



**Groundwater Sample Results,
Combined Level 2 and Level 4 Laboratory Report,
Electronic Data Deliverable, Data Validation Report,
and the Sample Location Report, SDG 320-18986-1**

*Naval Weapons Station Earle
Colts Neck, New Jersey*

July 2019

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NWS EARLE
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LABORATORY DATA PACKAGE, 320-18986-1, NWS EARLE NJ
06/06/2016
TESTAMERICA LABORATORIES, INC

ANALYTICAL REPORT

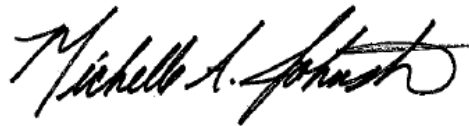
Job Number: 320-18986-1

Job Description: Ensafe-NWS-Earle, NJ PFCs Groundwater

For:

Earth Toxics, Inc
PO BOX 3382
Logan, UT 84321

Attention: Mike Dryden



Approved for release.
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Project Manager II
6/6/2016 3:58 PM

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cc: Tina Cantwell
Ms. Nicole Loos
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The test results in this report relate only to the samples in this report and meet all requirements of NELAC, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is 4025.

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

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Table of Contents

Cover Title Page	1
Data Summaries	4
Definitions	4
Case Narrative	5
Detection Summary	6
Client Sample Results	11
Default Detection Limits	27
Isotope Dilution Summary	28
QC Sample Results	29
QC Association	31
Chronicle	33
Certification Summary	37
Method Summary	38
Sample Summary	39
Manual Integration Summary	40
Reagent Traceability	49
COAs	70
Organic Sample Data	341
LCMS	341
Method PFC DOD	341
Method PFC DOD QC Summary	342
Method PFC DOD Sample Data	348
Standards Data	536
Method PFC DOD ICAL Data	536
Method PFC DOD CCAL Data	632
Raw QC Data	724

Table of Contents

Method PFC DOD Blank Data	724
Method PFC DOD LCS/LCSD Data	732
Method PFC DOD MS/MSD Data	739
Method PFC DOD Run Logs	763
Method PFC DOD Prep Data	768
Shipping and Receiving Documents	780
Client Chain of Custody	781
Sample Receipt Checklist	783

Definitions/Glossary

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

TestAmerica Job ID: 320-18986-1

Qualifiers

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
M	Manual integrated compound.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
D	The reported value is from a dilution.
Q	One or more quality control criteria failed.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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 Groundwater
Report Number: 320-18986-1

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

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

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

Sample Receipt

The samples were received on 5/19/2016 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.1° C and 6.8° C.

The following samples were received at the laboratory at an elevated temperature of 6.8° C: FB051616 (320-18986-10), EB051616 (320-18986-11), MCFSMW-4_0516 (320-18986-12), MCFSMW-4_0516 (320-18986-12[MS]), MCFSMW-4_0516 (320-18986-12[MSD]), MCFSMW-5_0516 (320-18986-13), MCFSMW-5_0516 DUP (320-18986-14), MCFSMW-3_0516 (320-18986-15) and MCFSMW-16_0516 (320-18986-16). It can be noted that there was water present in the cooler indicating the presence of melted ice. The laboratory will proceed with the requested analyses per the chain of custody for these samples unless instructed otherwise. The client was notified on 5/20/2016.

The sample collection time on the container label for sample MCFSMW-14_0516 (320-18986-3) did not match the information on the chain of custody. The container label lists a collection time of 0901 while the chain of custody lists a collection time of 0911. The laboratory logged the collection time per the chain of custody and will proceed unless instructed otherwise. The client was notified on 5/20/2016.

No other anomalies were encountered during sample receipt.

Perfluorinated Hydrocarbons (PFCs)

Samples FB051716 (320-18986-1), EB051716 (320-18986-2), MCFSMW-14_0516 (320-18986-3), 46MW03_0516 (320-18986-4), 46MW01_0516 (320-18986-5), 46MW02_0516 (320-18986-6), 46MW05_0516 (320-18986-7), 46MW04_0516 (320-18986-8), MCFSMW-17_0516 (320-18986-9), FB051616 (320-18986-10), EB051616 (320-18986-11), MCFSMW-4_0516 (320-18986-12), MCFSMW-5_0516 (320-18986-13), MCFSMW-5_0516 DUP (320-18986-14), MCFSMW-3_0516 (320-18986-15) and MCFSMW-16_0516 (320-18986-16) were analyzed for Perfluorinated Hydrocarbons (PFC) in accordance with WS-LC-0025. The samples were prepared on 05/21/2016 and analyzed on 05/29/2016, 06/01/2016 and 06/02/2016.

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

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to high concentrations of target analytes and/or analytes present above the calibration range, samples 46MW05_0516 (320-18986-7), 46MW04_0516 (320-18986-8), MCFSMW-3_0516 (320-18986-15) and MCFSMW-16_0516 (320-18986-16) had to be analyzed at dilutions. The reporting limits and method detection limits have been adjusted relative to the dilutions required.

The Isotope Dilution Analyte (IDA) recovery associated with the following sample is above the method recommended limit: MCFSMW-16_0516 (320-18986-16). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

The level 1 standard from the ICAL (ICV 320-112007/12 & ICV 320-111859-13) 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 Groundwater

TestAmerica Job ID: 320-18986-1

Client Sample ID: FB051716

Lab Sample ID: 320-18986-1

No Detections.

Client Sample ID: EB051716

Lab Sample ID: 320-18986-2

No Detections.

Client Sample ID: MCFSMW-14_0516

Lab Sample ID: 320-18986-3

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.94	J M	2.3	1.9	0.81	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 46MW03_0516

Lab Sample ID: 320-18986-4

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	2.1	J M	2.4	1.9	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.1	J M	3.8	2.8	1.2	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 46MW01_0516

Lab Sample ID: 320-18986-5

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	3.5	J M	3.9	2.9	1.3	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 46MW02_0516

Lab Sample ID: 320-18986-6

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	11		2.3	1.8	0.85	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	12		2.3	1.8	0.74	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	140	M	2.3	1.8	0.80	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	10		2.3	1.8	0.60	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	330	M	3.7	2.8	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	38	M	2.3	1.8	0.69	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 46MW05_0516

Lab Sample ID: 320-18986-7

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	56		2.5	2.0	0.90	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	23		2.5	2.0	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	820	J M	2.5	2.0	0.85	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	2.2	J	2.5	2.0	0.64	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	4200	J M	3.9	2.9	1.3	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: 46MW05_0516 (Continued)

Lab Sample ID: 320-18986-7

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	130	M	2.5	2.0	0.73	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	38	D M	25	20	9.0	ng/L	10		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	15	J D	25	20	7.9	ng/L	10		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	740	D M	25	20	8.5	ng/L	10		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	3100	D M	39	29	13	ng/L	10		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA) - DL	120	D M	25	20	7.3	ng/L	10		WS-LC-0025	Total/NA

Client Sample ID: 46MW04_0516

Lab Sample ID: 320-18986-8

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	21		2.4	1.9	0.88	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	11		2.4	1.9	0.77	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	810	J M	2.4	1.9	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	8.6		2.4	1.9	0.63	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3100	J M	3.8	2.9	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	30	M	2.4	1.9	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	14	J D	24	19	8.8	ng/L	10		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	770	D M	24	19	8.3	ng/L	10		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA) - DL	9.9	J D	24	19	6.3	ng/L	10		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	2900	D M	38	29	12	ng/L	10		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA) - DL	29	D M	24	19	7.2	ng/L	10		WS-LC-0025	Total/NA

Client Sample ID: MCFSMW-17_0516

Lab Sample ID: 320-18986-9

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	2.1	J	2.7	2.2	1.0	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.4		2.7	2.2	0.88	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	12	M	2.7	2.2	0.95	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	26	M	4.4	3.3	1.4	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	26	M	2.7	2.2	0.82	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: FB051616

Lab Sample ID: 320-18986-10

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: FB051616 (Continued)

Lab Sample ID: 320-18986-10

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	1.4	J M	2.3	1.8	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	10	M	3.6	2.7	1.2	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: EB051616

Lab Sample ID: 320-18986-11

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	7.6	M	3.7	2.8	1.2	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: MCFSMW-4_0516

Lab Sample ID: 320-18986-12

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	21		2.3	1.8	0.84	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	77		2.3	1.8	0.73	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	220	M	2.3	1.8	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	11		2.3	1.8	0.60	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	67	M	3.7	2.7	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	160	M	2.3	1.8	0.68	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: MCFSMW-5_0516

Lab Sample ID: 320-18986-13

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	12		2.3	1.9	0.85	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	11		2.3	1.9	0.75	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	45	M	2.3	1.9	0.81	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	2.9		2.3	1.9	0.61	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	37	M	3.7	2.8	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	23	M	2.3	1.9	0.70	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: MCFSMW-5_0516 DUP

Lab Sample ID: 320-18986-14

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	12		2.3	1.9	0.85	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	13		2.3	1.9	0.75	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	42	M	2.3	1.9	0.81	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	2.7		2.3	1.9	0.61	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: MCFSMW-5_0516 DUP (Continued)

Lab Sample ID: 320-18986-14

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	38	M	3.7	2.8	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	21	M	2.3	1.9	0.70	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: MCFSMW-3_0516

Lab Sample ID: 320-18986-15

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	43		2.3	1.8	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	30		2.3	1.8	0.73	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1300	J M	2.3	1.8	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	7.2		2.3	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	790	J M	3.6	2.7	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	120	M	2.3	1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	36	D	9.1	7.2	3.3	ng/L	4		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	30	D	9.1	7.2	2.9	ng/L	4		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	1400	D M	9.1	7.2	3.2	ng/L	4		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA) - DL	5.7	J D	9.1	7.2	2.4	ng/L	4		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	690	D M	14	11	4.6	ng/L	4		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA) - DL	120	D M	9.1	7.2	2.7	ng/L	4		WS-LC-0025	Total/NA

Client Sample ID: MCFSMW-16_0516

Lab Sample ID: 320-18986-16

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	30		2.8	2.2	1.0	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	37		2.8	2.2	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	560	M	2.8	2.2	0.96	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	2.8		2.8	2.2	0.73	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	910	J M	4.4	3.3	1.4	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	330	M	2.8	2.2	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	23	D	11	8.9	4.1	ng/L	4		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	37	D	11	8.9	3.6	ng/L	4		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	480	D M	11	8.9	3.9	ng/L	4		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	750	D M	18	13	5.7	ng/L	4		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: MCFSMW-16_0516 (Continued)

Lab Sample ID: 320-18986-16

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA) - DL	310	D M	11	8.9	3.3	ng/L	4		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: FB051716

Lab Sample ID: 320-18986-1

Date Collected: 05/17/16 08:05

Matrix: Water

Date Received: 05/19/16 09:30

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		05/29/16 09:10	1
Perfluoroheptanoic acid (PFHpA)	1.9	U	2.3	1.9	0.75	ng/L		05/29/16 09:10	1
Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.3	1.9	0.82	ng/L		05/29/16 09:10	1
Perfluorononanoic acid (PFNA)	1.9	U M	2.3	1.9	0.61	ng/L		05/29/16 09:10	1
Perfluorooctanesulfonic acid (PFOS)	2.8	U M	3.8	2.8	1.2	ng/L		05/29/16 09:10	1
Perfluorooctanoic acid (PFOA)	1.9	U	2.3	1.9	0.70	ng/L		05/29/16 09:10	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	121		25 - 150	05/21/16 11:40	05/29/16 09:10	1
13C4 PFOA	131		25 - 150	05/21/16 11:40	05/29/16 09:10	1
13C4 PFOS	135		25 - 150	05/21/16 11:40	05/29/16 09:10	1
13C4-PFHpA	118		25 - 150	05/21/16 11:40	05/29/16 09:10	1
13C5 PFNA	121		25 - 150	05/21/16 11:40	05/29/16 09:10	1
18O2 PFHxS	123		25 - 150	05/21/16 11:40	05/29/16 09:10	1

Client Sample Results

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: EB051716

Lab Sample ID: 320-18986-2

Date Collected: 05/17/16 08:10

Matrix: Water

Date Received: 05/19/16 09:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	1.9	0.89	ng/L		05/29/16 09:31	1
Perfluoroheptanoic acid (PFHpA)	1.9	U M	2.4	1.9	0.78	ng/L		05/29/16 09:31	1
Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	1.9	0.84	ng/L		05/29/16 09:31	1
Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.63	ng/L		05/29/16 09:31	1
Perfluorooctanesulfonic acid (PFOS)	2.9	U M	3.9	2.9	1.2	ng/L		05/29/16 09:31	1
Perfluorooctanoic acid (PFOA)	1.9	U	2.4	1.9	0.72	ng/L		05/29/16 09:31	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	119		25 - 150	05/21/16 11:40	05/29/16 09:31	1
13C4 PFOA	129		25 - 150	05/21/16 11:40	05/29/16 09:31	1
13C4 PFOS	139		25 - 150	05/21/16 11:40	05/29/16 09:31	1
13C4-PFHpA	134		25 - 150	05/21/16 11:40	05/29/16 09:31	1
13C5 PFNA	126		25 - 150	05/21/16 11:40	05/29/16 09:31	1
18O2 PFHxS	124		25 - 150	05/21/16 11:40	05/29/16 09:31	1

Client Sample Results

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: MCFSMW-14_0516

Lab Sample ID: 320-18986-3

Date Collected: 05/17/16 09:11

Matrix: Water

Date Received: 05/19/16 09:30

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		05/29/16 10:56	1
Perfluoroheptanoic acid (PFHpA)	1.9	U	2.3	1.9	0.75	ng/L		05/29/16 10:56	1
Perfluorohexanesulfonic acid (PFHxS)	0.94	J M	2.3	1.9	0.81	ng/L		05/29/16 10:56	1
Perfluorononanoic acid (PFNA)	1.9	U	2.3	1.9	0.61	ng/L		05/29/16 10:56	1
Perfluorooctanesulfonic acid (PFOS)	2.8	U M	3.7	2.8	1.2	ng/L		05/29/16 10:56	1
Perfluorooctanoic acid (PFOA)	1.9	U	2.3	1.9	0.70	ng/L		05/29/16 10:56	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	93		25 - 150	05/21/16 11:40	05/29/16 10:56	1
13C4 PFOA	83		25 - 150	05/21/16 11:40	05/29/16 10:56	1
13C4 PFOS	127		25 - 150	05/21/16 11:40	05/29/16 10:56	1
13C4-PFHpA	90		25 - 150	05/21/16 11:40	05/29/16 10:56	1
13C5 PFNA	81		25 - 150	05/21/16 11:40	05/29/16 10:56	1
18O2 PFHxS	126		25 - 150	05/21/16 11:40	05/29/16 10:56	1

Client Sample Results

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: 46MW03_0516

Lab Sample ID: 320-18986-4

Date Collected: 05/17/16 10:11

Matrix: Water

Date Received: 05/19/16 09:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	1.9	0.87	ng/L		05/29/16 11:17	1
Perfluoroheptanoic acid (PFHpA)	1.9	U	2.4	1.9	0.76	ng/L		05/29/16 11:17	1
Perfluorohexanesulfonic acid (PFHxS)	2.1	J M	2.4	1.9	0.83	ng/L		05/29/16 11:17	1
Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.62	ng/L		05/29/16 11:17	1
Perfluorooctanesulfonic acid (PFOS)	3.1	J M	3.8	2.8	1.2	ng/L		05/29/16 11:17	1
Perfluorooctanoic acid (PFOA)	1.9	U M	2.4	1.9	0.71	ng/L		05/29/16 11:17	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	95		25 - 150	05/21/16 11:40	05/29/16 11:17	1
13C4 PFOA	96		25 - 150	05/21/16 11:40	05/29/16 11:17	1
13C4 PFOS	131		25 - 150	05/21/16 11:40	05/29/16 11:17	1
13C4-PFHpA	93		25 - 150	05/21/16 11:40	05/29/16 11:17	1
13C5 PFNA	88		25 - 150	05/21/16 11:40	05/29/16 11:17	1
18O2 PFHxS	129		25 - 150	05/21/16 11:40	05/29/16 11:17	1

Client Sample Results

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: 46MW01_0516

Lab Sample ID: 320-18986-5

Date Collected: 05/17/16 11:21

Matrix: Water

Date Received: 05/19/16 09:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	2.0	U	2.5	2.0	0.90	ng/L		05/29/16 11:39	1
Perfluoroheptanoic acid (PFHpA)	2.0	U	2.5	2.0	0.79	ng/L		05/29/16 11:39	1
Perfluorohexanesulfonic acid (PFHxS)	2.0	U	2.5	2.0	0.85	ng/L		05/29/16 11:39	1
Perfluorononanoic acid (PFNA)	2.0	U	2.5	2.0	0.64	ng/L		05/29/16 11:39	1
Perfluorooctanesulfonic acid (PFOS)	3.5	J M	3.9	2.9	1.3	ng/L		05/29/16 11:39	1
Perfluorooctanoic acid (PFOA)	2.0	U	2.5	2.0	0.73	ng/L		05/29/16 11:39	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>13C2 PFHxA</i>	101		25 - 150	05/21/16 11:40	05/29/16 11:39	1
<i>13C4 PFOA</i>	103		25 - 150	05/21/16 11:40	05/29/16 11:39	1
<i>13C4 PFOS</i>	139		25 - 150	05/21/16 11:40	05/29/16 11:39	1
<i>13C4-PFHpA</i>	101		25 - 150	05/21/16 11:40	05/29/16 11:39	1
<i>13C5 PFNA</i>	88		25 - 150	05/21/16 11:40	05/29/16 11:39	1
<i>18O2 PFHxS</i>	135		25 - 150	05/21/16 11:40	05/29/16 11:39	1

Client Sample Results

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: 46MW02_0516

Lab Sample ID: 320-18986-6

Date Collected: 05/17/16 11:21

Matrix: Water

Date Received: 05/19/16 09:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	11		2.3	1.8	0.85	ng/L		05/29/16 12:00	1
Perfluoroheptanoic acid (PFHpA)	12		2.3	1.8	0.74	ng/L		05/29/16 12:00	1
Perfluorohexanesulfonic acid (PFHxS)	140	M	2.3	1.8	0.80	ng/L		05/29/16 12:00	1
Perfluorononanoic acid (PFNA)	10		2.3	1.8	0.60	ng/L		05/29/16 12:00	1
Perfluorooctanesulfonic acid (PFOS)	330	M	3.7	2.8	1.2	ng/L		05/29/16 12:00	1
Perfluorooctanoic acid (PFOA)	38	M	2.3	1.8	0.69	ng/L		05/29/16 12:00	1
Isotope Dilution	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac		
13C2 PFHxA	86		25 - 150		05/21/16 11:40	05/29/16 12:00	1		
13C4 PFOA	91		25 - 150		05/21/16 11:40	05/29/16 12:00	1		
13C4 PFOS	106		25 - 150		05/21/16 11:40	05/29/16 12:00	1		
13C4-PFHpA	87		25 - 150		05/21/16 11:40	05/29/16 12:00	1		
13C5 PFNA	69		25 - 150		05/21/16 11:40	05/29/16 12:00	1		
18O2 PFHxS	121		25 - 150		05/21/16 11:40	05/29/16 12:00	1		

Client Sample Results

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: 46MW05_0516

Lab Sample ID: 320-18986-7

Date Collected: 05/17/16 12:31

Matrix: Water

Date Received: 05/19/16 09:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	56		2.5	2.0	0.90	ng/L		05/29/16 12:21	1
Perfluoroheptanoic acid (PFHpA)	23		2.5	2.0	0.79	ng/L		05/29/16 12:21	1
Perfluorohexanesulfonic acid (PFHxS)	820	J M	2.5	2.0	0.85	ng/L		05/29/16 12:21	1
Perfluorononanoic acid (PFNA)	2.2	J	2.5	2.0	0.64	ng/L		05/29/16 12:21	1
Perfluorooctanesulfonic acid (PFOS)	4200	J M	3.9	2.9	1.3	ng/L		05/29/16 12:21	1
Perfluorooctanoic acid (PFOA)	130	M	2.5	2.0	0.73	ng/L		05/29/16 12:21	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	86		25 - 150	05/21/16 11:40	05/29/16 12:21	1
13C4 PFOA	78		25 - 150	05/21/16 11:40	05/29/16 12:21	1
13C4 PFOS	58		25 - 150	05/21/16 11:40	05/29/16 12:21	1
13C4-PFHpA	77		25 - 150	05/21/16 11:40	05/29/16 12:21	1
13C5 PFNA	54		25 - 150	05/21/16 11:40	05/29/16 12:21	1
18O2 PFHxS	86		25 - 150	05/21/16 11:40	05/29/16 12:21	1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	38	D M	25	20	9.0	ng/L		06/01/16 11:43	10
Perfluoroheptanoic acid (PFHpA)	15	J D	25	20	7.9	ng/L		06/01/16 11:43	10
Perfluorohexanesulfonic acid (PFHxS)	740	D M	25	20	8.5	ng/L		06/01/16 11:43	10
Perfluorononanoic acid (PFNA)	20	U M	25	20	6.4	ng/L		06/01/16 11:43	10
Perfluorooctanesulfonic acid (PFOS)	3100	D M	39	29	13	ng/L		06/01/16 11:43	10
Perfluorooctanoic acid (PFOA)	120	D M	25	20	7.3	ng/L		06/01/16 11:43	10

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	90		25 - 150	05/21/16 11:40	06/01/16 11:43	10
13C4 PFOA	100		25 - 150	05/21/16 11:40	06/01/16 11:43	10
13C4 PFOS	114		25 - 150	05/21/16 11:40	06/01/16 11:43	10
13C4-PFHpA	91		25 - 150	05/21/16 11:40	06/01/16 11:43	10
13C5 PFNA	87		25 - 150	05/21/16 11:40	06/01/16 11:43	10
18O2 PFHxS	118		25 - 150	05/21/16 11:40	06/01/16 11:43	10

Client Sample Results

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: 46MW04_0516

Lab Sample ID: 320-18986-8

Date Collected: 05/17/16 12:26

Matrix: Water

Date Received: 05/19/16 09:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	21		2.4	1.9	0.88	ng/L		05/29/16 12:42	1
Perfluoroheptanoic acid (PFHpA)	11		2.4	1.9	0.77	ng/L		05/29/16 12:42	1
Perfluorohexanesulfonic acid (PFHxS)	810	J M	2.4	1.9	0.83	ng/L		05/29/16 12:42	1
Perfluorononanoic acid (PFNA)	8.6		2.4	1.9	0.63	ng/L		05/29/16 12:42	1
Perfluorooctanesulfonic acid (PFOS)	3100	J M	3.8	2.9	1.2	ng/L		05/29/16 12:42	1
Perfluorooctanoic acid (PFOA)	30	M	2.4	1.9	0.72	ng/L		05/29/16 12:42	1
Isotope Dilution	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac		
13C2 PFHxA	106		25 - 150		05/21/16 11:40	05/29/16 12:42	1		
13C4 PFOA	106		25 - 150		05/21/16 11:40	05/29/16 12:42	1		
13C4 PFOS	61		25 - 150		05/21/16 11:40	05/29/16 12:42	1		
13C4-PFHpA	92		25 - 150		05/21/16 11:40	05/29/16 12:42	1		
13C5 PFNA	57		25 - 150		05/21/16 11:40	05/29/16 12:42	1		
18O2 PFHxS	88		25 - 150		05/21/16 11:40	05/29/16 12:42	1		

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	14	J D	24	19	8.8	ng/L		06/01/16 12:05	10
Perfluoroheptanoic acid (PFHpA)	19	U	24	19	7.7	ng/L		06/01/16 12:05	10
Perfluorohexanesulfonic acid (PFHxS)	770	D M	24	19	8.3	ng/L		06/01/16 12:05	10
Perfluorononanoic acid (PFNA)	9.9	J D	24	19	6.3	ng/L		06/01/16 12:05	10
Perfluorooctanesulfonic acid (PFOS)	2900	D M	38	29	12	ng/L		06/01/16 12:05	10
Perfluorooctanoic acid (PFOA)	29	D M	24	19	7.2	ng/L		06/01/16 12:05	10
Isotope Dilution	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac		
13C2 PFHxA	104		25 - 150		05/21/16 11:40	06/01/16 12:05	10		
13C4 PFOA	110		25 - 150		05/21/16 11:40	06/01/16 12:05	10		
13C4 PFOS	94		25 - 150		05/21/16 11:40	06/01/16 12:05	10		
13C4-PFHpA	101		25 - 150		05/21/16 11:40	06/01/16 12:05	10		
13C5 PFNA	81		25 - 150		05/21/16 11:40	06/01/16 12:05	10		
18O2 PFHxS	113		25 - 150		05/21/16 11:40	06/01/16 12:05	10		

Client Sample Results

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: MCFSMW-17_0516

Lab Sample ID: 320-18986-9

Date Collected: 05/17/16 14:36

Matrix: Water

Date Received: 05/19/16 09:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	2.1	J	2.7	2.2	1.0	ng/L		06/02/16 15:41	1
Perfluoroheptanoic acid (PFHpA)	6.4		2.7	2.2	0.88	ng/L		06/02/16 15:41	1
Perfluorohexanesulfonic acid (PFHxS)	12	M	2.7	2.2	0.95	ng/L		06/02/16 15:41	1
Perfluorononanoic acid (PFNA)	2.2	U	2.7	2.2	0.72	ng/L		06/02/16 15:41	1
Perfluorooctanesulfonic acid (PFOS)	26	M	4.4	3.3	1.4	ng/L		06/02/16 15:41	1
Perfluorooctanoic acid (PFOA)	26	M	2.7	2.2	0.82	ng/L		06/02/16 15:41	1
Isotope Dilution	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac		
13C2 PFHxA	98		25 - 150		05/21/16 11:40	06/02/16 15:41	1		
13C4 PFOA	83		25 - 150		05/21/16 11:40	06/02/16 15:41	1		
13C4 PFOS	114		25 - 150		05/21/16 11:40	06/02/16 15:41	1		
13C4-PFHpA	93		25 - 150		05/21/16 11:40	06/02/16 15:41	1		
13C5 PFNA	61		25 - 150		05/21/16 11:40	06/02/16 15:41	1		
18O2 PFHxS	119		25 - 150		05/21/16 11:40	06/02/16 15:41	1		

Client Sample Results

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: FB051616

Lab Sample ID: 320-18986-10

Date Collected: 05/16/16 10:00

Matrix: Water

Date Received: 05/19/16 09:30

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		05/29/16 13:25	1
Perfluoroheptanoic acid (PFHpA)	1.8	U	2.3	1.8	0.73	ng/L		05/29/16 13:25	1
Perfluorohexanesulfonic acid (PFHxS)	1.4	J M	2.3	1.8	0.79	ng/L		05/29/16 13:25	1
Perfluorononanoic acid (PFNA)	1.8	U M	2.3	1.8	0.60	ng/L		05/29/16 13:25	1
Perfluorooctanesulfonic acid (PFOS)	10	M	3.6	2.7	1.2	ng/L		05/29/16 13:25	1
Perfluorooctanoic acid (PFOA)	1.8	U	2.3	1.8	0.68	ng/L		05/29/16 13:25	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	115		25 - 150	05/21/16 11:40	05/29/16 13:25	1
13C4 PFOA	126		25 - 150	05/21/16 11:40	05/29/16 13:25	1
13C4 PFOS	128		25 - 150	05/21/16 11:40	05/29/16 13:25	1
13C4-PFHpA	125		25 - 150	05/21/16 11:40	05/29/16 13:25	1
13C5 PFNA	122		25 - 150	05/21/16 11:40	05/29/16 13:25	1
18O2 PFHxS	131		25 - 150	05/21/16 11:40	05/29/16 13:25	1

Client Sample Results

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: EB051616

Lab Sample ID: 320-18986-11

Date Collected: 05/16/16 10:05

Matrix: Water

Date Received: 05/19/16 09:30

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		05/29/16 13:46	1
Perfluoroheptanoic acid (PFHpA)	1.9	U	2.3	1.9	0.75	ng/L		05/29/16 13:46	1
Perfluorohexanesulfonic acid (PFHxS)	1.9	U M	2.3	1.9	0.81	ng/L		05/29/16 13:46	1
Perfluorononanoic acid (PFNA)	1.9	U	2.3	1.9	0.61	ng/L		05/29/16 13:46	1
Perfluorooctanesulfonic acid (PFOS)	7.6	M	3.7	2.8	1.2	ng/L		05/29/16 13:46	1
Perfluorooctanoic acid (PFOA)	1.9	U M	2.3	1.9	0.70	ng/L		05/29/16 13:46	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	118		25 - 150	05/21/16 11:40	05/29/16 13:46	1
13C4 PFOA	127		25 - 150	05/21/16 11:40	05/29/16 13:46	1
13C4 PFOS	134		25 - 150	05/21/16 11:40	05/29/16 13:46	1
13C4-PFHpA	124		25 - 150	05/21/16 11:40	05/29/16 13:46	1
13C5 PFNA	119		25 - 150	05/21/16 11:40	05/29/16 13:46	1
18O2 PFHxS	128		25 - 150	05/21/16 11:40	05/29/16 13:46	1

Client Sample Results

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: MCFSMW-4_0516

Lab Sample ID: 320-18986-12

Date Collected: 05/16/16 11:11

Matrix: Water

Date Received: 05/19/16 09:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	21		2.3	1.8	0.84	ng/L		06/02/16 16:03	1
Perfluoroheptanoic acid (PFHpA)	77		2.3	1.8	0.73	ng/L		06/02/16 16:03	1
Perfluorohexanesulfonic acid (PFHxS)	220	M	2.3	1.8	0.79	ng/L		06/02/16 16:03	1
Perfluorononanoic acid (PFNA)	11		2.3	1.8	0.60	ng/L		06/02/16 16:03	1
Perfluorooctanesulfonic acid (PFOS)	67	M	3.7	2.7	1.2	ng/L		06/02/16 16:03	1
Perfluorooctanoic acid (PFOA)	160	M	2.3	1.8	0.68	ng/L		06/02/16 16:03	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	80		25 - 150	05/21/16 11:40	06/02/16 16:03	1
13C4 PFOA	89		25 - 150	05/21/16 11:40	06/02/16 16:03	1
13C4 PFOS	101		25 - 150	05/21/16 11:40	06/02/16 16:03	1
13C4-PFHpA	85		25 - 150	05/21/16 11:40	06/02/16 16:03	1
13C5 PFNA	91		25 - 150	05/21/16 11:40	06/02/16 16:03	1
18O2 PFHxS	93		25 - 150	05/21/16 11:40	06/02/16 16:03	1

Client Sample Results

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: MCFSMW-5_0516

Lab Sample ID: 320-18986-13

Date Collected: 05/16/16 12:46

Matrix: Water

Date Received: 05/19/16 09:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	12		2.3	1.9	0.85	ng/L		06/02/16 16:24	1
Perfluoroheptanoic acid (PFHpA)	11		2.3	1.9	0.75	ng/L		06/02/16 16:24	1
Perfluorohexanesulfonic acid (PFHxS)	45	M	2.3	1.9	0.81	ng/L		06/02/16 16:24	1
Perfluorononanoic acid (PFNA)	2.9		2.3	1.9	0.61	ng/L		06/02/16 16:24	1
Perfluorooctanesulfonic acid (PFOS)	37	M	3.7	2.8	1.2	ng/L		06/02/16 16:24	1
Perfluorooctanoic acid (PFOA)	23	M	2.3	1.9	0.70	ng/L		06/02/16 16:24	1
Isotope Dilution	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac		
13C2 PFHxA	86		25 - 150		05/21/16 11:40	06/02/16 16:24	1		
13C4 PFOA	79		25 - 150		05/21/16 11:40	06/02/16 16:24	1		
13C4 PFOS	107		25 - 150		05/21/16 11:40	06/02/16 16:24	1		
13C4-PFHpA	81		25 - 150		05/21/16 11:40	06/02/16 16:24	1		
13C5 PFNA	52		25 - 150		05/21/16 11:40	06/02/16 16:24	1		
18O2 PFHxS	120		25 - 150		05/21/16 11:40	06/02/16 16:24	1		

Client Sample Results

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: MCFSMW-5_0516 DUP

Lab Sample ID: 320-18986-14

Date Collected: 05/16/16 12:46

Matrix: Water

Date Received: 05/19/16 09:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	12		2.3	1.9	0.85	ng/L		06/02/16 17:07	1
Perfluoroheptanoic acid (PFHpA)	13		2.3	1.9	0.75	ng/L		06/02/16 17:07	1
Perfluorohexanesulfonic acid (PFHxS)	42	M	2.3	1.9	0.81	ng/L		06/02/16 17:07	1
Perfluorononanoic acid (PFNA)	2.7		2.3	1.9	0.61	ng/L		06/02/16 17:07	1
Perfluorooctanesulfonic acid (PFOS)	38	M	3.7	2.8	1.2	ng/L		06/02/16 17:07	1
Perfluorooctanoic acid (PFOA)	21	M	2.3	1.9	0.70	ng/L		06/02/16 17:07	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	87		25 - 150	05/21/16 11:40	06/02/16 17:07	1
13C4 PFOA	86		25 - 150	05/21/16 11:40	06/02/16 17:07	1
13C4 PFOS	103		25 - 150	05/21/16 11:40	06/02/16 17:07	1
13C4-PFHpA	83		25 - 150	05/21/16 11:40	06/02/16 17:07	1
13C5 PFNA	62		25 - 150	05/21/16 11:40	06/02/16 17:07	1
18O2 PFHxS	112		25 - 150	05/21/16 11:40	06/02/16 17:07	1

Client Sample Results

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: MCFSMW-3_0516

Lab Sample ID: 320-18986-15

Date Collected: 05/16/16 13:56

Matrix: Water

Date Received: 05/19/16 09:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	43		2.3	1.8	0.83	ng/L		05/29/16 16:58	1
Perfluoroheptanoic acid (PFHpA)	30		2.3	1.8	0.73	ng/L		05/29/16 16:58	1
Perfluorohexanesulfonic acid (PFHxS)	1300	J M	2.3	1.8	0.79	ng/L		05/29/16 16:58	1
Perfluorononanoic acid (PFNA)	7.2		2.3	1.8	0.59	ng/L		05/29/16 16:58	1
Perfluorooctanesulfonic acid (PFOS)	790	J M	3.6	2.7	1.2	ng/L		05/29/16 16:58	1
Perfluorooctanoic acid (PFOA)	120	M	2.3	1.8	0.68	ng/L		05/29/16 16:58	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	92		25 - 150	05/21/16 11:40	05/29/16 16:58	1
13C4 PFOA	98		25 - 150	05/21/16 11:40	05/29/16 16:58	1
13C4 PFOS	91		25 - 150	05/21/16 11:40	05/29/16 16:58	1
13C4-PFHpA	88		25 - 150	05/21/16 11:40	05/29/16 16:58	1
13C5 PFNA	75		25 - 150	05/21/16 11:40	05/29/16 16:58	1
18O2 PFHxS	79		25 - 150	05/21/16 11:40	05/29/16 16:58	1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	36	D	9.1	7.2	3.3	ng/L		06/02/16 13:55	4
Perfluoroheptanoic acid (PFHpA)	30	D	9.1	7.2	2.9	ng/L		06/02/16 13:55	4
Perfluorohexanesulfonic acid (PFHxS)	1400	D M	9.1	7.2	3.2	ng/L		06/02/16 13:55	4
Perfluorononanoic acid (PFNA)	5.7	J D	9.1	7.2	2.4	ng/L		06/02/16 13:55	4
Perfluorooctanesulfonic acid (PFOS)	690	D M	14	11	4.6	ng/L		06/02/16 13:55	4
Perfluorooctanoic acid (PFOA)	120	D M	9.1	7.2	2.7	ng/L		06/02/16 13:55	4

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	115		25 - 150	05/21/16 11:40	06/02/16 13:55	4
13C4 PFOA	117		25 - 150	05/21/16 11:40	06/02/16 13:55	4
13C4 PFOS	115		25 - 150	05/21/16 11:40	06/02/16 13:55	4
13C4-PFHpA	103		25 - 150	05/21/16 11:40	06/02/16 13:55	4
13C5 PFNA	100		25 - 150	05/21/16 11:40	06/02/16 13:55	4
18O2 PFHxS	101		25 - 150	05/21/16 11:40	06/02/16 13:55	4

Client Sample Results

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: MCFSMW-16_0516

Lab Sample ID: 320-18986-16

Date Collected: 05/16/16 15:46

Matrix: Water

Date Received: 05/19/16 09:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	30		2.8	2.2	1.0	ng/L		05/29/16 17:19	1
Perfluoroheptanoic acid (PFHpA)	37		2.8	2.2	0.89	ng/L		05/29/16 17:19	1
Perfluorohexanesulfonic acid (PFHxS)	560	M	2.8	2.2	0.96	ng/L		05/29/16 17:19	1
Perfluorononanoic acid (PFNA)	2.8		2.8	2.2	0.73	ng/L		05/29/16 17:19	1
Perfluorooctanesulfonic acid (PFOS)	910	J M	4.4	3.3	1.4	ng/L		05/29/16 17:19	1
Perfluorooctanoic acid (PFOA)	330	M	2.8	2.2	0.83	ng/L		05/29/16 17:19	1
Isotope Dilution	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac		
13C2 PFHxA	131		25 - 150		05/21/16 11:40	05/29/16 17:19	1		
13C4 PFOA	109		25 - 150		05/21/16 11:40	05/29/16 17:19	1		
13C4 PFOS	132		25 - 150		05/21/16 11:40	05/29/16 17:19	1		
13C4-PFHpA	130		25 - 150		05/21/16 11:40	05/29/16 17:19	1		
13C5 PFNA	75		25 - 150		05/21/16 11:40	05/29/16 17:19	1		
18O2 PFHxS	156	Q	25 - 150		05/21/16 11:40	05/29/16 17:19	1		

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	23	D	11	8.9	4.1	ng/L		06/02/16 14:16	4
Perfluoroheptanoic acid (PFHpA)	37	D	11	8.9	3.6	ng/L		06/02/16 14:16	4
Perfluorohexanesulfonic acid (PFHxS)	480	D M	11	8.9	3.9	ng/L		06/02/16 14:16	4
Perfluorononanoic acid (PFNA)	8.9	U	11	8.9	2.9	ng/L		06/02/16 14:16	4
Perfluorooctanesulfonic acid (PFOS)	750	D M	18	13	5.7	ng/L		06/02/16 14:16	4
Perfluorooctanoic acid (PFOA)	310	D M	11	8.9	3.3	ng/L		06/02/16 14:16	4
Isotope Dilution	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac		
13C2 PFHxA	97		25 - 150		05/21/16 11:40	06/02/16 14:16	4		
13C4 PFOA	84		25 - 150		05/21/16 11:40	06/02/16 14:16	4		
13C4 PFOS	111		25 - 150		05/21/16 11:40	06/02/16 14:16	4		
13C4-PFHpA	91		25 - 150		05/21/16 11:40	06/02/16 14:16	4		
13C5 PFNA	62		25 - 150		05/21/16 11:40	06/02/16 14:16	4		
18O2 PFHxS	118		25 - 150		05/21/16 11:40	06/02/16 14:16	4		

Default Detection Limits

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

TestAmerica Job ID: 320-18986-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Prep: 3535

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

Isotope Dilution Summary

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

TestAmerica Job ID: 320-18986-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)					
		3C2 PFHx (25-150)	3C4 PFO/ (25-150)	3C4 PFO/ (25-150)	3C4-PFHp (25-150)	3C5 PFN/ (25-150)	3O2 PFHx (25-150)
320-18986-1	FB051716	121	131	135	118	121	123
320-18986-2	EB051716	119	129	139	134	126	124
320-18986-3	MCFSMW-14_0516	93	83	127	90	81	126
320-18986-4	46MW03_0516	95	96	131	93	88	129
320-18986-5	46MW01_0516	101	103	139	101	88	135
320-18986-6	46MW02_0516	86	91	106	87	69	121
320-18986-7	46MW05_0516	86	78	58	77	54	86
320-18986-7 - DL	46MW05_0516	90	100	114	91	87	118
320-18986-8	46MW04_0516	106	106	61	92	57	88
320-18986-8 - DL	46MW04_0516	104	110	94	101	81	113
320-18986-9	MCFSMW-17_0516	98	83	114	93	61	119
320-18986-10	FB051616	115	126	128	125	122	131
320-18986-11	EB051616	118	127	134	124	119	128
320-18986-12	MCFSMW-4_0516	80	89	101	85	91	93
320-18986-12 MS	MCFSMW-4_0516	80	87	109	86	85	113
320-18986-12 MSD	MCFSMW-4_0516	78	87	119	88	92	110
320-18986-13	MCFSMW-5_0516	86	79	107	81	52	120
320-18986-14	MCFSMW-5_0516 DUP	87	86	103	83	62	112
320-18986-15	MCFSMW-3_0516	92	98	91	88	75	79
320-18986-15 - DL	MCFSMW-3_0516	115	117	115	103	100	101
320-18986-16	MCFSMW-16_0516	131	109	132	130	75	156 Q
320-18986-16 - DL	MCFSMW-16_0516	97	84	111	91	62	118
LCS 320-110850/2-A	Lab Control Sample	122	125	129	126	124	135
MB 320-110850/1-A	Method Blank	130	134	131	130	132	131

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

QC Sample Results

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

TestAmerica Job ID: 320-18986-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-110850/1-A
Matrix: Water
Analysis Batch: 112007

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 110850

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorobutanesulfonic acid (PFBS)	2.0	U	2.5	2.0	0.92	ng/L		06/01/16 05:17	1
Perfluoroheptanoic acid (PFHpA)	2.0	U	2.5	2.0	0.80	ng/L		06/01/16 05:17	1
Perfluorohexanesulfonic acid (PFHxS)	2.0	U	2.5	2.0	0.87	ng/L		06/01/16 05:17	1
Perfluorononanoic acid (PFNA)	2.0	U	2.5	2.0	0.65	ng/L		06/01/16 05:17	1
Perfluorooctanesulfonic acid (PFOS)	3.0	U M	4.0	3.0	1.3	ng/L		06/01/16 05:17	1
Perfluorooctanoic acid (PFOA)	2.0	U	2.5	2.0	0.75	ng/L		06/01/16 05:17	1

Isotope Dilution	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFHxA	130		25 - 150	05/21/16 11:40	06/01/16 05:17	1
13C4 PFOA	134		25 - 150	05/21/16 11:40	06/01/16 05:17	1
13C4 PFOS	131		25 - 150	05/21/16 11:40	06/01/16 05:17	1
13C4-PFHpA	130		25 - 150	05/21/16 11:40	06/01/16 05:17	1
13C5 PFNA	132		25 - 150	05/21/16 11:40	06/01/16 05:17	1
18O2 PFHxS	131		25 - 150	05/21/16 11:40	06/01/16 05:17	1

Lab Sample ID: LCS 320-110850/2-A
Matrix: Water
Analysis Batch: 111859

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 110850

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorobutanesulfonic acid (PFBS)	35.4	27.7		ng/L		78	50 - 150
Perfluoroheptanoic acid (PFHpA)	40.0	30.5		ng/L		76	60 - 140
Perfluorohexanesulfonic acid (PFHxS)	36.4	24.6		ng/L		67	60 - 140
Perfluorononanoic acid (PFNA)	40.0	30.9		ng/L		77	60 - 140
Perfluorooctanesulfonic acid (PFOS)	37.1	24.3		ng/L		65	60 - 140
Perfluorooctanoic acid (PFOA)	40.0	33.0		ng/L		83	60 - 140

Isotope Dilution	LCS LCS		Limits
	%Recovery	Qualifier	
13C2 PFHxA	122		25 - 150
13C4 PFOA	125		25 - 150
13C4 PFOS	129		25 - 150
13C4-PFHpA	126		25 - 150
13C5 PFNA	124		25 - 150
18O2 PFHxS	135		25 - 150

Lab Sample ID: 320-18986-12 MS
Matrix: Water
Analysis Batch: 111859

Client Sample ID: MCFSMW-4_0516
Prep Type: Total/NA
Prep Batch: 110850

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Perfluorobutanesulfonic acid (PFBS)	21		33.8	47.5		ng/L		78	50 - 150
Perfluoroheptanoic acid (PFHpA)	77		38.2	105		ng/L		74	60 - 140
Perfluorohexanesulfonic acid (PFHxS)	220	M	34.7	253	M	ng/L		91	60 - 140
Perfluorononanoic acid (PFNA)	11		38.2	41.8		ng/L		81	60 - 140

TestAmerica Sacramento

QC Sample Results

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

TestAmerica Job ID: 320-18986-1

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

Lab Sample ID: 320-18986-12 MS

Matrix: Water

Analysis Batch: 111859

Client Sample ID: MCFSMW-4_0516

Prep Type: Total/NA

Prep Batch: 110850

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	67	M	35.4	96.6	M	ng/L		84	60 - 140
Perfluorooctanoic acid (PFOA)	160	M	38.2	195	M	ng/L		92	60 - 140
MS MS									
Isotope Dilution	%Recovery	Qualifier	Limits						
13C2 PFHxA	80		25 - 150						
13C4 PFOA	87		25 - 150						
13C4 PFOS	109		25 - 150						
13C4-PFHpA	86		25 - 150						
13C5 PFNA	85		25 - 150						
18O2 PFHxS	113		25 - 150						

Lab Sample ID: 320-18986-12 MSD

Matrix: Water

Analysis Batch: 111859

Client Sample ID: MCFSMW-4_0516

Prep Type: Total/NA

Prep Batch: 110850

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanesulfonic acid (PFBS)	21		32.2	45.9		ng/L		77	50 - 150	3	30
Perfluoroheptanoic acid (PFHpA)	77		36.4	105		ng/L		78	60 - 140	0	30
Perfluorohexanesulfonic acid (PFHxS)	220	M	33.1	248	M	ng/L		81	60 - 140	2	30
Perfluorononanoic acid (PFNA)	11		36.4	40.2		ng/L		80	60 - 140	4	30
Perfluorooctanesulfonic acid (PFOS)	67	M	33.8	101	M	ng/L		99	60 - 140	4	30
Perfluorooctanoic acid (PFOA)	160	M	36.4	185	M	ng/L		70	60 - 140	5	30
MSD MSD											
Isotope Dilution	%Recovery	Qualifier	Limits								
13C2 PFHxA	78		25 - 150								
13C4 PFOA	87		25 - 150								
13C4 PFOS	119		25 - 150								
13C4-PFHpA	88		25 - 150								
13C5 PFNA	92		25 - 150								
18O2 PFHxS	110		25 - 150								

QC Association Summary

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

TestAmerica Job ID: 320-18986-1

LCMS

Prep Batch: 110850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-18986-1	FB051716	Total/NA	Water	3535	
320-18986-2	EB051716	Total/NA	Water	3535	
320-18986-3	MCFSMW-14_0516	Total/NA	Water	3535	
320-18986-4	46MW03_0516	Total/NA	Water	3535	
320-18986-5	46MW01_0516	Total/NA	Water	3535	
320-18986-6	46MW02_0516	Total/NA	Water	3535	
320-18986-7 - DL	46MW05_0516	Total/NA	Water	3535	
320-18986-7	46MW05_0516	Total/NA	Water	3535	
320-18986-8	46MW04_0516	Total/NA	Water	3535	
320-18986-8 - DL	46MW04_0516	Total/NA	Water	3535	
320-18986-9	MCFSMW-17_0516	Total/NA	Water	3535	
320-18986-10	FB051616	Total/NA	Water	3535	
320-18986-11	EB051616	Total/NA	Water	3535	
320-18986-12	MCFSMW-4_0516	Total/NA	Water	3535	
320-18986-12 MS	MCFSMW-4_0516	Total/NA	Water	3535	
320-18986-12 MSD	MCFSMW-4_0516	Total/NA	Water	3535	
320-18986-13	MCFSMW-5_0516	Total/NA	Water	3535	
320-18986-14	MCFSMW-5_0516 DUP	Total/NA	Water	3535	
320-18986-15	MCFSMW-3_0516	Total/NA	Water	3535	
320-18986-15 - DL	MCFSMW-3_0516	Total/NA	Water	3535	
320-18986-16 - DL	MCFSMW-16_0516	Total/NA	Water	3535	
320-18986-16	MCFSMW-16_0516	Total/NA	Water	3535	
LCS 320-110850/2-A	Lab Control Sample	Total/NA	Water	3535	
MB 320-110850/1-A	Method Blank	Total/NA	Water	3535	

Analysis Batch: 111859

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-18986-1	FB051716	Total/NA	Water	WS-LC-0025	110850
320-18986-2	EB051716	Total/NA	Water	WS-LC-0025	110850
320-18986-3	MCFSMW-14_0516	Total/NA	Water	WS-LC-0025	110850
320-18986-4	46MW03_0516	Total/NA	Water	WS-LC-0025	110850
320-18986-5	46MW01_0516	Total/NA	Water	WS-LC-0025	110850
320-18986-6	46MW02_0516	Total/NA	Water	WS-LC-0025	110850
320-18986-7	46MW05_0516	Total/NA	Water	WS-LC-0025	110850
320-18986-8	46MW04_0516	Total/NA	Water	WS-LC-0025	110850
320-18986-10	FB051616	Total/NA	Water	WS-LC-0025	110850
320-18986-11	EB051616	Total/NA	Water	WS-LC-0025	110850
320-18986-12 MS	MCFSMW-4_0516	Total/NA	Water	WS-LC-0025	110850
320-18986-12 MSD	MCFSMW-4_0516	Total/NA	Water	WS-LC-0025	110850
320-18986-15	MCFSMW-3_0516	Total/NA	Water	WS-LC-0025	110850
320-18986-16	MCFSMW-16_0516	Total/NA	Water	WS-LC-0025	110850
LCS 320-110850/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	110850

Analysis Batch: 112007

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-18986-7 - DL	46MW05_0516	Total/NA	Water	WS-LC-0025	110850
320-18986-8 - DL	46MW04_0516	Total/NA	Water	WS-LC-0025	110850
MB 320-110850/1-A	Method Blank	Total/NA	Water	WS-LC-0025	110850

QC Association Summary

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

TestAmerica Job ID: 320-18986-1

LCMS (Continued)

Analysis Batch: 112205

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-18986-9	MCFSMW-17_0516	Total/NA	Water	WS-LC-0025	110850
320-18986-12	MCFSMW-4_0516	Total/NA	Water	WS-LC-0025	110850
320-18986-13	MCFSMW-5_0516	Total/NA	Water	WS-LC-0025	110850
320-18986-14	MCFSMW-5_0516 DUP	Total/NA	Water	WS-LC-0025	110850
320-18986-15 - DL	MCFSMW-3_0516	Total/NA	Water	WS-LC-0025	110850
320-18986-16 - DL	MCFSMW-16_0516	Total/NA	Water	WS-LC-0025	110850

Lab Chronicle

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: FB051716

Date Collected: 05/17/16 08:05

Date Received: 05/19/16 09:30

Lab Sample ID: 320-18986-1

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			533 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	533 mL	1.00 mL	111859	05/29/16 09:10	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: EB051716

Date Collected: 05/17/16 08:10

Date Received: 05/19/16 09:30

Lab Sample ID: 320-18986-2

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			517.2 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	517.2 mL	1.00 mL	111859	05/29/16 09:31	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: MCFSMW-14_0516

Date Collected: 05/17/16 09:11

Date Received: 05/19/16 09:30

Lab Sample ID: 320-18986-3

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			535.6 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	535.6 mL	1.00 mL	111859	05/29/16 10:56	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: 46MW03_0516

Date Collected: 05/17/16 10:11

Date Received: 05/19/16 09:30

Lab Sample ID: 320-18986-4

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			527.2 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	527.2 mL	1.00 mL	111859	05/29/16 11:17	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: 46MW01_0516

Date Collected: 05/17/16 11:21

Date Received: 05/19/16 09:30

Lab Sample ID: 320-18986-5

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			509.1 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	509.1 mL	1.00 mL	111859	05/29/16 11:39	JRB	TAL SAC
Instrument ID: A6										

Lab Chronicle

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: 46MW02_0516
Date Collected: 05/17/16 11:21
Date Received: 05/19/16 09:30

Lab Sample ID: 320-18986-6
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			542 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	542 mL	1.00 mL	111859	05/29/16 12:00	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: 46MW05_0516
Date Collected: 05/17/16 12:31
Date Received: 05/19/16 09:30

Lab Sample ID: 320-18986-7
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			509.1 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	509.1 mL	1.00 mL	111859	05/29/16 12:21	JRB	TAL SAC
Instrument ID: A6										
Total/NA	Prep	3535	DL		509.1 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025	DL	10	509.1 mL	1.00 mL	112007	06/01/16 11:43	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: 46MW04_0516
Date Collected: 05/17/16 12:26
Date Received: 05/19/16 09:30

Lab Sample ID: 320-18986-8
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			522.1 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	522.1 mL	1.00 mL	111859	05/29/16 12:42	JRB	TAL SAC
Instrument ID: A6										
Total/NA	Prep	3535	DL		522.1 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025	DL	10	522.1 mL	1.00 mL	112007	06/01/16 12:05	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: MCFSMW-17_0516
Date Collected: 05/17/16 14:36
Date Received: 05/19/16 09:30

Lab Sample ID: 320-18986-9
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			456.3 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	456.3 mL	1.00 mL	112205	06/02/16 15:41	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: FB051616
Date Collected: 05/16/16 10:00
Date Received: 05/19/16 09:30

Lab Sample ID: 320-18986-10
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			549.3 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC

Lab Chronicle

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: FB051616
 Date Collected: 05/16/16 10:00
 Date Received: 05/19/16 09:30

Lab Sample ID: 320-18986-10
 Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	WS-LC-0025		1	549.3 mL	1.00 mL	111859	05/29/16 13:25	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: EB051616
 Date Collected: 05/16/16 10:05
 Date Received: 05/19/16 09:30

Lab Sample ID: 320-18986-11
 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			535.9 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	535.9 mL	1.00 mL	111859	05/29/16 13:46	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: MCFSMW-4_0516
 Date Collected: 05/16/16 11:11
 Date Received: 05/19/16 09:30

Lab Sample ID: 320-18986-12
 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			547.6 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	547.6 mL	1.00 mL	112205	06/02/16 16:03	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: MCFSMW-5_0516
 Date Collected: 05/16/16 12:46
 Date Received: 05/19/16 09:30

Lab Sample ID: 320-18986-13
 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			536.9 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	536.9 mL	1.00 mL	112205	06/02/16 16:24	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: MCFSMW-5_0516 DUP
 Date Collected: 05/16/16 12:46
 Date Received: 05/19/16 09:30

Lab Sample ID: 320-18986-14
 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			537 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	537 mL	1.00 mL	112205	06/02/16 17:07	JRB	TAL SAC
Instrument ID: A6										

Lab Chronicle

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

TestAmerica Job ID: 320-18986-1

Client Sample ID: MCFSMW-3_0516

Lab Sample ID: 320-18986-15

Date Collected: 05/16/16 13:56

Matrix: Water

Date Received: 05/19/16 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			552 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	552 mL	1.00 mL	111859	05/29/16 16:58	JRB	TAL SAC
Instrument ID: A6										
Total/NA	Prep	3535	DL		552 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025	DL	4	552 mL	1.00 mL	112205	06/02/16 13:55	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: MCFSMW-16_0516

Lab Sample ID: 320-18986-16

Date Collected: 05/16/16 15:46

Matrix: Water

Date Received: 05/19/16 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			450.9 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	450.9 mL	1.00 mL	111859	05/29/16 17:19	JRB	TAL SAC
Instrument ID: A6										
Total/NA	Prep	3535	DL		450.9 mL	1.00 mL	110850	05/21/16 11:40	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025	DL	4	450.9 mL	1.00 mL	112205	06/02/16 14:16	JRB	TAL SAC
Instrument ID: A6										

Laboratory References:

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

Certification Summary

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

TestAmerica Job ID: 320-18986-1

Laboratory: TestAmerica Sacramento

The certifications listed below are applicable to this report.

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

Laboratory: TestAmerica Denver

The certifications listed below are applicable to this report.

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

Method Summary

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

TestAmerica Job ID: 320-18986-1

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

Protocol References:

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

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

Sample Summary

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

TestAmerica Job ID: 320-18986-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-18986-1	FB051716	Water	05/17/16 08:05	05/19/16 09:30
320-18986-2	EB051716	Water	05/17/16 08:10	05/19/16 09:30
320-18986-3	MCFSMW-14_0516	Water	05/17/16 09:11	05/19/16 09:30
320-18986-4	46MW03_0516	Water	05/17/16 10:11	05/19/16 09:30
320-18986-5	46MW01_0516	Water	05/17/16 11:21	05/19/16 09:30
320-18986-6	46MW02_0516	Water	05/17/16 11:21	05/19/16 09:30
320-18986-7	46MW05_0516	Water	05/17/16 12:31	05/19/16 09:30
320-18986-8	46MW04_0516	Water	05/17/16 12:26	05/19/16 09:30
320-18986-9	MCFSMW-17_0516	Water	05/17/16 14:36	05/19/16 09:30
320-18986-10	FB051616	Water	05/16/16 10:00	05/19/16 09:30
320-18986-11	EB051616	Water	05/16/16 10:05	05/19/16 09:30
320-18986-12	MCFSMW-4_0516	Water	05/16/16 11:11	05/19/16 09:30
320-18986-13	MCFSMW-5_0516	Water	05/16/16 12:46	05/19/16 09:30
320-18986-14	MCFSMW-5_0516 DUP	Water	05/16/16 12:46	05/19/16 09:30
320-18986-15	MCFSMW-3_0516	Water	05/16/16 13:56	05/19/16 09:30
320-18986-16	MCFSMW-16_0516	Water	05/16/16 15:46	05/19/16 09:30

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 111859

Lab Sample ID: ICV 320-111859/13 Client Sample ID: _____

Date Analyzed: 05/28/16 20:24 Lab File ID: 28MAY2016A6A_014.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C2 PFDA	12.38	Incomplete Integration	barnettj	05/29/16 15:17

Lab Sample ID: 320-18986-1 Client Sample ID: FB051716

Date Analyzed: 05/29/16 09:10 Lab File ID: 28MAY2016A6A_050.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	11.54	Isomers	barnettj	05/31/16 17:17
Perfluorononanoic acid (PFNA)	11.55	Missed Peak	barnettj	05/31/16 17:17

Lab Sample ID: 320-18986-2 Client Sample ID: EB051716

Date Analyzed: 05/29/16 09:31 Lab File ID: 28MAY2016A6A_051.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	9.47	Missed Peak	barnettj	05/31/16 17:18
Perfluorooctanesulfonic acid (PFOS)	11.54	Missed Peak	barnettj	05/31/16 17:18

Lab Sample ID: 320-18986-3 Client Sample ID: MCFSMW-14_0516

Date Analyzed: 05/29/16 10:56 Lab File ID: 28MAY2016A6A_055.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.51	Isomers	barnettj	05/31/16 17:19
Perfluorooctanesulfonic acid (PFOS)	11.55	Isomers	barnettj	05/31/16 17:19

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 111859

Lab Sample ID: 320-18986-4 Client Sample ID: 46MW03_0516

Date Analyzed: 05/29/16 11:17 Lab File ID: 28MAY2016A6A_056.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.50	Isomers	barnettj	05/31/16 17:36
Perfluorooctanoic acid (PFOA)	10.60	Isomers	barnettj	05/31/16 17:36
Perfluorooctanesulfonic acid (PFOS)	11.26	Isomers	barnettj	05/31/16 17:36

Lab Sample ID: 320-18986-5 Client Sample ID: 46MW01_0516

Date Analyzed: 05/29/16 11:39 Lab File ID: 28MAY2016A6A_057.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	11.54	Isomers	barnettj	05/31/16 17:37

Lab Sample ID: 320-18986-6 Client Sample ID: 46MW02_0516

Date Analyzed: 05/29/16 12:00 Lab File ID: 28MAY2016A6A_058.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.51	Isomers	barnettj	05/31/16 17:39
Perfluorooctanoic acid (PFOA)	10.59	Isomers	barnettj	05/31/16 17:39
Perfluorooctanesulfonic acid (PFOS)	11.55	Isomers	barnettj	05/31/16 17:39

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 111859

Lab Sample ID: 320-18986-7 Client Sample ID: 46MW05_0516

Date Analyzed: 05/29/16 12:21 Lab File ID: 28MAY2016A6A_059.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.51	Isomers	barnettj	05/31/16 17:40
Perfluorooctanoic acid (PFOA)	10.59	Isomers	barnettj	05/31/16 17:40
Perfluorooctanesulfonic acid (PFOS)	11.55	Isomers	barnettj	05/31/16 17:40

Lab Sample ID: 320-18986-8 Client Sample ID: 46MW04_0516

Date Analyzed: 05/29/16 12:42 Lab File ID: 28MAY2016A6A_060.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.51	Isomers	barnettj	05/31/16 17:42
Perfluorooctanoic acid (PFOA)	10.59	Isomers	barnettj	05/31/16 17:42
Perfluorooctanesulfonic acid (PFOS)	11.56	Isomers	barnettj	05/31/16 17:42

Lab Sample ID: 320-18986-10 Client Sample ID: FB051616

Date Analyzed: 05/29/16 13:25 Lab File ID: 28MAY2016A6A_062.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.51	Isomers	barnettj	05/31/16 17:44
Perfluorooctanesulfonic acid (PFOS)	11.54	Isomers	barnettj	05/31/16 17:44
Perfluorononanoic acid (PFNA)	11.55	Missed Peak	barnettj	05/31/16 17:44

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 111859

Lab Sample ID: 320-18986-11 Client Sample ID: EB051616

Date Analyzed: 05/29/16 13:46 Lab File ID: 28MAY2016A6A_063.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.50	Isomers	barnettj	05/31/16 17:46
Perfluorooctanoic acid (PFOA)	10.59	Isomers	barnettj	05/31/16 17:46
Perfluorooctanesulfonic acid (PFOS)	11.54	Isomers	barnettj	05/31/16 17:46

Lab Sample ID: 320-18986-12 MS Client Sample ID: MCFSMW-4_0516 MS

Date Analyzed: 05/29/16 15:33 Lab File ID: 28MAY2016A6A_068.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.50	Isomers	barnettj	06/01/16 16:52
Perfluorooctanoic acid (PFOA)	10.58	Isomers	barnettj	06/01/16 16:52
Perfluorooctanesulfonic acid (PFOS)	11.54	Isomers	barnettj	06/01/16 16:52

Lab Sample ID: 320-18986-12 MSD Client Sample ID: MCFSMW-4_0516 MSD

Date Analyzed: 05/29/16 15:54 Lab File ID: 28MAY2016A6A_069.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	barnettj	06/01/16 16:53
Perfluorooctanoic acid (PFOA)	10.57	Isomers	barnettj	06/01/16 16:53
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	barnettj	06/01/16 16:53

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 111859

Lab Sample ID: 320-18986-15 Client Sample ID: MCFSMW-3_0516

Date Analyzed: 05/29/16 16:58 Lab File ID: 28MAY2016A6A_072.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.50	Isomers	barnettj	06/01/16 16:56
Perfluorooctanoic acid (PFOA)	10.59	Isomers	barnettj	06/01/16 16:56
Perfluorooctanesulfonic acid (PFOS)	11.54	Isomers	barnettj	06/01/16 16:56

Lab Sample ID: 320-18986-16 Client Sample ID: MCFSMW-16_0516

Date Analyzed: 05/29/16 17:19 Lab File ID: 28MAY2016A6A_073.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.51	Isomers	barnettj	06/01/16 16:57
Perfluorooctanoic acid (PFOA)	10.59	Isomers	barnettj	06/01/16 16:57
Perfluorooctanesulfonic acid (PFOS)	11.55	Isomers	barnettj	06/01/16 16:57

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 112007

Lab Sample ID: MB 320-110850/1-A Client Sample ID: _____

Date Analyzed: 06/01/16 05:17 Lab File ID: 31MAY2016A6A_049.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	11.58	Isomers	barnettj	06/01/16 15:21

Lab Sample ID: 320-18986-7 DL Client Sample ID: 46MW05_0516 DL

Date Analyzed: 06/01/16 11:43 Lab File ID: 31MAY2016A6A_067.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	7.09	Incomplete Integration	barnettj	06/01/16 15:59
Perfluorohexanesulfonic acid (PFHxS)	9.52	Isomers	barnettj	06/01/16 15:59
Perfluorooctanoic acid (PFOA)	10.61	Isomers	barnettj	06/01/16 15:59
Perfluorooctanesulfonic acid (PFOS)	11.56	Isomers	barnettj	06/01/16 15:59
Perfluorononanoic acid (PFNA)	11.61	Missed Peak	barnettj	06/01/16 15:59

Lab Sample ID: 320-18986-8 DL Client Sample ID: 46MW04_0516 DL

Date Analyzed: 06/01/16 12:05 Lab File ID: 31MAY2016A6A_068.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.51	Isomers	barnettj	06/01/16 16:01
Perfluorooctanoic acid (PFOA)	10.60	Isomers	barnettj	06/01/16 16:01
Perfluorooctanesulfonic acid (PFOS)	11.56	Isomers	barnettj	06/01/16 16:01

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 112205

Lab Sample ID: 320-18986-15 DL Client Sample ID: MCFSMW-3_0516 DL

Date Analyzed: 06/02/16 13:55 Lab File ID: 31MAY2016A6A_140.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.52	Isomers	barnettj	06/02/16 15:59
Perfluorooctanoic acid (PFOA)	10.60	Isomers	barnettj	06/02/16 15:59
Perfluorooctanesulfonic acid (PFOS)	11.57	Isomers	barnettj	06/02/16 15:59

Lab Sample ID: 320-18986-16 DL Client Sample ID: MCFSMW-16_0516 DL

Date Analyzed: 06/02/16 14:16 Lab File ID: 31MAY2016A6A_141.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.52	Isomers	barnettj	06/02/16 17:12
Perfluorooctanoic acid (PFOA)	10.60	Isomers	barnettj	06/02/16 17:12
Perfluorooctanesulfonic acid (PFOS)	11.57	Isomers	barnettj	06/02/16 17:12

Lab Sample ID: 320-18986-9 Client Sample ID: MCFSMW-17_0516

Date Analyzed: 06/02/16 15:41 Lab File ID: 31MAY2016A6A_145.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.53	Isomers	barnettj	06/02/16 17:14
Perfluorooctanoic acid (PFOA)	10.61	Isomers	barnettj	06/02/16 17:14
Perfluorooctanesulfonic acid (PFOS)	11.58	Isomers	barnettj	06/02/16 17:14

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 112205

Lab Sample ID: 320-18986-12 Client Sample ID: MCFSMW-4_0516

Date Analyzed: 06/02/16 16:03 Lab File ID: 31MAY2016A6A_146.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.52	Isomers	barnettj	06/02/16 17:15
Perfluorooctanoic acid (PFOA)	10.60	Isomers	barnettj	06/02/16 17:15
Perfluorooctanesulfonic acid (PFOS)	11.57	Isomers	barnettj	06/02/16 17:15

Lab Sample ID: 320-18986-13 Client Sample ID: MCFSMW-5_0516

Date Analyzed: 06/02/16 16:24 Lab File ID: 31MAY2016A6A_147.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.53	Isomers	barnettj	06/02/16 17:18
Perfluorooctanoic acid (PFOA)	10.61	Isomers	barnettj	06/02/16 17:18
Perfluorooctanesulfonic acid (PFOS)	11.57	Isomers	barnettj	06/02/16 17:18

Lab Sample ID: 320-18986-14 Client Sample ID: MCFSMW-5_0516 DUP

Date Analyzed: 06/02/16 17:07 Lab File ID: 31MAY2016A6A_148.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.50	Isomers	barnettj	06/03/16 09:52
Perfluorooctanoic acid (PFOA)	10.59	Isomers	barnettj	06/03/16 09:52
Perfluorooctanesulfonic acid (PFOS)	11.55	Isomers	barnettj	06/03/16 09:52

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 112205

Lab Sample ID: CCV 320-112205/76 Client Sample ID: _____

Date Analyzed: 06/02/16 17:49 Lab File ID: 31MAY2016A6A_150.d GC Column: Acquity ID: 2.1 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorodecanoic acid (PFDA)	12.41	Incomplete Integration	barnettj	06/03/16 09:51

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00005	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00005	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00006	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00009	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00006	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00006	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00006	200 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00010	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012	200 uL	13C4 PFOS	0.956 ug/mL
LCMPFUDa_00007	200 uL	13C2 PFUnA	1 ug/mL					
.LCM2PFHxDA_00005	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)	13C2-PFHxDA	50 ug/mL	
.LCM2PFTeDA_00005	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)	13C2-PFTeDA	50 ug/mL	
.LCM4PFHPA_00005	05/22/20	Wellington Laboratories, Lot M4PFHpa0515			(Purchased Reagent)	13C4-PFHpA	50 ug/mL	
.LCM5PFPEA_00006	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)	13C5-PFPeA	50 ug/mL	
.LCM8FOSA_00009	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)	13C8 FOSA	50 ug/mL	
.LCMPFBA_00006	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)	13C4 PFBA	50 ug/mL	
.LCMPFDA_00007	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)	13C2 PFDA	50 ug/mL	
.LCMPFDoA_00006	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)	13C2 PFDoA	50 ug/mL	
.LCMPFHxA_00008	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)	13C2 PFHxA	50 ug/mL	
.LCMPFHxS_00006	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)	1802 PFHxS	47.3 ug/mL	
.LCMPFNA_00005	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)	13C5 PFNA	50 ug/mL	
.LCMPFOA_00010	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)	13C4 PFOA	50 ug/mL	
.LCMPFOS_00012	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)	13C4 PFOS	47.8 ug/mL	
.LCMPFUDa_00007	10/31/19	Wellington Laboratories, Lot MPFUDa1014			(Purchased Reagent)	13C2 PFUnA	50 ug/mL	
LCPFCL-11_00019	09/08/16	04/18/16	MeOH/H2O, Lot 90285	5 mL	LCMPFCSU_00036	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
							1802 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
							LCPFCLSP_00045	25 uL
							Perfluorobutanesulfonic acid (PFBS)	0.442 ng/mL
		Perfluorodecanoic acid	0.5 ng/mL					

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

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
							Perfluorooctadecanoic 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_00036	10/07/16	04/07/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00004	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00004	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHFA_00004	200 uL	13C4-PFHFA	1 ug/mL
					LCM5PFPEA_00005	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00008	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00005	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00005	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00005	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00009	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00006	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00004	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00004	12/07/20		Wellington Laboratories, Lot M2PFTeDA1115		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHFA_00004	05/22/20		Wellington Laboratories, Lot M4PFHFA0515		(Purchased Reagent)		13C4-PFHFA	50 ug/mL
..LCM5PFPEA_00005	05/22/20		Wellington Laboratories, Lot M5PFPeA0515		(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00008	12/22/17		Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00005	10/31/19		Wellington Laboratories, Lot MPFBA1014		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00007	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00005	07/17/19		Wellington Laboratories, Lot MPFDoA0714		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00008	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00005	08/23/20		Wellington Laboratories, Lot MPFHxS1015		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00005	04/13/19		Wellington Laboratories, Lot MPFNA0414		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00009	01/22/21		Wellington Laboratories, Lot MPFOA0116		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00012	01/22/21		Wellington Laboratories, Lot MPFOS0116		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00006	10/31/19		Wellington Laboratories, Lot MPFUdA1014		(Purchased Reagent)		13C2 PFUnA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFCSP_00045	09/08/16	04/18/16	Methanol, Lot 090285	5 mL	LCPFCSP_00044	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
							Perfluorooctadecanoic 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_00044	09/08/16	03/08/16	Methanol, Lot 090285	10000 uL	LCPFBA_00003	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	200 uL	Perfluorotridecanoic acid	1 ug/mL
LCPFUdA_00003	200 uL	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.: 320-18986-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFDA 00004	07/02/20		Wellington Laboratories, Lot PFDA0615		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA 00004	01/30/20		Wellington Laboratories, Lot PFDoA0115		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...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 00005	11/06/20		Wellington Laboratories, Lot PFOA1115		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA 00004	04/25/17		Wellington Laboratories, Lot PFOA0807		(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS_00004	06/20/19		Wellington Laboratories, Lot LPFOS0614		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
...LCPFOSA 00006	09/02/17		Wellington Laboratories, Lot FOSA0815I		(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA 00004	01/30/20		Wellington Laboratories, Lot PFPeA0115		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA 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_00020	09/08/16	04/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00036	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_00045	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.: 320-18986-1

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	
							Perfluorooctadecanoic 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_00036	10/07/16	04/07/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00004	200 uL	13C2-PFHxDA	1 ug/mL	
					LCM2PFTeDA_00004	200 uL	13C2-PFTeDA	1 ug/mL	
					LCM4PFHHPA_00004	200 uL	13C4-PFHHPA	1 ug/mL	
					LCM5PFPEA_00005	200 uL	13C5-PFPeA	1 ug/mL	
					LCM8FOSA_00008	200 uL	13C8 FOSA	1 ug/mL	
					LCMPFBA_00005	200 uL	13C4 PFBA	1 ug/mL	
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL	
					LCMPFDoA_00005	200 uL	13C2 PFDoA	1 ug/mL	
					LCMPFHxA_00008	200 uL	13C2 PFHxA	1 ug/mL	
					LCMPFHxS_00005	200 uL	18O2 PFHxS	0.946 ug/mL	
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL	
					LCMPFOA_00009	200 uL	13C4 PFOA	1 ug/mL	
					LCMPFOS_00012	200 uL	13C4 PFOS	0.956 ug/mL	
					LCMPFUDa_00006	200 uL	13C2 PFUnA	1 ug/mL	
..LCM2PFHxDA_00004	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112				(Purchased Reagent)	13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00004	12/07/20		Wellington Laboratories, Lot M2PFTeDA1115				(Purchased Reagent)	13C2-PFTeDA	50 ug/mL
..LCM4PFHHPA_00004	05/22/20		Wellington Laboratories, Lot M4PFHHPA0515				(Purchased Reagent)	13C4-PFHHPA	50 ug/mL
..LCM5PFPEA_00005	05/22/20		Wellington Laboratories, Lot M5PFPeA0515				(Purchased Reagent)	13C5-PFPeA	50 ug/mL
..LCM8FOSA_00008	12/22/17		Wellington Laboratories, Lot M8FOSA1215I				(Purchased Reagent)	13C8 FOSA	50 ug/mL
..LCMPFBA_00005	10/31/19		Wellington Laboratories, Lot MPFBA1014				(Purchased Reagent)	13C4 PFBA	50 ug/mL
..LCMPFDA_00007	08/19/20		Wellington Laboratories, Lot MPFDA0815				(Purchased Reagent)	13C2 PFDA	50 ug/mL
..LCMPFDoA_00005	07/17/19		Wellington Laboratories, Lot MPFDoA0714				(Purchased Reagent)	13C2 PFDoA	50 ug/mL
..LCMPFHxA_00008	04/09/20		Wellington Laboratories, Lot MPFHxA0415				(Purchased Reagent)	13C2 PFHxA	50 ug/mL
..LCMPFHxS_00005	08/23/20		Wellington Laboratories, Lot MPFHxS1015				(Purchased Reagent)	18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00005	04/13/19		Wellington Laboratories, Lot MPFNA0414				(Purchased Reagent)	13C5 PFNA	50 ug/mL
..LCMPFOA_00009	01/22/21		Wellington Laboratories, Lot MPFOA0116				(Purchased Reagent)	13C4 PFOA	50 ug/mL
..LCMPFOS_00012	01/22/21		Wellington Laboratories, Lot MPFOS0116				(Purchased Reagent)	13C4 PFOS	47.8 ug/mL
..LCMPFUDa_00006	10/31/19		Wellington Laboratories, Lot MPFUDa1014				(Purchased Reagent)	13C2 PFUnA	50 ug/mL
.LCPFCSP_00045	09/08/16	04/18/16	Methanol, Lot 090285	5 mL	LCPFCSP_00044	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 (PFHHPA)	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.: 320-18986-1

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
							Perfluorooctadecanoic 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_00044	09/08/16	03/08/16	Methanol, Lot 090285	10000 uL	LCPFBA_00003	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	200 uL	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_00004	07/02/20		Wellington Laboratories, Lot PFDA0615		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00004	01/30/20		Wellington Laboratories, Lot PFDoA0115		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...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.: 320-18986-1

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 00005	11/06/20		Wellington Laboratories, Lot PFOA1115		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA 00004	04/25/17		Wellington Laboratories, Lot PFODA0807		(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS_00004	06/20/19		Wellington Laboratories, Lot LPFOS0614		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
...LCPFOSA 00006	09/02/17		Wellington Laboratories, Lot FOSA0815I		(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA 00004	01/30/20		Wellington Laboratories, Lot PFPeA0115		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA 00003	06/19/18		Wellington Laboratories, Lot PFTeDA0613		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA 00003	12/10/18		Wellington Laboratories, Lot PFTTrDA1213		(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_00017	09/08/16	04/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00036	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_00045	250 uL
					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		
					Perfluorooctadecanoic 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.: 320-18986-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFCSU_00036	10/07/16	04/07/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00004	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00004	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00004	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00005	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00008	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00005	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00005	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00005	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00009	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012	200 uL	13C4 PFOS	0.956 ug/mL
LCMPFUdA_00006	200 uL	13C2 PFUnA	1 ug/mL					
..LCM2PFHxDA_00004	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)	13C2-PFHxDA	50 ug/mL	
..LCM2PFTeDA_00004	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)	13C2-PFTeDA	50 ug/mL	
..LCM4PFHPA_00004	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)	13C4-PFHpA	50 ug/mL	
..LCM5PFPEA_00005	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)	13C5-PFPeA	50 ug/mL	
..LCM8FOSA_00008	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)	13C8 FOSA	50 ug/mL	
..LCMPFBA_00005	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)	13C4 PFBA	50 ug/mL	
..LCMPFDA_00007	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)	13C2 PFDA	50 ug/mL	
..LCMPFDoA_00005	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)	13C2 PFDoA	50 ug/mL	
..LCMPFHxA_00008	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)	13C2 PFHxA	50 ug/mL	
..LCMPFHxS_00005	08/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)	18O2 PFHxS	47.3 ug/mL	
..LCMPFNA_00005	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)	13C5 PFNA	50 ug/mL	
..LCMPFOA_00009	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)	13C4 PFOA	50 ug/mL	
..LCMPFOS_00012	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)	13C4 PFOS	47.8 ug/mL	
..LCMPFUdA_00006	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)	13C2 PFUnA	50 ug/mL	
.LCPFCSP_00045	09/08/16	04/18/16	Methanol, Lot 090285	5 mL	LCPFCSP_00044	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
							Perfluorooctadecanoic 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.: 320-18986-1

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_00044	09/08/16	03/08/16	Methanol, Lot 090285	10000 uL	LCPFBA_00003	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	200 uL	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 LFFBS1014		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00004	07/02/20		Wellington Laboratories, Lot PFDA0615		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00004	01/30/20		Wellington Laboratories, Lot PFDoA0115		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDSA_00001	09/13/18		Wellington Laboratories, Lot LFFDS0913		(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 LFFHpS1112		(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 LFFHxS0514		(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_00005	11/06/20		Wellington Laboratories, Lot PFOA1115		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00004	04/25/17		Wellington Laboratories, Lot PFODA0807		(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS_00004	06/20/19		Wellington Laboratories, Lot LFFOS0614		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
...LCPFOSA_00006	09/02/17		Wellington Laboratories, Lot FOSA0815I		(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00004	01/30/20		Wellington Laboratories, Lot PFPeA0115		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00003	06/19/18		Wellington Laboratories, Lot PFTeDA0613		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00003	12/10/18		Wellington Laboratories, Lot PFTTrDA1213		(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

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
LCPFCL4_00020	09/08/16	04/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00036	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
							LCPFCSU_00044	100 uL
					Perfluorobutanesulfonic acid (PFBS)	17.68 ng/mL		
					Perfluorodecanoic acid	20 ng/mL		
					Perfluorododecanoic acid	20 ng/mL		
					Perfluorodecane Sulfonic acid (PFHpA)	19.28 ng/mL		
					Perfluoroheptanoic acid	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		
					Perfluorooctadecanoic 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_00036	10/07/16	04/07/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00004	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00004	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00004	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00005	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00008	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00005	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00005	200 uL	13C2 PFDoA	1 ug/mL
LCMPFHxA_00008	200 uL	13C2 PFHxA	1 ug/mL					

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxS 00005	200 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA 00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00009	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00006	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA 00004	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA 00004	12/07/20		Wellington Laboratories, Lot M2PFTeDA1115		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA 00004	05/22/20		Wellington Laboratories, Lot M4PFHPA0515		(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA 00005	05/22/20		Wellington Laboratories, Lot M5PFPeA0515		(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA 00008	12/22/17		Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00005	10/31/19		Wellington Laboratories, Lot MPFBA1014		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA 00007	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00005	07/17/19		Wellington Laboratories, Lot MPFDoA0714		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00008	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00005	08/23/20		Wellington Laboratories, Lot MPFHxS1015		(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
..LCMPFNA 00005	04/13/19		Wellington Laboratories, Lot MPFNA0414		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00009	01/22/21		Wellington Laboratories, Lot MPFOA0116		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00012	01/22/21		Wellington Laboratories, Lot MPFOS0116		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA 00006	10/31/19		Wellington Laboratories, Lot MPFUdA1014		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
..LCPFCSP_00044	09/08/16	03/08/16	Methanol, Lot 090285	10000 uL	LCPFBA 00003	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA 00001	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA 00001	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00003	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA 00004	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00004	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA 00006	200 uL	Perfluorooctane Sulfonylamide	1 ug/mL
					LCPPeA 00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPPTeDA 00003	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPPTrDA 00003	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPPUdA 00003	200 uL	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 00004	07/02/20		Wellington Laboratories, Lot PFDA0615		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA 00004	01/30/20		Wellington Laboratories, Lot PFDoA0115		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDSA 00001	09/13/18		Wellington Laboratories, Lot LPFDS0913		(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

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_00005	11/06/20		Wellington Laboratories, Lot PFOA1115		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00004	04/25/17		Wellington Laboratories, Lot PFOA0807		(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS_00004	06/20/19		Wellington Laboratories, Lot LPFOS0614		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA_00006	09/02/17		Wellington Laboratories, Lot FOSA0815I		(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00004	01/30/20		Wellington Laboratories, Lot PFPeA0115		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00003	06/19/18		Wellington Laboratories, Lot PFTeDA0613		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00003	12/10/18		Wellington Laboratories, Lot PFTTrDA1213		(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_00018	09/08/16	04/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00036	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_00044	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							
Perfluorooctadecanoic acid	50 ng/mL							

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

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_00036	10/07/16	04/07/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00004	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00004	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00004	200 uL	13C4-PFHpa	1 ug/mL
					LCM5PFPEA_00005	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00008	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00005	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00005	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00005	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00009	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUDa_00006	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00004	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00004	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00004	05/22/20	Wellington Laboratories, Lot M4PFHPA0515			(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA_00005	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00008	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00005	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00007	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00005	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00008	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00005	08/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00005	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00009	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00012	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa_00006	10/31/19	Wellington Laboratories, Lot MPFUDa1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00044	09/08/16	03/08/16	Methanol, Lot 090285	10000 uL	LCPFBA_00003	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpa_00004	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxSA_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUDA_00003	200 uL	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_00004	07/02/20		Wellington Laboratories, Lot PFDA0615		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00004	01/30/20		Wellington Laboratories, Lot PFDoA0115		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..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_00005	11/06/20		Wellington Laboratories, Lot PFOA1115		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00004	04/25/17		Wellington Laboratories, Lot PFODA0807		(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS_00004	06/20/19		Wellington Laboratories, Lot LPFOS0614		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA_00006	09/02/17		Wellington Laboratories, Lot FOSA0815I		(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00004	01/30/20		Wellington Laboratories, Lot PFPeA0115		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_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_00017	09/08/16	04/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00036	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFCSP_00044	1000 uL	13C2 PFUnA	50 ng/mL
							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
							Perfluorooctadecanoic 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_00036	10/07/16	04/07/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00004	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00004	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00004	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00005	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00008	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00005	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00005	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00005	200 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00009	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00006	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00004	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00004	12/07/20		Wellington Laboratories, Lot M2PFTeDA1115		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00004	05/22/20		Wellington Laboratories, Lot M4PFHpA0515		(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00005	05/22/20		Wellington Laboratories, Lot M5PFPeA0515		(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00008	12/22/17		Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00005	10/31/19		Wellington Laboratories, Lot MPFBA1014		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00007	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00005	07/17/19		Wellington Laboratories, Lot MPFDoA0714		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00008	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFHxA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFHxS 00005	08/23/20		Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)	18O2 PFHxS	47.3 ug/mL
..LCMPFNA 00005	04/13/19		Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)	13C5 PFNA	50 ug/mL
..LCMPFOA 00009	01/22/21		Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)	13C4 PFOA	50 ug/mL
..LCMPFOS 00012	01/22/21		Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)	13C4 PFOS	47.8 ug/mL
..LCMPFUdA 00006	10/31/19		Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)	13C2 PFUnA	50 ug/mL
..LCPFCSP_00044	09/08/16	03/08/16	Methanol, Lot 090285	10000 uL	LCPFBFA 00003	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBFA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA 00001	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA 00001	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00003	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA 00004	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00004	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA 00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA 00003	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00003	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00003	200 uL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBFA 00003	03/05/18		Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)	Perfluorobutyric acid	50 ug/mL
..LCPFBFA_00001	10/09/19		Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA 00004	07/02/20		Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)	Perfluorodecanoic acid	50 ug/mL
..LCPFDoA 00004	01/30/20		Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)	Perfluorododecanoic acid	50 ug/mL
..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 00005	11/06/20		Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA 00004	04/25/17		Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)	Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS_00004	06/20/19		Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)	Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA 00006	09/02/17		Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)	Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA 00004	01/30/20		Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)	Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA 00003	06/19/18		Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)	Perfluorotetradecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

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_00017	09/08/16	04/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00036	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_00044	2000 uL	Perfluorobutyric acid	400 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	353.6 ng/mL
							Perfluorodecanoic acid	400 ng/mL
							Perfluorododecanoic acid	400 ng/mL
							Perfluorodecane Sulfonic acid	385.6 ng/mL
							Perfluoroheptanoic acid (PFHpA)	400 ng/mL
							Perfluoroheptanesulfonic Acid	380.8 ng/mL
							Perfluorohexanoic acid	400 ng/mL
							Perfluorohexadecanoic acid	400 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	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_00036	10/07/16	04/07/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00004	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00004	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00004	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPeA_00005	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00008	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00005	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00005	200 uL	13C2 PFDoA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxA 00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00005	200 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA 00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00009	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00006	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA 00004	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTEdA 00004	12/07/20	Wellington Laboratories, Lot M2PFTEdA1115			(Purchased Reagent)		13C2-PFTEdA	50 ug/mL
..LCM4PFHFA 00004	05/22/20	Wellington Laboratories, Lot M4PFHFA0515			(Purchased Reagent)		13C4-PFHFA	50 ug/mL
..LCM5PFPEA 00005	05/22/20	Wellington Laboratories, Lot M5PFPEA0515			(Purchased Reagent)		13C5-PFPEA	50 ug/mL
..LCM8FOSA 00008	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00005	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA 00007	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00005	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00008	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00005	08/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
..LCMPFNA 00005	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00009	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00012	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA 00006	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
..LCPFCSP_00044	09/08/16	03/08/16	Methanol, Lot 090285	10000 uL	LCPFBA 00003	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA 00001	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA 00001	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00003	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA 00004	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00004	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA 00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTEdA 00003	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00003	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00003	200 uL	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 00004	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA 00004	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

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_00005	11/06/20		Wellington Laboratories, Lot PFOA1115		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL		
..LCPFODA_00004	04/25/17		Wellington Laboratories, Lot PFODA0807		(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL		
..LCPFOS_00004	06/20/19		Wellington Laboratories, Lot LPFOS0614		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL		
..LCPFOSA_00006	09/02/17		Wellington Laboratories, Lot FOSA0815I		(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL		
..LCPFPeA_00004	01/30/20		Wellington Laboratories, Lot PFPeA0115		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL		
..LCPFTeDA_00003	06/19/18		Wellington Laboratories, Lot PFTeDA0613		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL		
..LCPFTrDA_00003	12/10/18		Wellington Laboratories, Lot PFTTrDA1213		(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL		
..LCPFUDA_00003	06/19/18		Wellington Laboratories, Lot PFUDA0613		(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL		
LCPFCIC_00017	06/16/16	05/14/16	MeOH/H2O, Lot 09285	5 mL	LCMPFCSU_00040	250 uL	13C2-PFHxDA	50 ng/mL		
							13C2-PFTeDA	50 ng/mL		
							13C4-PFHpA	50 ng/mL		
							13C5-PFPeA	50 ng/mL		
							13C8 FOSA	50 ng/mL		
							13C4 PFBA	50 ng/mL		
							13C2 PFDA	50 ng/mL		
							13C2 PFDoA	50 ng/mL		
							13C2 PFHxA	50 ng/mL		
							18O2 PFHxS	47.3 ng/mL		
							13C5 PFNA	50 ng/mL		
							13C4 PFOA	50 ng/mL		
							13C4 PFOS	47.8 ng/mL		
					13C2 PFUnA	50 ng/mL				
					LCPFACMXB_00007	125 uL	Perfluorobutanesulfonic acid (PFBS)	44.25 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL		
							Perfluorohexanesulfonic acid (PFHxS)	47.25 ng/mL		
Perfluorononanoic acid (PFNA)	50 ng/mL									
Perfluorooctanesulfonic acid (PFOS)	47.75 ng/mL									
Perfluorooctanoic acid (PFOA)	50 ng/mL									
.LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005	200 uL	13C2-PFHxDA	1 ug/mL		
							LCM2PFTeDA_00005	200 uL	13C2-PFTeDA	1 ug/mL
							LCM4PFHPA_00005	200 uL	13C4-PFHpA	1 ug/mL
							LCM5PFPEA_00006	200 uL	13C5-PFPeA	1 ug/mL
							LCM8FOSA_00009	200 uL	13C8 FOSA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFBA 00006	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA 00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00006	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00006	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA 00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00010	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00007	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA 00005	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA 00005	12/07/20		Wellington Laboratories, Lot M2PFTeDA1115		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA 00005	05/22/20		Wellington Laboratories, Lot M4PFHPA0515		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA 00006	05/22/20		Wellington Laboratories, Lot M5PFPeA0515		(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA 00009	12/22/17		Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00006	10/31/19		Wellington Laboratories, Lot MPFBA1014		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA 00007	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00006	07/17/19		Wellington Laboratories, Lot MPFDoA0714		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00008	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00006	10/23/20		Wellington Laboratories, Lot MPFHxS1015		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA 00005	04/13/19		Wellington Laboratories, Lot MPFNA0414		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00010	01/22/21		Wellington Laboratories, Lot MPFOA0116		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00012	01/22/21		Wellington Laboratories, Lot MPFOS0116		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA 00007	10/31/19		Wellington Laboratories, Lot MPFUdA1014		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
..LCPFACMXB_00007	11/06/20		Wellington Laboratories, Lot PFACMXB1115		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.89 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.91 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
LCPFCSP_00049	11/17/16	05/17/16	Methanol, Lot 090285	10000 uL	LCPFBA 00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBS 00003	200 uL	Perfluorobutane Sulfonate	0.884 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonate	0.964 ug/mL
							Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpa_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHps_00008	200 uL	Perfluoroheptane Sulfonate	0.952 ug/mL
							Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexane Sulfonate	0.91 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00002	200 uL	PFNS (Perflouro-1-nonanesulfonate)	0.96 ug/mL
					LCPFOA_00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFPeS_00002	200 uL	PFPeS (Perflouro-1-pentanesulfonate)	0.938 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
.LCPFBA_00004	01/30/20		Wellington Laboratories, Lot PFBA0115		(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
.LCPFBS_00003	10/09/19		Wellington Laboratories, Lot LPFBS1014		(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
.LCPFBSA_00001	10/09/19		Wellington Laboratories, Lot LPFBS1014		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00004	07/02/20		Wellington Laboratories, Lot PFDA0615		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
.LCPFDoA_00004	01/30/20		Wellington Laboratories, Lot PFDoA0115		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
.LCPFDS_00005	07/02/20		Wellington Laboratories, Lot LPFDS0615		(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
							Perfluorodecane Sulfonic acid	48.2 ug/mL
.LCPFHpa_00005	01/22/21		Wellington Laboratories, Lot PFHpA0116		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHps_00008	11/06/20		Wellington Laboratories, Lot LPFHpS1115		(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
							Perfluoroheptanesulfonic Acid	47.6 ug/mL
.LCPFHxA_00004	12/22/20		Wellington Laboratories, Lot PFHxA1215		(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
.LCPFHxDA_00004	11/28/17		Wellington Laboratories, Lot PFHxDA0707		(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00001	07/03/20		Wellington Laboratories, Lot brPFHxSK0615		(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA_00005	10/23/20		Wellington Laboratories, Lot PFNA1015		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFNS_00002	07/04/17		Wellington Laboratories, Lot LPFNS0712		(Purchased Reagent)		PFNS (Perflouro-1-nonanesulfonate)	48 ug/mL
.LCPFOA_00005	11/06/20		Wellington Laboratories, Lot PFOA1115		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00005	01/30/20		Wellington Laboratories, Lot PFODA0115		(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS-br_00001	10/14/20		Wellington Laboratories, Lot brPFOSK1015		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA_00006	09/02/17		Wellington Laboratories, Lot FOSA0815I		(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
.LCPFPeA_00004	01/30/20		Wellington Laboratories, Lot PFPeA0115		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
.LCPFPeS_00002	07/04/17		Wellington Laboratories, Lot LPFPeS0712		(Purchased Reagent)		PFPeS (Perflouro-1-pentanesulfonate)	46.9 ug/mL
.LCPFTeDA_00004	12/09/20		Wellington Laboratories, Lot PFTeDA1215		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
.LCPFTrDA_00004	12/10/18		Wellington Laboratories, Lot PFTTrDA1213		(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
.LCPFUdA_00004	08/19/20		Wellington Laboratories, Lot PFUdA0815		(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL

Reagent

LCM2PFHxDA_00004



R: 3/3/16 CBW

591157

ID: LCM2PFHxDA_00004

Exp: 01/07/21 Prep: CBW

13C2-PFHxDA at 50ug/mL

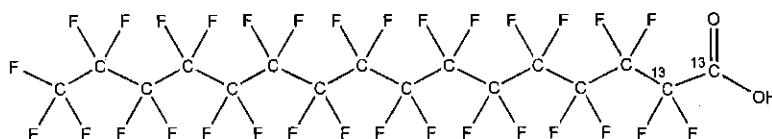


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFHxDA **LOT NUMBER:** M2PFHxDA1112
COMPOUND: Perfluoro-n-[1,2-¹³C₂]hexadecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₄HF₃₁O₂ **MOLECULAR WEIGHT:** 816.11
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
 (1,2-¹³C₂)
LAST TESTED: (mm/dd/yyyy) 01/07/2016
EXPIRY DATE: (mm/dd/yyyy) 01/07/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 

B.G. Chittim

Date: 01/11/2016
 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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.

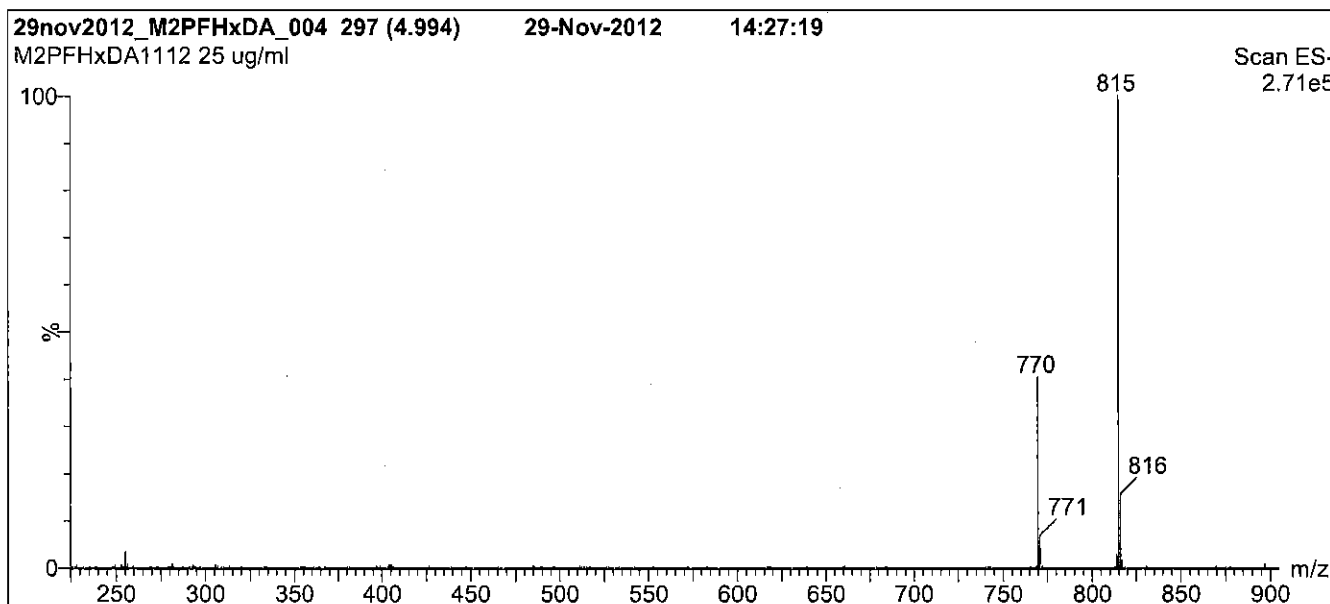
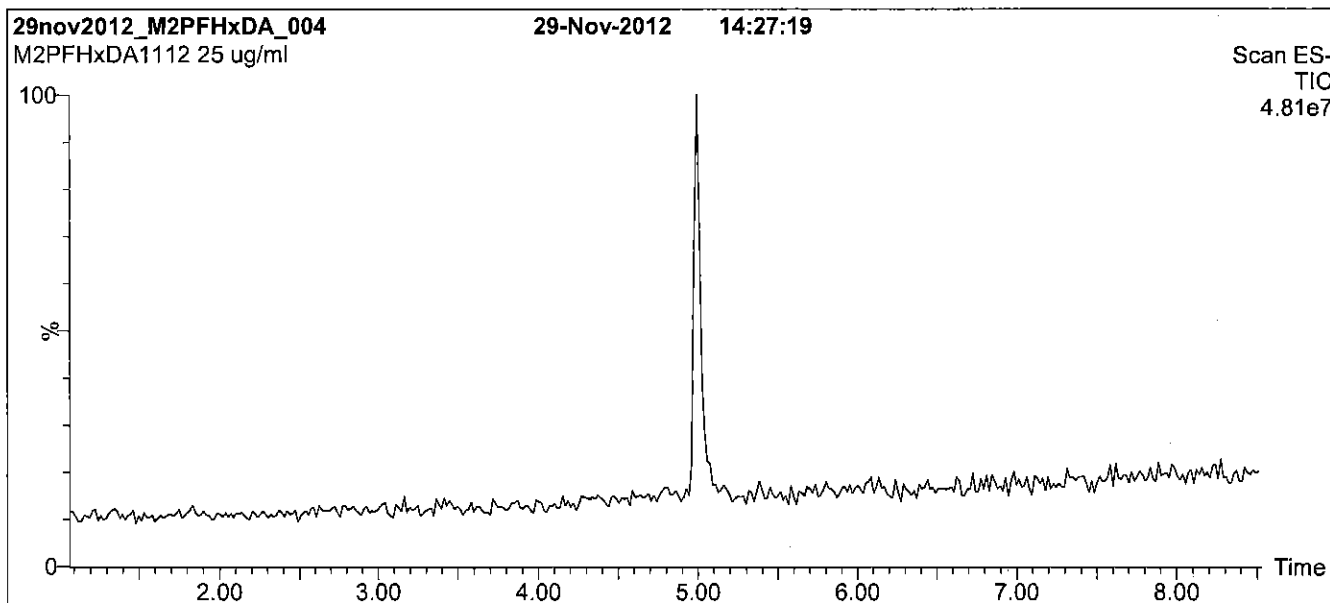
QUALITY MANAGEMENT:

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).



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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc 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

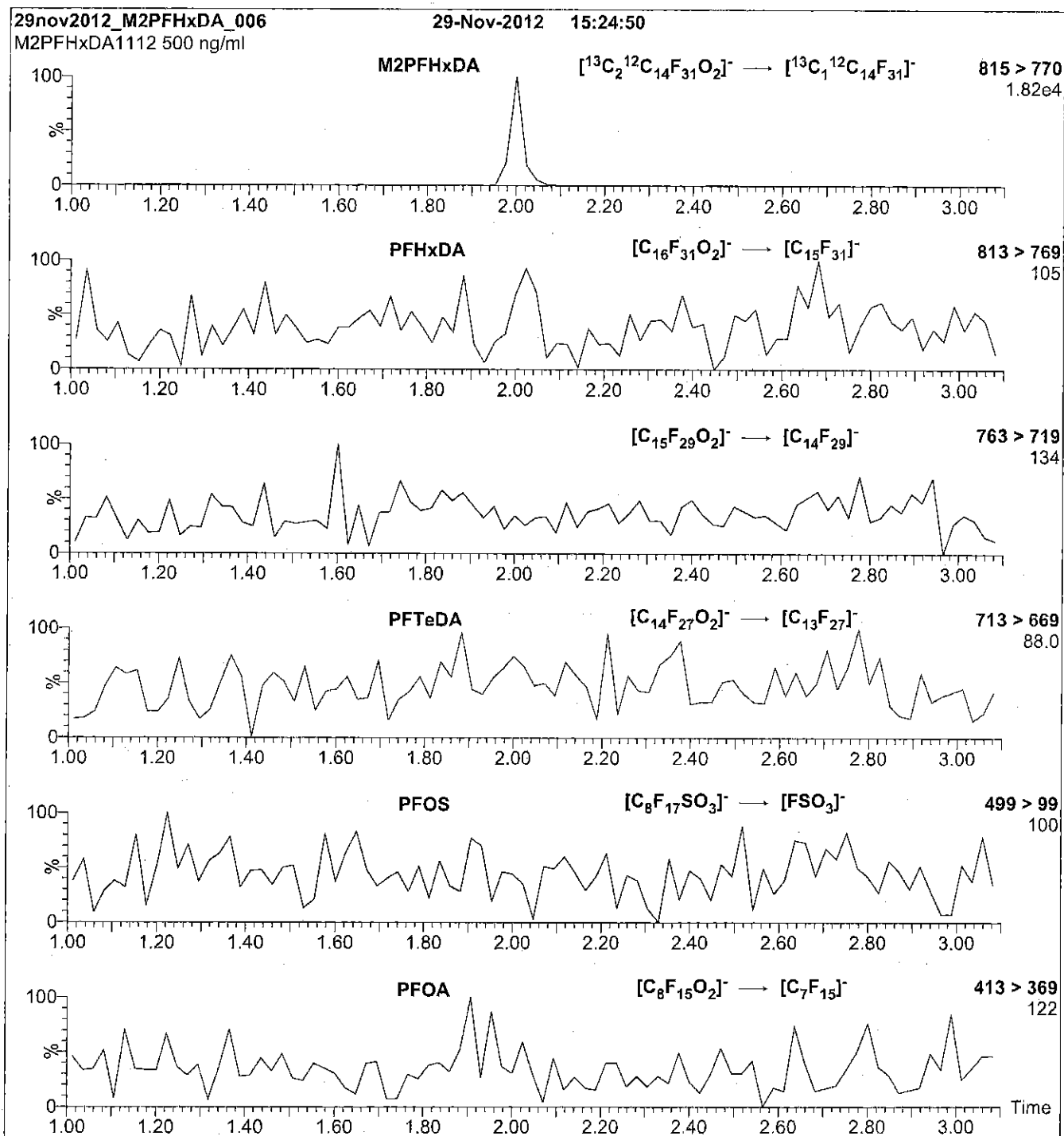
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

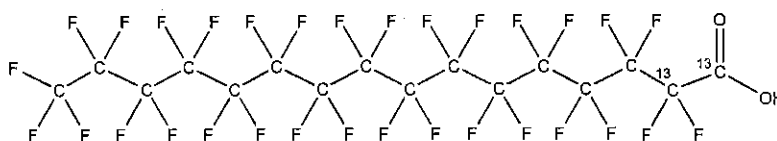
LCM2PFHxDA_00005



R-4/7/16 CBW

609709
ID: LCM2PFHxDA_00005
Exp: 01/07/21 Prep: CBW
13C2-PFHxDA at 50ug/mL**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION

PRODUCT CODE: M2PFHxDA **LOT NUMBER:** M2PFHxDA1112
COMPOUND: Perfluoro-n-[1,2-¹³C₂]hexadecanoic acid
STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₄HF₃₁O₂ **MOLECULAR WEIGHT:** 816.11
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
(1,2-¹³C₂)
LAST TESTED: (mm/dd/yyyy) 01/07/2016
EXPIRY DATE: (mm/dd/yyyy) 01/07/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 01/11/2016

(mm/dd/yyyy)

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

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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.

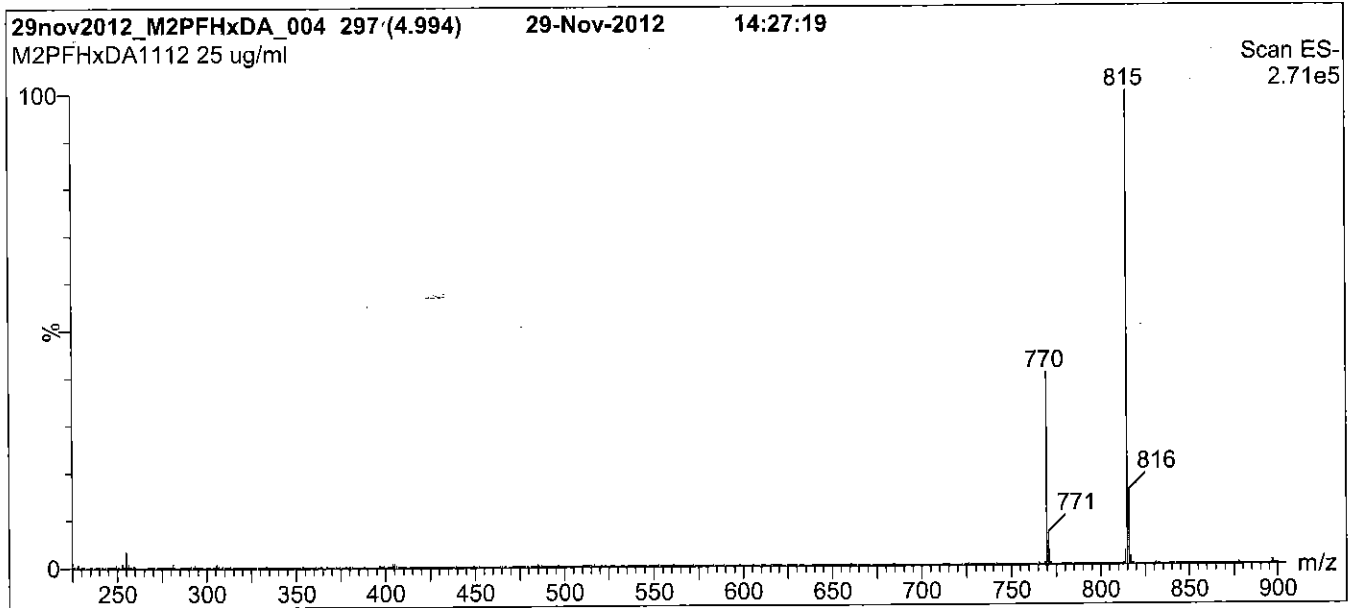
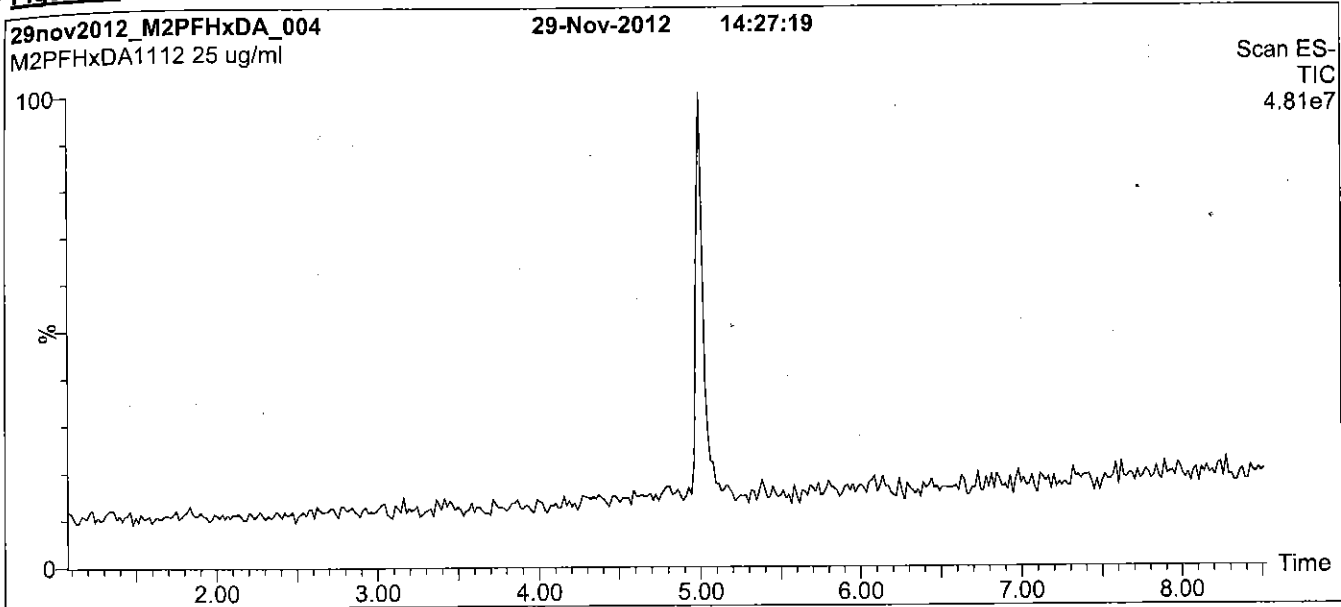
QUALITY MANAGEMENT:

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).



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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc 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

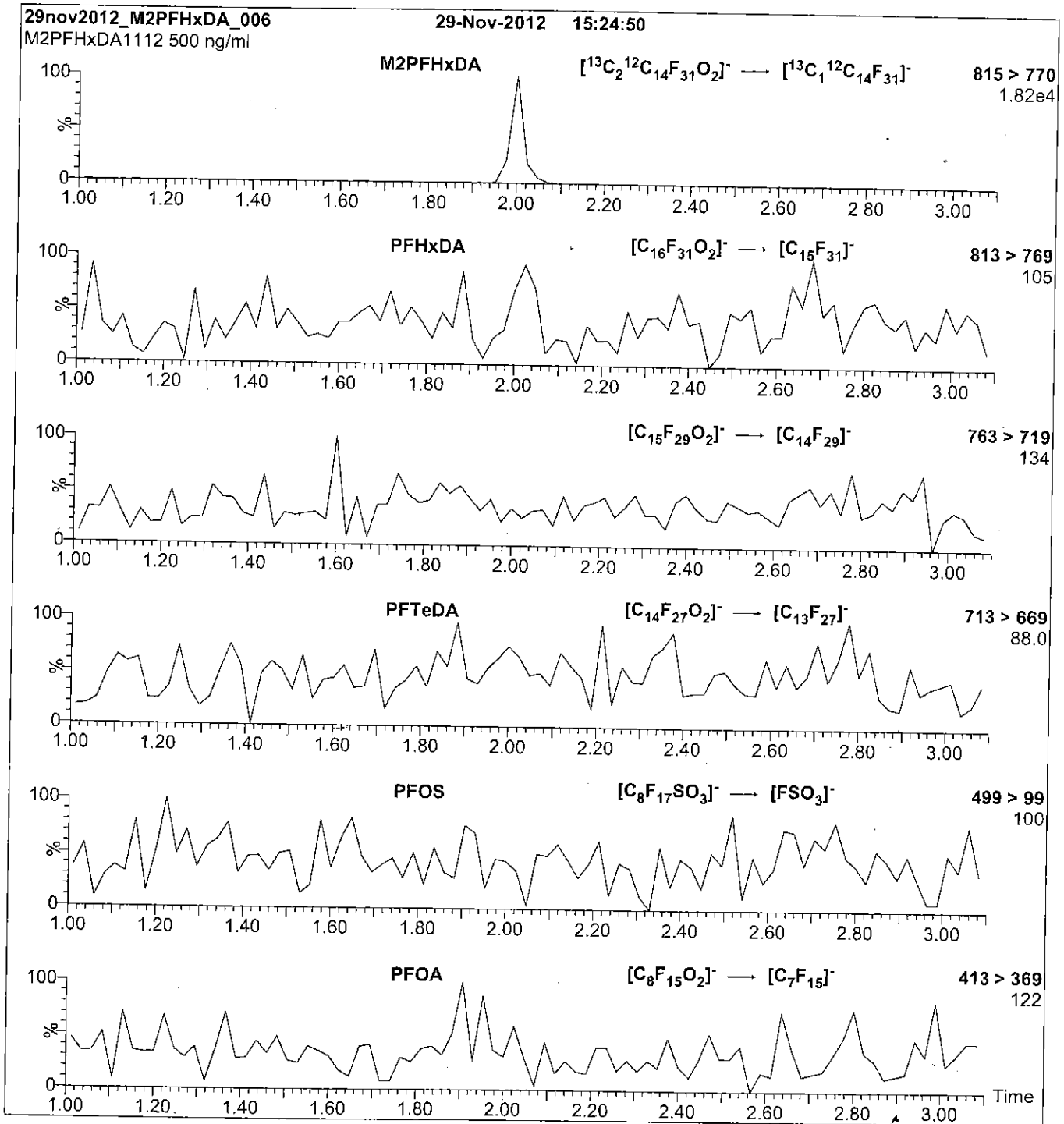
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCM2PFTeDA_00004



R: 3/3/16 CBW

591158

ID: LCM2PFTeDA_00004

Exp: 12/07/20 Prpd: CBW

13C2-PFTeDA at 50ug/mL

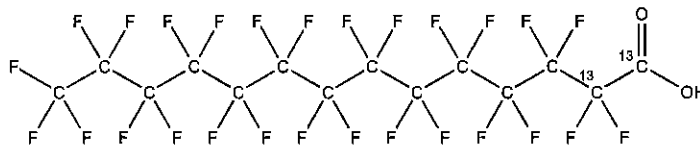


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFTeDA **LOT NUMBER:** M2PFTeDA1115
COMPOUND: Perfluoro-n-[1,2-¹³C₂]tetradecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₂HF₂₇O₂ **MOLECULAR WEIGHT:** 716.10
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
 (1,2-¹³C₂)
LAST TESTED: (mm/dd/yyyy) 12/07/2015
EXPIRY DATE: (mm/dd/yyyy) 12/07/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/08/2015
(mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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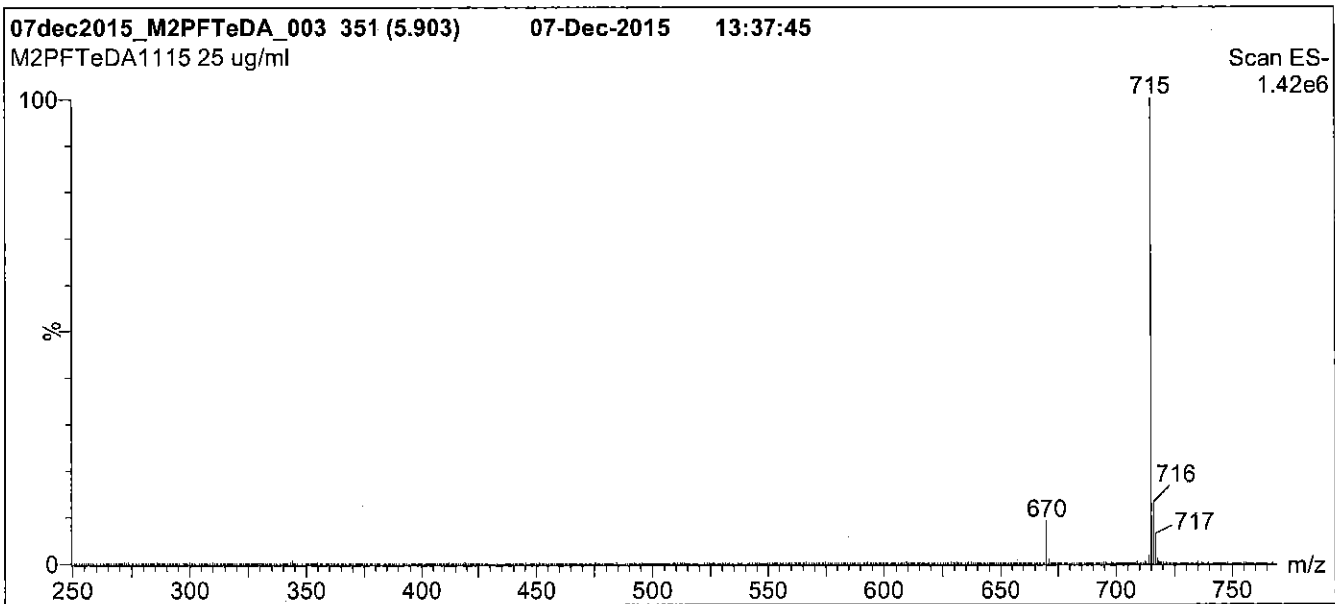
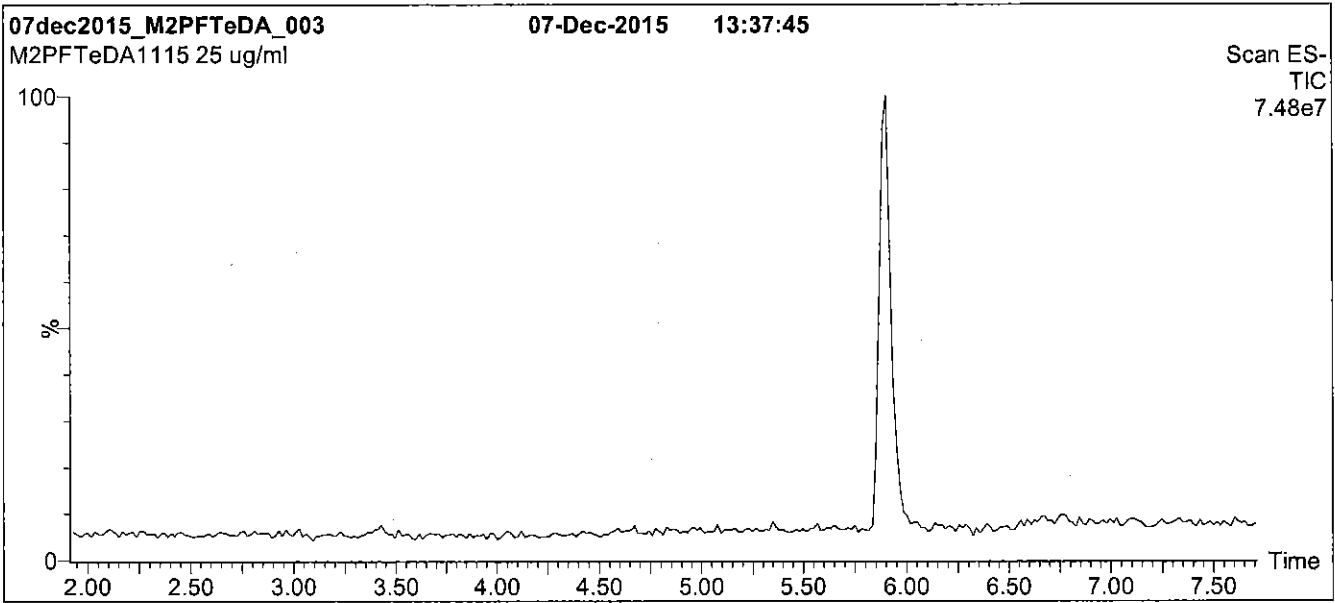
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

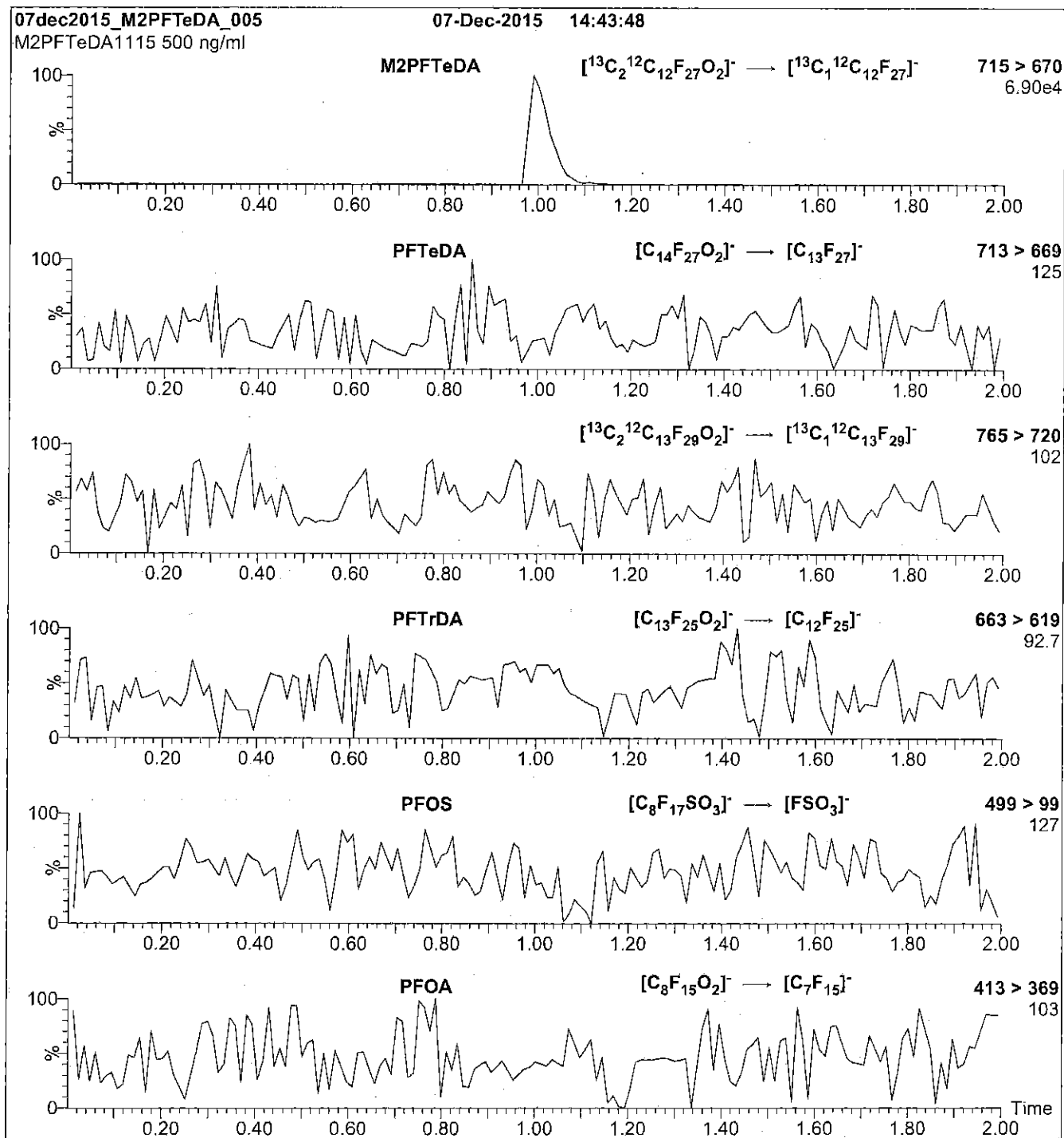
Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)
Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml M2PFTeDA)

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

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCM2PFTeDA_00005



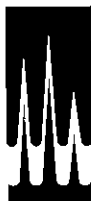
R = 4/7/16 CBW

609710

ID: LCM2PFTeDA_00005

Exp: 12/07/20 Prod: CBW

13C2-PFTeDA at 50ug/ml

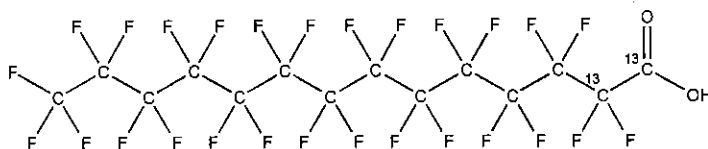


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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFTeDA **LOT NUMBER:** M2PFTeDA1115
COMPOUND: Perfluoro-n-[1,2-¹³C₂]tetradecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₂HF₂₇O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 716.10
SOLVENT(S): Methanol
 Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/07/2015
EXPIRY DATE: (mm/dd/yyyy) 12/07/2020

ISOTOPIC PURITY: ≥99% ¹³C
 (1,2-¹³C₂)

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/08/2015
 (mm/dd/yyyy)

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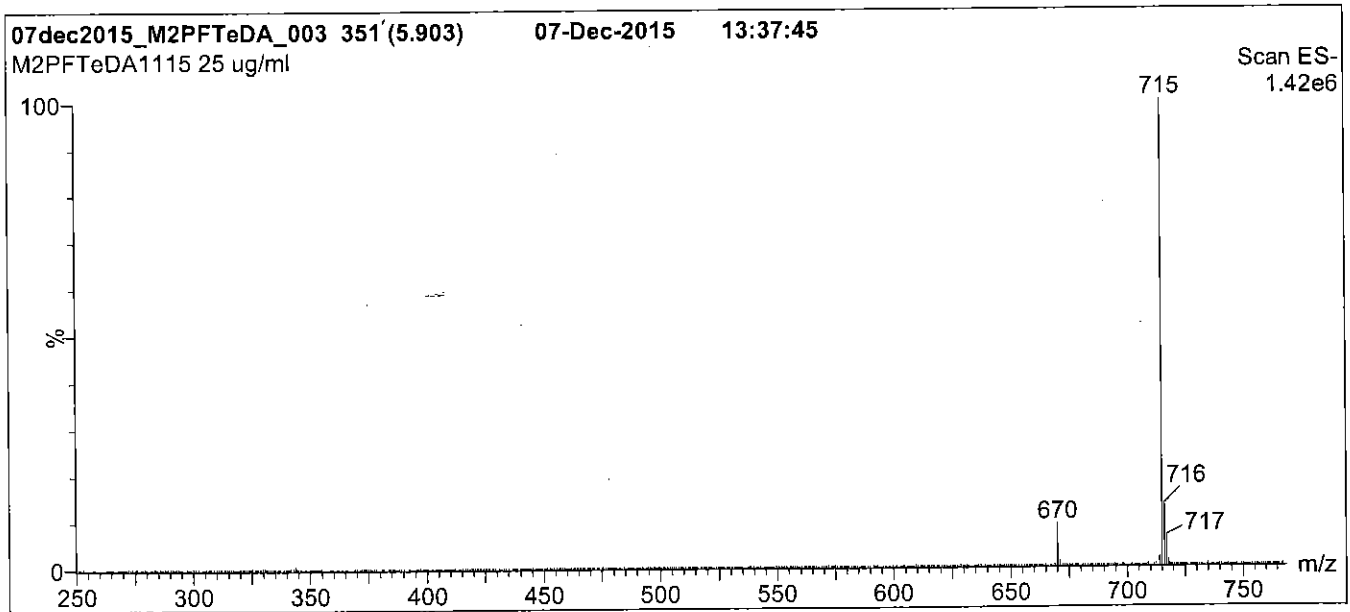
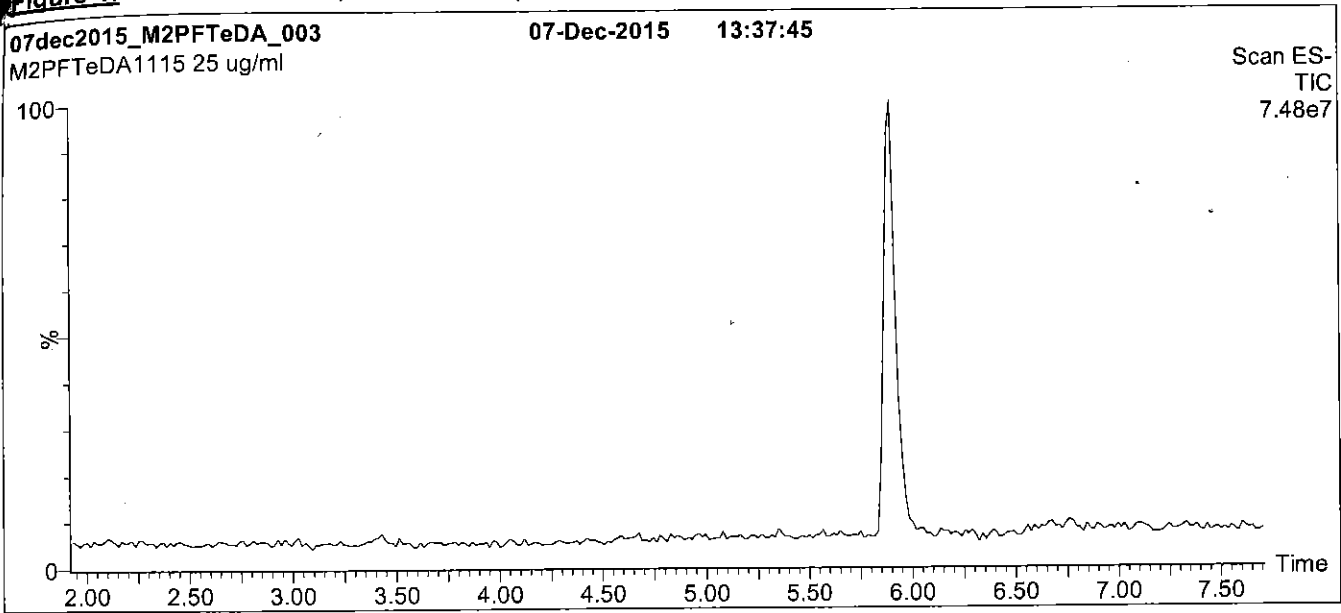
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Figure 1: M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc 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

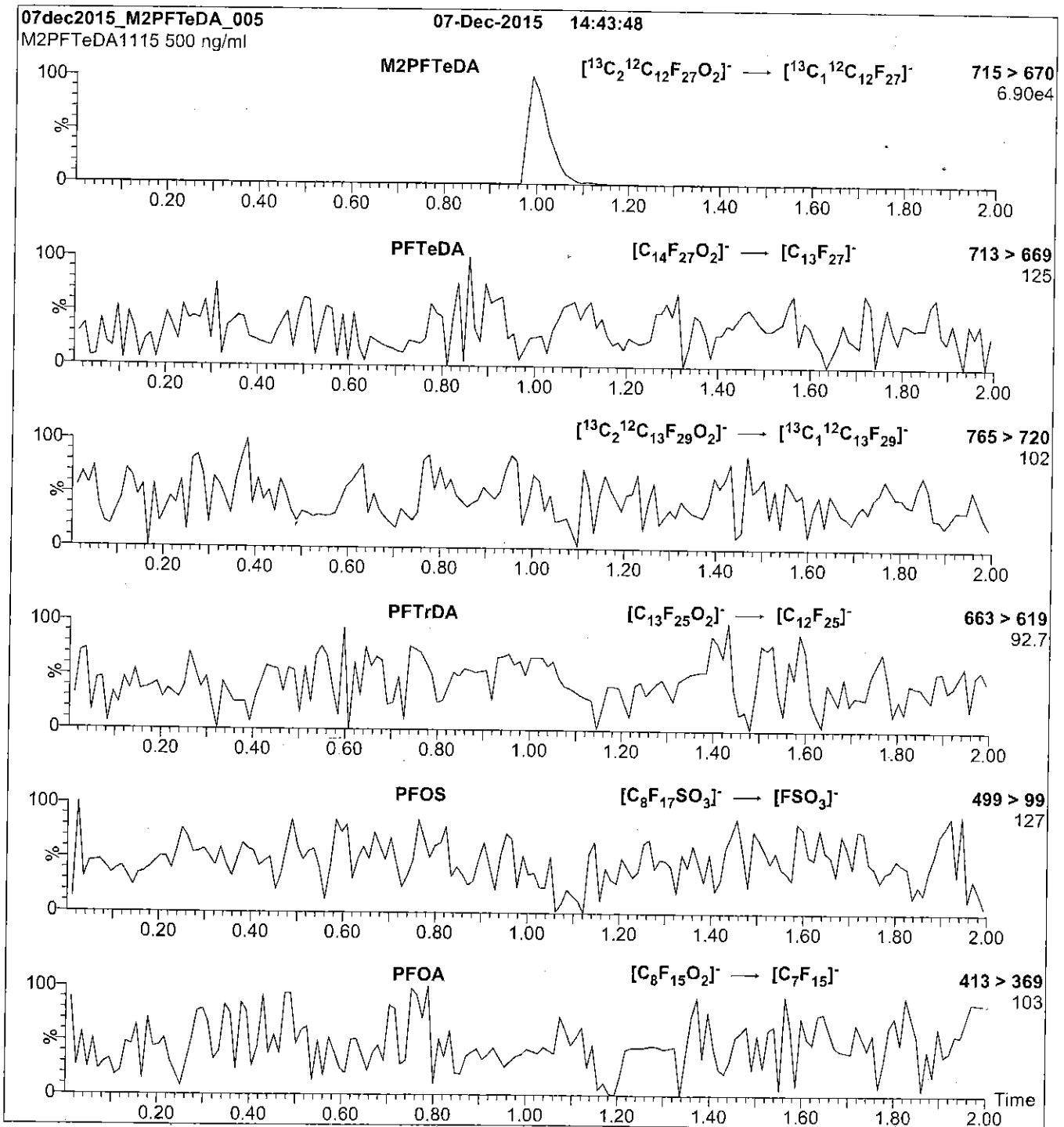
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml M2PFTeDA)

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

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCM4PFHPA_00004



R: 3/3/16 CBW

591159

ID: LCM4PFHPA_00004

Exp: 05/22/20 Ppdt: CBW

13C4-Perfluoroheptanoic a



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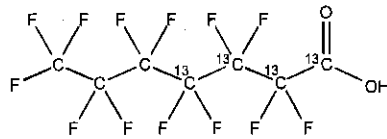
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M4PFHpA
COMPOUND: Perfluoro-n-[1,2,3,4-¹³C₄]heptanoic acid

LOT NUMBER: M4PFHpA0515

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₄¹²C₃HF₁₃O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 368.03
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/22/2015

ISOTOPIC PURITY: ≥99%¹³C
(1,2,3,4-¹³C₄)

EXPIRY DATE: (mm/dd/yyyy) 05/22/2020

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

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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.

