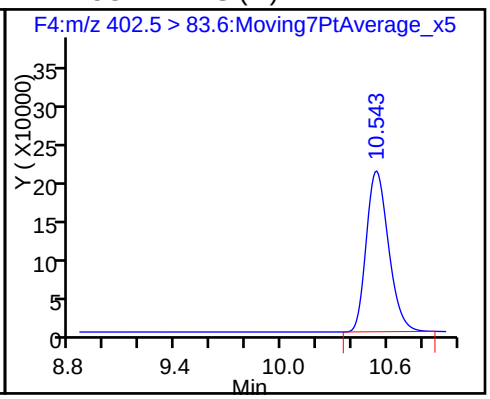
9 Perfluoroheptanoic acid (ND)



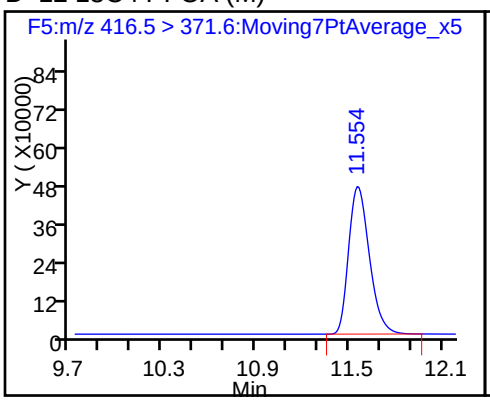
58 Perfluorohexanesulfonic acid (ND)



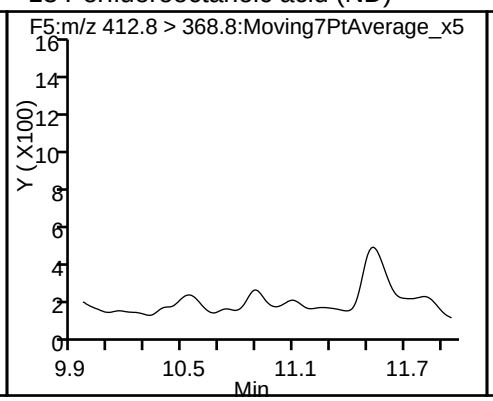
D 11 18O2 PFHxS (M)



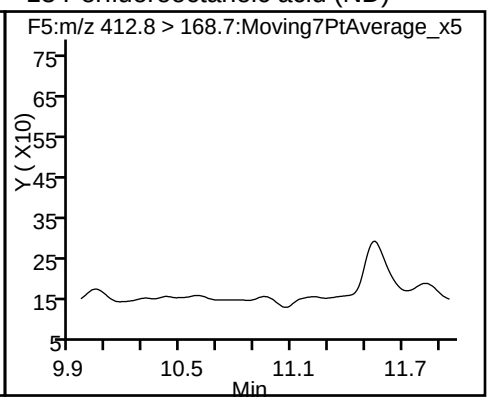
D 12 13C4 PFOA (M)



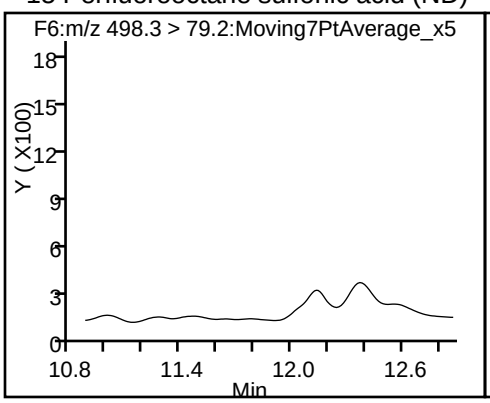
13 Perfluorooctanoic acid (ND)



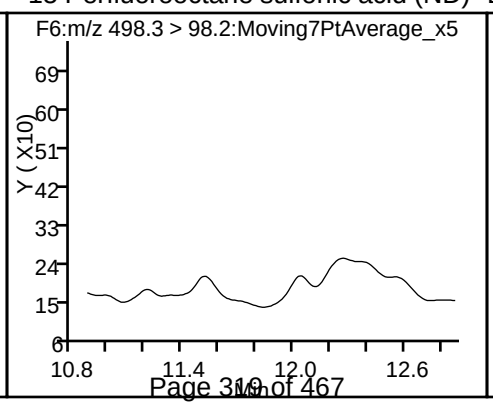
13 Perfluorooctanoic acid (ND)



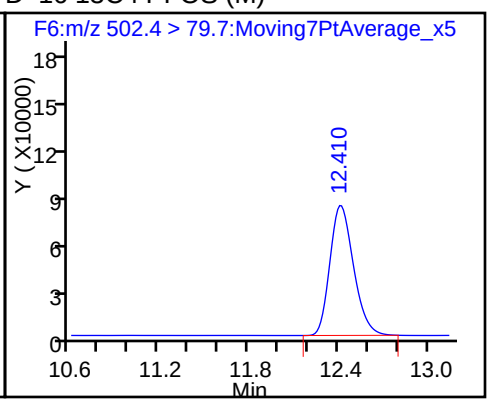
15 Perfluorooctane sulfonic acid (ND)



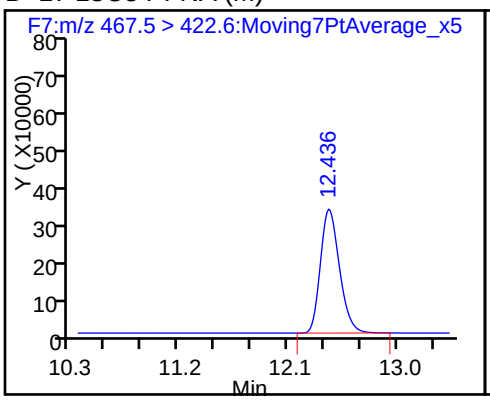
15 Perfluorooctane sulfonic acid (ND)



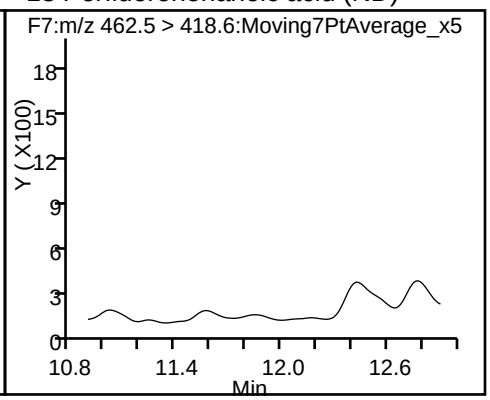
D 16 13C4 PFOS (M)



D 17 13C5 PFNA (M)



18 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Client Sample ID: DW-71 Lab Sample ID: 320-17376-8

Matrix: Water Lab File ID: 26FEB2016A4A_026.d

Analysis Method: WS-LC-0025 Date Collected: 02/20/2016 11:26

Extraction Method: 3535 Date Extracted: 02/25/2016 10:17

Sample wt/vol: 578.2(mL) Date Analyzed: 02/27/2016 00:31

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.: 101820 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.7	U	2.2	1.7	0.79
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.7	U	2.2	1.7	0.69
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.7	U	2.2	1.7	0.75
375-95-1	Perfluorononanoic acid (PFNA)	1.7	U	2.2	1.7	0.57
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	2.6	1.1
335-67-1	Perfluorooctanoic acid (PFOA)	1.7	U	2.2	1.7	0.65

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	80		25-150
STL00990	13C4 PFOA	78		25-150
STL00991	13C4 PFOS	100		25-150
STL01892	13C4-PFHpA	82		25-150
STL00995	13C5 PFNA	82		25-150
STL00994	18O2 PFHxS	106		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_026.d
Lims ID: 320-17376-A-8-A Lab Sample ID: 320-17376-8
Client ID: DW-71
Sample Type: Client
Inject. Date: 27-Feb-2016 00:31:21 ALS Bottle#: 11 Worklist Smp#: 22
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17376-A-8-A
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:19:39 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:45:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 6 13C2 PFHxA										
314.6 > 269.7	9.206	8.604	0.602		3231630	40.1		80.2	6296	
D 8 13C4-PFHpA										
366.6 > 321.6	10.446	9.856	0.590		2793271	41.1		82.3	5056	
D 11 18O2 PFHxS										
402.5 > 83.6	10.471	9.892	0.579		1823877	50.3		106	3792	
D 12 13C4 PFOA										
416.5 > 371.6	11.503	10.958	0.545		3067466	39.1		78.3	8949	
D 16 13C4 PFOS										
502.4 > 79.7	12.384	11.876	0.508		775820	47.6		99.6	1969	
D 17 13C5 PFNA										
467.5 > 422.6	12.411	11.898	0.513		2665025	41.1		82.3	4379	

Report Date: 29-Feb-2016 10:19:47 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_026.d

Injection Date: 27-Feb-2016 00:31:21 Instrument ID: A4

Lims ID: 320-17376-A-8-A Lab Sample ID: 320-17376-8

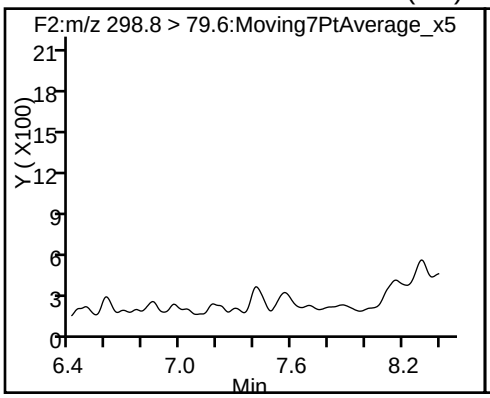
Client ID: DW-71

Operator ID: JRB ALS Bottle#: 11 Worklist Smp#: 22

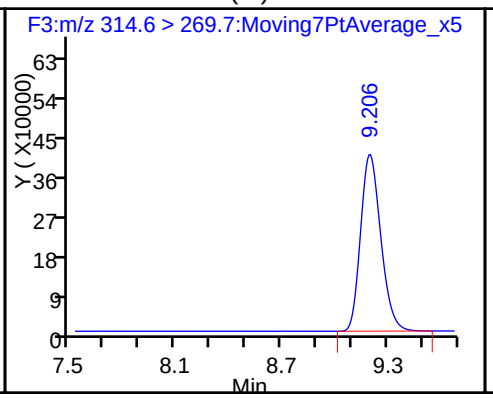
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

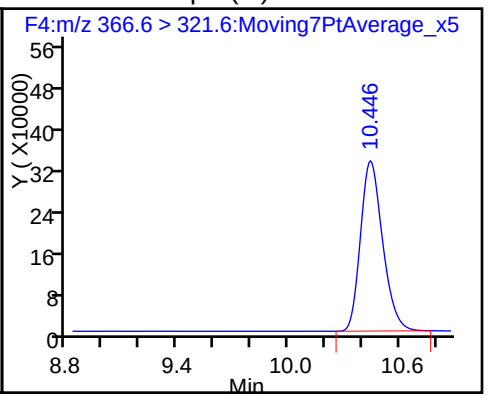
51 Perfluorobutanesulfonic acid (ND)



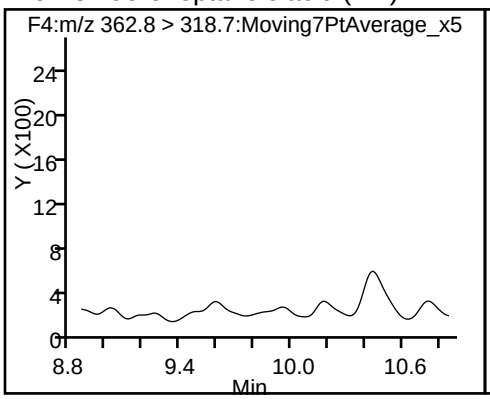
D 6 13C2 PFHxA (M)



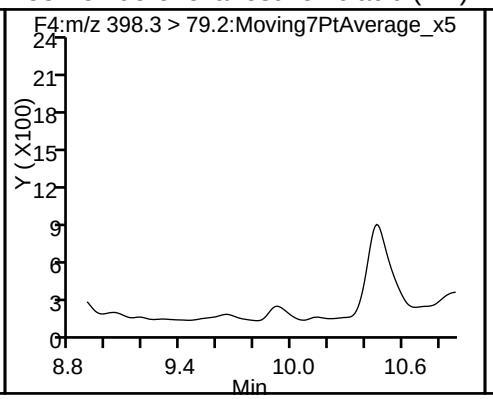
D 8 13C4-PFHpA (M)



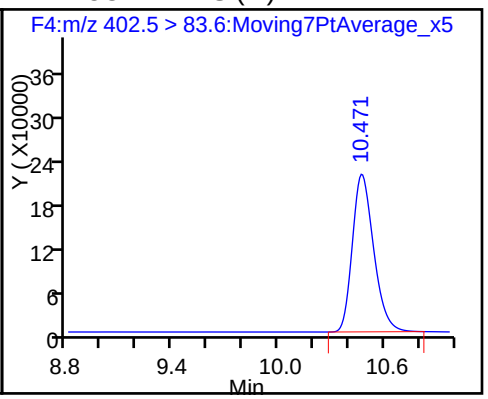
9 Perfluoroheptanoic acid (ND)



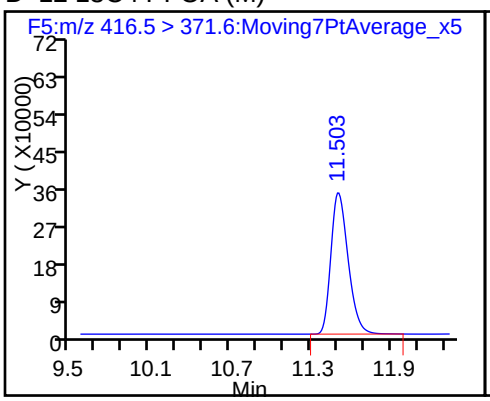
58 Perfluorohexanesulfonic acid (ND)



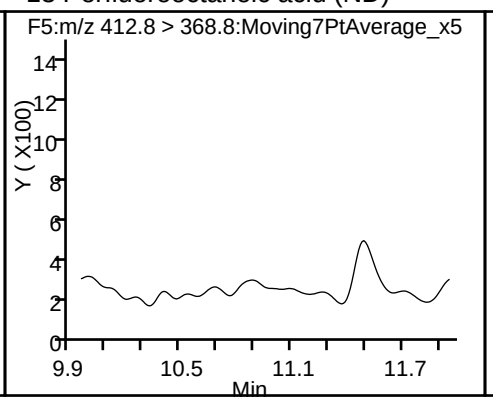
D 11 18O2 PFHxS (M)



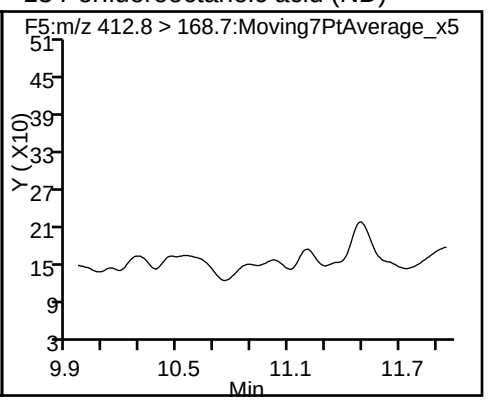
D 12 13C4 PFOA (M)



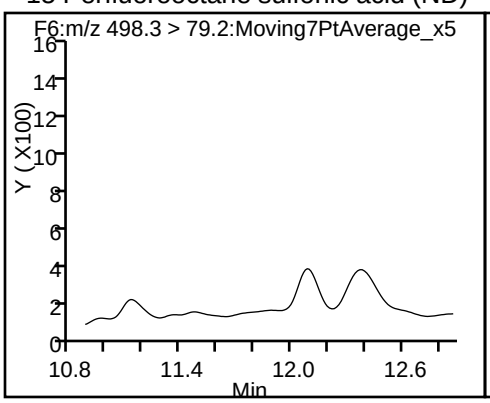
13 Perfluorooctanoic acid (ND)



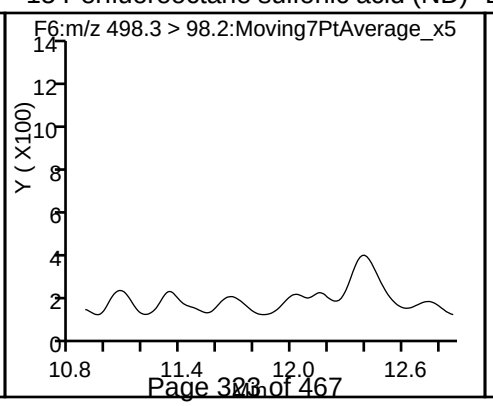
13 Perfluorooctanoic acid (ND)



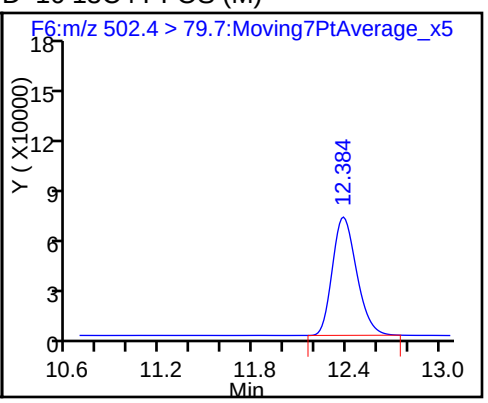
15 Perfluorooctane sulfonic acid (ND)



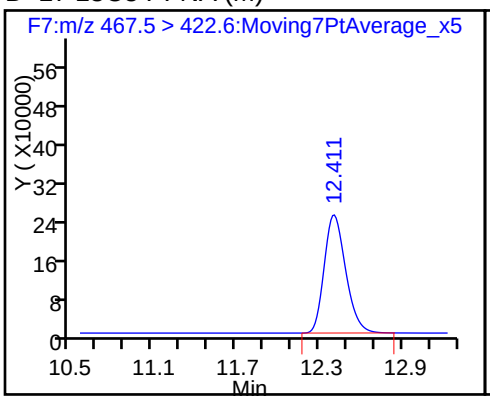
15 Perfluorooctane sulfonic acid (ND)



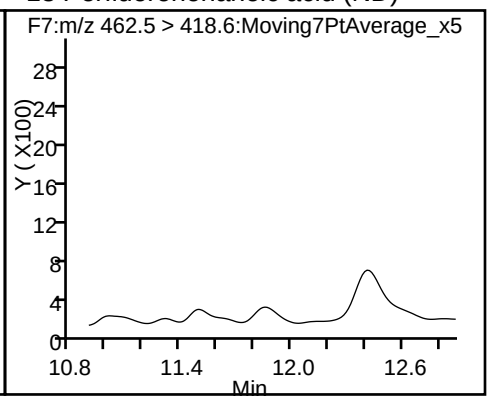
D 16 13C4 PFOS (M)



D 17 13C5 PFNA (M)



18 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17376-1

SDG No.:

Client Sample ID: DW-71FB | Lab Sample ID: 320-17376-9

Matrix: Water | Lab File ID: 26FEB2016A4A_027.d

Analysis Method: WS-LC-0025 | Date Collected: 02/20/2016 11:11

Extraction Method: 3535 | Date Extracted: 02/25/2016 10:17

Sample wt/vol: 538.8(mL) | Date Analyzed: 02/27/2016 00:52

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.: 101820 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.3	1.9	0.85
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	U	2.3	1.9	0.74
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.3	1.9	0.81
375-95-1	Perfluorononanoic acid (PFNA)	1.9	U	2.3	1.9	0.61
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.8	U	3.7	2.8	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	1.9	U	2.3	1.9	0.69

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	82		25-150
STL00990	13C4 PFOA	95		25-150
STL00991	13C4 PFOS	99		25-150
STL01892	13C4-PFHpA	93		25-150
STL00995	13C5 PFNA	92		25-150
STL00994	18O2 PFHxS	115		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_027.d
Lims ID: 320-17376-B-9-A Lab Sample ID: 320-17376-9
Client ID: DW-71FB
Sample Type: Client
Inject. Date: 27-Feb-2016 00:52:32 ALS Bottle#: 12 Worklist Smp#: 23
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17376-B-9-A
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:19:39 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:45:38

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 6 13C2 PFHxA										
314.6 > 269.7	9.269	8.604	0.665		3319836	41.2		82.4	7662	
D 8 13C4-PFHpA										
366.6 > 321.6	10.488	9.856	0.632		3146245	46.3		92.7	5675	
D 11 18O2 PFHxS										
402.5 > 83.6	10.515	9.892	0.623		1965341	54.2		115	5399	
D 12 13C4 PFOA										
416.5 > 371.6	11.523	10.958	0.565		3727608	47.6		95.1	5629	
D 16 13C4 PFOS										
502.4 > 79.7	12.372	11.876	0.496		771679	47.3		99.0	1913	
D 17 13C5 PFNA										
467.5 > 422.6	12.398	11.898	0.500		2991111	46.2		92.3	5463	

Report Date: 29-Feb-2016 10:19:55 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_027.d

Injection Date: 27-Feb-2016 00:52:32 Instrument ID: A4

Lims ID: 320-17376-B-9-A Lab Sample ID: 320-17376-9

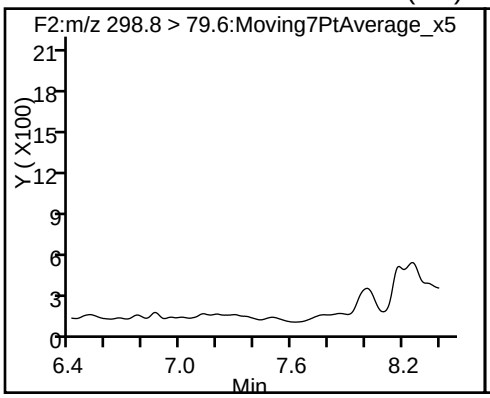
Client ID: DW-71FB

Operator ID: JRB ALS Bottle#: 12 Worklist Smp#: 23

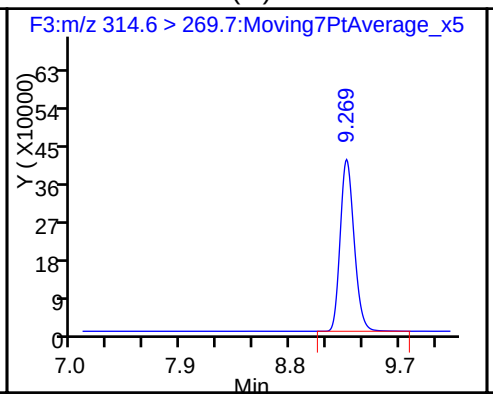
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

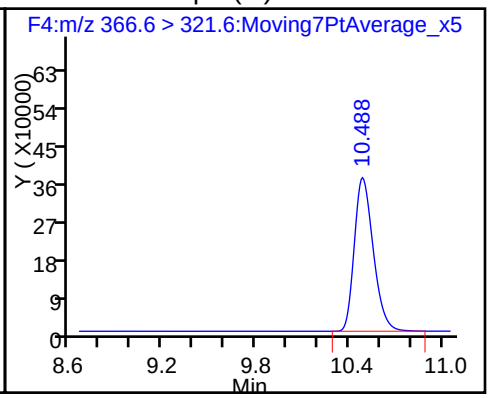
51 Perfluorobutanesulfonic acid (ND)



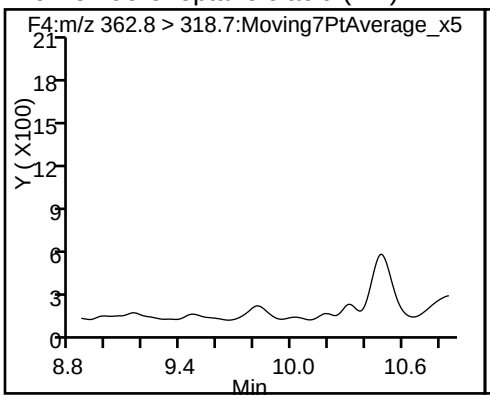
D 6 13C2 PFHxA (M)



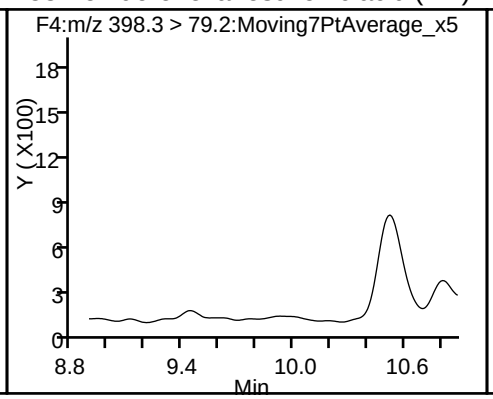
D 8 13C4-PFHpA (M)



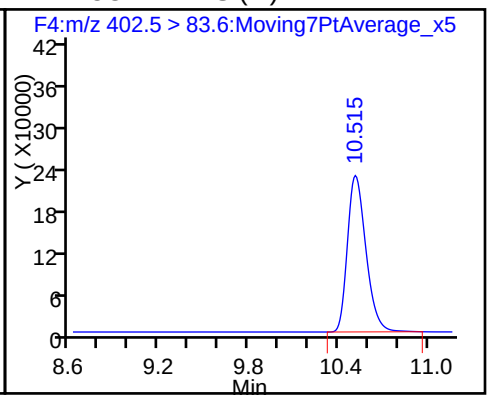
9 Perfluoroheptanoic acid (ND)



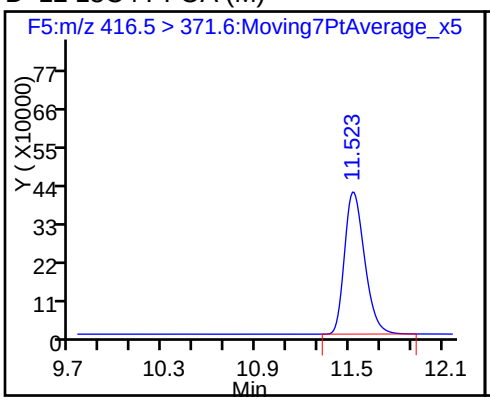
58 Perfluorohexanesulfonic acid (ND)



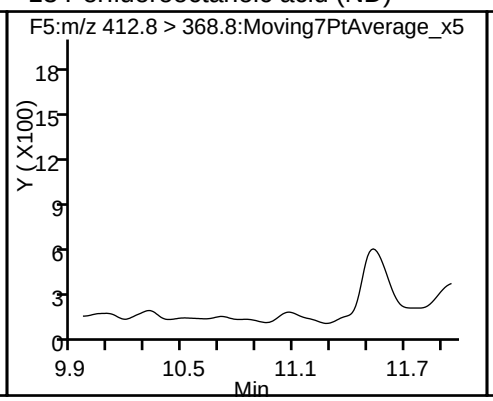
D 11 18O2 PFHxS (M)



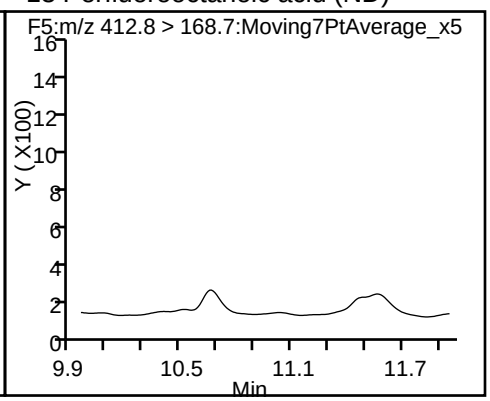
D 12 13C4 PFOA (M)



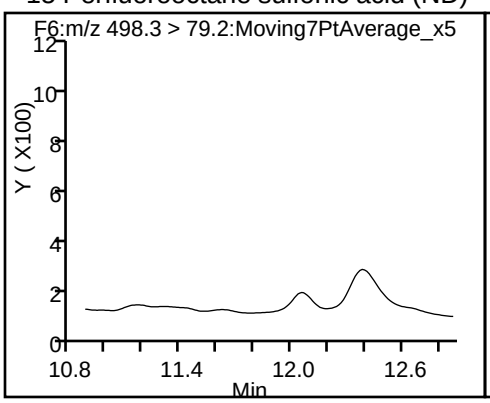
13 Perfluorooctanoic acid (ND)



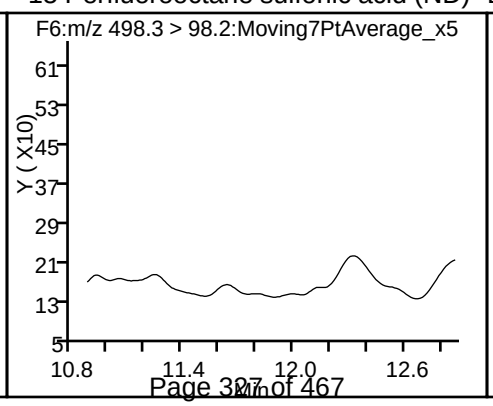
13 Perfluorooctanoic acid (ND)



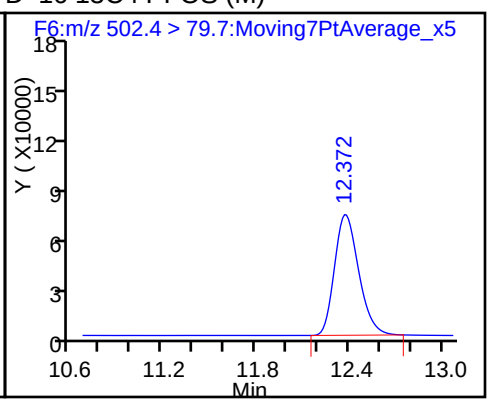
15 Perfluorooctane sulfonic acid (ND)



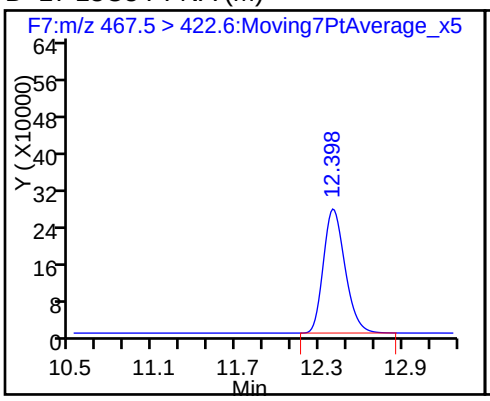
15 Perfluorooctane sulfonic acid (ND)



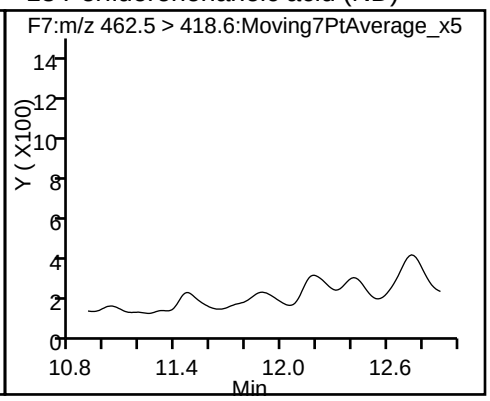
D 16 13C4 PFOS (M)



D 17 13C5 PFNA (M)



18 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17376-1

SDG No.:

Client Sample ID: DW-84 | Lab Sample ID: 320-17376-10

Matrix: Water | Lab File ID: 26FEB2016A4A_028.d

Analysis Method: WS-LC-0025 | Date Collected: 02/20/2016 11:01

Extraction Method: 3535 | Date Extracted: 02/25/2016 10:17

Sample wt/vol: 567(mL) | Date Analyzed: 02/27/2016 01:13

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.: 101820 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.2	1.8	0.81
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	U	2.2	1.8	0.71
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.2	1.8	0.77
375-95-1	Perfluorononanoic acid (PFNA)	1.8	U	2.2	1.8	0.58
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	2.6	1.1
335-67-1	Perfluorooctanoic acid (PFOA)	1.8	U	2.2	1.8	0.66

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	73		25-150
STL00990	13C4 PFOA	66		25-150
STL00991	13C4 PFOS	85		25-150
STL01892	13C4-PFHpA	79		25-150
STL00995	13C5 PFNA	50		25-150
STL00994	18O2 PFHxS	100		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_028.d
Lims ID: 320-17376-A-10-A Lab Sample ID: 320-17376-10
Client ID: DW-84
Sample Type: Client
Inject. Date: 27-Feb-2016 01:13:43 ALS Bottle#: 13 Worklist Smp#: 24
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17376-A-10-A
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:19:39 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:46:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 6 13C2 PFHxA										
314.6 > 269.7	9.245	8.604	0.641		2937512	36.4		72.9	8004	
D 8 13C4-PFHpA										
366.6 > 321.6	10.480	9.856	0.624		2694189	39.7		79.3	6808	
D 11 18O2 PFHxS										
402.5 > 83.6	10.515	9.892	0.623		1722096	47.5		100	4081	
D 12 13C4 PFOA										
416.5 > 371.6	11.533	10.958	0.575		2584804	33.0		65.9	5025	
13 Perfluorooctanoic acid										
412.8 > 368.8	11.319	10.958	0.361	1.000	2735	0.1007			1.8	
D 16 13C4 PFOS										
502.4 > 79.7	12.397	11.876	0.521		662978	40.7		85.1	1206	
D 17 13C5 PFNA										
467.5 > 422.6	12.424	11.898	0.526		1612355	24.9		49.8	2754	

Report Date: 29-Feb-2016 10:20:02 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_028.d

Injection Date: 27-Feb-2016 01:13:43 Instrument ID: A4

Lims ID: 320-17376-A-10-A Lab Sample ID: 320-17376-10

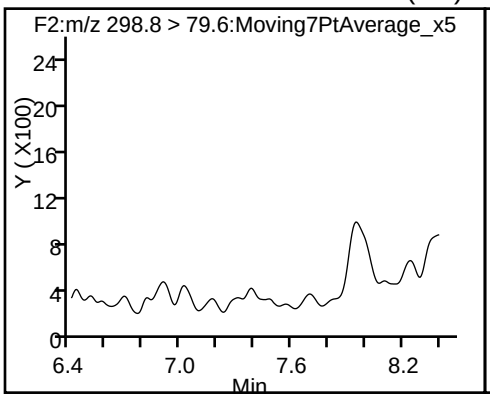
Client ID: DW-84

Operator ID: JRB ALS Bottle#: 13 Worklist Smp#: 24

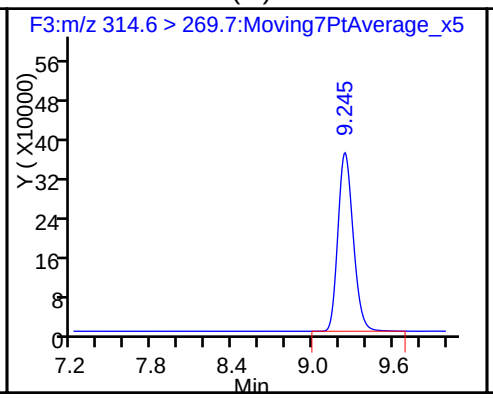
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

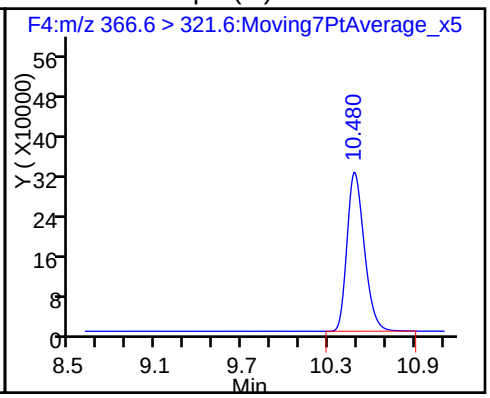
51 Perfluorobutanesulfonic acid (ND)



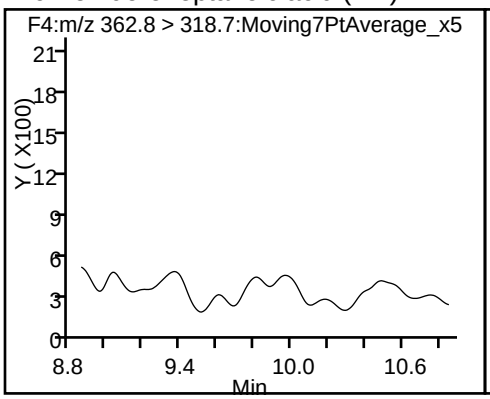
D 6 13C2 PFHxA (M)



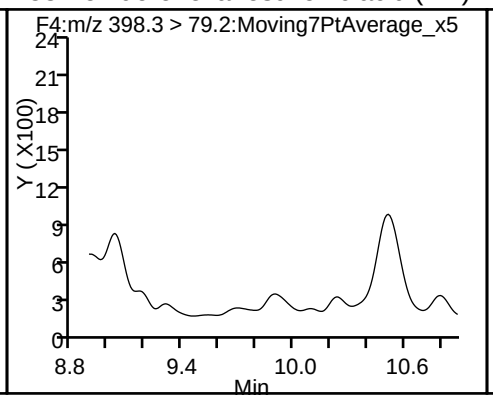
D 8 13C4-PFHpA (M)



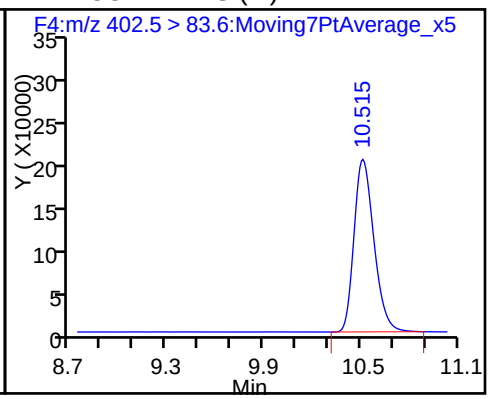
9 Perfluoroheptanoic acid (ND)



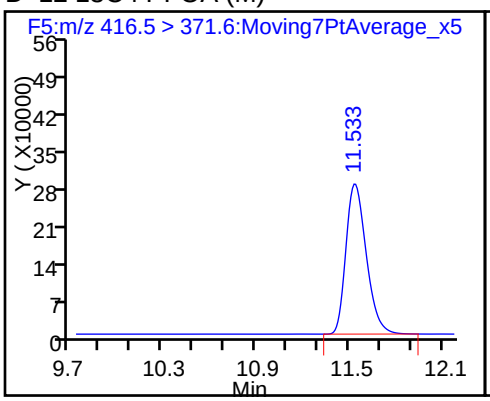
58 Perfluorohexanesulfonic acid (ND)



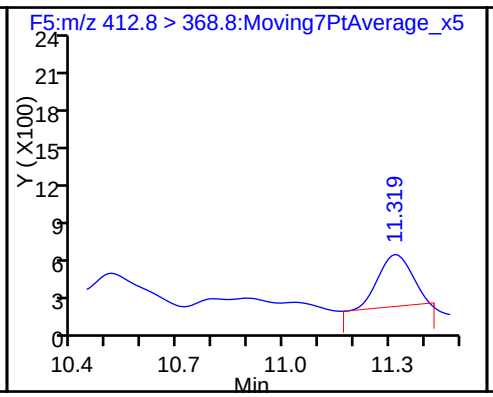
D 11 18O2 PFHxS (M)



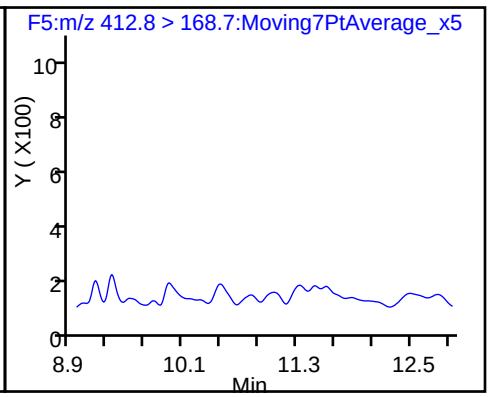
D 12 13C4 PFOA (M)



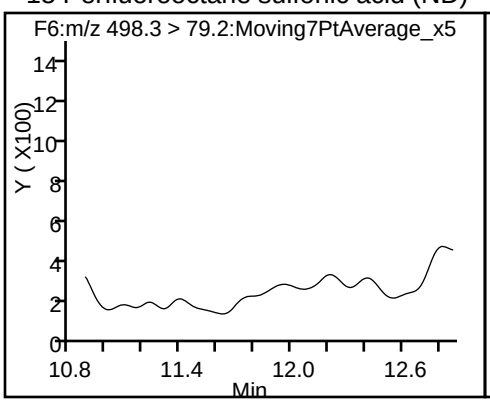
13 Perfluorooctanoic acid



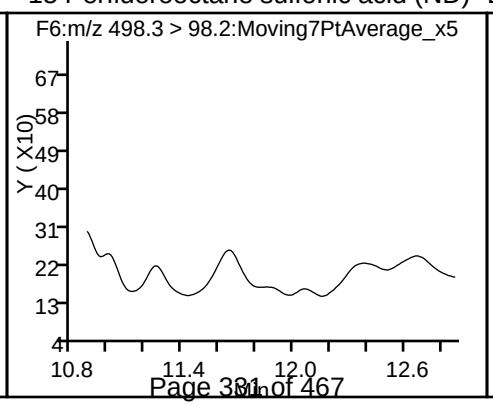
13 Perfluorooctanoic acid



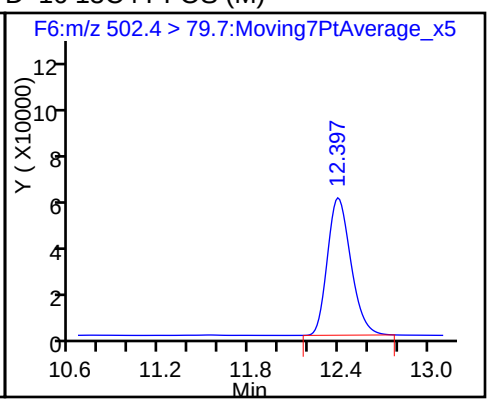
15 Perfluorooctane sulfonic acid (ND)



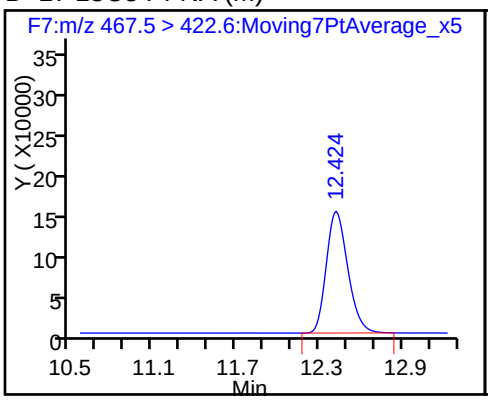
15 Perfluorooctane sulfonic acid (ND)



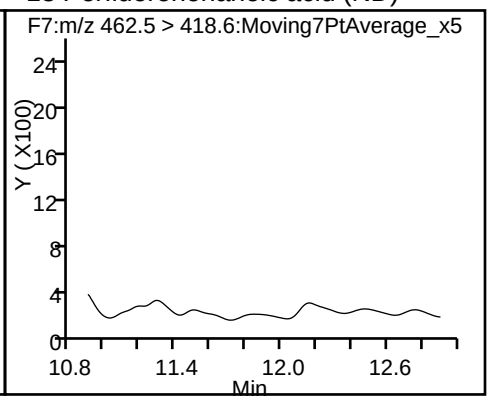
D 16 13C4 PFOS (M)



D 17 13C5 PFNA (M)



18 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17376-1

SDG No.:

Client Sample ID: DW-84FB | Lab Sample ID: 320-17376-11

Matrix: Water | Lab File ID: 26FEB2016A4A_029.d

Analysis Method: WS-LC-0025 | Date Collected: 02/20/2016 10:37

Extraction Method: 3535 | Date Extracted: 02/25/2016 10:17

Sample wt/vol: 558.7(mL) | Date Analyzed: 02/27/2016 01:34

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.: 101820 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.2	1.8	0.82
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	U	2.2	1.8	0.72
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.2	1.8	0.78
375-95-1	Perfluorononanoic acid (PFNA)	1.8	U	2.2	1.8	0.59
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	1.1
335-67-1	Perfluorooctanoic acid (PFOA)	1.8	U	2.2	1.8	0.67

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	113		25-150
STL00990	13C4 PFOA	109		25-150
STL00991	13C4 PFOS	95		25-150
STL01892	13C4-PFHpA	114		25-150
STL00995	13C5 PFNA	111		25-150
STL00994	18O2 PFHxS	100		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_029.d
Lims ID: 320-17376-B-11-A Lab Sample ID: 320-17376-11
Client ID: DW-84FB
Sample Type: Client
Inject. Date: 27-Feb-2016 01:34:53 ALS Bottle#: 14 Worklist Smp#: 25
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17376-B-11-A
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:19:39 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:46:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 6 13C2 PFHxA										
314.6 > 269.7	9.456	8.604	0.852		4556302	56.5		113	12797	
D 8 13C4-PFHpA										
366.6 > 321.6	10.709	9.856	0.853		3868670	57.0		114	6711	
D 11 18O2 PFHxS										
402.5 > 83.6	10.736	9.892	0.844		1722261	47.5		100	3010	
D 12 13C4 PFOA										
416.5 > 371.6	11.746	10.958	0.788		4261653	54.4		109	6886	
D 16 13C4 PFOS										
502.4 > 79.7	12.575	11.876	0.699		743269	45.6		95.4	2118	
D 17 13C5 PFNA										
467.5 > 422.6	12.614	11.898	0.716		3602313	55.6		111	6301	

Report Date: 29-Feb-2016 10:20:06 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_029.d

Injection Date: 27-Feb-2016 01:34:53 Instrument ID: A4

Lims ID: 320-17376-B-11-A Lab Sample ID: 320-17376-11

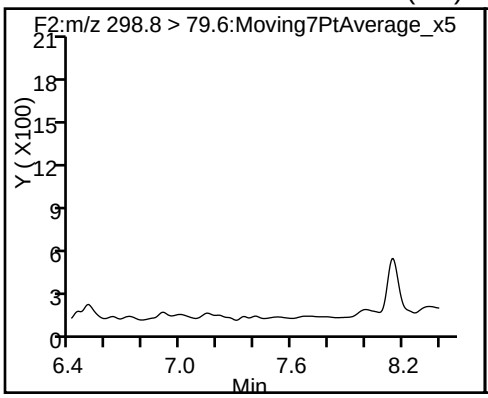
Client ID: DW-84FB

Operator ID: JRB ALS Bottle#: 14 Worklist Smp#: 25

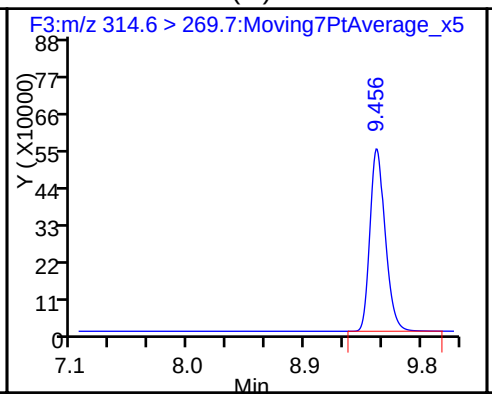
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

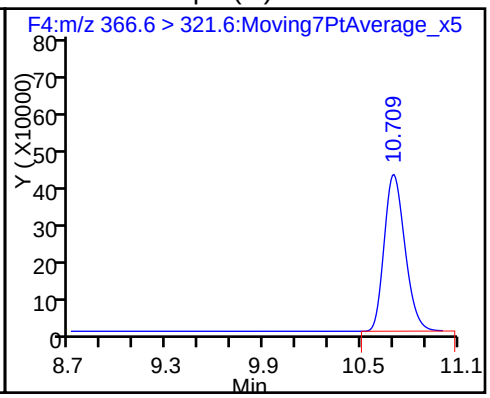
51 Perfluorobutanesulfonic acid (ND)



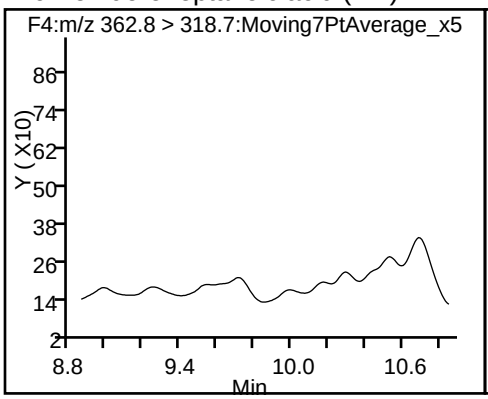
D 6 13C2 PFHxA (M)



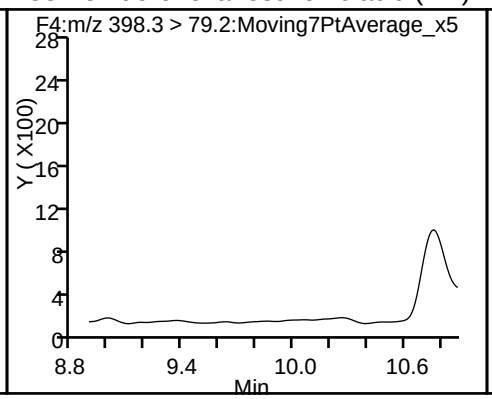
D 8 13C4-PFHpA (M)



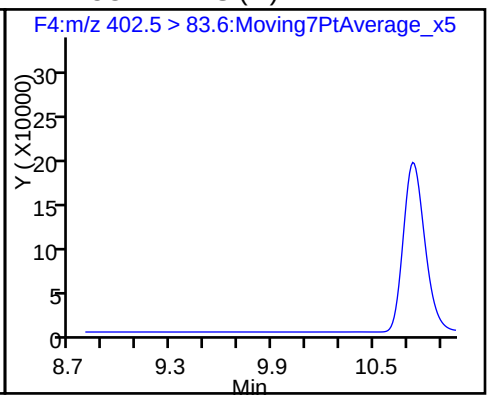
9 Perfluoroheptanoic acid (ND)



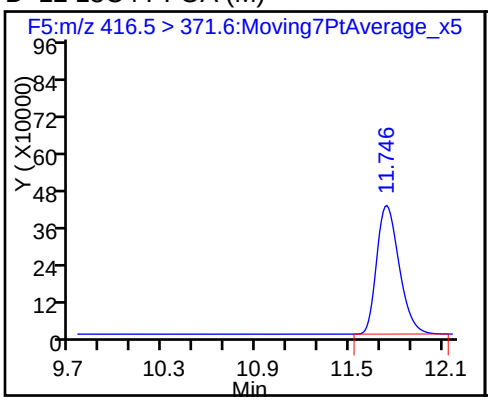
58 Perfluorohexanesulfonic acid (ND)



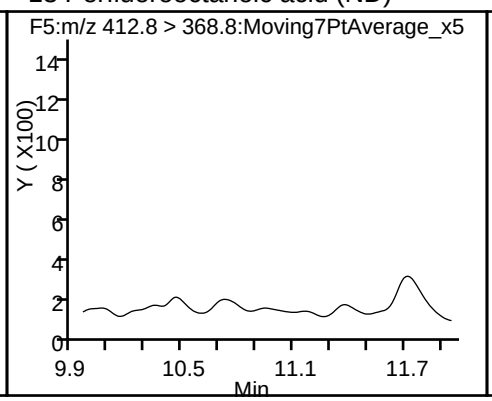
D 11 18O2 PFHxS (M)



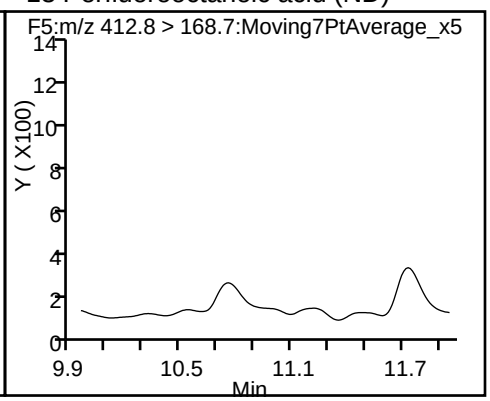
D 12 13C4 PFOA (M)



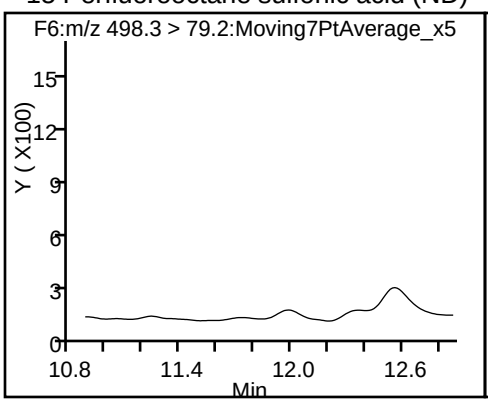
13 Perfluorooctanoic acid (ND)



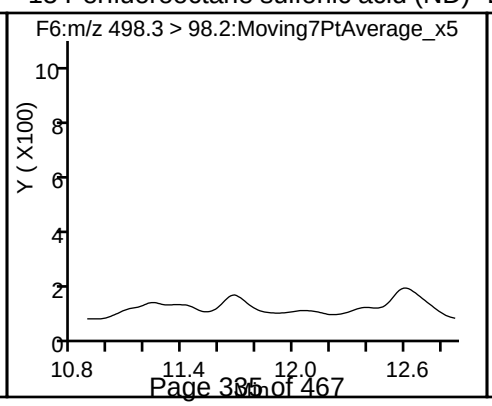
13 Perfluorooctanoic acid (ND)



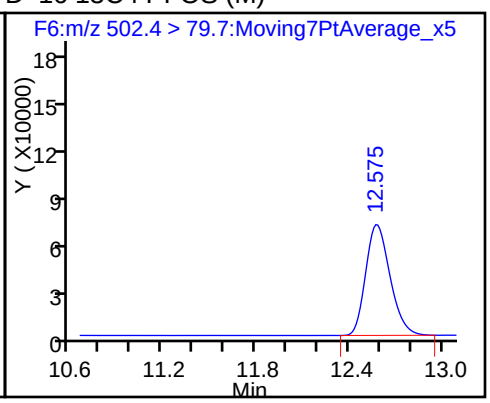
15 Perfluorooctane sulfonic acid (ND)



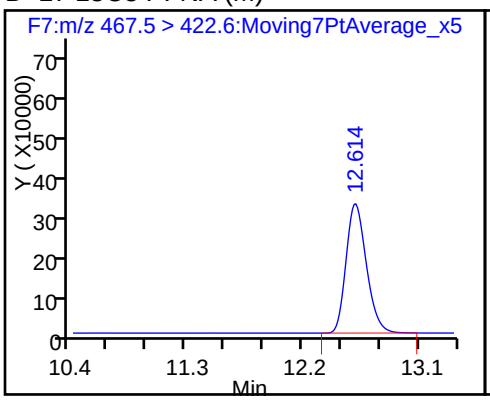
15 Perfluorooctane sulfonic acid (ND)



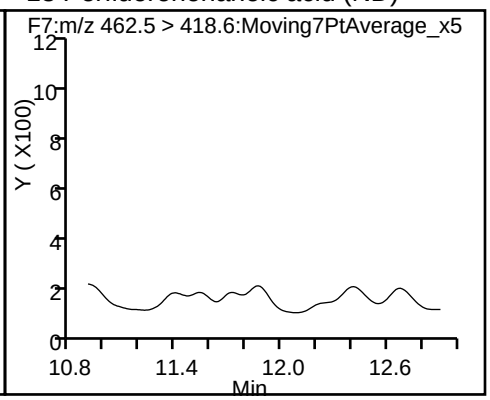
D 16 13C4 PFOS (M)



D 17 13C5 PFNA (M)



18 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Client Sample ID: DW-91 Lab Sample ID: 320-17376-12

Matrix: Water Lab File ID: 26FEB2016A4A_030.d

Analysis Method: WS-LC-0025 Date Collected: 02/20/2016 10:26

Extraction Method: 3535 Date Extracted: 02/25/2016 10:17

Sample wt/vol: 541.5(mL) Date Analyzed: 02/27/2016 01:56

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.: 101820 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.3	1.8	0.85
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	U	2.3	1.8	0.74
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.3	1.8	0.80
375-95-1	Perfluorononanoic acid (PFNA)	1.8	U	2.3	1.8	0.60
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.8	U	3.7	2.8	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	1.8	U	2.3	1.8	0.69

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	86		25-150
STL00990	13C4 PFOA	87		25-150
STL00991	13C4 PFOS	99		25-150
STL01892	13C4-PFHpA	93		25-150
STL00995	13C5 PFNA	72		25-150
STL00994	18O2 PFHxS	105		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_030.d
Lims ID: 320-17376-B-12-A Lab Sample ID: 320-17376-12
Client ID: DW-91
Sample Type: Client
Inject. Date: 27-Feb-2016 01:56:04 ALS Bottle#: 15 Worklist Smp#: 26
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17376-B-12-A
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:19:39 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:47:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 6 13C2 PFHxA										
314.6 > 269.7	9.576	8.604	0.972		3457101	42.9		85.8	9438	
D 8 13C4-PFHpA										
366.6 > 321.6	10.791	9.856	0.935		3150471	46.4		92.8	5505	
D 11 18O2 PFHxS										
402.5 > 83.6	10.819	9.892	0.927		1795302	49.5		105	4769	
D 12 13C4 PFOA										
416.5 > 371.6	11.817	10.958	0.859		3427806	43.7		87.5	6192	
D 16 13C4 PFOS										
502.4 > 79.7	12.638	11.876	0.762		767926	47.1		98.6	1759	
D 17 13C5 PFNA										
467.5 > 422.6	12.665	11.898	0.767		2346872	36.2		72.4	4303	

Report Date: 29-Feb-2016 10:20:10 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_030.d

Injection Date: 27-Feb-2016 01:56:04 Instrument ID: A4

Lims ID: 320-17376-B-12-A Lab Sample ID: 320-17376-12

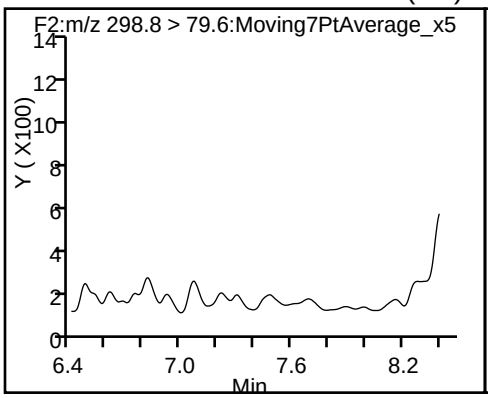
Client ID: DW-91

Operator ID: JRB ALS Bottle#: 15 Worklist Smp#: 26

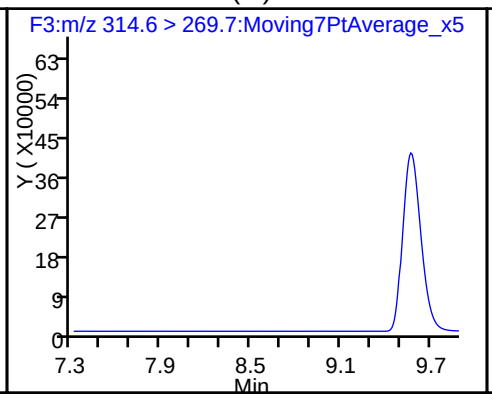
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

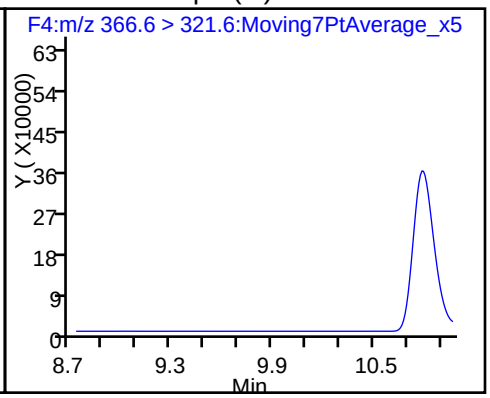
51 Perfluorobutanesulfonic acid (ND)



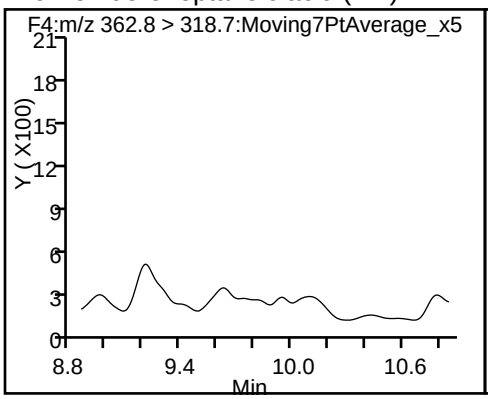
D 6 13C2 PFHxA (M)



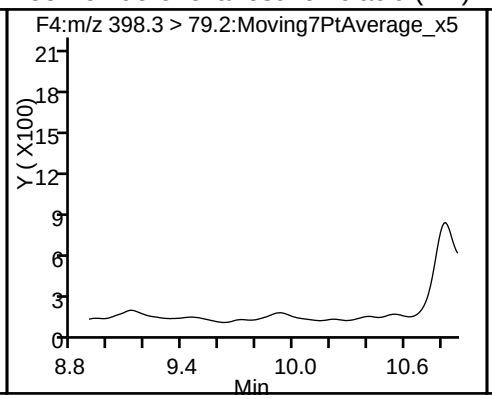
D 8 13C4-PFHpA (M)



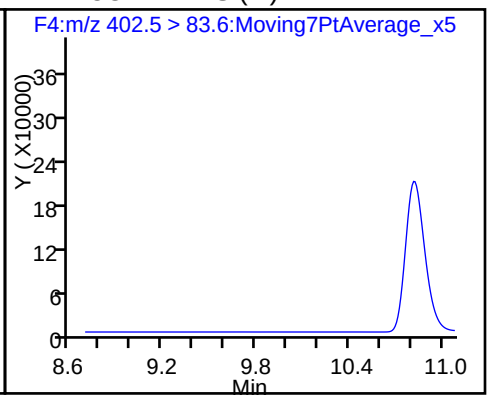
9 Perfluoroheptanoic acid (ND)



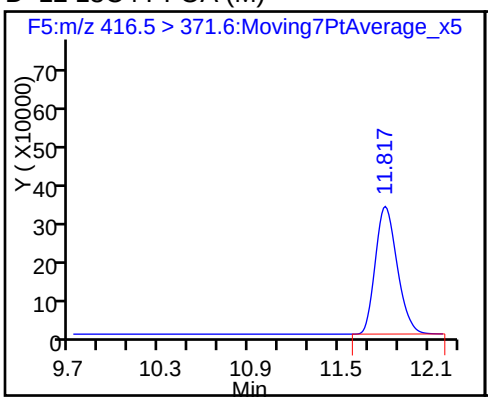
58 Perfluorohexanesulfonic acid (ND)



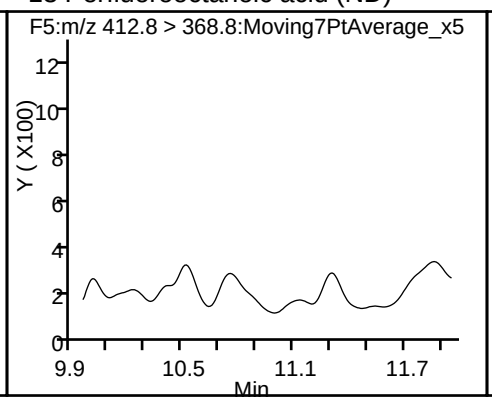
D 11 18O2 PFHxS (M)



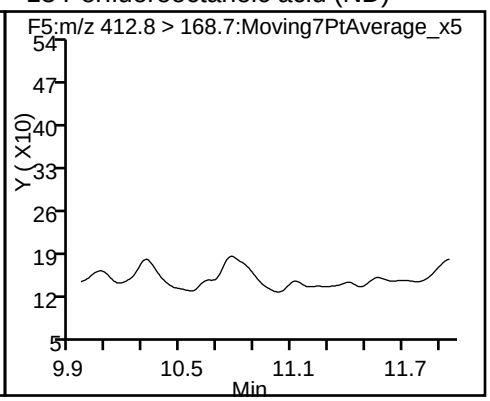
D 12 13C4 PFOA (M)



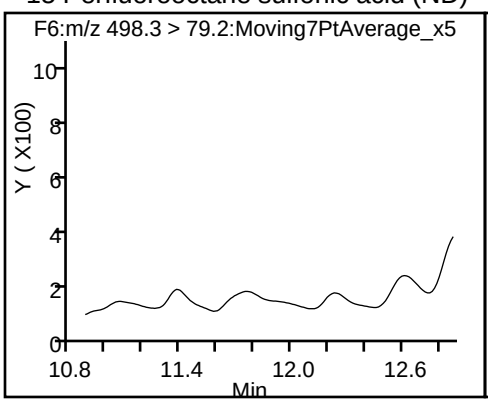
13 Perfluorooctanoic acid (ND)



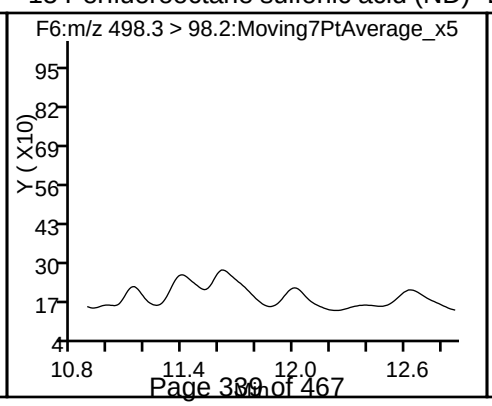
13 Perfluorooctanoic acid (ND)



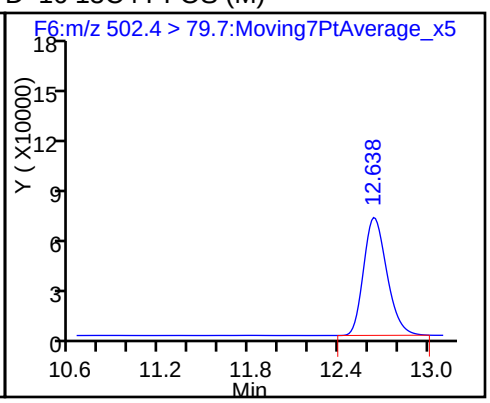
15 Perfluorooctane sulfonic acid (ND)



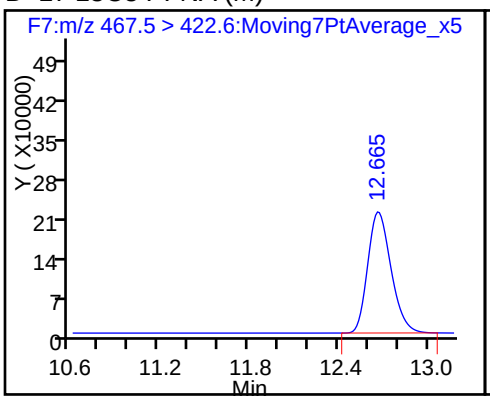
15 Perfluorooctane sulfonic acid (ND)



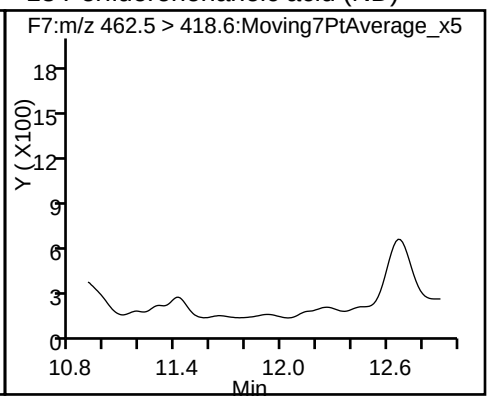
D 16 13C4 PFOS (M)



D 17 13C5 PFNA (M)



18 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17376-1

SDG No.:

Client Sample ID: DW-91FB | Lab Sample ID: 320-17376-13

Matrix: Water | Lab File ID: 26FEB2016A4A_031.d

Analysis Method: WS-LC-0025 | Date Collected: 02/20/2016 10:06

Extraction Method: 3535 | Date Extracted: 02/25/2016 10:17

Sample wt/vol: 570.3(mL) | Date Analyzed: 02/27/2016 02:17

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.: 101820 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.2	1.8	0.80
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	U	2.2	1.8	0.70
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	U	2.2	1.8	0.76
375-95-1	Perfluorononanoic acid (PFNA)	1.8	U	2.2	1.8	0.57
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	2.6	1.1
335-67-1	Perfluorooctanoic acid (PFOA)	1.8	U	2.2	1.8	0.66

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	110		25-150
STL00990	13C4 PFOA	116		25-150
STL00991	13C4 PFOS	100		25-150
STL01892	13C4-PFHpA	116		25-150
STL00995	13C5 PFNA	115		25-150
STL00994	18O2 PFHxS	108		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_031.d
Lims ID: 320-17376-B-13-A Lab Sample ID: 320-17376-13
Client ID: DW-91FB
Sample Type: Client
Inject. Date: 27-Feb-2016 02:17:15 ALS Bottle#: 16 Worklist Smp#: 27
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17376-B-13-A
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:19:39 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 12:23:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 6 13C2 PFHxA										
314.6 > 269.7	9.394	8.604	0.790		4432117	55.0		110	7738	
D 8 13C4-PFHpA										
366.6 > 321.6	10.635	9.856	0.779		3953598	58.2		116	6514	
D 11 18O2 PFHxS										
402.5 > 83.6	10.663	9.892	0.771		1846980	50.9		108	3892	
D 12 13C4 PFOA										
416.5 > 371.6	11.668	10.958	0.710		4548853	58.0		116	5991	
D 16 13C4 PFOS										
502.4 > 79.7	12.511	11.876	0.635		777614	47.7		99.8	2845	
D 17 13C5 PFNA										
467.5 > 422.6	12.538	11.898	0.640		3713397	57.3		115	5277	

Report Date: 29-Feb-2016 10:20:14 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_031.d

Injection Date: 27-Feb-2016 02:17:15 Instrument ID: A4

Lims ID: 320-17376-B-13-A Lab Sample ID: 320-17376-13

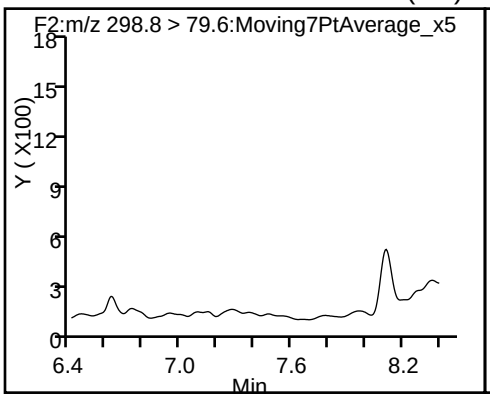
Client ID: DW-91FB

Operator ID: JRB ALS Bottle#: 16 Worklist Smp#: 27

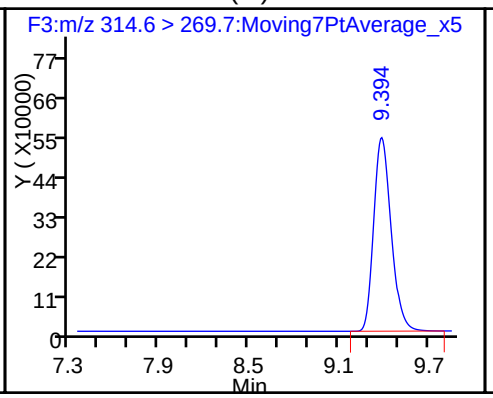
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