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Certified By:

B.G. Chittim

Date: 05/25/2015

(mm/dd/yyyy)

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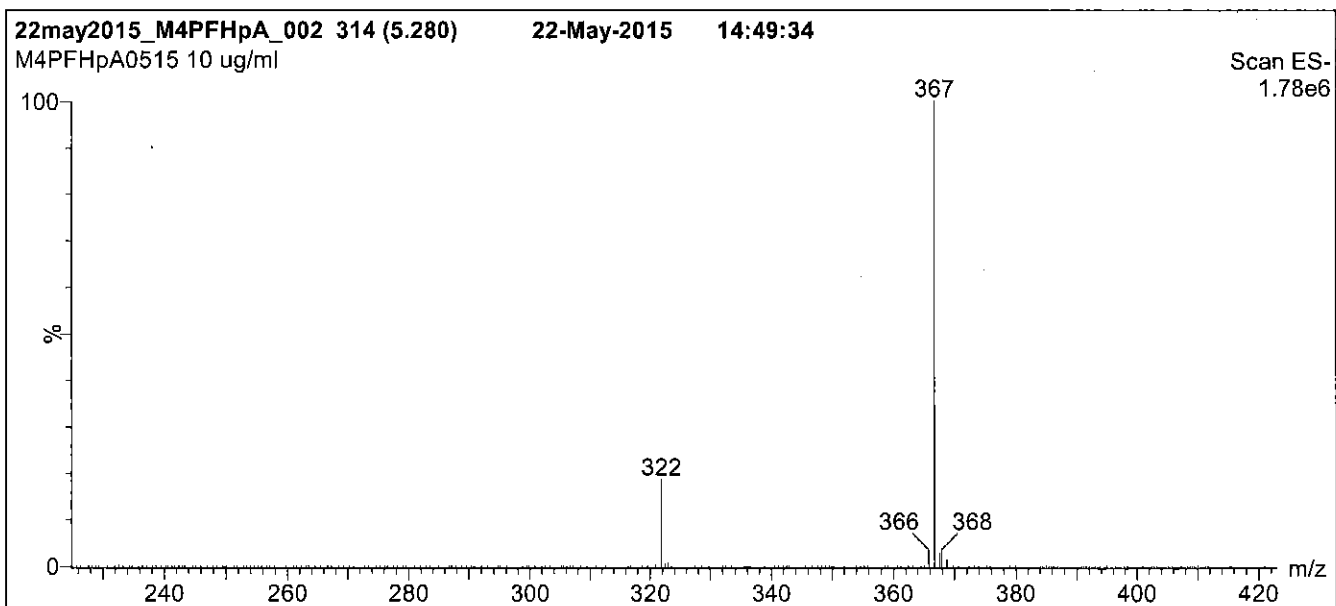
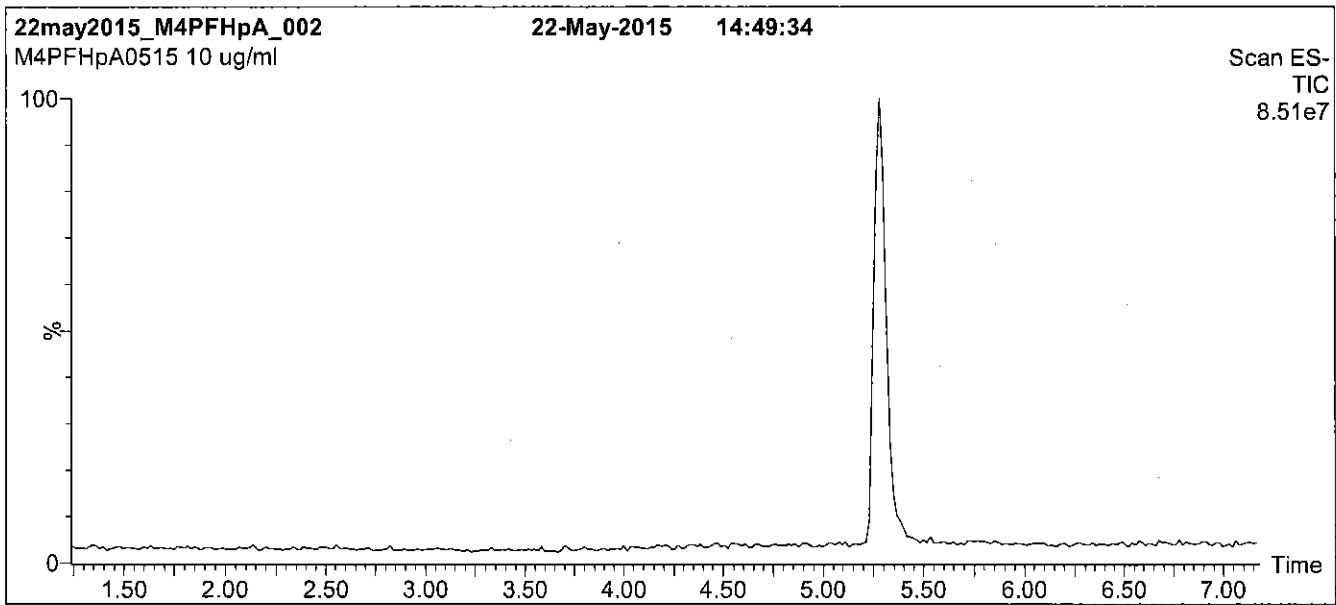
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Figure 1: M4PFHpA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H₂O
(both with 10 mM NH₄OAc 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

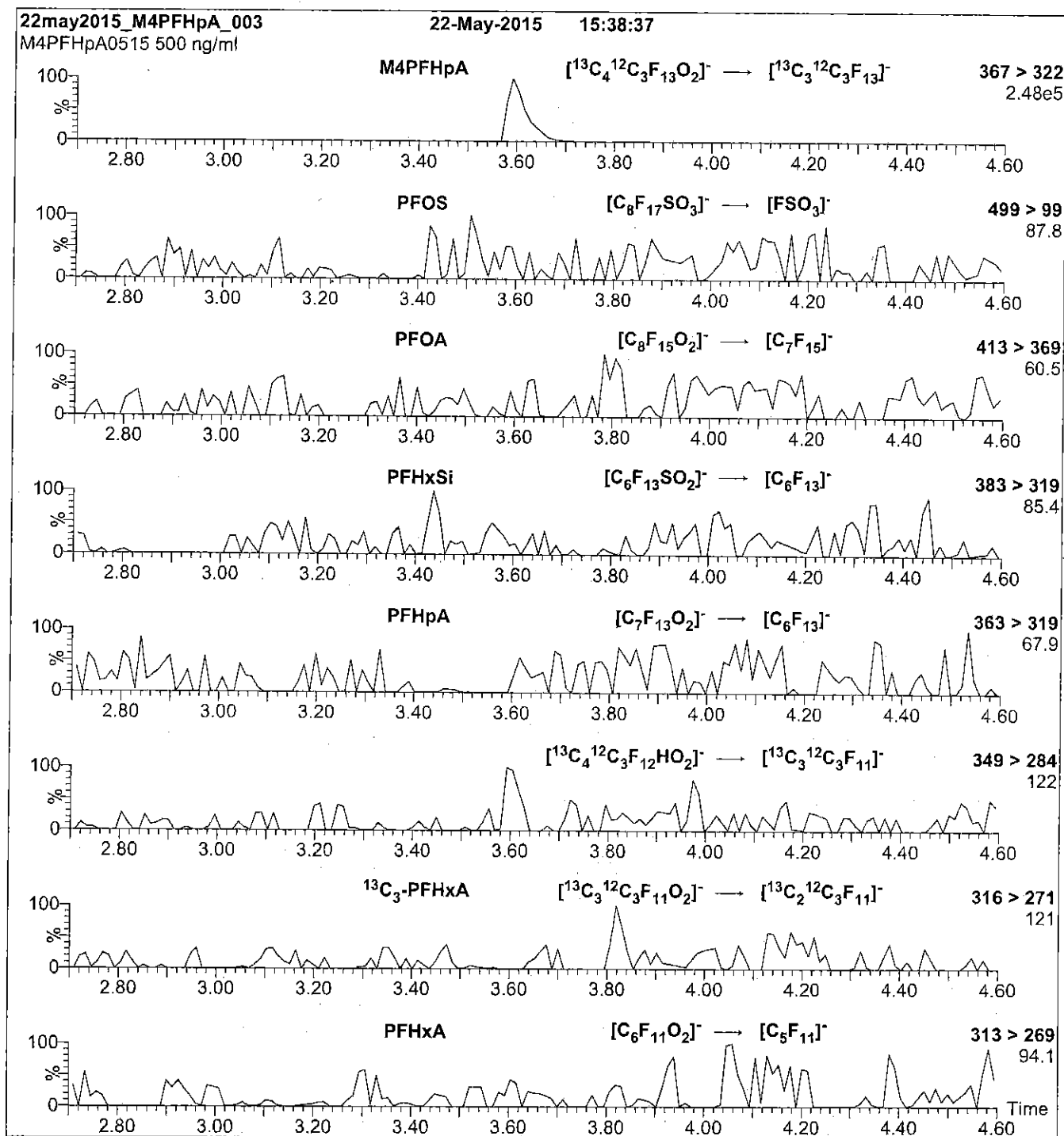
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCM4PFHPA_00005



R: 4/7/16 CBW

609711

ID: LCM4PFHPA_00005

Exp: 05/22/20 Prpd: CBW

13C4-Perfluoroheptanoic a



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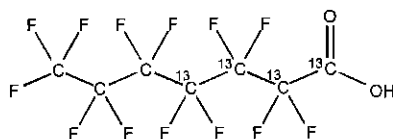
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M4PFHpA
COMPOUND: Perfluoro-n-[1,2,3,4-¹³C₄]heptanoic acid

LOT NUMBER: M4PFHpA0515

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₄¹²C₃HF₁₃O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 368.03

SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ¹³C

LAST TESTED: (mm/dd/yyyy) 05/22/2015

(1,2,3,4-¹³C₄)

EXPIRY DATE: (mm/dd/yyyy) 05/22/2020

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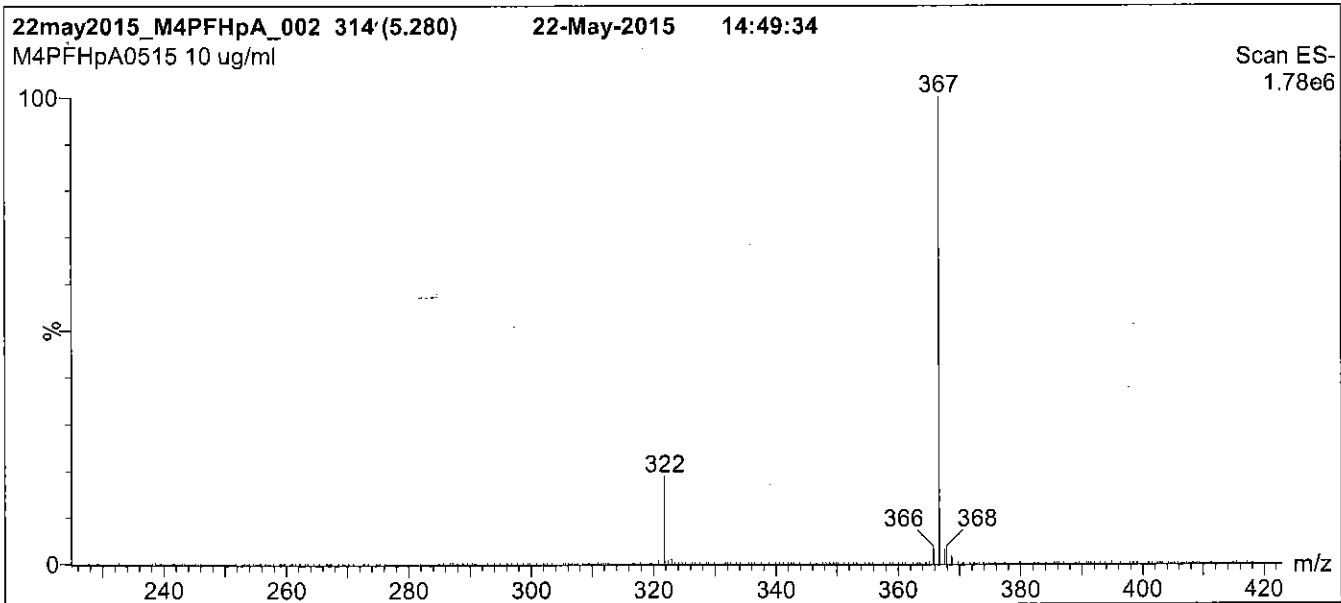
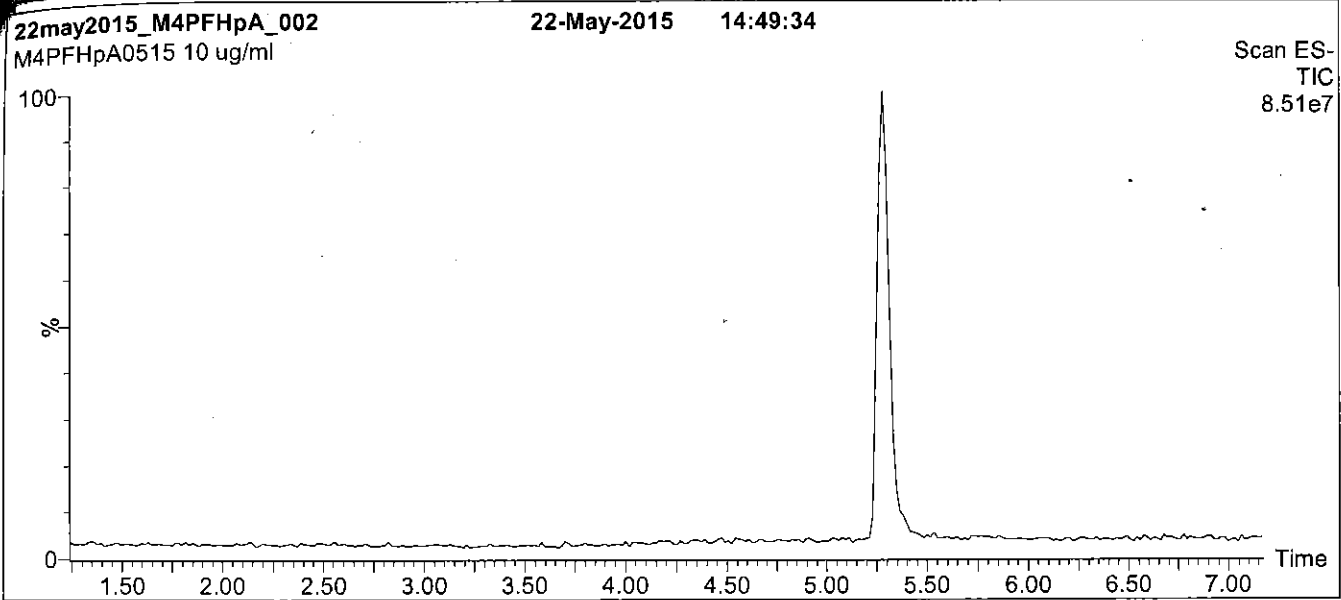
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Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

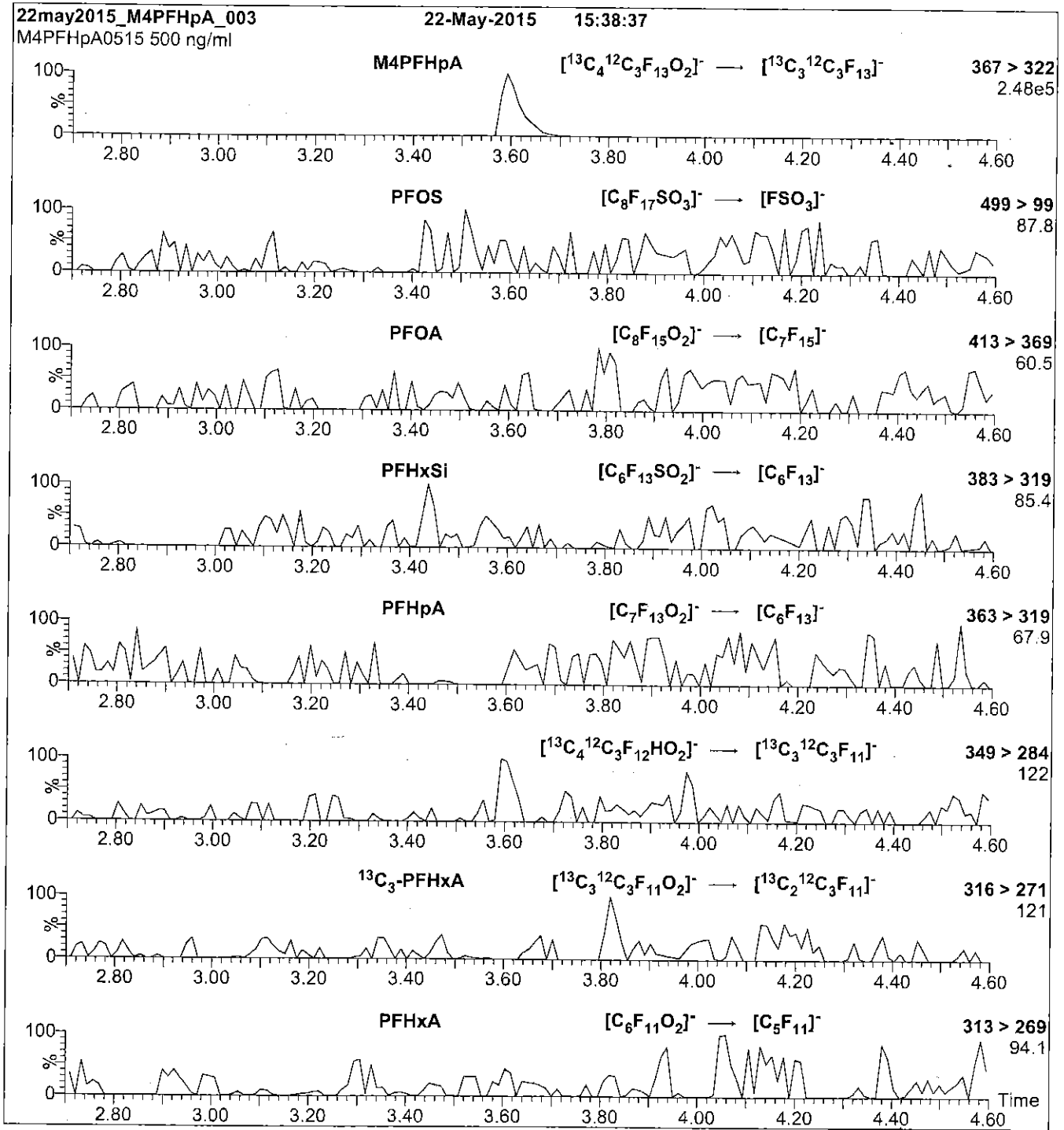
Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/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% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM5PFPEA_00005



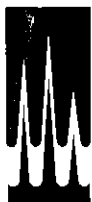
R: 3/3/16 CBW

591160

ID: LCM5PFPEA_00005

Exp: 05/22/20 Prod: CBW

13C5-Perfluoropentanoic a



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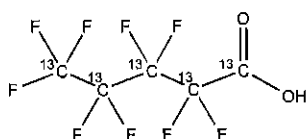
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M5PFPeA
COMPOUND: Perfluoro-n-[¹³C₅]pentanoic acid

LOT NUMBER: M5PFPeA0515

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₅HF₉O₂
CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ¹³C
(¹³C₅)

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:

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

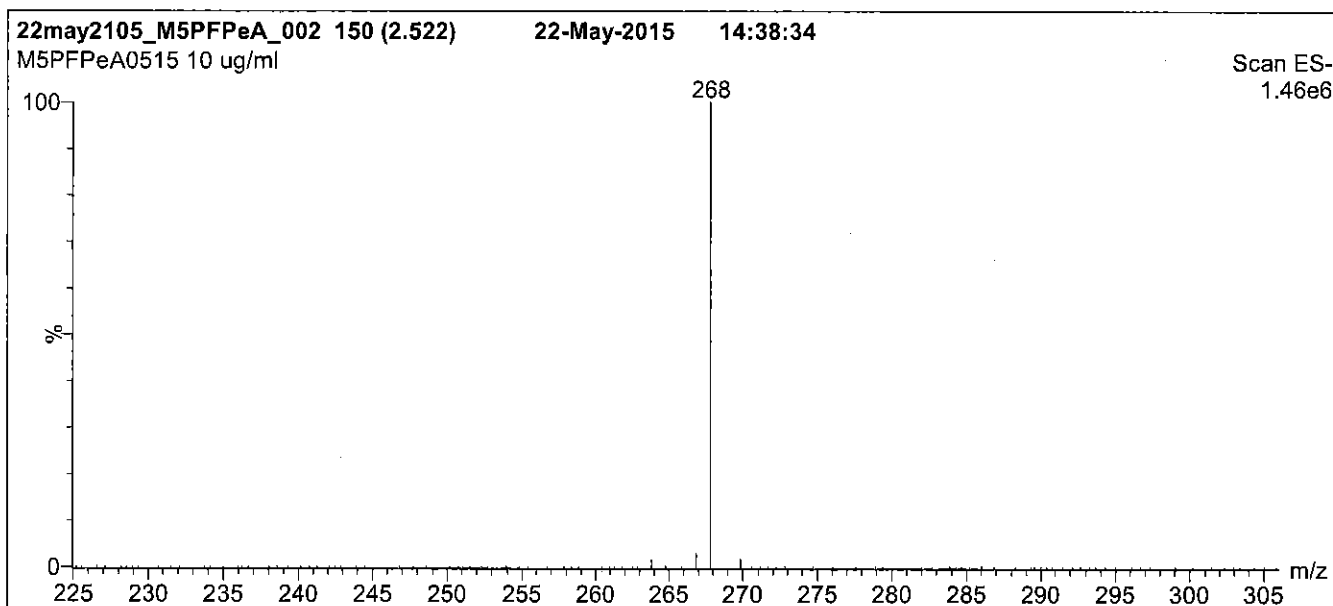
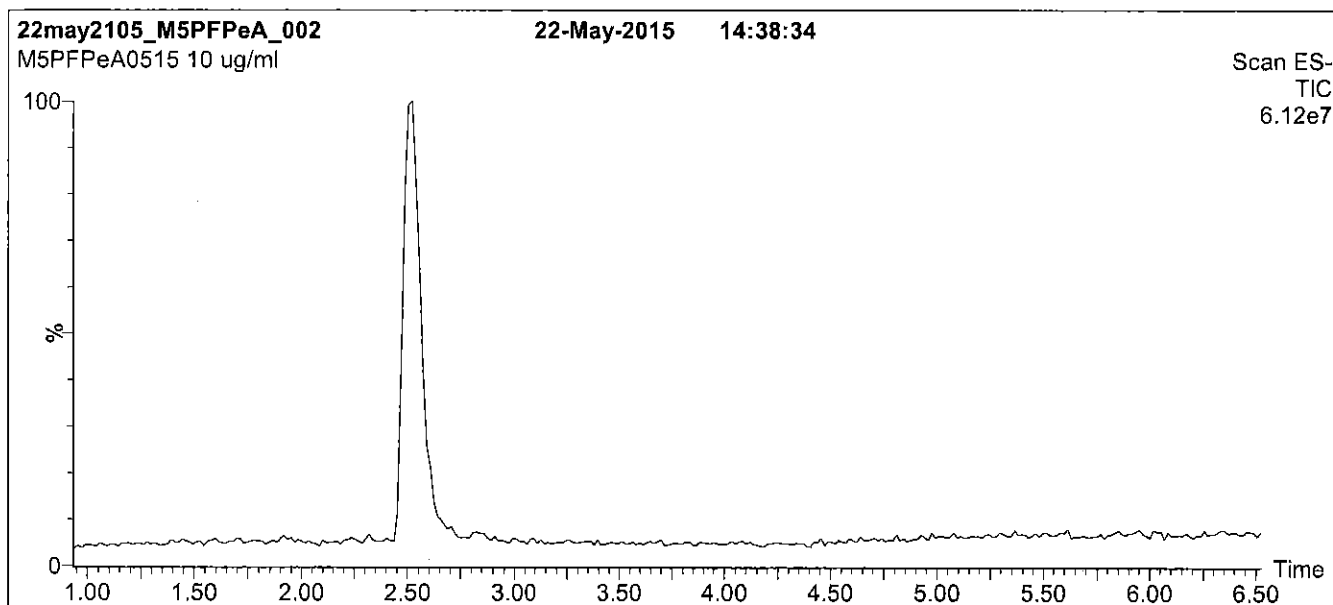
QUALITY MANAGEMENT:

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).



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H₂O
(both with 10 mM NH₄OAc 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

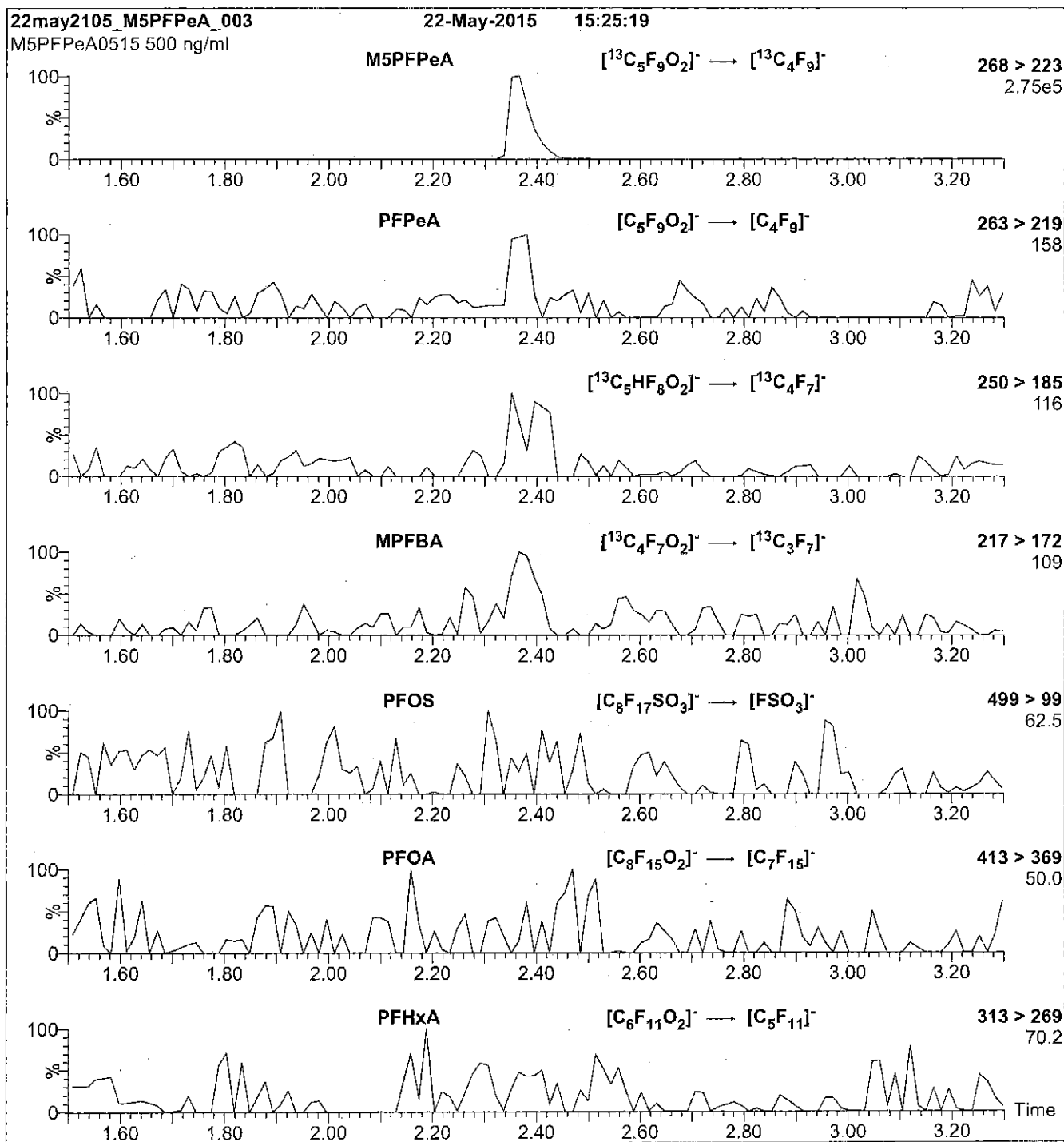
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

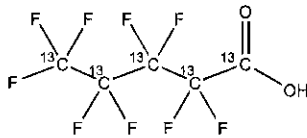
LCM5PFPEA_00006



R: 4/7/16 CBW

609706

ID: LCM5PFPEA_00006

Exp: 05/22/20 Prod: CBW
13C5-Perfluoropentanoic a**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:** M5PFPeA
COMPOUND: Perfluoro-n-[¹³C₅]pentanoic acid**LOT NUMBER:** M5PFPeA0515**STRUCTURE:****CAS #:** Not available**MOLECULAR FORMULA:** ¹³C₅HF₉O₂
CONCENTRATION: 50 ± 2.5 µg/ml**MOLECULAR WEIGHT:** 269.01
SOLVENT(S): Methanol
Water (<1%)**CHEMICAL PURITY:** >98%
LAST TESTED: (mm/dd/yyyy) 05/22/2015
EXPIRY DATE: (mm/dd/yyyy) 05/22/2020**ISOTOPIC PURITY:** ≥99% ¹³C
(¹³C₅)**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:

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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. 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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

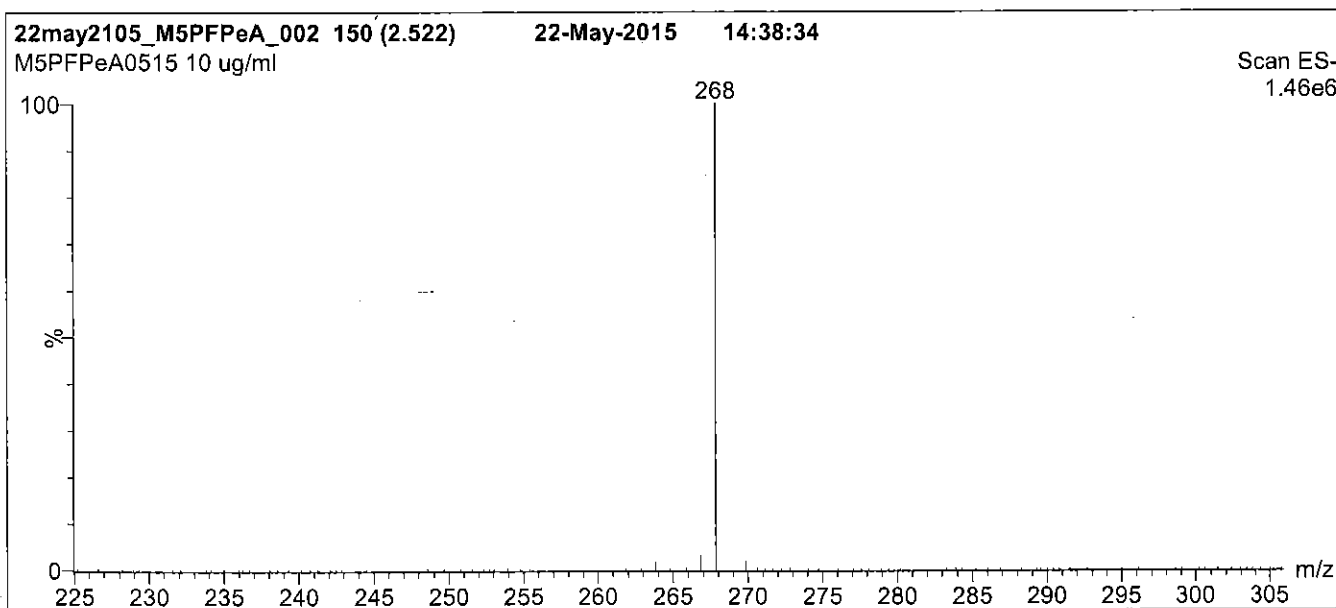
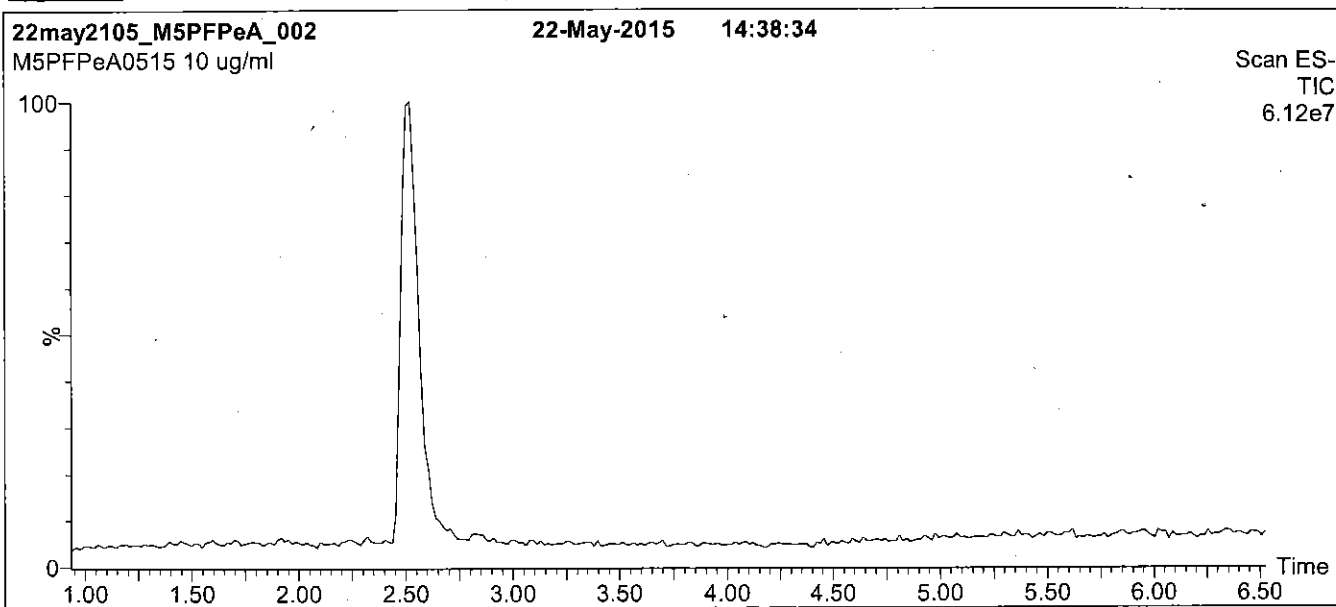
QUALITY MANAGEMENT:

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).



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

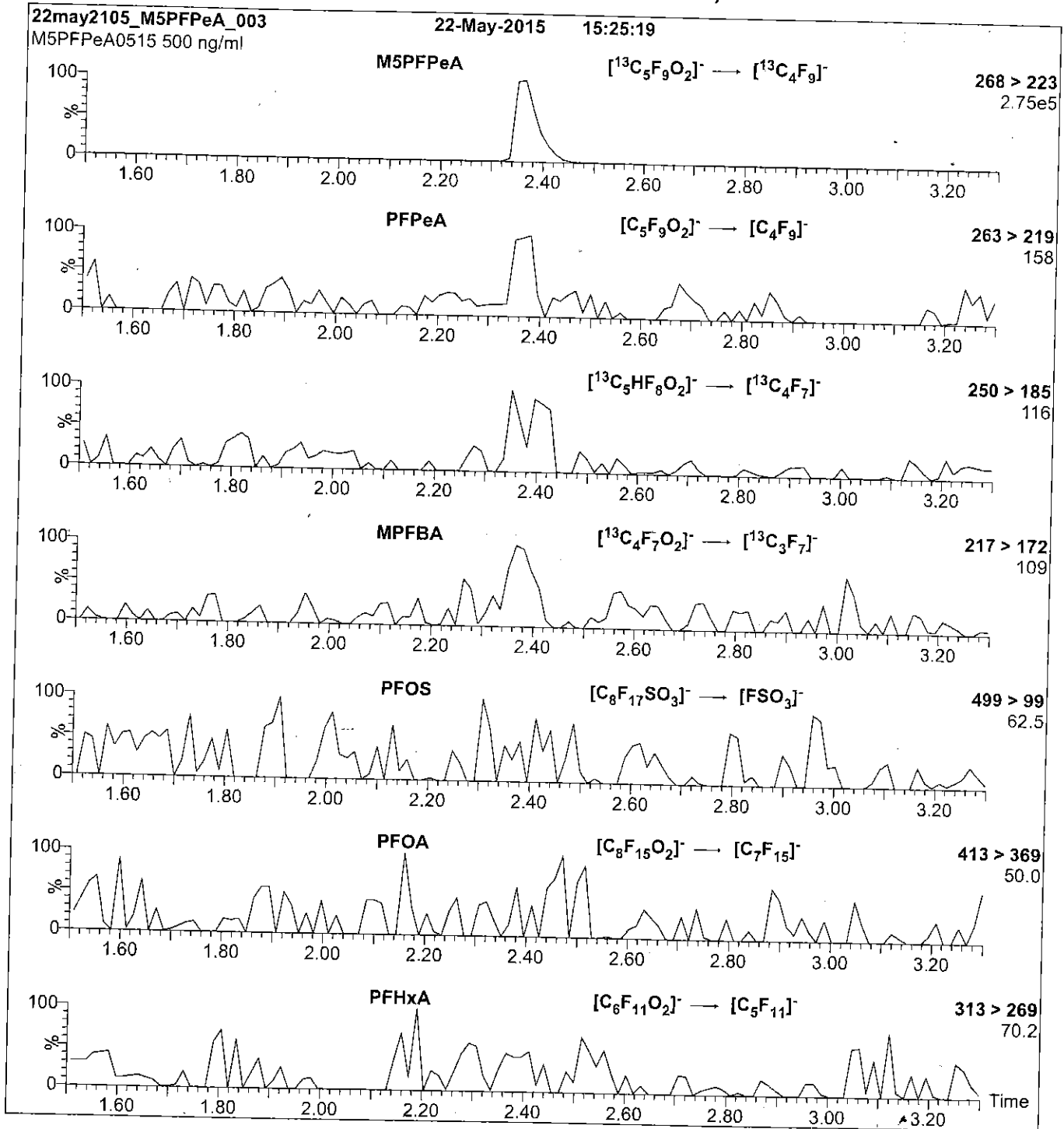
Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCM8FOSA_00008



R: 3/3/16 CBW

591143

ID: LCM8FOSA_00008

Exp: 12/22/17 Prod: CBW

13C8-Perfluorooctanesulfo



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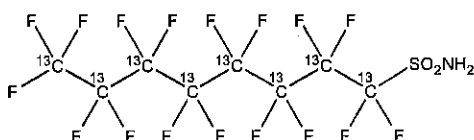
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M8FOSA-I
COMPOUND: Perfluoro-1-[¹³C₈]octanesulfonamide

LOT NUMBER: M8FOSA1215I

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₈H₂F₁₇NO₂S
CONCENTRATION: 50 ± 2.5 µg/ml
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/22/2015
EXPIRY DATE: (mm/dd/yyyy) 12/22/2017
RECOMMENDED STORAGE: Refrigerate ampoule

MOLECULAR WEIGHT: 507.09
SOLVENT(S): Isopropanol
ISOTOPIC PURITY: ≥99% ¹³C
(¹³C₈)

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 01/14/2016

(mm/dd/yyyy)

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

INTENDED USE:

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HOMOGENEITY:

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

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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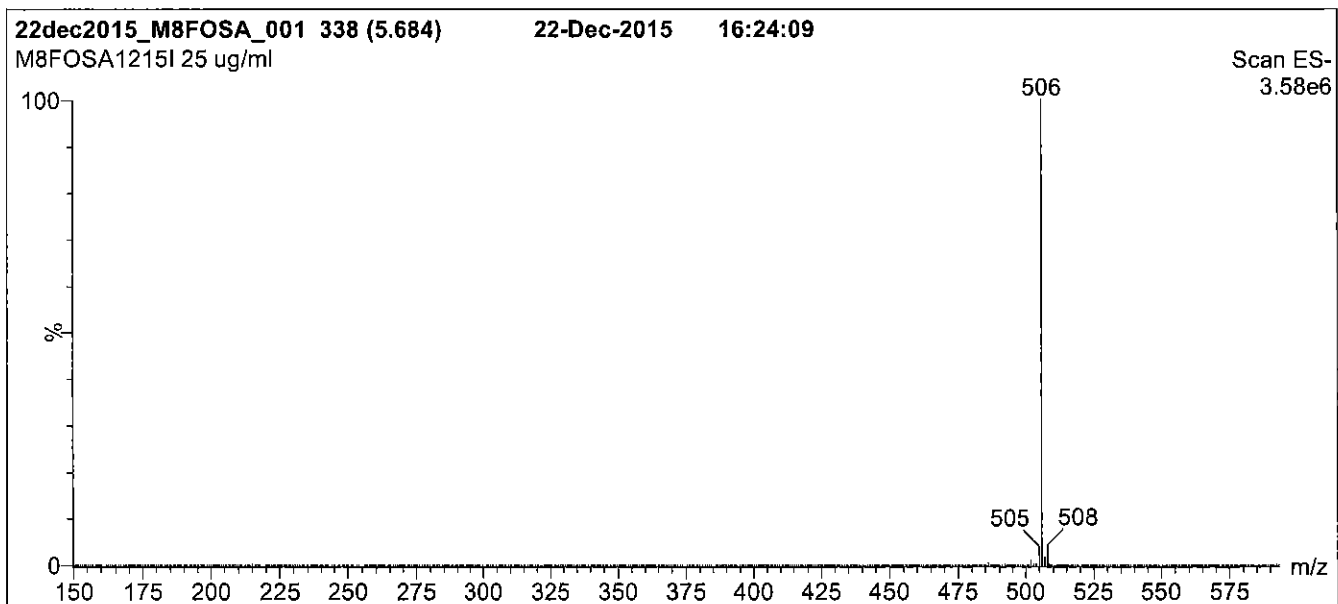
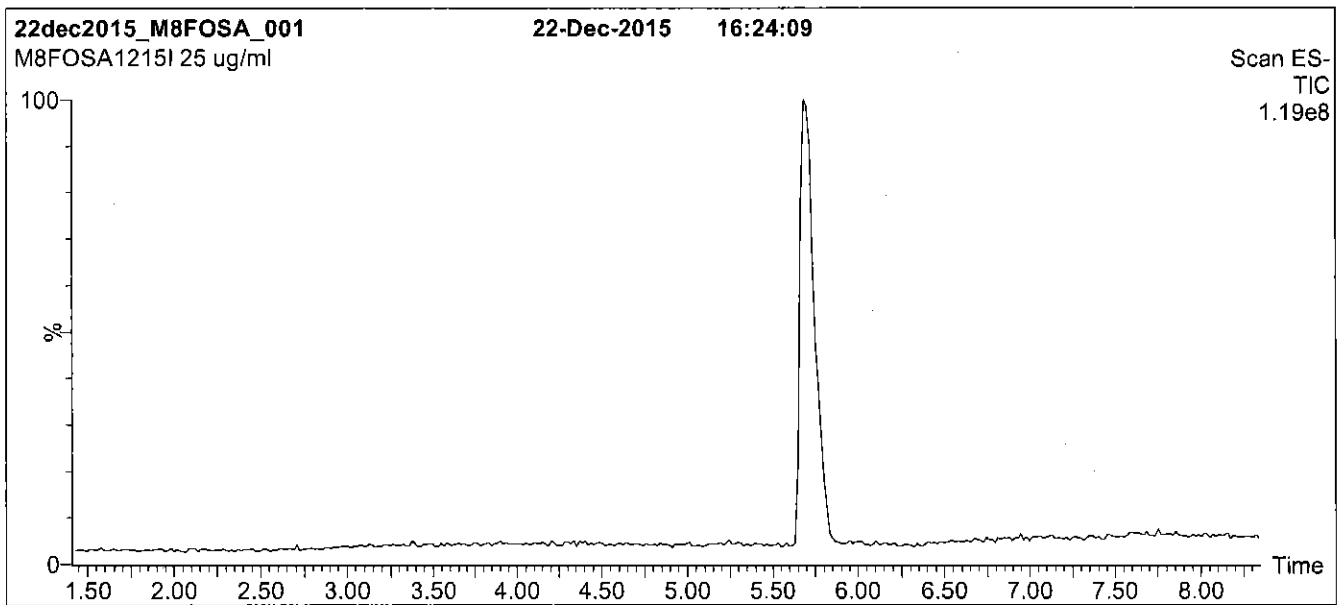
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

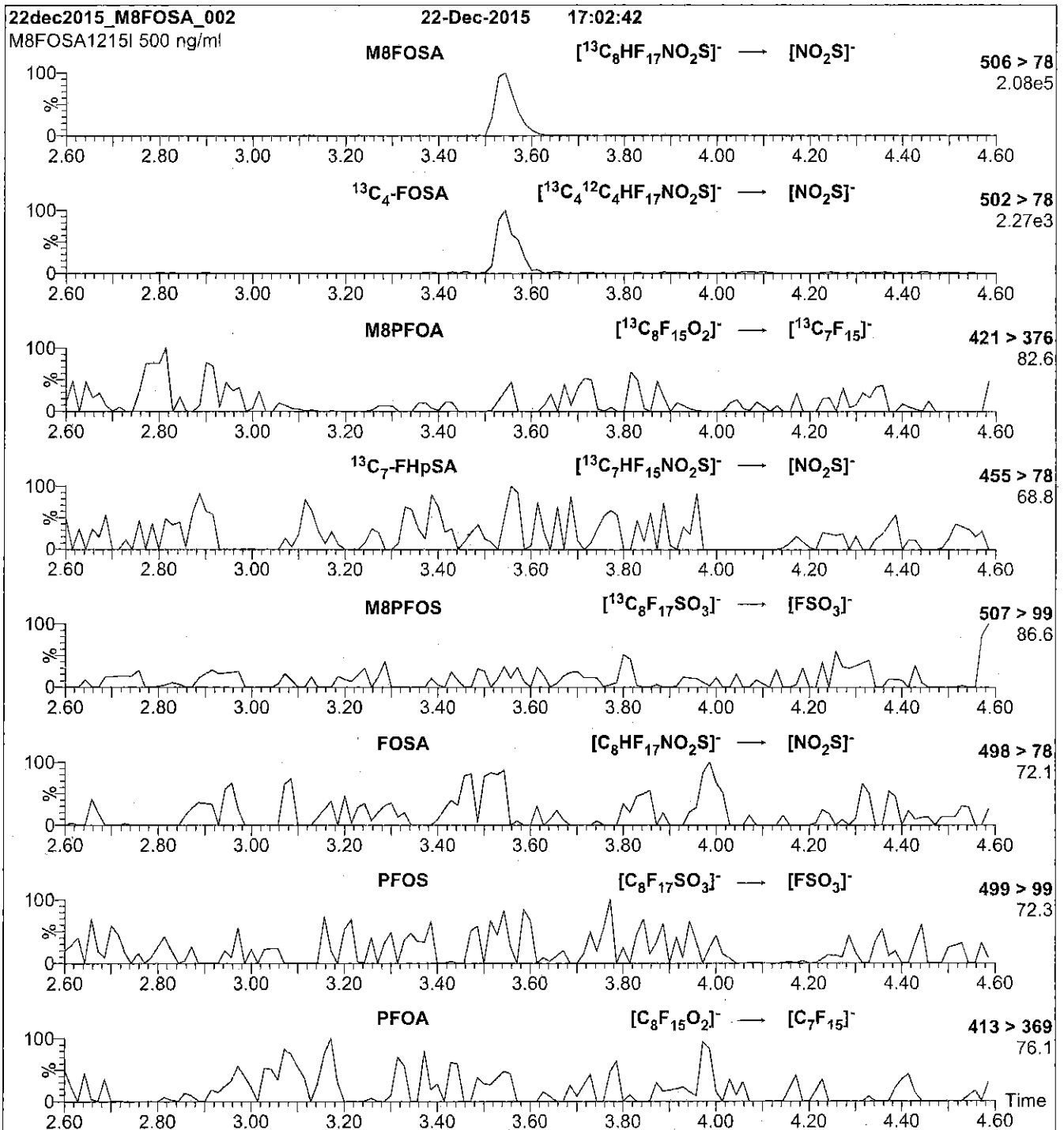
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCM8FOSA_00009



R=4/7/16 CBW

609714

ID: LCM8FOSA_00009

Exp: 12/22/17 Prpd: CBW

13C8-Perfluorooctanesulfo



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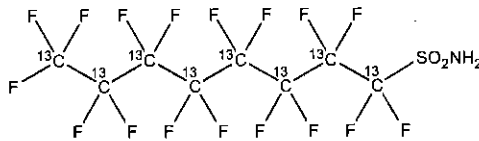
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M8FOSA-I
COMPOUND: Perfluoro-1-[¹³C₈]octanesulfonamide

LOT NUMBER: M8FOSA1215I

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₈H₂F₁₇NO₂S
CONCENTRATION: 50 ± 2.5 µg/ml
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/22/2015
EXPIRY DATE: (mm/dd/yyyy) 12/22/2017
RECOMMENDED STORAGE: Refrigerate ampoule

MOLECULAR WEIGHT: 507.09
SOLVENT(S): Isopropanol
ISOTOPIC PURITY: ≥99% ¹³C
(¹³C₈)

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 01/14/2016
(mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON 'N1G 3M5 CANADA
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HOMOGENEITY:

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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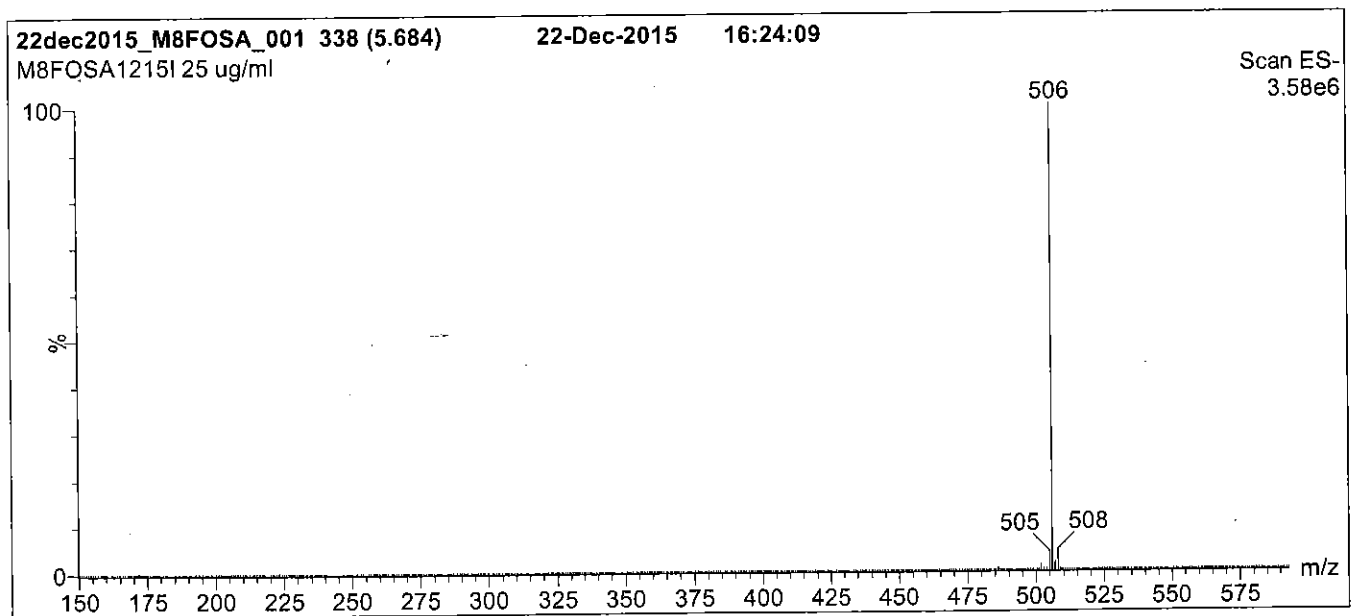
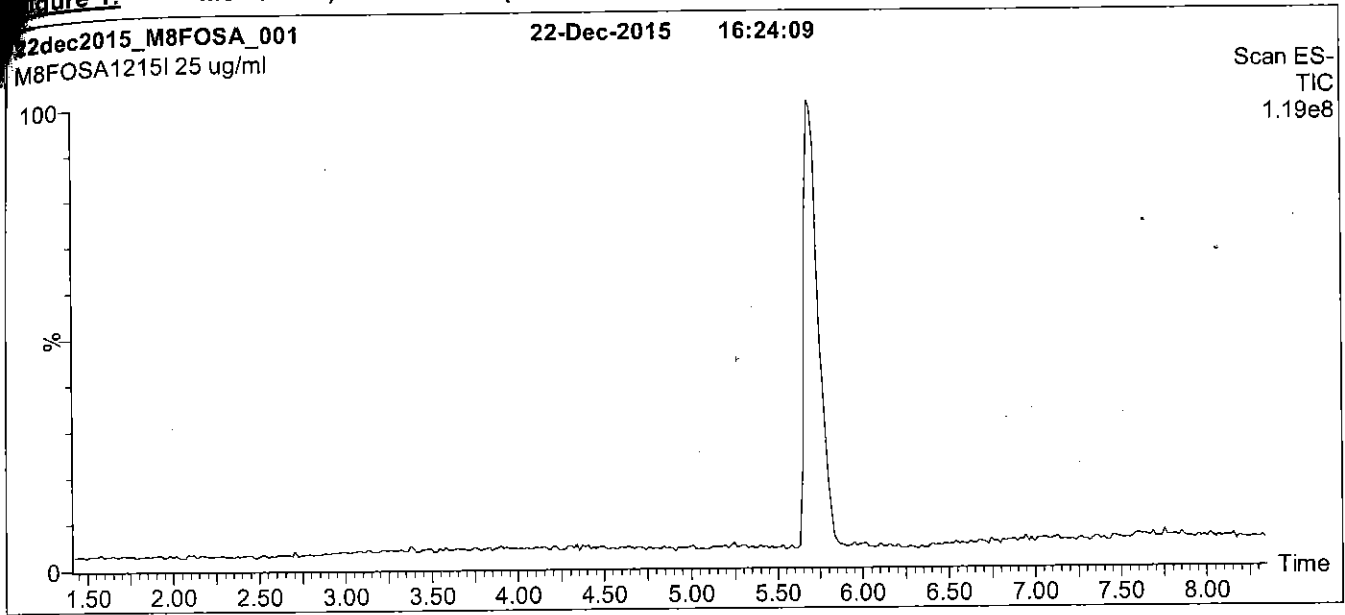
QUALITY MANAGEMENT:

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).



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

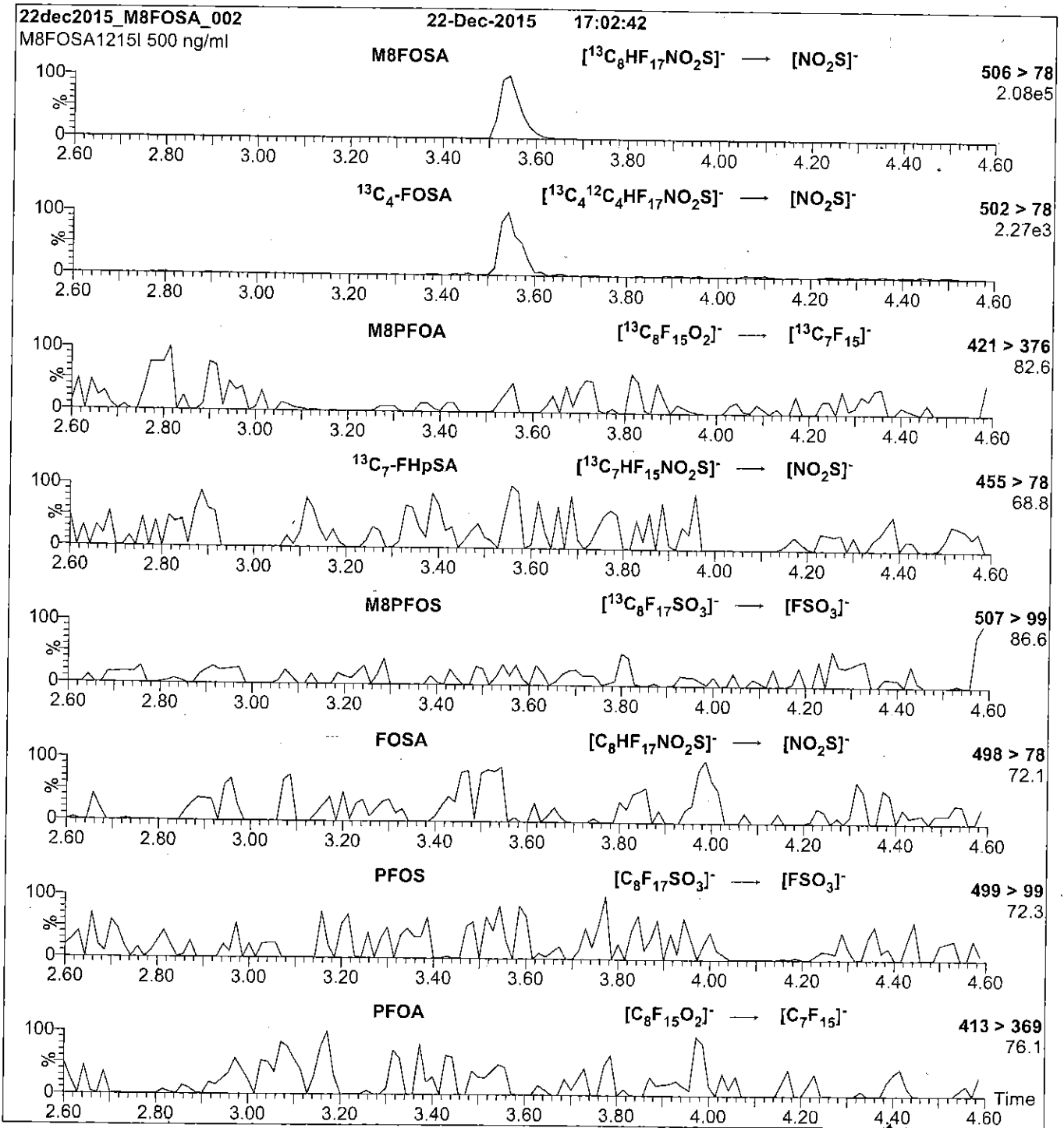
Flow: 300 μ l/min

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% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFBA_00005



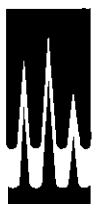
R: 3/3/16 CBW

591161

ID: LCMFBA_00005

Exp: 10/31/19 Prep: CBW

13C4-Perfluorobutanoic ac



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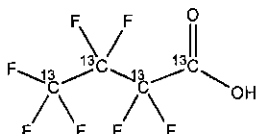
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFBA
COMPOUND: Perfluoro-n-[1,2,3,4-¹³C₄]butanoic acid

LOT NUMBER: MPFBA1014

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₄HF₇O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 218.01
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/31/2014

ISOTOPIC PURITY: ≥99%¹³C
(1,2,3,4-¹³C₄)

EXPIRY DATE: (mm/dd/yyyy) 10/31/2019

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 03/31/2015

(mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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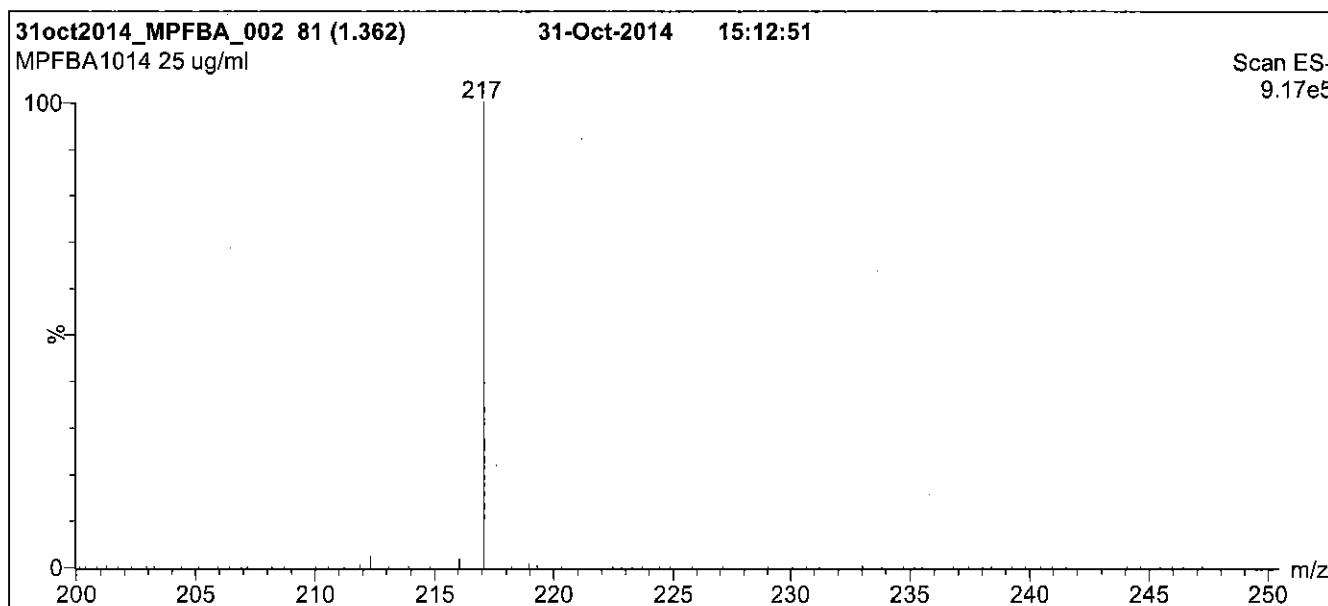
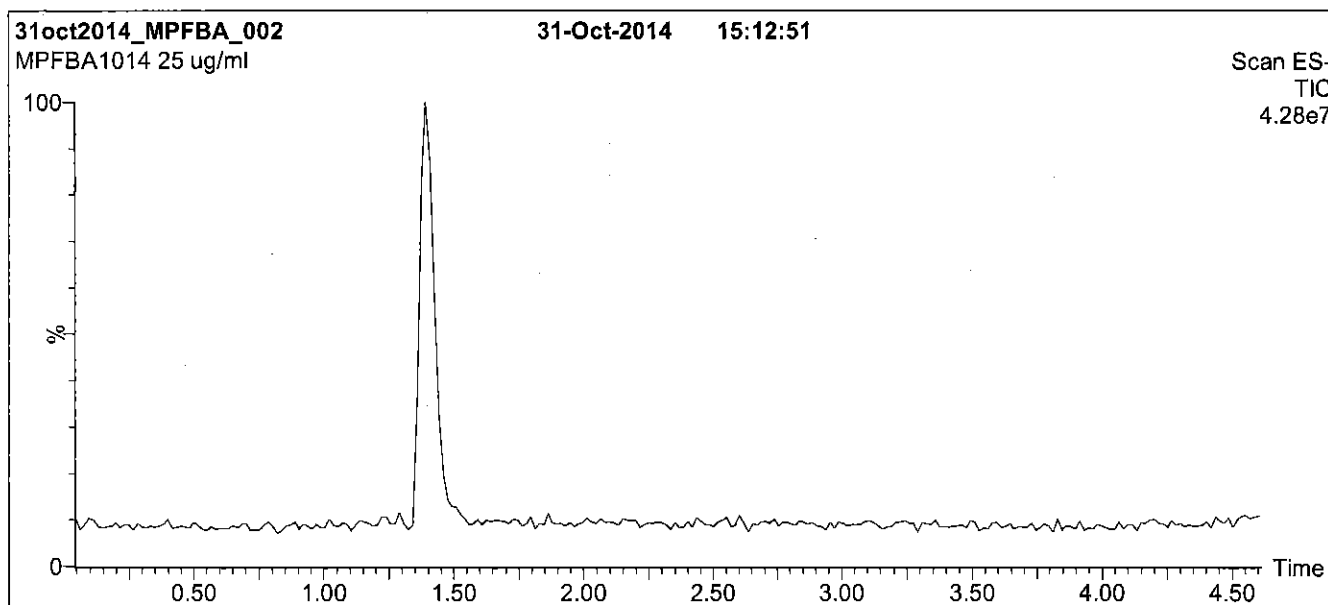
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H₂O
(both with 10 mM NH₄OAc 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

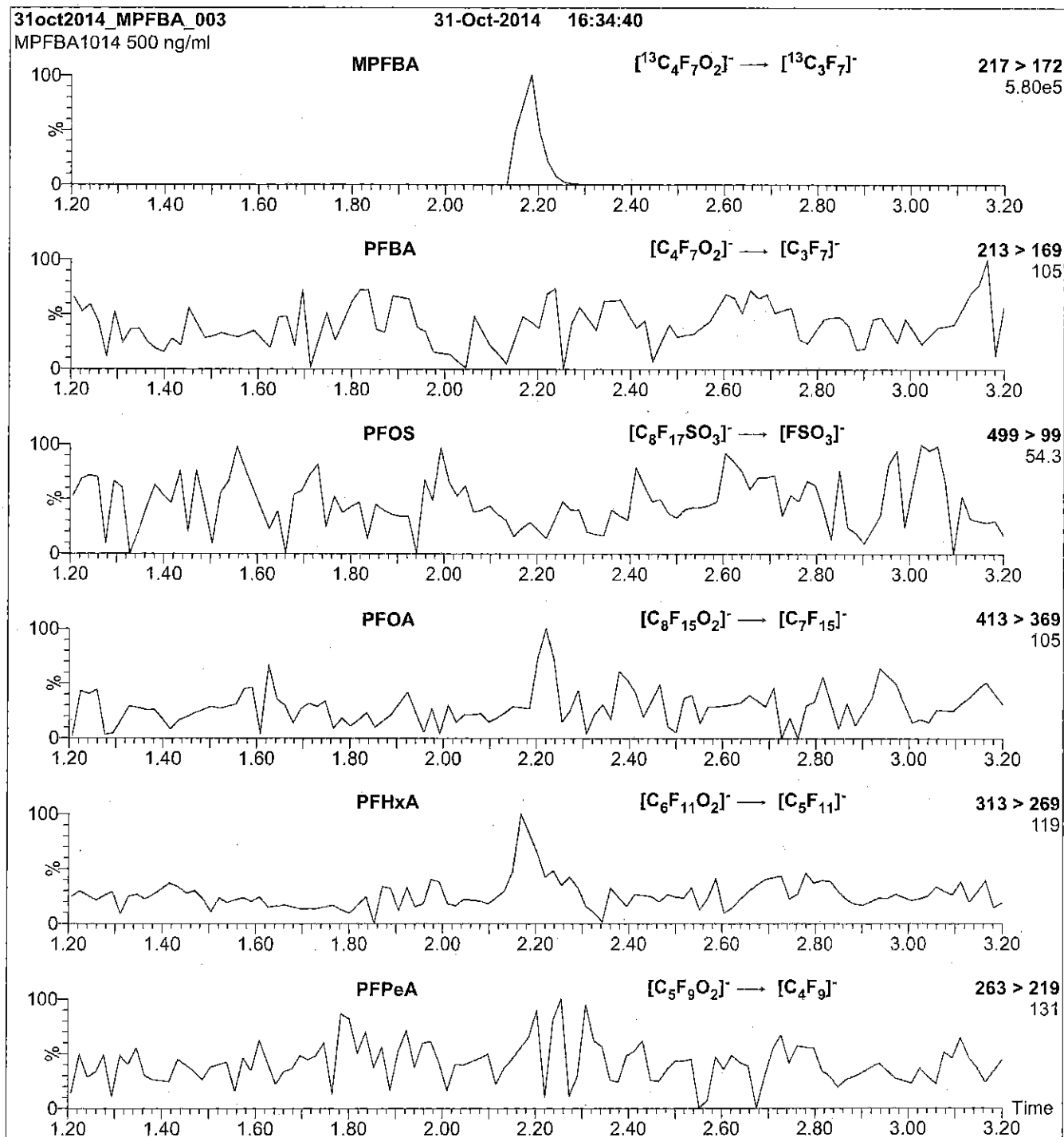
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFBA_00006



R=4/7/16 CBW

609707

ID: LCMPPFBA_00006

Exp: 10/31/19 Ppnd: CBW

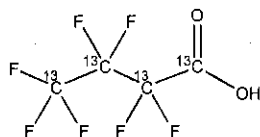
13C4-Perfluorobutanoic ac



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFBA **LOT NUMBER:** MPFBA1014
COMPOUND: Perfluoro-n-[1,2,3,4-¹³C₄]butanoic acid
STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₄HF₇O₂ **MOLECULAR WEIGHT:** 218.01
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99%¹³C
 (1,2,3,4-¹³C₄)
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.

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Certified By:

B.G. Chittim

Date: 03/31/2015

(mm/dd/yyyy)

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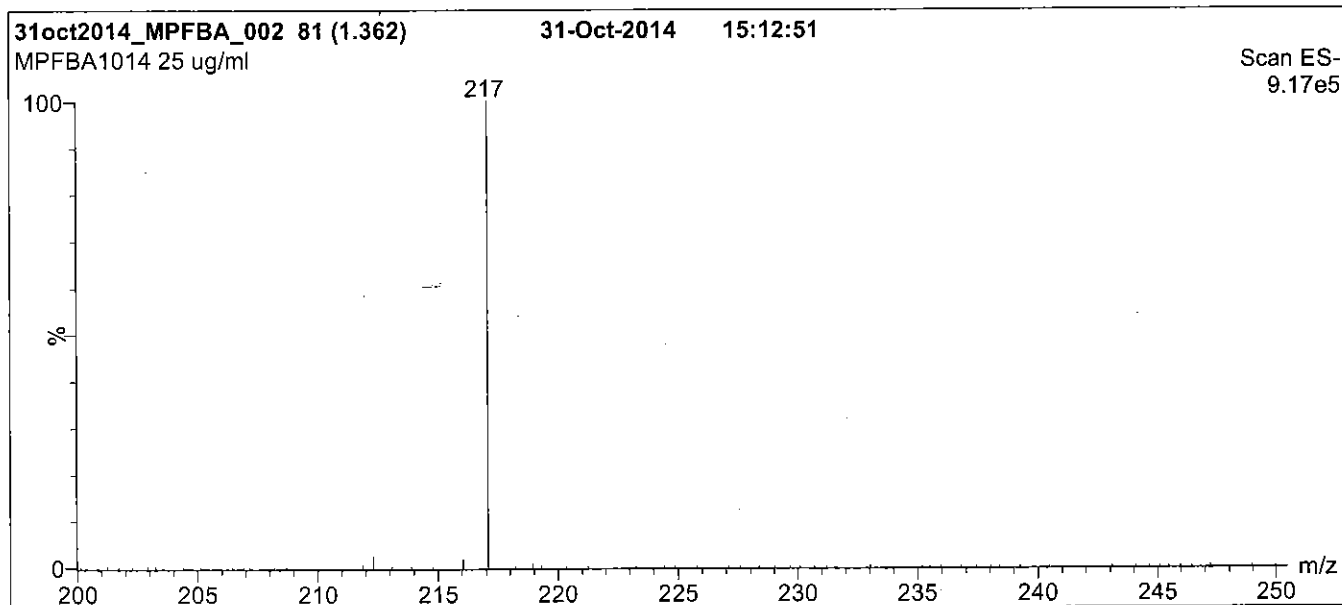
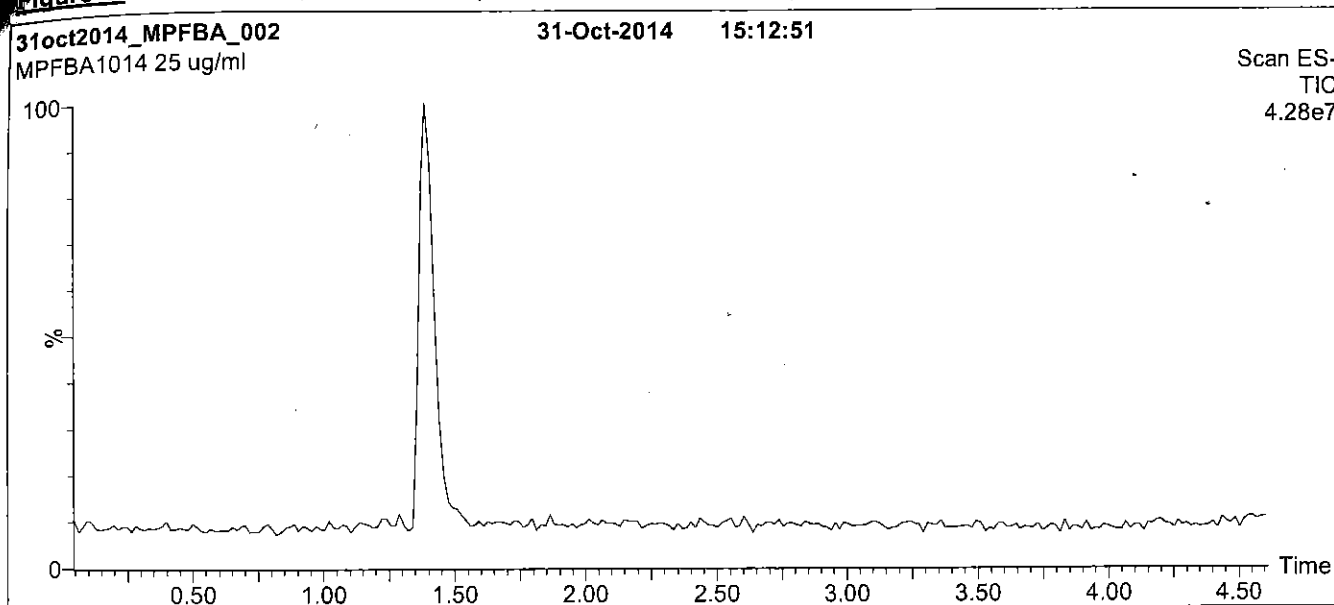
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Figure 1: MPFBA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H₂O
(both with 10 mM NH₄OAc 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

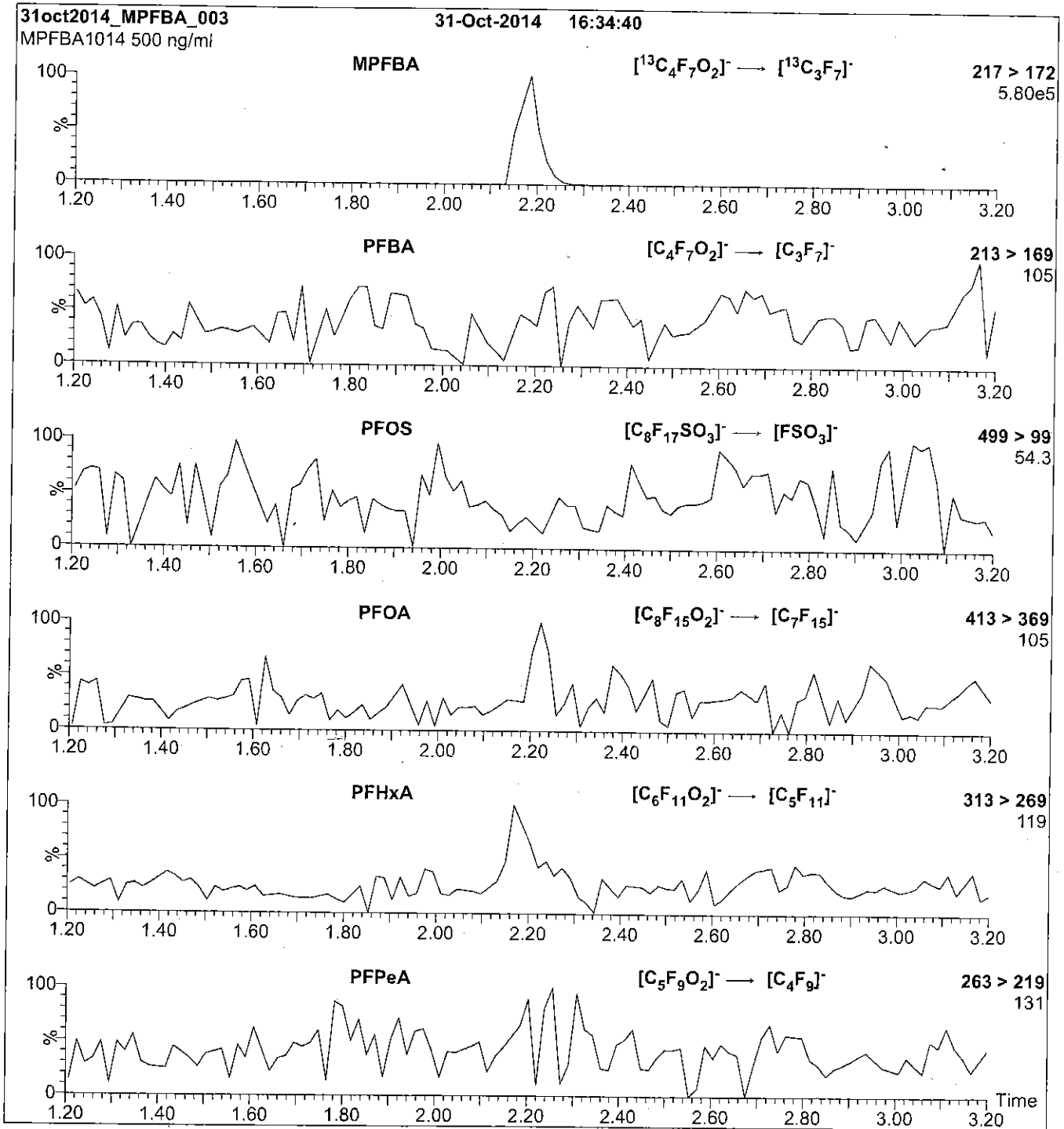
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFDA_00007



Rec. 3/29/16 JRB ✓

605232
ID: LCMPFDA_00007
Exp: 08/19/20 Prpd: CBW
13C2-Perfluorodecanoic a



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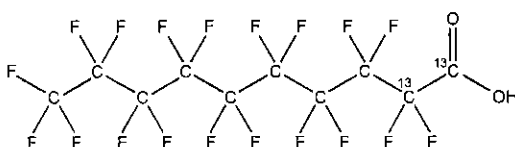
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDA
COMPOUND: Perfluoro-n-[1,2-¹³C₂]decanoic acid

LOT NUMBER: MPFDA0815

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₂¹²C₈HF₁₉O₂
CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/19/2015
EXPIRY DATE: (mm/dd/yyyy) 08/19/2020

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

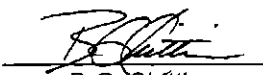
DOCUMENTATION/ DATA ATTACHED:

- 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 ¹³C₁-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim

Date: 08/21/2015
(mm/dd/yyyy)

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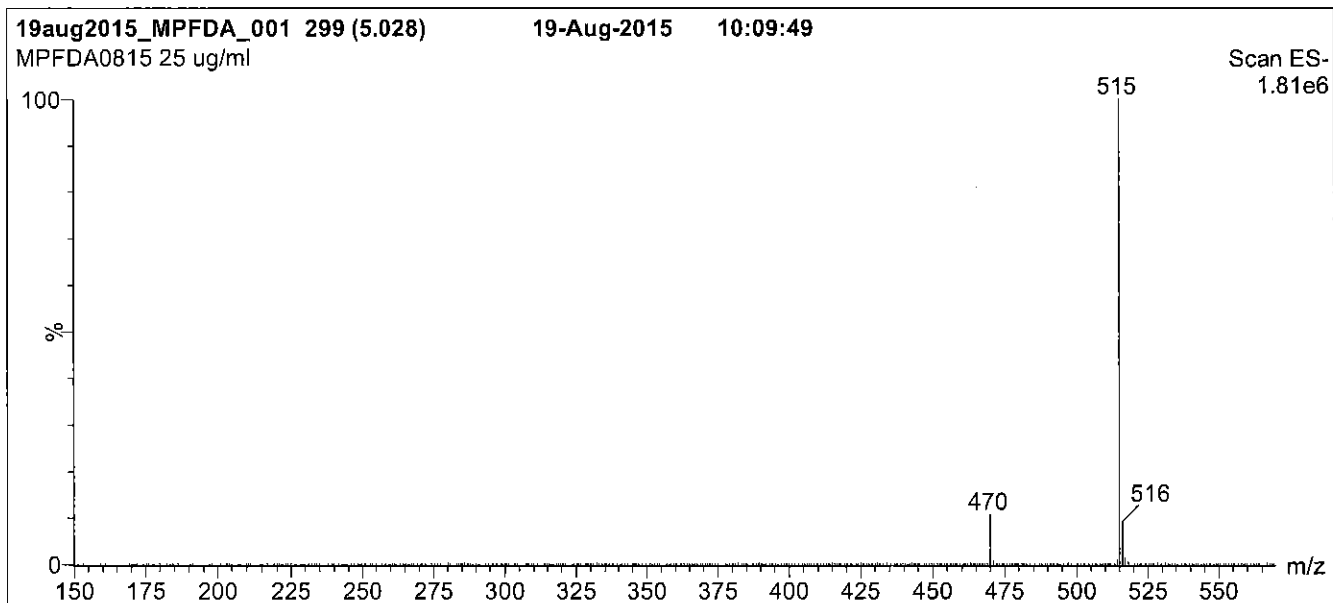
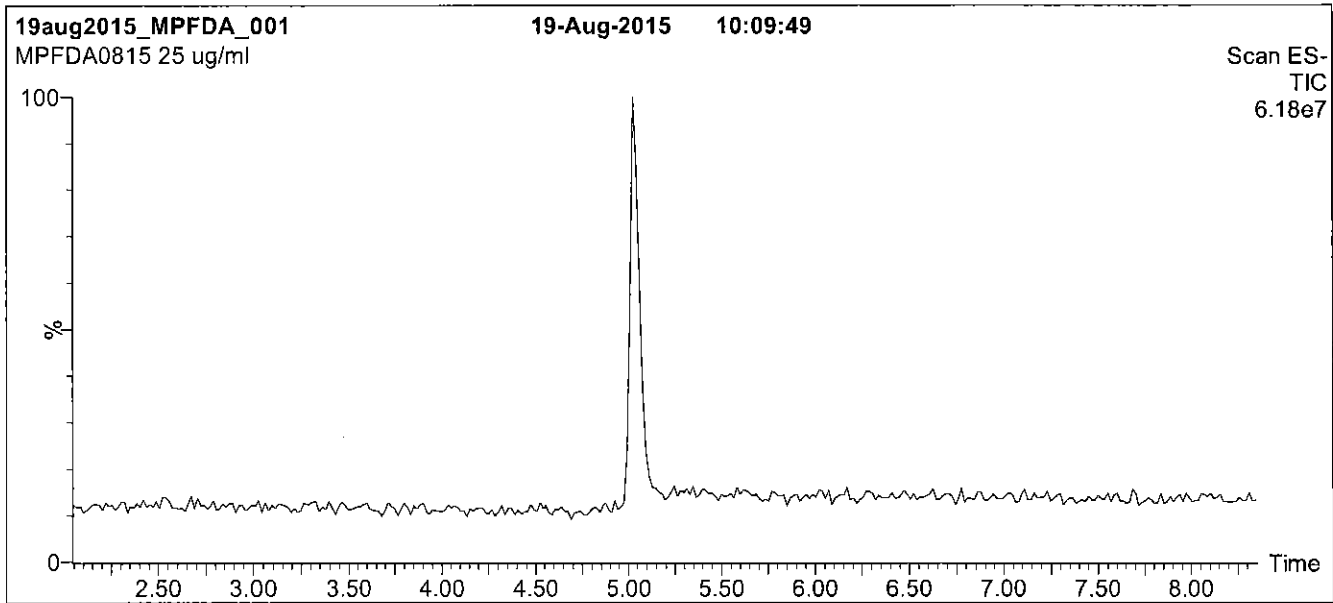
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LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP,
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

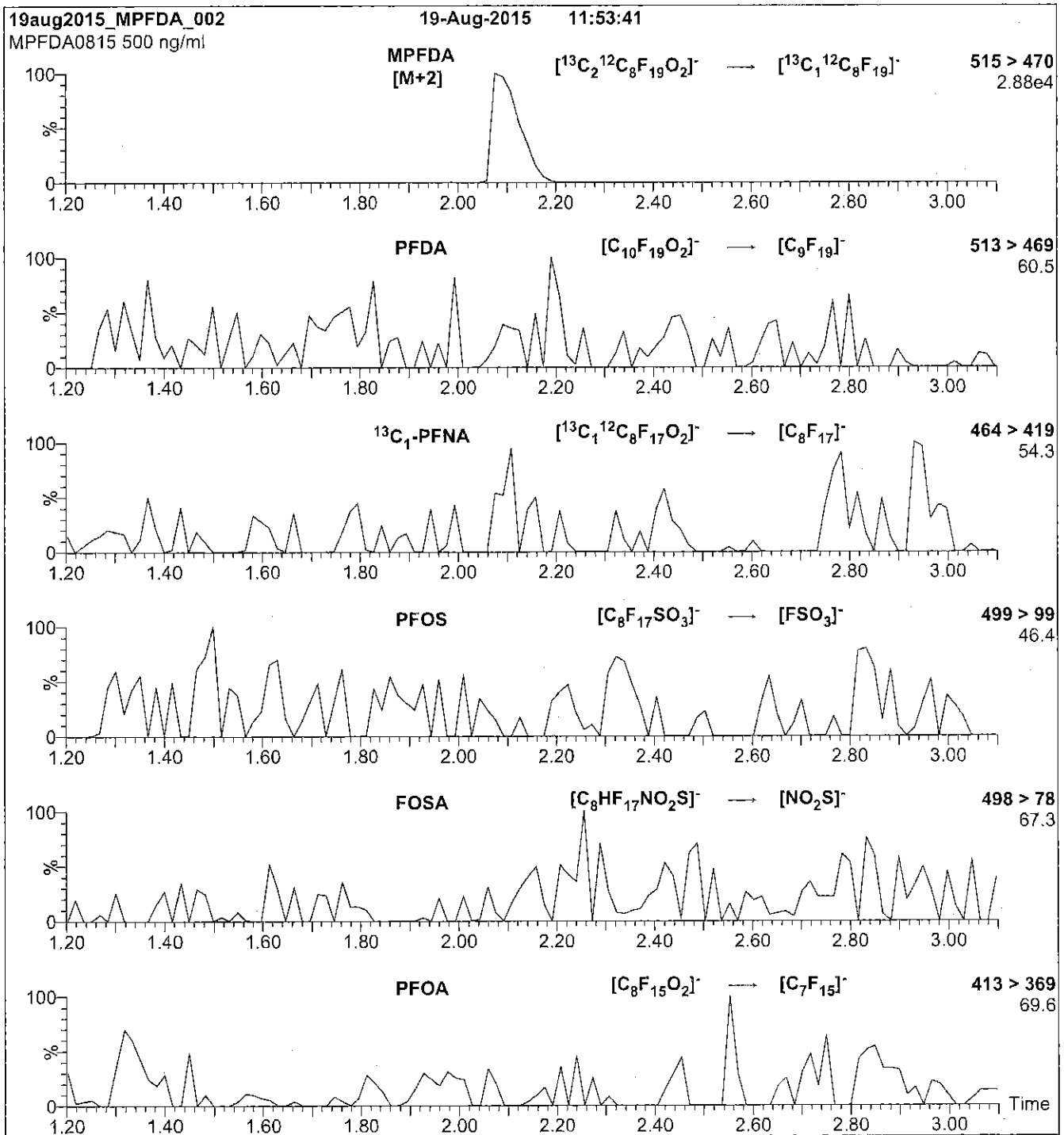
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFD_oA_00005

591162
ID: LCMPFDoA_00005
Exp: 07/17/19 Prep: CBW
13C2-Perfluorododecanoic

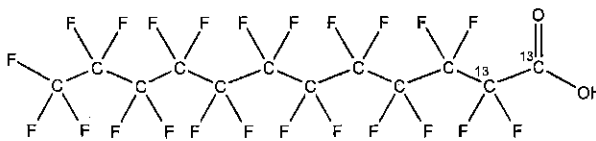
R: 3/3/16 CBW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDoA **LOT NUMBER:** MPFDoA0714
COMPOUND: Perfluoro-n-[1,2-¹³C₂]dodecanoic acid
STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₀HF₂₃O₂ **MOLECULAR WEIGHT:** 616.08
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
(1,2-¹³C₂)
LAST TESTED: (mm/dd/yyyy) 07/17/2014
EXPIRY DATE: (mm/dd/yyyy) 07/17/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 04/01/2015
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

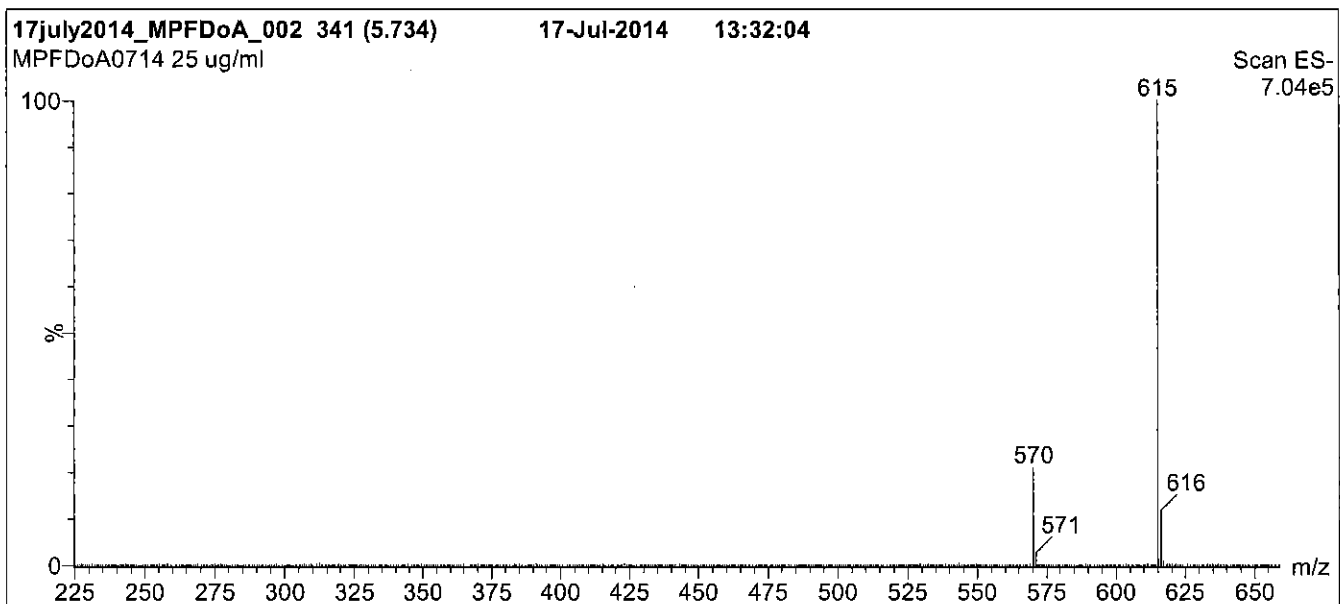
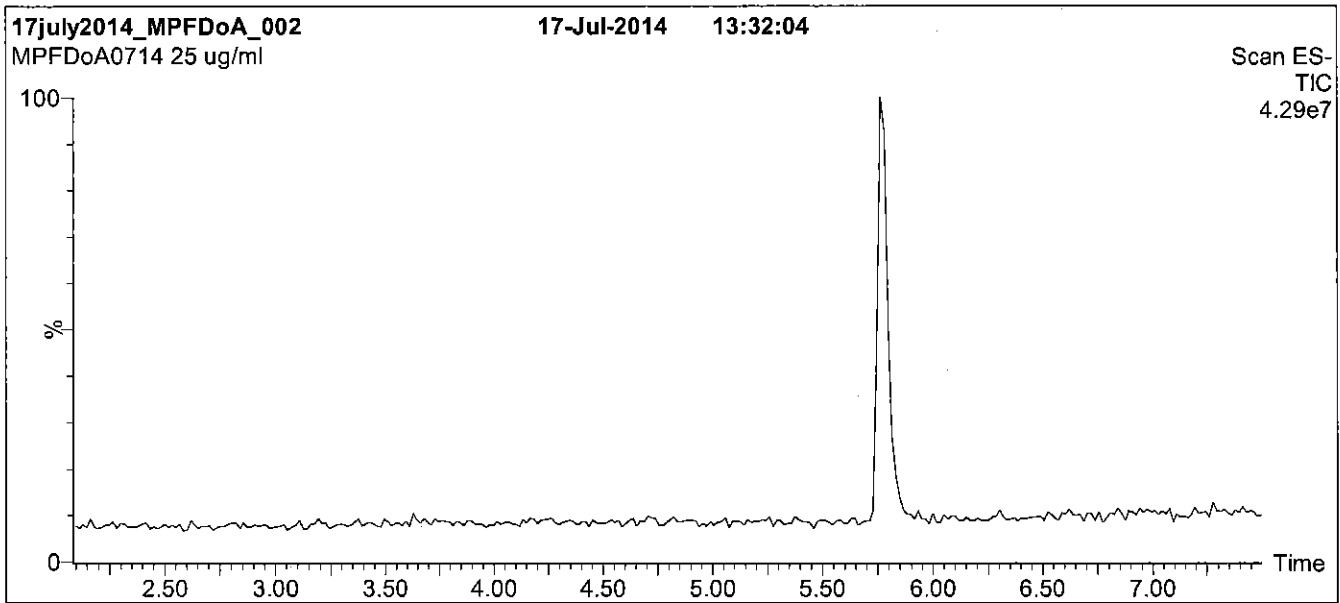
QUALITY MANAGEMENT:

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).



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

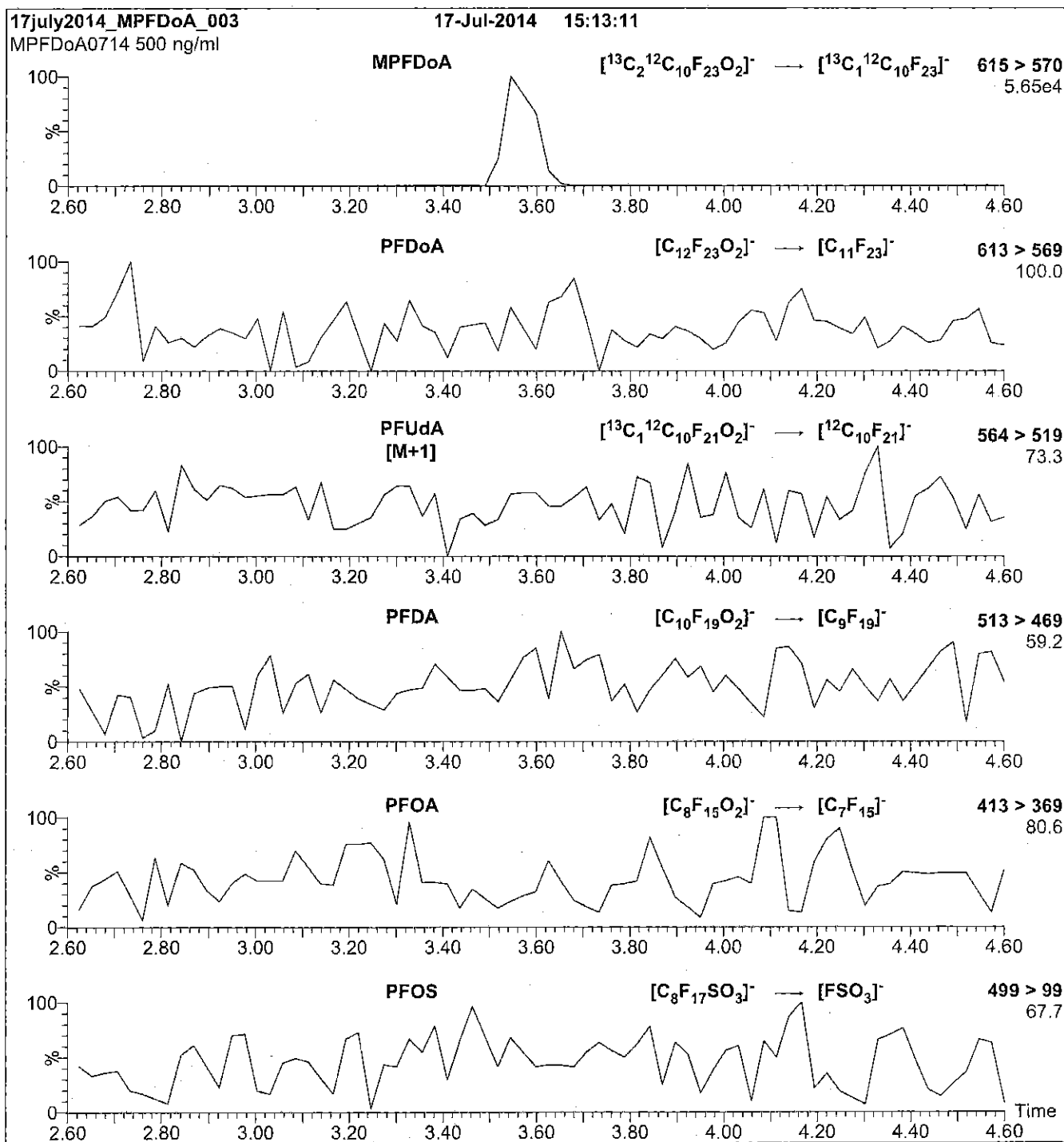
Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFD_oA_00006



R: 4/7/16 CBW

609708

ID: LCMPPFDaA_00006

Exp: 07/17/19 Prpt: CBW

13C2-Perfluorododecanoic

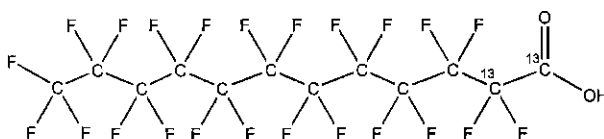


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDoA **LOT NUMBER:** MPFDoA0714
COMPOUND: Perfluoro-n-[1,2-¹³C₂]dodecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₀HF₂₃O₂ **MOLECULAR WEIGHT:** 616.08
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
 (1,2-¹³C₂)
LAST TESTED: (mm/dd/yyyy) 07/17/2014
EXPIRY DATE: (mm/dd/yyyy) 07/17/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 04/01/2015

(mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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.

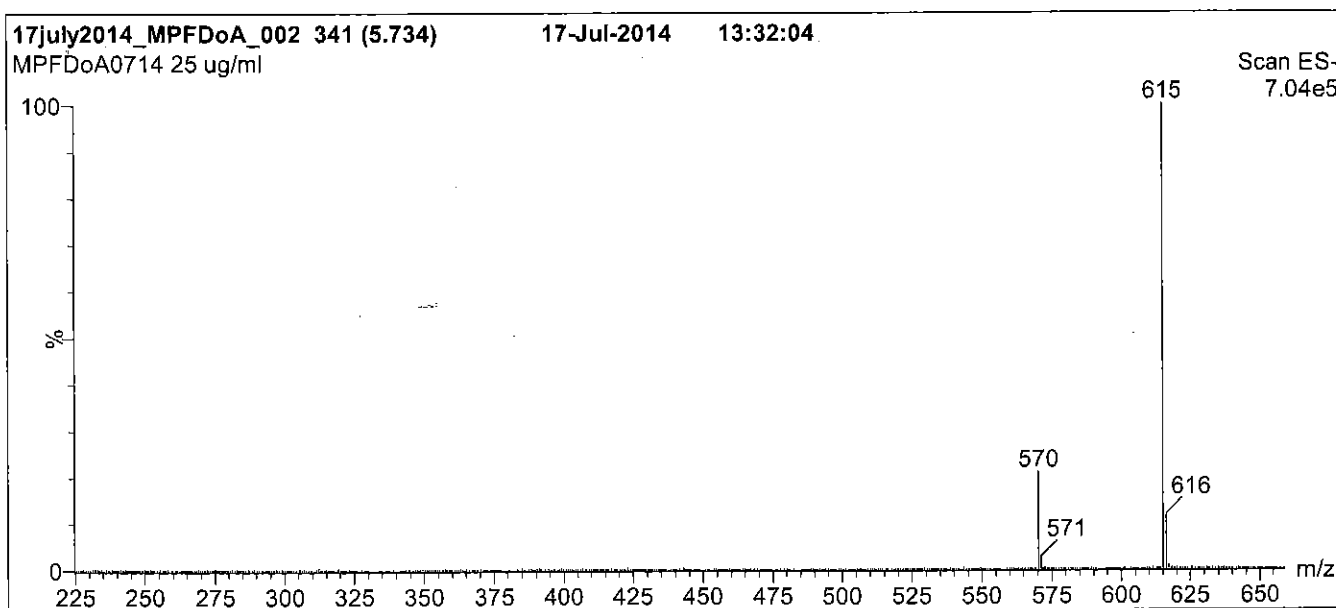
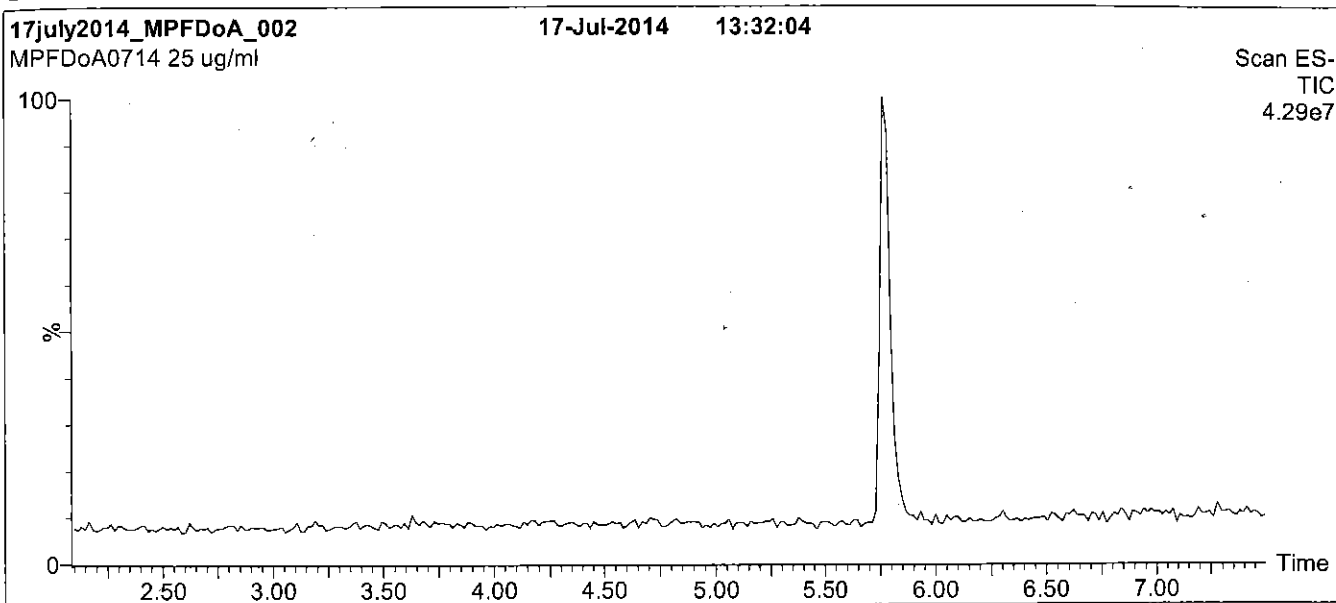
QUALITY MANAGEMENT:

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).



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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 55% (80:20 MeOH:ACN) / 45% H₂O
 (both with 10 mM NH₄OAc 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

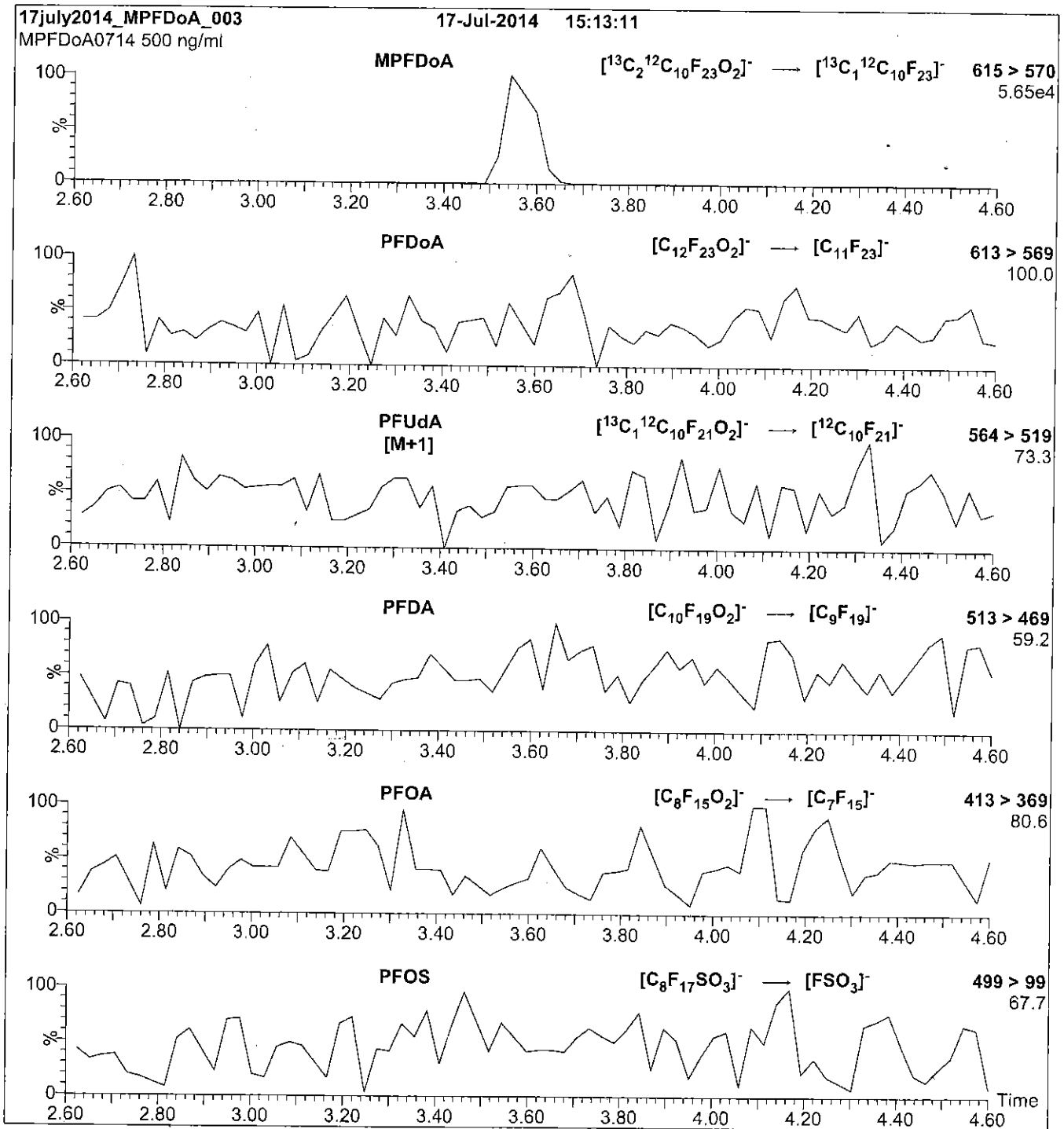
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFHxA_00008



605233

ID: LCMPPHxA_00008

Exp: 04/09/20 Prod: CBW

13C2-Perfluorohexanoic.ac

Rec. 3/29/16 JRB ✓

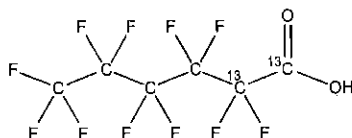
**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:** MPFHxA
COMPOUND: Perfluoro-n-[1,2-¹³C₂]hexanoic acid**LOT NUMBER:** MPFHxA0415**STRUCTURE:****CAS #:** Not available**MOLECULAR FORMULA:** ¹³C₂¹²C₄HF₁₁O₂
CONCENTRATION: 50 ± 2.5 µg/ml**MOLECULAR WEIGHT:** 316.04
SOLVENT(S): Methanol
Water (<1%)**CHEMICAL PURITY:** >98%
LAST TESTED: (mm/dd/yyyy) 04/09/2015**ISOTOPIC PURITY:** ≥99%¹³C
(1,2-¹³C₂)**EXPIRY DATE:** (mm/dd/yyyy) 04/09/2020**RECOMMENDED STORAGE:** Store ampoule in a cool, dark place**DOCUMENTATION/ DATA ATTACHED:**

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim
Date: 04/14/2015
(mm/dd/yyyy)Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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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.

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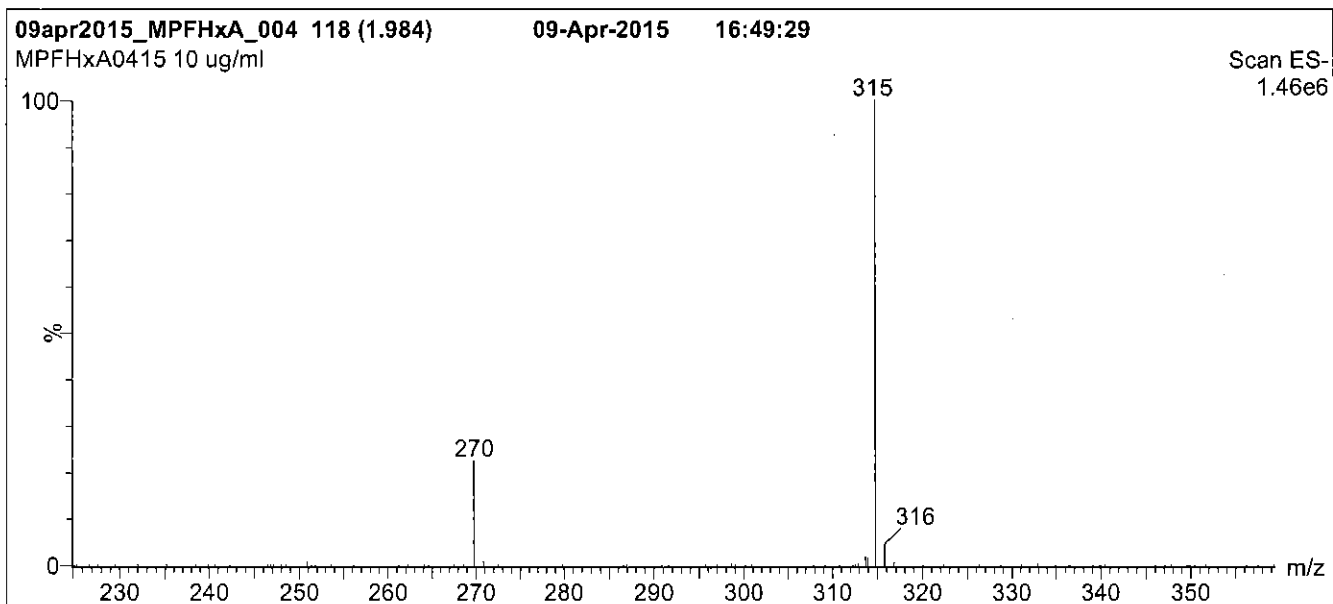
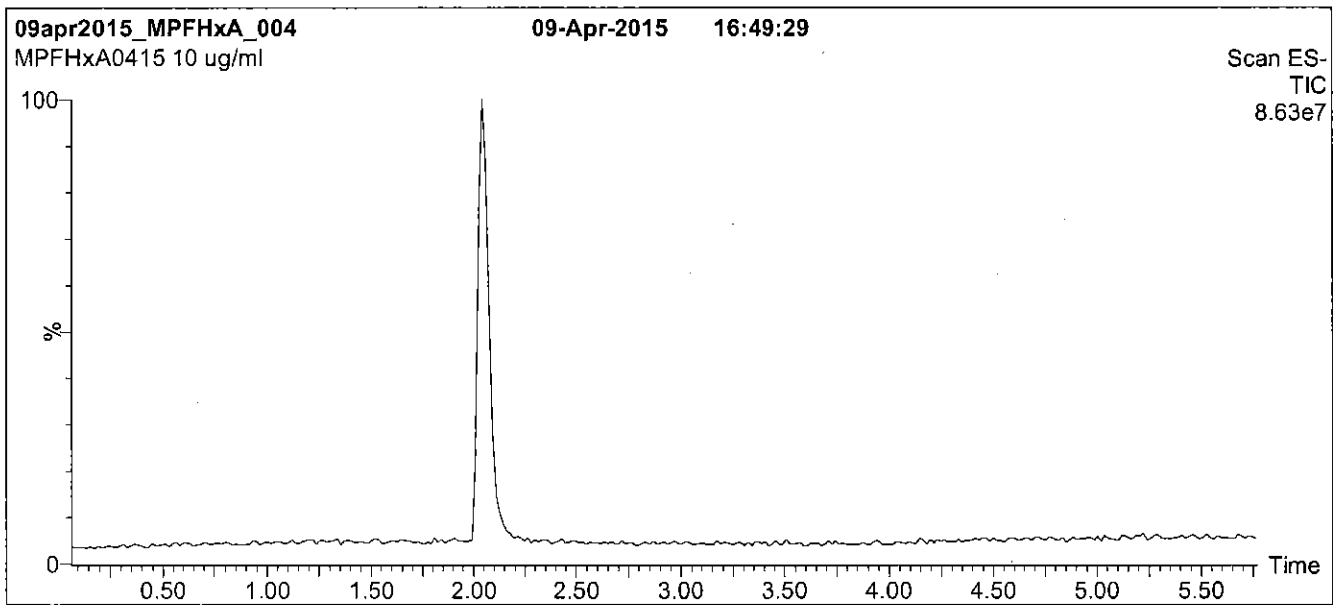
QUALITY MANAGEMENT:

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Figure 1: MPFHxA; 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

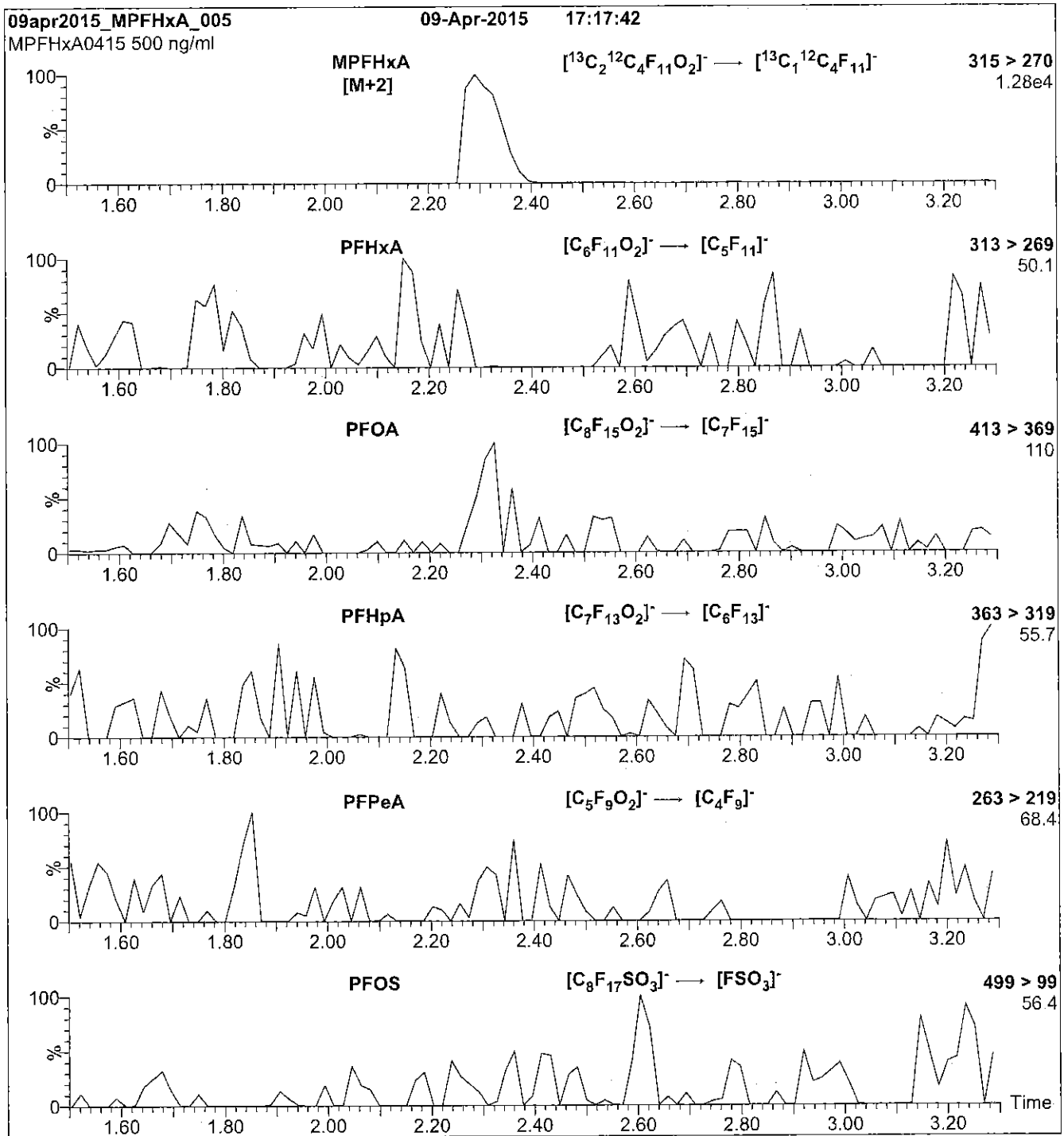
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFHXS_00005



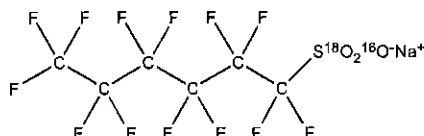
R: 3/3/16 CBW

591163

ID: LCMPFHxS_00005

Exp: 08/23/20 Pprd: CBW

18O2-Perfluorohexanesulfo

**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:** MPFHxS
COMPOUND: Sodium perfluoro-1-hexane[¹⁸O₂]sulfonate**LOT NUMBER:** MPFHxS1015**STRUCTURE:****CAS #:** Not available

MOLECULAR FORMULA: C₆F₁₃S¹⁸O₂¹⁶ONa
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
 47.3 ± 2.4 µg/ml (MPFHxS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/23/2015
EXPIRY DATE: (mm/dd/yyyy) 10/23/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 426.10
SOLVENT(S): Methanol
ISOTOPIC PURITY: >94% (¹⁸O₂)

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 (C₆F₁₃S¹⁸O₂¹⁶O⁻) has been observed to be up to 10% lower than for PFHxS (C₆F₁₃S¹⁶O₃) when both compounds are injected together. This difference may vary between instruments.
- Due to the isotopic purity of the starting material (¹⁸O₂ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**Certified By:**

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

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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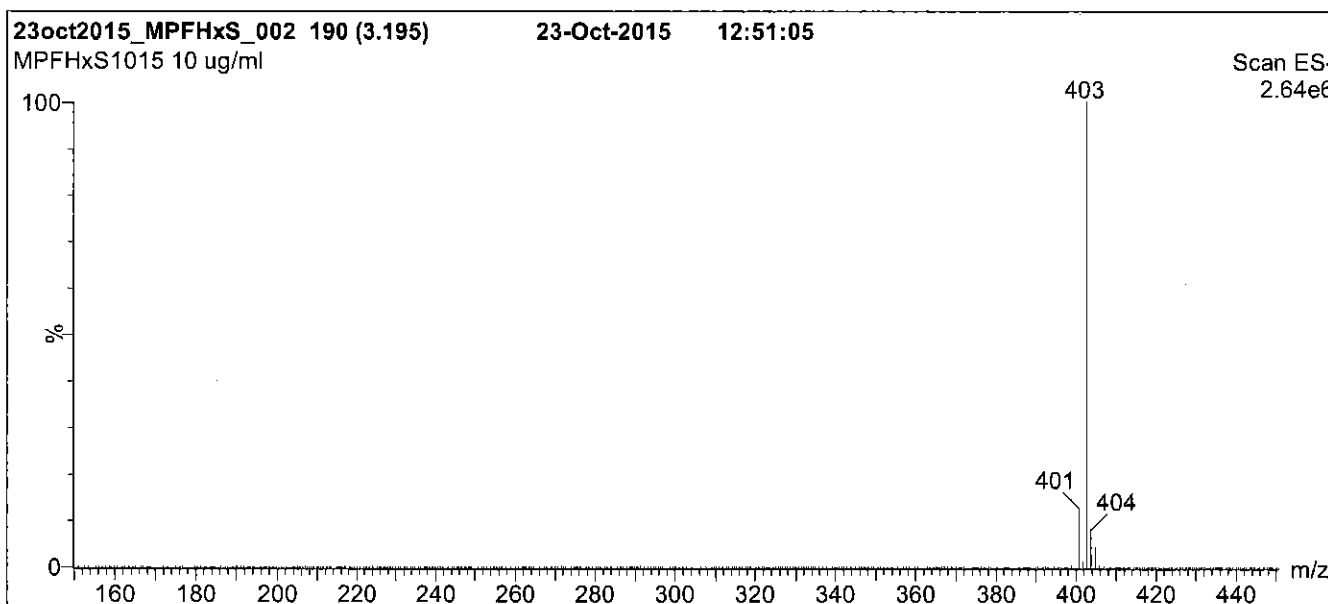
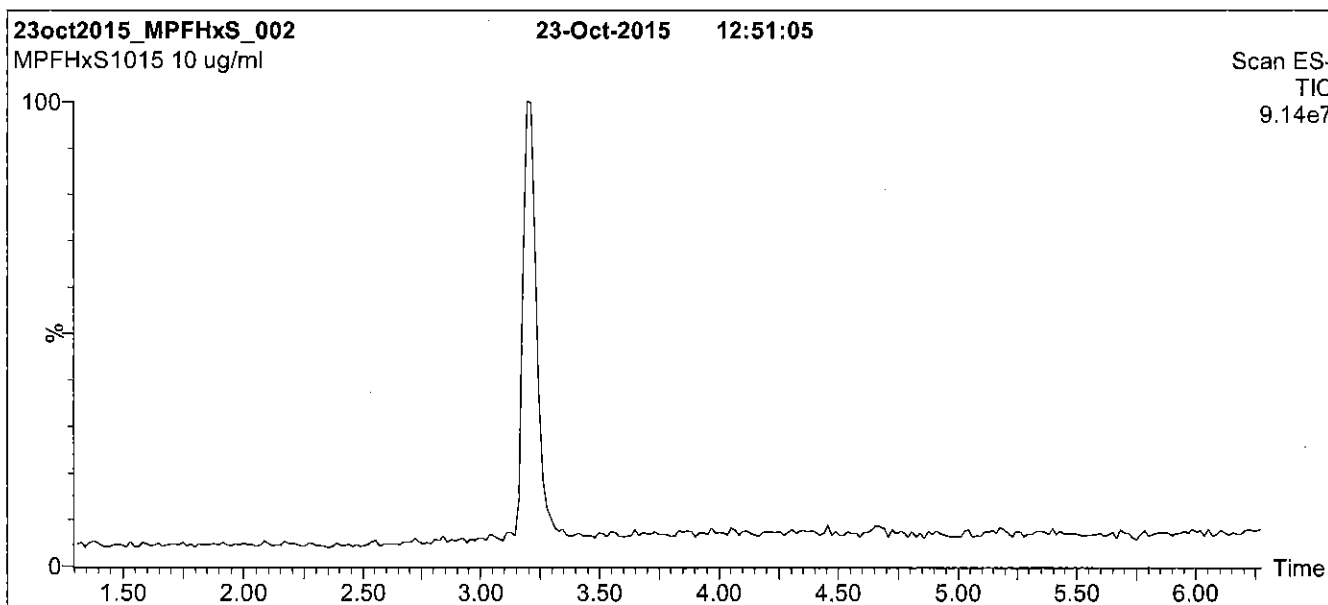
QUALITY MANAGEMENT:

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).



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: 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

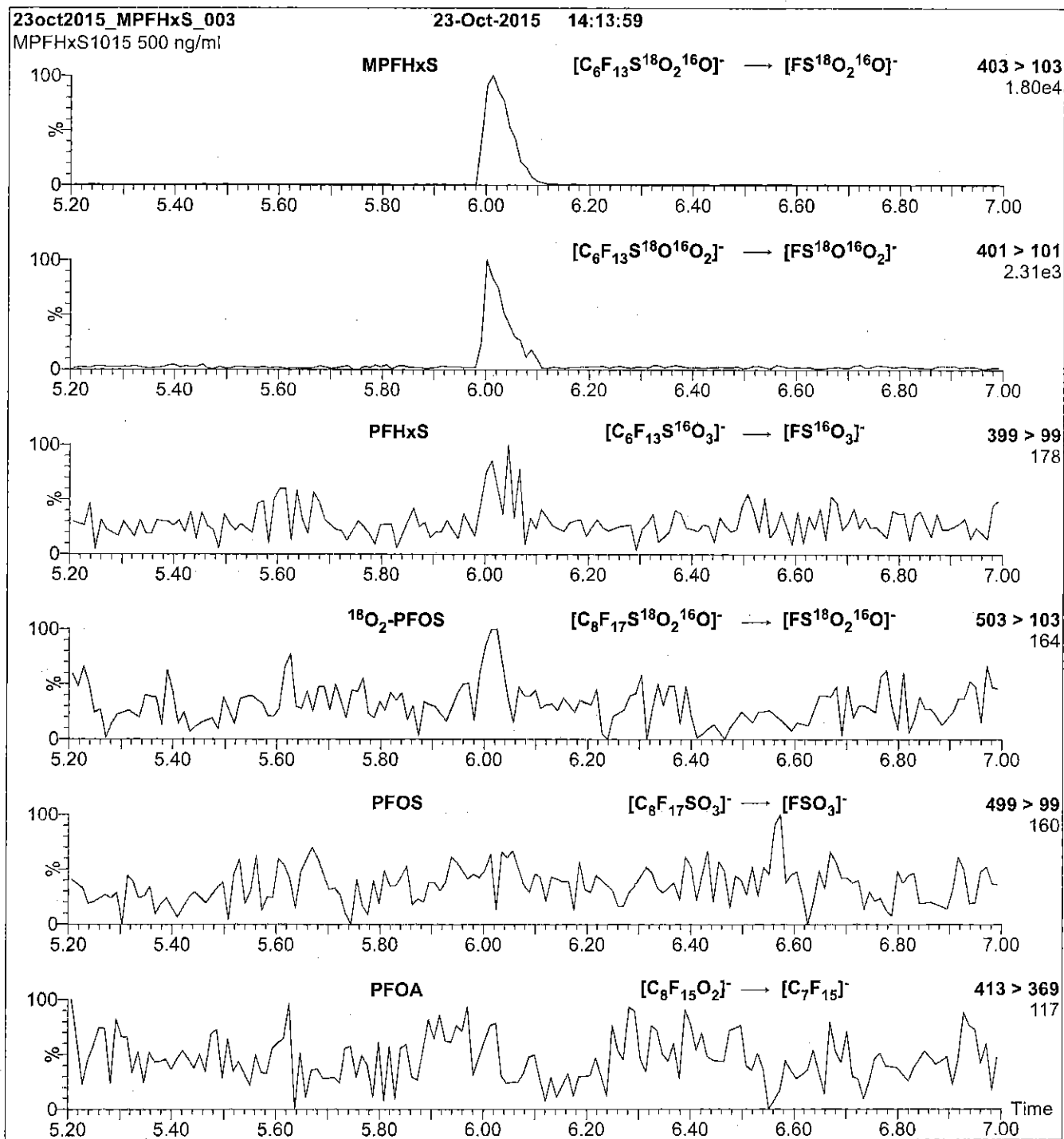
Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)
Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFHXS_00006



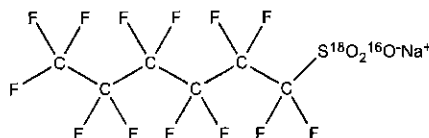
R: 417/16 CBW

609705

ID: LCMPFHxS_00006

Exp: 10/23/20 Ppfd: CBW

18O2-Perfluorohexanesulfo

**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:** MPFHxS **LOT NUMBER:** MPFHxS1015
COMPOUND: Sodium perfluoro-1-hexane[¹⁸O₂]sulfonate**STRUCTURE:** **CAS #:** Not available

MOLECULAR FORMULA:	C ₆ F 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)	10/23/2015		
EXPIRY DATE: (mm/dd/yyyy)	10/23/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS (C₆F₁₃S¹⁸O₂¹⁶O) has been observed to be up to 10% lower than for PFHxS (C₆F₁₃S¹⁶O₃) when both compounds are injected together. This difference may vary between instruments.
- Due to the isotopic purity of the starting material (¹⁸O₂ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 10/28/2015

(mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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HOMOGENEITY:

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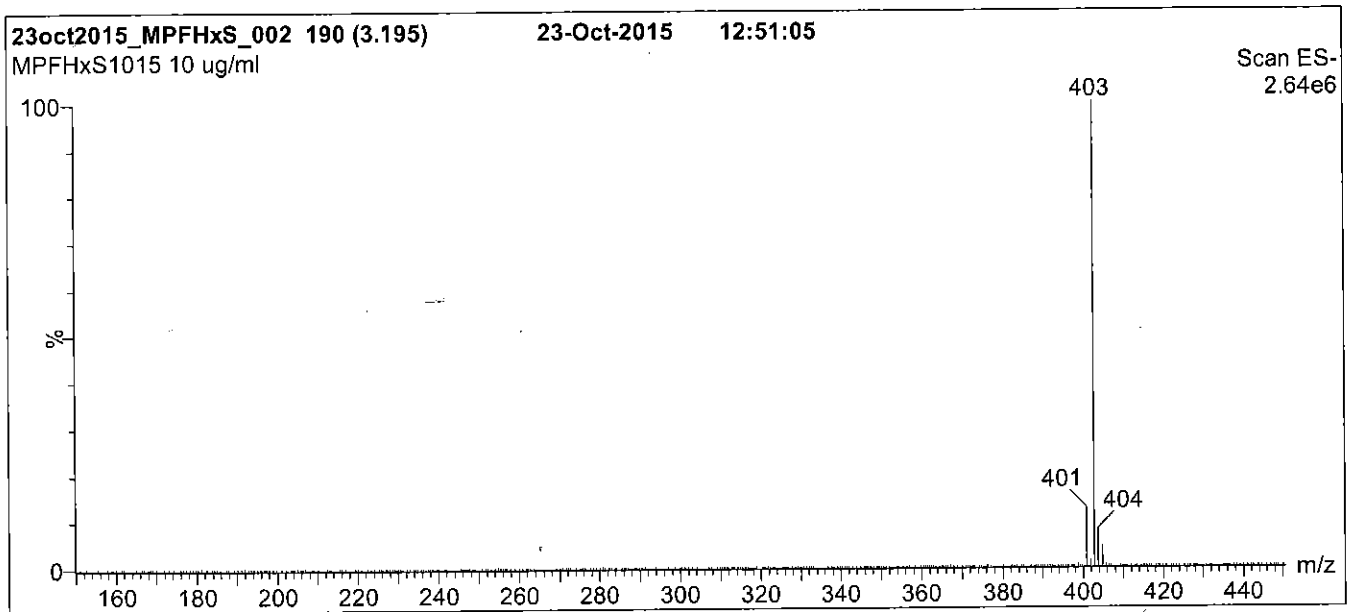
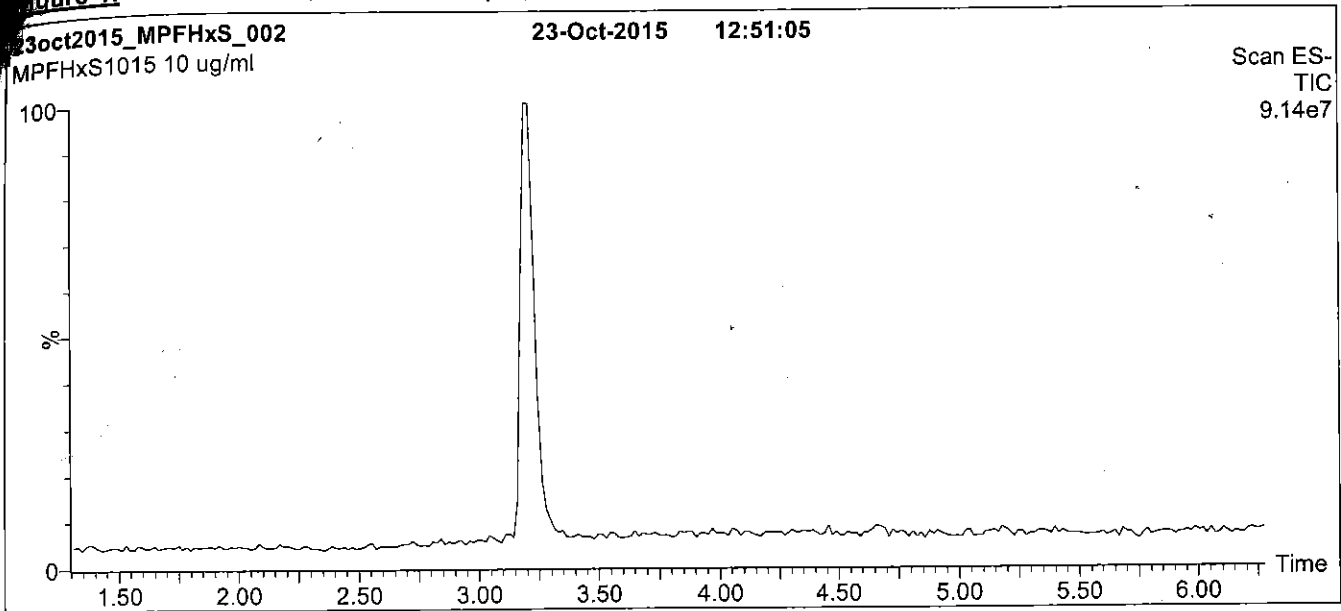
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

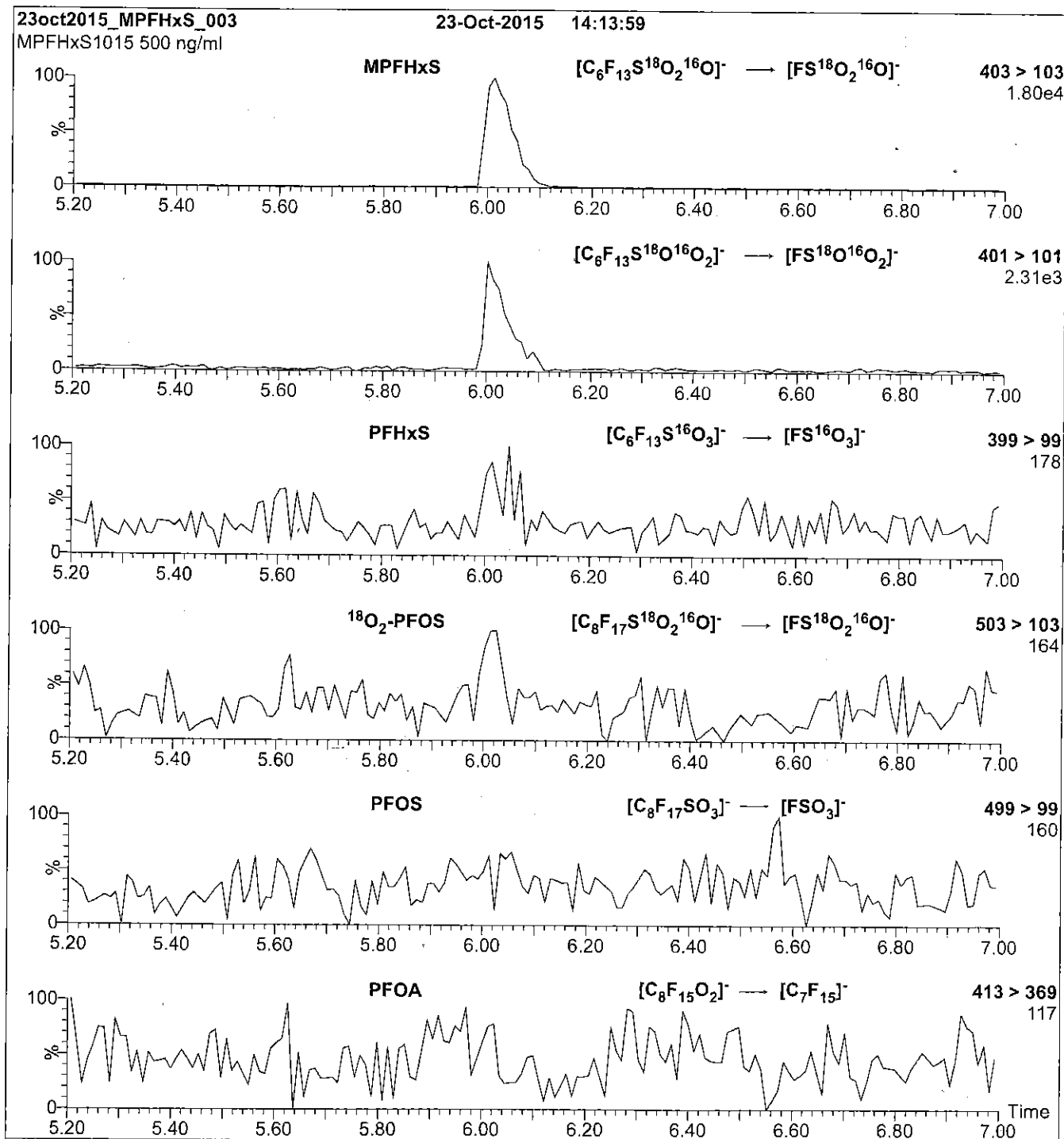
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFNA_00005



605245
 ID: LCMPFNA_00005
 Exp: 04/13/19 Prpd: CBW
 13C5-Perfluorononanoic aci

Rec. 3/29/16 JES V



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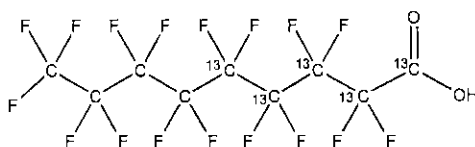
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFNA
COMPOUND: Perfluoro-n-[1,2,3,4,5-¹³C₅]nonanoic acid

LOT NUMBER: MPFNA0414

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₅¹²C₄HF₁₇O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 469.04
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%¹³C
 (1,2,3,4,5-¹³C₅)

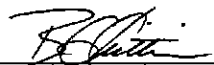
DOCUMENTATION/ DATA ATTACHED:

- 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

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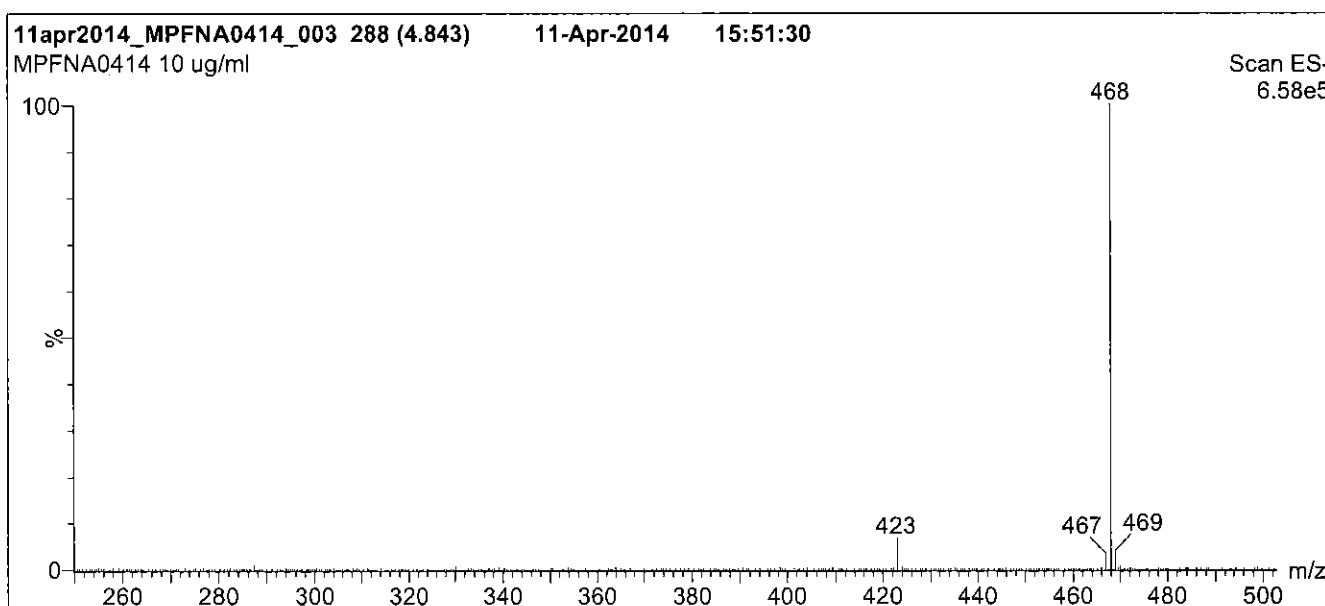
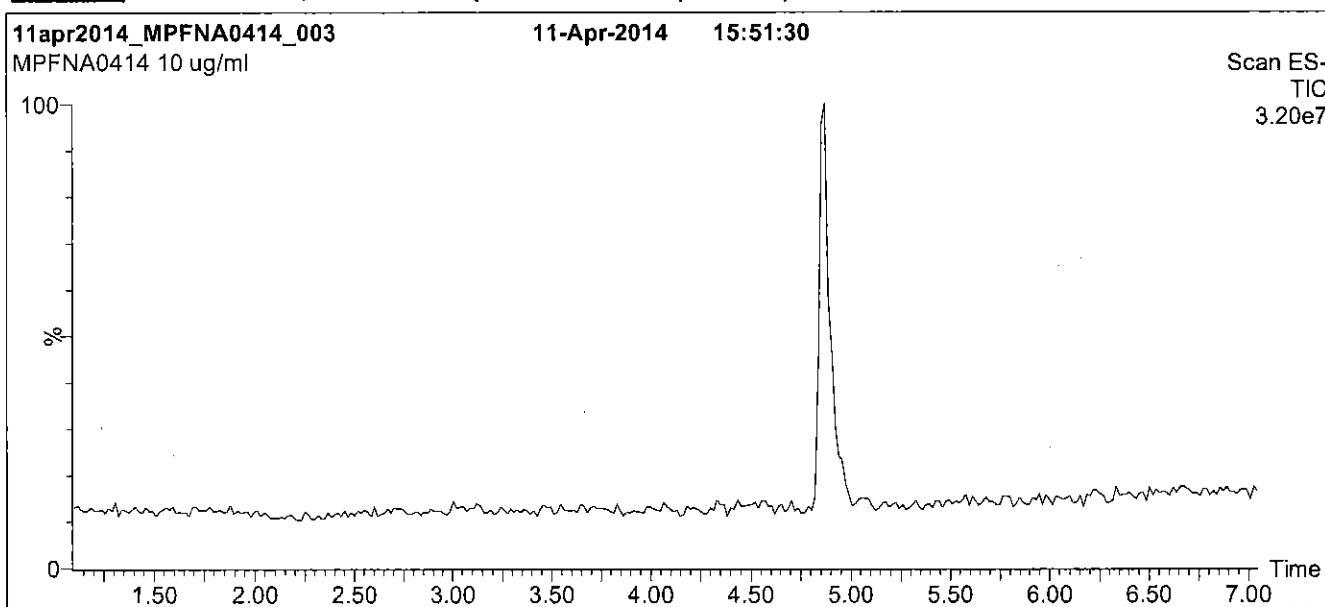
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

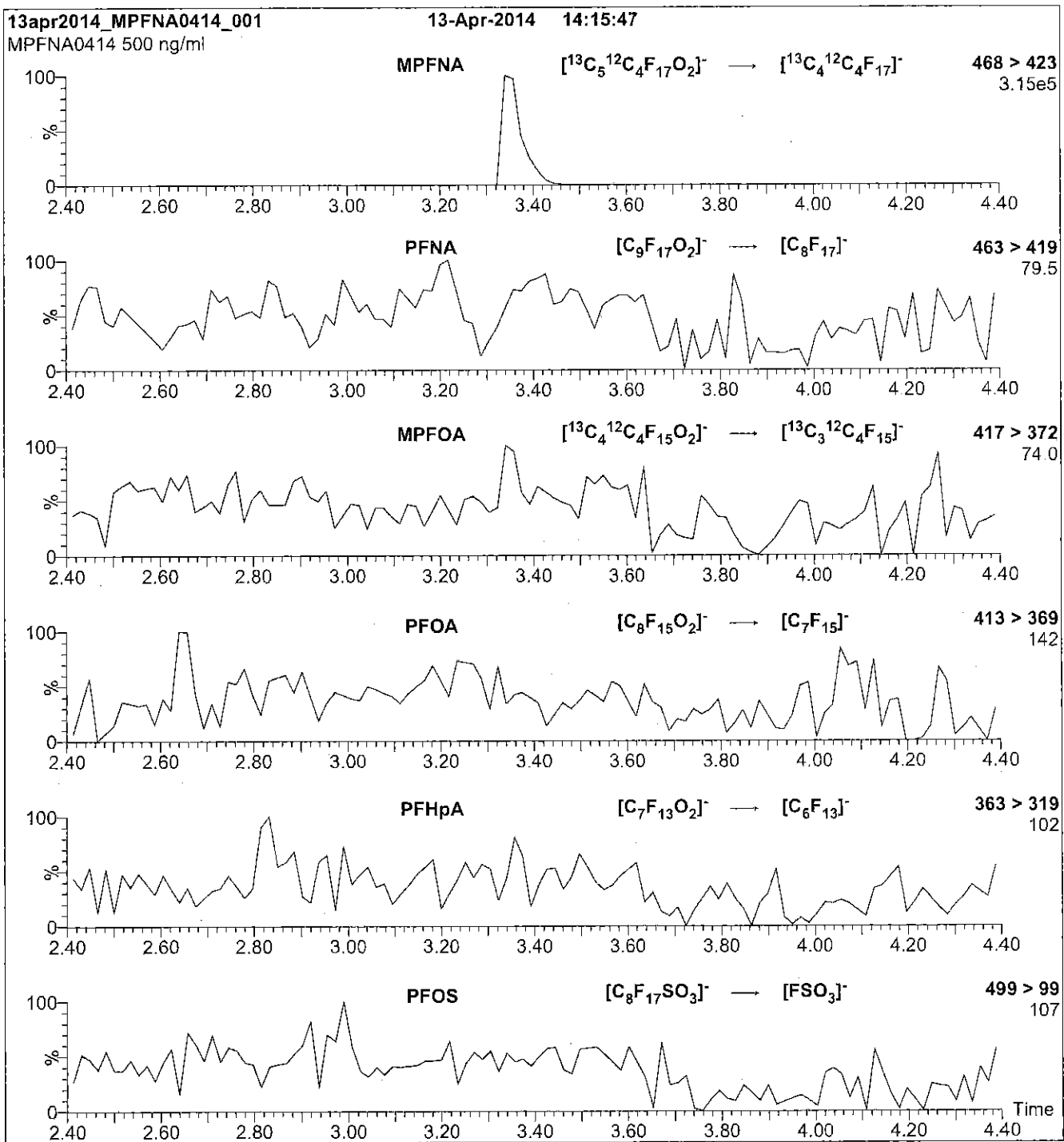
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFOA_00009



R: 3/3/16 CBW

591145

ID: LCMFOA_00009

Exp: 01/22/21 Prep: CBW

13C4-Perfluorooctanoic ac



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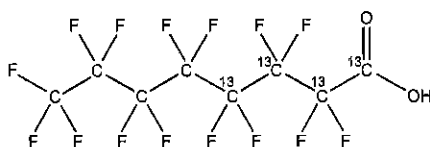
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOA
COMPOUND: Perfluoro-n-[1,2,3,4-¹³C₄]octanoic acid

LOT NUMBER: MPFOA0116

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₄¹²C₄HF₁₅O₂
CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ¹³C
(1,2,3,4-¹³C₄)

LAST TESTED: (mm/dd/yyyy) 01/22/2016

EXPIRY DATE: (mm/dd/yyyy) 01/22/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 02/01/2016

(mm/dd/yyyy)

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

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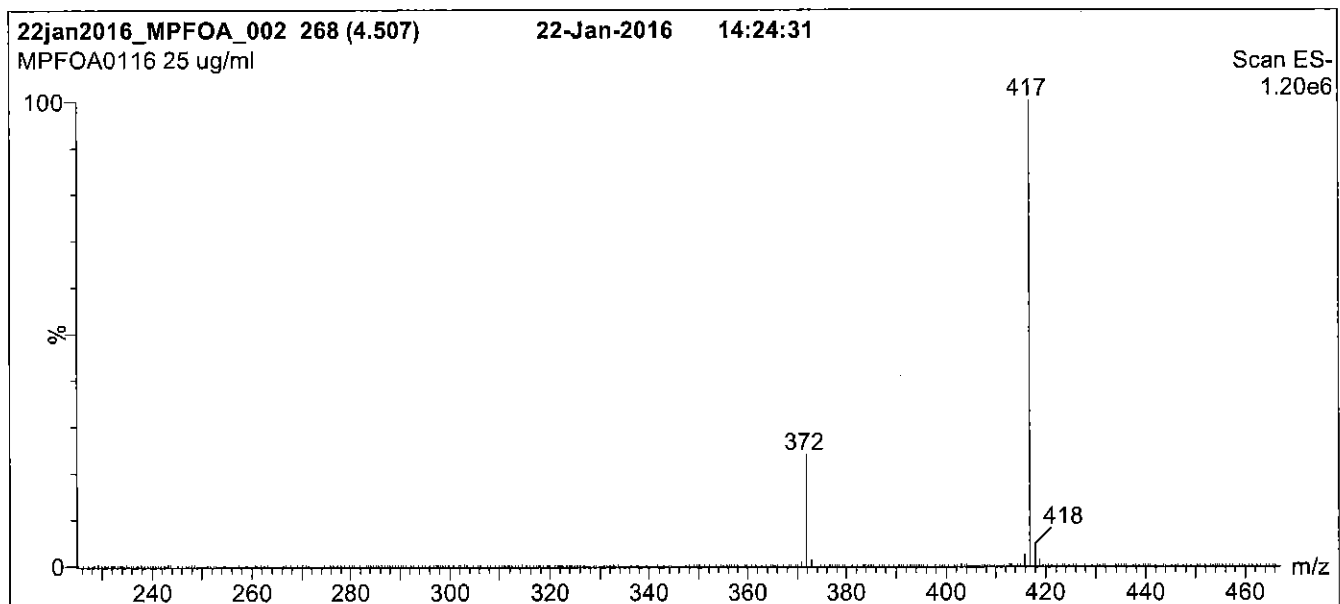
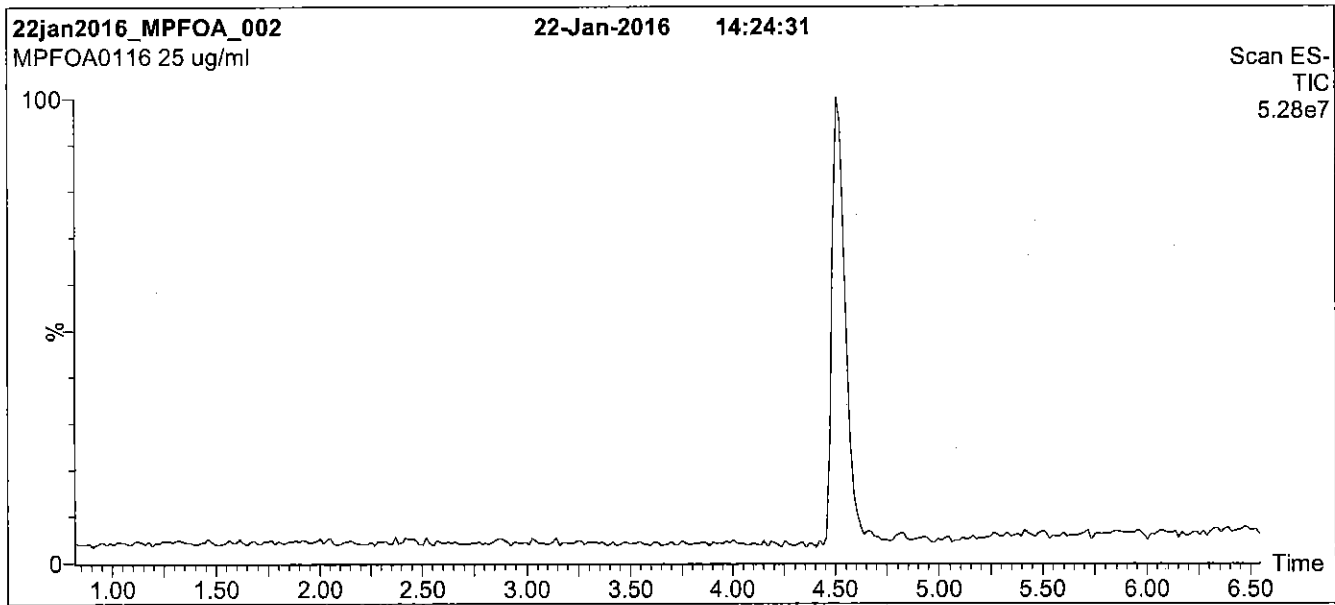
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Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc 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

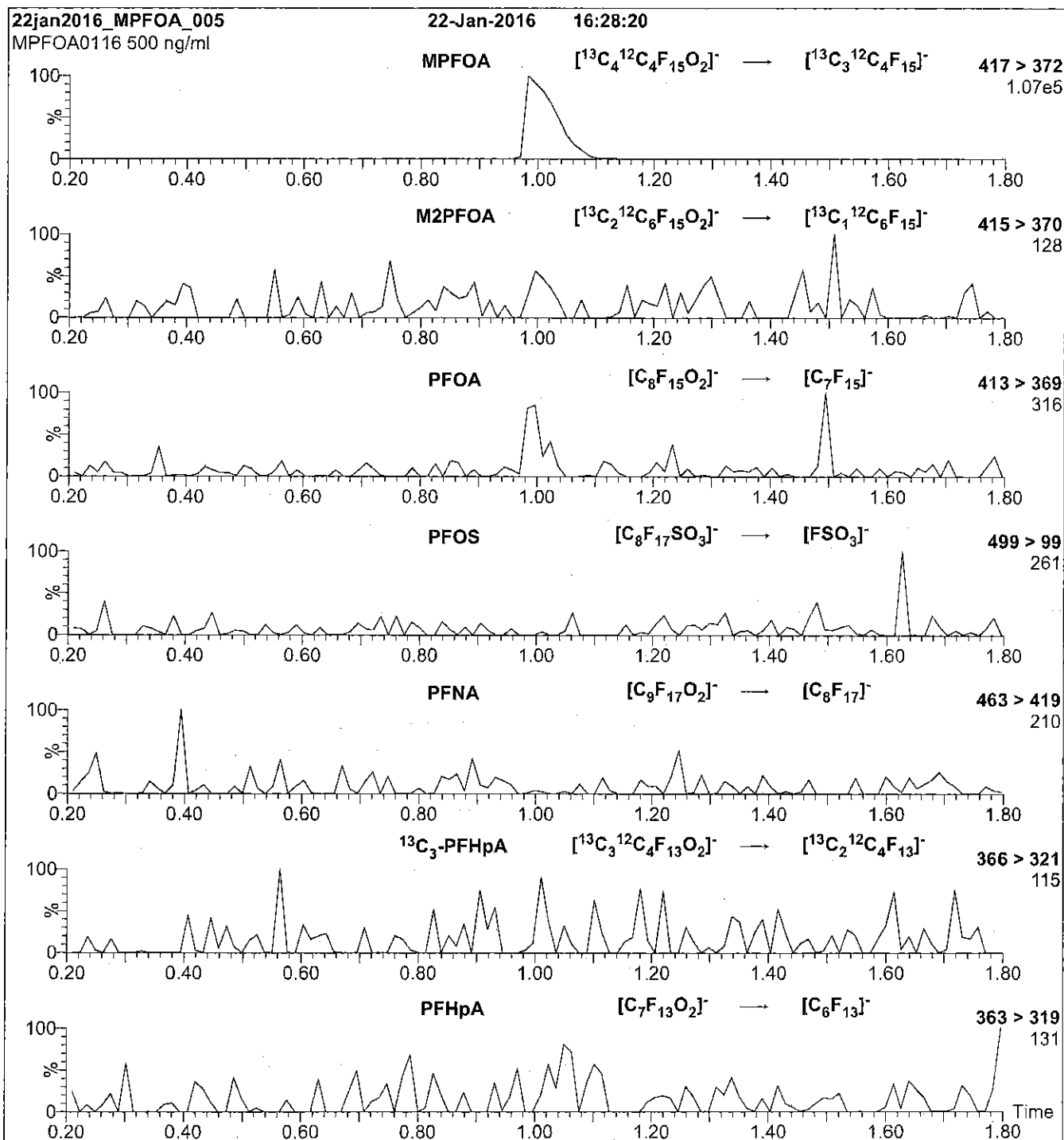
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFOA_00010



R: 4/7/16 CBW

609713

ID: LCMFOA_00010

Exp: 01/22/21 Ppd: CBW

13C4-Perfluorooctanoic ac



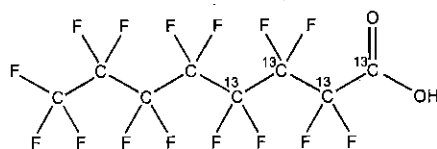
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CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOA
COMPOUND: Perfluoro-n-[1,2,3,4-¹³C₄]octanoic acid

LOT NUMBER: MPFOA0116

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: ¹³C₄¹²C₄HF₁₆O₂
CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/22/2016
EXPIRY DATE: (mm/dd/yyyy) 01/22/2021

ISOTOPIC PURITY: ≥99% ¹³C
(1,2,3,4-¹³C₄)

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 native perfluoro-n-octanoic acid (PFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 02/01/2016

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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 $\pm 5\%$ (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.

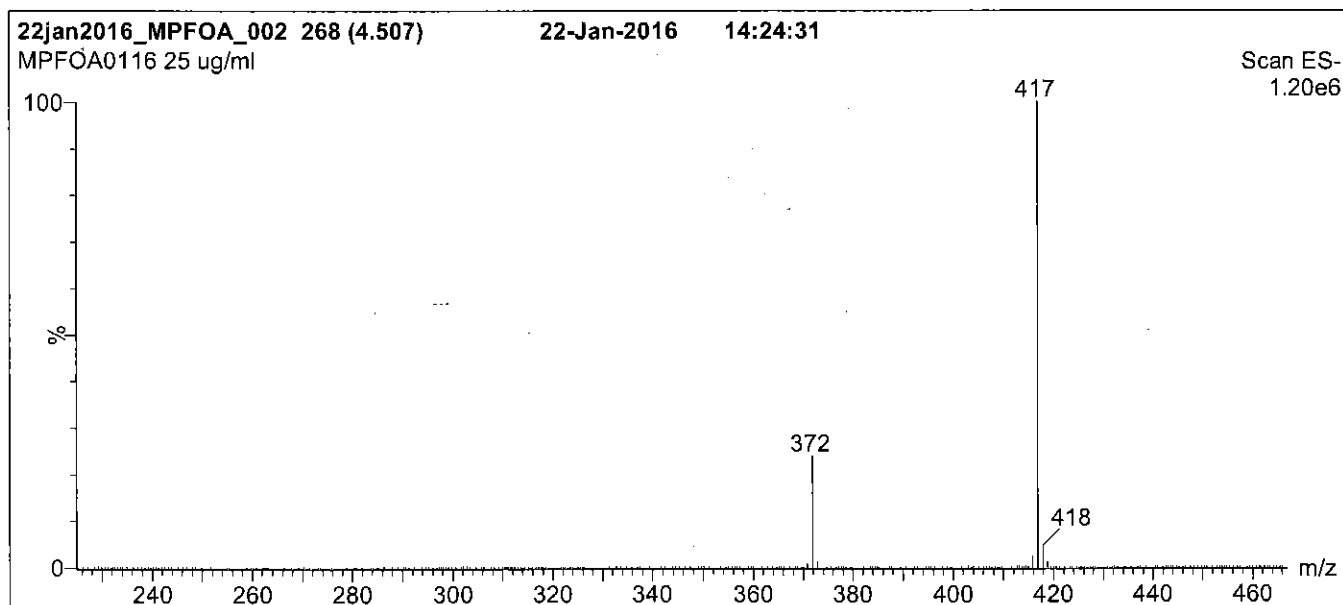
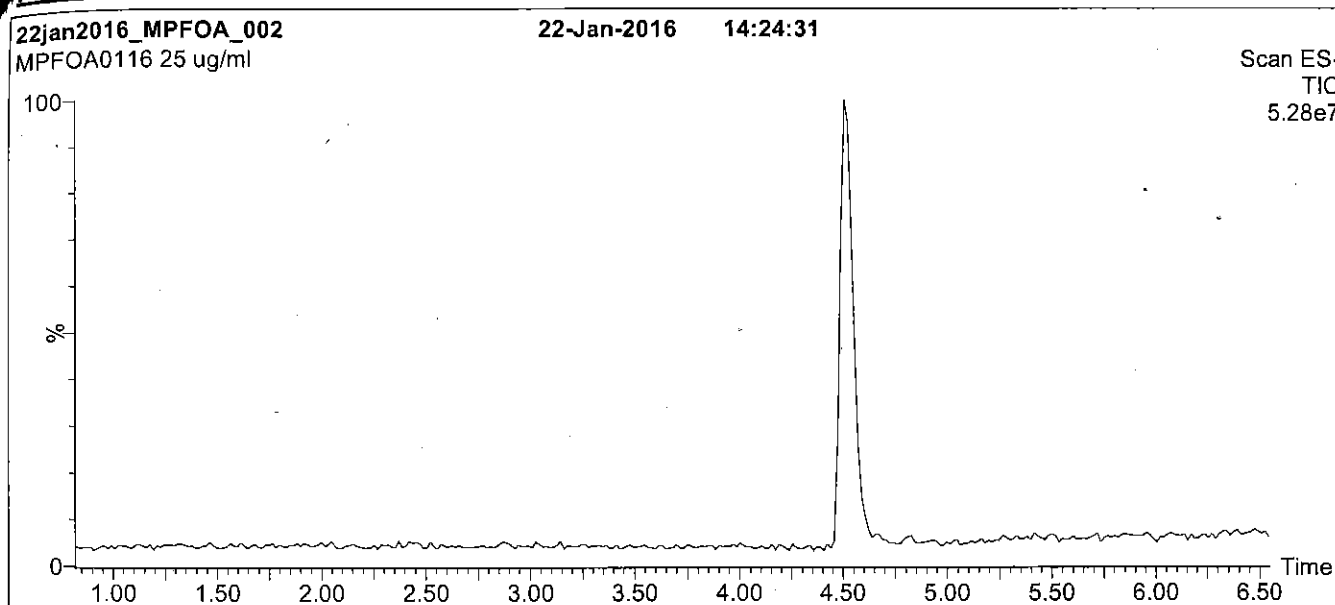
QUALITY MANAGEMENT:

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).



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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, RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc 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

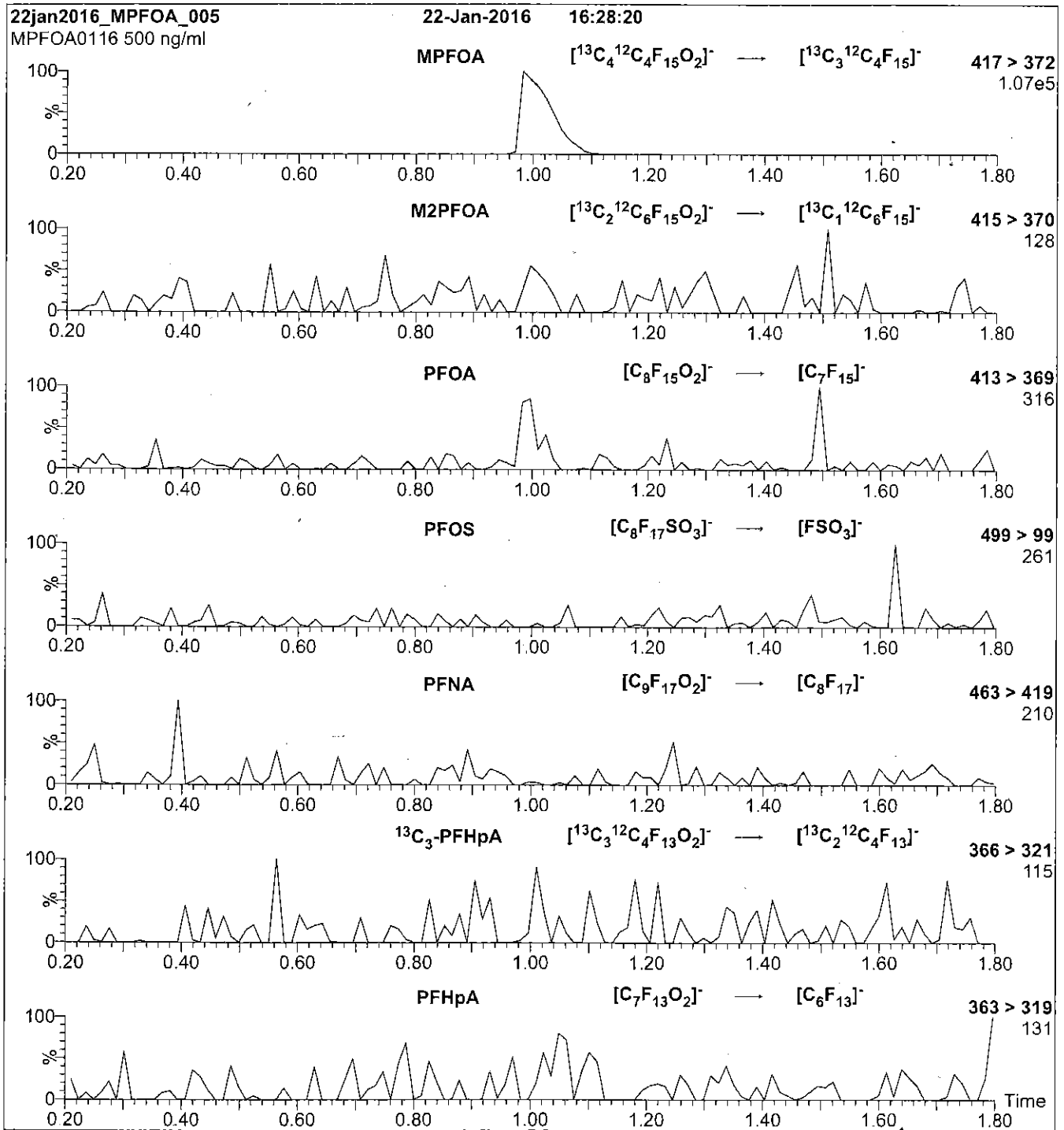
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFOS_00012

605227
ID: LCMFOS_00012
Exp: 01/22/21 Prpd: CBW
13C4-Perfluorooctanesulfo

606228
ID: LCMFOS_00013
Exp: 01/22/21 Prpd: CBW
13C4-Perfluorooctanesulfo

Rec 3/29/16 JRB ✓

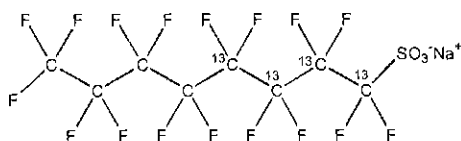


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0116
COMPOUND: Sodium perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₄¹²C₄F₁₇SO₃Na **MOLECULAR WEIGHT:** 526.08
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.8 ± 2.4 µg/ml (MPFOS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
(1,2,3,4-¹³C₄)
LAST TESTED: (mm/dd/yyyy) 01/22/2016
EXPIRY DATE: (mm/dd/yyyy) 01/22/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.8% Sodium perfluoro-1-[1,2,3-¹³C₃]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 02/01/2016
(mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

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.

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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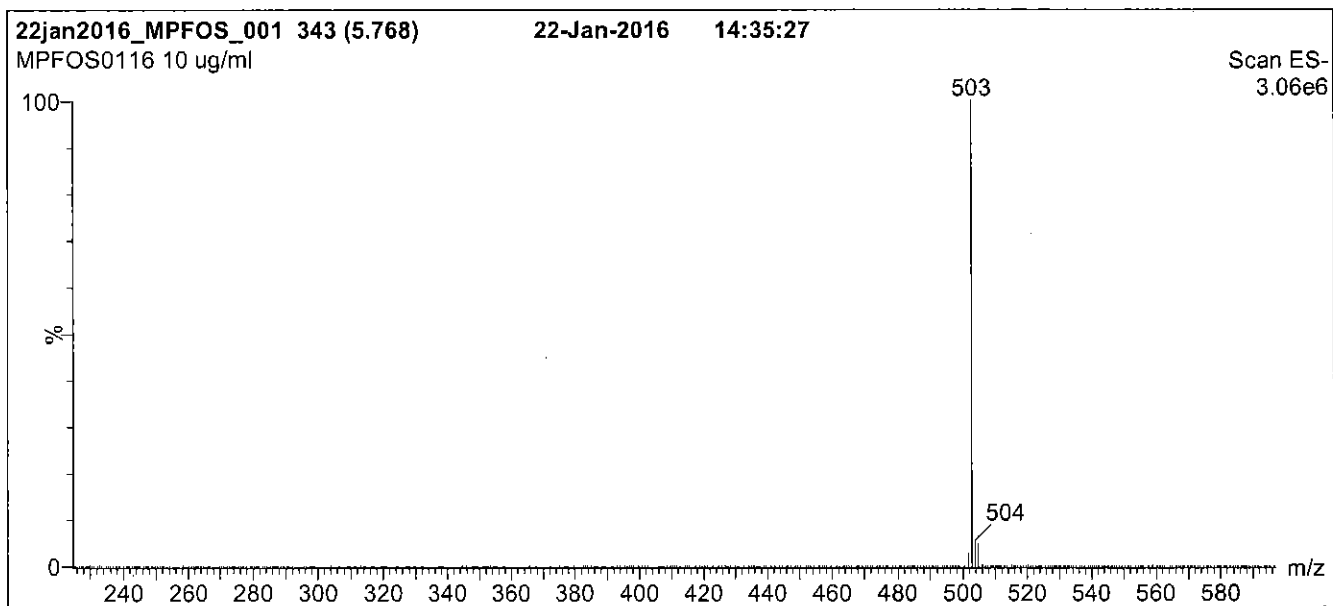
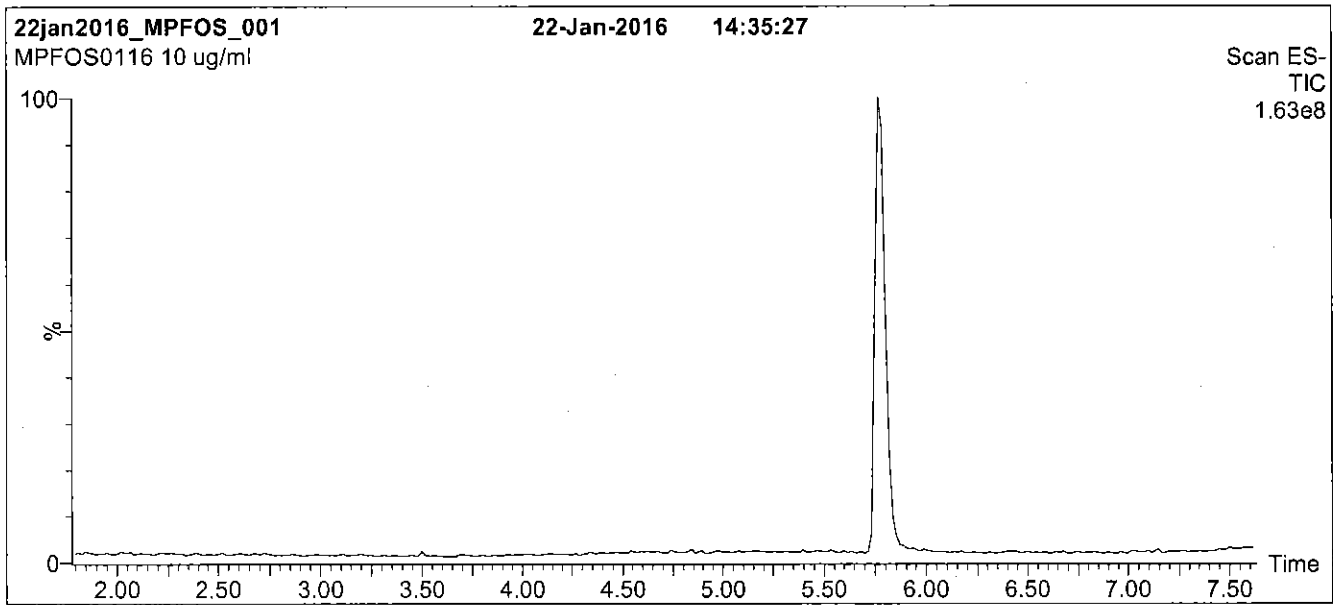
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc 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

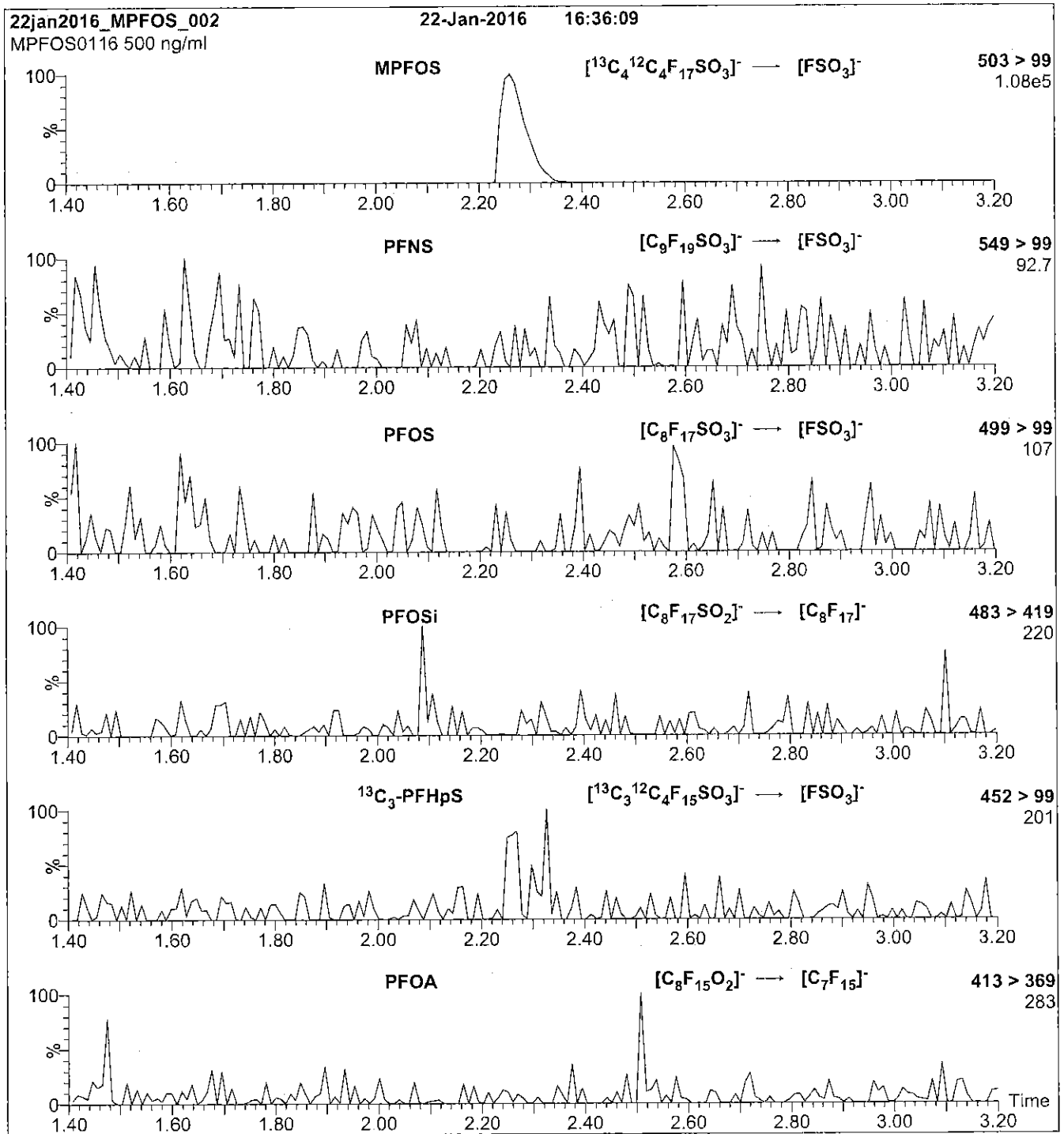
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFUdA_00006



591165

ID: LCMPFUdA_00006

Exp: 10/31/19 Pripd: CBW

13C2-Perfluoroundecanoic

R: 3/3/16 CBW



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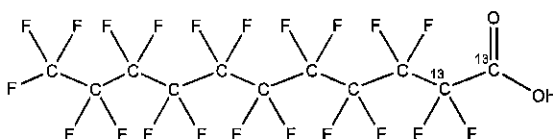
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFUdA
COMPOUND: Perfluoro-n-[1,2-¹³C₂]undecanoic acid

LOT NUMBER: MPFUdA1014

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₂¹²C₉HF₂₁O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 566.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/31/2014
EXPIRY DATE: (mm/dd/yyyy) 10/31/2019

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

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 1-¹³C₁-PFUdA (~1%; see Figure 2), 2-¹³C₁-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ¹³C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 04/01/2015
(mm/dd/yyyy)

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

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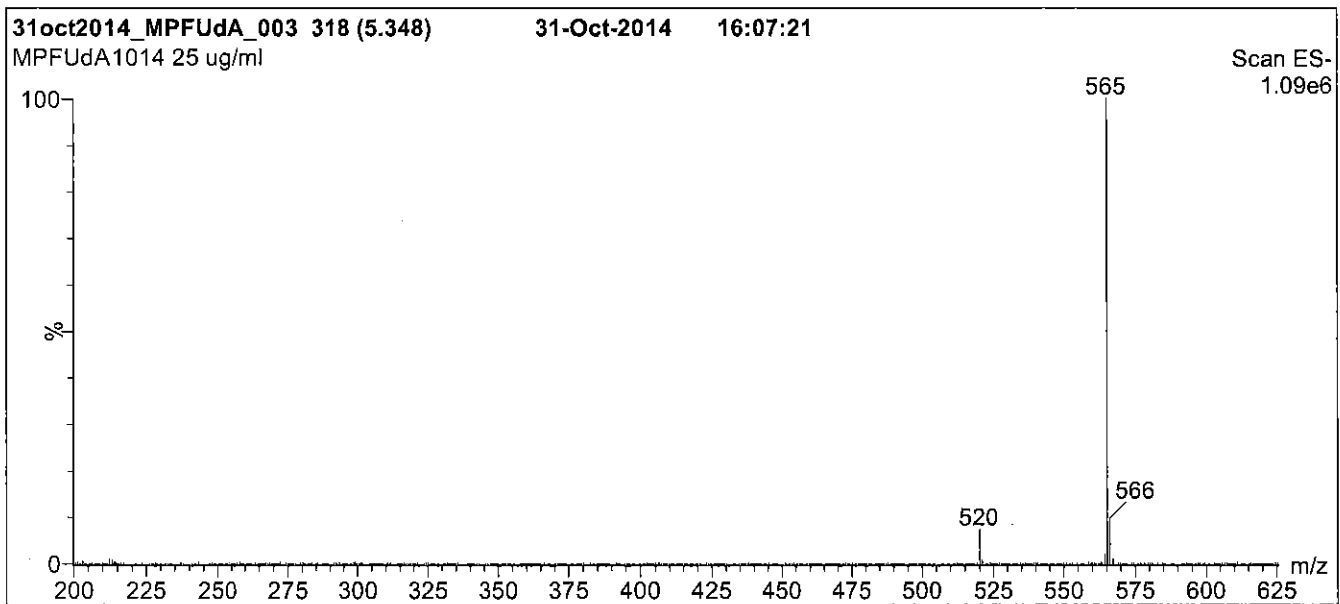
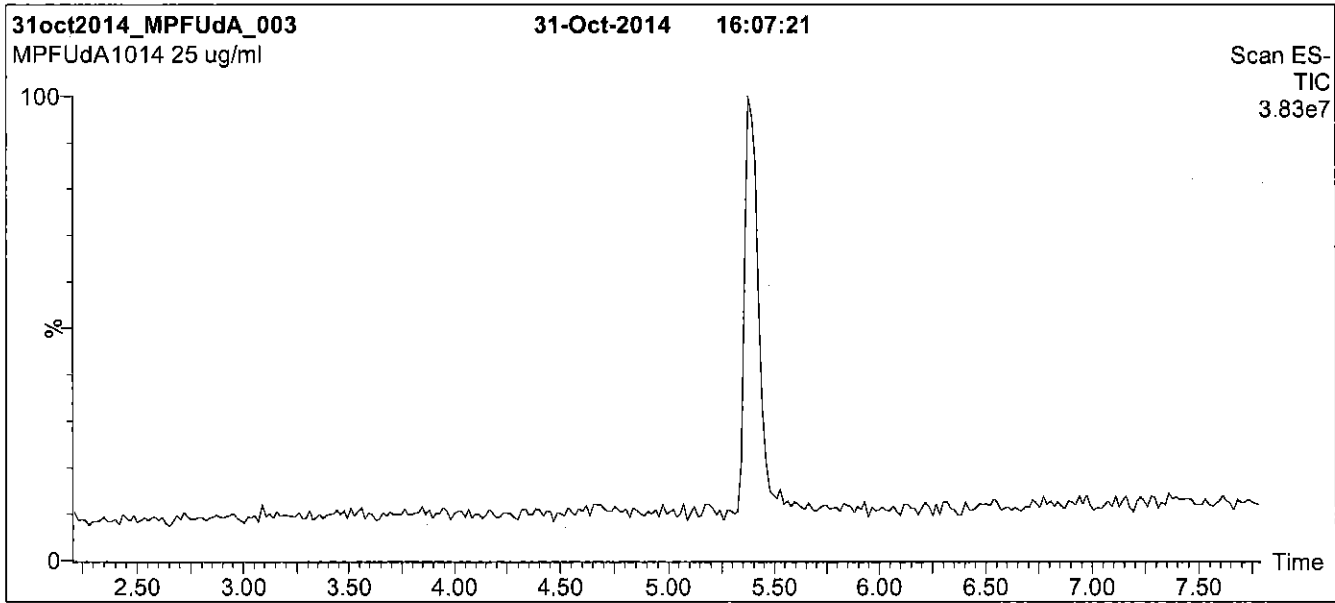
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm

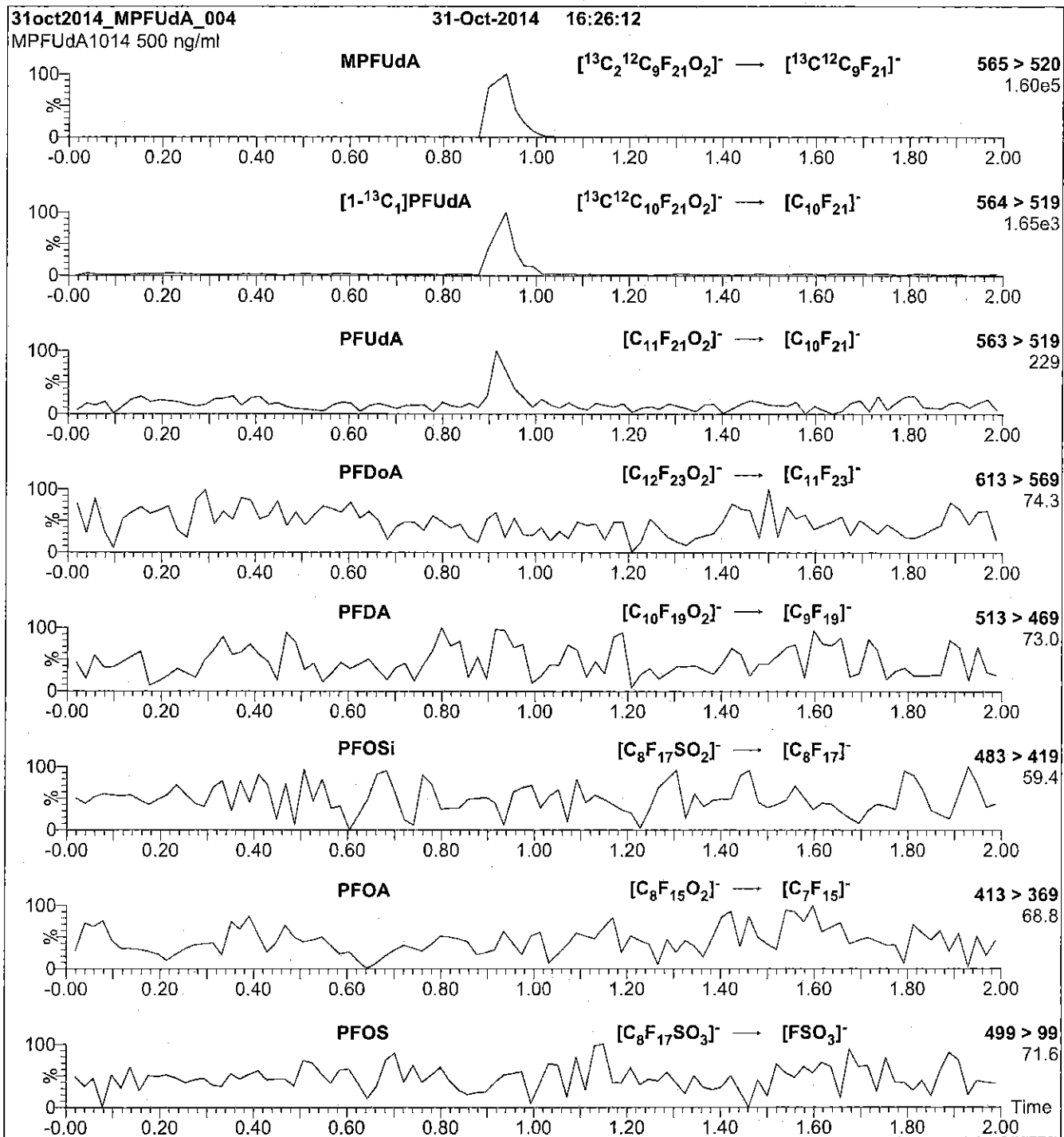
Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for
 2 min before returning to initial conditions in 0.5 min.
 Time: 10 min

Flow: 300 μ l/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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFUdA_00007



609704
 ID: LCMFUDA_00007
 Exp: 10/31/19 Prod: CBW
 13C2-Perfluoroundecanoic

R: 4/7/16 CBW



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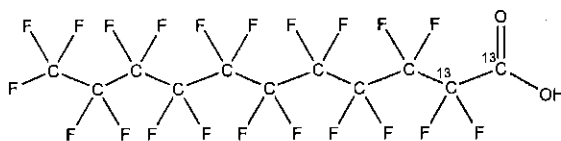
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFUdA
COMPOUND: Perfluoro-n-[1,2-¹³C₂]undecanoic acid

LOT NUMBER: MPFUdA1014

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₂¹²C₈HF₂₁O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 566.08
SOLVENT(S): Methanol
 Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/31/2014
EXPIRY DATE: (mm/dd/yyyy) 10/31/2019

ISOTOPIC PURITY: ≥99% ¹³C
 (1,2-¹³C₂)

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

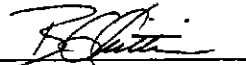
DOCUMENTATION/ DATA ATTACHED:

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 1-¹³C₁-PFUdA (~1%; see Figure 2), 2-¹³C₁-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ¹³C-precursor.

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Certified By: 
 B.G. Chittim

Date: 04/01/2015
 (mm/dd/yyyy)

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HOMOGENEITY:

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

UNCERTAINTY:

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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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

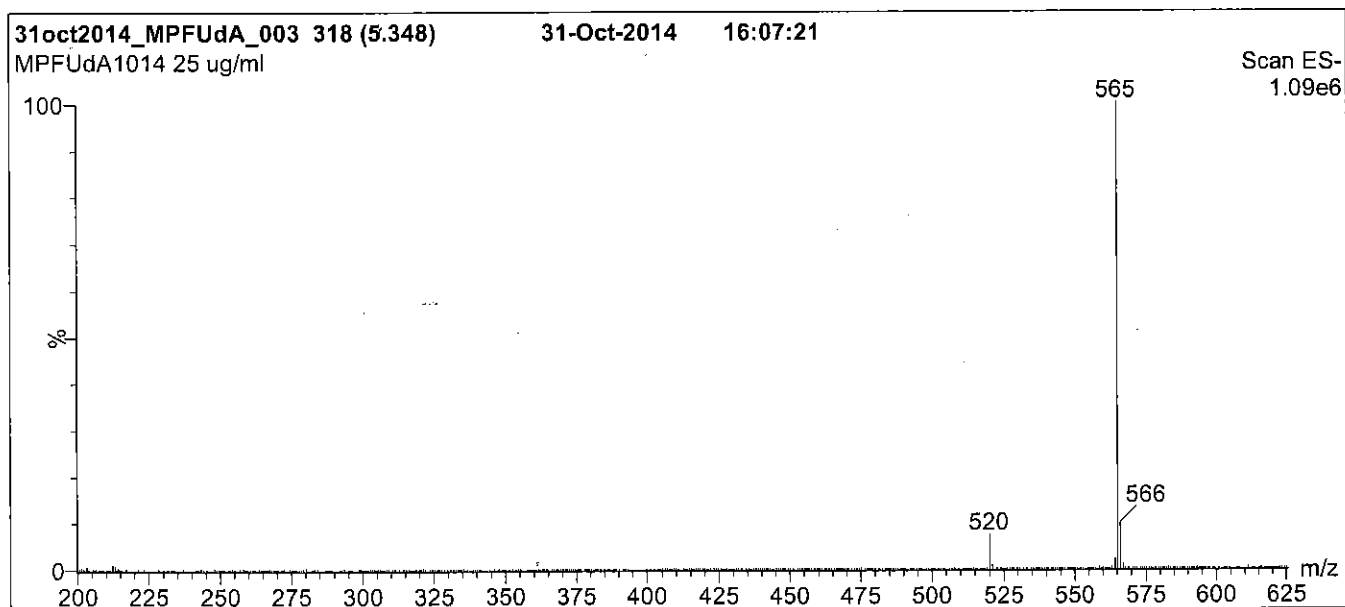
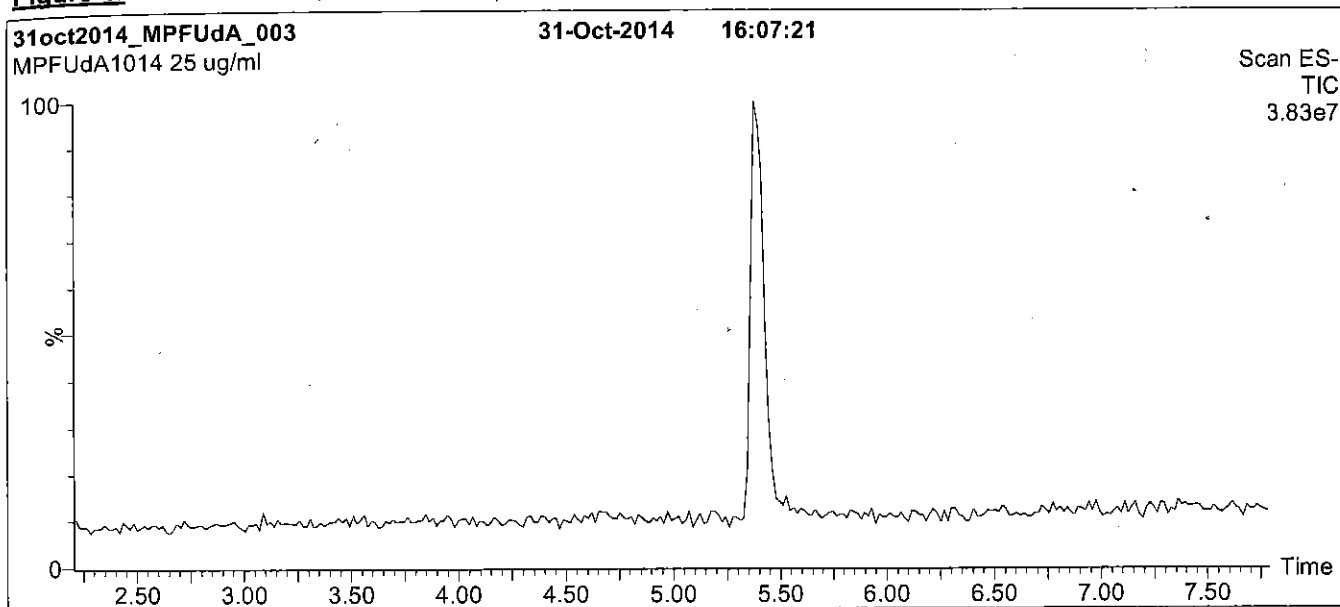
QUALITY MANAGEMENT:

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).



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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc 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

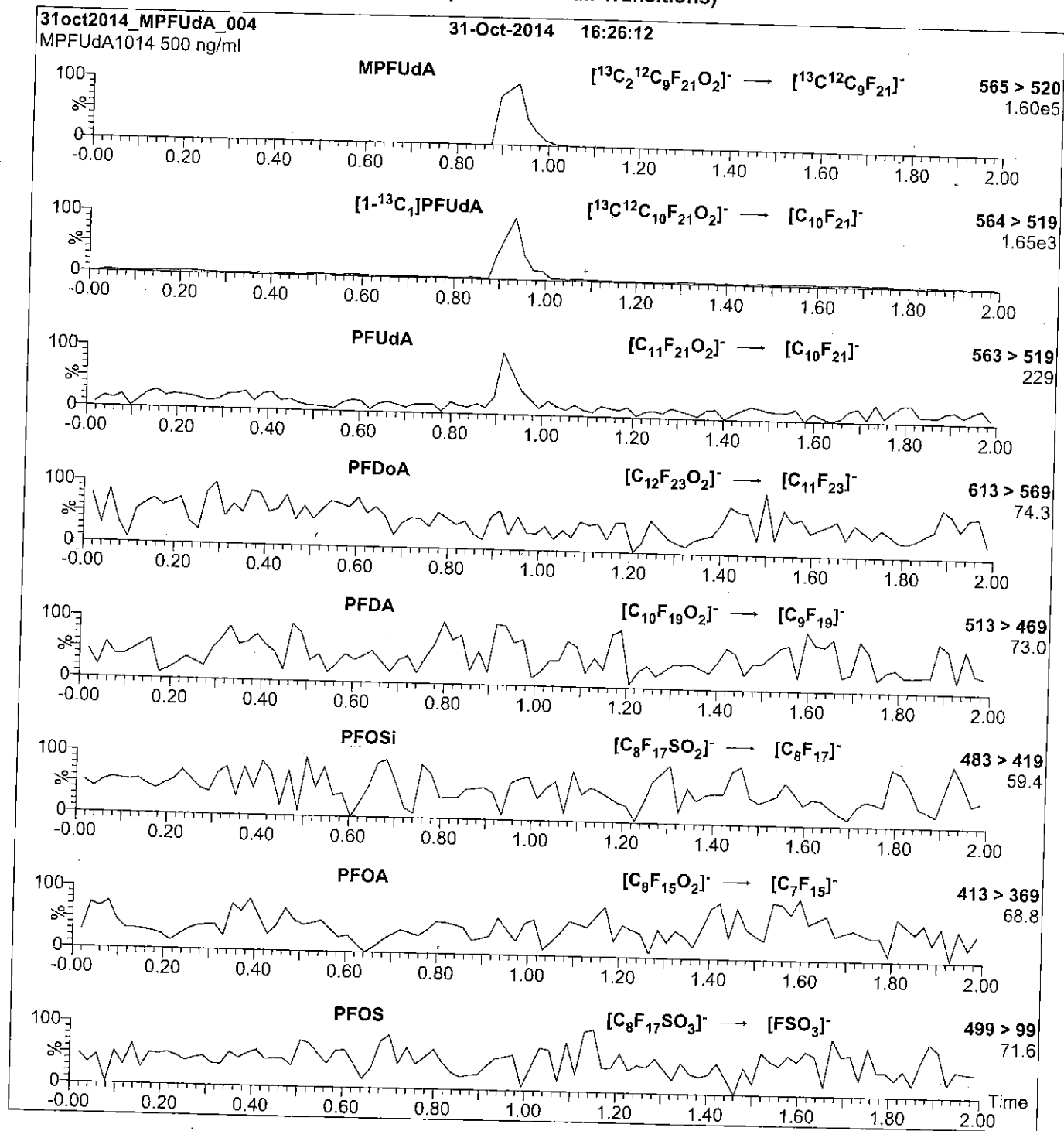
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCPFACMXB_00007



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LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PFAC-MXB

**Solution/Mixture of Native
Perfluoroalkylcarboxylic Acids and
Native Perfluoroalkylsulfonates**

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

DESCRIPTION:

PFAC-MXB is a solution/mixture of thirteen native perfluoroalkylcarboxylic acids (C₄-C₁₄, C₁₆, and C₁₈) and four native perfluoroalkylsulfonates (C₄, C₆, C₈ and C₁₀). The full name, abbreviation and concentration for each of the components are given in Table A.

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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LIMITED WARRANTY:

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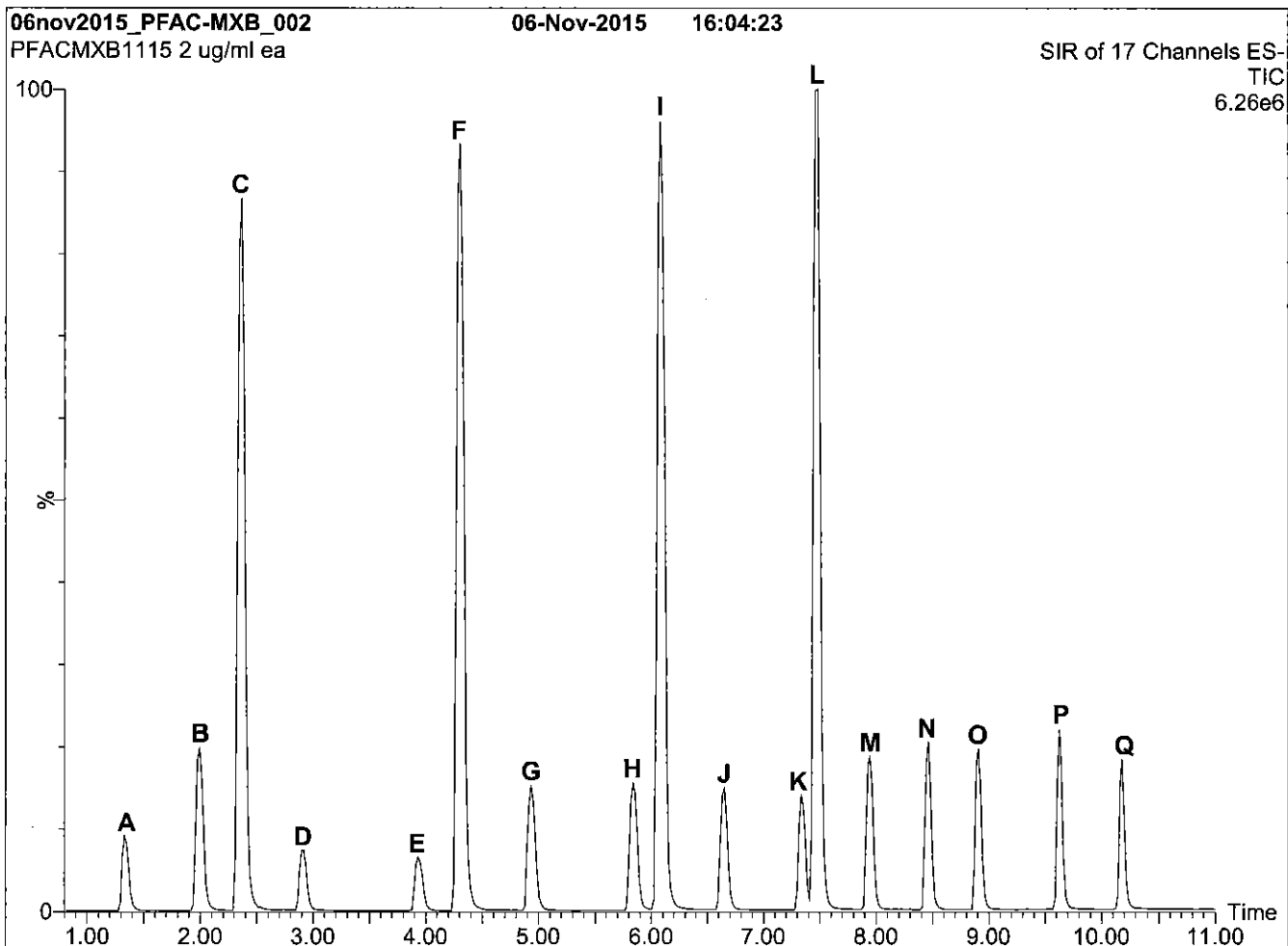
Table A: PFAC-MXB; Components and Concentrations (ng/ml, ± 5% in Methanol / Water (<1%))

Name	Abbreviation	Concentration (ng/ml)		Peak Assignment in Figure 1
		as the salt	as the anion	
Perfluoro-n-butanoic acid	PFBA	2000		A
Perfluoro-n-pentanoic acid	PFPeA	2000		B
Perfluoro-n-hexanoic acid	PFHxA	2000		D
Perfluoro-n-heptanoic acid	PFHpA	2000		E
Perfluoro-n-octanoic acid	PFOA	2000		G
Perfluoro-n-nonanoic acid	PFNA	2000		H
Perfluoro-n-decanoic acid	PFDA	2000		J
Perfluoro-n-undecanoic acid	PFUdA	2000		K
Perfluoro-n-dodecanoic acid	PFDoA	2000		M
Perfluoro-n-tridecanoic acid	PFTrDA	2000		N
Perfluoro-n-tetradecanoic acid	PFTeDA	2000		O
Perfluoro-n-hexadecanoic acid	PFHxDA	2000		P
Perfluoro-n-octadecanoic acid	PFODA	2000		Q
Name	Abbreviation	Concentration (ng/ml)		Peak Assignment in Figure 1
		as the salt	as the anion	
Potassium perfluoro-1-butanesulfonate	L-PFBS	2000	1770	C
Sodium perfluoro-1-hexanesulfonate	L-PFHxS	2000	1890	F
Sodium perfluoro-1-octanesulfonate	L-PFOS	2000	1910	I
Sodium perfluoro-1-decanesulfonate	L-PFDS	2000	1930	L

Certified By: 
B.G. Chittim

Date: 11/11/2015
(mm/dd/yyyy)

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 55% H₂O / 45% (80:20 MeOH:ACN)
 (both with 10 mM NH₄OAc buffer)
 Ramp to 95% organic over 10 min and hold for 1 min
 before returning to initial conditions in 0.5 min.

Time: 12 min

Flow: 300 μ l/min

MS Parameters

Experiment: SIR of 17 Channels

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

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

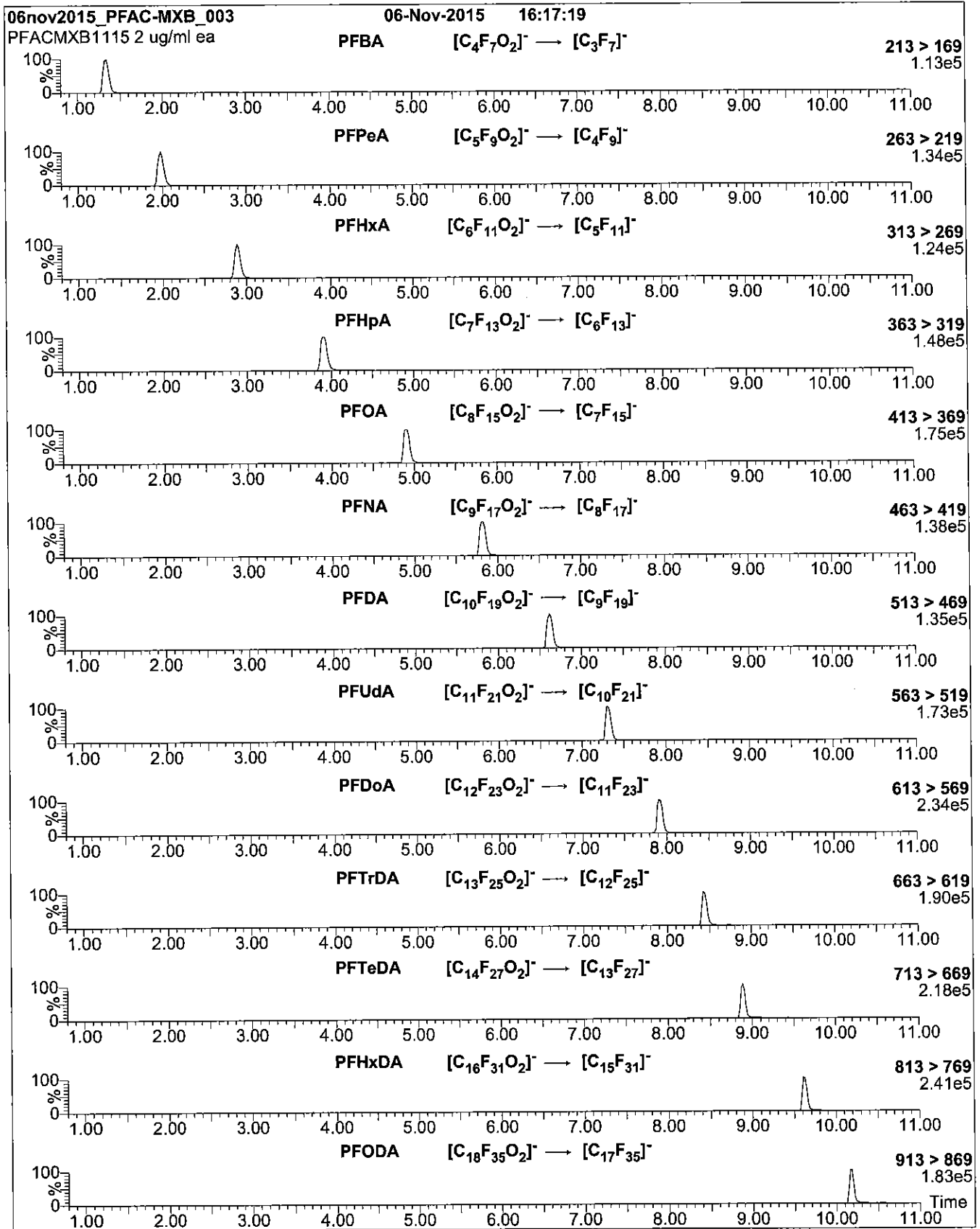
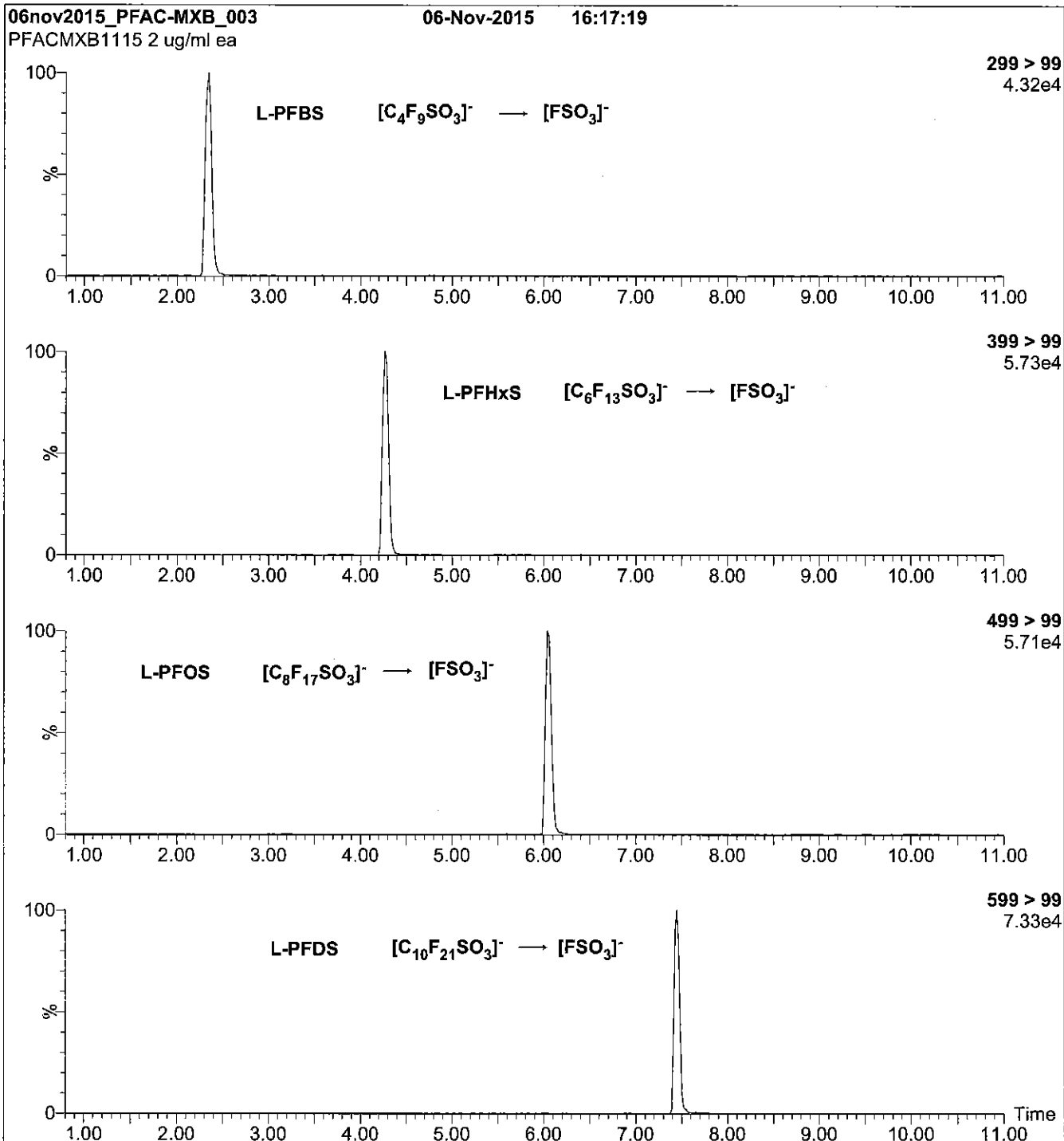


Figure 3: PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figures 2 and 3:

Injection: on-column (PFAC-MXB)
Mobile phase: Same as Figure 1
Flow: 300 μ /min

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

Reagent

LCPFBA_00003

rec 7/15/14



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFBA

LOT NUMBER:

PFBA0313

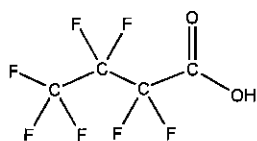
COMPOUND:

Perfluoro-n-butanoic acid

STRUCTURE:

CAS #:

375-22-4



MOLECULAR FORMULA:

C₄HF₇O₂

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)

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: 03/06/2013

(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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SYNTHESIS / CHARACTERIZATION:

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LIMITED WARRANTY:

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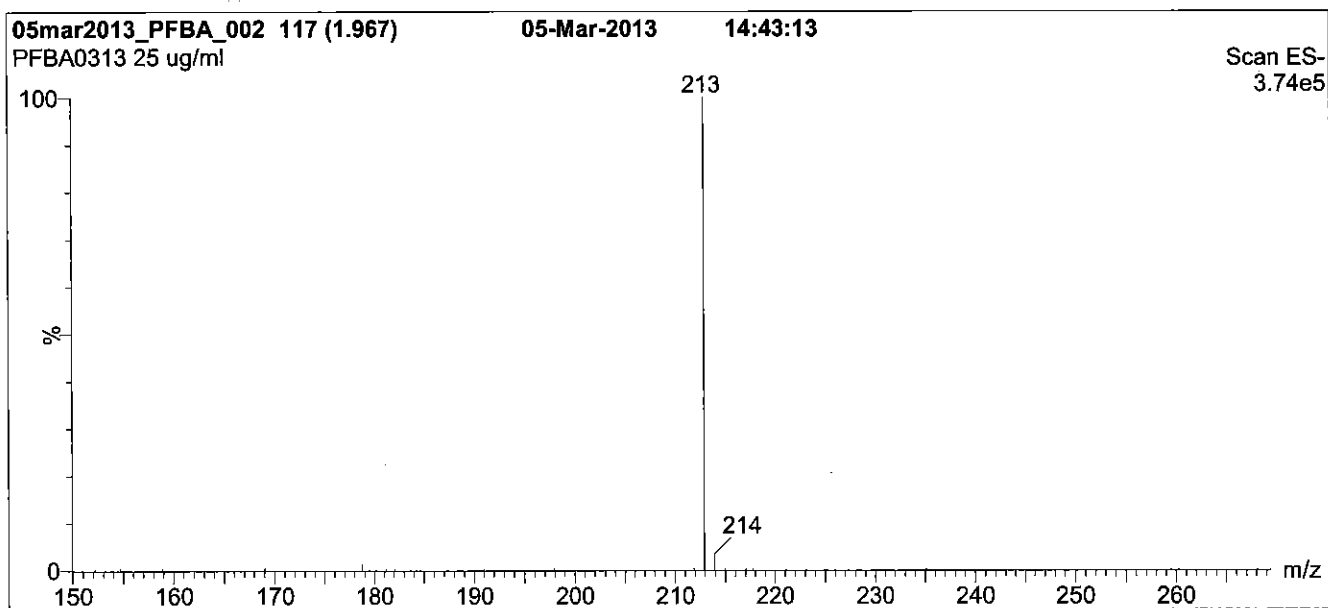
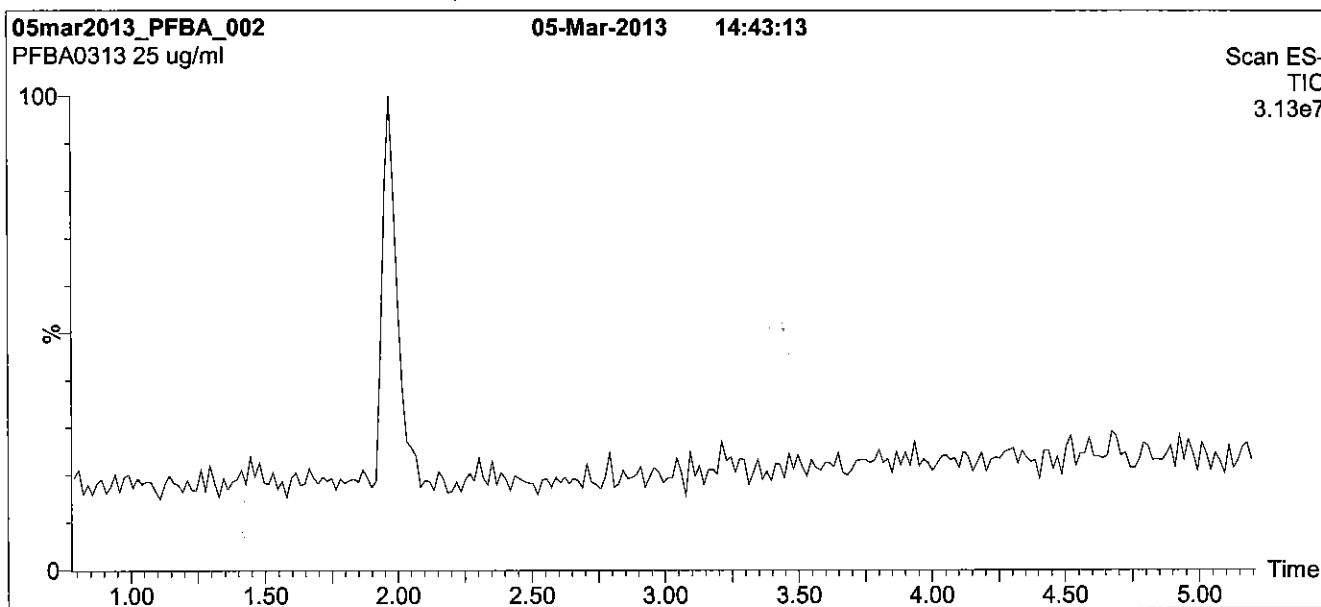
QUALITY MANAGEMENT:

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).



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 25% (80:20 MeOH:ACN) / 75% H₂O
(both with 10 mM NH₄OAc 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

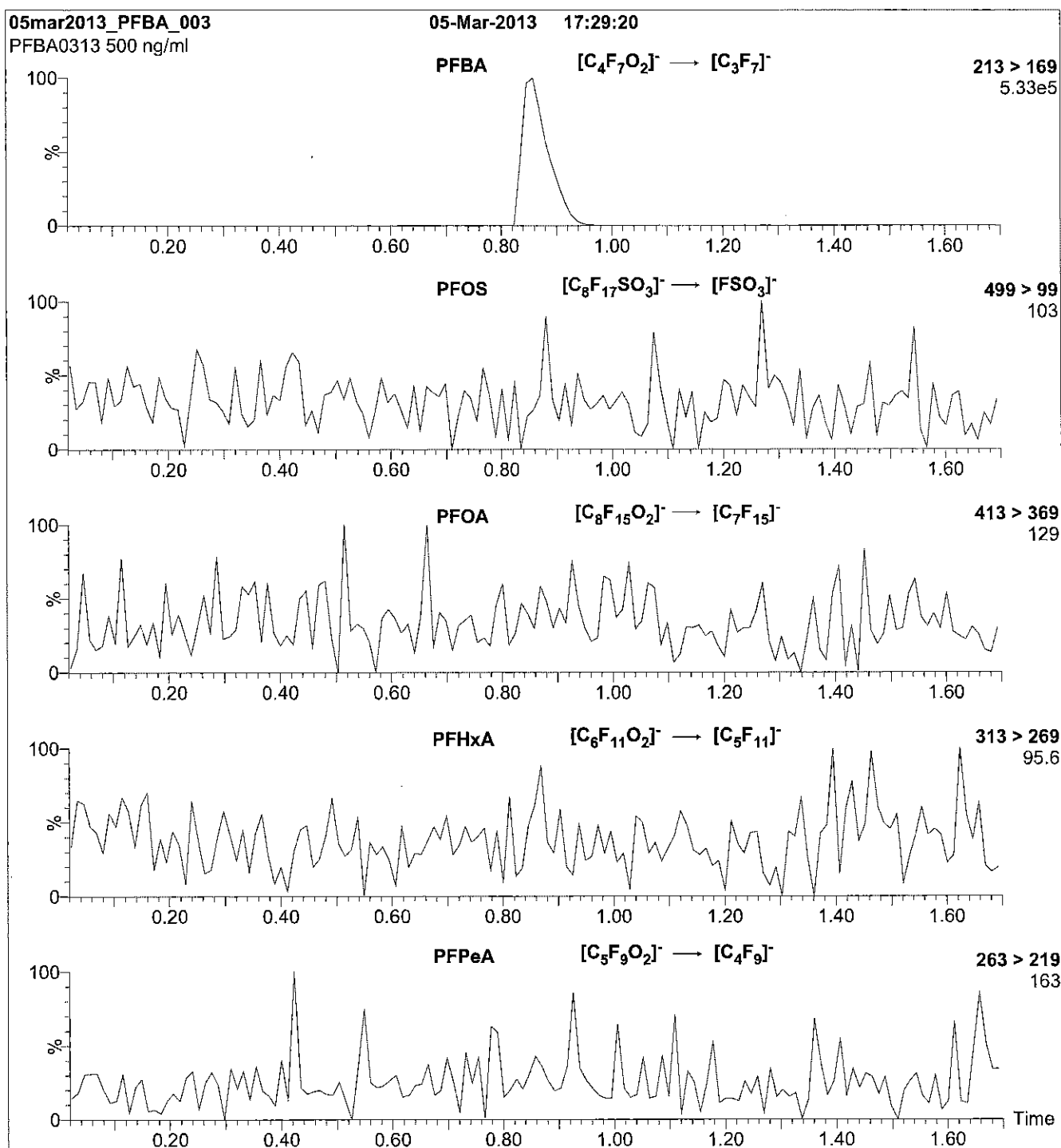
Flow: 300 μ l/min

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 μ l (500 ng/ml PFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.70e-3
Collision Energy (eV) = 10

Reagent

LCPFBA_00004



R: 2125/16 CBW

587895

ID: LCPFBA_00004

Exp: 01/30/20 Prep: CBW

PF-n-butanoic acid

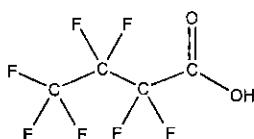


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFBA **LOT NUMBER:** PFBA0115
COMPOUND: Perfluoro-n-butanoic acid

STRUCTURE: **CAS #:** 375-22-4



MOLECULAR FORMULA: C₄HF₇O₂ **MOLECULAR WEIGHT:** 214.04
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____

B.G. Chittim

Date: 03/25/2015
(mm/dd/yyyy)

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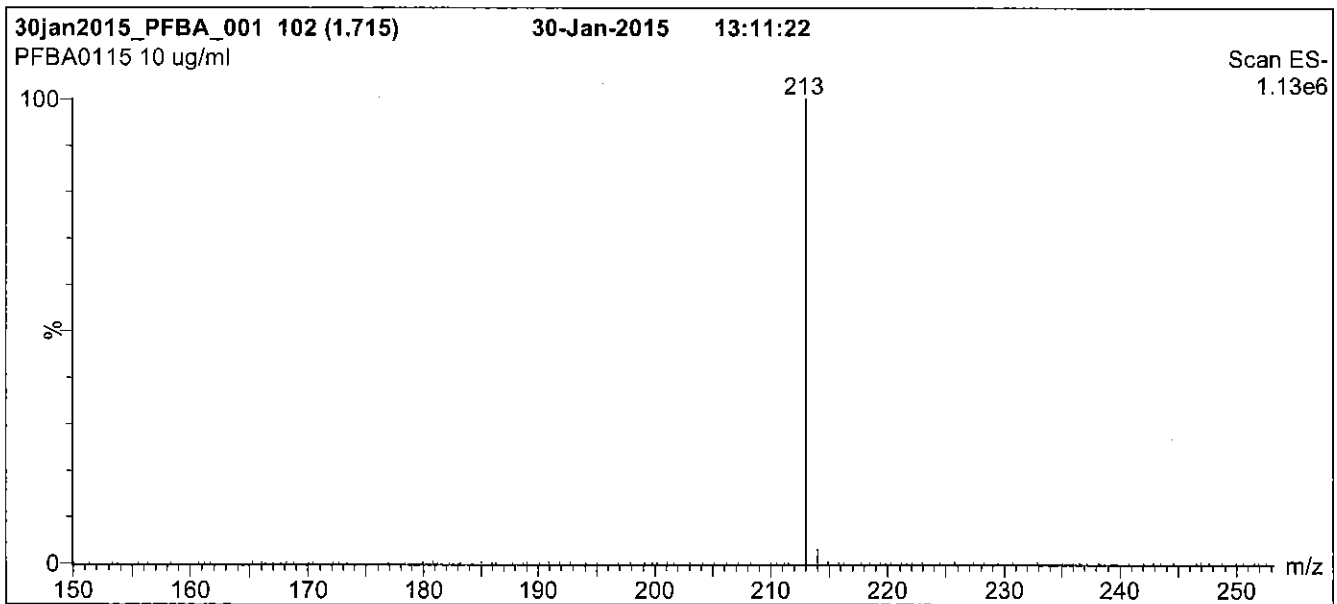
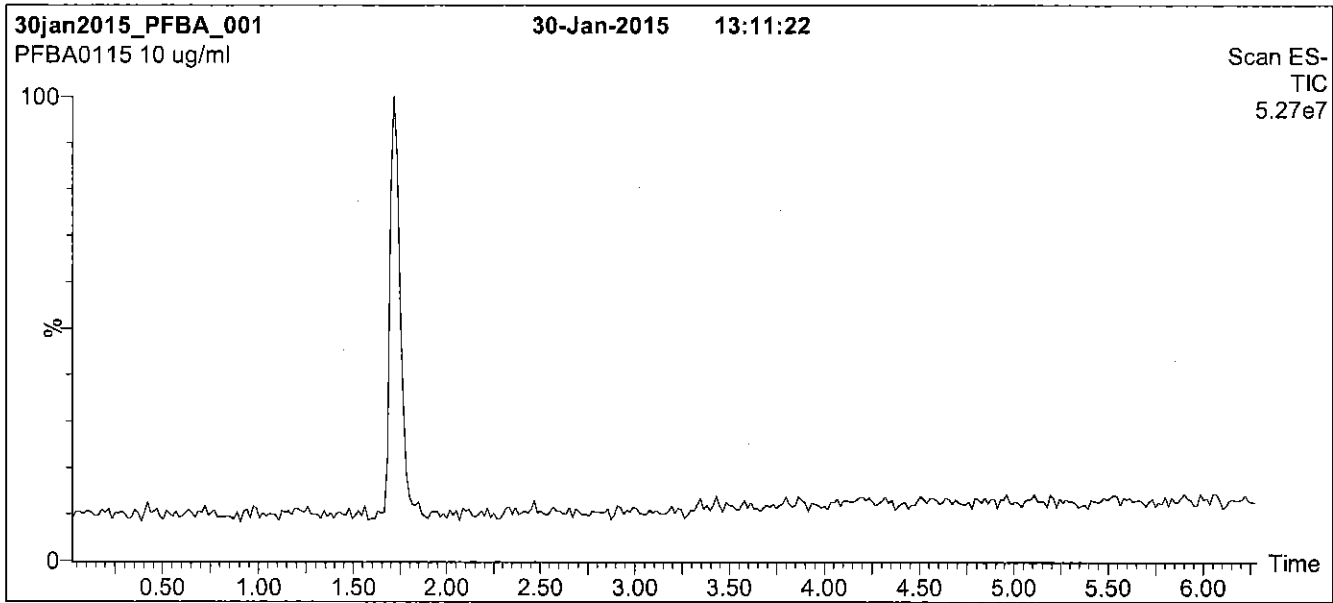
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Figure 1: PFBA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

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Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H₂O
(both with 10 mM NH₄OAc 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

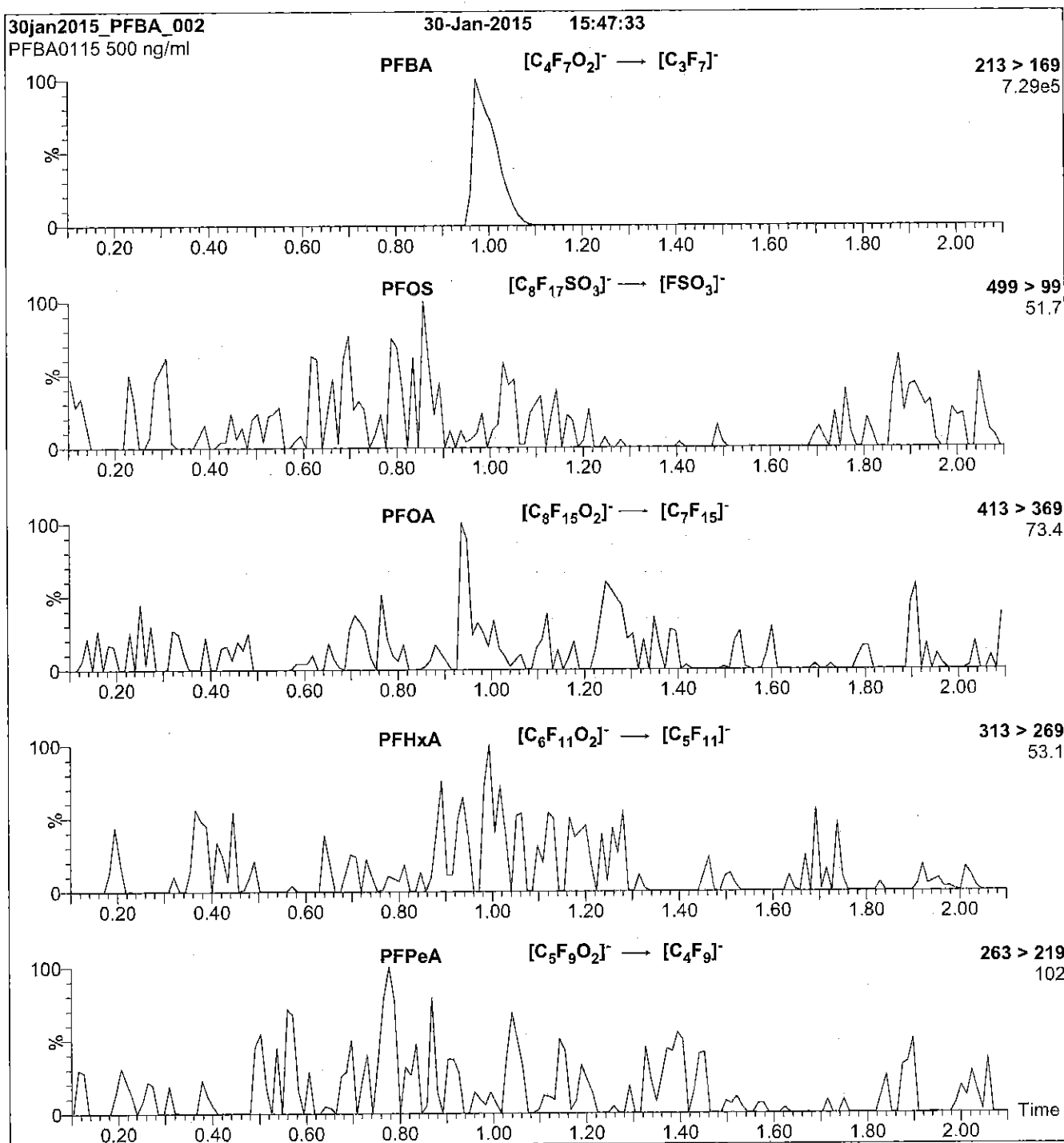
Flow: 300 μ l/min

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 μ l (500 ng/ml PFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

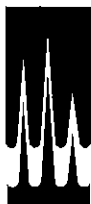
Flow: 300 μ l/min

MS Parameters

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

Reagent

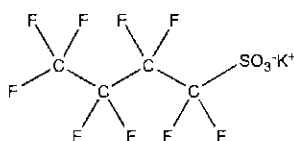
LCPFBS_00003



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: C₄F₉SO₃K **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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

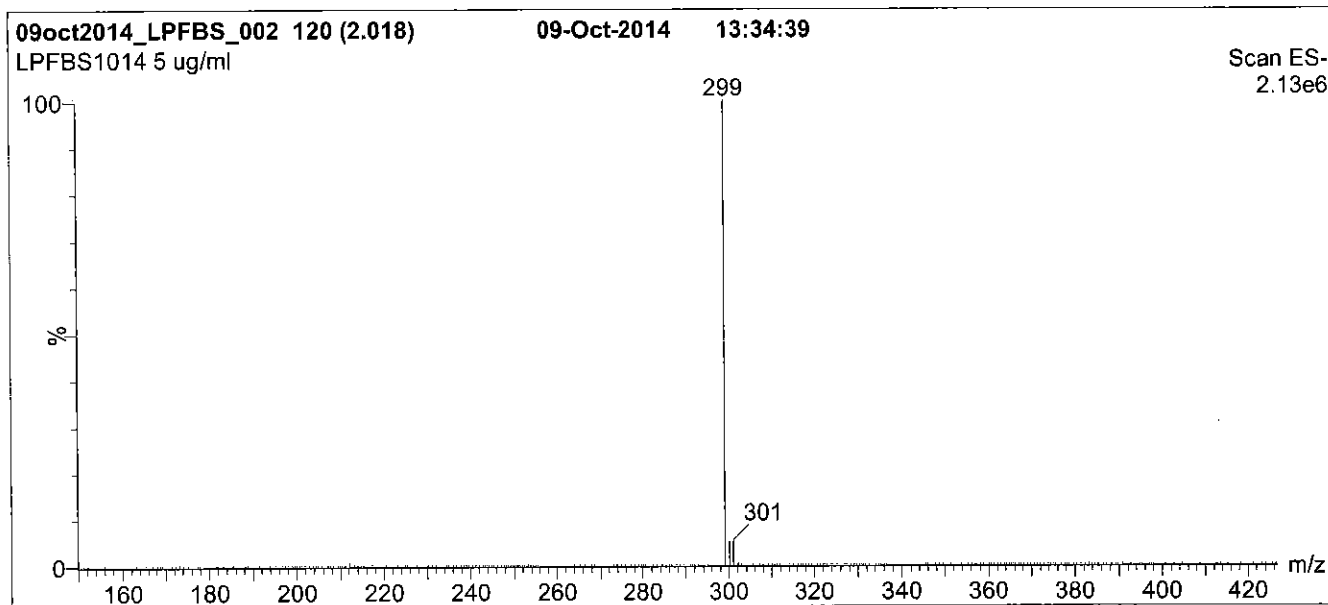
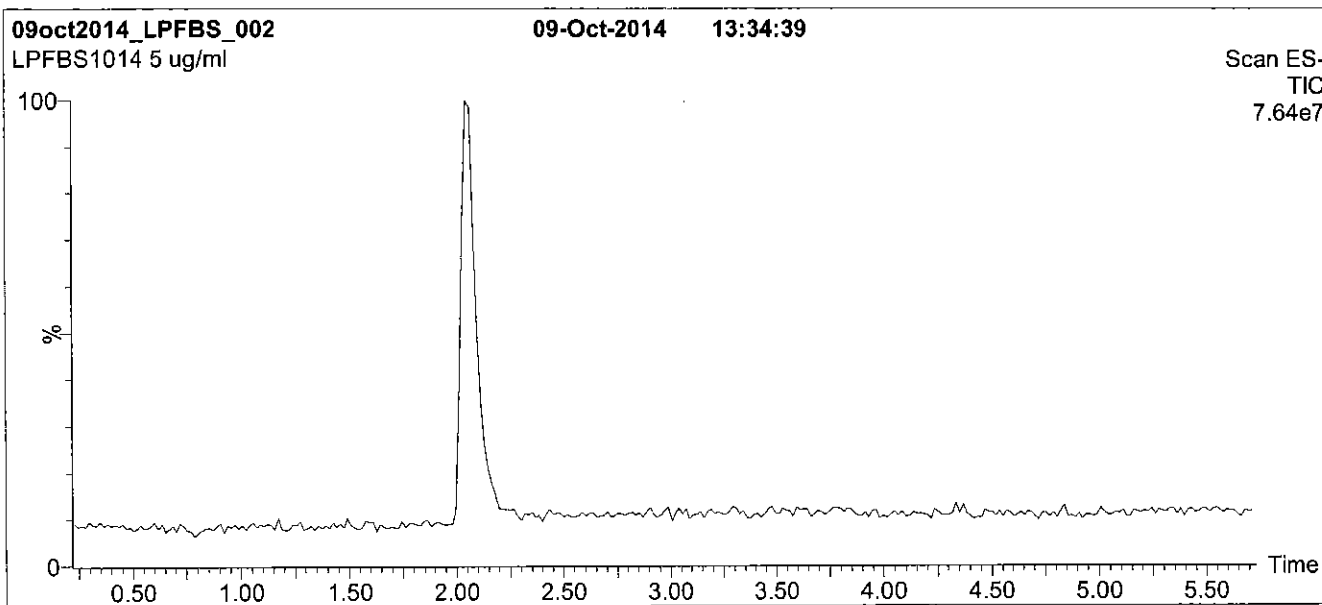
QUALITY MANAGEMENT:

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).



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-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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H₂O
(both with 10 mM NH₄OAc 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

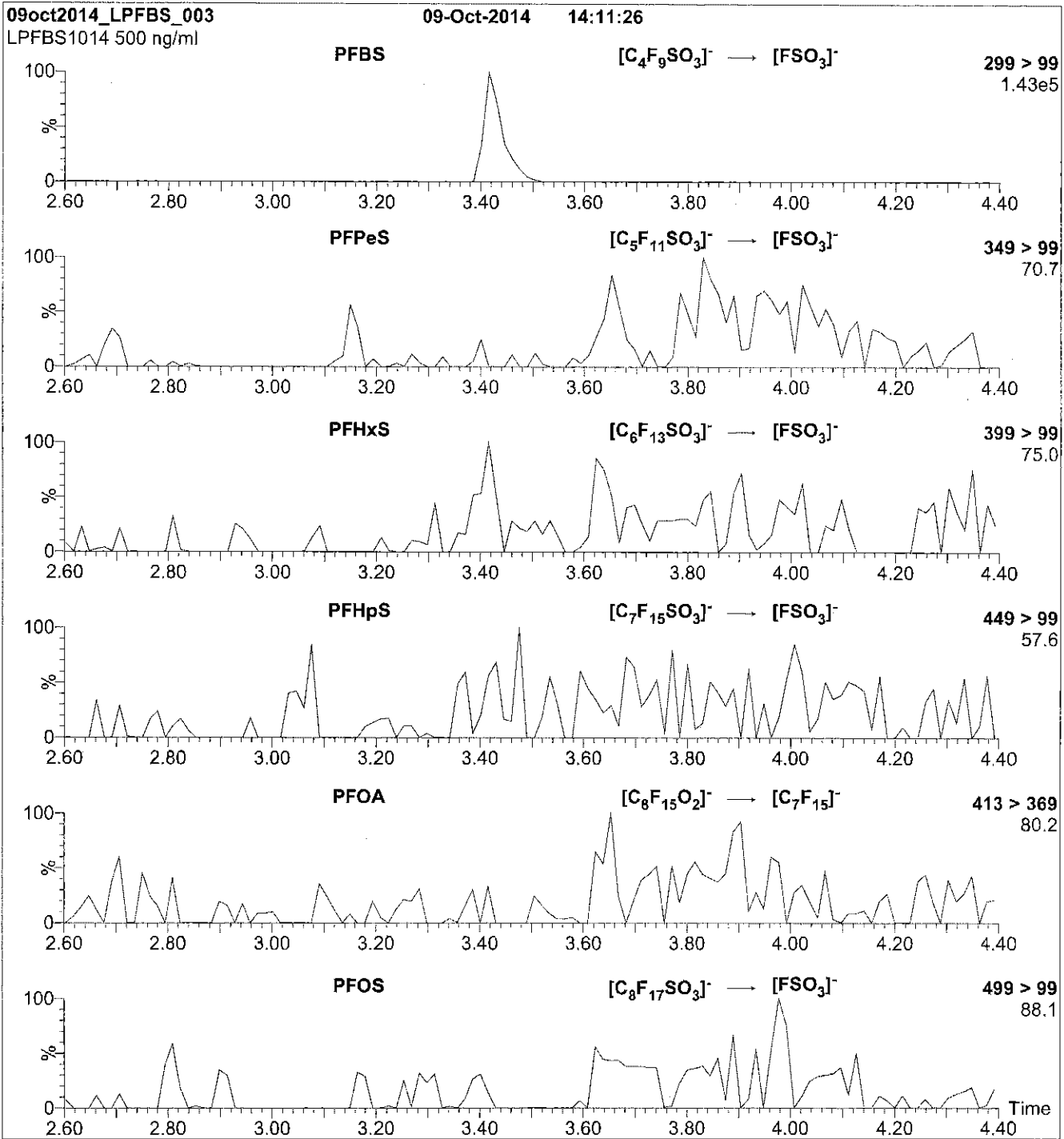
Flow: 300 μ l/min

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 μ l (500 ng/ml L-PFBS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFDA_00004

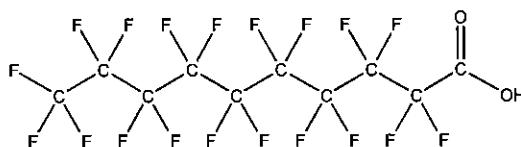


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE: **CAS #:** 335-76-2



MOLECULAR FORMULA: $C_{10}H_{18}O_2$ **MOLECULAR WEIGHT:** 514.08
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/02/2015
EXPIRY DATE: (mm/dd/yyyy) 07/02/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____


 B.G. Chittim

Date: 07/24/2015
 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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 $\pm 5\%$ (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.

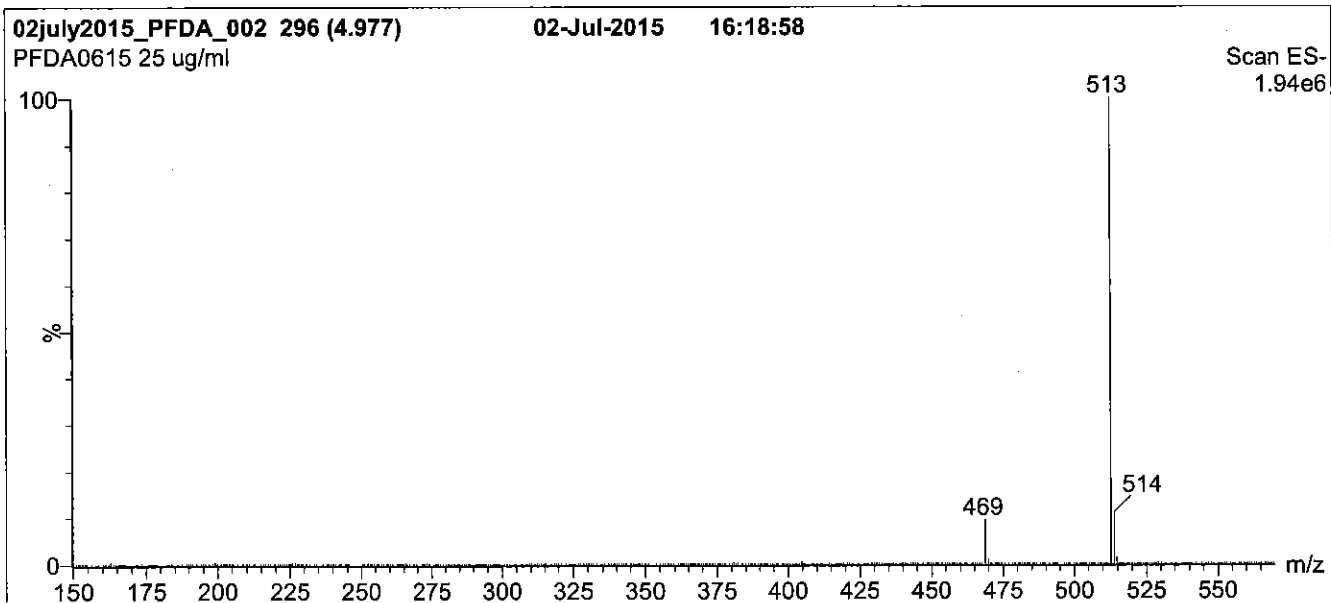
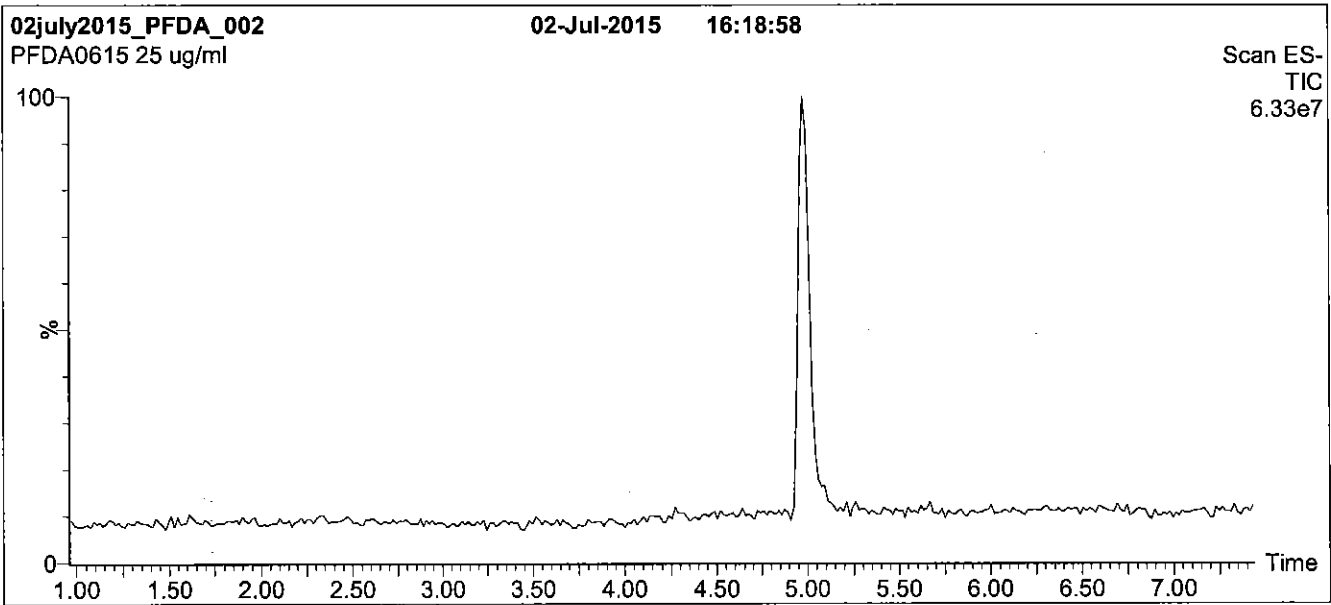
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

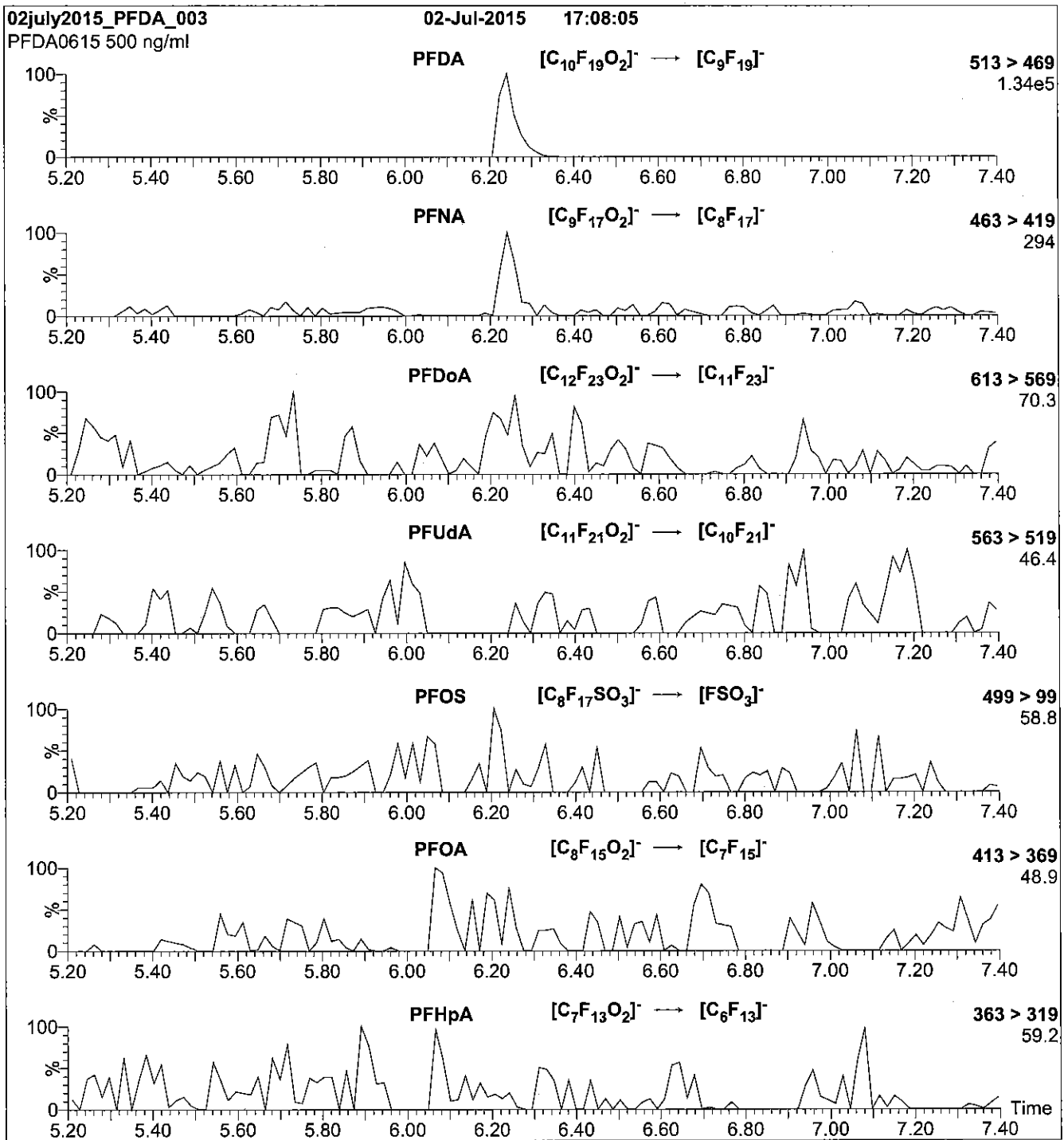
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFDoA_00004

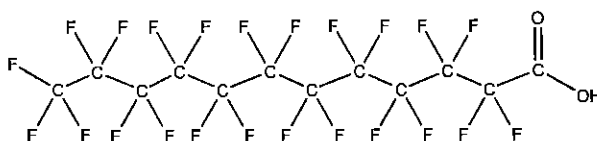


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFD0A **LOT NUMBER:** PFD0A0115
COMPOUND: Perfluoro-n-dodecanoic acid

STRUCTURE: **CAS #:** 307-55-1



MOLECULAR FORMULA: $C_{12}HF_{23}O_2$ **MOLECULAR WEIGHT:** 614.10
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____


 B.G. Chittim

Date: 03/25/2015
 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

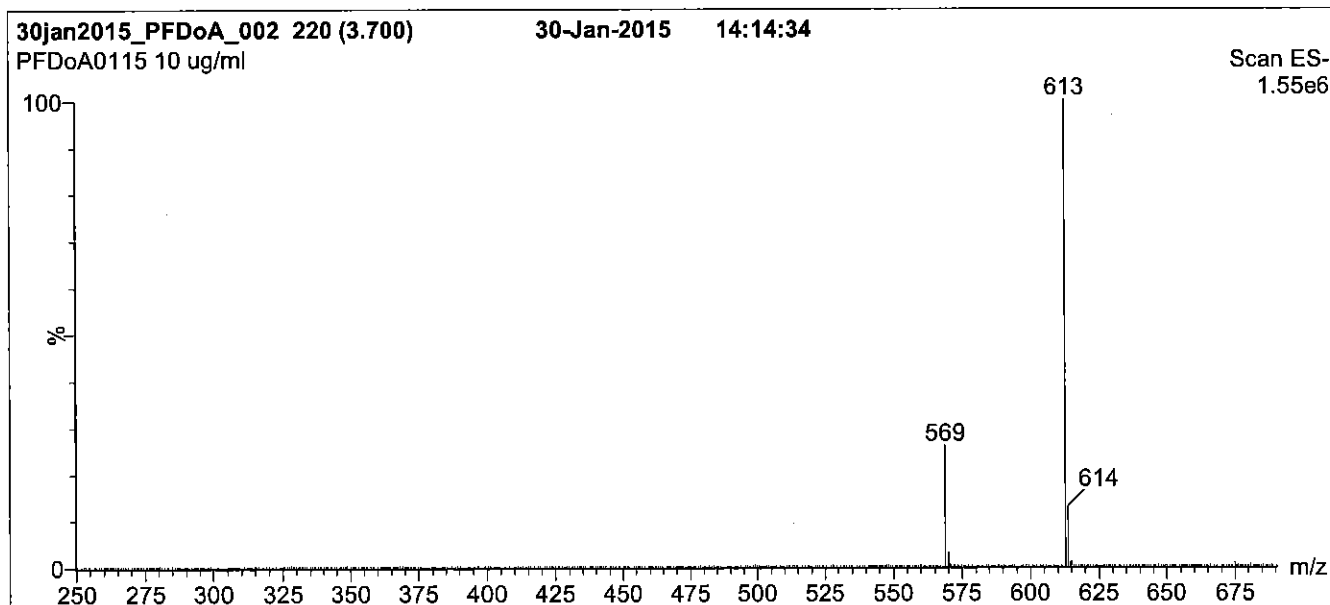
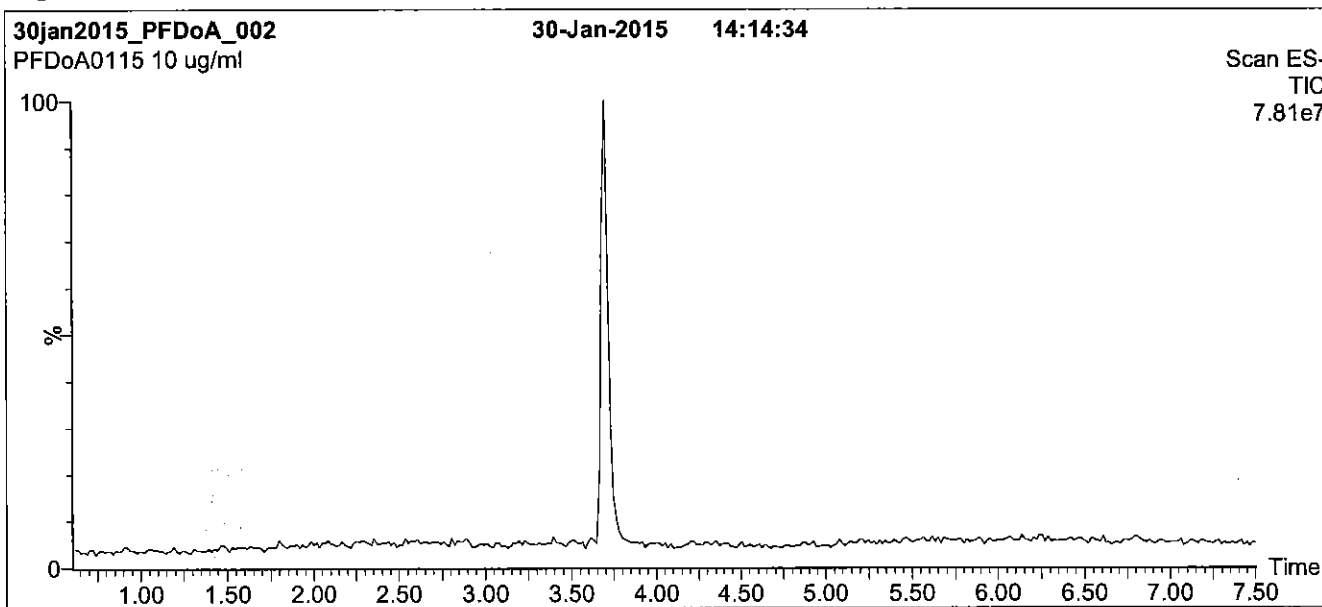
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc 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

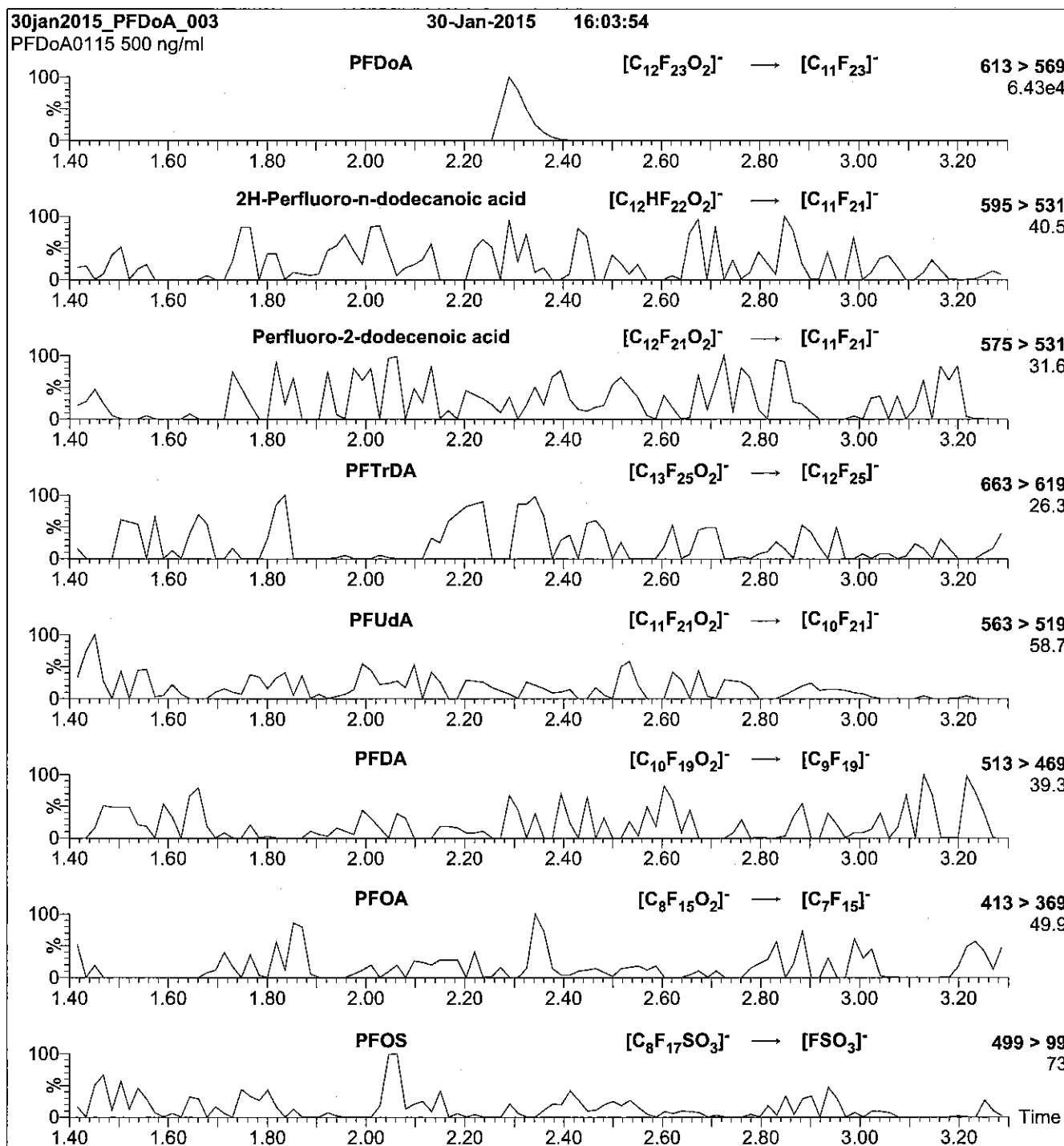
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

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

Flow: 300 μ l/min

Reagent

LCPFDS_00005



605240
 ID: LCPFDS_00005
 Exp: 07/02/20 Prep: CBW
 PF-1-decanesulfonate sodi

Rec. 3/29/16 JRB

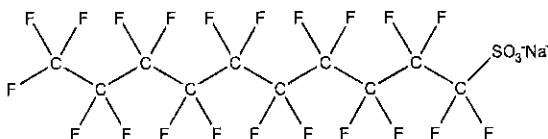


WELLINGTON
 LABORATORIES

CERTIFICATE OF ANALYSIS
 DOCUMENTATION

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

STRUCTURE: **CAS #:** 2806-15-7



MOLECULAR FORMULA: C₁₀F₂₁SO₃Na **MOLECULAR WEIGHT:** 622.13
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
 48.2 ± 2.4 µg/ml (PFDS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/02/2015
EXPIRY DATE: (mm/dd/yyyy) 07/02/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

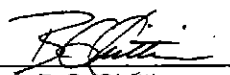
DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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, \dots, 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 $\pm 5\%$ (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.

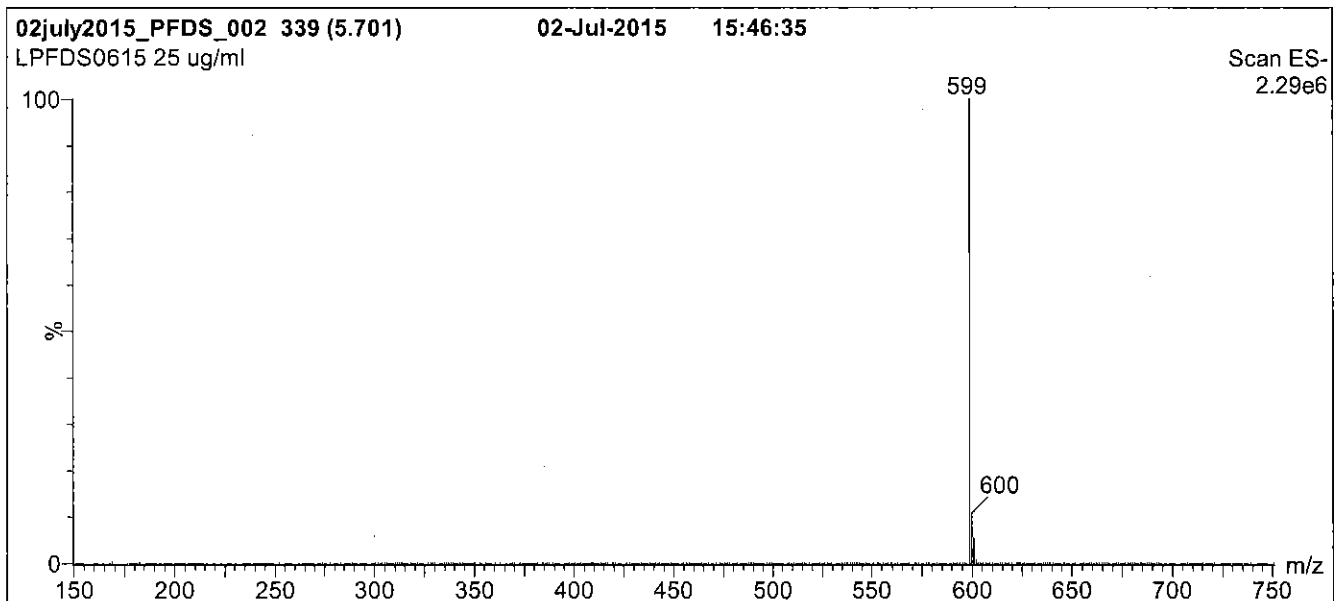
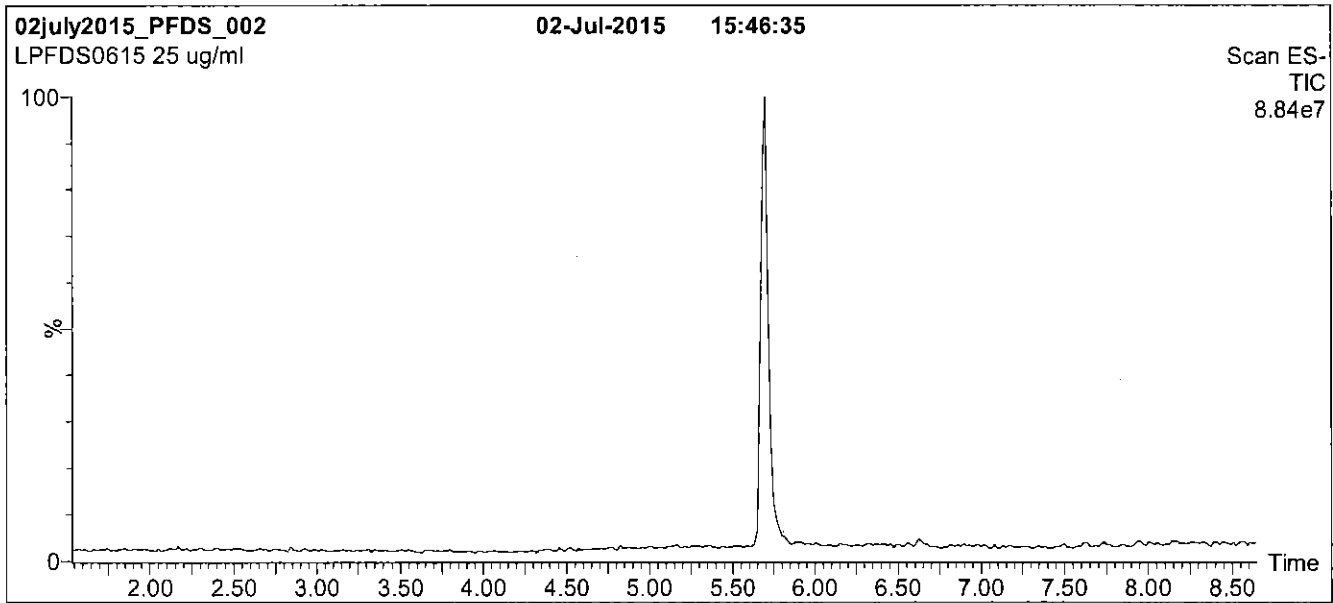
QUALITY MANAGEMENT:

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).



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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

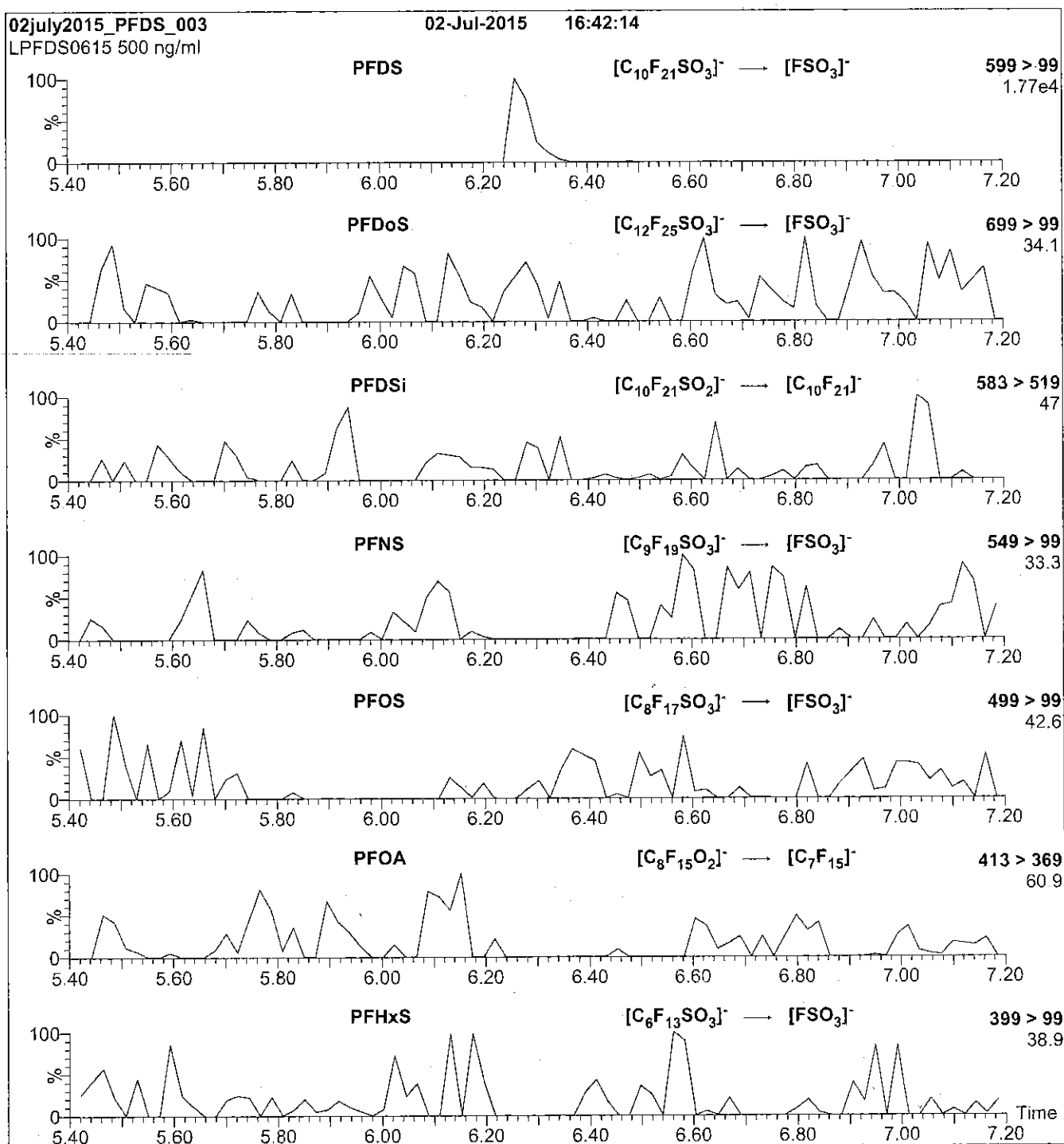
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFHpA_00004

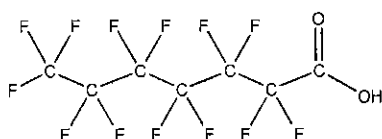


PRODUCT CODE: PFHpA
COMPOUND: Perfluoro-n-heptanoic acid

LOT NUMBER: PFHpA0514

STRUCTURE:

CAS #: 375-85-9



MOLECULAR FORMULA: C₇HF₁₃O₂
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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

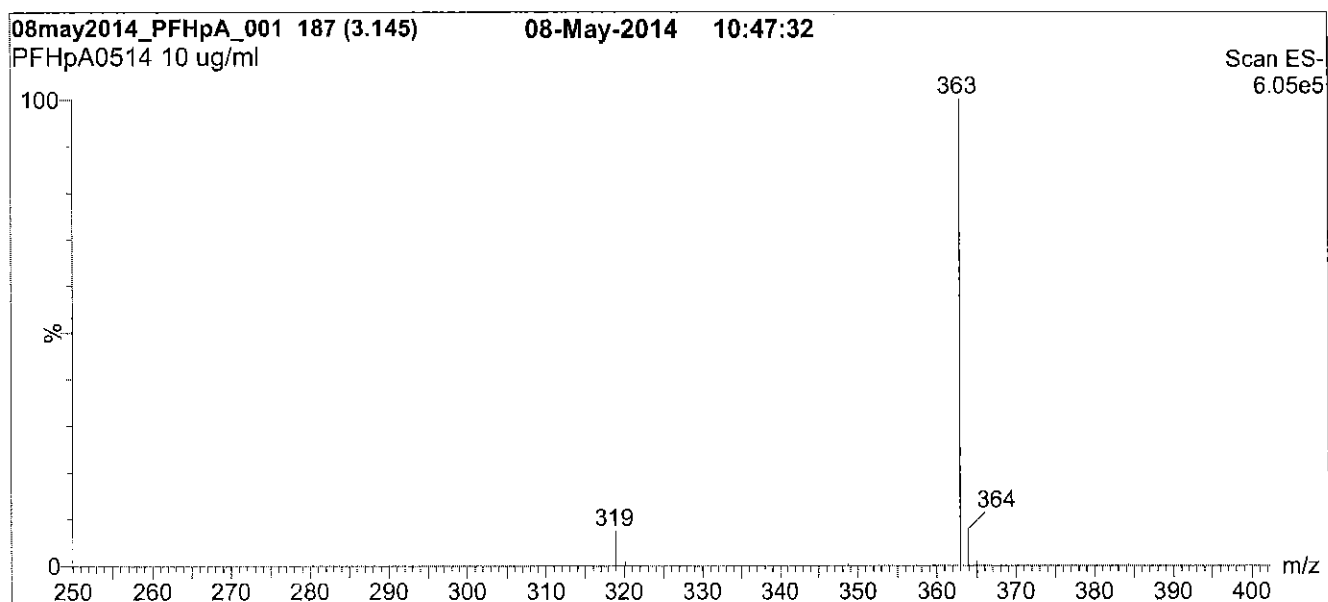
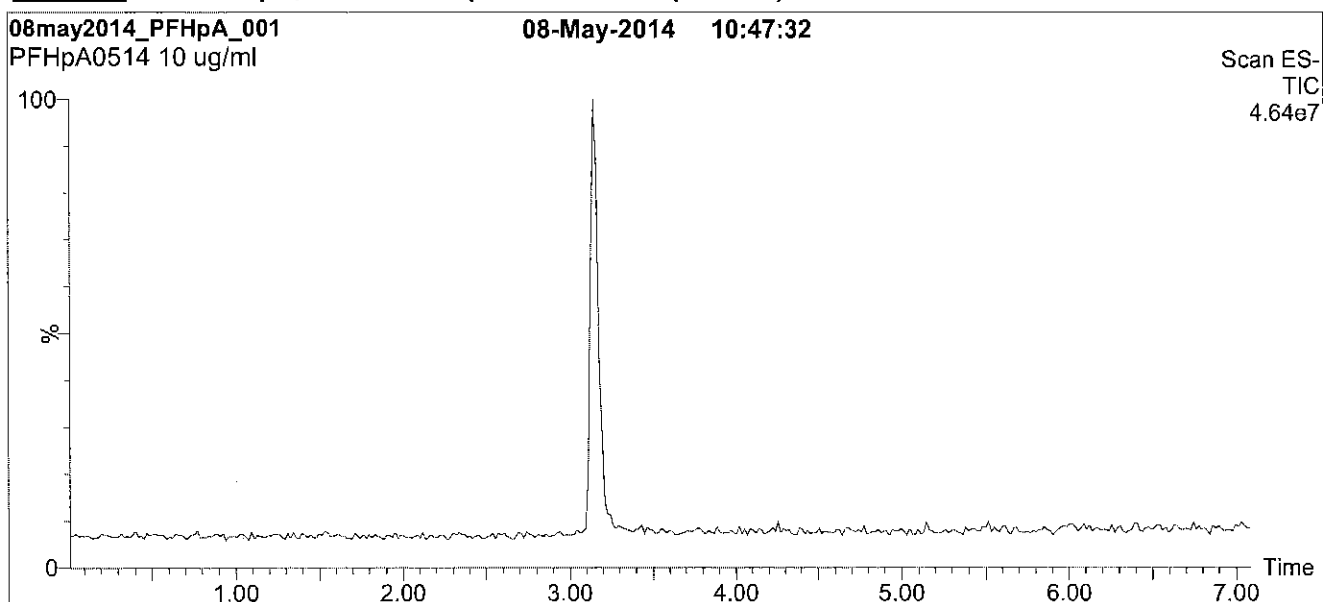
QUALITY MANAGEMENT:

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).



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 C₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

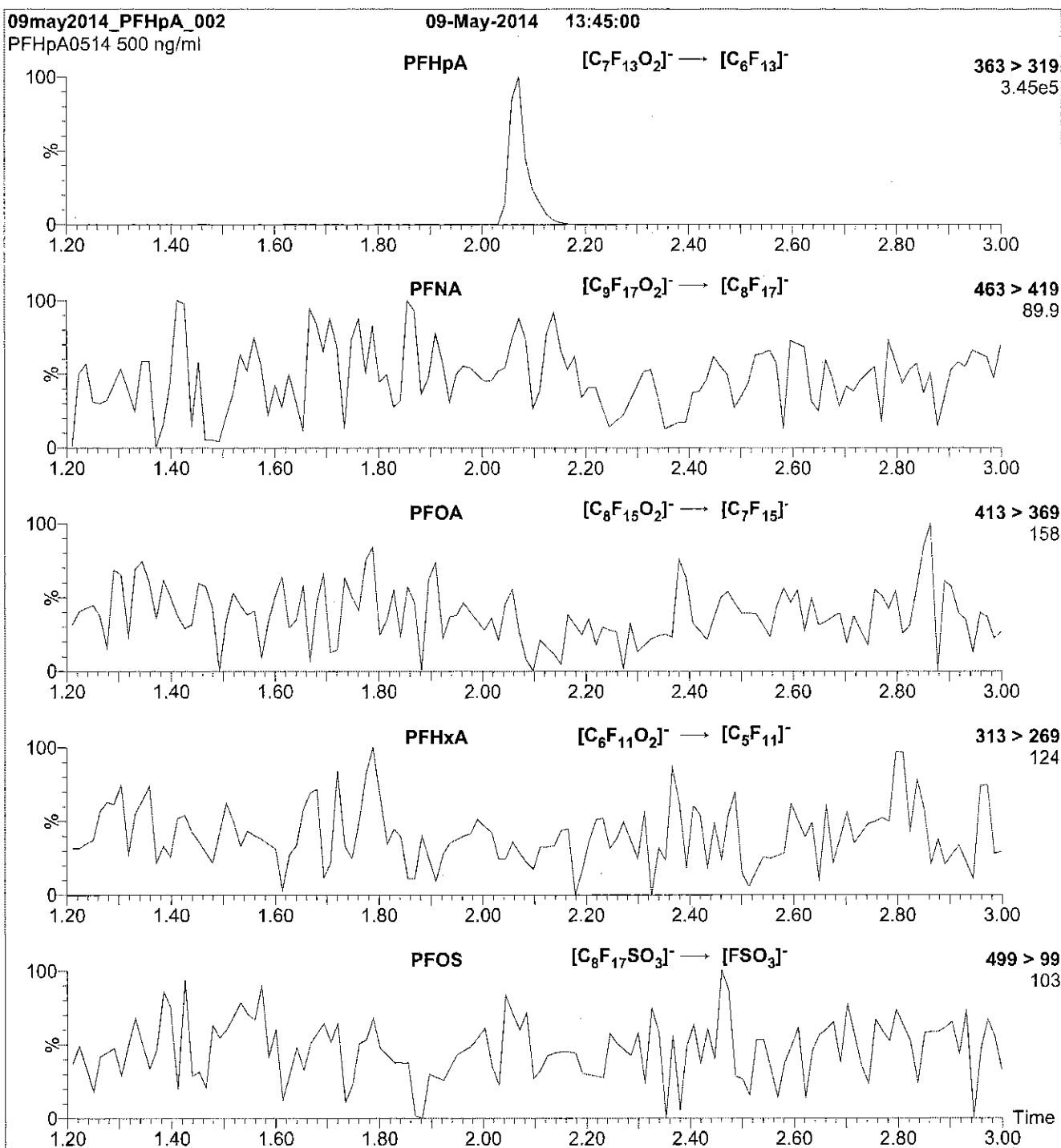
Flow: 300 μ l/min

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 μ l (500 ng/ml PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFHpA_00005



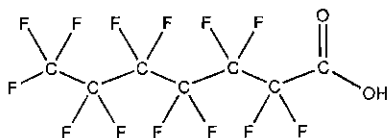
609639

ID: LCPFHpA_00005

Exp: 01/22/21 Prpd: CBW

PF-n-heptanoic acid

R: 4/7/16 CBW

**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:** PFHpA
COMPOUND: Perfluoro-n-heptanoic acid**LOT NUMBER:** PFHpA0116**STRUCTURE:****CAS #:** 375-85-9**MOLECULAR FORMULA:** C₇H₁₃O₂
CONCENTRATION: 50 ± 2.5 µg/ml**MOLECULAR WEIGHT:** 364.06
SOLVENT(S): Methanol
Water (<1%)**CHEMICAL PURITY:** >98%
LAST TESTED: (mm/dd/yyyy) 01/22/2016
EXPIRY DATE: (mm/dd/yyyy) 01/22/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place**DOCUMENTATION/ DATA ATTACHED:**Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)**ADDITIONAL INFORMATION:**

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 02/02/2016

(mm/dd/yyyy)

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

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

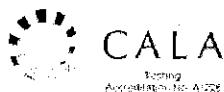
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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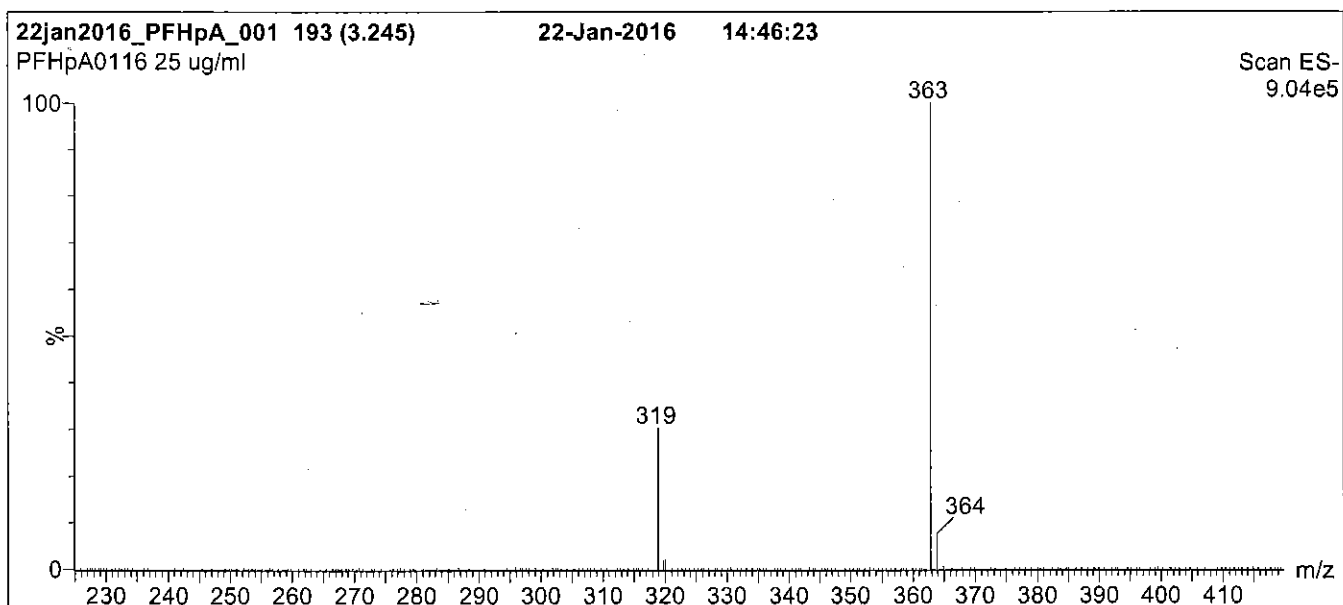
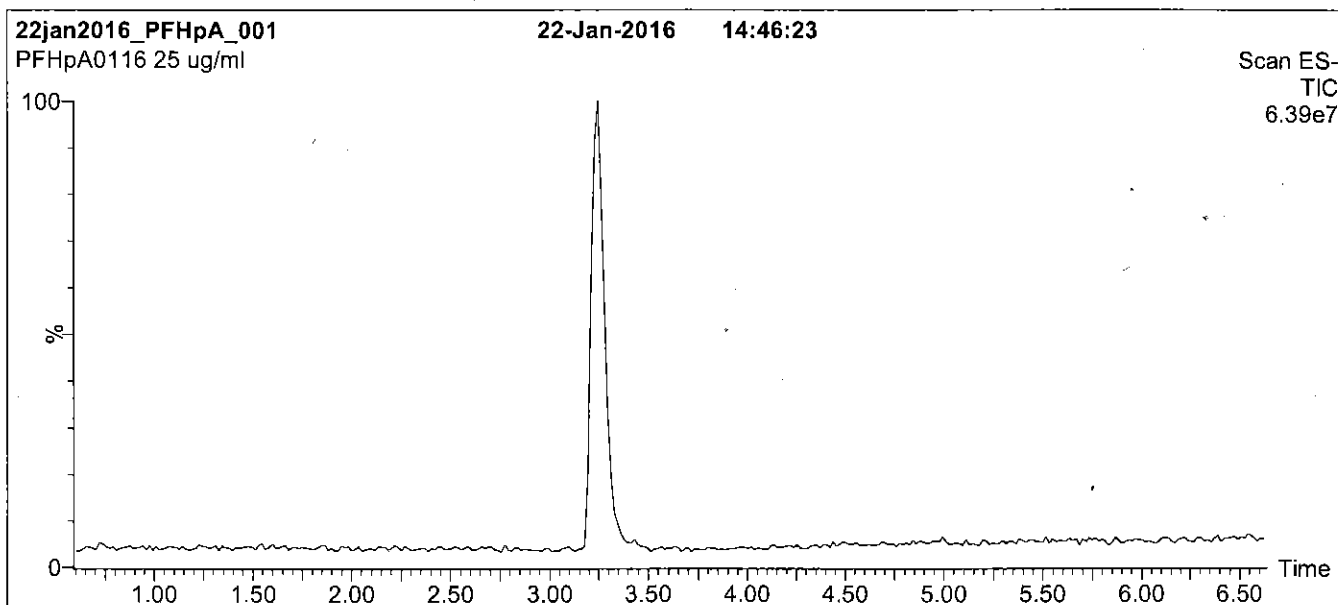
QUALITY MANAGEMENT:

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).



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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc 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

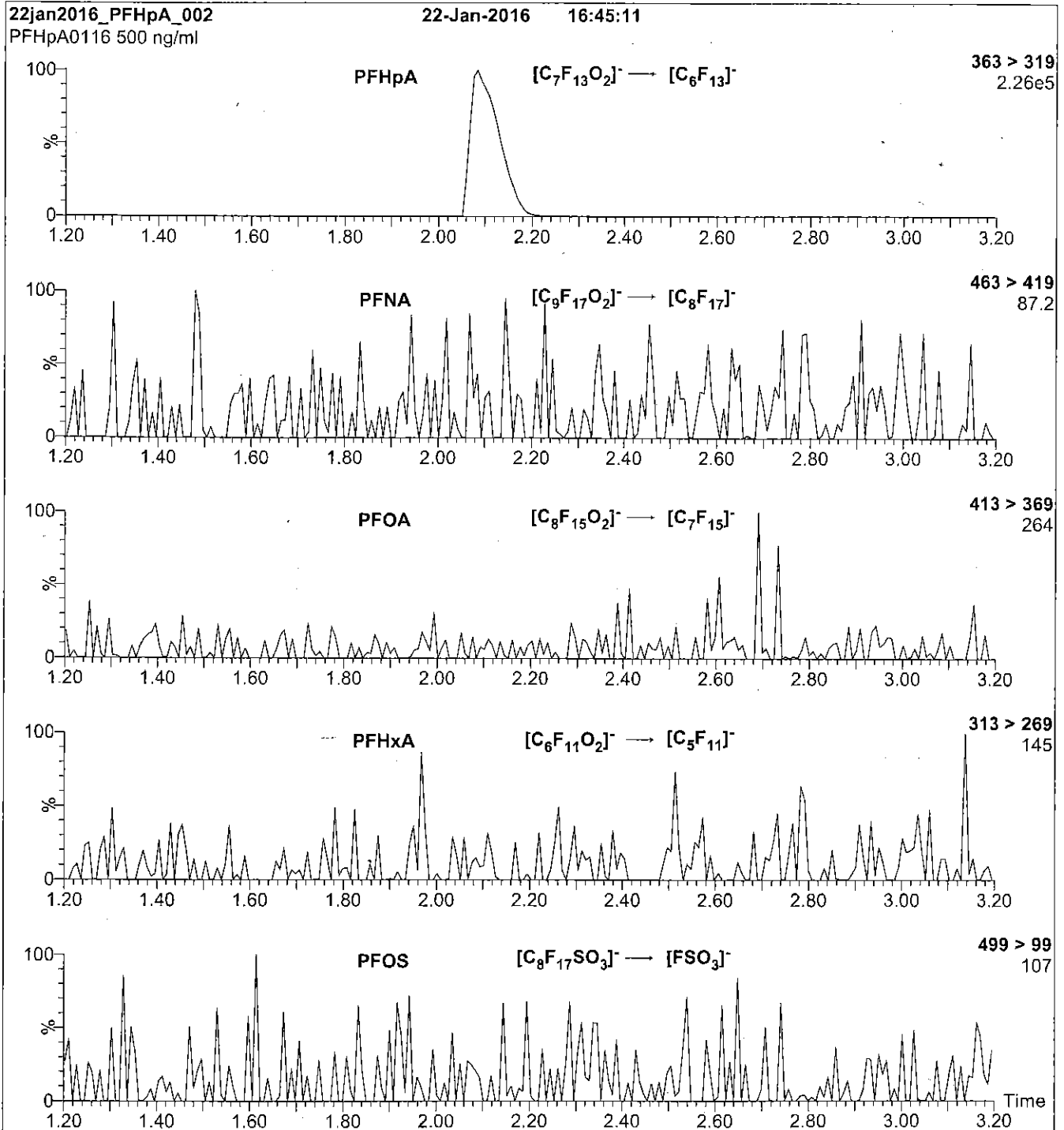
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

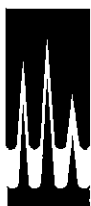
Flow: 300 μ l/min

MS Parameters

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

Reagent

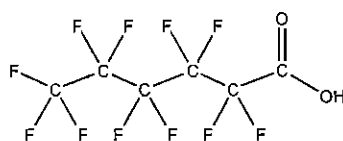
LCPFHxA_00003



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxA **LOT NUMBER:** PFHxA0514
COMPOUND: Perfluoro-n-hexanoic acid
STRUCTURE: **CAS #:** 307-24-4



MOLECULAR FORMULA: C₆HF₁₁O₂ **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:

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

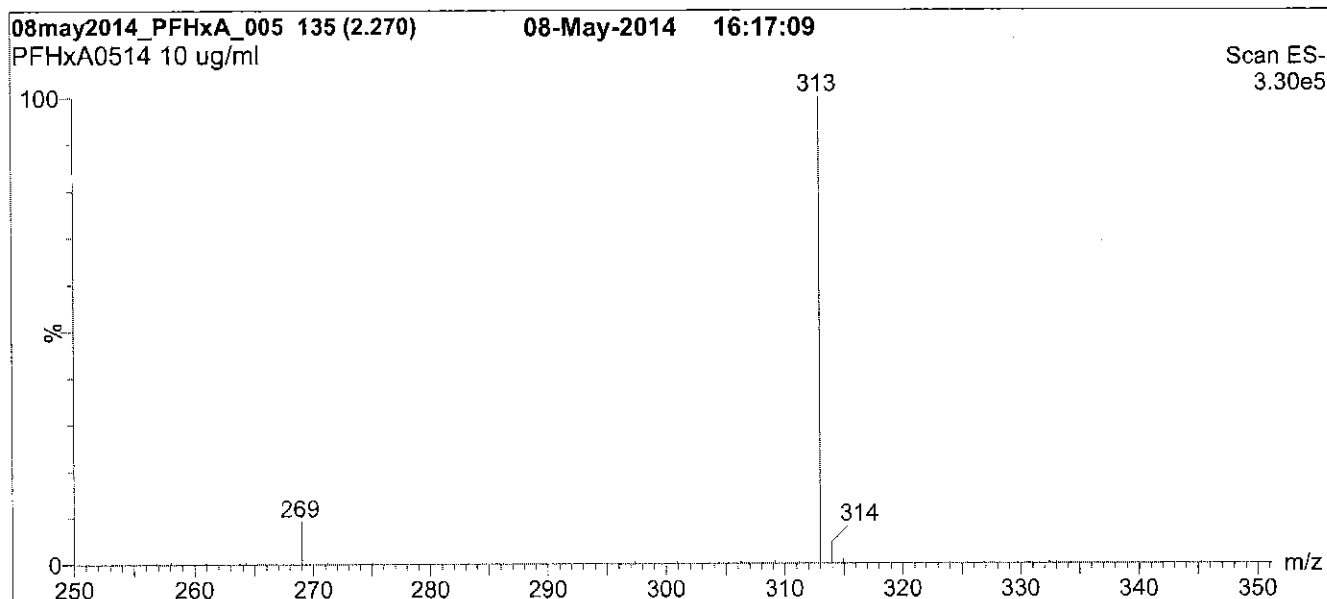
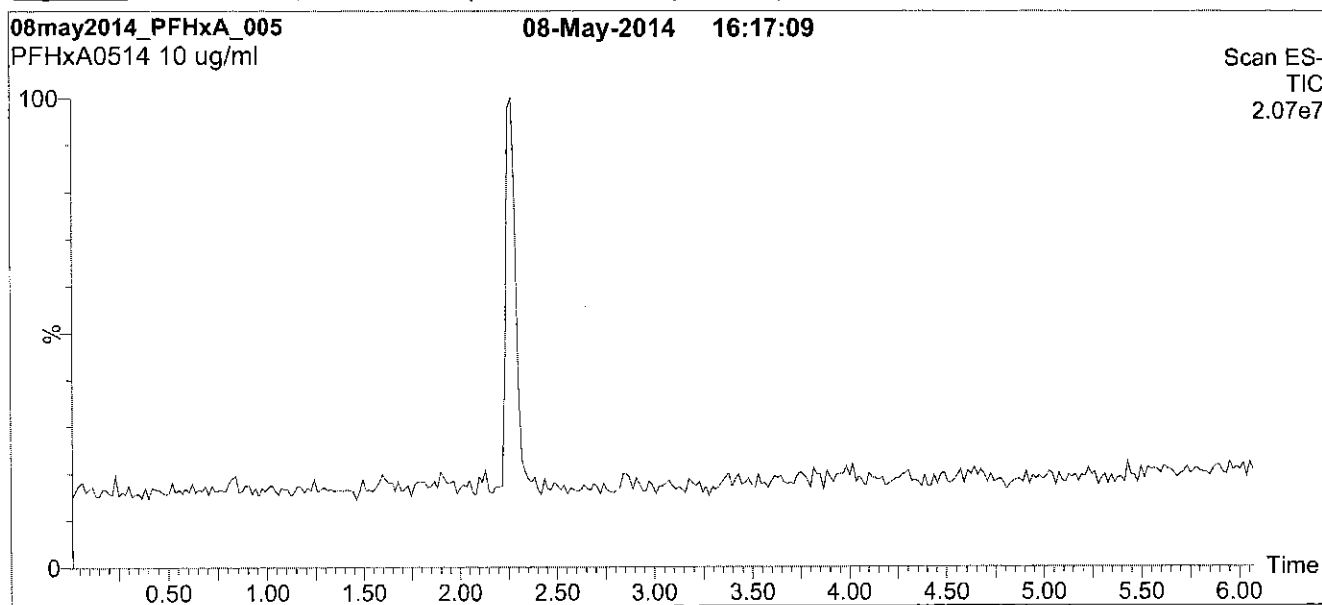
QUALITY MANAGEMENT:

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).