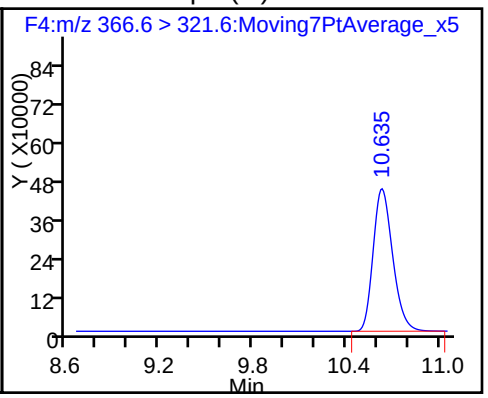
51 Perfluorobutanesulfonic acid (ND)



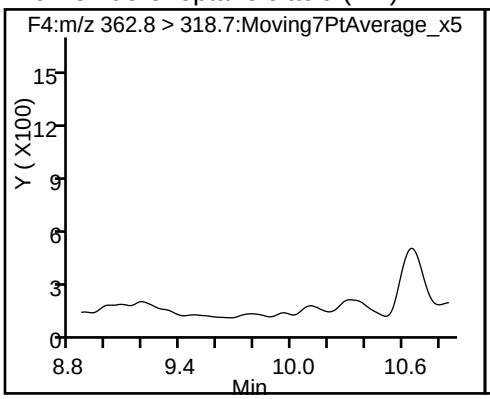
D 6 13C2 PFHxA (M)



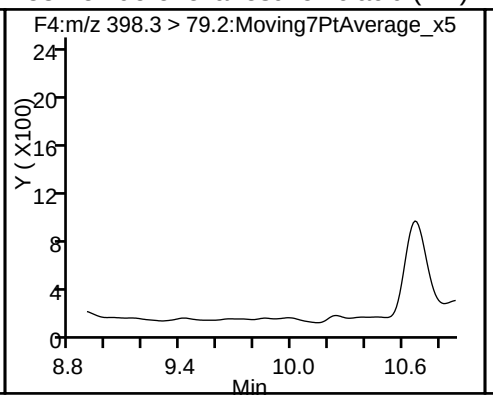
D 8 13C4-PFHpA (M)



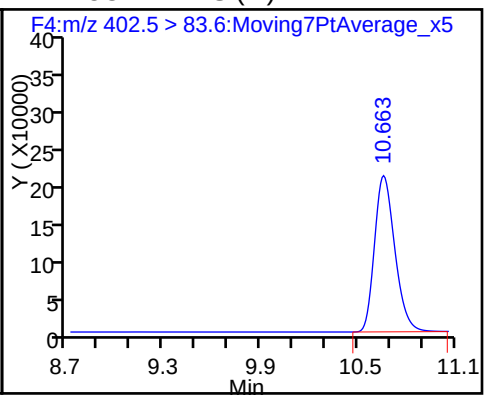
9 Perfluoroheptanoic acid (ND)



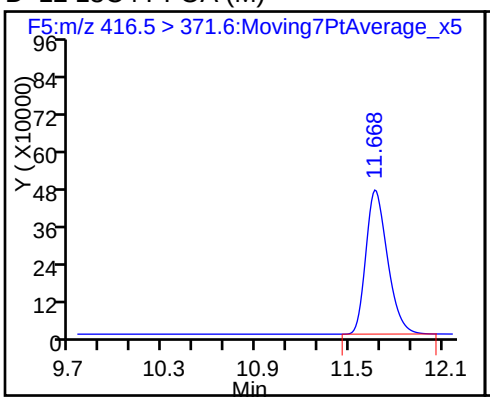
58 Perfluorohexanesulfonic acid (ND)



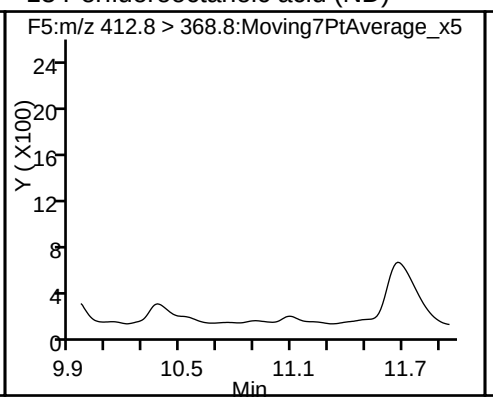
D 11 18O2 PFHxS (M)



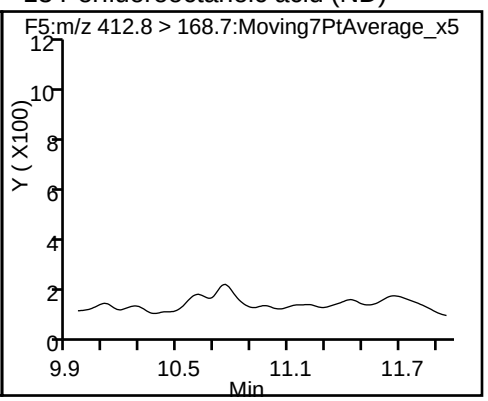
D 12 13C4 PFOA (M)



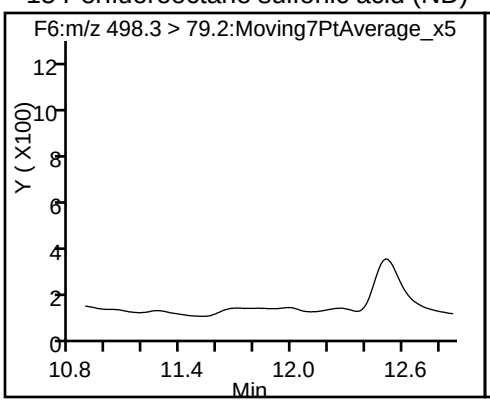
13 Perfluorooctanoic acid (ND)



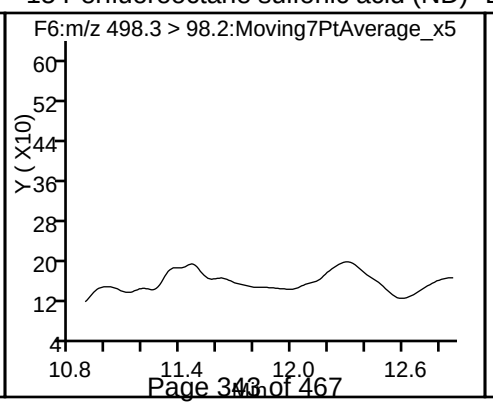
13 Perfluorooctanoic acid (ND)



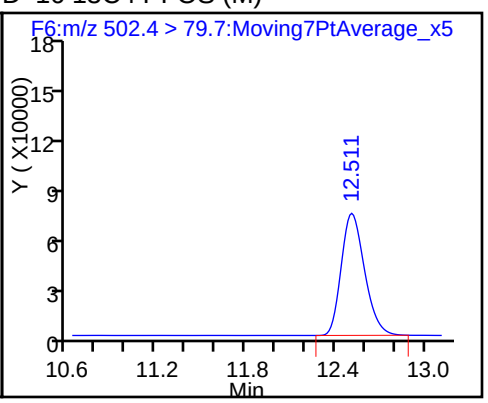
15 Perfluorooctane sulfonic acid (ND)



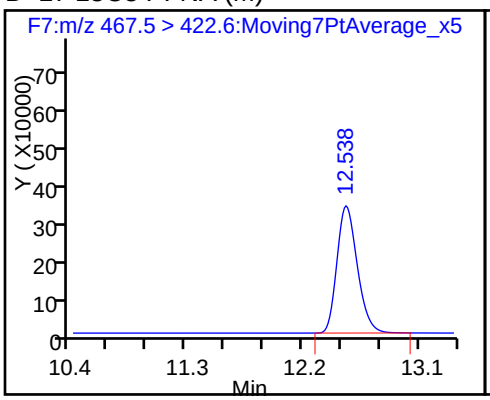
15 Perfluorooctane sulfonic acid (ND)



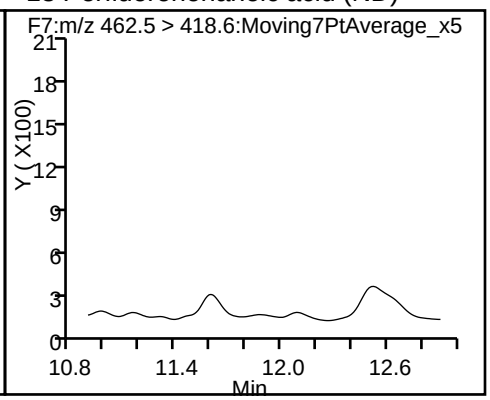
D 16 13C4 PFOS (M)



D 17 13C5 PFNA (M)



18 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17376-1

SDG No.:

Client Sample ID: DUP022016 | Lab Sample ID: 320-17376-14

Matrix: Water | Lab File ID: 26FEB2016A4A_032.d

Analysis Method: WS-LC-0025 | Date Collected: 02/20/2016 10:26

Extraction Method: 3535 | Date Extracted: 02/25/2016 10:17

Sample wt/vol: 535.6(mL) | Date Analyzed: 02/27/2016 02:38

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.: 101820 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	U	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)	1.9	U	2.3	1.9	0.61
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.8	U	3.7	2.8	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	1.9	U	2.3	1.9	0.70

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		25-150
STL00990	13C4 PFOA	99		25-150
STL00991	13C4 PFOS	91		25-150
STL01892	13C4-PFHpA	94		25-150
STL00995	13C5 PFNA	86		25-150
STL00994	18O2 PFHxS	107		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_032.d
Lims ID: 320-17376-A-14-A Lab Sample ID: 320-17376-14
Client ID: DUP022016
Sample Type: Client
Inject. Date: 27-Feb-2016 02:38:27 ALS Bottle#: 17 Worklist Smp#: 28
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17376-A-14-A
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:19:39 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:29:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 6 13C2 PFHxA										
314.6 > 269.7	9.128	8.604	0.524		3514742	43.6		87.2	9981	
D 8 13C4-PFHpA										
366.6 > 321.6	10.369	9.856	0.513		3208685	47.2		94.5	7174	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	10.395	9.892	0.503	1.000	7536	0.1913				
D 11 18O2 PFHxS										
402.5 > 83.6	10.403	9.892	0.511		1837470	50.7		107	4310	
D 12 13C4 PFOA										
416.5 > 371.6	11.420	10.958	0.462		3876588	49.5		98.9	7874	
D 16 13C4 PFOS										
502.4 > 79.7	12.270	11.876	0.394		706716	43.4		90.7	1366	
D 17 13C5 PFNA										
467.5 > 422.6	12.297	11.898	0.399		2795912	43.2		86.3	4190	

Report Date: 29-Feb-2016 10:20:19 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_032.d

Injection Date: 27-Feb-2016 02:38:27 Instrument ID: A4

Lims ID: 320-17376-A-14-A Lab Sample ID: 320-17376-14

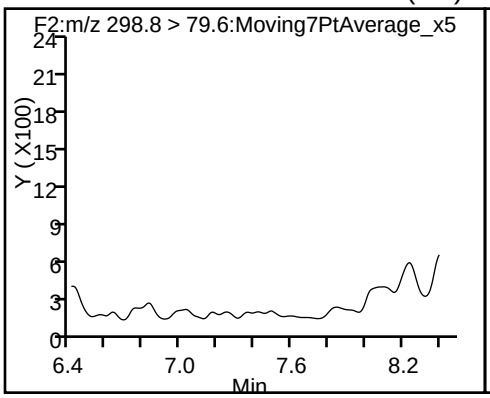
Client ID: DUP022016

Operator ID: JRB ALS Bottle#: 17 Worklist Smp#: 28

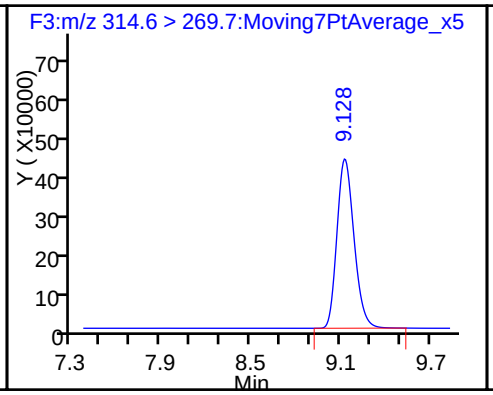
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

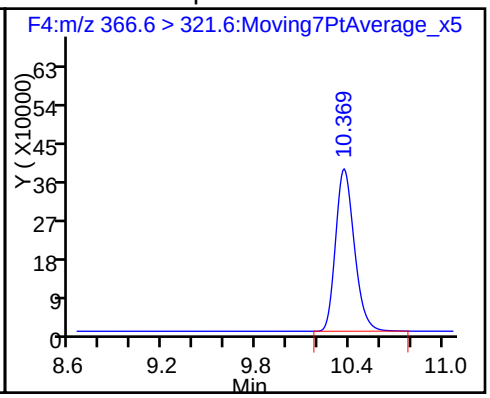
51 Perfluorobutanesulfonic acid (ND)



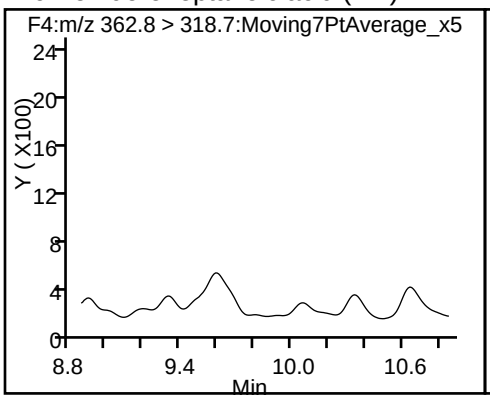
D 6 13C2 PFHxA



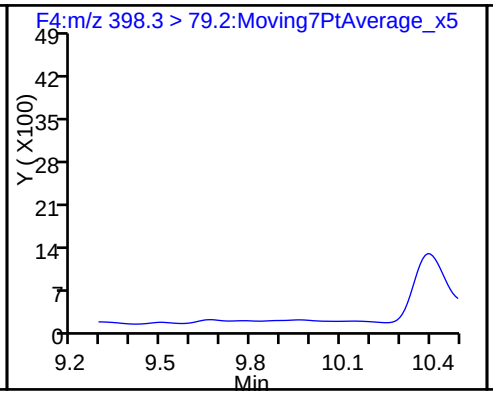
D 8 13C4-PFHpA



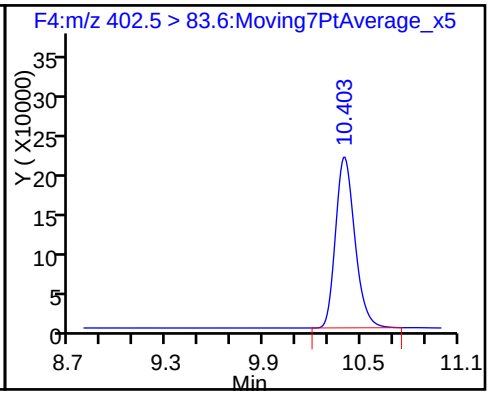
9 Perfluoroheptanoic acid (ND)



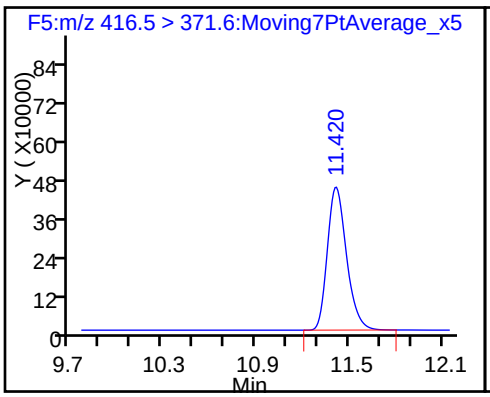
58 Perfluorohexanesulfonic acid



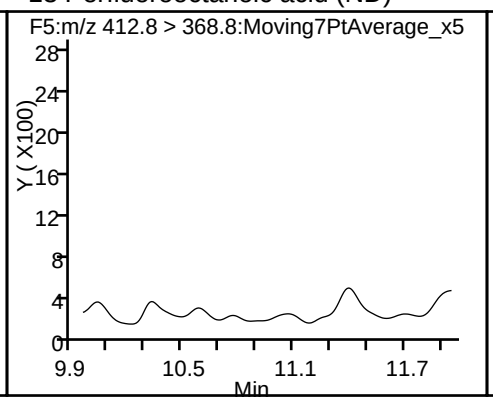
D 11 18O2 PFHxS



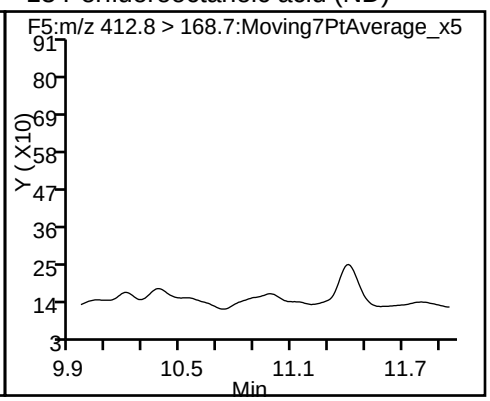
D 12 13C4 PFOA



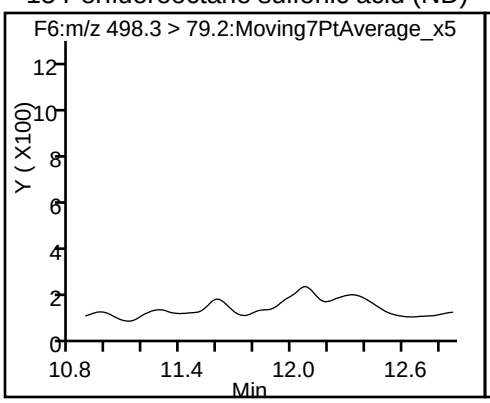
13 Perfluorooctanoic acid (ND)



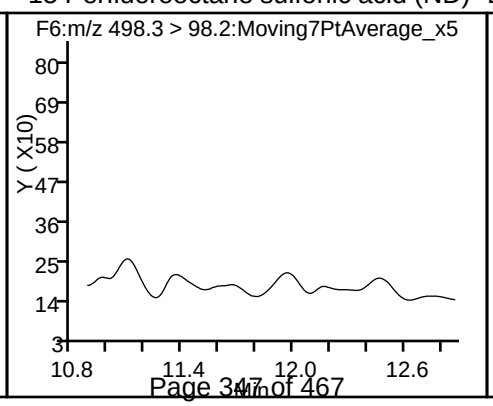
13 Perfluorooctanoic acid (ND)



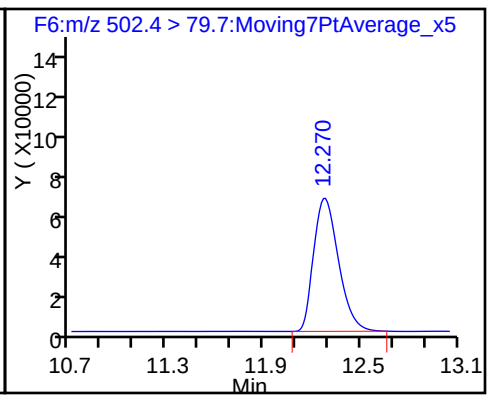
15 Perfluorooctane sulfonic acid (ND)



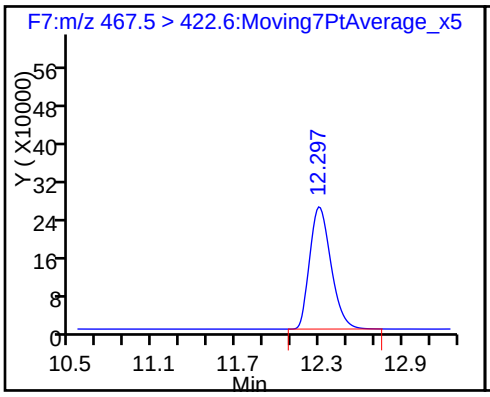
15 Perfluorooctane sulfonic acid (ND)



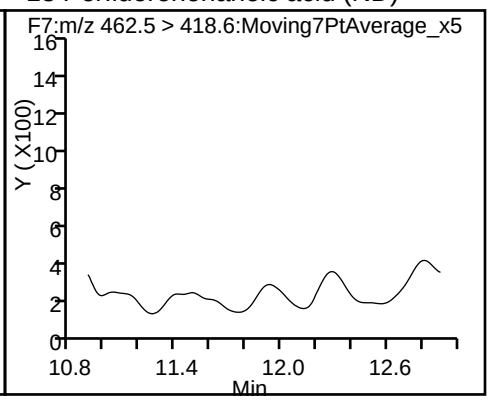
D 16 13C4 PFOS



D 17 13C5 PFNA



18 Perfluorononanoic acid (ND)



FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1 Analy Batch No.: 101820

SDG No.:

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/26/2016 17:27 Calibration End Date: 02/26/2016 19:34 Calibration ID: 19414

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-101820/2	26FEB2016A4A_006.d
Level 2	STD 320-101820/3	26FEB2016A4A_007.d
Level 3	STD 320-101820/4	26FEB2016A4A_008.d
Level 4	STD 320-101820/5	26FEB2016A4A_009.d
Level 5	STD 320-101820/6	26FEB2016A4A_010.d
Level 6	STD 320-101820/7	26FEB2016A4A_011.d
Level 7	STD 320-101820/8	26FEB2016A4A_012.d

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7				RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	5.996	6.023	5.990	5.996	6.020	6.085	+++++				5.793 - 6.293	6.018
Perfluoro-n-hexadecanoic acid (PFHxDA)	5.996	6.023	5.990	5.996	6.020	6.085	6.192				5.793 - 6.293	6.043
Perfluoro-n-octandecanoic acid (PFODA)	5.996	6.023	5.990	5.996	6.020	6.085	6.192				5.793 - 6.293	6.043
Perfluoropentanoic acid (PFPeA)	7.208	7.245	7.198	7.208	7.235	7.336	+++++				7.025 - 7.525	7.238
Perfluorobutanesulfonic acid (PFBS)	7.346	7.369	7.318	7.332	7.360	7.465	+++++				7.154 - 7.654	7.365
Perfluorohexanoic acid (PFHxA)	8.526	8.550	8.497	8.511	8.550	8.714	+++++				8.354 - 8.854	8.558
Perfluoroheptanoic acid (PFHpA)	9.791	9.808	9.740	9.748	9.799	10.003	+++++				9.609 - 10.109	9.815
Perfluorohexanesulfonic acid (PFHxS)	+++++	9.833	9.765	9.782	9.833	10.037	+++++				9.642 - 10.142	9.850
Perfluorooctanoic acid (PFOA)	10.895	10.895	10.831	10.849	10.913	11.116	+++++				10.708 - 11.208	10.917
Perfluoroheptanesulfonic Acid (PFHpS)	10.904	10.895	10.831	10.849	10.913	11.116	+++++				10.710 - 11.210	10.918
Perfluorooctanesulfonic acid (PFOS)	11.819	11.819	11.748	11.771	11.842	12.026	+++++				11.624 - 12.124	11.838
Perfluorononanoic acid (PFNA)	+++++	11.844	11.772	11.796	11.867	12.047	12.126				11.649 - 12.149	11.909
Perfluorodecanoic acid (PFDA)	12.641	12.641	12.577	12.603	12.666	12.831	+++++				12.443 - 12.943	12.660
Perfluorooctane Sulfonamide (FOSA)	13.173	13.174	13.111	13.132	13.194	13.349	+++++				12.972 - 13.472	13.189
Perfluorodecane Sulfonic acid	+++++	13.278	13.227	13.237	13.299	13.443	+++++				13.074 - 13.574	13.297
Perfluoroundecanoic acid (PFUnA)	13.330	13.330	13.268	13.288	13.350	13.485	+++++				13.122 - 13.622	13.342
Perfluorododecanoic acid (PFDoA)	13.899	13.899	13.840	13.864	13.911	14.047	14.099				13.687 - 14.187	13.937
Perfluorotridecanoic Acid (PFTriA)	14.395	14.395	14.340	14.359	14.414	14.524	14.579				14.180 - 14.680	14.429
Perfluorotetradecanoic acid (PFTeA)	+++++	14.810	14.764	14.782	14.828	14.929	14.975				14.591 - 15.091	14.848
13C4 PFBA	5.999	6.023	5.987	5.996	6.023	6.082	+++++				5.793 - 6.293	6.018
13C2-PFHxDA	5.996	6.023	5.990	5.996	6.020	6.085	6.192				5.793 - 6.293	6.043
13C5-PFPeA	7.208	7.240	7.194	7.208	7.231	7.332	+++++				7.022 - 7.522	7.236
13C2 PFHxA	8.526	8.558	8.497	8.511	8.550	8.706	+++++				8.354 - 8.854	8.558
13C4-PFHpA	9.791	9.799	9.731	9.748	9.799	10.003	+++++				9.606 - 10.106	9.812
18O2 PFHxS	9.825	9.825	9.765	9.782	9.833	10.046	+++++				9.642 - 10.142	9.846
13C4 PFOA	10.895	10.895	10.831	10.849	10.913	11.116	+++++				10.708 - 11.208	10.917
13C4 PFOS	11.819	11.819	11.748	11.771	11.842	12.026	+++++				11.626 - 12.126	11.838
13C5 PFNA	11.843	11.844	11.772	11.796	11.855	12.047	12.126				11.648 - 12.148	11.898
13C2 PFDA	12.641	12.641	12.577	12.603	12.666	12.831	+++++				12.443 - 12.943	12.660
13C8 FOSA	13.173	13.174	13.111	13.132	13.194	13.349	+++++				12.972 - 13.472	13.189
13C2 PFUnA	13.319	13.319	13.268	13.288	13.350	13.485	+++++				13.119 - 13.619	13.338
13C2 PFDoA	13.899	13.899	13.852	13.864	13.911	14.047	14.099				13.689 - 14.189	13.939
13C2-PFTeDA	14.810	14.819	14.764	14.782	14.828	14.929	14.975				14.594 - 15.094	14.844

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1 Analy Batch No.: 101820

SDG No.:

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/26/2016 17:27 Calibration End Date: 02/26/2016 19:34 Calibration ID: 19414

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-101820/2	26FEB2016A4A_006.d
Level 2	STD 320-101820/3	26FEB2016A4A_007.d
Level 3	STD 320-101820/4	26FEB2016A4A_008.d
Level 4	STD 320-101820/5	26FEB2016A4A_009.d
Level 5	STD 320-101820/6	26FEB2016A4A_010.d
Level 6	STD 320-101820/7	26FEB2016A4A_011.d
Level 7	STD 320-101820/8	26FEB2016A4A_012.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	101409 87550	98603 75131	94921 +++++	94994	Ave		92101.5300				10.3		50.0			
13C2-PFHxDA	472.32 44649	801.90 160903	4765.8 260388	19752	Ave		70247.3686				44.2	*	50.0			
13C5-PFPeA	66933 57294	65230 48932	60667 +++++	62784	Ave		60306.7933				10.8		50.0			
13C2 PFHxA	88525 74991	87441 64224	83155 +++++	85222	Ave		80592.9033				11.6		50.0			
13C4-PFHpA	74692 63851	74281 52539	71360 +++++	70746	Ave		67911.4200				12.5		50.0			
18O2 PFHxS	40363 34411	38693 26467	36972 +++++	40743	Ave		36274.7322				14.7		50.0			
13C4 PFOA	91427 70488	90763 56216	80400 +++++	81044	Ave		78389.7400				17.0		50.0			
13C4 PFOS	17566 16522	16454 12336	16061 +++++	18868	Ave		16301.2622				13.5		50.0			
13C5 PFNA	73947 66566	72488 53847	69470 47334	69892	Ave		64792.1629				15.7		50.0			
13C2 PFDA	89903 76709	90491 58427	87696 +++++	81302	Ave		80754.4933				15.1		50.0			
13C8 FOSA	118951 110565	123711 88279	117686 +++++	119746	Ave		113156.133				11.4		50.0			
13C2 PFUnA	83548 70185	88039 58060	83593 +++++	79295	Ave		77120.1000				14.4		50.0			
13C2 PFDoA	95672 86151	91059 75573	90097 64382	93739	Ave		85239.0714				13.3		50.0			
13C2-PFTeDA	73405 70465	79119 62127	72519 52656	73021	Ave		69044.4371				12.8		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.: 320-17376-1 Analy Batch No.: 101820

SDG No.:

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/26/2016 17:27 Calibration End Date: 02/26/2016 19:34 Calibration ID: 19414

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)	47232 40226	40095 +++++	47658	49380	44649	AveID		0.4899				9.6		35.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	47232 40226	40095 32549	47658	49380	44649	AveID		0.5065				6.4		50.0			
Perfluoro-n-octandecanoic acid (PFODA)	47232 40226	40095 32549	47658	49380	44649	AveID		0.5065				6.4		50.0			
Perfluoropentanoic acid (PFPeA)	37482 23563	31294 +++++	29930	30439	27061	AveID		0.4953				6.5		35.0			
Perfluorobutanesulfonic acid (PFBS)	18330 19136	19635 +++++	22526	25634	23183	AveID		0.5995				16.9		50.0			
Perfluorohexanoic acid (PFHxA)	40920 29409	44019 +++++	38277	38617	33448	AveID		0.4638				4.4		35.0			
Perfluoroheptanoic acid (PFHpA)	38768 28049	34377 +++++	35642	42571	34005	L2ID	-0.023	0.5375							0.9920		0.9900
Perfluorohexanesulfonic acid (PFHxS)	+++++ 26300	45106 +++++	38400	38334	32063	AveID		1.0141				9.4		35.0			
Perfluorooctanoic acid (PFOA)	53138 29410	43783 +++++	40123	43251	37542	AveID		0.5253				6.5		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	43887 26426	44979 +++++	43027	42681	36167	AveID		2.4174				10.6		50.0			
Perfluorooctanesulfonic acid (PFOS)	84559 44705	54662 +++++	63324	61830	56619	AveID		3.7344				15.6		35.0			
Perfluorononanoic acid (PFNA)	+++++ 56604	55348 47993	71987	78943	66375	L2ID	-0.286	1.0595							0.9970		0.9900
Perfluorodecanoic acid (PFDA)	82752 53064	66890 +++++	76361	77406	68142	AveID		0.8798				8.4		35.0			
Perfluorooctane Sulfonamide (FOSA)	108830 81887	92552 +++++	113520	116900	106262	AveID		0.9154				9.3		35.0			
Perfluorodecane Sulfonic acid	+++++ 17185	27028 +++++	29365	29016	25320	AveID		1.5869				10.2		50.0			
Perfluoroundecanoic acid (PFUnA)	114460 59870	86849 +++++	88736	84020	75752	AveID		1.0980				12.5		35.0			
Perfluorododecanoic acid (PFDoA)	85782 63629	58610 50646	73947	75725	70291	AveID		0.8019				9.7		35.0			
Perfluorotridecanoic Acid (PFTriA)	87546 53505	70711 44971	74348	76078	65277	AveID		0.7847				9.5		50.0			
Perfluorotetradecanoic acid (PFTeA)	+++++ 26758	44638 21924	32314	32770	29733	AveID		0.3730				15.5		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.: 320-17376-1 Analy Batch No.: 101820

SDG No.:

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/26/2016 17:27 Calibration End Date: 02/26/2016 19:34 Calibration ID: 19414

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-101820/2	26FEB2016A4A_006.d
Level 2	STD 320-101820/3	26FEB2016A4A_007.d
Level 3	STD 320-101820/4	26FEB2016A4A_008.d
Level 4	STD 320-101820/5	26FEB2016A4A_009.d
Level 5	STD 320-101820/6	26FEB2016A4A_010.d
Level 6	STD 320-101820/7	26FEB2016A4A_011.d
Level 7	STD 320-101820/8	26FEB2016A4A_012.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	5070461 3756568	4930149 +++++	4746061	4749707	4377513	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C2-PFHxDA	Ave	23616 8045132	40095 13019404	238292	987601	2232439	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C5-PFPeA	Ave	3346630 2446599	3261520 +++++	3033360	3139219	2864710	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C2 PFHxA	Ave	4426273 3211197	4372033 +++++	4157743	4261075	3749550	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C4-PFHpA	Ave	3734585 2626968	3714051 +++++	3567999	3537280	3192543	50.0 50.0	50.0 +++++	50.0	50.0	50.0
18O2 PFHxS	Ave	1909171 1251868	1830168 +++++	1748784	1927158	1627620	47.3 47.3	47.3 +++++	47.3	47.3	47.3
13C4 PFOA	Ave	4571363 2810804	4538141 +++++	4019997	4052200	3524417	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C4 PFOS	Ave	839661 589650	786520 +++++	767723	901914	789734	47.8 47.8	47.8 +++++	47.8	47.8	47.8
13C5 PFNA	Ave	3697336 2692366	3624410 2366713	3473506	3494609	3328317	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDA	Ave	4495148 2921349	4524534 +++++	4384792	4065096	3835429	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C8 FOSA	Ave	5947539 4413928	6185554 +++++	5884275	5987305	5528239	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C2 PFUnA	Ave	4177390 2903023	4401956 +++++	4179654	3964757	3509250	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C2 PFDoA	Ave	4783613 3778672	4552925 3219090	4504852	4686949	4307574	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFTeDA	Ave	3670244 3106370	3955936 2632793	3625950	3651029	3523231	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.: 320-17376-1 Analy Batch No.: 101820

SDG No.:

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/26/2016 17:27 Calibration End Date: 02/26/2016 19:34 Calibration ID: 19414

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-101820/2	26FEB2016A4A_006.d
Level 2	STD 320-101820/3	26FEB2016A4A_007.d
Level 3	STD 320-101820/4	26FEB2016A4A_008.d
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Level 5	STD 320-101820/6	26FEB2016A4A_010.d
Level 6	STD 320-101820/7	26FEB2016A4A_011.d
Level 7	STD 320-101820/8	26FEB2016A4A_012.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	23616 8045132	40095 +++++	238292	987601	2232439	0.500 200	1.00 +++++	5.00	20.0	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)		AveID	23616 8045132	40095 13019404	238292	987601	2232439	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-octandecanoic acid (PFODA)		AveID	23616 8045132	40095 13019404	238292	987601	2232439	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoropentanoic acid (PFPeA)		AveID	18741 4712598	31294 +++++	149651	608776	1353041	0.500 200	1.00 +++++	5.00	20.0	50.0
Perfluorobutanesulfonic acid (PFBS)		AveID	8102 3383263	17357 +++++	99563	453215	1024709	0.442 177	0.884 +++++	4.42	17.7	44.2
Perfluorohexanoic acid (PFHxA)		AveID	20460 5881715	44019 +++++	191384	772331	1672408	0.500 200	1.00 +++++	5.00	20.0	50.0
Perfluoroheptanoic acid (PFHpA)		L2ID	19384 5609888	34377 +++++	178208	851417	1700245	0.500 200	1.00 +++++	5.00	20.0	50.0
Perfluorohexanesulfonic acid (PFHxS)		AveID	+++++ 4975885	42670 +++++	181632	725283	1516565	+++++ 189	0.946 +++++	4.73	18.9	47.3
Perfluorooctanoic acid (PFOA)		AveID	26569 5881968	43783 +++++	200616	865013	1877109	0.500 200	1.00 +++++	5.00	20.0	50.0
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	20890 5031569	42820 +++++	204808	812643	1721565	0.476 190	0.952 +++++	4.76	19.0	47.6
Perfluorooctanesulfonic acid (PFOS)		AveID	40419 8547545	52257 +++++	302690	1182197	2706389	0.478 191	0.956 +++++	4.78	19.1	47.8
Perfluorononanoic acid (PFNA)		L2ID	+++++ 11320855	55348 19197306	359937	1578862	3318743	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluorodecanoic acid (PFDA)		AveID	41376 10612845	66890 +++++	381807	1548111	3407085	0.500 200	1.00 +++++	5.00	20.0	50.0
Perfluorooctane Sulfonamide (FOSA)		AveID	54415 16377419	92552 +++++	567602	2337995	5313118	0.500 200	1.00 +++++	5.00	20.0	50.0
Perfluorodecane Sulfonic acid		AveID	+++++ 3313244	26055 +++++	141540	559426	1220447	+++++ 193	0.964 +++++	4.82	19.3	48.2

FORM VI

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1 Analy Batch No.: 101820

SDG No.:

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/26/2016 17:27 Calibration End Date: 02/26/2016 19:34 Calibration ID: 19414

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
Perfluoroundecanoic acid (PFUnA)		AveID	57230 11973923	86849 +++++	443678	1680391	3787583	0.500 200	1.00 +++++	5.00	20.0	50.0
Perfluorododecanoic acid (PFDoA)		AveID	42891 12725838	58610 20258578	369734	1514507	3514546	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorotridecanoic Acid (PFTriA)		AveID	43773 10701081	70711 17988306	371742	1521555	3263831	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorotetradecanoic acid (PFTeA)		AveID	+++++ 5351613	44638 8769485	161570	655399	1486647	+++++ 200	1.00 400	5.00	20.0	50.0

Curve Type Legend:

AveID = Average isotope dilution
L2ID = Linear 1/conc^2 IsoDil

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_006.d
Lims ID: Std L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 26-Feb-2016 17:27:46 ALS Bottle#: 2 Worklist Smp#: 2
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L1
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:17:01 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:03:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.7 > 168.6	5.996	6.043	-0.047	1.000	23616	0.4753		95.1	64.2	
36 Perfluorooctandecanoic acid										
212.7 > 168.6	5.996	6.043	-0.047	1.000	23616	0.4873		97.5	64.2	
34 Perfluorohexadecanoic acid										
212.7 > 168.6	5.996	6.043	-0.047	1.000	23616	0.4873		97.5	64.2	
D 35 13C2-PFHxDA										
212.7 > 168.6	5.996	6.043	-0.047		23616	0.3362		0.7	64.2	
D 1 13C4 PFBA										
216.7 > 171.5	5.999	6.043	-0.044		5070461	55.1		110	12745	
D 3 13C5-PFPeA										
267.6 > 222.7	7.208	7.272	-0.064		3346630	55.5		111	5737	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.208	7.275	-0.067	1.000	18741	0.5653		113	10.4	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.346	7.404	-0.058	1.000	8102	NC			15.5	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.346	7.404	-0.058	1.000	8102	0.3348		75.8		
7 Perfluorohexanoic acid										
312.9 > 268.7	8.526	8.604	-0.078	1.000	20460	0.4983		99.7	66.3	
D 6 13C2 PFHxA										
314.6 > 269.7	8.526	8.604	-0.078		4426273	54.9		110	8074	
D 8 13C4-PFHpA										
366.6 > 321.6	9.791	9.856	-0.065		3734585	55.0		110	4903	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.791	9.859	-0.068	1.000	19384	0.5257		105	50.7	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.825	9.892	-0.067	1.000	24959	0.6097		129		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.825	9.892	-0.067	1.000	24959	NC			47.1	
D 11 18O2 PFHxS										
402.5 > 83.6	9.825	9.892	-0.067		1909171	52.6		111	3562	
D 12 13C4 PFOA										
416.5 > 371.6	10.895	10.958	-0.063		4571363	58.3		117	6321	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.895	10.958	-0.063	1.000	26569	0.5532		111	20.3	
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.904	10.960	-0.056	1.000	20890	NC			93.8	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.904	10.960	-0.056	1.000	20890	0.4919		103		
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.819	11.874	-0.055	1.000	40419	0.6162		129	86.3	
D 16 13C4 PFOS										
502.4 > 79.7	11.819	11.876	-0.057		839661	51.5		108	2673	
D 17 13C5 PFNA										
467.5 > 422.6	11.843	11.898	-0.055		3697336	57.1		114	5407	
18 Perfluorononanoic acid										
462.5 > 418.6	11.843	11.899	-0.056	1.000	44539	0.8387		168	70.8	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.641	12.693	-0.052	1.000	41376	0.5231		105	98.5	
D 19 13C2 PFDA										
514.4 > 469.5	12.641	12.693	-0.052		4495148	55.7		111	6214	
D 23 13C8 FOSA										
505.4 > 77.6	13.173	13.222	-0.049		5947539	52.6		105	4978	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.173	13.222	-0.049	1.000	54415	0.4997		99.9	203	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.278	13.324	-0.046	1.000	8976	NC			48.0	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.278	13.324	-0.046	1.000	8976	0.3220		66.8		
D 26 13C2 PFUnA										
564.3 > 519.5	13.319	13.369	-0.050		4177390	54.2		108	3793	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.330	13.372	-0.042	1.000	57230	0.6239		125	85.6	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.899	13.937	-0.038	1.000	42891	0.5591		112	26.0	
D 28 13C2 PFDoA										
614.4 > 569.4	13.899	13.939	-0.040		4783613	56.1		112	3219	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.395	14.430	-0.035	1.000	43773	0.5831		117	33.6	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.800	14.841	-0.041	1.000	23303	0.6530		131	25.6	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.810	14.844	-0.034		3670244	53.2		106	2655	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L1_00018 Amount Added: 1.00 Units: mL

Report Date: 29-Feb-2016 10:17:02 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_006.d

Injection Date: 26-Feb-2016 17:27:46 Instrument ID: A4

Lims ID: Std L1

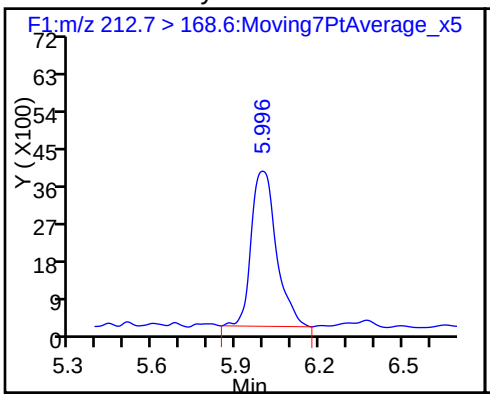
Client ID:

Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 2

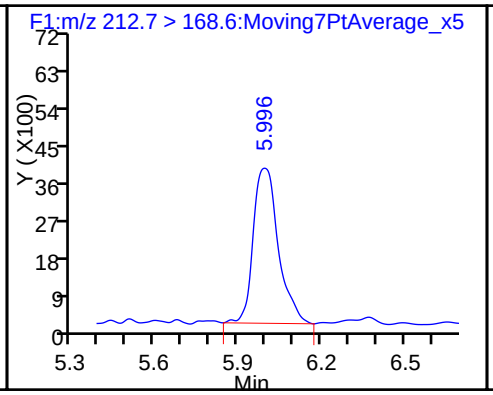
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

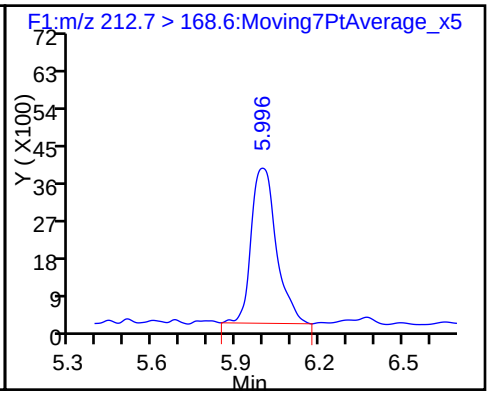
2 Perfluorobutyric acid



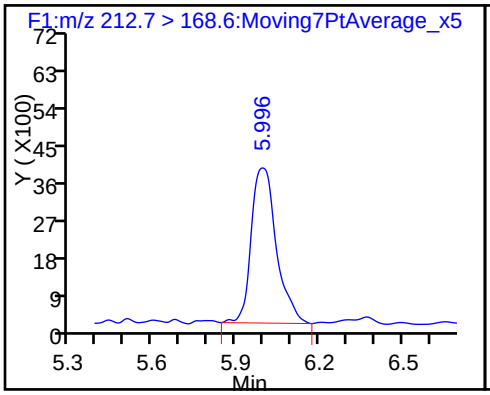
36 Perfluorooctandecanoic acid



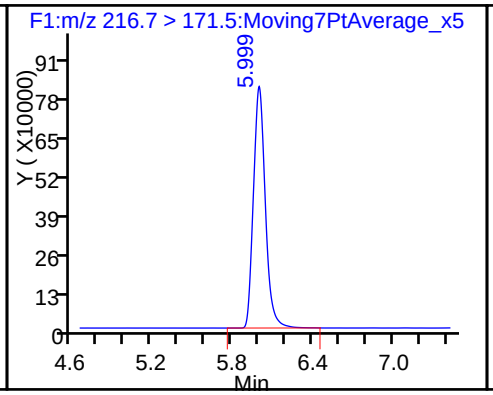
34 Perfluorohexadecanoic acid



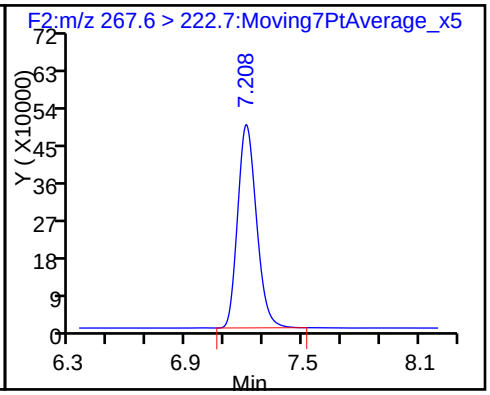
D 35 13C2-PFHxDA



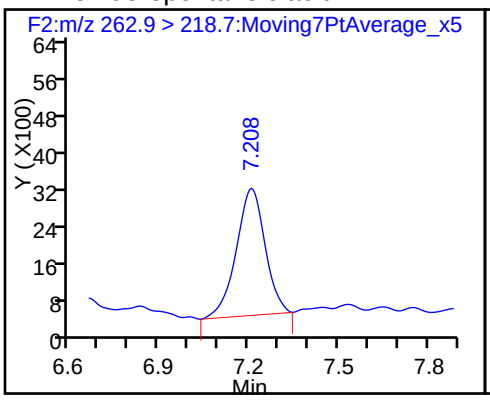
D 1 13C4 PFBA



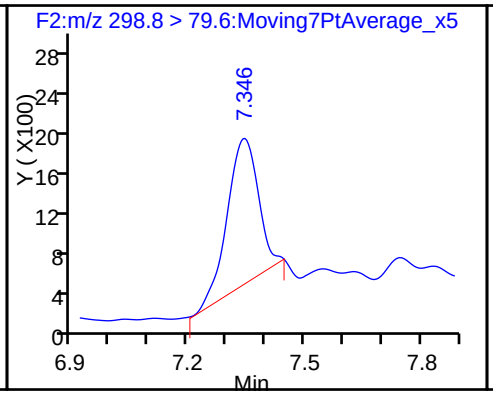
D 3 13C5-PFPeA



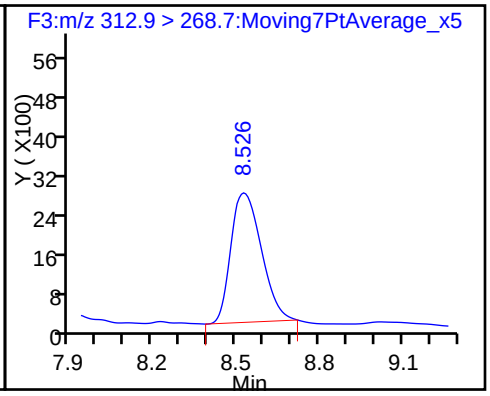
4 Perfluoropentanoic acid



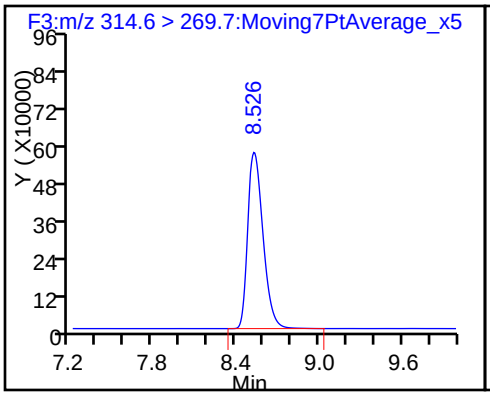
51 Perfluorobutanesulfonic acid



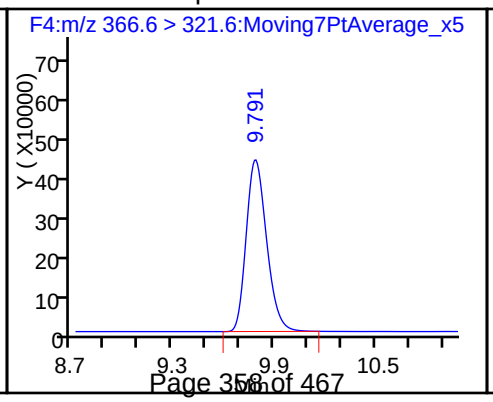
7 Perfluorohexanoic acid



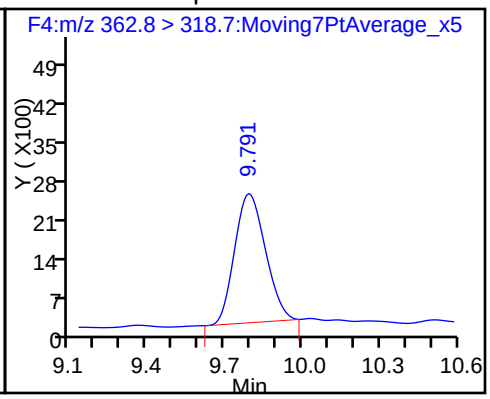
D 6 13C2 PFHxA



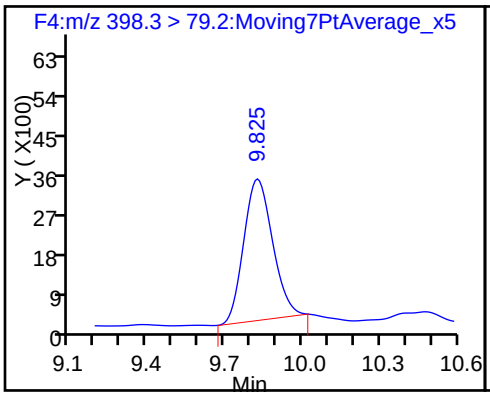
D 8 13C4-PFHpA



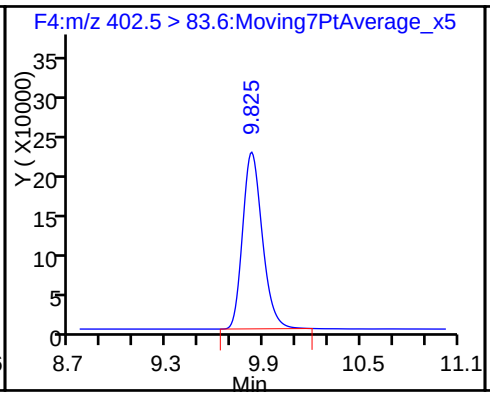
9 Perfluoroheptanoic acid



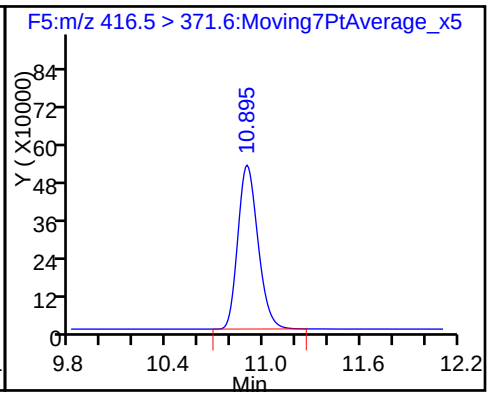
58 Perfluorohexanesulfonic acid



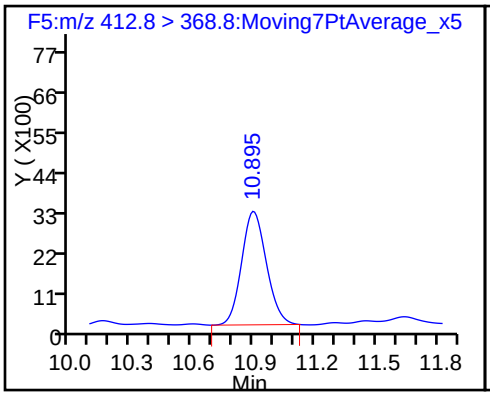
D 11 18O2 PFHxS



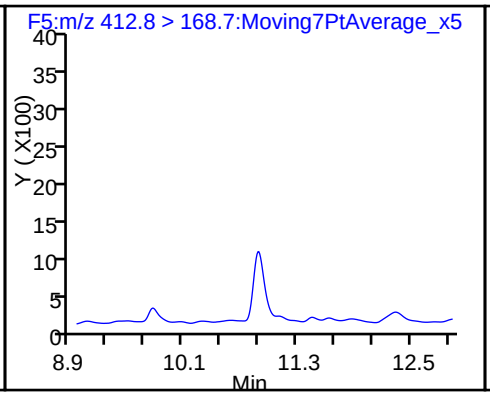
D 12 13C4 PFOA



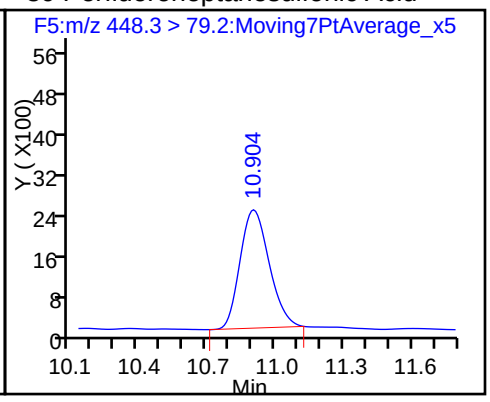
13 Perfluorooctanoic acid



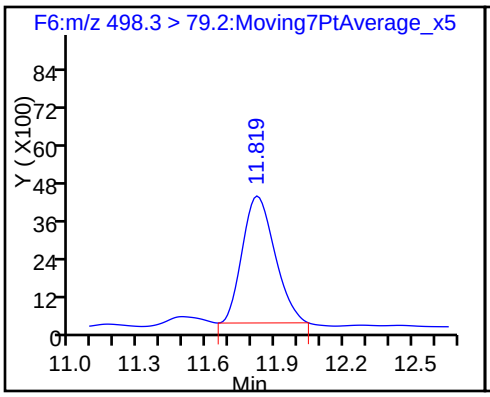
13 Perfluorooctanoic acid



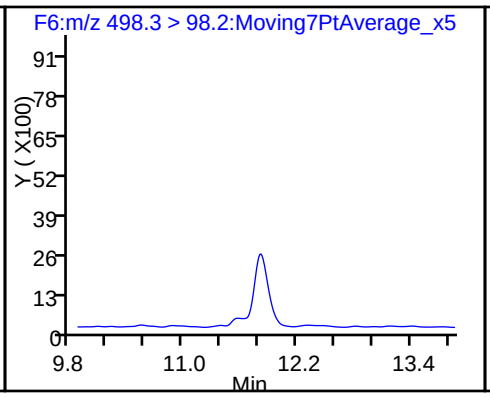
39 Perfluoroheptanesulfonic Acid



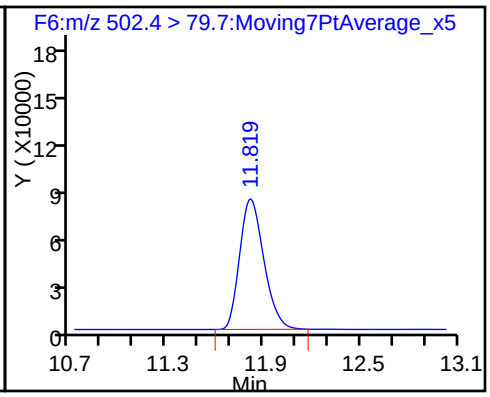
15 Perfluorooctane sulfonic acid



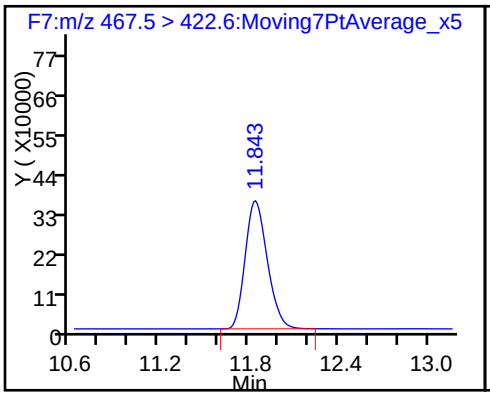
15 Perfluorooctane sulfonic acid



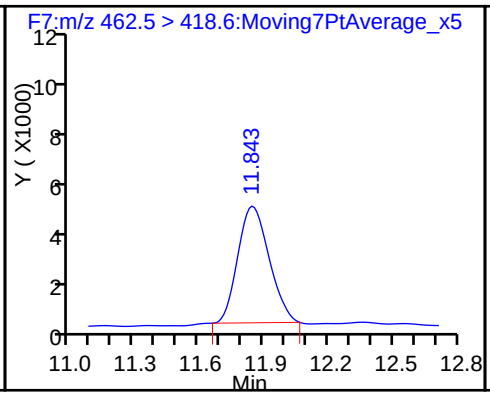
D 16 13C4 PFOS



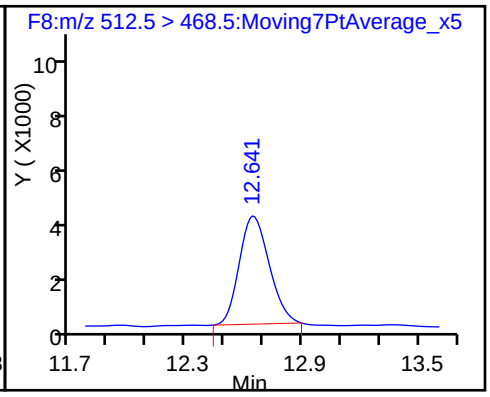
D 17 13C5 PFNA



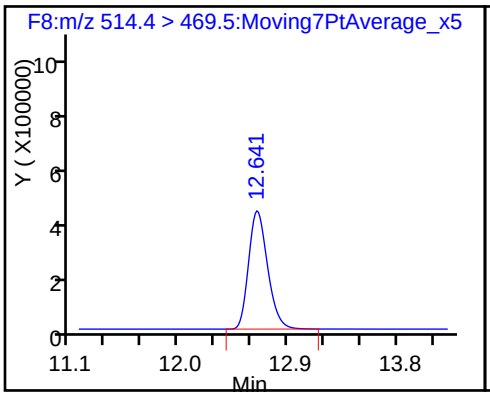
18 Perfluorononanoic acid



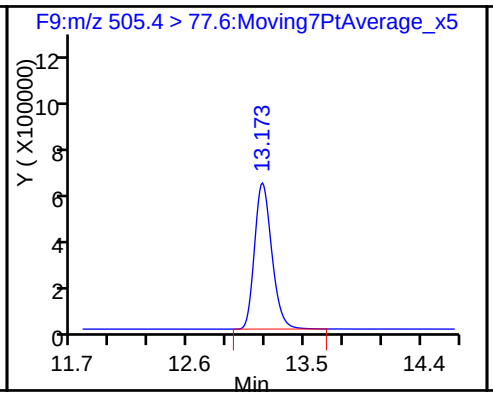
20 Perfluorodecanoic acid



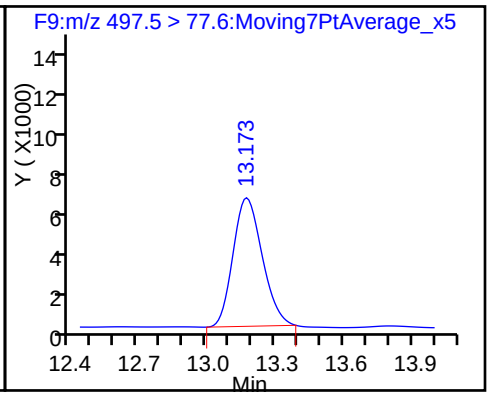
D 19 13C2 PFDA



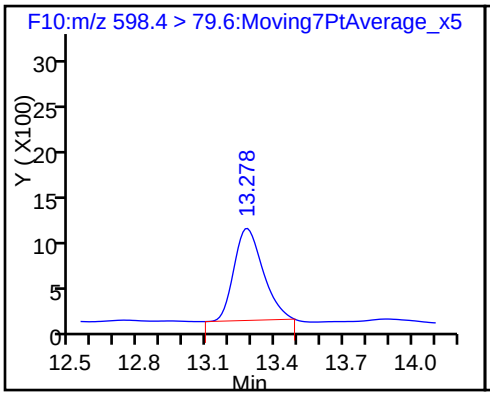
D 23 13C8 FOSA



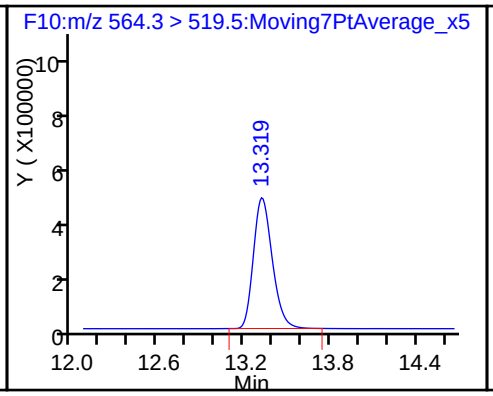
24 Perfluorooctane Sulfonamide



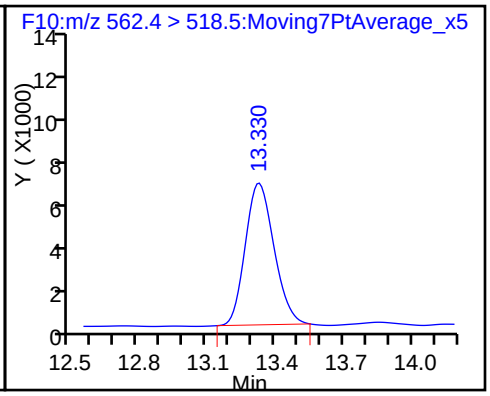
49 Perfluorodecane Sulfonic acid



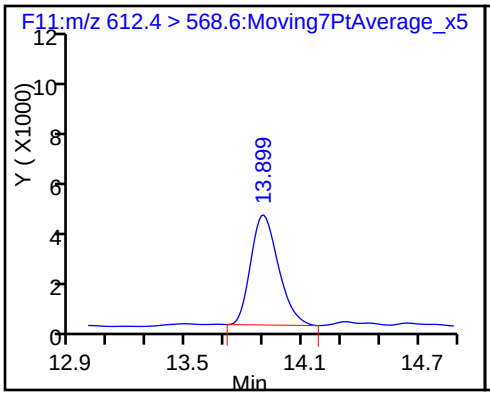
D 26 13C2 PFUnA



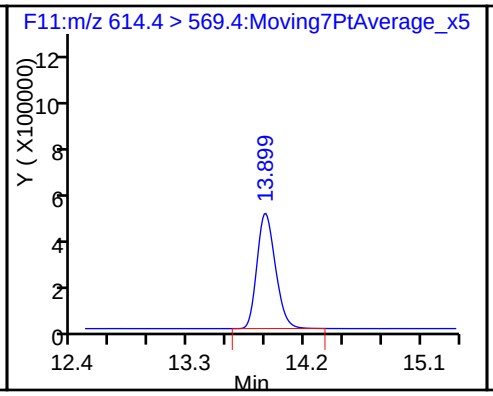
27 Perfluoroundecanoic acid



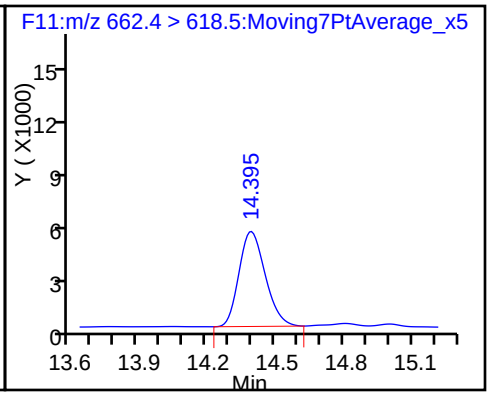
29 Perfluorododecanoic acid



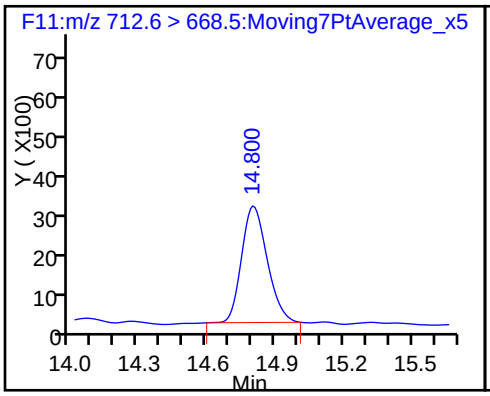
D 28 13C2 PFDoA



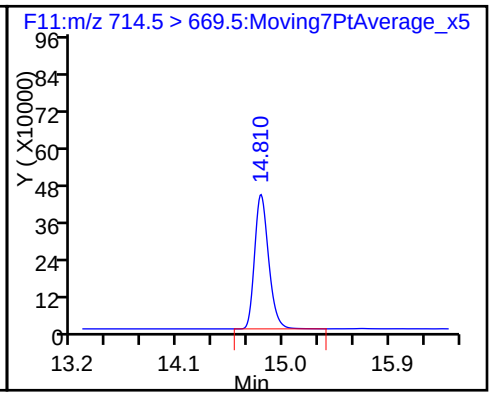
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_007.d
Lims ID: Std L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 26-Feb-2016 17:48:56 ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L2
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:17:10 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.7 > 168.6	6.023	6.043	-0.020	1.000	40095	0.8300		83.0	112	
36 Perfluorooctandecanoic acid										
212.7 > 168.6	6.023	6.043	-0.020	1.000	40095	0.8693		86.9	112	
34 Perfluorohexadecanoic acid										
212.7 > 168.6	6.023	6.043	-0.020	1.000	40095	0.8693		86.9	112	
D 35 13C2-PFHxDA										
212.7 > 168.6	6.023	6.043	-0.020		40095	0.5708		1.1	112	
D 1 13C4 PFBA										
216.7 > 171.5	6.023	6.043	-0.020		4930149	53.5		107	14775	
D 3 13C5-PFPeA										
267.6 > 222.7	7.240	7.272	-0.032		3261520	54.1		108	7856	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.245	7.275	-0.030	1.000	31294	0.9686		96.9	15.3	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.369	7.404	-0.035	1.000	17357	NC			30.3	
298.8 > 98.6	7.369	7.404	-0.035	1.000	15061		1.15(0.00-0.00)		34.1	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.369	7.404	-0.035	1.000	17357	0.7483		84.7		
7 Perfluorohexanoic acid										
312.9 > 268.7	8.550	8.604	-0.054	1.000	44019	1.09		109	176	
D 6 13C2 PFHxA										
314.6 > 269.7	8.558	8.604	-0.046		4372033	54.2		108	8690	
D 8 13C4-PFHpA										
366.6 > 321.6	9.799	9.856	-0.057		3714051	54.7		109	6533	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.808	9.859	-0.051	1.000	34377	0.9039		90.4	73.9	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.833	9.892	-0.059	1.000	42670	1.09		115		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.833	9.892	-0.059	1.000	42670	NC			83.9	
D 11 18O2 PFHxS										
402.5 > 83.6	9.825	9.892	-0.067		1830168	50.5		107	4022	
D 12 13C4 PFOA										
416.5 > 371.6	10.895	10.958	-0.063		4538141	57.9		116	6277	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.895	10.958	-0.063	1.000	43783	0.9182		91.8	29.7	
412.8 > 168.7	10.904	10.958	-0.054	1.001	14847		2.95(0.00-0.00)	91.8	56.8	
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.895	10.960	-0.065	1.000	42820	NC			211	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.895	10.960	-0.065	1.000	42820	1.08		113		
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.819	11.874	-0.055	1.000	52257	0.8504		89.0	158	
498.3 > 98.2	11.819	11.874	-0.055	1.000	29878		1.75(0.00-0.00)	89.0	76.9	
D 16 13C4 PFOS										
502.4 > 79.7	11.819	11.876	-0.057		786520	48.2		101	1567	
D 17 13C5 PFNA										
467.5 > 422.6	11.844	11.898	-0.054		3624410	55.9		112	4469	
18 Perfluorononanoic acid										
462.5 > 418.6	11.844	11.899	-0.055	1.000	55348	0.99		99.1	81.8	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.641	12.693	-0.052	1.000	66890	0.8401		84.0	126	
D 19 13C2 PFDA										
514.4 > 469.5	12.641	12.693	-0.052		4524534	56.0		112	5090	
D 23 13C8 FOSA										
505.4 > 77.6	13.174	13.222	-0.048		6185554	54.7		109	3864	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.174	13.222	-0.048	1.000	92552	0.8172		81.7	245	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.278	13.324	-0.046	1.000	26055	NC			91.9	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.278	13.324	-0.046	1.000	26055	1.00		104		
D 26 13C2 PFUnA										
564.3 > 519.5	13.319	13.369	-0.050		4401956	57.1		114	4364	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.330	13.372	-0.042	1.000	86849	0.8984		89.8	115	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.899	13.937	-0.038	1.000	58610	0.8026		80.3	44.1	
D 28 13C2 PFDoA										
614.4 > 569.4	13.899	13.939	-0.040		4552925	53.4		107	2649	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.395	14.430	-0.035	1.000	70711	0.9897		99.0	68.6	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.810	14.841	-0.031	1.000	44638	1.31		131	46.8	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.819	14.844	-0.025		3955936	57.3		115	3035	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L2_00018 Amount Added: 1.00 Units: mL

Report Date: 29-Feb-2016 10:17:13 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_007.d

Injection Date: 26-Feb-2016 17:48:56 Instrument ID: A4

Lims ID: Std L2

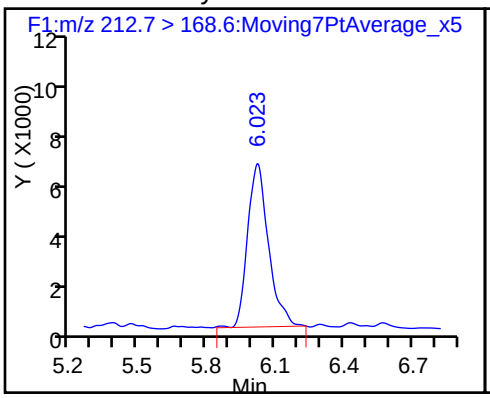
Client ID:

Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 3

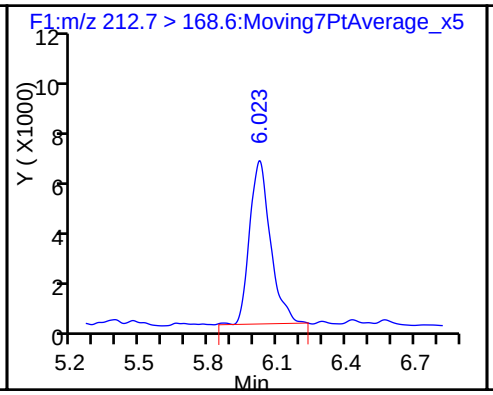
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