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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 C₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

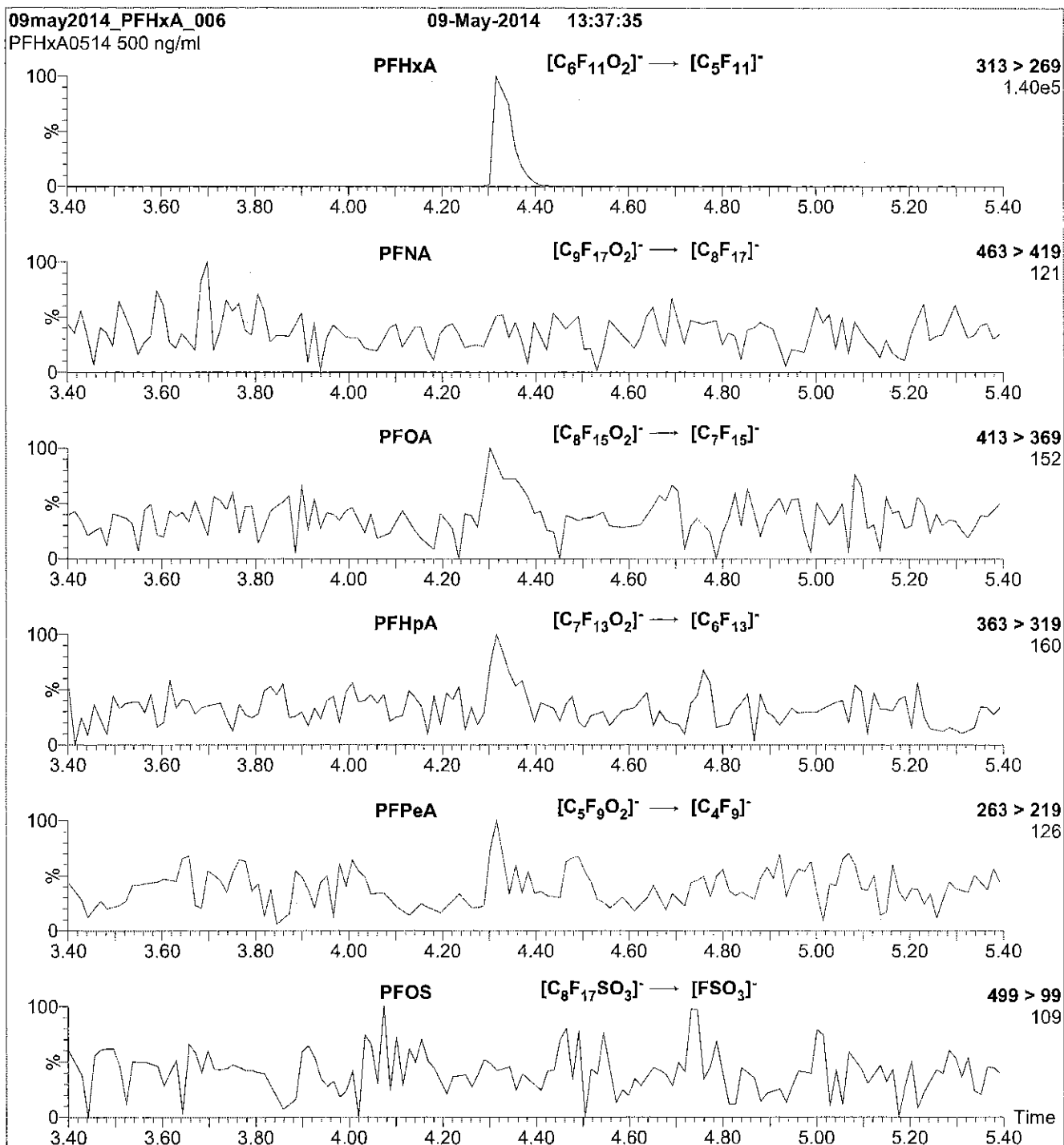
Flow: 300 μ l/min

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 μ l (500 ng/ml PFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 10

Reagent

LCPFHxA_00004



R: 4/7/16 CBW

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

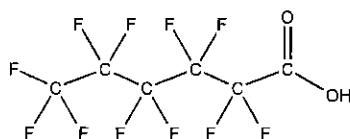


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxA **LOT NUMBER:** PFHxA1215
COMPOUND: Perfluoro-n-hexanoic acid

STRUCTURE: **CAS #:** 307-24-4



MOLECULAR FORMULA: C₆H₂F₁₁O₂ **MOLECULAR WEIGHT:** 314.05
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/22/2015
EXPIRY DATE: (mm/dd/yyyy) 12/22/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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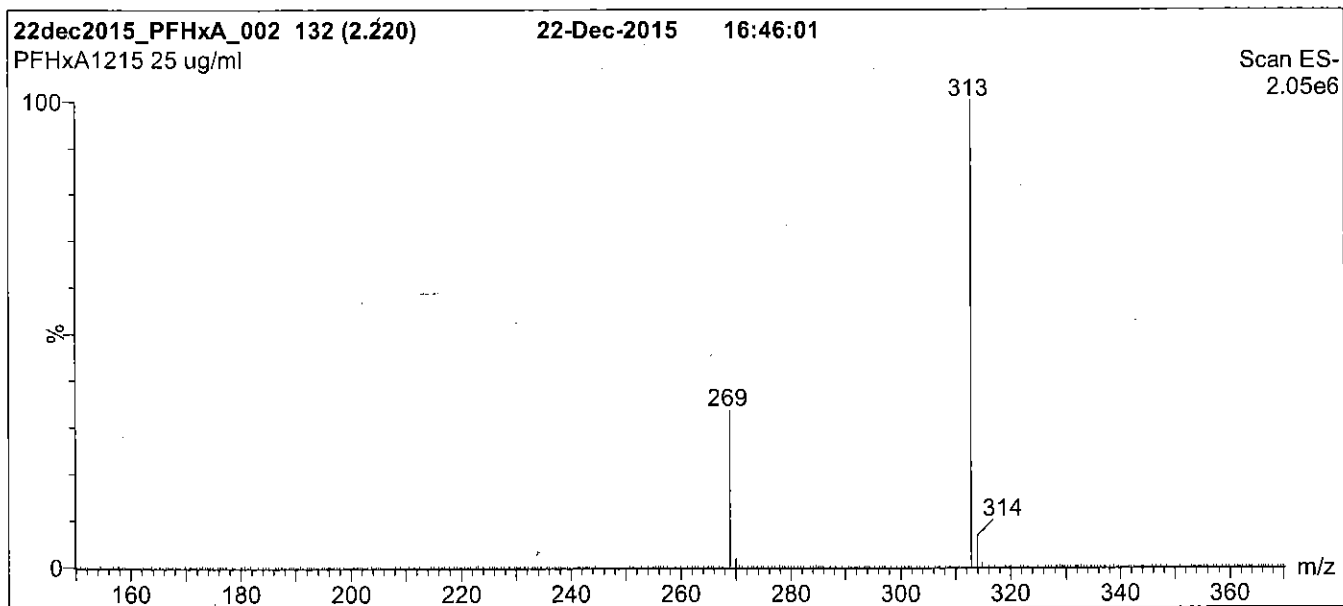
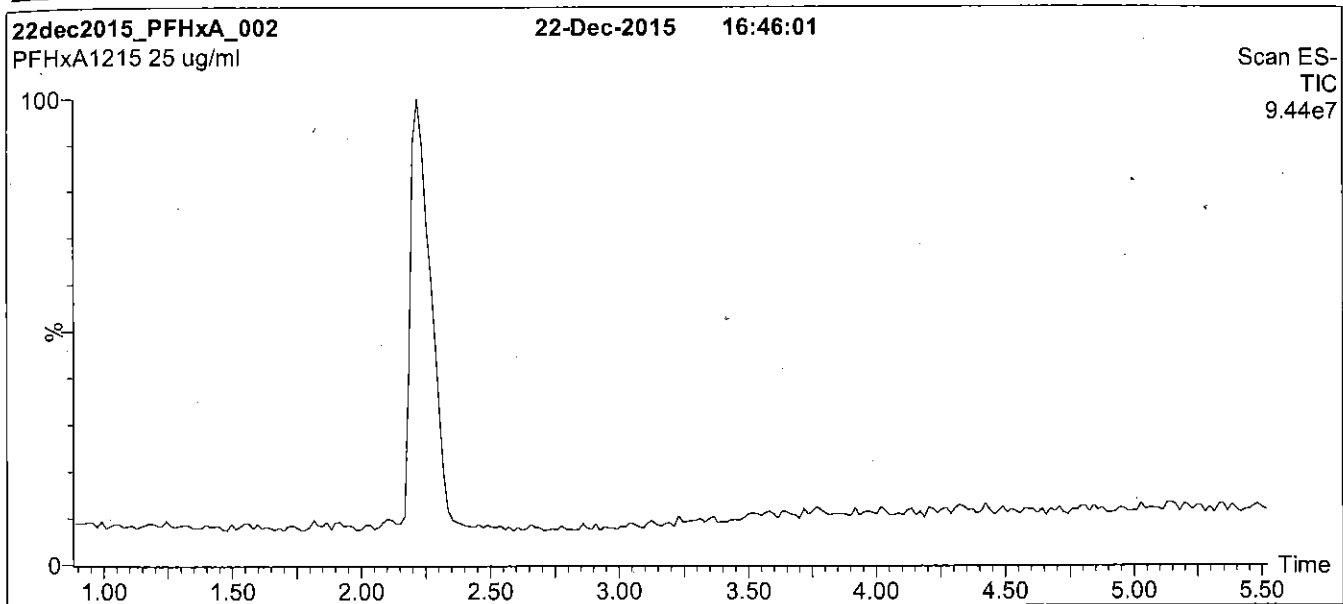
QUALITY MANAGEMENT:

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).



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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm

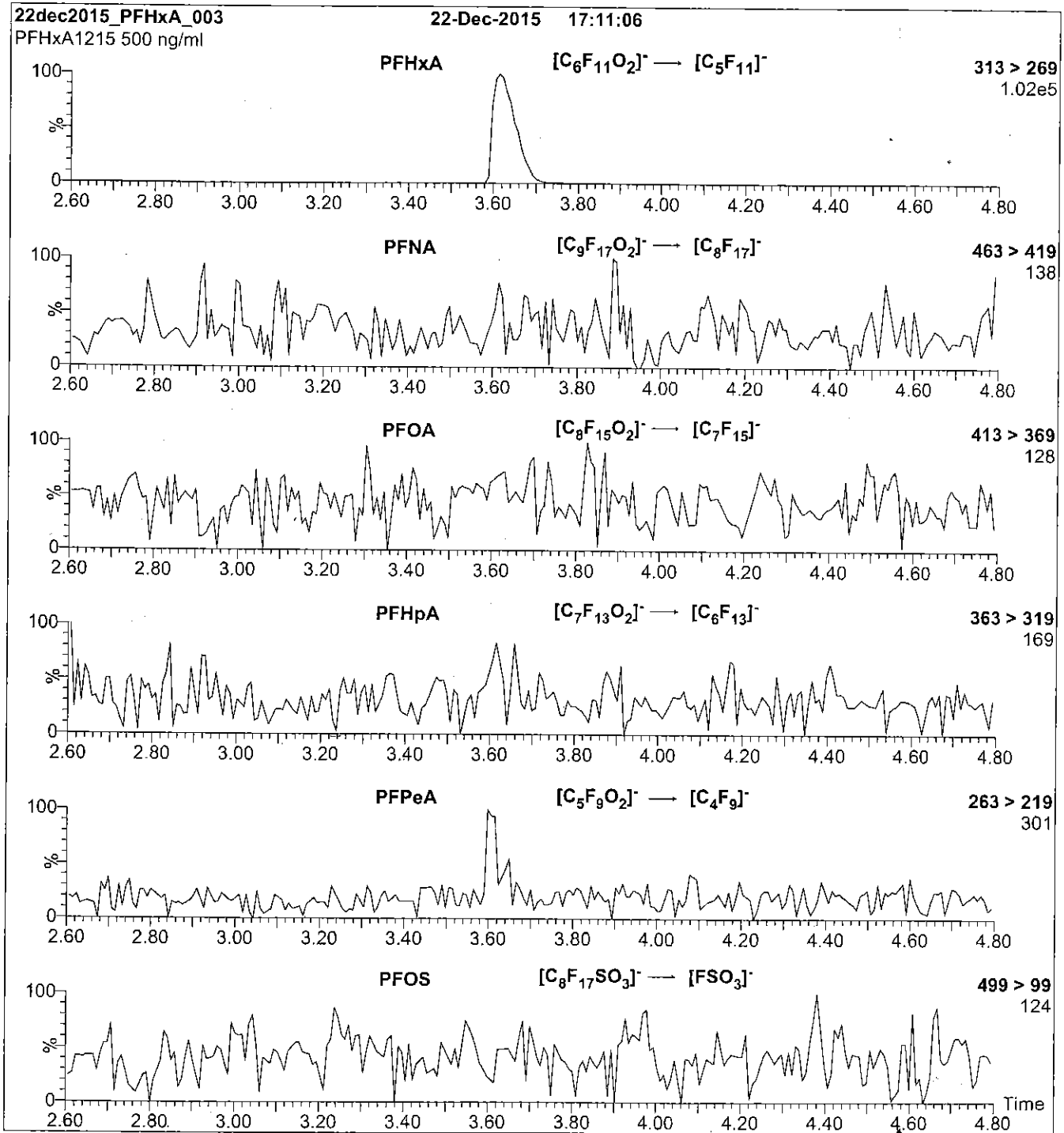
Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 2 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)
 Source: Electrospray (negative)
 Capillary Voltage (kV) = 2.00
 Cone Voltage (V) = 15.00
 Cone Gas Flow (l/hr) = 100
 Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFHxS-br_00001



PS 12/9/15 SW

566007
ID: LCPFHxS-br_00001
Exp: 07/03/20 Pppl: CBW
Potassium Perfluorohexane



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

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

DESCRIPTION:

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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

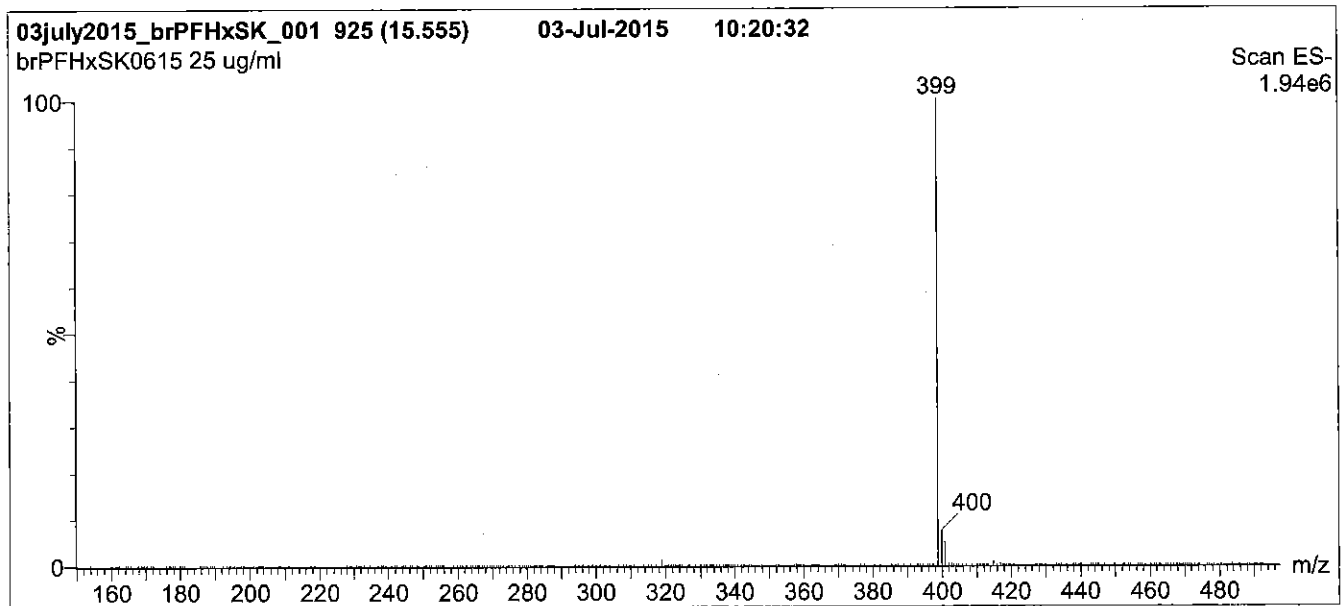
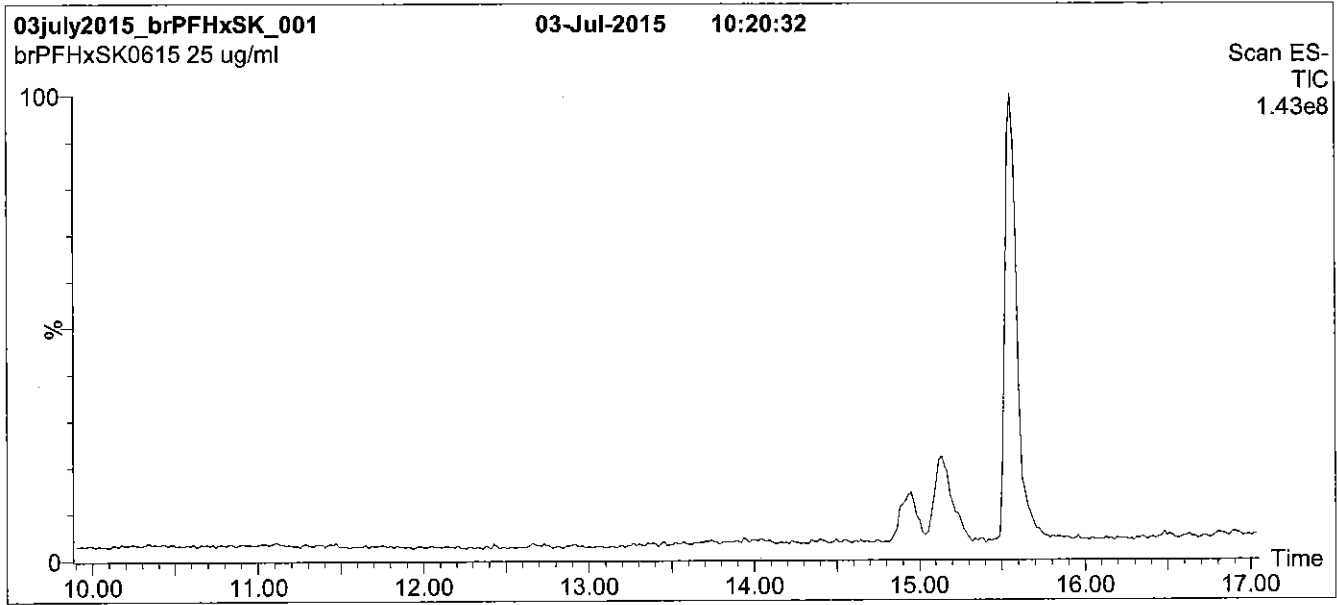
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	 CF ₃ CF ₃ CCF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.2
7	Other Unidentified Isomers		0.5

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

Certified By: 
 B.G. Chittim

Date: 07/15/2015
(mm/dd/yyyy)

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

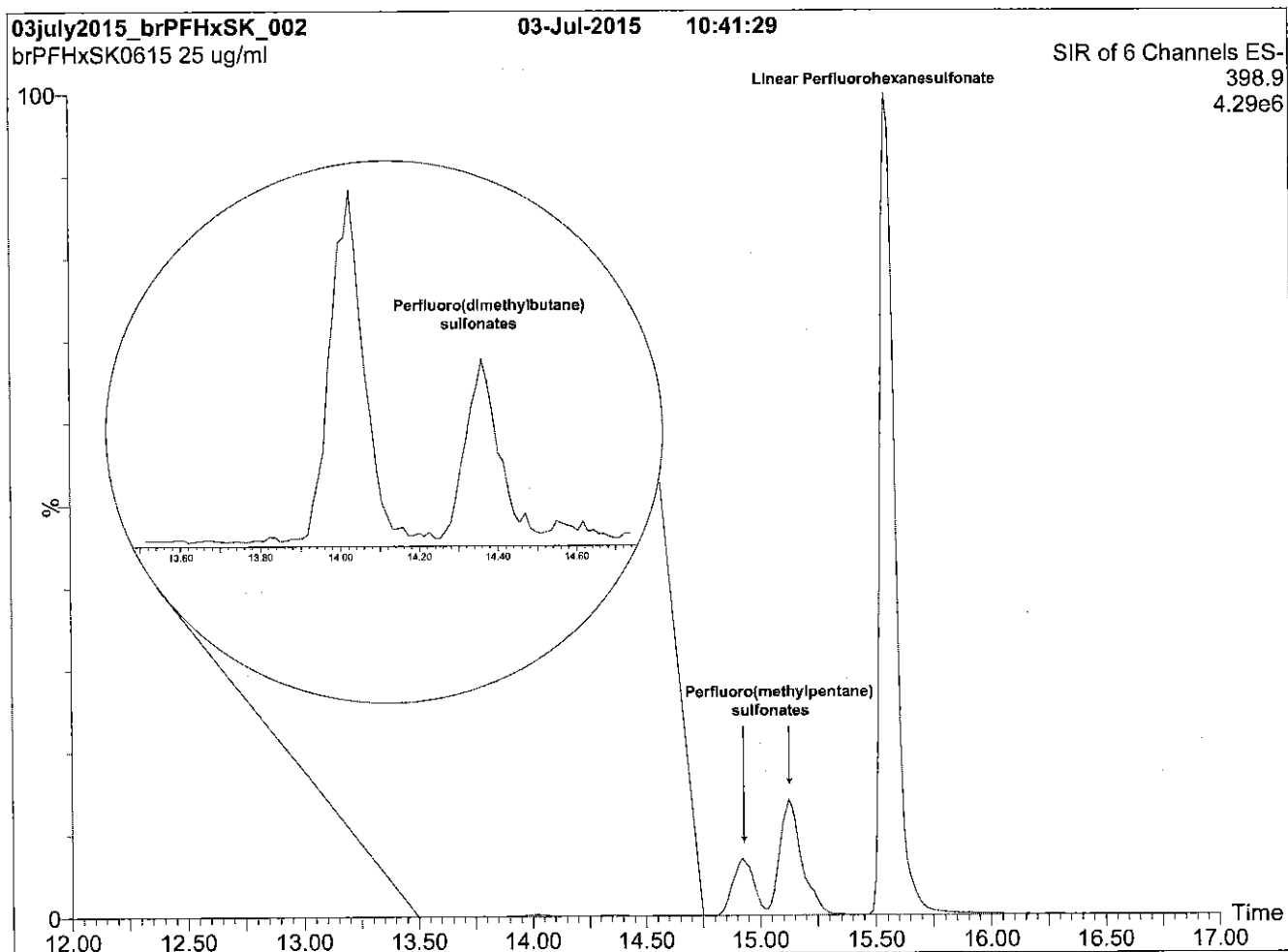
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Figure 2: br-PFHxSK; LC/MS Data



Conditions for Figure 2:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

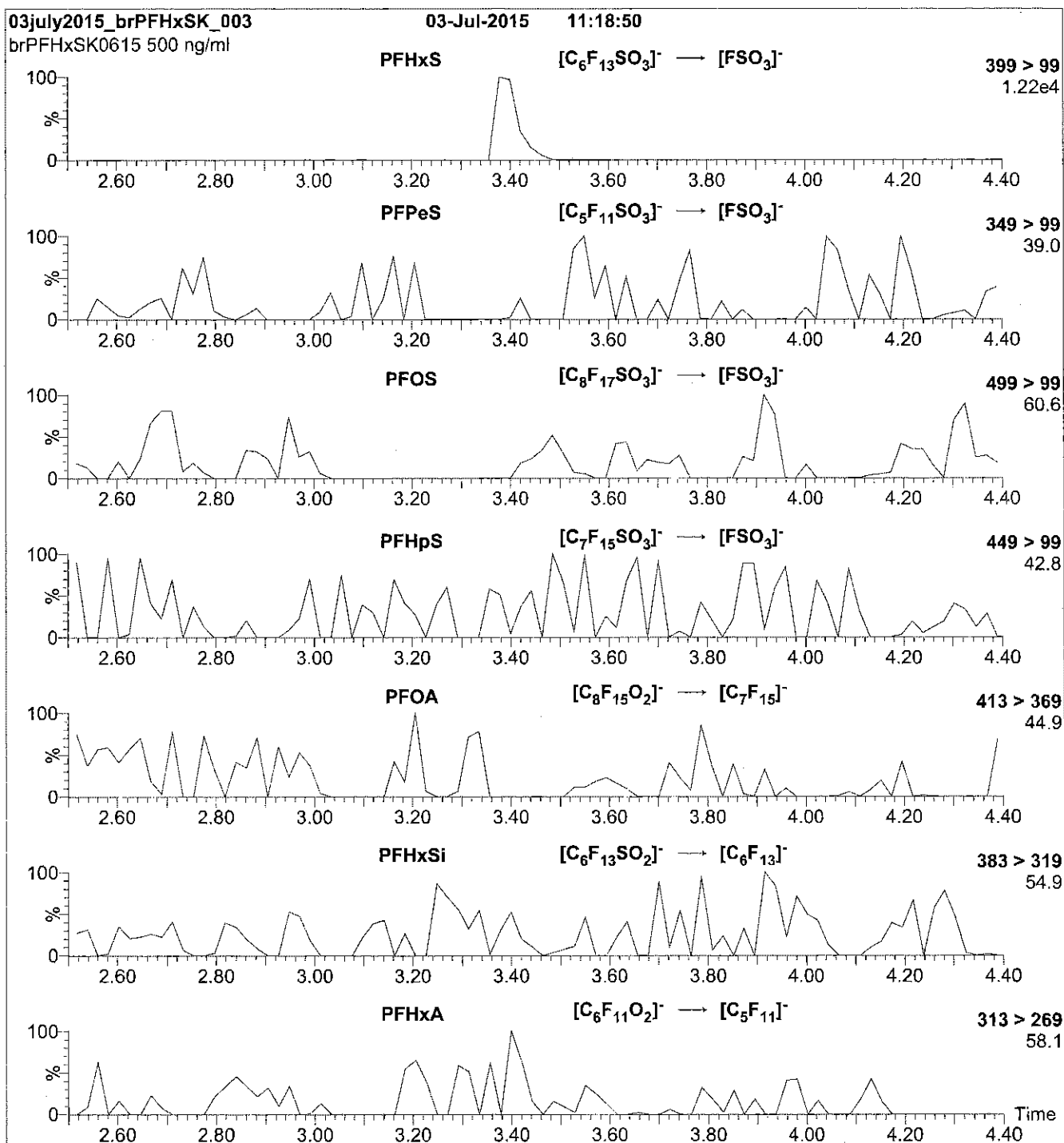
Flow: 300 μl/min

MS Parameters

Experiment: SIR (6 channels)

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

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



Conditions for Figure 3:

Injection: Direct loop injection
10 μ l (500 ng/ml br-PFHxSK)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFNA_00004

r: 3/27/15 ✓
s:



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFNA

LOT NUMBER:

PFNA0514

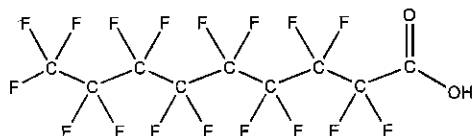
COMPOUND:

Perfluoro-n-nonanoic acid

STRUCTURE:

CAS #:

375-95-1



MOLECULAR FORMULA:

$C_9H_17O_2$

MOLECULAR WEIGHT:

464.08

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

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.
- Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA) and < 0.1% of perfluoro-n-heptanoic acid (PFHpA).

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Certified By:

B.G. Chittim

Date: 05/22/2014

(mm/dd/yyyy)

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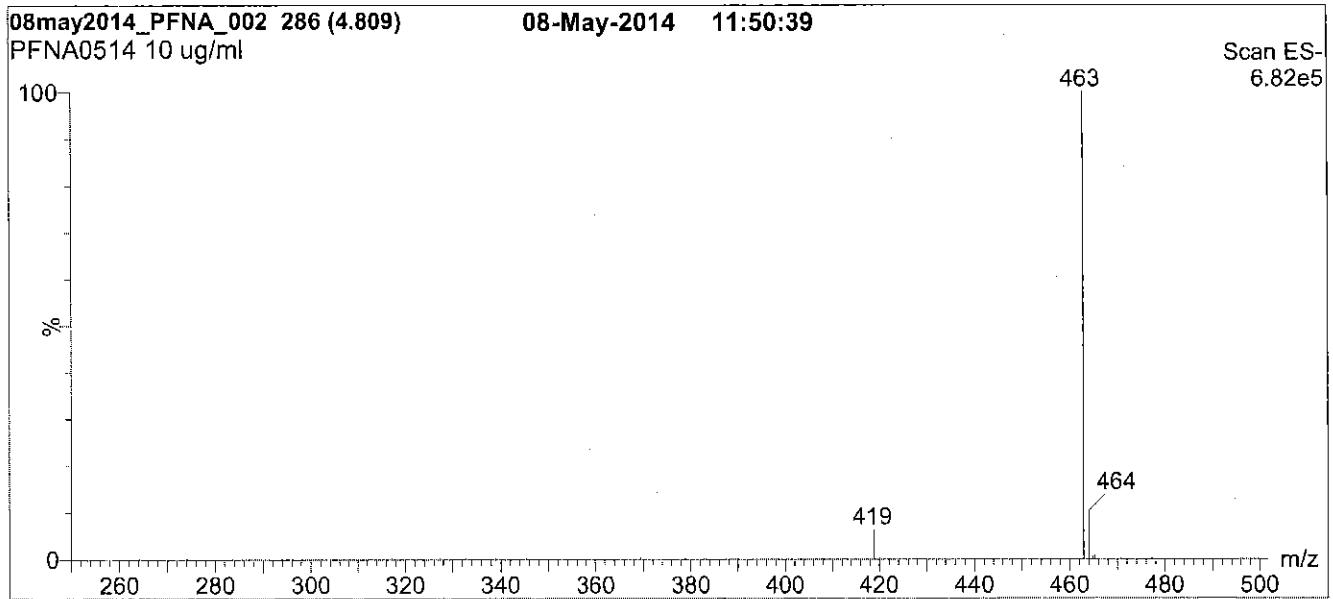
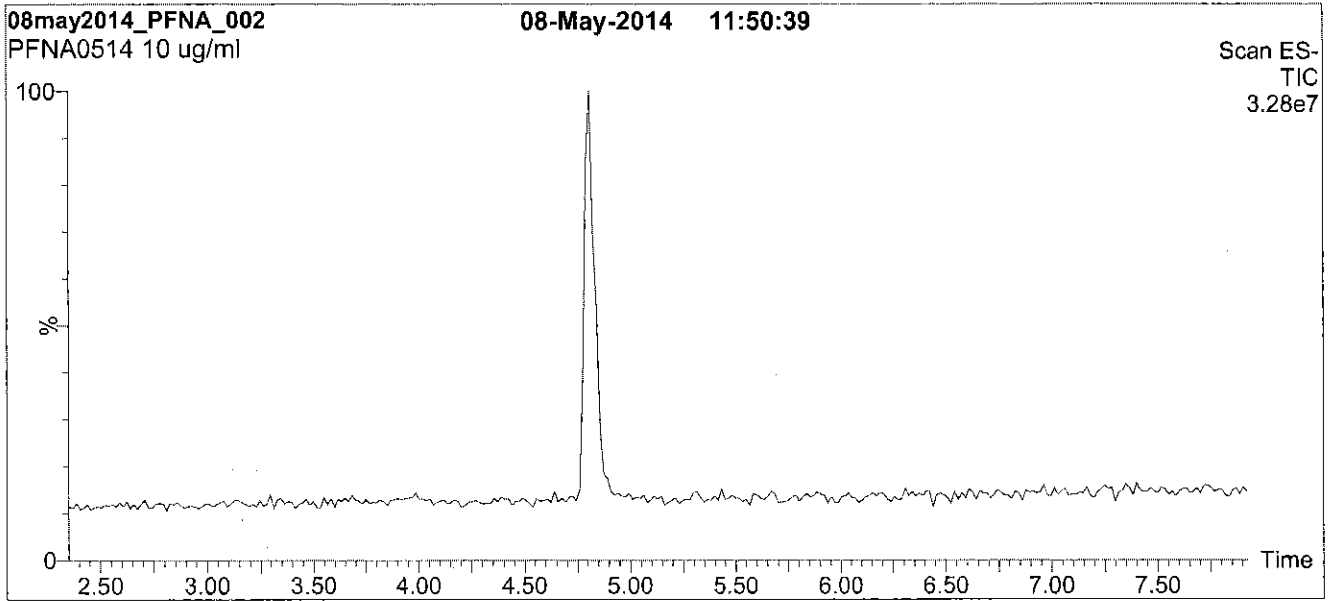
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Figure 1: PFNA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH C₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

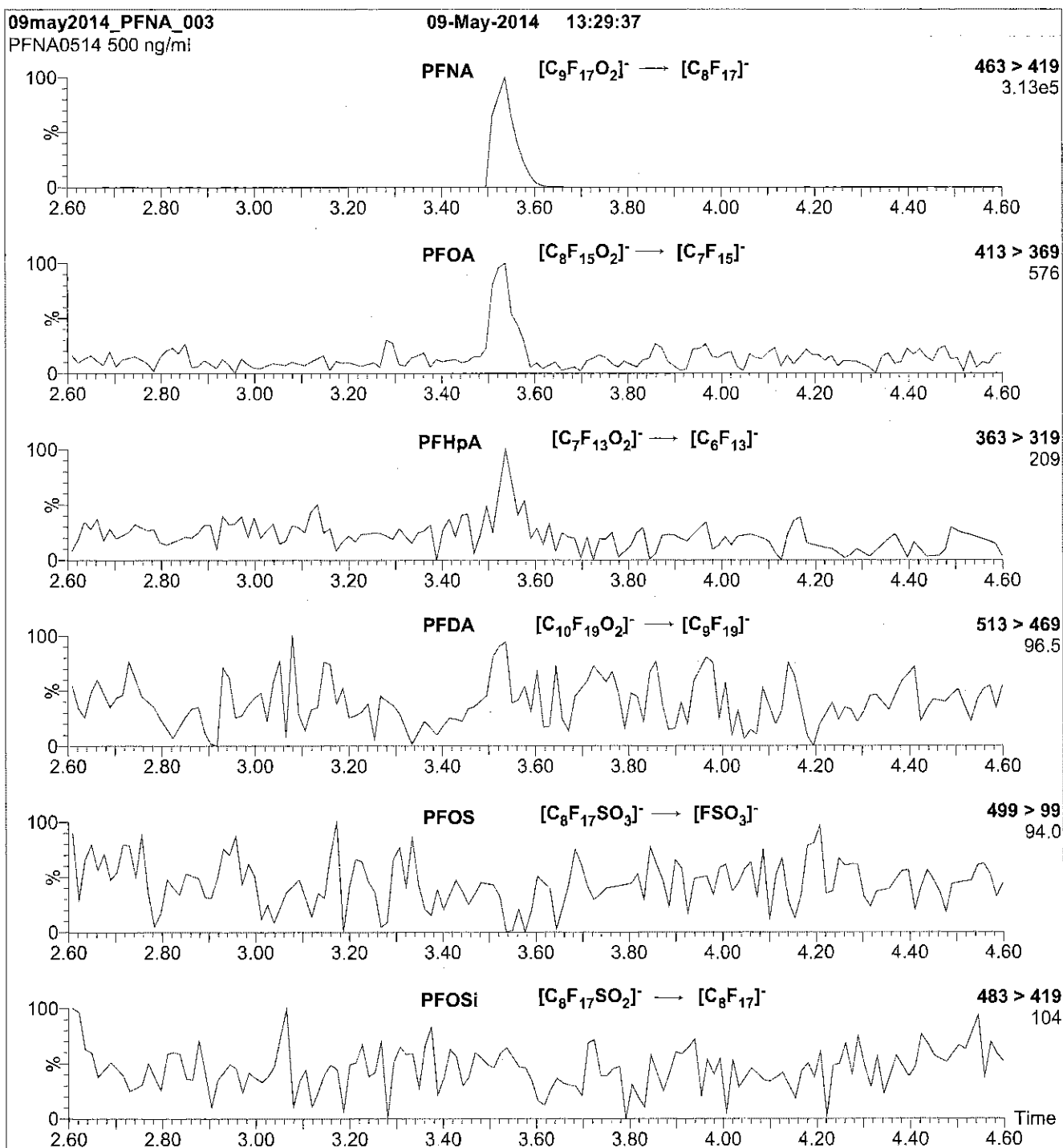
Flow: 300 μ l/min

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 μ l (500 ng/ml PFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 11

Reagent

LCPFNA_00005



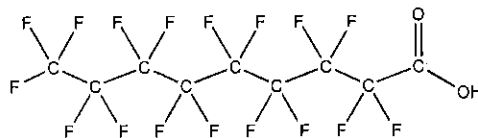
R: 4/7/16 CBW

609703

ID: LCPFNA_00005

Exp: 10/23/20 Prod: CBW

PF-n-nonanoic acid

**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:** PFNA
COMPOUND: Perfluoro-n-nonanoic acid**LOT NUMBER:** PFNA1015**STRUCTURE:****CAS #:** 375-95-1**MOLECULAR FORMULA:** C₉H_{F₁₇}O₂
CONCENTRATION: 50 ± 2.5 µg/ml**MOLECULAR WEIGHT:** 464.08
SOLVENT(S): Methanol
Water (<1%)**CHEMICAL PURITY:** >98%
LAST TESTED: (mm/dd/yyyy) 10/23/2015
EXPIRY DATE: (mm/dd/yyyy) 10/23/2020
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Date: 10/30/2015

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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 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.

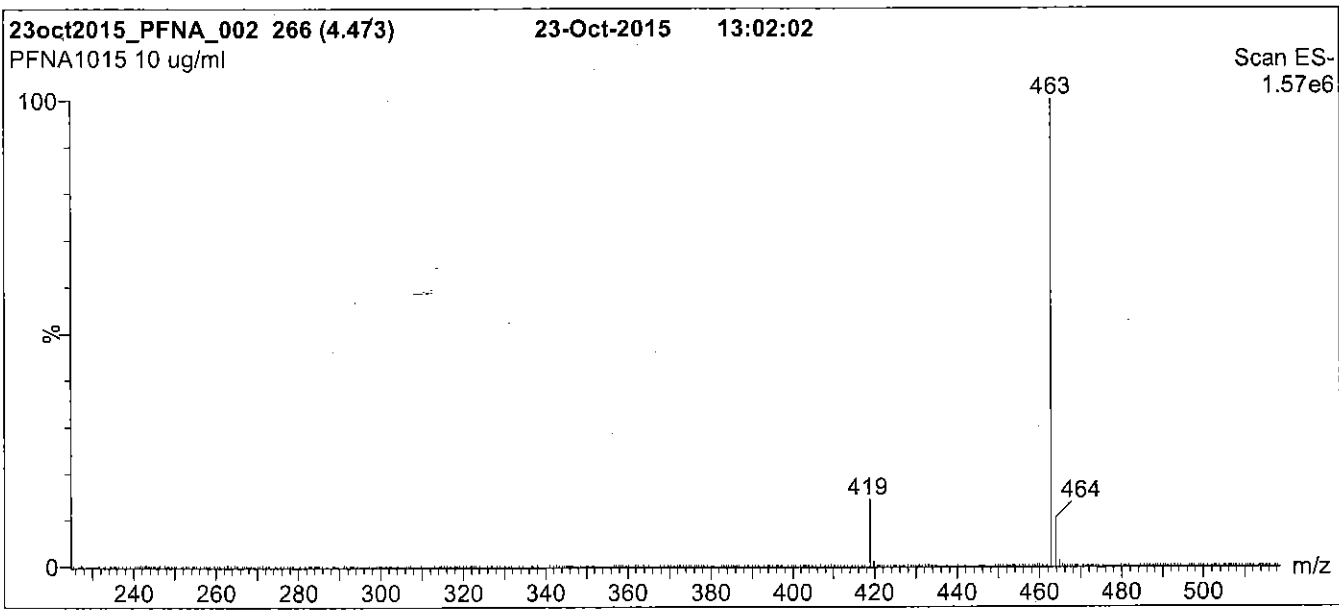
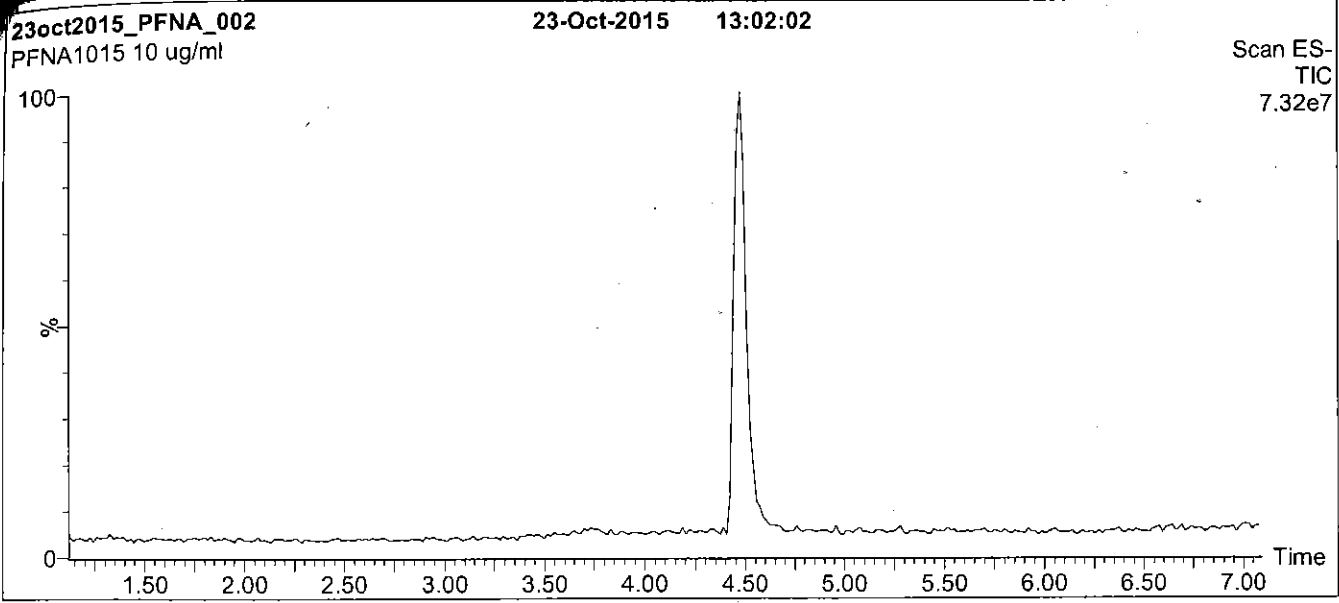
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm

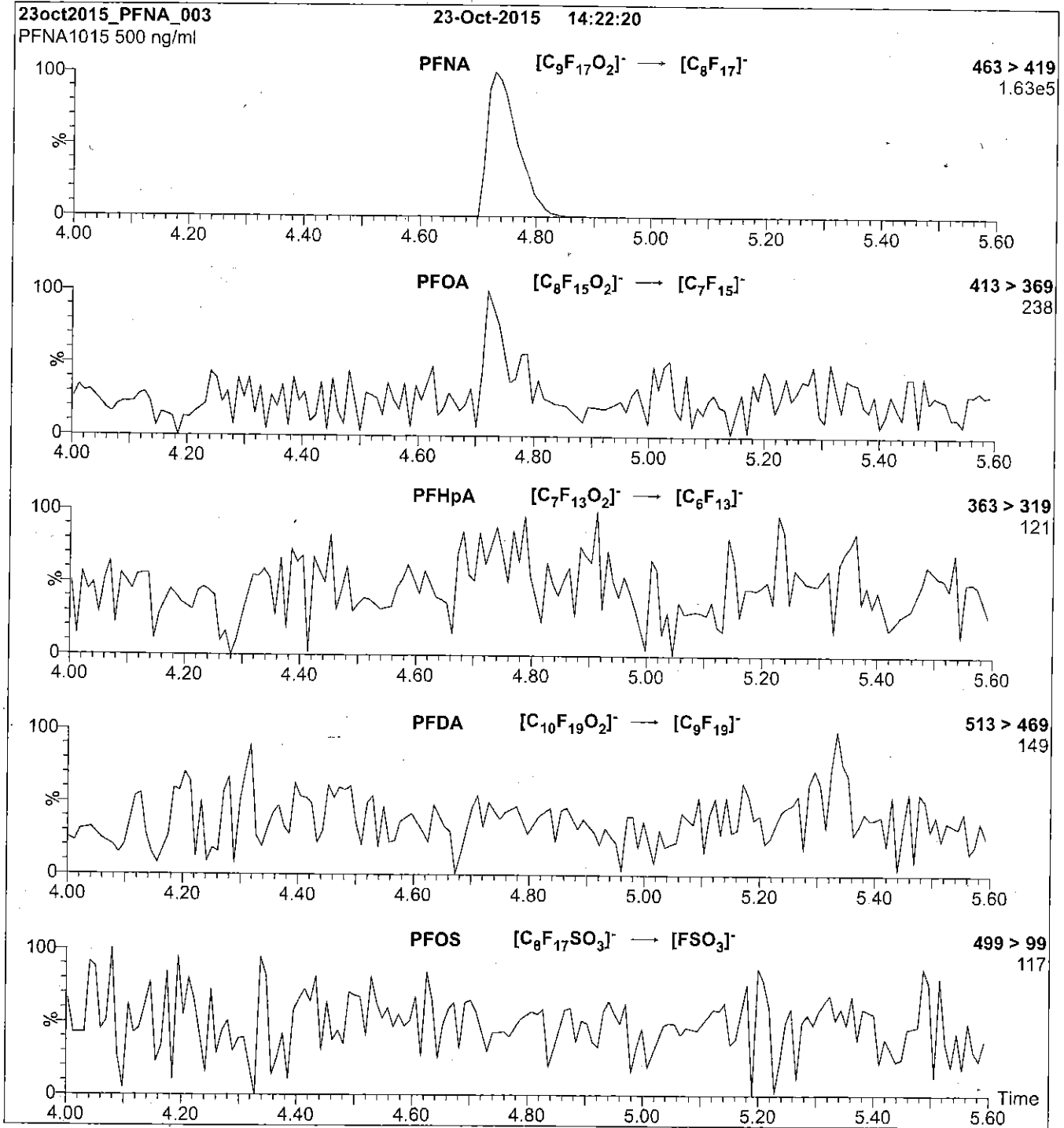
Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 2 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)
 Source: Electrospray (negative)
 Capillary Voltage (kV) = 2.00
 Cone Voltage (V) = 15.00
 Cone Gas Flow (l/hr) = 50
 Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

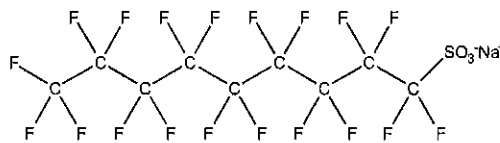
LCPFNS_00002



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFNS **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: $50.0 \pm 2.5 \mu\text{g/ml}$ (Na salt) **SOLVENT(S):** Methanol
 $48.0 \pm 2.4 \mu\text{g/ml}$ (PFNS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/04/2012
EXPIRY DATE: (mm/dd/yyyy) 07/04/2017
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____

B.G. Chittim

Date: 01/15/2013

(mm/dd/yyyy)

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

INTENDED USE:

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

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

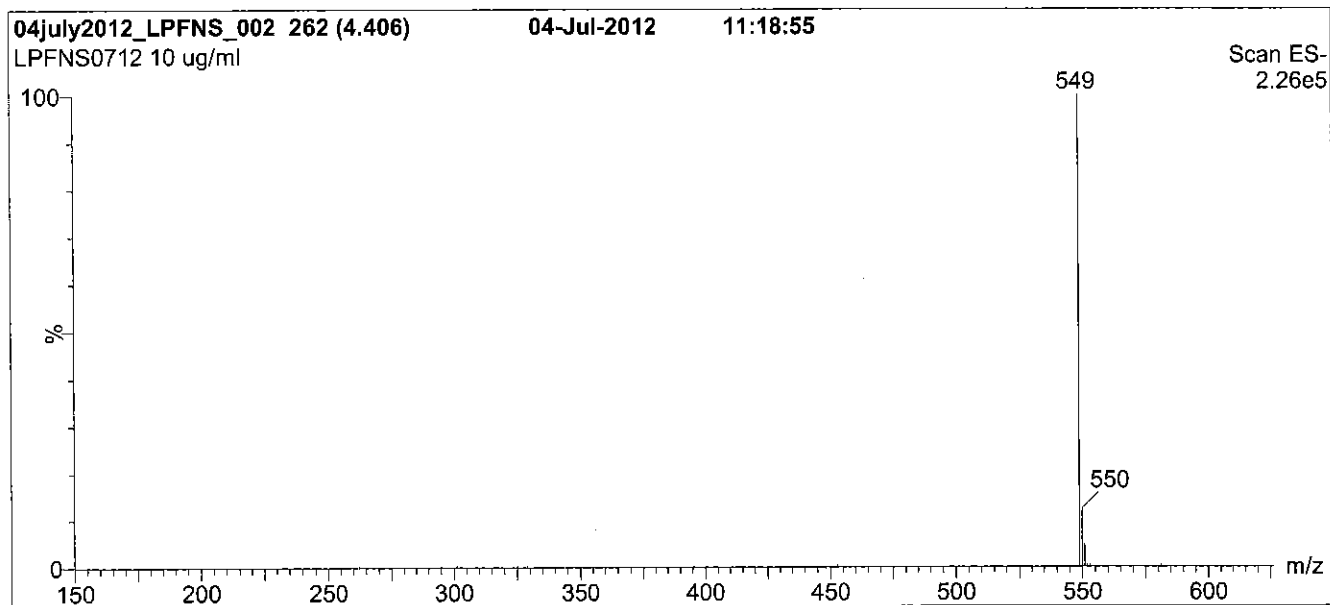
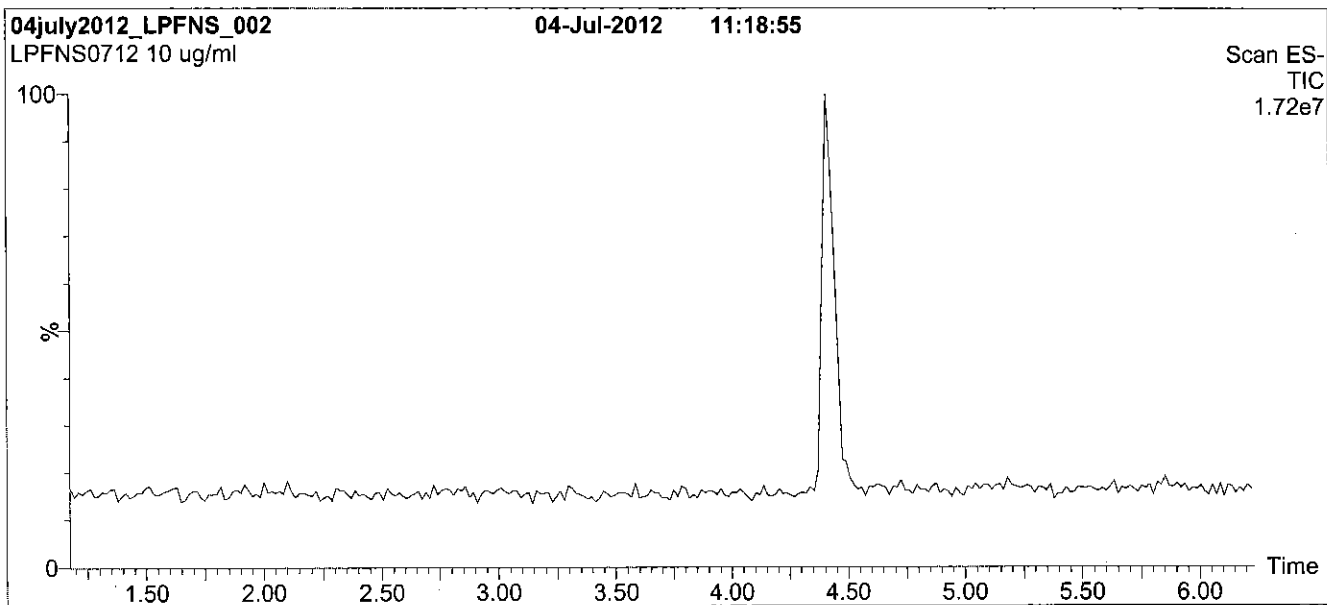
QUALITY MANAGEMENT:

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).



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-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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc 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

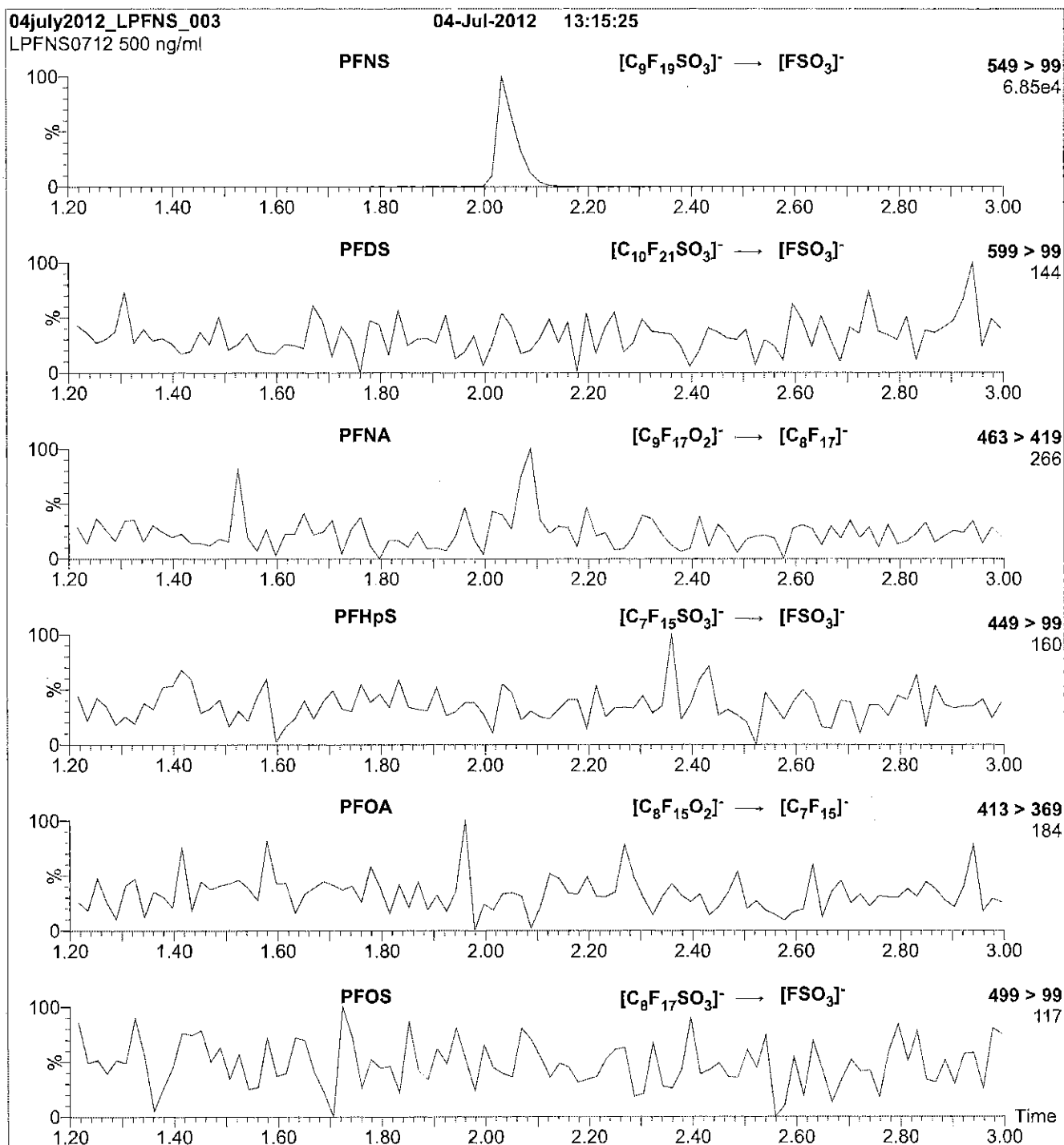
Flow: 300 μ l/min

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 μ l (500 ng/ml L-PFNS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

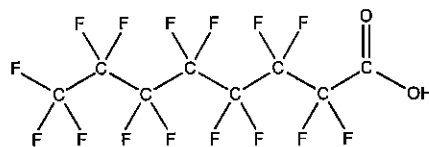
LCPFOA_00005



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFOA
COMPOUND: Perfluoro-n-octanoic acid
LOT NUMBER: PFOA1115
STRUCTURE:
CAS #: 335-67-1



MOLECULAR FORMULA: C₈HF₁₆O₂
CONCENTRATION: 50 ± 2.5 µg/ml
MOLECULAR WEIGHT: 414.07
SOLVENT(S): Methanol
 Water (<1%)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/06/2015
EXPIRY DATE: (mm/dd/yyyy) 11/06/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:


 B.G. Chittim

Date: 11/11/2015
 (mm/dd/yyyy)

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

INTENDED USE:

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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.

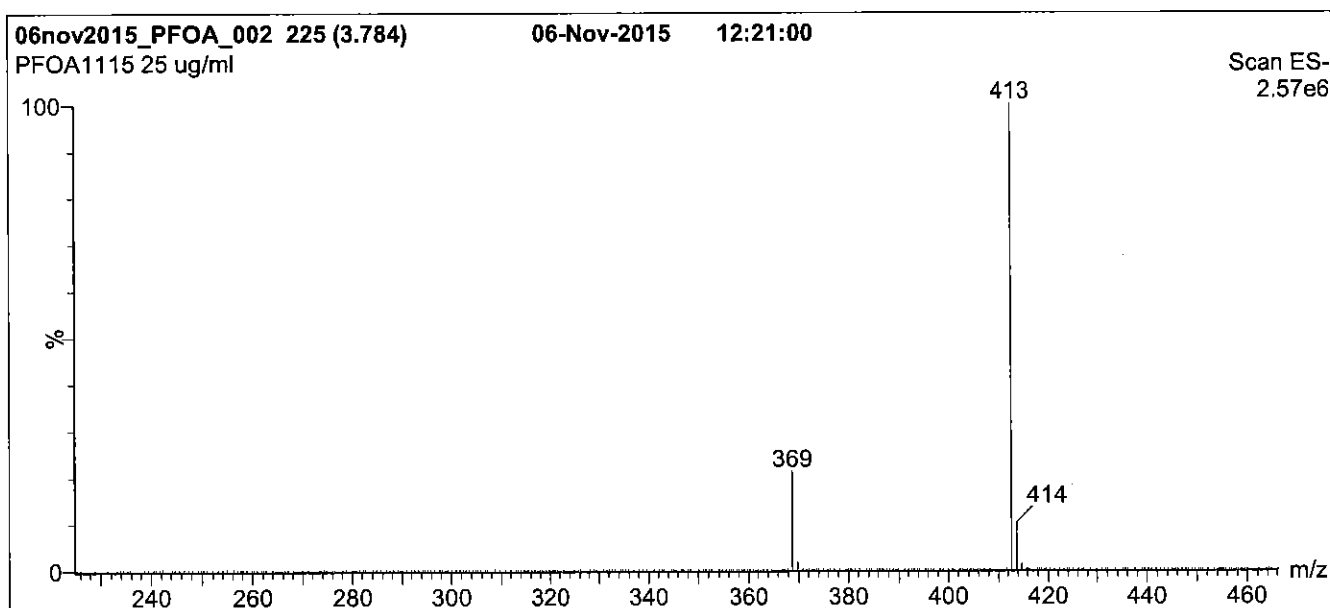
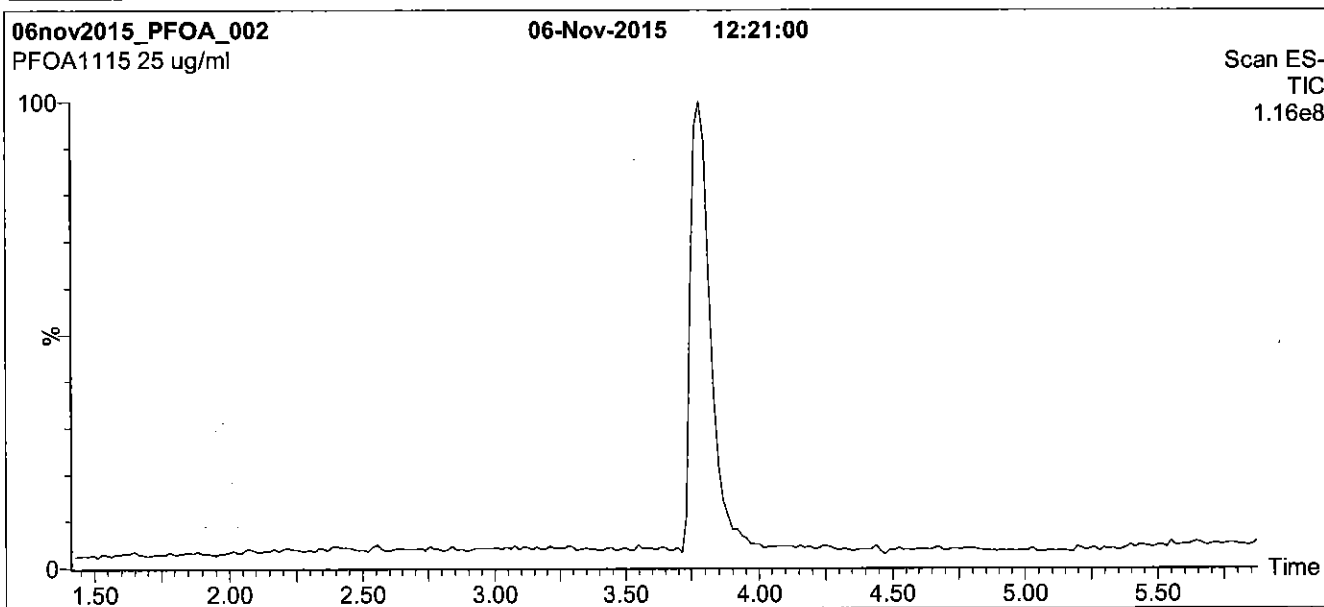
QUALITY MANAGEMENT:

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).



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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc 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

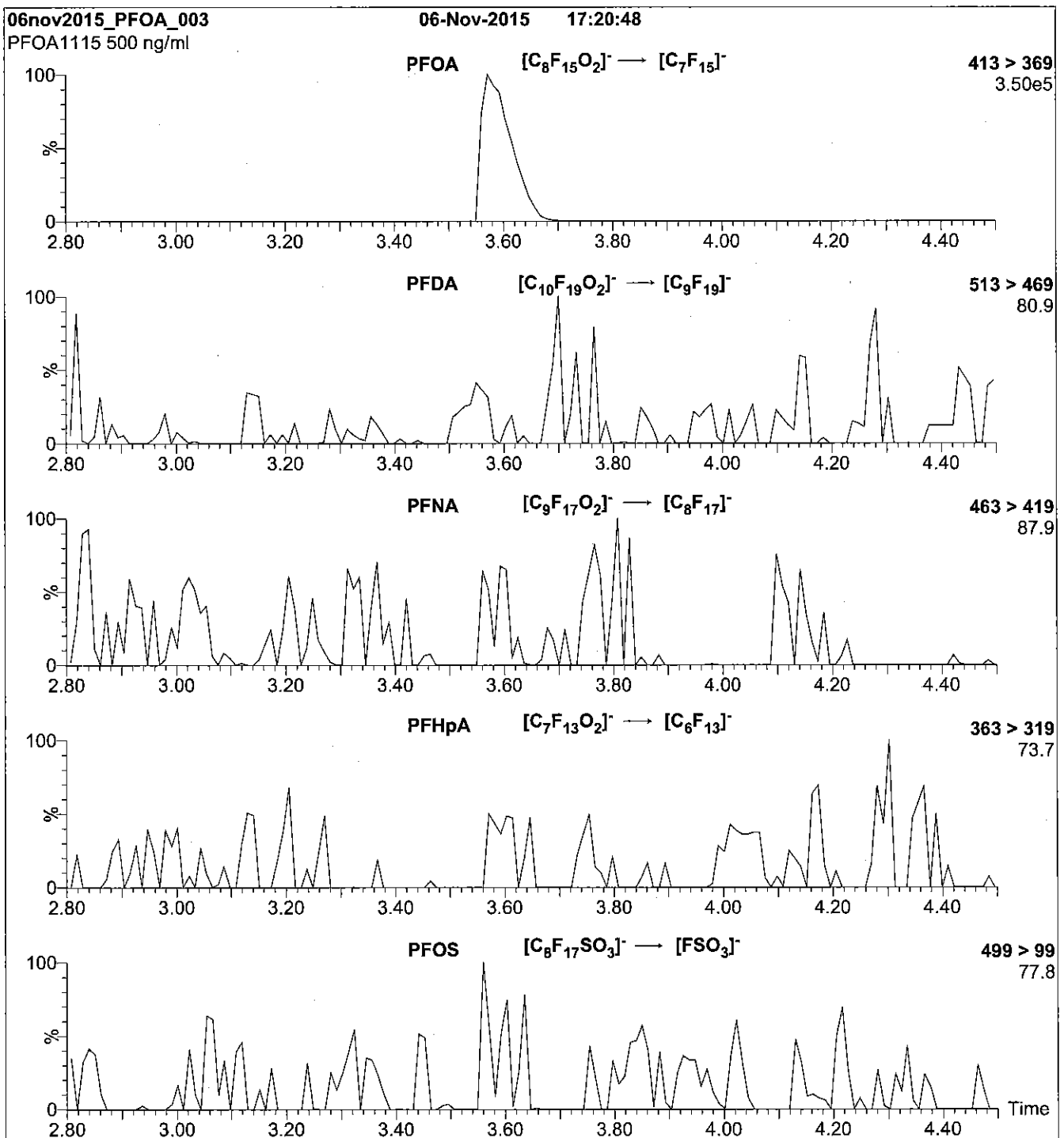
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFODA_00004

17 2/1/15

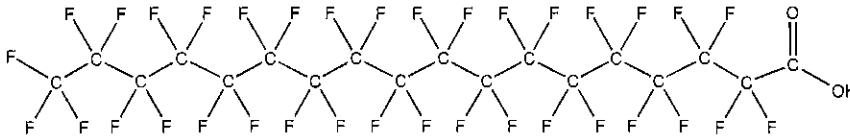


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE: **CAS #:** 16517-11-6



MOLECULAR FORMULA: $C_{18}H_{35}O_2$ **MOLECULAR WEIGHT:** 914.15
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **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

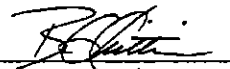
DOCUMENTATION/ DATA ATTACHED:

- 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:

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

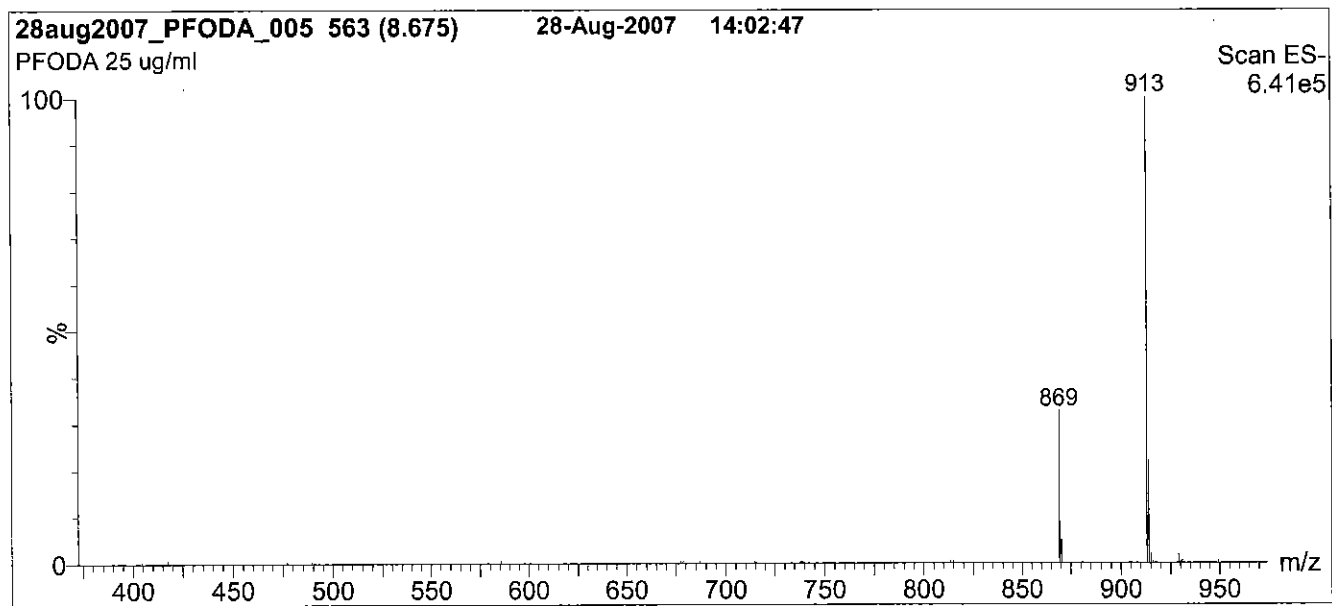
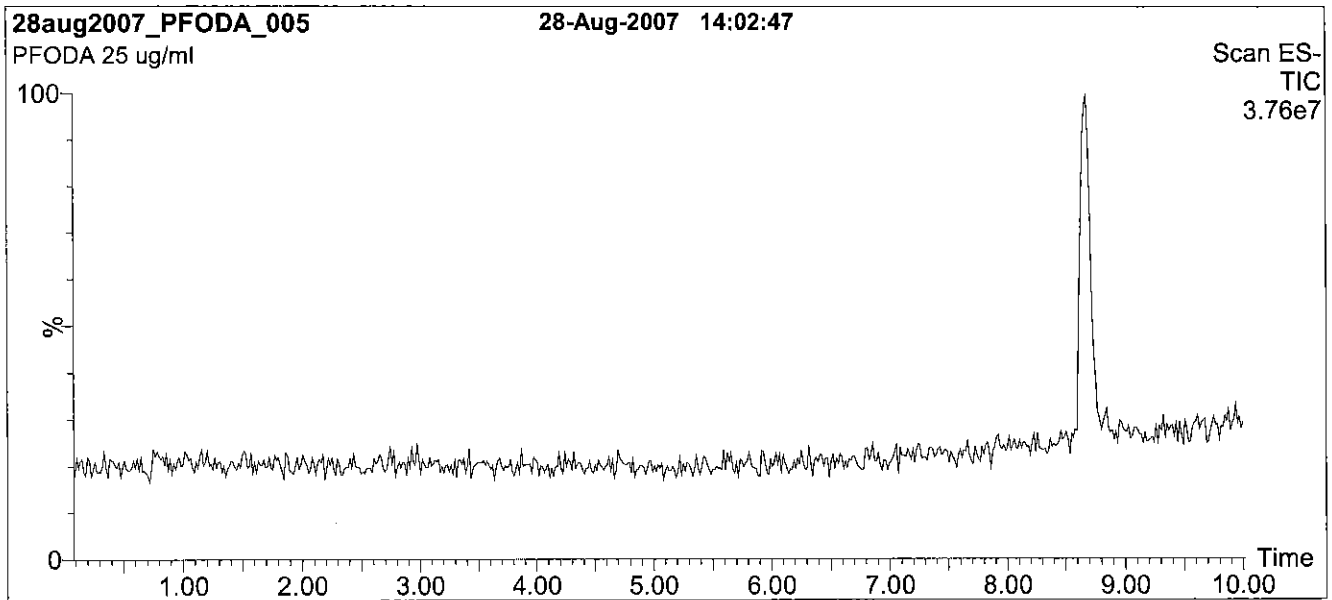
QUALITY MANAGEMENT:

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).



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 75% (80:20 MeOH:ACN) / 25% H₂O
(both with 10 mM NH₄OAc buffer)
Hold 5 min. Ramp to 100% organic over 6 min.
Hold 3 min before returning to initial conditions.
Time: 16 min

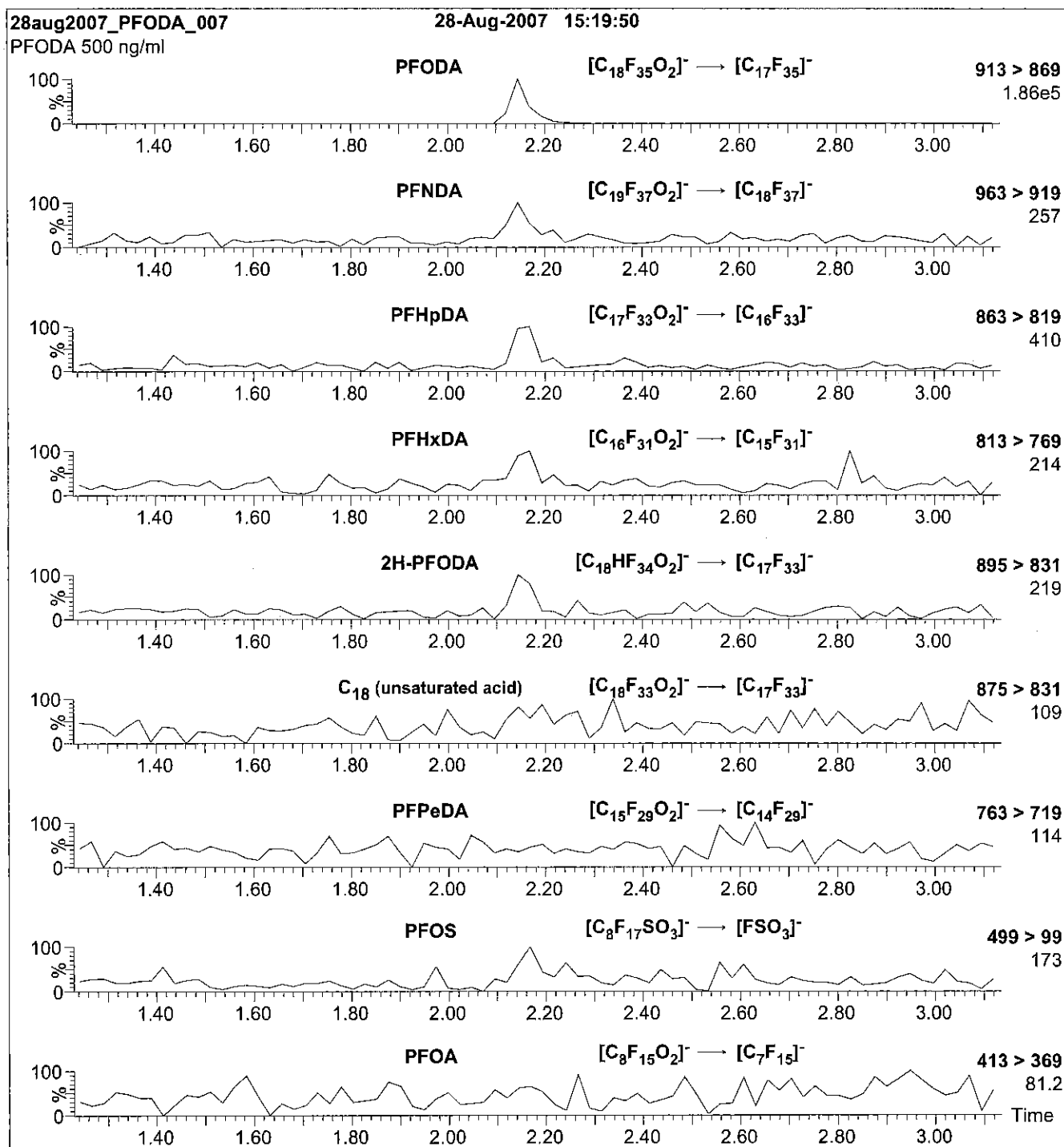
Flow: 300 μ l/min

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% H₂O
(both with 10 mM NH₄OAc buffer)

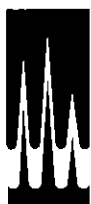
Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFODA_00005

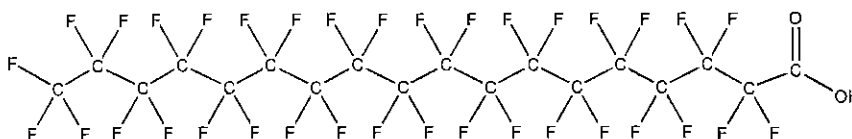


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFODA **LOT NUMBER:** PFODA0115
COMPOUND: Perfluoro-n-octadecanoic acid

STRUCTURE: **CAS #:** 16517-11-6



MOLECULAR FORMULA: C₁₈H_{F₃₅}O₂ **MOLECULAR WEIGHT:** 914.14
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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HAZARDS:

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

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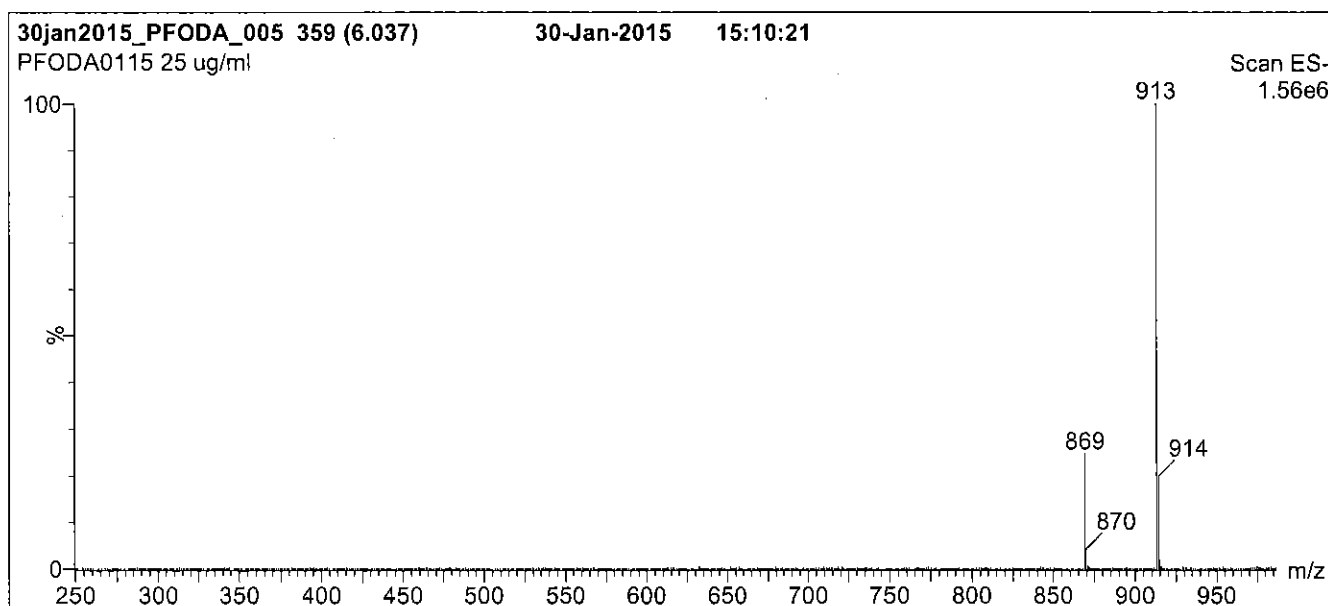
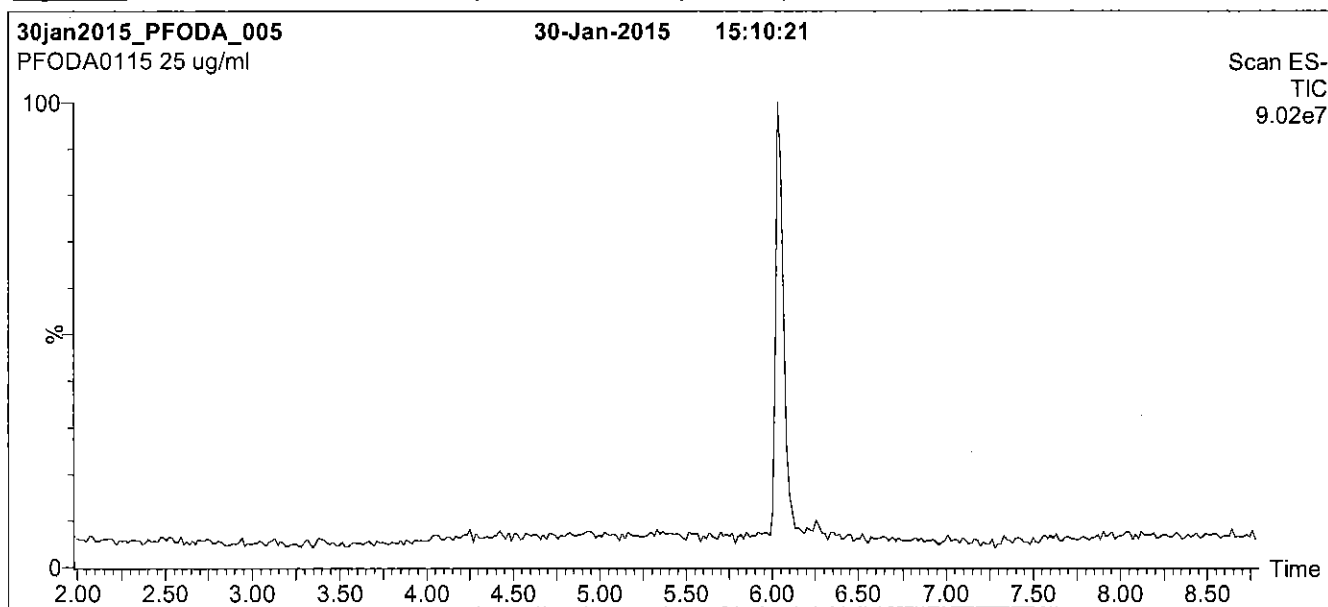
QUALITY MANAGEMENT:

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).



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc 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

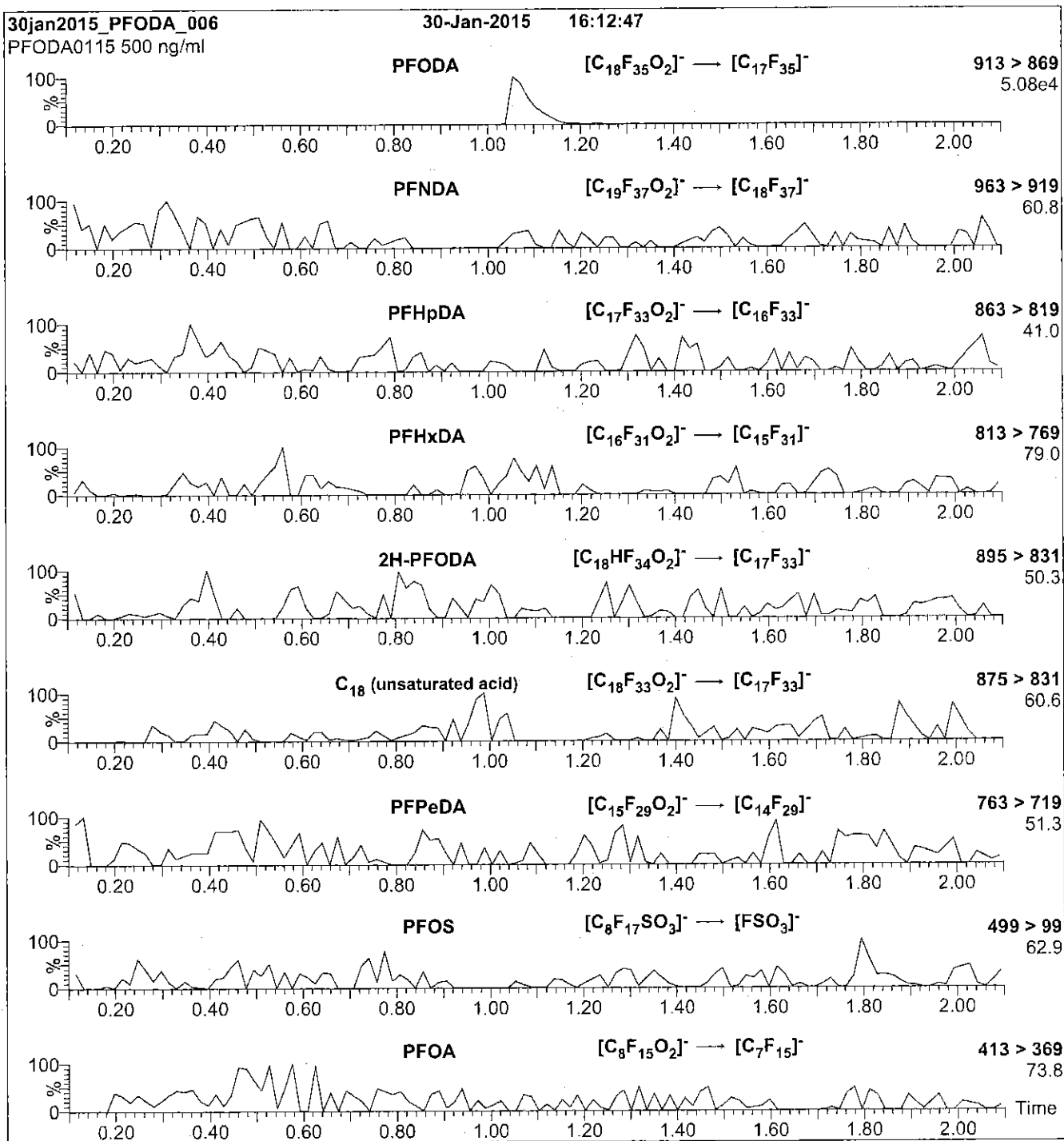
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

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

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFOS-br_00001



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CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

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

DESCRIPTION:

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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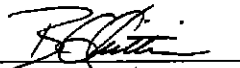
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Table A: br-PFOSK; Isomeric Components and Percent Composition (by ¹⁹F-NMR)*

Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-octanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF(SO ₃)K ⁺ CF ₃	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF(CF ₃)SO ₃ K ⁺ CF ₃	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF(CF ₃)CF ₂ SO ₃ K ⁺ CF ₃	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF(CF ₃)CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF(CF ₃)CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF(CF ₃)CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ -C(CF ₃)CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₂ -C(CF ₃)CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ -CF(CF ₃)-CF(CF ₃)-CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ -CF(CF ₃)-CF ₂ -CF(CF ₃)-CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	0.07

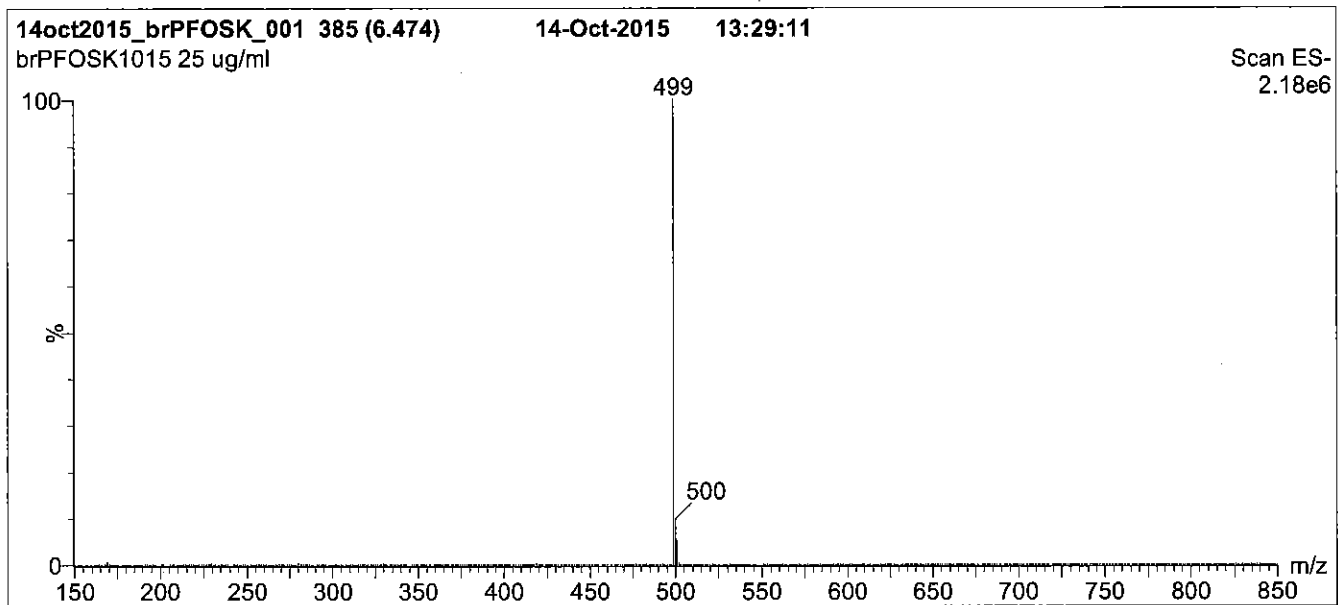
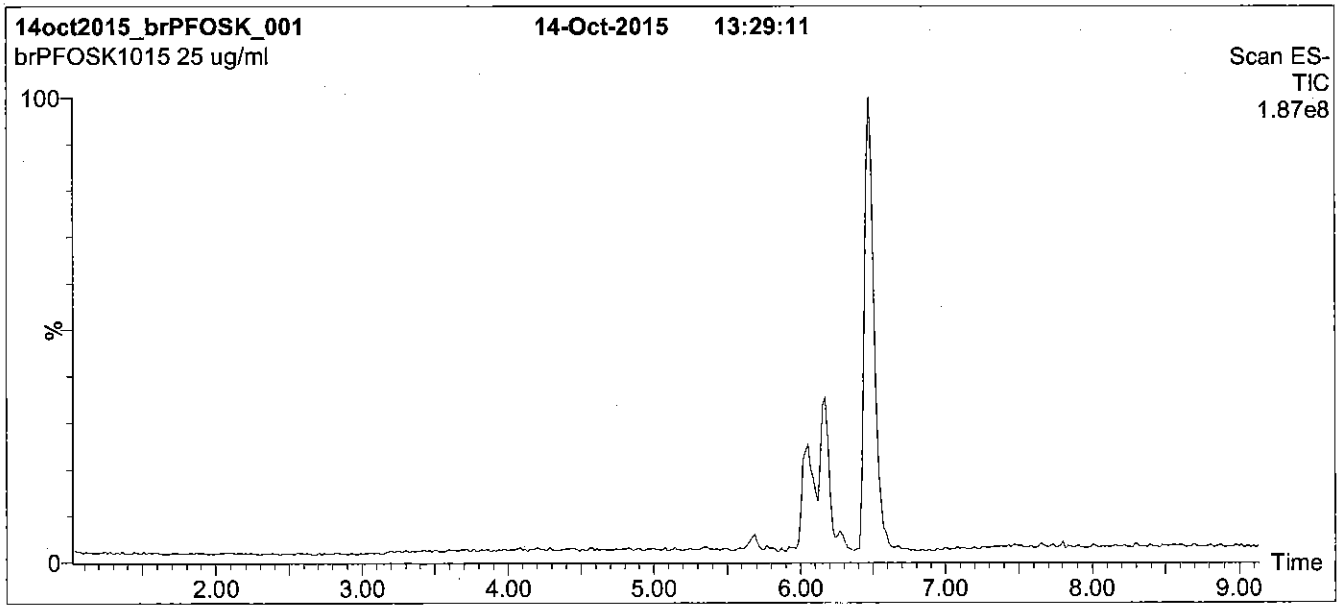
* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.

** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: 
B.G. Chittim

Date: 10/15/2015
(mm/dd/yyyy)

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

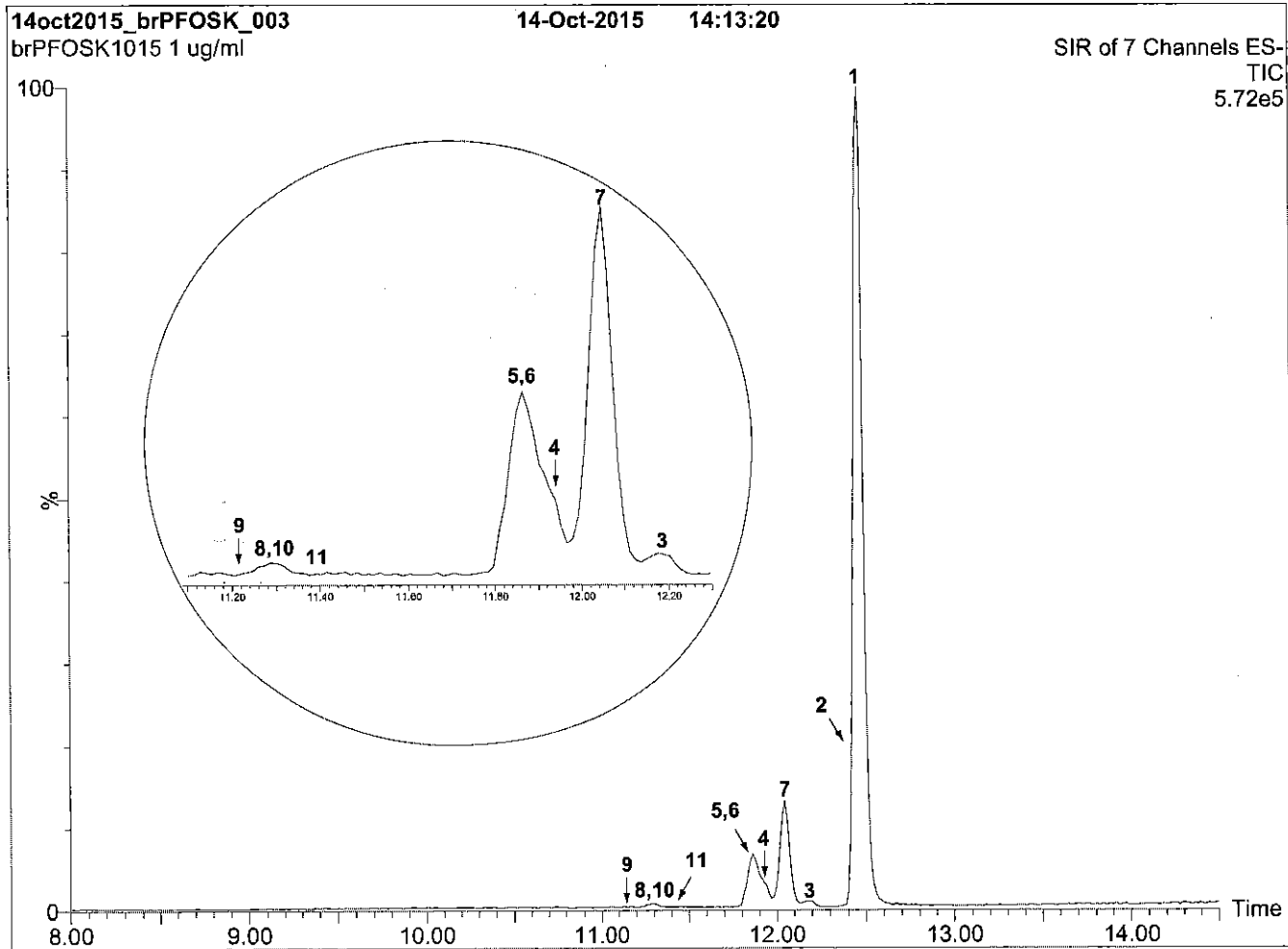
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Figure 2: br-PFOSK; LC/MS Data (SIR)



Conditions for Figure 2:

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

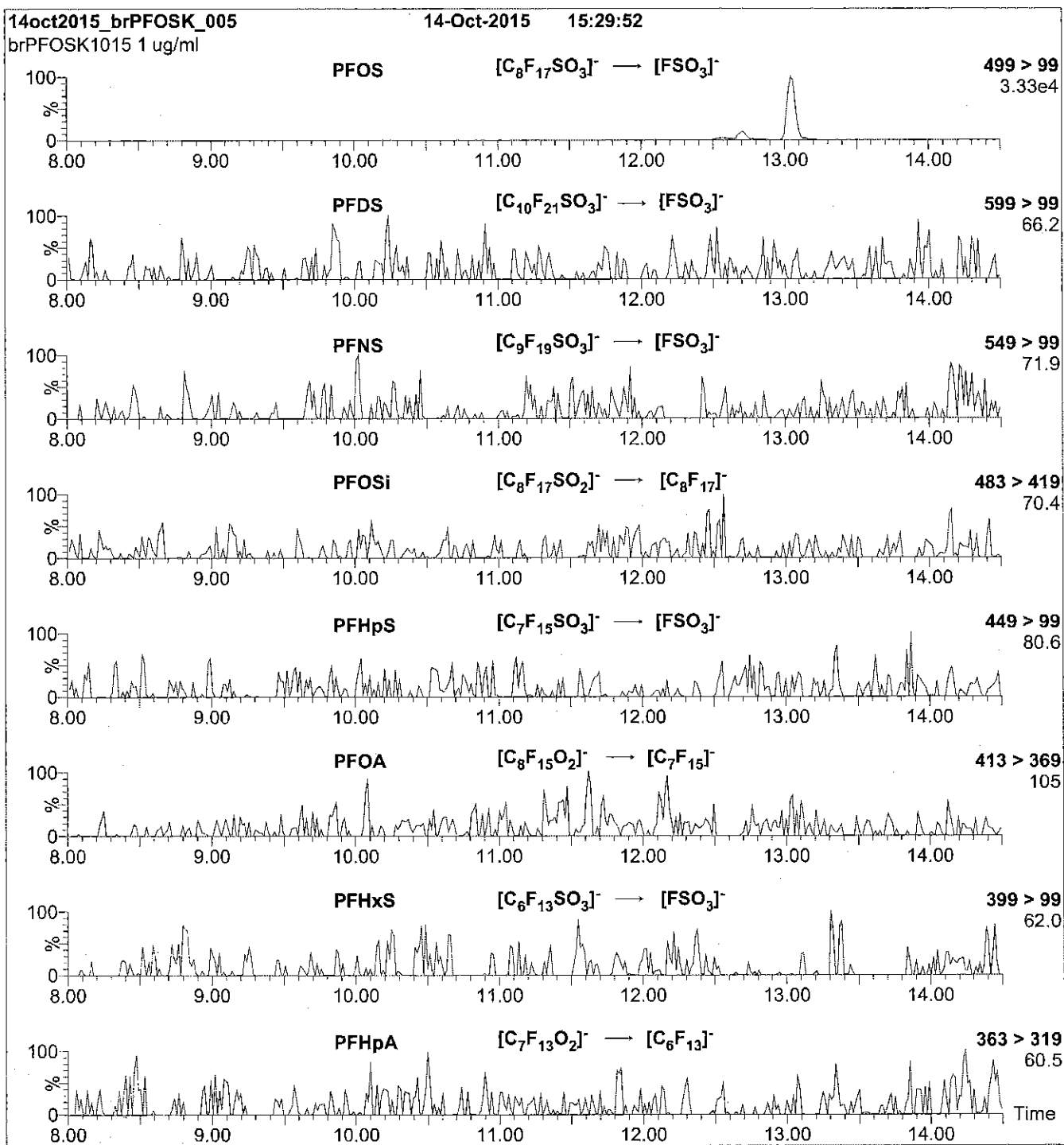
Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈ (1.7 μ m, 2.1 x 100 mm)
Injection: 1.0 μ g/ml of br-PFOSK
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H₂O (both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min
Flow: 300 μ l/min

MS Conditions:

SIR (ES⁻)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

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



Conditions for Figure 3:

Injection: On-column
 Mobile phase: Same as Figure 2
 Flow: 300 μ l/min

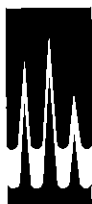
MS Parameters

Collision Gas (mbar) = 3.06e-3
 Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOS_00004

3/17/15 SV



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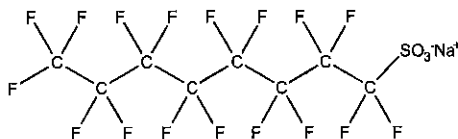
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFOS
COMPOUND: Sodium perfluoro-1-octanesulfonate

LOT NUMBER: LPFOS0614

STRUCTURE:

CAS #: 4021-47-0



MOLECULAR FORMULA: C₈F₁₇SO₃Na
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
 47.8 ± 2.4 µg/ml (PFOS anion)
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

MOLECULAR WEIGHT: 522.11
SOLVENT(S): Methanol

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: 10/27/2014
 (mm/dd/yyyy)

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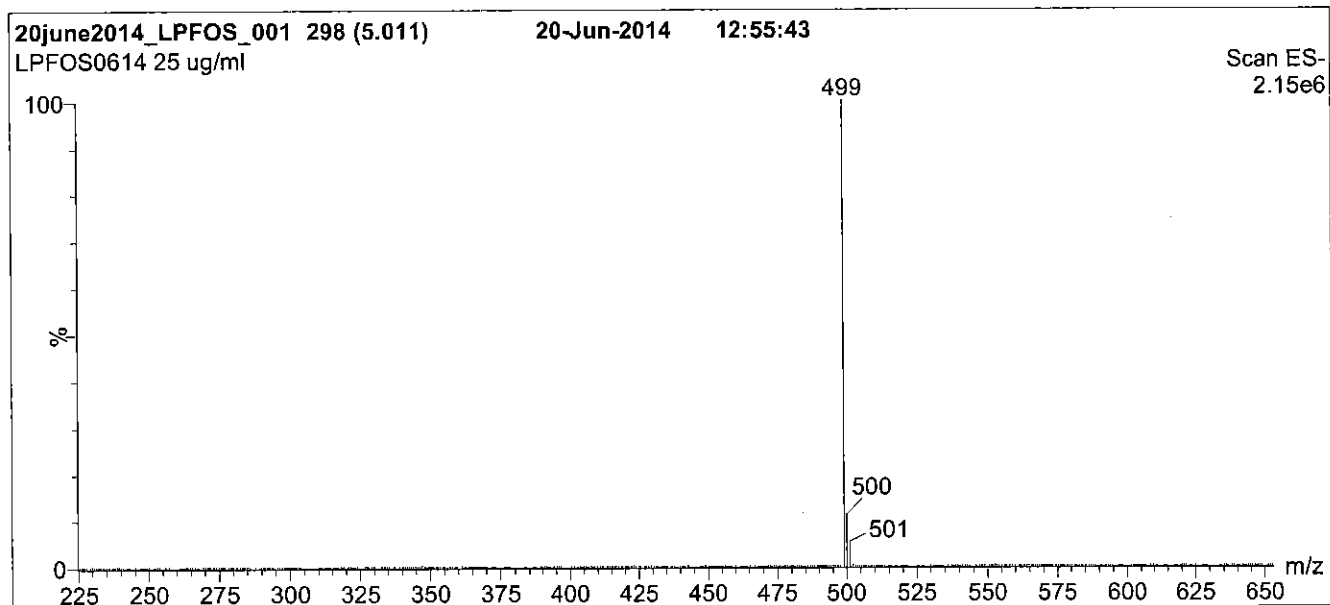
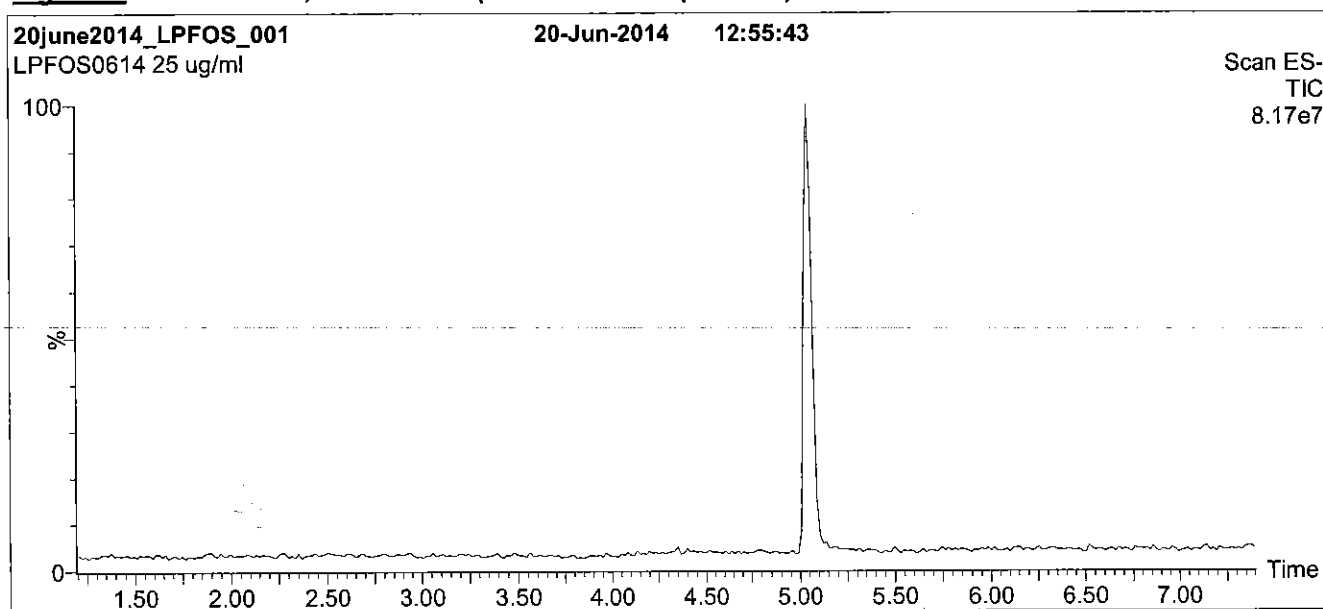
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Figure 1: L-PFOS; LC/MS Data (TIC and Mass Spectrum)



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MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H₂O
(both with 10 mM NH₄OAc 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

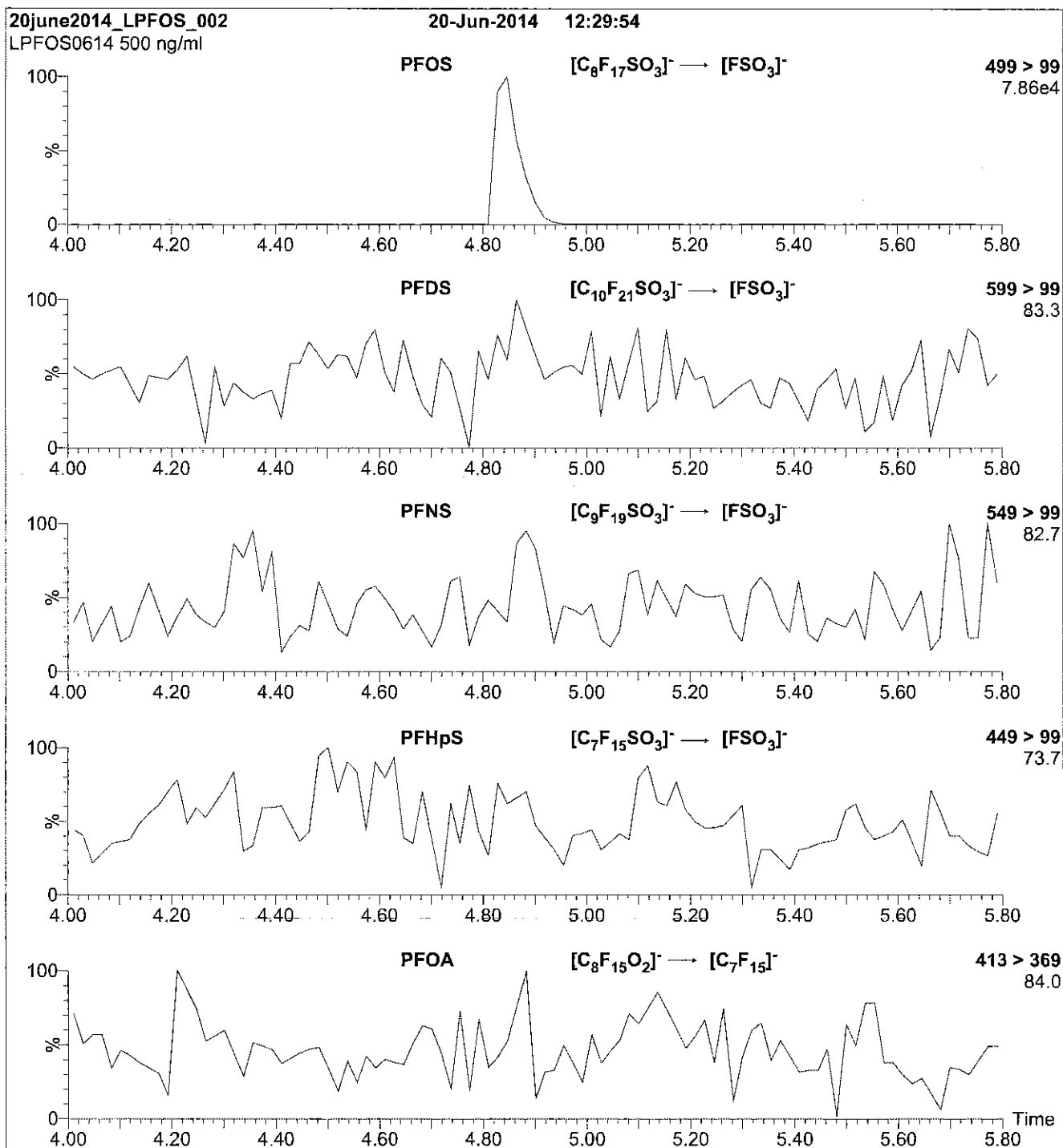
Flow: 300 μ l/min

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 μ l (500 ng/ml L-PFOS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
 Collision Energy (eV) = 40

Reagent

LCPFOSA_00006

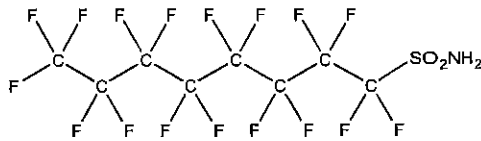


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FOSA-I **LOT NUMBER:** FOSA0815I
COMPOUND: Perfluoro-1-octanesulfonamide

STRUCTURE: **CAS #:** 754-91-6



MOLECULAR FORMULA: $C_8H_2F_{17}NO_2S$ **MOLECULAR WEIGHT:** 499.14
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):** Isopropanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/02/2015
EXPIRY DATE: (mm/dd/yyyy) 09/02/2017
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: _____


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Date: 09/11/2015
 (mm/dd/yyyy)

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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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

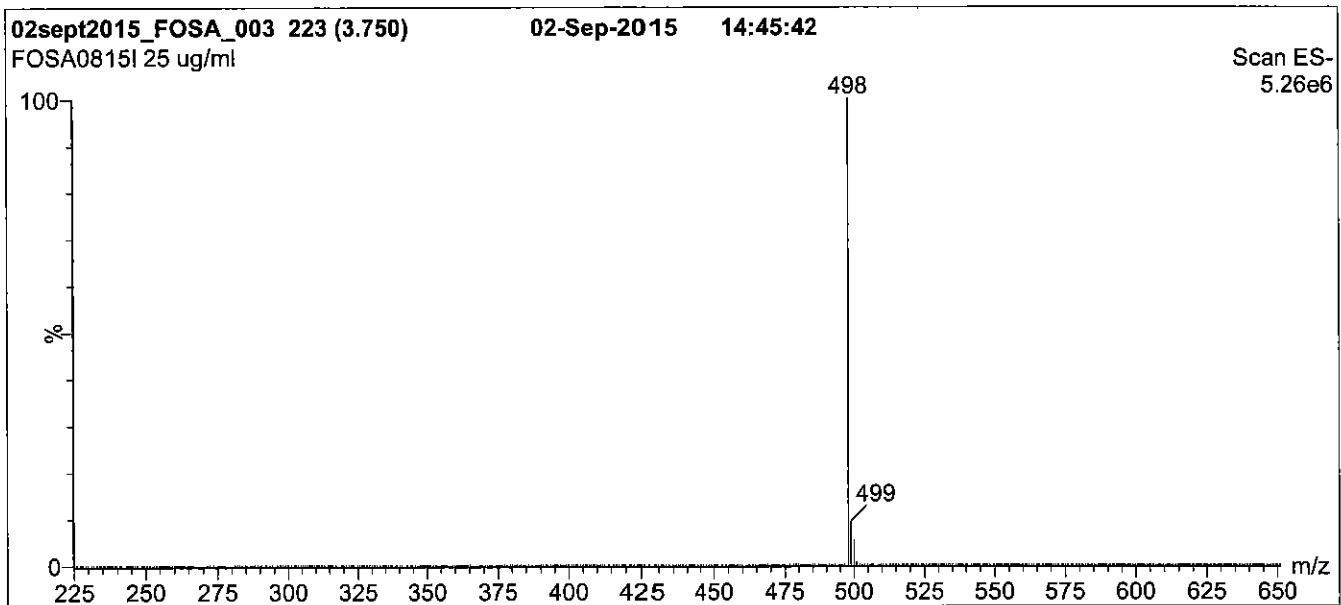
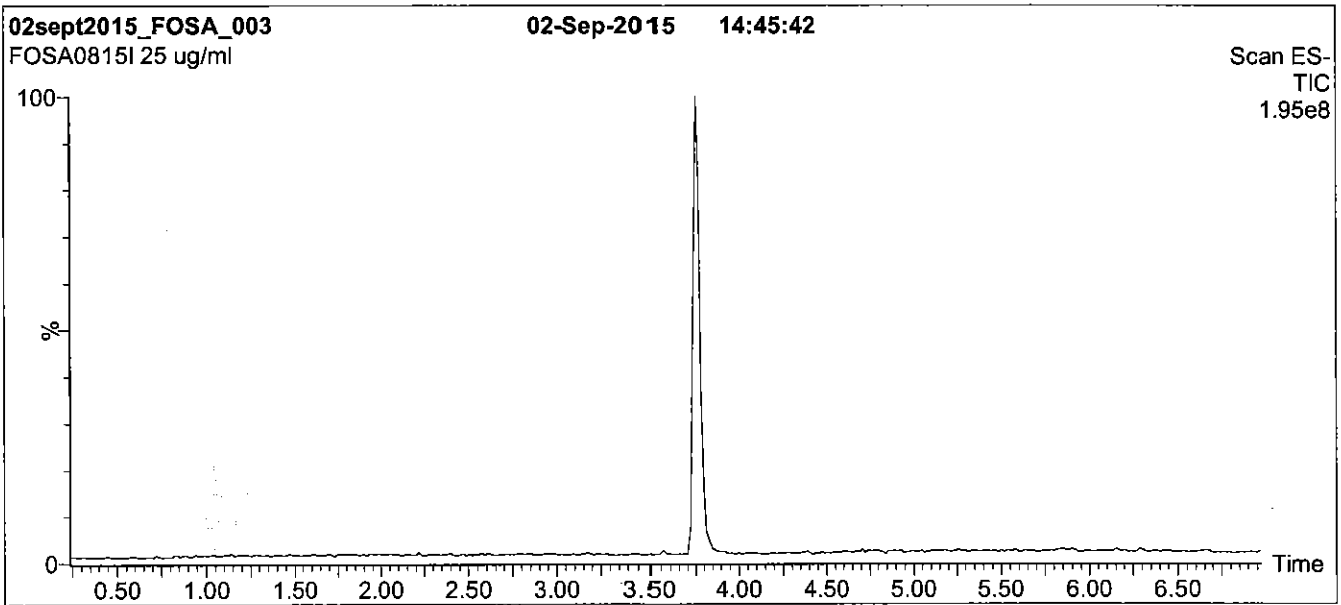
QUALITY MANAGEMENT:

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).



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 Shield RP_{1a}
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc 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

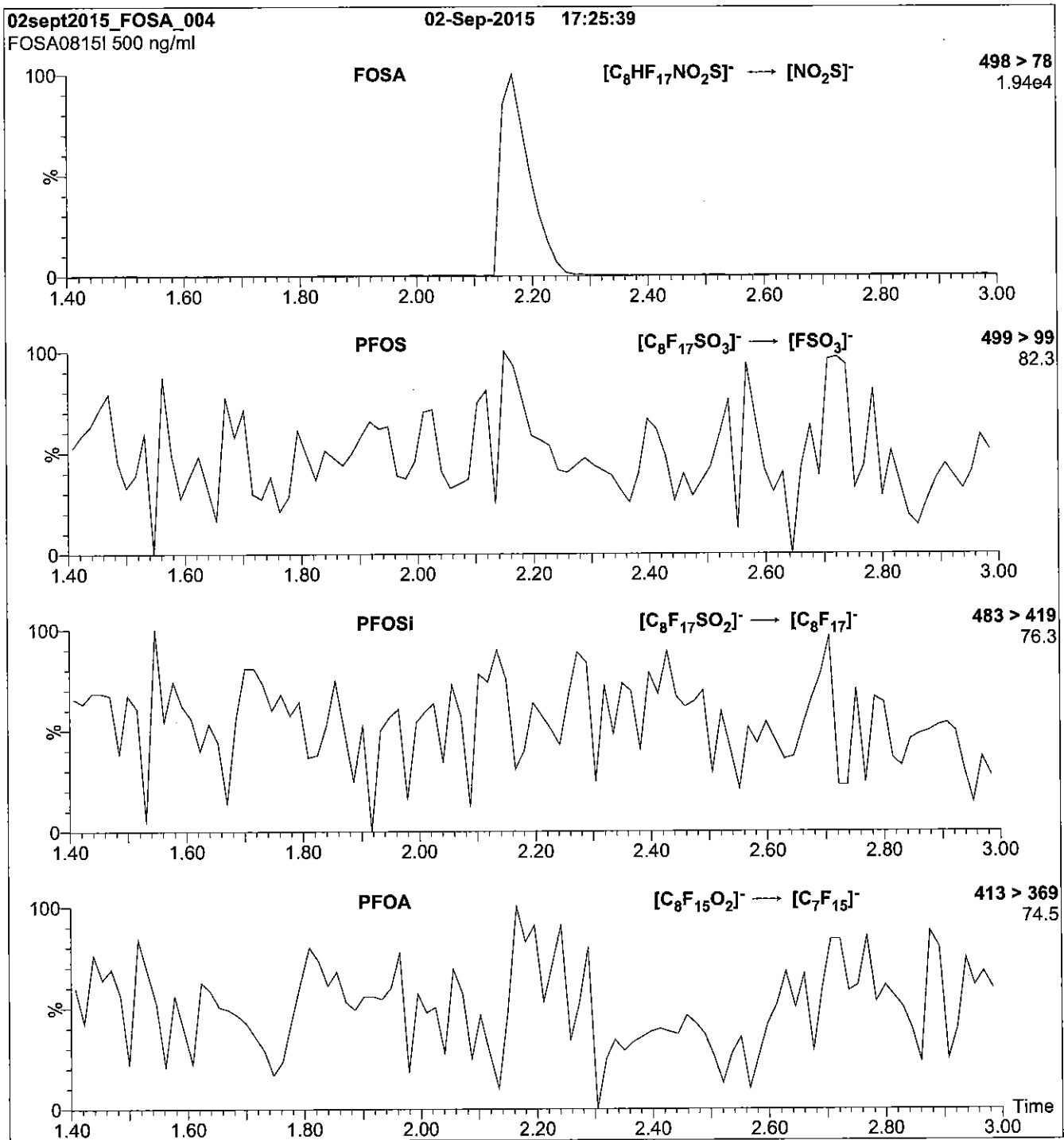
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

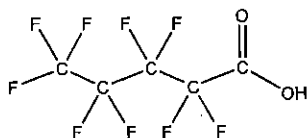
LCFPeA_00004



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFPeA **LOT NUMBER:** PFPeA0115
COMPOUND: Perfluoro-n-pentanoic acid
STRUCTURE: **CAS #:** 2706-90-3



MOLECULAR FORMULA: C₅HF₉O₂ **MOLECULAR WEIGHT:** 264.05
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of C₅H₂F₈O₂ (hydrido - derivative) as measured by ¹⁹F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____


 B.G. Chittim

Date: 03/26/2015
 (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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

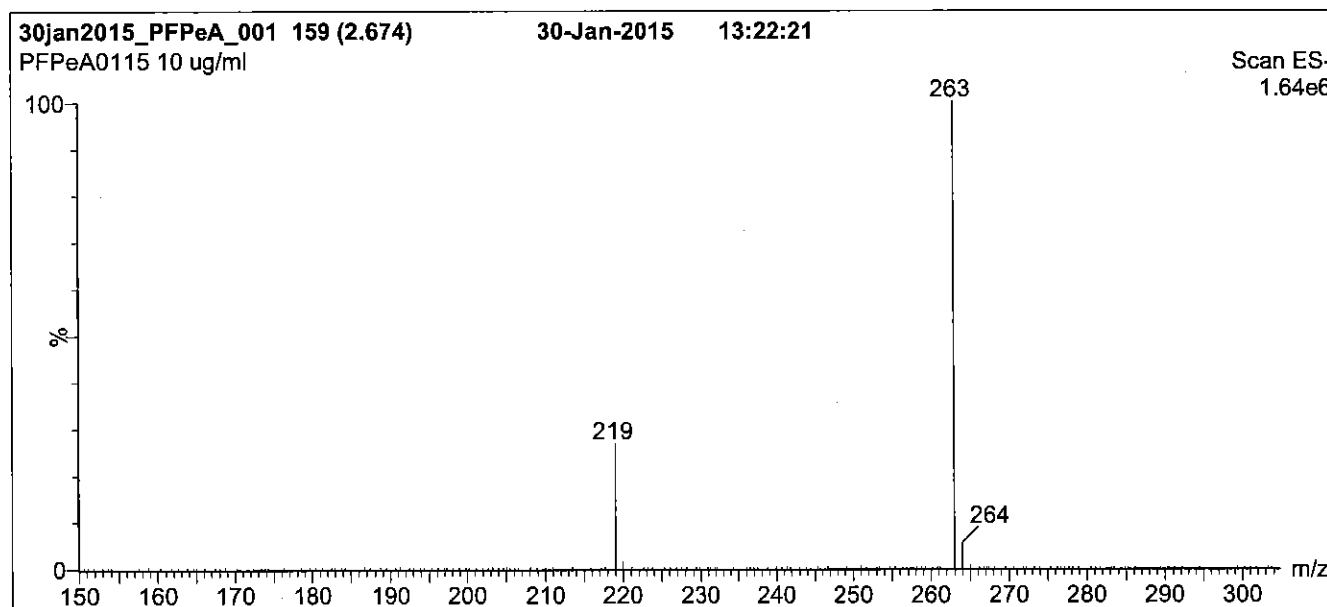
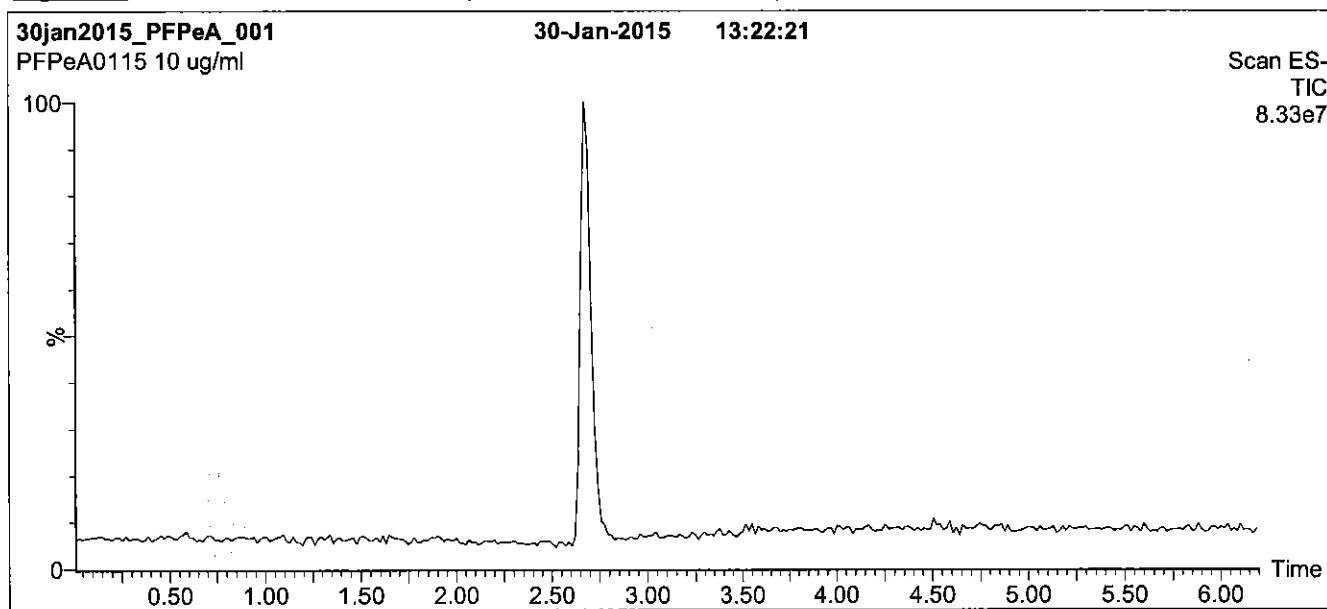
QUALITY MANAGEMENT:

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).



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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 30% (80:20 MeOH:ACN) / 70% H₂O
 (both with 10 mM NH₄OAc 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

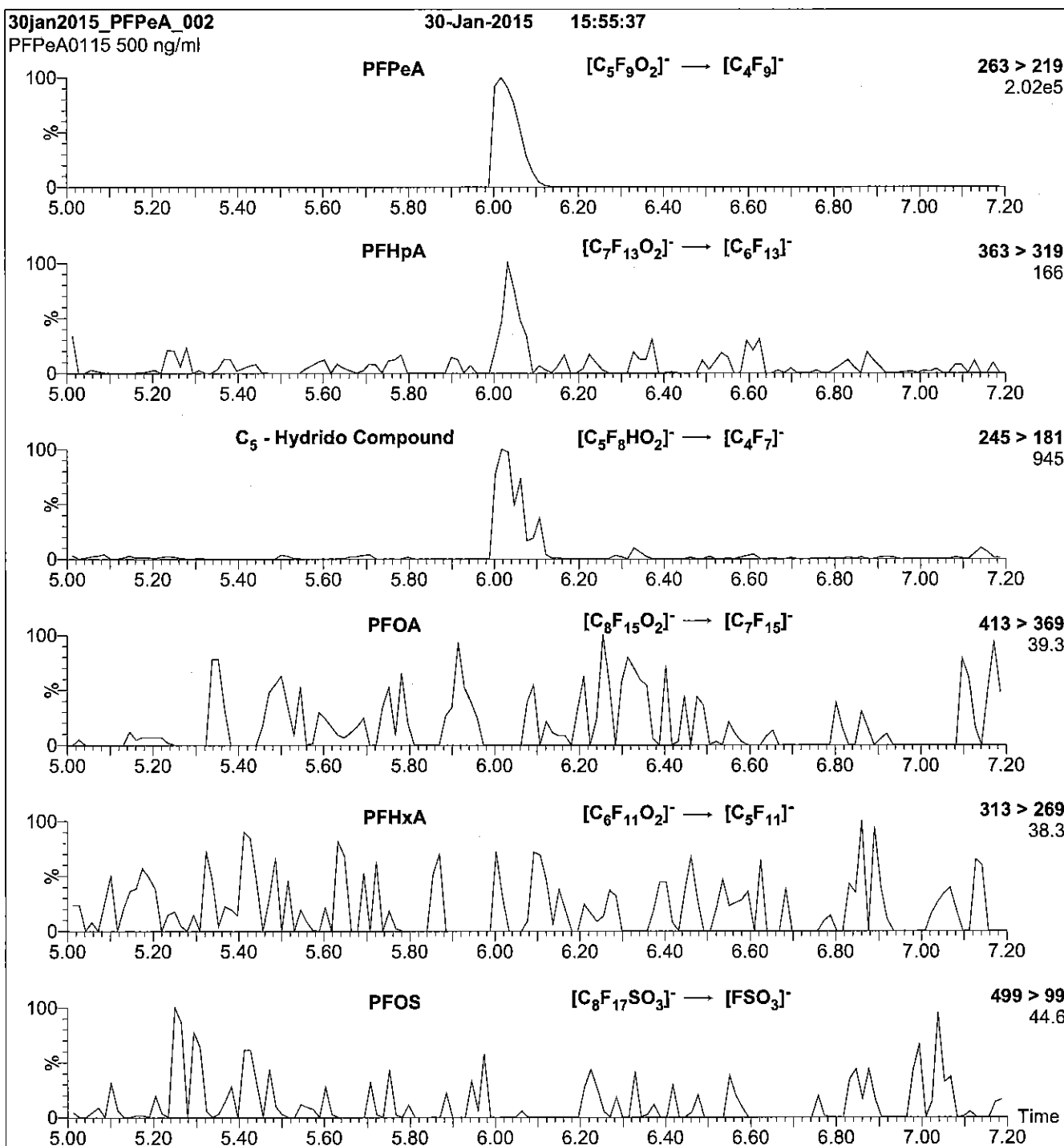
Flow: 300 μ l/min

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 μ l (500 ng/ml PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCFPeS_00002

R 2445 2



WELLINGTON LABORATORIES

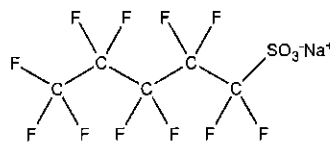
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFPeS
COMPOUND: Sodium perfluoro-1-pentanesulfonate

LOT NUMBER: LPFPeS0712

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: C₅F₁₁SO₃Na
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
 46.9 ± 2.3 µg/ml (PFPeS anion)
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

MOLECULAR WEIGHT: 372.09
SOLVENT(S): Methanol


DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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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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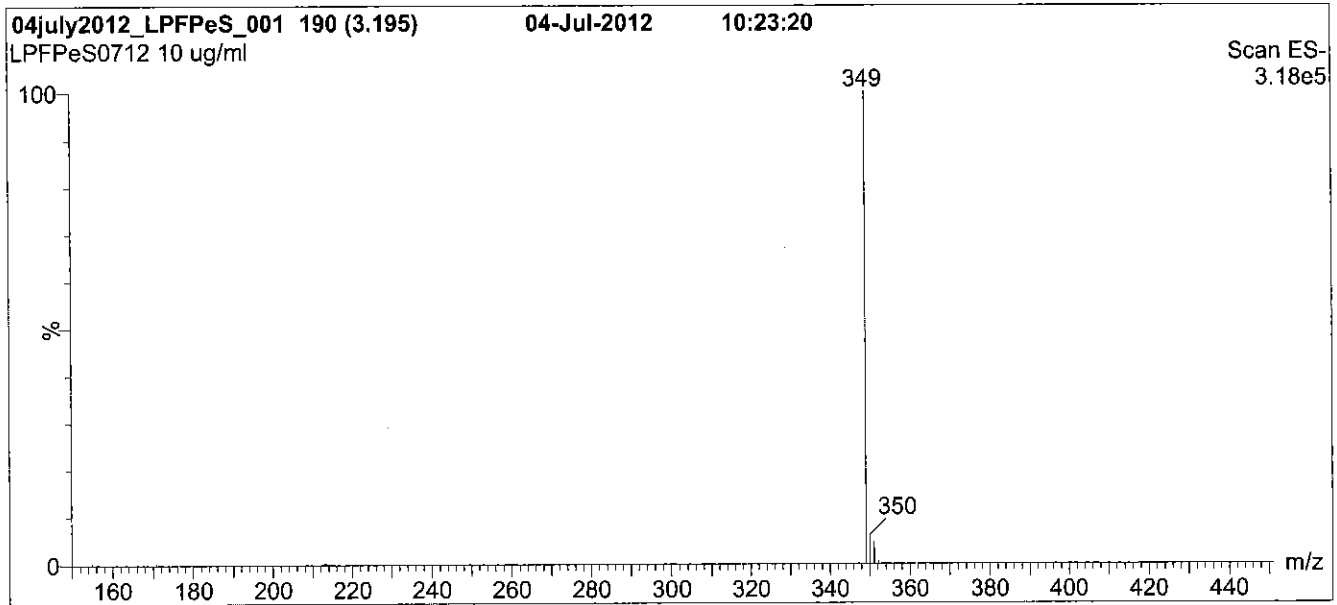
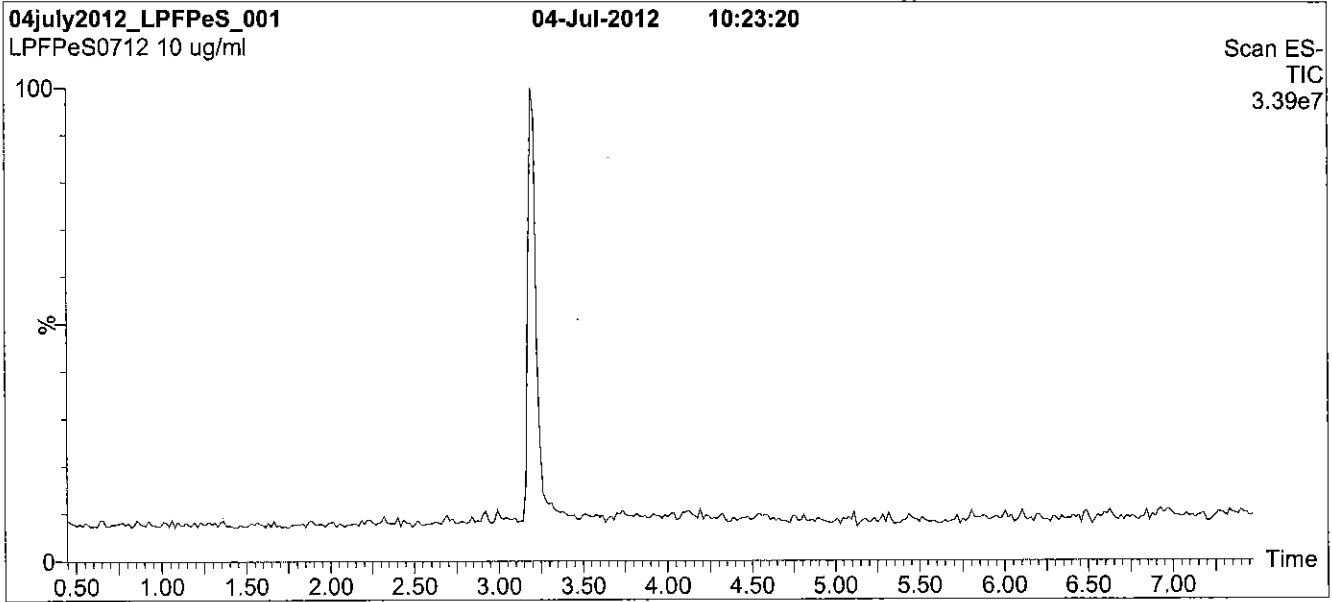
QUALITY MANAGEMENT:

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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 40% (80:20 MeOH:ACN) / 60% H₂O
 (both with 10 mM NH₄OAc 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

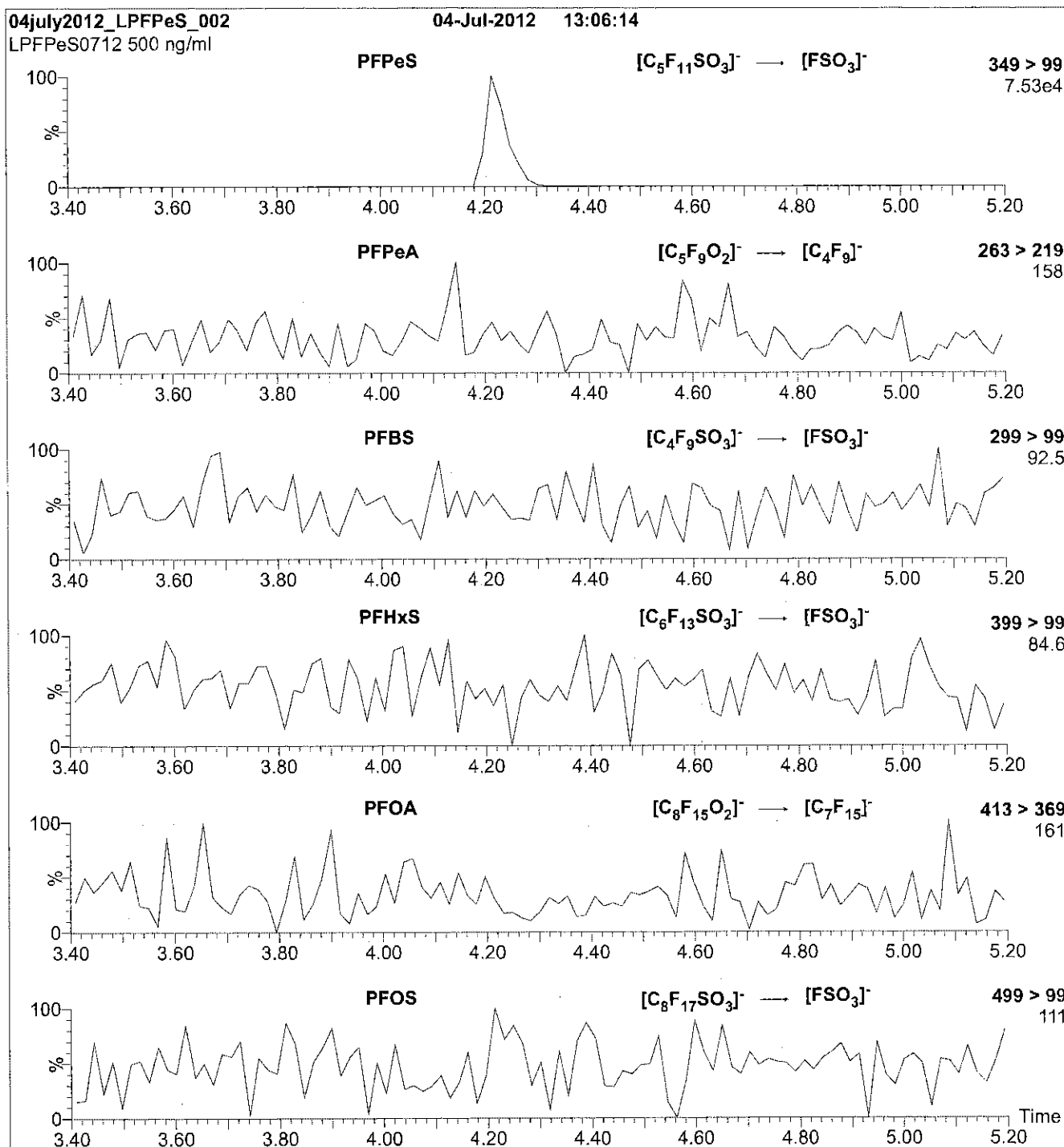
Flow: 300 μ l/min

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 μ l (500 ng/ml L-PFPeS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
 Collision Energy (eV) = 30

Reagent

LCPFTeDA_00003

v: 2/11/15 srw

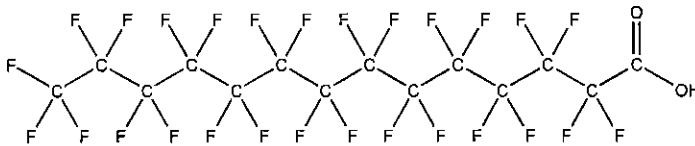


WELLINGTON LABORATORIES

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: $50 \pm 2.5 \mu\text{g/ml}$ **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

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

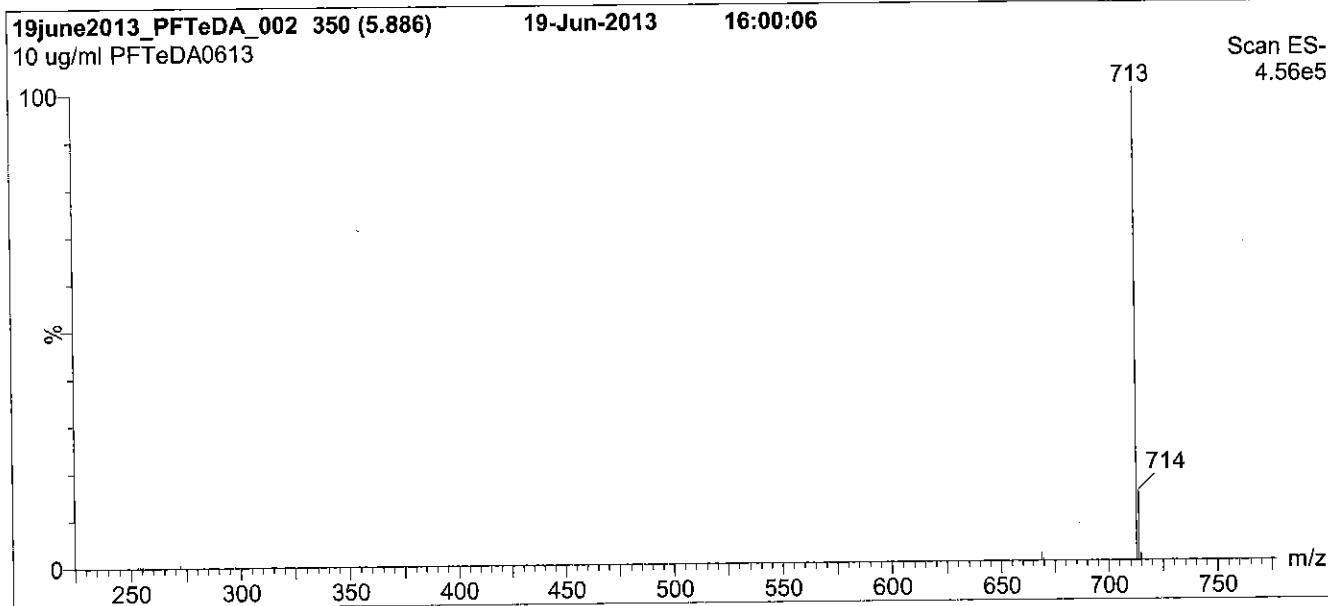
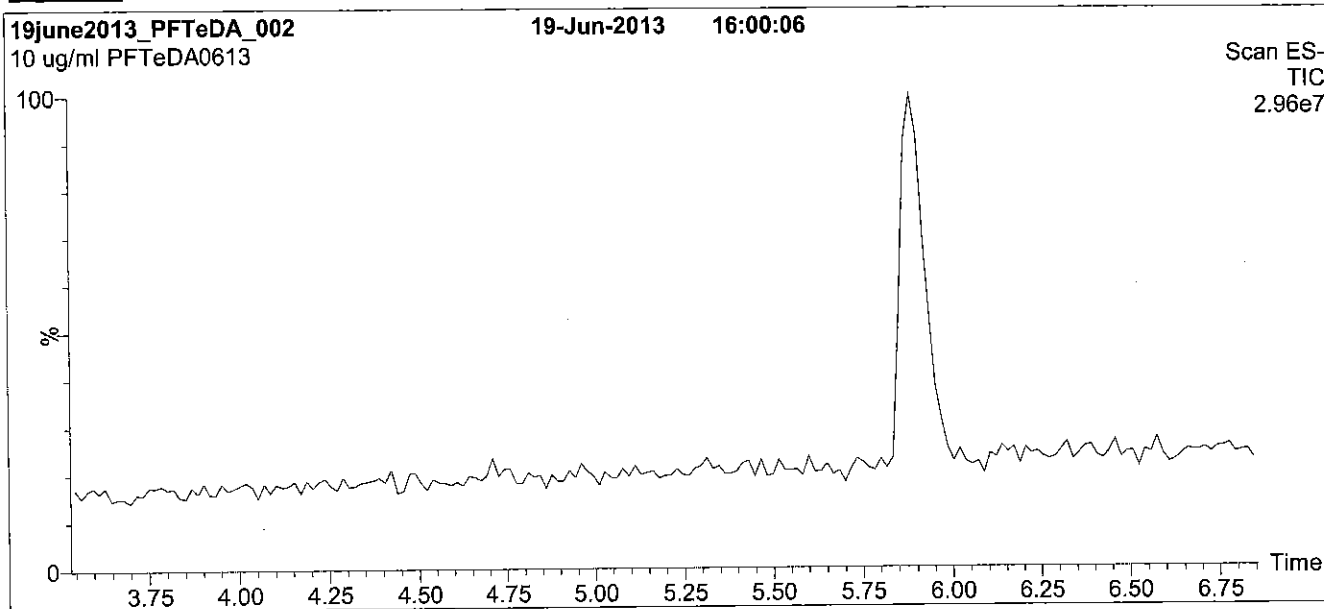
QUALITY MANAGEMENT:

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).