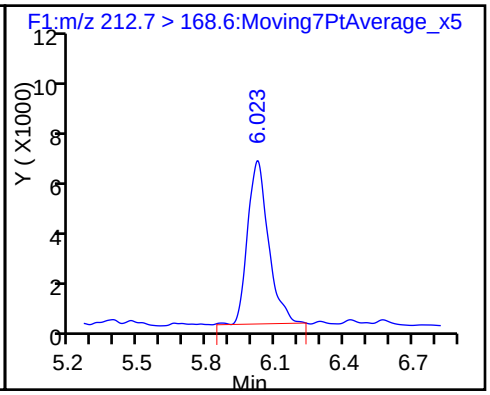
2 Perfluorobutyric acid



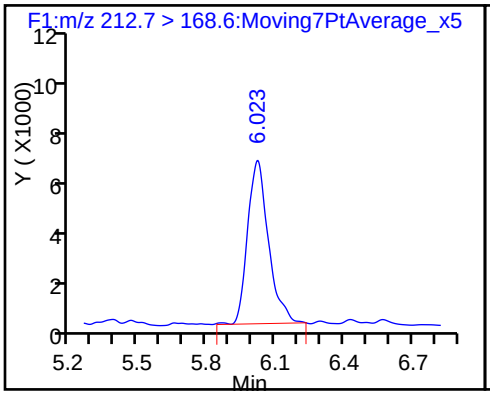
36 Perfluorooctandecanoic acid



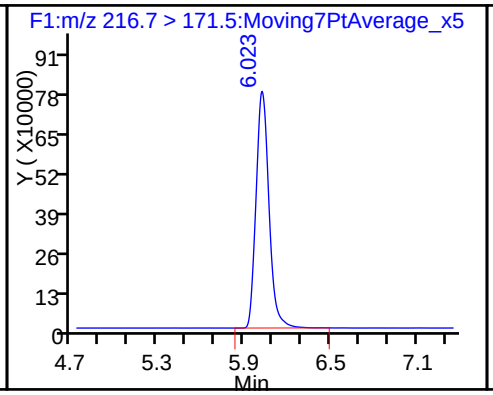
34 Perfluorohexadecanoic acid



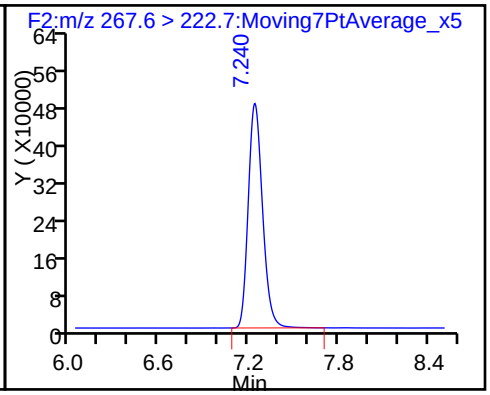
D 35 13C2-PFHxDA



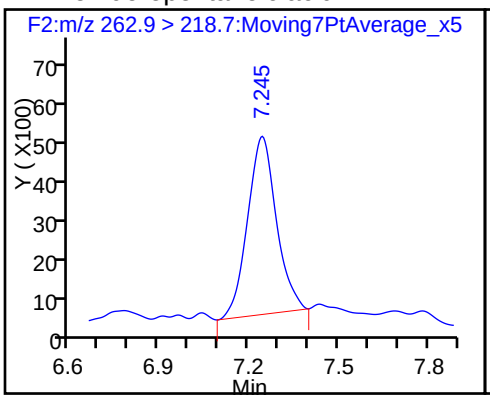
D 1 13C4 PFBA



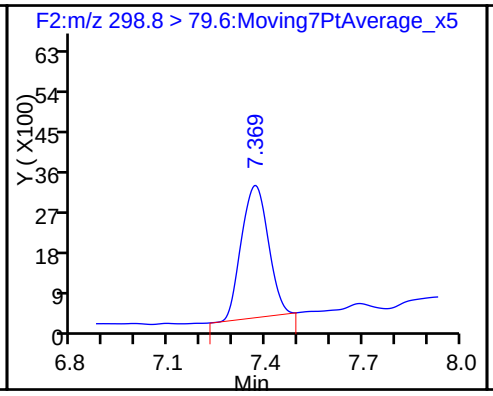
D 3 13C5-PFPeA



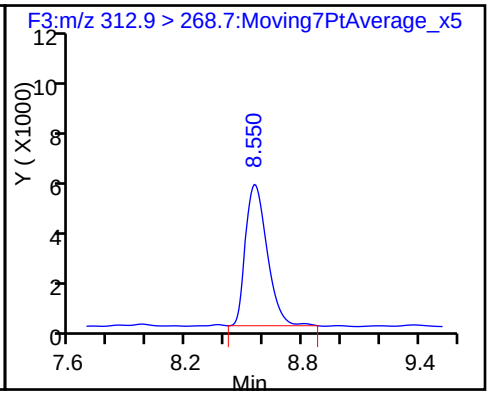
4 Perfluoropentanoic acid



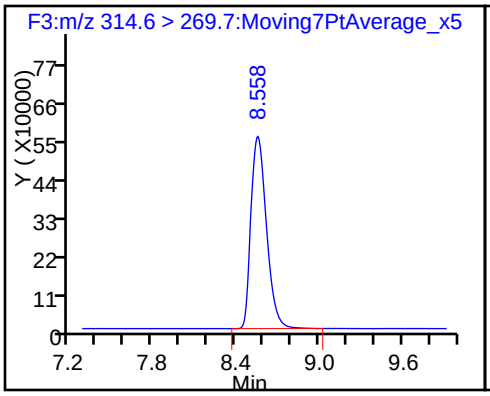
51 Perfluorobutanesulfonic acid



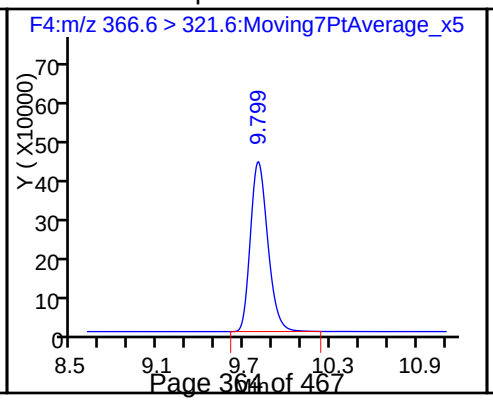
7 Perfluorohexanoic acid



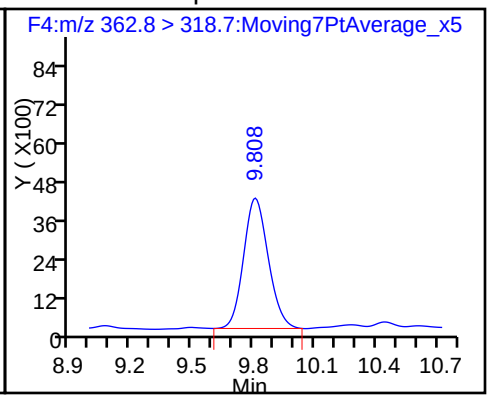
D 6 13C2 PFHxA



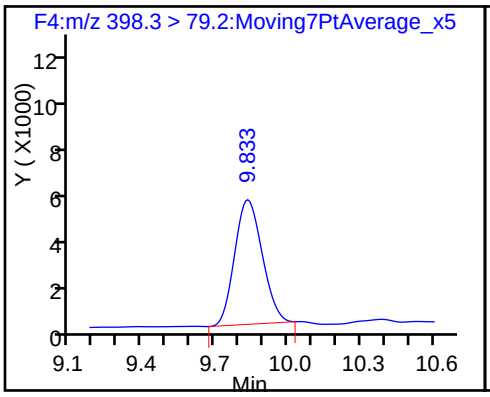
D 8 13C4-PFHpA



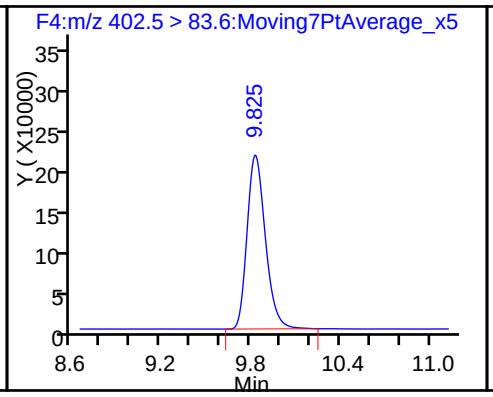
9 Perfluoroheptanoic acid



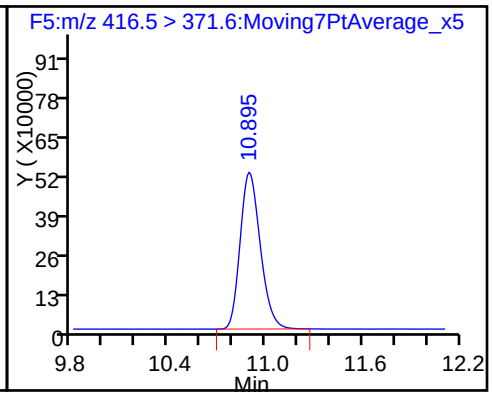
58 Perfluorohexanesulfonic acid



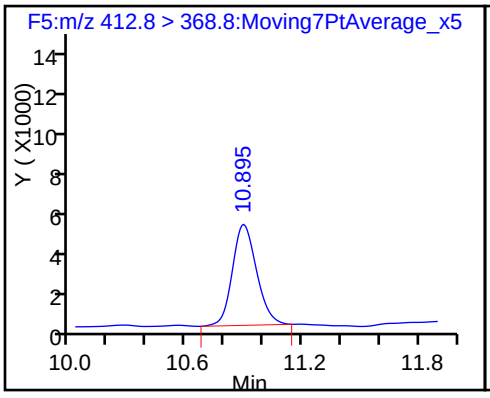
D 11 18O2 PFHxS



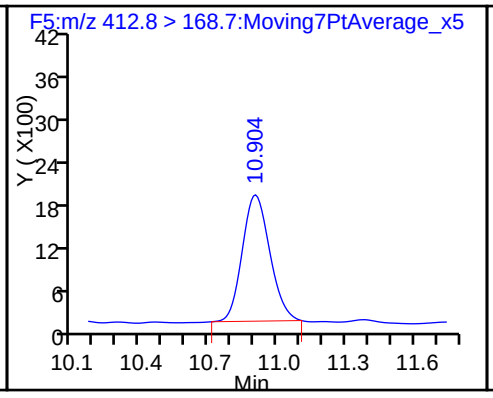
D 12 13C4 PFOA



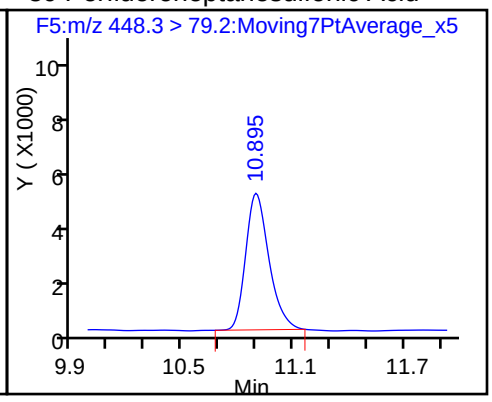
13 Perfluorooctanoic acid



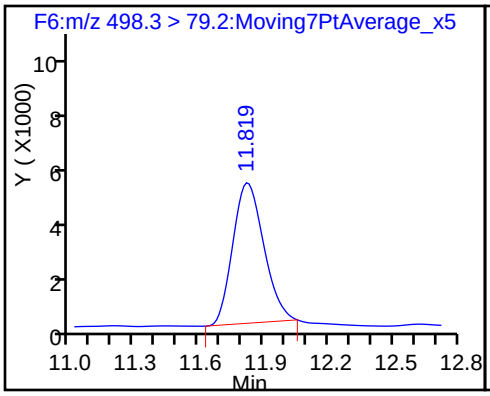
13 Perfluorooctanoic acid



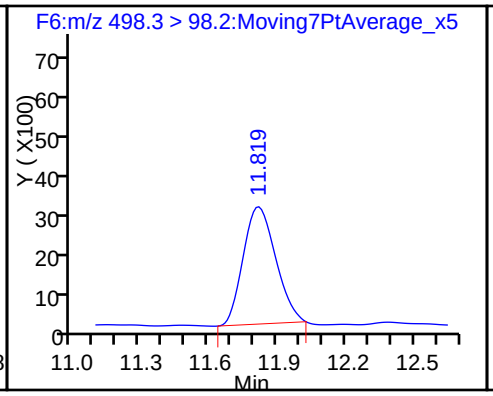
39 Perfluoroheptanesulfonic Acid



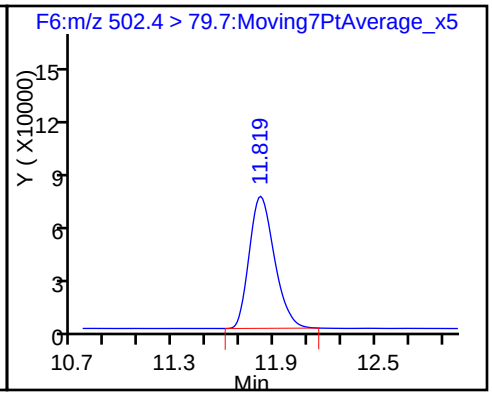
15 Perfluorooctane sulfonic acid



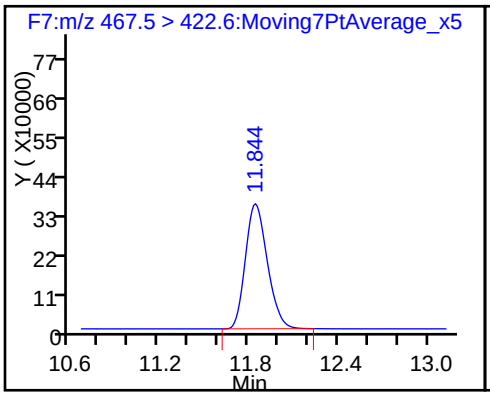
15 Perfluorooctane sulfonic acid



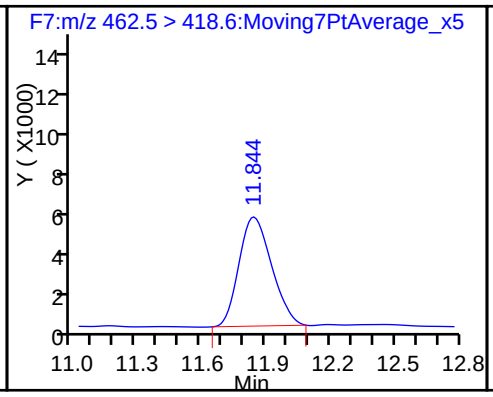
D 16 13C4 PFOS



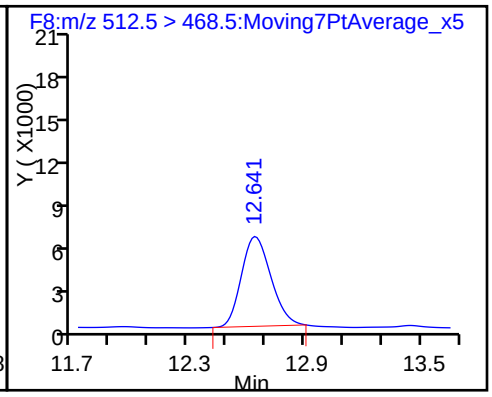
D 17 13C5 PFNA



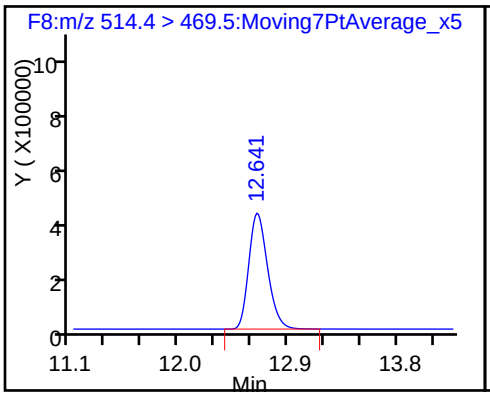
18 Perfluorononanoic acid



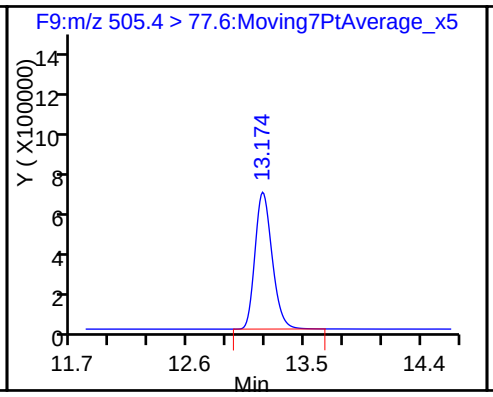
20 Perfluorodecanoic acid



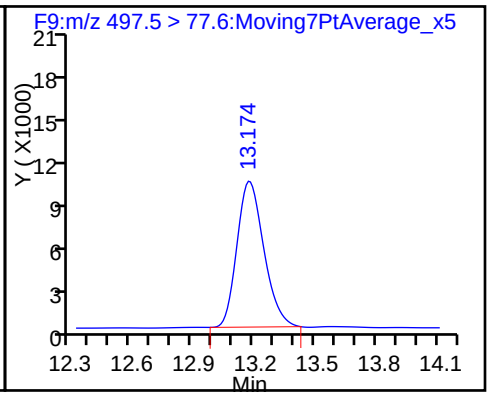
D 19 13C2 PFDA



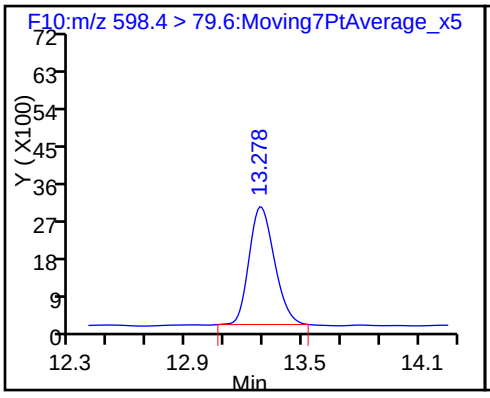
D 23 13C8 FOSA



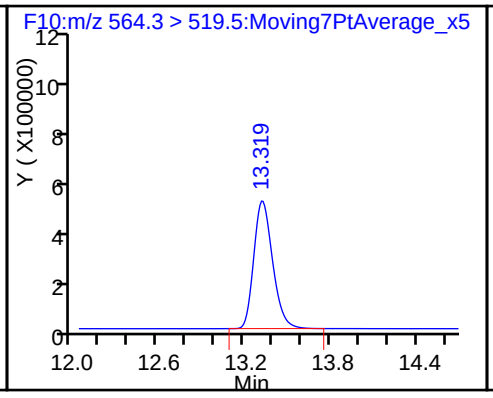
24 Perfluorooctane Sulfonamide



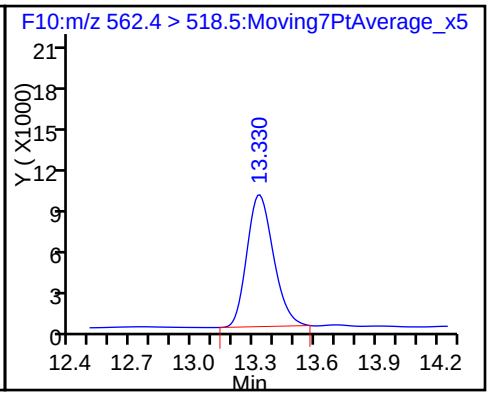
49 Perfluorodecane Sulfonic acid



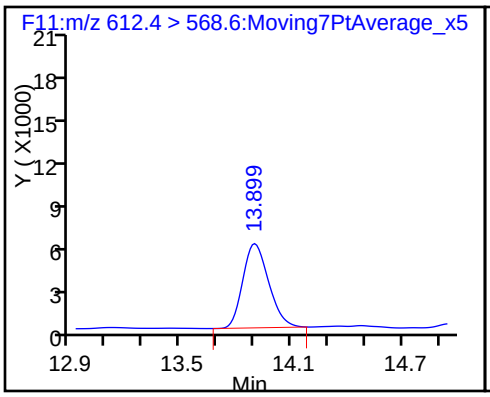
D 26 13C2 PFUnA



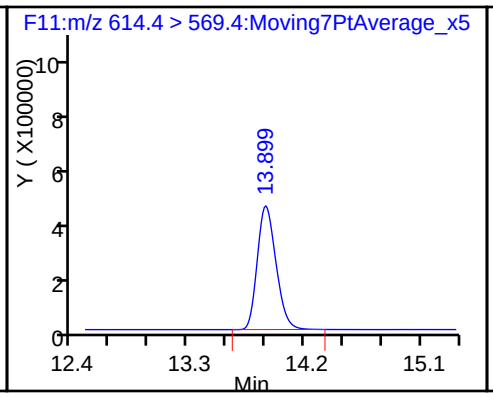
27 Perfluoroundecanoic acid



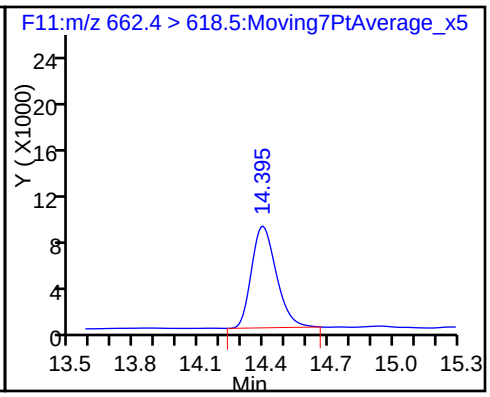
29 Perfluorododecanoic acid



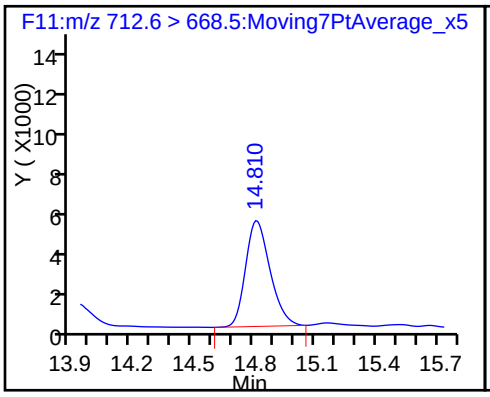
D 28 13C2 PFDoA



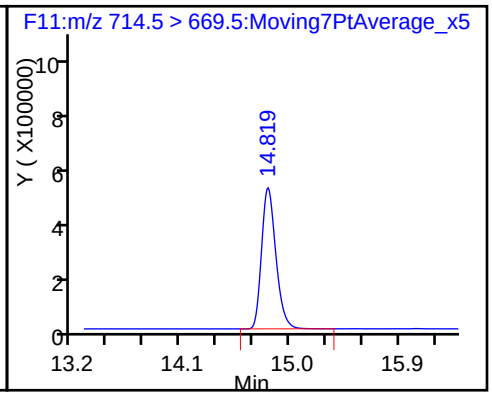
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_008.d
Lims ID: Std L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 26-Feb-2016 18:10:07 ALS Bottle#: 4 Worklist Smp#: 4
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L3
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:17:20 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.7 > 168.6	5.990	6.043	-0.053	1.000	238292	5.12		102	604	
36 Perfluorooctandecanoic acid										
212.7 > 168.6	5.990	6.043	-0.053	1.000	238292	5.22		104	604	
34 Perfluorohexadecanoic acid										
212.7 > 168.6	5.990	6.043	-0.053	1.000	238292	5.22		104	604	
D 35 13C2-PFHxDA										
212.7 > 168.6	5.990	6.043	-0.053		238292	3.39		6.8	604	
D 1 13C4 PFBA										
216.7 > 171.5	5.987	6.043	-0.056		4746061	51.5		103	14547	
D 3 13C5-PFPeA										
267.6 > 222.7	7.194	7.272	-0.078		3033360	50.3		101	5923	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.198	7.275	-0.077	1.000	149651	4.98		99.6	85.6	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.318	7.404	-0.086	1.000	99563	NC			174	
298.8 > 98.6	7.318	7.404	-0.086	1.000	64987		1.53(0.00-0.00)		103	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.318	7.404	-0.086	1.000	99563	4.49		102		
7 Perfluorohexanoic acid										
312.9 > 268.7	8.497	8.604	-0.107	1.000	191384	4.96		99.2	450	
D 6 13C2 PFHxA										
314.6 > 269.7	8.497	8.604	-0.107		4157743	51.6		103	8734	
D 8 13C4-PFHpA										
366.6 > 321.6	9.731	9.856	-0.125		3567999	52.5		105	5760	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.740	9.859	-0.119	1.000	178208	4.69		93.8	291	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.765	9.892	-0.127	1.000	181632	4.84		102		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.765	9.892	-0.127	1.000	181632	NC			437	
D 11 18O2 PFHxS										
402.5 > 83.6	9.765	9.892	-0.127		1748784	48.2		102	2500	
D 12 13C4 PFOA										
416.5 > 371.6	10.831	10.958	-0.127		4019997	51.3		103	7451	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.831	10.958	-0.127	1.000	200616	4.75		95.0	195	
412.8 > 168.7	10.831	10.958	-0.127	1.000	67115		2.99(0.00-0.00)	95.0	204	
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.831	10.960	-0.129	1.000	204808	NC			908	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.831	10.960	-0.129	1.000	204808	5.28		111		
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.748	11.874	-0.126	1.000	302690	5.05		106	648	
498.3 > 98.2	11.748	11.874	-0.126	1.000	188184		1.61(0.00-0.00)	106	655	
D 16 13C4 PFOS										
502.4 > 79.7	11.748	11.876	-0.128		767723	47.1		98.5	1709	
D 17 13C5 PFNA										
467.5 > 422.6	11.772	11.898	-0.126		3473506	53.6		107	5995	
18 Perfluorononanoic acid										
462.5 > 418.6	11.772	11.899	-0.127	1.000	359937	5.16		103	421	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.577	12.693	-0.116	1.000	381807	4.95		99.0	913	
D 19 13C2 PFDA										
514.4 > 469.5	12.577	12.693	-0.116		4384792	54.3		109	5193	
D 23 13C8 FOSA										
505.4 > 77.6	13.111	13.222	-0.111		5884275	52.0		104	3089	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.111	13.222	-0.111	1.000	567602	5.27		105	1109	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.227	13.324	-0.097	1.000	141540	NC			505	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.227	13.324	-0.097	1.000	141540	5.55		115		
D 26 13C2 PFUnA										
564.3 > 519.5	13.268	13.369	-0.101		4179654	54.2		108	4545	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.268	13.372	-0.104	1.000	443678	4.83		96.7	490	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.840	13.937	-0.097	1.000	369734	5.12		102	270	
D 28 13C2 PFDoA										
614.4 > 569.4	13.852	13.939	-0.087		4504852	52.8		106	2671	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.340	14.430	-0.090	1.000	371742	5.26		105	303	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.764	14.841	-0.077	1.000	161570	4.81		96.1	181	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.764	14.844	-0.080		3625950	52.5		105	2692	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L3_00016 Amount Added: 1.00 Units: mL

Report Date: 29-Feb-2016 10:17:24 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_008.d

Injection Date: 26-Feb-2016 18:10:07 Instrument ID: A4

Lims ID: Std L3

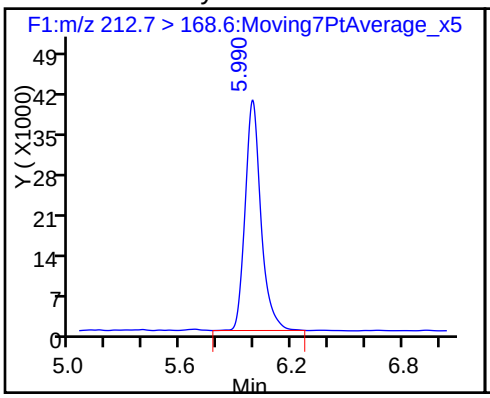
Client ID:

Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 4

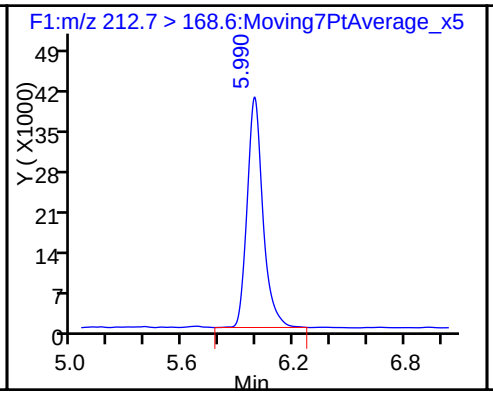
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

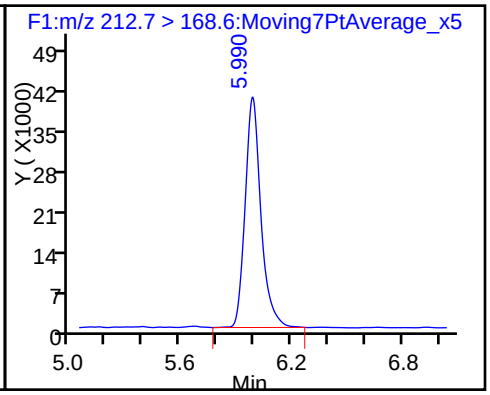
2 Perfluorobutyric acid



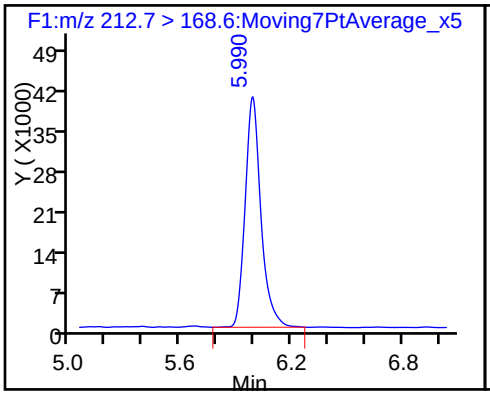
36 Perfluorooctandecanoic acid



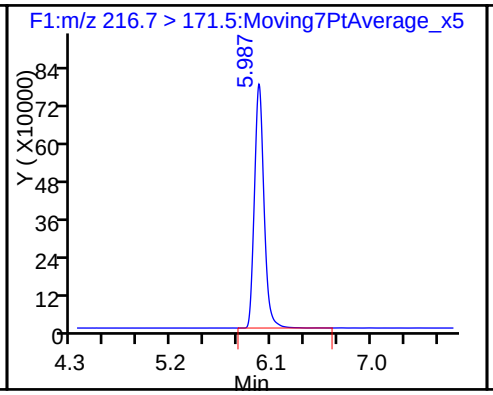
34 Perfluorohexadecanoic acid



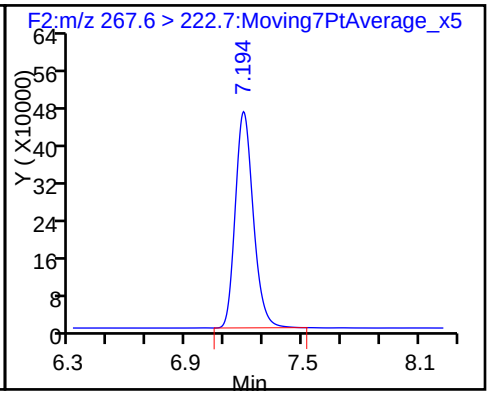
D 35 13C2-PFHxDA



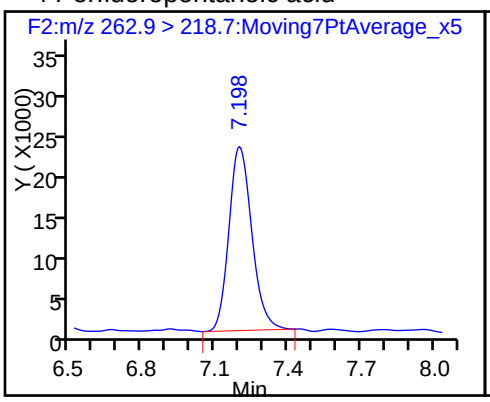
D 1 13C4 PFBA



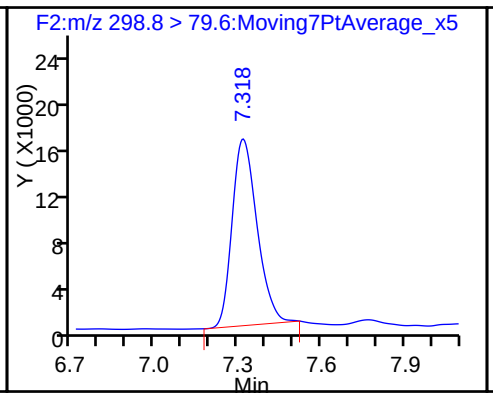
D 3 13C5-PFPeA



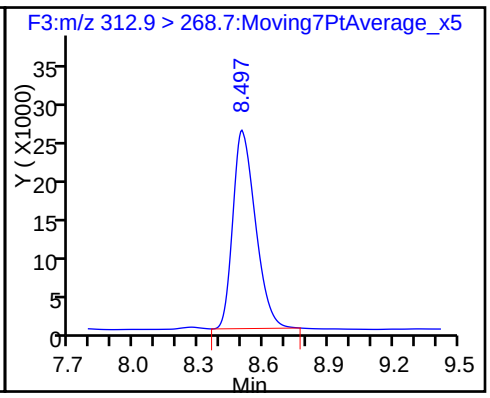
4 Perfluoropentanoic acid



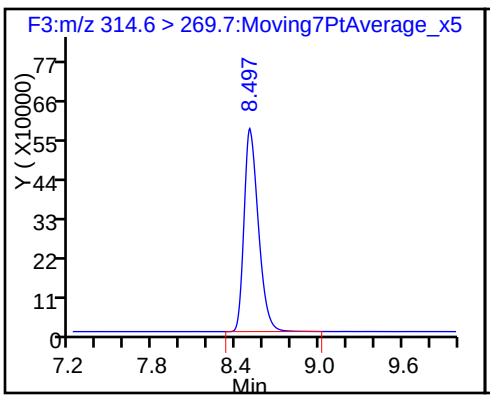
51 Perfluorobutanesulfonic acid



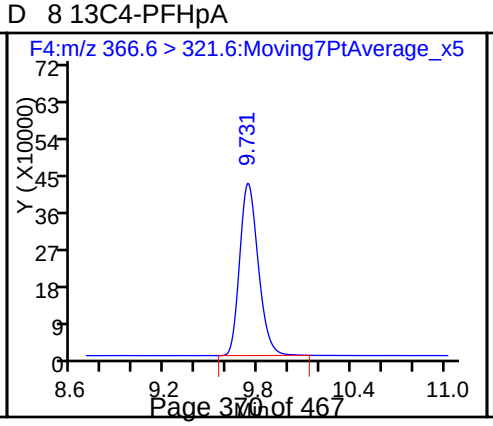
7 Perfluorohexanoic acid



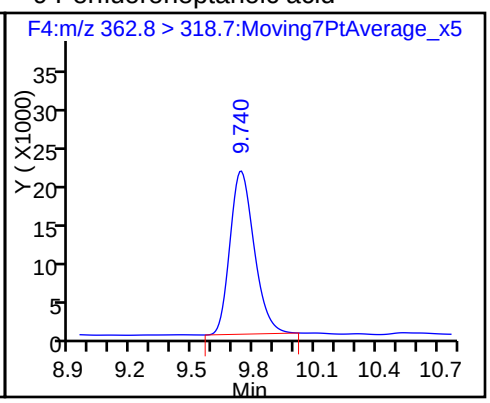
D 6 13C2 PFHxA



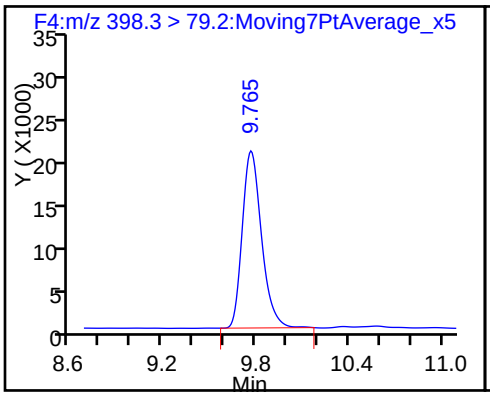
D 8 13C4-PFHpA



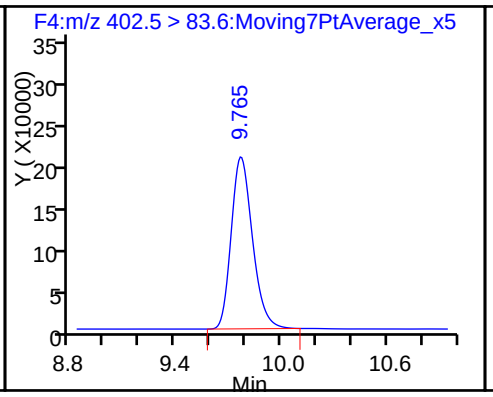
9 Perfluoroheptanoic acid



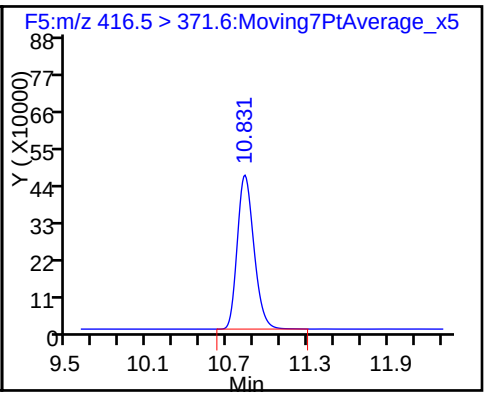
58 Perfluorohexanesulfonic acid



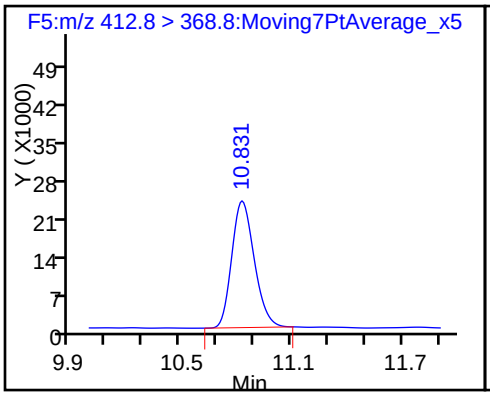
D 11 18O2 PFHxS



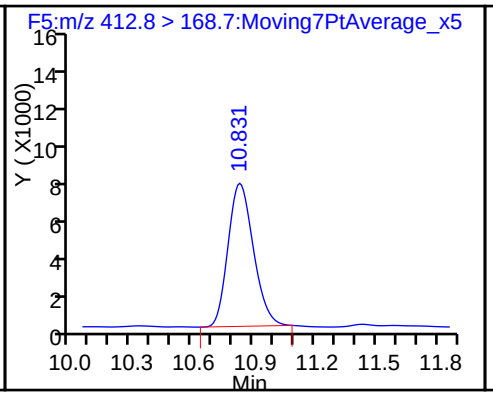
D 12 13C4 PFOA



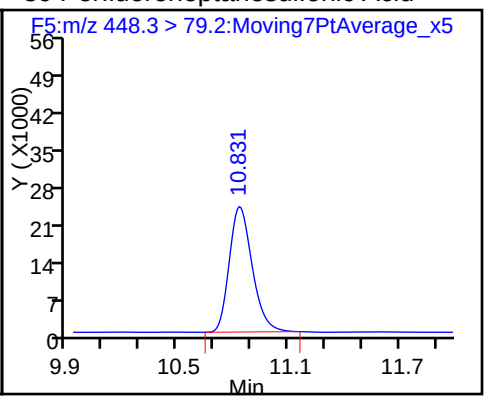
13 Perfluorooctanoic acid



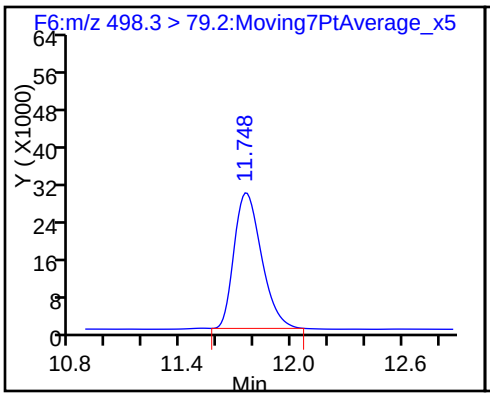
13 Perfluorooctanoic acid



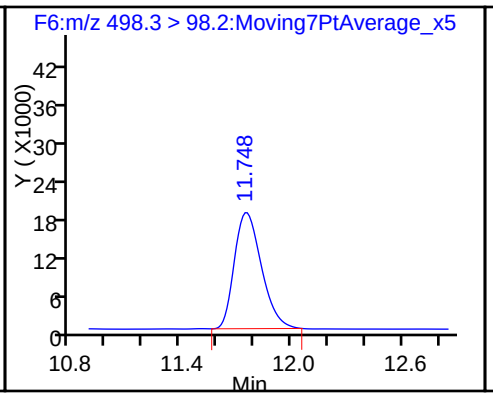
39 Perfluoroheptanesulfonic Acid



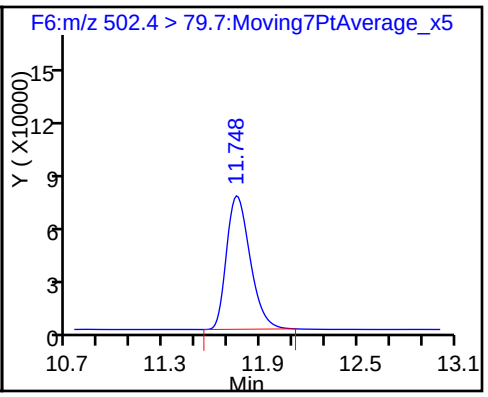
15 Perfluorooctane sulfonic acid



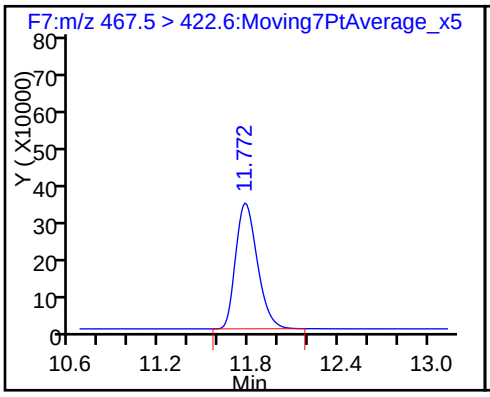
15 Perfluorooctane sulfonic acid



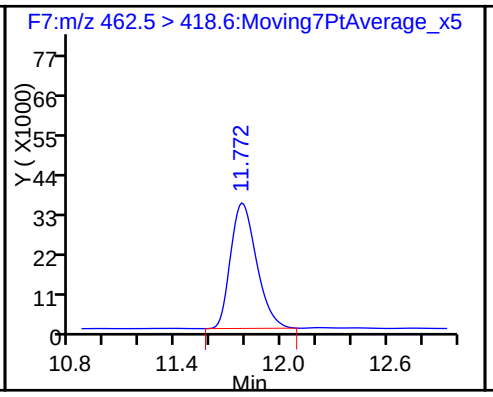
D 16 13C4 PFOS



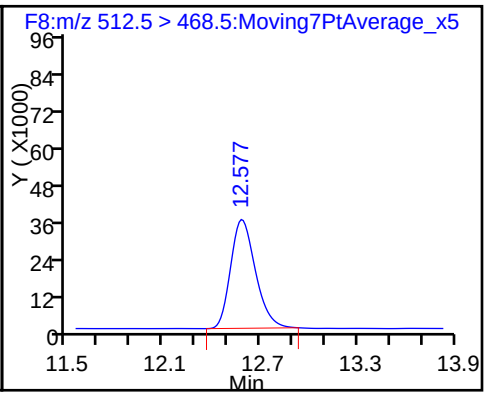
D 17 13C5 PFNA



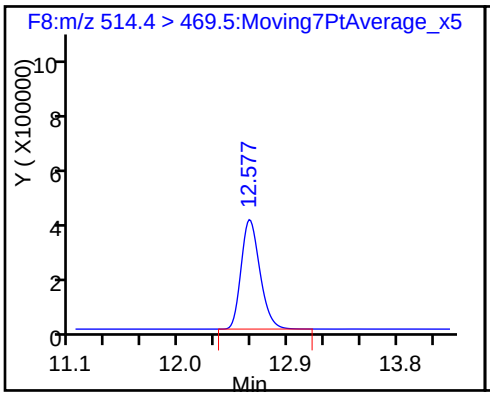
18 Perfluorononanoic acid



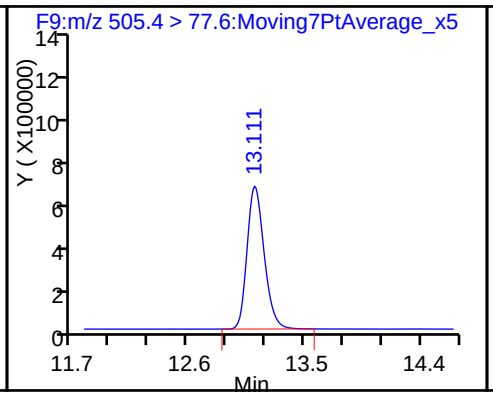
20 Perfluorodecanoic acid



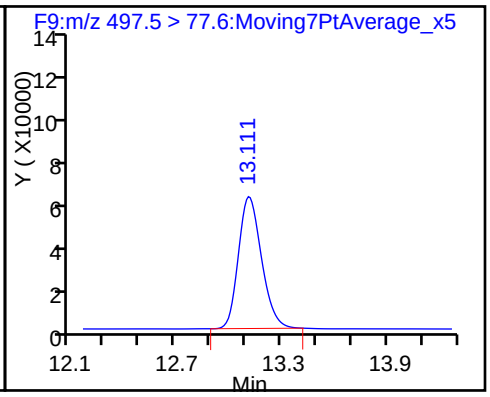
D 19 13C2 PFDA



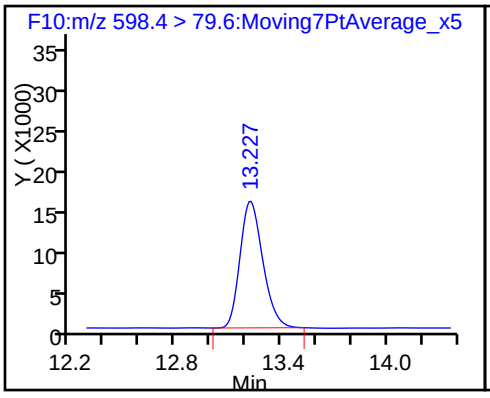
D 23 13C8 FOSA



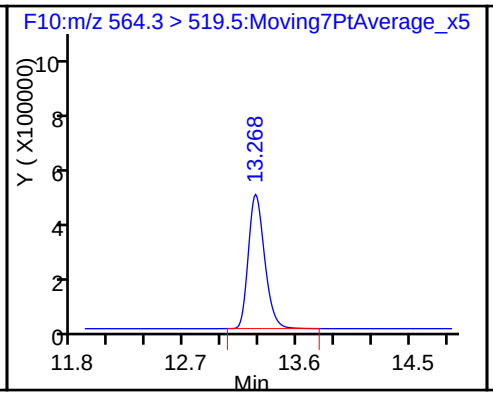
24 Perfluorooctane Sulfonamide



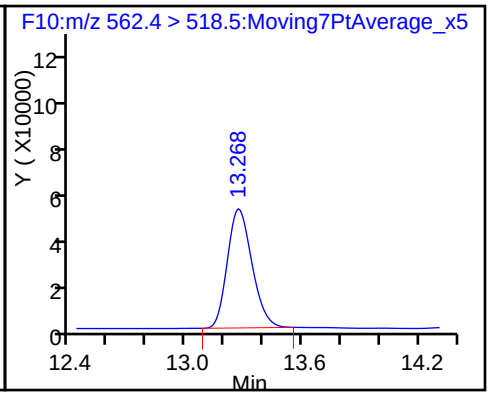
49 Perfluorodecane Sulfonic acid



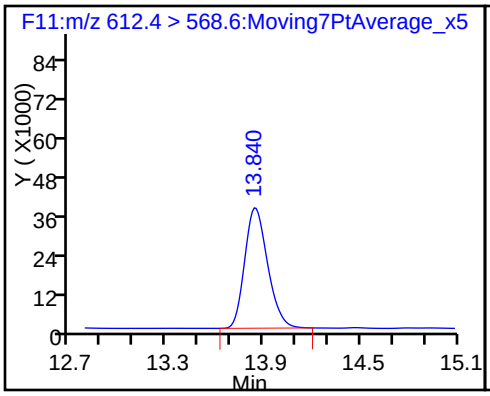
D 26 13C2 PFUnA



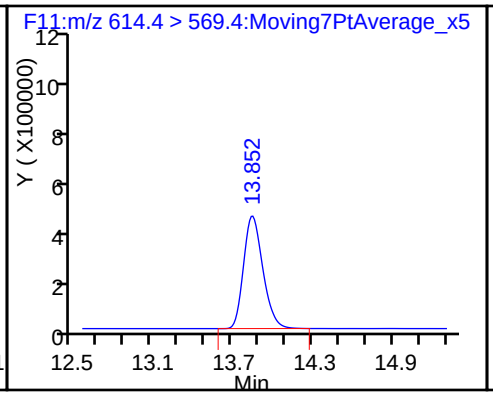
27 Perfluoroundecanoic acid



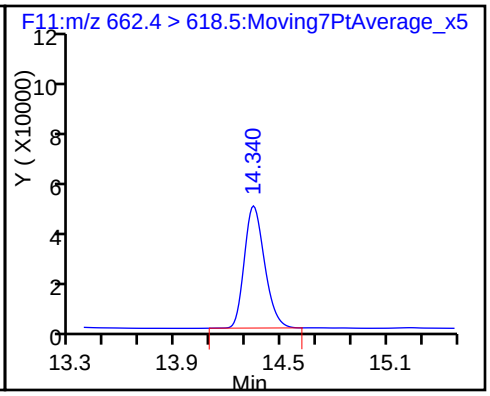
29 Perfluorododecanoic acid



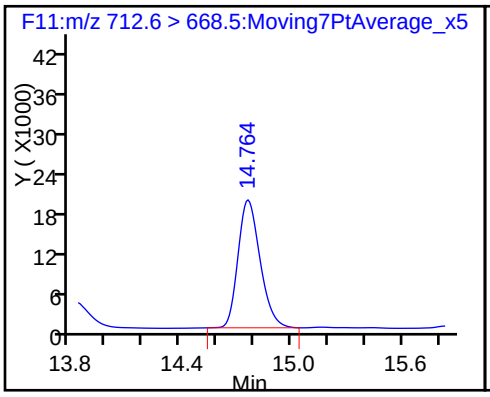
D 28 13C2 PFDoA



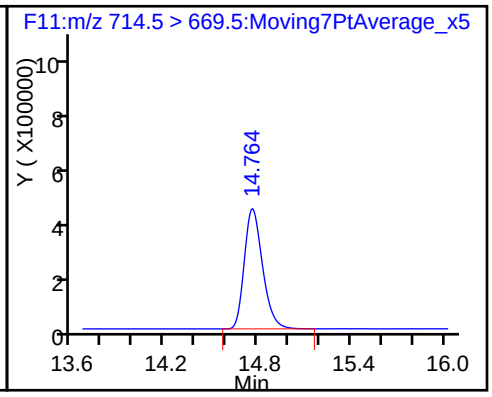
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_009.d
Lims ID: Std L4
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 26-Feb-2016 18:31:18 ALS Bottle#: 5 Worklist Smp#: 5
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L4
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:17:33 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 10:56:52

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.7 > 168.6	5.996	6.043	-0.047	1.000	987601	21.2		106	2450	
36 Perfluorooctandecanoic acid										
212.7 > 168.6	5.996	6.043	-0.047	1.000	987601	20.8		104	2450	
34 Perfluorohexadecanoic acid										
212.7 > 168.6	5.996	6.043	-0.047	1.000	987601	20.8		104	2450	
D 35 13C2-PFHxDA										
212.7 > 168.6	5.996	6.043	-0.047		987601	14.1		28.1	2450	
D 1 13C4 PFBA										
216.7 > 171.5	5.996	6.043	-0.047		4749707	51.6		103	14252	
D 3 13C5-PFPeA										
267.6 > 222.7	7.208	7.272	-0.064		3139219	52.1		104	8664	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.208	7.275	-0.067	1.000	608776	19.6		97.9	392	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.332	7.404	-0.072	1.000	453215	NC			745	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.332	7.404	-0.072	1.000	453215	18.6		105		
7 Perfluorohexanoic acid										
312.9 > 268.7	8.511	8.604	-0.093	1.000	772331	19.5		97.7	1194	
D 6 13C2 PFHxA										
314.6 > 269.7	8.511	8.604	-0.093		4261075	52.9		106	6973	
D 8 13C4-PFHpA										
366.6 > 321.6	9.748	9.856	-0.108		3537280	52.1		104	4941	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.748	9.859	-0.111	1.000	851417	22.4		112	1651	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.782	9.892	-0.110	1.000	725283	17.6		92.8		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.782	9.892	-0.110	1.000	725283	NC			1186	
D 11 18O2 PFHxS										
402.5 > 83.6	9.782	9.892	-0.110		1927158	53.1		112	3300	
D 12 13C4 PFOA										
416.5 > 371.6	10.849	10.958	-0.109		4052200	51.7		103	4531	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.849	10.958	-0.109	1.000	865013	20.3		102	829	
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.849	10.960	-0.111	1.000	812643	NC			2222	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.849	10.960	-0.111	1.000	812643	17.8		93.6		
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.771	11.874	-0.103	1.000	1182197	16.8		87.7	1636	
D 16 13C4 PFOS										
502.4 > 79.7	11.771	11.876	-0.105		901914	55.3		116	2369	
D 17 13C5 PFNA										
467.5 > 422.6	11.796	11.898	-0.102		3494609	53.9		108	3849	
18 Perfluorononanoic acid										
462.5 > 418.6	11.796	11.899	-0.103	1.000	1578862	21.6		108	1611	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.603	12.693	-0.090	1.000	1548111	21.6		108	2076	
D 19 13C2 PFDA										
514.4 > 469.5	12.603	12.693	-0.090		4065096	50.3		101	4492	
D 23 13C8 FOSA										
505.4 > 77.6	13.132	13.222	-0.090		5987305	52.9		106	4502	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.132	13.222	-0.090	1.000	2337995	21.3		107	2509	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.237	13.324	-0.087	1.000	559426	NC			1718	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.237	13.324	-0.087	1.000	559426	18.7		96.9		
D 26 13C2 PFUnA										
564.3 > 519.5	13.288	13.369	-0.081		3964757	51.4		103	3923	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.288	13.372	-0.084	1.000	1680391	19.3		96.5	1519	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.864	13.937	-0.073	1.000	1514507	20.1		101	919	
D 28 13C2 PFDoA										
614.4 > 569.4	13.864	13.939	-0.075		4686949	55.0		110	3274	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.359	14.430	-0.071	1.000	1521555	20.7		103	1013	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.782	14.841	-0.059	1.000	655399	18.7		93.7	653	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.782	14.844	-0.062		3651029	52.9		106	2562	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00017 Amount Added: 1.00 Units: mL

Report Date: 29-Feb-2016 10:17:34 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_009.d

Injection Date: 26-Feb-2016 18:31:18 Instrument ID: A4

Lims ID: Std L4

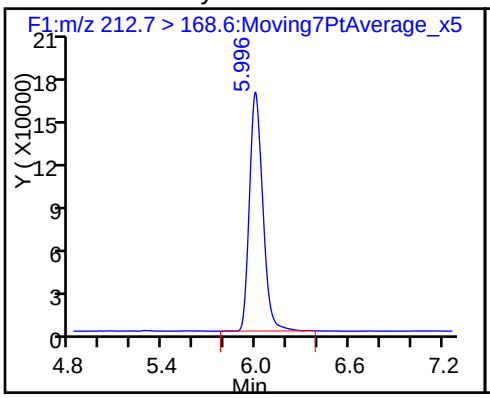
Client ID:

Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 5

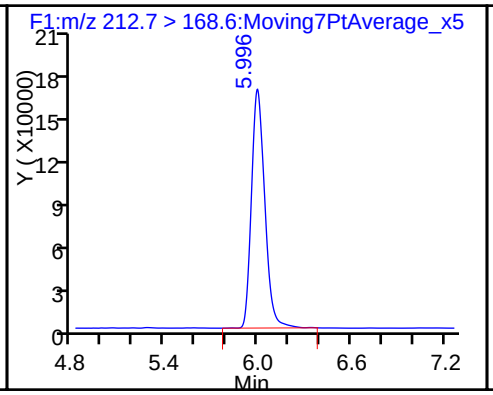
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

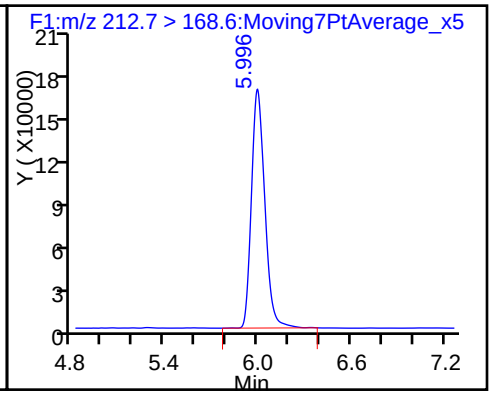
2 Perfluorobutyric acid



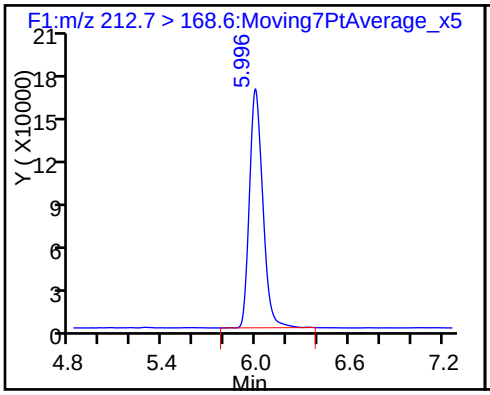
36 Perfluorooctandecanoic acid



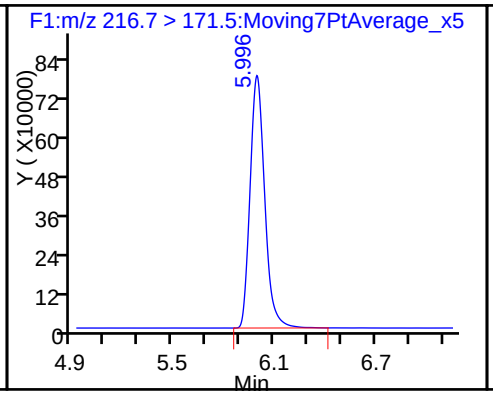
34 Perfluorohexadecanoic acid



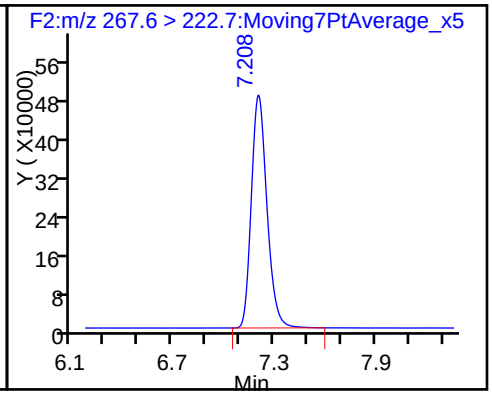
D 35 13C2-PFHxDA



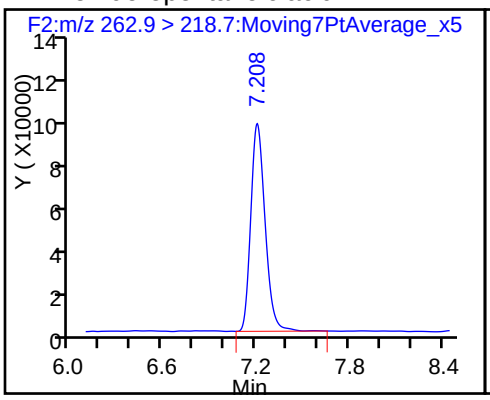
D 1 13C4 PFBA



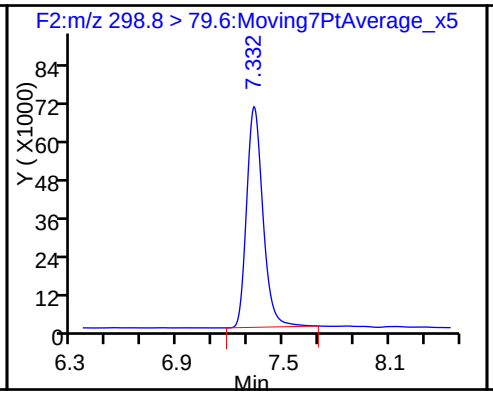
D 3 13C5-PFPeA



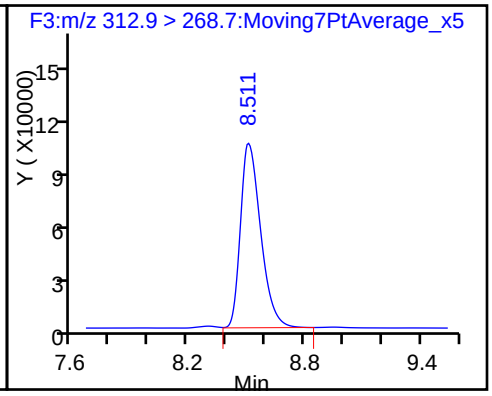
4 Perfluoropentanoic acid



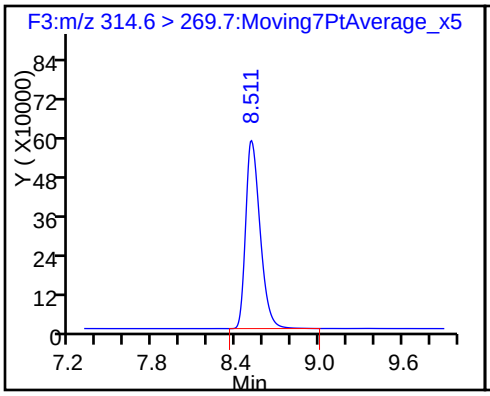
51 Perfluorobutanesulfonic acid



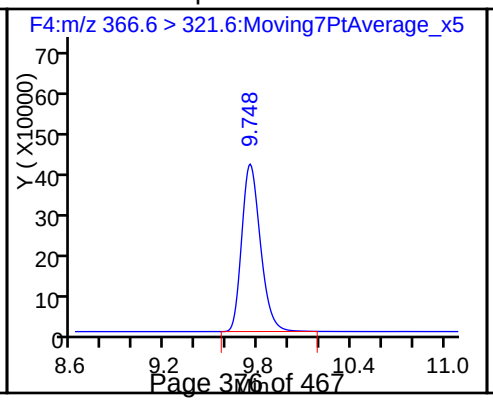
7 Perfluorohexanoic acid



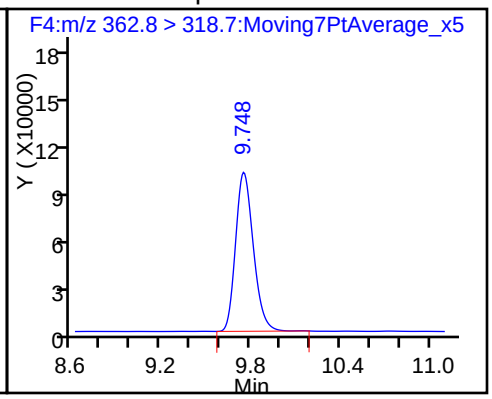
D 6 13C2 PFHxA



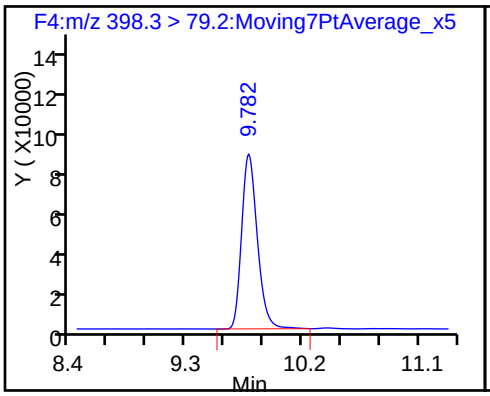
D 8 13C4-PFHpA



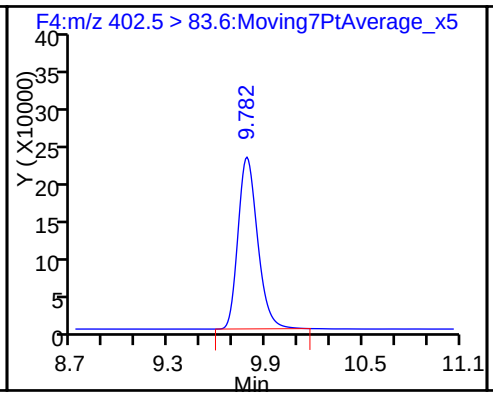
9 Perfluoroheptanoic acid



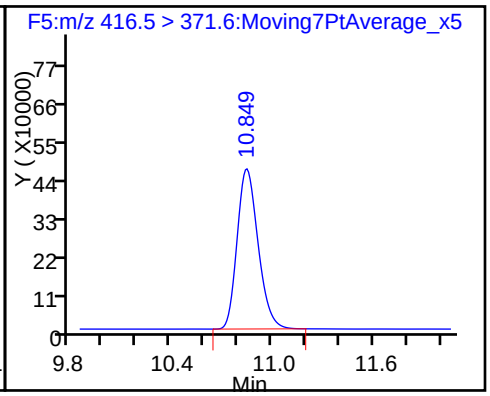
58 Perfluorohexanesulfonic acid



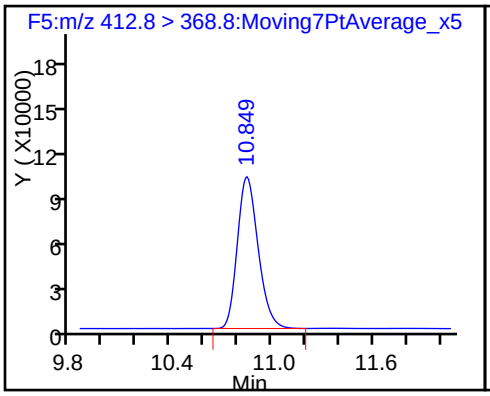
D 11 18O2 PFHxS



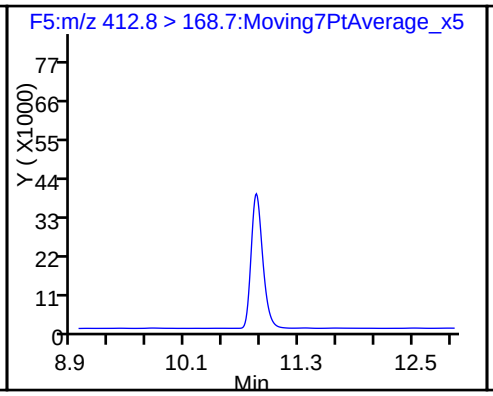
D 12 13C4 PFOA



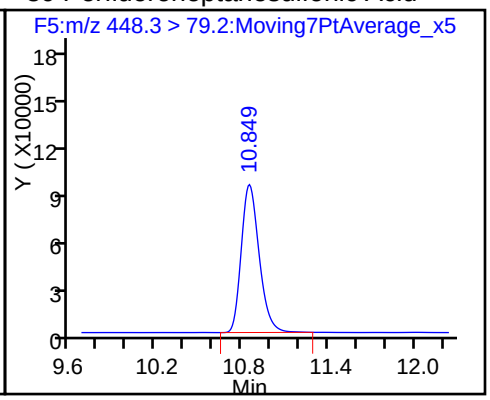
13 Perfluorooctanoic acid



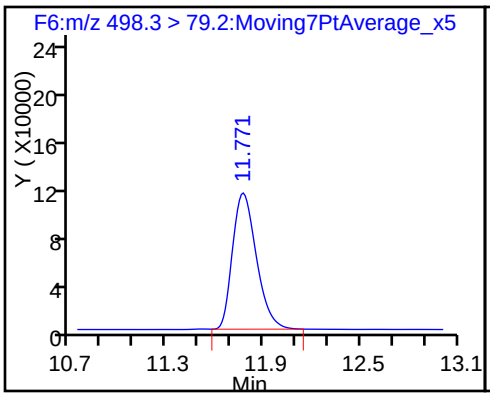
13 Perfluorooctanoic acid



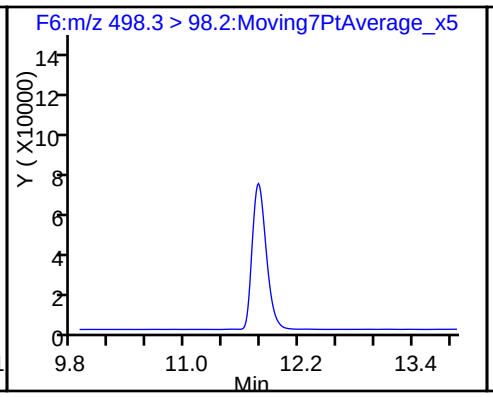
39 Perfluoroheptanesulfonic Acid



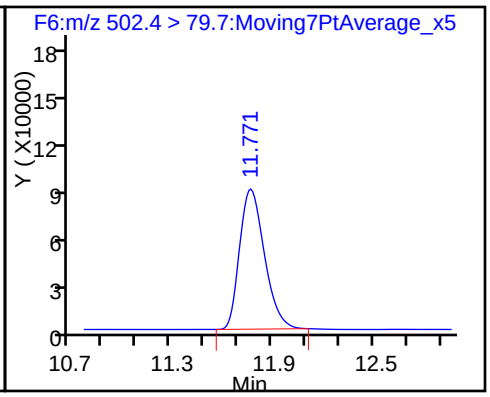
15 Perfluorooctane sulfonic acid



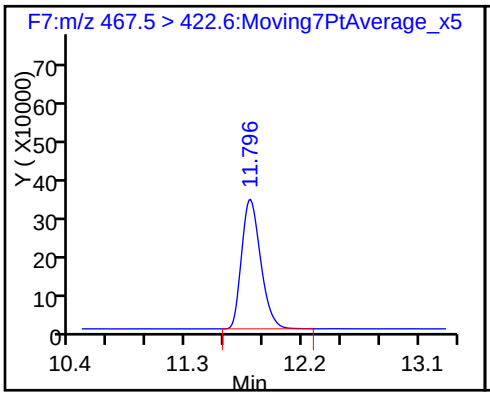
15 Perfluorooctane sulfonic acid



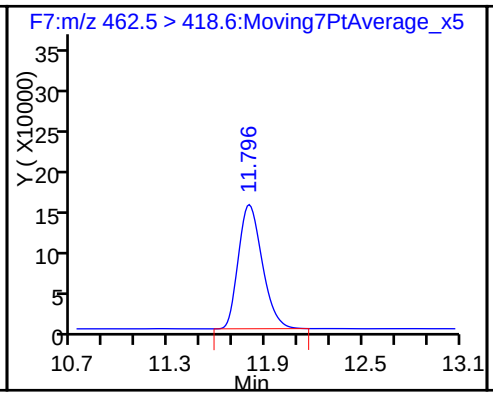
D 16 13C4 PFOS



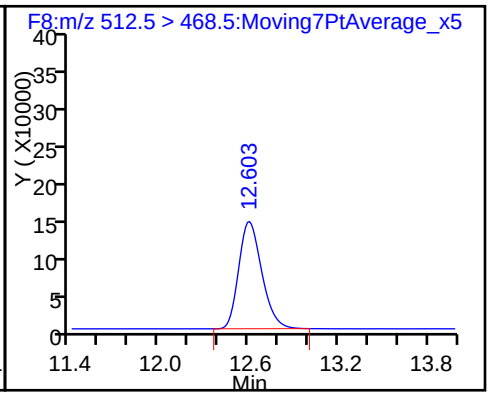
D 17 13C5 PFNA



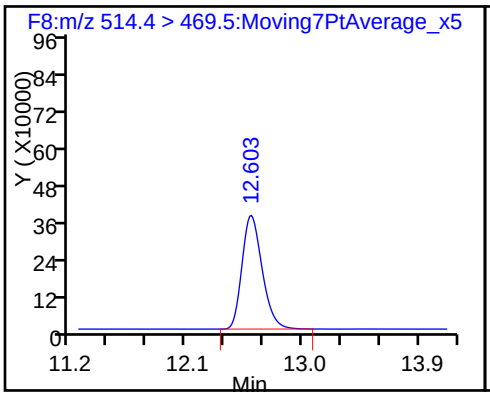
18 Perfluorononanoic acid



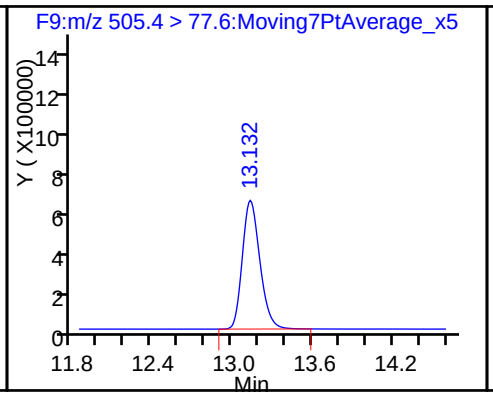
20 Perfluorodecanoic acid



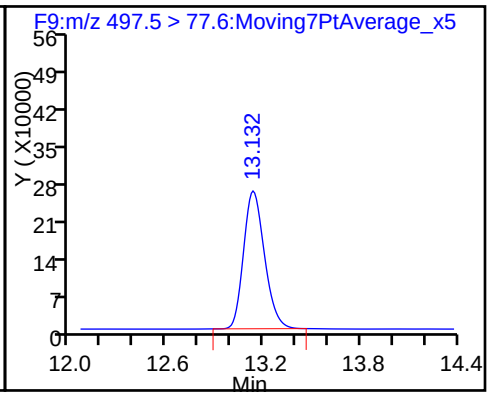
D 19 13C2 PFDA



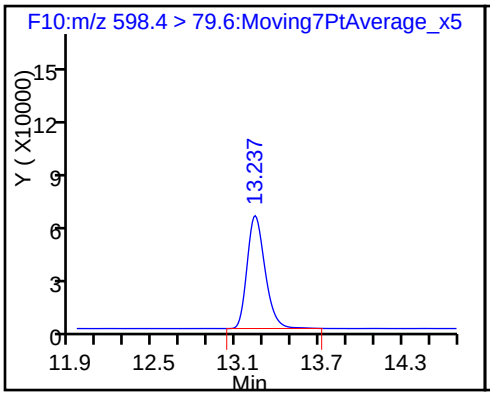
D 23 13C8 FOSA



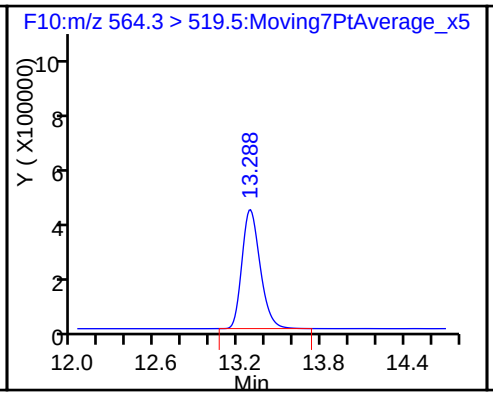
24 Perfluorooctane Sulfonamide



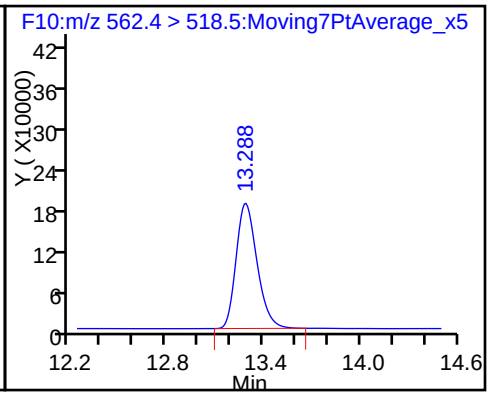
49 Perfluorodecane Sulfonic acid



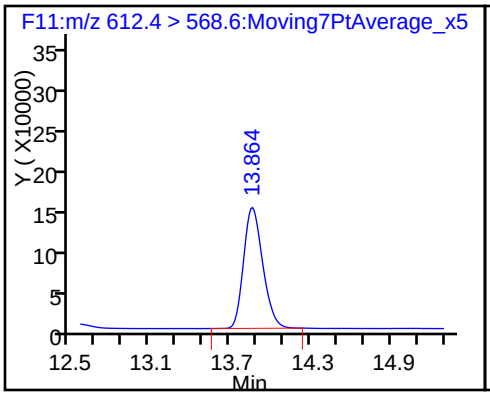
D 26 13C2 PFUnA



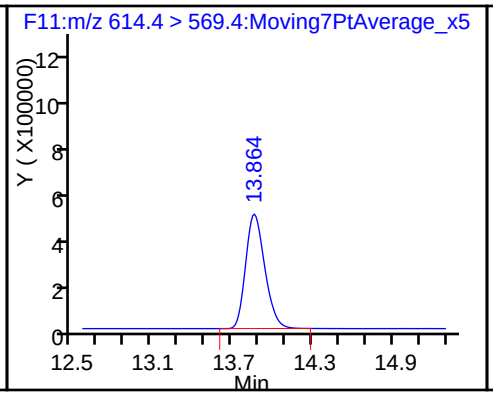
27 Perfluoroundecanoic acid



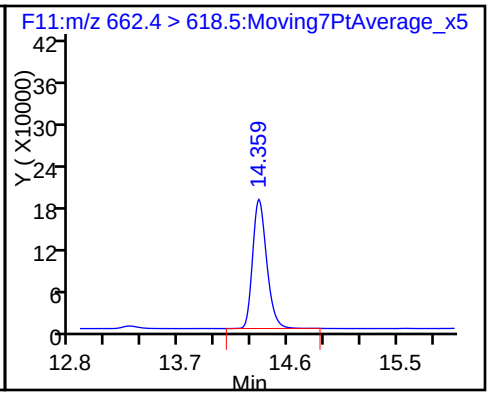
29 Perfluorododecanoic acid



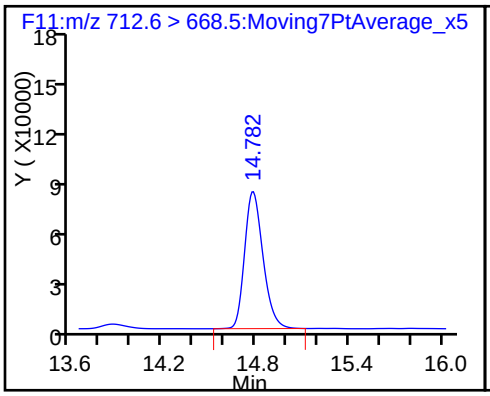
D 28 13C2 PFDoA



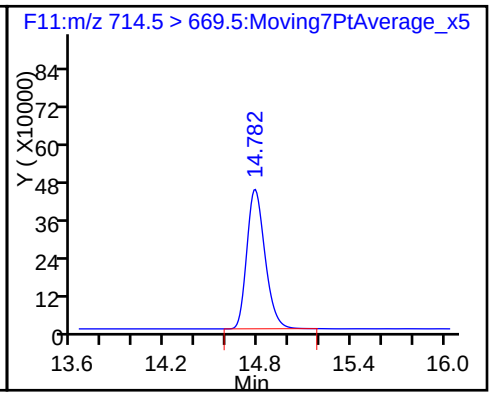
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_010.d
Lims ID: Std L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 26-Feb-2016 18:52:29 ALS Bottle#: 6 Worklist Smp#: 6
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L5
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:17:41 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 10:57:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.7 > 168.6	6.020	6.043	-0.023	1.000	2232439	52.0		104	5205	
36 Perfluorooctandecanoic acid										
212.7 > 168.6	6.020	6.043	-0.023	1.000	2232439	51.2		102	5205	
34 Perfluorohexadecanoic acid										
212.7 > 168.6	6.020	6.043	-0.023	1.000	2232439	51.2		102	5205	
D 35 13C2-PFHxDA										
212.7 > 168.6	6.020	6.043	-0.023		2232439	31.8		63.6	5205	
D 1 13C4 PFBA										
216.7 > 171.5	6.023	6.043	-0.020		4377513	47.5		95.1	12214	
D 3 13C5-PFPeA										
267.6 > 222.7	7.231	7.272	-0.041		2864710	47.5		95.0	6230	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.235	7.275	-0.040	1.000	1353041	47.7		95.4	703	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.360	7.404	-0.044	1.000	1024709	NC			1785	
298.8 > 98.6	7.360	7.404	-0.044	1.000	691916		1.48(0.00-0.00)		1413	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.360	7.404	-0.044	1.000	1024709	49.7		112		
7 Perfluorohexanoic acid										
312.9 > 268.7	8.550	8.604	-0.054	1.000	1672408	48.1		96.2	1910	
D 6 13C2 PFHxA										
314.6 > 269.7	8.550	8.604	-0.054		3749550	46.5		93.0	6068	
D 8 13C4-PFHpA										
366.6 > 321.6	9.799	9.856	-0.057		3192543	47.0		94.0	4659	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.799	9.859	-0.060	1.000	1700245	49.6		99.2	3072	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.833	9.892	-0.059	1.000	1516565	43.5		91.9		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.833	9.892	-0.059	1.000	1516565	NC			1742	
D 11 18O2 PFHxS										
402.5 > 83.6	9.833	9.892	-0.059		1627620	44.9		94.9	3669	
D 12 13C4 PFOA										
416.5 > 371.6	10.913	10.958	-0.045		3524417	45.0		89.9	4306	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.913	10.958	-0.045	1.000	1877109	50.7		101	1377	
412.8 > 168.7	10.913	10.958	-0.045	1.000	738449		2.54(0.00-0.00)	101	1269	
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.913	10.960	-0.047	1.000	1721565	NC			2310	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.913	10.960	-0.047	1.000	1721565	43.1		90.6		
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.842	11.874	-0.032	1.000	2706389	43.9		91.8	2625	
498.3 > 98.2	11.842	11.874	-0.032	1.000	1592378		1.70(0.00-0.00)	91.8	2405	
D 16 13C4 PFOS										
502.4 > 79.7	11.842	11.876	-0.034		789734	48.4		101	1750	
D 17 13C5 PFNA										
467.5 > 422.6	11.855	11.898	-0.043		3328317	51.4		103	3398	
18 Perfluorononanoic acid										
462.5 > 418.6	11.867	11.899	-0.032	1.000	3318743	47.3		94.6	2817	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.666	12.693	-0.027	1.000	3407085	50.5		101	4085	
D 19 13C2 PFDA										
514.4 > 469.5	12.666	12.693	-0.027		3835429	47.5		95.0	4645	
D 23 13C8 FOSA										
505.4 > 77.6	13.194	13.222	-0.028		5528239	48.9		97.7	4338	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.194	13.222	-0.028	1.000	5313118	52.5		105	2734	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.299	13.324	-0.025	1.000	1220447	NC			1947	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.299	13.324	-0.025	1.000	1220447	46.6		96.6		
D 26 13C2 PFUnA										
564.3 > 519.5	13.350	13.369	-0.019		3509250	45.5		91.0	3548	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.350	13.372	-0.022	1.000	3787583	49.1		98.3	2260	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.911	13.937	-0.026	1.000	3514546	50.9		102	1800	
D 28 13C2 PFDoA										
614.4 > 569.4	13.911	13.939	-0.028		4307574	50.5		101	2693	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.414	14.430	-0.016	1.000	3263831	48.3		96.6	1830	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.828	14.841	-0.013	1.000	1486647	46.3		92.5	1443	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 33 13C2-PFTeDA										
714.5 > 669.5	14.828	14.844	-0.016		3523231	51.0		102	2841	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00016 Amount Added: 1.00 Units: mL

Report Date: 29-Feb-2016 10:17:43 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_010.d

Injection Date: 26-Feb-2016 18:52:29 Instrument ID: A4

Lims ID: Std L5

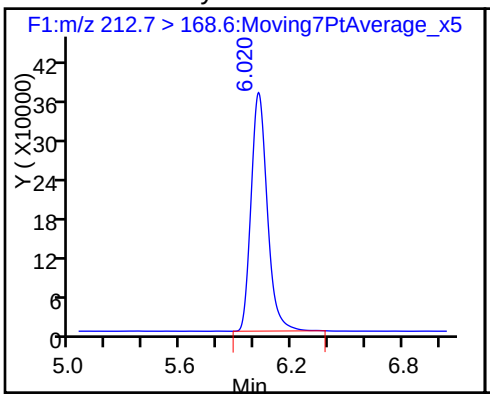
Client ID:

Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 6

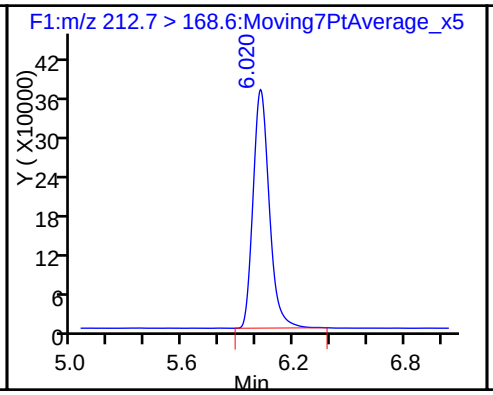
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

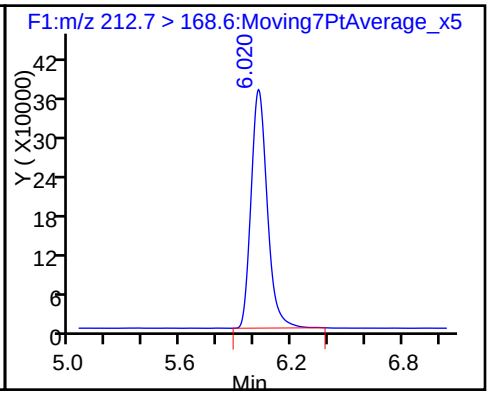
2 Perfluorobutyric acid



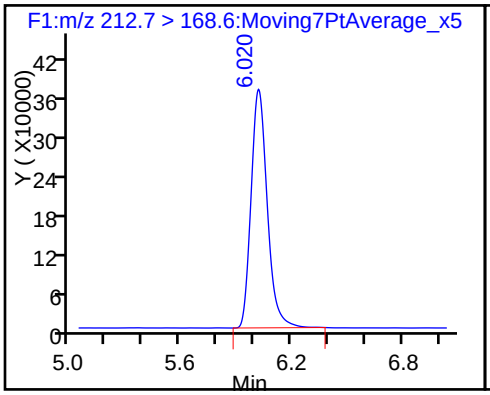
36 Perfluorooctandecanoic acid



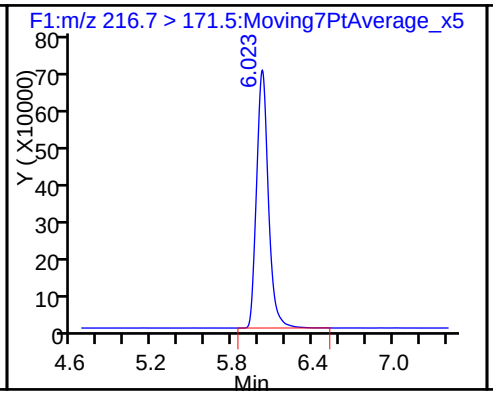
34 Perfluorohexadecanoic acid



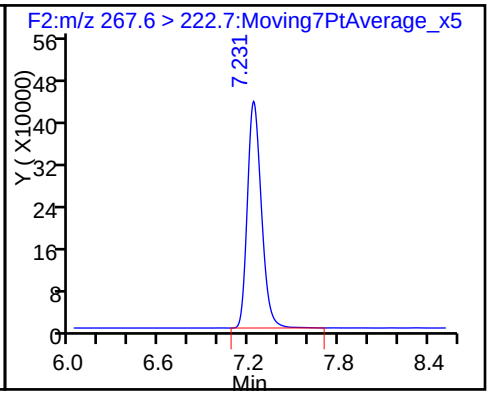
D 35 13C2-PFHxDA



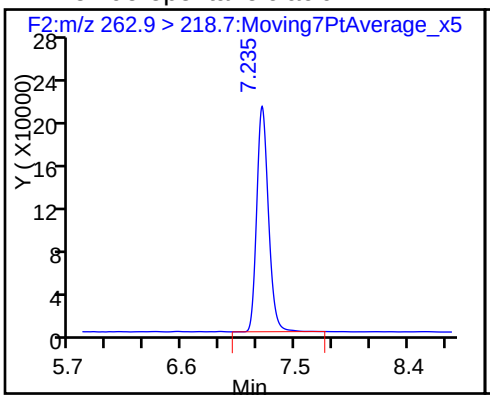
D 1 13C4 PFBA



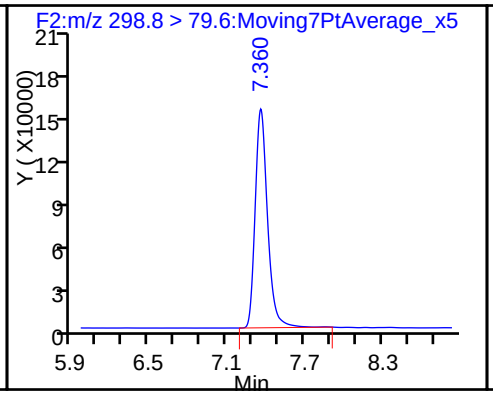
D 3 13C5-PFPeA



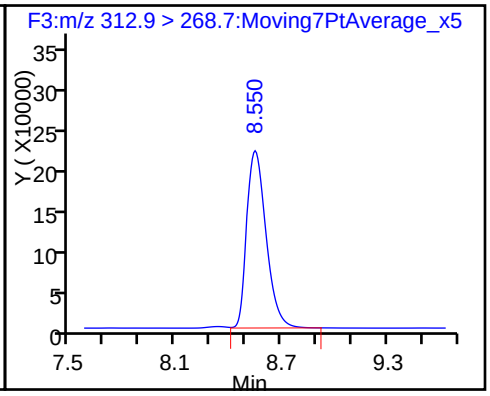
4 Perfluoropentanoic acid



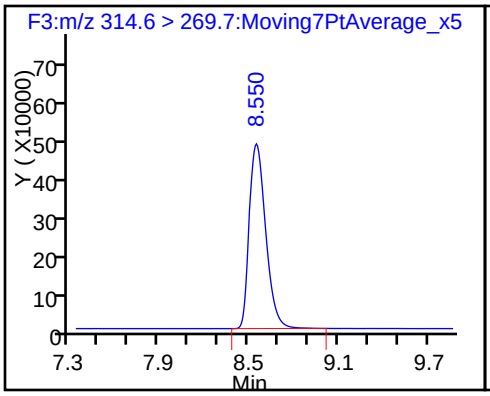
51 Perfluorobutanesulfonic acid



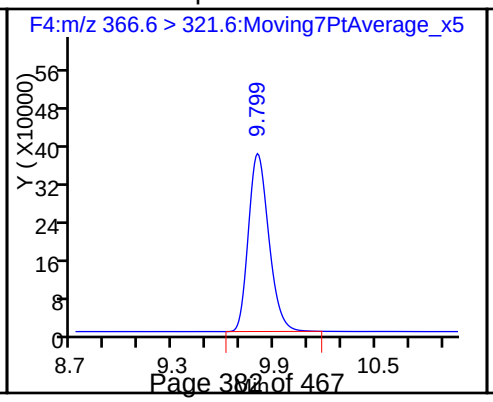
7 Perfluorohexanoic acid



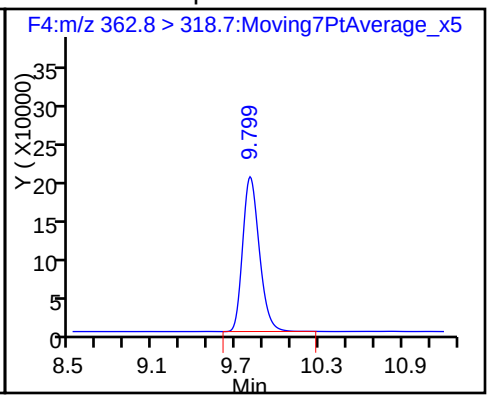
D 6 13C2 PFHxA



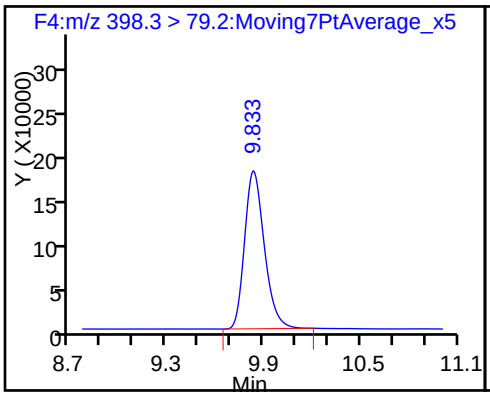
D 8 13C4-PFHpA



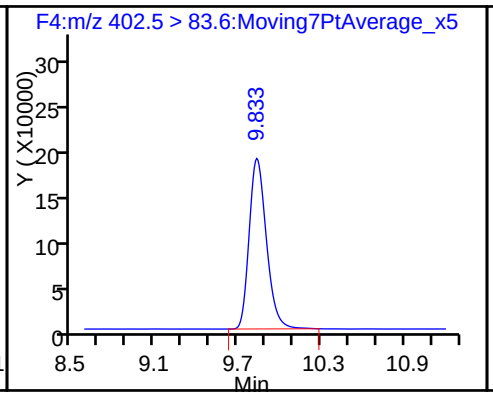
9 Perfluoroheptanoic acid



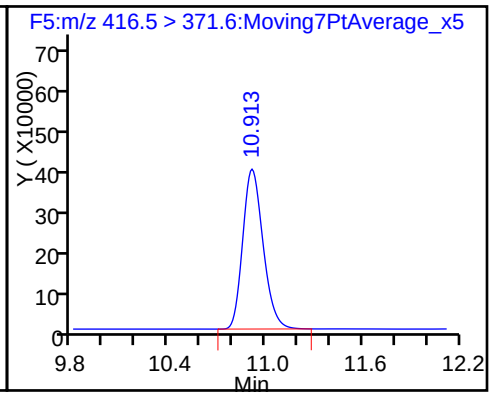
58 Perfluorohexanesulfonic acid



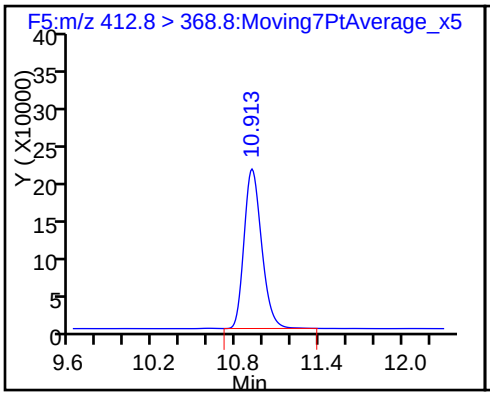
D 11 18O2 PFHxS



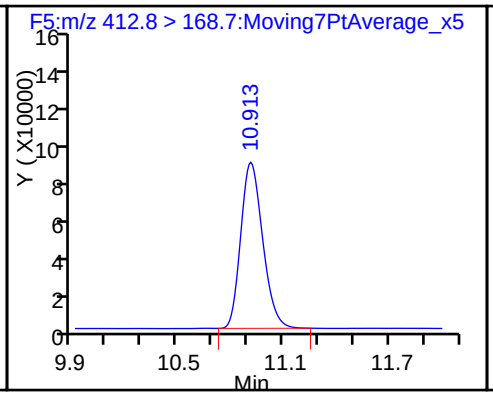
D 12 13C4 PFOA



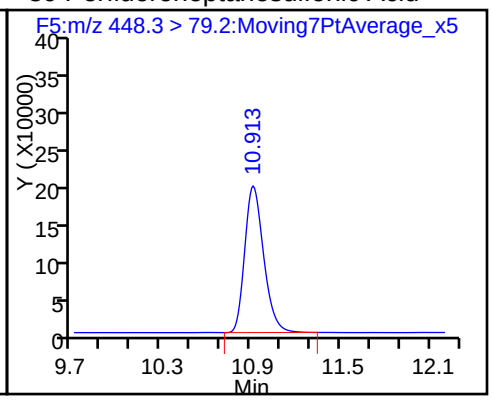
13 Perfluorooctanoic acid



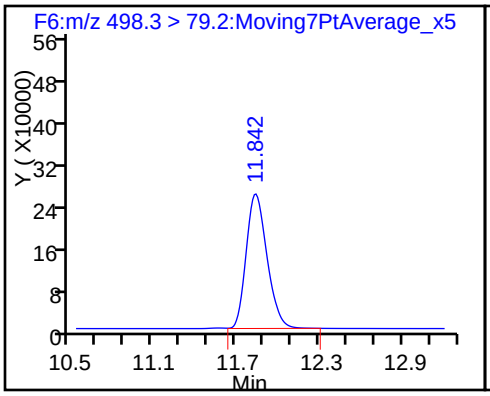
13 Perfluorooctanoic acid



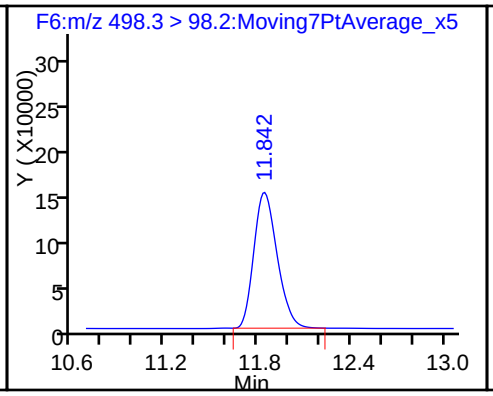
39 Perfluoroheptanesulfonic Acid



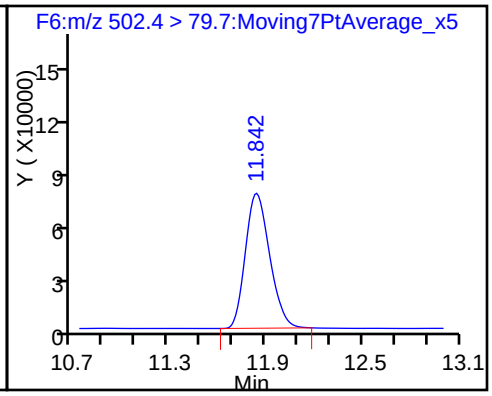
15 Perfluorooctane sulfonic acid



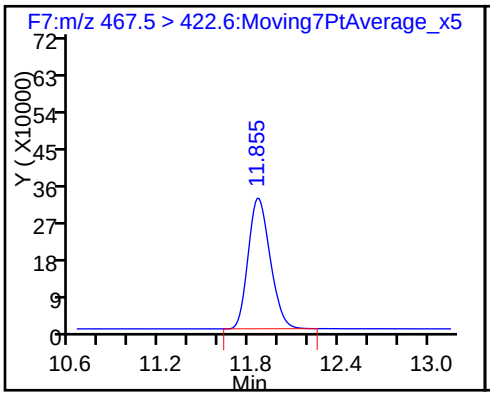
15 Perfluorooctane sulfonic acid



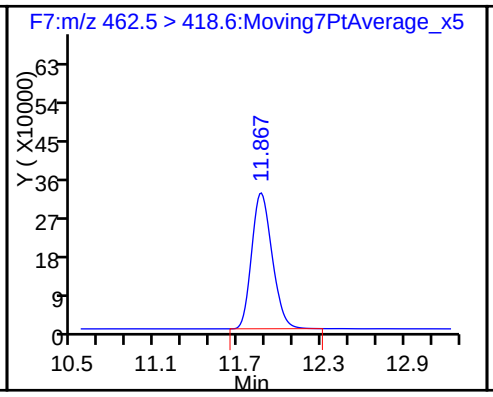
D 16 13C4 PFOS



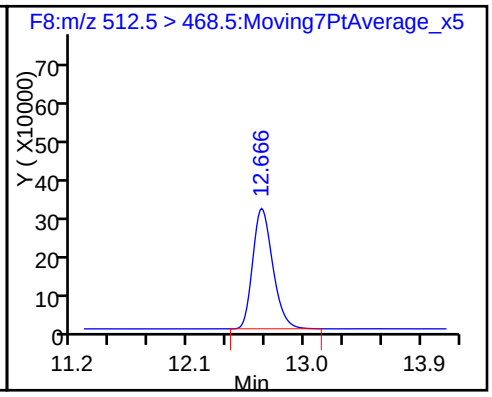
D 17 13C5 PFNA



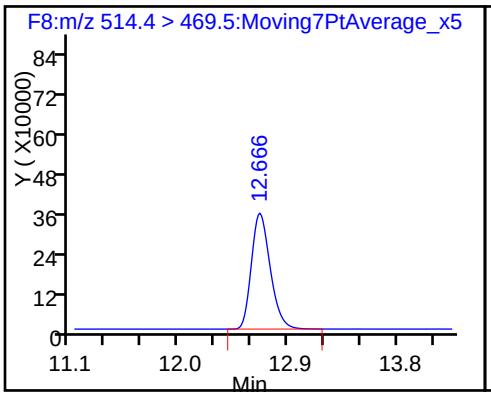
18 Perfluorononanoic acid



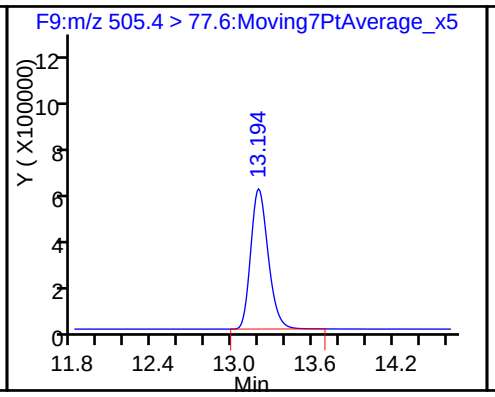
20 Perfluorodecanoic acid



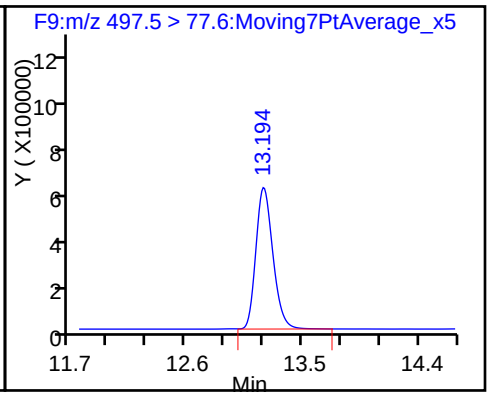
D 19 13C2 PFDA



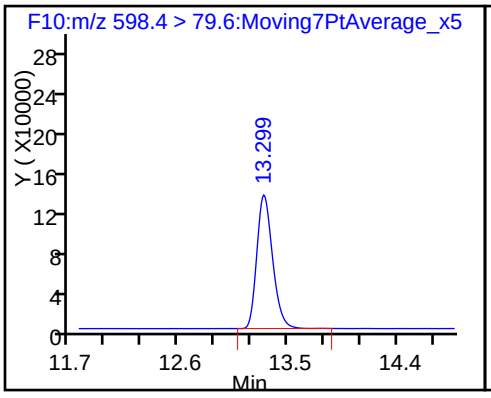
D 23 13C8 FOSA



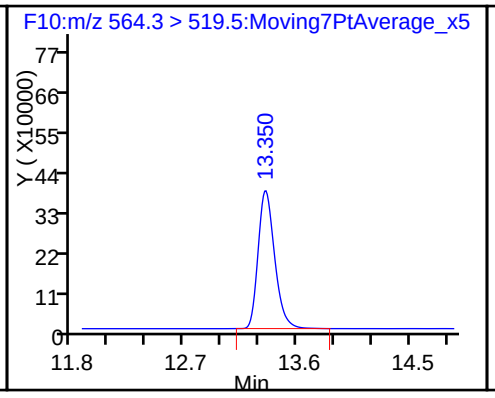
24 Perfluorooctane Sulfonamide



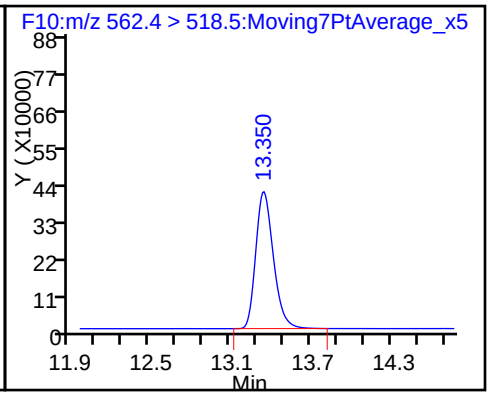
49 Perfluorodecane Sulfonic acid



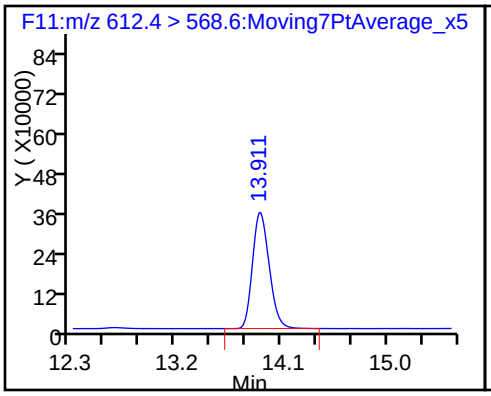
D 26 13C2 PFUnA



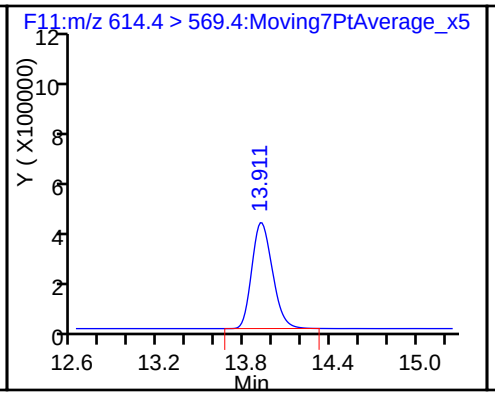
27 Perfluoroundecanoic acid



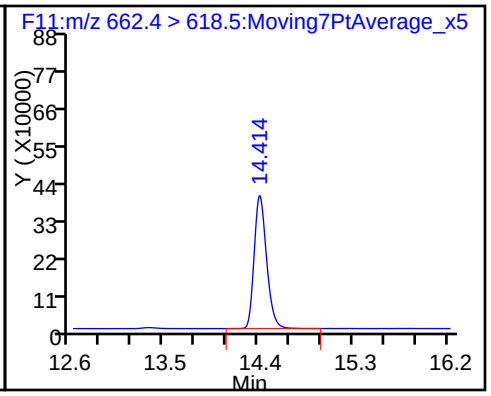
29 Perfluorododecanoic acid



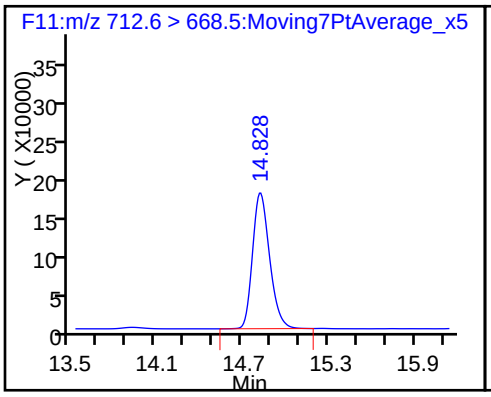
D 28 13C2 PFDoA



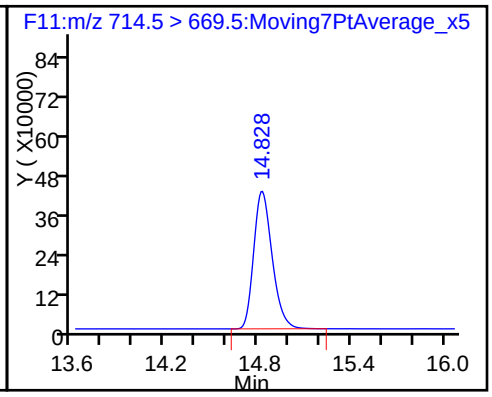
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_011.d
Lims ID: Std L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 26-Feb-2016 19:13:41 ALS Bottle#: 7 Worklist Smp#: 7
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L6
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:17:52 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 10:57:56

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.7 > 168.6	6.085	6.043	0.042	1.000	8045132	218.6		109	15106	
36 Perfluorooctandecanoic acid										
212.7 > 168.6	6.085	6.043	0.042	1.000	8045132	210.2		105	15106	
34 Perfluorohexadecanoic acid										
212.7 > 168.6	6.085	6.043	0.042	1.000	8045132	210.2		105	15106	
D 35 13C2-PFHxDA										
212.7 > 168.6	6.085	6.043	0.042		8045132	114.5		229	15106	
D 1 13C4 PFBA										
216.7 > 171.5	6.082	6.043	0.039		3756568	40.8		81.6	11348	
D 3 13C5-PFPeA										
267.6 > 222.7	7.332	7.272	0.060		2446599	40.6		81.1	5884	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.336	7.275	0.061	1.000	4712598	194.4		97.2	2025	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.465	7.404	0.061	1.000	3383263	NC			4399	
298.8 > 98.6	7.465	7.404	0.061	1.000	2174958		1.56(0.00-0.00)		2203	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.465	7.404	0.061	1.000	3383263	213.2		121		
7 Perfluorohexanoic acid										
312.9 > 268.7	8.714	8.604	0.110	1.000	5881715	197.4		98.7	1986	
D 6 13C2 PFHxA										
314.6 > 269.7	8.706	8.604	0.102		3211197	39.8		79.7	5675	
D 8 13C4-PFHpA										
366.6 > 321.6	10.003	9.856	0.147		2626968	38.7		77.4	3107	
9 Perfluoroheptanoic acid										
362.8 > 318.7	10.003	9.859	0.144	1.000	5609888	198.7		99.4	6231	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	10.037	9.892	0.145	1.000	4975885	185.4		98.0		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	10.037	9.892	0.145	1.000	4975885	NC			5118	
D 11 18O2 PFHxS										
402.5 > 83.6	10.046	9.892	0.154		1251868	34.5		73.0	2344	
D 12 13C4 PFOA										
416.5 > 371.6	11.116	10.958	0.158		2810804	35.9		71.7	4955	
13 Perfluorooctanoic acid										
412.8 > 368.8	11.116	10.958	0.158	1.000	5881968	199.2		99.6	3535	
412.8 > 168.7	11.116	10.958	0.158	1.000	2072115		2.84(0.00-0.00)	99.6	3396	
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	11.116	10.960	0.156	1.000	5031569	NC			5624	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	11.116	10.960	0.156	1.000	5031569	168.7		88.6		
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	12.026	11.874	0.152	1.000	8547545	185.5		97.0	3208	
498.3 > 98.2	12.026	11.874	0.152	1.000	5055541		1.69(0.00-0.00)	97.0	3535	
D 16 13C4 PFOS										
502.4 > 79.7	12.026	11.876	0.150		589650	36.2		75.7	1058	
D 17 13C5 PFNA										
467.5 > 422.6	12.047	11.898	0.149		2692366	41.6		83.1	4296	
18 Perfluorononanoic acid										
462.5 > 418.6	12.047	11.899	0.148	1.000	11320855	198.7		99.3	7127	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.831	12.693	0.138	1.000	10612845	206.5		103	4859	
D 19 13C2 PFDA										
514.4 > 469.5	12.831	12.693	0.138		2921349	36.2		72.4	3674	
D 23 13C8 FOSA										
505.4 > 77.6	13.349	13.222	0.127		4413928	39.0		78.0	3936	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.349	13.222	0.127	1.000	16377419	202.7		101	2857	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.443	13.324	0.119	1.000	3313244	NC			3200	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.443	13.324	0.119	1.000	3313244	169.3		87.8		
D 26 13C2 PFUnA										
564.3 > 519.5	13.485	13.369	0.116		2903023	37.6		75.3	3376	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.485	13.372	0.113	1.000	11973923	187.8		93.9	4039	
29 Perfluorododecanoic acid										
612.4 > 568.6	14.047	13.937	0.110	1.000	12725838	210.0		105	2435	
D 28 13C2 PFDoA										
614.4 > 569.4	14.047	13.939	0.108		3778672	44.3		88.7	2428	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.524	14.430	0.094	1.000	10701081	180.5		90.2	2845	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.929	14.841	0.088	1.000	5351613	189.8		94.9	2191	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 33 13C2-PFTeDA										
714.5 > 669.5	14.929	14.844	0.085		3106370	45.0		90.0	2017	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L6_00015 Amount Added: 1.00 Units: mL

Report Date: 29-Feb-2016 10:17:54 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_011.d

Injection Date: 26-Feb-2016 19:13:41 Instrument ID: A4

Lims ID: Std L6

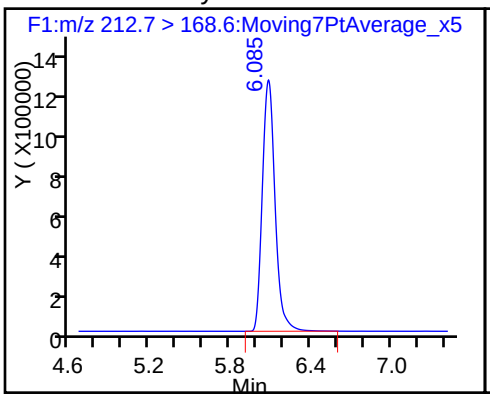
Client ID:

Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 7

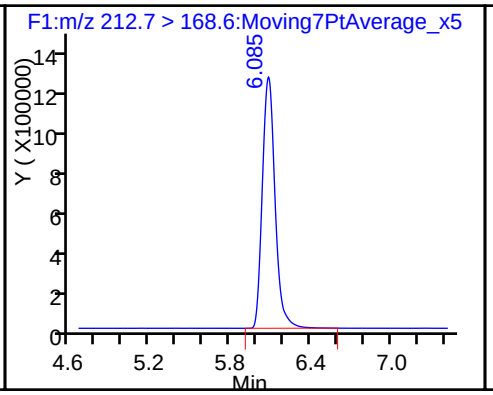
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

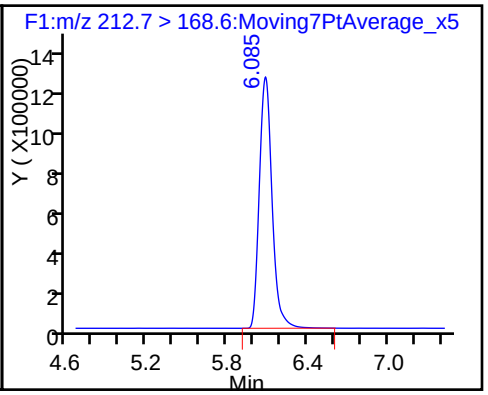
2 Perfluorobutyric acid



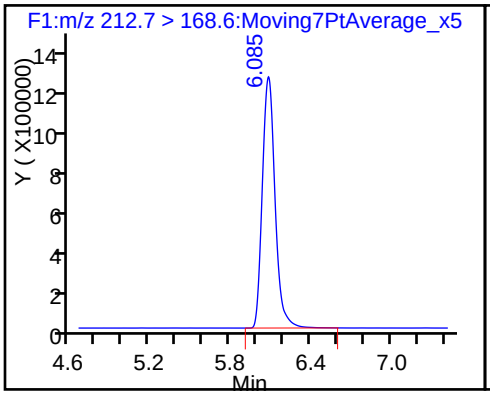
36 Perfluorooctandecanoic acid



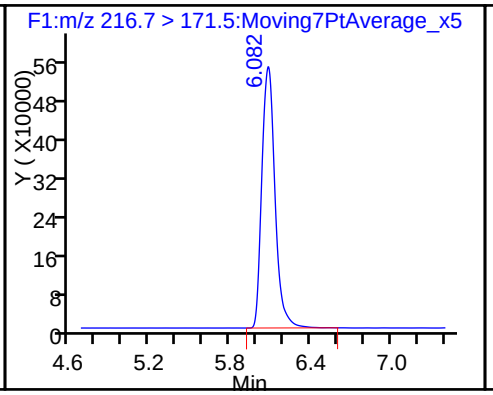
34 Perfluorohexadecanoic acid



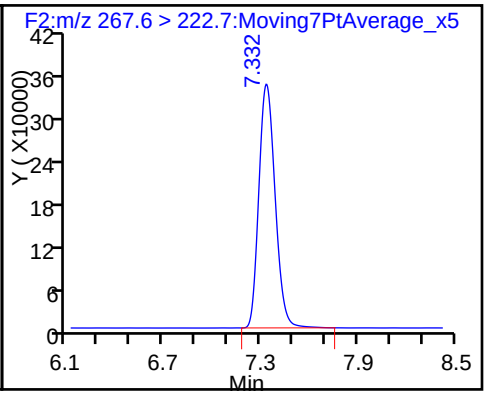
D 35 13C2-PFHxDA



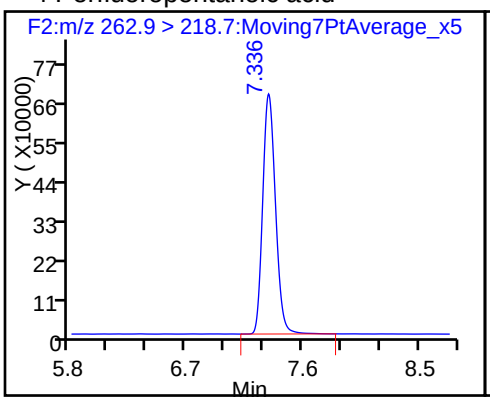
D 1 13C4 PFBA



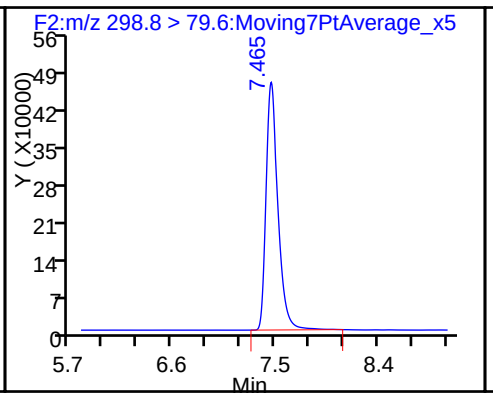
D 3 13C5-PFPeA



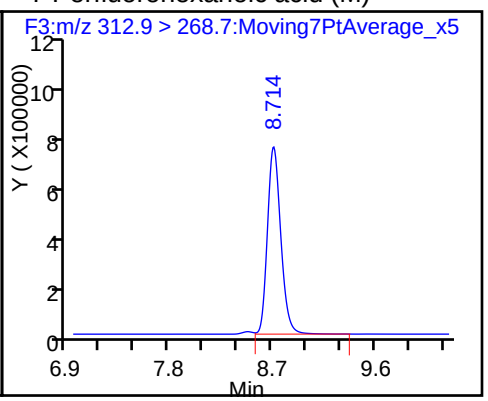
4 Perfluoropentanoic acid



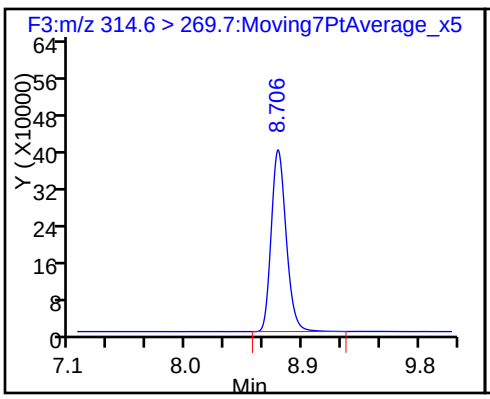
51 Perfluorobutanesulfonic acid



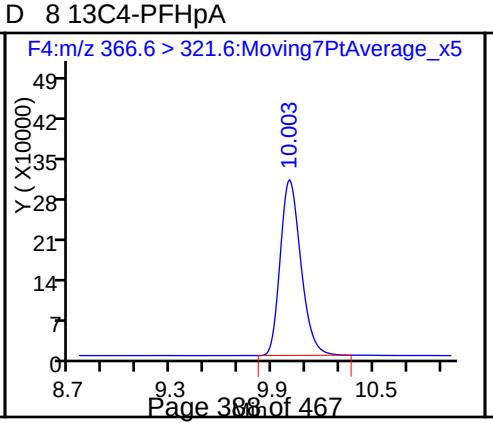
7 Perfluorohexanoic acid (M)



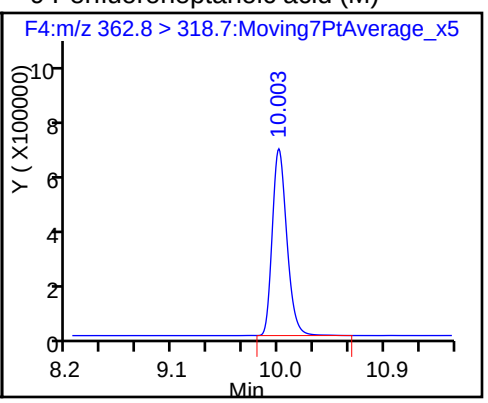
D 6 13C2 PFHxA



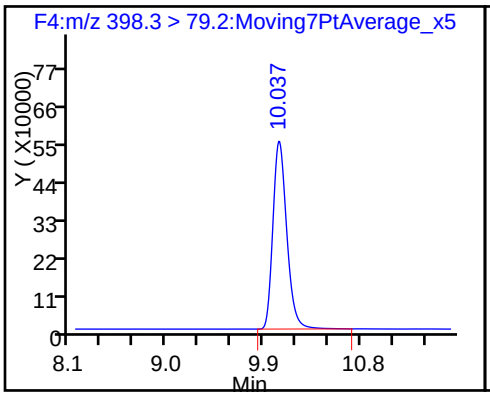
D 8 13C4-PFHpA



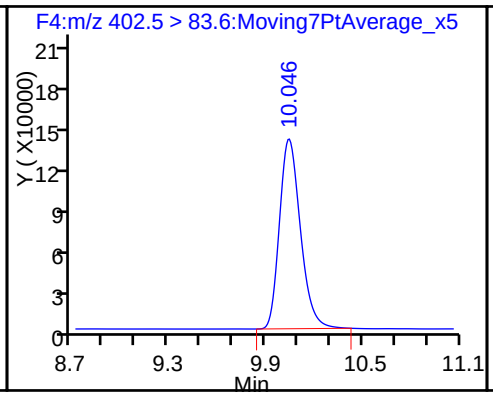
9 Perfluoroheptanoic acid (M)



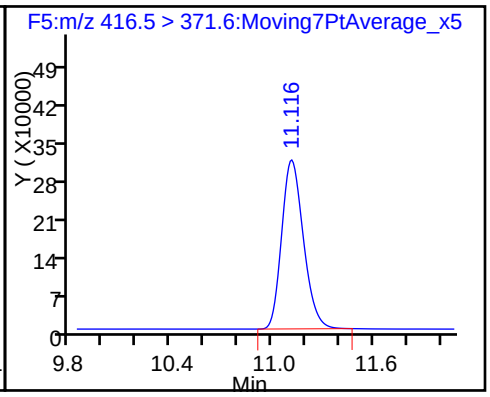
58 Perfluorohexanesulfonic acid



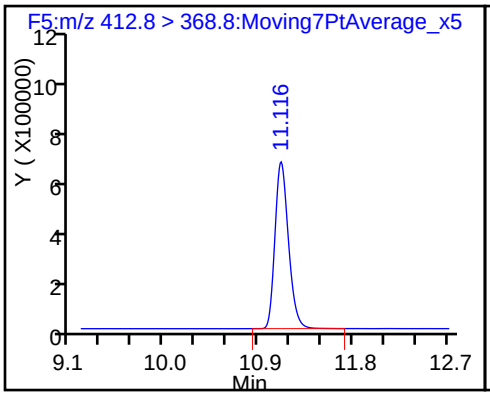
D 11 18O2 PFHxS



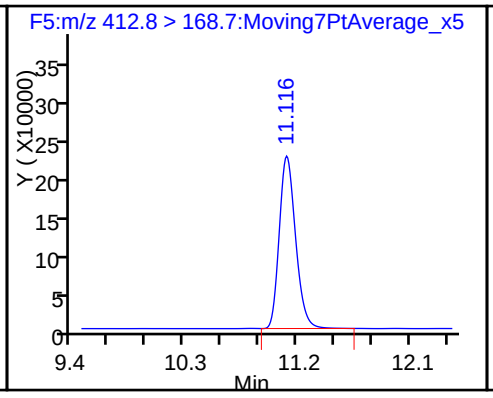
D 12 13C4 PFOA



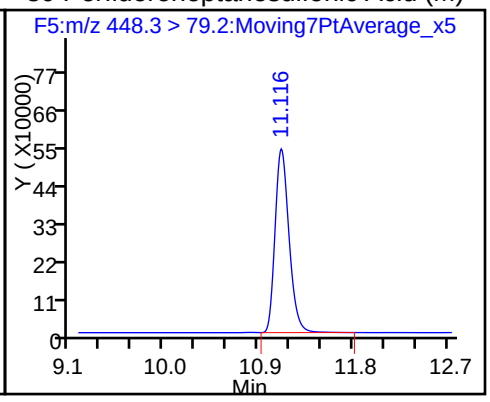
13 Perfluorooctanoic acid



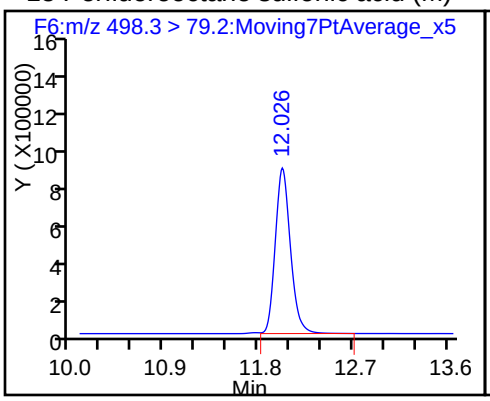
13 Perfluorooctanoic acid



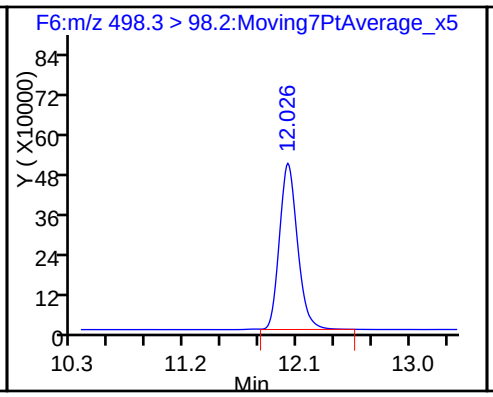
39 Perfluoroheptanesulfonic Acid (M)



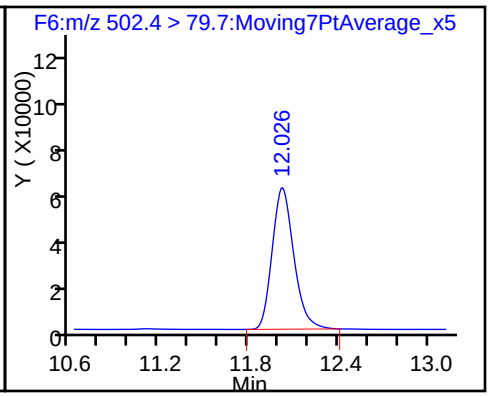
15 Perfluorooctane sulfonic acid (M)



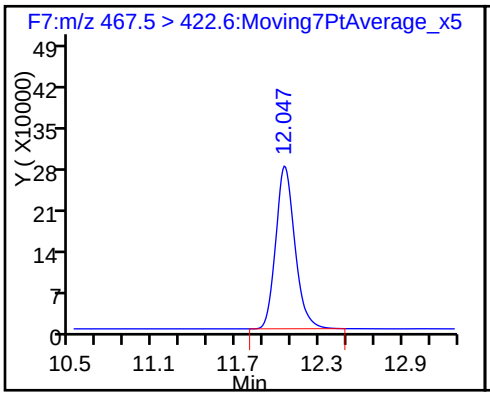
15 Perfluorooctane sulfonic acid



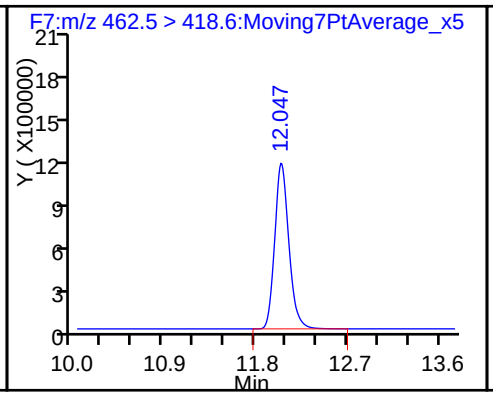
D 16 13C4 PFOS



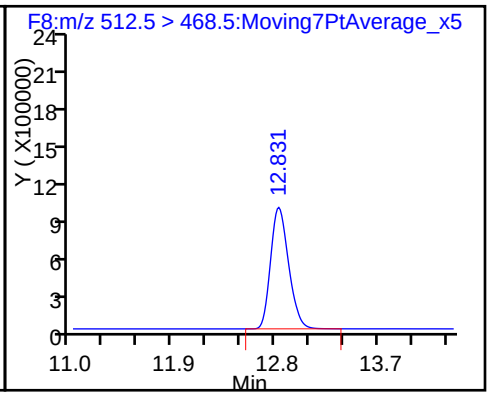
D 17 13C5 PFNA



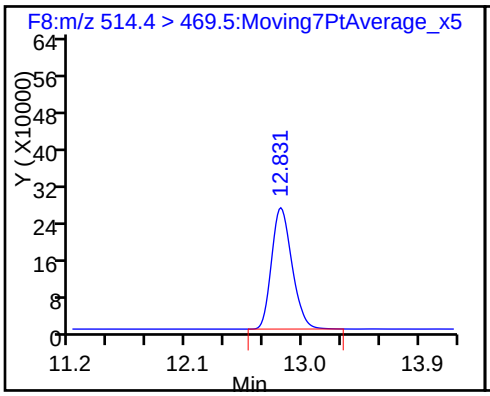
18 Perfluorononanoic acid



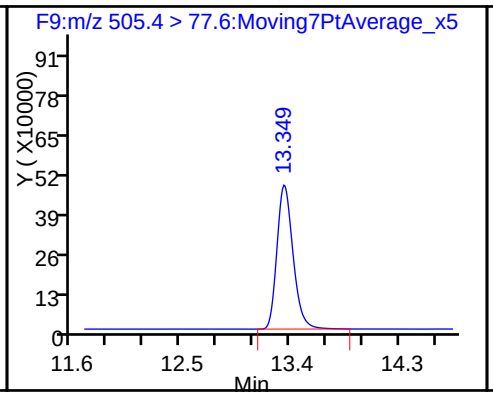
20 Perfluorodecanoic acid



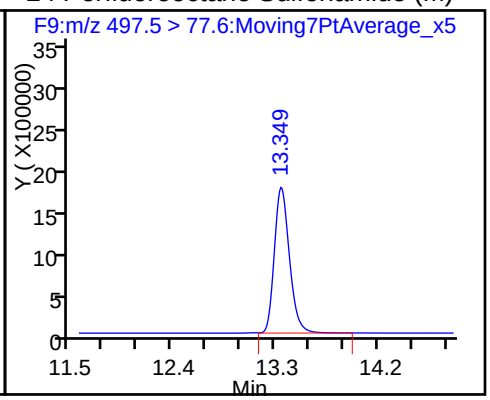
D 19 13C2 PFDA



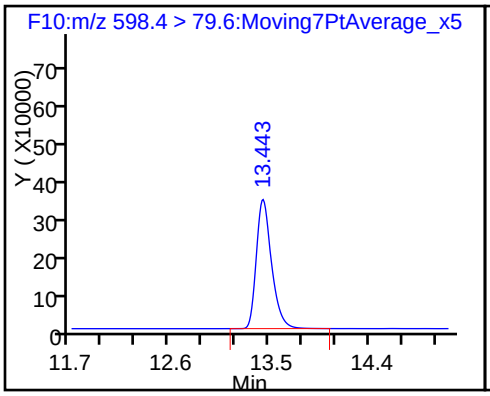
D 23 13C8 FOSA



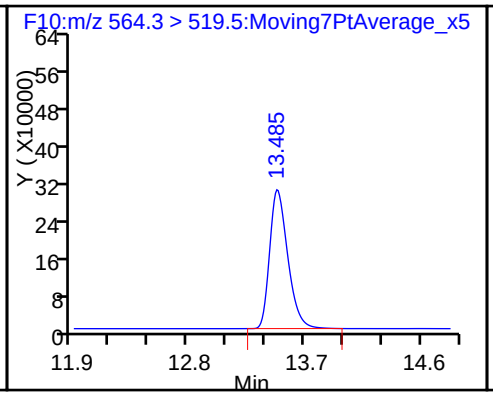
24 Perfluorooctane Sulfonamide (M)



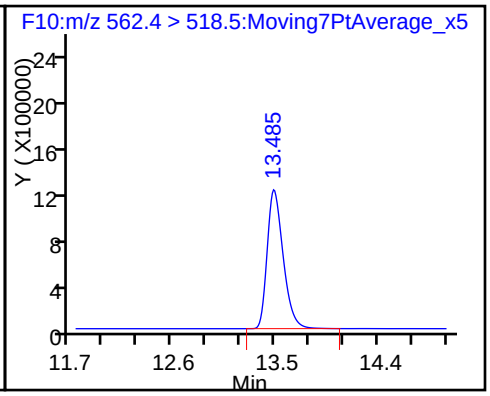
49 Perfluorodecane Sulfonic acid



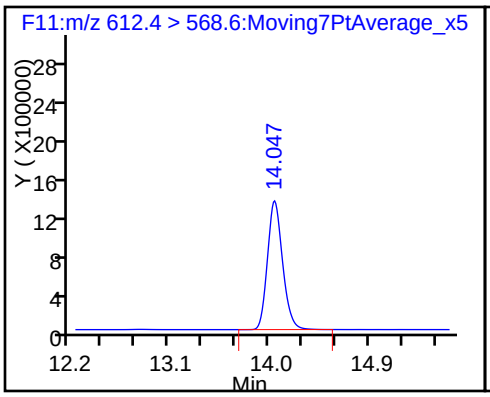
D 26 13C2 PFUnA



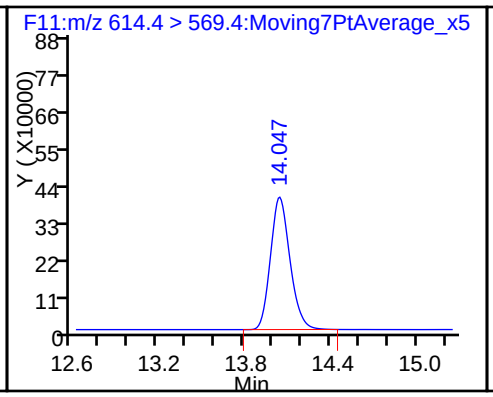
27 Perfluoroundecanoic acid



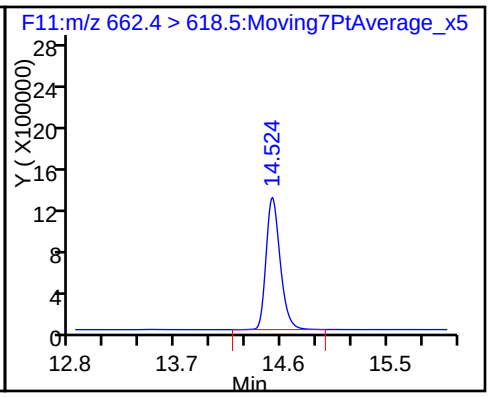
29 Perfluorododecanoic acid



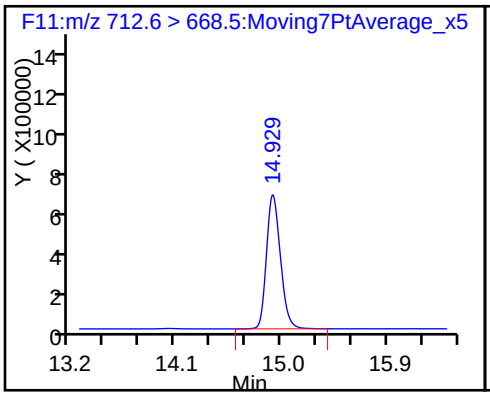
D 28 13C2 PFDoA



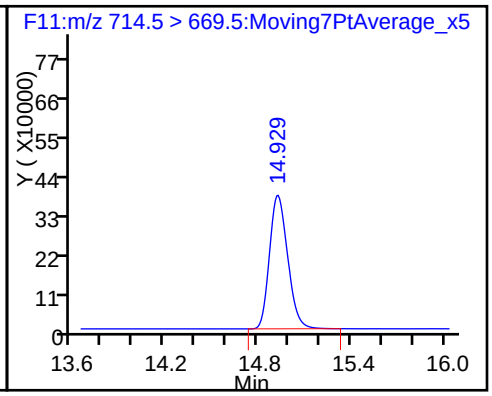
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



Report Date: 29-Feb-2016 10:18:04 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d
Lims ID: Std L7
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 26-Feb-2016 19:34:51 ALS Bottle#: 8 Worklist Smp#: 8
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L7
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:18:02 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:05:31

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.7 > 168.6	6.192	6.043	0.149	1.000	13019404	444.8		111	20839	
36 Perfluorooctandecanoic acid										
212.7 > 168.6	6.192	6.043	0.149	1.000	13019404	399.2		99.8	20839	
34 Perfluorohexadecanoic acid										
212.7 > 168.6	6.192	6.043	0.149	1.000	13019404	399.2		99.8	20839	
D 35 13C2-PFHxDA										
212.7 > 168.6	6.192	6.043	0.149		13019404	185.3		371	20839	
D 1 13C4 PFBA										
216.7 > 171.5	6.192	6.043	0.149		2987145	32.4		64.9	8072	
D 3 13C5-PFPeA										
267.6 > 222.7	7.493	7.272	0.221		1975114	32.8		65.5	3595	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.497	7.275	0.222	1.000	7659075	391.5		97.9	2796	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.640	7.404	0.236	1.000	5017537	NC			4823	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.640	7.404	0.236	1.000	5017537	409.2		116		
7 Perfluorohexanoic acid										
312.9 > 268.7	8.878	8.604	0.274	1.000	9456149	396.3		99.1	2271	
D 6 13C2 PFHxA										
314.6 > 269.7	8.878	8.604	0.274		2572389	31.9		63.8	5436	
D 8 13C4-PFHpA										
366.6 > 321.6	10.122	9.856	0.266		2186109	32.2		64.4	3667	
9 Perfluoroheptanoic acid										
362.8 > 318.7	10.122	9.859	0.263	1.000	8628695	367.2		91.8	5526	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	10.165	9.892	0.273	1.000	7989673	385.2		102		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluorohexane Sulfonate										
398.3 > 79.2	10.165	9.892	0.273	1.000	7989673	NC			5939	
D 11 18O2 PFHxS										
402.5 > 83.6	10.165	9.892	0.273		967433	26.7		56.4	1667	
D 12 13C4 PFOA										
416.5 > 371.6	11.208	10.958	0.250		2337137	29.8		59.6	3071	
13 Perfluorooctanoic acid										
412.8 > 368.8	11.208	10.958	0.250	1.000	9108302	370.9		92.7	4732	
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	11.208	10.960	0.248	1.000	7750764	NC			5723	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	11.208	10.960	0.248	1.000	7750764	347.7		91.3		
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	12.095	11.874	0.221	1.000	13988180	406.2		106	3269	
D 16 13C4 PFOS										
502.4 > 79.7	12.105	11.876	0.229		440790	27.0		56.6	672	
D 17 13C5 PFNA										
467.5 > 422.6	12.126	11.898	0.228		2366713	36.5		73.1	3671	
18 Perfluorononanoic acid										
462.5 > 418.6	12.126	11.899	0.227	1.000	19197306	383.0		95.8	7006	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.895	12.693	0.202	1.000	18831586	425.5		106	4841	
D 19 13C2 PFDA										
514.4 > 469.5	12.895	12.693	0.202		2515187	31.1		62.3	3552	
D 23 13C8 FOSA										
505.4 > 77.6	13.421	13.222	0.199		3744575	33.1		66.2	2891	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.421	13.222	0.199	1.000	28457057	415.1		104	3000	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.505	13.324	0.181	1.000	4978145	NC			2582	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.505	13.324	0.181	1.000	4978145	340.2		88.2		
D 26 13C2 PFUnA										
564.3 > 519.5	13.553	13.369	0.184		2553333	33.1		66.2	2499	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.553	13.372	0.181	1.000	20407183	363.9		91.0	3490	
29 Perfluorododecanoic acid										
612.4 > 568.6	14.099	13.937	0.162	1.000	20258578	392.4		98.1	2532	
D 28 13C2 PFDoA										
614.4 > 569.4	14.099	13.939	0.160		3219090	37.8		75.5	2504	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.579	14.430	0.149	1.000	17988306	356.1		89.0	2727	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.975	14.841	0.134	1.000	8769485	365.1		91.3	2381	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.975	14.844	0.131		2632793	38.1		76.3	2313	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L7_00015 Amount Added: 1.00 Units: mL

Report Date: 29-Feb-2016 10:18:04 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Injection Date: 26-Feb-2016 19:34:51 Instrument ID: A4

Lims ID: Std L7

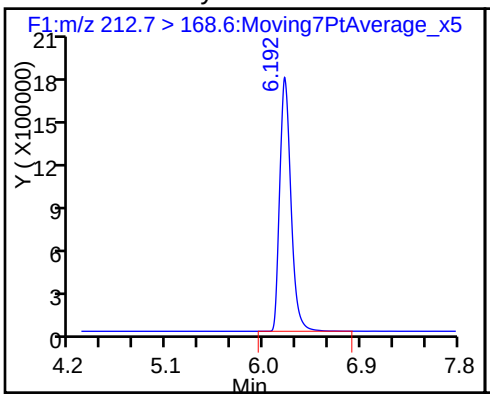
Client ID:

Operator ID: JRB ALS Bottle#: 8 Worklist Smp#: 8

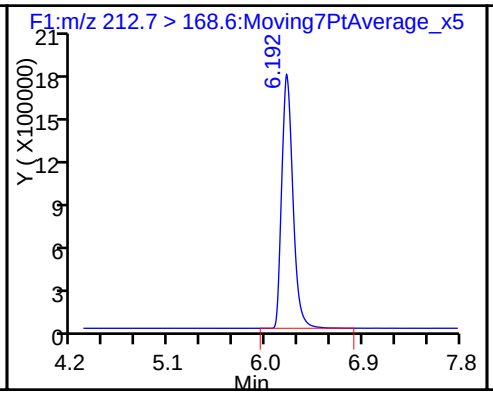
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

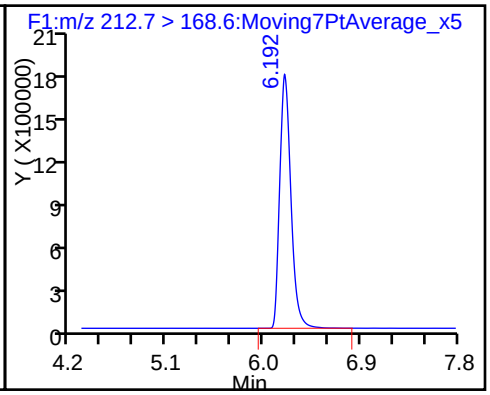
2 Perfluorobutyric acid



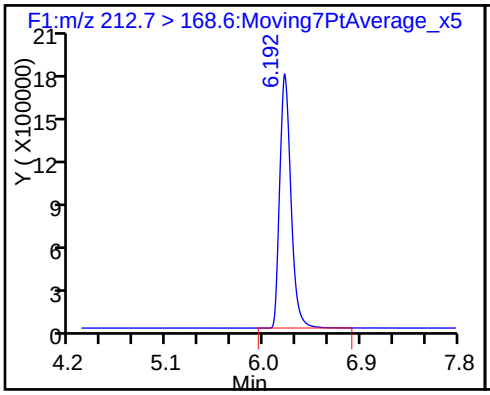
36 Perfluorooctandecanoic acid



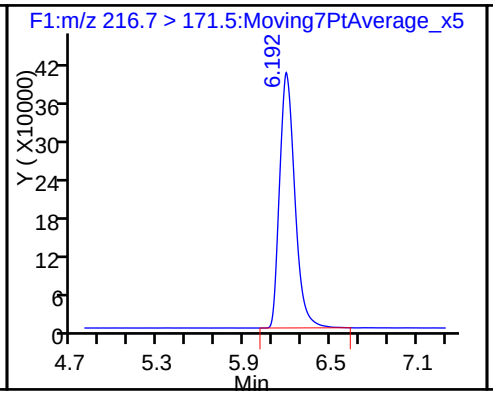
34 Perfluorohexadecanoic acid



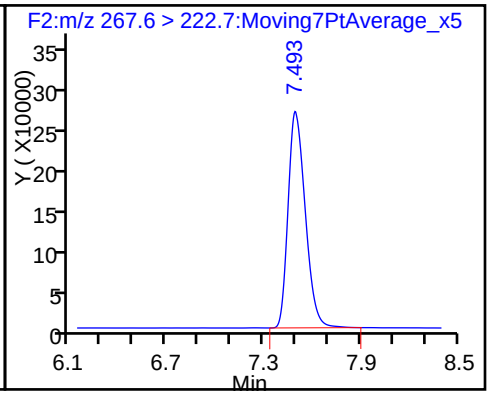
D 35 13C2-PFHxDA



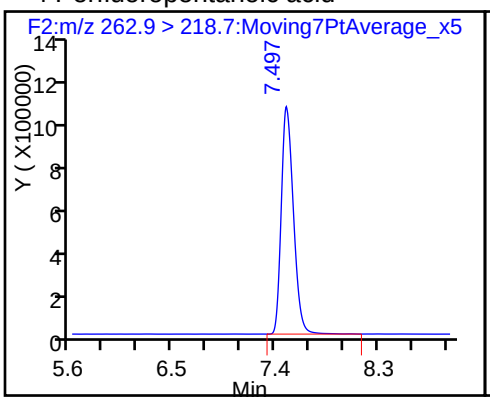
D 1 13C4 PFBA



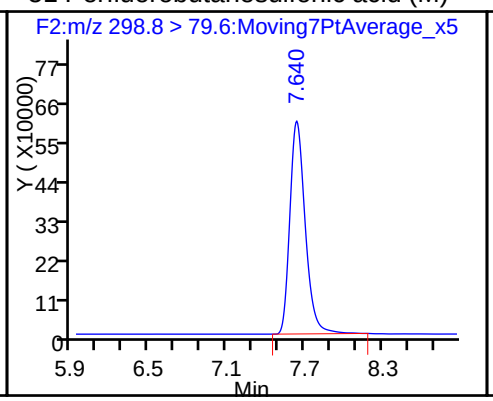
D 3 13C5-PFPeA



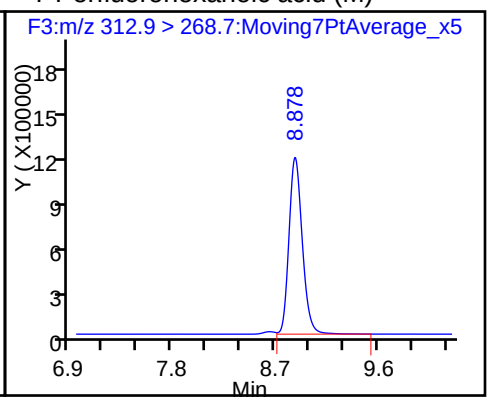
4 Perfluoropentanoic acid



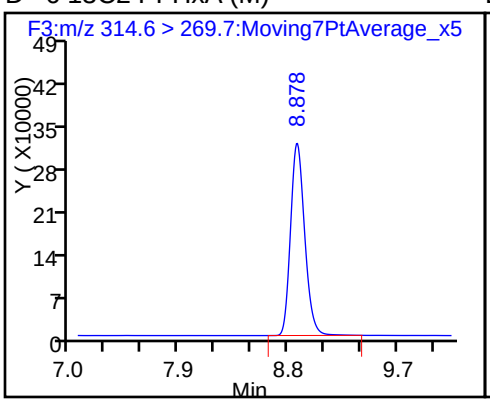
51 Perfluorobutanesulfonic acid (M)



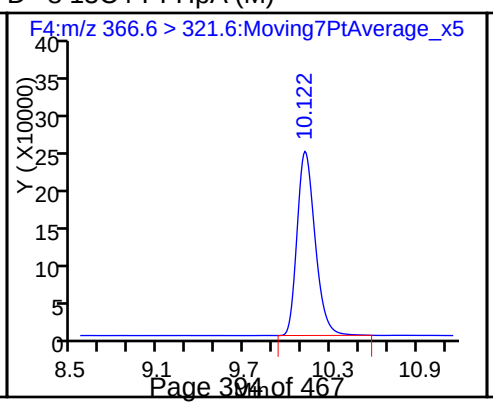
7 Perfluorohexanoic acid (M)



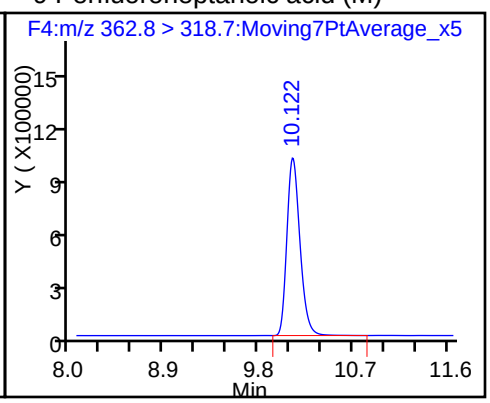
D 6 13C2 PFHxA (M)



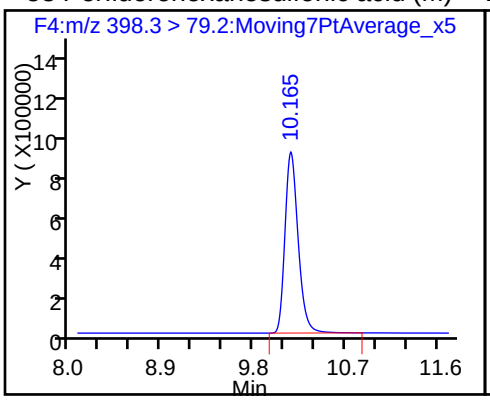
D 8 13C4-PFHpA (M)



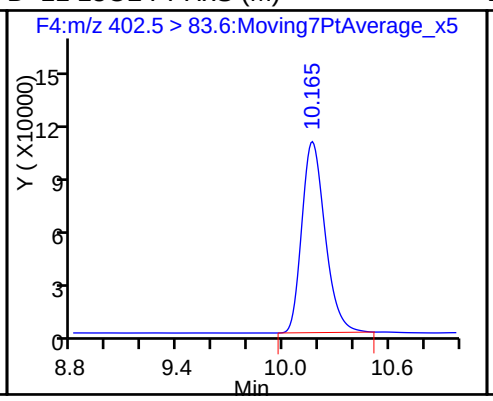
9 Perfluoroheptanoic acid (M)



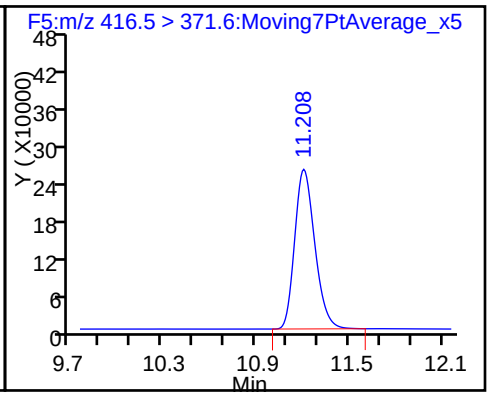
58 Perfluorohexanesulfonic acid (M)



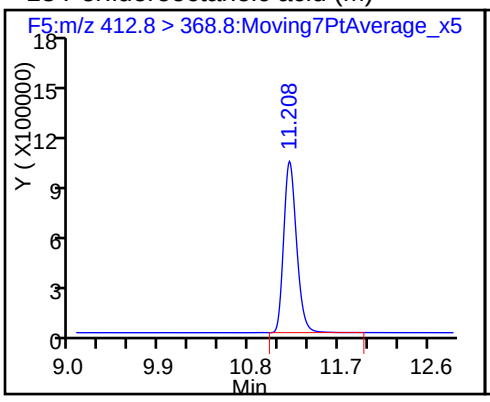
D 11 18O2 PFHxS (M)



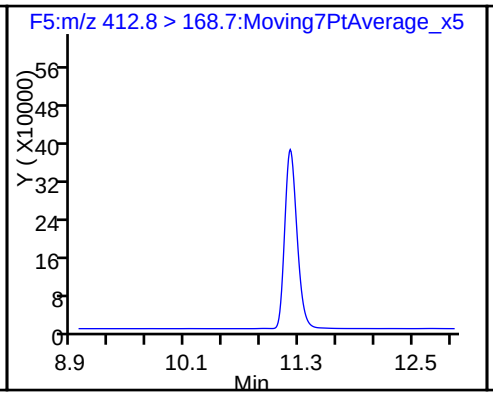
D 12 13C4 PFOA



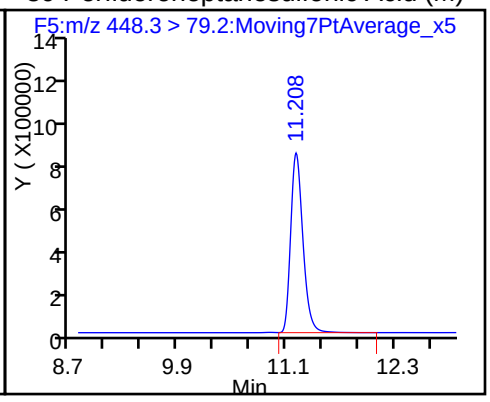
13 Perfluorooctanoic acid (M)



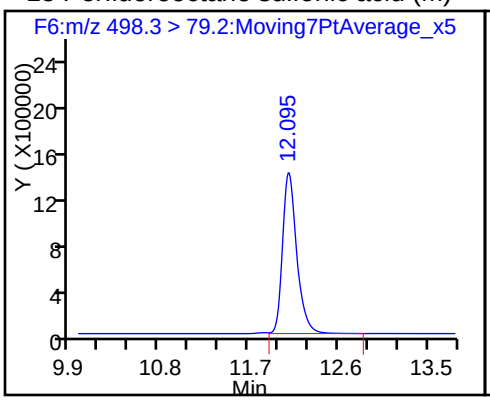
13 Perfluorooctanoic acid



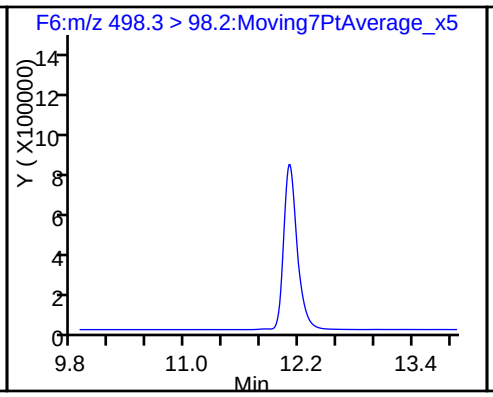
39 Perfluoroheptanesulfonic Acid (M)



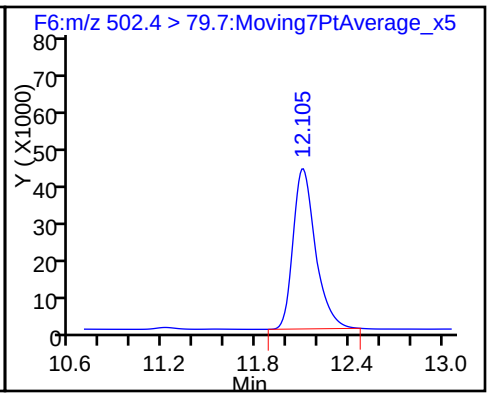
15 Perfluorooctane sulfonic acid (M)



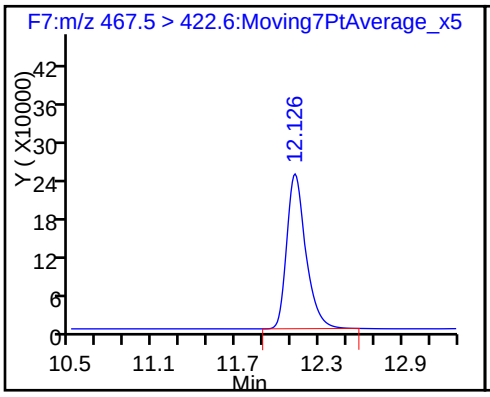
15 Perfluorooctane sulfonic acid



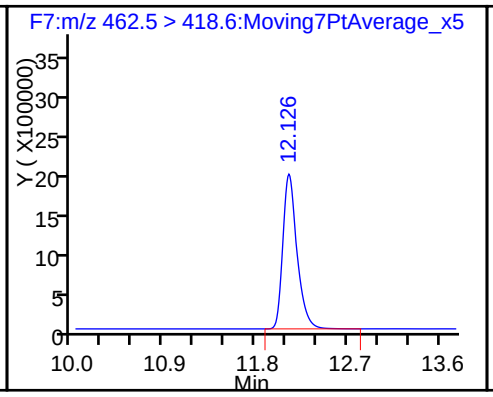
D 16 13C4 PFOS



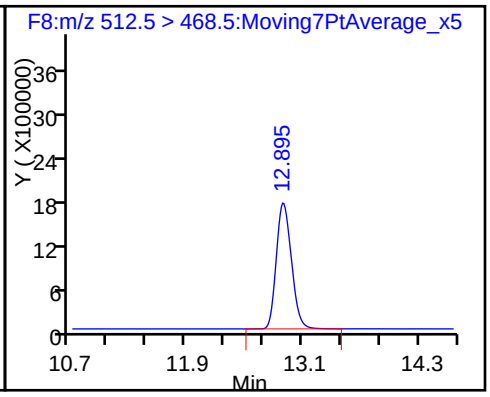
D 17 13C5 PFNA



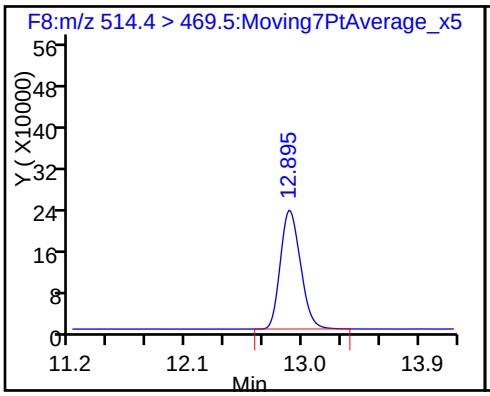
18 Perfluorononanoic acid



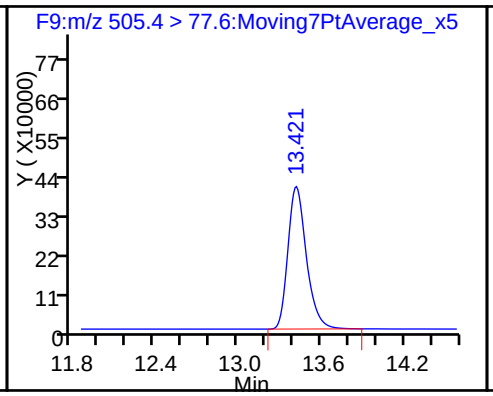
20 Perfluorodecanoic acid



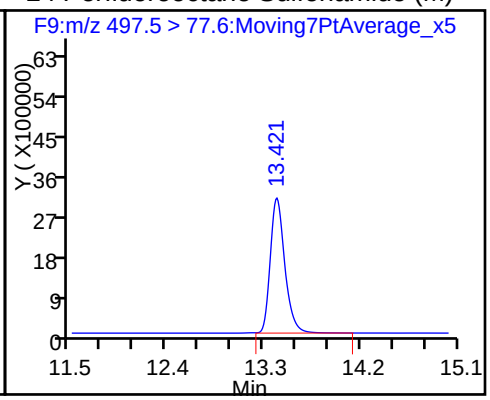
D 19 13C2 PFDA



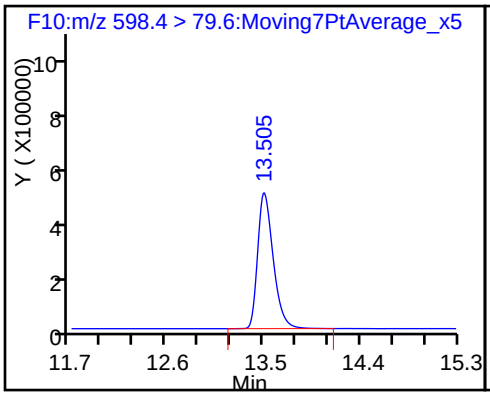
D 23 13C8 FOSA



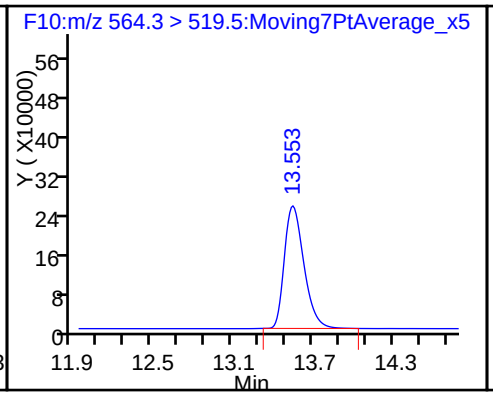
24 Perfluorooctane Sulfonamide (M)



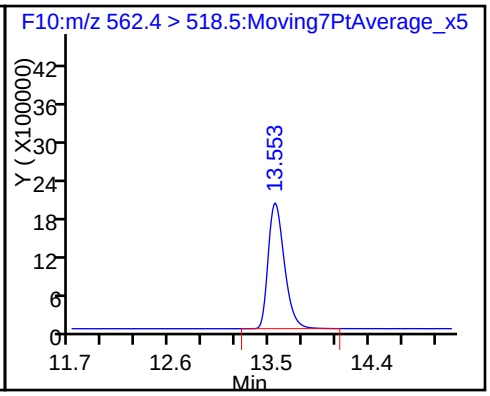
49 Perfluorodecane Sulfonic acid



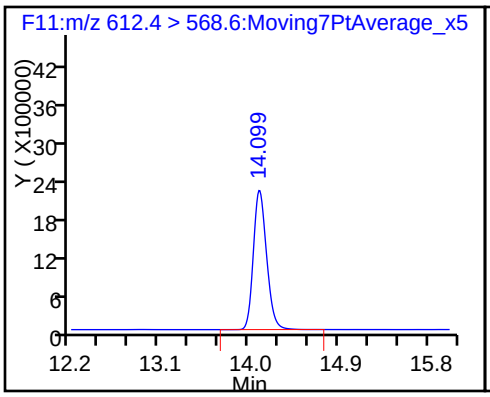
D 26 13C2 PFUnA



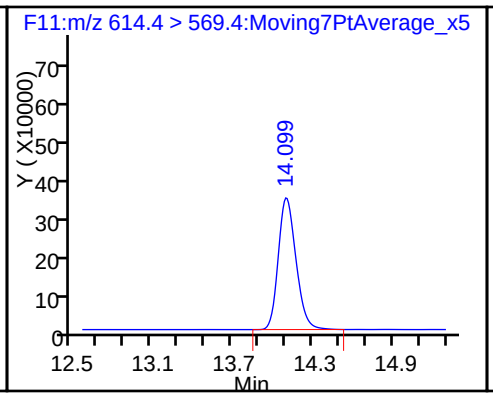
27 Perfluoroundecanoic acid



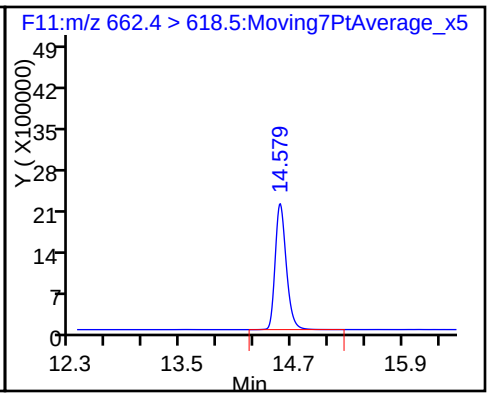
29 Perfluorododecanoic acid



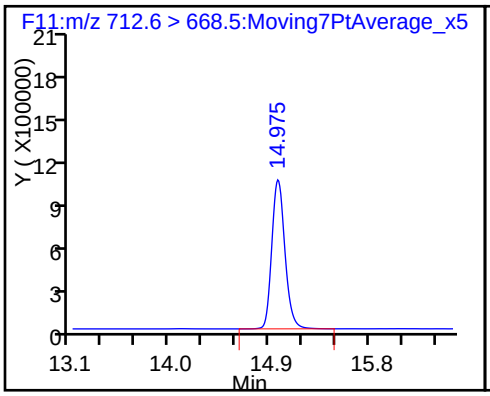
D 28 13C2 PFDoA



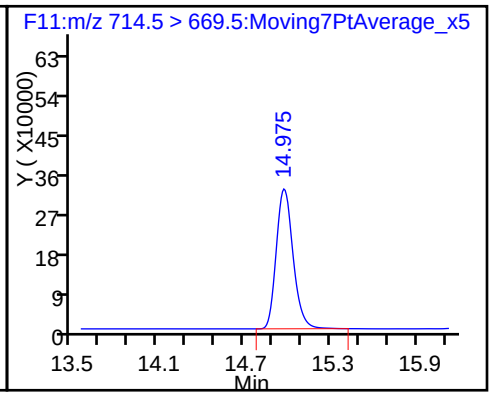
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Lab Sample ID: ICV 320-101820/10 Calibration Date: 02/26/2016 20:17

Instrument ID: A4 Calib Start Date: 02/26/2016 17:27

GC Column: Acquity ID: 2.10(mm) Calib End Date: 02/26/2016 19:34

Lab File ID: 26FEB2016A4A_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.4899	0.5519		56.3	50.0	12.6	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	AveID	0.5065	0.5297		52.3	50.0	4.6	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	0.5065	0.5297		52.3	50.0	4.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.4953	0.5075		51.2	50.0	2.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	0.5995	0.6951		51.3	44.3	15.9	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.4638	0.4588		49.5	50.0	-1.1	25.0
Perfluoroheptanoic acid (PFHpA)	L2ID		0.5882		54.8	50.0	9.5	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.014	1.050		48.9	47.3	3.5	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	2.417	2.069		40.7	47.6	-14.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	0.5253	0.5473		52.1	50.0	4.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	3.734	3.671		46.9	47.8	-1.7	25.0
Perfluorononanoic acid (PFNA)	L2ID		1.058		50.2	50.0	0.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.8798	0.8749		49.7	50.0	-0.6	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9154	0.9791		53.5	50.0	7.0	25.0
Perfluorodecane Sulfonic acid	AveID	1.587	1.562		47.5	48.3	-1.6	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.098	1.117		50.9	50.0	1.8	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8019	0.8729		54.4	50.0	8.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.7847	0.7421		47.3	50.0	-5.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.3730	0.3561		47.7	50.0	-4.5	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_014.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 26-Feb-2016 20:17:12 ALS Bottle#: 9 Worklist Smp#: 10
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub6

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:18:18 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:13:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.7 > 168.6	6.198	6.043	0.155	1.000	2279528	56.3			5353	
36 Perfluorooctandecanoic acid										
212.7 > 168.6	6.198	6.043	0.155	1.000	2279528	52.3			5353	
34 Perfluorohexadecanoic acid										
212.7 > 168.6	6.198	6.043	0.155	1.000	2279528	52.3			5353	
D 35 13C2-PFHxDA										
212.7 > 168.6	6.198	6.043	0.155		2279528	32.5		64.9	5353	
D 1 13C4 PFBA										
216.7 > 171.5	6.198	6.043	0.155		4130305	44.8		89.7	12319	
D 3 13C5-PFPeA										
267.6 > 222.7	7.502	7.272	0.230		2687035	44.6		89.1	5981	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.502	7.275	0.227	1.000	1363584	51.2			670	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.647	7.404	0.243	1.000	1010829	NC			1426	
298.8 > 98.6	7.647	7.404	0.243	1.000	671868		1.50(0.00-0.00)		936	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.647	7.404	0.243	1.000	1010829	51.3				
7 Perfluorohexanoic acid										
312.9 > 268.7	8.870	8.604	0.266	1.000	1718894	49.5			1645	
D 6 13C2 PFHxA										
314.6 > 269.7	8.863	8.604	0.259		3746191	46.5		93.0	6006	
D 8 13C4-PFHpA										
366.6 > 321.6	10.105	9.856	0.249		3014195	44.4		88.8	4431	
9 Perfluoroheptanoic acid										
362.8 > 318.7	10.105	9.859	0.246	1.000	1773049	54.8			2124	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	10.139	9.892	0.247	1.000	1630372	48.9				
10 Perfluorohexane Sulfonate										
398.3 > 79.2	10.139	9.892	0.247	1.000	1630372	NC			2536	
D 11 18O2 PFHxS										
402.5 > 83.6	10.139	9.892	0.247		1554519	42.9		90.6	3837	
D 12 13C4 PFOA										
416.5 > 371.6	11.180	10.958	0.222		3390361	43.3		86.5	4780	
13 Perfluorooctanoic acid										
412.8 > 368.8	11.190	10.958	0.232	1.000	1855656	52.1			1213	
412.8 > 168.7	11.190	10.958	0.232	1.000	711639		2.61(0.00-0.00)		1455	
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	11.180	10.960	0.220	1.000	1595097	NC			3254	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	11.180	10.960	0.220	1.000	1595097	40.7				
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	12.075	11.874	0.201	1.000	2838213	46.9			2688	
498.3 > 98.2	12.075	11.874	0.201	1.000	1731419		1.64(0.00-0.00)		2433	
D 16 13C4 PFOS										
502.4 > 79.7	12.075	11.876	0.199		774022	47.5		99.3	1480	
D 17 13C5 PFNA										
467.5 > 422.6	12.106	11.898	0.208		3281679	50.6		101	6229	
18 Perfluorononanoic acid										
462.5 > 418.6	12.106	11.899	0.207	1.000	3471042	50.2			3082	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.882	12.693	0.189	1.000	3234126	49.7			2890	
D 19 13C2 PFDA										
514.4 > 469.5	12.869	12.693	0.176		3696513	45.8		91.5	5622	
21 PFNS (Perflouro-1-nonanesulfonate)										
548.6 > 79.6	12.831	12.831	0.0	1.000	1010175	NC			1549	
D 23 13C8 FOSA										
505.4 > 77.6	13.400	13.222	0.178		5294827	46.8		93.6	3379	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.400	13.222	0.178	1.000	5183972	53.5			3824	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.485	13.324	0.161	1.000	1220419	NC			2092	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.485	13.324	0.161	1.000	1220419	47.5				
D 26 13C2 PFUnA										
564.3 > 519.5	13.529	13.369	0.160		3470905	45.0		90.0	5042	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.529	13.372	0.157	1.000	3878037	50.9			2117	
29 Perfluorododecanoic acid										
612.4 > 568.6	14.078	13.937	0.141	1.000	3756873	54.4			1818	
D 28 13C2 PFDoA										
614.4 > 569.4	14.078	13.939	0.139		4303774	50.5		101	3011	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.552	14.430	0.122	1.000	3193673	47.3			1695	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.497	14.727	-0.230	1.000	510351	NC			1569	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.957	14.841	0.116	1.000	1532525	47.7			1171	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.957	14.844	0.113		3495891	50.6		101	2838	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_00014 Amount Added: 1.00 Units: mL

Report Date: 29-Feb-2016 10:18:20 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_014.d

Injection Date: 26-Feb-2016 20:17:12 Instrument ID: A4

Lims ID: ICV

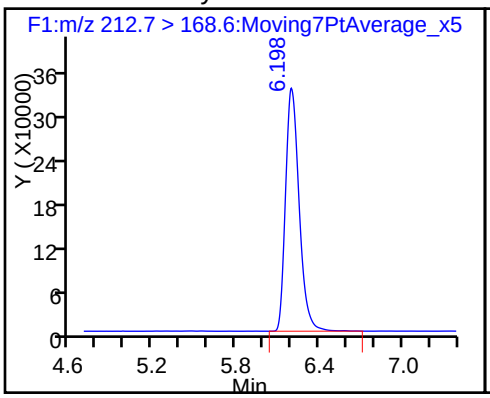
Client ID:

Operator ID: JRB ALS Bottle#: 9 Worklist Smp#: 10

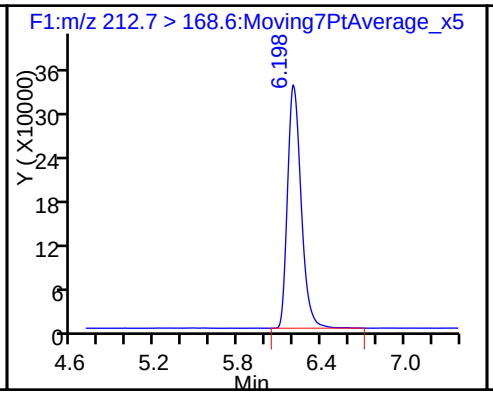
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

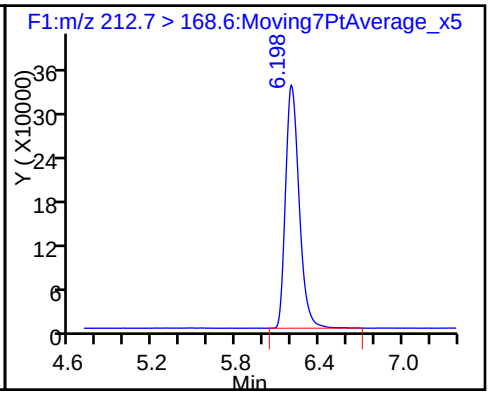
2 Perfluorobutyric acid



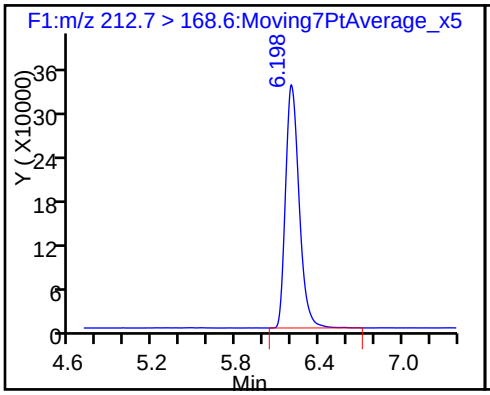
36 Perfluorooctandecanoic acid



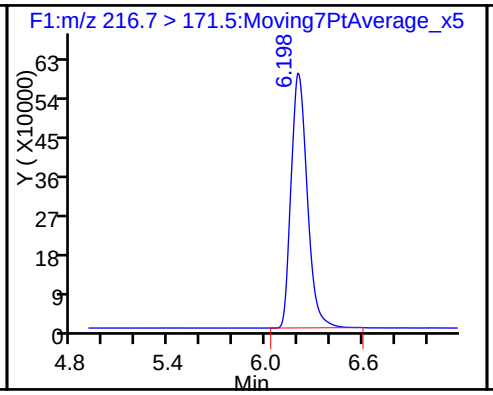
34 Perfluorohexadecanoic acid



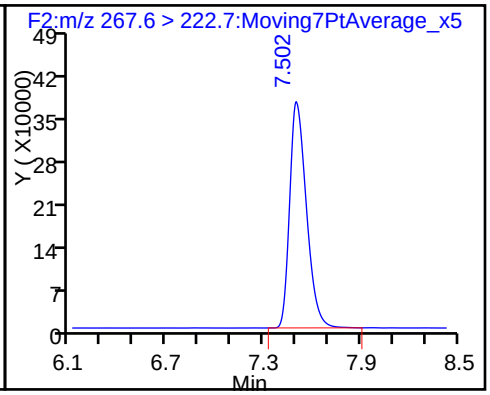
D 35 13C2-PFHxDA



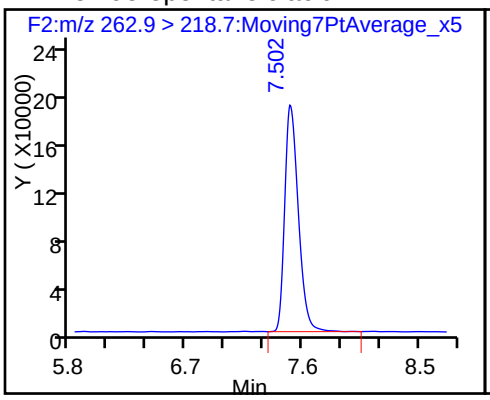
D 1 13C4 PFBA



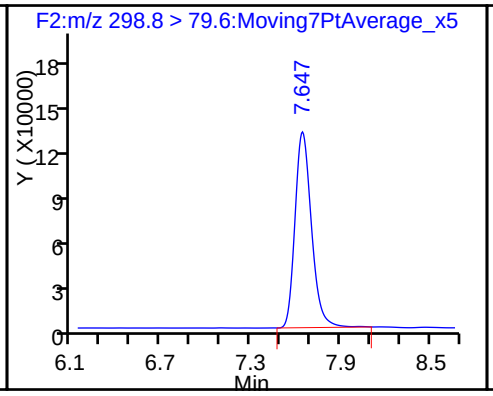
D 3 13C5-PFPeA



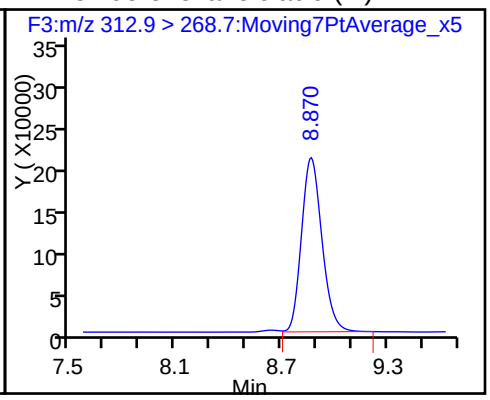
4 Perfluoropentanoic acid



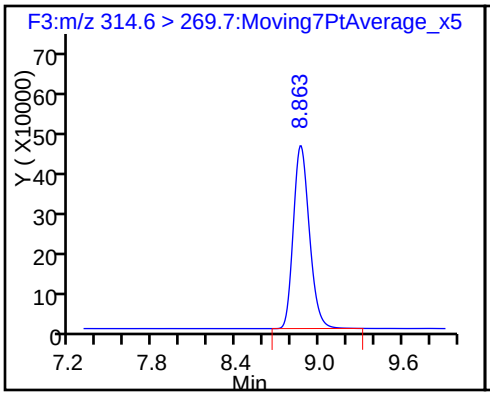
51 Perfluorobutanesulfonic acid



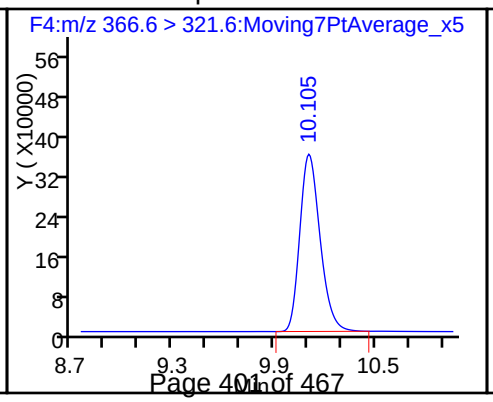
7 Perfluorohexanoic acid (M)



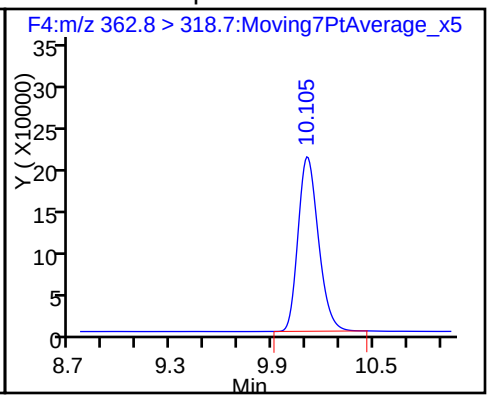
D 6 13C2 PFHxA



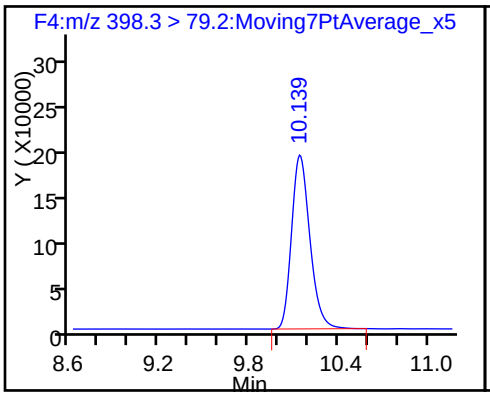
D 8 13C4-PFHpA



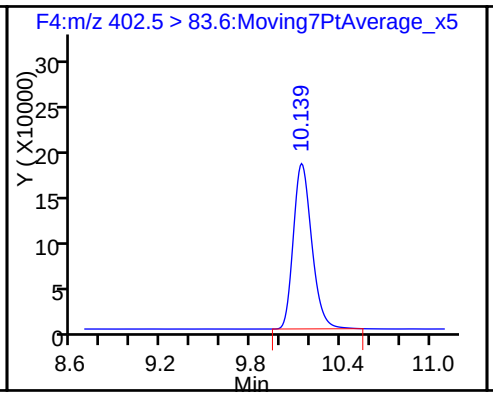
9 Perfluoroheptanoic acid



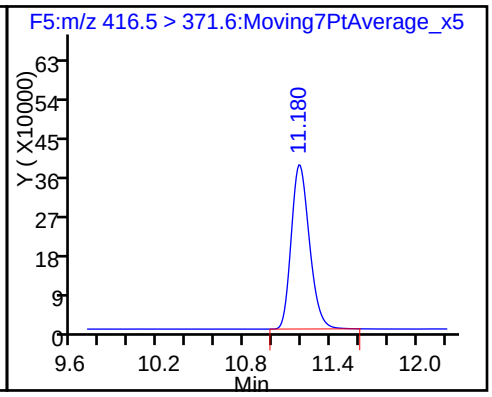
58 Perfluorohexanesulfonic acid



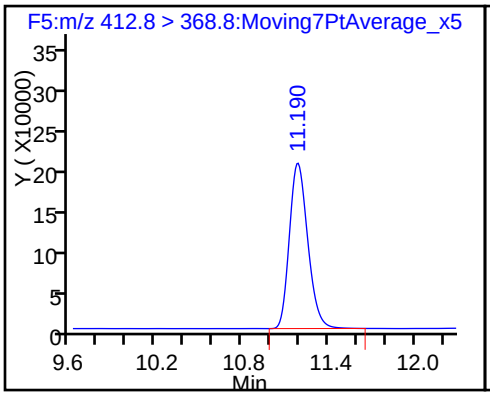
D 11 18O2 PFHxS



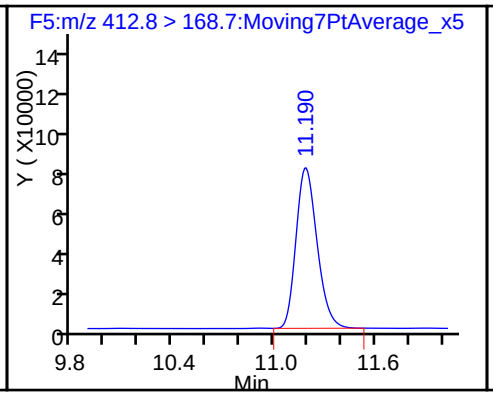
D 12 13C4 PFOA



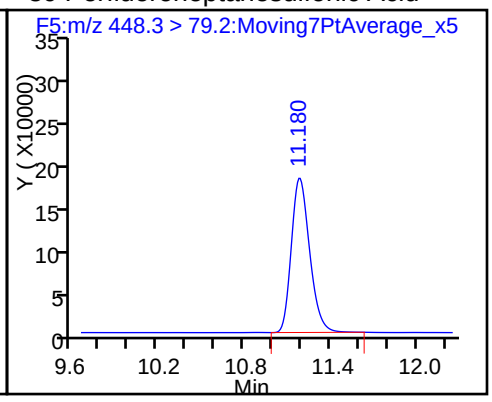
13 Perfluorooctanoic acid



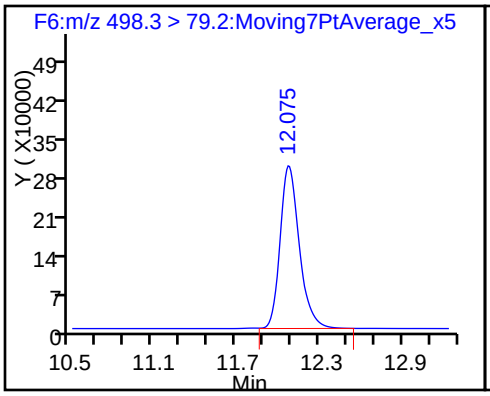
13 Perfluorooctanoic acid



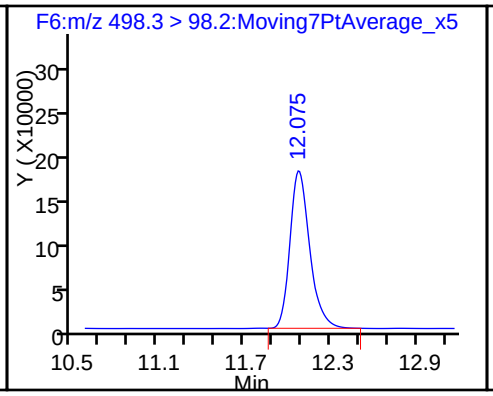
39 Perfluoroheptanesulfonic Acid



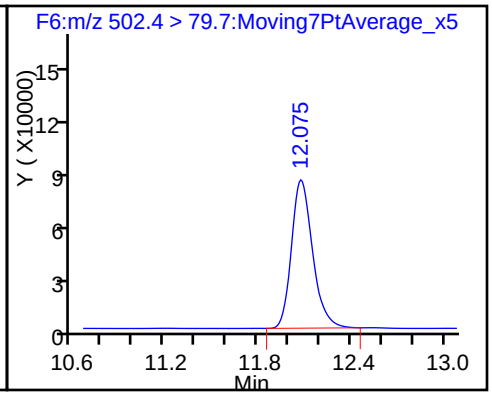
15 Perfluorooctane sulfonic acid



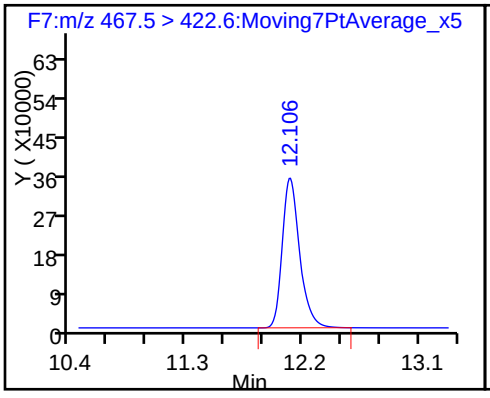
15 Perfluorooctane sulfonic acid



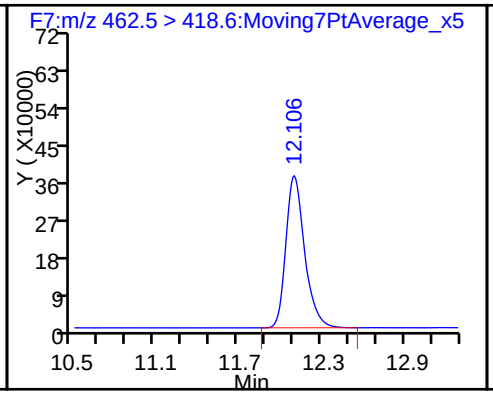
D 16 13C4 PFOS



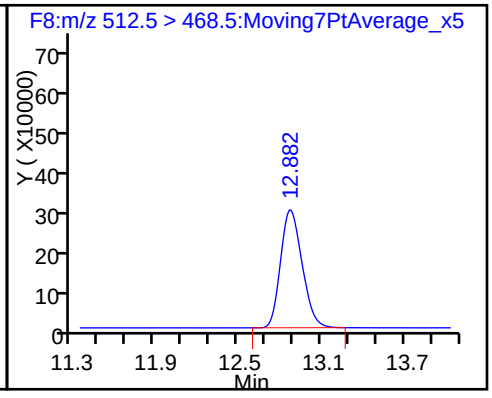
D 17 13C5 PFNA



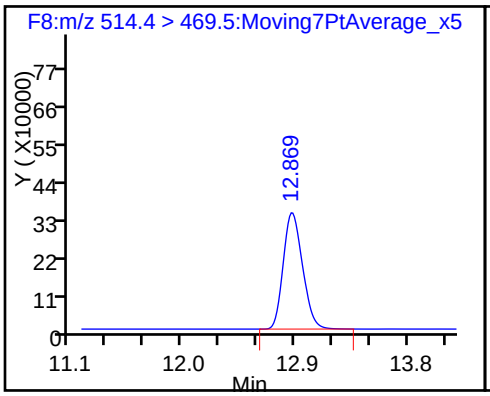
18 Perfluorononanoic acid



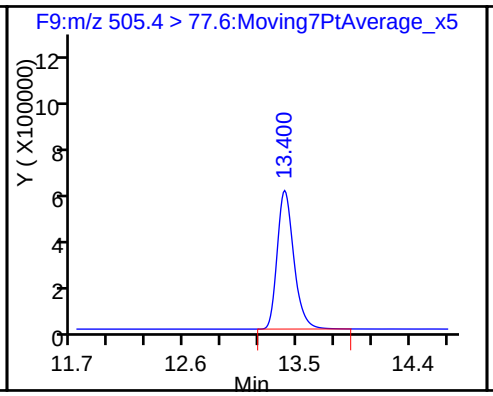
20 Perfluorodecanoic acid



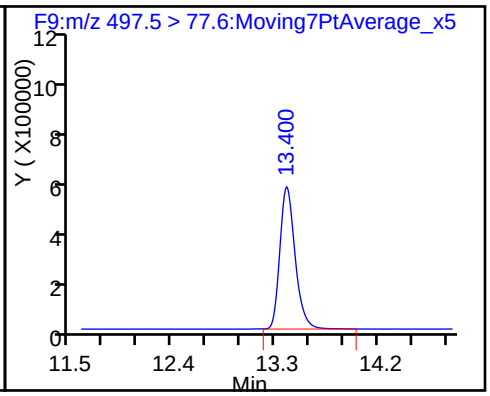
D 19 13C2 PFDA



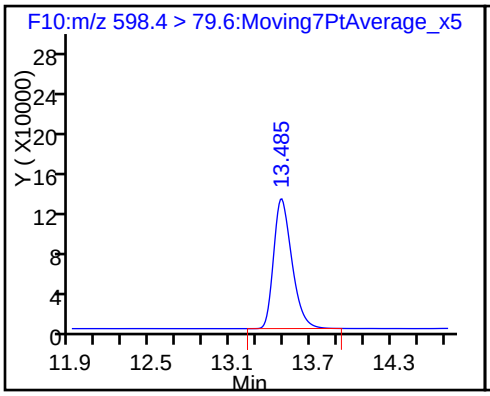
D 23 13C8 FOSA



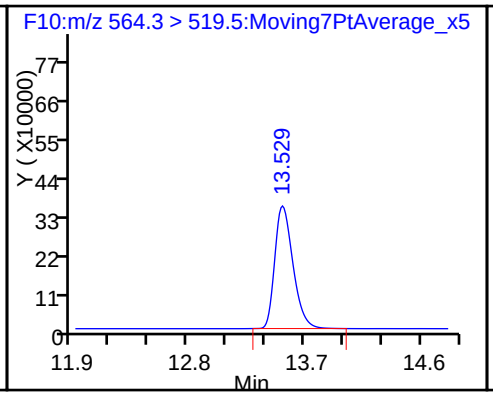
24 Perfluorooctane Sulfonamide



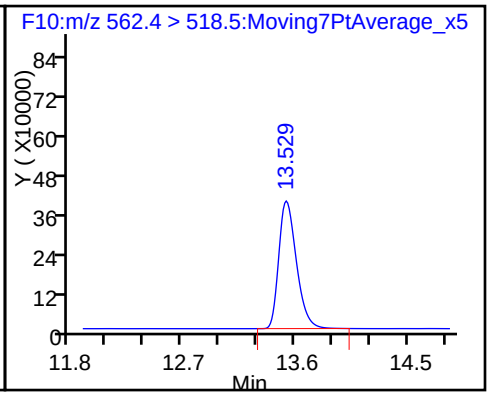
49 Perfluorodecane Sulfonic acid



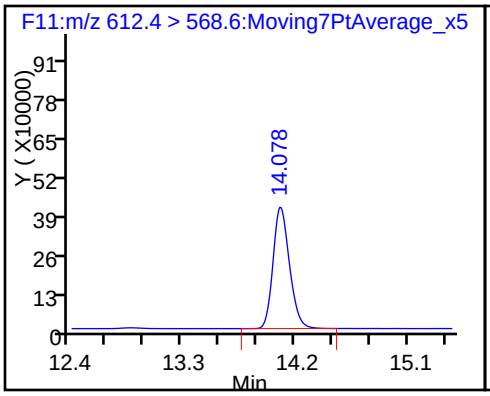
D 26 13C2 PFUnA



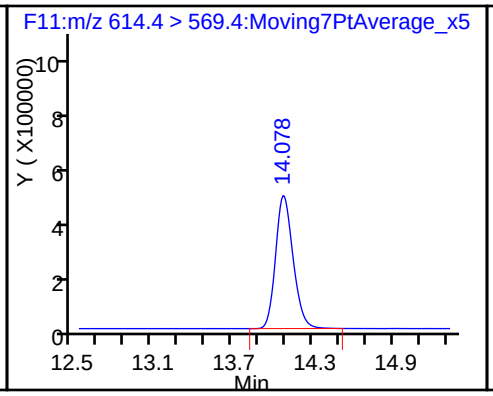
27 Perfluoroundecanoic acid



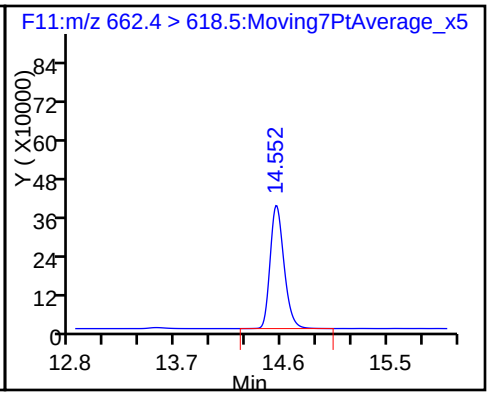
29 Perfluorododecanoic acid



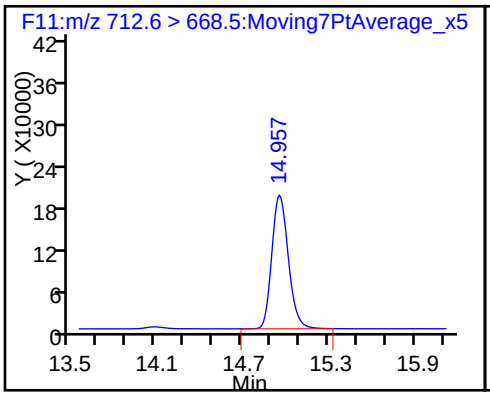
D 28 13C2 PFDoA



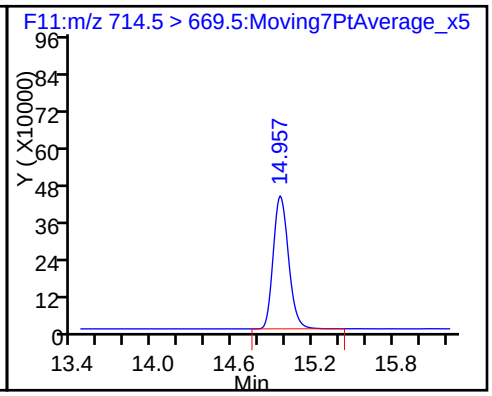
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Lab Sample ID: CCV 320-101820/21 Calibration Date: 02/27/2016 00:10

Instrument ID: A4 Calib Start Date: 02/26/2016 17:27

GC Column: Acquity ID: 2.10(mm) Calib End Date: 02/26/2016 19:34

Lab File ID: 26FEB2016A4A_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	0.4899	0.5032		51.3	50.0	2.7	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	AveID	0.5065	0.5009		49.4	50.0	-1.1	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	0.5065	0.5009		49.4	50.0	-1.1	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.4953	0.4633		46.8	50.0	-6.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	0.5995	0.6281		46.3	44.2	4.8	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.4638	0.4340		46.8	50.0	-6.4	25.0
Perfluoroheptanoic acid (PFHpA)	L2ID		0.4998		46.5	50.0	-6.9	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.014	0.9948		46.4	47.3	-1.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	2.417	2.800		55.1	47.6	15.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	0.5253	0.4731		45.0	50.0	-9.9	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	3.734	4.308		55.1	47.8	15.4	25.0
Perfluorononanoic acid (PFNA)	L2ID		1.002		47.6	50.0	-4.9	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.8798	0.9186		52.2	50.0	4.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9154	0.9687		52.9	50.0	5.8	25.0
Perfluorodecane Sulfonic acid	AveID	1.587	1.698		51.6	48.2	7.0	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.098	1.030		46.9	50.0	-6.2	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8019	0.7831		48.8	50.0	-2.3	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.7847	0.7122		45.4	50.0	-9.2	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.3730	0.3501		46.9	50.0	-6.1	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_025.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 27-Feb-2016 00:10:10 ALS Bottle#: 6 Worklist Smp#: 21
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:19:39 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:24:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.7 > 168.6	6.415	6.043	0.372	1.000	2076624	51.3		103	5554	
36 Perfluorooctandecanoic acid										
212.7 > 168.6	6.415	6.043	0.372	1.000	2076624	49.4		98.9	5554	
34 Perfluorohexadecanoic acid										
212.7 > 168.6	6.415	6.043	0.372	1.000	2076624	49.4		98.9	5554	
D 35 13C2-PFHxDA										
212.7 > 168.6	6.415	6.043	0.372		2076624	29.6		59.1	5554	
D 1 13C4 PFBA										
216.7 > 171.5	6.415	6.043	0.372		4127183	44.8		89.6	10669	
D 3 13C5-PFPeA										
267.6 > 222.7	7.778	7.272	0.506		2806814	46.5		93.1	5815	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.778	7.275	0.503	1.000	1300446	46.8		93.5	514	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.922	7.404	0.518	1.000	887539	NC			1062	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.922	7.404	0.518	1.000	887539	46.3		105		
7 Perfluorohexanoic acid										
312.9 > 268.7	9.144	8.604	0.540	1.000	1599137	46.8		93.6	1980	
D 6 13C2 PFHxA										
314.6 > 269.7	9.144	8.604	0.540		3684517	45.7		91.4	8785	
D 8 13C4-PFHpA										
366.6 > 321.6	10.378	9.856	0.522		2994042	44.1		88.2	4820	
9 Perfluoroheptanoic acid										
362.8 > 318.7	10.378	9.859	0.519	1.000	1496392	46.5		93.1	1989	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	10.412	9.892	0.520	1.000	1504172	46.4		98.1		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluorohexane Sulfonate										
398.3 > 79.2	10.412	9.892	0.520	1.000	1504172	NC			1970	
D 11 18O2 PFHxS										
402.5 > 83.6	10.412	9.892	0.520		1512095	41.7		88.1	3199	
D 12 13C4 PFOA										
416.5 > 371.6	11.447	10.958	0.489		3614445	46.1		92.2	7386	
13 Perfluorooctanoic acid										
412.8 > 368.8	11.447	10.958	0.489	1.000	1709960	45.0		90.1	1294	
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	11.447	10.960	0.487	1.000	1780978	NC			5444	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	11.447	10.960	0.487	1.000	1780978	55.1		116		
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	12.334	11.874	0.460	1.000	2751655	55.1		115	2629	
D 16 13C4 PFOS										
502.4 > 79.7	12.334	11.876	0.458		638663	39.2		82.0	1217	
D 17 13C5 PFNA										
467.5 > 422.6	12.347	11.898	0.449		3034388	46.8		93.7	6231	
18 Perfluorononanoic acid										
462.5 > 418.6	12.360	11.899	0.461	1.000	3040796	47.6		95.1	3190	
20 Perfluorodecanoic acid										
512.5 > 468.5	13.120	12.693	0.427	1.000	3331888	52.2		104	4454	
D 19 13C2 PFDA										
514.4 > 469.5	13.120	12.693	0.427		3627237	44.9		89.8	5833	
21 PFNS (Perflouro-1-nonanesulfonate)										
548.6 > 79.6	13.079	12.831	0.248	1.000	1011641	NC			2526	
D 23 13C8 FOSA										
505.4 > 77.6	13.634	13.222	0.412		5014453	44.3		88.6	3116	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.634	13.222	0.412	1.000	4857567	52.9		106	2971	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.695	13.324	0.371	1.000	1093554	NC			2143	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.695	13.324	0.371	1.000	1093554	51.6		107		
D 26 13C2 PFUnA										
564.3 > 519.5	13.742	13.369	0.373		3551177	46.0		92.1	3176	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.742	13.372	0.370	1.000	3656098	46.9		93.8	2498	
29 Perfluorododecanoic acid										
612.4 > 568.6	14.285	13.937	0.348	1.000	3246654	48.8		97.7	1425	
D 28 13C2 PFDoA										
614.4 > 569.4	14.285	13.939	0.346		4146001	48.6		97.3	2826	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.736	14.430	0.306	1.000	2952884	45.4		90.8	1411	
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.681	14.727	-0.046	1.000	406990	NC			1210	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	15.118	14.841	0.277	1.000	1451467	46.9		93.9	1071	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 33 13C2-PFTeDA										
714.5 > 669.5	15.118	14.844	0.274		3645677	52.8		106	2688	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00016 Amount Added: 1.00 Units: mL

Report Date: 29-Feb-2016 10:19:40 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_025.d

Injection Date: 27-Feb-2016 00:10:10 Instrument ID: A4

Lims ID: CCV L5

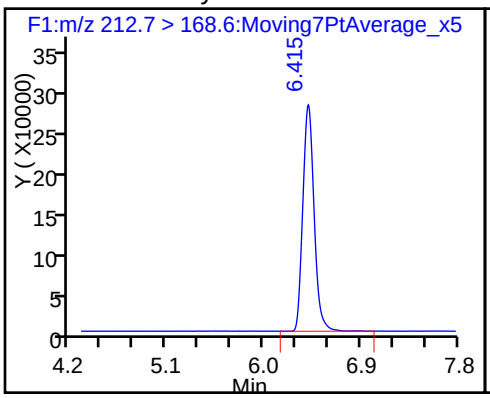
Client ID:

Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 21

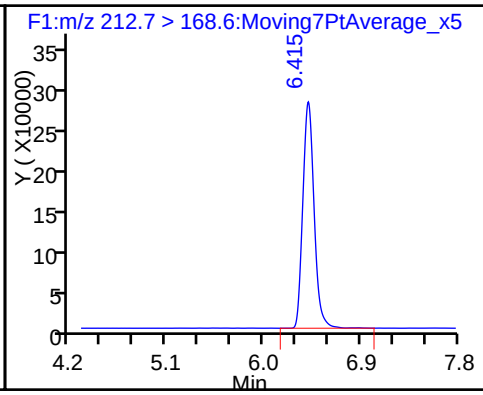
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

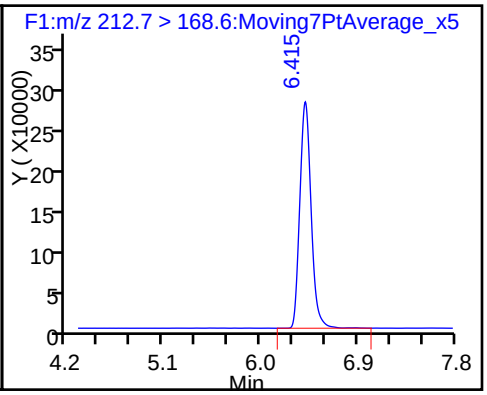
2 Perfluorobutyric acid



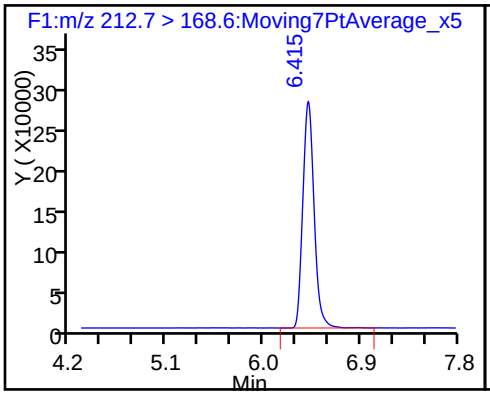
36 Perfluorooctandecanoic acid



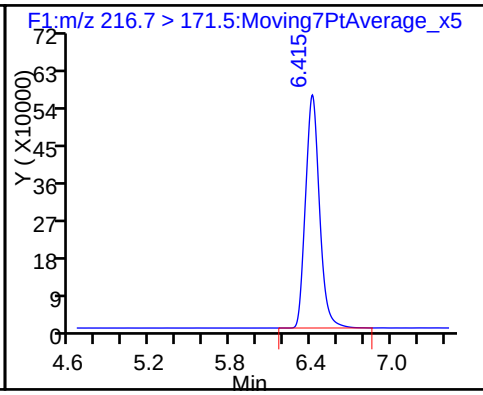
34 Perfluorohexadecanoic acid



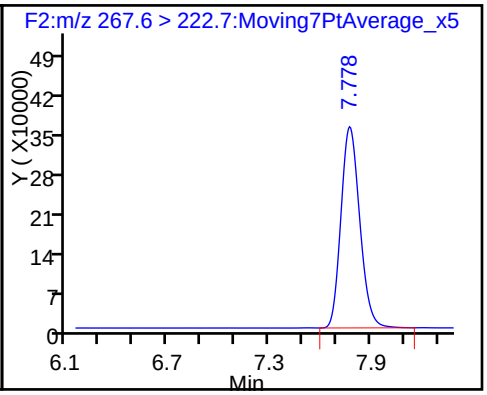
D 35 13C2-PFHxDA



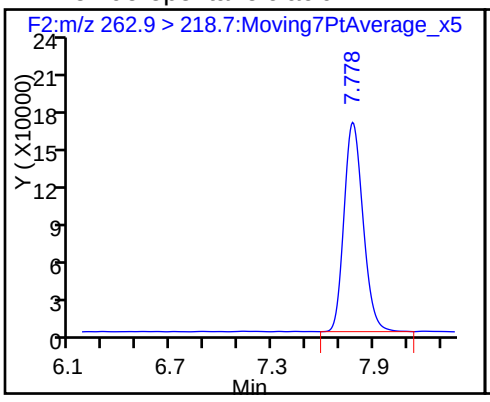
D 1 13C4 PFBA



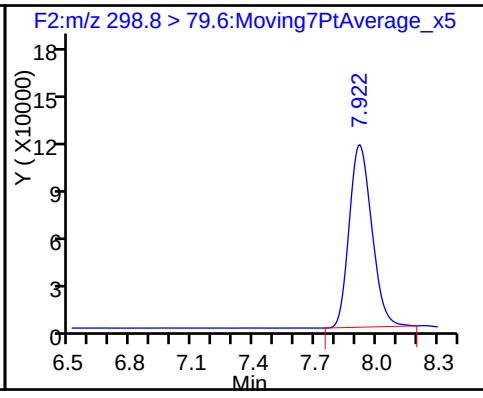
D 3 13C5-PFPeA



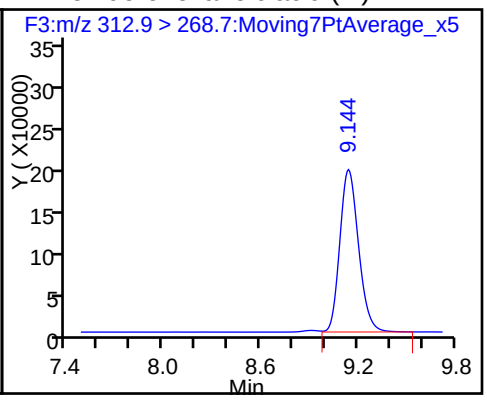
4 Perfluoropentanoic acid



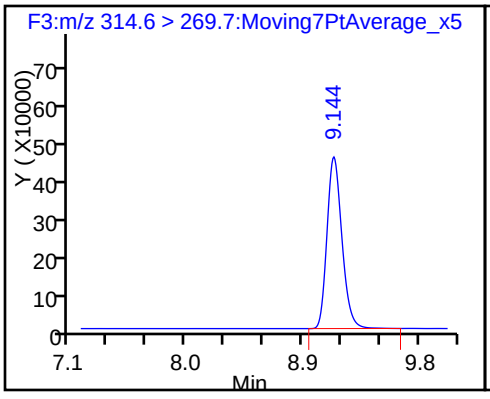
51 Perfluorobutanesulfonic acid



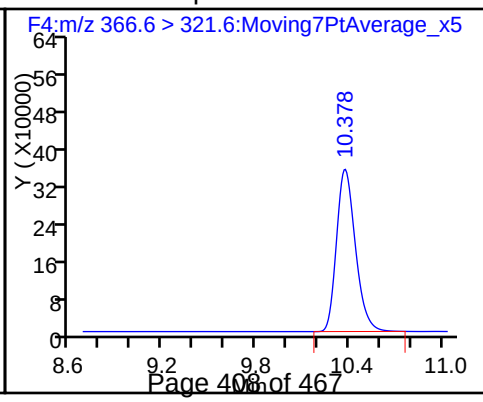
7 Perfluorohexanoic acid (M)