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc 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

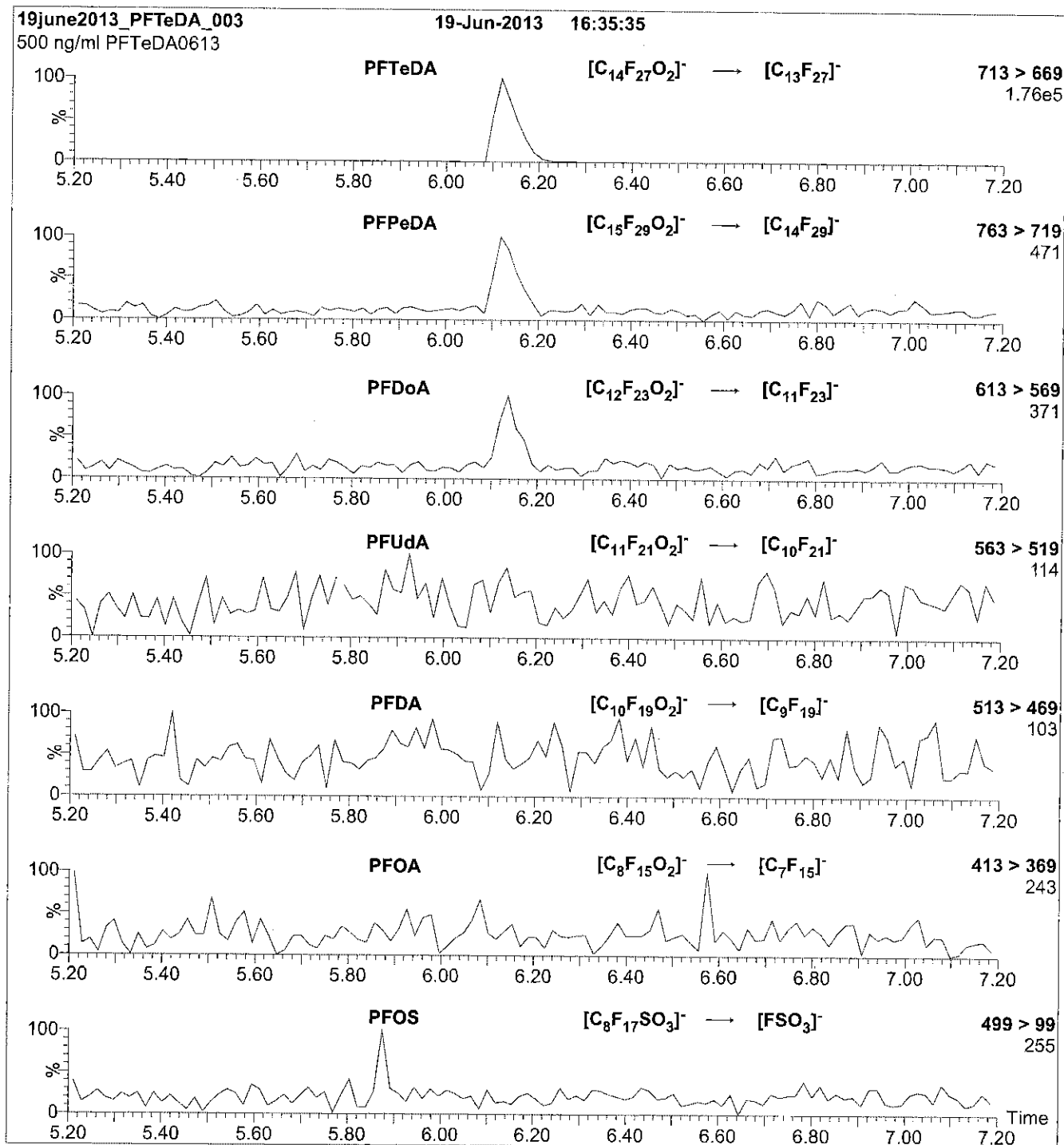
Flow: 300 μ l/min

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 injection
10 μ l (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 14

Reagent

LCPFTeDA_00004



R: 4/7/16 CBW

609636

ID: LCPFTeDA_00004

Exp: 12/09/20 Pripd: CBW

PF-n-tetradecanoic acid

**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:**

PFTeDA

LOT NUMBER:

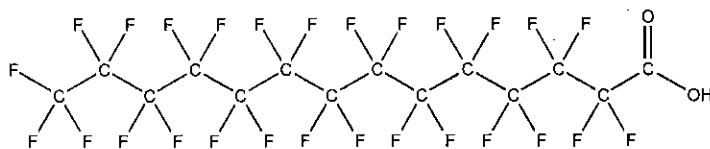
PFTeDA1215

COMPOUND:

Perfluoro-n-tetradecanoic acid

STRUCTURE:**CAS #:**

376-06-7

**MOLECULAR FORMULA:** $C_{14}H_{27}F_{27}O_2$ **MOLECULAR WEIGHT:**

714.11

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**Methanol
Water (<1%)**CHEMICAL PURITY:**

>98%

LAST TESTED: (mm/dd/yyyy)

12/09/2015

EXPIRY DATE: (mm/dd/yyyy)

12/09/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDa ($C_{12}H_{23}F_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}H_{29}F_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/09/2015

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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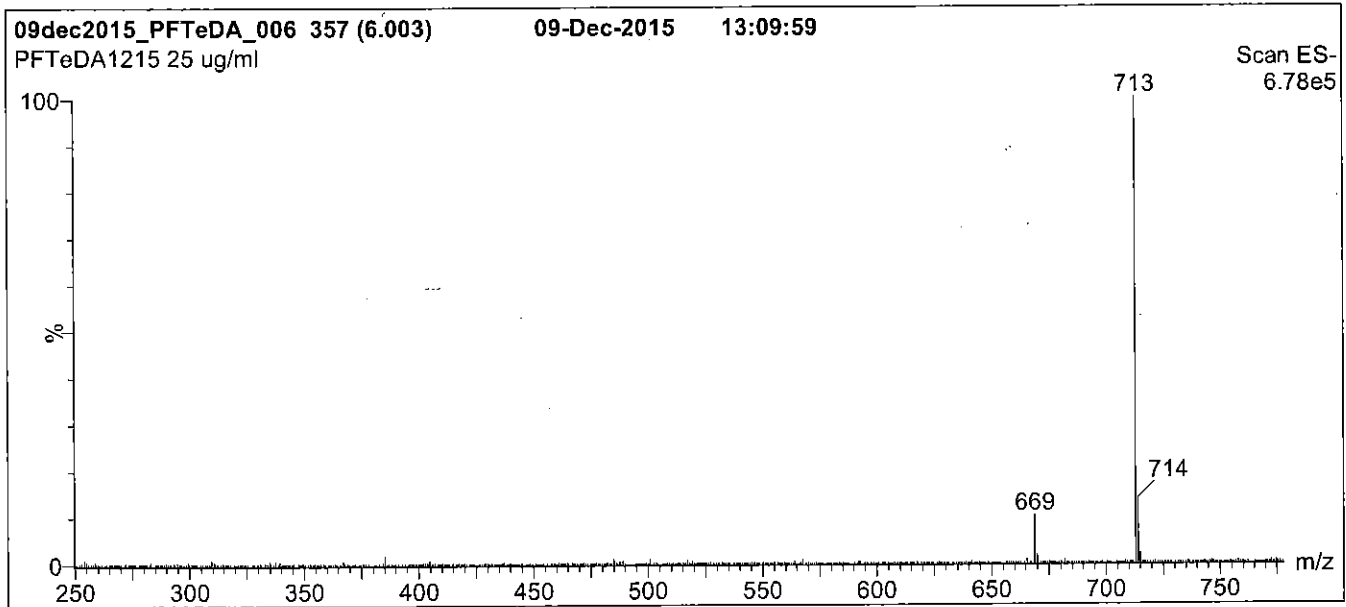
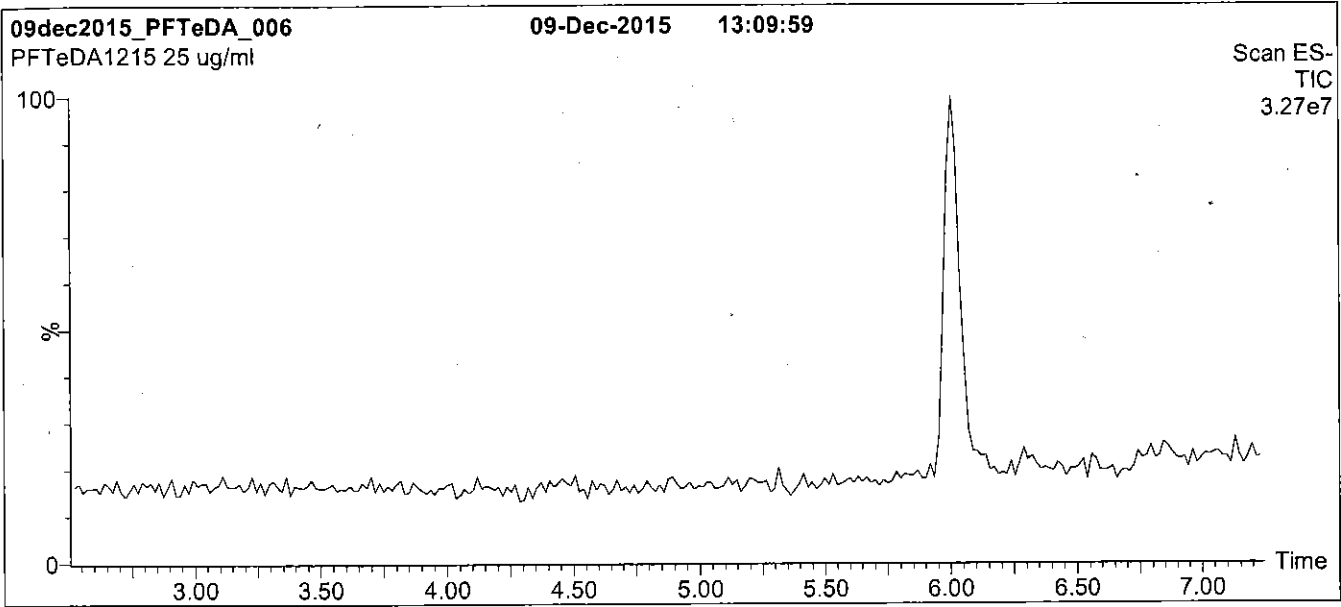
QUALITY MANAGEMENT:

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



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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 RP₁₈
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

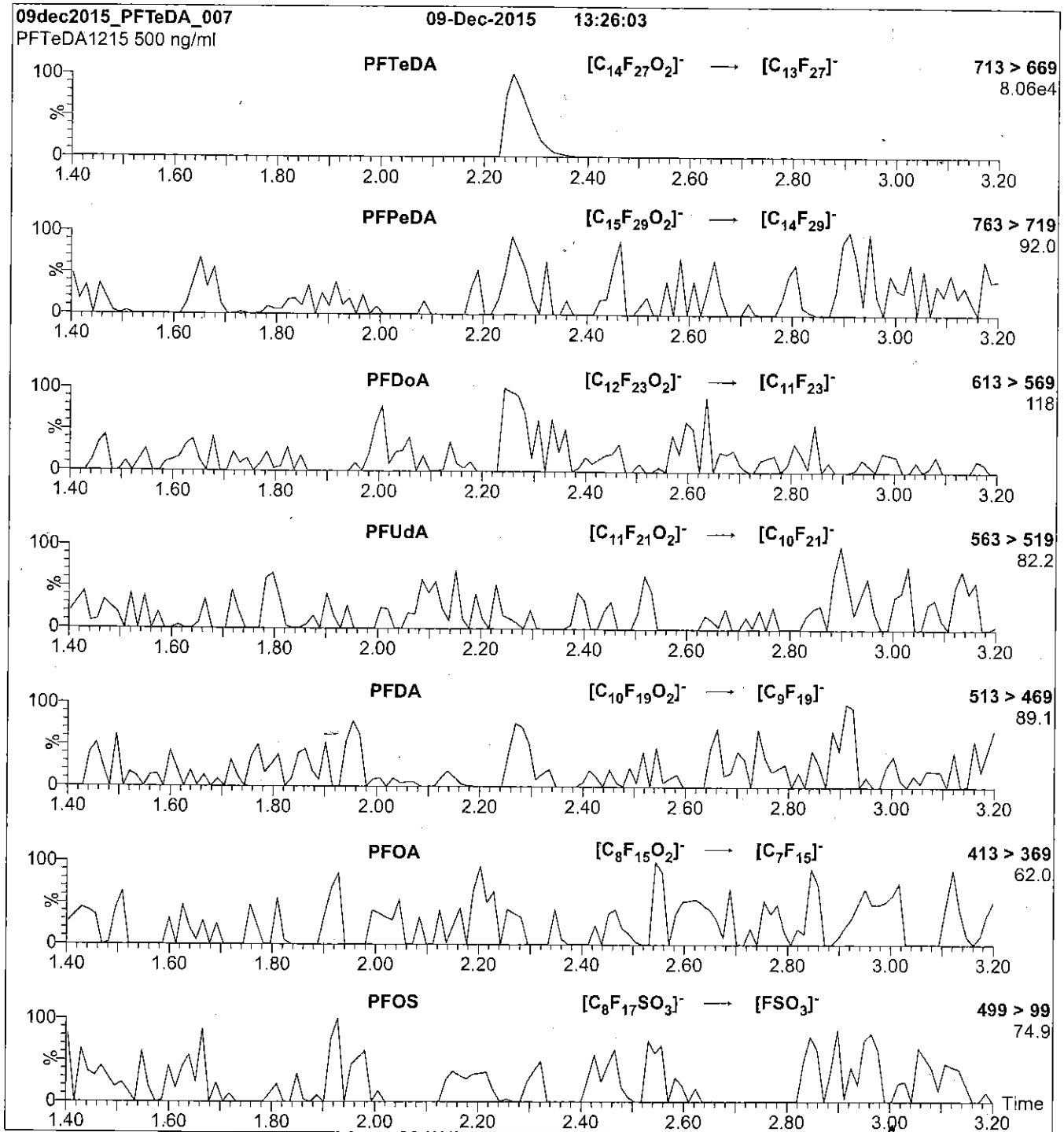
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

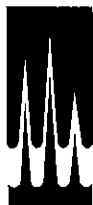
Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 14

Reagent

LCPFT_rDA_00003

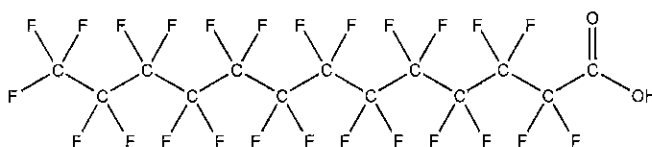


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTrDA **LOT NUMBER:** PFTrDA1213
COMPOUND: Perfluoro-n-tridecanoic acid

STRUCTURE: **CAS #:** 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{26}O_2$ **MOLECULAR WEIGHT:** 664.11
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **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 PFDaA ($C_{12}HF_{23}O_2$), 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)

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EXPIRY DATE / PERIOD OF VALIDITY:

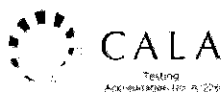
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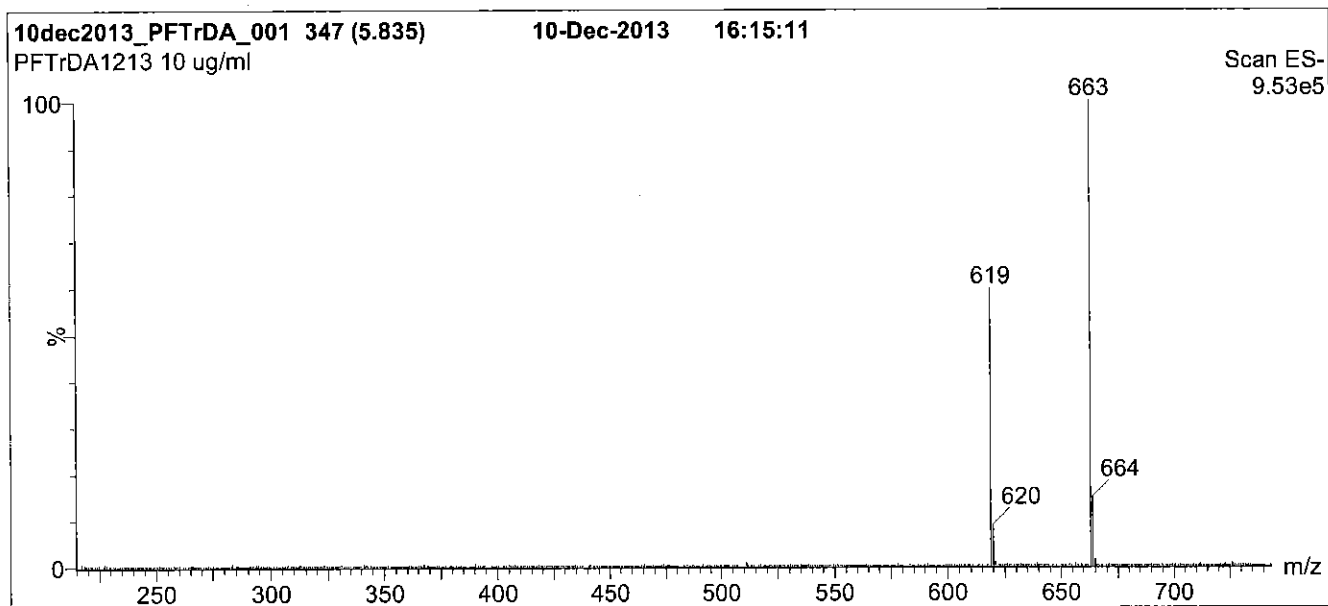
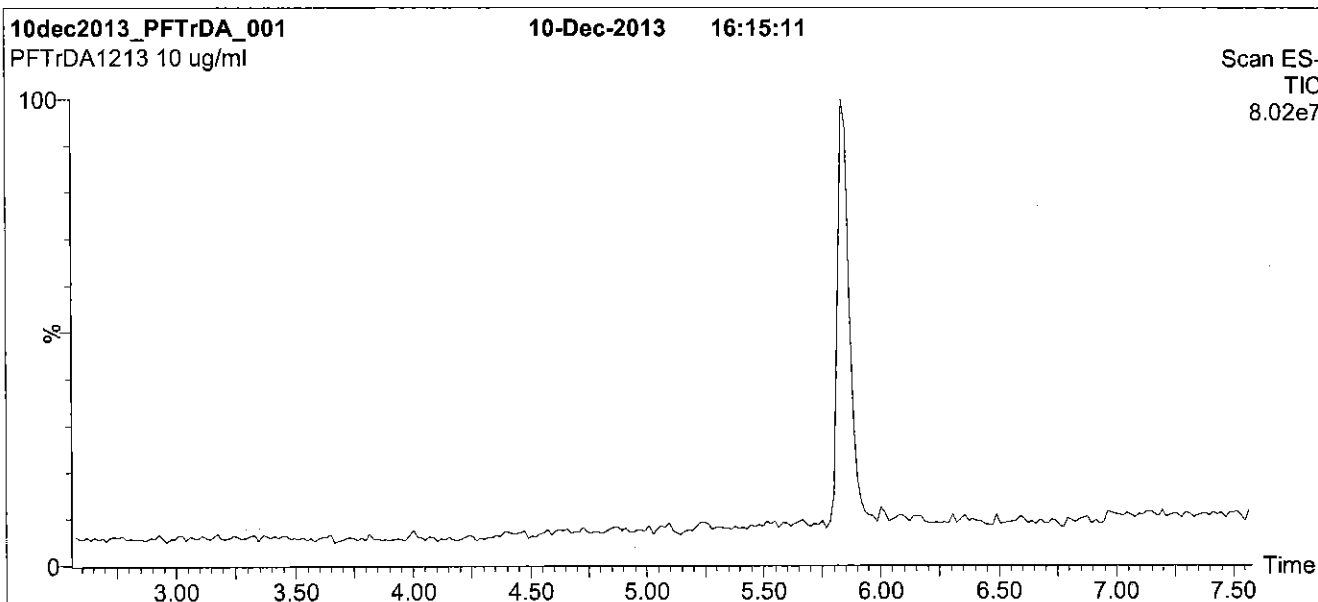
QUALITY MANAGEMENT:

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Figure 1: PFTTrDA; 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc 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

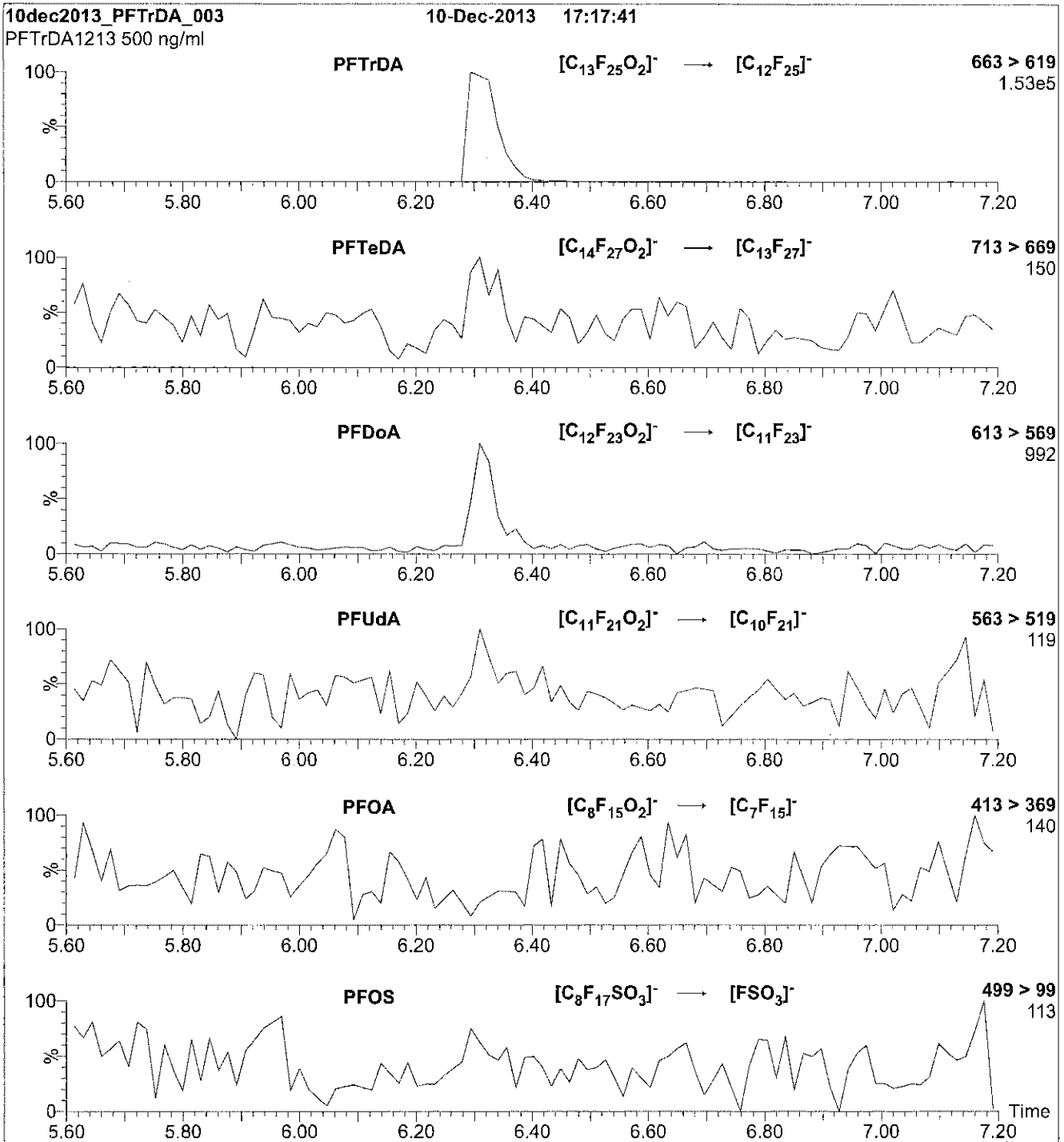
Flow: 300 μ l/min

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 μ l (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 15

Reagent

LCPFT_rDA_00004



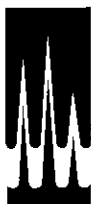
R: 4/7/16 CBW

609697

ID: LCPFTrDA_00004

Exp: 12/10/18 Ppfd: CBW

PF-n-tridecanoic acid

**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:**

PFTrDA

LOT NUMBER:

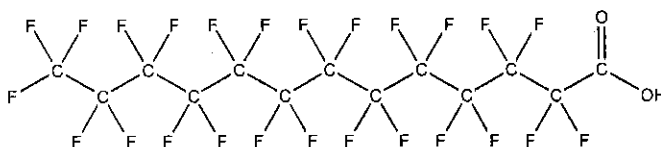
PFTrDA1213

COMPOUND:

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STRUCTURE:**CAS #:**

72629-94-8

**MOLECULAR FORMULA:** $C_{13}H_{25}O_2$ **MOLECULAR WEIGHT:**

664.11

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **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:

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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:

03/25/2015
(mm/dd/yyyy)Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON 'N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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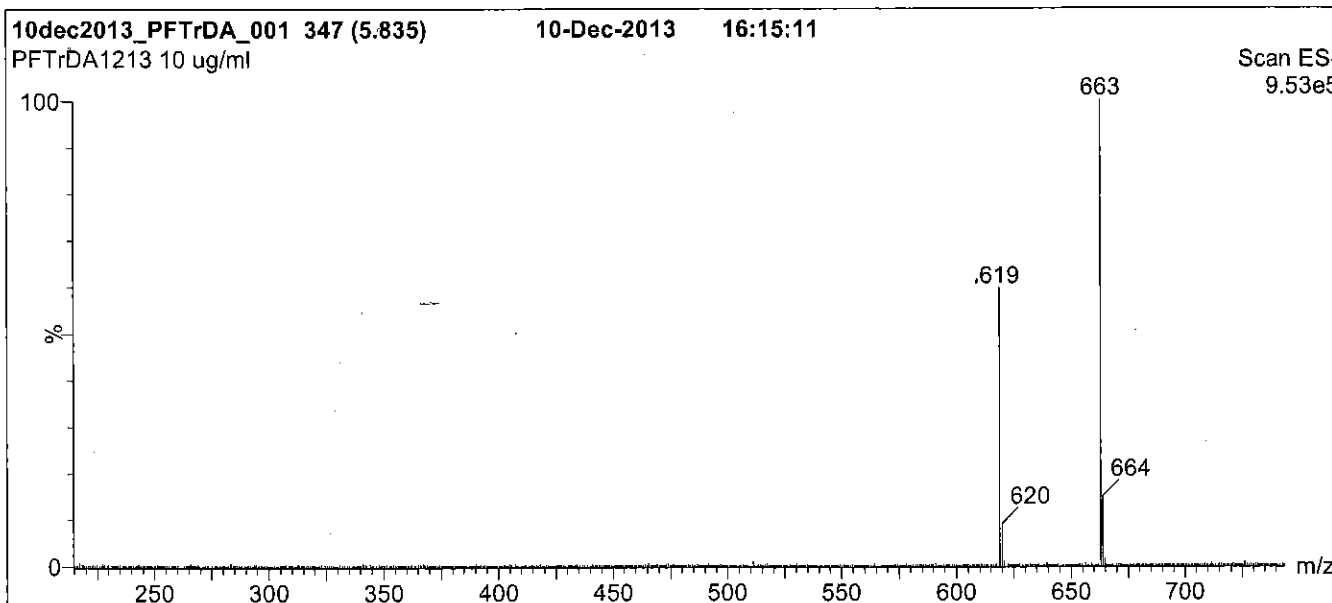
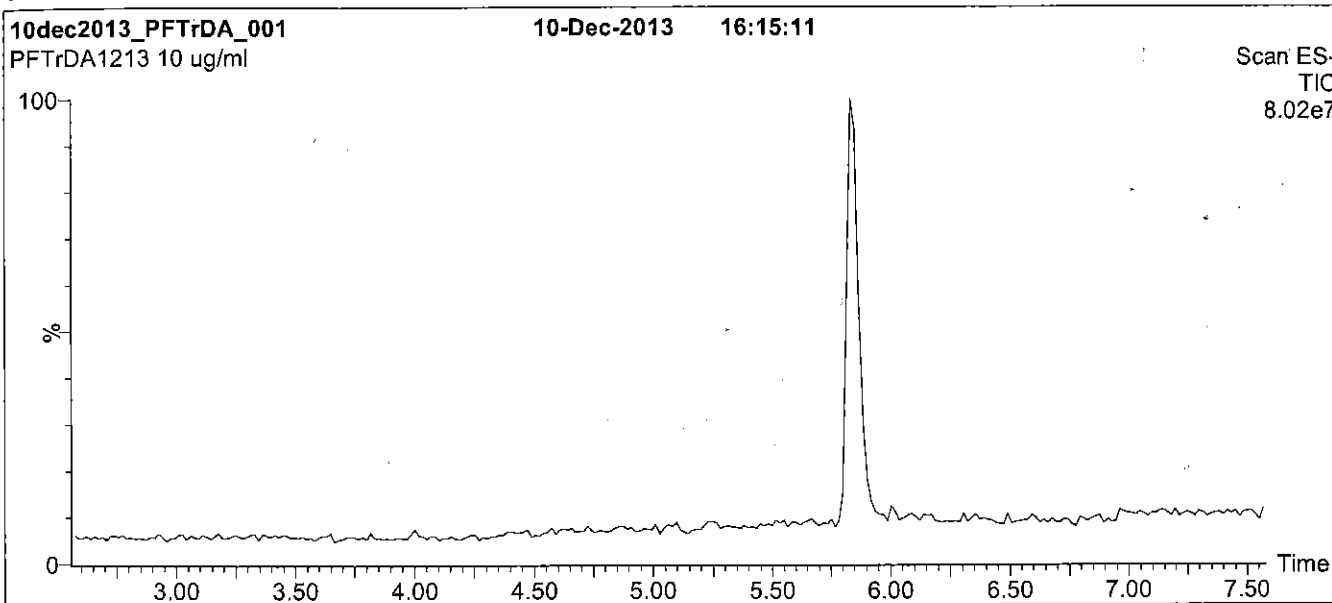
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Figure 1: PFTrDA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 60% (80:20 MeOH:ACN) / 40% H₂O
 (both with 10 mM NH₄OAc 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

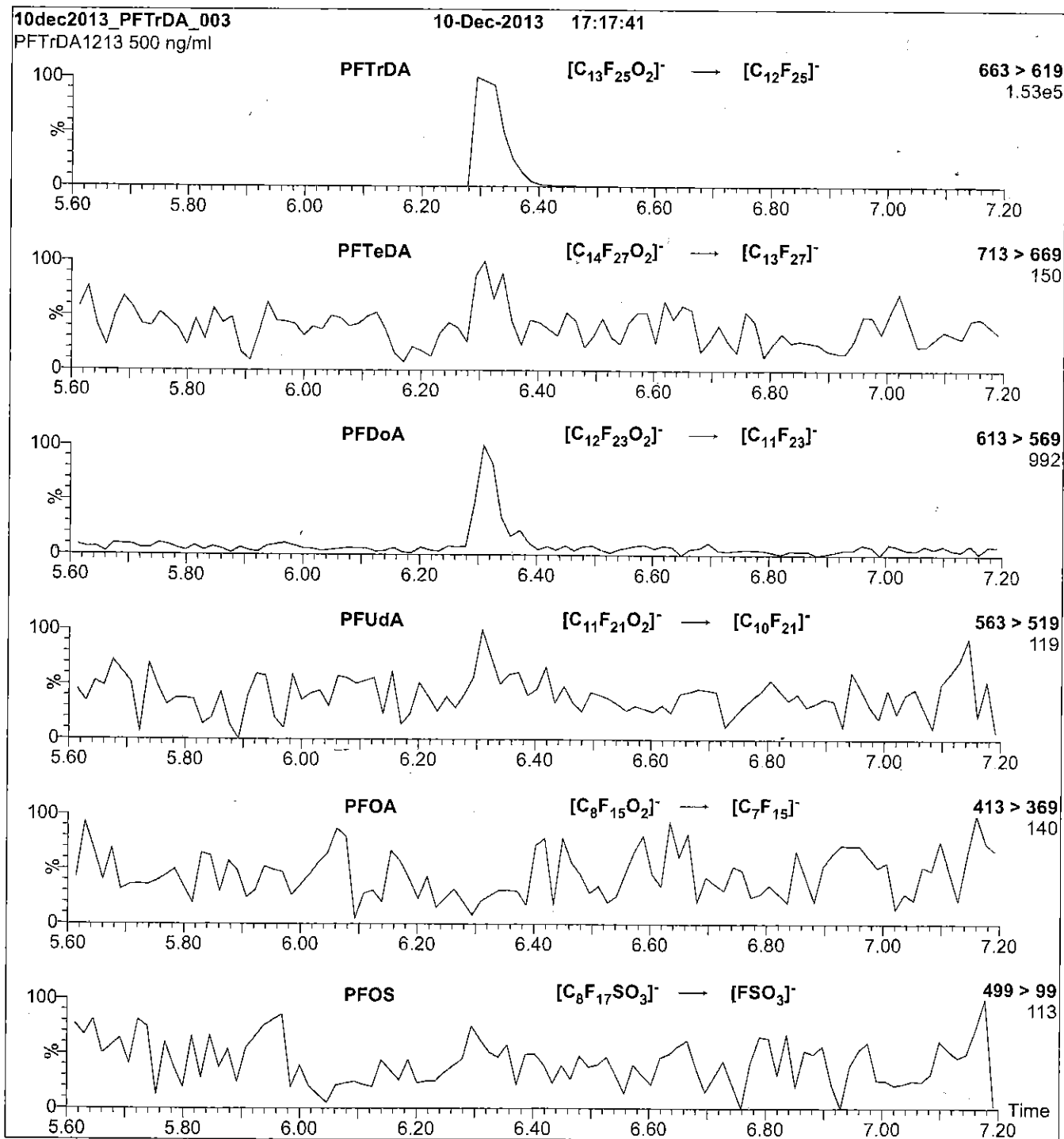
Flow: 300 μ l/min

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 μ l (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

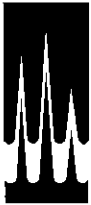
MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 15

Reagent

LCPFUdA_00003

PC 2/11/15 SFV

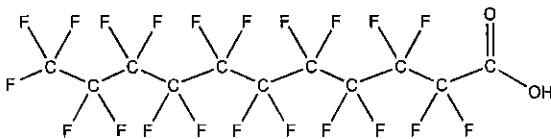


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFUdA **LOT NUMBER:** PFUdA0613
COMPOUND: Perfluoro-n-undecanoic acid

STRUCTURE: **CAS #:** 2058-94-8



MOLECULAR FORMULA: C₁₁HF₂₁O₂ **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:

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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:** 07/03/2013
(mm/dd/yyyy)

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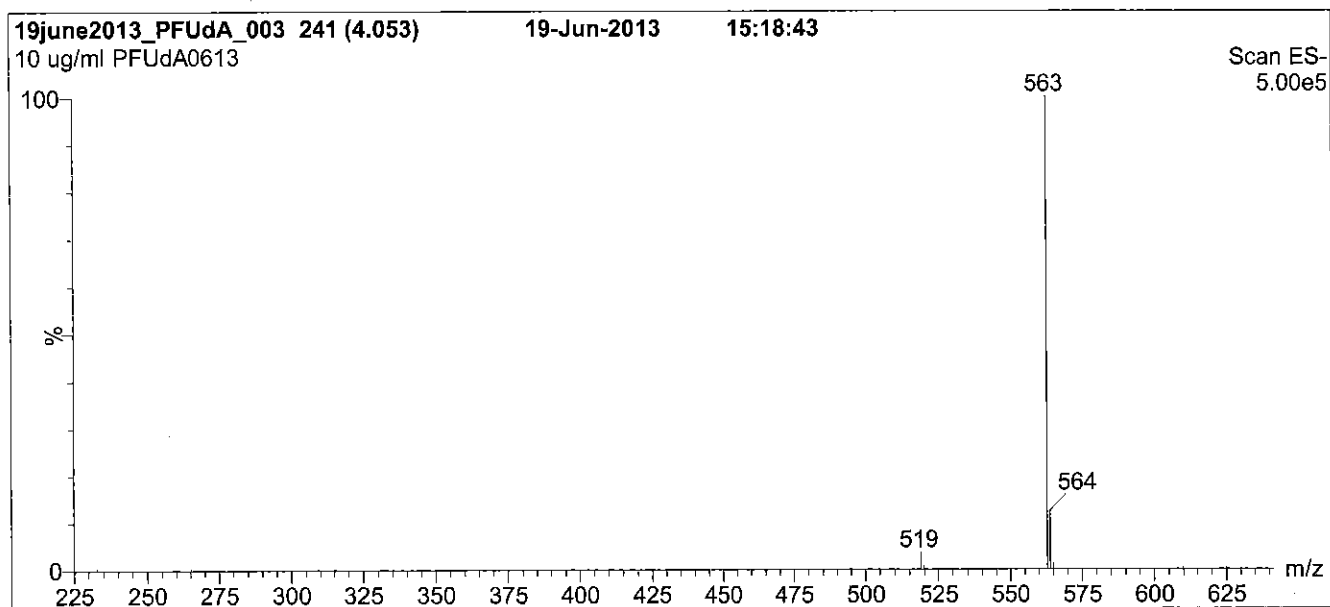
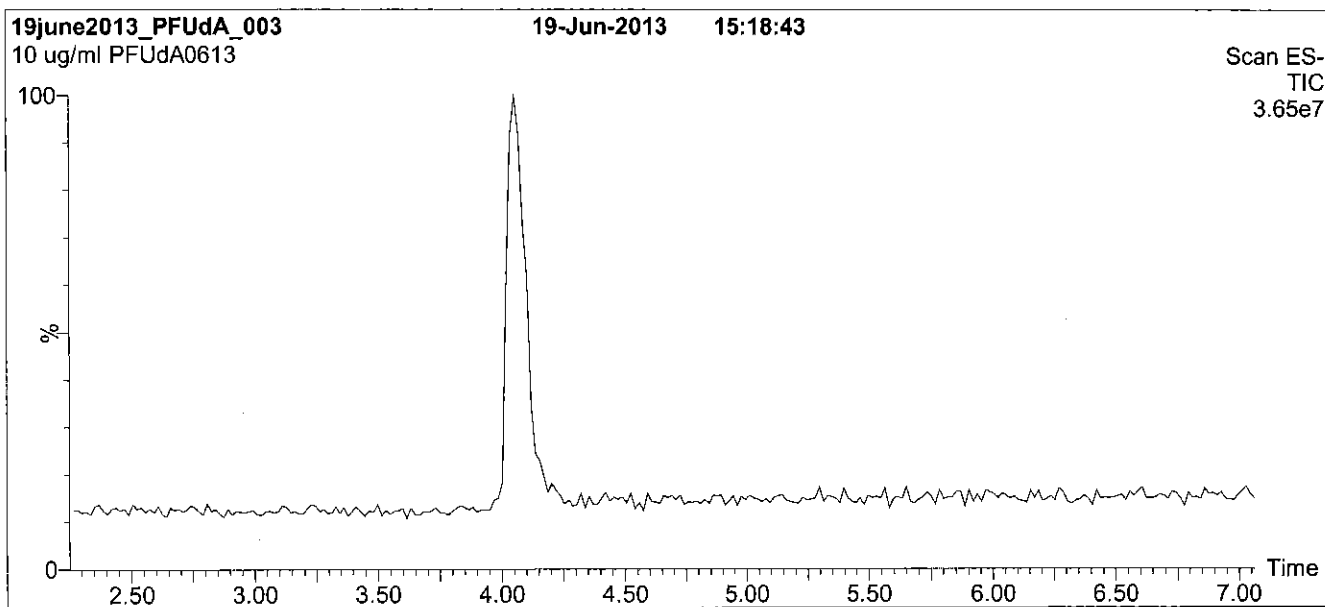
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc 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

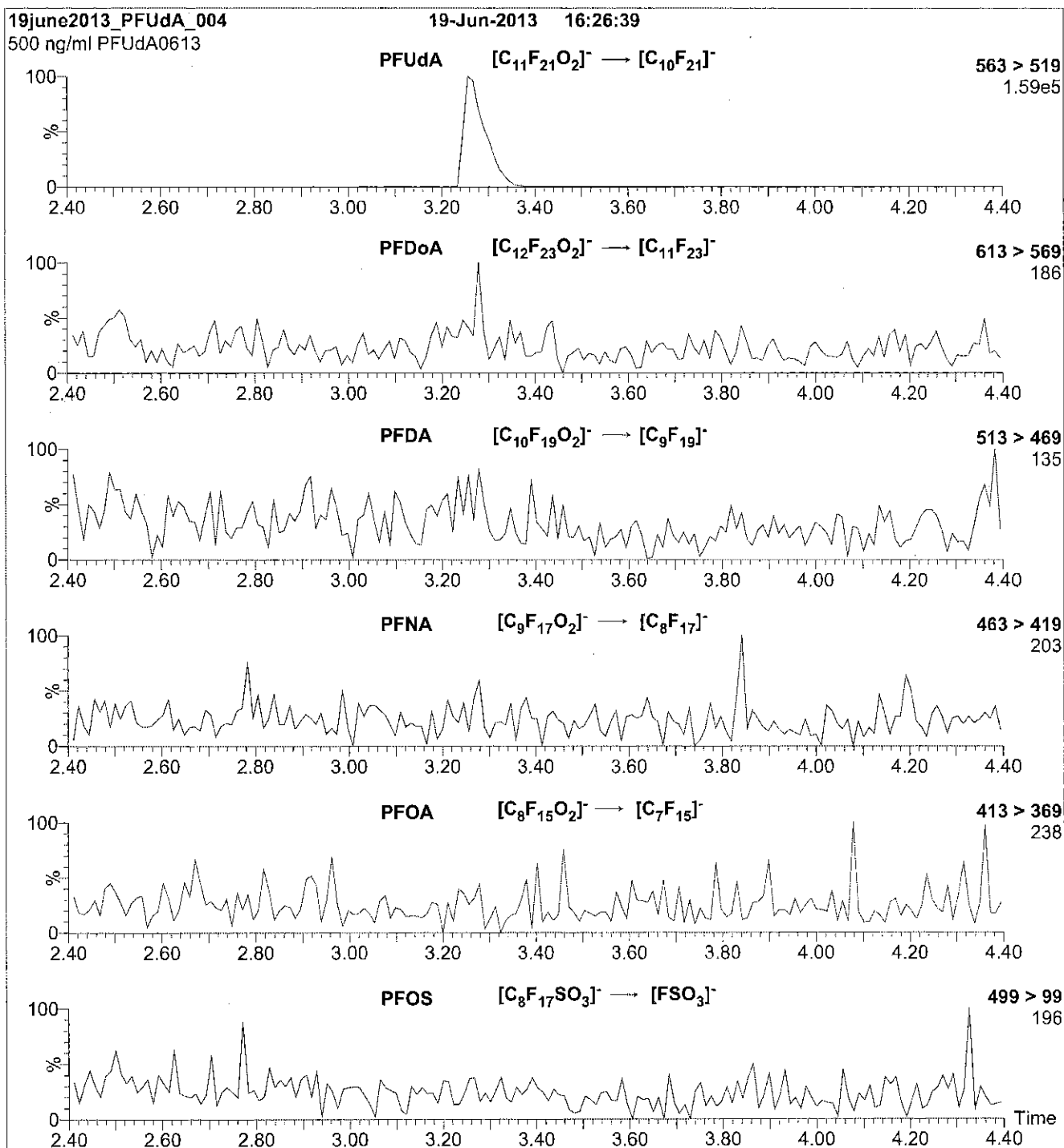
Flow: 300 μ l/min

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 μ l (500 ng/ml PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFUdA_00004

605242
ID: LCPFUdA_00004
Exp: 08/19/20 Prp: CBW
PF-n-undecanoic acid

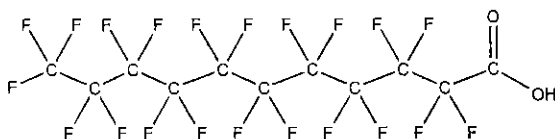
Rec. 3/29/16 JRB ✓



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFUdA **LOT NUMBER:** PFUdA0815
COMPOUND: Perfluoro-n-undecanoic acid
STRUCTURE: **CAS #:** 2058-94-8



MOLECULAR FORMULA: C₁₁H_{F₂₁}O₂ **MOLECULAR WEIGHT:** 564.09
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/19/2015
EXPIRY DATE: (mm/dd/yyyy) 08/19/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

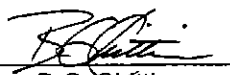
DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. 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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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:

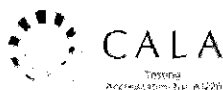
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

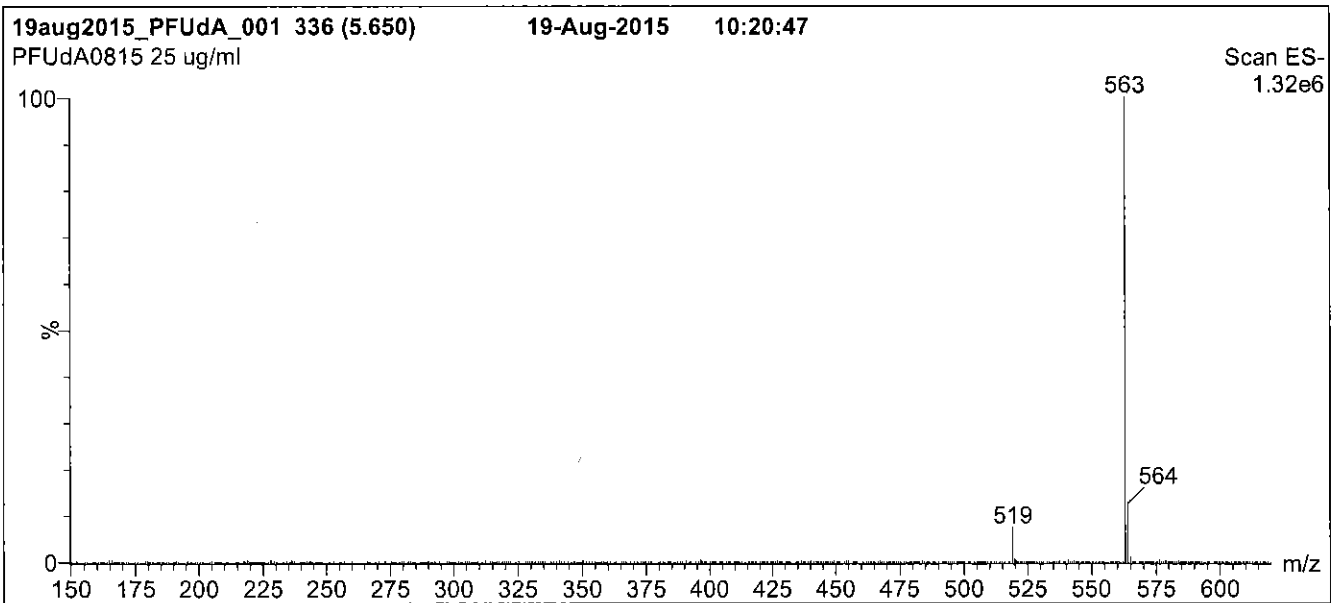
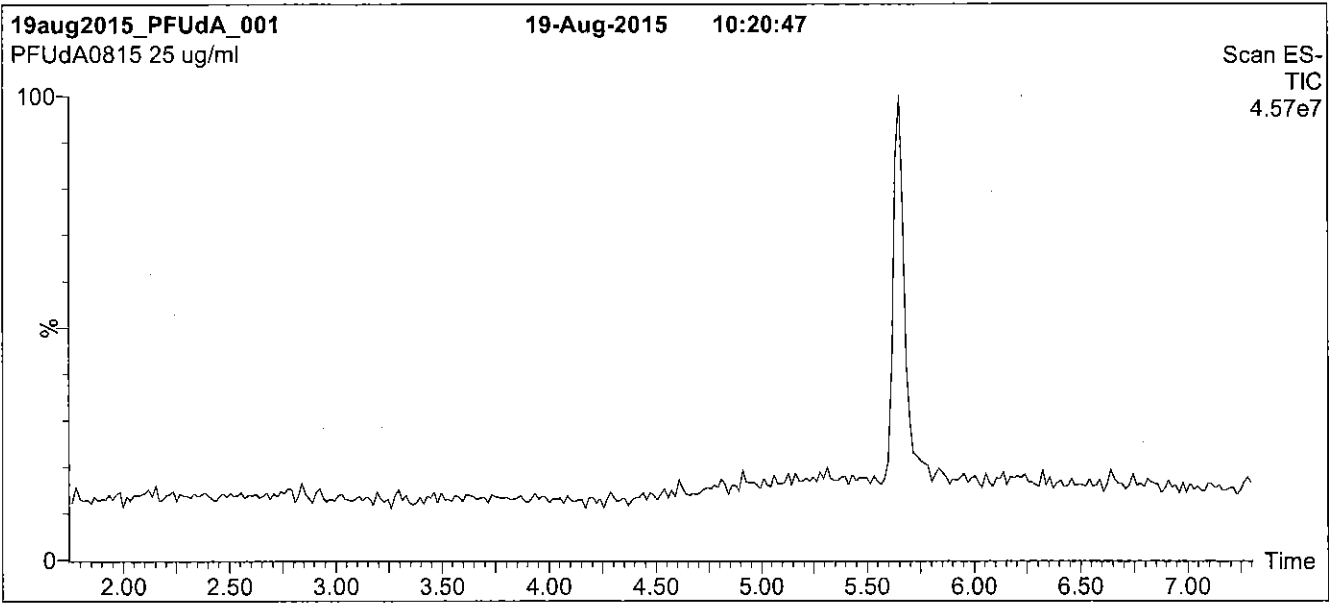
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

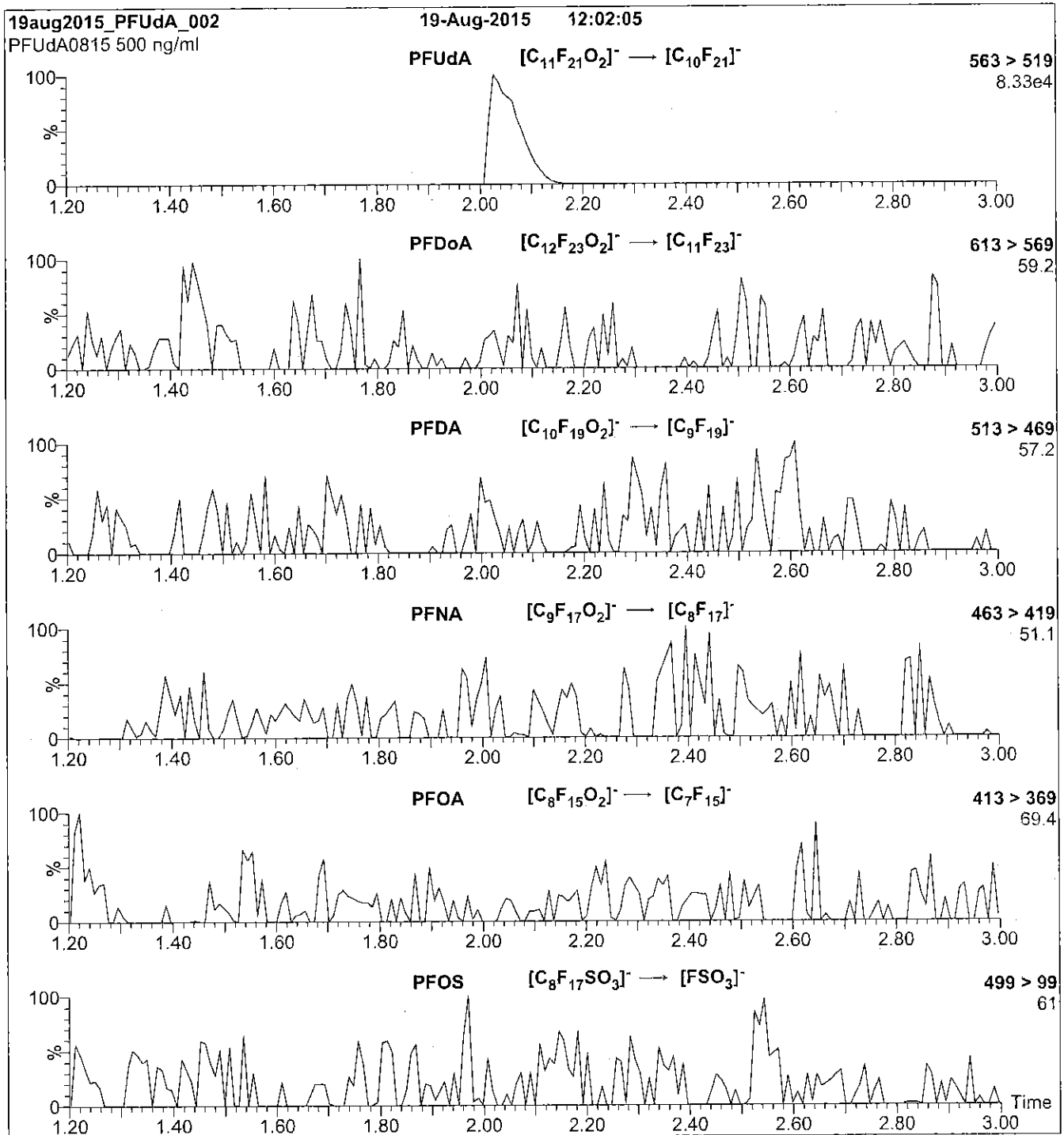
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
 10 μ l (500 ng/ml PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
 Collision Energy (eV) = 11

Method PFC DOD

Perfluronated Hydrocarbons (LC/MS)
by Method PFC_DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

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 #
FB051716	320-18986-1	121	118	123	131	135	121
EB051716	320-18986-2	119	134	124	129	139	126
MCFSMW-14_0516	320-18986-3	93	90	126	83	127	81
46MW03_0516	320-18986-4	95	93	129	96	131	88
46MW01_0516	320-18986-5	101	101	135	103	139	88
46MW02_0516	320-18986-6	86	87	121	91	106	69
46MW05_0516	320-18986-7	86	77	86	78	58	54
46MW05_0516 DL	320-18986-7 DL	90	91	118	100	114	87
46MW04_0516	320-18986-8	106	92	88	106	61	57
46MW04_0516 DL	320-18986-8 DL	104	101	113	110	94	81
MCFSMW-17_0516	320-18986-9	98	93	119	83	114	61
FB051616	320-18986-10	115	125	131	126	128	122
EB051616	320-18986-11	118	124	128	127	134	119
MCFSMW-4_0516	320-18986-12	80	85	93	89	101	91
MCFSMW-5_0516	320-18986-13	86	81	120	79	107	52
MCFSMW-5_0516 DUP	320-18986-14	87	83	112	86	103	62
MCFSMW-3_0516	320-18986-15	92	88	79	98	91	75
MCFSMW-3_0516 DL	320-18986-15 DL	115	103	101	117	115	100
MCFSMW-16_0516	320-18986-16	131	130	156 Q	109	132	75
MCFSMW-16_0516 DL	320-18986-16 DL	97	91	118	84	111	62
	MB 320-110850/1-A	130	130	131	134	131	132
	LCS 320-110850/2-A	122	126	135	125	129	124
MCFSMW-4_0516 MS	320-18986-12 MS	80	86	113	87	109	85
MCFSMW-4_0516 MSD	320-18986-12 MSD	78	88	110	87	119	92

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 III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 28MAY2016A6A_049.d
 Lab ID: LCS 320-110850/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
13C2 PFHxA	100	122	122	25-150	
13C4 PFOA	100	125	125	25-150	
13C4 PFOS	95.6	123	129	25-150	
13C4-PFHpA	100	126	126	25-150	
13C5 PFNA	100	124	124	25-150	
18O2 PFHxS	94.6	128	135	25-150	
Perfluorobutanesulfonic acid (PFBS)	35.4	27.7	78	50-150	
Perfluoroheptanoic acid (PFHpA)	40.0	30.5	76	60-140	
Perfluorohexanesulfonic acid (PFHxS)	36.4	24.6	67	60-140	
Perfluorononanoic acid (PFNA)	40.0	30.9	77	60-140	
Perfluorooctanesulfonic acid (PFOS)	37.1	24.3	65	60-140	
Perfluorooctanoic acid (PFOA)	40.0	33.0	83	60-140	

Column to be used to flag recovery and RPD values

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-18986-1

SDG No.: _____

Matrix: Water Level: Low

Lab File ID: 28MAY2016A6A_068.d

Lab ID: 320-18986-12 MS

Client ID: MCFSMW-4_0516 MS

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC	QC LIMITS REC	#
13C2 PFHxA	95.5	73	76.3	80	25-150	
13C4 PFOA	95.5	81	82.7	87	25-150	
13C4 PFOS	91.3	88	99.7	109	25-150	
13C4-PFHpA	95.5	78	81.9	86	25-150	
13C5 PFNA	95.5	83	80.8	85	25-150	
18O2 PFHxS	90.3	80	102	113	25-150	
Perfluorobutanesulfonic acid (PFBS)	33.8	21	47.5	78	50-150	
Perfluoroheptanoic acid (PFHpA)	38.2	77	105	74	60-140	
Perfluorohexanesulfonic acid (PFHxS)	34.7	220	253	91	60-140	M
Perfluorononanoic acid (PFNA)	38.2	11	41.8	81	60-140	
Perfluorooctanesulfonic acid (PFOS)	35.4	67	96.6	84	60-140	M
Perfluorooctanoic acid (PFOA)	38.2	160	195	92	60-140	M

Column to be used to flag recovery and RPD values

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 28MAY2016A6A_069.d
 Lab ID: 320-18986-12 MSD Client ID: MCFSMW-4_0516 MSD

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
13C2 PFHxA	91.0	71.3	78			25-150	
13C4 PFOA	91.0	79.5	87			25-150	
13C4 PFOS	87.0	104	119			25-150	
13C4-PFHpA	91.0	79.8	88			25-150	
13C5 PFNA	91.0	84.1	92			25-150	
18O2 PFHxS	86.1	95.0	110			25-150	
Perfluorobutanesulfonic acid (PFBS)	32.2	45.9	77	3	30	50-150	
Perfluoroheptanoic acid (PFHpA)	36.4	105	78	0	30	60-140	
Perfluorohexanesulfonic acid (PFHxS)	33.1	248	81	2	30	60-140	M
Perfluorononanoic acid (PFNA)	36.4	40.2	80	4	30	60-140	
Perfluorooctanesulfonic acid (PFOS)	33.8	101	99	4	30	60-140	M
Perfluorooctanoic acid (PFOA)	36.4	185	70	5	30	60-140	M

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Lab File ID: 31MAY2016A6A_049.d Lab Sample ID: MB 320-110850/1-A
 Matrix: Water Date Extracted: 05/21/2016 11:40
 Instrument ID: A6 Date Analyzed: 06/01/2016 05:17
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-110850/2-A	28MAY2016A6 A 049.d	05/29/2016 08:48
FB051716	320-18986-1	28MAY2016A6 A 050.d	05/29/2016 09:10
EB051716	320-18986-2	28MAY2016A6 A 051.d	05/29/2016 09:31
MCFSMW-14_0516	320-18986-3	28MAY2016A6 A 055.d	05/29/2016 10:56
46MW03_0516	320-18986-4	28MAY2016A6 A 056.d	05/29/2016 11:17
46MW01_0516	320-18986-5	28MAY2016A6 A 057.d	05/29/2016 11:39
46MW02_0516	320-18986-6	28MAY2016A6 A 058.d	05/29/2016 12:00
46MW05_0516	320-18986-7	28MAY2016A6 A 059.d	05/29/2016 12:21
46MW04_0516	320-18986-8	28MAY2016A6 A 060.d	05/29/2016 12:42
FB051616	320-18986-10	28MAY2016A6 A 062.d	05/29/2016 13:25
EB051616	320-18986-11	28MAY2016A6 A 063.d	05/29/2016 13:46
MCFSMW-4_0516 MS	320-18986-12 MS	28MAY2016A6 A 068.d	05/29/2016 15:33
MCFSMW-4_0516 MSD	320-18986-12 MSD	28MAY2016A6 A 069.d	05/29/2016 15:54
MCFSMW-3_0516	320-18986-15	28MAY2016A6 A 072.d	05/29/2016 16:58
MCFSMW-16_0516	320-18986-16	28MAY2016A6 A 073.d	05/29/2016 17:19
46MW05_0516 DL	320-18986-7 DL	31MAY2016A6 A 067.d	06/01/2016 11:43
46MW04_0516 DL	320-18986-8 DL	31MAY2016A6 A 068.d	06/01/2016 12:05
MCFSMW-3_0516 DL	320-18986-15 DL	31MAY2016A6 A 140.d	06/02/2016 13:55
MCFSMW-16_0516 DL	320-18986-16 DL	31MAY2016A6 A 141.d	06/02/2016 14:16
MCFSMW-17_0516	320-18986-9	31MAY2016A6 A 145.d	06/02/2016 15:41
MCFSMW-4_0516	320-18986-12	31MAY2016A6 A 146.d	06/02/2016 16:03
MCFSMW-5_0516	320-18986-13	31MAY2016A6 A 147.d	06/02/2016 16:24

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
SDG No.: _____
Lab File ID: 31MAY2016A6A_049.d Lab Sample ID: MB 320-110850/1-A
Matrix: Water Date Extracted: 05/21/2016 11:40
Instrument ID: A6 Date Analyzed: 06/01/2016 05:17
Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
MCFSMW-5_0516 DUP	320-18986-14	31MAY2016A6 A 148.d	06/02/2016 17:07

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: FB051716 Lab Sample ID: 320-18986-1
 Matrix: Water Lab File ID: 28MAY2016A6A_050.d
 Analysis Method: WS-LC-0025 Date Collected: 05/17/2016 08:05
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 533 (mL) Date Analyzed: 05/29/2016 09:10
 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.: 111859 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	0.82
375-95-1	Perfluorononanoic acid (PFNA)	1.9	U M	2.3	1.9	0.61
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.8	U M	3.8	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	121		25-150
STL00990	13C4 PFOA	131		25-150
STL00991	13C4 PFOS	135		25-150
STL01892	13C4-PFHpA	118		25-150
STL00995	13C5 PFNA	121		25-150
STL00994	18O2 PFHxS	123		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_050.d
 Lims ID: 320-18986-A-1-A
 Client ID: FB051716
 Sample Type: Client
 Inject. Date: 29-May-2016 09:10:10 ALS Bottle#: 27 Worklist Smp#: 49
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-1-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 17:18:54 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj Date: 31-May-2016 17:17:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.088	7.085	0.003	1.000	2451	0.0554			
D 6 13C2 PFHxA	315.0 > 270.0	8.236	8.236	0.0		3544476	60.7	121	22585	
D 8 13C4-PFHpA	367.0 > 322.0	9.475	9.474	0.001		3670366	59.2	118	71719	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.475	9.475	0.0	1.000	8243	-0.3630		79.0	
D 11 18O2 PFHxS	403.0 > 84.0	9.511	9.507	0.004		1659491	58.1	123	3612	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.505	9.507	-0.002	1.000	3398	0.1059			
D 12 13C4 PFOA	417.0 > 372.0	10.577	10.586	-0.009		4403355	65.4	131	73023	
13 Perfluorooctanoic acid	413.0 > 369.0	10.577	10.587	-0.010	1.000	8757	0.0978		4.1	
D 16 13C4 PFOS	503.0 > 80.0	11.543	11.543	0.0		2270818	64.6	135	13569	
15 Perfluorooctane sulfonic acid	499.0 > 80.0	11.543	11.545	-0.002	1.000	33316	0.5586		1727	M
	499.0 > 99.0	11.552	11.545	0.007	1.001	18997	1.75(0.00-0.00)		919	M
D 17 13C5 PFNA	468.0 > 423.0	11.561	11.562	-0.001		3762797	60.7	121	269528	
18 Perfluorononanoic acid	463.0 > 419.0	11.553	11.563	-0.010	1.000	1070	0.0168		54.3	M

QC Flag Legend

Review Flags

M - Manually Integrated

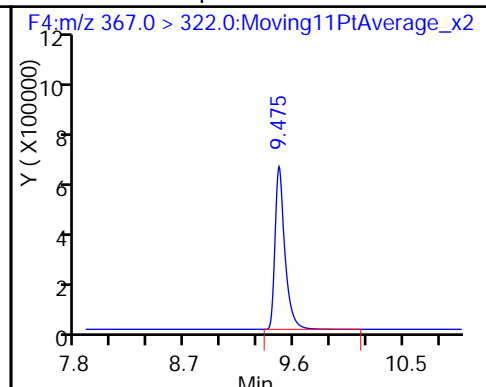
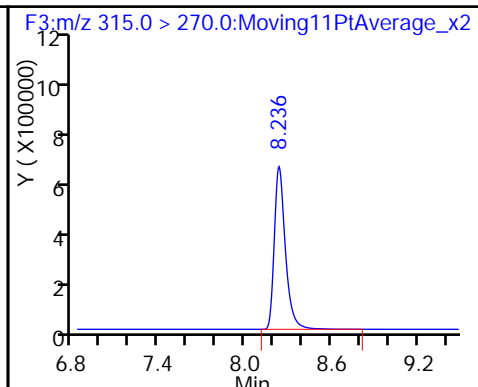
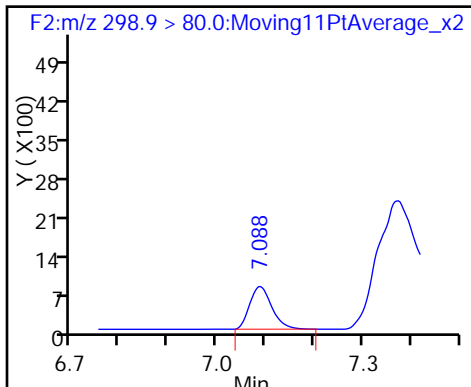
TestAmerica Sacramento

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Injection Date: 29-May-2016 09:10:10 Instrument ID: A6
Lims ID: 320-18986-A-1-A Lab Sample ID: 320-18986-1
Client ID: FB051716
Operator ID: JRB ALS Bottle#: 27 Worklist Smp#: 49
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxA

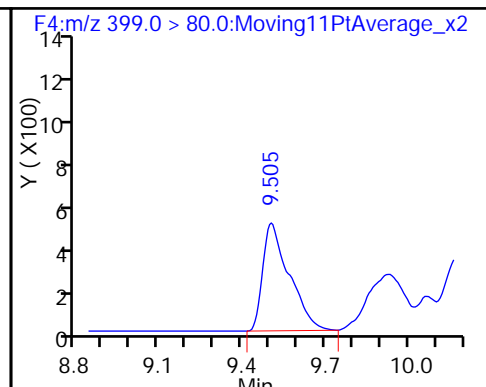
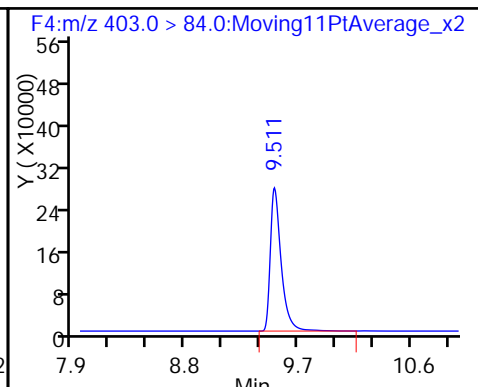
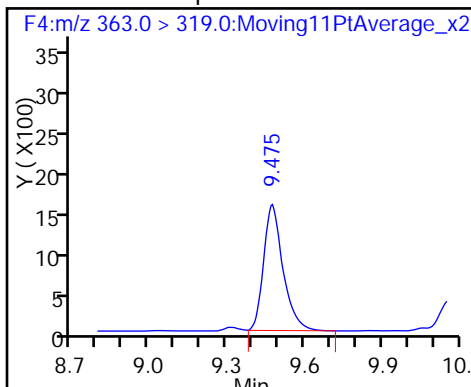
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid

D 11 18O2 PFHxS

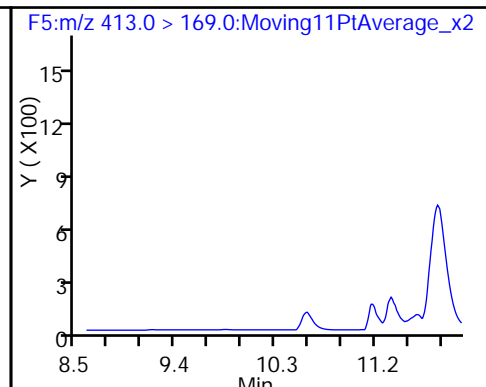
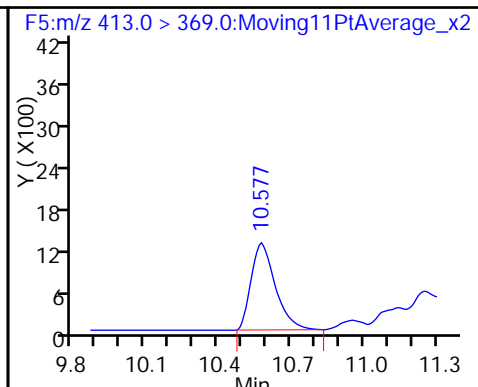
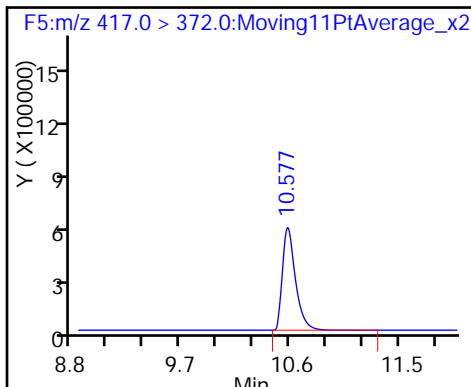
41 Perfluorohexanesulfonic acid



D 12 13C4 PFOA

13 Perfluorooctanoic acid

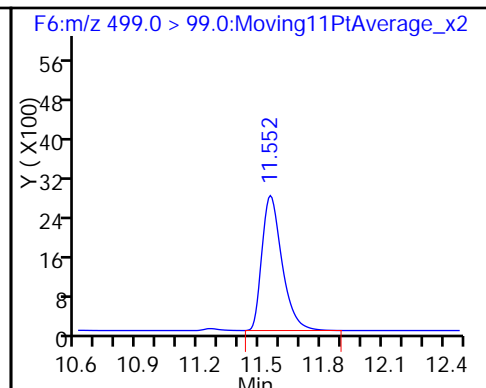
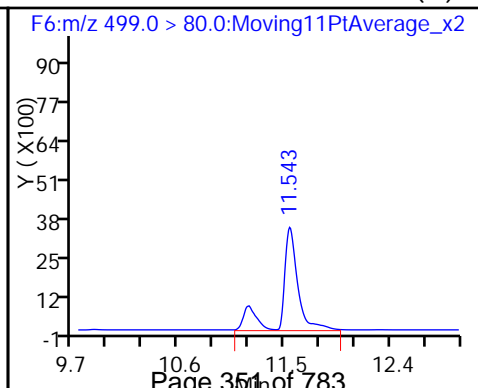
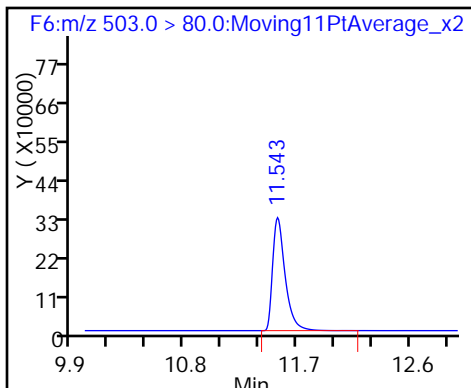
13 Perfluorooctanoic acid



D 16 13C4 PFOS

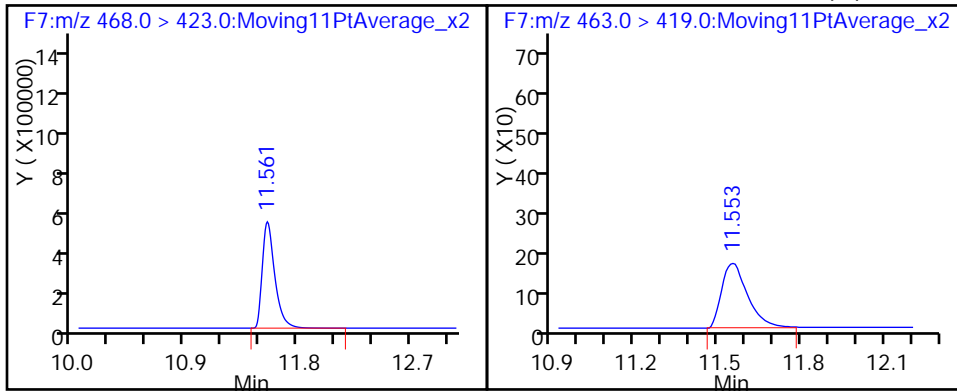
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid



D 17 13C5 PFNA

18 Perfluorononanoic acid (M)



TestAmerica Sacramento

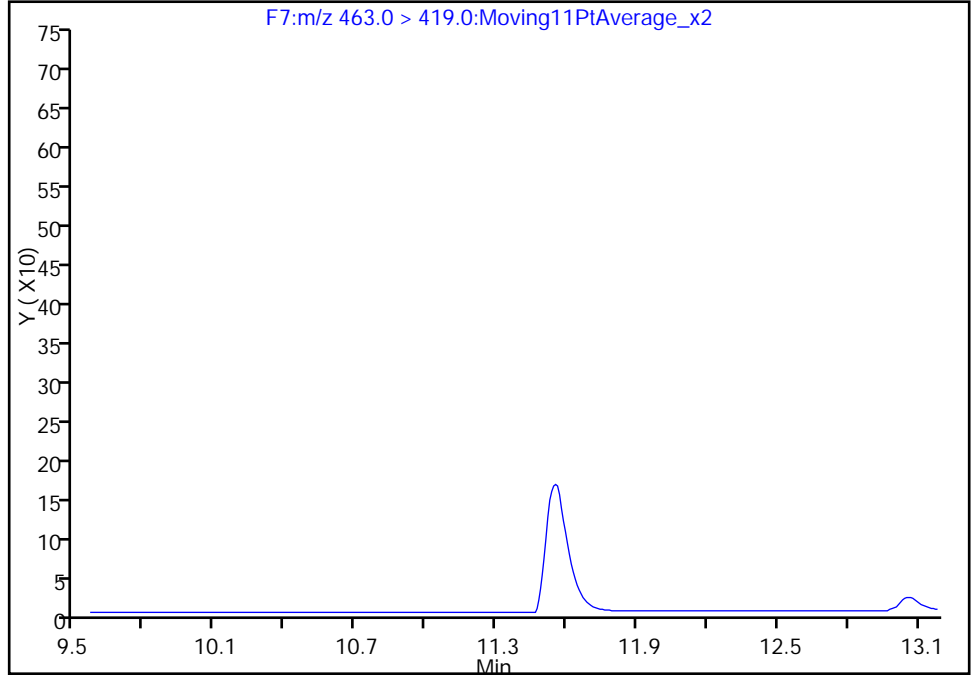
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Injection Date: 29-May-2016 09:10:10 Instrument ID: A6
Lims ID: 320-18986-A-1-A Lab Sample ID: 320-18986-1
Client ID: FB051716
Operator ID: JRB ALS Bottle#: 27 Worklist Smp#: 49
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F7:MRM

18 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

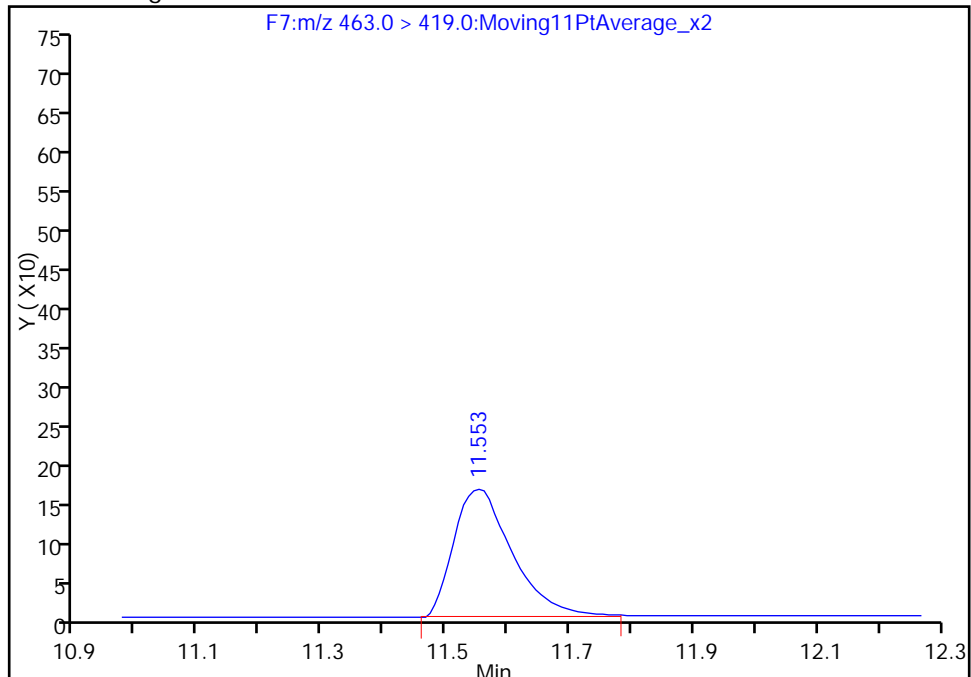
Not Detected
Expected RT: 11.56

Processing Integration Results



RT: 11.55
Area: 1070
Amount: 0.016841
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:17:45
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

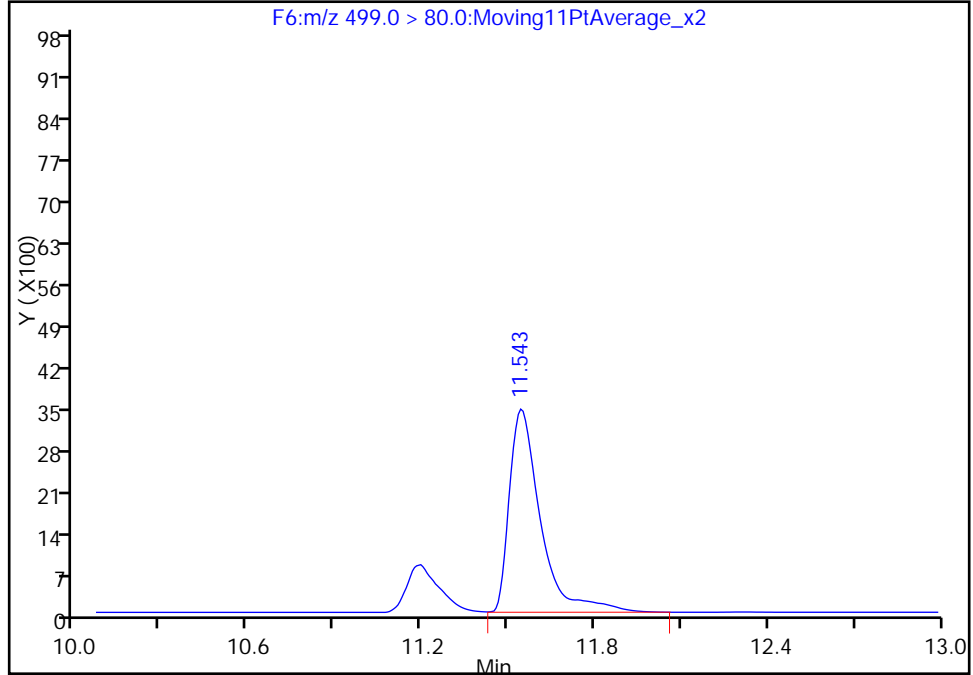
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Injection Date: 29-May-2016 09:10:10 Instrument ID: A6
Lims ID: 320-18986-A-1-A Lab Sample ID: 320-18986-1
Client ID: FB051716
Operator ID: JRB ALS Bottle#: 27 Worklist Smp#: 49
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

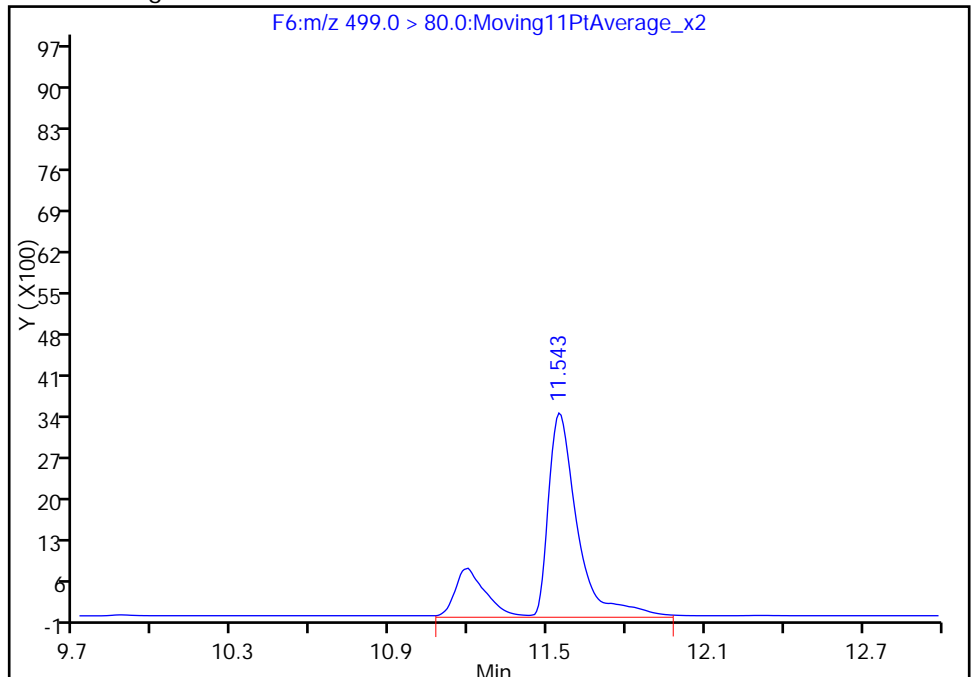
RT: 11.54
Area: 25747
Amount: 0.431708
Amount Units: ng/ml

Processing Integration Results



RT: 11.54
Area: 33316
Amount: 0.558620
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:17:45
Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: EB051716 Lab Sample ID: 320-18986-2
 Matrix: Water Lab File ID: 28MAY2016A6A_051.d
 Analysis Method: WS-LC-0025 Date Collected: 05/17/2016 08:10
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 517.2 (mL) Date Analyzed: 05/29/2016 09:31
 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.: 111859 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	1.9	0.89
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	U M	2.4	1.9	0.78
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	1.9	0.84
375-95-1	Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.63
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.9	U M	3.9	2.9	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	1.9	U	2.4	1.9	0.72

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	119		25-150
STL00990	13C4 PFOA	129		25-150
STL00991	13C4 PFOS	139		25-150
STL01892	13C4-PFHpA	134		25-150
STL00995	13C5 PFNA	126		25-150
STL00994	18O2 PFHxS	124		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_051.d
 Lims ID: 320-18986-A-2-A
 Client ID: EB051716
 Sample Type: Client
 Inject. Date: 29-May-2016 09:31:27 ALS Bottle#: 28 Worklist Smp#: 50
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-2-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 17:18:54 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj Date: 31-May-2016 17:18:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 6 13C2 PFHxA	315.0 > 270.0	8.230	8.236	-0.006	3476037	59.6		119	8152	
D 8 13C4-PFHpA	367.0 > 322.0	9.469	9.474	-0.005	4148467	66.9		134	245689	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.469	9.475	-0.006	918	-0.4479			26.6	M
D 11 18O2 PFHxS	403.0 > 84.0	9.504	9.507	-0.003	1678960	58.8		124	10773	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.510	9.507	0.003	3049	0.0939				
D 12 13C4 PFOA	417.0 > 372.0	10.586	10.586	0.0	4345891	64.5		129	288408	
13 Perfluorooctanoic acid	413.0 > 369.0	10.586	10.587	-0.001	2733	0.0309			0.8	
	413.0 > 169.0	10.586	10.587	-0.001	3843		0.71(0.00-0.00)		9.7	
D 16 13C4 PFOS	503.0 > 80.0	11.543	11.543	0.0	2327627	66.2		139	67798	
15 Perfluorooctane sulfonic acid	499.0 > 80.0	11.543	11.545	-0.002	12698	0.2077			771	M
	499.0 > 99.0	11.543	11.545	-0.002	3841		3.31(0.00-0.00)		304	
D 17 13C5 PFNA	468.0 > 423.0	11.561	11.562	-0.001	3911506	63.1		126	18867	

QC Flag Legend

Review Flags

M - Manually Integrated

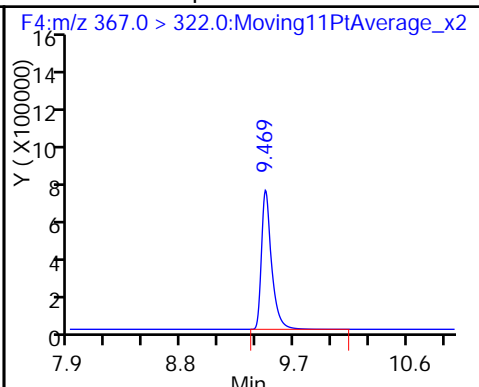
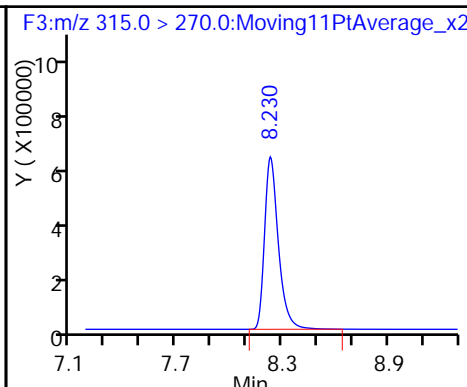
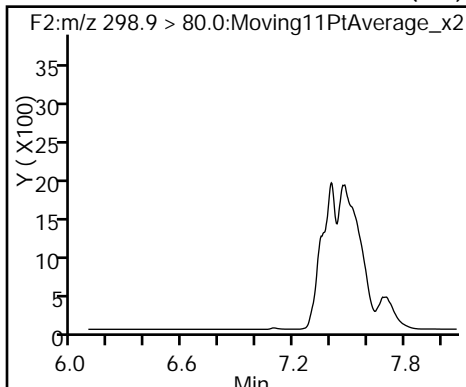
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_051.d
Injection Date: 29-May-2016 09:31:27 Instrument ID: A6
Lims ID: 320-18986-A-2-A Lab Sample ID: 320-18986-2
Client ID: EB051716
Operator ID: JRB ALS Bottle#: 28 Worklist Smp#: 50
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid (ND)

D 6 13C2 PFHxA

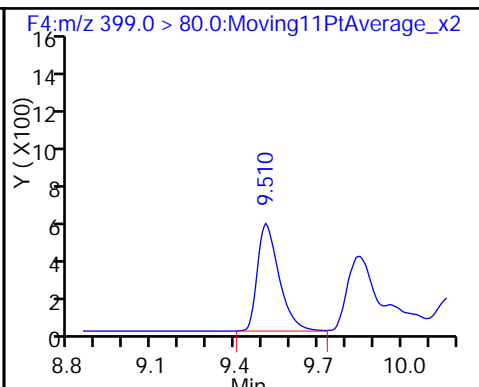
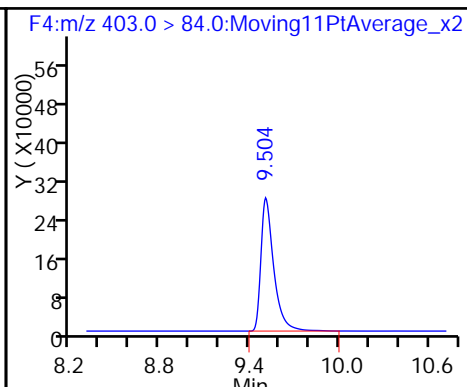
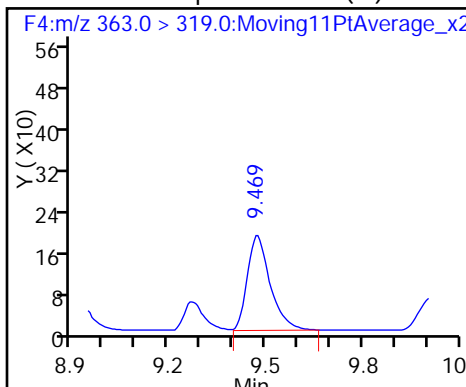
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid (M)

D 11 18O2 PFHxS

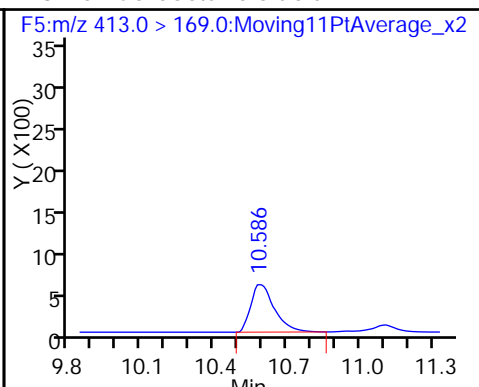
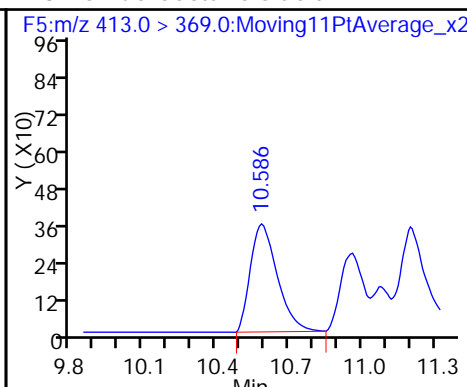
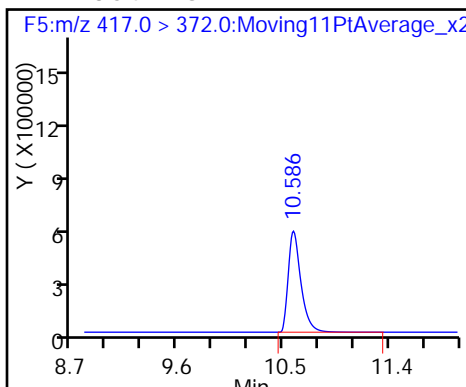
41 Perfluorohexanesulfonic acid



D 12 13C4 PFOA

13 Perfluorooctanoic acid

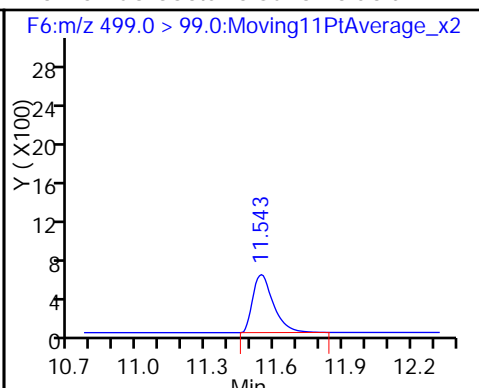
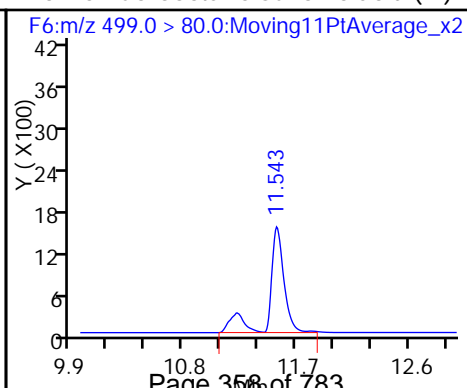
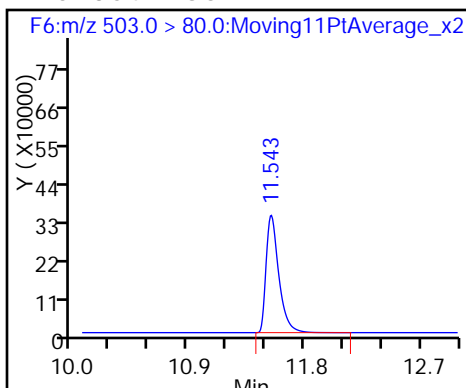
13 Perfluorooctanoic acid



D 16 13C4 PFOS

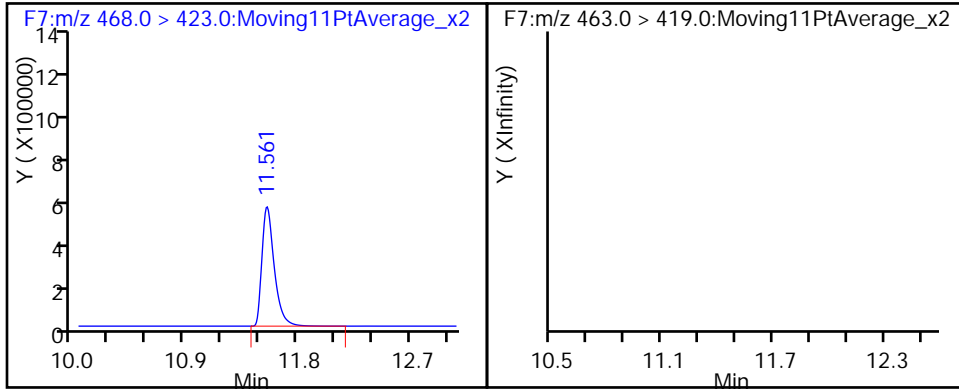
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid



D 17 13C5 PFNA

18 Perfluorononanoic acid (ND)



TestAmerica Sacramento

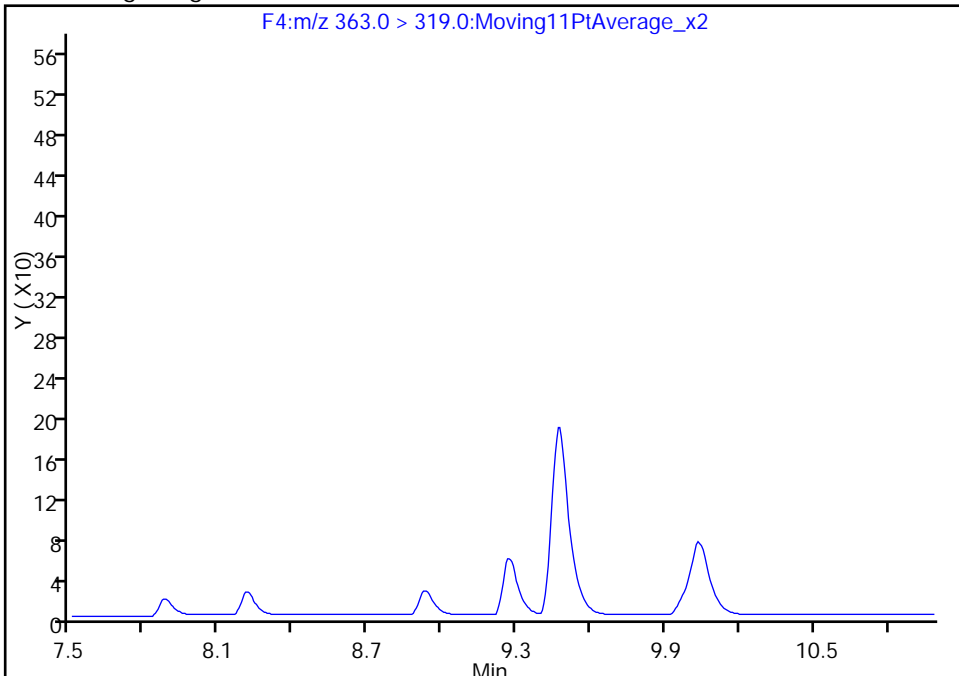
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Injection Date: 29-May-2016 09:31:27 Instrument ID: A6
Lims ID: 320-18986-A-2-A Lab Sample ID: 320-18986-2
Client ID: EB051716
Operator ID: JRB ALS Bottle#: 28 Worklist Smp#: 50
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

9 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

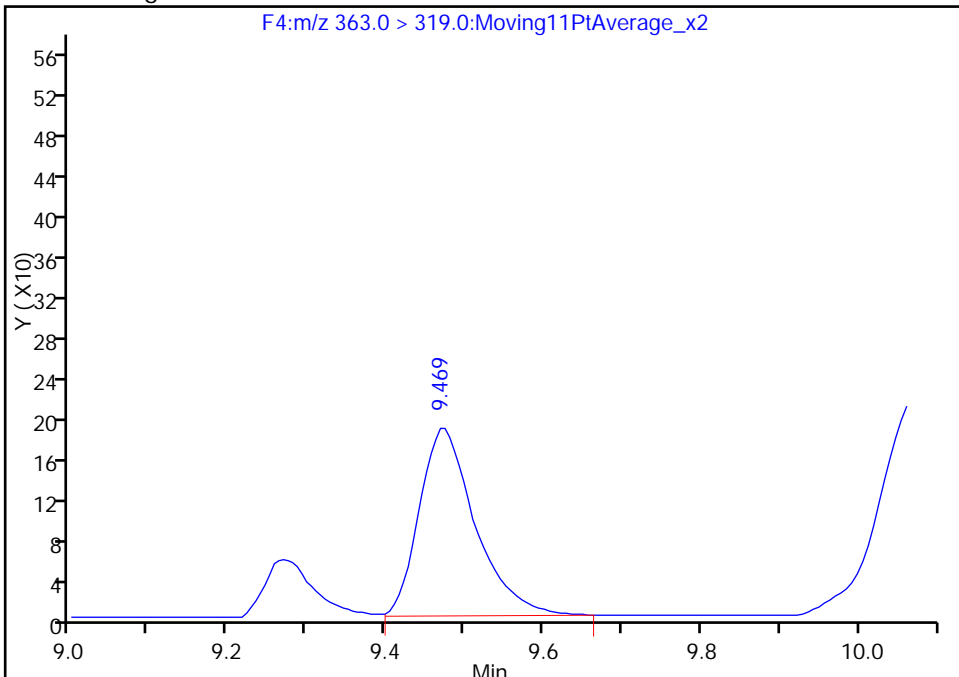
Not Detected
Expected RT: 9.47

Processing Integration Results



Manual Integration Results

RT: 9.47
Area: 918
Amount: -0.447944
Amount Units: ng/ml



Reviewer: barnettj, 31-May-2016 17:18:54
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

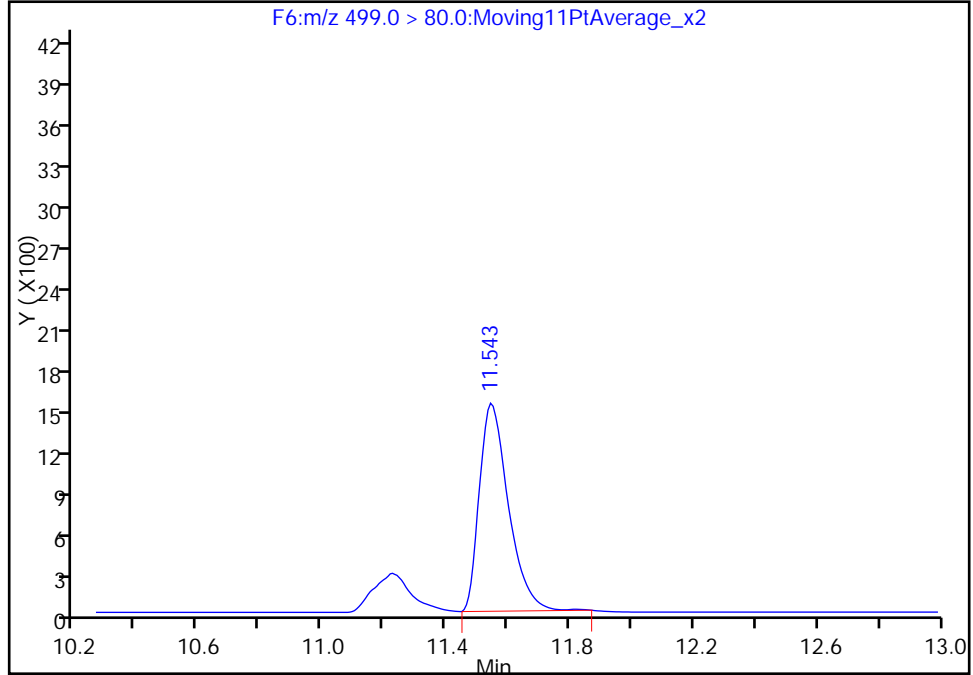
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Injection Date: 29-May-2016 09:31:27 Instrument ID: A6
Lims ID: 320-18986-A-2-A Lab Sample ID: 320-18986-2
Client ID: EB051716
Operator ID: JRB ALS Bottle#: 28 Worklist Smp#: 50
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

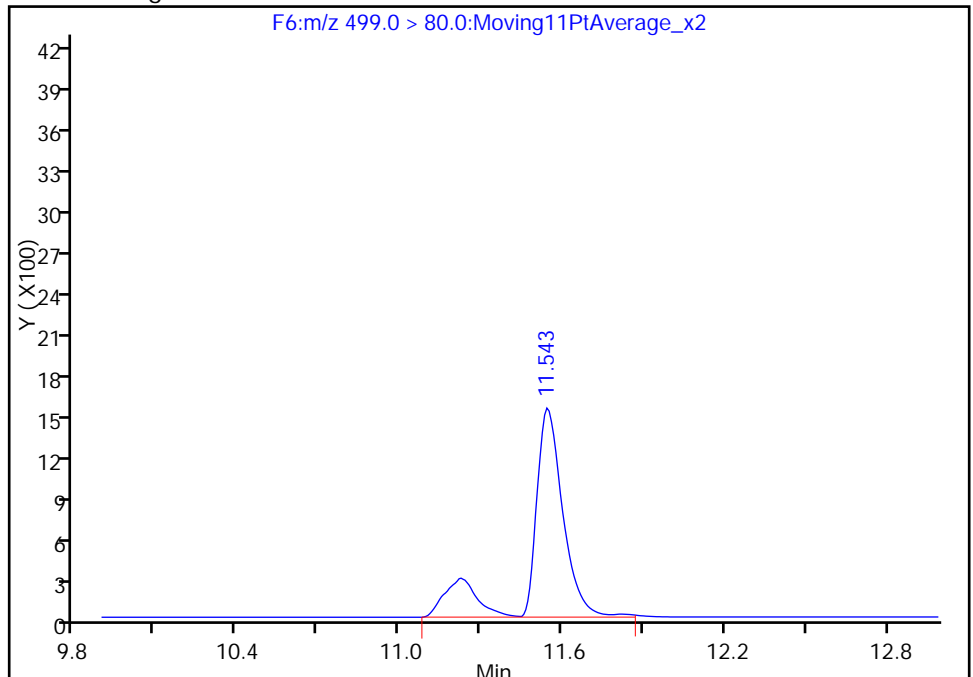
RT: 11.54
Area: 10008
Amount: 0.163712
Amount Units: ng/ml

Processing Integration Results



RT: 11.54
Area: 12698
Amount: 0.207715
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:18:54
Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: MCFSMW-14_0516 Lab Sample ID: 320-18986-3
 Matrix: Water Lab File ID: 28MAY2016A6A_055.d
 Analysis Method: WS-LC-0025 Date Collected: 05/17/2016 09:11
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 535.6(mL) Date Analyzed: 05/29/2016 10:56
 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.: 111859 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)	0.94	J M	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 M	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	93		25-150
STL00990	13C4 PFOA	83		25-150
STL00991	13C4 PFOS	127		25-150
STL01892	13C4-PFHpA	90		25-150
STL00995	13C5 PFNA	81		25-150
STL00994	18O2 PFHxS	126		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_055.d
 Lims ID: 320-18986-A-3-A
 Client ID: MCFSMW-14_0516
 Sample Type: Client
 Inject. Date: 29-May-2016 10:56:34 ALS Bottle#: 29 Worklist Smp#: 54
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-3-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 17:46:27 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj Date: 31-May-2016 17:19:15

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 6 13C2 PFHxA	315.0 > 270.0	8.230	8.236	-0.006	2725296	46.7		93.4	86054	
D 8 13C4-PFHpA	367.0 > 322.0	9.470	9.474	-0.004	2778270	44.8		89.6	33180	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.481	9.475	0.006	2945	-0.4127			4.1	
D 11 18O2 PFHxS	403.0 > 84.0	9.505	9.507	-0.002	1705796	59.7		126	12566	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.510	9.507	0.003	16671	0.5054				M
D 12 13C4 PFOA	417.0 > 372.0	10.586	10.586	0.0	2799681	41.6		83.1	185561	
13 Perfluorooctanoic acid	413.0 > 369.0	10.596	10.587	0.009	4038	0.0709			2.6	
D 16 13C4 PFOS	503.0 > 80.0	11.544	11.543	0.001	2137290	60.8		127	102249	
15 Perfluorooctane sulfonic acid	499.0 > 80.0	11.552	11.545	0.007	24709	0.4402			55.2	M
	499.0 > 99.0	11.544	11.545	-0.001	6852		3.61(0.00-0.00)		37.6	M
D 17 13C5 PFNA	468.0 > 423.0	11.561	11.562	-0.001	2515735	40.6		81.1	27961	

QC Flag Legend

Review Flags

M - Manually Integrated

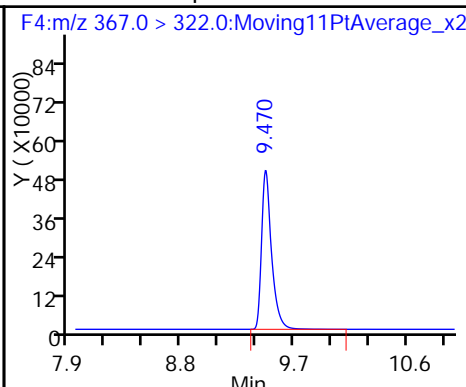
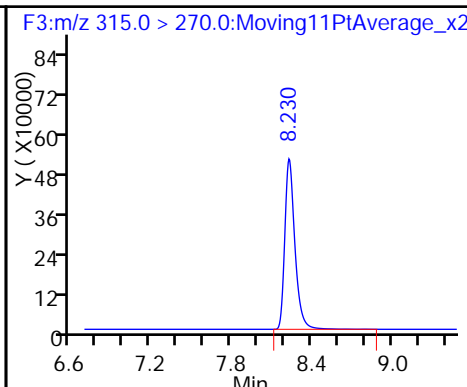
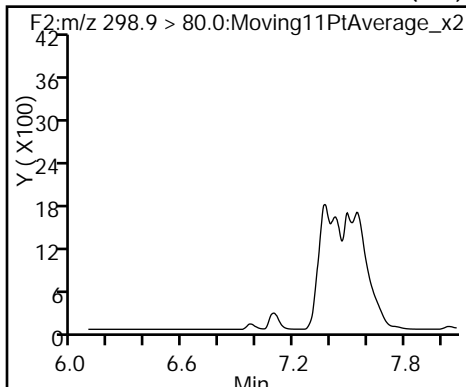
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_055.d
Injection Date: 29-May-2016 10:56:34 Instrument ID: A6
Lims ID: 320-18986-A-3-A Lab Sample ID: 320-18986-3
Client ID: MCFSMW-14_0516
Operator ID: JRB ALS Bottle#: 29 Worklist Smp#: 54
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid (ND)

D 6 13C2 PFHxS

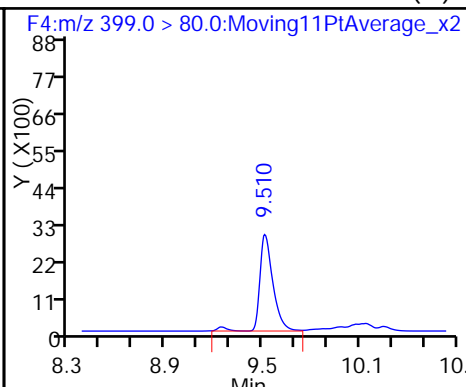
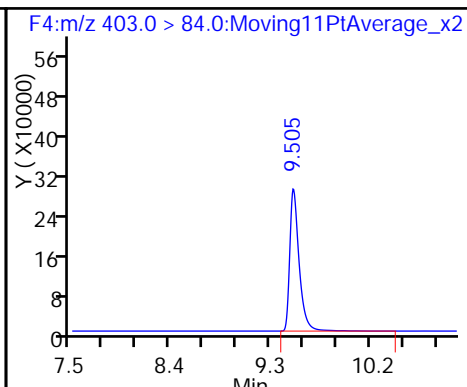
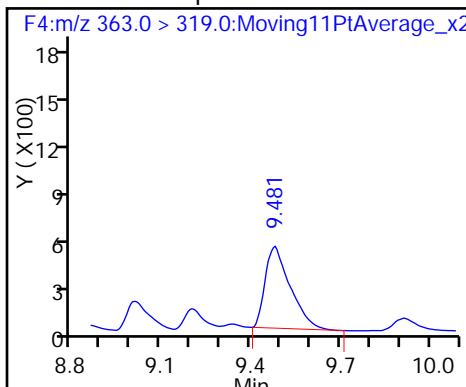
D 8 13C4-PFHpa



9 Perfluoroheptanoic acid

D 11 18O2 PFHxS

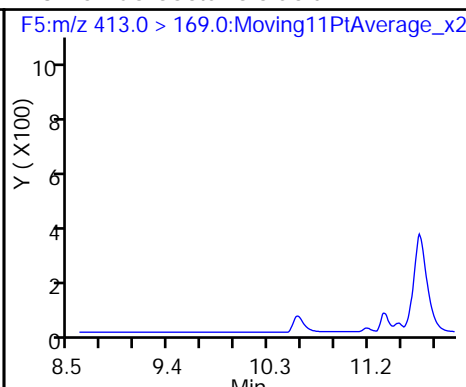
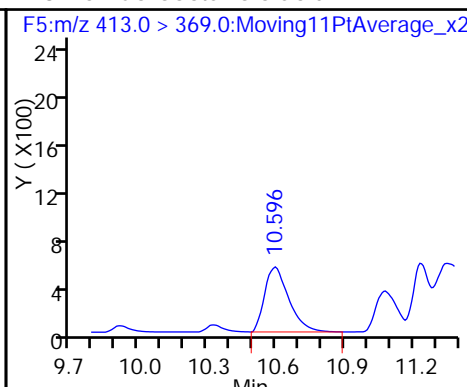
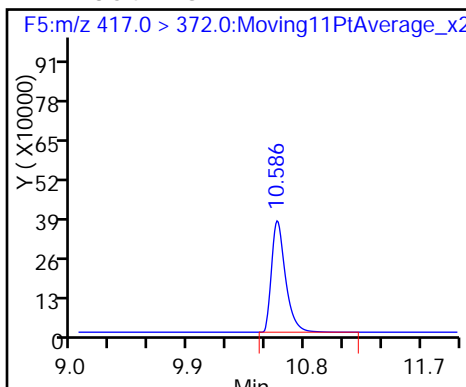
41 Perfluorohexanesulfonic acid (M)



D 12 13C4 PFOA

13 Perfluorooctanoic acid

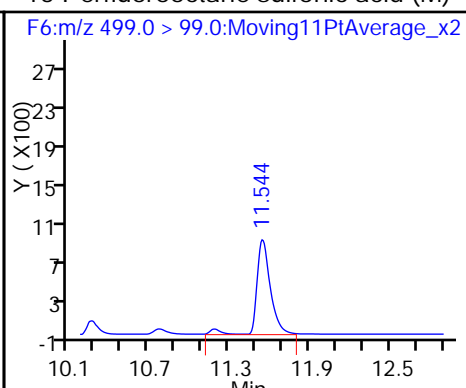
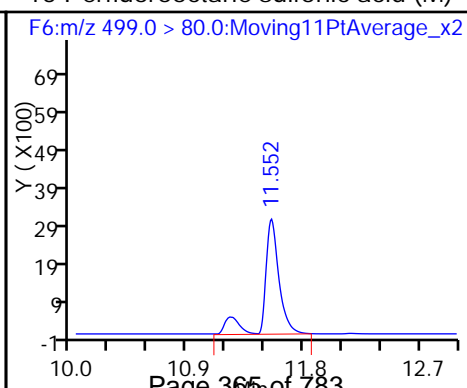
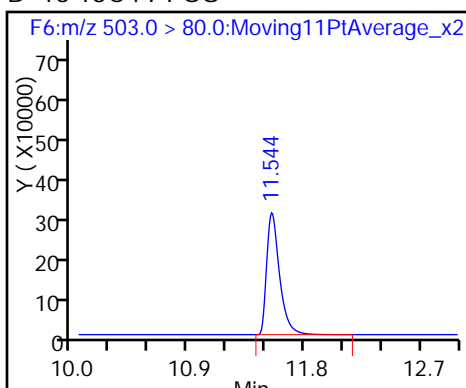
13 Perfluorooctanoic acid



D 16 13C4 PFOS

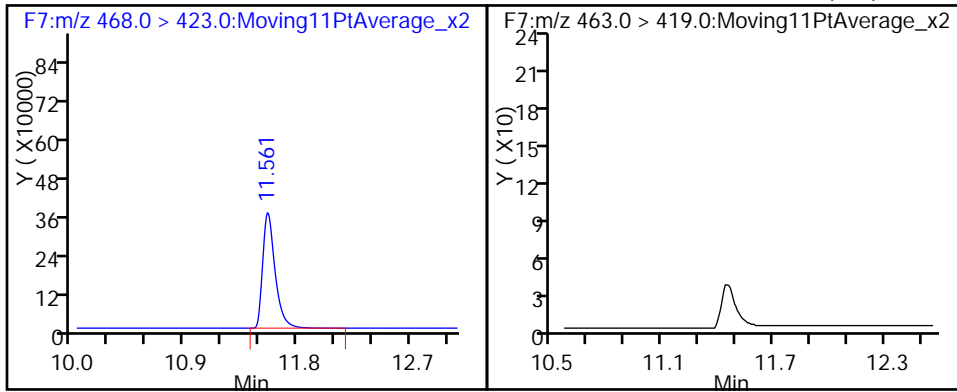
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid (ND)



TestAmerica Sacramento

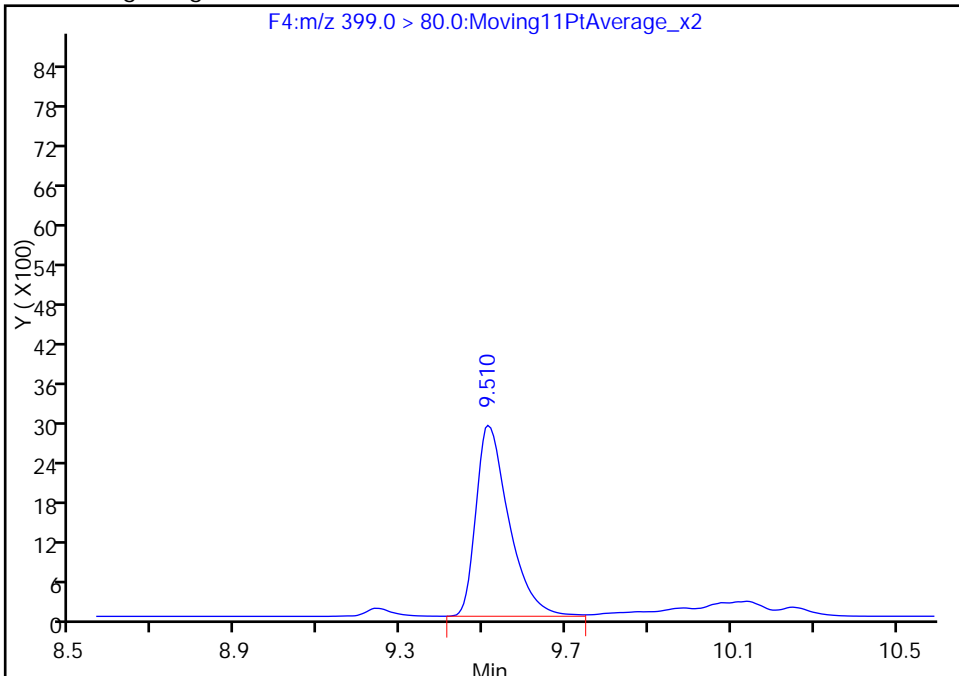
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Injection Date: 29-May-2016 10:56:34 Instrument ID: A6
Lims ID: 320-18986-A-3-A Lab Sample ID: 320-18986-3
Client ID: MCFSMW-14_0516
Operator ID: JRB ALS Bottle#: 29 Worklist Smp#: 54
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

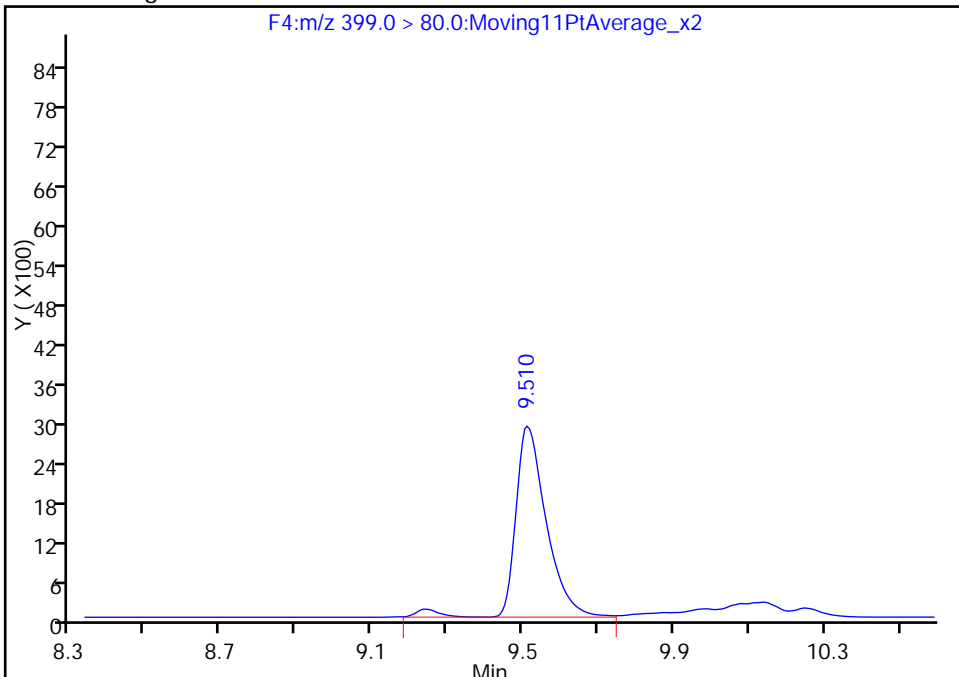
RT: 9.51
Area: 16144
Amount: 0.489445
Amount Units: ng/ml

Processing Integration Results



RT: 9.51
Area: 16671
Amount: 0.505422
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

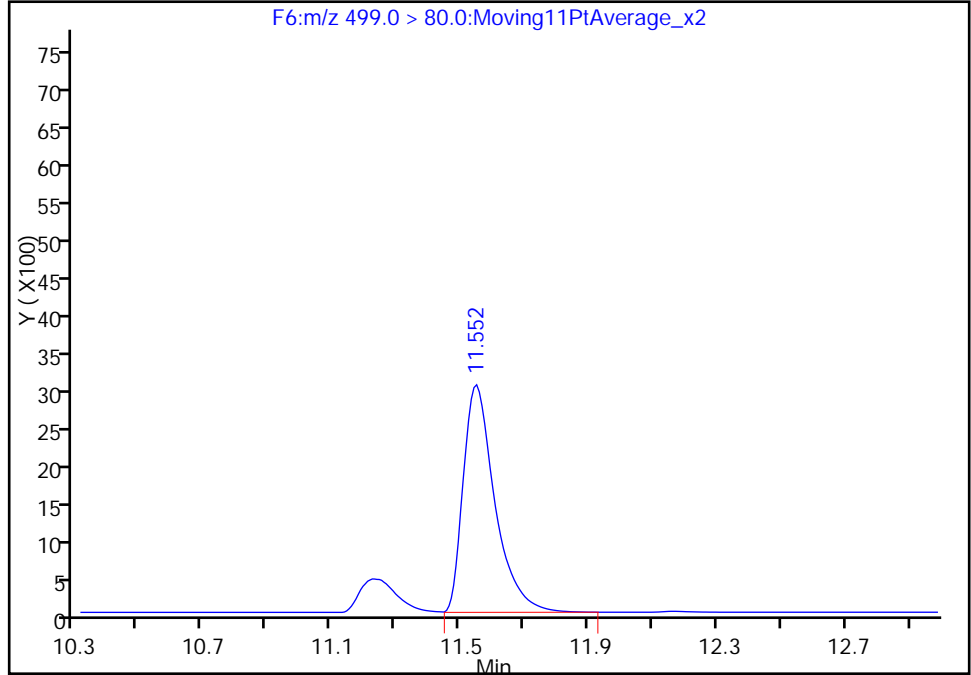
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Injection Date: 29-May-2016 10:56:34 Instrument ID: A6
Lims ID: 320-18986-A-3-A Lab Sample ID: 320-18986-3
Client ID: MCFSMW-14_0516
Operator ID: JRB ALS Bottle#: 29 Worklist Smp#: 54
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

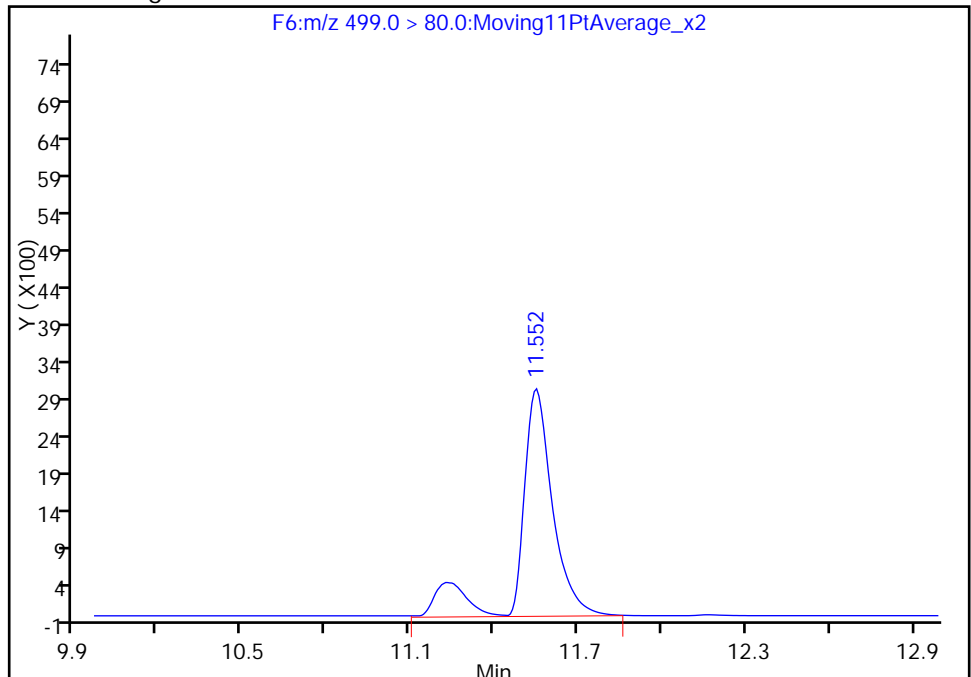
RT: 11.55
Area: 20780
Amount: 0.370193
Amount Units: ng/ml

Processing Integration Results



RT: 11.55
Area: 24709
Amount: 0.440187
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:19:15
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

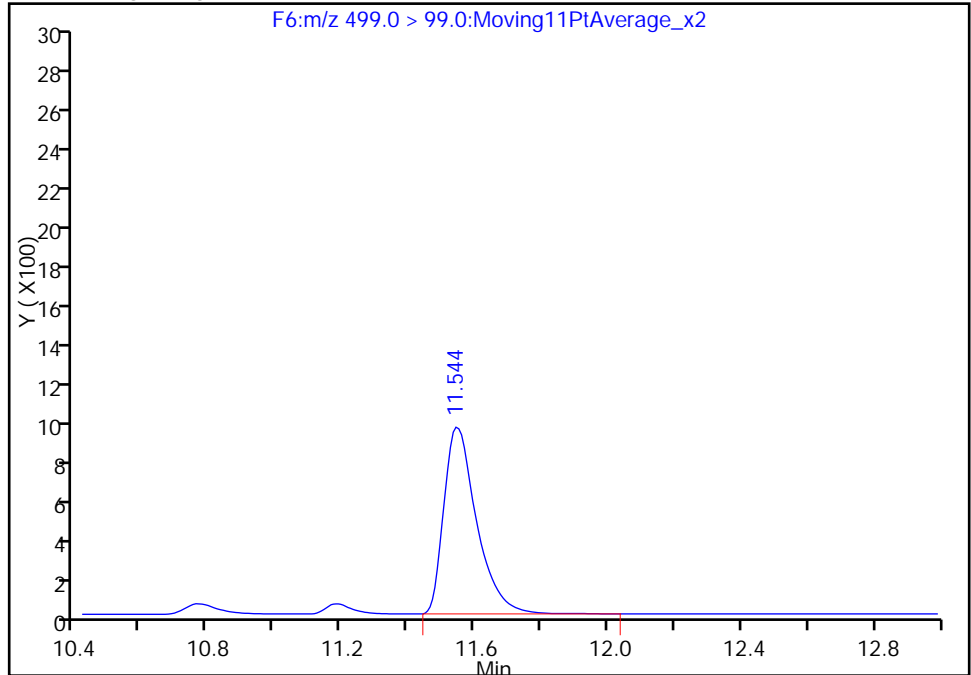
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Injection Date: 29-May-2016 10:56:34 Instrument ID: A6
Lims ID: 320-18986-A-3-A Lab Sample ID: 320-18986-3
Client ID: MCFSMW-14_0516
Operator ID: JRB ALS Bottle#: 29 Worklist Smp#: 54
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

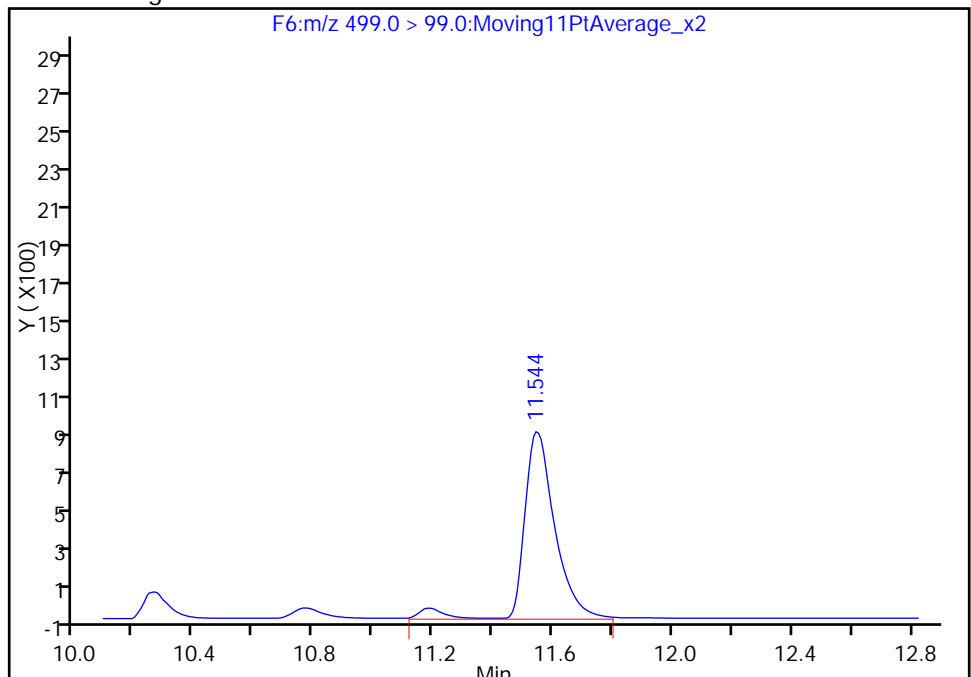
RT: 11.54
Area: 6399
Amount: 0.370193
Amount Units: ng/ml

Processing Integration Results



RT: 11.54
Area: 6852
Amount: 0.440187
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:19:15

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: 46MW03_0516 Lab Sample ID: 320-18986-4
 Matrix: Water Lab File ID: 28MAY2016A6A_056.d
 Analysis Method: WS-LC-0025 Date Collected: 05/17/2016 10:11
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 527.2 (mL) Date Analyzed: 05/29/2016 11:17
 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.: 111859 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	1.9	0.87
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	U	2.4	1.9	0.76
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.1	J M	2.4	1.9	0.83
375-95-1	Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.62
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.1	J M	3.8	2.8	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	1.9	U M	2.4	1.9	0.71

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		25-150
STL00990	13C4 PFOA	96		25-150
STL00991	13C4 PFOS	131		25-150
STL01892	13C4-PFHpA	93		25-150
STL00995	13C5 PFNA	88		25-150
STL00994	18O2 PFHxS	129		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_056.d
 Lims ID: 320-18986-A-4-A
 Client ID: 46MW03_0516
 Sample Type: Client
 Inject. Date: 29-May-2016 11:17:52 ALS Bottle#: 30 Worklist Smp#: 55
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320I18986-a-4-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 17:46:27 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj Date: 31-May-2016 17:36:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 6 13C2 PFHxA	315.0 > 270.0	8.230	8.236	-0.006	2772453	47.5		95.0	24995	
D 8 13C4-PFHpA	367.0 > 322.0	9.475	9.474	0.001	2890256	46.6		93.3	51696	
D 11 18O2 PFHxS	403.0 > 84.0	9.504	9.507	-0.003	1738297	60.9		129	17144	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.504	9.507	-0.003	36688	1.09				M
D 12 13C4 PFOA	417.0 > 372.0	10.586	10.586	0.0	3248300	48.2		96.5	108984	
13 Perfluorooctanoic acid	413.0 > 369.0	10.595	10.587	0.008	4232	0.0641			1.6	M
	413.0 > 169.0	10.577	10.587	-0.010	233		18.16(0.00-0.00)		1.5	M
D 16 13C4 PFOS	503.0 > 80.0	11.543	11.543	0.0	2195141	62.5		131	158570	
15 Perfluorooctane sulfonic acid	499.0 > 80.0	11.262	11.545	-0.283	93142	1.62			2557	M
D 17 13C5 PFNA	468.0 > 423.0	11.561	11.562	-0.001	2715159	43.8		87.5	43715	

QC Flag Legend

Review Flags

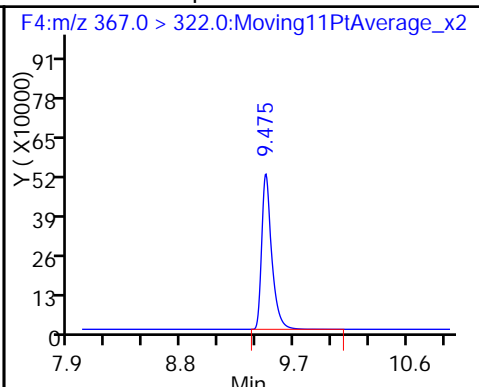
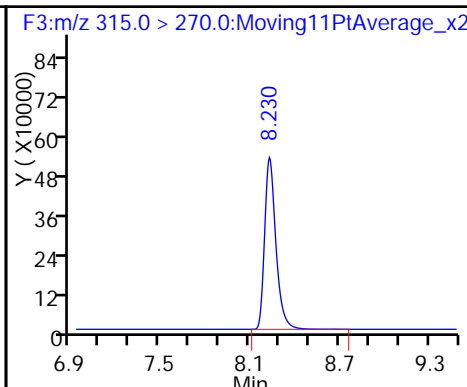
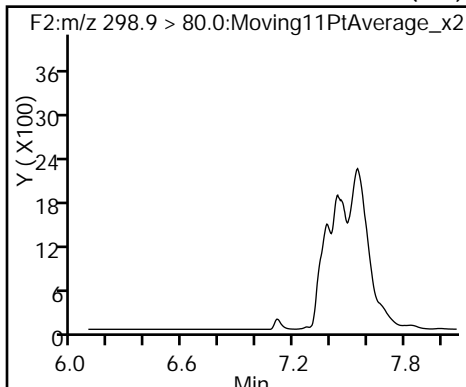
M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_056.d
Injection Date: 29-May-2016 11:17:52 Instrument ID: A6
Lims ID: 320-18986-A-4-A Lab Sample ID: 320-18986-4
Client ID: 46MW03_0516
Operator ID: JRB ALS Bottle#: 30 Worklist Smp#: 55
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid (ND) D 6 13C2 PFHxS

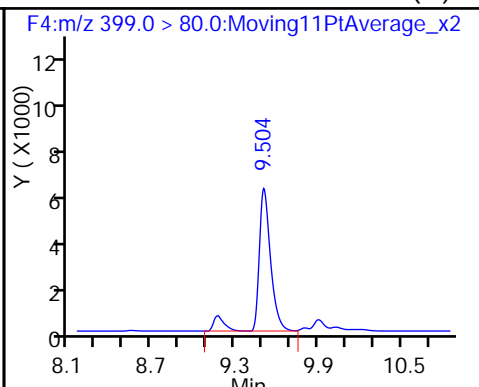
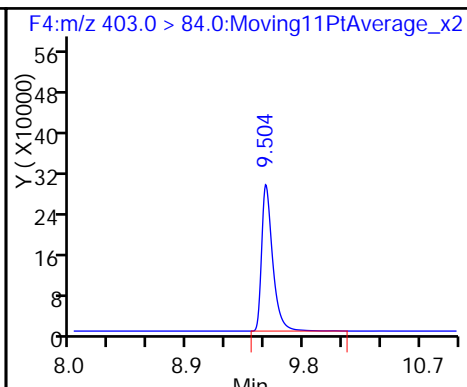
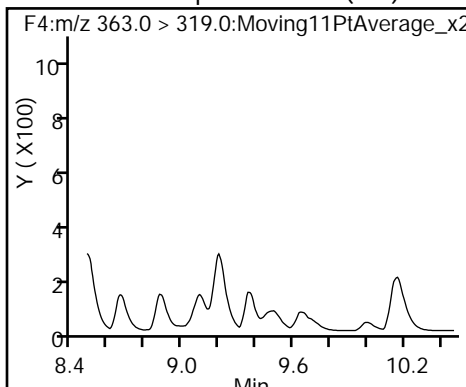
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid (ND)

D 11 18O2 PFHxS

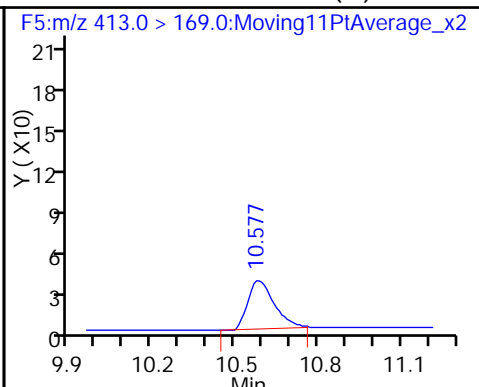
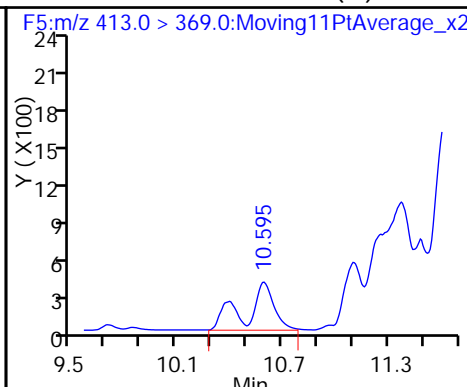
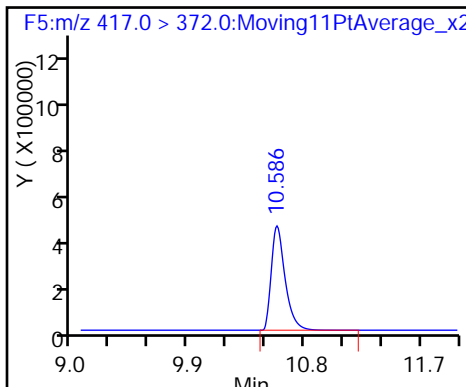
41 Perfluorohexanesulfonic acid (M)