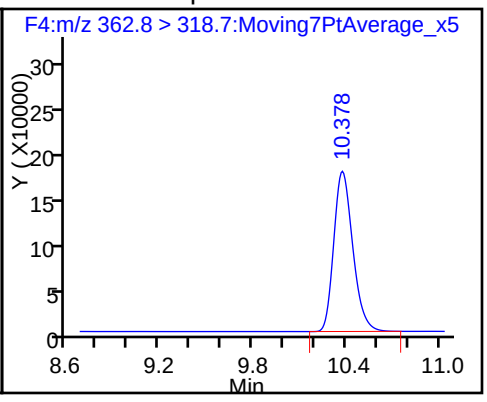
D 6 13C2 PFHxA



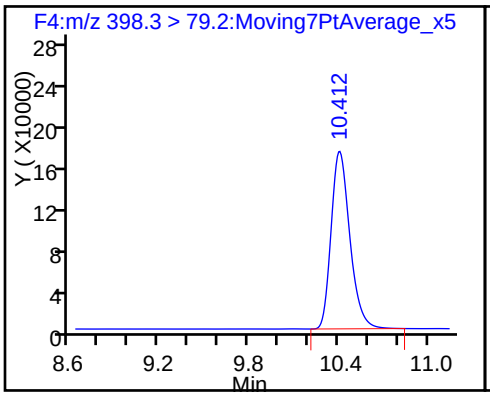
D 8 13C4-PFHpA



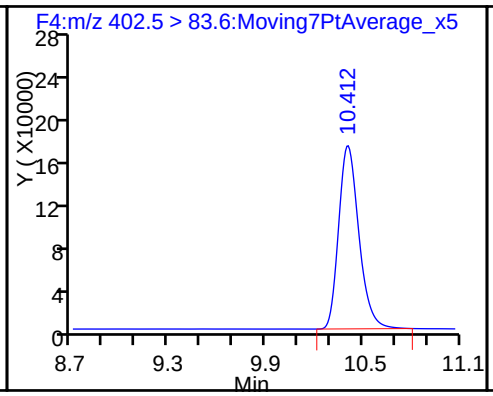
9 Perfluoroheptanoic acid



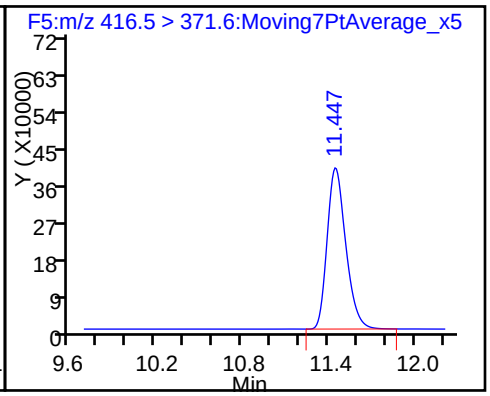
58 Perfluorohexanesulfonic acid



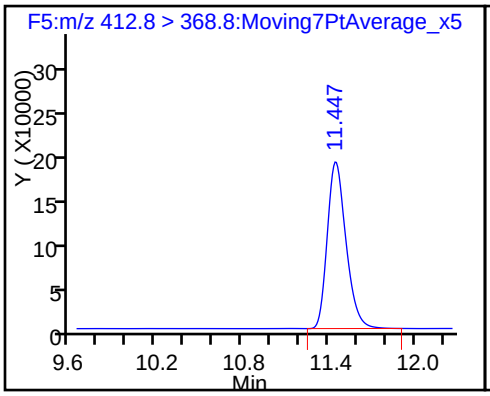
D 11 18O2 PFHxS



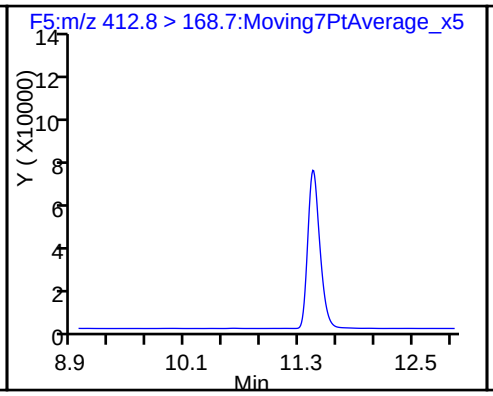
D 12 13C4 PFOA



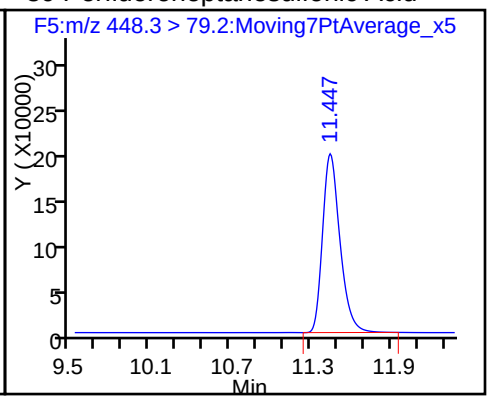
13 Perfluorooctanoic acid



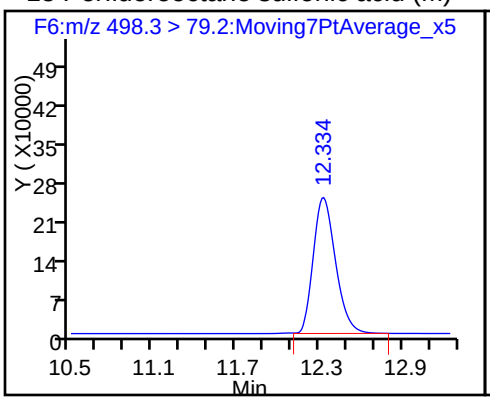
13 Perfluorooctanoic acid



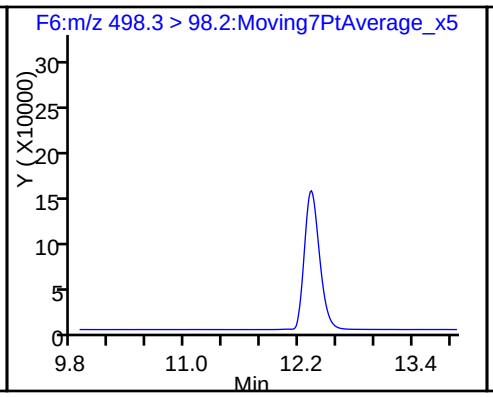
39 Perfluoroheptanesulfonic Acid



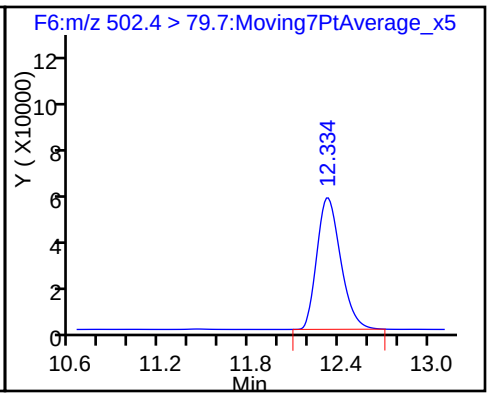
15 Perfluorooctane sulfonic acid (M)



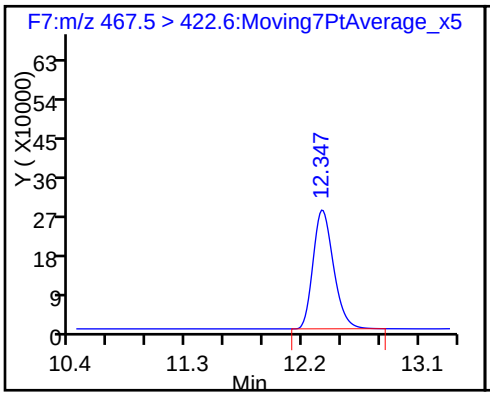
15 Perfluorooctane sulfonic acid



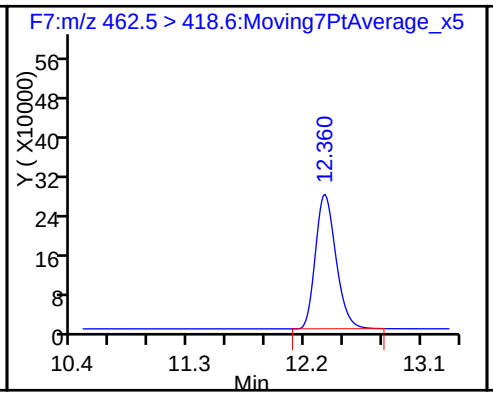
D 16 13C4 PFOS



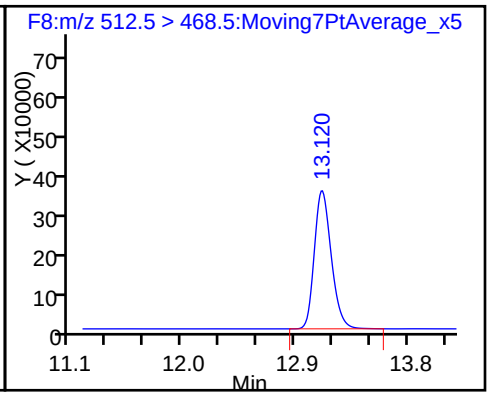
D 17 13C5 PFNA



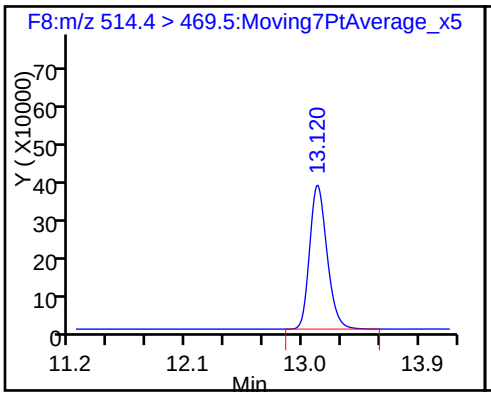
18 Perfluorononanoic acid



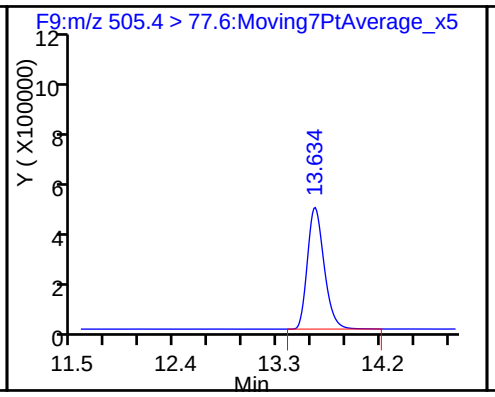
20 Perfluorodecanoic acid



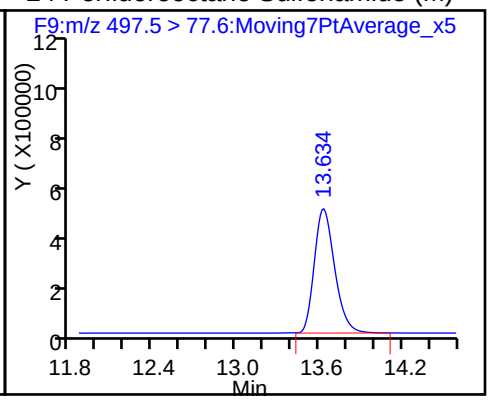
D 19 13C2 PFDA



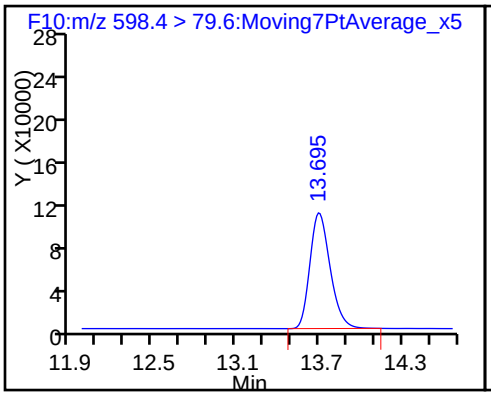
D 23 13C8 FOSA



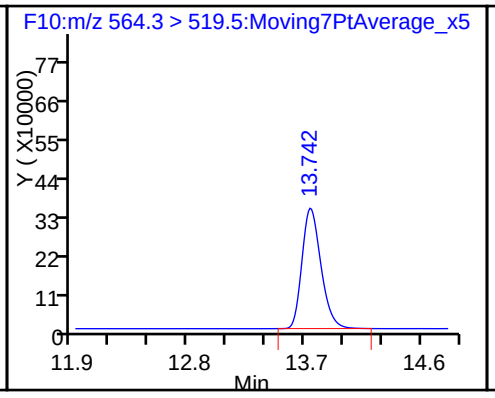
24 Perfluorooctane Sulfonamide (M)



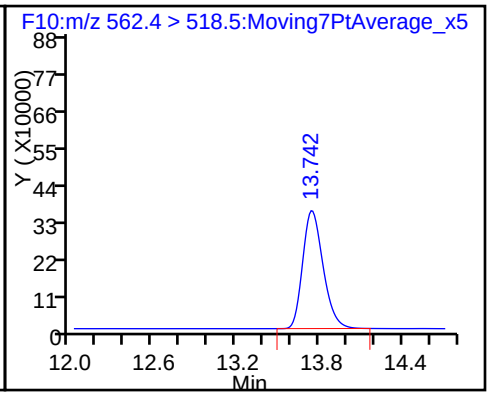
49 Perfluorodecane Sulfonic acid



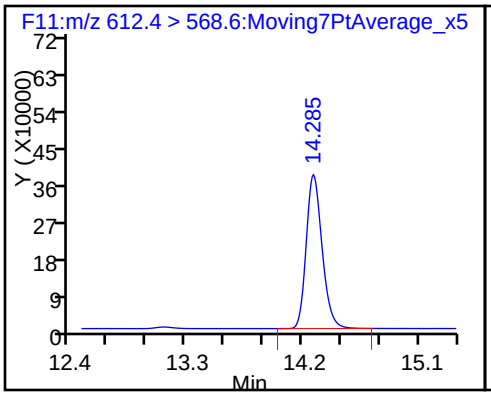
D 26 13C2 PFUnA



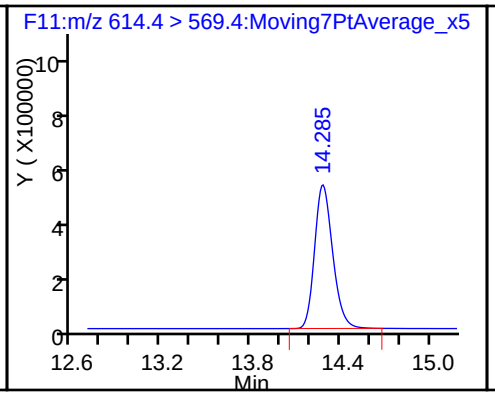
27 Perfluoroundecanoic acid



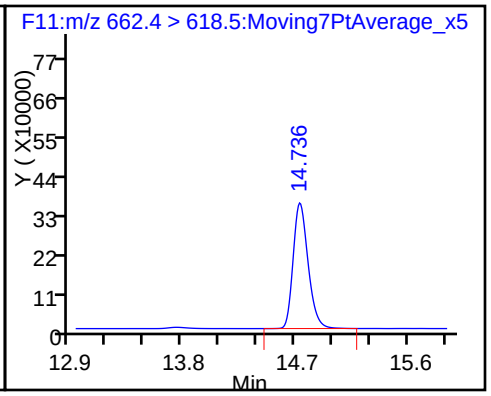
29 Perfluorododecanoic acid



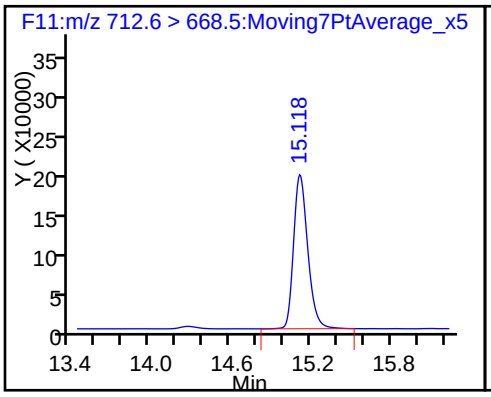
D 28 13C2 PFDoA



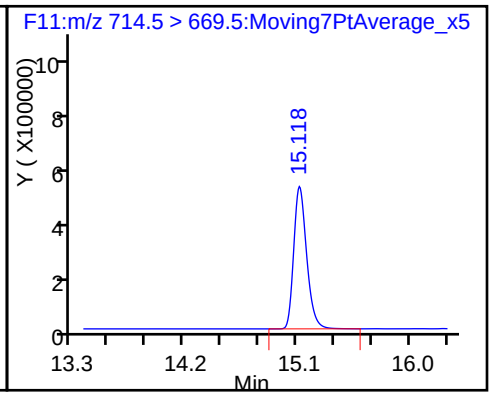
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Lab Sample ID: CCV 320-101820/32 Calibration Date: 02/27/2016 04:03

Instrument ID: A4 Calib Start Date: 02/26/2016 17:27

GC Column: Acquity ID: 2.10(mm) Calib End Date: 02/26/2016 19:34

Lab File ID: 26FEB2016A4A_036.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.4899	0.5088		20.8	20.0	3.8	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	AveID	0.5065	0.4848		19.1	20.0	-4.3	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	0.5065	0.4848		19.1	20.0	-4.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.4953	0.4656		18.8	20.0	-6.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	0.5995	0.5773		17.0	17.7	-3.7	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.4638	0.4355		18.8	20.0	-6.1	25.0
Perfluoroheptanoic acid (PFHpA)	L2ID		0.5180		19.3	20.0	-3.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.014	1.030		19.2	18.9	1.5	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	2.417	3.072		24.2	19.0	27.1*	25.0
Perfluorooctanoic acid (PFOA)	AveID	0.5253	0.4714		17.9	20.0	-10.3	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	3.734	4.447		22.8	19.1	19.1	25.0
Perfluorononanoic acid (PFNA)	L2ID		1.157		22.1	20.0	10.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.8798	0.9255		21.0	20.0	5.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9154	0.9434		20.6	20.0	3.1	25.0
Perfluorodecane Sulfonic acid	AveID	1.587	1.790		21.7	19.3	12.8	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.098	1.048		19.1	20.0	-4.6	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8019	0.8217		20.5	20.0	2.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.7847	0.8482		21.6	20.0	8.1	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.3730	0.3888		20.8	20.0	4.2	25.0

Report Date: 29-Feb-2016 10:20:38 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_036.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 27-Feb-2016 04:03:09 ALS Bottle#: 5 Worklist Smp#: 32
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:20:38 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:28:44

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.7 > 168.6	6.313	6.043	0.270	1.000	888064	20.8		104	2152	
36 Perfluorooctandecanoic acid										
212.7 > 168.6	6.313	6.043	0.270	1.000	888064	19.1		95.7	2152	
34 Perfluorohexadecanoic acid										
212.7 > 168.6	6.313	6.043	0.270	1.000	888064	19.1		95.7	2152	
D 35 13C2-PFHxDA										
212.7 > 168.6	6.313	6.043	0.270		888064	12.6		25.3	2152	
D 1 13C4 PFBA										
216.7 > 171.5	6.313	6.043	0.270		4363708	47.4		94.8	11501	
D 3 13C5-PFPeA										
267.6 > 222.7	7.686	7.272	0.414		2899360	48.1		96.2	6099	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.686	7.275	0.411	1.000	539924	18.8		94.0	224	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.830	7.404	0.426	1.000	343056	NC			481	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.830	7.404	0.426	1.000	343056	17.0		96.3		
7 Perfluorohexanoic acid										
312.9 > 268.7	9.073	8.604	0.469	1.000	685593	18.8		93.9	1154	
D 6 13C2 PFHxA										
314.6 > 269.7	9.073	8.604	0.469		3935514	48.8		97.7	6295	
D 8 13C4-PFHpA										
366.6 > 321.6	10.293	9.856	0.437		3356319	49.4		98.8	6280	
9 Perfluoroheptanoic acid										
362.8 > 318.7	10.293	9.859	0.434	1.000	695485	19.3		96.6	1242	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	10.327	9.892	0.435	1.000	654745	19.2		102		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluorohexane Sulfonate										
398.3 > 79.2	10.327	9.892	0.435	1.000	654745	NC			1286	
D 11 18O2 PFHxS										
402.5 > 83.6	10.327	9.892	0.435		1589768	43.8		92.7	3233	
D 12 13C4 PFOA										
416.5 > 371.6	11.319	10.958	0.361		4007572	51.1		102	5365	
13 Perfluorooctanoic acid										
412.8 > 368.8	11.319	10.958	0.361	1.000	755656	17.9		89.7	443	
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	11.319	10.960	0.359	1.000	835910	NC			2314	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	11.319	10.960	0.359	1.000	835910	24.2		127		
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	12.174	11.874	0.300	1.000	1215170	22.8		119	2048	
D 16 13C4 PFOS										
502.4 > 79.7	12.174	11.876	0.298		683148	41.9		87.7	1608	
D 17 13C5 PFNA										
467.5 > 422.6	12.195	11.898	0.297		3458098	53.4		107	4822	
18 Perfluorononanoic acid										
462.5 > 418.6	12.195	11.899	0.296	1.000	1600329	22.1		111	2416	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.945	12.693	0.252	1.000	1551550	21.0		105	1896	
D 19 13C2 PFDA										
514.4 > 469.5	12.945	12.693	0.252		4191158	51.9		104	3868	
21 PFNS (Perflouro-1-nonanesulfonate)										
548.6 > 79.6	12.895	12.831	0.064	1.000	465601	NC			1255	
D 23 13C8 FOSA										
505.4 > 77.6	13.463	13.222	0.241		5396353	47.7		95.4	4287	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.463	13.222	0.241	1.000	2036274	20.6		103	3179	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.529	13.324	0.205	1.000	493195	NC			1339	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.529	13.324	0.205	1.000	493195	21.7		113		
D 26 13C2 PFUnA										
564.3 > 519.5	13.576	13.369	0.207		4432706	57.5		115	3558	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.576	13.372	0.204	1.000	1857670	19.1		95.4	1983	
29 Perfluorododecanoic acid										
612.4 > 568.6	14.119	13.937	0.182	1.000	1505068	20.5		102	648	
D 28 13C2 PFDoA										
614.4 > 569.4	14.119	13.939	0.180		4579274	53.7		107	3074	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.607	14.430	0.177	1.000	1553609	21.6		108	917	
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.543	14.727	-0.184	1.000	165357	NC			843	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	15.011	14.841	0.170	1.000	712159	20.8		104	431	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 33 13C2-PFTeDA										
714.5 > 669.5	15.011	14.844	0.167		3955261	57.3		115	2947	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00017 Amount Added: 1.00 Units: mL

Report Date: 29-Feb-2016 10:20:39 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_036.d

Injection Date: 27-Feb-2016 04:03:09 Instrument ID: A4

Lims ID: CCV L4

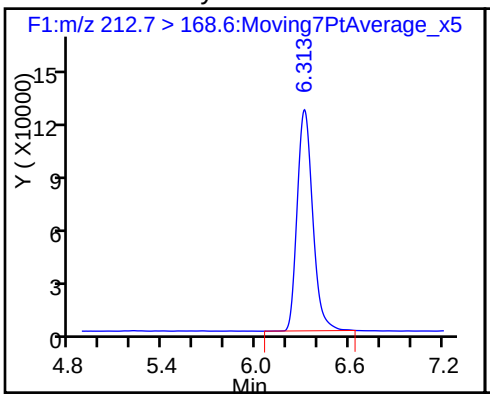
Client ID:

Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 32

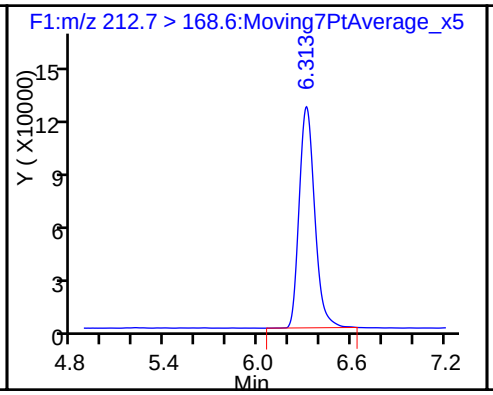
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

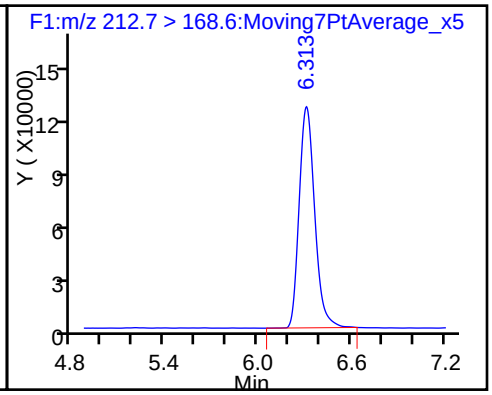
2 Perfluorobutyric acid



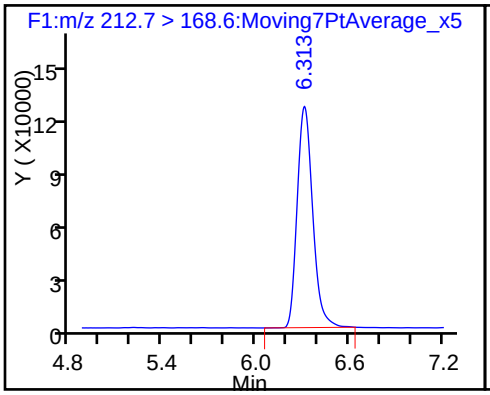
36 Perfluorooctandecanoic acid



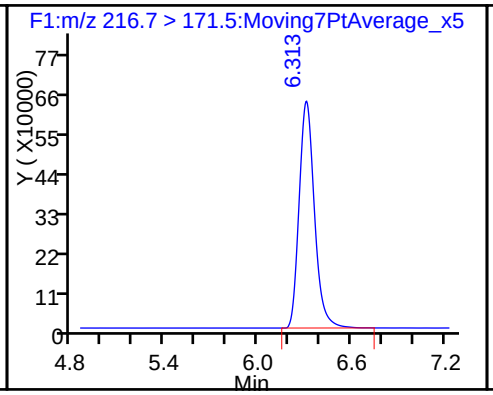
34 Perfluorohexadecanoic acid



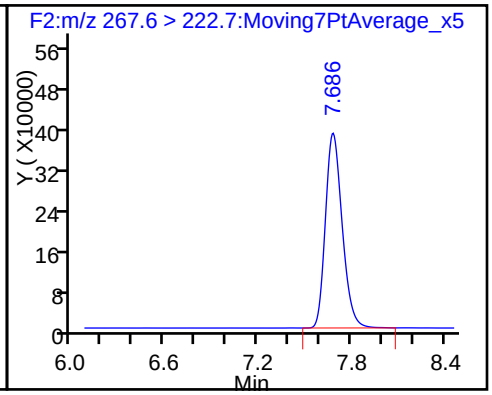
D 35 13C2-PFHxDA



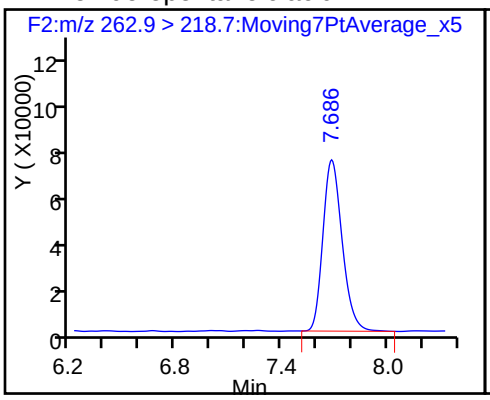
D 1 13C4 PFBA



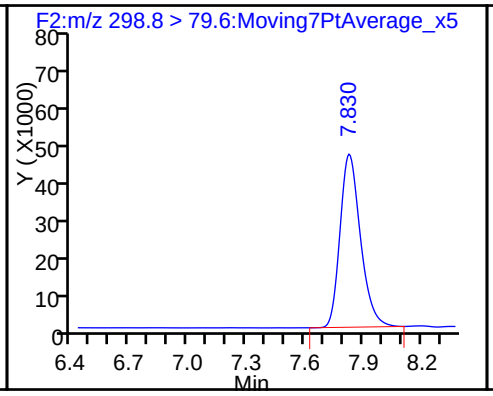
D 3 13C5-PFPeA



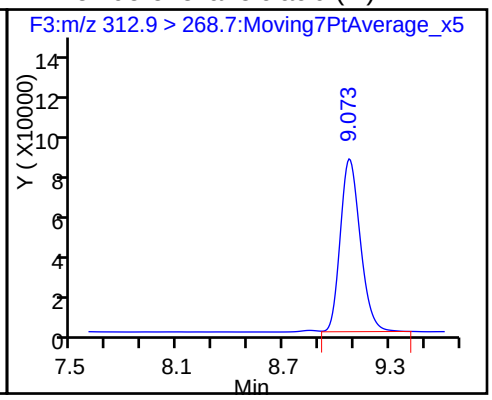
4 Perfluoropentanoic acid



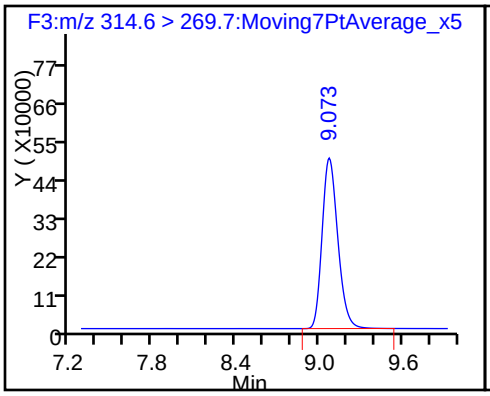
51 Perfluorobutanesulfonic acid



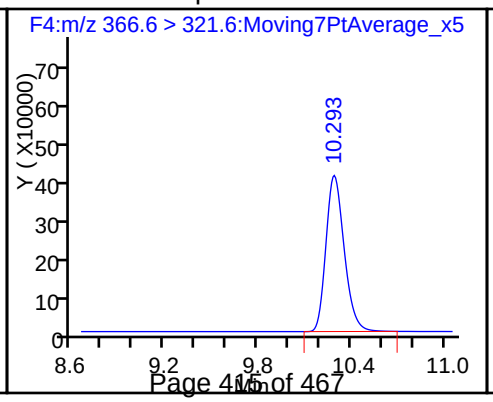
7 Perfluorohexanoic acid (M)



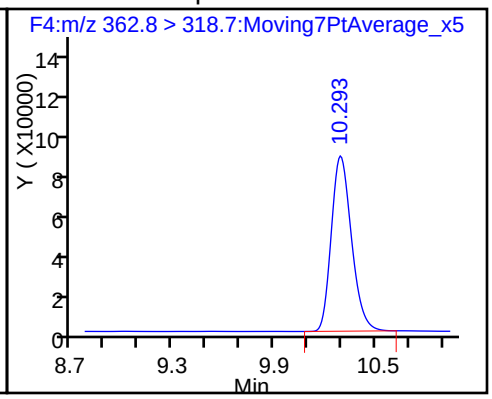
D 6 13C2 PFHxA



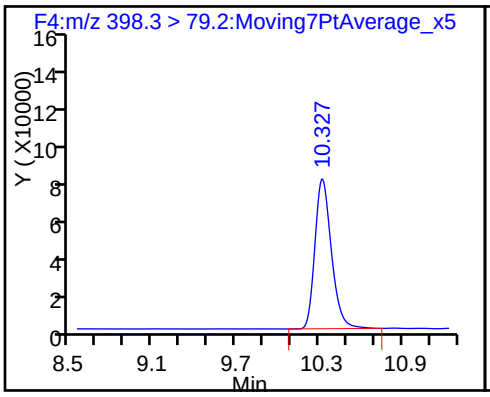
D 8 13C4-PFHpA



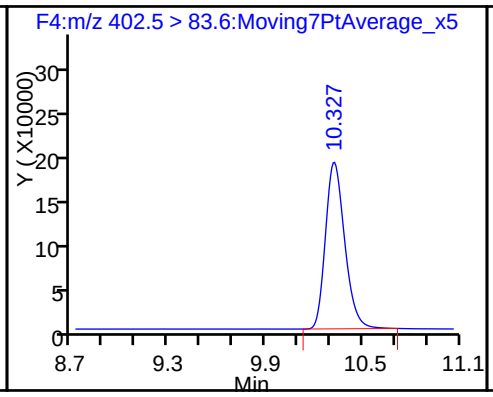
9 Perfluoroheptanoic acid



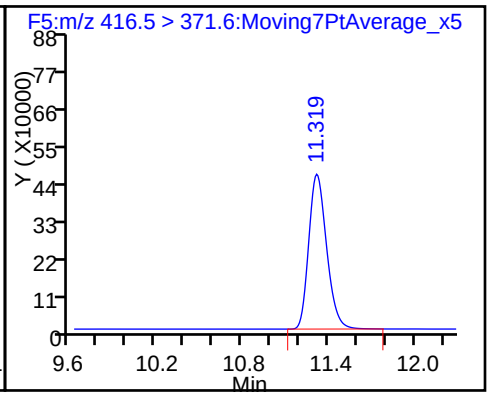
58 Perfluorohexanesulfonic acid



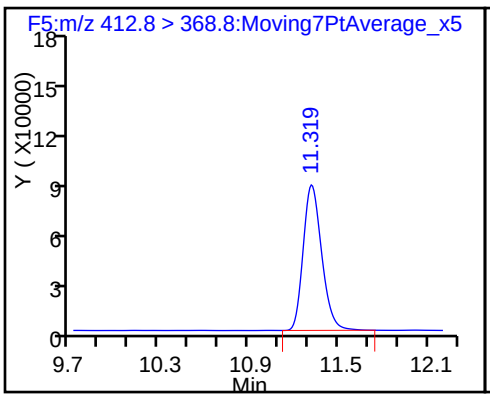
D 11 18O2 PFHxS



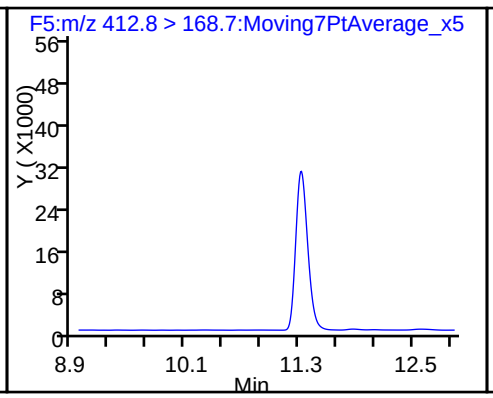
D 12 13C4 PFOA



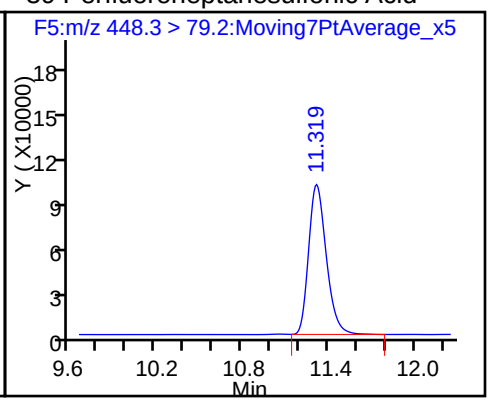
13 Perfluorooctanoic acid



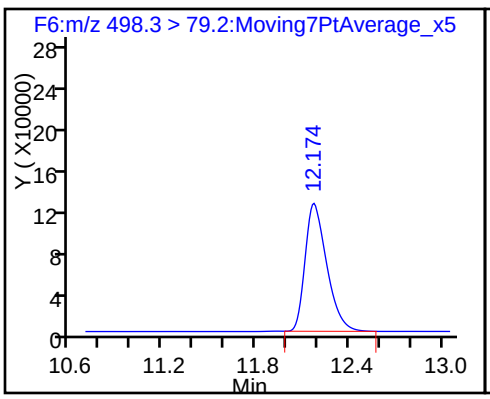
13 Perfluorooctanoic acid



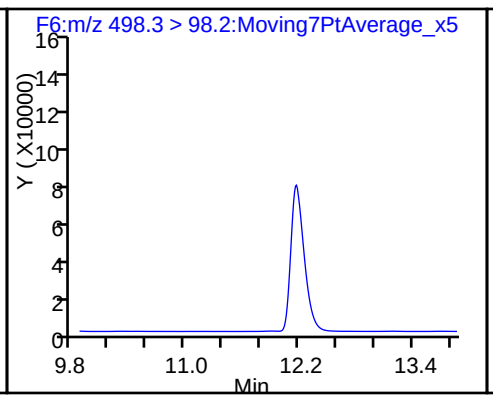
39 Perfluoroheptanesulfonic Acid



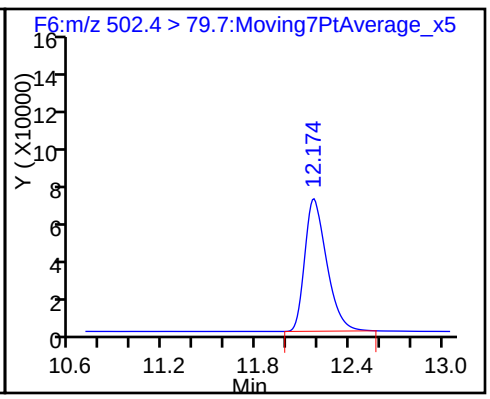
15 Perfluorooctane sulfonic acid



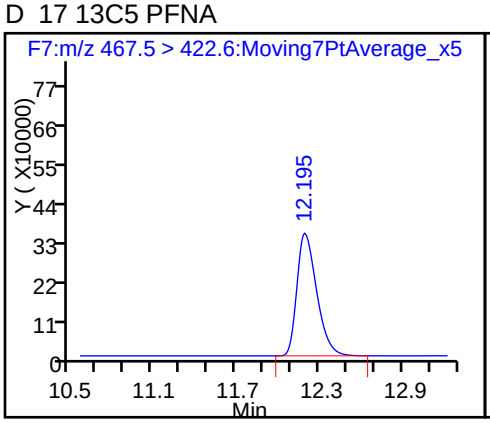
15 Perfluorooctane sulfonic acid



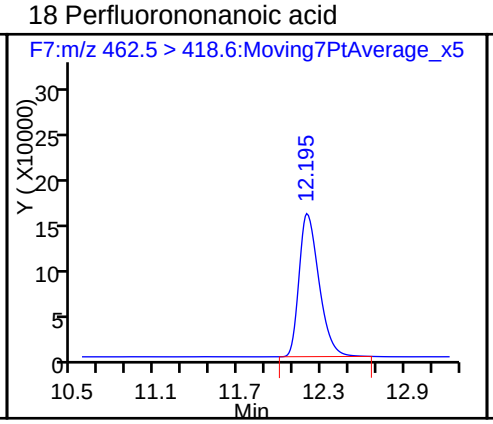
D 16 13C4 PFOS



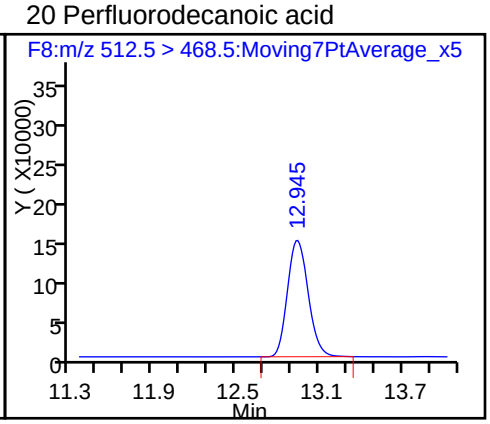
D 17 13C5 PFNA



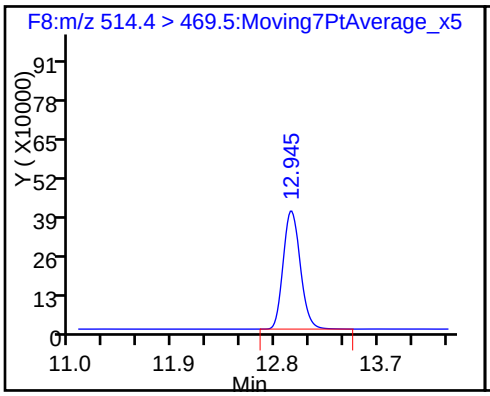
18 Perfluorononanoic acid



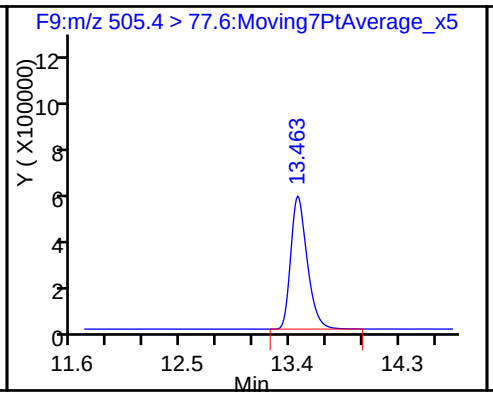
20 Perfluorodecanoic acid



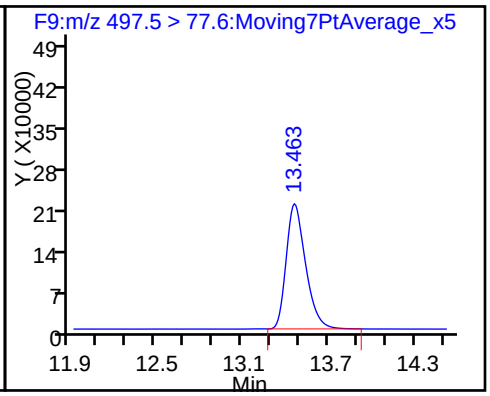
D 19 13C2 PFDA



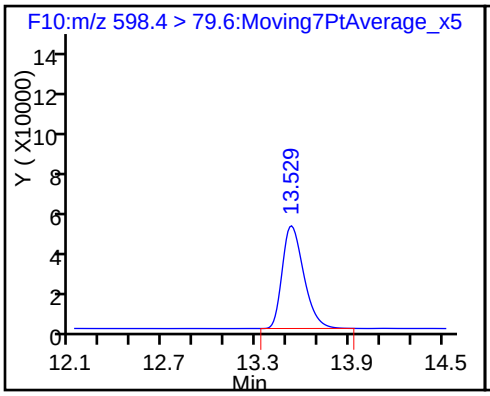
D 23 13C8 FOSA



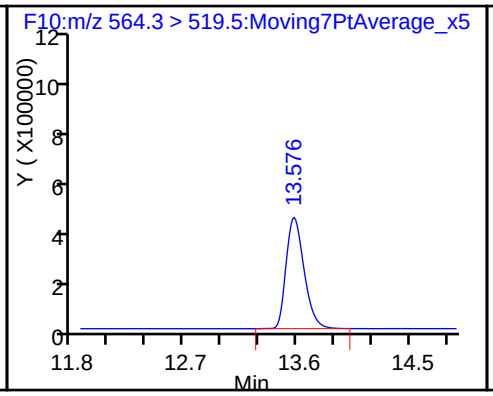
24 Perfluorooctane Sulfonamide



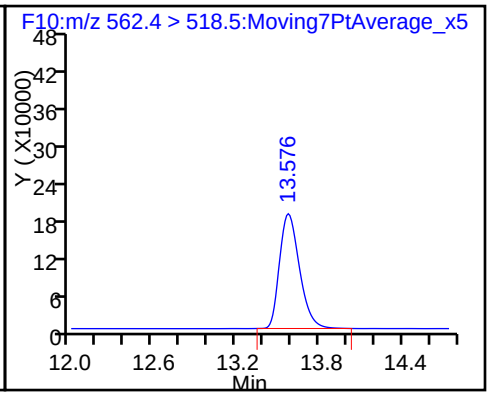
49 Perfluorodecane Sulfonic acid



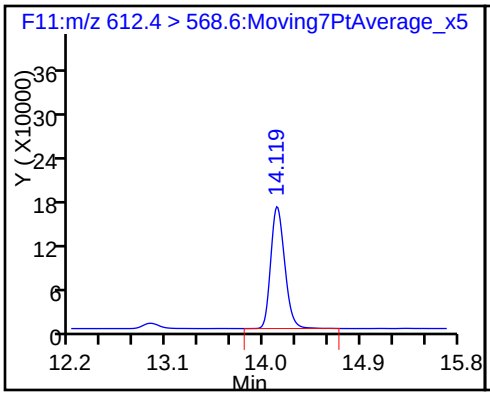
D 26 13C2 PFUnA



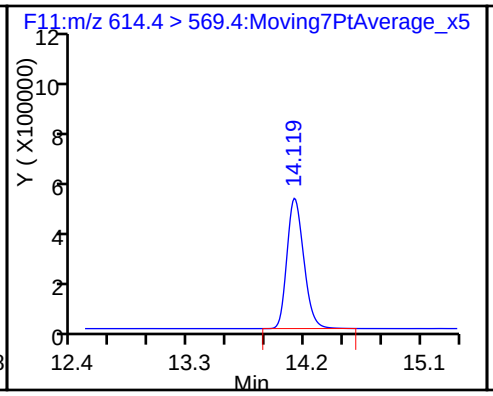
27 Perfluoroundecanoic acid



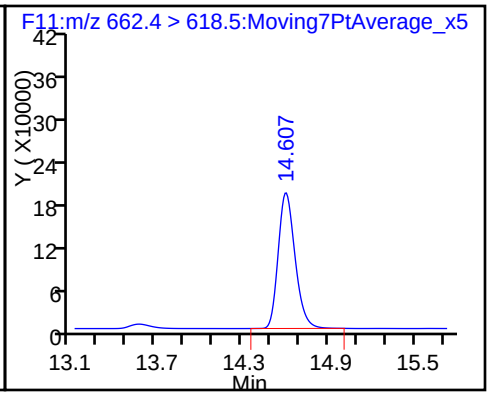
29 Perfluorododecanoic acid



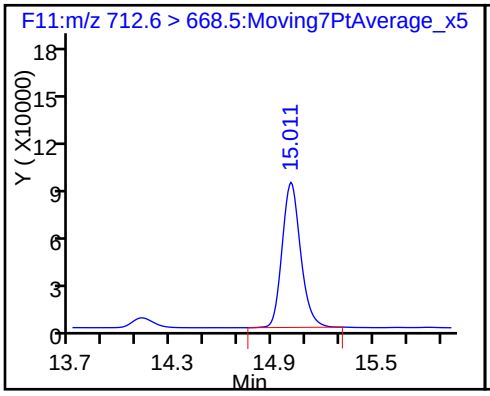
D 28 13C2 PFDoA



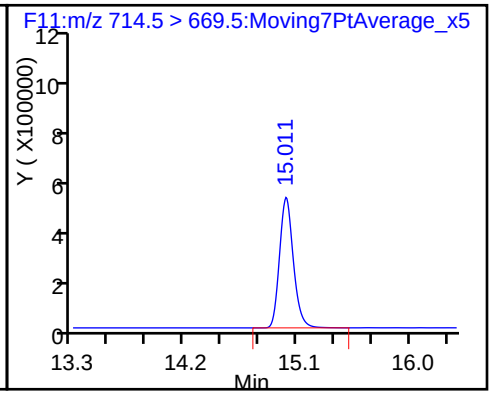
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17376-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-101543/1-A

Matrix: Water | Lab File ID: 26FEB2016A4A_015.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 02/25/2016 10:17

Sample wt/vol: 500(mL) | Date Analyzed: 02/26/2016 20:38

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.: 101820 | 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	114		25-150
STL00990	13C4 PFOA	116		25-150
STL00991	13C4 PFOS	141		25-150
STL01892	13C4-PFHpA	110		25-150
STL00995	13C5 PFNA	109		25-150
STL00994	18O2 PFHxS	113		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_015.d
Lims ID: MB 320-101543/1-A
Client ID:
Sample Type: MB
Inject. Date: 26-Feb-2016 20:38:22 ALS Bottle#: 1 Worklist Smp#: 11
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: MB 320-101543/1-A box 21
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:18:18 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:15:06

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.7 > 168.6	6.125	6.043	0.082	1.000	20152	0.4286			9.6	
36 Perfluorooctandecanoic acid										
212.7 > 168.6	6.125	6.043	0.082	1.000	20152	0.4329			9.6	
34 Perfluorohexadecanoic acid										
212.7 > 168.6	6.125	6.043	0.082	1.000	20152	0.4329			9.6	
D 35 13C2-PFHxDA										
212.7 > 168.6	6.125	6.043	0.082		20152	0.2869		0.6	9.6	
D 1 13C4 PFBA										
216.7 > 171.5	6.198	6.043	0.155		4798721	52.1		104	13168	
D 3 13C5-PFPeA										
267.6 > 222.7	7.502	7.272	0.230		3148738	52.2		104	6089	
D 6 13C2 PFHxA										
314.6 > 269.7	8.870	8.604	0.266		4582219	56.9		114	8769	
D 8 13C4-PFHpA										
366.6 > 321.6	10.114	9.856	0.258		3736481	55.0		110	6575	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	10.156	9.892	0.264	1.000	7584	0.1823				
10 Perfluorohexane Sulfonate										
398.3 > 79.2	10.156	9.892	0.264	1.000	7584	NC			19.8	
D 11 18O2 PFHxS										
402.5 > 83.6	10.148	9.892	0.256		1940684	53.5		113	3810	
D 12 13C4 PFOA										
416.5 > 371.6	11.190	10.958	0.232		4539499	57.9		116	7096	
13 Perfluorooctanoic acid										
412.8 > 368.8	11.199	10.958	0.241	1.000	4416	0.0926			2.8	
D 16 13C4 PFOS										
502.4 > 79.7	12.085	11.876	0.209		1097750	67.3		141	3087	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 17 13C5 PFNA										
467.5 > 422.6	12.106	11.898	0.208		3522545	54.4		109	6952	
D 19 13C2 PFDA										
514.4 > 469.5	12.882	12.693	0.189		4715461	58.4		117	6190	
D 23 13C8 FOSA										
505.4 > 77.6	13.411	13.222	0.189		3879224	34.3		68.6	4681	
D 26 13C2 PFUnA										
564.3 > 519.5	13.541	13.369	0.172		4344590	56.3		113	4004	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.541	13.372	0.169	1.000	11508	0.1206			15.9	
29 Perfluorododecanoic acid										
612.4 > 568.6	14.088	13.937	0.151	1.000	9132	0.1239			7.3	
D 28 13C2 PFDoA										
614.4 > 569.4	14.088	13.939	0.149		4595153	53.9		108	3249	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.561	14.430	0.131	1.000	10525	0.1460			8.7	
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.506	14.727	-0.221	1.000	1699	NC			6.0	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.966	14.841	0.125	1.000	17441	0.5087			19.6	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.966	14.844	0.122		3525659	51.1		102	2880	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 29-Feb-2016 10:18:29 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_015.d

Injection Date: 26-Feb-2016 20:38:22 Instrument ID: A4

Lims ID: MB 320-101543/1-A

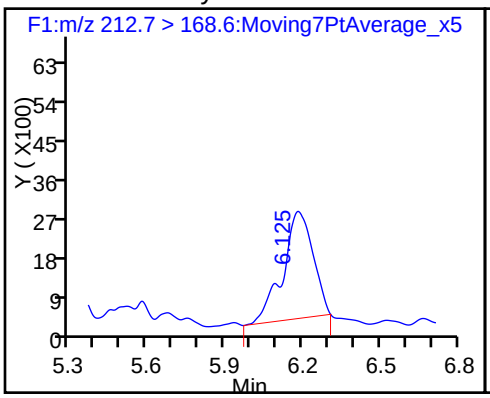
Client ID:

Operator ID: JRB ALS Bottle#: 1 Worklist Smp#: 11

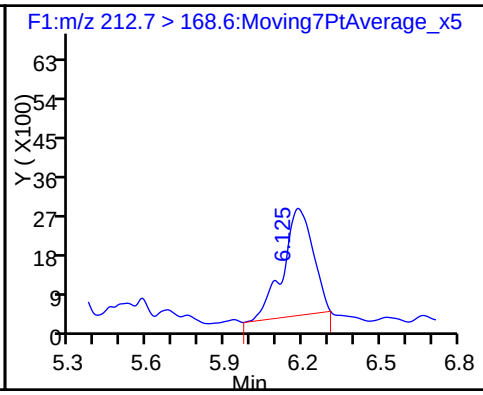
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

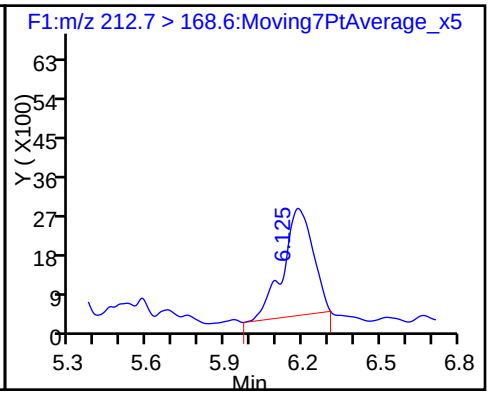
2 Perfluorobutyric acid



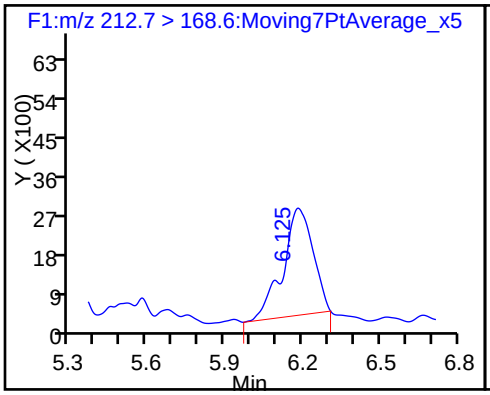
36 Perfluorooctandecanoic acid



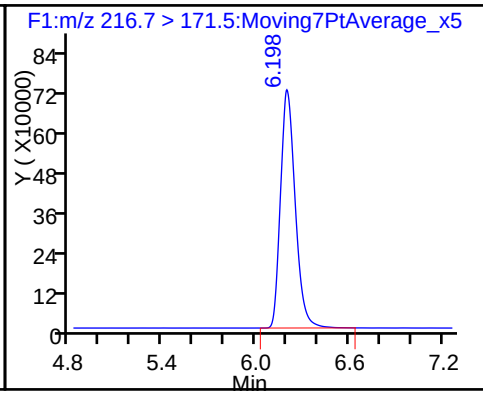
34 Perfluorohexadecanoic acid



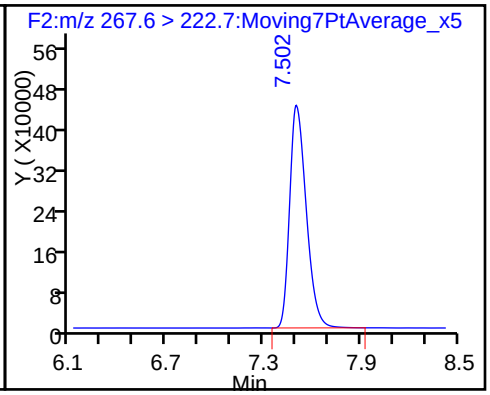
D 35 13C2-PFHxDA



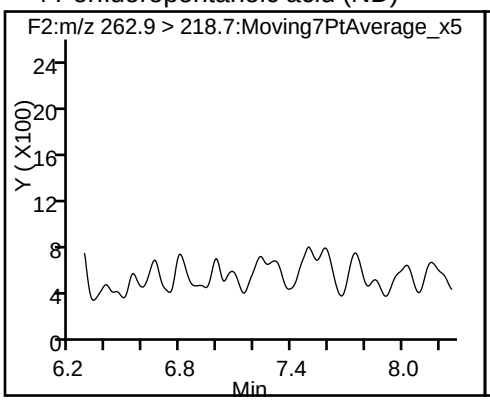
D 1 13C4 PFBA



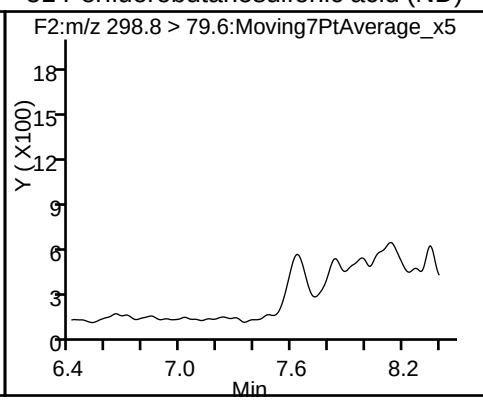
D 3 13C5-PFPeA



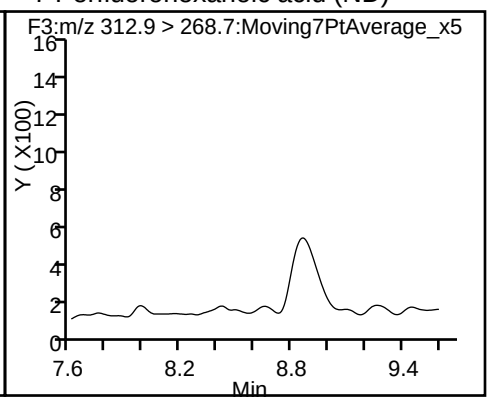
4 Perfluoropentanoic acid (ND)



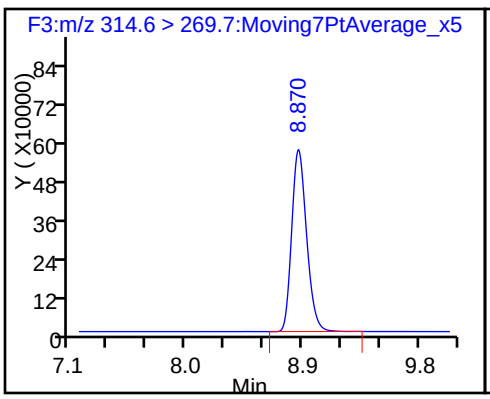
51 Perfluorobutanesulfonic acid (ND)



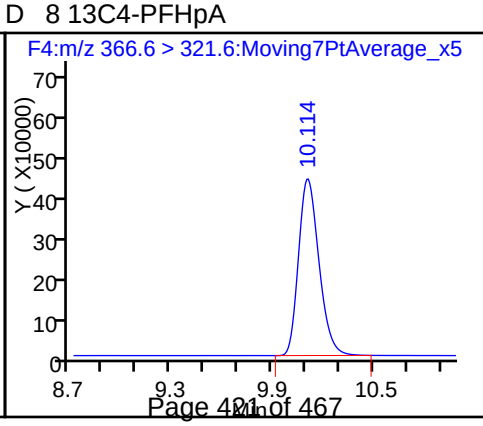
7 Perfluorohexanoic acid (ND)



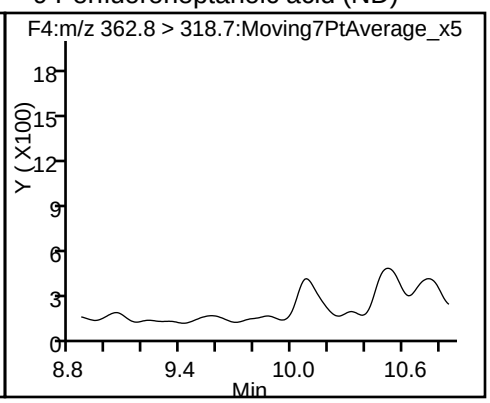
D 6 13C2 PFHxA



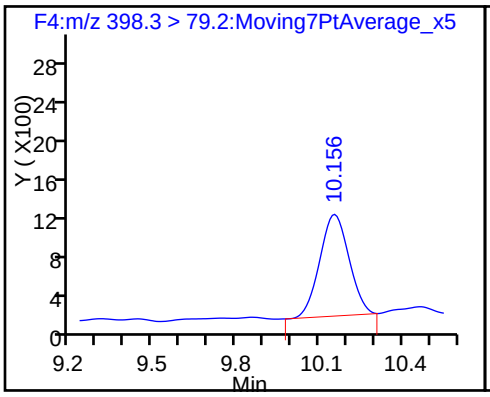
D 8 13C4-PFHpA



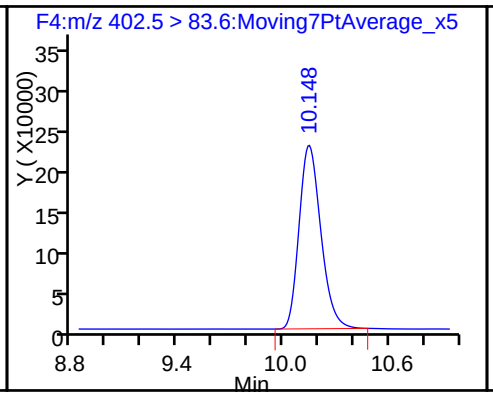
9 Perfluoroheptanoic acid (ND)



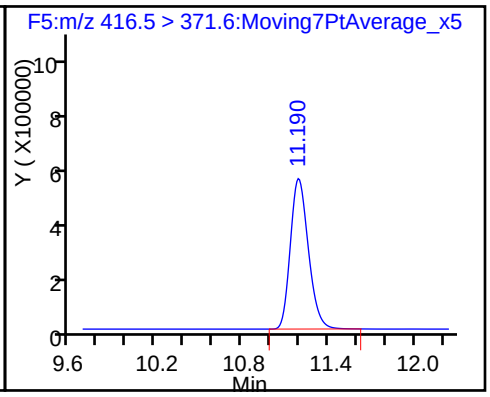
58 Perfluorohexanesulfonic acid



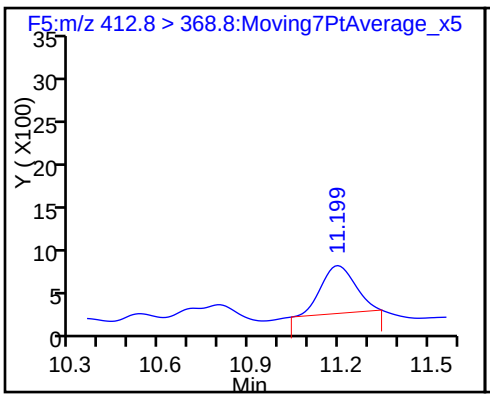
D 11 18O2 PFHxS



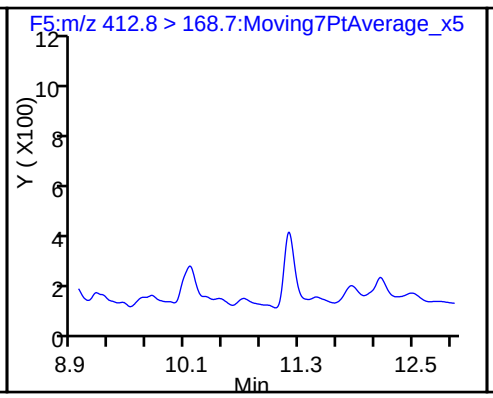
D 12 13C4 PFOA



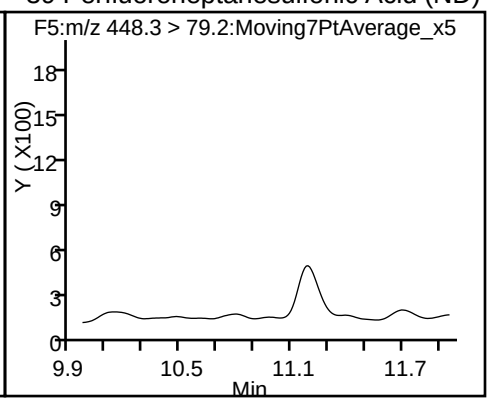
13 Perfluorooctanoic acid



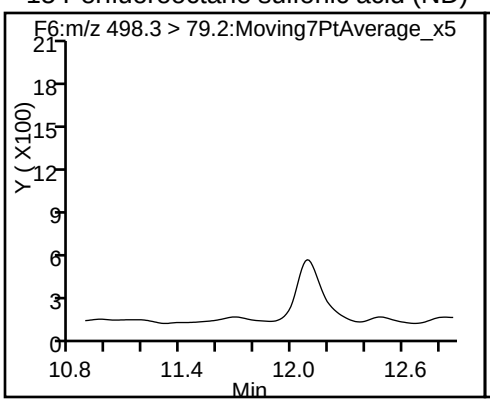
13 Perfluorooctanoic acid



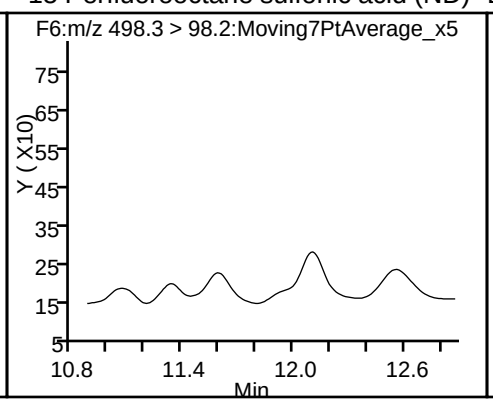
39 Perfluoroheptanesulfonic Acid (ND)



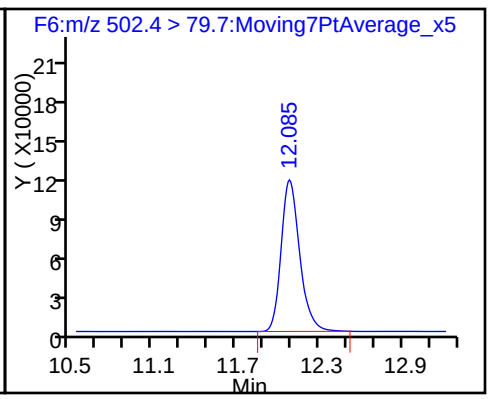
15 Perfluorooctane sulfonic acid (ND)



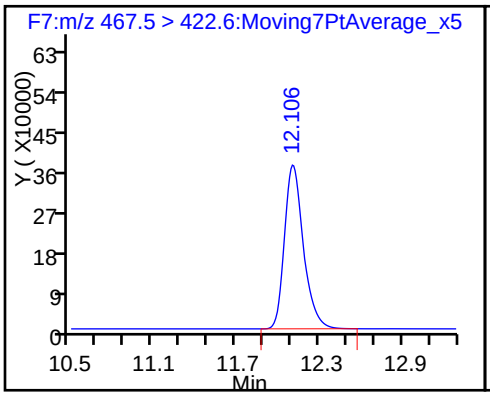
15 Perfluorooctane sulfonic acid (ND)



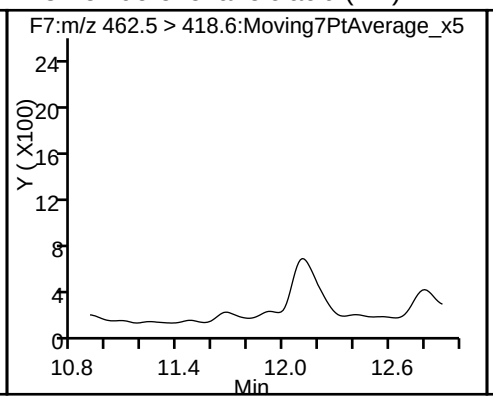
D 16 13C4 PFOS



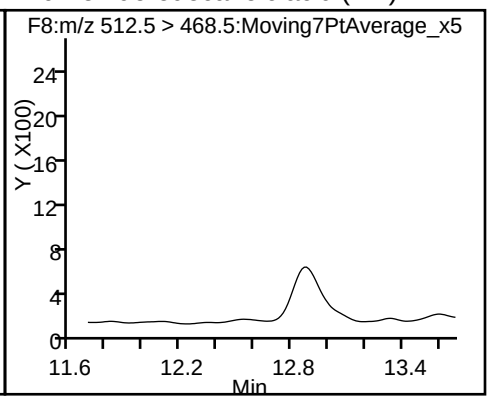
D 17 13C5 PFNA



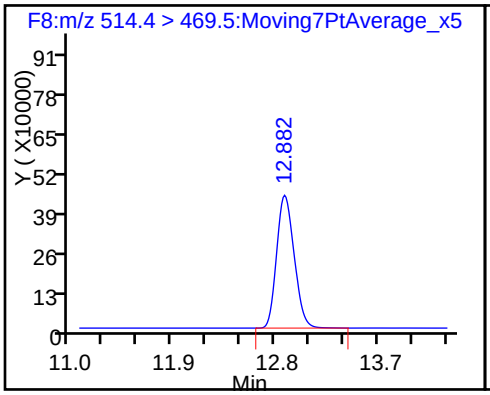
18 Perfluorononanoic acid (ND)



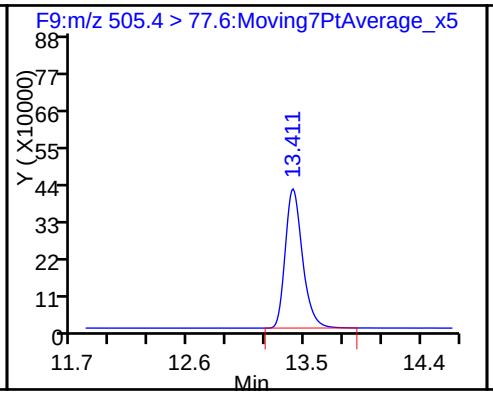
20 Perfluorodecanoic acid (ND)



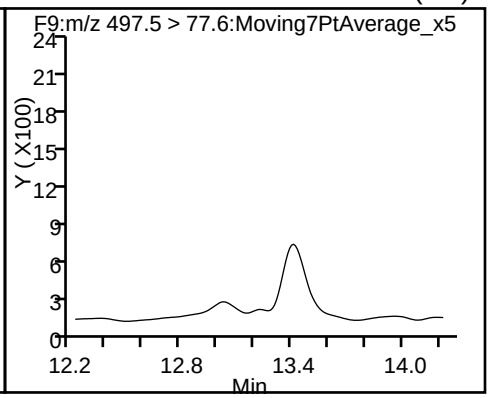
D 19 13C2 PFDA



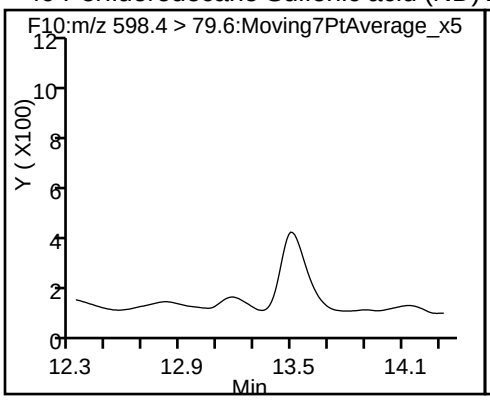
D 23 13C8 FOSA



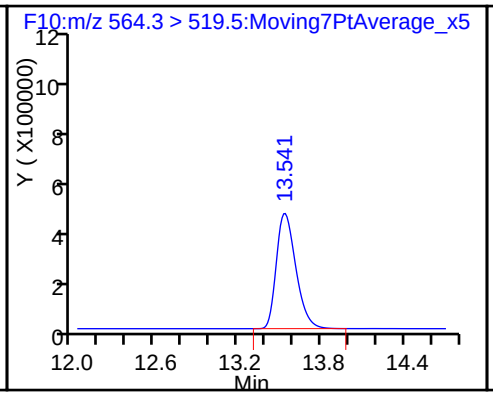
24 Perfluorooctane Sulfonamide (ND)



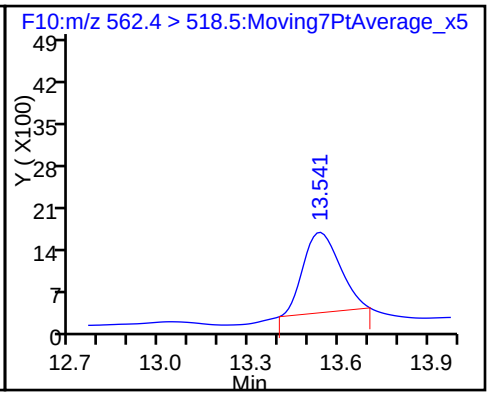
49 Perfluorodecane Sulfonic acid (ND)



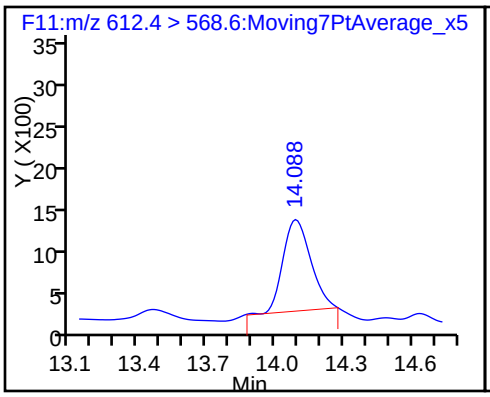
D 26 13C2 PFUnA



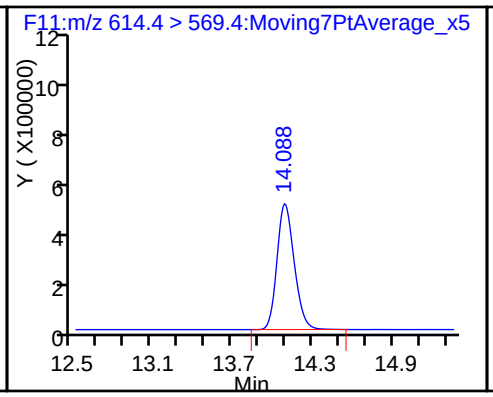
27 Perfluoroundecanoic acid



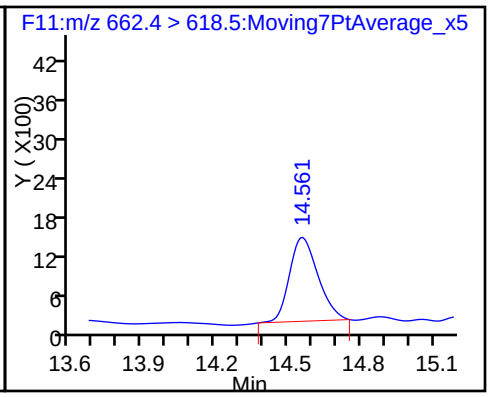
29 Perfluorododecanoic acid



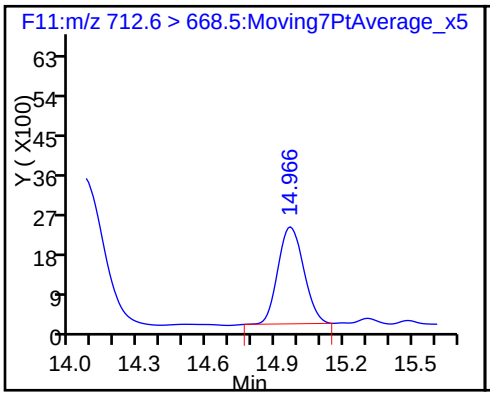
D 28 13C2 PFDoA



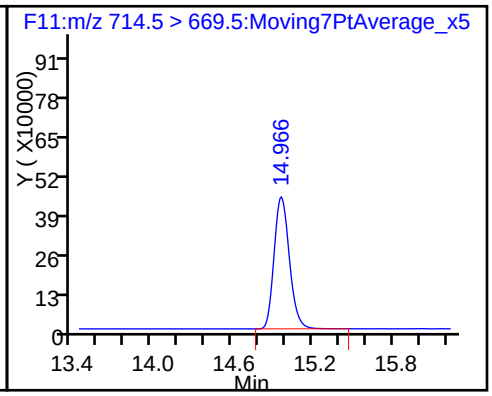
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17376-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-101543/2-A

Matrix: Water | Lab File ID: 26FEB2016A4A_016.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 02/25/2016 10:17

Sample wt/vol: 500(mL) | Date Analyzed: 02/26/2016 20:59

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.: 101820 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	42.3		2.5	2.0	0.92
375-85-9	Perfluoroheptanoic acid (PFHpA)	36.8		2.5	2.0	0.80
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	30.7		2.5	2.0	0.87
375-95-1	Perfluorononanoic acid (PFNA)	40.7		2.5	2.0	0.65
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	28.7		4.0	3.0	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	40.6		2.5	2.0	0.75

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		25-150
STL00990	13C4 PFOA	99		25-150
STL00991	13C4 PFOS	134		25-150
STL01892	13C4-PFHpA	108		25-150
STL00995	13C5 PFNA	100		25-150
STL00994	18O2 PFHxS	106		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_016.d
Lims ID: LCS 320-101543/2-A
Client ID:
Sample Type: LCS
Inject. Date: 26-Feb-2016 20:59:33 ALS Bottle#: 2 Worklist Smp#: 12
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: LCS 320-101543/2-A
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:18:18 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:16:42

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.7 > 168.6	6.212	6.043	0.169	1.000	917835	20.4		102	1405	
36 Perfluorooctandecanoic acid										
212.7 > 168.6	6.212	6.043	0.169	1.000	917835	22.8		114	1405	
34 Perfluorohexadecanoic acid										
212.7 > 168.6	6.212	6.043	0.169	1.000	917835	22.8		114	1405	
D 35 13C2-PFHxDA										
212.7 > 168.6	6.212	6.043	0.169		917835	13.1		26.1	1405	
D 1 13C4 PFBA										
216.7 > 171.5	6.217	6.043	0.174		4595018	49.9		99.8	14840	
D 3 13C5-PFPeA										
267.6 > 222.7	7.528	7.272	0.256		2924679	48.5		97.0	5549	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.528	7.275	0.253	1.000	526739	18.2		90.9	252	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.673	7.404	0.269	1.000	486982	NC			678	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.673	7.404	0.269	1.000	486982	21.2		120		
7 Perfluorohexanoic acid										
312.9 > 268.7	8.901	8.604	0.297	1.000	745383	19.4		97.0	1305	
D 6 13C2 PFHxA										
314.6 > 269.7	8.901	8.604	0.297		4142881	51.4		103	6458	
D 8 13C4-PFHpA										
366.6 > 321.6	10.139	9.856	0.283		3676626	54.1		108	5725	
9 Perfluoroheptanoic acid										
362.8 > 318.7	10.139	9.859	0.280	1.000	724791	18.4		91.9	1049	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	10.165	9.892	0.273	1.000	598006	15.4		81.2		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluorohexane Sulfonate										
398.3 > 79.2	10.165	9.892	0.273	1.000	598006	NC			1328	
D 11 18O2 PFHxS										
402.5 > 83.6	10.173	9.892	0.281		1815003	50.0		106	3609	
D 12 13C4 PFOA										
416.5 > 371.6	11.217	10.958	0.259		3898747	49.7		99.5	8230	
13 Perfluorooctanoic acid										
412.8 > 368.8	11.217	10.958	0.259	1.000	830925	20.3		101	547	
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	11.217	10.960	0.257	1.000	720771	NC			3725	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	11.217	10.960	0.257	1.000	720771	13.7		71.9		
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	12.105	11.874	0.231	1.000	1166322	14.3		75.0	2047	
498.3 > 98.2	12.105	11.874	0.231	1.000	666702		1.75(0.00-0.00)		1747	
D 16 13C4 PFOS										
502.4 > 79.7	12.105	11.876	0.229		1040387	63.8		134	2444	
D 17 13C5 PFNA										
467.5 > 422.6	12.126	11.898	0.228		3250383	50.2		100	4866	
18 Perfluorononanoic acid										
462.5 > 418.6	12.136	11.899	0.237	1.000	1383992	20.4		102	1609	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.895	12.693	0.202	1.000	1354975	19.4		96.9	1815	
D 19 13C2 PFDA										
514.4 > 469.5	12.907	12.693	0.214		3974119	49.2		98.4	4956	
21 PFNS (Perflouro-1-nonanesulfonate)										
548.6 > 79.6	12.857	12.831	0.026	1.000	508500	NC			1749	
D 23 13C8 FOSA										
505.4 > 77.6	13.432	13.222	0.210		3180087	28.1		56.2	2631	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.432	13.222	0.210	1.000	1180666	20.3		101	1530	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.505	13.324	0.181	1.000	548360	NC			1457	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.505	13.324	0.181	1.000	548360	15.9		82.3		
D 26 13C2 PFUnA										
564.3 > 519.5	13.553	13.369	0.184		3633748	47.1		94.2	4307	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.553	13.372	0.181	1.000	1620183	20.3		102	1897	
29 Perfluorododecanoic acid										
612.4 > 568.6	14.109	13.937	0.172	1.000	1280861	20.1		100	898	
D 28 13C2 PFDoA										
614.4 > 569.4	14.109	13.939	0.170		3981698	46.7		93.4	2575	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.579	14.430	0.149	1.000	1191555	19.1		95.3	843	
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.524	14.727	-0.203	1.000	257923	NC			799	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.975	14.841	0.134	1.000	514558	17.3		86.6	477	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.975	14.844	0.131		3277304	47.5		94.9	2385	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 29-Feb-2016 10:18:35 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_016.d

Injection Date: 26-Feb-2016 20:59:33 Instrument ID: A4

Lims ID: LCS 320-101543/2-A

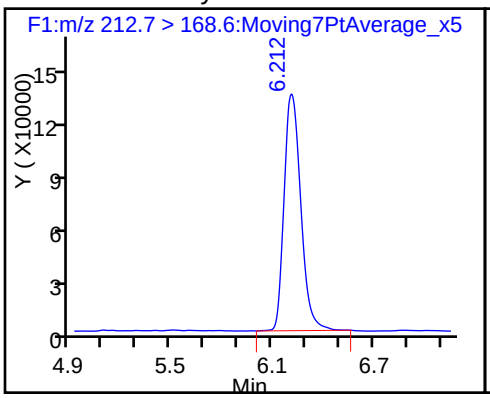
Client ID:

Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 12

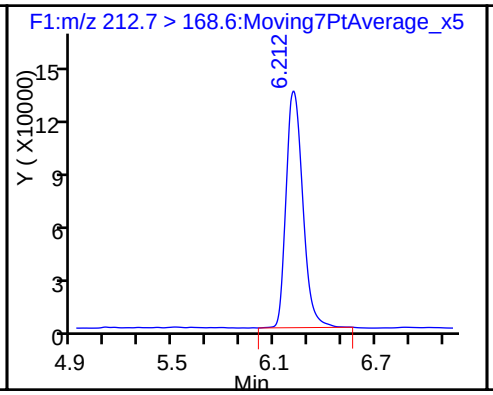
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

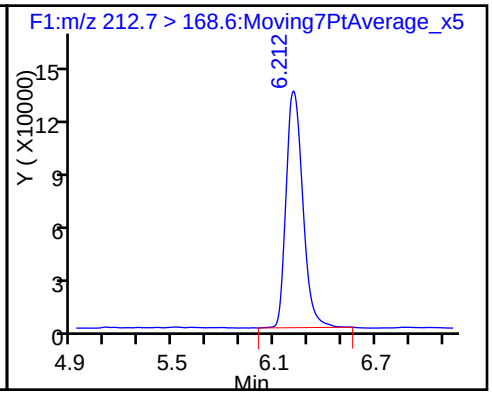
2 Perfluorobutyric acid



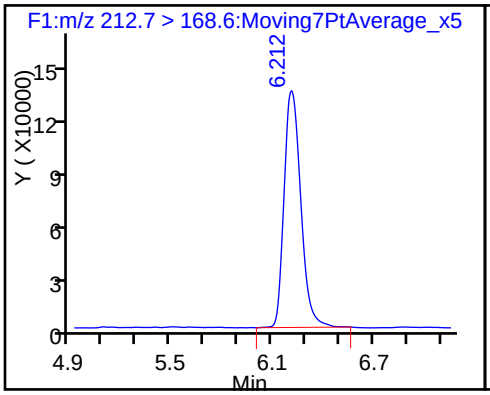
36 Perfluorooctandecanoic acid



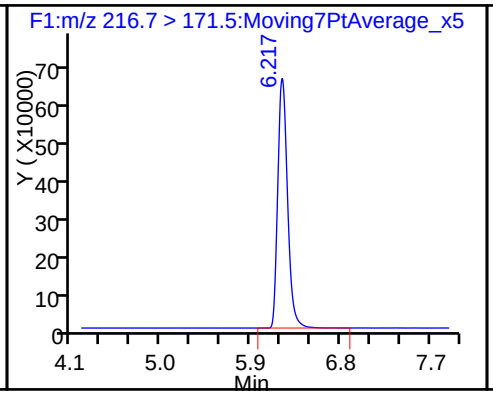
34 Perfluorohexadecanoic acid



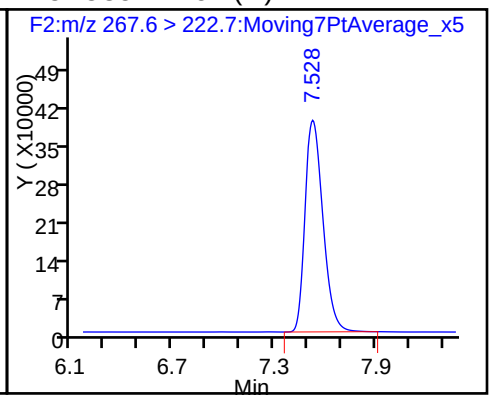
D 35 13C2-PFHxDA



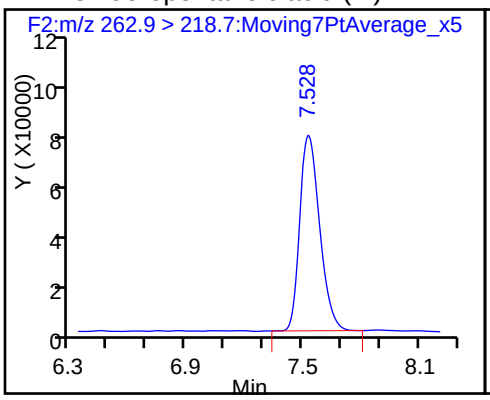
D 1 13C4 PFBA



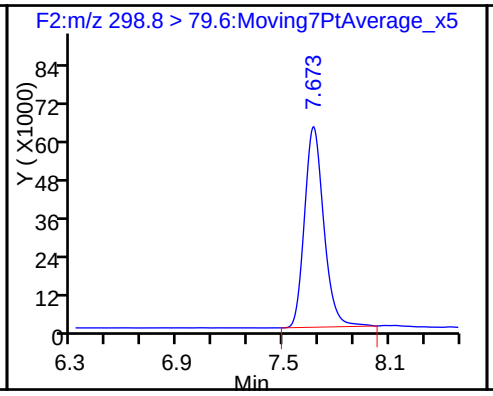
D 3 13C5-PFPeA (M)



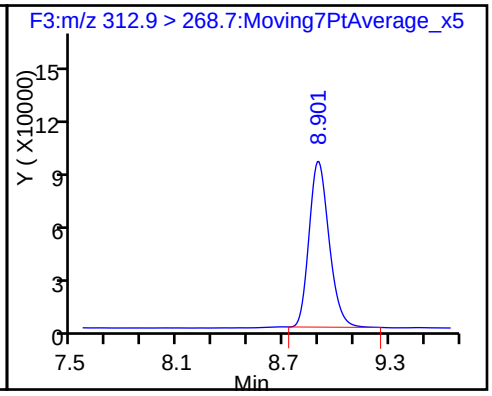
4 Perfluoropentanoic acid (M)



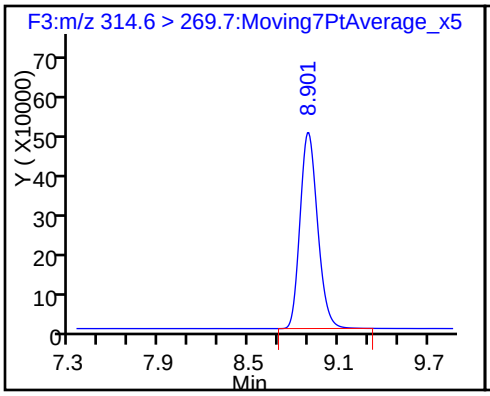
51 Perfluorobutanesulfonic acid



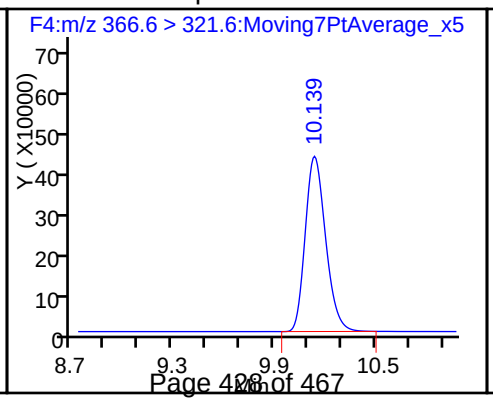
7 Perfluorohexanoic acid



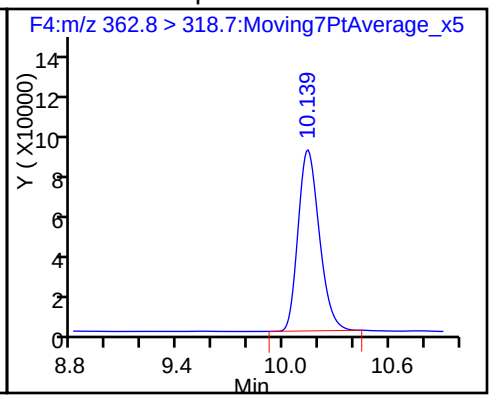
D 6 13C2 PFHxA



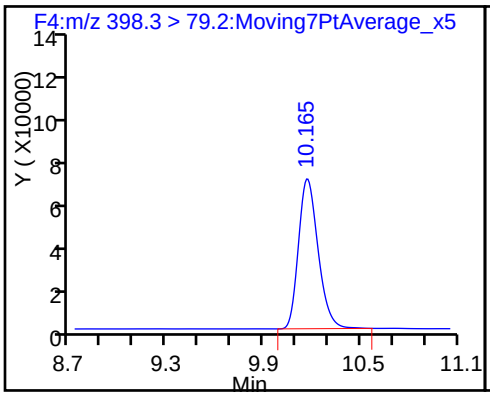
D 8 13C4-PFHpA



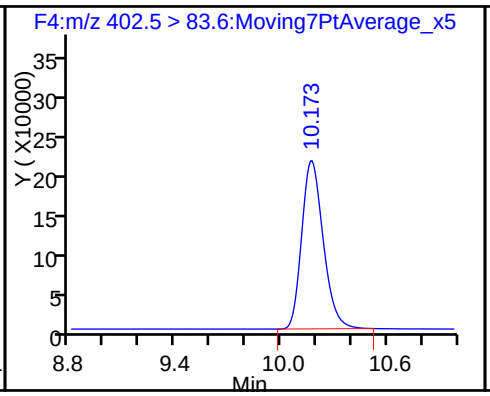
9 Perfluoroheptanoic acid



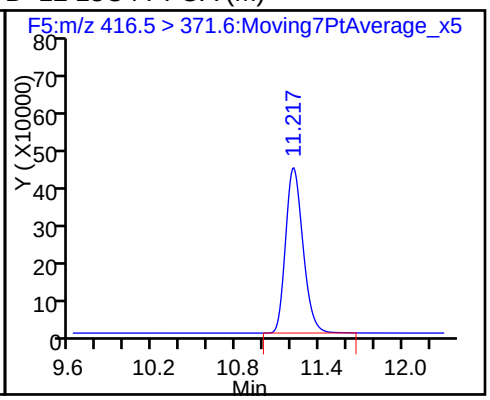
58 Perfluorohexanesulfonic acid



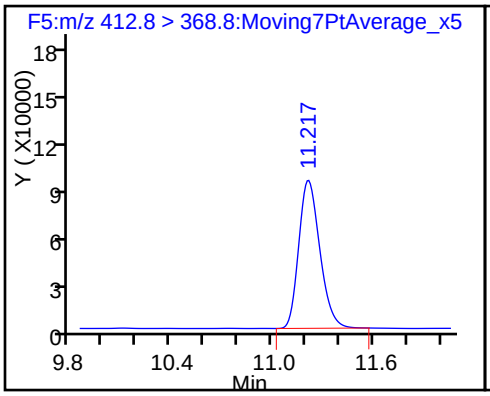
D 11 18O2 PFHxS



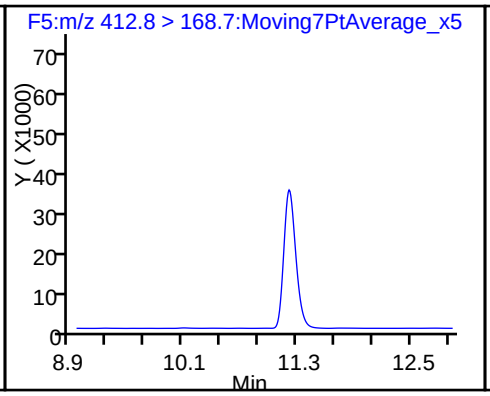
D 12 13C4 PFOA (M)



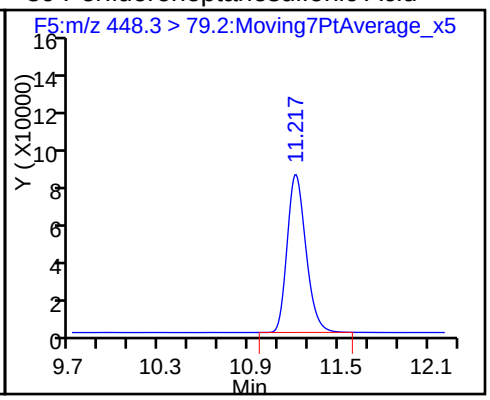
13 Perfluorooctanoic acid



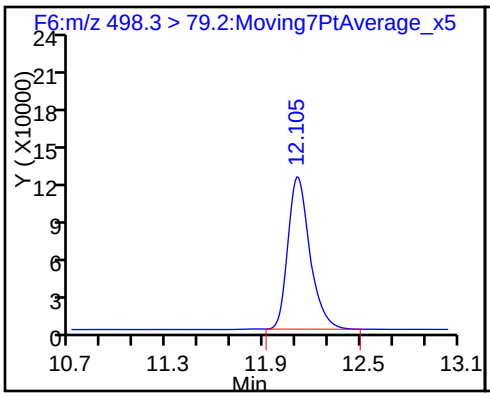
13 Perfluorooctanoic acid



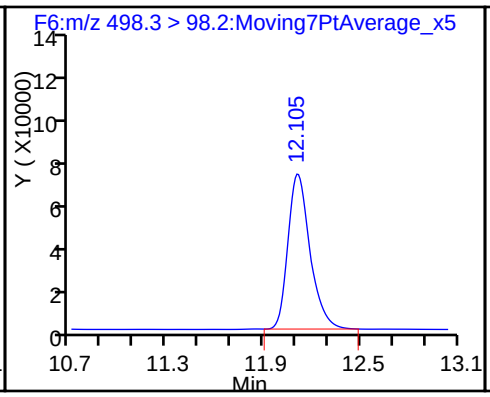
39 Perfluoroheptanesulfonic Acid



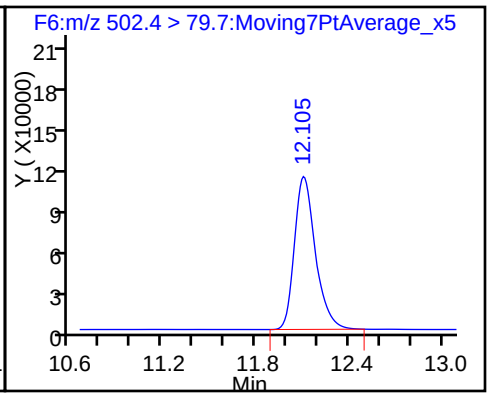
15 Perfluorooctane sulfonic acid



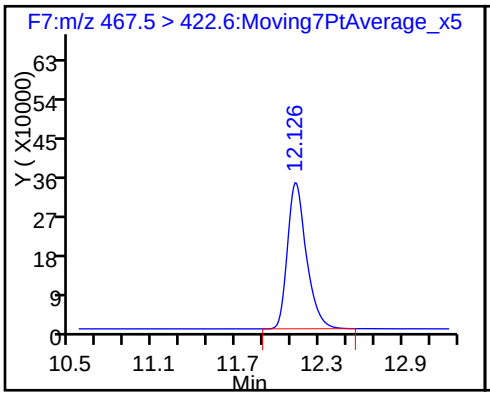
15 Perfluorooctane sulfonic acid



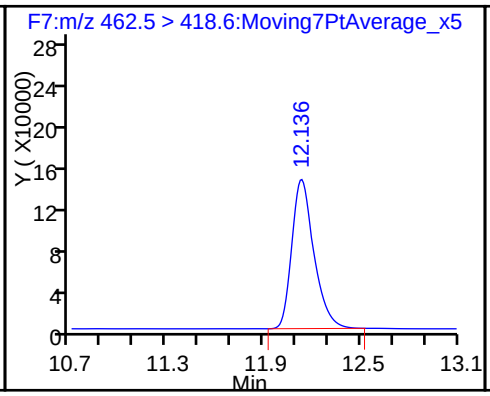
D 16 13C4 PFOS



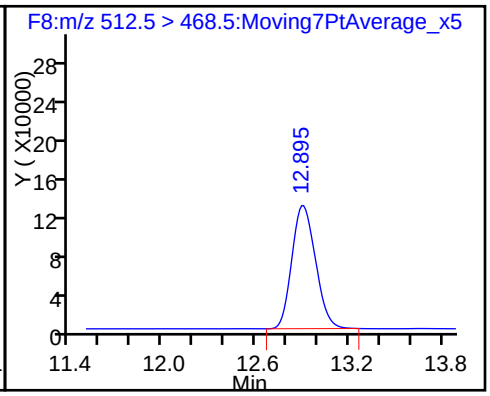
D 17 13C5 PFNA



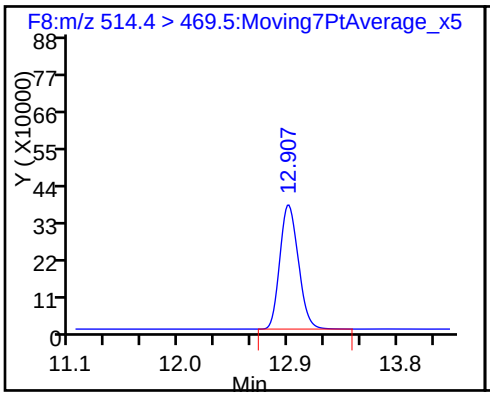
18 Perfluorononanoic acid



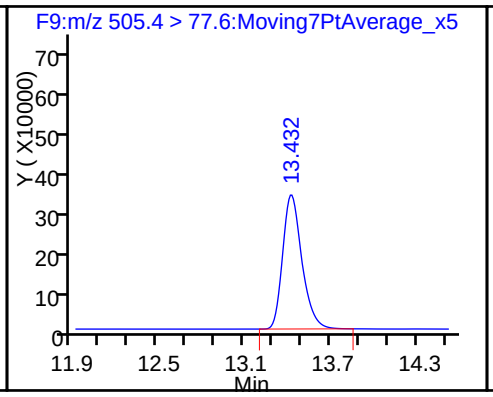
20 Perfluorodecanoic acid



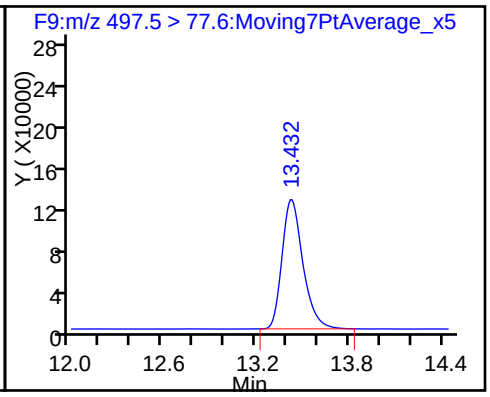
D 19 13C2 PFDA



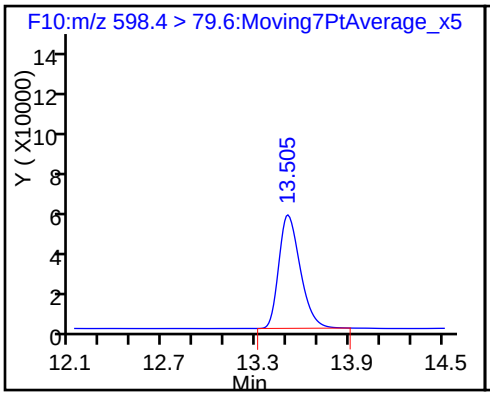
D 23 13C8 FOSA



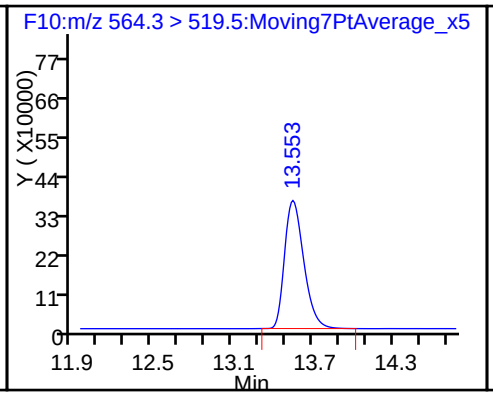
24 Perfluorooctane Sulfonamide



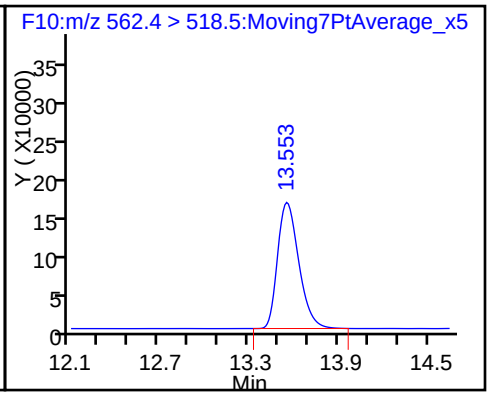
49 Perfluorodecane Sulfonic acid



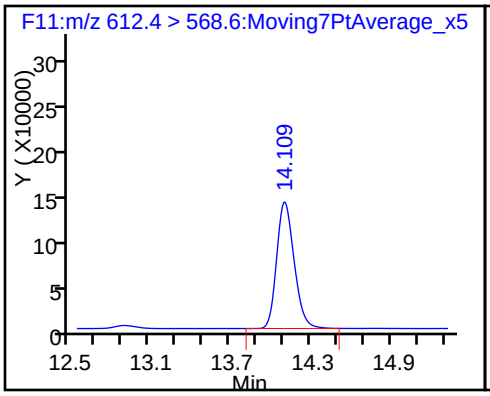
D 26 13C2 PFUnA



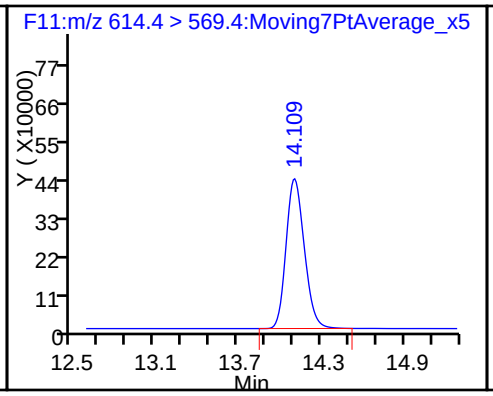
27 Perfluoroundecanoic acid



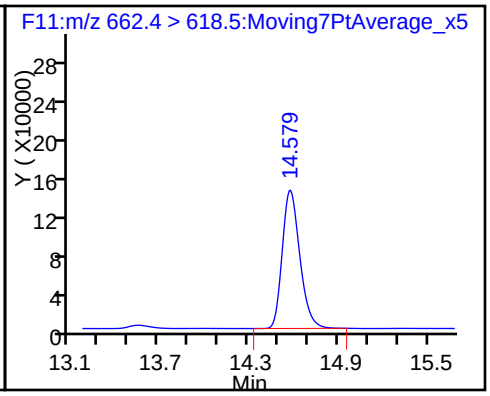
29 Perfluorododecanoic acid



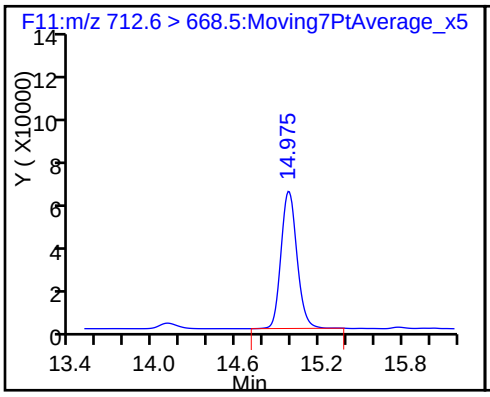
D 28 13C2 PFDoA



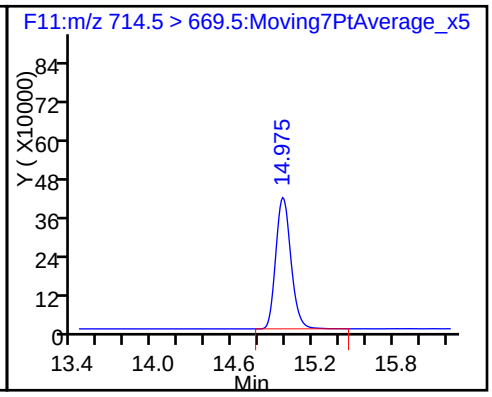
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17376-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCSD 320-101543/3-A

Matrix: Water | Lab File ID: 26FEB2016A4A_017.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 02/25/2016 10:17

Sample wt/vol: 500(mL) | Date Analyzed: 02/26/2016 21:20

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.: 101820 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	40.8		2.5	2.0	0.92
375-85-9	Perfluoroheptanoic acid (PFHpA)	34.5		2.5	2.0	0.80
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	30.8		2.5	2.0	0.87
375-95-1	Perfluorononanoic acid (PFNA)	39.2		2.5	2.0	0.65
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	27.5		4.0	3.0	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	39.1		2.5	2.0	0.75

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	106		25-150
STL00990	13C4 PFOA	101		25-150
STL00991	13C4 PFOS	150		25-150
STL01892	13C4-PFHpA	110		25-150
STL00995	13C5 PFNA	109		25-150
STL00994	18O2 PFHxS	109		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_017.d
Lims ID: LCSD 320-101543/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 26-Feb-2016 21:20:44 ALS Bottle#: 3 Worklist Smp#: 13
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: LCSD 320-101543/3-A
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Feb-2016 10:18:18 Calib Date: 26-Feb-2016 19:34:51
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_012.d

Column 1 : Det: F1:MRM
Process Host: XAWRK018

First Level Reviewer: barnettj Date: 27-Feb-2016 11:18:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.7 > 168.6	6.221	6.043	0.178	1.000	915309	20.8		104	1609	
36 Perfluorooctandecanoic acid										
212.7 > 168.6	6.221	6.043	0.178	1.000	915309	21.1		106	1609	
34 Perfluorohexadecanoic acid										
212.7 > 168.6	6.221	6.043	0.178	1.000	915309	21.1		106	1609	
D 35 13C2-PFHxDA										
212.7 > 168.6	6.221	6.043	0.178		915309	13.0		26.1	1609	
D 1 13C4 PFBA										
216.7 > 171.5	6.221	6.043	0.178		4488603	48.7		97.5	11665	
D 3 13C5-PFPeA										
267.6 > 222.7	7.535	7.272	0.263		2927541	48.5		97.1	5478	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.541	7.275	0.266	1.000	551192	19.0		95.0	266	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.679	7.404	0.275	1.000	485025	NC			705	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.679	7.404	0.275	1.000	485025	20.4		115		
7 Perfluorohexanoic acid										
312.9 > 268.7	8.909	8.604	0.305	1.000	734201	18.5		92.5	1408	
D 6 13C2 PFHxA										
314.6 > 269.7	8.909	8.604	0.305		4277266	53.1		106	7871	
D 8 13C4-PFHpA										
366.6 > 321.6	10.148	9.856	0.292		3744209	55.1		110	5846	
9 Perfluoroheptanoic acid										
362.8 > 318.7	10.148	9.859	0.289	1.000	691845	17.2		86.2	1238	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	10.182	9.892	0.290	1.000	620336	15.4		81.5		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluorohexane Sulfonate										
398.3 > 79.2	10.182	9.892	0.290	1.000	620336	NC			1202	
D 11 18O2 PFHxS										
402.5 > 83.6	10.182	9.892	0.290		1877081	51.7		109	4537	
D 12 13C4 PFOA										
416.5 > 371.6	11.217	10.958	0.259		3951294	50.4		101	5137	
13 Perfluorooctanoic acid										
412.8 > 368.8	11.217	10.958	0.259	1.000	812601	19.6		97.9	501	
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	11.217	10.960	0.257	1.000	730309	NC			2844	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	11.217	10.960	0.257	1.000	730309	12.4		65.1		
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	12.105	11.874	0.231	1.000	1249775	13.7		71.8	1653	
D 16 13C4 PFOS										
502.4 > 79.7	12.105	11.876	0.229		1165210	71.5		150	2903	
D 17 13C5 PFNA										
467.5 > 422.6	12.136	11.898	0.238		3540340	54.6		109	5638	
18 Perfluorononanoic acid										
462.5 > 418.6	12.136	11.899	0.237	1.000	1450853	19.6		98.0	2051	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.895	12.693	0.202	1.000	1527066	21.2		106	1903	
D 19 13C2 PFDA										
514.4 > 469.5	12.895	12.693	0.202		4095824	50.7		101	5065	
21 PFNS (Perflouro-1-nonanesulfonate)										
548.6 > 79.6	12.857	12.831	0.026	1.000	527343	NC			925	
D 23 13C8 FOSA										
505.4 > 77.6	13.421	13.222	0.199		2422352	21.4		42.8	2258	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.421	13.222	0.199	1.000	917171	20.7		103	1409	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.505	13.324	0.181	1.000	556677	NC			1168	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.505	13.324	0.181	1.000	556677	14.4		74.6		
D 26 13C2 PFUnA										
564.3 > 519.5	13.553	13.369	0.184		3782099	49.0		98.1	3027	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.553	13.372	0.181	1.000	1598290	19.2		96.2	1887	
29 Perfluorododecanoic acid										
612.4 > 568.6	14.099	13.937	0.162	1.000	1403825	20.5		102	906	
D 28 13C2 PFDoA										
614.4 > 569.4	14.099	13.939	0.160		4278117	50.2		100	3604	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.570	14.430	0.140	1.000	1328209	19.8		98.9	918	
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.515	14.727	-0.212	1.000	298536	NC			1025	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.966	14.841	0.125	1.000	628997	19.7		98.5	541	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 33 13C2-PFTeDA										
714.5 > 669.5	14.966	14.844	0.122		3737065	54.1		108	3308	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 29-Feb-2016 10:18:40 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160227-28708.b\26FEB2016A4A_017.d

Injection Date: 26-Feb-2016 21:20:44 Instrument ID: A4

Lims ID: LCSD 320-101543/3-A

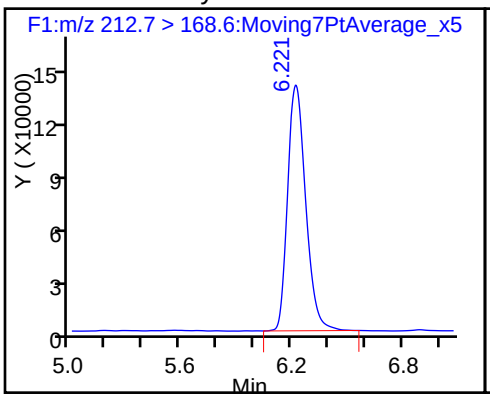
Client ID:

Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 13

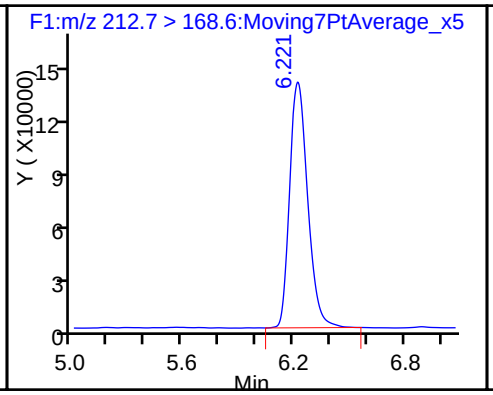
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

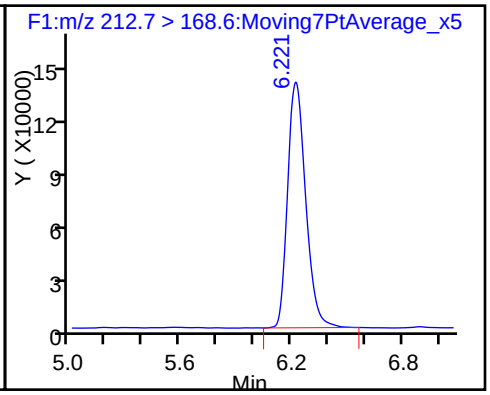
2 Perfluorobutyric acid



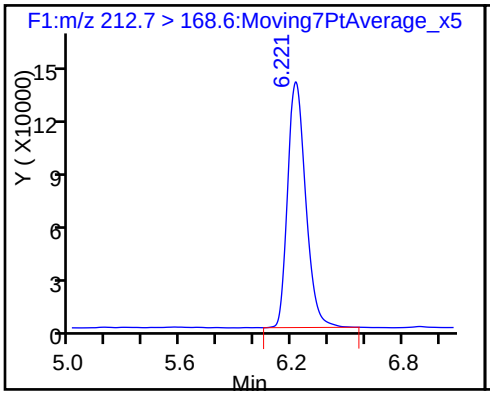
36 Perfluorooctandecanoic acid



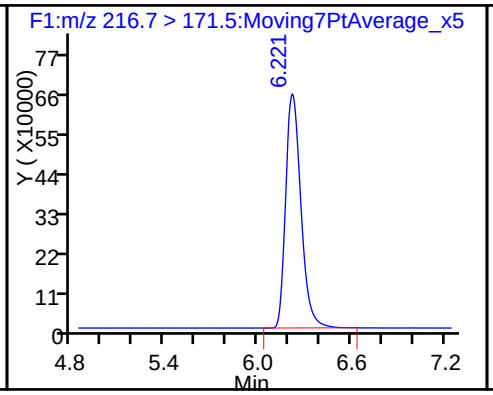
34 Perfluorohexadecanoic acid



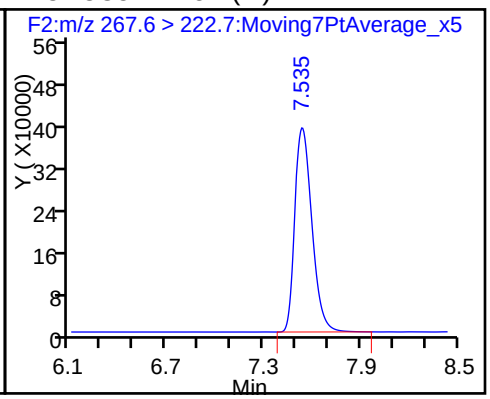
D 35 13C2-PFHxDA



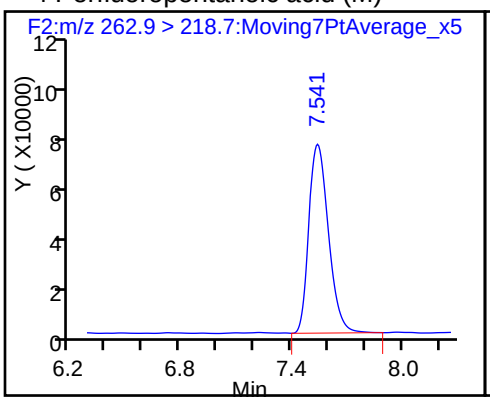
D 1 13C4 PFBA



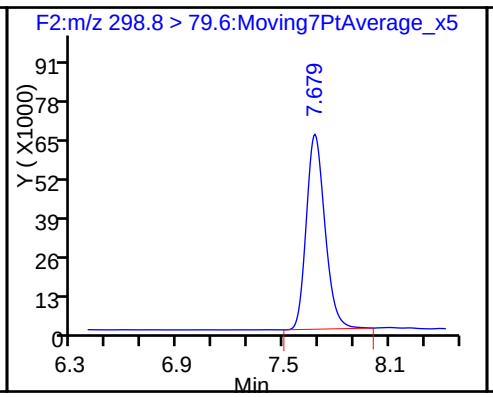
D 3 13C5-PFPeA (M)



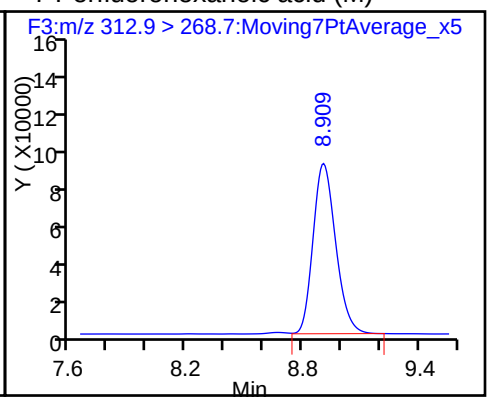
4 Perfluoropentanoic acid (M)



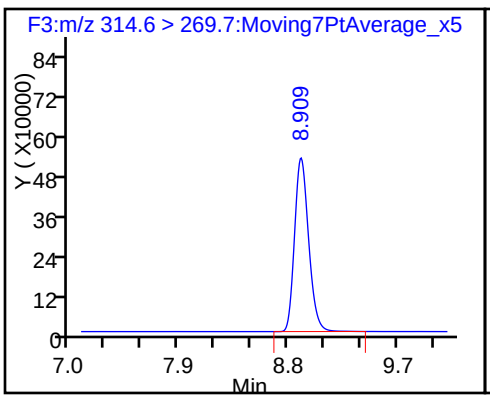
51 Perfluorobutanesulfonic acid



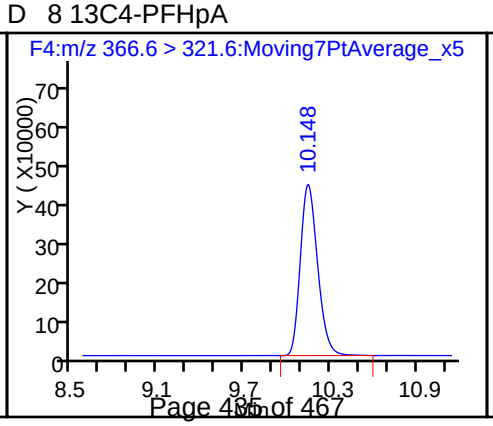
7 Perfluorohexanoic acid (M)



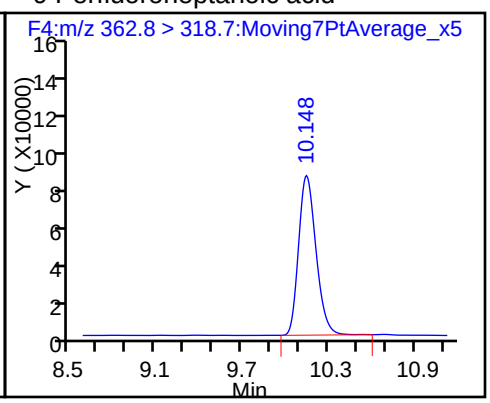
D 6 13C2 PFHxA



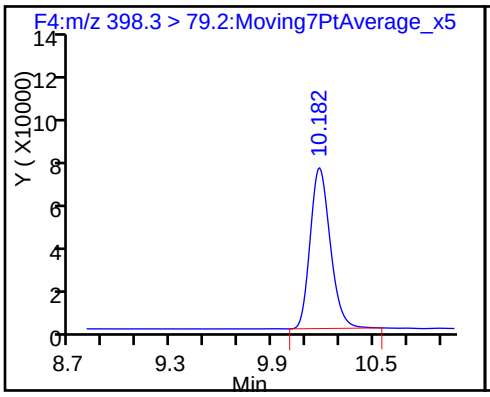
D 8 13C4-PFHpA



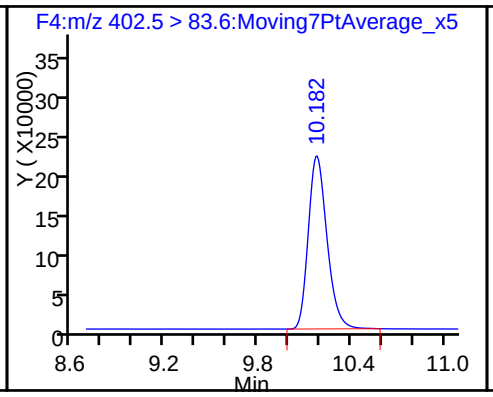
9 Perfluoroheptanoic acid



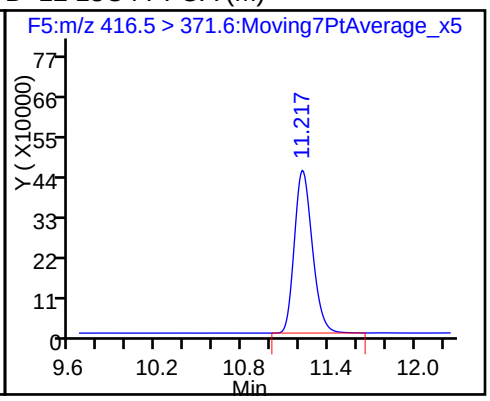
58 Perfluorohexanesulfonic acid



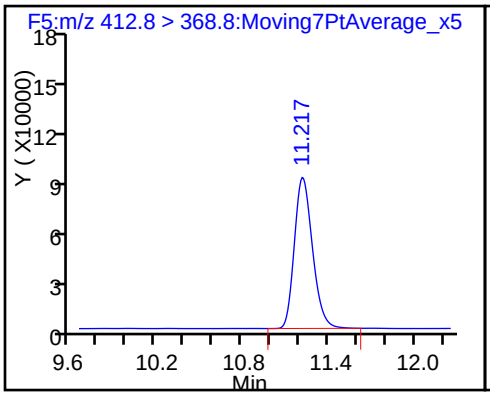
D 11 18O2 PFHxS



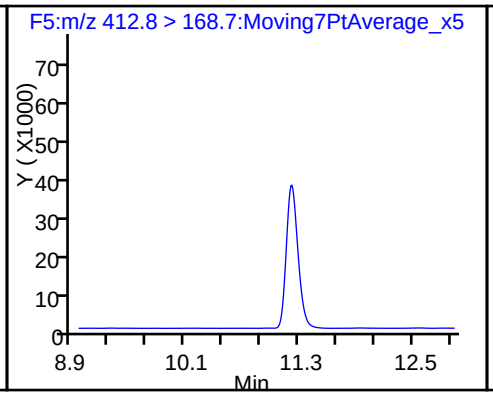
D 12 13C4 PFOA (M)



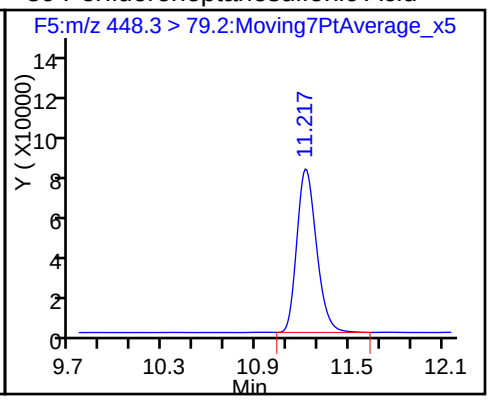
13 Perfluorooctanoic acid



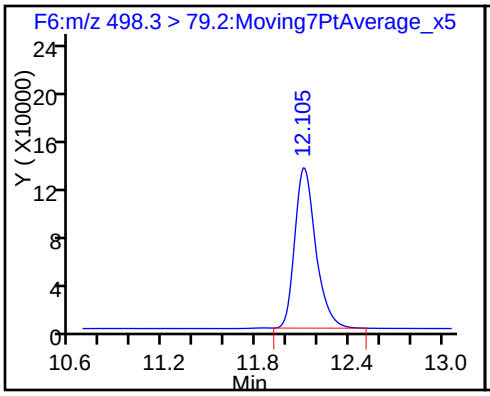
13 Perfluorooctanoic acid



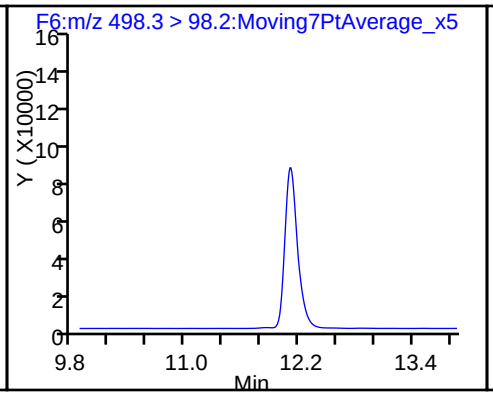
39 Perfluoroheptanesulfonic Acid



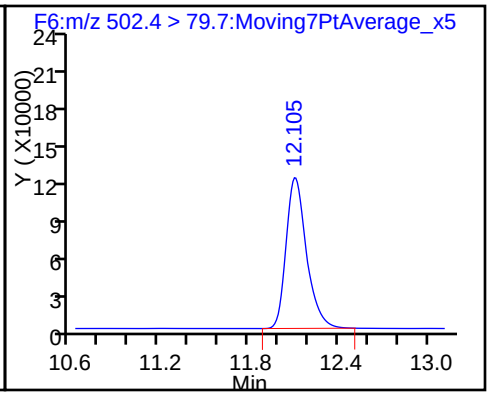
15 Perfluorooctane sulfonic acid



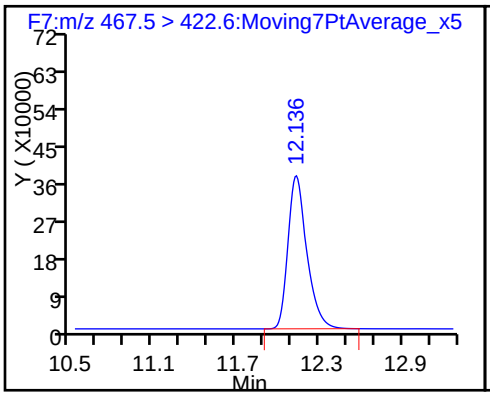
15 Perfluorooctane sulfonic acid



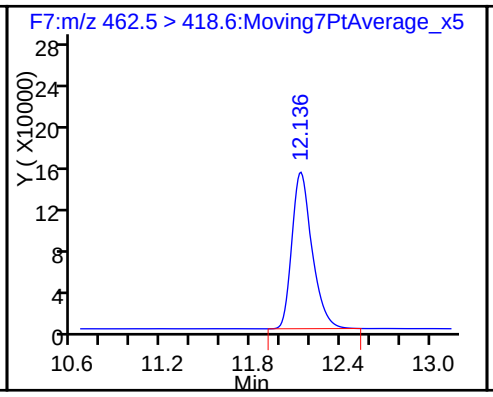
D 16 13C4 PFOS



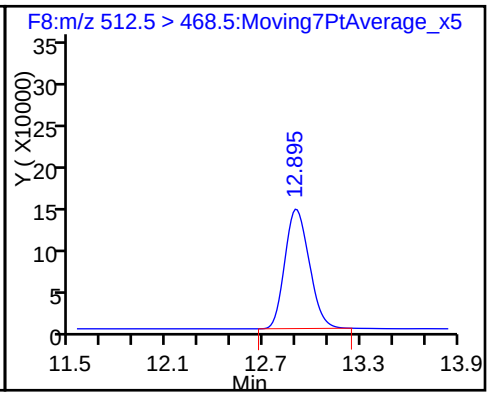
D 17 13C5 PFNA



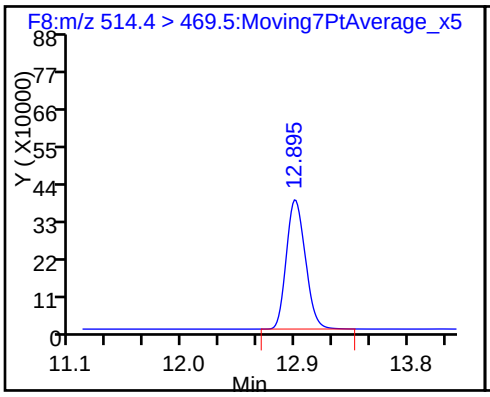
18 Perfluorononanoic acid



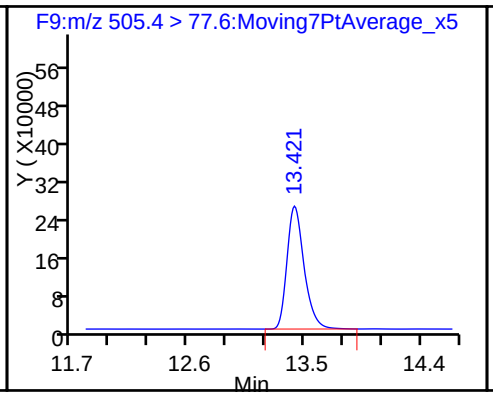
20 Perfluorodecanoic acid



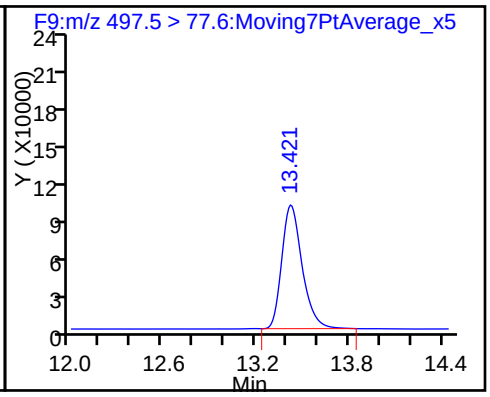
D 19 13C2 PFDA



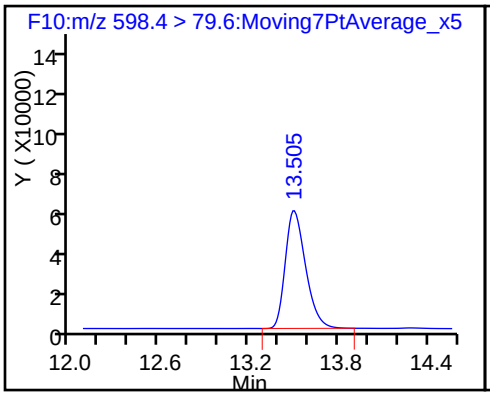
D 23 13C8 FOSA



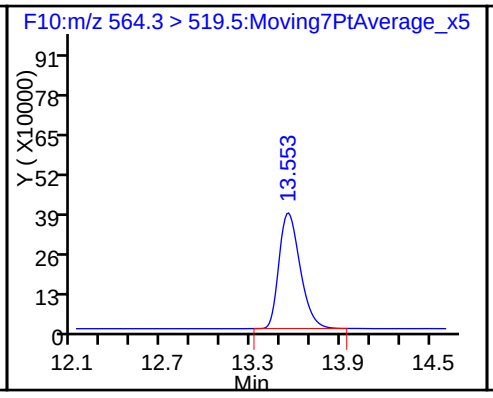
24 Perfluorooctane Sulfonamide



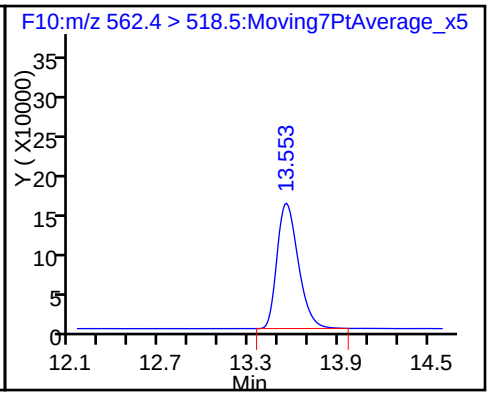
49 Perfluorodecane Sulfonic acid



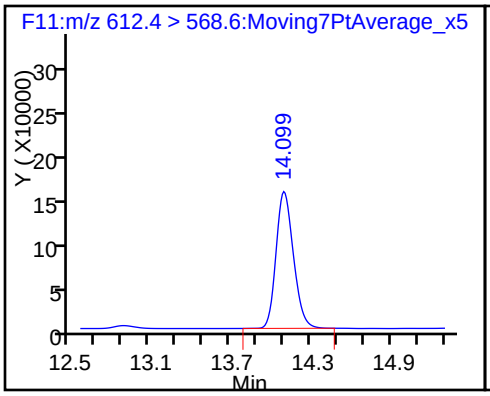
D 26 13C2 PFUnA



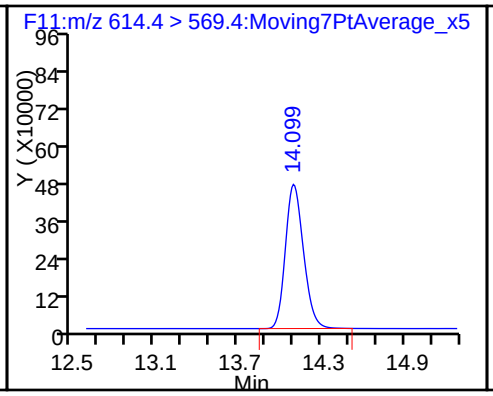
27 Perfluoroundecanoic acid



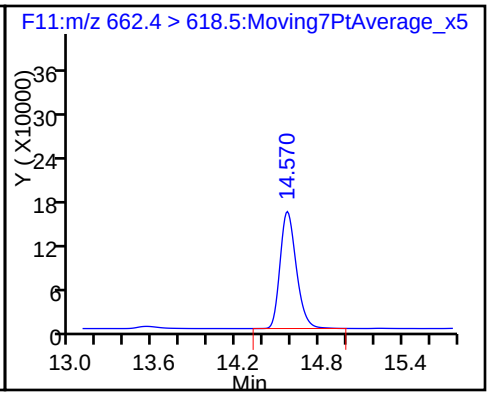
29 Perfluorododecanoic acid



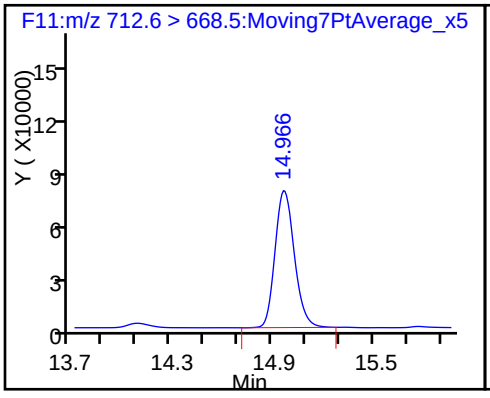
D 28 13C2 PFDoA



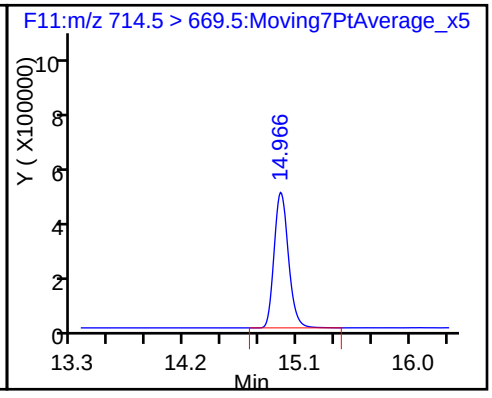
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Instrument ID: A4 Start Date: 02/26/2016 17:27

Analysis Batch Number: 101820 End Date: 02/27/2016 19:20

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-101820/2 IC		02/26/2016 17:27	1	26FEB2016A4A_006.d	Acquity 2.1(mm)
STD 320-101820/3 IC		02/26/2016 17:48	1	26FEB2016A4A_007.d	Acquity 2.1(mm)
STD 320-101820/4 IC		02/26/2016 18:10	1	26FEB2016A4A_008.d	Acquity 2.1(mm)
STD 320-101820/5 IC		02/26/2016 18:31	1	26FEB2016A4A_009.d	Acquity 2.1(mm)
STD 320-101820/6 IC		02/26/2016 18:52	1	26FEB2016A4A_010.d	Acquity 2.1(mm)
STD 320-101820/7 IC		02/26/2016 19:13	1	26FEB2016A4A_011.d	Acquity 2.1(mm)
STD 320-101820/8 IC		02/26/2016 19:34	1	26FEB2016A4A_012.d	Acquity 2.1(mm)
ZZZZZ		02/26/2016 19:56	1		Acquity 2.1(mm)
ICV 320-101820/10		02/26/2016 20:17	1	26FEB2016A4A_014.d	Acquity 2.1(mm)
MB 320-101543/1-A		02/26/2016 20:38	1	26FEB2016A4A_015.d	Acquity 2.1(mm)
LCS 320-101543/2-A		02/26/2016 20:59	1	26FEB2016A4A_016.d	Acquity 2.1(mm)
LCSD 320-101543/3-A		02/26/2016 21:20	1	26FEB2016A4A_017.d	Acquity 2.1(mm)
320-17376-1		02/26/2016 21:41	1	26FEB2016A4A_018.d	Acquity 2.1(mm)
320-17376-2		02/26/2016 22:03	1	26FEB2016A4A_019.d	Acquity 2.1(mm)
320-17376-3		02/26/2016 22:24	1	26FEB2016A4A_020.d	Acquity 2.1(mm)
320-17376-4		02/26/2016 22:45	1	26FEB2016A4A_021.d	Acquity 2.1(mm)
320-17376-5		02/26/2016 23:06	1	26FEB2016A4A_022.d	Acquity 2.1(mm)
320-17376-6		02/26/2016 23:27	1	26FEB2016A4A_023.d	Acquity 2.1(mm)
320-17376-7		02/26/2016 23:48	1	26FEB2016A4A_024.d	Acquity 2.1(mm)
CCV 320-101820/21		02/27/2016 00:10	1	26FEB2016A4A_025.d	Acquity 2.1(mm)
320-17376-8		02/27/2016 00:31	1	26FEB2016A4A_026.d	Acquity 2.1(mm)
320-17376-9		02/27/2016 00:52	1	26FEB2016A4A_027.d	Acquity 2.1(mm)
320-17376-10		02/27/2016 01:13	1	26FEB2016A4A_028.d	Acquity 2.1(mm)
320-17376-11		02/27/2016 01:34	1	26FEB2016A4A_029.d	Acquity 2.1(mm)
320-17376-12		02/27/2016 01:56	1	26FEB2016A4A_030.d	Acquity 2.1(mm)
320-17376-13		02/27/2016 02:17	1	26FEB2016A4A_031.d	Acquity 2.1(mm)
320-17376-14		02/27/2016 02:38	1	26FEB2016A4A_032.d	Acquity 2.1(mm)
ZZZZZ		02/27/2016 02:59	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 03:20	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 03:41	1		Acquity 2.1(mm)
CCV 320-101820/32		02/27/2016 04:03	1	26FEB2016A4A_036.d	Acquity 2.1(mm)
ZZZZZ		02/27/2016 10:09	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 10:31	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Instrument ID: A4 Start Date: 02/26/2016 17:27

Analysis Batch Number: 101820 End Date: 02/27/2016 19:20

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		02/27/2016 10:52	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 11:13	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 11:34	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 11:56	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 12:17	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 12:38	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 12:59	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 13:20	1		Acquity 2.1(mm)
CCV 320-101820/43		02/27/2016 13:41	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 14:03	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 14:24	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 14:45	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 15:06	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 15:27	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 15:49	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 16:10	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 16:31	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 16:52	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 17:13	1		Acquity 2.1(mm)
CCV 320-101820/54		02/27/2016 17:34	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 17:56	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 18:17	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 18:38	1		Acquity 2.1(mm)
ZZZZZ		02/27/2016 18:59	1		Acquity 2.1(mm)
CCV 320-101820/59		02/27/2016 19:20	1		Acquity 2.1(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-17376-1

SDG No.:

Batch Number: 101543 Batch Start Date: 02/25/16 10:16 Batch Analyst: Arauz, Horacio J

Batch Method: 3535 Batch End Date: 02/26/16 15:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00027	LCPFCSP 00041
MB 320-101543/1		3535, WS-LC-0025				500 mL	1.00 mL	50 uL	
LCS 320-101543/2		3535, WS-LC-0025				500 mL	1.00 mL	50 uL	20 uL
LCSD 320-101543/3		3535, WS-LC-0025				500 mL	1.00 mL	50 uL	20 uL
320-17376-A-1	BC_2_20_16	3535, WS-LC-0025	T	605.6 g	45.95 g	559.7 mL	1.00 mL	50 uL	
320-17376-B-2	DW-29	3535, WS-LC-0025	T	599.15 g	46.14 g	553 mL	1.00 mL	50 uL	
320-17376-B-3	DW-29FB	3535, WS-LC-0025	T	594.16 g	45.91 g	548.3 mL	1.00 mL	50 uL	
320-17376-B-4	DW-13	3535, WS-LC-0025	T	609.9 g	44.06 g	565.8 mL	1.00 mL	50 uL	
320-17376-A-5	DW-13FB	3535, WS-LC-0025	T	593.42 g	44.45 g	549 mL	1.00 mL	50 uL	
320-17376-A-6	DW-3	3535, WS-LC-0025	T	598.97 g	47.31 g	551.7 mL	1.00 mL	50 uL	
320-17376-A-7	DW-3FB	3535, WS-LC-0025	T	598.23 g	44.20 g	554 mL	1.00 mL	50 uL	
320-17376-A-8	DW-71	3535, WS-LC-0025	T	624.3 g	46.11 g	578.2 mL	1.00 mL	50 uL	
320-17376-B-9	DW-71FB	3535, WS-LC-0025	T	584.73 g	45.89 g	538.8 mL	1.00 mL	50 uL	
320-17376-A-10	DW-84	3535, WS-LC-0025	T	610.8 g	43.76 g	567 mL	1.00 mL	50 uL	
320-17376-B-11	DW-84FB	3535, WS-LC-0025	T	602.4 g	43.74 g	558.7 mL	1.00 mL	50 uL	
320-17376-B-12	DW-91	3535, WS-LC-0025	T	585.68 g	44.15 g	541.5 mL	1.00 mL	50 uL	
320-17376-B-13	DW-91FB	3535, WS-LC-0025	T	614.4 g	44.09 g	570.3 mL	1.00 mL	50 uL	
320-17376-A-14	DUP022016	3535, WS-LC-0025	T	579.88 g	44.31 g	535.6 mL	1.00 mL	50 uL	

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.: 320-17376-1

SDG No.:

Batch Number: 101543 Batch Start Date: 02/25/16 10:16 Batch Analyst: Arauz, Horacio J

Batch Method: 3535 Batch End Date: 02/26/16 15:30

Batch Notes	
Balance ID	QA-070
Batch Comment	Hexane 0000116331; 1N Sodium Hydrox/H2O 585462; MeOH 582954
H2O Lot used	2/19/16
Pipette ID	EC15219
Analyst who added reagent	HJA
SU Reagent Drop	HJA
SU Reagent Drop Witness	SNE
Solvent Lot #	585662
Solvent Name	0.3% Ammonium hydroxide/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	Wax 500mg
Solid Phase Extraction Disk Lot Number	002635307A

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): 17376, 17406 Work List ID(s): 28708, 28745

Extraction Batch: 101543, 101659 Analysis Batch(es): 101820, 101944

Delivery Rank 4 Due Date: 2/29/16

A. Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# 101853	✓	✓	
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. NCM	✓	✓	
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# 48339, 48380	✓	✓	
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: 3/1/16

2nd Level Reviewer: MWM Date: 3/2/2016

24

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-101543

Analyst: Arauz, Horacio J

Batch Open: 2/25/2016 10:16:18AM

Method Code: 320-3535_IVWT-320

Batch End: 2/26/16 15:30

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~320-101543/1 N/A	N/A		500 mL				N/A	N/A	N/A		MB 320-101543/1-A
				1.00 mL								
2	LCS~320-101543/2 N/A	N/A		500 mL				N/A	N/A	N/A		LCS 320-101543/2-A
				1.00 mL								
3	LCSD~320-101543/3 N/A	N/A		500 mL				N/A	N/A	N/A		LCSD 320-101543/3-A
				1.00 mL								
4	320-17376-A-1 (PFC_IDA_DOD5)	N/A (320-17376-1)	605.6 g	559.7 mL				2/29/16	7_Day_Rush	4		320-17376-A-1-A
			45.95 g	1.00 mL								
5	320-17376-B-2 (PFC_IDA_DOD5)	N/A (320-17376-1)	599.15 g	553 mL				2/29/16	7_Day_Rush	4		320-17376-B-2-A
			46.14 g	1.00 mL								
6	320-17376-B-3 (PFC_IDA_DOD5)	N/A (320-17376-1)	594.16 g	548.3 mL				2/29/16	7_Day_Rush	4		320-17376-B-3-A
			45.91 g	1.00 mL								
7	320-17376-B-4 (PFC_IDA_DOD5)	N/A (320-17376-1)	609.9 g	565.8 mL				2/29/16	7_Day_Rush	4		320-17376-B-4-A
			44.06 g	1.00 mL								
8	320-17376-A-5 (PFC_IDA_DOD5)	N/A (320-17376-1)	593.42 g	549 mL				2/29/16	7_Day_Rush	4		320-17376-A-5-A
			44.45 g	1.00 mL								
9	320-17376-A-6 (PFC_IDA_DOD5)	N/A (320-17376-1)	598.97 g	551.7 mL				2/29/16	7_Day_Rush	4		320-17376-A-6-A
			47.31 g	1.00 mL								
10	320-17376-A-7 (PFC_IDA_DOD5)	N/A (320-17376-1)	598.23 g	554 mL				2/29/16	7_Day_Rush	4		320-17376-A-7-A
			44.20 g	1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-101543 Analyst: Arauz, Horacio J Batch Open: 2/25/2016 10:16:18AM