D 12 13C4 PFOA

13 Perfluorooctanoic acid (M)

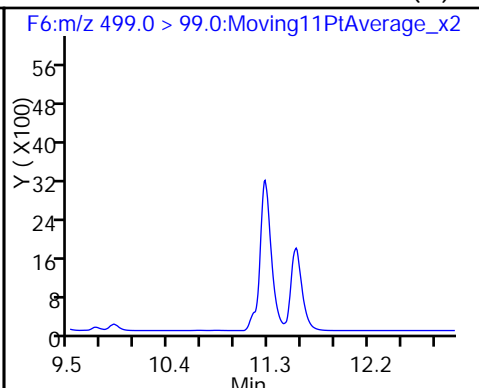
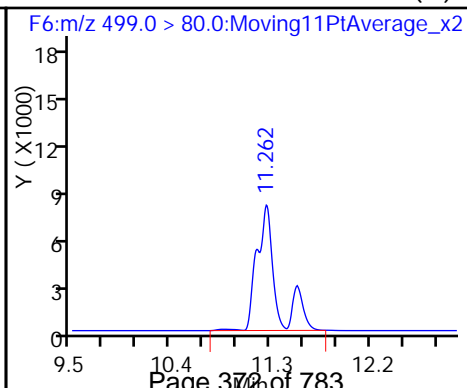
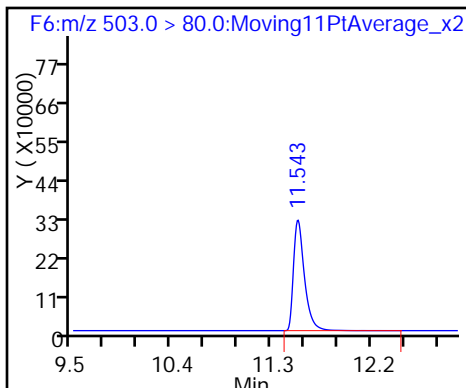
13 Perfluorooctanoic acid (M)



D 16 13C4 PFOS

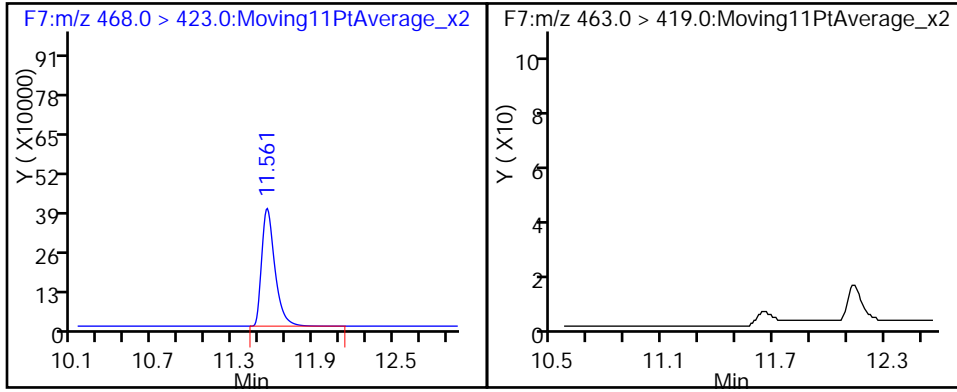
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid (ND)



TestAmerica Sacramento

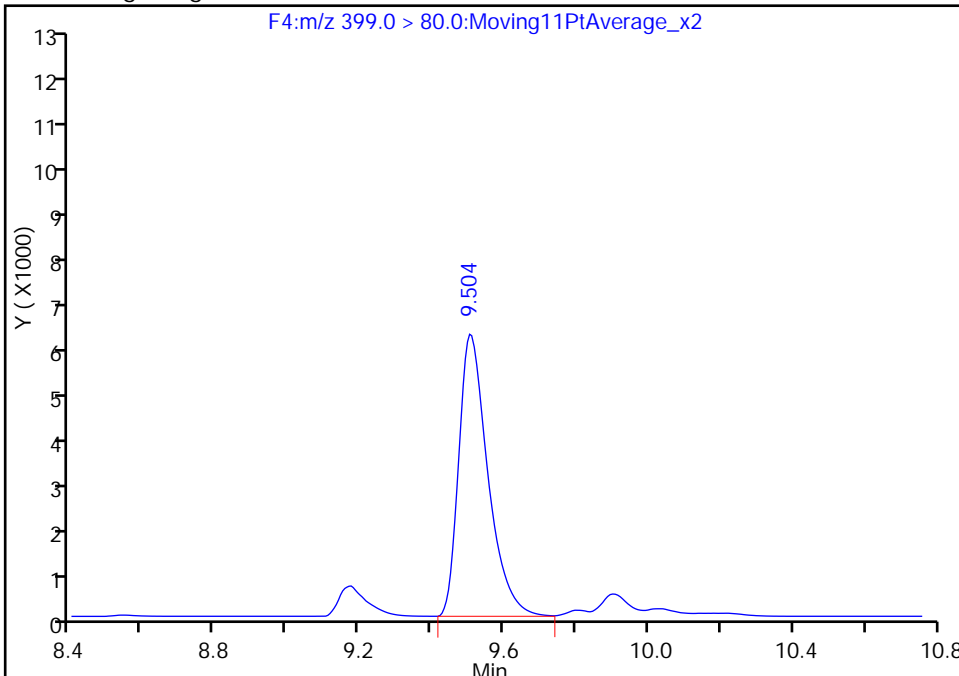
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Injection Date: 29-May-2016 11:17:52 Instrument ID: A6
Lims ID: 320-18986-A-4-A Lab Sample ID: 320-18986-4
Client ID: 46MW03_0516
Operator ID: JRB ALS Bottle#: 30 Worklist Smp#: 55
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

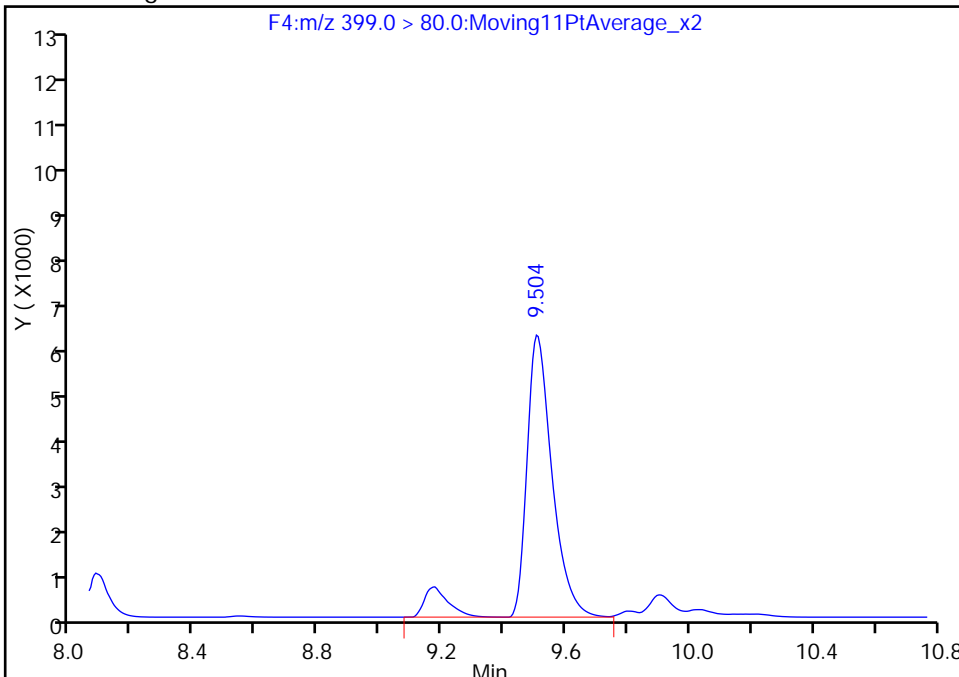
RT: 9.50
Area: 33309
Amount: 0.990963
Amount Units: ng/ml

Processing Integration Results



RT: 9.50
Area: 36688
Amount: 1.091491
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:36:36
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

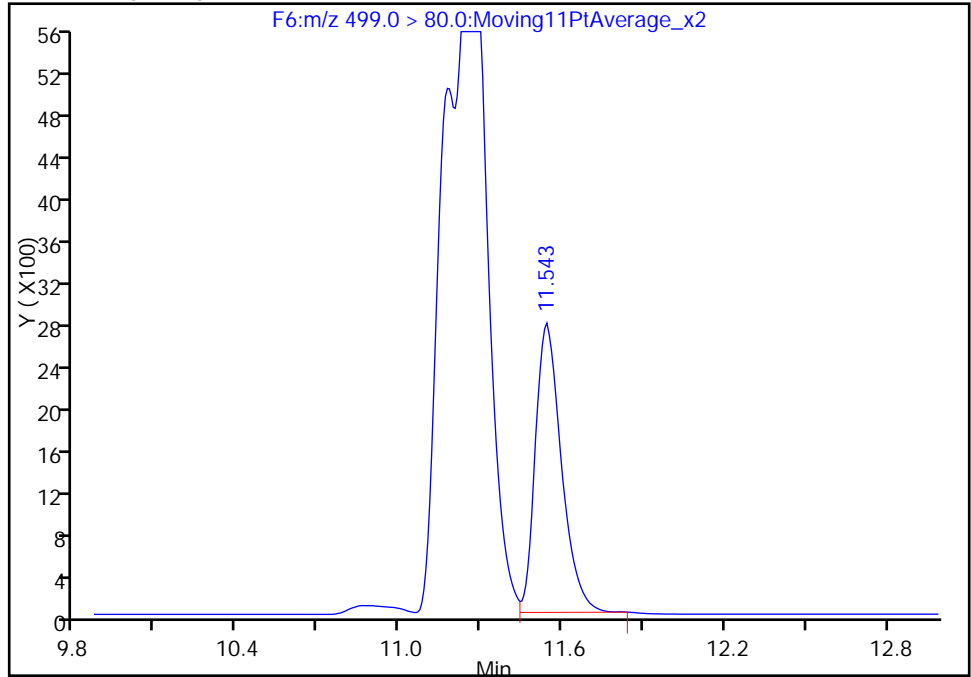
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Lims ID: 320-18986-A-4-A Lab Sample ID: 320-18986-4
Client ID: 46MW03_0516
Operator ID: JRB ALS Bottle#: 30 Worklist Smp#: 55
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

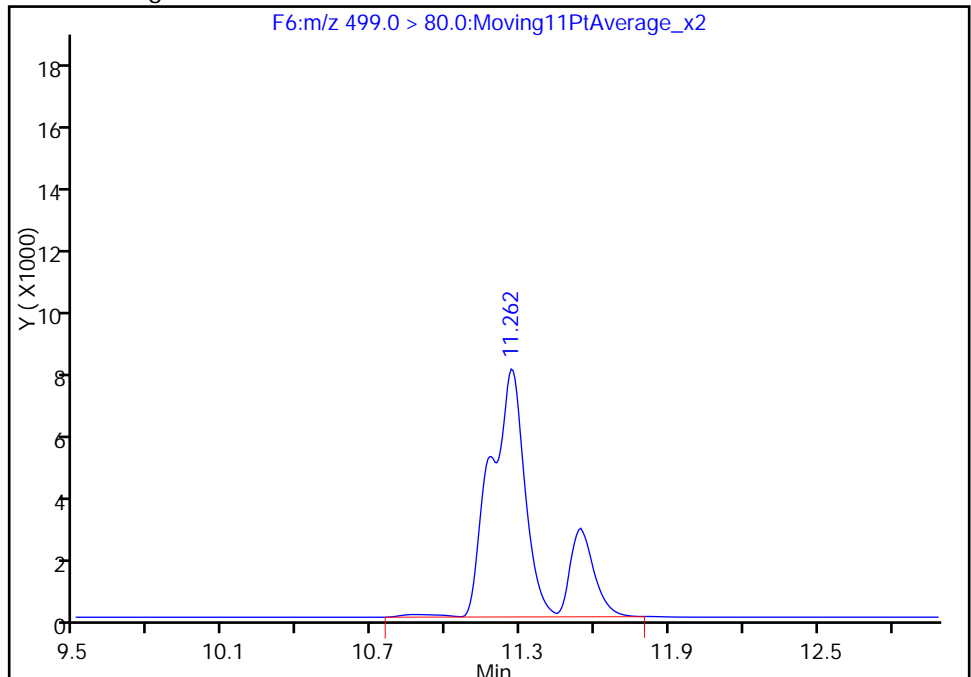
RT: 11.54
Area: 18272
Amount: 0.316934
Amount Units: ng/ml

Processing Integration Results



RT: 11.26
Area: 93142
Amount: 1.615581
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:36:36
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

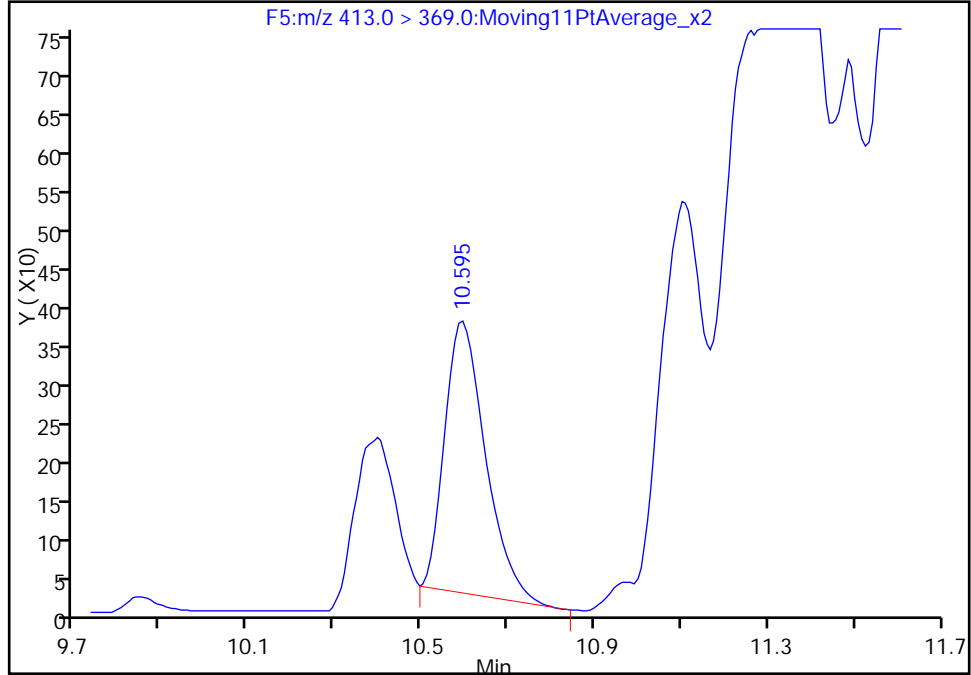
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Injection Date: 29-May-2016 11:17:52 Instrument ID: A6
Lims ID: 320-18986-A-4-A Lab Sample ID: 320-18986-4
Client ID: 46MW03_0516
Operator ID: JRB ALS Bottle#: 30 Worklist Smp#: 55
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:M/RM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

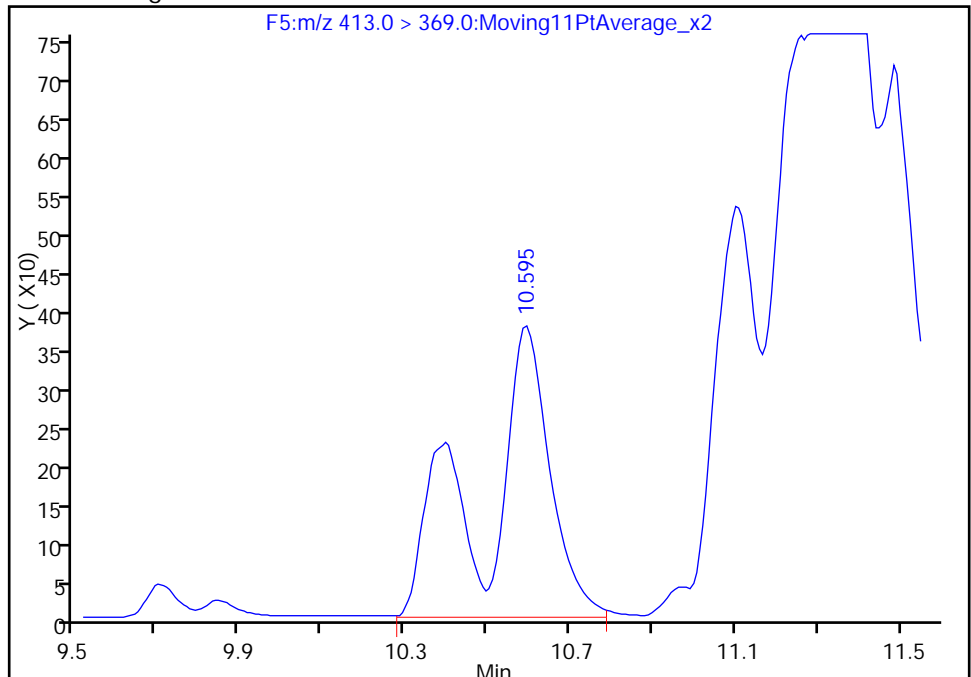
RT: 10.60
Area: 2318
Amount: 0.035101
Amount Units: ng/ml

Processing Integration Results



RT: 10.60
Area: 4232
Amount: 0.064084
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

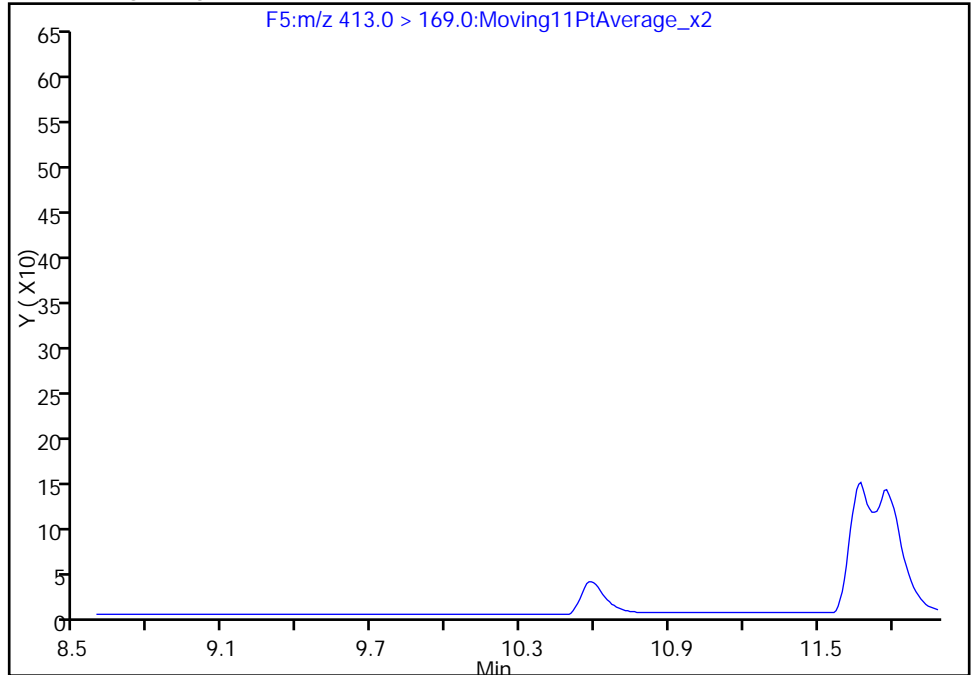
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Injection Date: 29-May-2016 11:17:52 Instrument ID: A6
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Client ID: 46MW03_0516
Operator ID: JRB ALS Bottle#: 30 Worklist Smp#: 55
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

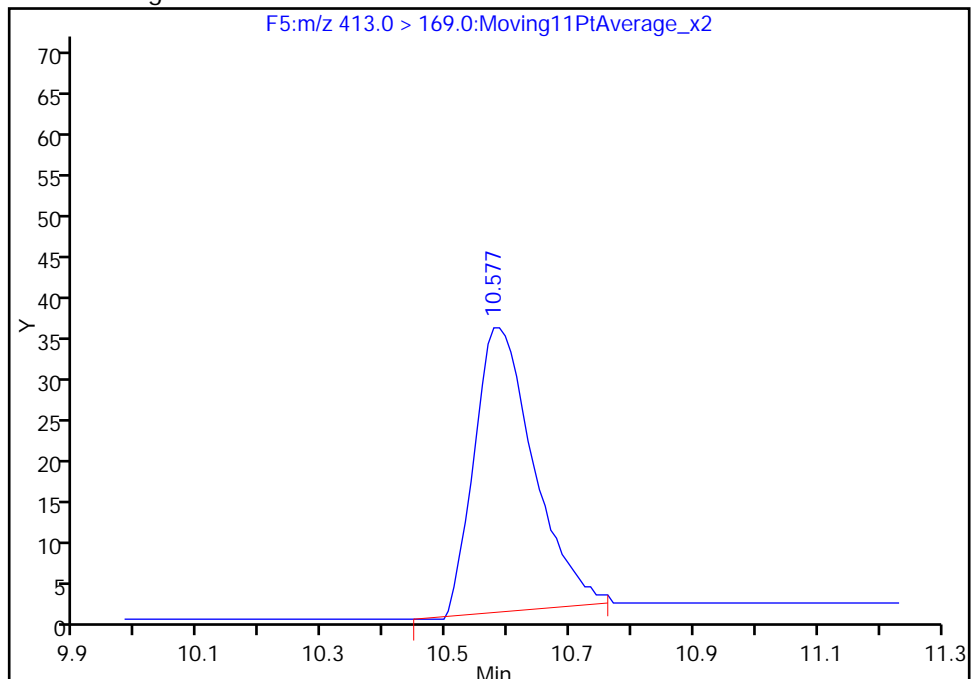
Not Detected
Expected RT: 10.59

Processing Integration Results



Manual Integration Results

RT: 10.58
Area: 233
Amount: 0.064084
Amount Units: ng/ml



Reviewer: barnettj, 31-May-2016 17:36:36

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: 46MW01_0516 Lab Sample ID: 320-18986-5
 Matrix: Water Lab File ID: 28MAY2016A6A_057.d
 Analysis Method: WS-LC-0025 Date Collected: 05/17/2016 11:21
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 509.1(mL) Date Analyzed: 05/29/2016 11:39
 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.: 111859 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	0.90
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.0	U	2.5	2.0	0.79
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	2.5	2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	2.0	U	2.5	2.0	0.64
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.5	J M	3.9	2.9	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	U	2.5	2.0	0.73

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		25-150
STL00990	13C4 PFOA	103		25-150
STL00991	13C4 PFOS	139		25-150
STL01892	13C4-PFHpA	101		25-150
STL00995	13C5 PFNA	88		25-150
STL00994	18O2 PFHxS	135		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_057.d
 Lims ID: 320-18986-A-5-A
 Client ID: 46MW01_0516
 Sample Type: Client
 Inject. Date: 29-May-2016 11:39:08 ALS Bottle#: 31 Worklist Smp#: 56
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-5-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 17:46:27 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj Date: 31-May-2016 17:37:23

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 6 13C2 PFHxA	315.0 > 270.0	8.236	8.236	0.0	2942478	50.4		101	79556	
D 8 13C4-PFHpA	367.0 > 322.0	9.475	9.474	0.001	3136093	50.6		101	56542	
D 11 18O2 PFHxS	403.0 > 84.0	9.511	9.507	0.004	1819200	63.7		135	7064	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.518	9.507	0.011	1.000	2065	0.0587			
D 12 13C4 PFOA	417.0 > 372.0	10.586	10.586	0.0	3479853	51.7		103	117208	
13 Perfluorooctanoic acid	413.0 > 369.0	10.605	10.587	0.018	1.000	4144	0.0586		3.1	
D 16 13C4 PFOS	503.0 > 80.0	11.543	11.543	0.0	2327770	66.2		139	9682	
15 Perfluorooctane sulfonic acid	499.0 > 80.0	11.543	11.545	-0.002	1.000	107515	1.76		1333	M
	499.0 > 99.0	11.543	11.545	-0.002	1.000	44861	2.40(0.00-0.00)		166	M
D 17 13C5 PFNA	468.0 > 423.0	11.561	11.562	-0.001	2724513	43.9		87.8	20864	

QC Flag Legend

Review Flags

M - Manually Integrated

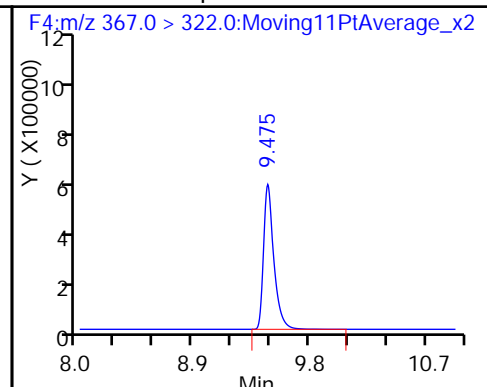
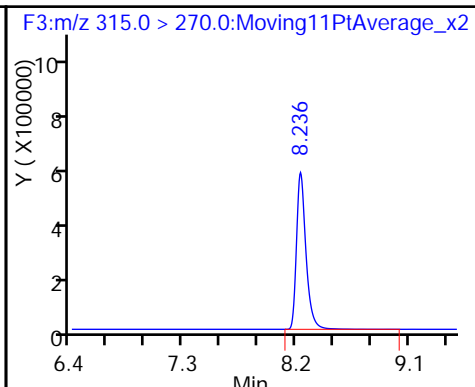
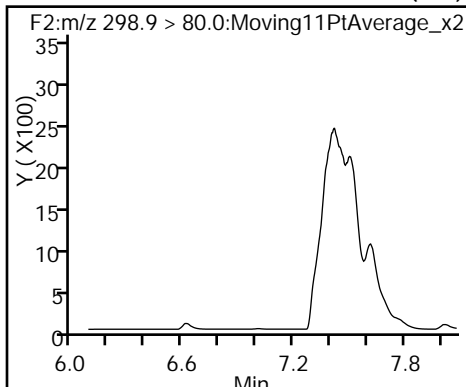
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_057.d
Injection Date: 29-May-2016 11:39:08 Instrument ID: A6
Lims ID: 320-18986-A-5-A Lab Sample ID: 320-18986-5
Client ID: 46MW01_0516
Operator ID: JRB ALS Bottle#: 31 Worklist Smp#: 56
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid (ND)

D 6 13C2 PFHxA

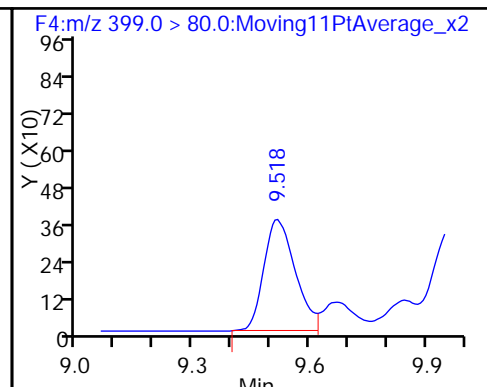
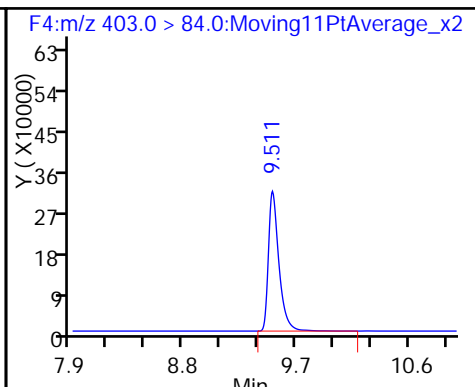
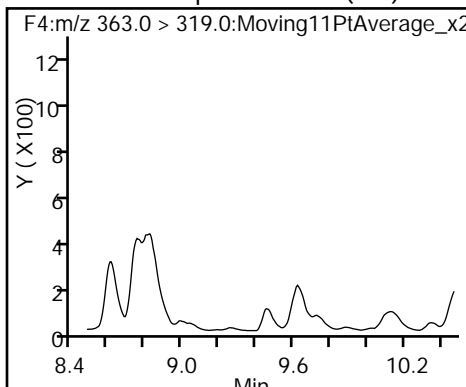
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid (ND)

D 11 18O2 PFHxS

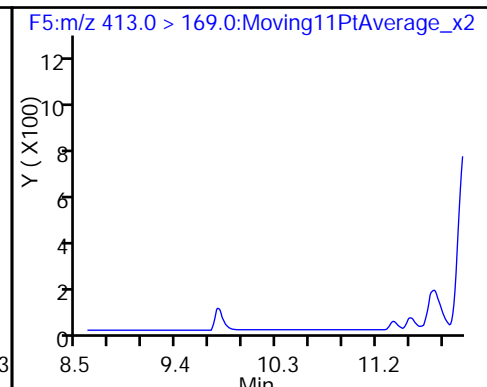
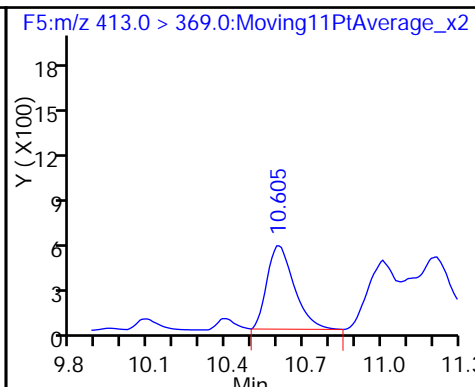
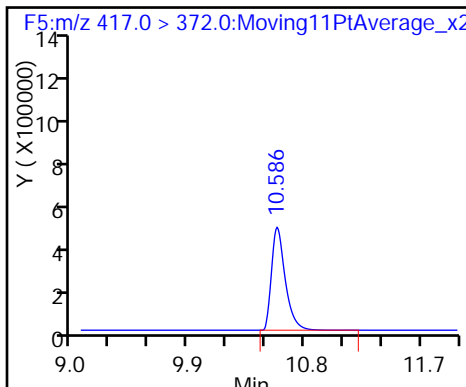
41 Perfluorohexanesulfonic acid



D 12 13C4 PFOA

13 Perfluorooctanoic acid

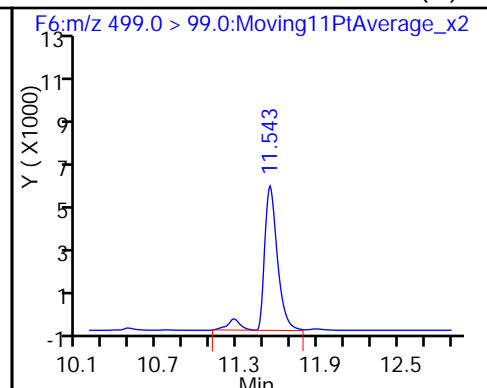
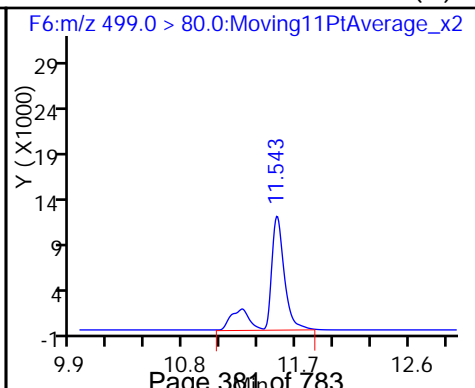
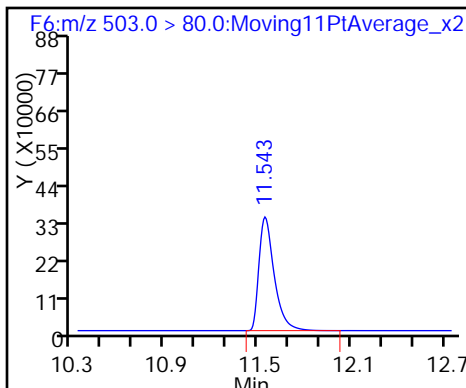
13 Perfluorooctanoic acid



D 16 13C4 PFOS

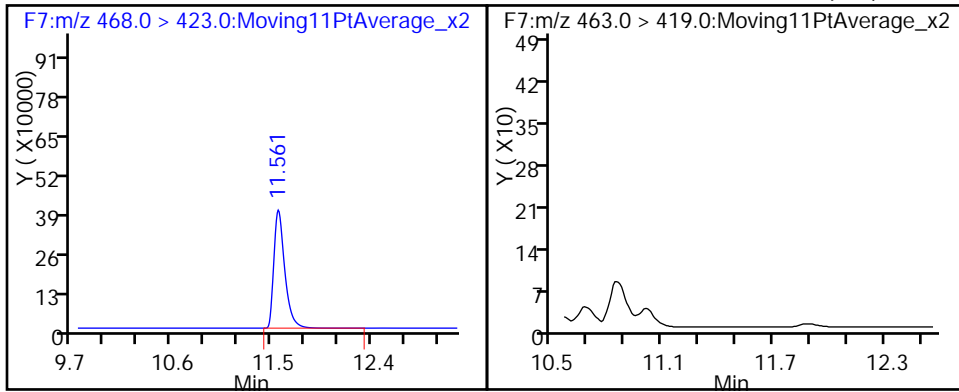
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid (ND)



TestAmerica Sacramento

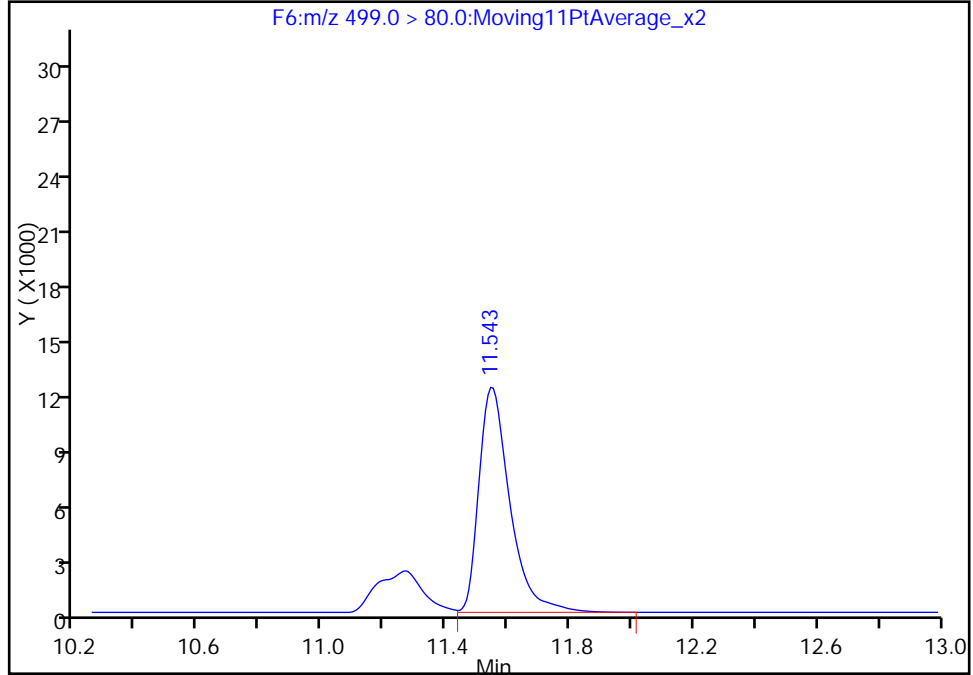
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Injection Date: 29-May-2016 11:39:08 Instrument ID: A6
Lims ID: 320-18986-A-5-A Lab Sample ID: 320-18986-5
Client ID: 46MW01_0516
Operator ID: JRB ALS Bottle#: 31 Worklist Smp#: 56
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

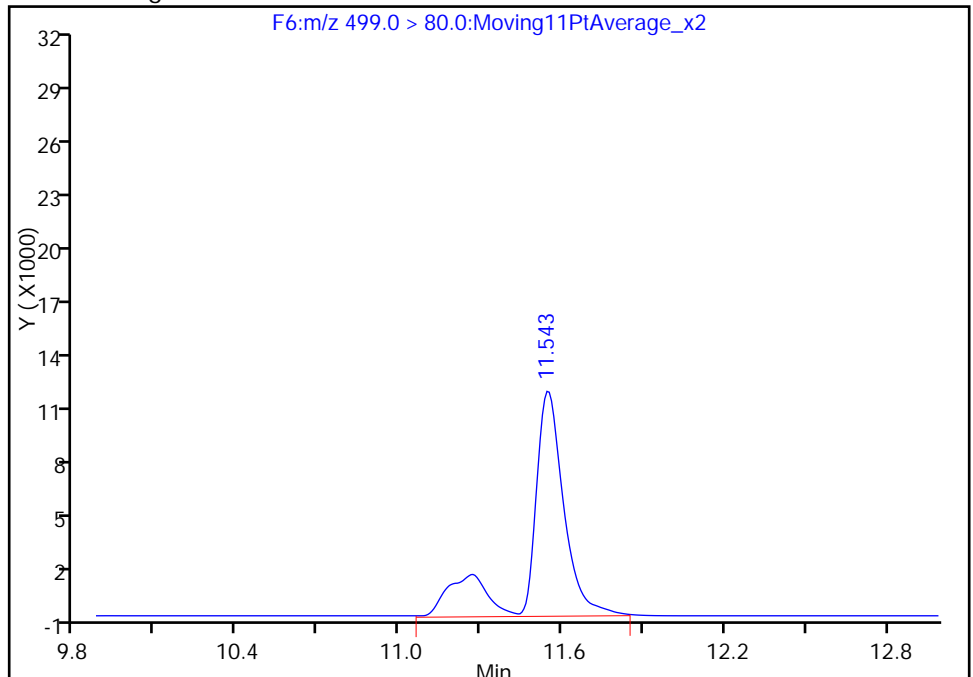
RT: 11.54
Area: 83525
Amount: 1.366224
Amount Units: ng/ml

Processing Integration Results



RT: 11.54
Area: 107515
Amount: 1.758630
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:37:23
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

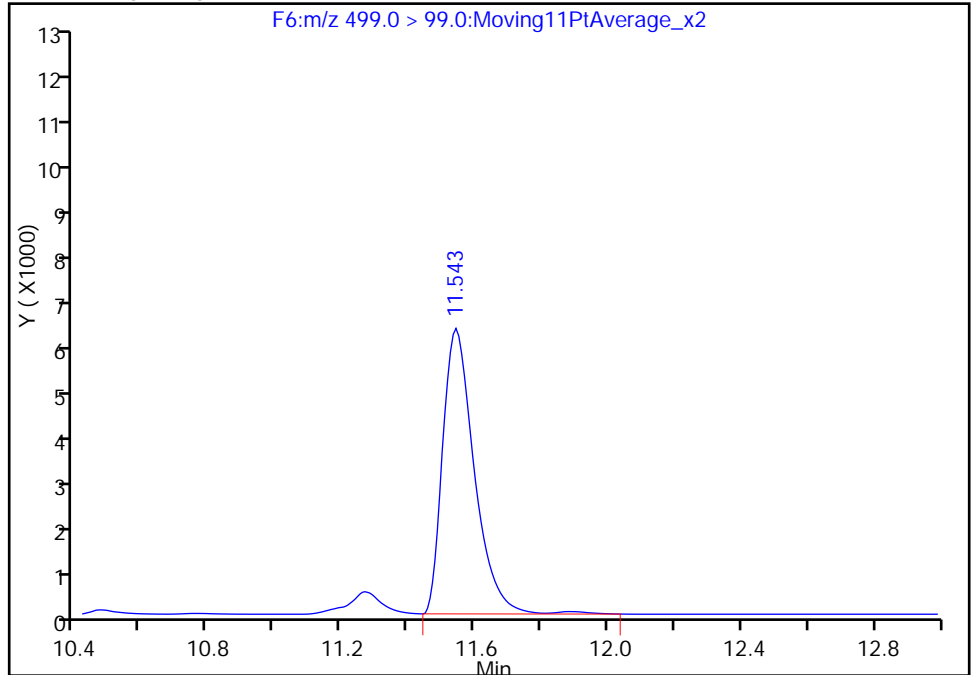
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Client ID: 46MW01_0516
Operator ID: JRB ALS Bottle#: 31 Worklist Smp#: 56
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

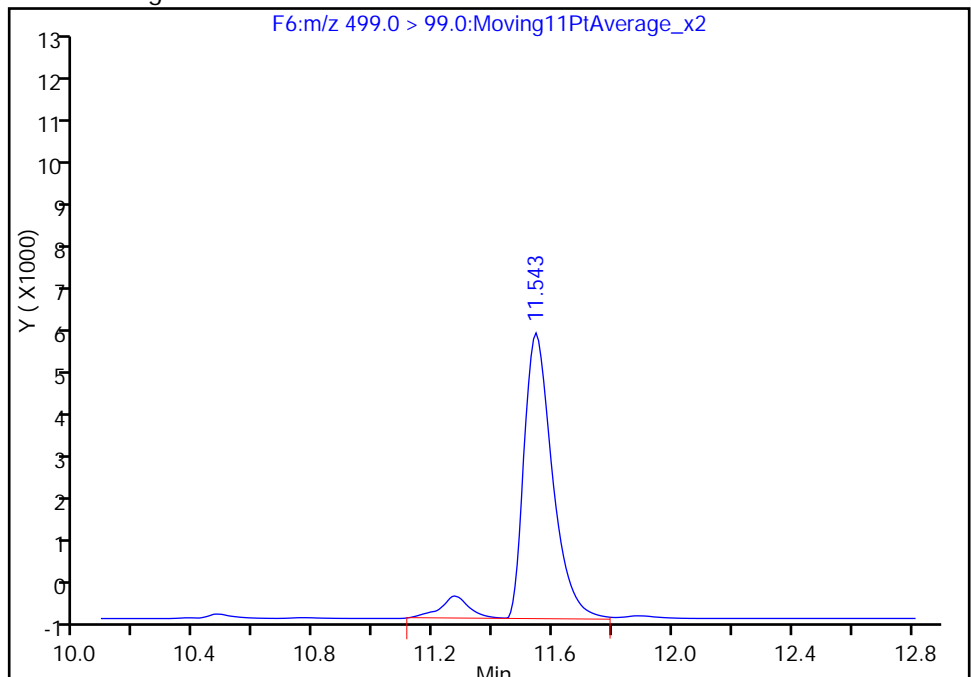
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Amount: 1.366224
Amount Units: ng/ml

Processing Integration Results



RT: 11.54
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Amount: 1.758630
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: 46MW02_0516 Lab Sample ID: 320-18986-6
 Matrix: Water Lab File ID: 28MAY2016A6A_058.d
 Analysis Method: WS-LC-0025 Date Collected: 05/17/2016 11:21
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 542 (mL) Date Analyzed: 05/29/2016 12:00
 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.: 111859 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	11		2.3	1.8	0.85
375-85-9	Perfluoroheptanoic acid (PFHpA)	12		2.3	1.8	0.74
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	140	M	2.3	1.8	0.80
375-95-1	Perfluorononanoic acid (PFNA)	10		2.3	1.8	0.60
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	330	M	3.7	2.8	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	38	M	2.3	1.8	0.69

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	86		25-150
STL00990	13C4 PFOA	91		25-150
STL00991	13C4 PFOS	106		25-150
STL01892	13C4-PFHpA	87		25-150
STL00995	13C5 PFNA	69		25-150
STL00994	18O2 PFHxS	121		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_058.d
 Lims ID: 320-18986-A-6-A
 Client ID: 46MW02_0516
 Sample Type: Client
 Inject. Date: 29-May-2016 12:00:25 ALS Bottle#: 32 Worklist Smp#: 57
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-6-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 17:46:27 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj Date: 31-May-2016 17:39:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.088	7.085	0.003	1.000	264406	6.05				
D 6 13C2 PFHxA										
315.0 > 270.0	8.241	8.236	0.005		2501705	42.9		85.7	36000	
D 8 13C4-PFHpA										
367.0 > 322.0	9.475	9.474	0.001		2688674	43.4		86.8	239807	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.475	9.475	0.0	1.000	455567	6.65			246	
D 11 18O2 PFHxS										
403.0 > 84.0	9.510	9.507	0.003		1639684	57.4		121	14989	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.510	9.507	0.003	1.000	2396373	75.6				M
D 12 13C4 PFOA										
417.0 > 372.0	10.586	10.586	0.0		3052735	45.3		90.6	27046	
13 Perfluorooctanoic acid										M
413.0 > 369.0	10.586	10.587	-0.001	1.000	1278390	20.6			904	M
413.0 > 169.0	10.586	10.587	-0.001	1.000	466929		2.74(0.00-0.00)		608	M
D 16 13C4 PFOS										
503.0 > 80.0	11.552	11.543	0.009		1772988	50.4		106	10030	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.552	11.545	0.007	1.000	8378478	179.9			5556	M
499.0 > 99.0	11.552	11.545	0.007	1.000	3850235		2.18(0.00-0.00)		5660	M
D 17 13C5 PFNA										
468.0 > 423.0	11.569	11.562	0.007		2150665	34.7		69.3	10936	
18 Perfluorononanoic acid										
463.0 > 419.0	11.569	11.563	0.006	1.000	205063	5.65			2298	

QC Flag Legend

Review Flags

M - Manually Integrated

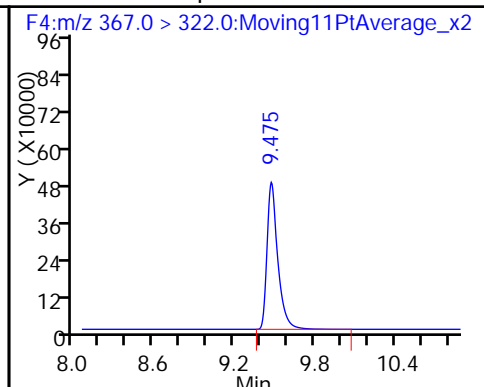
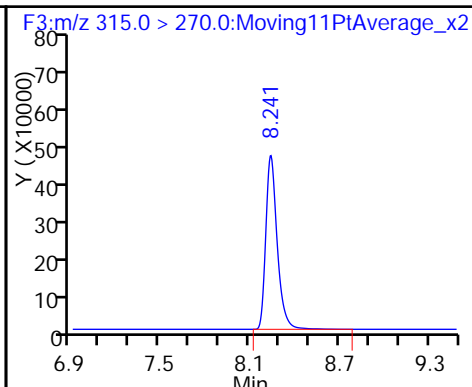
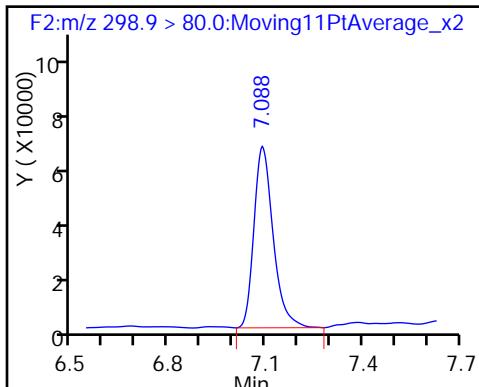
TestAmerica Sacramento

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Injection Date: 29-May-2016 12:00:25 Instrument ID: A6
Lims ID: 320-18986-A-6-A Lab Sample ID: 320-18986-6
Client ID: 46MW02_0516
Operator ID: JRB ALS Bottle#: 32 Worklist Smp#: 57
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxA

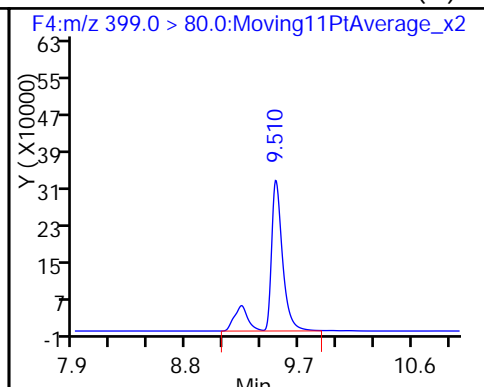
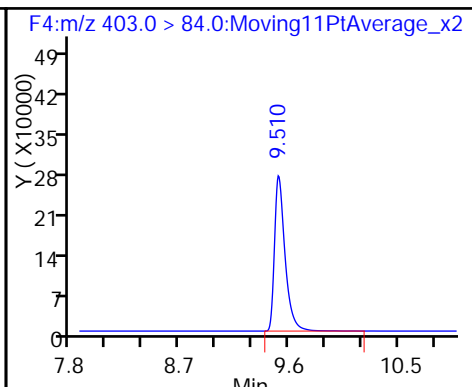
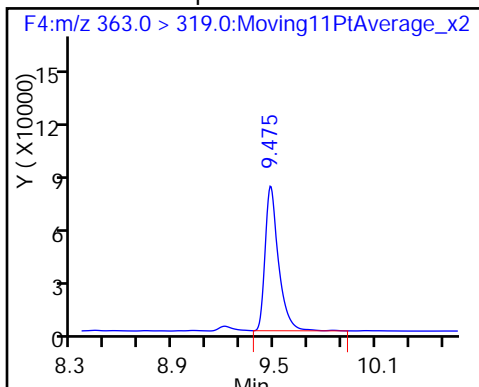
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid

D 11 18O2 PFHxS

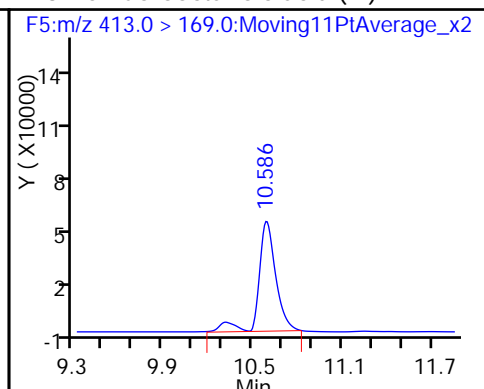
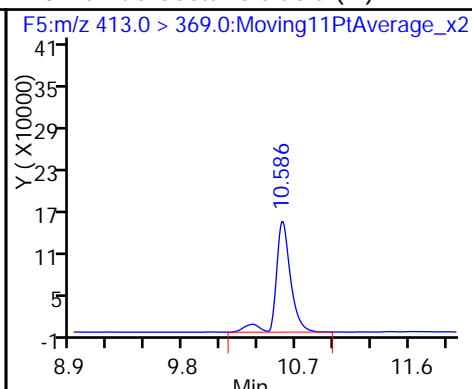
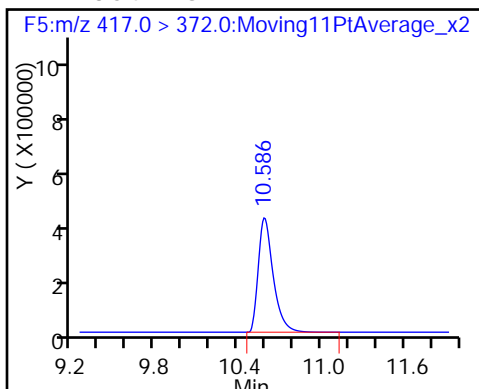
41 Perfluorohexanesulfonic acid (M)



D 12 13C4 PFOA

13 Perfluorooctanoic acid (M)

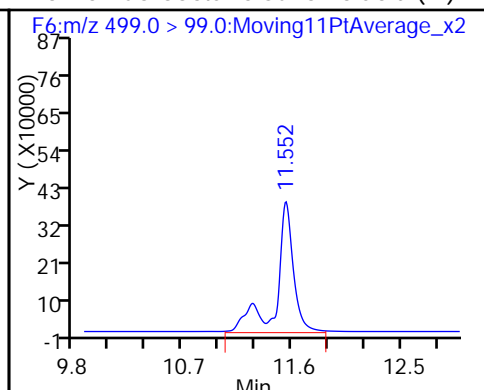
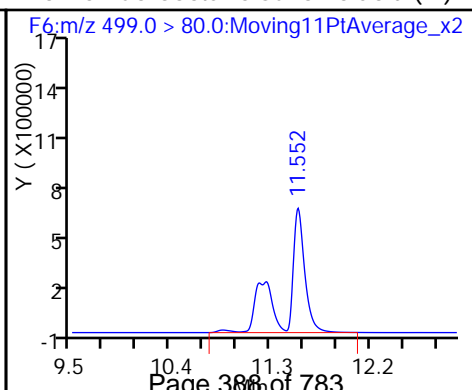
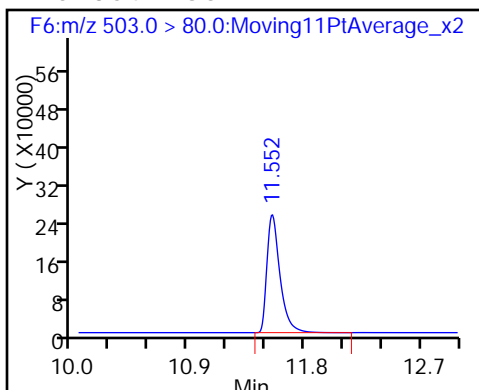
13 Perfluorooctanoic acid (M)



D 16 13C4 PFOS

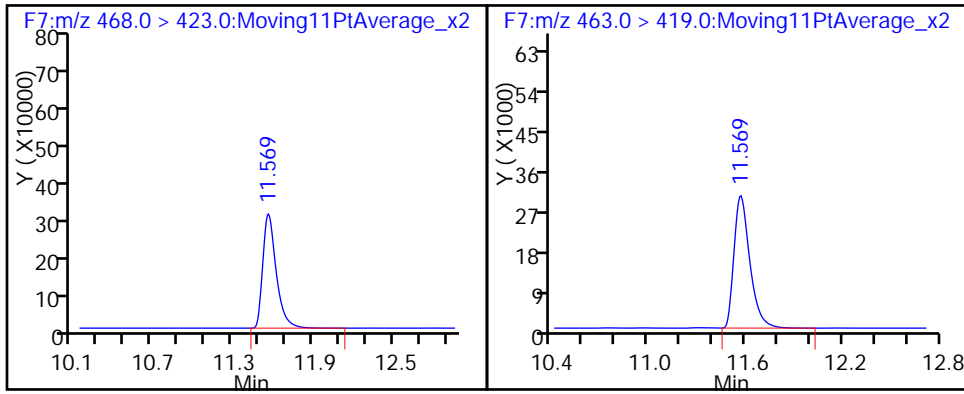
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid



TestAmerica Sacramento

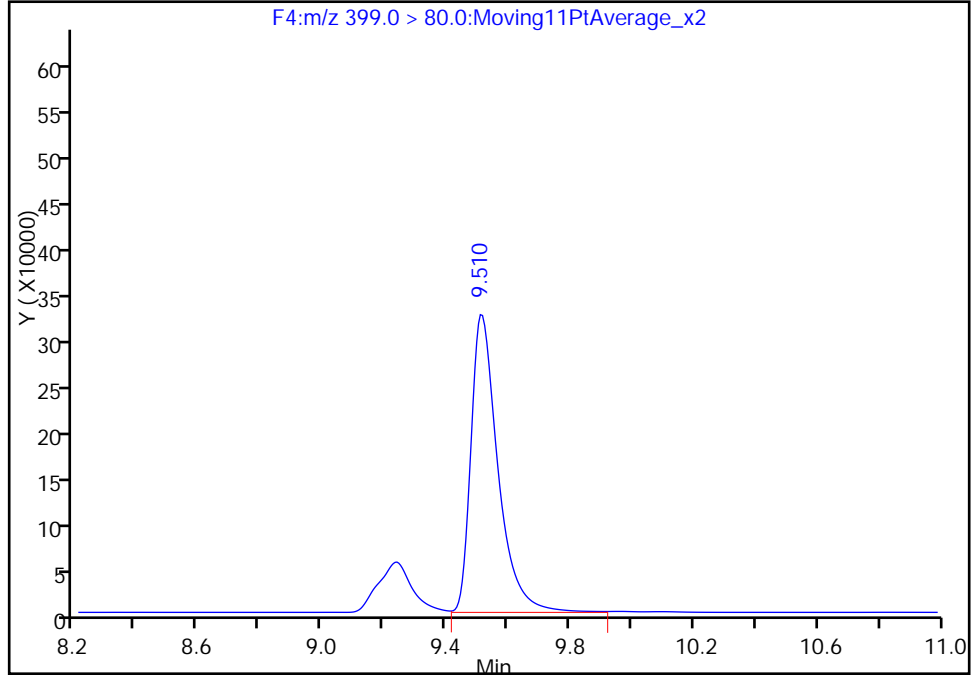
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Lims ID: 320-18986-A-6-A Lab Sample ID: 320-18986-6
Client ID: 46MW02_0516
Operator ID: JRB ALS Bottle#: 32 Worklist Smp#: 57
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

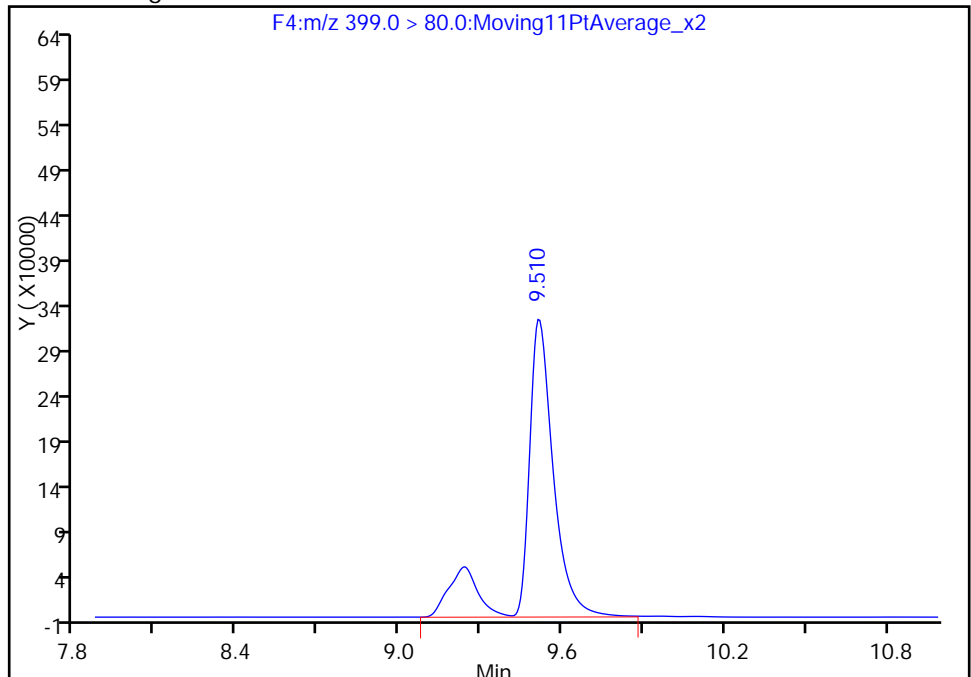
RT: 9.51
Area: 1985306
Amount: 62.616284
Amount Units: ng/ml

Processing Integration Results



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Area: 2396373
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Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:39:09
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

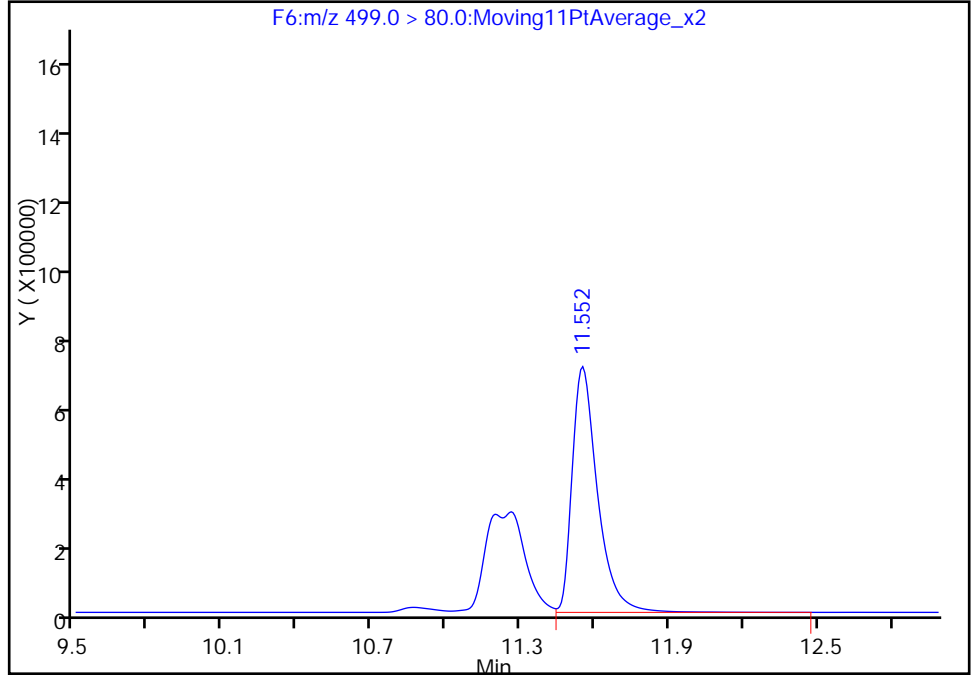
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Client ID: 46MW02_0516
Operator ID: JRB ALS Bottle#: 32 Worklist Smp#: 57
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

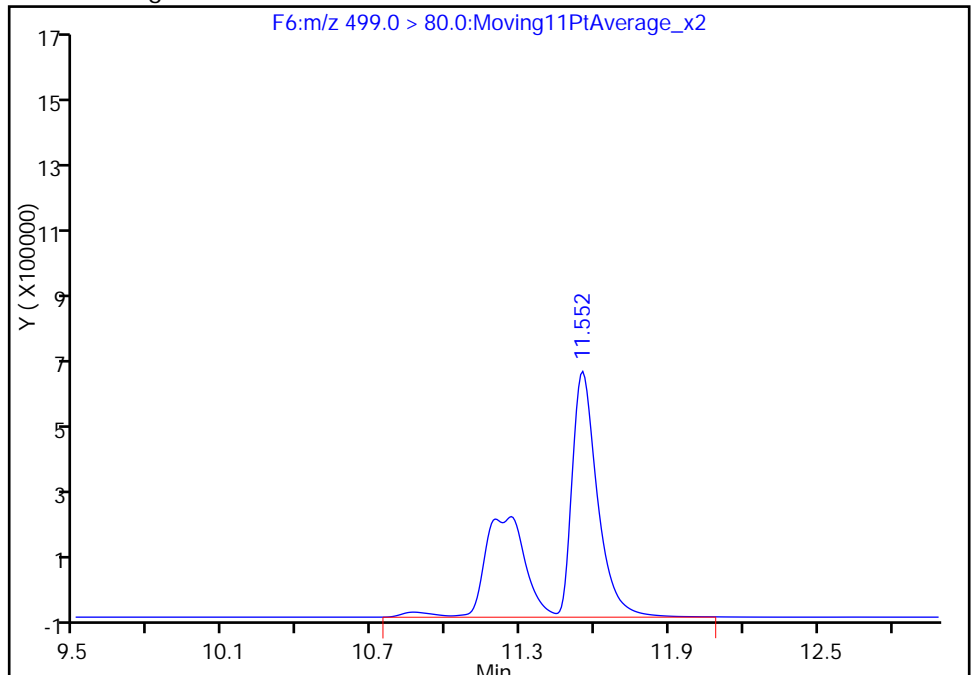
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Amount: 108.0638
Amount Units: ng/ml

Processing Integration Results



RT: 11.55
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Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:39:09
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

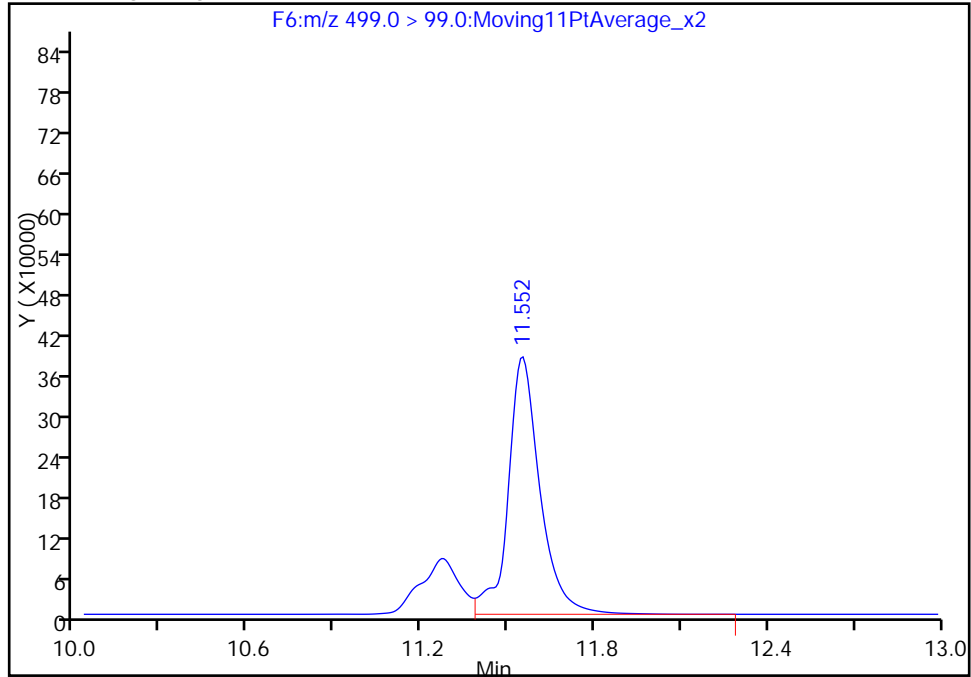
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Injection Date: 29-May-2016 12:00:25 Instrument ID: A6
Lims ID: 320-18986-A-6-A Lab Sample ID: 320-18986-6
Client ID: 46MW02_0516
Operator ID: JRB ALS Bottle#: 32 Worklist Smp#: 57
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

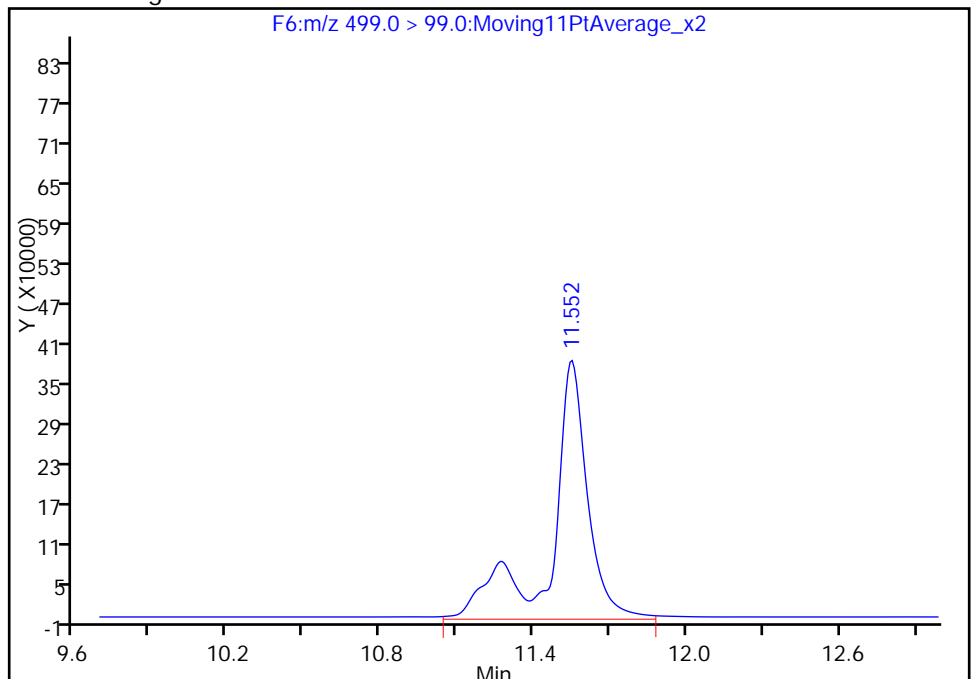
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Area: 2924195
Amount: 108.0638
Amount Units: ng/ml

Processing Integration Results



RT: 11.55
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Amount: 179.9306
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

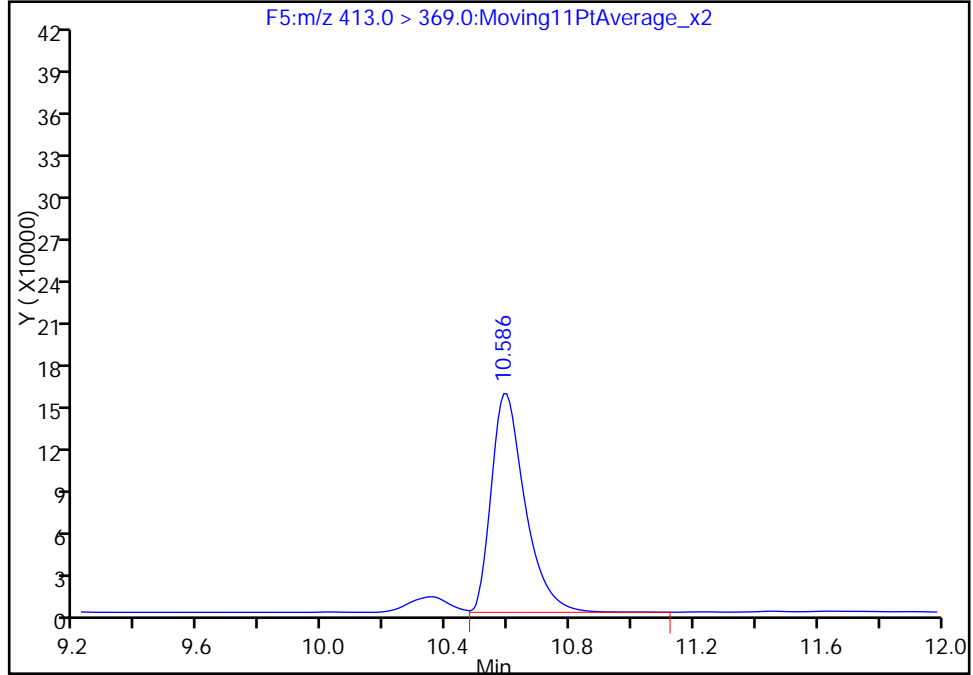
Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_058.d
Injection Date: 29-May-2016 12:00:25 Instrument ID: A6
Lims ID: 320-18986-A-6-A Lab Sample ID: 320-18986-6
Client ID: 46MW02_0516
Operator ID: JRB ALS Bottle#: 32 Worklist Smp#: 57
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

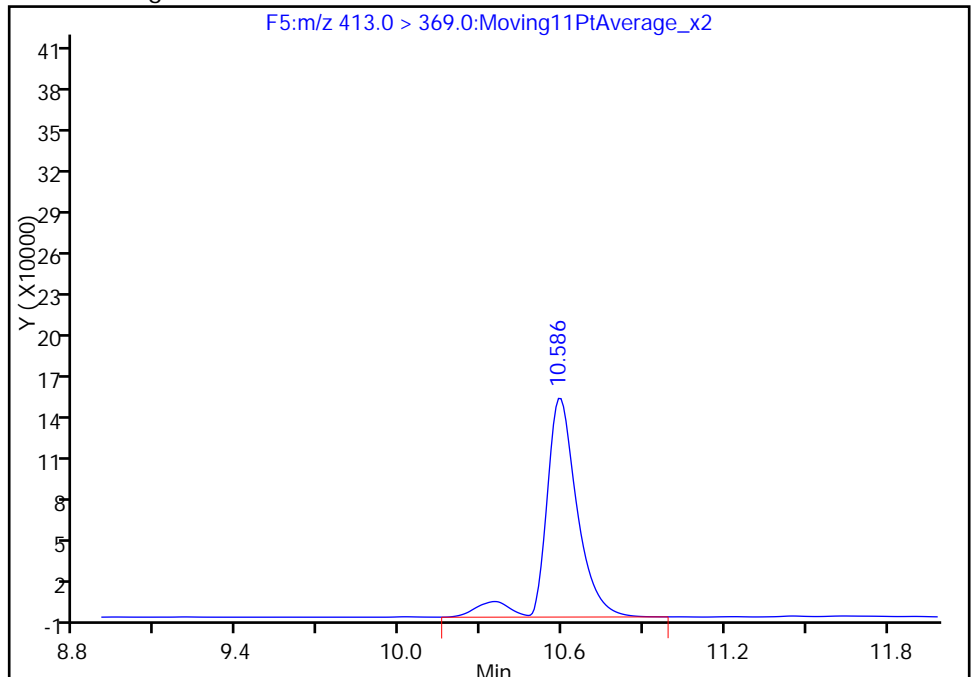
RT: 10.59
Area: 1182310
Amount: 19.050452
Amount Units: ng/ml

Processing Integration Results



RT: 10.59
Area: 1278390
Amount: 20.598580
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:39:09
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

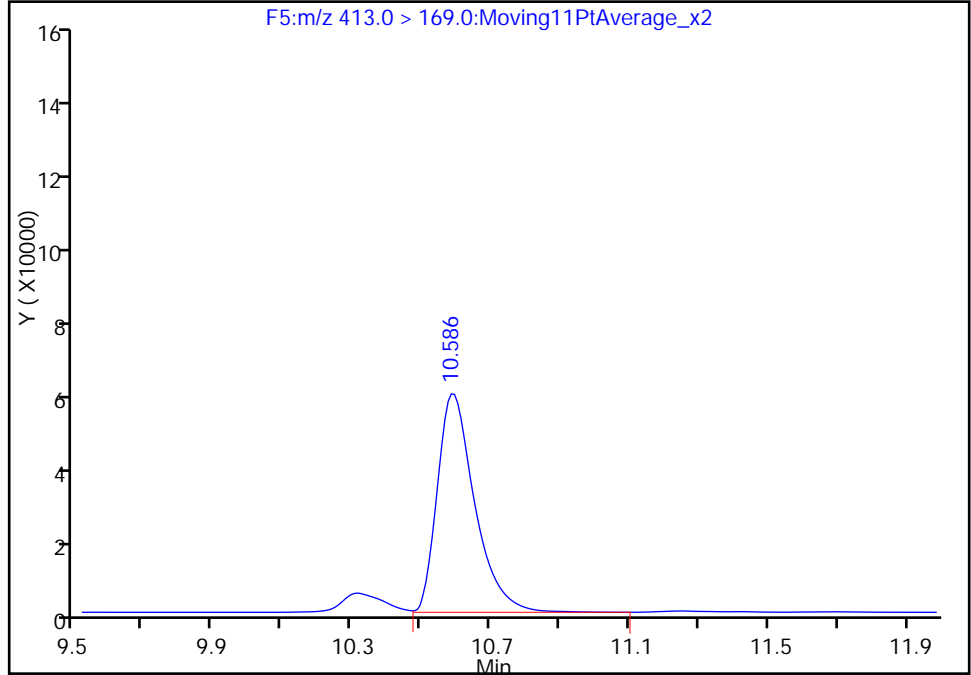
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Lims ID: 320-18986-A-6-A Lab Sample ID: 320-18986-6
Client ID: 46MW02_0516
Operator ID: JRB ALS Bottle#: 32 Worklist Smp#: 57
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

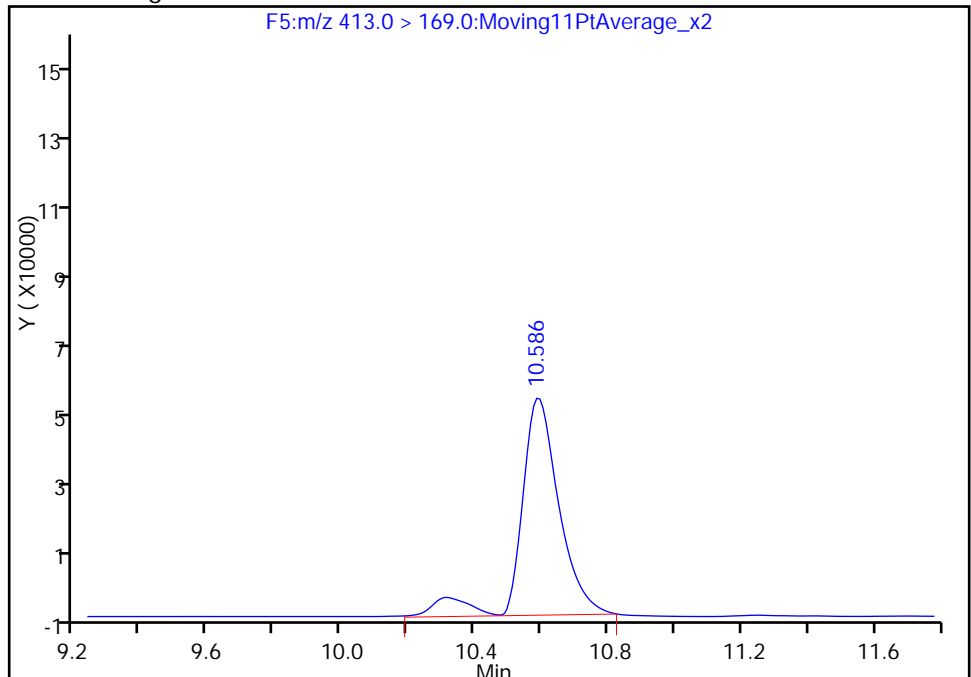
RT: 10.59
Area: 437300
Amount: 19.050452
Amount Units: ng/ml

Processing Integration Results



RT: 10.59
Area: 466929
Amount: 20.598580
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: 46MW05_0516 Lab Sample ID: 320-18986-7
 Matrix: Water Lab File ID: 28MAY2016A6A_059.d
 Analysis Method: WS-LC-0025 Date Collected: 05/17/2016 12:31
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 509.1(mL) Date Analyzed: 05/29/2016 12:21
 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.: 111859 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	56		2.5	2.0	0.90
375-85-9	Perfluoroheptanoic acid (PFHpA)	23		2.5	2.0	0.79
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	820	J M	2.5	2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	2.2	J	2.5	2.0	0.64
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	4200	J M	3.9	2.9	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	130	M	2.5	2.0	0.73

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	86		25-150
STL00990	13C4 PFOA	78		25-150
STL00991	13C4 PFOS	58		25-150
STL01892	13C4-PFHpA	77		25-150
STL00995	13C5 PFNA	54		25-150
STL00994	18O2 PFHxS	86		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_059.d
 Lims ID: 320-18986-A-7-A
 Client ID: 46MW05_0516
 Sample Type: Client
 Inject. Date: 29-May-2016 12:21:43 ALS Bottle#: 33 Worklist Smp#: 58
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-7-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 17:46:27 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj Date: 31-May-2016 17:40:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.081	7.085	-0.004	1.000	889004	28.6				
D 6 13C2 PFHxA										
315.0 > 270.0	8.230	8.236	-0.006		2507976	43.0		86.0	9847	
D 8 13C4-PFHpA										
367.0 > 322.0	9.470	9.474	-0.004		2379973	38.4		76.8	144166	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.470	9.475	-0.005	1.000	699747	11.9			216	
D 11 18O2 PFHxS										
403.0 > 84.0	9.505	9.507	-0.002		1166680	40.9		86.4	9922	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.511	9.507	0.004	1.000	9407589	417.0				EM EM
D 12 13C4 PFOA										
417.0 > 372.0	10.586	10.586	0.0		2617696	38.9		77.7	15757	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.586	10.587	-0.001	1.000	3537980	66.5			1680	M
413.0 > 169.0	10.586	10.587	-0.001	1.000	1489539		2.38(0.00-0.00)		1838	M
D 16 13C4 PFOS										
503.0 > 80.0	11.552	11.543	0.009		974284	27.7		58.0	11912	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.552	11.545	0.007	1.000	54635769	2135.2			1113	EM
499.0 > 99.0	11.552	11.545	0.007	1.000	21226385		2.57(0.00-0.00)		1463	M
D 17 13C5 PFNA										
468.0 > 423.0	11.570	11.562	0.008		1666940	26.9		53.7	29560	
18 Perfluorononanoic acid										
463.0 > 419.0	11.570	11.563	0.007	1.000	31081	1.10			52.8	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

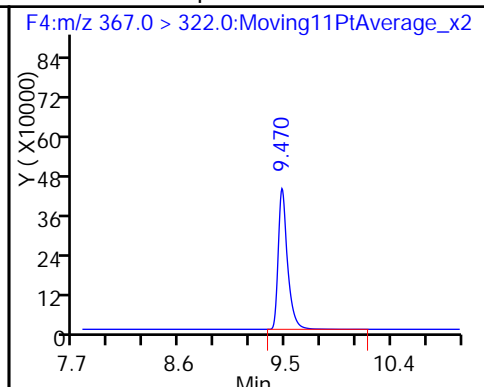
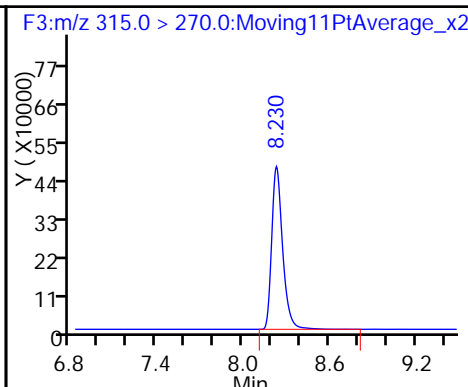
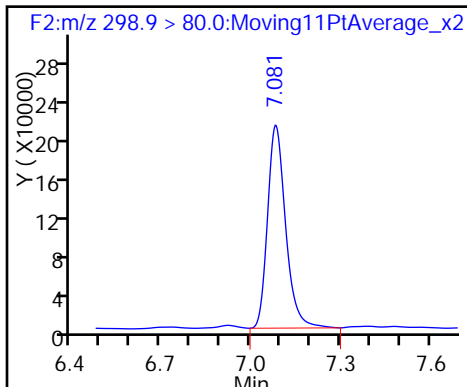
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_059.d
Injection Date: 29-May-2016 12:21:43 Instrument ID: A6
Lims ID: 320-18986-A-7-A Lab Sample ID: 320-18986-7
Client ID: 46MW05_0516
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 58
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxA

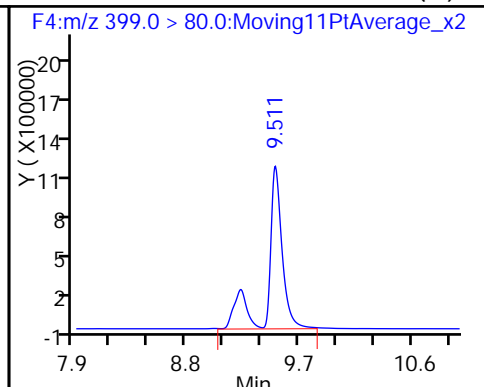
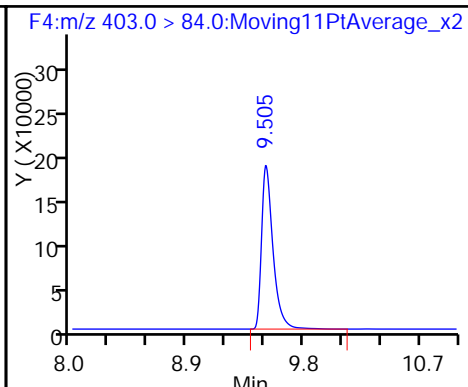
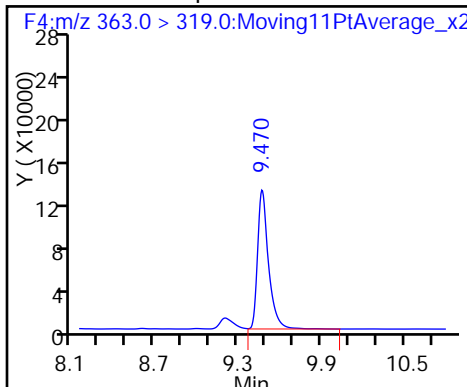
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid

D 11 18O2 PFHxS

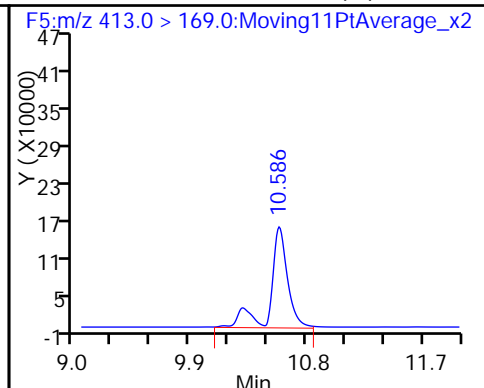
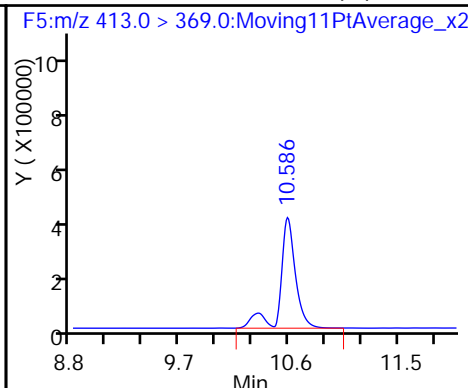
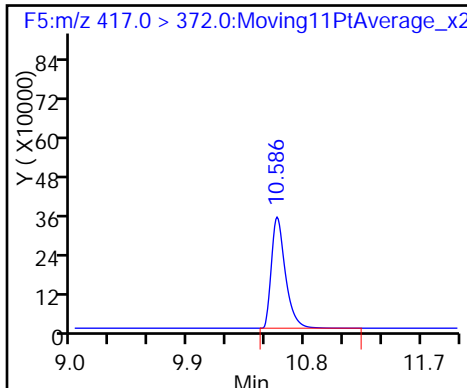
41 Perfluorohexanesulfonic acid (M)



D 12 13C4 PFOA

13 Perfluorooctanoic acid (M)

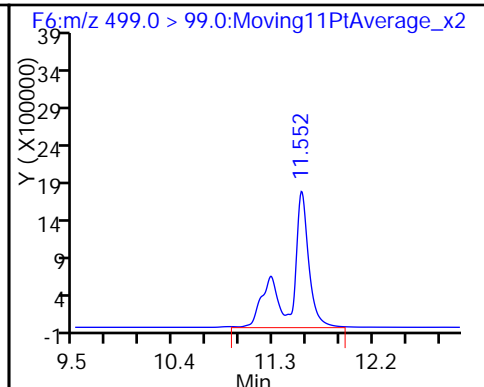
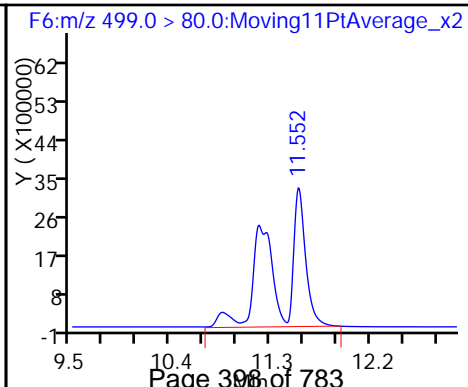
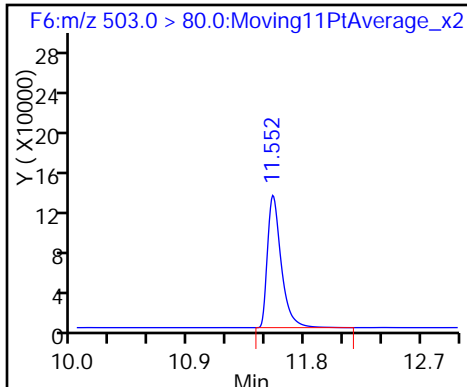
13 Perfluorooctanoic acid (M)



D 16 13C4 PFOS

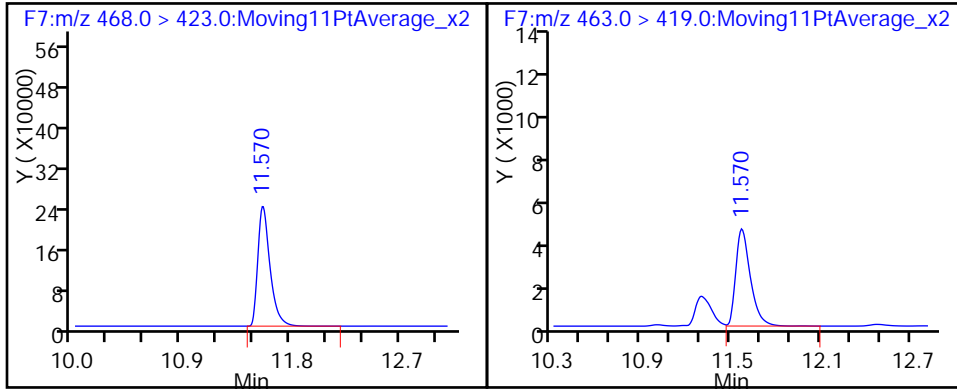
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid



TestAmerica Sacramento

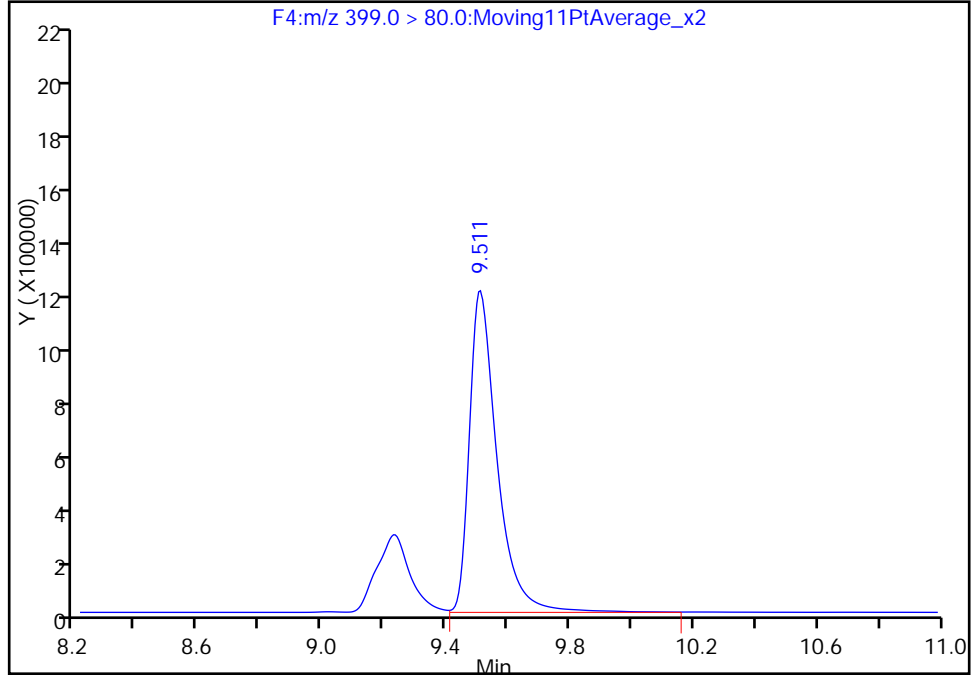
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Injection Date: 29-May-2016 12:21:43 Instrument ID: A6
Lims ID: 320-18986-A-7-A Lab Sample ID: 320-18986-7
Client ID: 46MW05_0516
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 58
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:M/RM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

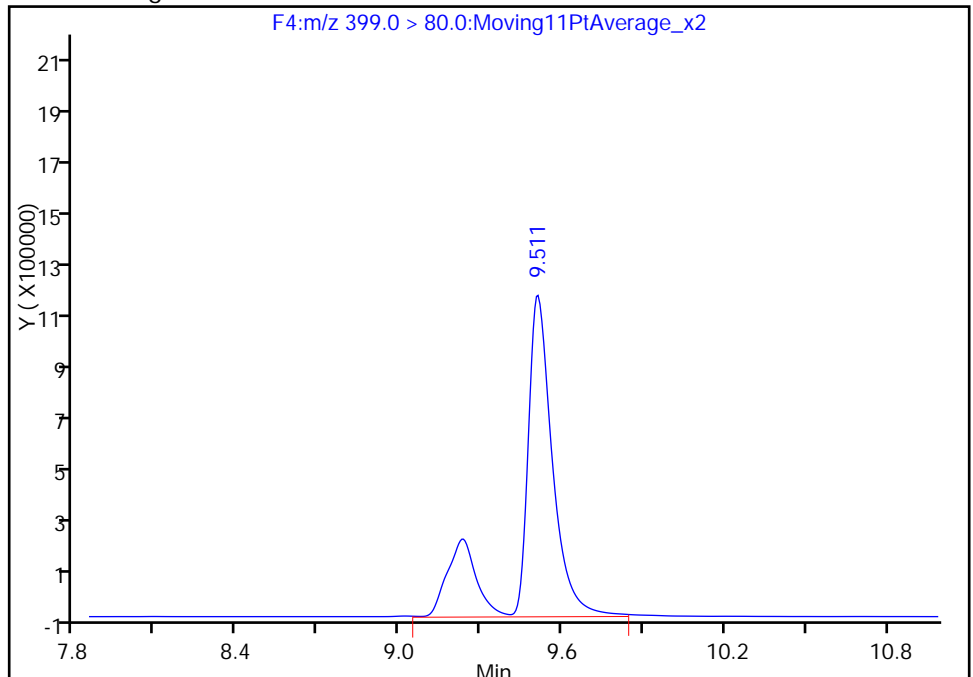
RT: 9.51
Area: 7318256
Amount: 324.3963
Amount Units: ng/ml

Processing Integration Results



RT: 9.51
Area: 9407589
Amount: 417.0101
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

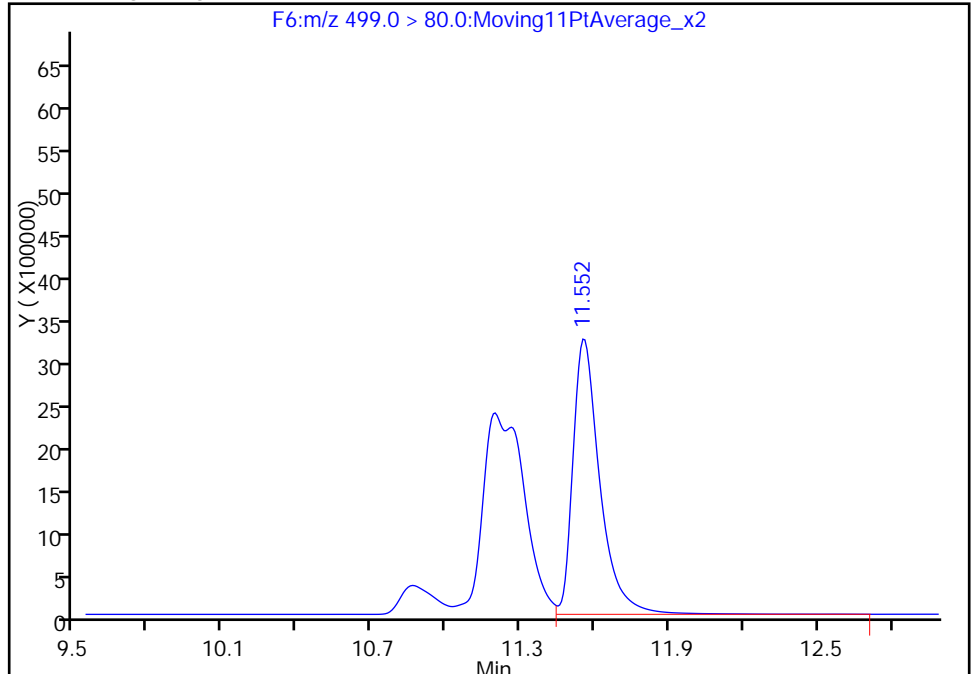
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Injection Date: 29-May-2016 12:21:43 Instrument ID: A6
Lims ID: 320-18986-A-7-A Lab Sample ID: 320-18986-7
Client ID: 46MW05_0516
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 58
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

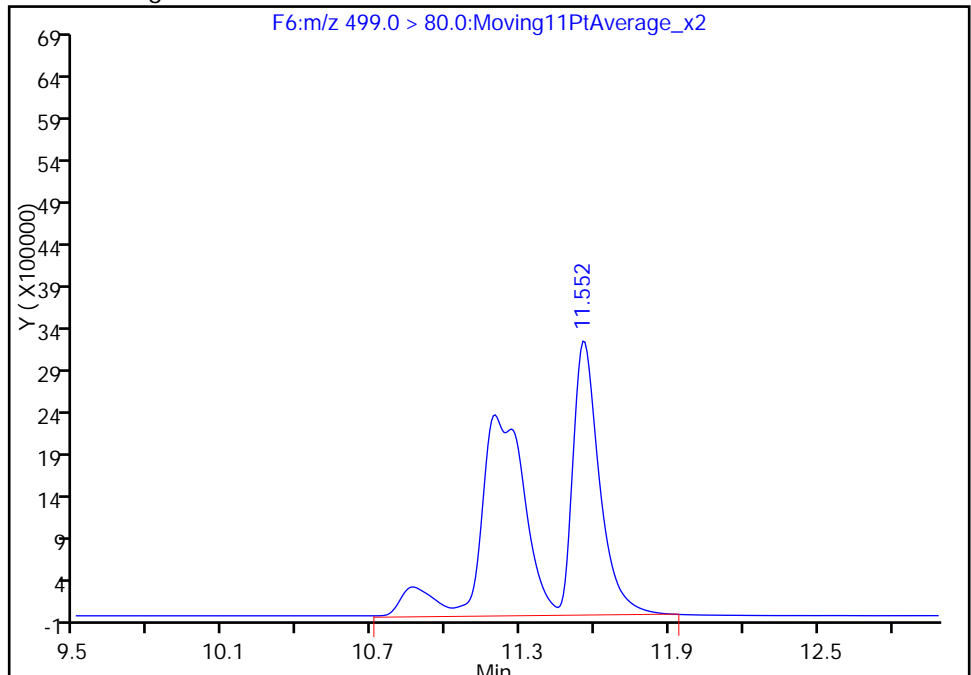
RT: 11.55
Area: 24447598
Amount: 955.4241
Amount Units: ng/ml

Processing Integration Results



RT: 11.55
Area: 54635769
Amount: 2135.1926
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:40:57
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

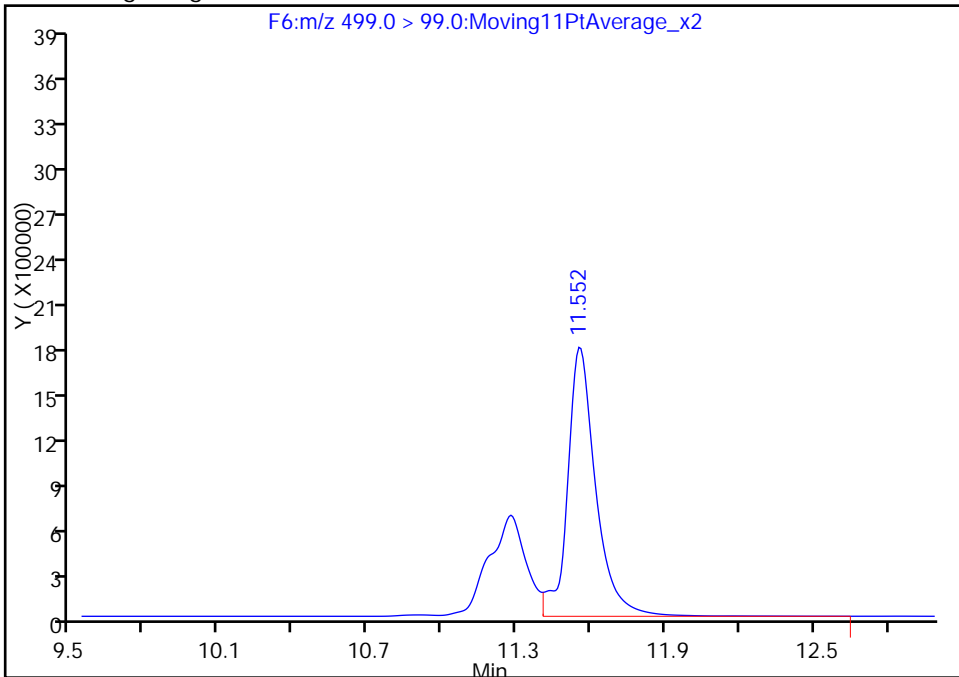
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Injection Date: 29-May-2016 12:21:43 Instrument ID: A6
Lims ID: 320-18986-A-7-A Lab Sample ID: 320-18986-7
Client ID: 46MW05_0516
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 58
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

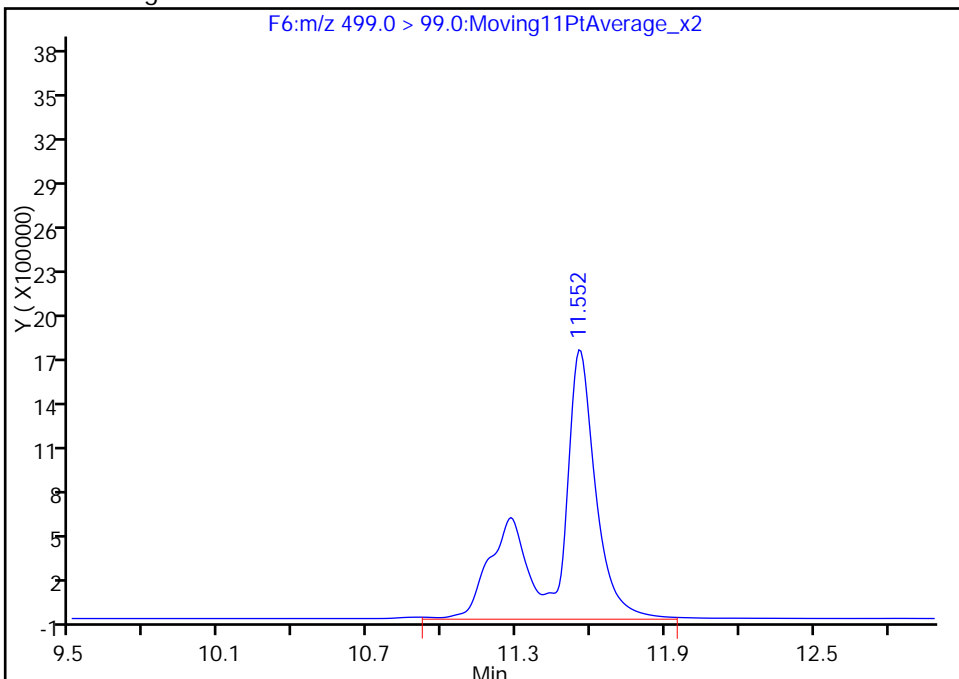
RT: 11.55
Area: 14064159
Amount: 955.4241
Amount Units: ng/ml

Processing Integration Results



RT: 11.55
Area: 21226385
Amount: 2135.1926
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

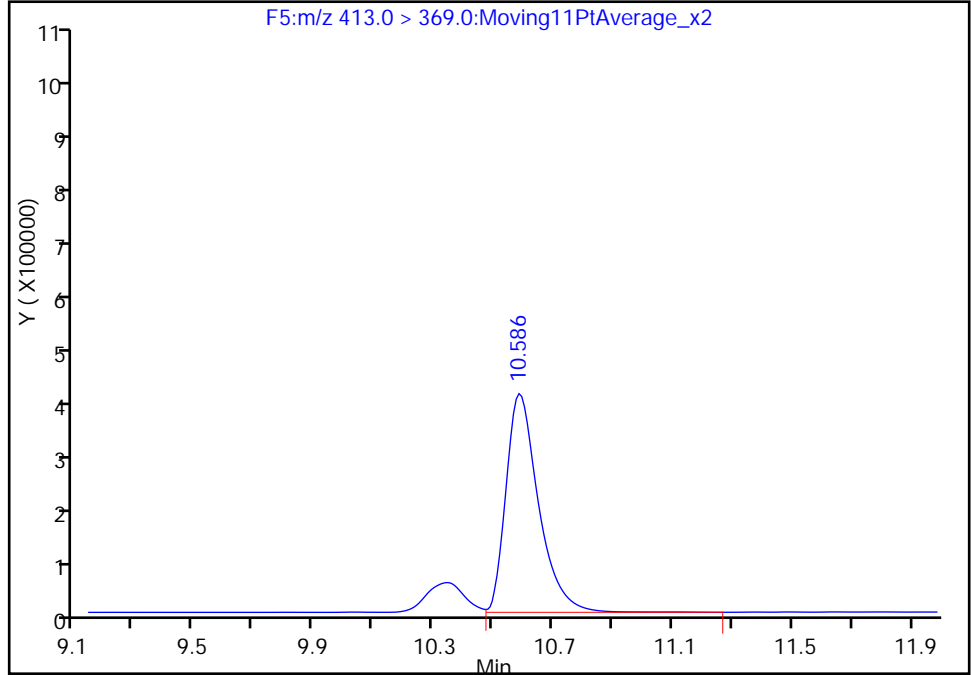
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Injection Date: 29-May-2016 12:21:43 Instrument ID: A6
Lims ID: 320-18986-A-7-A Lab Sample ID: 320-18986-7
Client ID: 46MW05_0516
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 58
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

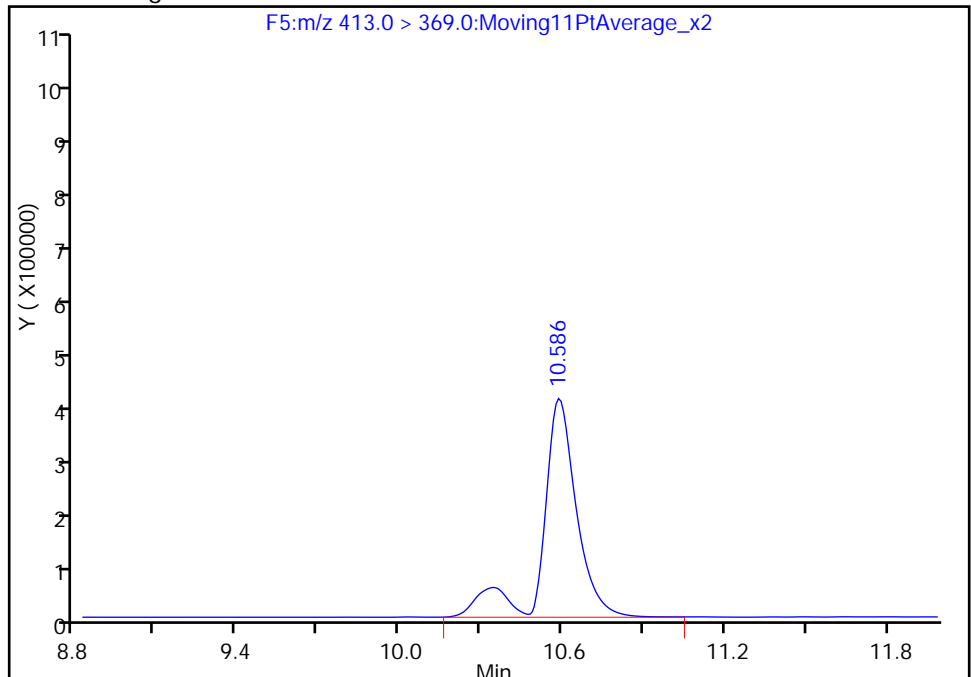
RT: 10.59
Area: 3058204
Amount: 57.465908
Amount Units: ng/ml

Processing Integration Results



RT: 10.59
Area: 3537980
Amount: 66.481253
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

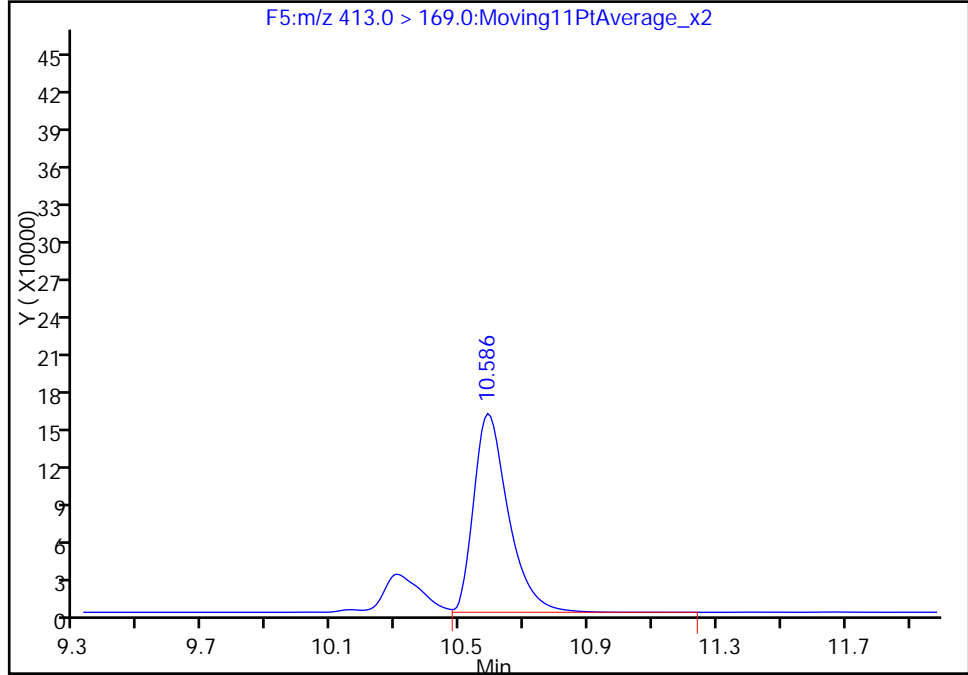
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Injection Date: 29-May-2016 12:21:43 Instrument ID: A6
Lims ID: 320-18986-A-7-A Lab Sample ID: 320-18986-7
Client ID: 46MW05_0516
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 58
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

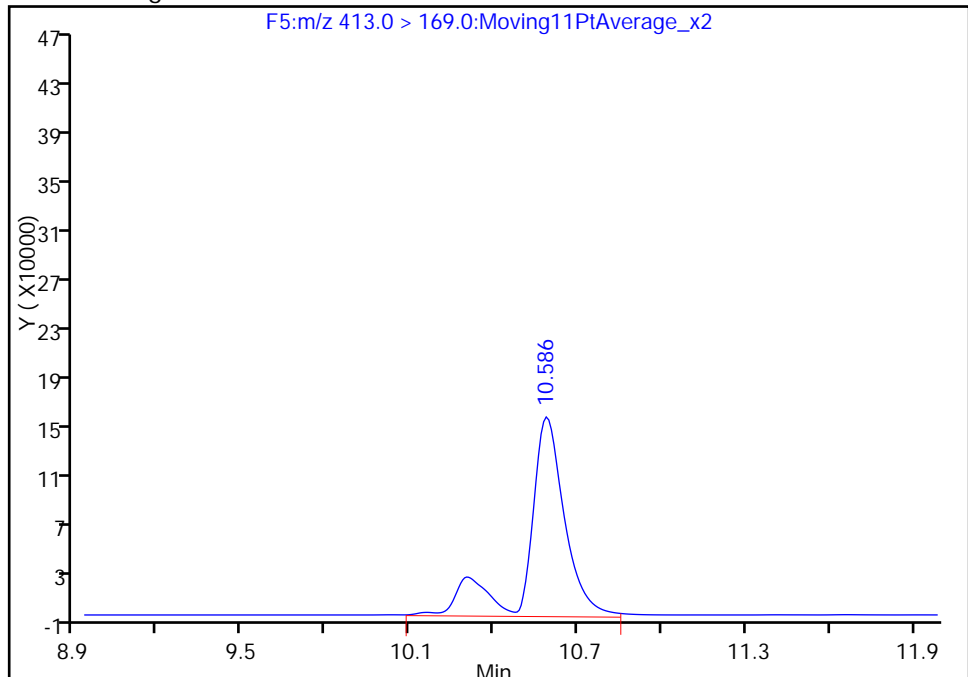
RT: 10.59
Area: 1188811
Amount: 57.465908
Amount Units: ng/ml

Processing Integration Results



RT: 10.59
Area: 1489539
Amount: 66.481253
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: 46MW05_0516 DL Lab Sample ID: 320-18986-7 DL
 Matrix: Water Lab File ID: 31MAY2016A6A_067.d
 Analysis Method: WS-LC-0025 Date Collected: 05/17/2016 12:31
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 509.1 (mL) Date Analyzed: 06/01/2016 11:43
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 10
 Injection Volume: 15 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 112007 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	<i>Perfluorobutanesulfonic acid (PFBS)</i>	38	D M	25	20	9.0
375-85-9	<i>Perfluoroheptanoic acid (PFHpA)</i>	15	J D	25	20	7.9
355-46-4	<i>Perfluorohexanesulfonic acid (PFHxS)</i>	740	D M	25	20	8.5
375-95-1	<i>Perfluorononanoic acid (PFNA)</i>	20	U M	25	20	6.4
1763-23-1	<i>Perfluorooctanesulfonic acid (PFOS)</i>	3100	D M	39	29	13
335-67-1	<i>Perfluorooctanoic acid (PFOA)</i>	120	D M	25	20	7.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		25-150
STL00990	13C4 PFOA	100		25-150
STL00991	13C4 PFOS	114		25-150
STL01892	13C4-PFHpA	91		25-150
STL00995	13C5 PFNA	87		25-150
STL00994	18O2 PFHxS	118		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_067.d
 Lims ID: 320-18986-A-7-A
 Client ID: 46MW05_0516
 Sample Type: Client
 Inject. Date: 01-Jun-2016 11:43:49 ALS Bottle#: 33 Worklist Smp#: 65
 Injection Vol: 15.0 ul Dil. Factor: 10.0000
 Sample Info: 320-18986-a-7-a 10X BOX 80
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Jun-2016 15:33:27 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK032

First Level Reviewer: barnettj Date: 01-Jun-2016 15:59:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										M
298.9 > 80.0	7.088	7.099	-0.011	1.000	90939	1.92				M
D 6 13C2 PFHxA										
315.0 > 270.0	8.236	8.252	-0.016		275585	4.50		9.0	20099	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.481	9.494	-0.013	1.000	74589	0.7480			217	
D 8 13C4-PFHpA										
367.0 > 322.0	9.481	9.495	-0.014		313431	4.57		9.1	24540	
D 11 18O2 PFHxS										
403.0 > 84.0	9.518	9.532	-0.014		172536	5.59		11.8	8648	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.518	9.533	-0.015	1.000	1291746	37.8				M
D 12 13C4 PFOA										
417.0 > 372.0	10.605	10.612	-0.007		364126	5.00		10.0	23582	
13 Perfluorooctanoic acid										M
413.0 > 369.0	10.605	10.612	-0.007	1.000	447248	5.98			145	M
413.0 > 169.0	10.605	10.612	-0.007	1.000	185465		2.41(0.00-0.00)		463	M
D 16 13C4 PFOS										
503.0 > 80.0	11.560	11.568	-0.008		216862	5.46		11.4	15355	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.560	11.571	-0.011	1.000	8876789	158.4			1846	M
499.0 > 99.0	11.560	11.571	-0.011	1.000	3610036		2.46(0.00-0.00)		1838	M
D 17 13C5 PFNA										
468.0 > 423.0	11.586	11.589	-0.003		291203	4.37		8.7	20603	
18 Perfluorononanoic acid										M
463.0 > 419.0	11.611	11.589	0.022	1.000	1479	0.0294			23.3	M

QC Flag Legend

Review Flags

M - Manually Integrated

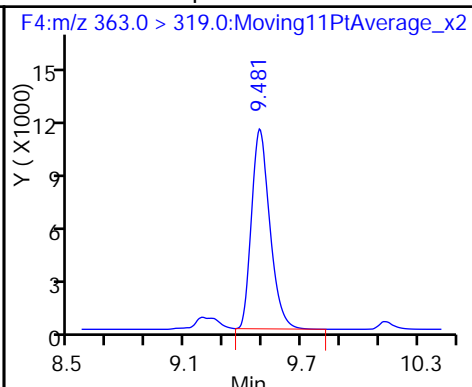
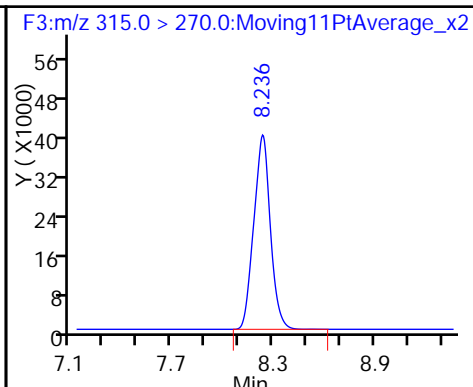
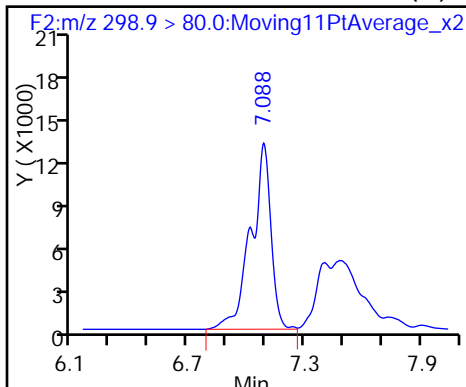
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_067.d
Injection Date: 01-Jun-2016 11:43:49 Instrument ID: A6
Lims ID: 320-18986-A-7-A Lab Sample ID: 320-18986-7
Client ID: 46MW05_0516
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 65
Injection Vol: 15.0 ul Dil. Factor: 10.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid (M)

D 6 13C2 PFHxA

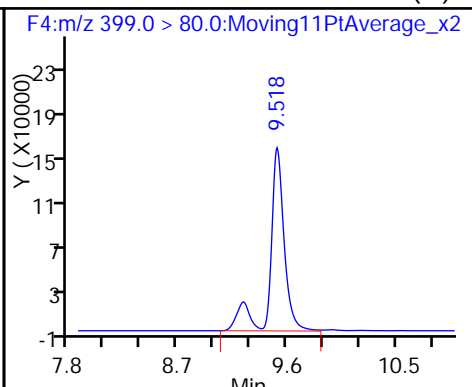
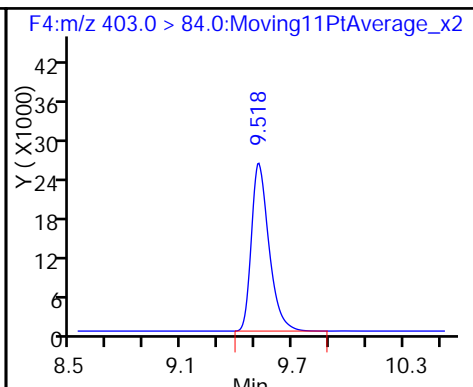
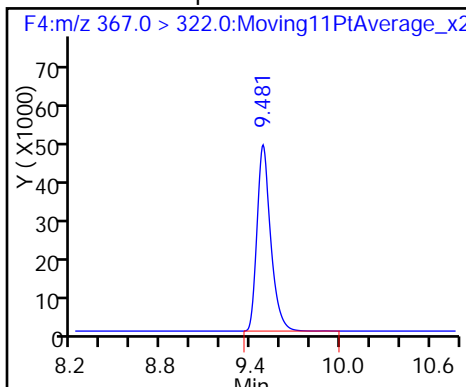
9 Perfluoroheptanoic acid



D 8 13C4-PFHpA

D 11 18O2 PFHxS

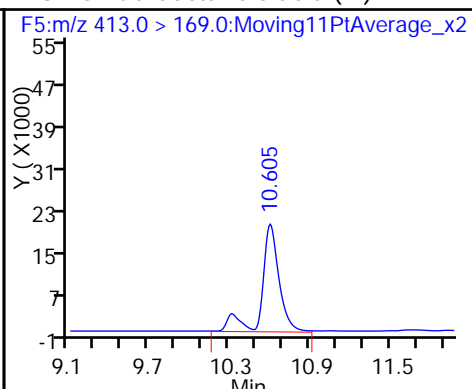
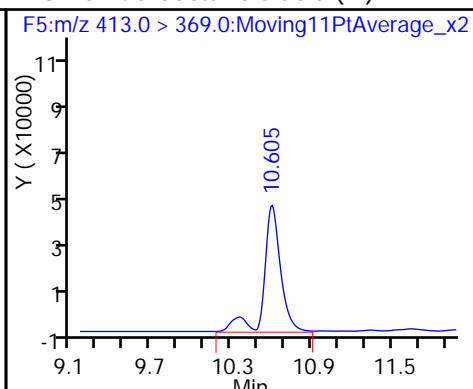
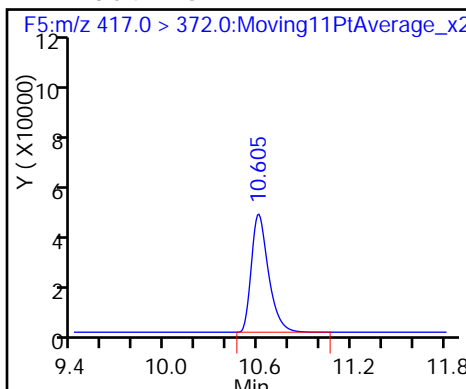
41 Perfluorohexanesulfonic acid (M)



D 12 13C4 PFOA

13 Perfluorooctanoic acid (M)

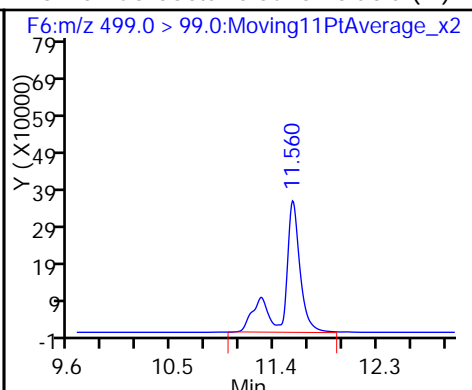
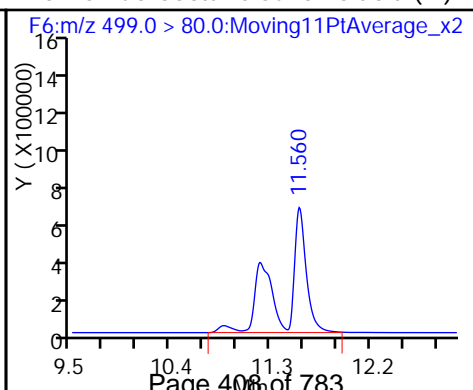
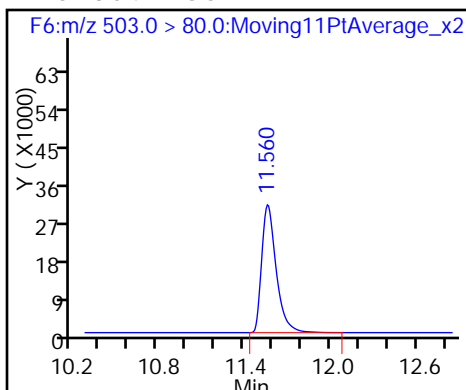
13 Perfluorooctanoic acid (M)



D 16 13C4 PFOS

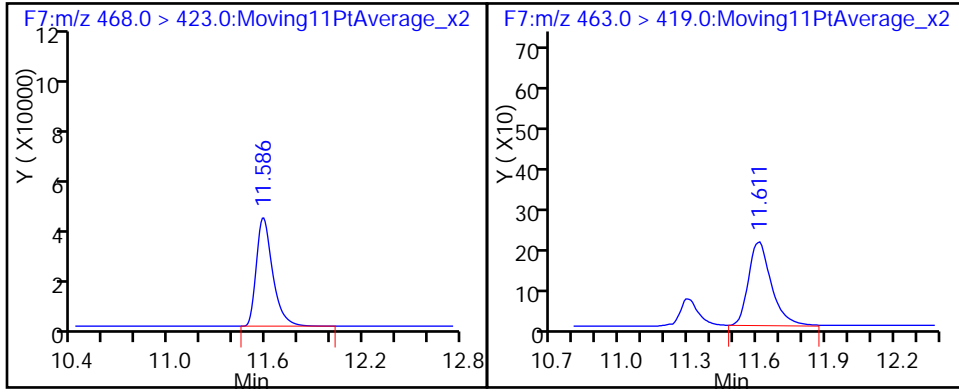
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid (M)



TestAmerica Sacramento

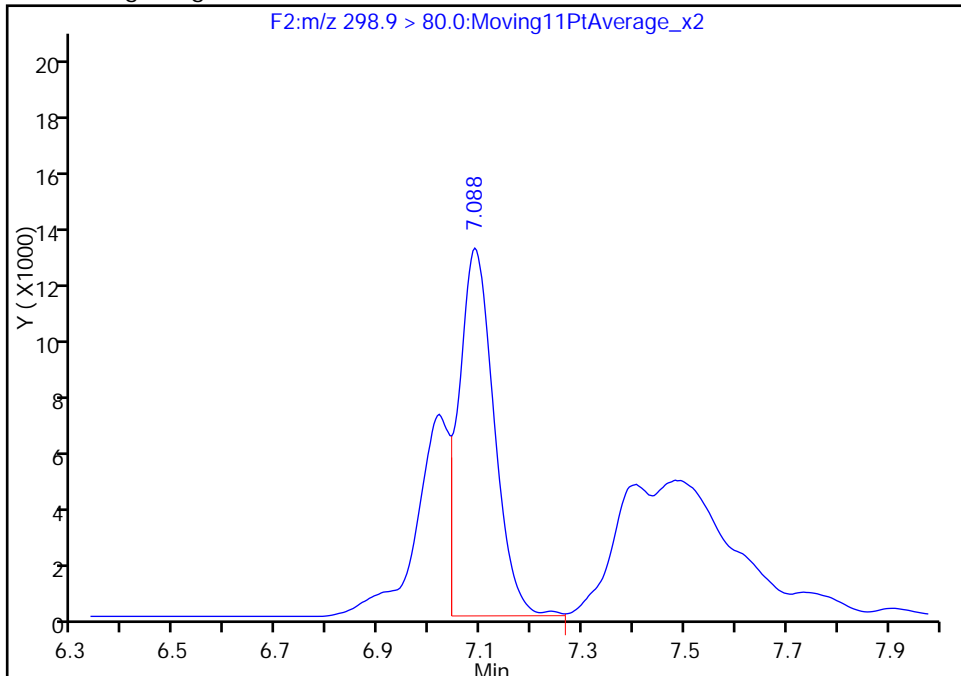
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Injection Date: 01-Jun-2016 11:43:49 Instrument ID: A6
Lims ID: 320-18986-A-7-A Lab Sample ID: 320-18986-7
Client ID: 46MW05_0516
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 65
Injection Vol: 15.0 ul Dil. Factor: 10.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F2:MRM

40 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

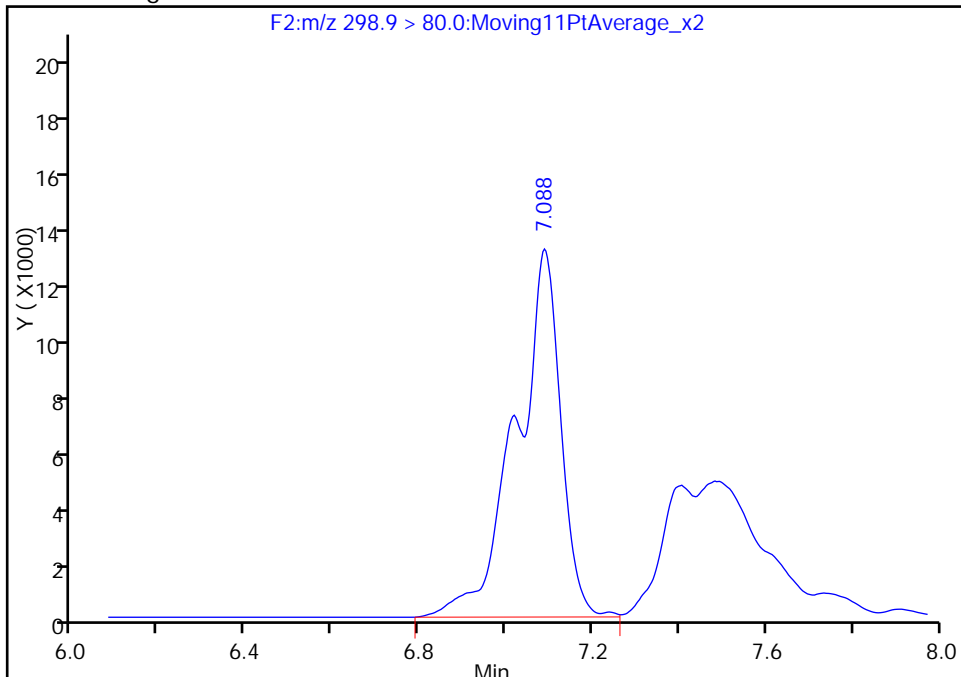
RT: 7.09
Area: 59397
Amount: 1.252335
Amount Units: ng/ml

Processing Integration Results



RT: 7.09
Area: 90939
Amount: 1.917371
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

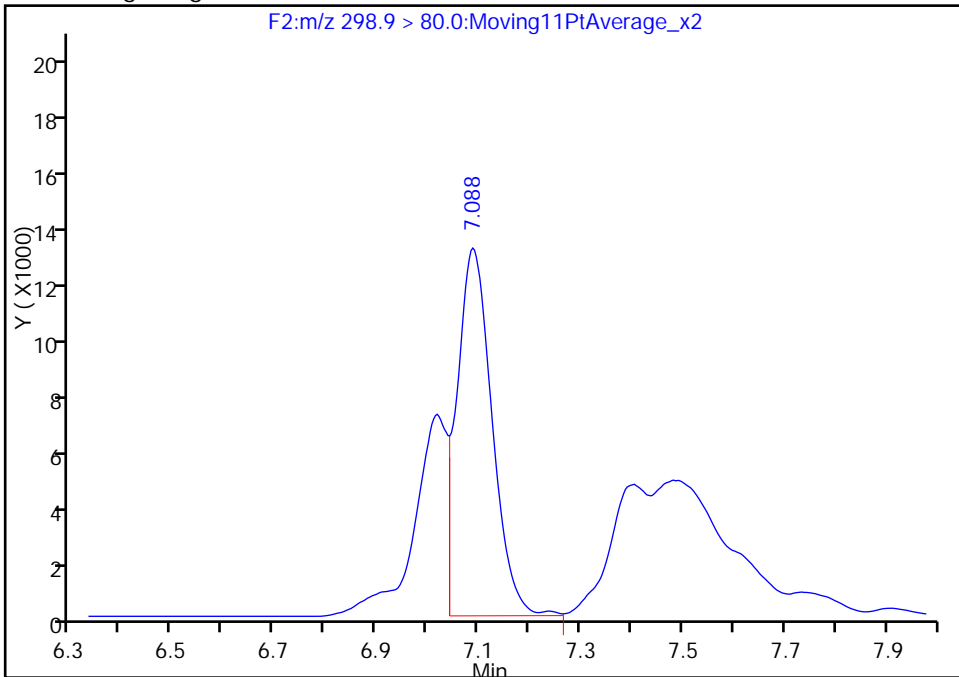
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Injection Date: 01-Jun-2016 11:43:49 Instrument ID: A6
Lims ID: 320-18986-A-7-A Lab Sample ID: 320-18986-7
Client ID: 46MW05_0516
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 65
Injection Vol: 15.0 ul Dil. Factor: 10.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F2:MRM

40 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

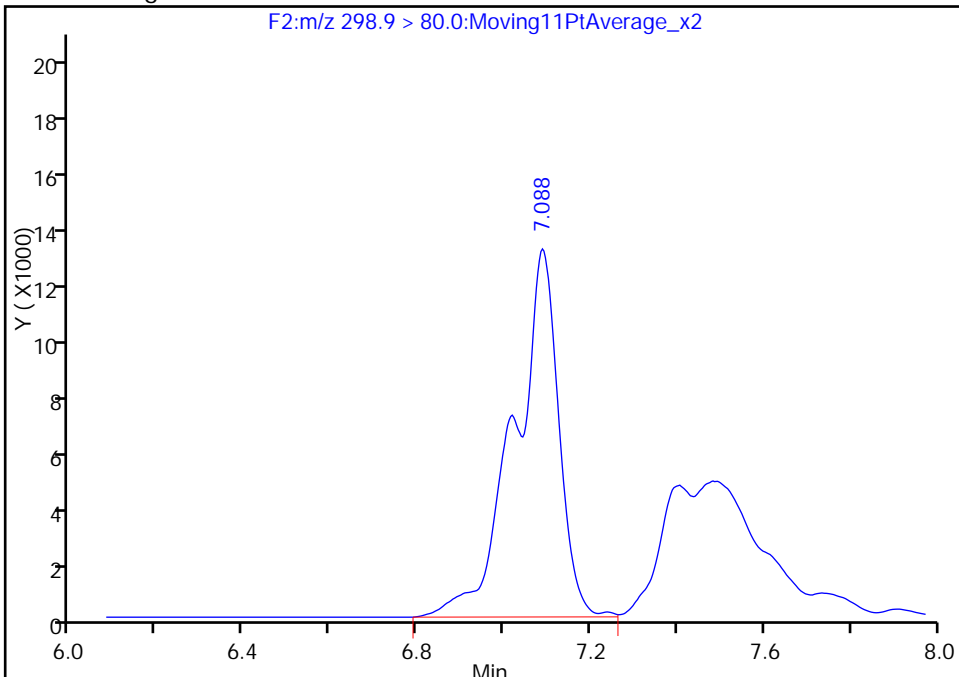
RT: 7.09
Area: 59397
Amount: 1.252335
Amount Units: ng/ml

Processing Integration Results



RT: 7.09
Area: 90939
Amount: 1.917371
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

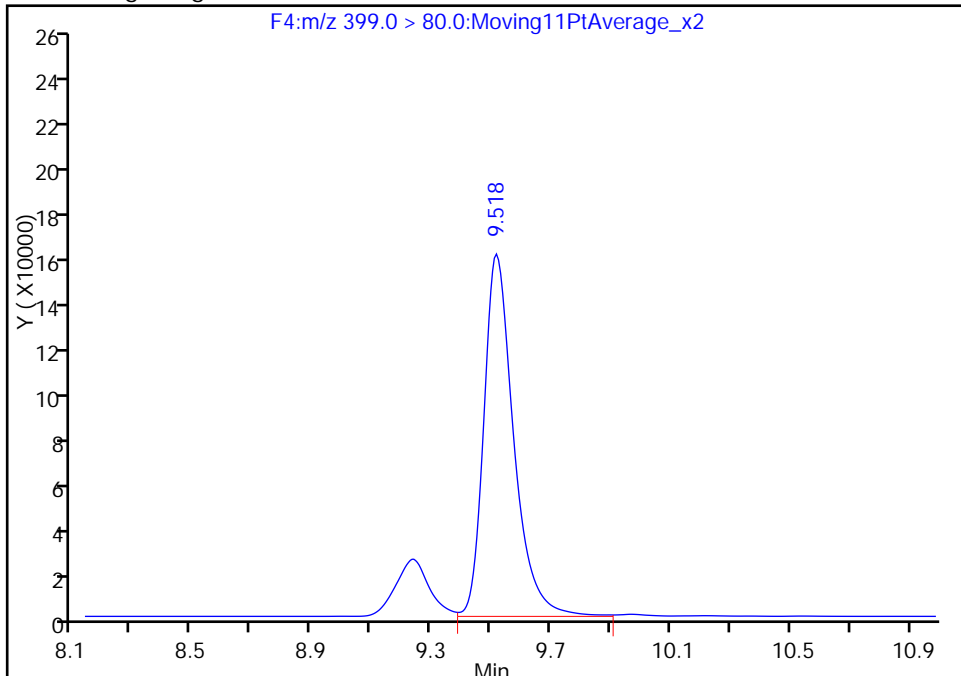
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Injection Date: 01-Jun-2016 11:43:49 Instrument ID: A6
Lims ID: 320-18986-A-7-A Lab Sample ID: 320-18986-7
Client ID: 46MW05_0516
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 65
Injection Vol: 15.0 ul Dil. Factor: 10.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

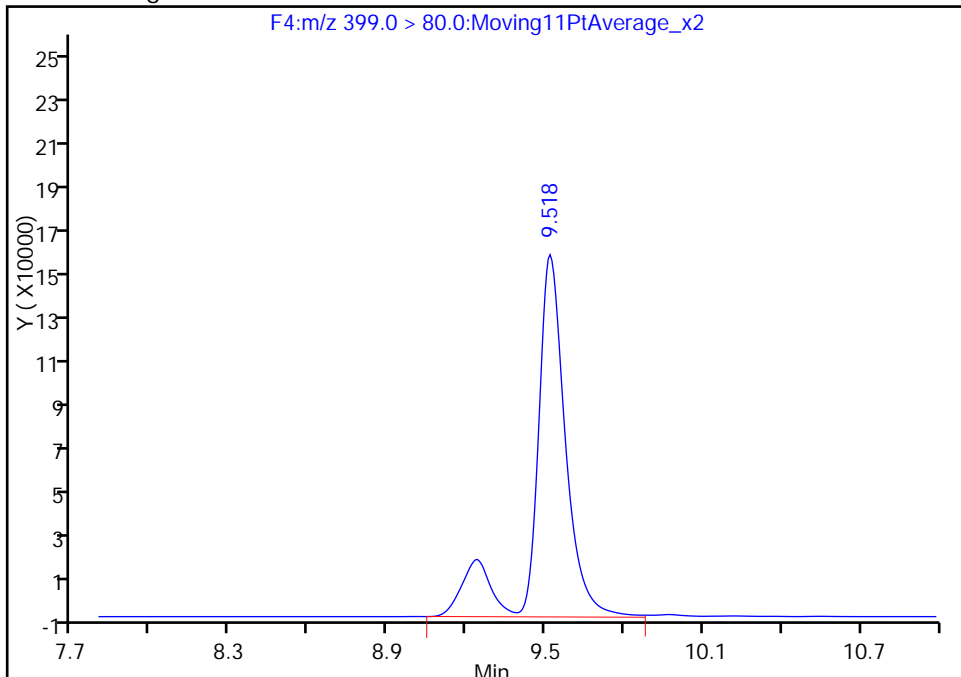
RT: 9.52
Area: 1095100
Amount: 32.053287
Amount Units: ng/ml

Processing Integration Results



RT: 9.52
Area: 1291746
Amount: 37.809063
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

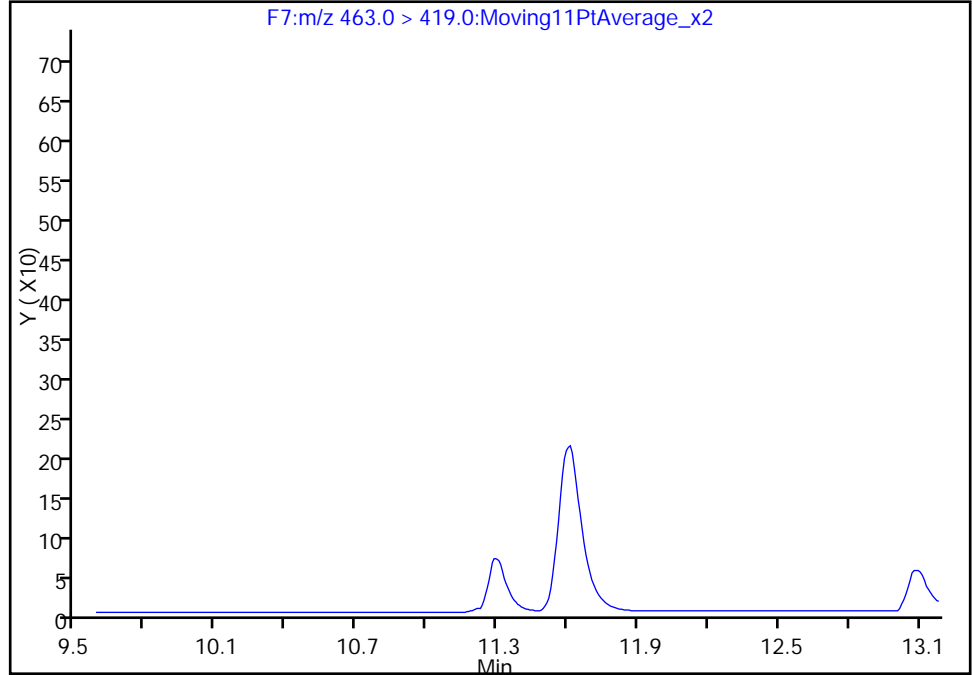
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Injection Date: 01-Jun-2016 11:43:49 Instrument ID: A6
Lims ID: 320-18986-A-7-A Lab Sample ID: 320-18986-7
Client ID: 46MW05_0516
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 65
Injection Vol: 15.0 ul Dil. Factor: 10.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F7:M/RM