Method Code: 320-3535_IVWT-320 Batch End:

11	320-17376-A-8 (PFC_IDA_DOD5)	N/A (320-17376-1)	624.3 g 46.11 g	578.2 mL 1.00 mL				2/29/16	7_Day_Rush	4	
12	320-17376-B-9 (PFC_IDA_DOD5)	N/A (320-17376-1)	584.73 g 45.89 g	538.8 mL 1.00 mL				2/29/16	7_Day_Rush	4	
13	320-17376-A-10 (PFC_IDA_DOD5)	N/A (320-17376-1)	610.8 g 43.76 g	567 mL 1.00 mL				2/29/16	7_Day_Rush	4	
14	320-17376-B-11 (PFC_IDA_DOD5)	N/A (320-17376-1)	602.4 g 43.74 g	558.7 mL 1.00 mL				2/29/16	7_Day_Rush	4	
15	320-17376-B-12 (PFC_IDA_DOD5)	N/A (320-17376-1)	585.68 g 44.15 g	541.5 mL 1.00 mL				2/29/16	7_Day_Rush	4	
16	320-17376-B-13 (PFC_IDA_DOD5)	N/A (320-17376-1)	614.4 g 44.09 g	570.3 mL 1.00 mL				2/29/16	7_Day_Rush	4	
17	320-17376-A-14 (PFC_IDA_DOD5)	N/A (320-17376-1)	579.88 g 44.31 g	535.6 mL 1.00 mL				2/29/16	7_Day_Rush	4	
18	320-17406-A-1 (PFC_IDA_DOD5)	N/A (320-17406-1)	528.33 g 38.72 g	489.6 mL 1.00 mL				3/1/16	7_Day_Rush	4	
19	320-17406-A-2 (PFC_IDA_DOD5)	N/A (320-17406-1)	590.08 g 44.02 g	546.1 mL 1.00 mL				3/1/16	7_Day_Rush	4	
20	320-17406-A-3 (PFC_IDA_DOD5)	N/A (320-17406-1)	554.15 g 45.89 g	508.3 mL 1.00 mL				3/1/16	7_Day_Rush	4	
21	320-17406-A-4 (PFC_IDA_DOD5)	N/A (320-17406-1)	582.11 g 44.12 g	538 mL 1.00 mL				3/1/16	7_Day_Rush	4	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-101543 Analyst: Arauz, Horacio J Batch Open: 2/25/2016 10:16:18AM

Method Code: 320-3535_IVWT-320 Batch End:

Batch Notes

First Start time	NA
First End time	NA
Balance ID	QA-070
SPE Cartridge Type	Wax 500mg
Solid Phase Extraction Disk Lot Number	002635307A
H2O Lot used	2/19/16
Pipette ID	EC15219
Solvent Name	0.3% Ammonium hydroxide/MeOH
Solvent Lot #	585662
Analyst who added reagent	HJA
SU Reagent Drop	HJA
SU Reagent Drop Witness	SNE
Acid Name	NA
Acid Lot	NA
Reagent ID	NA
Reagent Lot Number	NA
NaCl Lot #	NA
SOP Number	WS-LC-0025
Batch Comment	Hexane 0000116331; 1N Sodium Hydrox/H2O 585462; MeOH 582954

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-101543 Analyst: Arauz, Horacio J Batch Open: 2/25/2016 10:16:18AM

Method Code: 320-3535_IVWT-320 Batch End:

Comments

320-17376-A-1	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17376-B-2	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17376-B-3	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17376-B-4	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17376-A-5	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17376-A-6	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17376-A-7	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17376-A-8	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17376-B-9	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17376-A-10	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17376-B-11	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17376-B-12	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17376-B-13	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17376-A-14	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-1	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-2	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-3	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-4	Method Comments:	Q5Rev111213_StdVarApp_30day disposal

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-101543 Analyst: Arauz, Horacio J Batch Open: 2/25/2016 10:16:18AM

Method Code: 320-3535_IVWT-320 Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-101543/1	LCMPFCSU_00027	50 uL	1.00 mL	HJA 2-25-16	SNE 2/25/16
LCS 320-101543/2	LCMPFCSU_00027	50 uL	1.00 mL		
LCS 320-101543/2	LCPFCSP_00041	20 uL	1.00 mL		
LCSD 320-101543/3	LCMPFCSU_00027	50 uL	1.00 mL		
LCSD 320-101543/3	LCPFCSP_00041	20 uL	1.00 mL		
320-17376-A-1	LCMPFCSU_00027	50 uL	1.00 mL		
320-17376-B-2	LCMPFCSU_00027	50 uL	1.00 mL		
320-17376-B-3	LCMPFCSU_00027	50 uL	1.00 mL		
320-17376-B-4	LCMPFCSU_00027	50 uL	1.00 mL		
320-17376-A-5	LCMPFCSU_00027	50 uL	1.00 mL		
320-17376-A-6	LCMPFCSU_00027	50 uL	1.00 mL		
320-17376-A-7	LCMPFCSU_00027	50 uL	1.00 mL		
320-17376-A-8	LCMPFCSU_00027	50 uL	1.00 mL		
320-17376-B-9	LCMPFCSU_00027	50 uL	1.00 mL		
320-17376-A-10	LCMPFCSU_00027	50 uL	1.00 mL		
320-17376-B-11	LCMPFCSU_00027	50 uL	1.00 mL		
320-17376-B-12	LCMPFCSU_00027	50 uL	1.00 mL		
320-17376-B-13	LCMPFCSU_00027	50 uL	1.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-101543 Analyst: Arauz, Horacio J Batch Open: 2/25/2016 10:16:18AM

Method Code: 320-3535_IVWT-320 Batch End:

320-17376-A-14	LCMPFCSU_00027	50 uL	1.00 mL	HJA 2-25-16	SNE 2/25/16
320-17406-A-1	LCMPFCSU_00027	50 uL	1.00 mL		
320-17406-A-2	LCMPFCSU_00027	50 uL	1.00 mL		
320-17406-A-3	LCMPFCSU_00027	50 uL	1.00 mL		
320-17406-A-4	LCMPFCSU_00027	50 uL	1.00 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

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Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 101543 Test: PFC

Earliest Holding Time: 2/26/16

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	✓	✓
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: 2/26/16

2nd Level Reviewer: [signature] Date: 2/26/16

Comments:

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-101659
Analyst: Arauz, Horacio J
Batch Open: 2/26/2016 8:58:15AM
Method Code: 320-3535_IVWT-320
Batch End: 2/26/16 17:50

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~320-101659/1 N/A	N/A		500 mL				N/A	N/A	N/A		MB 320-101659/1-A
				1.00 mL								
2	LCS~320-101659/2 N/A	N/A		500 mL				N/A	N/A	N/A		LCS 320-101659/2-A
				1.00 mL								
3	LCSD~320-101659/3 N/A	N/A		500 mL				N/A	N/A	N/A		LCSD 320-101659/3-A
				1.00 mL								
4	320-17406-B-5 (PFC_IDA_DOD5)	N/A (320-17406-1)	553.43 g	507.4 mL				3/1/16	7_Day_Rush	4		320-17406-B-5-A
			46.02 g	1.00 mL								
5	320-17406-B-6 (PFC_IDA_DOD5)	N/A (320-17406-1)	606.6 g	562.5 mL				3/1/16	7_Day_Rush	4		320-17406-B-6-A
			44.09 g	1.00 mL								
6	320-17406-A-7 (PFC_IDA_DOD5)	N/A (320-17406-1)	539.18 g	493 mL				3/1/16	7_Day_Rush	4		320-17406-A-7-A
			46.19 g	1.00 mL								
7	320-17406-B-8 (PFC_IDA_DOD5)	N/A (320-17406-1)	614.8 g	570.5 mL				3/1/16	7_Day_Rush	4		320-17406-B-8-A
			44.29 g	1.00 mL								
8	320-17406-A-9 (PFC_IDA_DOD5)	N/A (320-17406-1)	545.50 g	499.2 mL				3/1/16	7_Day_Rush	4		320-17406-A-9-A
			46.26 g	1.00 mL								
9	320-17406-A-10 (PFC_IDA_DOD5)	N/A (320-17406-1)	616.0 g	572.1 mL				3/1/16	7_Day_Rush	4		320-17406-A-10-A
			43.93 g	1.00 mL								
10	320-17406-A-11 (PFC_IDA_DOD5)	N/A (320-17406-1)	549.99 g	505.7 mL				3/1/16	7_Day_Rush	4		320-17406-A-11-A
			44.28 g	1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-101659 Analyst: Arauz, Horacio J Batch Open: 2/26/2016 8:58:15AM

Method Code: 320-3535_IVWT-320 Batch End:

11	320-17406-B-12 (PFC_IDA_DOD5)	N/A (320-17406-1)	591.70 g 43.95 g	547.8 mL 1.00 mL				3/1/16	7_Day_Rush	4	
12	320-17406-A-13 (PFC_IDA_DOD5)	N/A (320-17406-1)	606.9 g 46.04 g	560.9 mL 1.00 mL				3/1/16	7_Day_Rush	4	
13	320-17406-A-14 (PFC_IDA_DOD5)	N/A (320-17406-1)	599.09 g 43.70 g	555.4 mL 1.00 mL				3/1/16	7_Day_Rush	4	
14	320-17406-A-15 (PFC_IDA_DOD5)	N/A (320-17406-1)	610.5 g 44.03 g	566.5 mL 1.00 mL				3/1/16	7_Day_Rush	4	
15	320-17406-A-16 (PFC_IDA_DOD5)	N/A (320-17406-1)	580.28 g 44.28 g	536 mL 1.00 mL				3/1/16	7_Day_Rush	4	
16	320-17406-A-17 (PFC_IDA_DOD5)	N/A (320-17406-1)	611.1 g 44.15 g	567 mL 1.00 mL				3/1/16	7_Day_Rush	4	
17	320-17406-A-18 (PFC_IDA_DOD5)	N/A (320-17406-1)	557.51 g 44.31 g	513.2 mL 1.00 mL				3/1/16	7_Day_Rush	4	
18	320-17406-A-19 (PFC_IDA_DOD5)	N/A (320-17406-1)	469.76 g 44.21 g	425.6 mL 1.00 mL				3/1/16	7_Day_Rush	4	
19	320-17406-B-20 (PFC_IDA_DOD5)	N/A (320-17406-1)	614.2 g 43.66 g	570.5 mL 1.00 mL				3/1/16	7_Day_Rush	4	
20	320-17406-B-21 (PFC_IDA_DOD5)	N/A (320-17406-1)	483.85 g 43.93 g	439.9 mL 1.00 mL				3/1/16	7_Day_Rush	4	
21	320-17406-A-22 (PFC_IDA_DOD5)	N/A (320-17406-1)	543.67 g 44.12 g	499.6 mL 1.00 mL				3/1/16	7_Day_Rush	4	
22	320-17406-A-23 (PFC_IDA_DOD5)	N/A (320-17406-1)	548.01 g 44.01 g	504 mL 1.00 mL				3/1/16	7_Day_Rush	4	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-101659 Analyst: Arauz, Horacio J Batch Open: 2/26/2016 8:58:15AM

Method Code: 320-3535_IVWT-320 Batch End:

23	320-17406-B-24 (PFC_IDA_DOD5)	N/A (320-17406-1)	581.60 g 43.93 g	537.7 mL 1.00 mL				3/1/16	7_Day_Rush	4	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-101659 Analyst: Arauz, Horacio J Batch Open: 2/26/2016 8:58:15AM

Method Code: 320-3535_IVWT-320 Batch End:

Batch Notes

First Start time	NA
First End time	NA
Balance ID	QA-070
SPE Cartridge Type	Wax 500mg
Solid Phase Extraction Disk Lot Number	002635307A
H2O Lot used	2/23/16
Pipette ID	EC15219
Solvent Name	0.3% Ammonium hydroxide/MeOH
Solvent Lot #	588176
Analyst who added reagent	HJA
SU Reagent Drop	HJA
SU Reagent Drop Witness	SN E
Acid Name	NA
Acid Lot	NA
Reagent ID	NA
Reagent Lot Number	NA
NaCl Lot #	NA
SOP Number	WS-LC-0025
Batch Comment	Hexane 0000116331; 1N Sodium Hydrox/H2O 585462; MeOH 582954

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-101659 Analyst: Arauz, Horacio J Batch Open: 2/26/2016 8:58:15AM

Method Code: 320-3535_IVWT-320 Batch End:

Comments

320-17406-B-5	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-B-6	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-7	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-B-8	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-9	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-10	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-11	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-B-12	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-13	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-14	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-15	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-16	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-17	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-18	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-19	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-B-20	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-B-21	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-22	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-17406-A-23		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-101659 Analyst: Arauz, Horacio J Batch Open: 2/26/2016 8:58:15AM

Method Code: 320-3535_IVWT-320 Batch End:

320-17406-B-24	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
	Method Comments:	Q5Rev111213_StdVarApp_30day disposal

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-101659 Analyst: Arauz, Horacio J Batch Open: 2/26/2016 8:58:15AM

Method Code: 320-3535_IVWT-320 Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-101659/1	LCMPFCSU_00028	50 uL	1.00 mL	HSA 2-26-16	SNE 2/26/16
LCS 320-101659/2	LCMPFCSU_00028	50 uL	1.00 mL		
LCS 320-101659/2	LCPFCSP_00041	20 uL	1.00 mL		
LCSD 320-101659/3	LCMPFCSU_00028	50 uL	1.00 mL		
LCSD 320-101659/3	LCPFCSP_00041	20 uL	1.00 mL		
320-17406-B-5	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-B-6	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-A-7	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-B-8	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-A-9	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-A-10	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-A-11	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-B-12	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-A-13	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-A-14	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-A-15	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-A-16	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-A-17	LCMPFCSU_00028	50 uL	1.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-101659 Analyst: Arauz, Horacio J Batch Open: 2/26/2016 8:58:15AM

Method Code: 320-3535_IVWT-320 Batch End:

320-17406-A-18	LCMPFCSU_00028	50 uL	1.00 mL	HJA 2-26-16	SNE 2/26/16
320-17406-A-19	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-B-20	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-B-21	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-A-22	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-A-23	LCMPFCSU_00028	50 uL	1.00 mL		
320-17406-B-24	LCMPFCSU_00028	50 uL	1.00 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

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Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 320-101659 Test: PFC-L

Earliest Holding Time:

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)		✓
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 CI 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: 2/26/16

2nd Level Reviewer: CBW Date: 3/2/16

Comments:

Shipping and Receiving Documents

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica

Client Information	Sampler: Tom Lesinski	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 1
Company: Earth Toxics, Inc				Job #
Address: PO BOX 3382	Due Date Requested:			
City: Logan	TAT Requested (days):			
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

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)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	DV-LC-0012 (PFOS, PFOA, PFNA, PFHxS, PFHpA & PFBS)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N		
BC_2_20_16	2-20-16	—	G	W			X	2	

320-17376 Chain of Custody

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: 2-20-16 1500	Company: TestAmerica	Received by:	Date/Time:	Company:	
Relinquished by:	Date/Time: 2/22/16 1150	Company: TestAmerica	Received by:	Date/Time: 2/23/16 945	Company:	
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: 0.1, 1.4

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica

Client Information	Sampler: Tom Lesinski	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 1
Company: Earth Toxics, Inc				Job #
Address: PO BOX 3382	Due Date Requested:			
City: Logan	TAT Requested (days):			
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

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)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	DV-LC-0012 (PFOS, PFOA, PFNA, PFHxS, PFHpA & PFBS)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N		
DW-29	2-20-16	1341	G	W			X	2	
DW-29FB	2-20-16	1322	G	W			X	2	

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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
	2-20-16 1500	TestAmerica			
Relinquished by	Date/Time	Company	Received by:	Date/Time: 2/23/16 945	Company
	2-22-16 11:45				
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: 0.1, 1.4

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica

Client Information	Sampler: Tom Lesinski	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 1
Company: Earth Toxics, Inc				Job #:
Address: PO BOX 3382	Due Date Requested:			
City: Logan	TAT Requested (days):			
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

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)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	DV-LC-0012 (PFOS, PFOA, PFNA, PFHxS, PFHpA & PFBS)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N		
DW-13	2-20-16	1256	6	W			X	2	
DW-13FB	2-20-16	1237	6	W			X	2	

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
		2-20-16 1500	TestAmer			
	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
		2/22/16 1545			2/23/16 945	
	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	0.1, 1.4

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica

Client Information	Sampler: Tom Lesinski	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 1
Company: Earth Toxics, Inc				Job #:
Address: PO BOX 3382	Due Date Requested:			
City: Logan	TAT Requested (days):			
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

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, 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)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	DV-LC-0012 (PFOS, PFOA, PFNA, PFHxS, PFHpA & PFBS)	Total Number of containers	Special Instructions/Note:
	Preservation Code:						N		
DW-3	2-20-16		G	W			X	2	
DW-3FB	2-20-16	1137	G	W			X	2	

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		2-20-16 1500	TestAmerica			
2	Relinquished by	Date/Time 2/22/16 1800	Company TestAmerica	Received by	Date/Time 2/23/16 945	Company
3	Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temperature(s)°C and Other Remarks	0.1, 1.4

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica

Client Information	Sampler: Tom Lesinski	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 1
Company: Earth Toxics, Inc				Job #:
Address: PO BOX 3382	Due Date Requested:			
City: Logan	TAT Requested (days):			
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

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, 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)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	DV-LC-0012 (PFOS, PFOA, PFNA, PFHxS, PFHpA & PFBS)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N		
DW-71	2-20-16	1126	G	W			X	2	
DW-71FB	2-20-16	1111	G	W			X	2	

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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		2-20-16 1500	TestAmerica			
2		2/21/16 1522	TestAm		2/23/16 945	
3		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: 0-1 1.4

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica

Client Information	Sampler: Tom Lesinski	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 1
Company: Earth Toxics, Inc				Job #:

Address: PO BOX 3382	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Logan	TAT Requested (days):		A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: UT, 84321			
Phone:	PO #: Purchase Order Requested		Other:
Email: mdryden@earthtoxics.com	WO #:		
Project Name: Ensafe-NWS - Earle, NJ PFCs Potable Water	Project #: 28014493		
Site:	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	DV-LC-0012 (PFOS, PFOA, PFNA, PFHxS, PFHpA & PFBS)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N		
DW-04	2-20-16	1101							
DW-04 FB	2-20-16	1037							

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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: 2-20-16 1500	Company: TestAmerica	Received by	Date/Time	Company
Relinquished by:	Date/Time: 2/22/16 1515	Company: TestAmerica	Received by:	Date/Time: 2/23/16 945	Company
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	0.1, 1.9

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica

Client Information	Sampler	Lab PM	Carrier Tracking No(s)	COC No
Client Contact: Mike Dryden	Phone	Johnston, Michelle A E-Mail: michelle.johnston@testamericainc.com		280-48902-18075.1 Page: Page 1 of 1
Company: Earth Toxics, Inc				Job #
Address: PO BOX 3382	Due Date Requested:			
City: Logan	TAT Requested (days):			
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

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)	Field Filtered Sample (Yes or No)	DV-LC-0012 (PFOS, PFOA, PFNA, PFHxS, PFHpA & PFBS)	Total Number of containers	Special Instructions/Note:
			Preservation Code:			N		
DW-91	2-20-16	1026	G	W		X	2	
DW-91FB	2-20-16	1006	G	W		X	2	
DUP022016	2-20-16	1026	G	W		X	2	

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: 2-20-16 1500	Company: TestAmerica	Received by:		Date/Time:		Company
Relinquished by:	Date/Time: 2-22-16 1830	Company: FedEx	Received by:		Date/Time: 2/23/16 945		Company
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: 0-1 ; 1.4

Login Sample Receipt Checklist

Client: Earth Toxics, Inc

Job Number: 320-17376-1

Login Number: 17376
List Number: 1
Creator: Nelson, Kym D

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.	N/A	
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?	True	
There are no discrepancies between the containers received and the COC.	True	
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").	True	
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
320-17376-1	BC_2_20_16	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	ng/L	U	0.82	MDL	1.0	Total	101820	2/20/2016 12:00 AM	2/25/2016 10:17 AM	2/26/2016 9:41 PM	Perfluorinated Hydrocarbons
320-17376-1	BC_2_20_16	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	ng/L	U	0.72	MDL	1.0	Total	101820	2/20/2016 12:00 AM	2/25/2016 10:17 AM	2/26/2016 9:41 PM	Perfluorinated Hydrocarbons
320-17376-1	BC_2_20_16	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	ng/L	U	0.78	MDL	1.0	Total	101820	2/20/2016 12:00 AM	2/25/2016 10:17 AM	2/26/2016 9:41 PM	Perfluorinated Hydrocarbons
320-17376-1	BC_2_20_16	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	**0.67**	ng/L	J	0.58	MDL	1.0	Total	101820	2/20/2016 12:00 AM	2/25/2016 10:17 AM	2/26/2016 9:41 PM	Perfluorinated Hydrocarbons
320-17376-1	BC_2_20_16	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	ng/L	U	1.1	MDL	1.0	Total	101820	2/20/2016 12:00 AM	2/25/2016 10:17 AM	2/26/2016 9:41 PM	Perfluorinated Hydrocarbons
320-17376-1	BC_2_20_16	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	1.8	ng/L	U	0.67	MDL	1.0	Total	101820	2/20/2016 12:00 AM	2/25/2016 10:17 AM	2/26/2016 9:41 PM	Perfluorinated Hydrocarbons
320-17376-2	DW-29	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	ng/L	U	0.83	MDL	1.0	Total	101820	2/20/2016 1:41 PM	2/25/2016 10:17 AM	2/26/2016 10:03 PM	Perfluorinated Hydrocarbons
320-17376-2	DW-29	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	ng/L	U	0.73	MDL	1.0	Total	101820	2/20/2016 1:41 PM	2/25/2016 10:17 AM	2/26/2016 10:03 PM	Perfluorinated Hydrocarbons
320-17376-2	DW-29	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	ng/L	U	0.79	MDL	1.0	Total	101820	2/20/2016 1:41 PM	2/25/2016 10:17 AM	2/26/2016 10:03 PM	Perfluorinated Hydrocarbons
320-17376-2	DW-29	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	1.8	ng/L	U	0.59	MDL	1.0	Total	101820	2/20/2016 1:41 PM	2/25/2016 10:17 AM	2/26/2016 10:03 PM	Perfluorinated Hydrocarbons
320-17376-2	DW-29	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	ng/L	U	1.2	MDL	1.0	Total	101820	2/20/2016 1:41 PM	2/25/2016 10:17 AM	2/26/2016 10:03 PM	Perfluorinated Hydrocarbons
320-17376-2	DW-29	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	1.8	ng/L	U	0.68	MDL	1.0	Total	101820	2/20/2016 1:41 PM	2/25/2016 10:17 AM	2/26/2016 10:03 PM	Perfluorinated Hydrocarbons
320-17376-3	DW-29FB	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	**1.7**	ng/L	J	0.84	MDL	1.0	Total	101820	2/20/2016 1:22 PM	2/25/2016 10:17 AM	2/26/2016 10:24 PM	Perfluorinated Hydrocarbons
320-17376-3	DW-29FB	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	ng/L	U	0.73	MDL	1.0	Total	101820	2/20/2016 1:22 PM	2/25/2016 10:17 AM	2/26/2016 10:24 PM	Perfluorinated Hydrocarbons
320-17376-3	DW-29FB	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	ng/L	U	0.79	MDL	1.0	Total	101820	2/20/2016 1:22 PM	2/25/2016 10:17 AM	2/26/2016 10:24 PM	Perfluorinated Hydrocarbons
320-17376-3	DW-29FB	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	1.8	ng/L	U	0.60	MDL	1.0	Total	101820	2/20/2016 1:22 PM	2/25/2016 10:17 AM	2/26/2016 10:24 PM	Perfluorinated Hydrocarbons
320-17376-3	DW-29FB	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	ng/L	U	1.2	MDL	1.0	Total	101820	2/20/2016 1:22 PM	2/25/2016 10:17 AM	2/26/2016 10:24 PM	Perfluorinated Hydrocarbons
320-17376-3	DW-29FB	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	1.8	ng/L	U	0.68	MDL	1.0	Total	101820	2/20/2016 1:22 PM	2/25/2016 10:17 AM	2/26/2016 10:24 PM	Perfluorinated Hydrocarbons
320-17376-4	DW-13	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	ng/L	U	0.81	MDL	1.0	Total	101820	2/20/2016 12:56 PM	2/25/2016 10:17 AM	2/26/2016 10:45 PM	Perfluorinated Hydrocarbons
320-17376-4	DW-13	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	ng/L	U	0.71	MDL	1.0	Total	101820	2/20/2016 12:56 PM	2/25/2016 10:17 AM	2/26/2016 10:45 PM	Perfluorinated Hydrocarbons
320-17376-4	DW-13	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	ng/L	U	0.77	MDL	1.0	Total	101820	2/20/2016 12:56 PM	2/25/2016 10:17 AM	2/26/2016 10:45 PM	Perfluorinated Hydrocarbons
320-17376-4	DW-13	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	1.8	ng/L	U	0.58	MDL	1.0	Total	101820	2/20/2016 12:56 PM	2/25/2016 10:17 AM	2/26/2016 10:45 PM	Perfluorinated Hydrocarbons
320-17376-4	DW-13	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	ng/L	U	1.1	MDL	1.0	Total	101820	2/20/2016 12:56 PM	2/25/2016 10:17 AM	2/26/2016 10:45 PM	Perfluorinated Hydrocarbons
320-17376-4	DW-13	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	1.8	ng/L	U	0.66	MDL	1.0	Total	101820	2/20/2016 12:56 PM	2/25/2016 10:17 AM	2/26/2016 10:45 PM	Perfluorinated Hydrocarbons
320-17376-5	DW-13FB	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	ng/L	U	0.84	MDL	1.0	Total	101820	2/20/2016 12:37 PM	2/25/2016 10:17 AM	2/26/2016 11:06 PM	Perfluorinated Hydrocarbons
320-17376-5	DW-13FB	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	ng/L	U	0.73	MDL	1.0	Total	101820	2/20/2016 12:37 PM	2/25/2016 10:17 AM	2/26/2016 11:06 PM	Perfluorinated Hydrocarbons
320-17376-5	DW-13FB	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	ng/L	U	0.79	MDL	1.0	Total	101820	2/20/2016 12:37 PM	2/25/2016 10:17 AM	2/26/2016 11:06 PM	Perfluorinated Hydrocarbons
320-17376-5	DW-13FB	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	1.8	ng/L	U	0.60	MDL	1.0	Total	101820	2/20/2016 12:37 PM	2/25/2016 10:17 AM	2/26/2016 11:06 PM	Perfluorinated Hydrocarbons
320-17376-5	DW-13FB	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	ng/L	U	1.2	MDL	1.0	Total	101820	2/20/2016 12:37 PM	2/25/2016 10:17 AM	2/26/2016 11:06 PM	Perfluorinated Hydrocarbons
320-17376-5	DW-13FB	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	1.8	ng/L	U	0.68	MDL	1.0	Total	101820	2/20/2016 12:37 PM	2/25/2016 10:17 AM	2/26/2016 11:06 PM	Perfluorinated Hydrocarbons
320-17376-6	DW-3	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	**1.4**	ng/L	J	0.83	MDL	1.0	Total	101820	2/20/2016 11:56 AM	2/25/2016 10:17 AM	2/26/2016 11:27 PM	Perfluorinated Hydrocarbons
320-17376-6	DW-3	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	ng/L	U	0.73	MDL	1.0	Total	101820	2/20/2016 11:56 AM	2/25/2016 10:17 AM	2/26/2016 11:27 PM	Perfluorinated Hydrocarbons
320-17376-6	DW-3	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	**0.97**	ng/L	J	0.79	MDL	1.0	Total	101820	2/20/2016 11:56 AM	2/25/2016 10:17 AM	2/26/2016 11:27 PM	Perfluorinated Hydrocarbons
320-17376-6	DW-3	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	**0.87**	ng/L	J	0.59	MDL	1.0	Total	101820	2/20/2016 11:56 AM	2/25/2016 10:17 AM	2/26/2016 11:27 PM	Perfluorinated Hydrocarbons
320-17376-6	DW-3	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	**16**	ng/L		1.2	MDL	1.0	Total	101820	2/20/2016 11:56 AM	2/25/2016 10:17 AM	2/26/2016 11:27 PM	Perfluorinated Hydrocarbons
320-17376-6	DW-3	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	**2.0**	ng/L	J	0.68	MDL	1.0	Total	101820	2/20/2016 11:56 AM	2/25/2016 10:17 AM	2/26/2016 11:27 PM	Perfluorinated Hydrocarbons
320-17376-7	DW-3FB	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	ng/L	U	0.83	MDL	1.0	Total	101820	2/20/2016 11:37 AM	2/25/2016 10:17 AM	2/26/2016 11:48 PM	Perfluorinated Hydrocarbons
320-17376-7	DW-3FB	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	ng/L	U	0.72	MDL	1.0	Total	101820	2/20/2016 11:37 AM	2/25/2016 10:17 AM	2/26/2016 11:48 PM	Perfluorinated Hydrocarbons
320-17376-7	DW-3FB	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	ng/L	U	0.79	MDL	1.0	Total	101820	2/20/2016 11:37 AM	2/25/2016 10:17 AM	2/26/2016 11:48 PM	Perfluorinated Hydrocarbons
320-17376-7	DW-3FB	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	1.8	ng/L	U	0.59	MDL	1.0	Total	101820	2/20/2016 11:37 AM	2/25/2016 10:17 AM	2/26/2016 11:48 PM	Perfluorinated Hydrocarbons
320-17376-7	DW-3FB	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	ng/L	U	1.2	MDL	1.0	Total	101820	2/20/2016 11:37 AM	2/25/2016 10:17 AM	2/26/2016 11:48 PM	Perfluorinated Hydrocarbons
320-17376-7	DW-3FB	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	1.8	ng/L	U	0.68	MDL	1.0	Total	101820	2/20/2016 11:37 AM	2/25/2016 10:17 AM	2/26/2016 11:48 PM	Perfluorinated Hydrocarbons
320-17376-8	DW-71	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.7	ng/L	U	0.79	MDL	1.0	Total	101820	2/20/2016 11:26 AM	2/25/2016 10:17 AM	2/27/2016 12:31 AM	Perfluorinated Hydrocarbons
320-17376-8	DW-71	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.7	ng/L	U	0.69	MDL	1.0	Total	101820	2/20/2016 11:26 AM	2/25/2016 10:17 AM	2/27/2016 12:31 AM	Perfluorinated Hydrocarbons
320-17376-8	DW-71	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.7	ng/L	U	0.75	MDL	1.0	Total	101820	2/20/2016 11:26 AM	2/25/2016 10:17 AM	2/27/2016 12:31 AM	Perfluorinated Hydrocarbons
320-17376-8	DW-71	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	1.7	ng/L	U	0.57	MDL	1.0	Total	101820	2/20/2016 11:26 AM	2/25/2016 10:17 AM	2/27/2016 12:31 AM	Perfluorinated Hydrocarbons
320-17376-8	DW-71	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	ng/L	U	1.1	MDL	1.0	Total	101820	2/20/2016 11:26 AM	2/25/2016 10:17 AM	2/27/2016 12:31 AM	Perfluorinated Hydrocarbons
320-17376-8	DW-71	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	1.7	ng/L	U	0.65	MDL	1.0	Total	101820	2/20/2016 11:26 AM	2/25/2016 10:17 AM	2/27/2016 12:31 AM	Perfluorinated Hydrocarbons
320-17376-9	DW-71FB	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	ng/L	U	0.85	MDL	1.0	Total	101820	2/20/2016 11:11 AM	2/25/2016 10:17 AM	2/27/2016 12:52 AM	Perfluorinated Hydrocarbons
320-17376-9	DW-71FB	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	ng/L	U	0.74	MDL	1.0	Total	101820	2/20/2016 11:11 AM	2/25/2016 10:17 AM	2/27/2016 12:52 AM	Perfluorinated Hydrocarbons
320-17376-9	DW-71FB	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	ng/L	U	0.81	MDL	1.0	Total	101820	2/20/2016 11:11 AM	2/25/2016 10:17 AM	2/27/2016 12:52 AM	Perfluorinated Hydrocarbons
320-17376-9	DW-71FB	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	1.9	ng/L	U	0.61	MDL	1.0	Total	101820	2/20/2016 11:11 AM	2/25/2016 10:17 AM	2/27/2016 12:52 AM	Perfluorinated Hydrocarbons
320-17376-9	DW-71FB	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.8	ng/L	U	1.2	MDL	1.0	Total	101820	2/20/2016 11:11 AM	2/25/2016 10:17 AM	2/27/2016 12:52 AM	Perfluorinated Hydrocarbons
320-17376-9	DW-71FB	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	1.9	ng/L	U	0.69	MDL	1.0	Total	101820	2/20/2016 11:11 AM	2/25/2016 10:17 AM	2/27/2016 12:52 AM	Perfluorinated Hydrocarbons
320-17376-10	DW-84	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	ng/L	U	0.81	MDL	1.0	Total	101820	2/20/2016 11:01 AM	2/25/2016 10:17 AM	2/27/2016 1:13 AM	Perfluorinated Hydrocarbons
320-17376-10	DW-84	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	ng/L	U	0.71	MDL	1.0	Total	101820	2/20/2016 11:01 AM	2/25/2016 10:17 AM	2/27/2016 1:13 AM	Perfluorinated Hydrocarbons
320-17376-10	DW-84	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	ng/L	U	0.77	MDL	1.0	Total	101820	2/20/2016 11:01 AM	2/25/2016 10:17 AM	2/27/2016 1:13 AM	Perfluorinated Hydrocarbons
320-17376-10	DW-84	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	1.8	ng/L	U	0.58	MDL	1.0	Total	101820	2/20/2016 11:01 AM	2/25/2016 10:17 AM	2/27/2016 1:13 AM	Perfluorinated Hydrocarbons
320-17376-10	DW-84	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	ng/L	U	1.1	MDL	1.0	Total	101820	2/20/2016 11:01 AM	2/25/2016 10:17 AM	2/27/2016 1:13 AM	Perfluorinated Hydrocarbons
320-17376-10	DW-84	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	1.8	ng/L	U	0.66	MDL	1.0	Total	101820	2/20/2016 11:01 AM	2/25/2016 10:17 AM	2/27/2016 1:13 AM	Perfluorinated Hydrocarbons
320-17376-11	DW-84FB	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	ng/L	U	0.82	MDL	1.0	Total	101820	2/20/2016 10:37 AM	2/25/2016 10:17 AM	2/27/2016 1:34 AM	Perfluorinated Hydrocarbons
320-17376-11	DW-84FB	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	ng/L	U	0.72	MDL	1.0	Total	101820	2/20/2016 10:37 AM	2/25/2016 10:17 AM	2/27/2016 1:34 AM	Perfluorinated Hydrocarbons
320-17376-11	DW-84FB	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	ng/L	U	0.78	MDL	1.0	Total	101820	2/20/2016 10:37 AM	2/25/2016 10:17 AM	2/27/2016 1:34 AM	Perfluorinated Hydrocarbons
320-17376-11	DW-84FB	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	1.8	ng/L	U	0.59	MDL	1.0	Total	101820	2/20/2016 10:37 AM	2/25/2016 10:17 AM	2/27/2016 1:34 AM	Perfluorinated Hydrocarbons
320-17376-11	DW-84FB	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	ng/L	U	1.1	MDL	1.0	Total	101820	2/20/2016 10:37 AM	2/25/2016 10:17 AM	2/27/2016 1:34 AM	Perfluorinated Hydrocarbons
320-17376-11	DW-84FB	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	1.8	ng/L	U	0.67	MDL	1.0	Total	101820	2/20/2016 10:37 AM	2/25/2016 10:17 AM	2/27/2016 1:34 AM	Perfluorinated Hydrocarbons
320-17376-12	DW-91	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	ng/L	U	0.85	MDL	1.0	Total	101820	2/20/2016 10:26 AM	2/25/2016 10:17 AM	2/27/2016 1:56 AM	Perfluorinated Hydrocarbons
320-17376-12	DW-91	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	ng/L	U	0.74	MDL	1.0	Total	101820	2/20/2016 10:26 AM	2/25/2016 10:17 AM	2/27/2016 1:56 AM	Perfluorinated Hydrocarbons
320-17376-12	DW-91	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	ng/L	U	0.80	MDL	1.0	Total	101820	2/20/2016 10:26 AM	2/25/2016 10:17 AM	2/27/2016 1:56 AM	Perfluorinated Hydrocarbons

Sample	Sample Name	Specific Method	CAS Number	Analyte	Result	Units	Qualifier	Limit	Reports To	Dilution	Result Basis	Batch	Sampled	Prepared	Analyzed	Analysis
320-17376-12	DW-91	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	1.8	ng/L	U	0.60	MDL	1.0	Total	101820	2/20/2016 10:26 AM	2/25/2016 10:17 AM	2/27/2016 1:56 AM	Perfluorinated Hydrocarbons
320-17376-12	DW-91	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.8	ng/L	U	1.2	MDL	1.0	Total	101820	2/20/2016 10:26 AM	2/25/2016 10:17 AM	2/27/2016 1:56 AM	Perfluorinated Hydrocarbons
320-17376-12	DW-91	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	1.8	ng/L	U	0.69	MDL	1.0	Total	101820	2/20/2016 10:26 AM	2/25/2016 10:17 AM	2/27/2016 1:56 AM	Perfluorinated Hydrocarbons
320-17376-13	DW-91FB	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	ng/L	U	0.80	MDL	1.0	Total	101820	2/20/2016 10:06 AM	2/25/2016 10:17 AM	2/27/2016 2:17 AM	Perfluorinated Hydrocarbons
320-17376-13	DW-91FB	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	ng/L	U	0.70	MDL	1.0	Total	101820	2/20/2016 10:06 AM	2/25/2016 10:17 AM	2/27/2016 2:17 AM	Perfluorinated Hydrocarbons
320-17376-13	DW-91FB	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	ng/L	U	0.76	MDL	1.0	Total	101820	2/20/2016 10:06 AM	2/25/2016 10:17 AM	2/27/2016 2:17 AM	Perfluorinated Hydrocarbons
320-17376-13	DW-91FB	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	1.8	ng/L	U	0.57	MDL	1.0	Total	101820	2/20/2016 10:06 AM	2/25/2016 10:17 AM	2/27/2016 2:17 AM	Perfluorinated Hydrocarbons
320-17376-13	DW-91FB	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	ng/L	U	1.1	MDL	1.0	Total	101820	2/20/2016 10:06 AM	2/25/2016 10:17 AM	2/27/2016 2:17 AM	Perfluorinated Hydrocarbons
320-17376-13	DW-91FB	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	1.8	ng/L	U	0.66	MDL	1.0	Total	101820	2/20/2016 10:06 AM	2/25/2016 10:17 AM	2/27/2016 2:17 AM	Perfluorinated Hydrocarbons
320-17376-14	DUP022016	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	ng/L	U	0.86	MDL	1.0	Total	101820	2/20/2016 10:26 AM	2/25/2016 10:17 AM	2/27/2016 2:38 AM	Perfluorinated Hydrocarbons
320-17376-14	DUP022016	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	ng/L	U	0.75	MDL	1.0	Total	101820	2/20/2016 10:26 AM	2/25/2016 10:17 AM	2/27/2016 2:38 AM	Perfluorinated Hydrocarbons
320-17376-14	DUP022016	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	ng/L	U	0.81	MDL	1.0	Total	101820	2/20/2016 10:26 AM	2/25/2016 10:17 AM	2/27/2016 2:38 AM	Perfluorinated Hydrocarbons
320-17376-14	DUP022016	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	1.9	ng/L	U	0.61	MDL	1.0	Total	101820	2/20/2016 10:26 AM	2/25/2016 10:17 AM	2/27/2016 2:38 AM	Perfluorinated Hydrocarbons
320-17376-14	DUP022016	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.8	ng/L	U	1.2	MDL	1.0	Total	101820	2/20/2016 10:26 AM	2/25/2016 10:17 AM	2/27/2016 2:38 AM	Perfluorinated Hydrocarbons
320-17376-14	DUP022016	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	1.9	ng/L	U	0.70	MDL	1.0	Total	101820	2/20/2016 10:26 AM	2/25/2016 10:17 AM	2/27/2016 2:38 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): 320-17363-1, 320-17376-1, 32017406-1, and 320-17463-1

Document Date: March 2016 **Number of Pages:** 13

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:	320-17363-1, 320-17376-1, 32017406-1, and 320-17463-1
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 February 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
- * Holding times
- * Initial calibration
- * Initial calibration verification
- Continuing calibration verification
- * Laboratory control sample/laboratory control sample duplicate results
- Isotope dilution recoveries
- Laboratory method blanks
- Field and trip blanks
- * Field duplicate precision
- Sample reporting issues
- * Sample result transcriptions/recalculations

Acceptable data parameters for which all criteria were met, as indicated above with an asterisk (*), are not discussed further.

Sample Receipt and Preservation

All samples were received by the laboratory in good condition, properly preserved, and at the proper temperature of less than 4 degrees Celsius.

The chain-of-custody form for sample delivery group (SDG) 320-1736-1 did not document the collection time for DW-3; the time was corrected by the laboratory based on sampler's instructions the same day. In addition, the requested sample analyses, sample type, and matrix were inadvertently omitted for samples DW-84 and DW-84B. The laboratory logged these samples as specified on the purchase order/scope of work.

For SDG 320-17463-1, the requested sample analysis was omitted and the laboratory logged these samples as specified on the purchase order/scope of work.

No adverse effects to data quality are anticipated do to these chain-of-custody form oversights.

Continuing Calibration Outliers

Initial calibration demonstrates that the instrument is capable of acceptable performance and the results are used to quantitate sample values. Initial and continuing calibration verification checks satisfactory performance of the instrument on a day-to-day basis. If calibration results are close to the expected values, the reported analyte concentrations are assumed to be accurate. All initial calibration and initial calibration verification criteria were met.

The perfluorooctane sulfonic acid (PFOS) continuing calibration (CCV 320-101820/43) had a percent recovery of 27.2%, which was above the <25% control limit. The laboratory reanalyzed all samples associated with this calibration. The reanalyzed sample results met all QC criteria and are reported for interpretation.

Isotope Dilution Recoveries

The isotope dilution analytes consist of carbon-13 labeled analogs, oxygen-18 labeled analogs, or deuterated analogs of the compounds of interest, and they are spiked into every standard and sample at the time of extraction. This provides a correction for recovery of each corresponding native compound because the native compound and its labeled compound exhibit similar effects upon extraction, concentration, and analysis. By determining the ratio of these amounts, both the quantity and mass of the compound can be ascertained.

The field blank DW-80FB isotope dilution percent recovery (%R) for $^{13}C_4$-PFOS was 156%, which was above the 25-150% control limit. Since associated compound PFOS was not detected, no qualification transpired because the elevated %R indicated a high result bias.

All isotope dilution analytes were below the 25-150% control limit for sample DW-55 during an initial analysis. However, this sample was reanalyzed due to a PFOS calibration outlier and this was the only analyte reported from the reanalysis. The data reviewer contacted the laboratory and requested the reanalyzed sample results be reported for all analytes. The reanalyzed sample results met all QC criteria and are reported for interpretation.

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.

Laboratory method blanks were analyzed with samples to assess contamination imparted by sample preparation and/or analysis. 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, two types of field-derived blanks were collected: trip blank and field blank. The trip blank, which was placed in every shipping cooler and never opened in the field, consisted of the same source water as the laboratory method blank and was primarily used to measure possible cross contamination of samples during shipping to and from the site. Field blanks consisted of laboratory blank water bottles that were opened in the field and transferred into another container at each sampling location; they were used to assess potential ambient conditions cross-contamination that could potentially affect the quality of the associated samples. 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.

Laboratory Method Blank Outliers

Laboratory method blank MB 320-102166/1-A contained perfluorobutanesulfonic acid (PFBS) at a concentration of 1.37 nanograms per liter (ng/L). PFBS was detected below the limit of quantitation and was qualified as undetected "U" in the following samples due to laboratory blank contamination: BC_02_26_16, DUP_022616, DW-18, DW-18FB, DW-78, DW-78FB, DW-100, and DW-100FB.

Trip Blanks and Field Blanks

Table 1 summarizes sample results qualified due to trip blank and field blank artifacts per the validation guidelines. Sample results that were either undetected or greater than the limit of quantitation were not qualified when blank outliers were observed.

Table 1
Trip and Field Blank Outliers

Blank	Blank Type	Analyte	Result (ng/L)	LOQ (ng/L)	Samples Qualified Undetected "U"
BC_02_26_16	Trip	Perfluorobutanesulfonic Acid (PFBS)	1.4	2.1	DUP_022616, DW-100, DW-100FB, DW-18, DW-18FB, DW-78, DW-78FB
BC_02_26_16	Trip	Perfluorononanoic Acid (PFNA)	0.64	2.1	DW-100FB
BC_2_20_16	Trip	Perfluorononanoic Acid (PFNA)	0.67	2.2	DW-3
DW-10FB	Field	Perfluorohexanesulfonic Acid (PFHXS)	0.80	2.2	None (a)
DW-18FB	Field	Perfluorobutanesulfonic Acid (PFBS)	1.3	2.3	DW-18
DW-29FB	Field	Perfluorobutanesulfonic Acid (PFBS)	1.7	2.3	None (a)
DW-48FB	Field	Perfluoroheptanoic Acid (PFHPA)	0.71	2.2	None (a)
DW-57FB	Field	Perfluorohexanesulfonic Acid (PFHXS)	1.1	2.2	None (b)

Table 1
Trip and Field Blank Outliers

Blank	Blank Type	Analyte	Result (ng/L)	LOQ (ng/L)	Samples Qualified Undetected "U"
DW-57FB	Field	Perfluorooctane Sulfonic Acid	1.7	3.6	None (b)
DW-78FB	Field	Perfluorobutanesulfonic Acid (PFBS)	1.2	2.2	DW-78
DW-87FB	Field	Perfluorohexanesulfonic Acid (PFHXS)	0.86	2.3	None (a)
DW-87FB	Field	Perfluorononanoic Acid (PFNA)	0.78	2.3	None (a)
DW-100FB	Field	Perfluorobutanesulfonic Acid (PFBS)	1.3	2.3	DW-100
DW-100FB	Field	Perfluorononanoic Acid (PFNA)	0.63	2.3	None (a)

Notes:
ng/L = Nanograms per liter
LOQ = Limit of quantitation
(a) = The associated sample result was undetected and no adverse effects to data is expected.
(b) = The associated sample result was greater than the limit of quantitation and was not qualified.

Sample Reporting Issues

Raw analytical data were reviewed with particular attention to manual integration. As stated in the laboratory's SOP, *commercial sources of PFOS may produce several peaks in the PFOS chromatogram. These adjacent peaks are either completely resolved or not resolved but with a profound deflection that can be resolved during peak integration. The later of the peaks matches the retention time of the single labeled PFOS peak. Earlier peaks are branched isomers of PFOS, rather than a result of peak splitting. The earlier peak is included during peak integration.*

The data reviewer noticed that three of the PFOS manual integrations were not performed consistently in accordance with the SOP and requested that the laboratory reassess the data. Based on this inquiry, PFOs for sample DW-68 and DW-95 were reintegrated and re-reported. The third sample (DW-57) was reported correctly and results were not changed.

Overall Assessment

The data from SDGs 320-17363-1, 320-17376-1, 32017406-1, and 320-17463-1 were reviewed independently from the laboratory to assess data quality. Several analytes were flagged as undetected during data review due to suspected cross-contamination from laboratory and/or field sources. 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	**Laboratory Identification**	**Sample Date**	**Sample Identification**	**Sample Type**
320173631	320-17363-1	2/19/2016	BC2_19_16	Trip Blank
320173631	320-17363-10	2/19/2016	DW-10	Potable Water
320173631	320-17363-11	2/19/2016	DW-10FB	Field Blank
320173631	320-17363-12	2/19/2016	DW-63	Potable Water
320173631	320-17363-13	2/19/2016	DW-63FB	Field Blank
320173631	320-17363-14	2/19/2016	DW-87	Potable Water
320173631	320-17363-15	2/19/2016	DW-87FB	Field Blank
320173631	320-17363-16	2/19/2016	DW-23	Potable Water
320173631	320-17363-17	2/19/2016	DW-23FB	Field Blank
320173631	320-17363-18	2/19/2016	DUP-021916	Duplicate of DW-23
320173631	320-17363-2	2/19/2016	DW-57	Potable Water
320173631	320-17363-3	2/19/2016	DW-57FB	Field Blank
320173631	320-17363-4	2/19/2016	DW-48	Potable Water
320173631	320-17363-5	2/19/2016	DW-48FB	Field Blank
320173631	320-17363-6	2/19/2016	DW-59	Potable Water
320173631	320-17363-7	2/19/2016	DW-59FB	Field Blank
320173631	320-17363-8	2/19/2016	DW-88	Potable Water
320173631	320-17363-9	2/19/2016	DW-88FB	Field Blank
320173761	320-17376-1	2/20/2016	BC_2_20_16	Trip Blank
320173761	320-17376-10	2/20/2016	DW-84	Potable Water
320173761	320-17376-11	2/20/2016	DW-84FB	Field Blank
320173761	320-17376-12	2/20/2016	DW-91	Potable Water
320173761	320-17376-13	2/20/2016	DW-91FB	Field Blank
320173761	320-17376-14	2/20/2016	DUP022016	Duplicate of DW-91
320173761	320-17376-2	2/20/2016	DW-29	Potable Water
320173761	320-17376-3	2/20/2016	DW-29FB	Field Blank
320173761	320-17376-4	2/20/2016	DW-13	Potable Water
320173761	320-17376-5	2/20/2016	DW-13FB	Field Blank
320173761	320-17376-6	2/20/2016	DW-3	Potable Water
320173761	320-17376-7	2/20/2016	DW-3FB	Field Blank
320173761	320-17376-8	2/20/2016	DW-71	Potable Water
320173761	320-17376-9	2/20/2016	DW-71FB	Field Blank
320174061	320-17406-1	2/22/2016	BC_2_22_16	Trip Blank
320174061	320-17406-10	2/22/2016	DW-15	Potable Water
320174061	320-17406-11	2/22/2016	DW-15FB	Field Blank
320174061	320-17406-12	2/22/2016	DW-19	Potable Water
320174061	320-17406-13	2/22/2016	DW-19FB	Field Blank
320174061	320-17406-14	2/22/2016	DW-68	Potable Water
320174061	320-17406-15	2/22/2016	DW-68FB	Field Blank
320174061	320-17406-16	2/22/2016	DW-55	Potable Water
320174061	320-17406-17	2/22/2016	DW-55FB	Field Blank
320174061	320-17406-18	2/22/2016	DW-95	Potable Water
320174061	320-17406-19	2/22/2016	DW-95FB	Field Blank
320174061	320-17406-2	2/22/2016	DW-1	Potable Water
320174061	320-17406-20	2/22/2016	DW-6	Potable Water

Table A-1 Sample Summary				
Sample Delivery Group	**Laboratory Identification**	**Sample Date**	**Sample Identification**	**Sample Type**
320174061	320-17406-21	2/22/2016	DW-6FB	Field Blank
320174061	320-17406-22	2/22/2016	DW-37	Potable Water
320174061	320-17406-23	2/22/2016	DW-37FB	Field Blank
320174061	320-17406-24	2/22/2016	DUP-022216	Duplicate of DW-37
320174061	320-17406-3	2/22/2016	DW-1FB	Field Blank
320174061	320-17406-4	2/22/2016	DW-56	Potable Water
320174061	320-17406-5	2/22/2016	DW-56FB	Field Blank
320174061	320-17406-6	2/22/2016	DW-80	Potable Water
320174061	320-17406-7	2/22/2016	DW-80FB	Field Blank
320174061	320-17406-8	2/22/2016	DW-44	Potable Water
320174061	320-17406-9	2/22/2016	DW-44FB	Field Blank
320174631	320-17463-1	2/26/2016	BC_02_26_16	Trip Blank
320174631	320-17463-2	2/26/2016	DW-18	Potable Water
320174631	320-17463-3	2/26/2016	DW-18FB	Field Blank
320174631	320-17463-4	2/26/2016	DW-78	Potable Water
320174631	320-17463-5	2/26/2016	DW-78FB	Field Blank
320174631	320-17463-6	2/26/2016	DW-100	Potable Water
320174631	320-17463-7	2/26/2016	DW-100FB	Field Blank
320174631	320-17463-8	2/26/2016	DUP_022616	Duplicate of DW-100

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 – February 2016

Sample Delivery Group			320173631			320173631			320173631			320173631			320173631		
Lab ID			320-17363-1			320-17363-10			320-17363-11			320-17363-12			320-17363-13		
Sample ID			BC2_19_16			DW-10			DW-10FB			DW-63			DW-63FB		
Sample Date			2/19/2016			2/19/2016			2/19/2016			2/19/2016			2/19/2016		
Sample Type			Trip Blank			Potable Water			Field Blank			Potable Water			Field Blank		
Analyte	**CAS No**	**Units**	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	ng/L	1.8	U		1.9	U		1.8	U		1.8	U		1.8	U	
Perfluoroheptanoic Acid (PFHPA)	375-85-9	ng/L	1.8	U		1.9	U		1.8	U		1.8	U		1.8	U	
Perfluorohexanesulfonic Acid (PFHXS)	355-46-4	ng/L	1.8	U		1.9	U		0.8	J		1.8	U		1.8	U	
Perfluorononanoic Acid (PFNA)	375-95-1	ng/L	1.8	U		1.9	U		1.8	U		1.8	U		1.8	U	
Perfluorooctane Sulfonic Acid (PFOS)	1763-23-1	ng/L	2.7	U		2.9	U		2.7	U		2.7	U		2.7	U	
Perfluorooctanoic Acid (PFOA)	335-67-1	ng/L	1.8	U		1.9	U		1.8	U		1.8	U		1.8	U	

Sample Delivery Group			320173631			320173631			320173631			320173631			320173631		
Lab ID			320-17363-14			320-17363-15			320-17363-16			320-17363-17			320-17363-18		
Sample ID			DW-87			DW-87FB			DW-23			DW-23FB			DUP-021916		
Sample Date			2/19/2016			2/19/2016			2/19/2016			2/19/2016			2/19/2016		
Sample Type			Potable Water			Field Blank			Potable Water			Field Blank			Duplicate (DW-23)		
Analyte	**CAS No**	**Units**	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	ng/L	0.86	J		1.8	U		1.8	U		1.8	U		2	U	
Perfluoroheptanoic Acid (PFHPA)	375-85-9	ng/L	1.8	U		1.8	U		1.8	U		1.8	U		2	U	
Perfluorohexanesulfonic Acid (PFHXS)	355-46-4	ng/L	1.8	U		0.86	J		1.8	U		1.8	U		2	U	
Perfluorononanoic Acid (PFNA)	375-95-1	ng/L	1.8	U		0.78	J		1.8	U		1.8	U		2	U	
Perfluorooctane Sulfonic Acid (PFOS)	1763-23-1	ng/L	2.7	U		2.7	U		2.7	U		2.7	U		3	U	
Perfluorooctanoic Acid (PFOA)	335-67-1	ng/L	1.8	U		1.8	U		1.8	U		1.8	U		2	U	

Sample Delivery Group			320173631			320173631			320173631			320173631			320173631		
Lab ID			320-17363-2			320-17363-3			320-17363-4			320-17363-5			320-17363-6		
Sample ID			DW-57			DW-57FB			DW-48			DW-48FB			DW-59		
Sample Date			2/19/2016			2/19/2016			2/19/2016			2/19/2016			2/19/2016		
Sample Type			Potable Water			Field Blank			Potable Water			Field Blank			Potable Water		
Analyte	**CAS No**	**Units**	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	ng/L	1.8	J		1.8	U		1.8	U		1.8	U		1.8	U	
Perfluoroheptanoic Acid (PFHPA)	375-85-9	ng/L	4.5			1.8	U		1.8	U		0.71	J		1.8	U	
Perfluorohexanesulfonic Acid (PFHXS)	355-46-4	ng/L	41			1.1	J		0.83	J		1.8	U		0.83	J	
Perfluorononanoic Acid (PFNA)	375-95-1	ng/L	3.4			1.8	U		1.8	U		1.8	U		1.8	U	
Perfluorooctane Sulfonic Acid (PFOS)	1763-23-1	ng/L	200			1.7	J		2.6	U		2.6	U		2.7	U	
Perfluorooctanoic Acid (PFOA)	335-67-1	ng/L	28			1.8	U		1.8	U		1.8	U		1.8	U	

Table B-1
Perfluorinated Compound Results – February 2016

Sample Delivery Group			320173631			320173631			320173631			320173761			320173761		
Lab ID			320-17363-7			320-17363-8			320-17363-9			320-17376-1			320-17376-10		
Sample ID			DW-59FB			DW-88			DW-88FB			BC_2_20_16			DW-84		
Sample Date			2/19/2016			2/19/2016			2/19/2016			2/20/2016			2/20/2016		
Sample Type			Field Blank			Potable Water			Field Blank			Trip Blank			Potable Water		
Analyte	**CAS No**	**Units**	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	ng/L	1.8	U		1.8	U		1.8	U		1.8	U		1.8	U	
Perfluoroheptanoic Acid (PFHPA)	375-85-9	ng/L	1.8	U		1.8	U		1.8	U		1.8	U		1.8	U	
Perfluorohexanesulfonic Acid (PFHXS)	355-46-4	ng/L	1.8	U		1.8	U		1.8	U		1.8	U		1.8	U	
Perfluorononanoic Acid (PFNA)	375-95-1	ng/L	1.8	U		1.8	U		1.8	U		0.67	J		1.8	U	
Perfluorooctane Sulfonic Acid (PFOS)	1763-23-1	ng/L	2.6	U		2.6	U		2.8	U		2.7	U		2.6	U	
Perfluorooctanoic Acid (PFOA)	335-67-1	ng/L	1.8	U		1.8	U		1.8	U		1.8	U		1.8	U	

Sample Delivery Group			320173761			320173761			320173761			320173761			320173761		
Lab ID			320-17376-11			320-17376-12			320-17376-13			320-17376-14			320-17376-2		
Sample ID			DW-84FB			DW-91			DW-91FB			DUP022016			DW-29		
Sample Date			2/20/2016			2/20/2016			2/20/2016			2/20/2016			2/20/2016		
Sample Type			Field Blank			Potable Water			Field Blank			Duplicate (DW-91)			Potable Water		
Analyte	**CAS No**	**Units**	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	ng/L	1.8	U		1.8	U		1.8	U		1.9	U		1.8	U	
Perfluoroheptanoic Acid (PFHPA)	375-85-9	ng/L	1.8	U		1.8	U		1.8	U		1.9	U		1.8	U	
Perfluorohexanesulfonic Acid (PFHXS)	355-46-4	ng/L	1.8	U		1.8	U		1.8	U		1.9	U		1.8	U	
Perfluorononanoic Acid (PFNA)	375-95-1	ng/L	1.8	U		1.8	U		1.8	U		1.9	U		1.8	U	
Perfluorooctane Sulfonic Acid (PFOS)	1763-23-1	ng/L	2.7	U		2.8	U		2.6	U		2.8	U		2.7	U	
Perfluorooctanoic Acid (PFOA)	335-67-1	ng/L	1.8	U		1.8	U		1.8	U		1.9	U		1.8	U	

Sample Delivery Group			320173761			320173761			320173761			320173761			320173761		
Lab ID			320-17376-3			320-17376-4			320-17376-5			320-17376-6			320-17376-7		
Sample ID			DW-29FB			DW-13			DW-13FB			DW-3			DW-3FB		
Sample Date			2/20/2016			2/20/2016			2/20/2016			2/20/2016			2/20/2016		
Sample Type			Field Blank			Potable Water			Field Blank			Potable Water			Field Blank		
Analyte	**CAS No**	**Units**	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	ng/L	1.7	J		1.8	U		1.8	U		1.4	J		1.8	U	
Perfluoroheptanoic Acid (PFHPA)	375-85-9	ng/L	1.8	U		1.8	U		1.8	U		1.8	U		1.8	U	
Perfluorohexanesulfonic Acid (PFHXS)	355-46-4	ng/L	1.8	U		1.8	U		1.8	U		0.97	J		1.8	U	
Perfluorononanoic Acid (PFNA)	375-95-1	ng/L	1.8	U		1.8	U		1.8	U		1.8	U	bf	1.8	U	
Perfluorooctane Sulfonic Acid (PFOS)	1763-23-1	ng/L	2.7	U		2.7	U		2.7	U		16			2.7	U	
Perfluorooctanoic Acid (PFOA)	335-67-1	ng/L	1.8	U		1.8	U		1.8	U		2	J		1.8	U	

Table B-1
Perfluorinated Compound Results – February 2016

Sample Delivery Group			320173761			320173761			320174061			320174061			320174061		
Lab ID			320-17376-8			320-17376-9			320-17406-1			320-17406-10			320-17406-11		
Sample ID			DW-71			DW-71FB			BC_2_22_16			DW-15			DW-15FB		
Sample Date			2/20/2016			2/20/2016			2/22/2016			2/22/2016			2/22/2016		
Sample Type			Potable Water			Field Blank			Trip Blank			Potable Water			Field Blank		
Analyte	**CAS No**	**Units**	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	ng/L	1.7	U		1.9	U		2	U		1.7	U		2	U	
Perfluoroheptanoic Acid (PFHPA)	375-85-9	ng/L	1.7	U		1.9	U		2	U		1.7	U		2	U	
Perfluorohexanesulfonic Acid (PFHXS)	355-46-4	ng/L	1.7	U		1.9	U		2	U		1.7	U		2	U	
Perfluorononanoic Acid (PFNA)	375-95-1	ng/L	1.7	U		1.9	U		2	U		1.7	U		2	U	
Perfluorooctane Sulfonic Acid (PFOS)	1763-23-1	ng/L	2.6	U		2.8	U		3.1	U		2.6	U		3	U	
Perfluorooctanoic Acid (PFOA)	335-67-1	ng/L	1.7	U		1.9	U		2	U		1.7	U		2	U	

Sample Delivery Group			320174061			320174061			320174061			320174061			320174061		
Lab ID			320-17406-12			320-17406-13			320-17406-14			320-17406-15			320-17406-16		
Sample ID			DW-19			DW-19FB			DW-68			DW-68FB			DW-55		
Sample Date			2/22/2016			2/22/2016			2/22/2016			2/22/2016			2/22/2016		
Sample Type			Potable Water			Field Blank			Potable Water			Field Blank			Potable Water		
Analyte	**CAS No**	**Units**	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	ng/L	1.8	U		1.8	U		1.8	U		1.8	U		1.9	U	
Perfluoroheptanoic Acid (PFHPA)	375-85-9	ng/L	1.8	U		1.8	U		6.1			1.8	U		1.9	U	
Perfluorohexanesulfonic Acid (PFHXS)	355-46-4	ng/L	1.8	U		1.8	U		4.7			1.8	U		1.1	J	
Perfluorononanoic Acid (PFNA)	375-95-1	ng/L	1.8	U		1.8	U		2.7			1.8	U		1.9	U	
Perfluorooctane Sulfonic Acid (PFOS)	1763-23-1	ng/L	2.7	U		2.7	U		18			2.6	U		2.8	U	
Perfluorooctanoic Acid (PFOA)	335-67-1	ng/L	1.8	U		1.8	U		27			1.8	U		1.9	U	

Sample Delivery Group			320174061			320174061			320174061			320174061			320174061		
Lab ID			320-17406-17			320-17406-18			320-17406-19			320-17406-2			320-17406-20		
Sample ID			DW-55FB			DW-95			DW-95FB			DW-1			DW-6		
Sample Date			2/22/2016			2/22/2016			2/22/2016			2/22/2016			2/22/2016		
Sample Type			Field Blank			Potable Water			Field Blank			Potable Water			Potable Water		
Analyte	**CAS No**	**Units**	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	ng/L	1.8	U		1.9	J		2.3	U		1.8	U		1.8	U	
Perfluoroheptanoic Acid (PFHPA)	375-85-9	ng/L	1.8	U		9.9			2.3	U		1.8	U		1.8	U	
Perfluorohexanesulfonic Acid (PFHXS)	355-46-4	ng/L	1.8	U		5.2			2.3	U		1.8	U		1.8	U	
Perfluorononanoic Acid (PFNA)	375-95-1	ng/L	1.8	U		1.5	J		2.3	U		1.8	U		1.8	U	
Perfluorooctane Sulfonic Acid (PFOS)	1763-23-1	ng/L	2.6	U		28			3.5	U		2.7	U		2.6	U	
Perfluorooctanoic Acid (PFOA)	335-67-1	ng/L	1.8	U		42			2.3	U		1.8	U		1.8	U	

Table B-1
Perfluorinated Compound Results – February 2016

Sample Delivery Group			320174061			320174061			320174061			320174061			320174061		
Lab ID			320-17406-21			320-17406-22			320-17406-23			320-17406-24			320-17406-3		
Sample ID			DW-6FB			DW-37			DW-37FB			DUP-022216			DW-1FB		
Sample Date			2/22/2016			2/22/2016			2/22/2016			2/22/2016			2/22/2016		
Sample Type			Field Blank			Potable Water			Field Blank			Duplicate (DW-37)			Field Blank		
Analyte	**CAS No**	**Units**	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	ng/L	2.3	U		2	U		2	U		1.9	U		2	U	
Perfluoroheptanoic Acid (PFHPA)	375-85-9	ng/L	2.3	U		2	U		2	U		1.9	U		2	U	
Perfluorohexanesulfonic Acid (PFHXS)	355-46-4	ng/L	2.3	U		2	U		2	U		1.9	U		2	U	
Perfluorononanoic Acid (PFNA)	375-95-1	ng/L	2.3	U		2	U		2	U		1.9	U		2	U	
Perfluorooctane Sulfonic Acid (PFOS)	1763-23-1	ng/L	3.4	U		3	U		3	U		2.8	U		3	U	
Perfluorooctanoic Acid (PFOA)	335-67-1	ng/L	2.3	U		2	U		2	U		1.9	U		2	U	

Sample Delivery Group			320174061			320174061			320174061			320174061			320174061		
Lab ID			320-17406-4			320-17406-5			320-17406-6			320-17406-7			320-17406-8		
Sample ID			DW-56			DW-56FB			DW-80			DW-80FB			DW-44		
Sample Date			2/22/2016			2/22/2016			2/22/2016			2/22/2016			2/22/2016		
Sample Type			Potable Water			Field Blank			Potable Water			Field Blank			Potable Water		
Analyte	**CAS No**	**Units**	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	ng/L	1.9	U		2	U		1.8	U		2	U		1.8	U	
Perfluoroheptanoic Acid (PFHPA)	375-85-9	ng/L	1.8	J		2	U		1.8	U		2	U		1.8	U	
Perfluorohexanesulfonic Acid (PFHXS)	355-46-4	ng/L	1.9	U		2	U		1.8	U		2	U		1.8	U	
Perfluorononanoic Acid (PFNA)	375-95-1	ng/L	1.9	U		2	U		1.8	U		2	U		1.8	U	
Perfluorooctane Sulfonic Acid (PFOS)	1763-23-1	ng/L	2.8	U		3	U		2.7	U		3	U		2.6	U	
Perfluorooctanoic Acid (PFOA)	335-67-1	ng/L	1.9	U		2	U		1.8	U		2	U		2.6		

Sample Delivery Group			320174061			320174631			320174631			320174631			320174631		
Lab ID			320-17406-9			320-17463-1			320-17463-2			320-17463-3			320-17463-4		
Sample ID			DW-44FB			BC_02_26_16			DW-18			DW-18FB			DW-78		
Sample Date			2/22/2016			2/26/2016			2/26/2016			2/26/2016			2/26/2016		
Sample Type			Field Blank			Trip Blank			Potable Water			Field Blank			Potable Water		
Analyte	**CAS No**	**Units**	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	ng/L	2	U		1.7	U	bl	1.8	U	bl	1.8	U	bl	1.9	U	bl
Perfluoroheptanoic Acid (PFHPA)	375-85-9	ng/L	2	U		1.7	U		1.8	U		1.8	U		1.9	U	
Perfluorohexanesulfonic Acid (PFHXS)	355-46-4	ng/L	2	U		1.7	U		1.8	U		1.8	U		1.9	U	
Perfluorononanoic Acid (PFNA)	375-95-1	ng/L	2	U		0.64	J		1.8	U		1.8	U		1.9	U	
Perfluorooctane Sulfonic Acid (PFOS)	1763-23-1	ng/L	3	U		2.6	U		2.7	U		2.7	U		2.9	U	
Perfluorooctanoic Acid (PFOA)	335-67-1	ng/L	2	U		1.7	U		1.8	U		1.8	U		1.9	U	

Table B-1
Perfluorinated Compound Results – February 2016

Sample Delivery Group			320174631			320174631			320174631			320174631		
Lab ID			320-17463-5			320-17463-6			320-17463-7			320-17463-8		
Sample ID			DW-78FB			DW-100			DW-100FB			DUP_022616		
Sample Date			2/26/2016			2/26/2016			2/26/2016			2/26/2016		
Sample Type			Field Blank			Potable Water			Field Blank			Duplicate (DW-100)		
Analyte	**CAS No**	**Units**	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	ng/L	1.7	U	bl	2	U	bl	1.9	U	bl	1.9	U	bl
Perfluoroheptanoic Acid (PFHPA)	375-85-9	ng/L	1.7	U		2	U		1.9	U		1.9	U	
Perfluorohexanesulfonic Acid (PFHXS)	355-46-4	ng/L	1.7	U		2	U		1.9	U		1.9	U	
Perfluorononanoic Acid (PFNA)	375-95-1	ng/L	1.7	U		2	U		1.9	U	bf	1.9	U	
Perfluorooctane Sulfonic Acid (PFOS)	1763-23-1	ng/L	2.6	U		2.9	U		2.8	U		2.9	U	
Perfluorooctanoic Acid (PFOA)	335-67-1	ng/L	1.7	U		2	U		1.9	U		1.9	U	

Notes:
ID = Identification
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*** — The analyte concentration was less than the limit of quantitation.

Qualification Reason Codes
bf = Result qualified as undetected due to field-derived blank results
bl = Result qualified as undetected due to laboratory blank results

Naval Weapons Station Earle

Approximate Existing Public Water Distribution System

Approximate Groundwater Flow

One Half Mile Area Designated for Drinking Water Sampling (Potable Well Source)

NWS Earle Property Boundary

0 450 900 Feet

NWS EARLE OFFBASE PFC INVESTIGATION
POTABLE WELL SAMPLE AREA
COLTS NECK, NEW JERSEY

NAVFAC Naval Facilities Engineering Command

RESOLUTION CONSULTANTS

REQUESTED BY: J. O'KEEFE	DATE: 2/3/2016
DRAWN BY: M. SENNE	TASK ORDER NUMBER: XXXXX

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