18 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

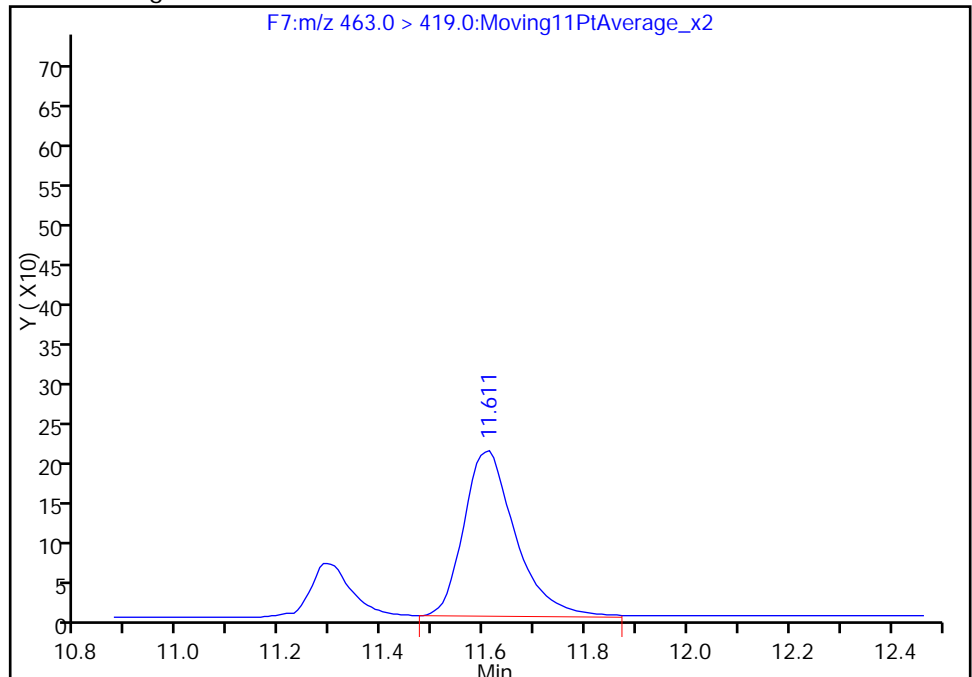
Not Detected
Expected RT: 11.59

Processing Integration Results



RT: 11.61
Area: 1479
Amount: 0.029395
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 01-Jun-2016 15:59:35
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

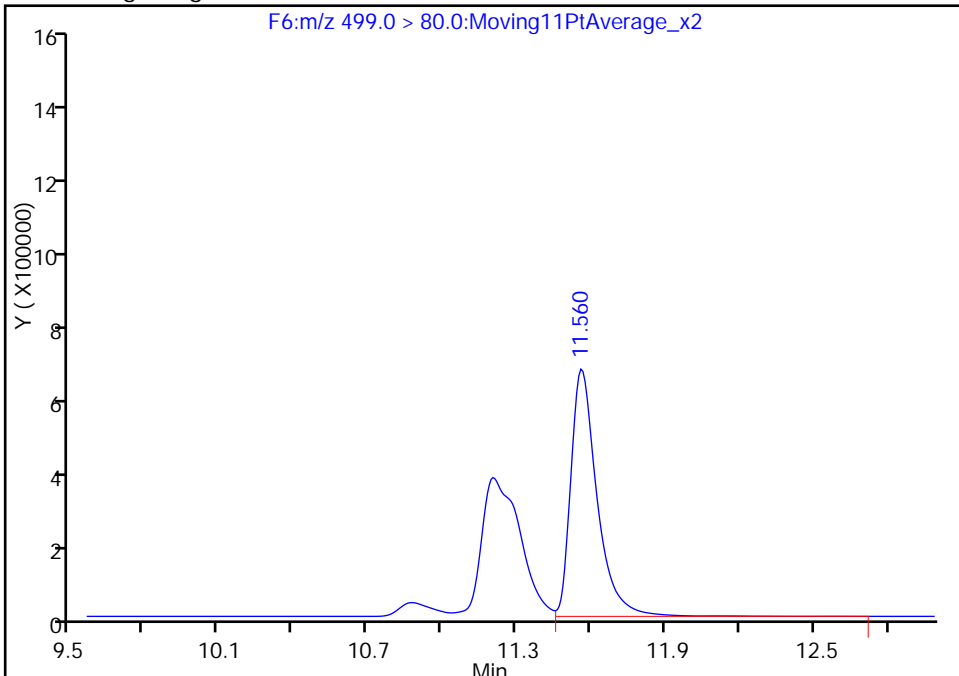
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Injection Date: 01-Jun-2016 11:43:49 Instrument ID: A6
Lims ID: 320-18986-A-7-A Lab Sample ID: 320-18986-7
Client ID: 46MW05_0516
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 65
Injection Vol: 15.0 ul Dil. Factor: 10.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

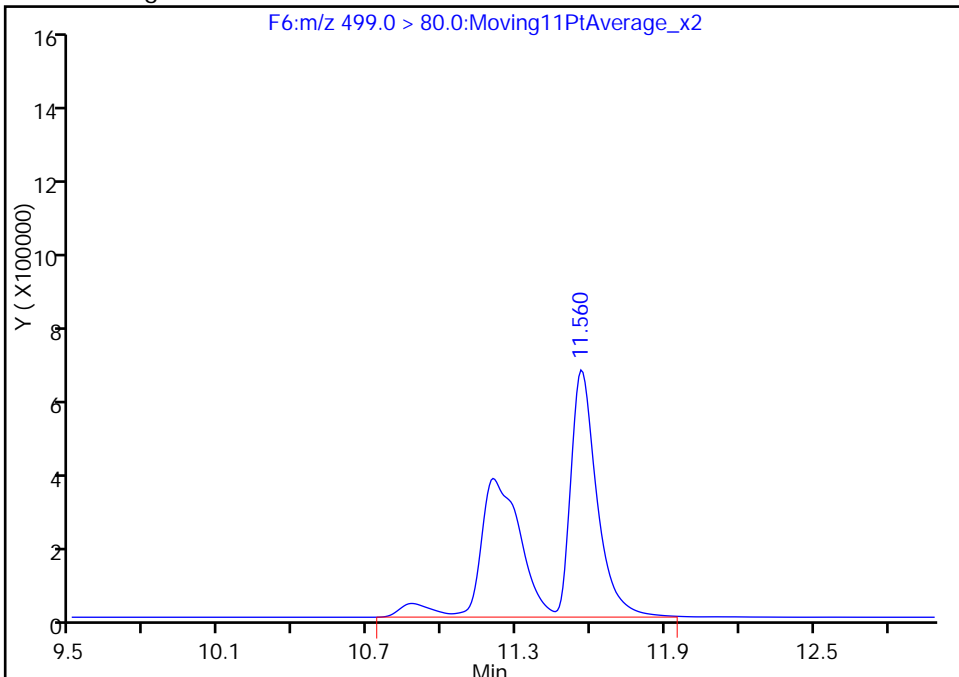
RT: 11.56
Area: 4734286
Amount: 84.468744
Amount Units: ng/ml

Processing Integration Results



RT: 11.56
Area: 8876789
Amount: 158.3789
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 01-Jun-2016 15:59:35
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

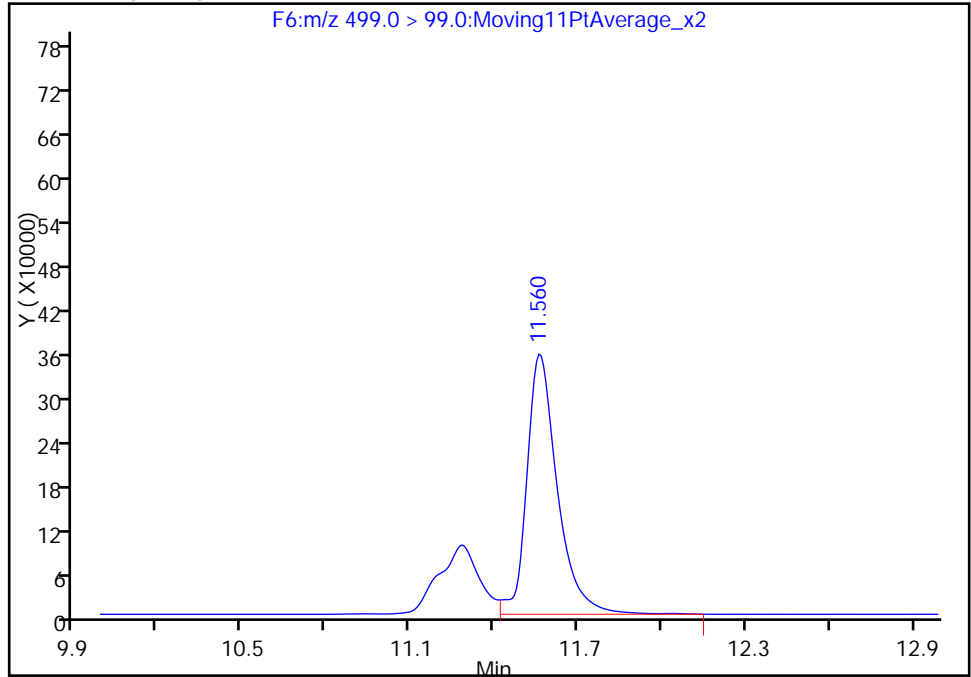
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Injection Date: 01-Jun-2016 11:43:49 Instrument ID: A6
Lims ID: 320-18986-A-7-A Lab Sample ID: 320-18986-7
Client ID: 46MW05_0516
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 65
Injection Vol: 15.0 ul Dil. Factor: 10.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

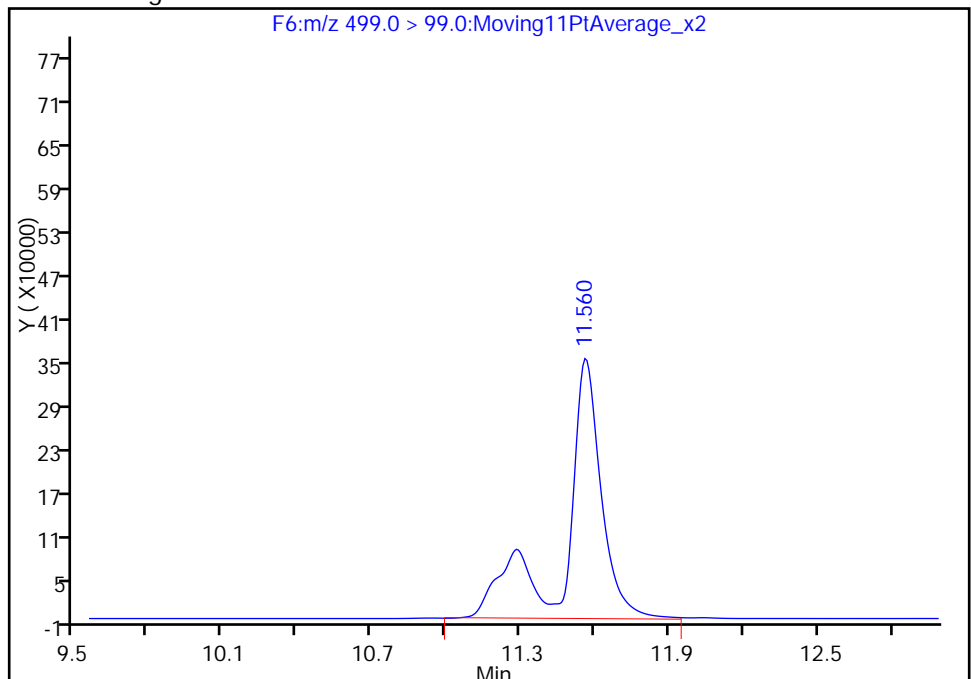
RT: 11.56
Area: 2684956
Amount: 84.468744
Amount Units: ng/ml

Processing Integration Results



RT: 11.56
Area: 3610036
Amount: 158.3789
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

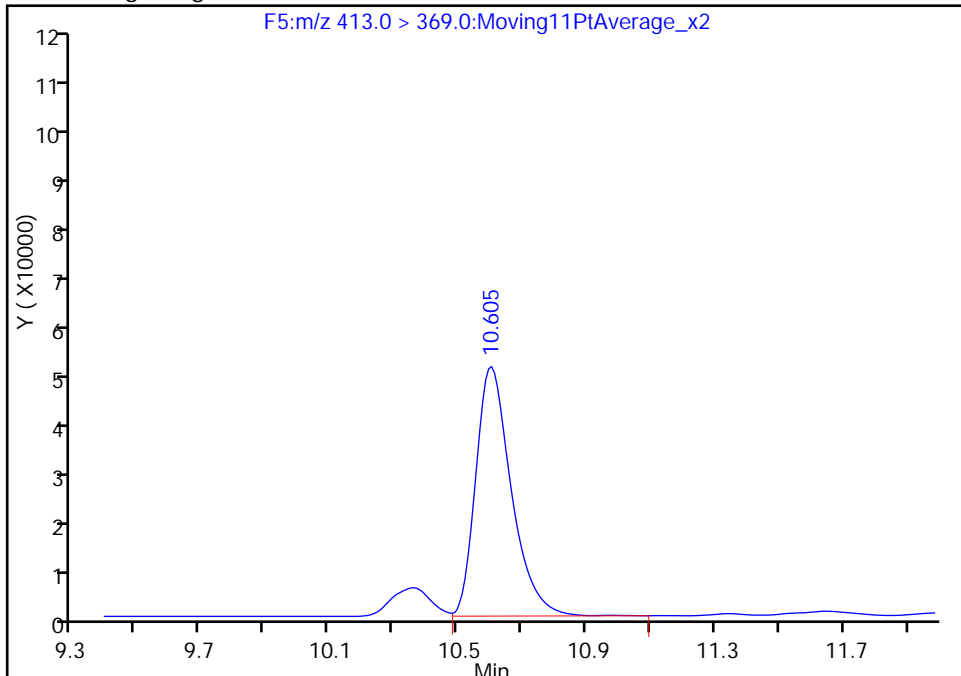
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Lims ID: 320-18986-A-7-A Lab Sample ID: 320-18986-7
Client ID: 46MW05_0516
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 65
Injection Vol: 15.0 ul Dil. Factor: 10.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

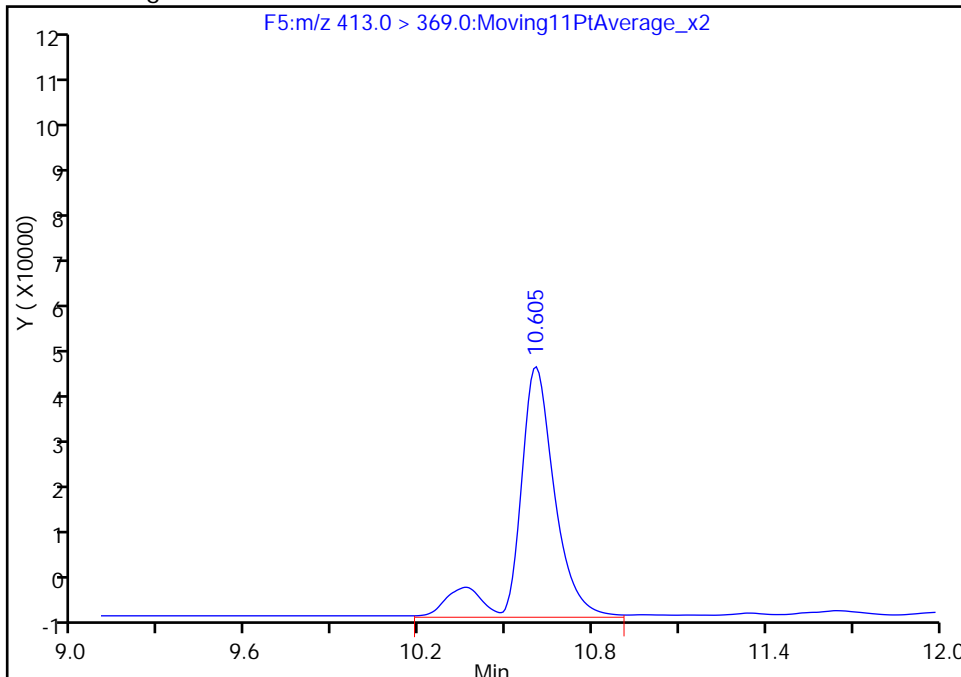
RT: 10.60
Area: 385091
Amount: 5.151276
Amount Units: ng/ml

Processing Integration Results



RT: 10.60
Area: 447248
Amount: 5.982736
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 01-Jun-2016 15:59:35
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

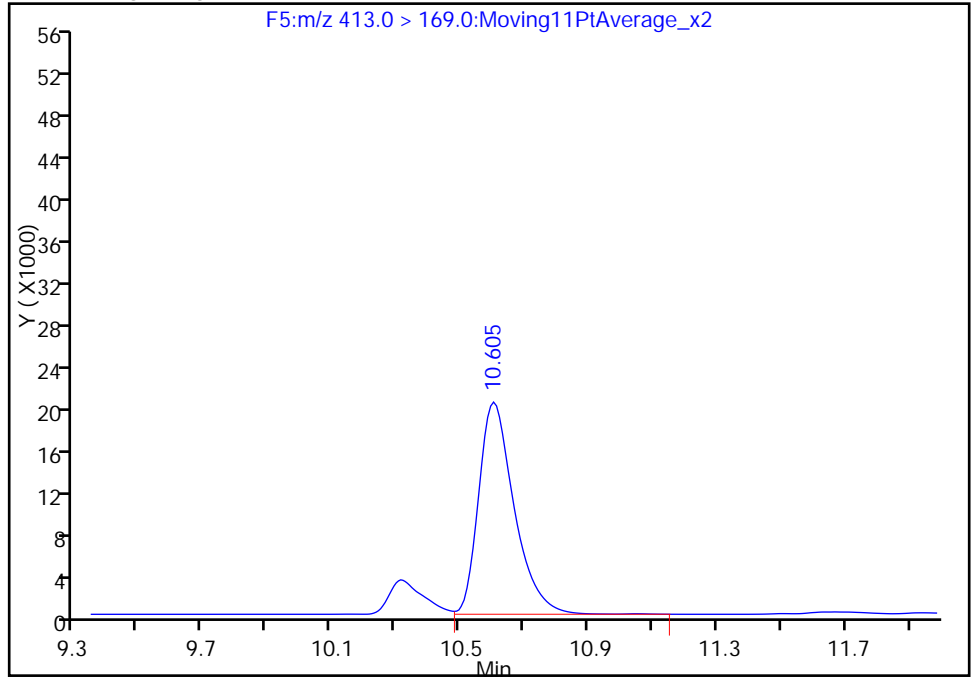
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Injection Date: 01-Jun-2016 11:43:49 Instrument ID: A6
Lims ID: 320-18986-A-7-A Lab Sample ID: 320-18986-7
Client ID: 46MW05_0516
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 65
Injection Vol: 15.0 ul Dil. Factor: 10.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

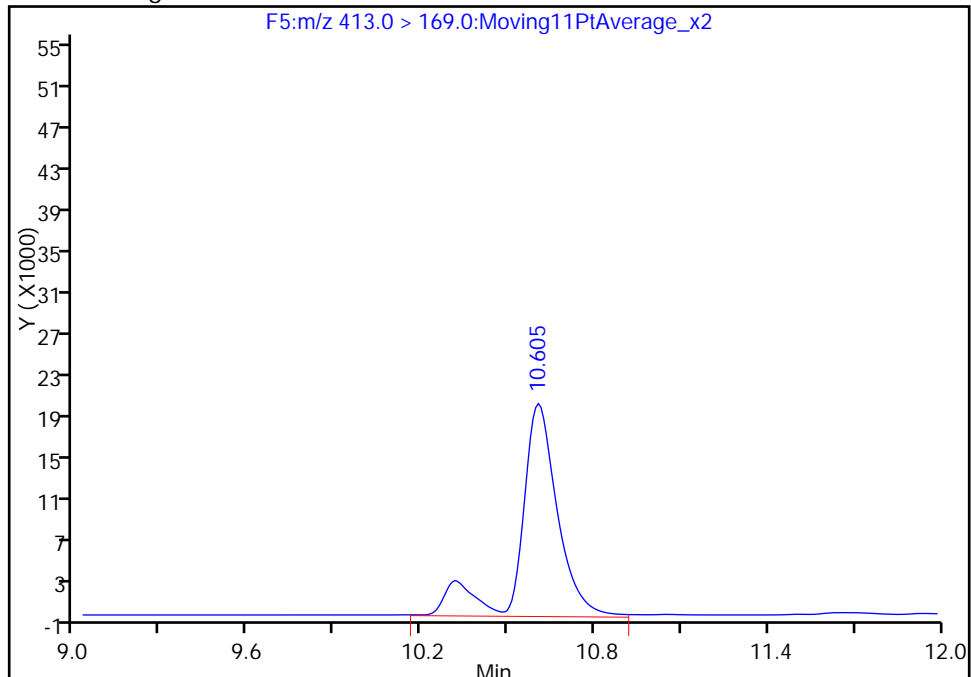
RT: 10.60
Area: 155560
Amount: 5.151276
Amount Units: ng/ml

Processing Integration Results



RT: 10.60
Area: 185465
Amount: 5.982736
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: 46MW04_0516 Lab Sample ID: 320-18986-8
 Matrix: Water Lab File ID: 28MAY2016A6A_060.d
 Analysis Method: WS-LC-0025 Date Collected: 05/17/2016 12:26
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 522.1(mL) Date Analyzed: 05/29/2016 12:42
 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.: 111859 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	21		2.4	1.9	0.88
375-85-9	Perfluoroheptanoic acid (PFHpA)	11		2.4	1.9	0.77
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	810	J M	2.4	1.9	0.83
375-95-1	Perfluorononanoic acid (PFNA)	8.6		2.4	1.9	0.63
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3100	J M	3.8	2.9	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	30	M	2.4	1.9	0.72

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	106		25-150
STL00990	13C4 PFOA	106		25-150
STL00991	13C4 PFOS	61		25-150
STL01892	13C4-PFHpA	92		25-150
STL00995	13C5 PFNA	57		25-150
STL00994	18O2 PFHxS	88		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_060.d
 Lims ID: 320-18986-A-8-A
 Client ID: 46MW04_0516
 Sample Type: Client
 Inject. Date: 29-May-2016 12:42:59 ALS Bottle#: 34 Worklist Smp#: 59
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-8-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 17:46:27 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj Date: 31-May-2016 17:42:43

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.081	7.085	-0.004	1.000	345885	10.9				
D 6 13C2 PFHxA										
315.0 > 270.0	8.225	8.236	-0.011		3091771	53.0		106	23131	
D 8 13C4-PFHpA										
367.0 > 322.0	9.464	9.474	-0.010		2864300	46.2		92.4	131692	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.464	9.475	-0.011	1.000	432446	5.88			184	
D 11 18O2 PFHxS										
403.0 > 84.0	9.505	9.507	-0.002		1187901	41.6		88.0	9100	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.505	9.507	-0.002	1.000	9695829	422.1				EM EM
D 12 13C4 PFOA										
417.0 > 372.0	10.586	10.586	0.0		3553055	52.8		106	119013	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.586	10.587	-0.001	1.000	1149097	15.9			824	M
413.0 > 169.0	10.586	10.587	-0.001	1.000	432395		2.66(0.00-0.00)		940	M
D 16 13C4 PFOS										
503.0 > 80.0	11.560	11.543	0.017		1025539	29.2		61.0	35074	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.560	11.545	0.015	1.000	42994610	1596.3			2679	EM
499.0 > 99.0	11.560	11.545	0.015	1.000	19644245		2.19(0.00-0.00)		2010	M
D 17 13C5 PFNA										
468.0 > 423.0	11.578	11.562	0.016		1775910	28.6		57.3	127301	
18 Perfluorononanoic acid										
463.0 > 419.0	11.578	11.563	0.015	1.000	135300	4.51			237	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

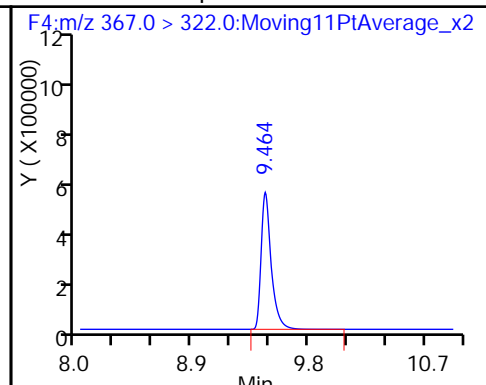
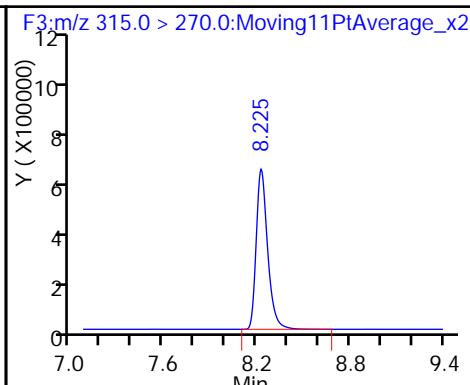
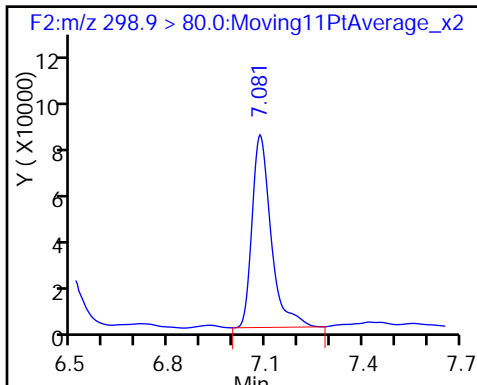
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_060.d
Injection Date: 29-May-2016 12:42:59 Instrument ID: A6
Lims ID: 320-18986-A-8-A Lab Sample ID: 320-18986-8
Client ID: 46MW04_0516
Operator ID: JRB ALS Bottle#: 34 Worklist Smp#: 59
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxA

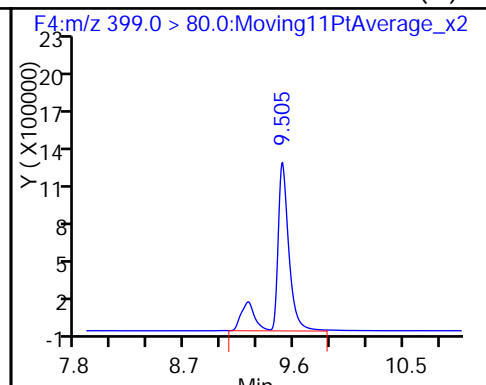
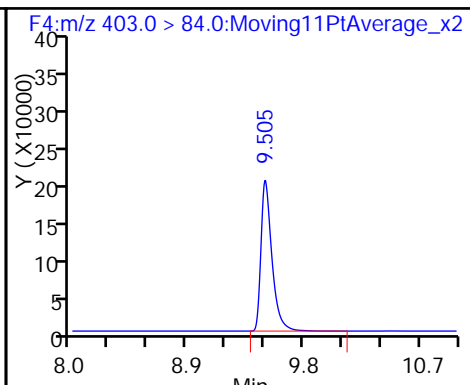
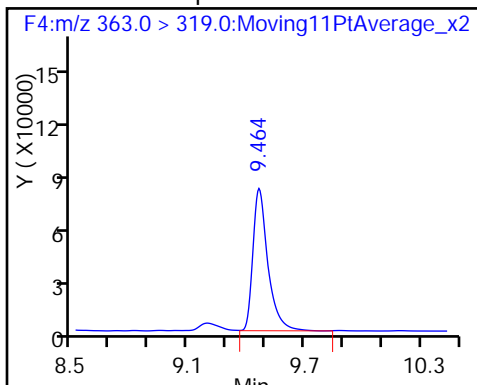
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid

D 11 18O2 PFHxS

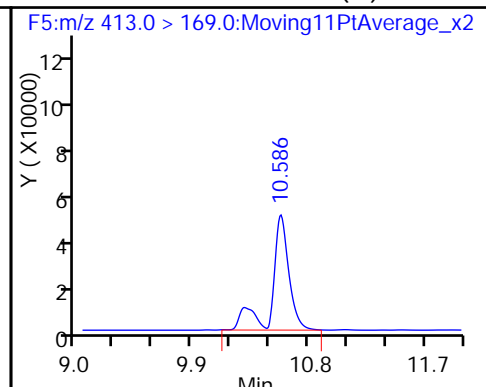
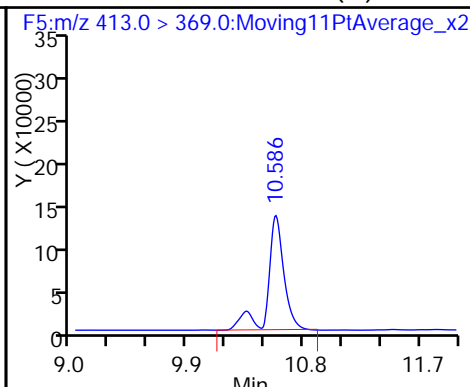
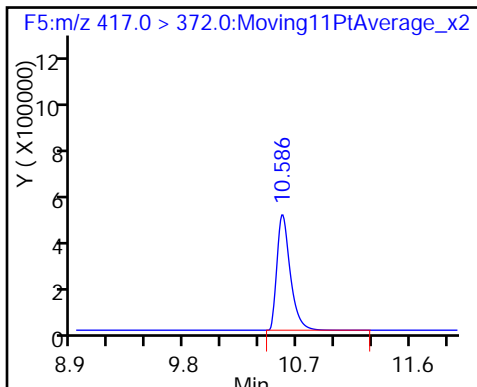
41 Perfluorohexanesulfonic acid (M)



D 12 13C4 PFOA

13 Perfluorooctanoic acid (M)

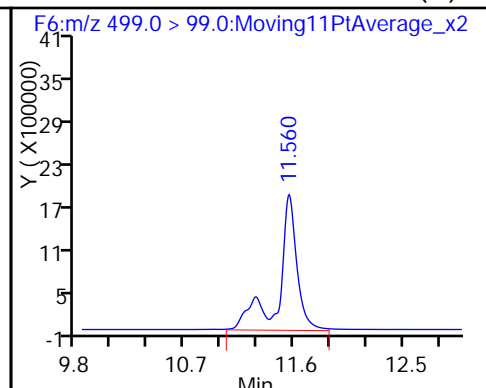
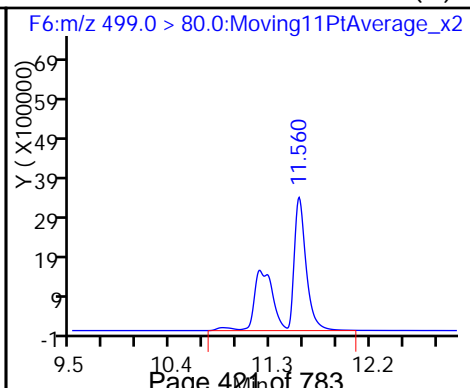
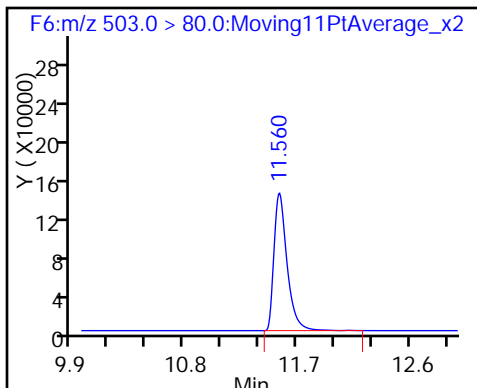
13 Perfluorooctanoic acid (M)



D 16 13C4 PFOS

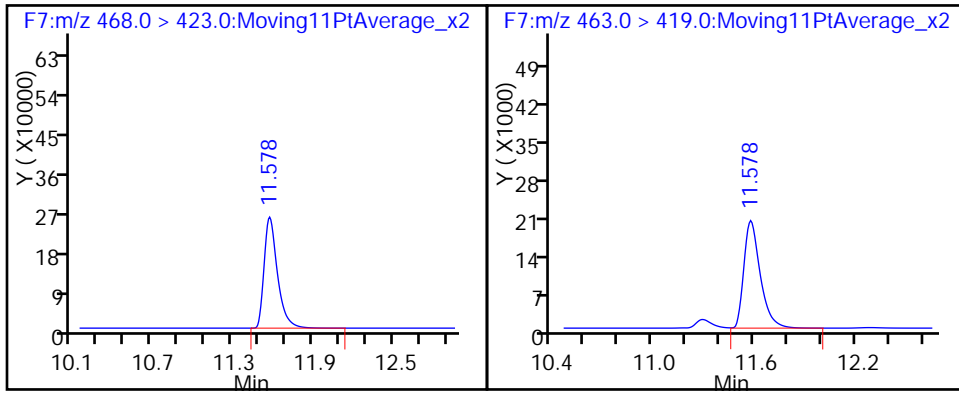
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid



TestAmerica Sacramento

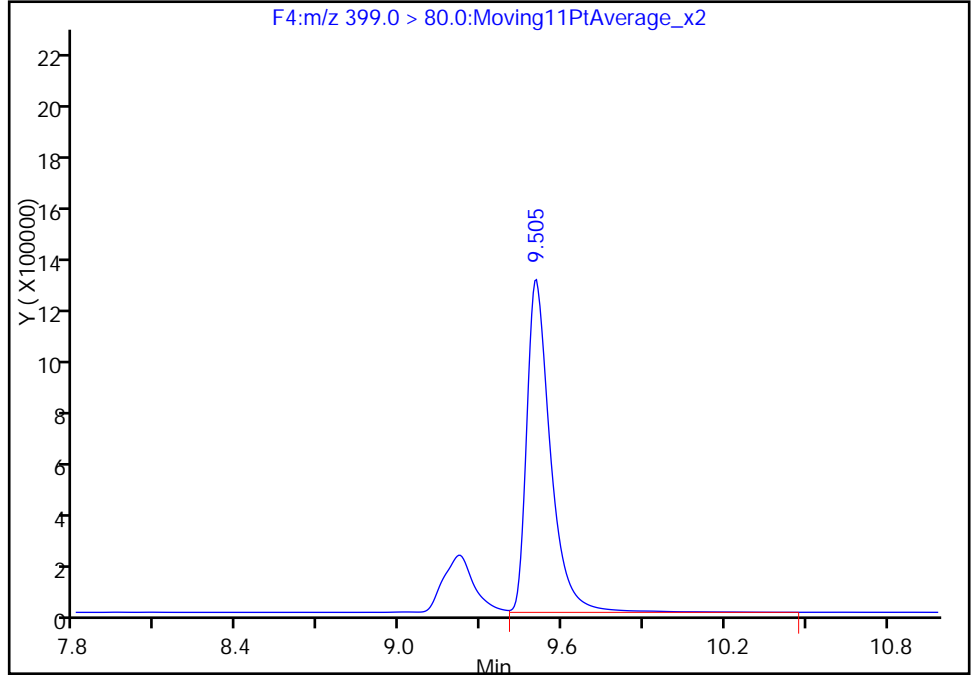
Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_060.d
Injection Date: 29-May-2016 12:42:59 Instrument ID: A6
Lims ID: 320-18986-A-8-A Lab Sample ID: 320-18986-8
Client ID: 46MW04_0516
Operator ID: JRB ALS Bottle#: 34 Worklist Smp#: 59
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

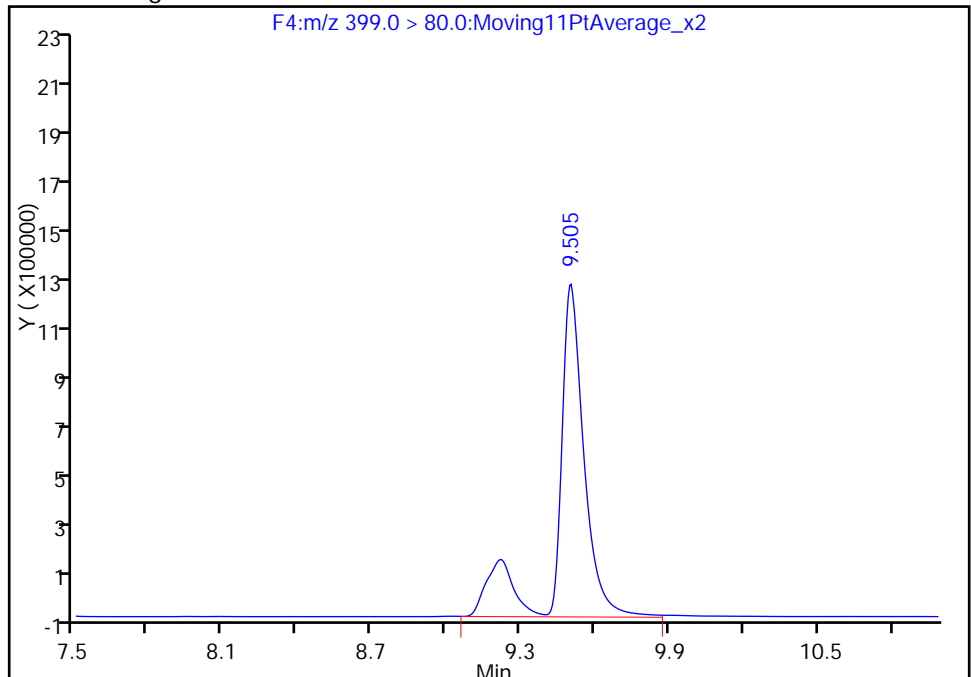
RT: 9.50
Area: 7974406
Amount: 347.1667
Amount Units: ng/ml

Processing Integration Results



RT: 9.50
Area: 9695829
Amount: 422.1091
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:42:43
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

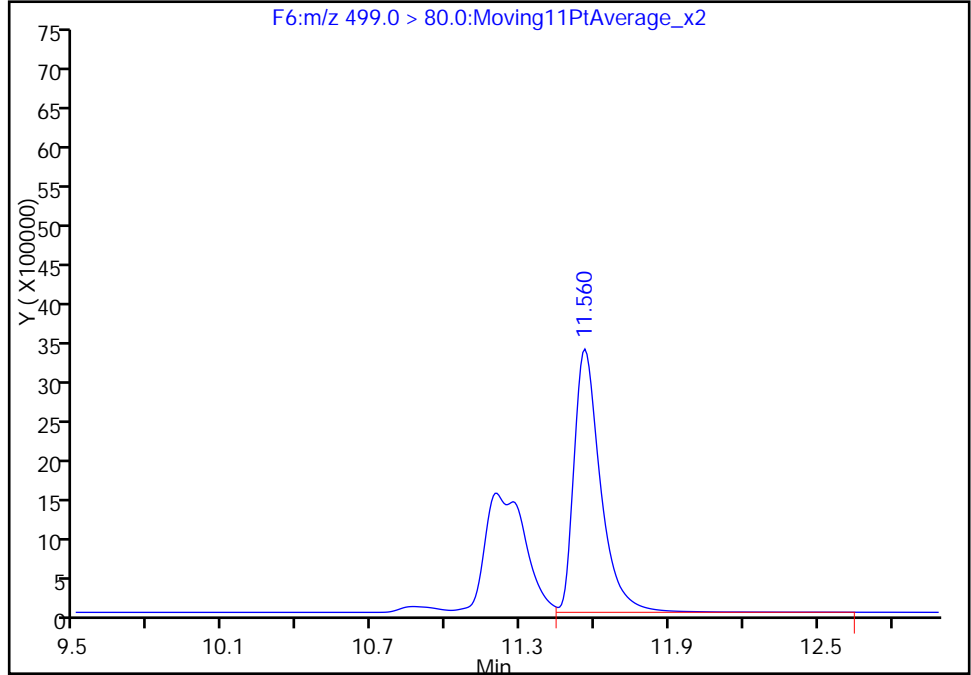
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Injection Date: 29-May-2016 12:42:59 Instrument ID: A6
Lims ID: 320-18986-A-8-A Lab Sample ID: 320-18986-8
Client ID: 46MW04_0516
Operator ID: JRB ALS Bottle#: 34 Worklist Smp#: 59
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

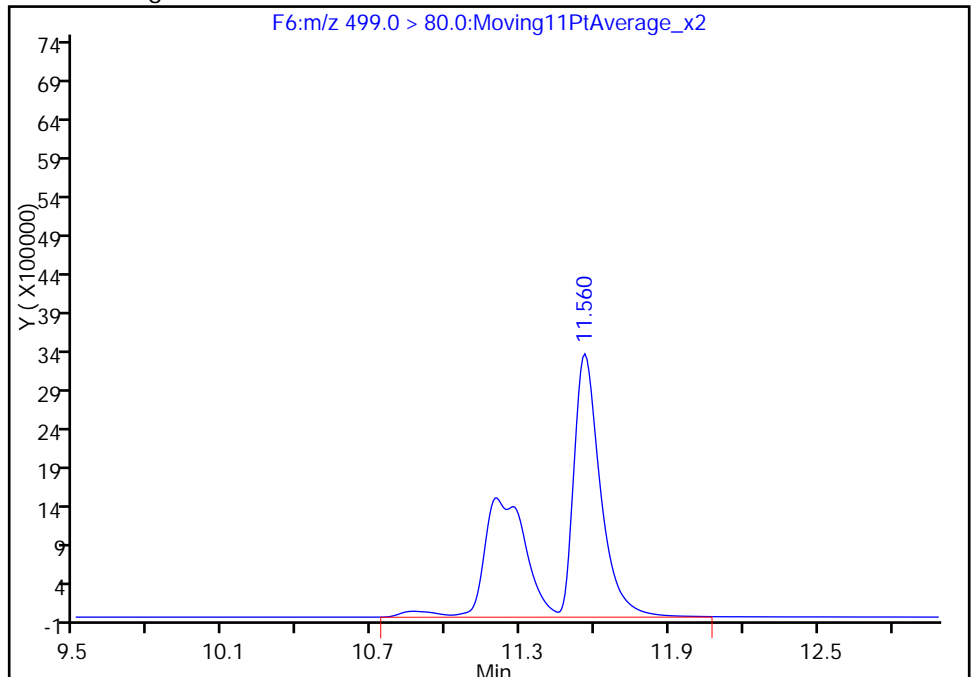
RT: 11.56
Area: 25032589
Amount: 929.3925
Amount Units: ng/ml

Processing Integration Results



RT: 11.56
Area: 42994610
Amount: 1596.2739
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:42:43
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

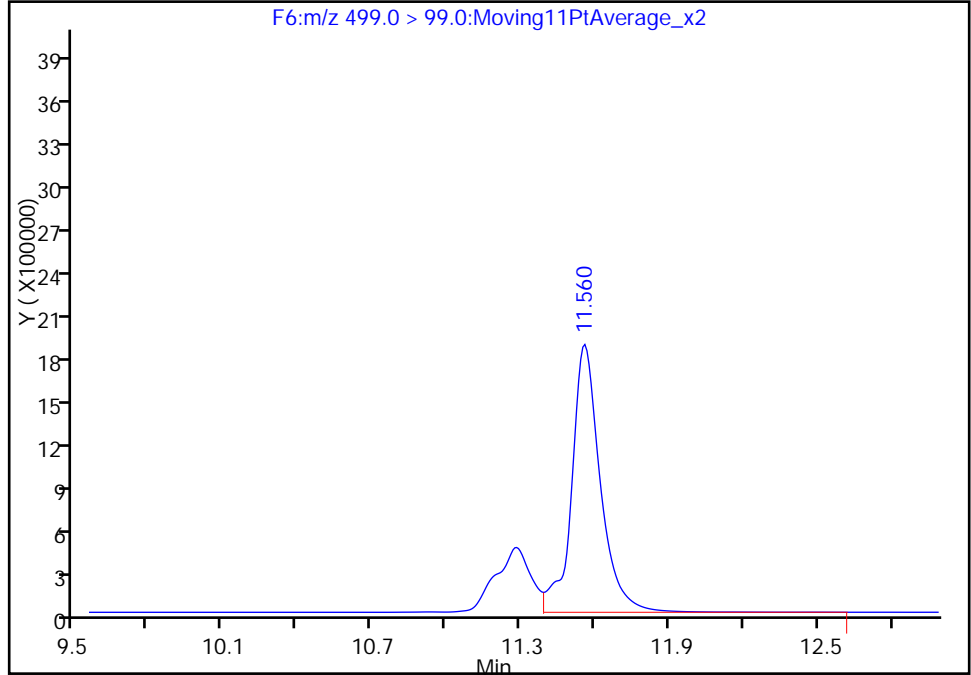
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Injection Date: 29-May-2016 12:42:59 Instrument ID: A6
Lims ID: 320-18986-A-8-A Lab Sample ID: 320-18986-8
Client ID: 46MW04_0516
Operator ID: JRB ALS Bottle#: 34 Worklist Smp#: 59
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

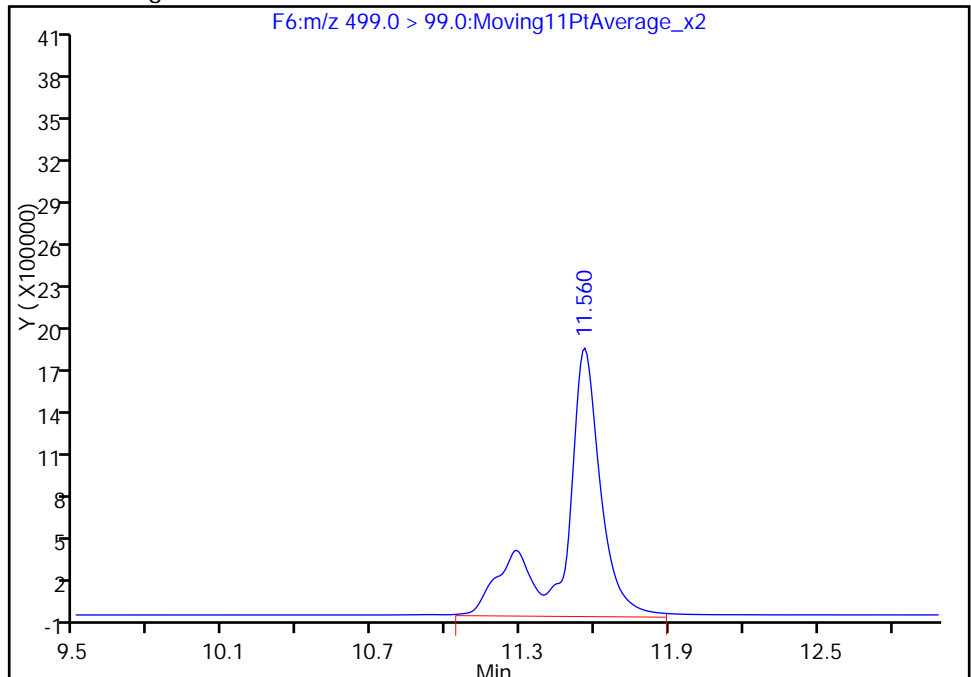
RT: 11.56
Area: 14827486
Amount: 929.3925
Amount Units: ng/ml

Processing Integration Results



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Amount: 1596.2739
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

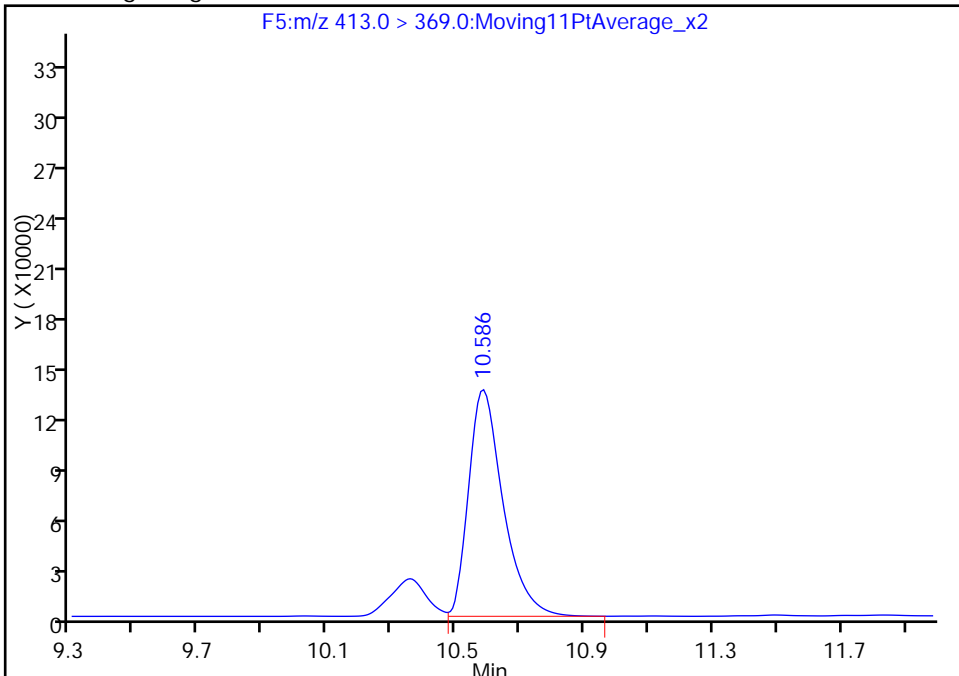
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Lims ID: 320-18986-A-8-A Lab Sample ID: 320-18986-8
Client ID: 46MW04_0516
Operator ID: JRB ALS Bottle#: 34 Worklist Smp#: 59
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:M/RM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

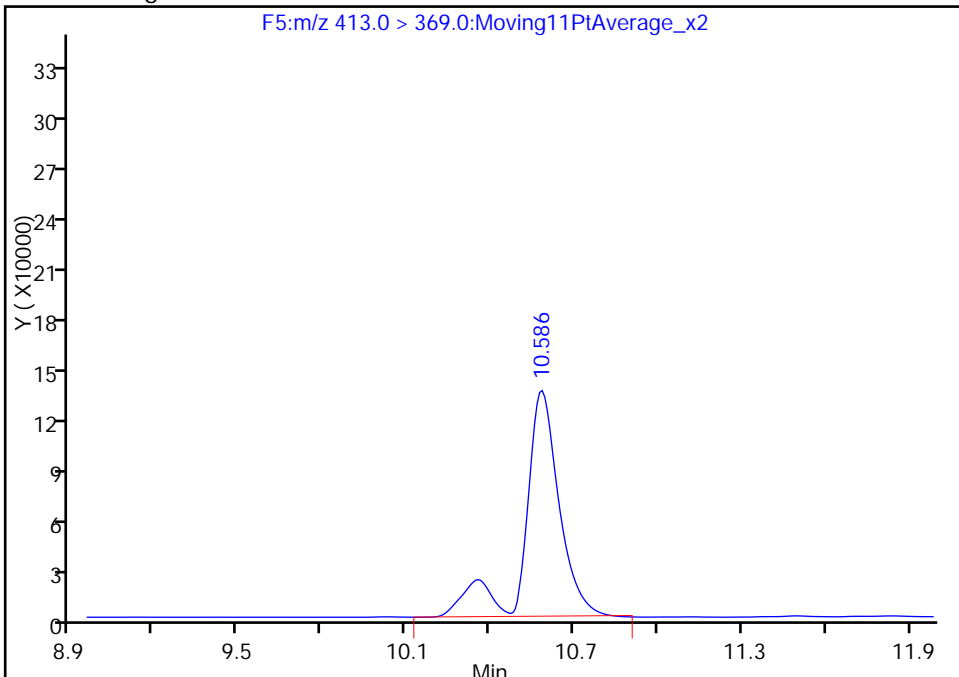
RT: 10.59
Area: 1003061
Amount: 13.886361
Amount Units: ng/ml

Processing Integration Results



RT: 10.59
Area: 1149097
Amount: 15.908081
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:42:43
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

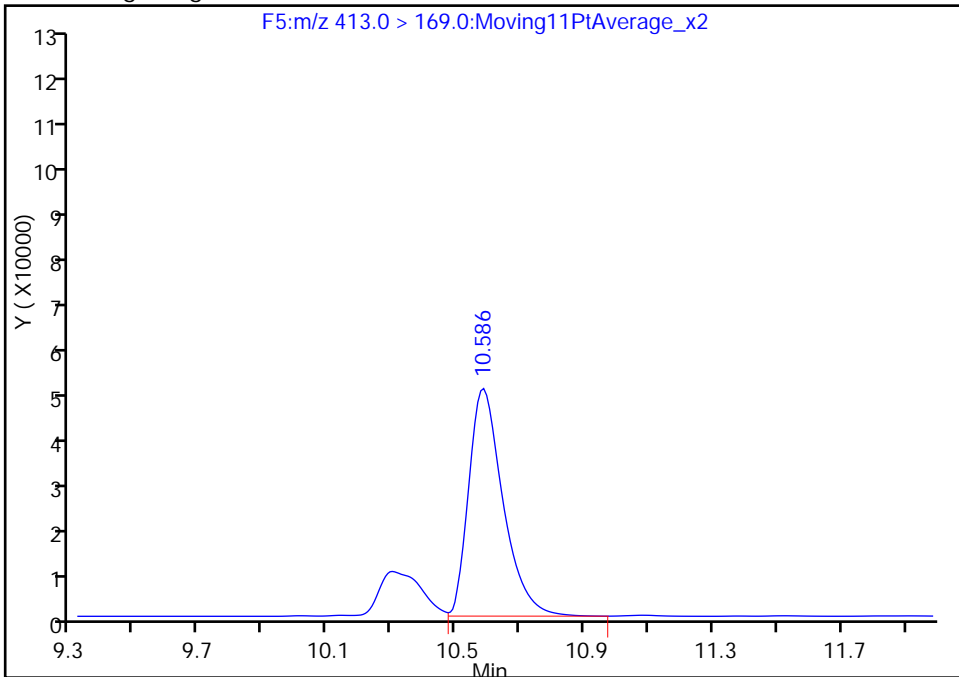
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Lims ID: 320-18986-A-8-A Lab Sample ID: 320-18986-8
Client ID: 46MW04_0516
Operator ID: JRB ALS Bottle#: 34 Worklist Smp#: 59
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

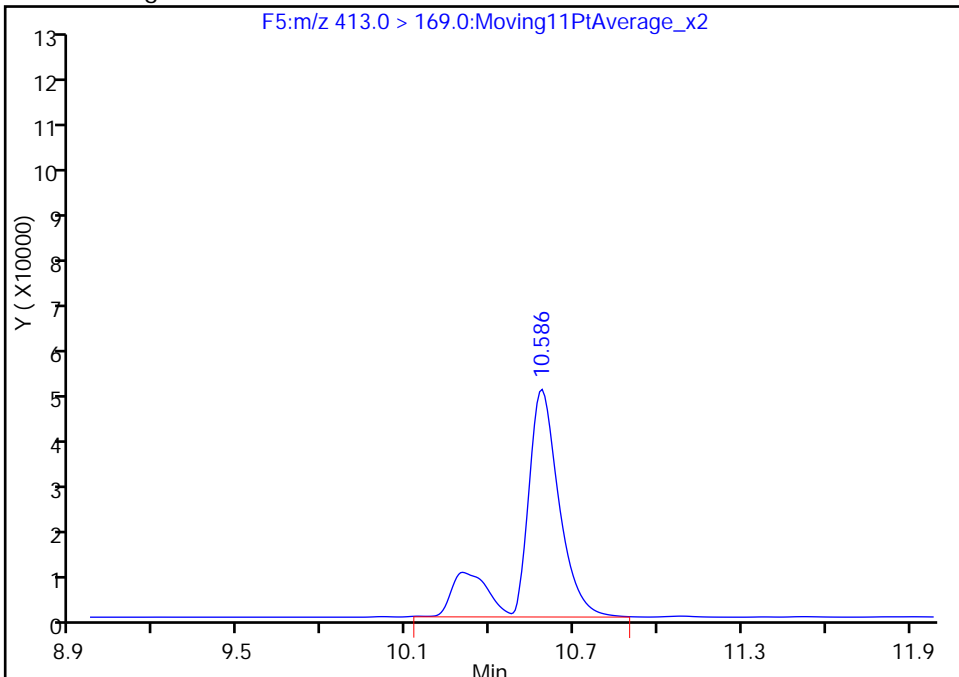
RT: 10.59
Area: 349283
Amount: 13.886361
Amount Units: ng/ml

Processing Integration Results



RT: 10.59
Area: 432395
Amount: 15.908081
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: 46MW04_0516 DL Lab Sample ID: 320-18986-8 DL
 Matrix: Water Lab File ID: 31MAY2016A6A_068.d
 Analysis Method: WS-LC-0025 Date Collected: 05/17/2016 12:26
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 522.1 (mL) Date Analyzed: 06/01/2016 12:05
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 10
 Injection Volume: 15 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 112007 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	<i>Perfluorobutanesulfonic acid (PFBS)</i>	14	<i>J D</i>	24	19	8.8
375-85-9	<i>Perfluoroheptanoic acid (PFHpA)</i>	19	<i>U</i>	24	19	7.7
355-46-4	<i>Perfluorohexanesulfonic acid (PFHxS)</i>	770	<i>D M</i>	24	19	8.3
375-95-1	<i>Perfluorononanoic acid (PFNA)</i>	9.9	<i>J D</i>	24	19	6.3
1763-23-1	<i>Perfluorooctanesulfonic acid (PFOS)</i>	2900	<i>D M</i>	38	29	12
335-67-1	<i>Perfluorooctanoic acid (PFOA)</i>	29	<i>D M</i>	24	19	7.2

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	104		25-150
STL00990	13C4 PFOA	110		25-150
STL00991	13C4 PFOS	94		25-150
STL01892	13C4-PFHpA	101		25-150
STL00995	13C5 PFNA	81		25-150
STL00994	18O2 PFHxS	113		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_068.d
 Lims ID: 320-18986-A-8-A
 Client ID: 46MW04_0516
 Sample Type: Client
 Inject. Date: 01-Jun-2016 12:05:05 ALS Bottle#: 34 Worklist Smp#: 66
 Injection Vol: 15.0 ul Dil. Factor: 10.0000
 Sample Info: 320-18986-a-8-a 10X
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Jun-2016 15:33:27 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK032

First Level Reviewer: barnettj Date: 01-Jun-2016 16:01:08

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.102	7.099	0.003	1.000	32777	0.7216				
D 6 13C2 PFHxA										
315.0 > 270.0	8.236	8.252	-0.016		319705	5.22		10.4	21671	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.475	9.494	-0.019	1.000	48588	0.3206			196	
D 8 13C4-PFHpA										
367.0 > 322.0	9.475	9.495	-0.020		346271	5.04		10.1	27210	
D 11 18O2 PFHxS										
403.0 > 84.0	9.511	9.532	-0.021		165228	5.36		11.3	4867	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.511	9.533	-0.022	1.000	1315888	40.2				M
D 12 13C4 PFOA										
417.0 > 372.0	10.596	10.612	-0.016		398383	5.48		11.0	25807	
13 Perfluorooctanoic acid										M
413.0 > 369.0	10.596	10.612	-0.016	1.000	121910	1.49			46.5	M
413.0 > 169.0	10.596	10.612	-0.016	1.000	45276		2.69(0.00-0.00)		80.3	M
D 16 13C4 PFOS										
503.0 > 80.0	11.560	11.568	-0.008		178658	4.50		9.4	8254	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.560	11.571	-0.011	1.000	6872241	148.8			5307	M
499.0 > 99.0	11.560	11.571	-0.011	1.000	3123090		2.20(0.00-0.00)		3993	M
D 17 13C5 PFNA										
468.0 > 423.0	11.578	11.589	-0.011		269553	4.04		8.1	19113	
18 Perfluorononanoic acid										
463.0 > 419.0	11.578	11.589	-0.011	1.000	24049	0.5164			274	

QC Flag Legend

Review Flags

M - Manually Integrated

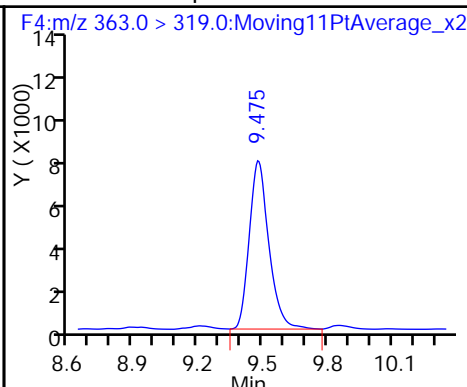
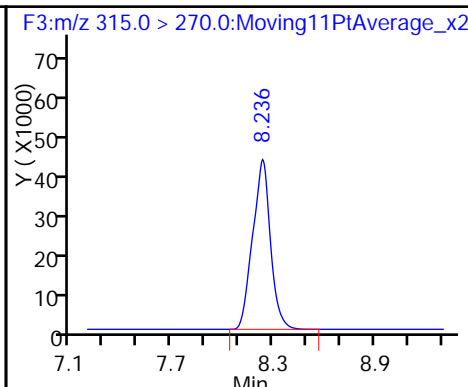
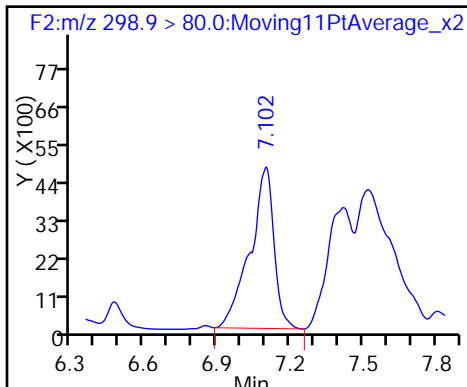
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_068.d
Injection Date: 01-Jun-2016 12:05:05 Instrument ID: A6
Lims ID: 320-18986-A-8-A Lab Sample ID: 320-18986-8
Client ID: 46MW04_0516
Operator ID: JRB ALS Bottle#: 34 Worklist Smp#: 66
Injection Vol: 15.0 ul Dil. Factor: 10.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxA

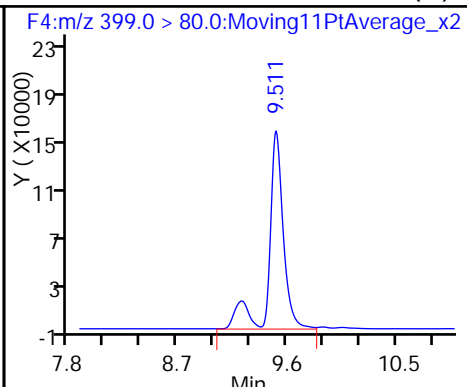
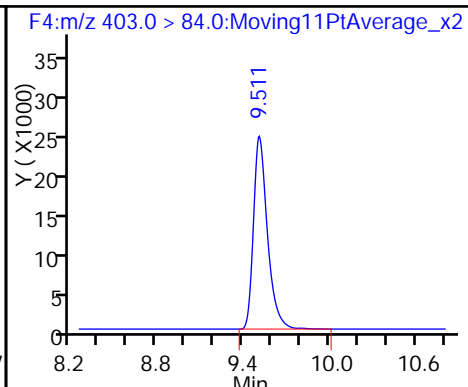
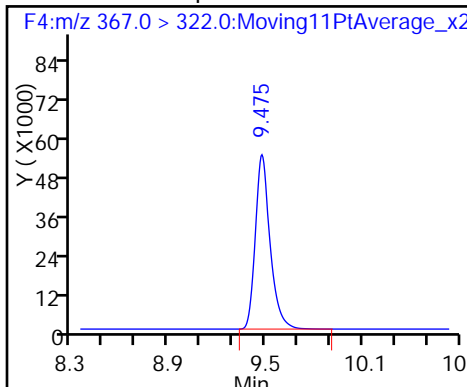
9 Perfluoroheptanoic acid



D 8 13C4-PFHpA

D 11 18O2 PFHxS

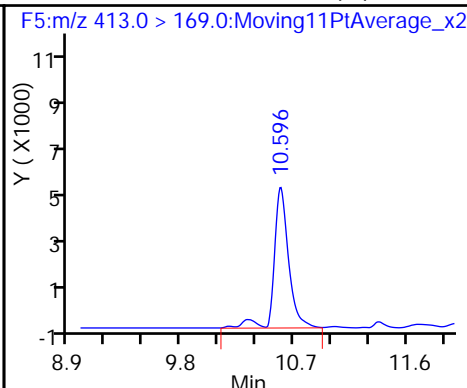
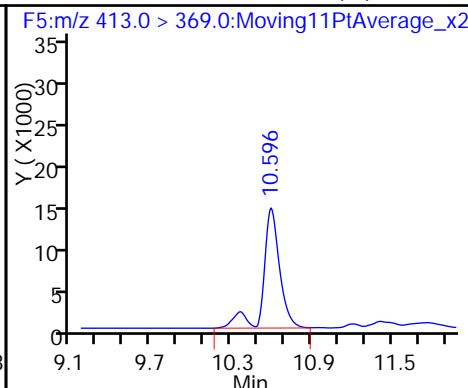
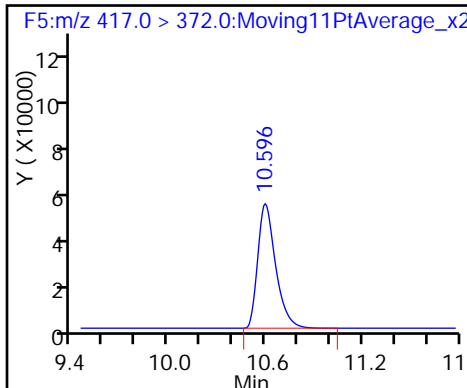
41 Perfluorohexanesulfonic acid (M)



D 12 13C4 PFOA

13 Perfluorooctanoic acid (M)

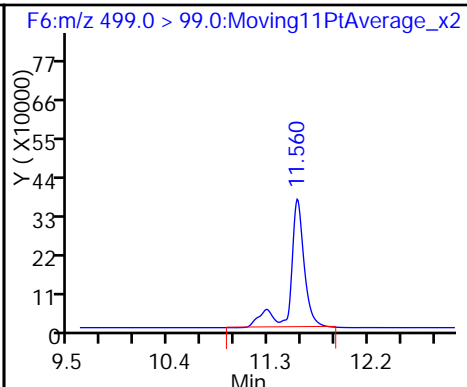
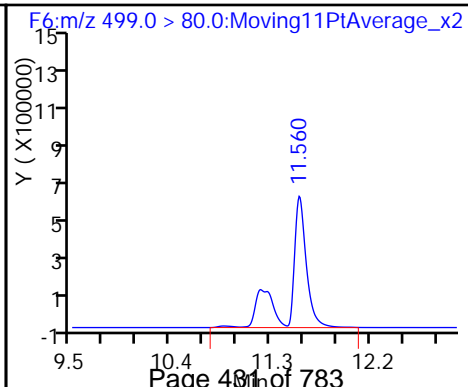
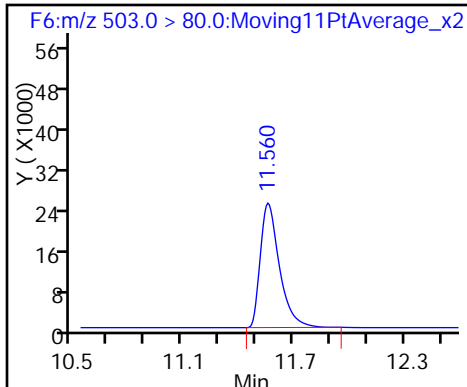
13 Perfluorooctanoic acid (M)



D 16 13C4 PFOS

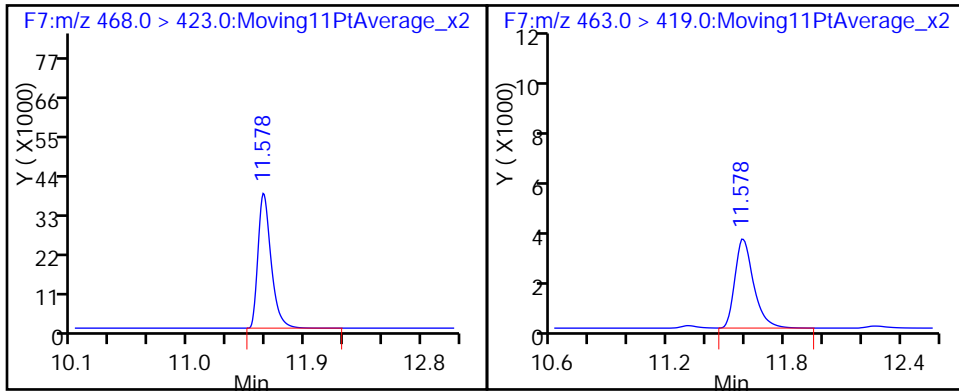
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid



TestAmerica Sacramento

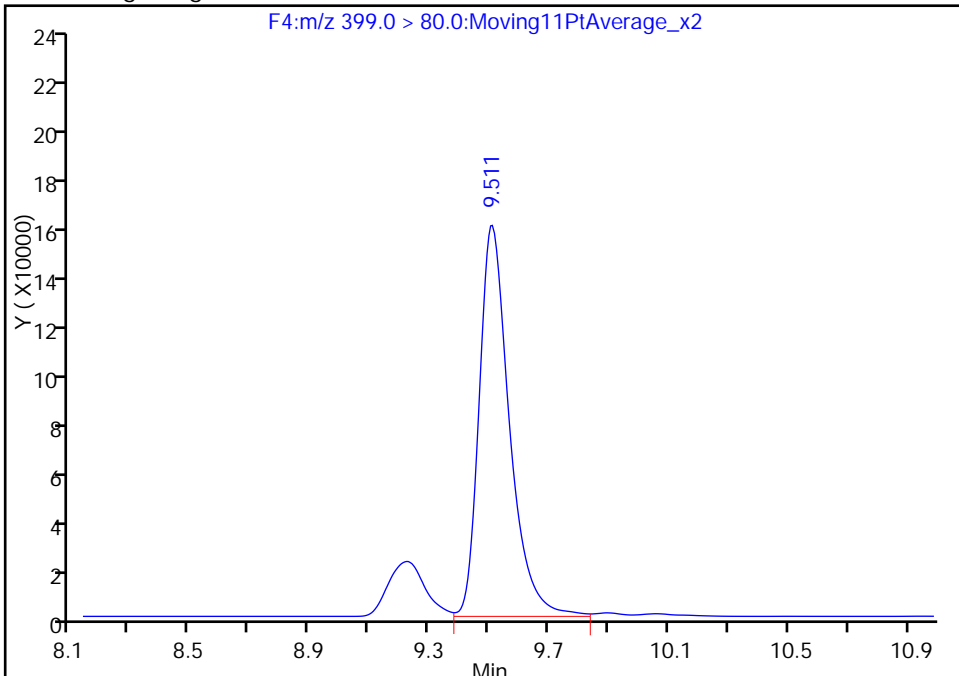
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Injection Date: 01-Jun-2016 12:05:05 Instrument ID: A6
Lims ID: 320-18986-A-8-A Lab Sample ID: 320-18986-8
Client ID: 46MW04_0516
Operator ID: JRB ALS Bottle#: 34 Worklist Smp#: 66
Injection Vol: 15.0 ul Dil. Factor: 10.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:M/RM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

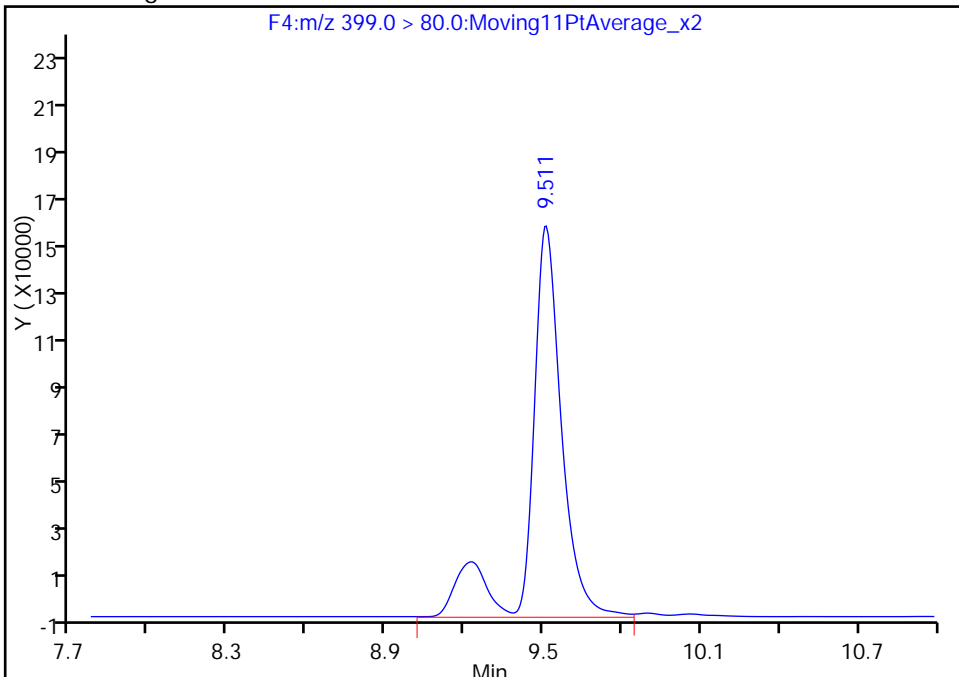
RT: 9.51
Area: 1114624
Amount: 34.067735
Amount Units: ng/ml

Processing Integration Results



RT: 9.51
Area: 1315888
Amount: 40.219234
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

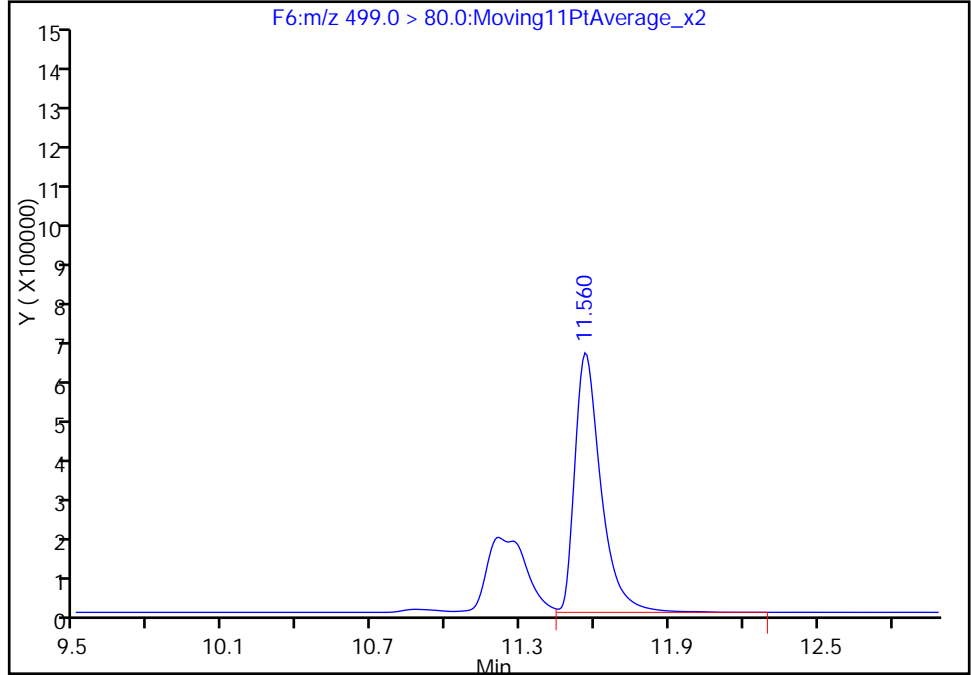
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Lims ID: 320-18986-A-8-A Lab Sample ID: 320-18986-8
Client ID: 46MW04_0516
Operator ID: JRB ALS Bottle#: 34 Worklist Smp#: 66
Injection Vol: 15.0 ul Dil. Factor: 10.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

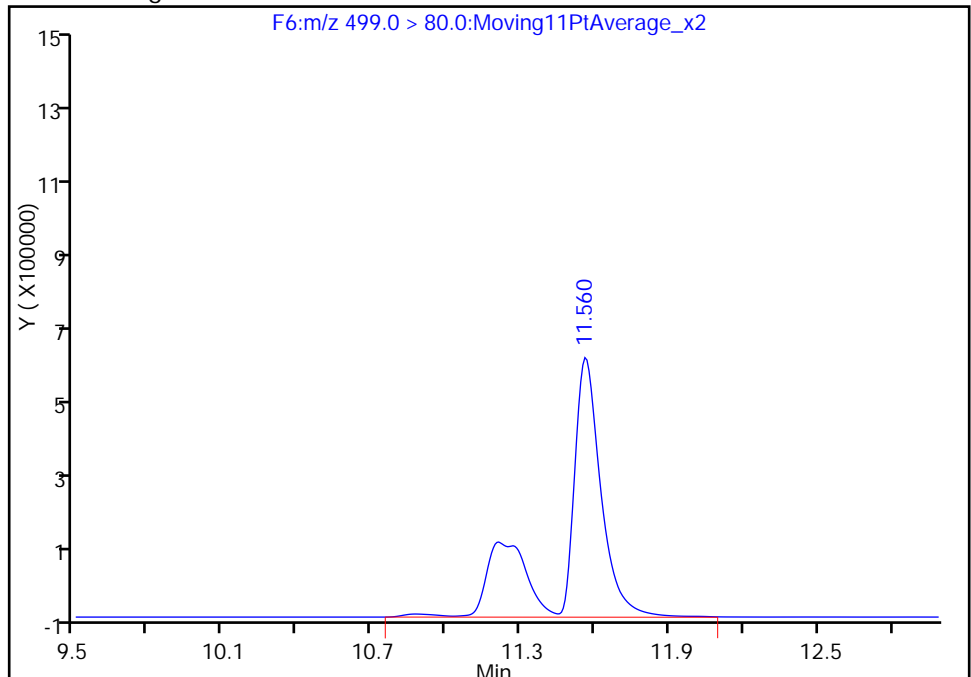
RT: 11.56
Area: 4723042
Amount: 102.2879
Amount Units: ng/ml

Processing Integration Results



RT: 11.56
Area: 6872241
Amount: 148.8336
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 01-Jun-2016 16:01:08
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

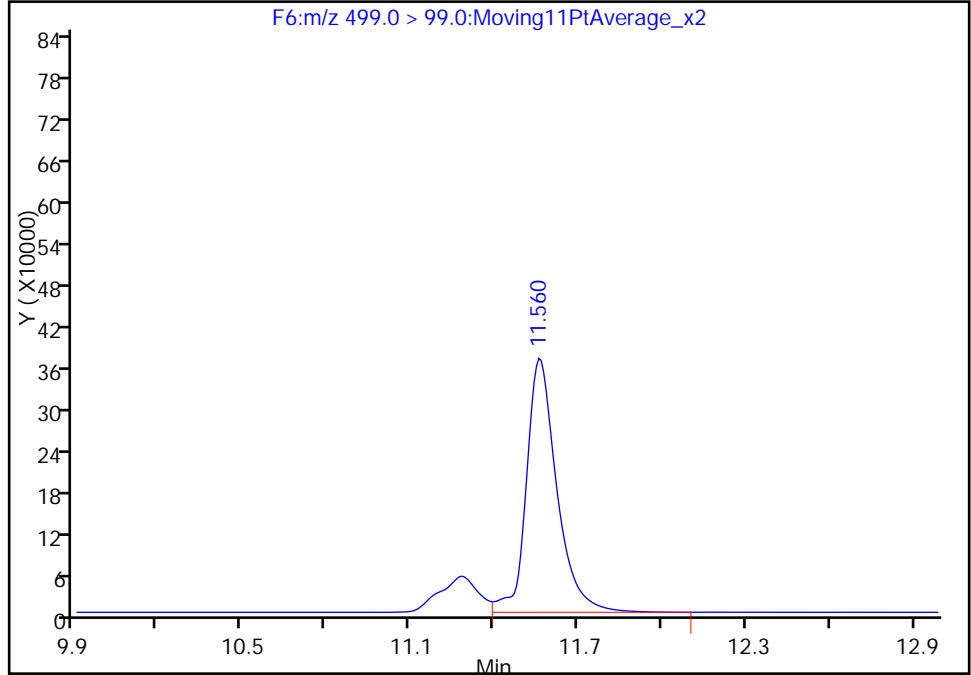
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Injection Date: 01-Jun-2016 12:05:05 Instrument ID: A6
Lims ID: 320-18986-A-8-A Lab Sample ID: 320-18986-8
Client ID: 46MW04_0516
Operator ID: JRB ALS Bottle#: 34 Worklist Smp#: 66
Injection Vol: 15.0 ul Dil. Factor: 10.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

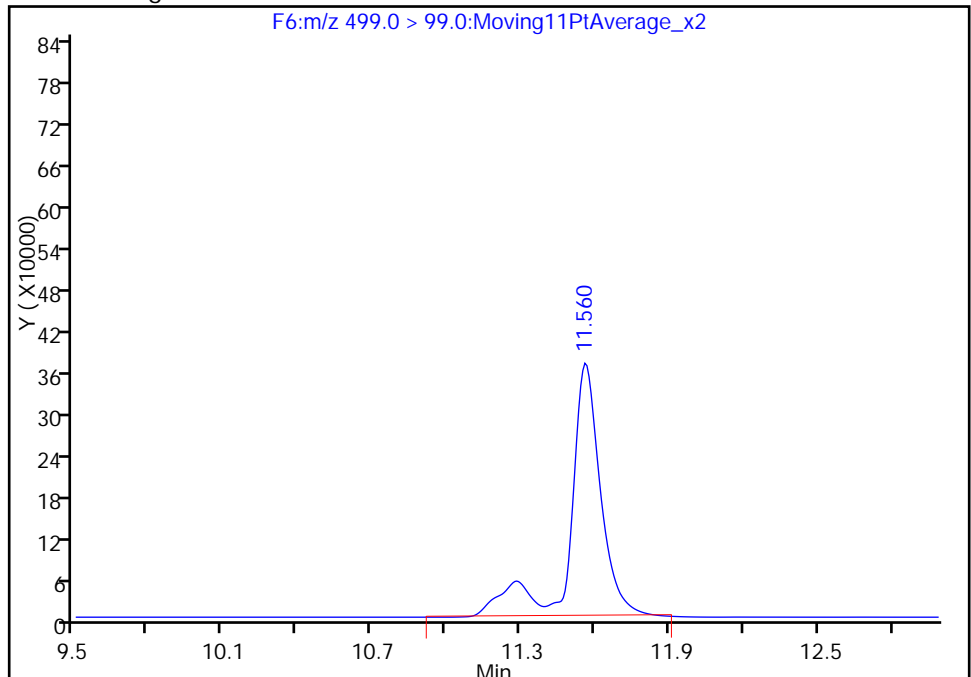
RT: 11.56
Area: 2779656
Amount: 102.2879
Amount Units: ng/ml

Processing Integration Results



RT: 11.56
Area: 3123090
Amount: 148.8336
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 01-Jun-2016 16:01:08

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

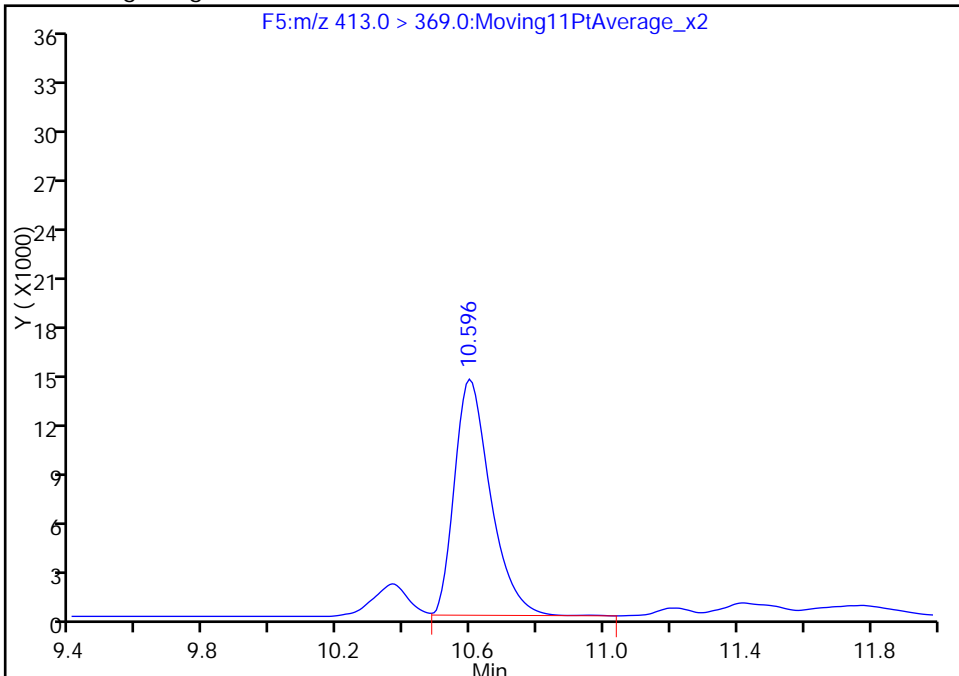
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Lims ID: 320-18986-A-8-A Lab Sample ID: 320-18986-8
Client ID: 46MW04_0516
Operator ID: JRB ALS Bottle#: 34 Worklist Smp#: 66
Injection Vol: 15.0 ul Dil. Factor: 10.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

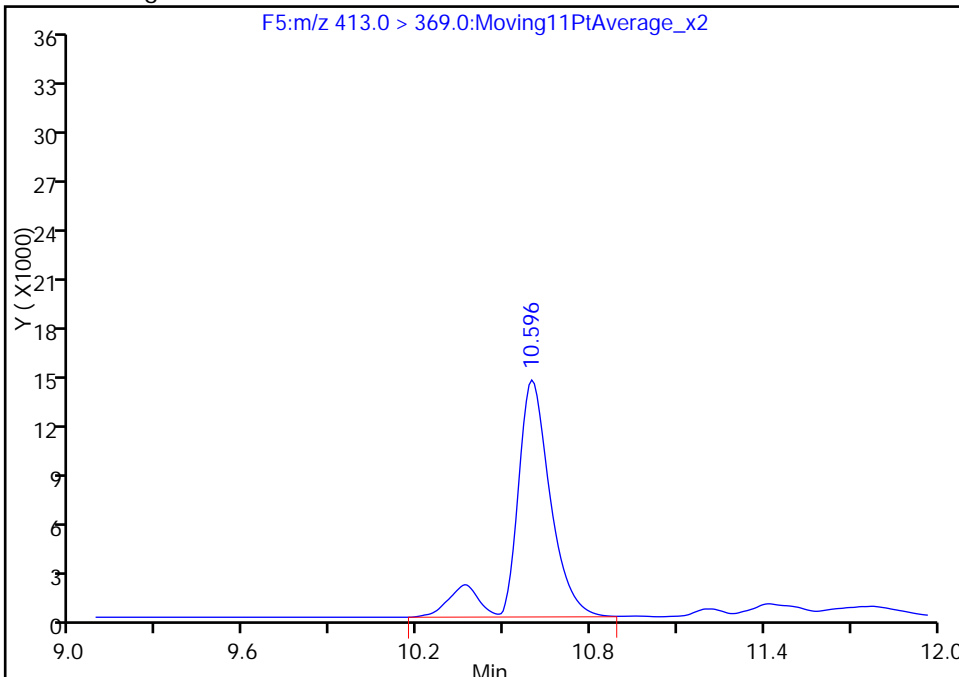
RT: 10.60
Area: 106673
Amount: 1.304238
Amount Units: ng/ml

Processing Integration Results



RT: 10.60
Area: 121910
Amount: 1.490533
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 01-Jun-2016 16:01:08
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

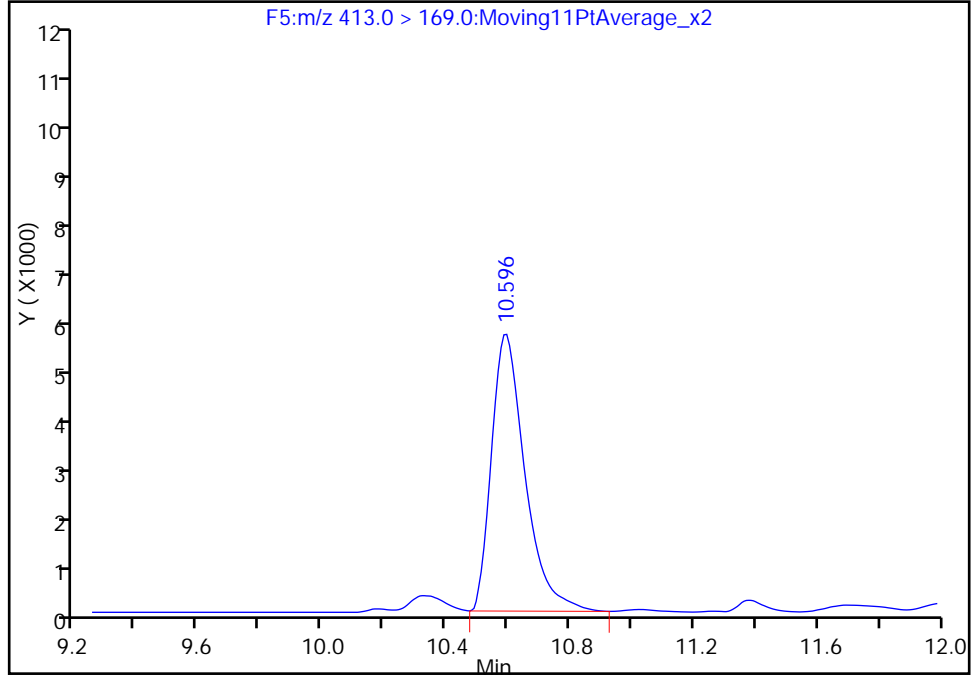
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Injection Date: 01-Jun-2016 12:05:05 Instrument ID: A6
Lims ID: 320-18986-A-8-A Lab Sample ID: 320-18986-8
Client ID: 46MW04_0516
Operator ID: JRB ALS Bottle#: 34 Worklist Smp#: 66
Injection Vol: 15.0 ul Dil. Factor: 10.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

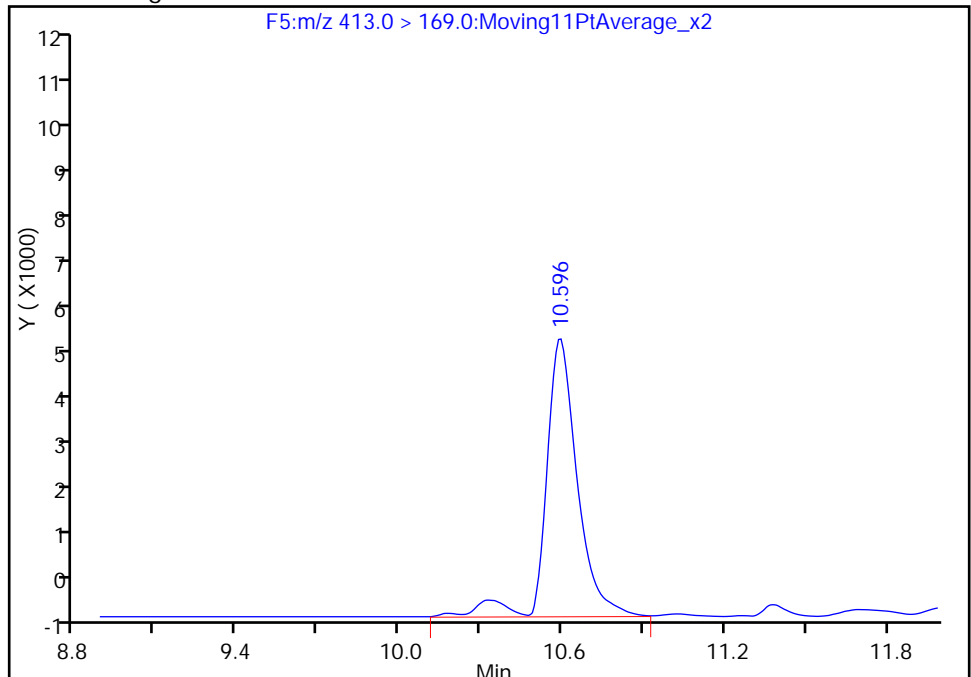
RT: 10.60
Area: 41575
Amount: 1.304238
Amount Units: ng/ml

Processing Integration Results



RT: 10.60
Area: 45276
Amount: 1.490533
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: MCFSMW-17_0516 Lab Sample ID: 320-18986-9
 Matrix: Water Lab File ID: 31MAY2016A6A_145.d
 Analysis Method: WS-LC-0025 Date Collected: 05/17/2016 14:36
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 456.3(mL) Date Analyzed: 06/02/2016 15:41
 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.: 112205 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.1	J	2.7	2.2	1.0
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.4		2.7	2.2	0.88
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	M	2.7	2.2	0.95
375-95-1	Perfluorononanoic acid (PFNA)	2.2	U	2.7	2.2	0.72
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	26	M	4.4	3.3	1.4
335-67-1	Perfluorooctanoic acid (PFOA)	26	M	2.7	2.2	0.82

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		25-150
STL00990	13C4 PFOA	83		25-150
STL00991	13C4 PFOS	114		25-150
STL01892	13C4-PFHpA	93		25-150
STL00995	13C5 PFNA	61		25-150
STL00994	18O2 PFHxS	119		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_145.d
 Lims ID: 320-18986-A-9-A
 Client ID: MCFSMW-17_0516
 Sample Type: Client
 Inject. Date: 02-Jun-2016 15:41:53 ALS Bottle#: 44 Worklist Smp#: 71
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-9-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Jun-2016 17:18:05 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 02-Jun-2016 17:14:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.088	7.099	-0.011	1.000	45985	0.9645				
D 6 13C2 PFHxA										
315.0 > 270.0	8.241	8.252	-0.011		2998633	48.9		97.9	24813	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.493	9.494	-0.001	1.000	233085	2.92			42.4	
D 8 13C4-PFHpA										
367.0 > 322.0	9.493	9.495	-0.002		3175866	46.3		92.5	29567	
D 11 18O2 PFHxS										
403.0 > 84.0	9.524	9.532	-0.008		1734351	56.2		119	19159	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.531	9.533	-0.002	1.000	187274	5.45				M
D 12 13C4 PFOA										
417.0 > 372.0	10.614	10.612	0.002		3002247	41.3		82.5	65738	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.614	10.612	0.002	1.000	740163	12.0			278	M
413.0 > 169.0	10.614	10.612	0.002	1.000	278299		2.66(0.00-0.00)		2787	M
D 16 13C4 PFOS										
503.0 > 80.0	11.568	11.568	0.0		2164323	54.5		114	6547	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.577	11.571	0.006	1.000	675202	12.1			1248	M
499.0 > 99.0	11.577	11.571	0.006	1.000	262234		2.57(0.00-0.00)		1577	M
D 17 13C5 PFNA										
468.0 > 423.0	11.586	11.589	-0.003		2026402	30.4		60.8	72778	
18 Perfluorononanoic acid										
463.0 > 419.0	11.586	11.589	-0.003	1.000	9705	0.2772			25.2	

QC Flag Legend

Review Flags

M - Manually Integrated

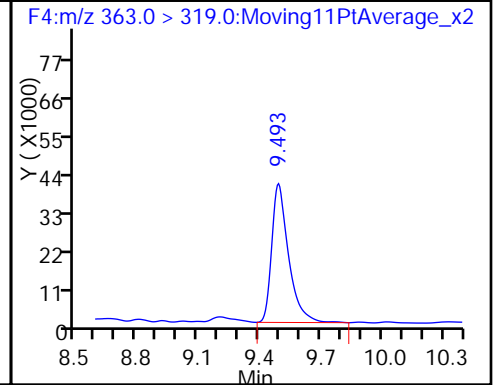
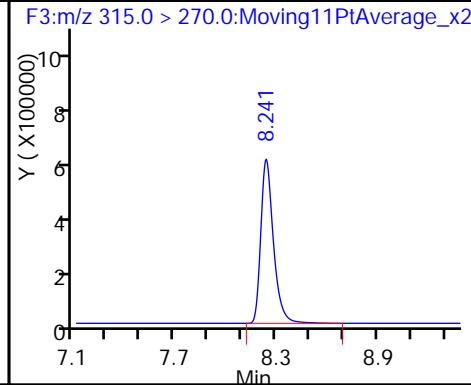
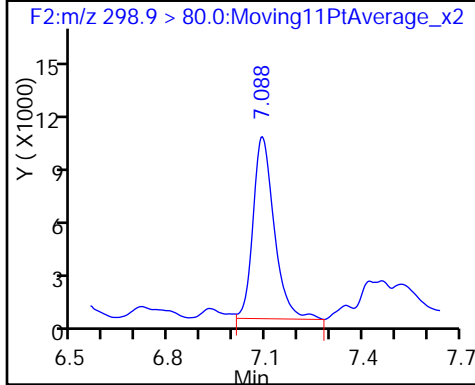
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_145.d
Injection Date: 02-Jun-2016 15:41:53 Instrument ID: A6
Lims ID: 320-18986-A-9-A Lab Sample ID: 320-18986-9
Client ID: MCFSMW-17_0516
Operator ID: JRB ALS Bottle#: 44 Worklist Smp#: 71
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxA

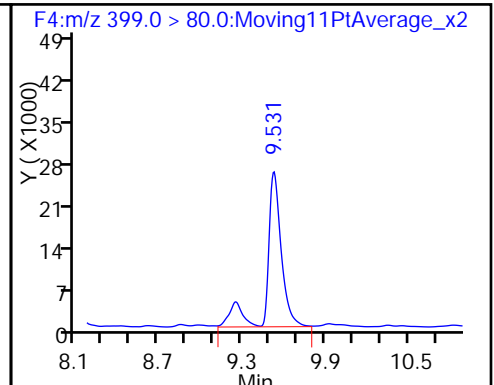
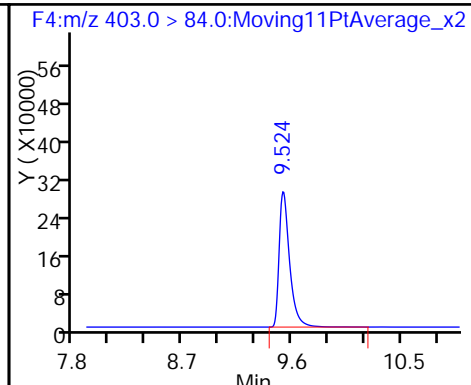
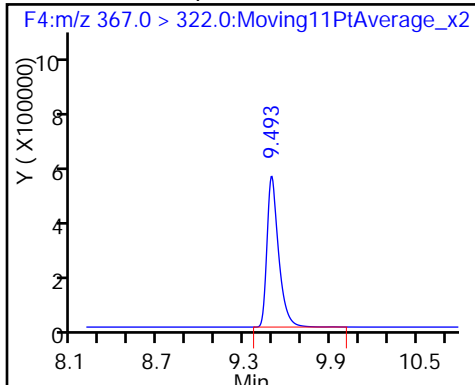
9 Perfluoroheptanoic acid



D 8 13C4-PFHpA

D 11 18O2 PFHxS

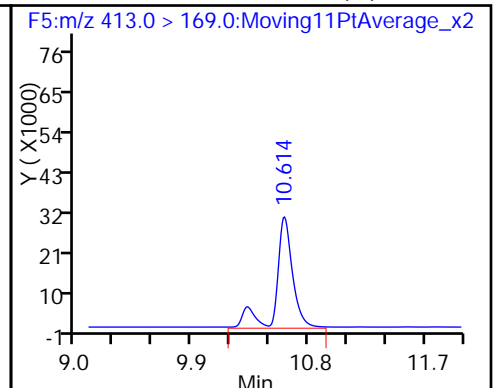
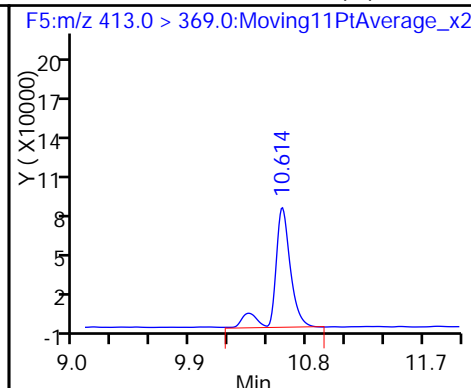
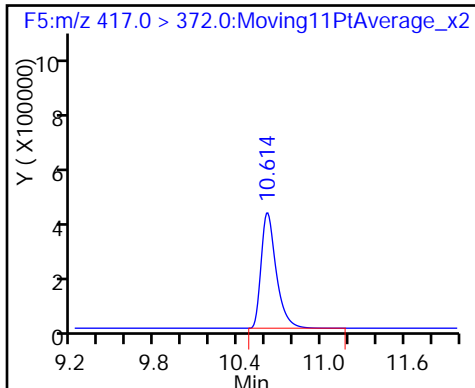
41 Perfluorohexanesulfonic acid (M)



D 12 13C4 PFOA

13 Perfluorooctanoic acid (M)

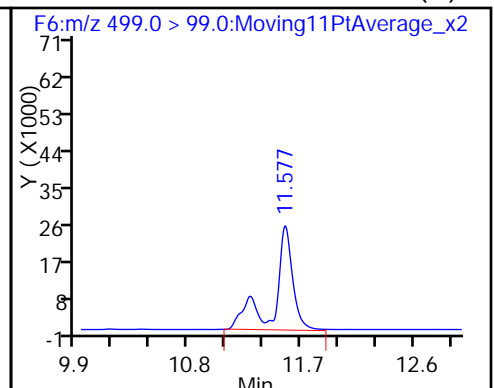
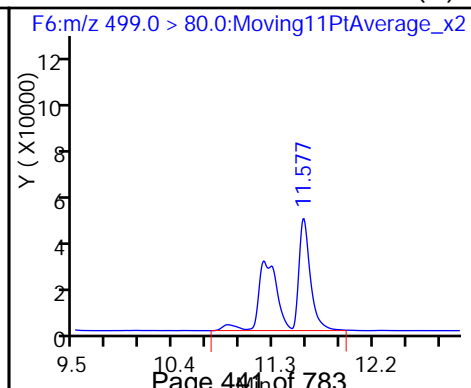
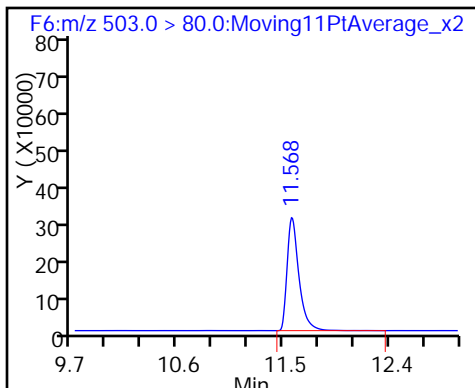
13 Perfluorooctanoic acid (M)



D 16 13C4 PFOS

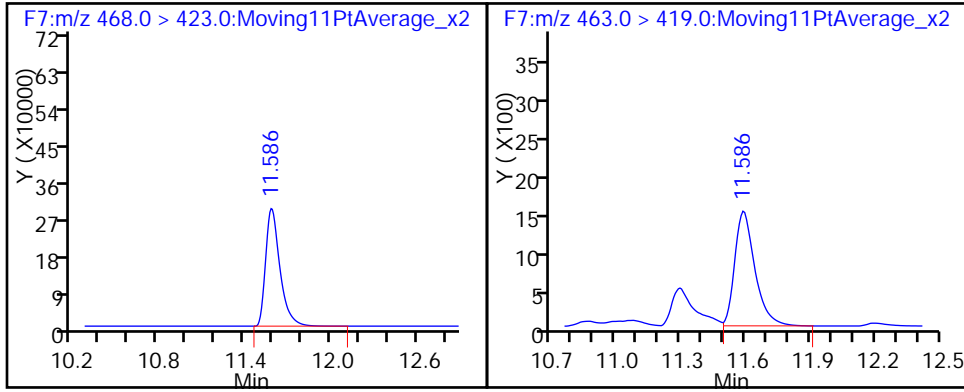
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid



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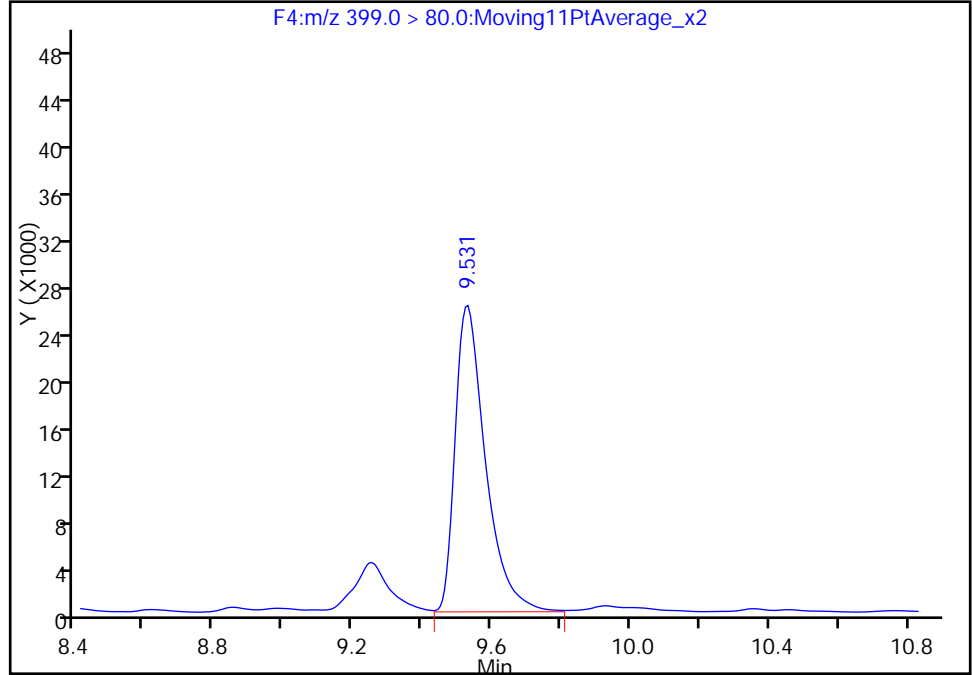
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Injection Date: 02-Jun-2016 15:41:53 Instrument ID: A6
Lims ID: 320-18986-A-9-A Lab Sample ID: 320-18986-9
Client ID: MCFSMW-17_0516
Operator ID: JRB ALS Bottle#: 44 Worklist Smp#: 71
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

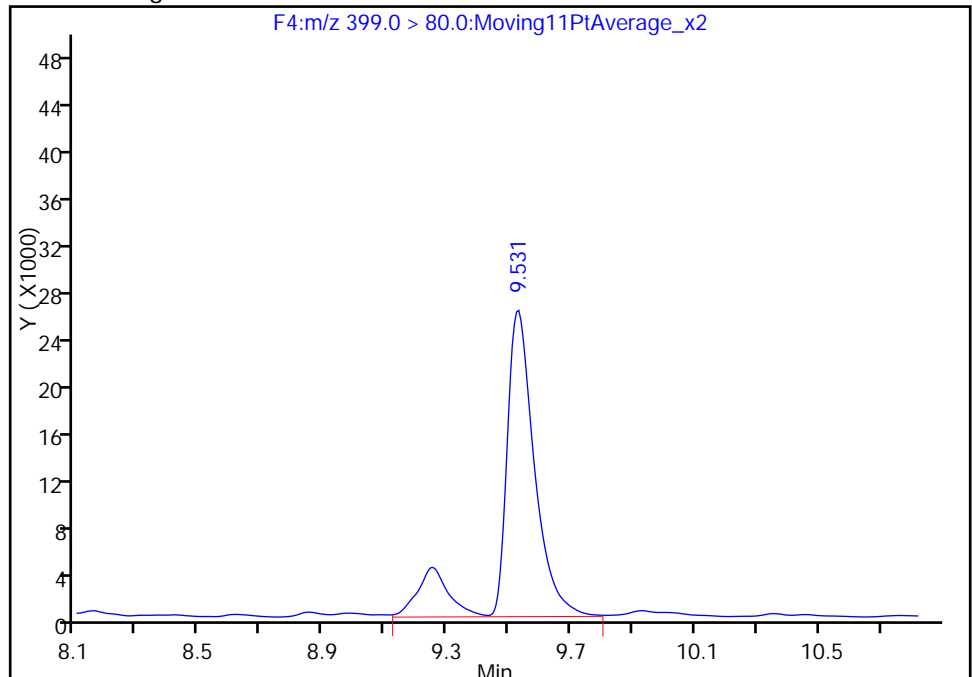
RT: 9.53
Area: 157851
Amount: 4.596305
Amount Units: ng/ml

Processing Integration Results



RT: 9.53
Area: 187274
Amount: 5.453044
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 02-Jun-2016 17:14:13
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

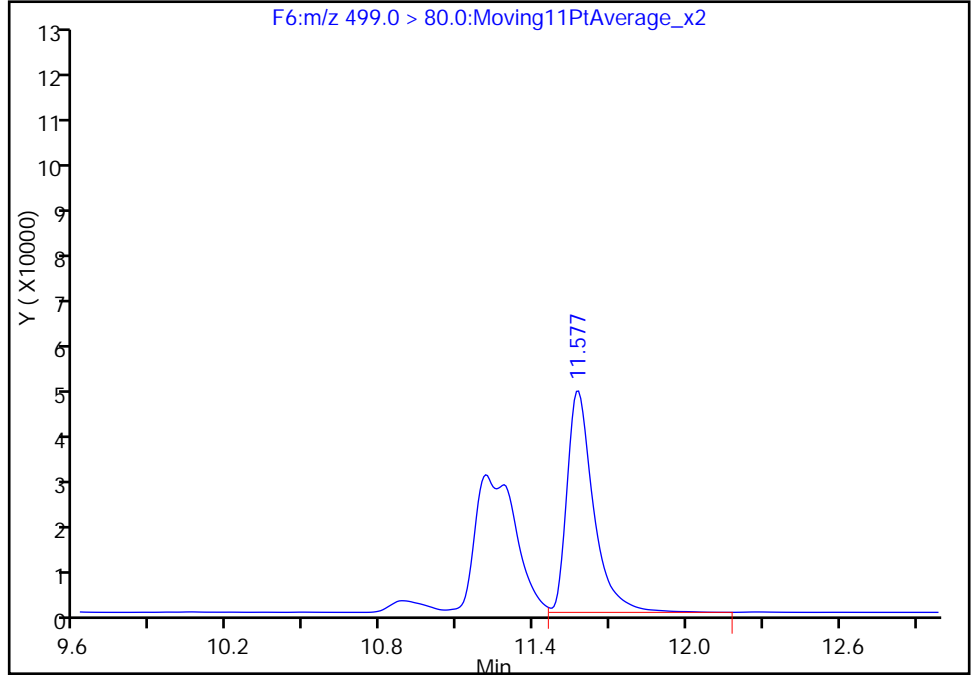
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Lims ID: 320-18986-A-9-A Lab Sample ID: 320-18986-9
Client ID: MCFSMW-17_0516
Operator ID: JRB ALS Bottle#: 44 Worklist Smp#: 71
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

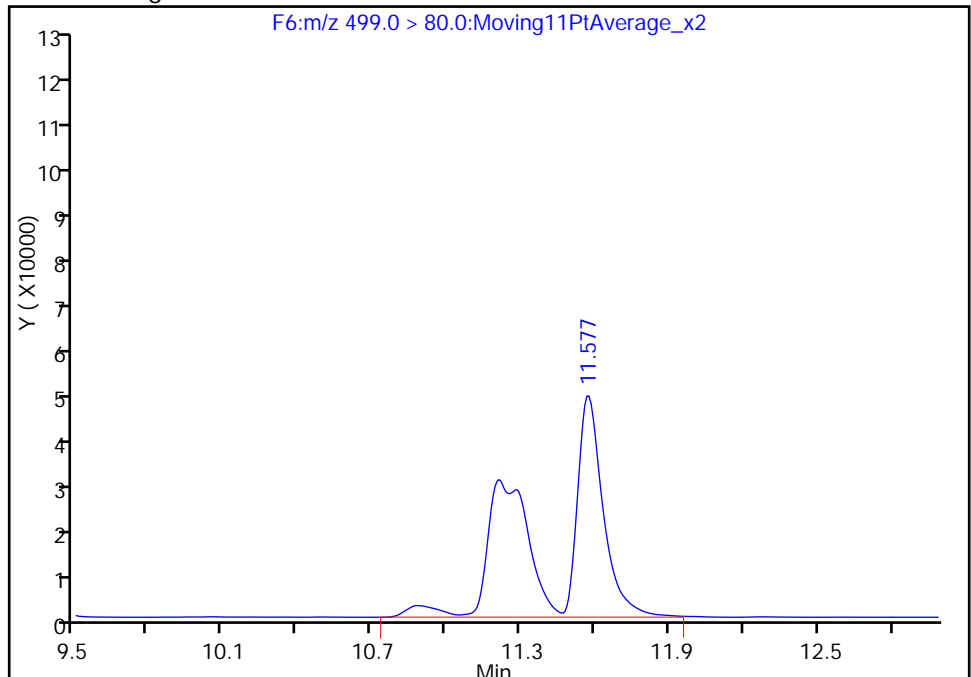
RT: 11.58
Area: 335761
Amount: 6.002514
Amount Units: ng/ml

Processing Integration Results



RT: 11.58
Area: 675202
Amount: 12.070817
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 02-Jun-2016 17:14:13
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

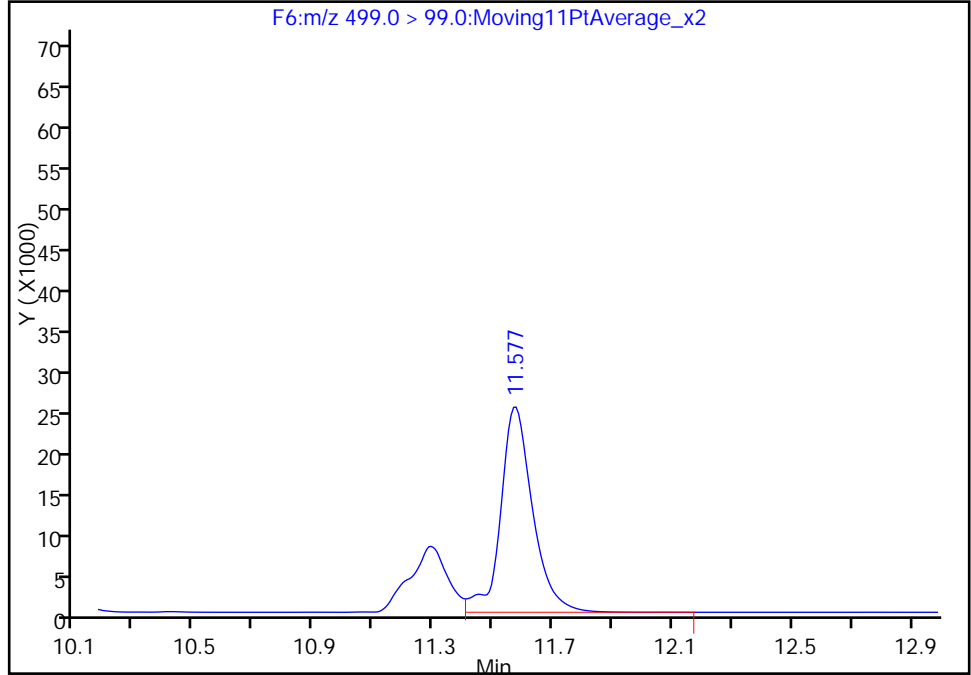
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Injection Date: 02-Jun-2016 15:41:53 Instrument ID: A6
Lims ID: 320-18986-A-9-A Lab Sample ID: 320-18986-9
Client ID: MCFSMW-17_0516
Operator ID: JRB ALS Bottle#: 44 Worklist Smp#: 71
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

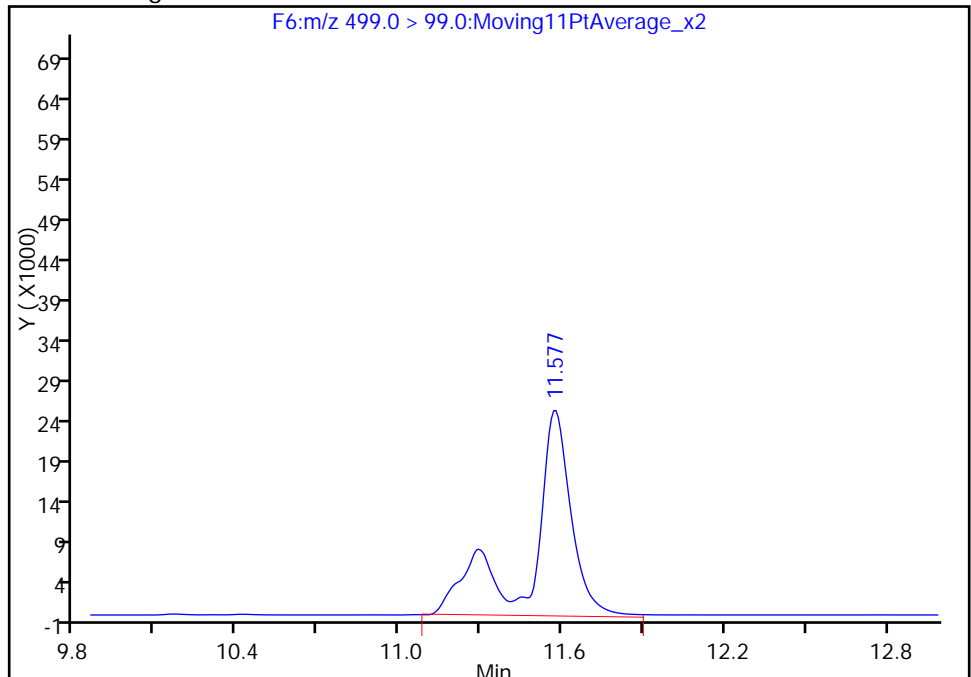
RT: 11.58
Area: 187771
Amount: 6.002514
Amount Units: ng/ml

Processing Integration Results



RT: 11.58
Area: 262234
Amount: 12.070817
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

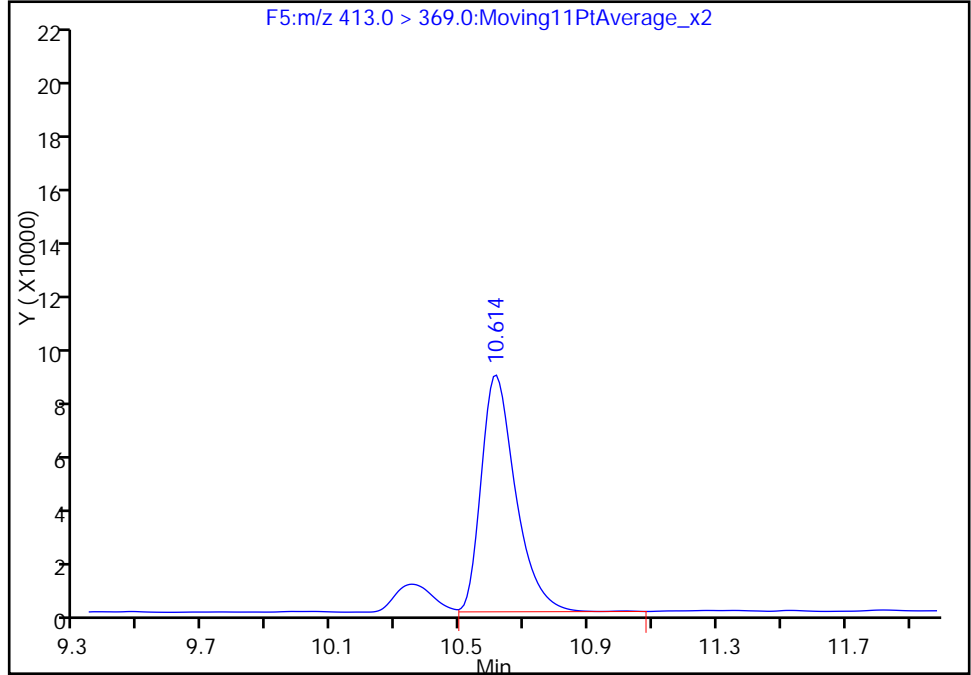
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Injection Date: 02-Jun-2016 15:41:53 Instrument ID: A6
Lims ID: 320-18986-A-9-A Lab Sample ID: 320-18986-9
Client ID: MCFSMW-17_0516
Operator ID: JRB ALS Bottle#: 44 Worklist Smp#: 71
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

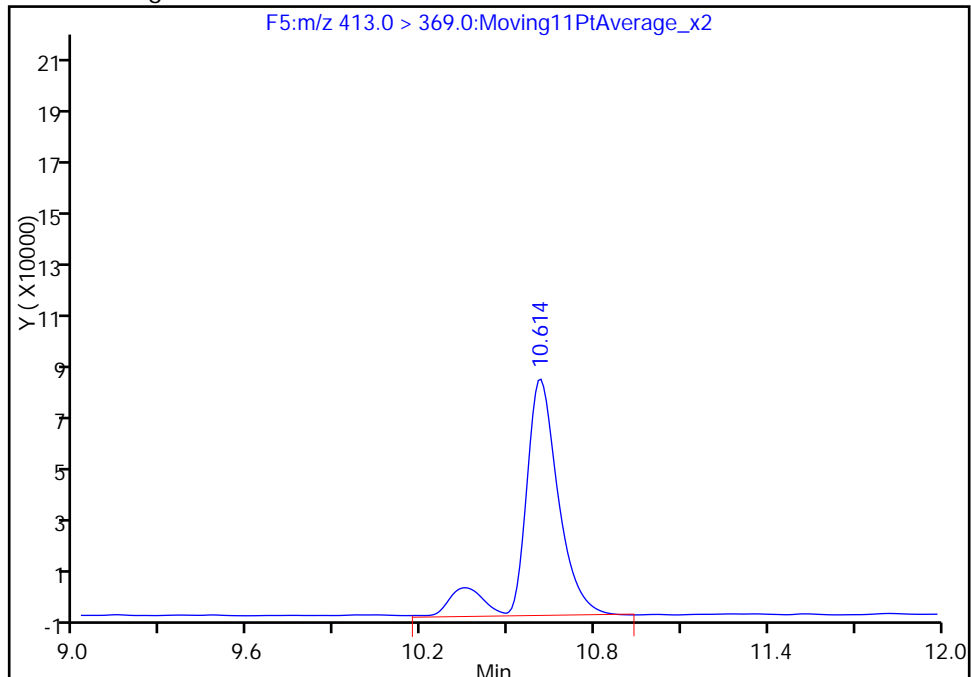
RT: 10.61
Area: 651634
Amount: 10.572081
Amount Units: ng/ml

Processing Integration Results



RT: 10.61
Area: 740163
Amount: 12.008371
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

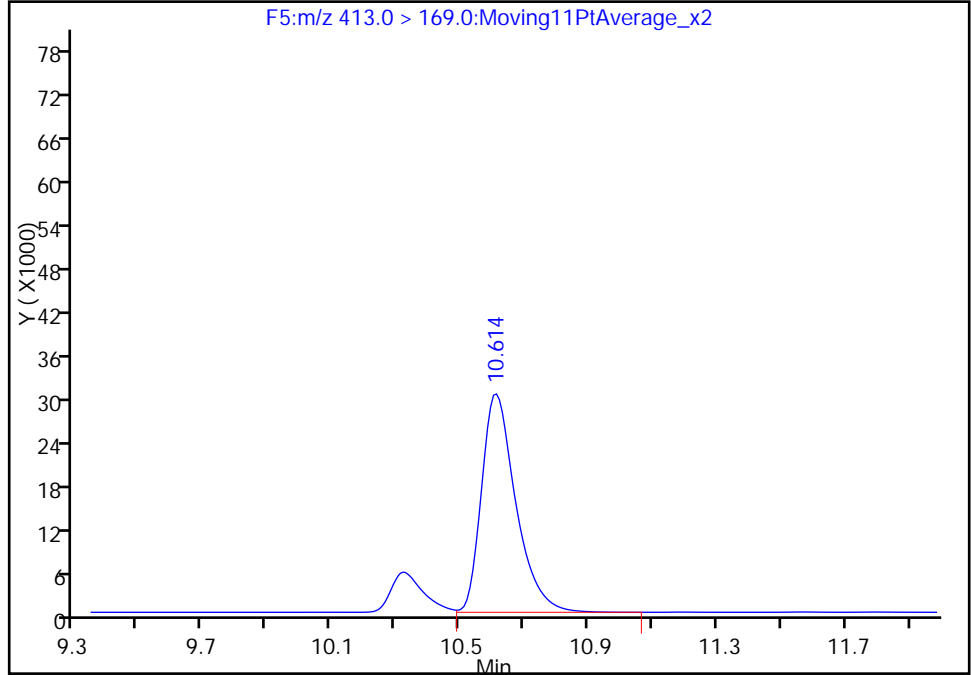
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Injection Date: 02-Jun-2016 15:41:53 Instrument ID: A6
Lims ID: 320-18986-A-9-A Lab Sample ID: 320-18986-9
Client ID: MCFSMW-17_0516
Operator ID: JRB ALS Bottle#: 44 Worklist Smp#: 71
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

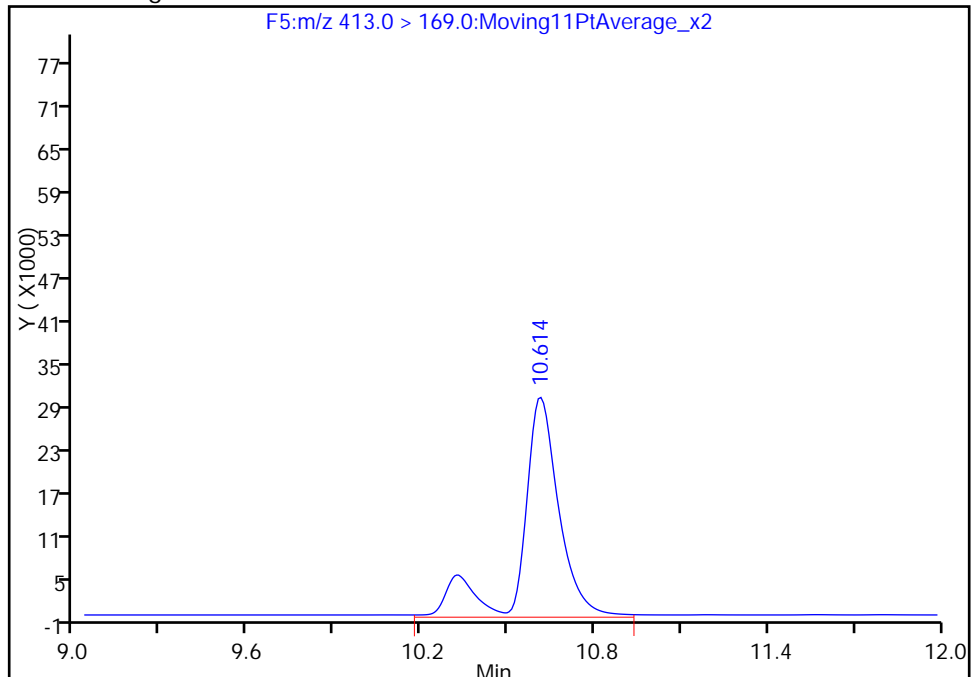
RT: 10.61
Area: 225684
Amount: 10.572081
Amount Units: ng/ml

Processing Integration Results



RT: 10.61
Area: 278299
Amount: 12.008371
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: FB051616 Lab Sample ID: 320-18986-10
 Matrix: Water Lab File ID: 28MAY2016A6A_062.d
 Analysis Method: WS-LC-0025 Date Collected: 05/16/2016 10:00
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 549.3 (mL) Date Analyzed: 05/29/2016 13:25
 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.: 111859 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)	1.4	J M	2.3	1.8	0.79
375-95-1	Perfluorononanoic acid (PFNA)	1.8	U M	2.3	1.8	0.60
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	10	M	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	115		25-150
STL00990	13C4 PFOA	126		25-150
STL00991	13C4 PFOS	128		25-150
STL01892	13C4-PFHpA	125		25-150
STL00995	13C5 PFNA	122		25-150
STL00994	18O2 PFHxS	131		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_062.d
 Lims ID: 320-18986-A-10-A
 Client ID: FB051616
 Sample Type: Client
 Inject. Date: 29-May-2016 13:25:29 ALS Bottle#: 36 Worklist Smp#: 61
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-10-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 17:46:27 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj Date: 31-May-2016 17:44:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 6 13C2 PFHxA	315.0 > 270.0	8.230	8.236	-0.006	3362064	57.6		115	33862	
D 8 13C4-PFHpA	367.0 > 322.0	9.470	9.474	-0.004	3858691	62.3		125	37654	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.470	9.475	-0.005	2740	-0.4274			20.2	
D 11 18O2 PFHxS	403.0 > 84.0	9.505	9.507	-0.002	1772019	62.1		131	73189	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.505	9.507	-0.002	26966	0.7870				M
D 12 13C4 PFOA	417.0 > 372.0	10.586	10.586	0.0	4255878	63.2		126	56343	
13 Perfluorooctanoic acid	413.0 > 369.0	10.596	10.587	0.009	28214	0.3261			16.1	
	413.0 > 169.0	10.596	10.587	0.009	7051		4.00(0.00-0.00)		26.5	
D 16 13C4 PFOS	503.0 > 80.0	11.543	11.543	0.0	2153765	61.3		128	154007	
15 Perfluorooctane sulfonic acid	499.0 > 80.0	11.543	11.545	-0.002	320000	5.66			1036	M
	499.0 > 99.0	11.543	11.545	-0.002	157967		2.03(0.00-0.00)		1490	M
D 17 13C5 PFNA	468.0 > 423.0	11.561	11.562	-0.001	3775691	60.9		122	41743	
18 Perfluorononanoic acid	463.0 > 419.0	11.545	11.563	-0.018	901	0.0141			46.3	M

QC Flag Legend

Review Flags

M - Manually Integrated

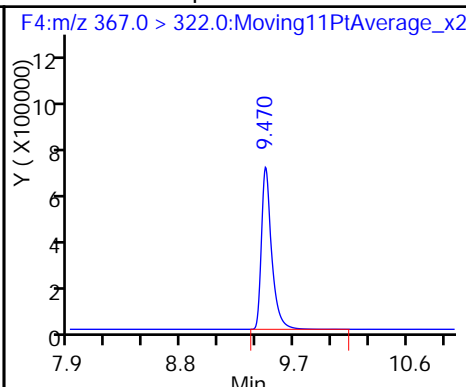
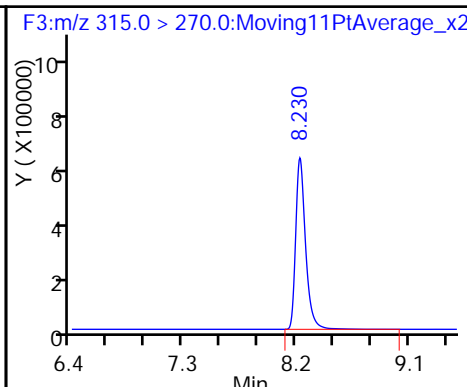
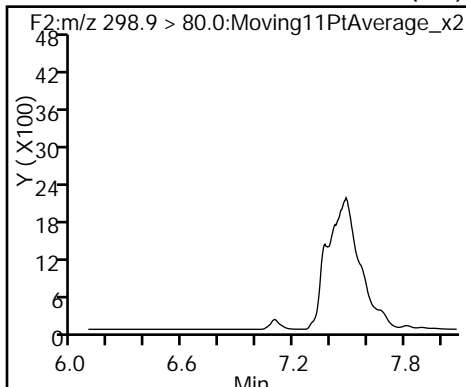
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_062.d
Injection Date: 29-May-2016 13:25:29 Instrument ID: A6
Lims ID: 320-18986-A-10-A Lab Sample ID: 320-18986-10
Client ID: FB051616
Operator ID: JRB ALS Bottle#: 36 Worklist Smp#: 61
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid (ND)

D 6 13C2 PFHxA

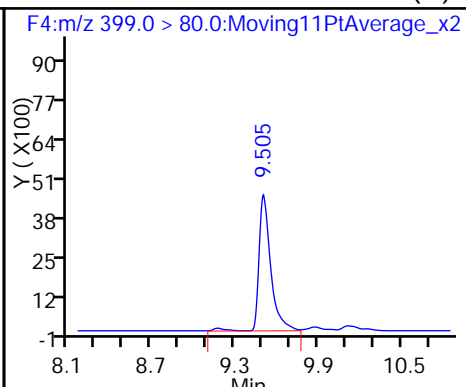
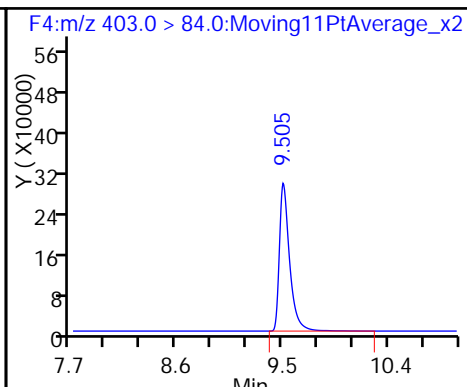
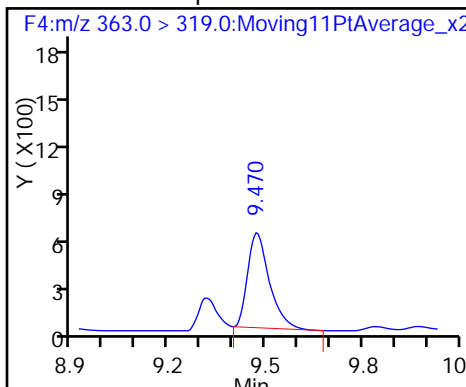
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid

D 11 18O2 PFHxS

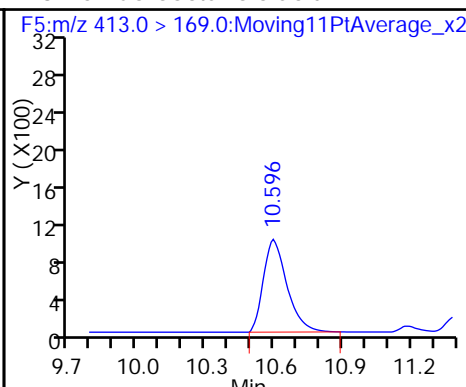
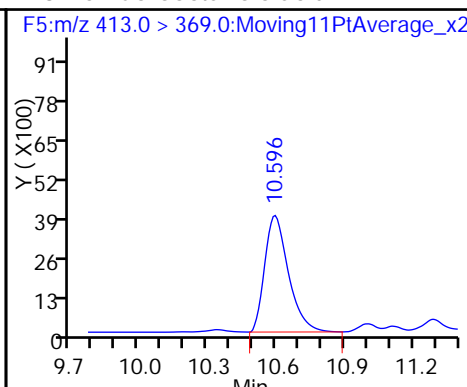
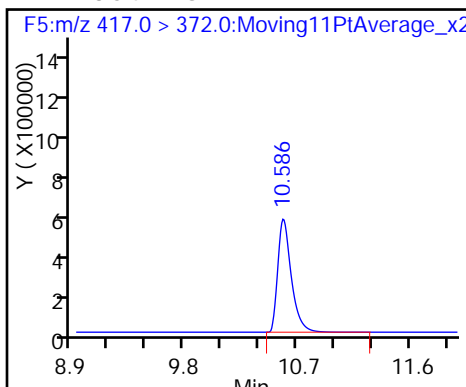
41 Perfluorohexanesulfonic acid (M)



D 12 13C4 PFOA

13 Perfluorooctanoic acid

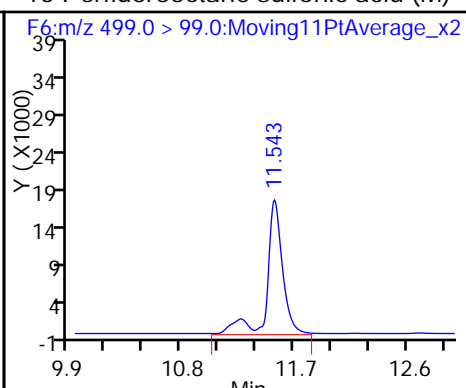
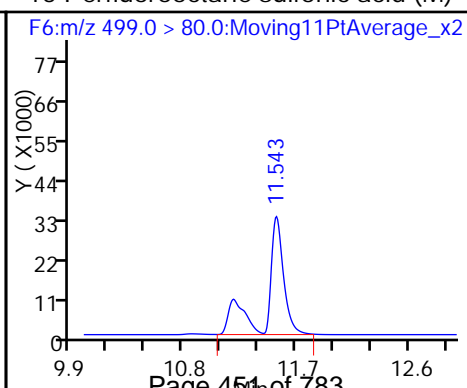
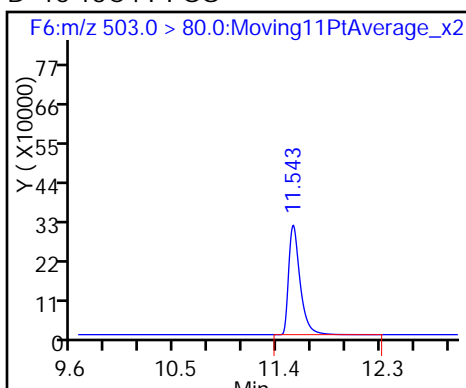
13 Perfluorooctanoic acid



D 16 13C4 PFOS

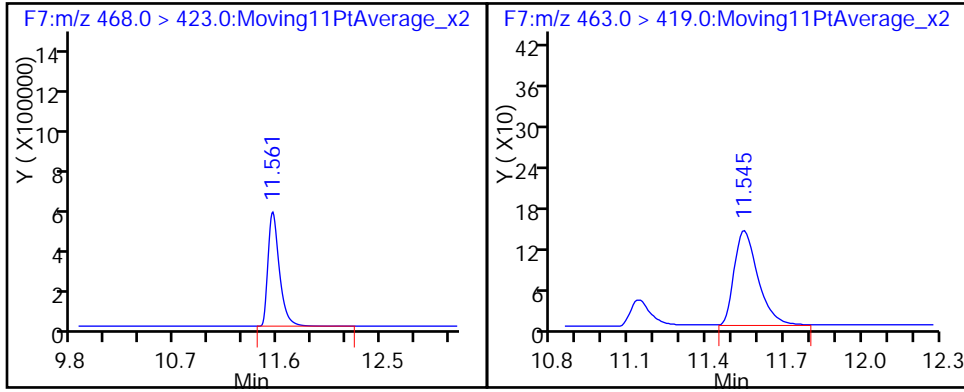
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid (M)



TestAmerica Sacramento

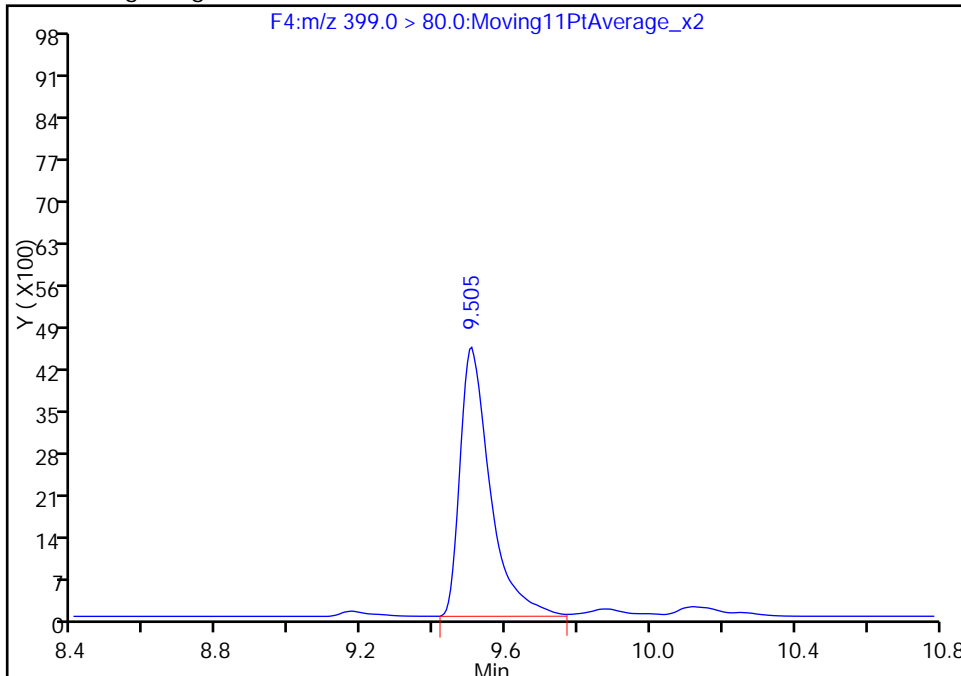
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Injection Date: 29-May-2016 13:25:29 Instrument ID: A6
Lims ID: 320-18986-A-10-A Lab Sample ID: 320-18986-10
Client ID: FB051616
Operator ID: JRB ALS Bottle#: 36 Worklist Smp#: 61
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

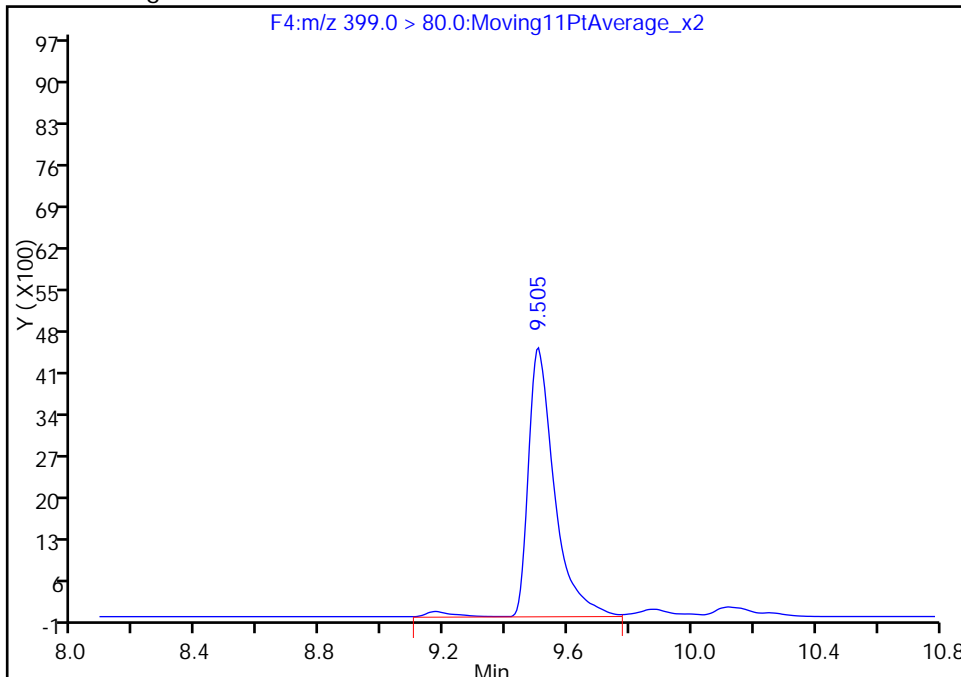
RT: 9.50
Area: 26236
Amount: 0.765683
Amount Units: ng/ml

Processing Integration Results



RT: 9.50
Area: 26966
Amount: 0.786988
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:44:59
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

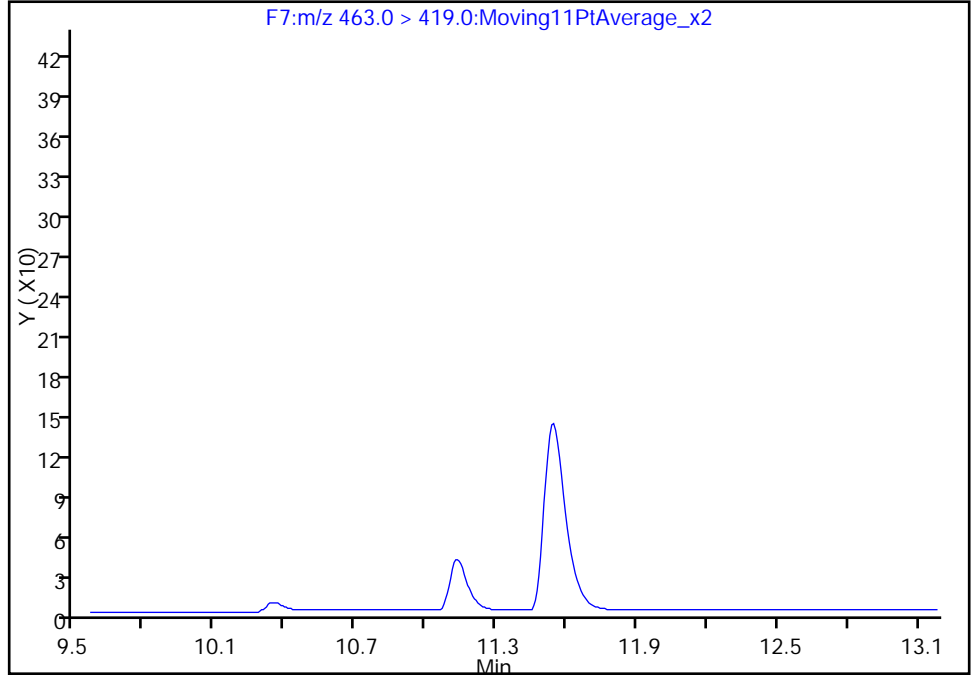
Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_062.d
Injection Date: 29-May-2016 13:25:29 Instrument ID: A6
Lims ID: 320-18986-A-10-A Lab Sample ID: 320-18986-10
Client ID: FB051616
Operator ID: JRB ALS Bottle#: 36 Worklist Smp#: 61
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F7:MRM

18 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

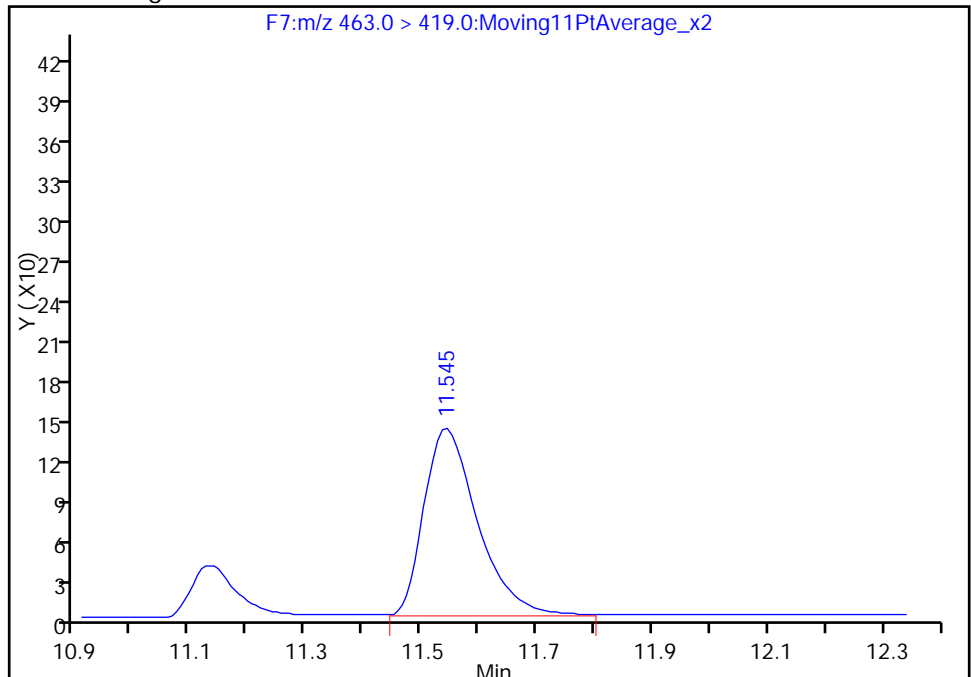
Not Detected
Expected RT: 11.56

Processing Integration Results



Manual Integration Results

RT: 11.54
Area: 901
Amount: 0.014132
Amount Units: ng/ml



Reviewer: barnettj, 31-May-2016 17:44:59
Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

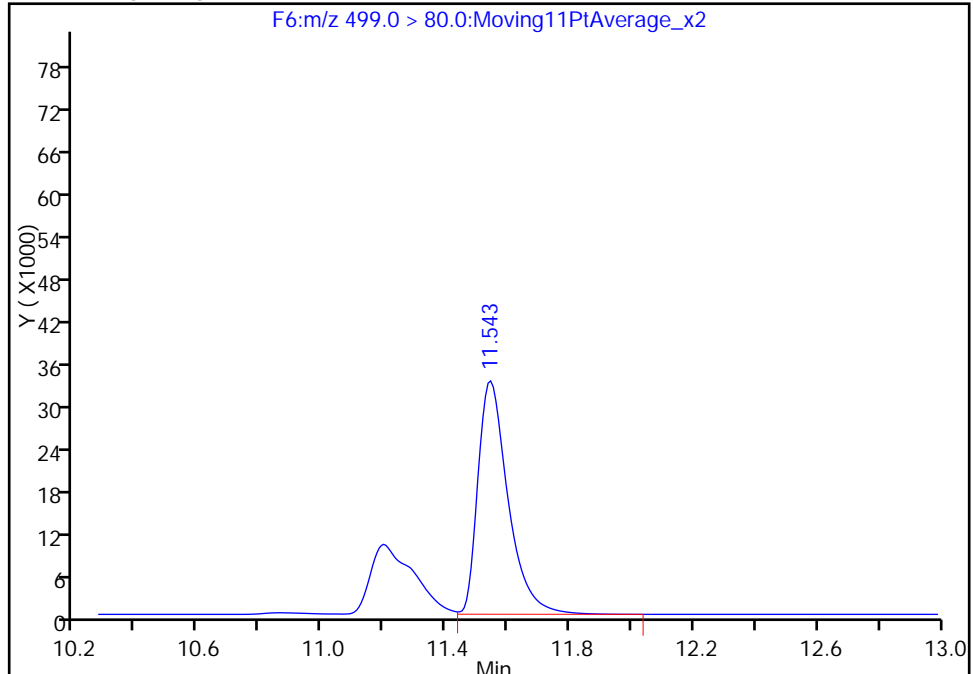
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Injection Date: 29-May-2016 13:25:29 Instrument ID: A6
Lims ID: 320-18986-A-10-A Lab Sample ID: 320-18986-10
Client ID: FB051616
Operator ID: JRB ALS Bottle#: 36 Worklist Smp#: 61
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

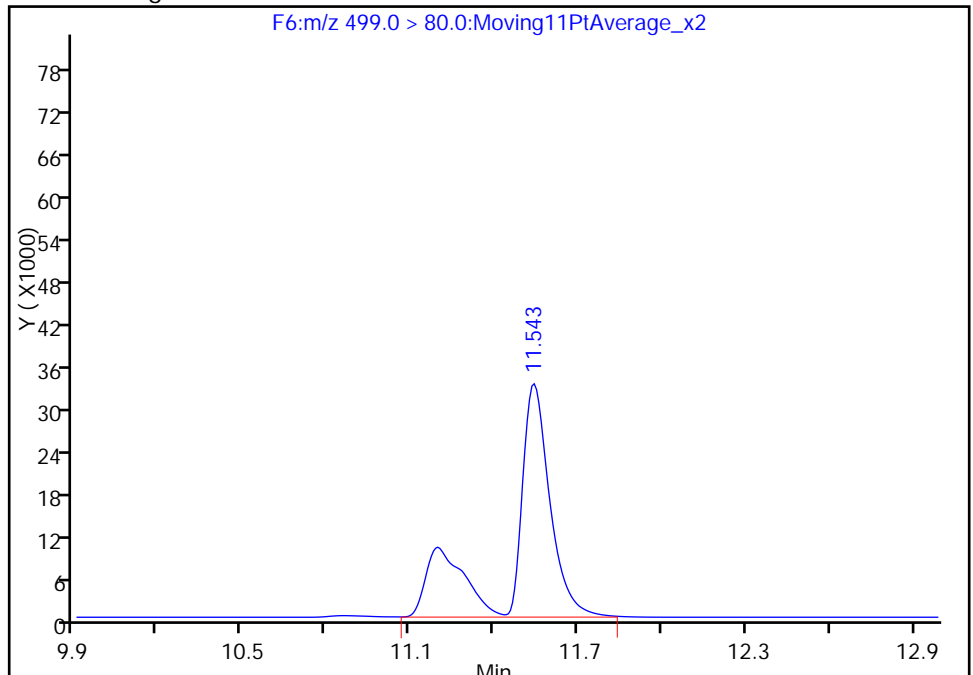
RT: 11.54
Area: 225021
Amount: 3.978051
Amount Units: ng/ml

Processing Integration Results



RT: 11.54
Area: 320000
Amount: 5.657144
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:44:59
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

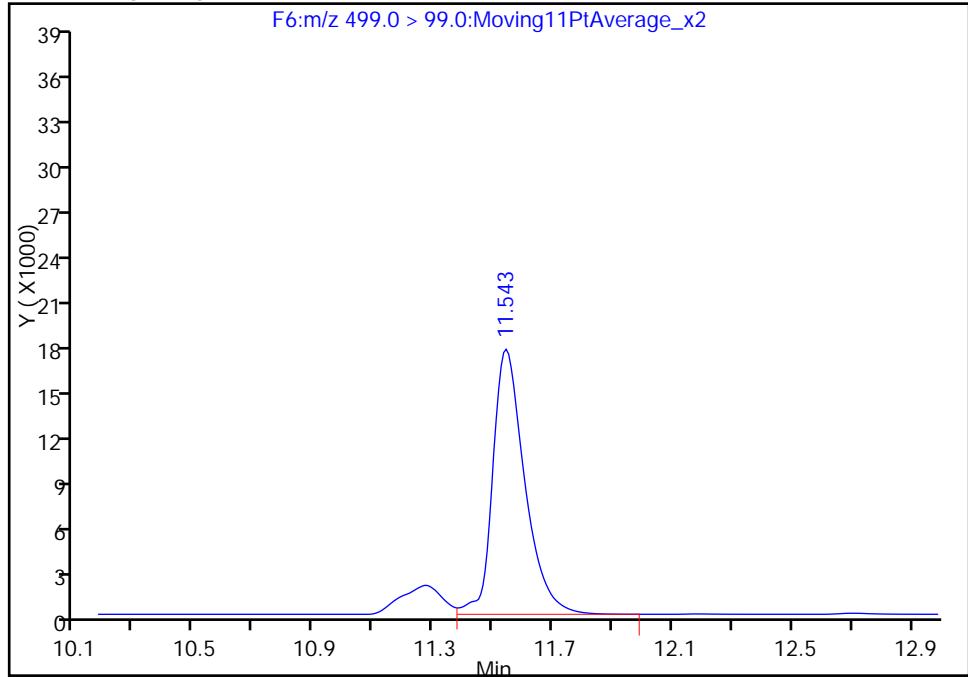
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Lims ID: 320-18986-A-10-A Lab Sample ID: 320-18986-10
Client ID: FB051616
Operator ID: JRB ALS Bottle#: 36 Worklist Smp#: 61
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

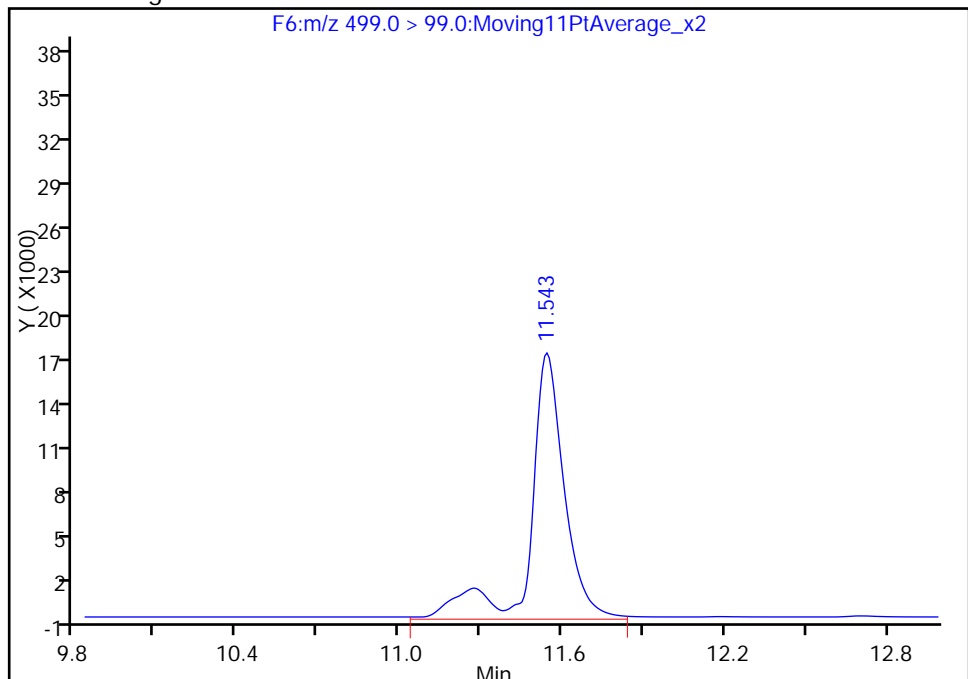
RT: 11.54
Area: 132543
Amount: 3.978051
Amount Units: ng/ml

Processing Integration Results



RT: 11.54
Area: 157967
Amount: 5.657144
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: EB051616 Lab Sample ID: 320-18986-11
 Matrix: Water Lab File ID: 28MAY2016A6A_063.d
 Analysis Method: WS-LC-0025 Date Collected: 05/16/2016 10:05
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 535.9(mL) Date Analyzed: 05/29/2016 13:46
 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.: 111859 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 M	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)	7.6	M	3.7	2.8	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	1.9	U M	2.3	1.9	0.70

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	118		25-150
STL00990	13C4 PFOA	127		25-150
STL00991	13C4 PFOS	134		25-150
STL01892	13C4-PFHpA	124		25-150
STL00995	13C5 PFNA	119		25-150
STL00994	18O2 PFHxS	128		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_063.d
 Lims ID: 320-18986-A-11-A
 Client ID: EB051616
 Sample Type: Client
 Inject. Date: 29-May-2016 13:46:45 ALS Bottle#: 37 Worklist Smp#: 62
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-11-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 17:46:27 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj Date: 31-May-2016 17:46:27

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.067	7.085	-0.018	1.000	875	0.0190				
D 6 13C2 PFHxA										
315.0 > 270.0	8.230	8.236	-0.006		3452968	59.2		118	78979	
D 8 13C4-PFHpA										
367.0 > 322.0	9.475	9.474	0.001		3849863	62.1		124	85498	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.469	9.475	-0.006	1.000	1997	-0.4355			93.0	
D 11 18O2 PFHxS										
403.0 > 84.0	9.510	9.507	0.003		1726254	60.5		128	15069	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.504	9.507	-0.003	1.000	10274	0.3078				M
D 12 13C4 PFOA										
417.0 > 372.0	10.586	10.586	0.0		4262577	63.3		127	9678	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.586	10.587	-0.001	1.000	16732	0.1931			3.9	M
413.0 > 169.0	10.577	10.587	-0.010	0.999	3915		4.27(0.00-0.00)		11.8	
D 16 13C4 PFOS										
503.0 > 80.0	11.543	11.543	0.0		2244533	63.9		134	162624	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.543	11.545	-0.002	1.000	239568	4.06			1731	M
499.0 > 99.0	11.543	11.545	-0.002	1.000	87211		2.75(0.00-0.00)		3519	M
D 17 13C5 PFNA										
468.0 > 423.0	11.561	11.562	-0.001		3696500	59.6		119	58741	

QC Flag Legend

Review Flags

M - Manually Integrated

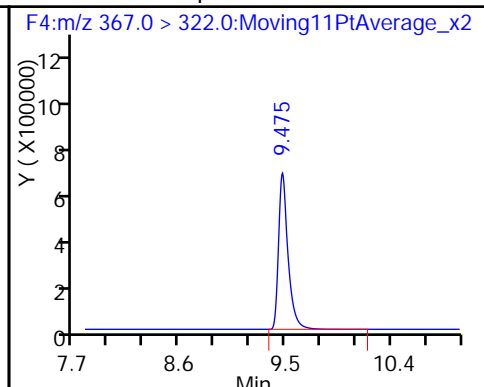
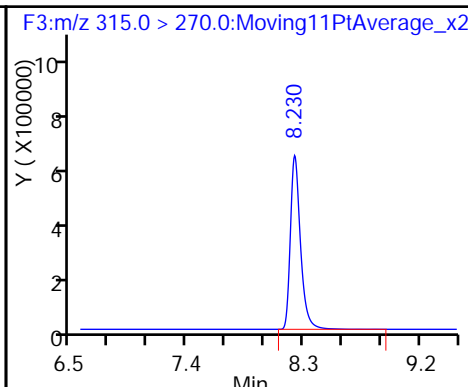
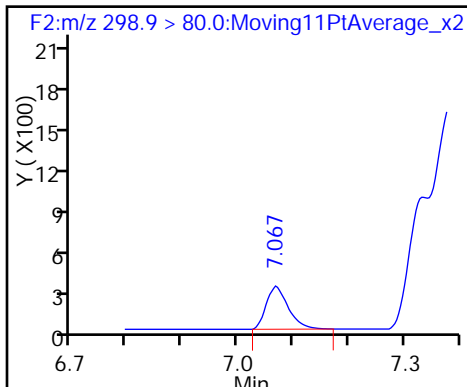
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_063.d
Injection Date: 29-May-2016 13:46:45 Instrument ID: A6
Lims ID: 320-18986-A-11-A Lab Sample ID: 320-18986-11
Client ID: EB051616
Operator ID: JRB ALS Bottle#: 37 Worklist Smp#: 62
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxS

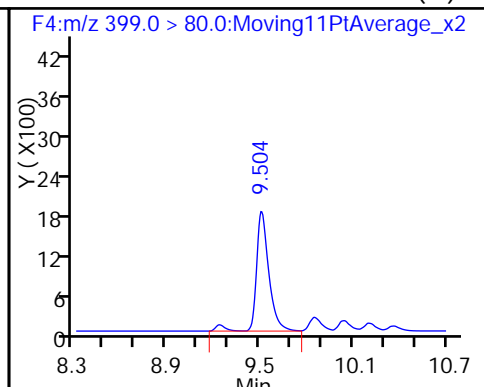
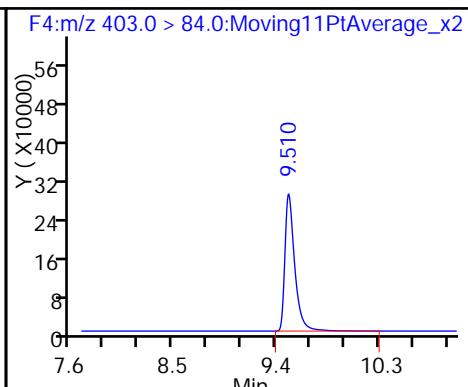
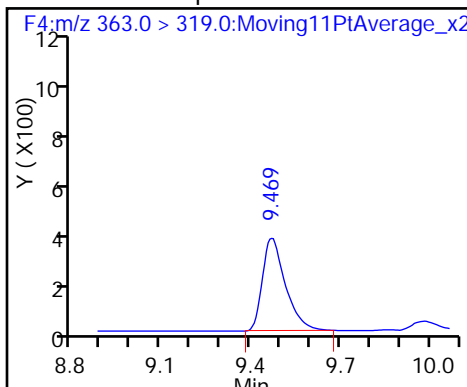
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid

D 11 18O2 PFHxS

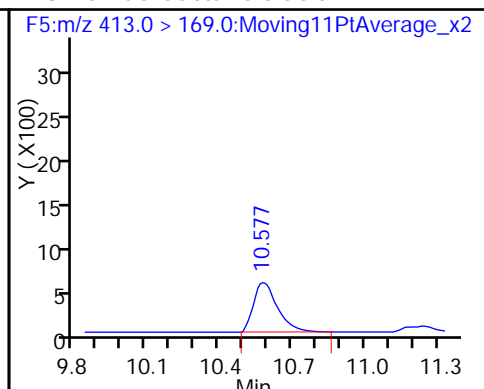
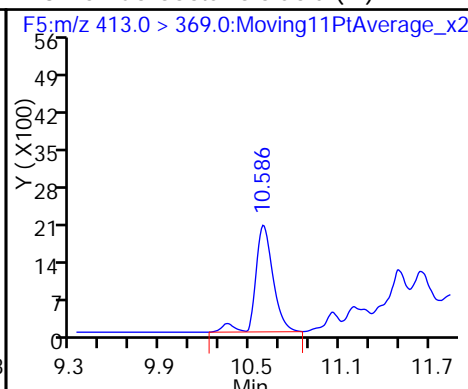
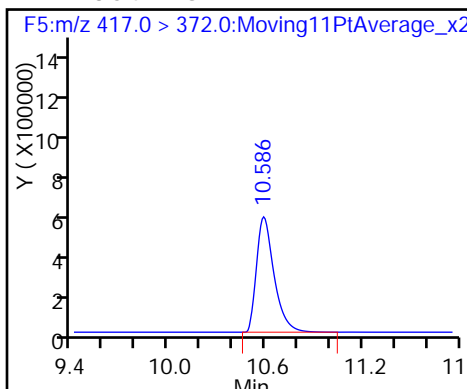
41 Perfluorohexanesulfonic acid (M)



D 12 13C4 PFOA

13 Perfluorooctanoic acid (M)

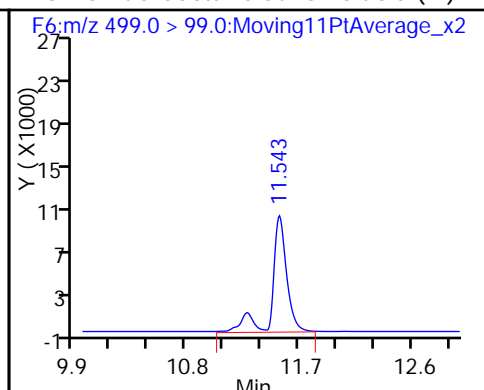
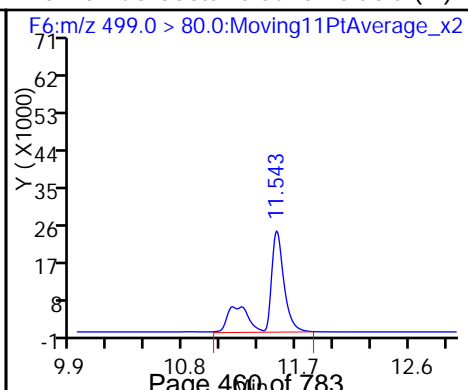
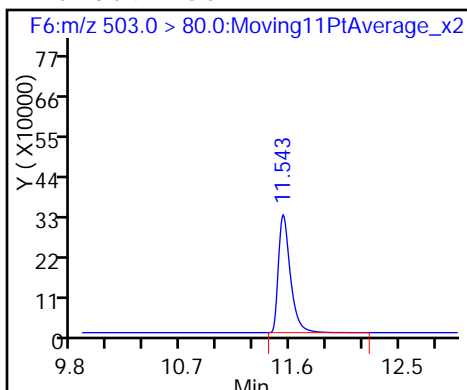
13 Perfluorooctanoic acid



D 16 13C4 PFOS

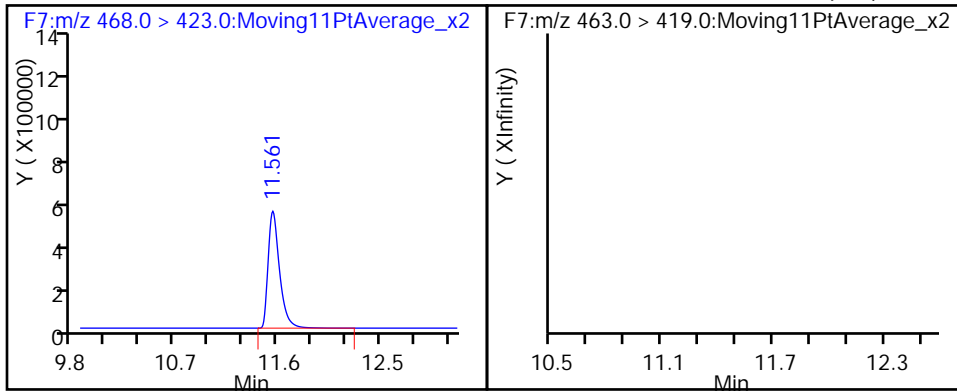
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid (ND)



TestAmerica Sacramento

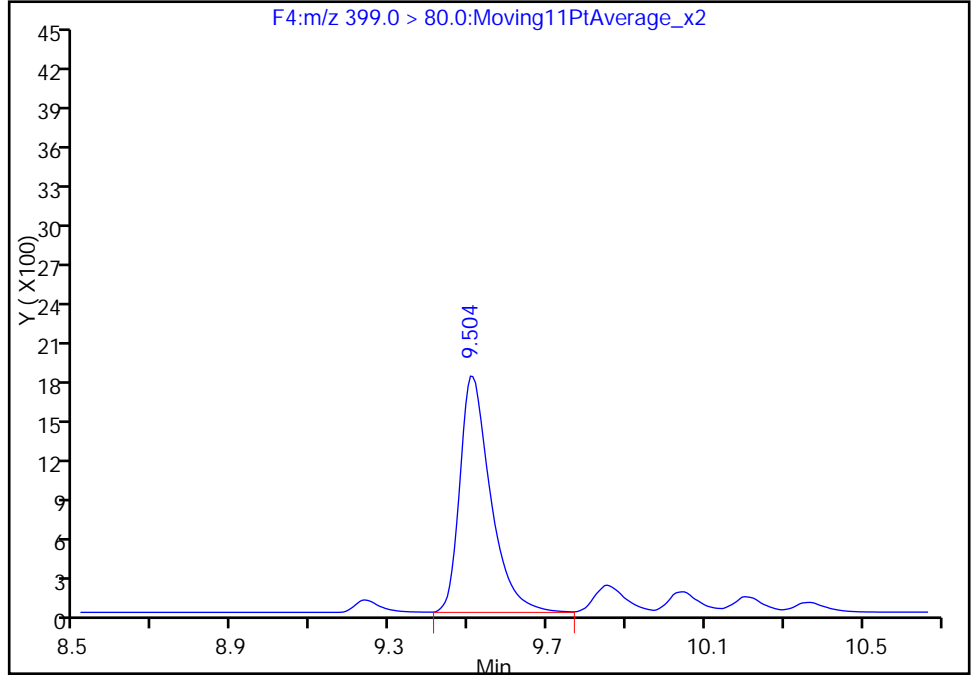
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Injection Date: 29-May-2016 13:46:45 Instrument ID: A6
Lims ID: 320-18986-A-11-A Lab Sample ID: 320-18986-11
Client ID: EB051616
Operator ID: JRB ALS Bottle#: 37 Worklist Smp#: 62
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

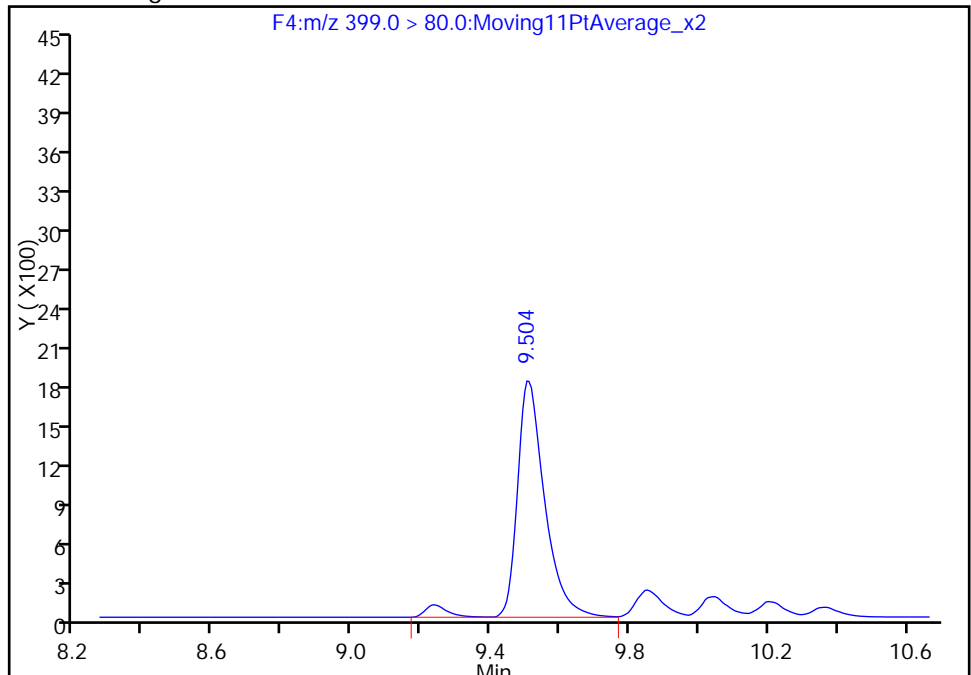
RT: 9.50
Area: 9848
Amount: 0.295028
Amount Units: ng/ml

Processing Integration Results



RT: 9.50
Area: 10274
Amount: 0.307790
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

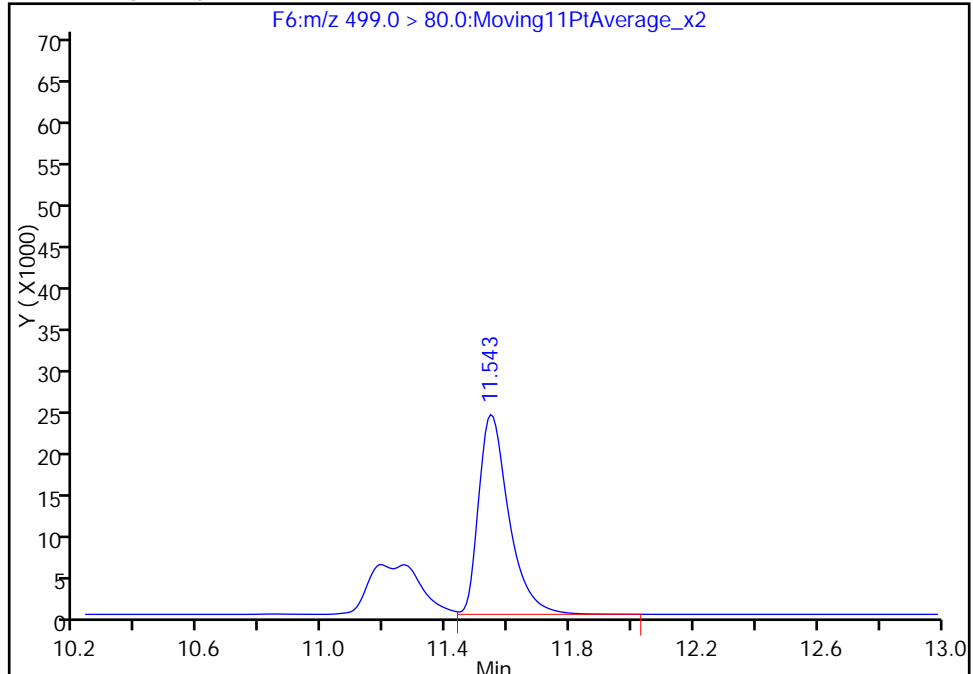
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Injection Date: 29-May-2016 13:46:45 Instrument ID: A6
Lims ID: 320-18986-A-11-A Lab Sample ID: 320-18986-11
Client ID: EB051616
Operator ID: JRB ALS Bottle#: 37 Worklist Smp#: 62
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

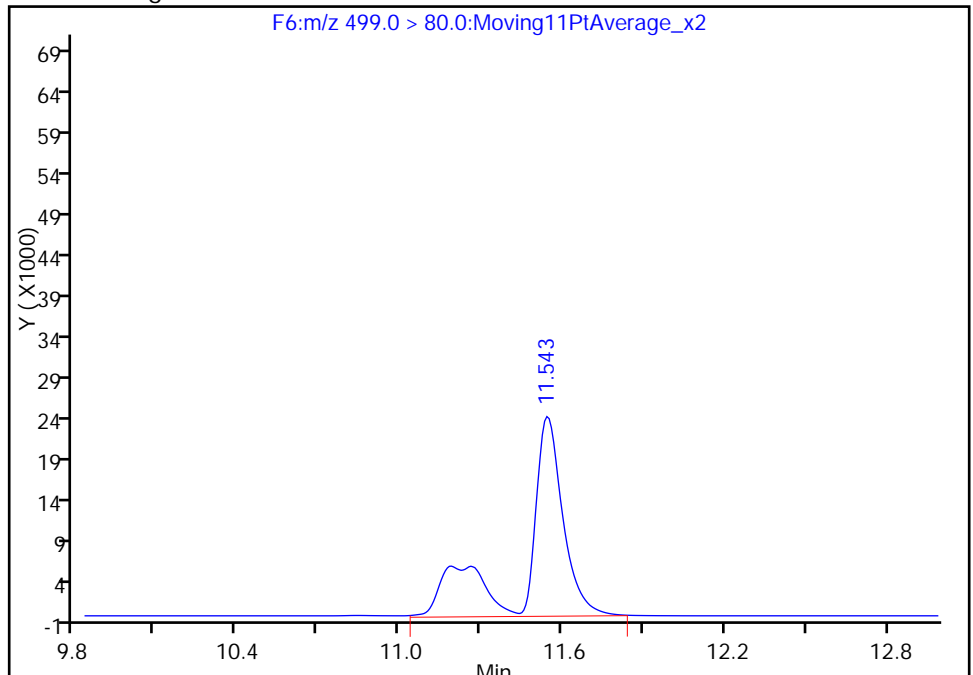
RT: 11.54
Area: 164674
Amount: 2.793474
Amount Units: ng/ml

Processing Integration Results



RT: 11.54
Area: 239568
Amount: 4.063950
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:46:27
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

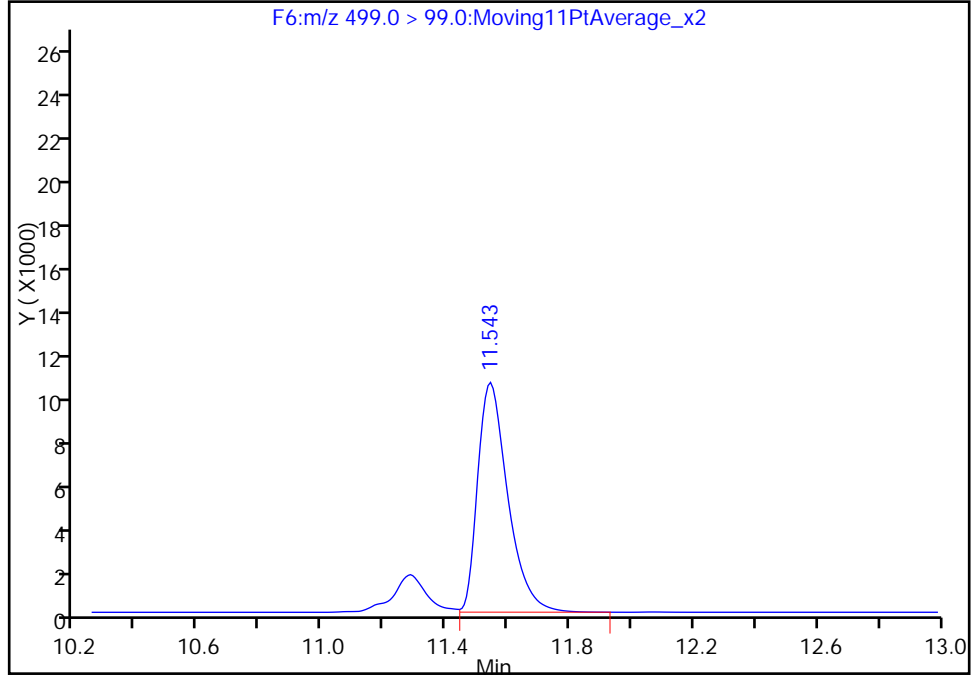
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Injection Date: 29-May-2016 13:46:45 Instrument ID: A6
Lims ID: 320-18986-A-11-A Lab Sample ID: 320-18986-11
Client ID: EB051616
Operator ID: JRB ALS Bottle#: 37 Worklist Smp#: 62
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

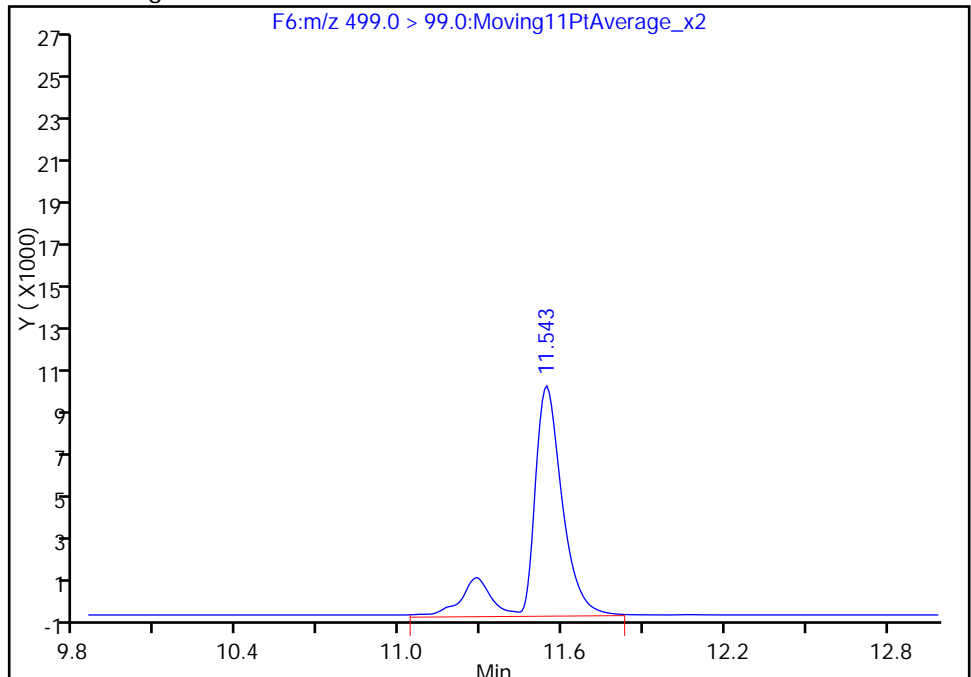
RT: 11.54
Area: 71077
Amount: 2.793474
Amount Units: ng/ml

Processing Integration Results



RT: 11.54
Area: 87211
Amount: 4.063950
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

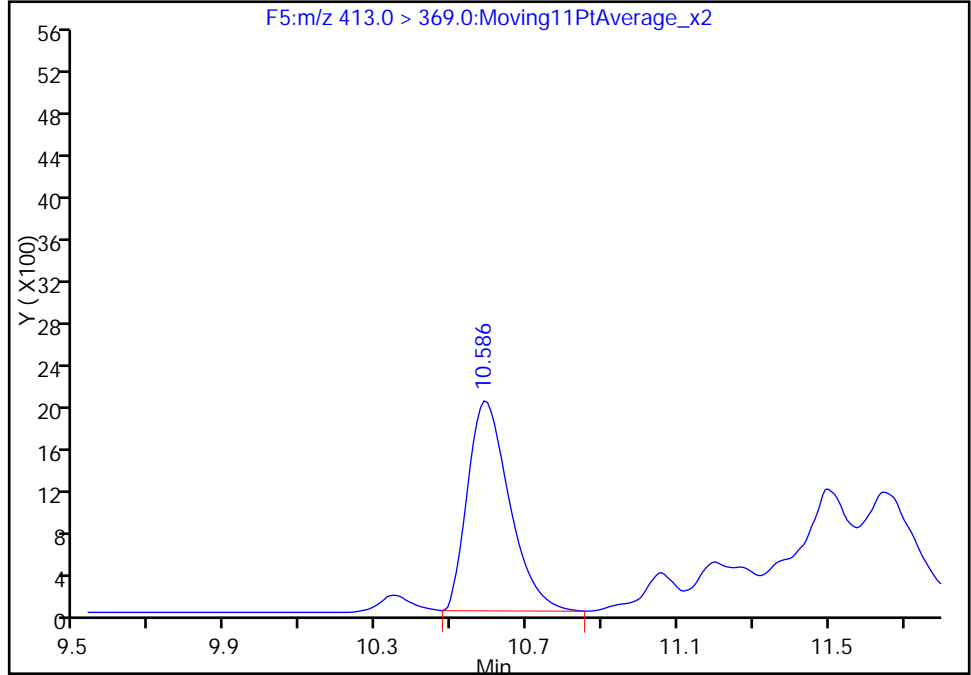
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Lims ID: 320-18986-A-11-A Lab Sample ID: 320-18986-11
Client ID: EB051616
Operator ID: JRB ALS Bottle#: 37 Worklist Smp#: 62
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

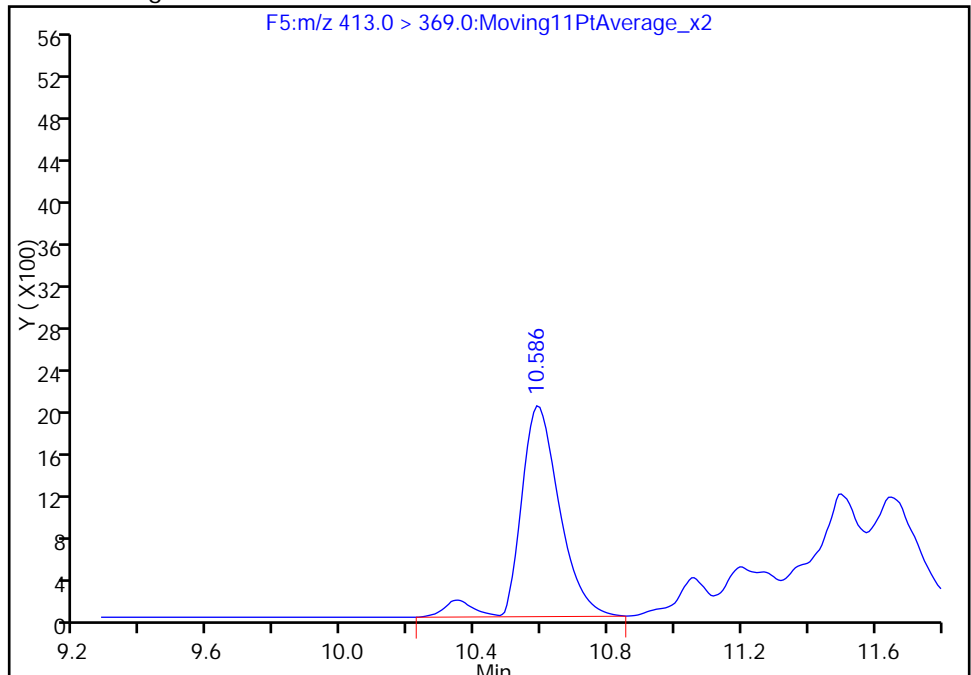
RT: 10.59
Area: 15567
Amount: 0.179637
Amount Units: ng/ml

Processing Integration Results



RT: 10.59
Area: 16732
Amount: 0.193081
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 31-May-2016 17:46:27
Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: MCFSMW-4_0516 Lab Sample ID: 320-18986-12
 Matrix: Water Lab File ID: 31MAY2016A6A_146.d
 Analysis Method: WS-LC-0025 Date Collected: 05/16/2016 11:11
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 547.6(mL) Date Analyzed: 06/02/2016 16:03
 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.: 112205 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	21		2.3	1.8	0.84
375-85-9	Perfluoroheptanoic acid (PFHpA)	77		2.3	1.8	0.73
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	220	M	2.3	1.8	0.79
375-95-1	Perfluorononanoic acid (PFNA)	11		2.3	1.8	0.60
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	67	M	3.7	2.7	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	160	M	2.3	1.8	0.68

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	80		25-150
STL00990	13C4 PFOA	89		25-150
STL00991	13C4 PFOS	101		25-150
STL01892	13C4-PFHpA	85		25-150
STL00995	13C5 PFNA	91		25-150
STL00994	18O2 PFHxS	93		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_146.d
 Lims ID: 320-18986-A-12-A
 Client ID: MCFSMW-4_0516
 Sample Type: Client
 Inject. Date: 02-Jun-2016 16:03:09 ALS Bottle#: 45 Worklist Smp#: 72
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-12-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Jun-2016 17:18:05 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 02-Jun-2016 17:15:52

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.081	7.099	-0.018	1.000	432228	11.6				
D 6 13C2 PFHxA										
315.0 > 270.0	8.241	8.252	-0.011		2462613	40.2		80.4	234117	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.487	9.494	-0.007	1.000	2836862	42.1			454	
D 8 13C4-PFHpA										
367.0 > 322.0	9.487	9.495	-0.008		2930936	42.7		85.4	31000	
D 11 18O2 PFHxS										
403.0 > 84.0	9.524	9.532	-0.008		1358602	44.1		93.1	12390	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.524	9.533	-0.009	1.000	3262585	121.3				M
D 12 13C4 PFOA										
417.0 > 372.0	10.604	10.612	-0.008		3224605	44.3		88.6	23621	
13 Perfluorooctanoic acid										M
413.0 > 369.0	10.604	10.612	-0.008	1.000	5780802	87.3			1336	M
413.0 > 169.0	10.604	10.612	-0.008	1.000	2282113		2.53(0.00-0.00)		645	M
D 16 13C4 PFOS										
503.0 > 80.0	11.568	11.568	0.0		1918201	48.3		101	1646	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.568	11.571	-0.003	1.000	1819302	36.7			1145	M
499.0 > 99.0	11.568	11.571	-0.003	1.000	772429		2.36(0.00-0.00)		5021	M
D 17 13C5 PFNA										
468.0 > 423.0	11.586	11.589	-0.003		3031330	45.5		90.9	14571	
18 Perfluorononanoic acid										
463.0 > 419.0	11.586	11.589	-0.003	1.000	315716	6.03			423	

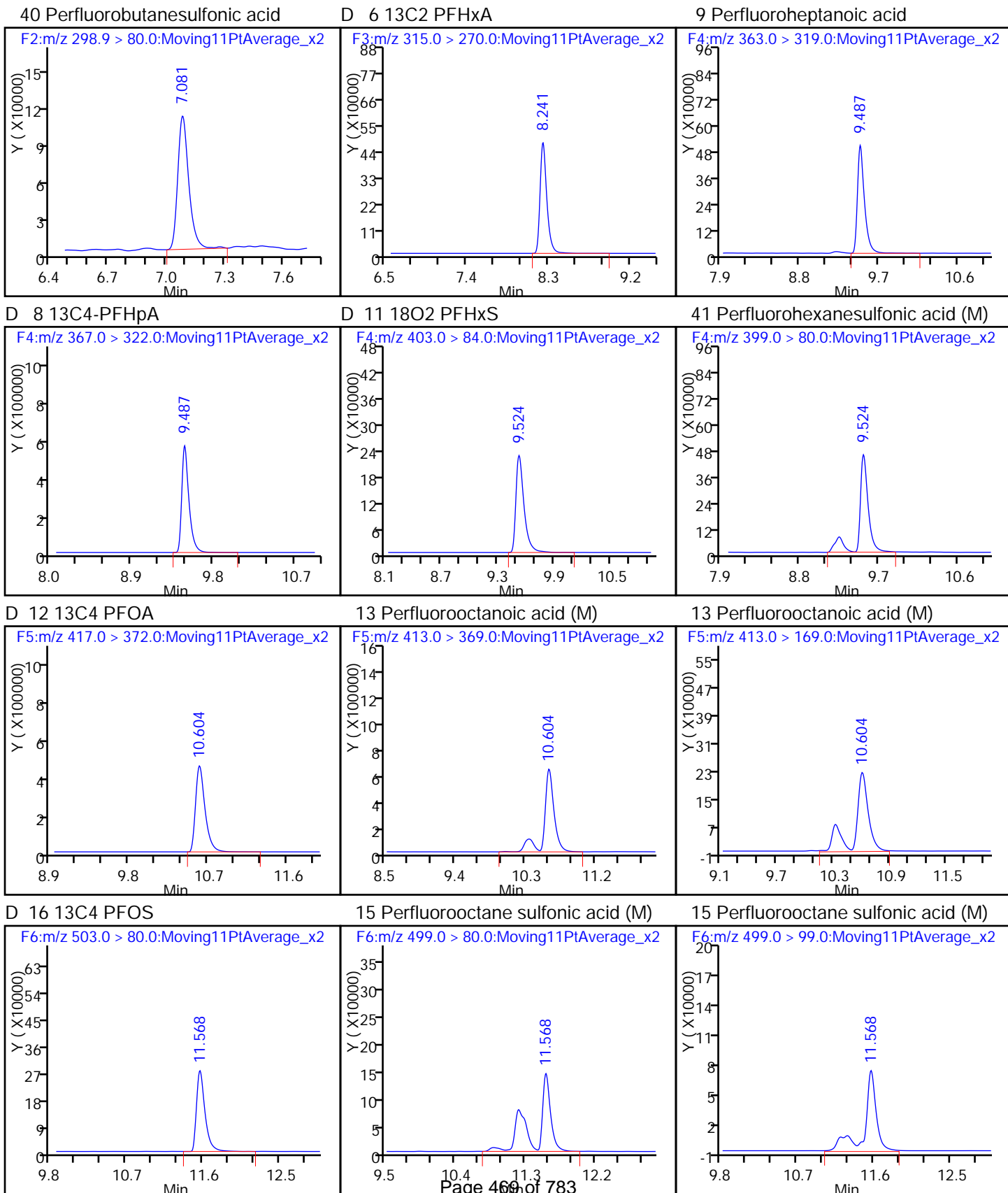
QC Flag Legend

Review Flags

M - Manually Integrated

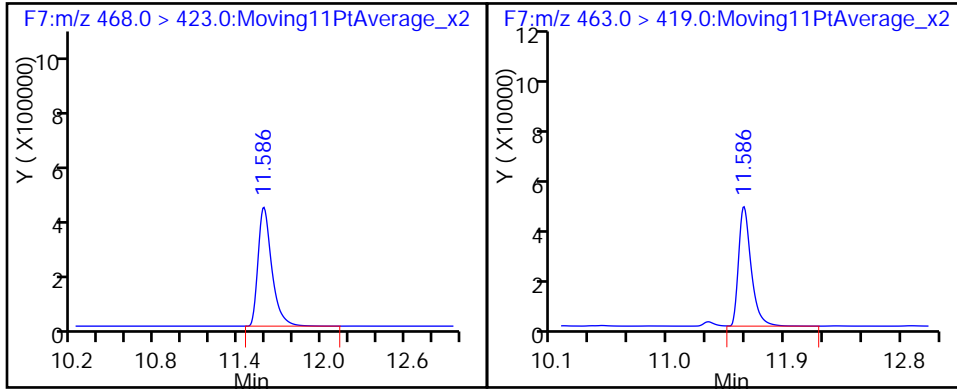
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_146.d
Injection Date: 02-Jun-2016 16:03:09 Instrument ID: A6
Lims ID: 320-18986-A-12-A Lab Sample ID: 320-18986-12
Client ID: MCFSMW-4_0516
Operator ID: JRB ALS Bottle#: 45 Worklist Smp#: 72
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL



D 17 13C5 PFNA

18 Perfluorononanoic acid



TestAmerica Sacramento

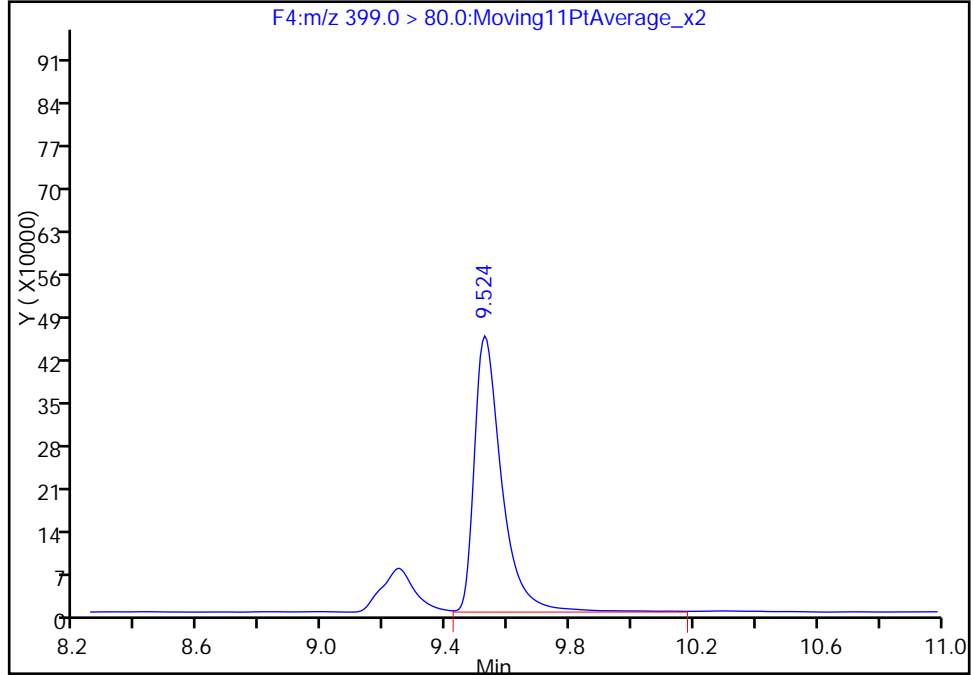
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Injection Date: 02-Jun-2016 16:03:09 Instrument ID: A6
Lims ID: 320-18986-A-12-A Lab Sample ID: 320-18986-12
Client ID: MCFSMW-4_0516
Operator ID: JRB ALS Bottle#: 45 Worklist Smp#: 72
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

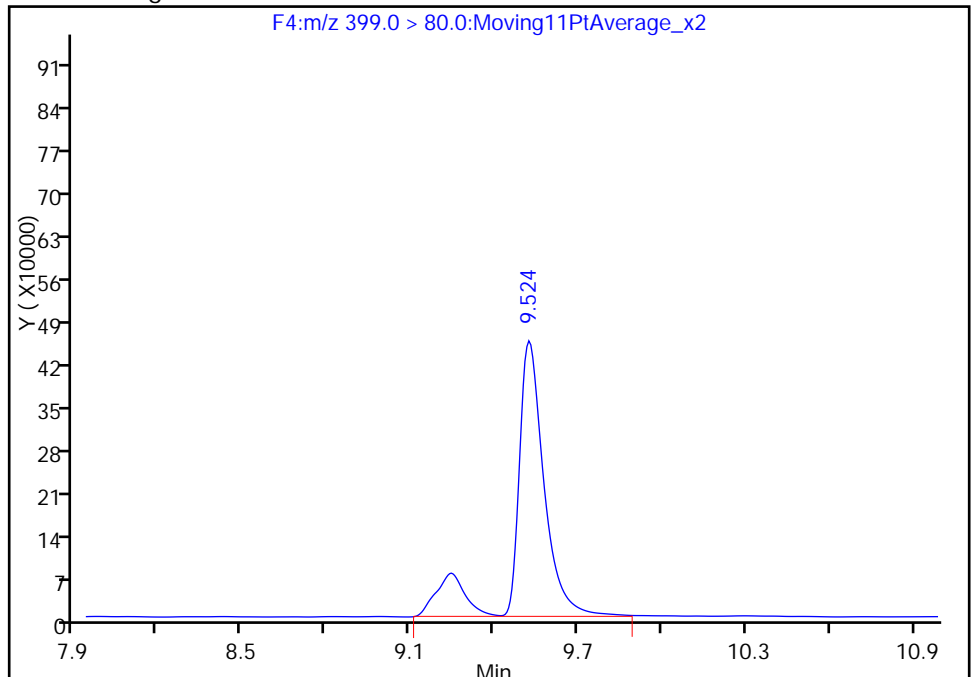
RT: 9.52
Area: 2805701
Amount: 104.2912
Amount Units: ng/ml

Processing Integration Results



RT: 9.52
Area: 3262585
Amount: 121.2741
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

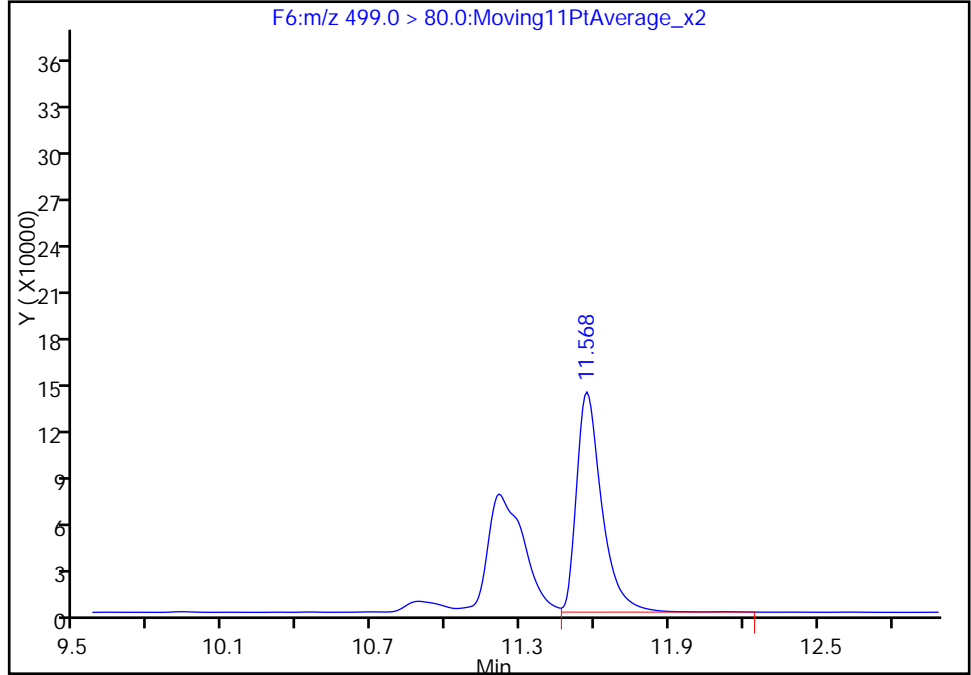
Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_146.d
Injection Date: 02-Jun-2016 16:03:09 Instrument ID: A6
Lims ID: 320-18986-A-12-A Lab Sample ID: 320-18986-12
Client ID: MCFSMW-4_0516
Operator ID: JRB ALS Bottle#: 45 Worklist Smp#: 72
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

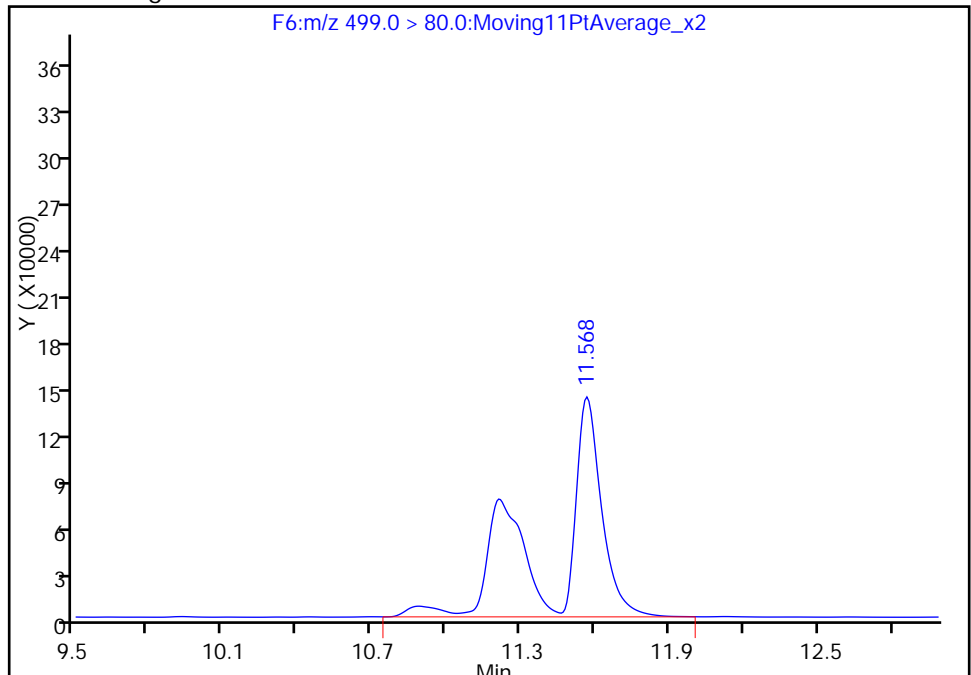
RT: 11.57
Area: 995697
Amount: 20.084364
Amount Units: ng/ml

Processing Integration Results



RT: 11.57
Area: 1819302
Amount: 36.697433
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

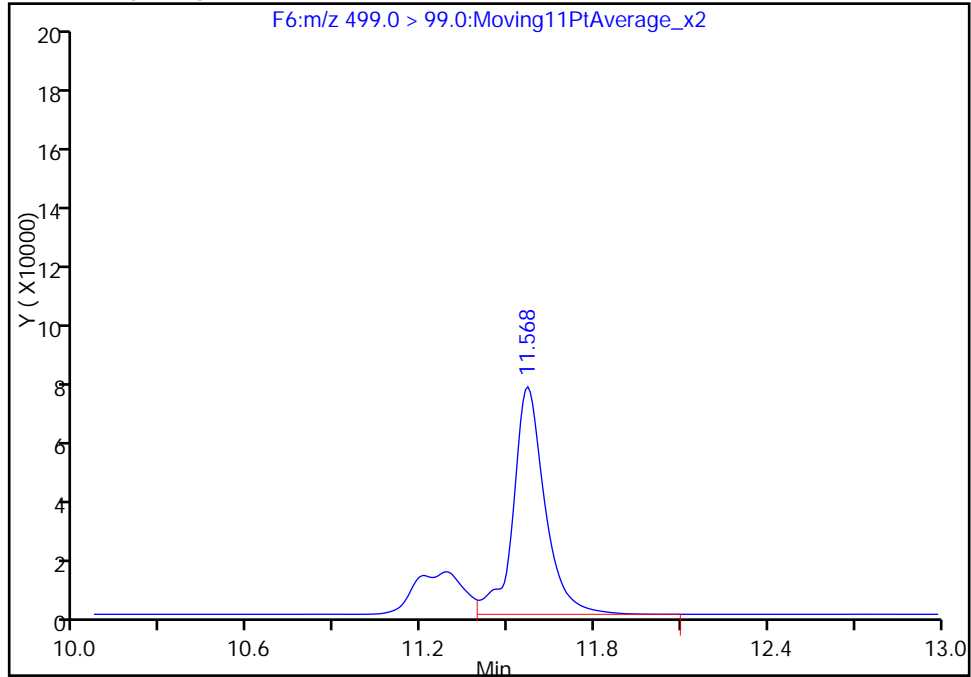
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Injection Date: 02-Jun-2016 16:03:09 Instrument ID: A6
Lims ID: 320-18986-A-12-A Lab Sample ID: 320-18986-12
Client ID: MCFSMW-4_0516
Operator ID: JRB ALS Bottle#: 45 Worklist Smp#: 72
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

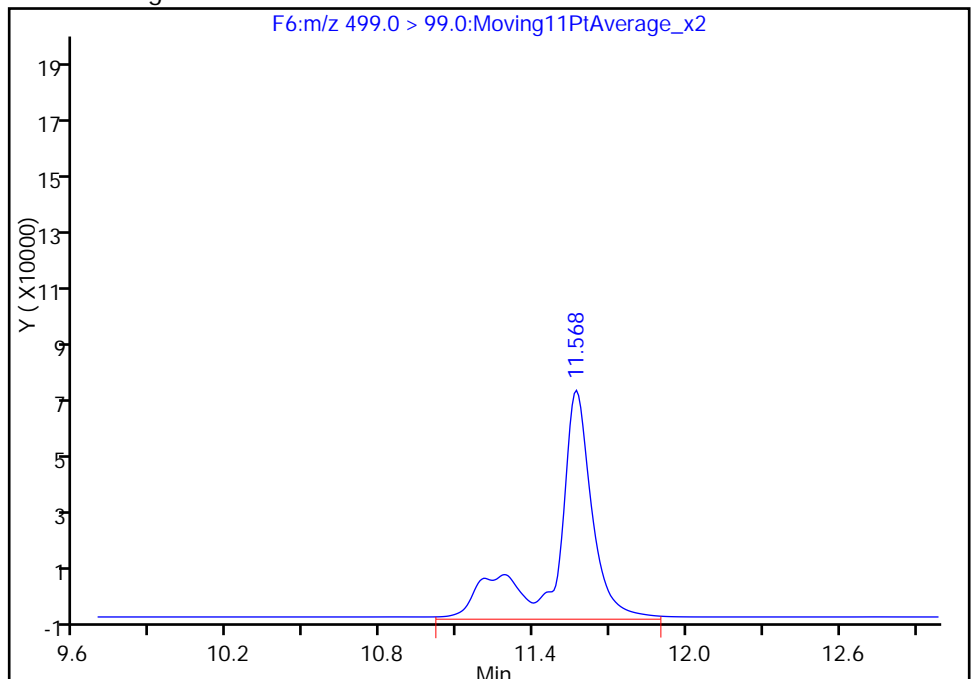
RT: 11.57
Area: 569871
Amount: 20.084364
Amount Units: ng/ml

Processing Integration Results



RT: 11.57
Area: 772429
Amount: 36.697433
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

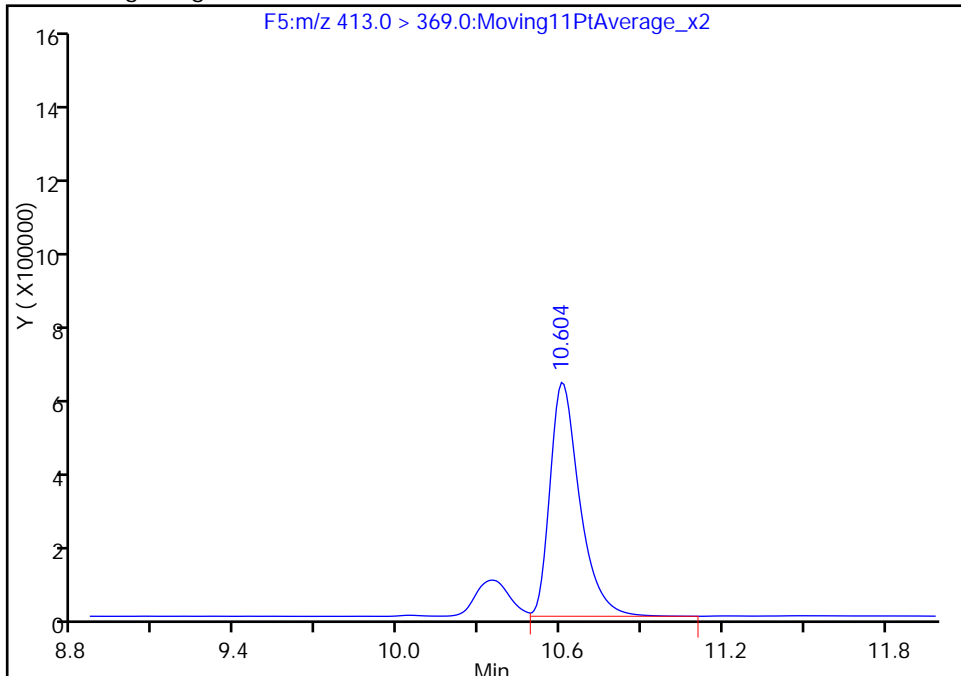
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Injection Date: 02-Jun-2016 16:03:09 Instrument ID: A6
Lims ID: 320-18986-A-12-A Lab Sample ID: 320-18986-12
Client ID: MCFSMW-4_0516
Operator ID: JRB ALS Bottle#: 45 Worklist Smp#: 72
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

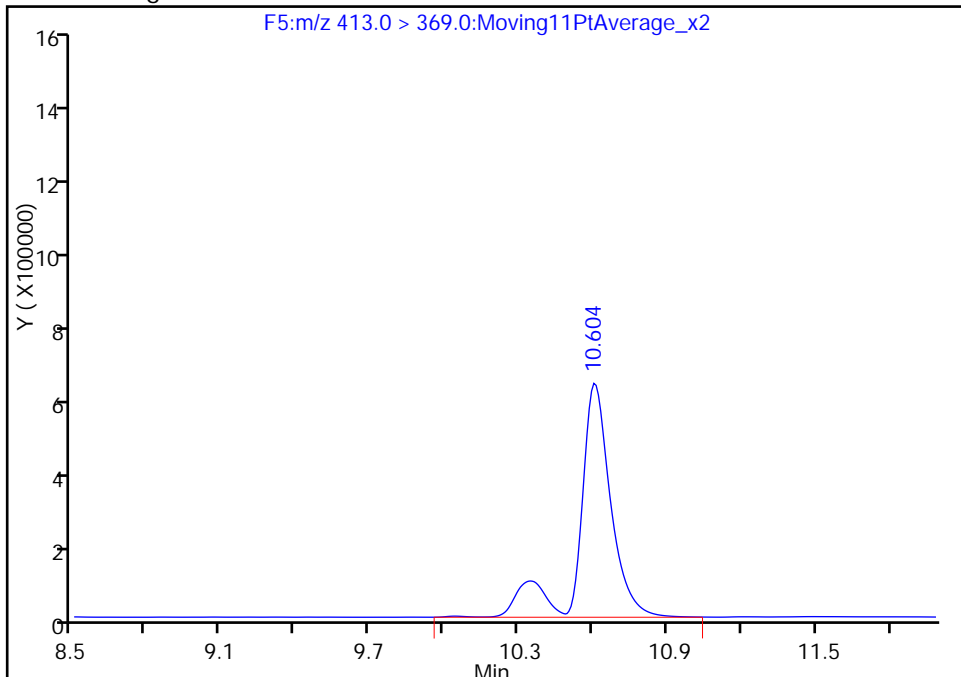
RT: 10.60
Area: 4893374
Amount: 73.915419
Amount Units: ng/ml

Processing Integration Results



RT: 10.60
Area: 5780802
Amount: 87.320201
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

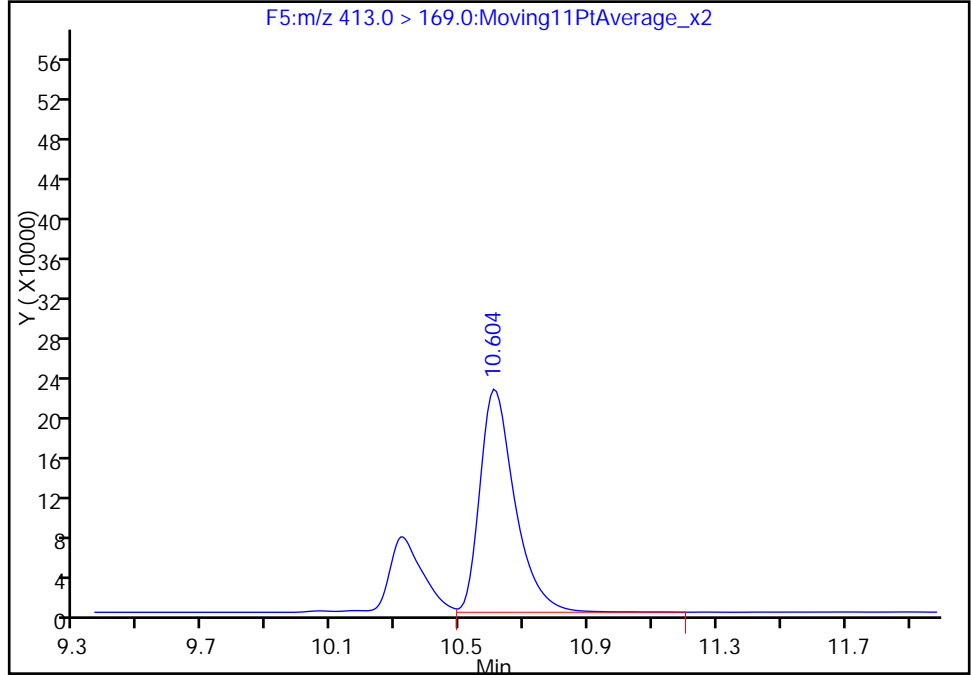
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Injection Date: 02-Jun-2016 16:03:09 Instrument ID: A6
Lims ID: 320-18986-A-12-A Lab Sample ID: 320-18986-12
Client ID: MCFSMW-4_0516
Operator ID: JRB ALS Bottle#: 45 Worklist Smp#: 72
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

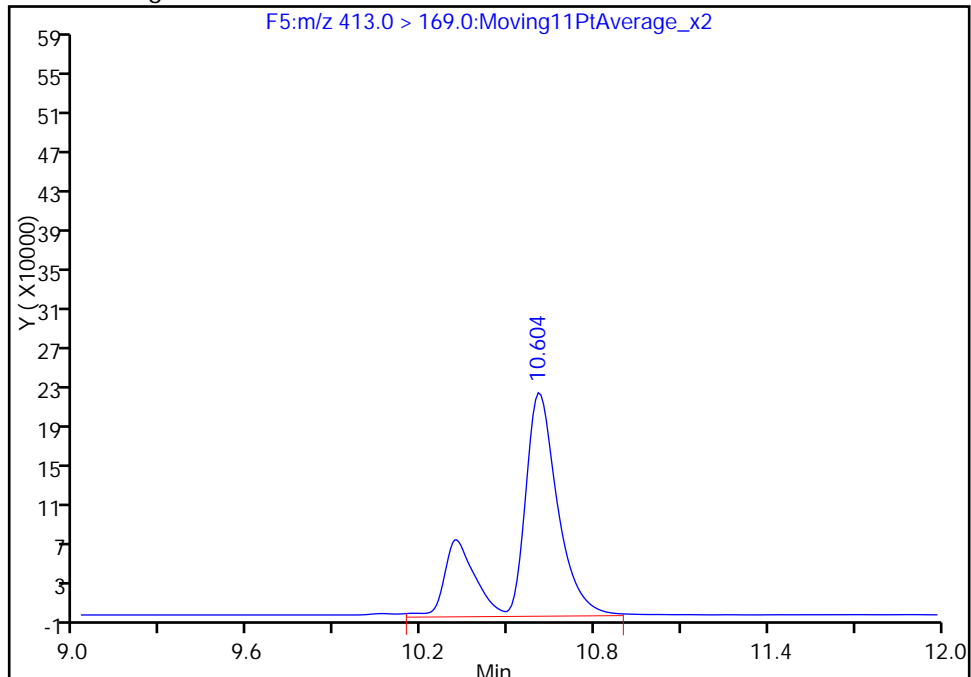
RT: 10.60
Area: 1686927
Amount: 73.915419
Amount Units: ng/ml

Processing Integration Results



RT: 10.60
Area: 2282113
Amount: 87.320201
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: MCFSMW-5_0516 Lab Sample ID: 320-18986-13
 Matrix: Water Lab File ID: 31MAY2016A6A_147.d
 Analysis Method: WS-LC-0025 Date Collected: 05/16/2016 12:46
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 536.9(mL) Date Analyzed: 06/02/2016 16:24
 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.: 112205 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	12		2.3	1.9	0.85
375-85-9	Perfluoroheptanoic acid (PFHpA)	11		2.3	1.9	0.75
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	45	M	2.3	1.9	0.81
375-95-1	Perfluorononanoic acid (PFNA)	2.9		2.3	1.9	0.61
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	37	M	3.7	2.8	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	23	M	2.3	1.9	0.70

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	86		25-150
STL00990	13C4 PFOA	79		25-150
STL00991	13C4 PFOS	107		25-150
STL01892	13C4-PFHpA	81		25-150
STL00995	13C5 PFNA	52		25-150
STL00994	18O2 PFHxS	120		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_147.d
 Lims ID: 320-18986-A-13-A
 Client ID: MCFSMW-5_0516
 Sample Type: Client
 Inject. Date: 02-Jun-2016 16:24:26 ALS Bottle#: 46 Worklist Smp#: 73
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-13-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Jun-2016 17:18:05 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 02-Jun-2016 17:18:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.095	7.099	-0.004	1.000	300571	6.22				
D 6 13C2 PFHxA										
315.0 > 270.0	8.247	8.252	-0.005		2650200	43.2		86.5	11735	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.493	9.494	-0.001	1.000	404664	6.12			99.4	
D 8 13C4-PFHpA										
367.0 > 322.0	9.493	9.495	-0.002		2763291	40.3		80.5	53835	
D 11 18O2 PFHxS										
403.0 > 84.0	9.531	9.532	-0.001		1757311	57.0		120	57961	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.531	9.533	-0.002	1.000	832790	23.9				M
D 12 13C4 PFOA										
417.0 > 372.0	10.614	10.612	0.002		2886812	39.7		79.4	9808	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.614	10.612	0.002	1.000	726705	12.3			292	M
413.0 > 169.0	10.614	10.612	0.002	1.000	253032		2.87(0.00-0.00)		669	M
D 16 13C4 PFOS										
503.0 > 80.0	11.568	11.568	0.0		2024548	51.0		107	5188	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.568	11.571	-0.003	1.000	1043686	19.9			2257	M
499.0 > 99.0	11.577	11.571	0.006	1.001	474246		2.20(0.00-0.00)		3628	M
D 17 13C5 PFNA										
468.0 > 423.0	11.586	11.589	-0.003		1734968	26.0		52.1	83219	
18 Perfluorononanoic acid										
463.0 > 419.0	11.594	11.589	0.005	1.000	46280	1.54			175	

QC Flag Legend

Review Flags

M - Manually Integrated

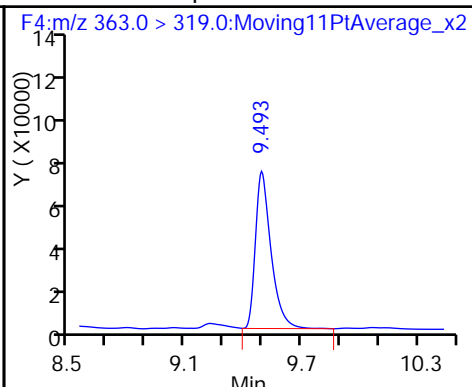
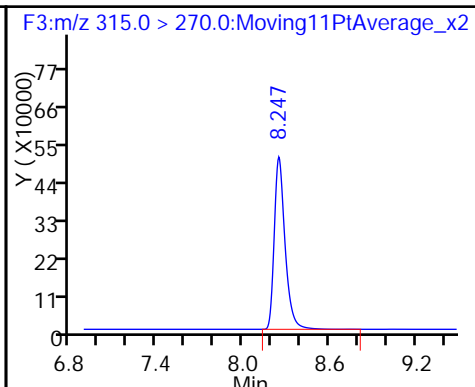
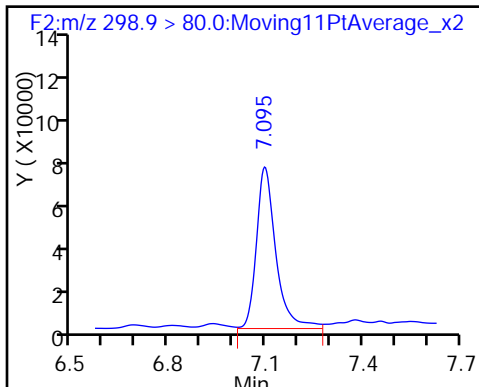
TestAmerica Sacramento

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Injection Date: 02-Jun-2016 16:24:26 Instrument ID: A6
Lims ID: 320-18986-A-13-A Lab Sample ID: 320-18986-13
Client ID: MCFSMW-5_0516
Operator ID: JRB ALS Bottle#: 46 Worklist Smp#: 73
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxA

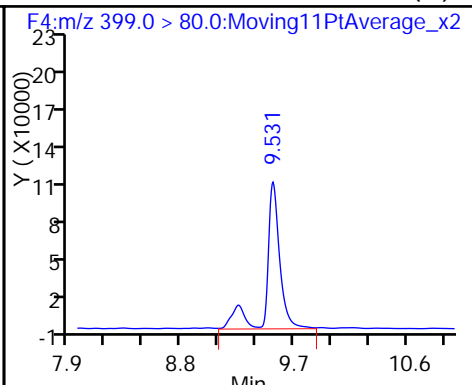
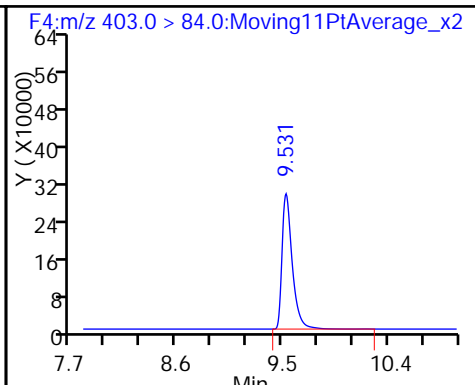
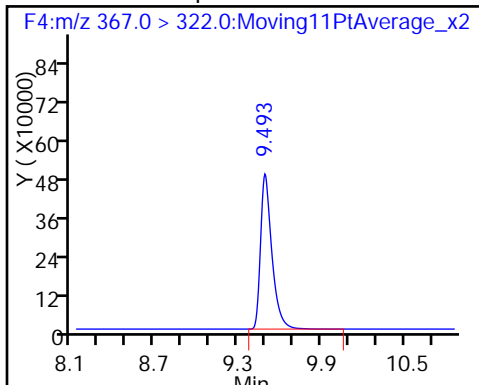
9 Perfluoroheptanoic acid



D 8 13C4-PFHpA

D 11 18O2 PFHxS

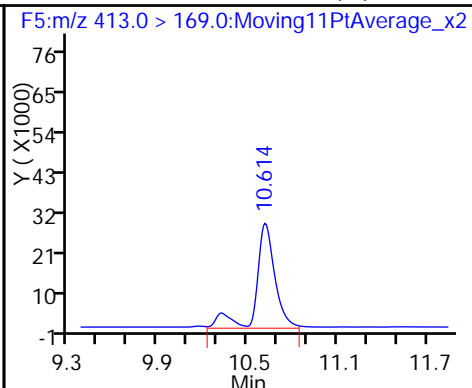
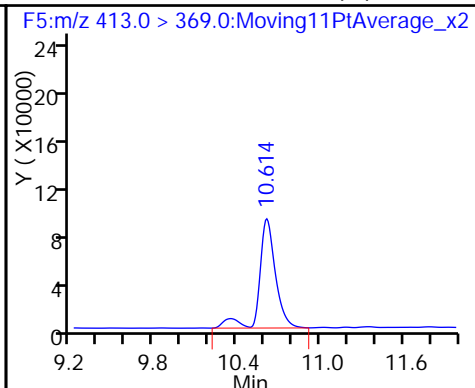
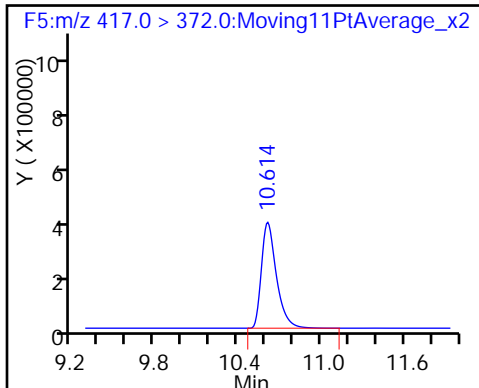
41 Perfluorohexanesulfonic acid (M)



D 12 13C4 PFOA

13 Perfluorooctanoic acid (M)

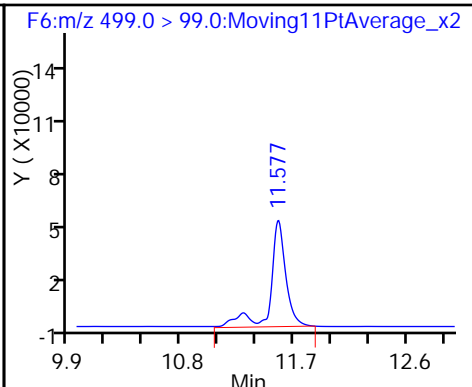
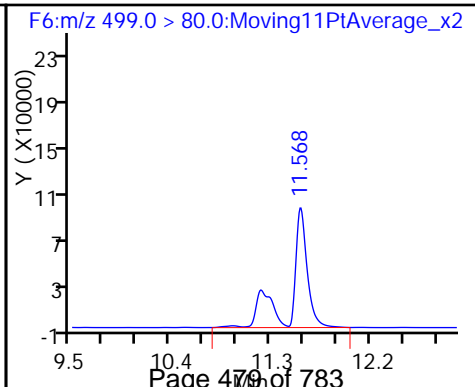
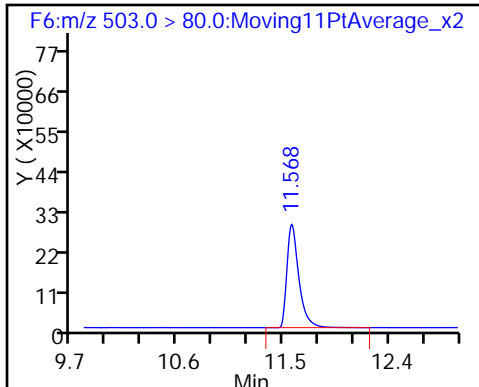
13 Perfluorooctanoic acid (M)



D 16 13C4 PFOS

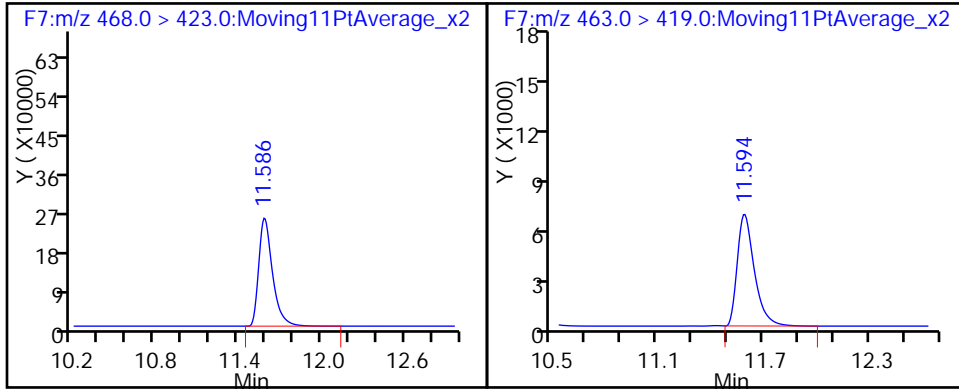
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid



TestAmerica Sacramento

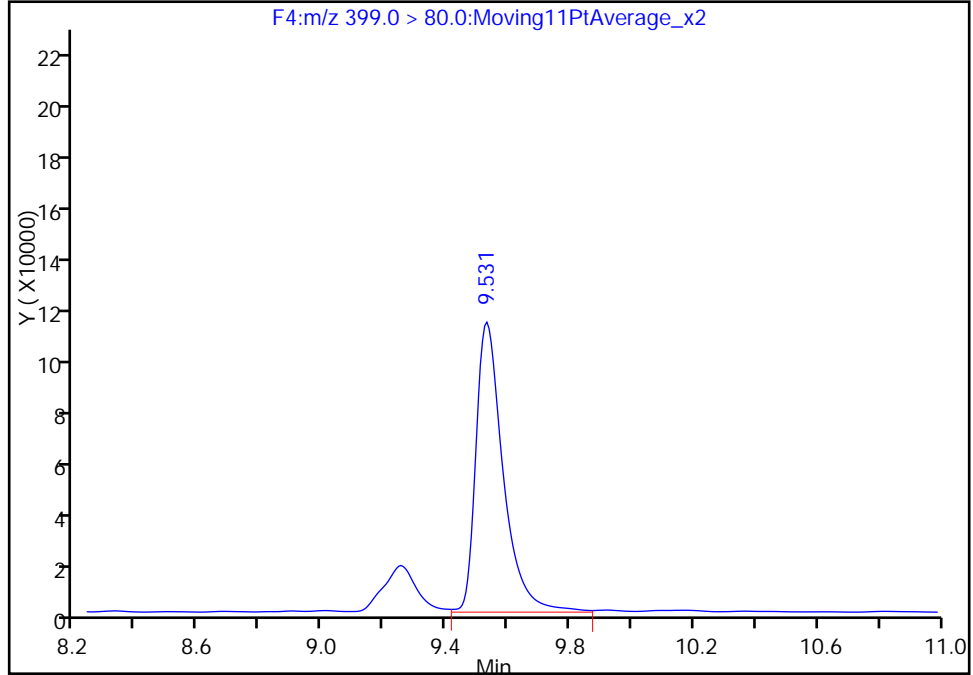
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Injection Date: 02-Jun-2016 16:24:26 Instrument ID: A6
Lims ID: 320-18986-A-13-A Lab Sample ID: 320-18986-13
Client ID: MCFSMW-5_0516
Operator ID: JRB ALS Bottle#: 46 Worklist Smp#: 73
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

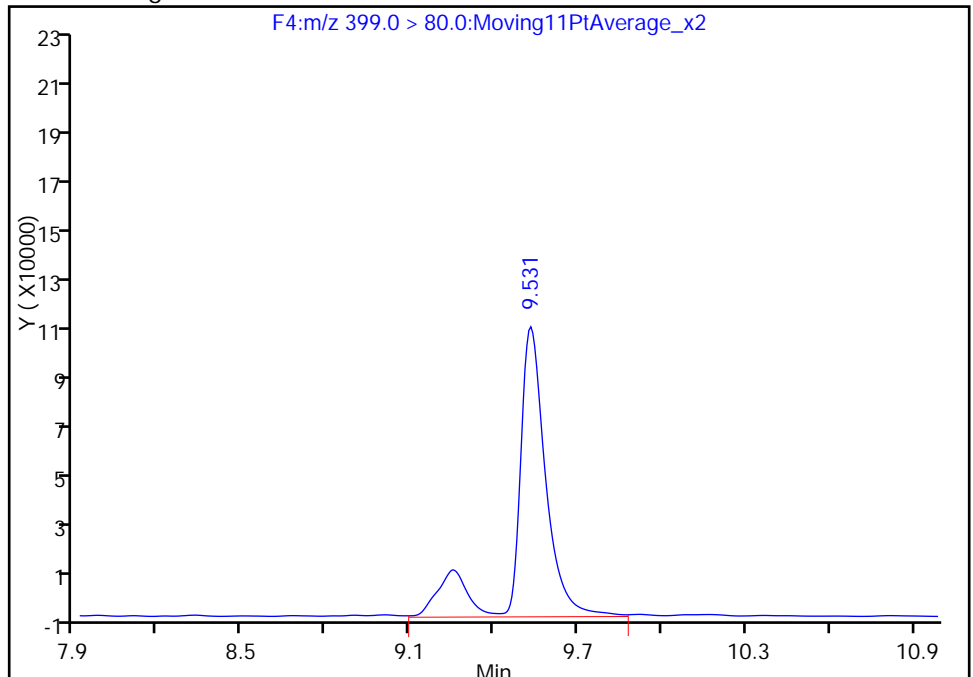
RT: 9.53
Area: 689604
Amount: 19.817536
Amount Units: ng/ml

Processing Integration Results



RT: 9.53
Area: 832790
Amount: 23.932352
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

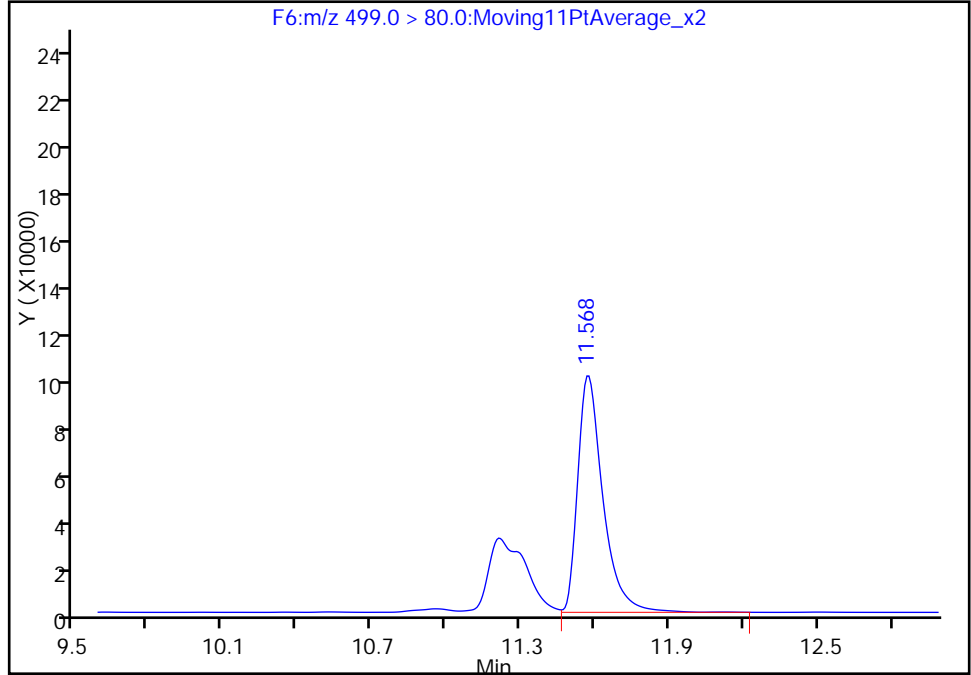
Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_147.d
Injection Date: 02-Jun-2016 16:24:26 Instrument ID: A6
Lims ID: 320-18986-A-13-A Lab Sample ID: 320-18986-13
Client ID: MCFSMW-5_0516
Operator ID: JRB ALS Bottle#: 46 Worklist Smp#: 73
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

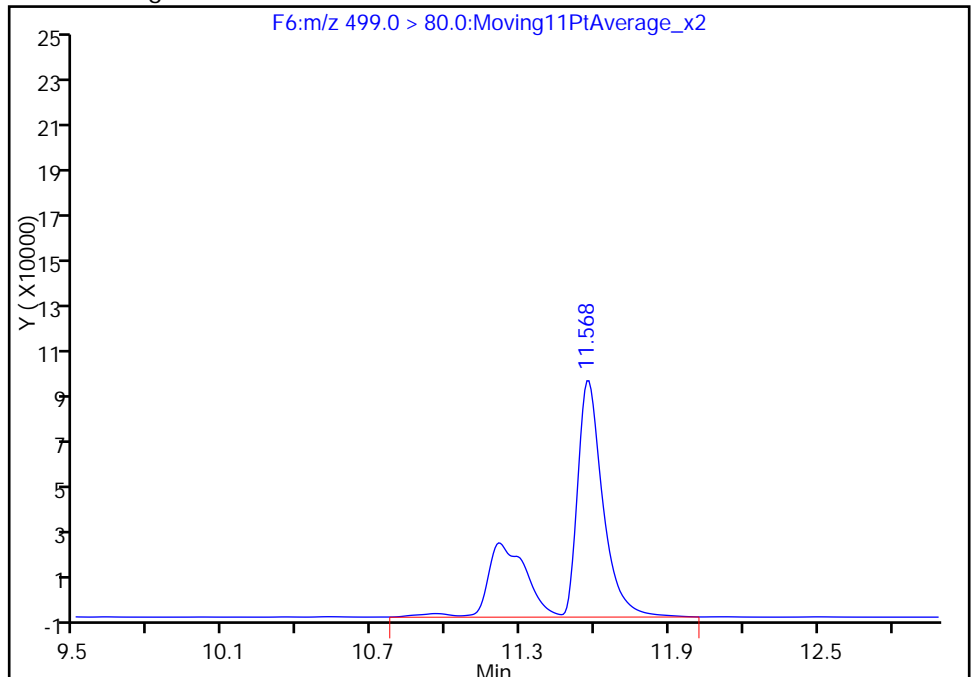
RT: 11.57
Area: 704851
Amount: 13.470827
Amount Units: ng/ml

Processing Integration Results



RT: 11.57
Area: 1043686
Amount: 19.946504
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 02-Jun-2016 17:18:05
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

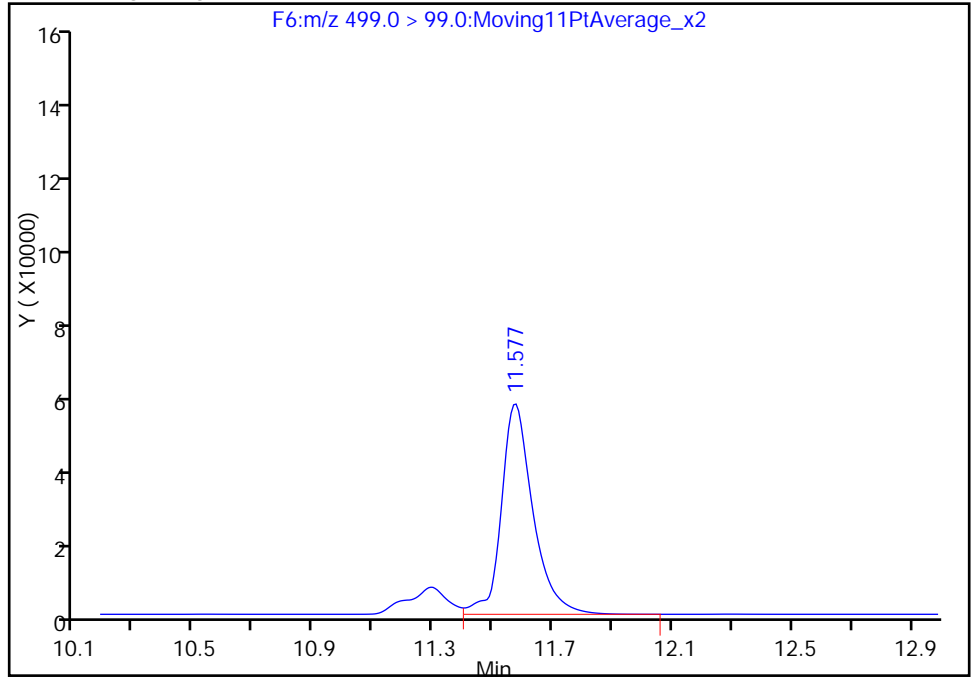
Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_147.d
Injection Date: 02-Jun-2016 16:24:26 Instrument ID: A6
Lims ID: 320-18986-A-13-A Lab Sample ID: 320-18986-13
Client ID: MCFSMW-5_0516
Operator ID: JRB ALS Bottle#: 46 Worklist Smp#: 73
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MFM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

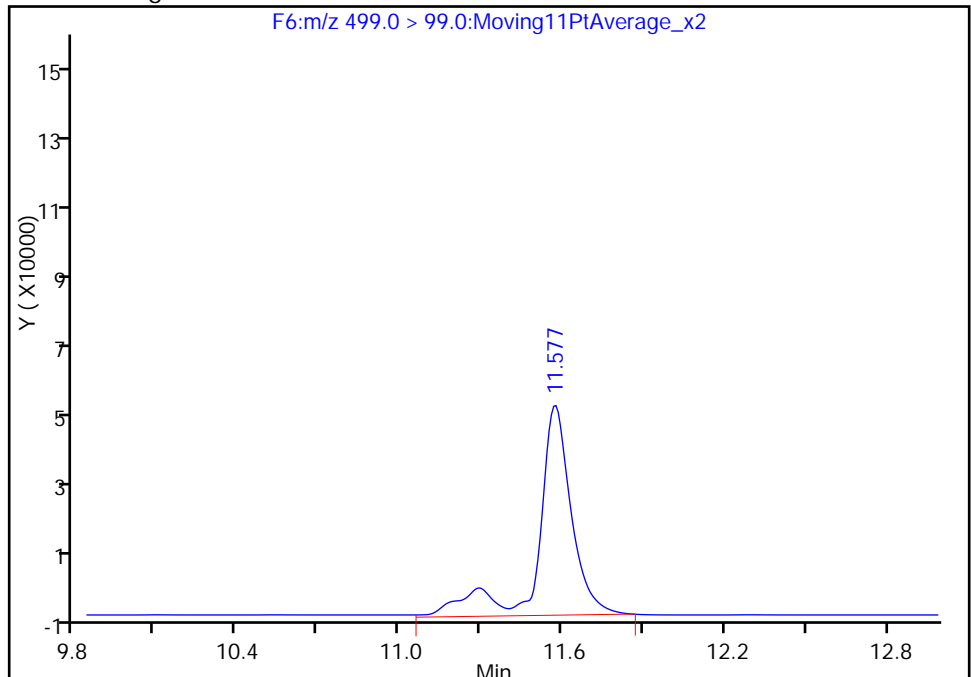
RT: 11.58
Area: 402432
Amount: 13.470827
Amount Units: ng/ml

Processing Integration Results



RT: 11.58
Area: 474246
Amount: 19.946504
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

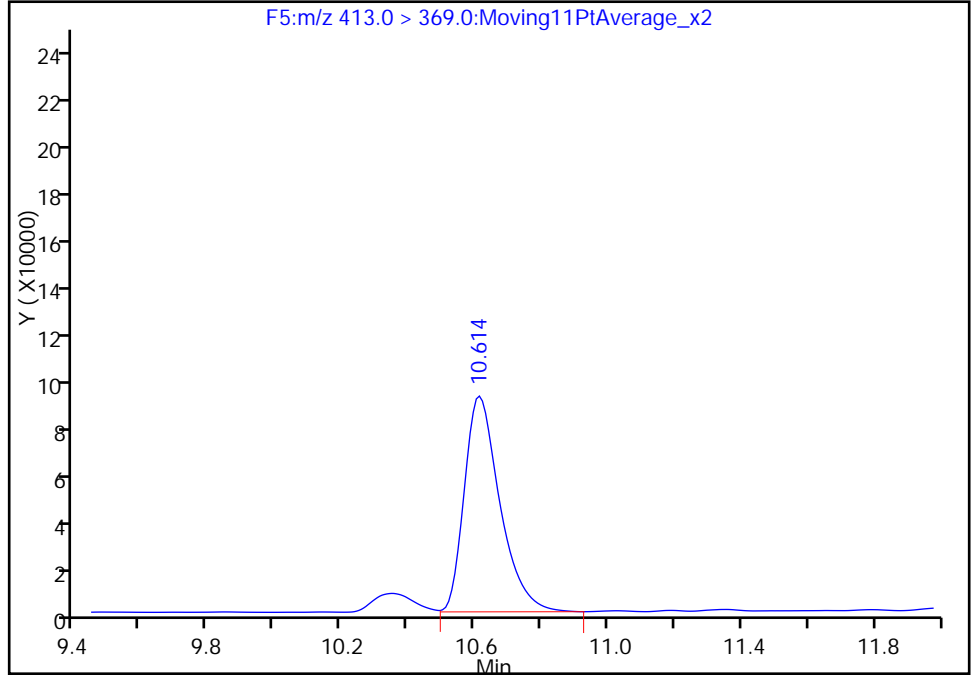
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Injection Date: 02-Jun-2016 16:24:26 Instrument ID: A6
Lims ID: 320-18986-A-13-A Lab Sample ID: 320-18986-13
Client ID: MCFSMW-5_0516
Operator ID: JRB ALS Bottle#: 46 Worklist Smp#: 73
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:M/RM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

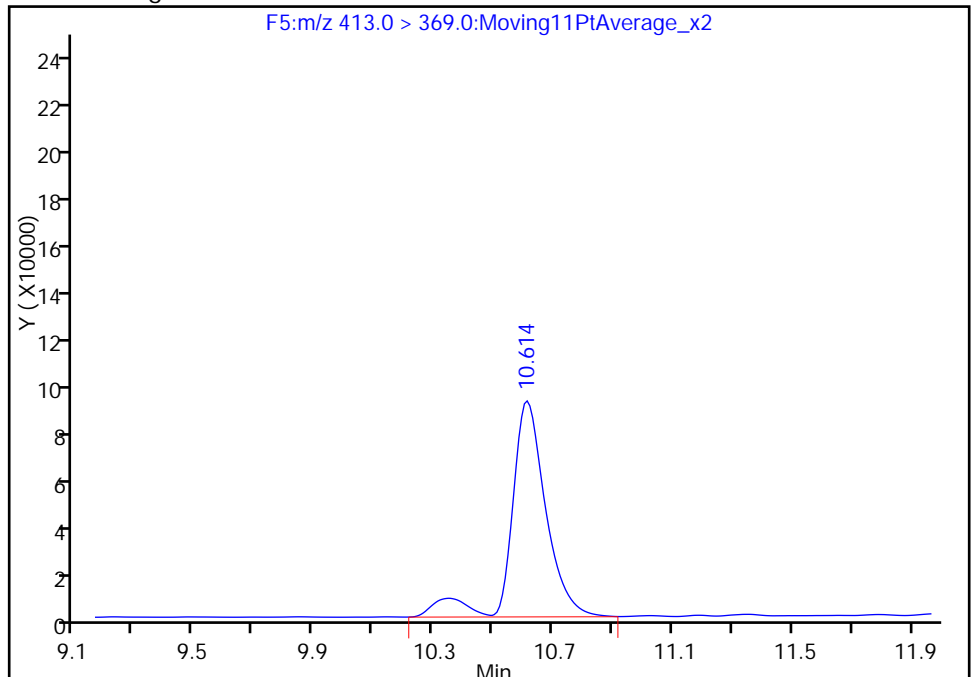
RT: 10.61
Area: 659654
Amount: 11.130146
Amount Units: ng/ml

Processing Integration Results



RT: 10.61
Area: 726705
Amount: 12.261477
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

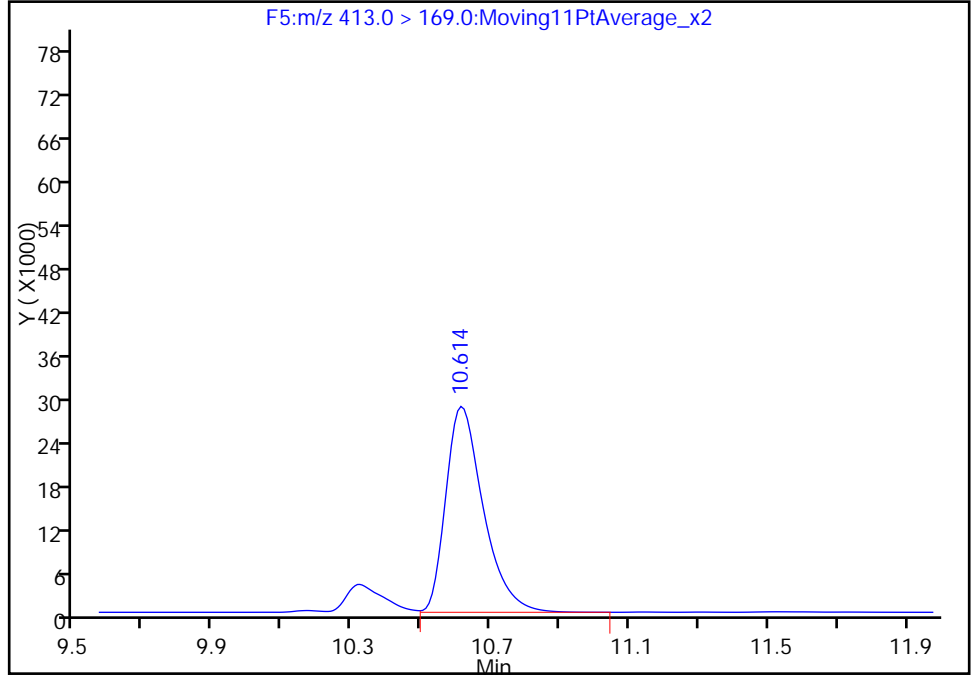
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Injection Date: 02-Jun-2016 16:24:26 Instrument ID: A6
Lims ID: 320-18986-A-13-A Lab Sample ID: 320-18986-13
Client ID: MCFSMW-5_0516
Operator ID: JRB ALS Bottle#: 46 Worklist Smp#: 73
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

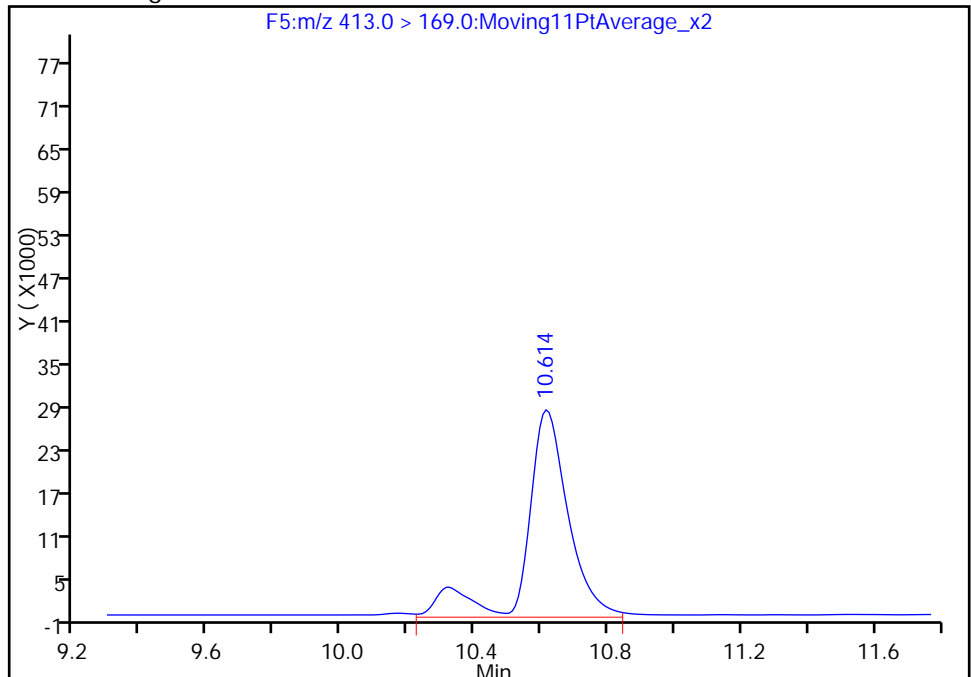
RT: 10.61
Area: 214101
Amount: 11.130146
Amount Units: ng/ml

Processing Integration Results



RT: 10.61
Area: 253032
Amount: 12.261477
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: MCFSMW-5_0516 DUP Lab Sample ID: 320-18986-14
 Matrix: Water Lab File ID: 31MAY2016A6A_148.d
 Analysis Method: WS-LC-0025 Date Collected: 05/16/2016 12:46
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 537(mL) Date Analyzed: 06/02/2016 17:07
 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.: 112205 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	12		2.3	1.9	0.85
375-85-9	Perfluoroheptanoic acid (PFHpA)	13		2.3	1.9	0.75
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	42	M	2.3	1.9	0.81
375-95-1	Perfluorononanoic acid (PFNA)	2.7		2.3	1.9	0.61
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	38	M	3.7	2.8	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	21	M	2.3	1.9	0.70

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		25-150
STL00990	13C4 PFOA	86		25-150
STL00991	13C4 PFOS	103		25-150
STL01892	13C4-PFHpA	83		25-150
STL00995	13C5 PFNA	62		25-150
STL00994	18O2 PFHxS	112		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_148.d
 Lims ID: 320-18986-A-14-A
 Client ID: MCFSMW-5_0516 DUP
 Sample Type: Client
 Inject. Date: 02-Jun-2016 17:07:24 ALS Bottle#: 47 Worklist Smp#: 74
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-14-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 03-Jun-2016 09:52:39 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK032

First Level Reviewer: barnettj Date: 03-Jun-2016 09:52:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.075	7.099	-0.024	1.000	290661	6.45				
D 6 13C2 PFHxA										
315.0 > 270.0	8.225	8.252	-0.027		2660961	43.4		86.8	16359	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.469	9.494	-0.025	1.000	461642	6.76			122	
D 8 13C4-PFHpA										
367.0 > 322.0	9.469	9.495	-0.026		2862553	41.7		83.4	101389	
D 11 18O2 PFHxS										
403.0 > 84.0	9.504	9.532	-0.028		1639452	53.2		112	6649	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.504	9.533	-0.029	1.000	732711	22.6				M
D 12 13C4 PFOA										
417.0 > 372.0	10.586	10.612	-0.026		3124948	42.9		85.9	82901	
13 Perfluorooctanoic acid										M
413.0 > 369.0	10.586	10.612	-0.026	1.000	718958	11.2			436	M
413.0 > 169.0	10.595	10.612	-0.017	1.001	272890		2.63(0.00-0.00)		1114	M
D 16 13C4 PFOS										
503.0 > 80.0	11.552	11.568	-0.016		1962823	49.4		103	3901	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.552	11.571	-0.019	1.000	1048313	20.7			1911	M
499.0 > 99.0	11.552	11.571	-0.019	1.000	486760		2.15(0.00-0.00)		6188	M
D 17 13C5 PFNA										
468.0 > 423.0	11.569	11.589	-0.020		2060279	30.9		61.8	149661	
18 Perfluorononanoic acid										
463.0 > 419.0	11.569	11.589	-0.020	1.000	51732	1.45			332	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_148.d

Injection Date: 02-Jun-2016 17:07:24

Instrument ID: A6

Lims ID: 320-18986-A-14-A

Lab Sample ID: 320-18986-14

Client ID: MCFSMW-5_0516 DUP

Operator ID: JRB

ALS Bottle#: 47

Worklist Smp#: 74

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

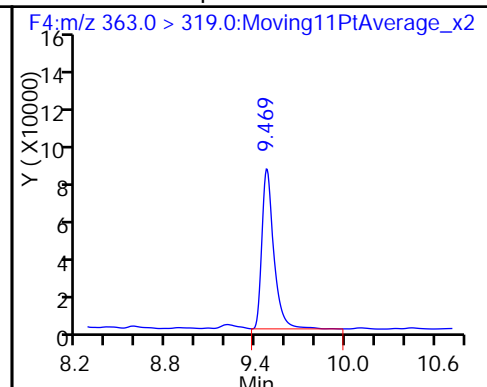
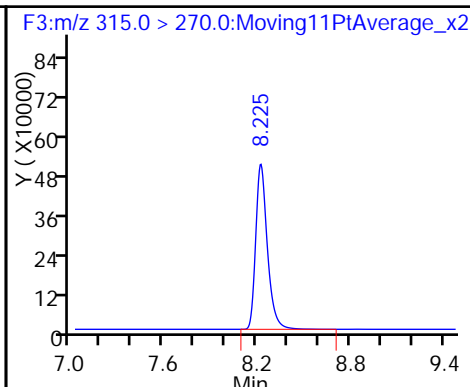
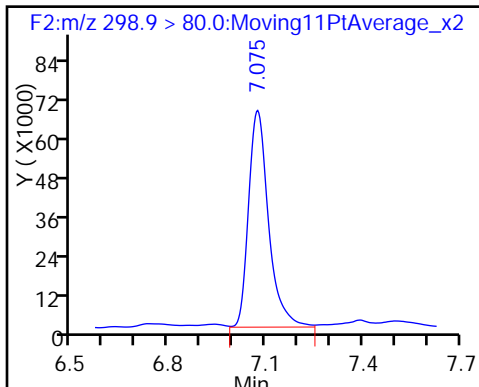
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxA

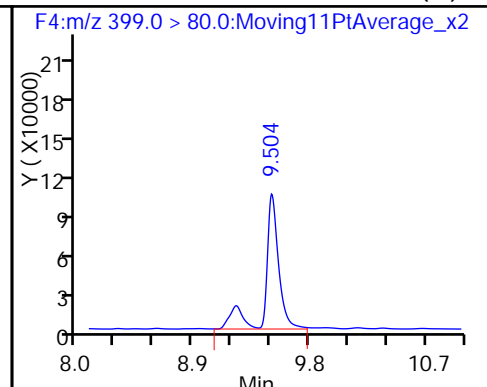
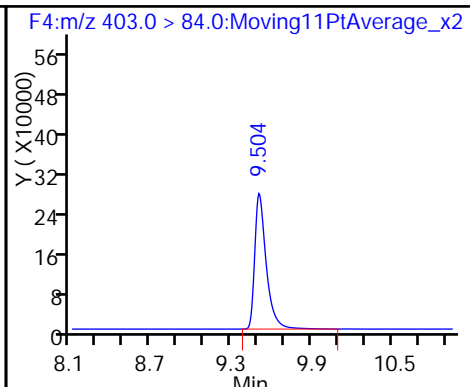
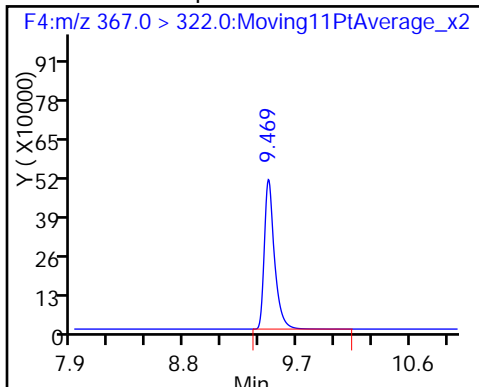
9 Perfluoroheptanoic acid



D 8 13C4-PFHpA

D 11 18O2 PFHxS

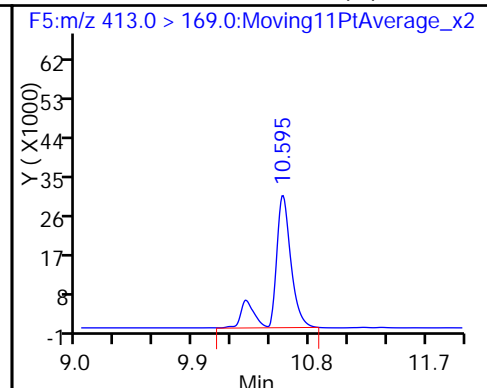
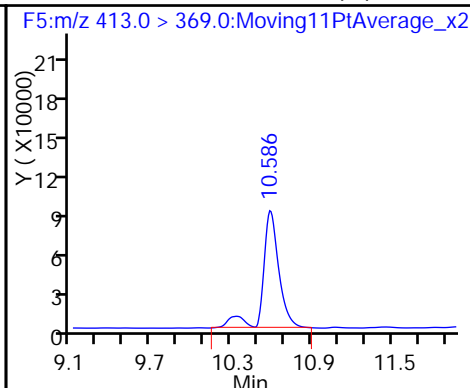
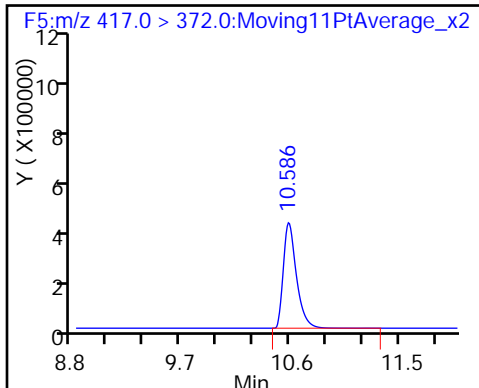
41 Perfluorohexanesulfonic acid (M)



D 12 13C4 PFOA

13 Perfluorooctanoic acid (M)

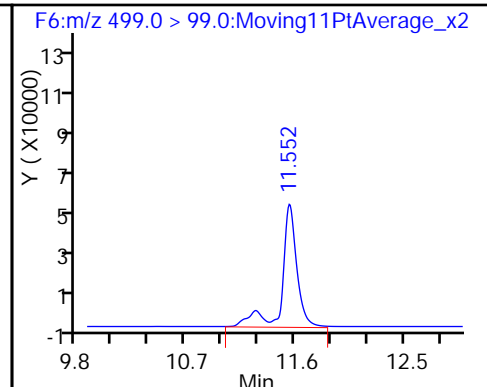
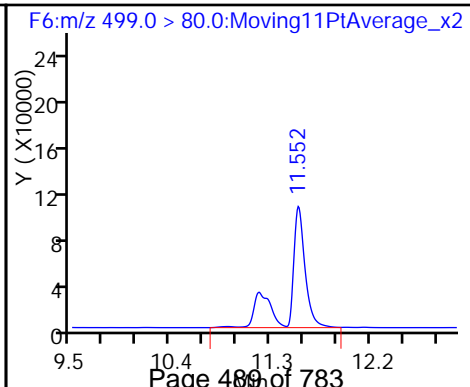
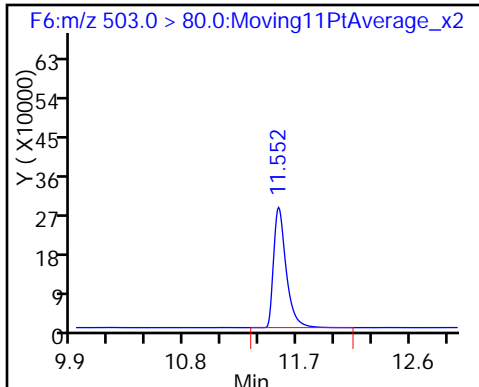
13 Perfluorooctanoic acid (M)



D 16 13C4 PFOS

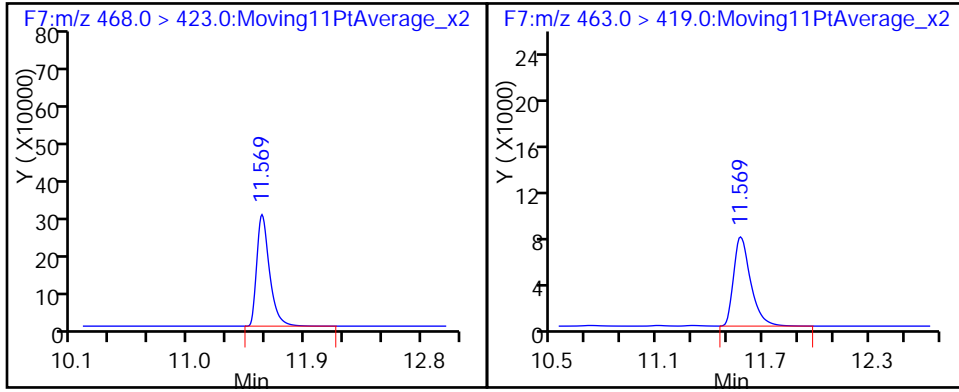
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid



TestAmerica Sacramento

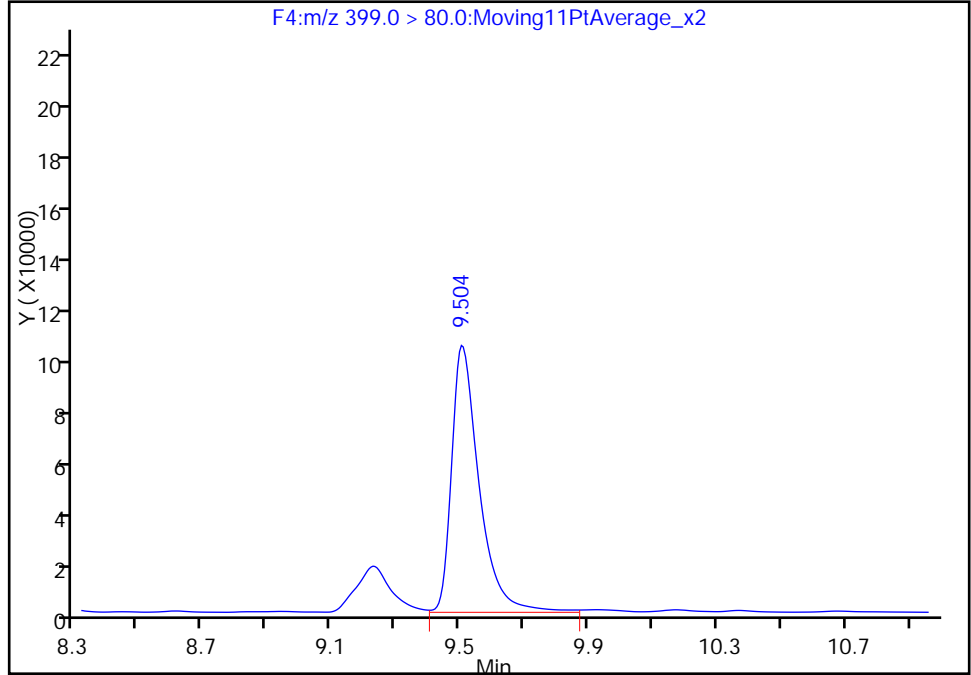
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Injection Date: 02-Jun-2016 17:07:24 Instrument ID: A6
Lims ID: 320-18986-A-14-A Lab Sample ID: 320-18986-14
Client ID: MCFSMW-5_0516 DUP
Operator ID: JRB ALS Bottle#: 47 Worklist Smp#: 74
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

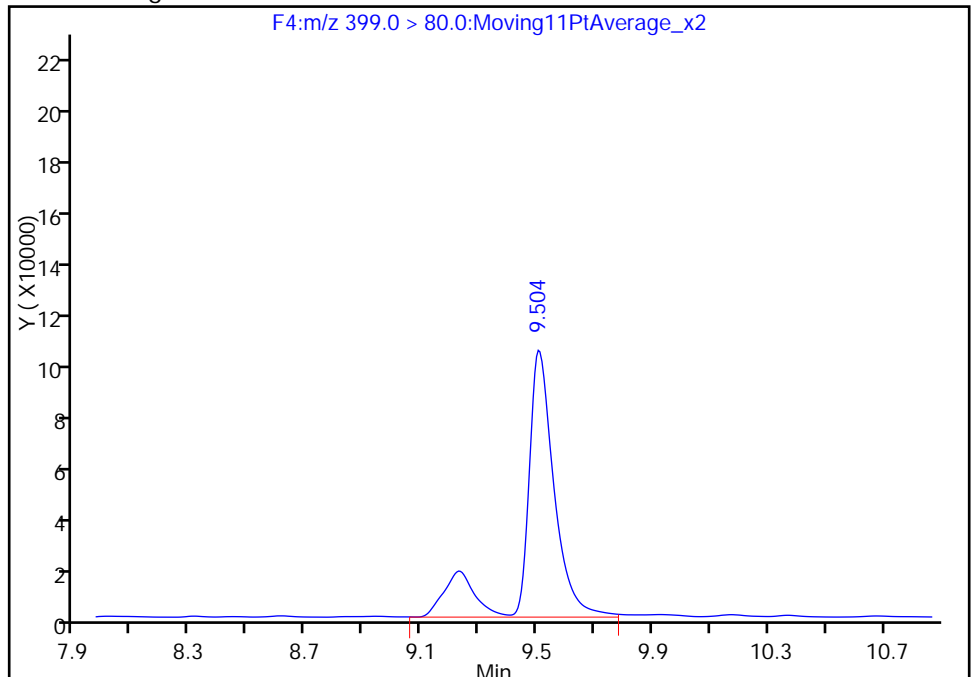
RT: 9.50
Area: 607171
Amount: 18.702981
Amount Units: ng/ml

Processing Integration Results



RT: 9.50
Area: 732711
Amount: 22.570050
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 03-Jun-2016 09:52:39
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

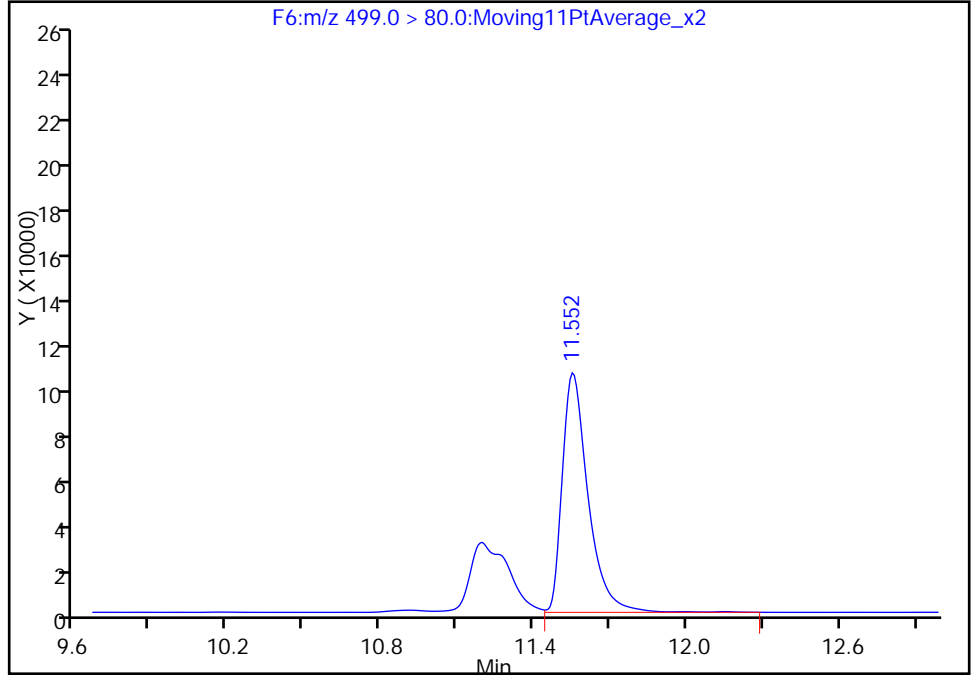
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Injection Date: 02-Jun-2016 17:07:24 Instrument ID: A6
Lims ID: 320-18986-A-14-A Lab Sample ID: 320-18986-14
Client ID: MCFSMW-5_0516 DUP
Operator ID: JRB ALS Bottle#: 47 Worklist Smp#: 74
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

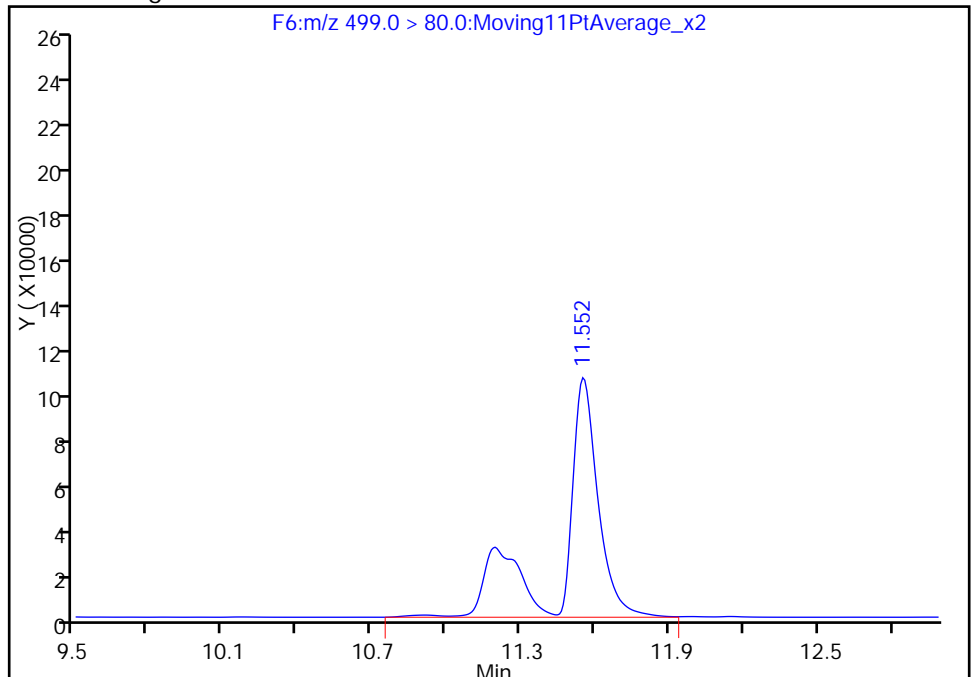
RT: 11.55
Area: 728071
Amount: 14.352171
Amount Units: ng/ml

Processing Integration Results



RT: 11.55
Area: 1048313
Amount: 20.664973
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 03-Jun-2016 09:52:39
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

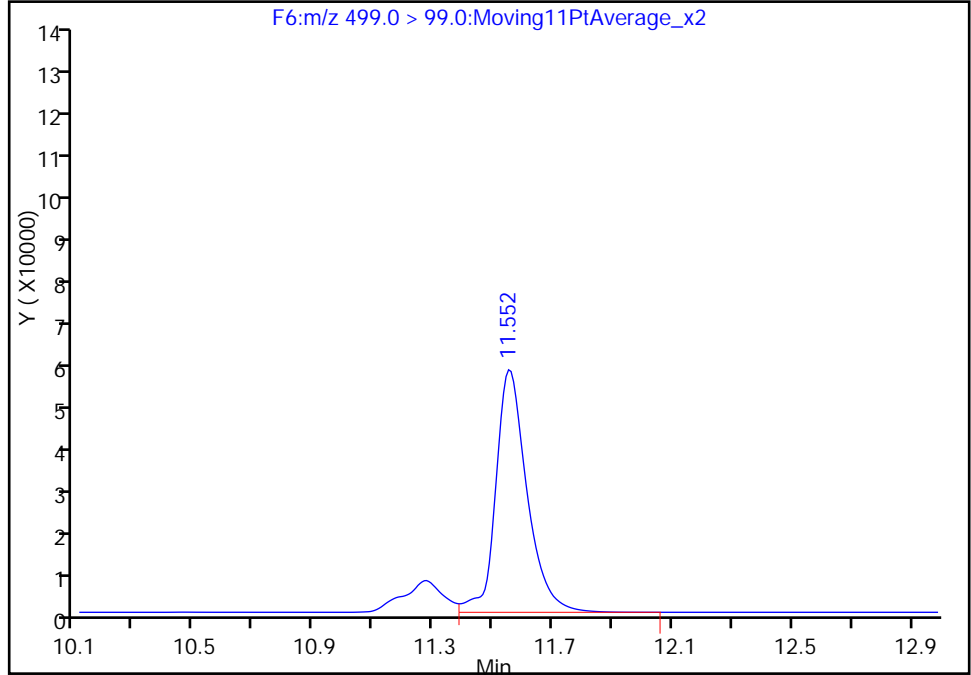
Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_148.d
Injection Date: 02-Jun-2016 17:07:24 Instrument ID: A6
Lims ID: 320-18986-A-14-A Lab Sample ID: 320-18986-14
Client ID: MCFSMW-5_0516 DUP
Operator ID: JRB ALS Bottle#: 47 Worklist Smp#: 74
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

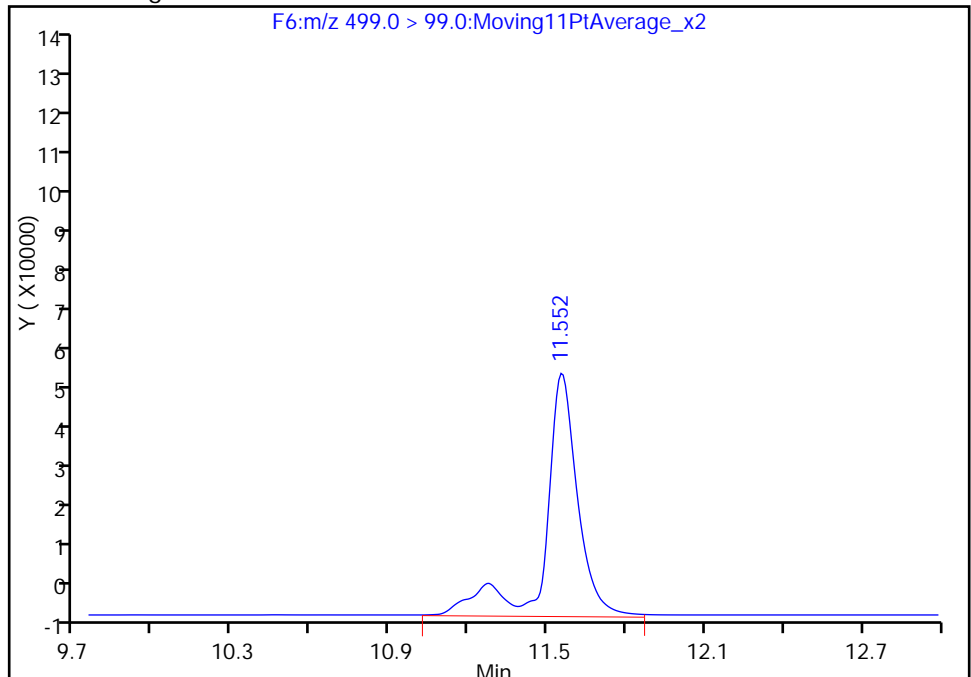
RT: 11.55
Area: 403605
Amount: 14.352171
Amount Units: ng/ml

Processing Integration Results



RT: 11.55
Area: 486760
Amount: 20.664973
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

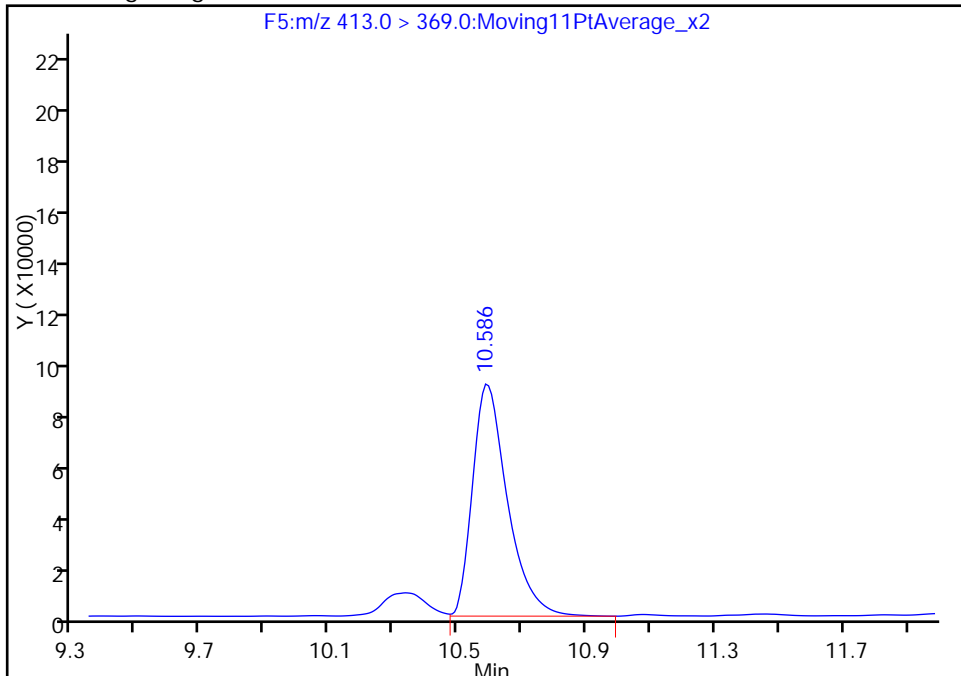
Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_148.d
Injection Date: 02-Jun-2016 17:07:24 Instrument ID: A6
Lims ID: 320-18986-A-14-A Lab Sample ID: 320-18986-14
Client ID: MCFSMW-5_0516 DUP
Operator ID: JRB ALS Bottle#: 47 Worklist Smp#: 74
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

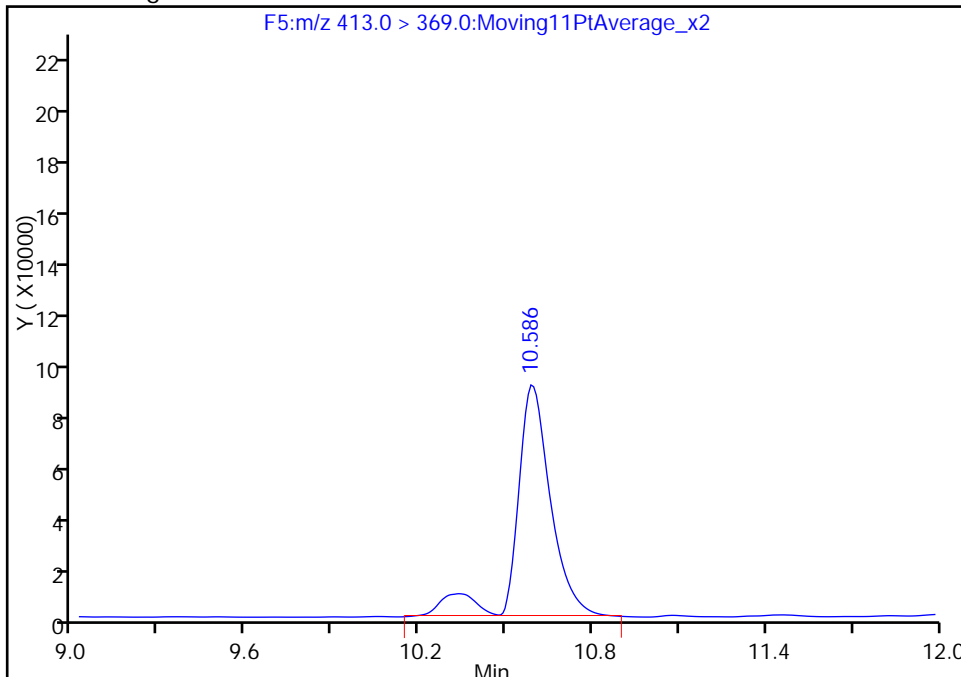
RT: 10.59
Area: 663598
Amount: 10.343450
Amount Units: ng/ml

Processing Integration Results



RT: 10.59
Area: 718958
Amount: 11.206342
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

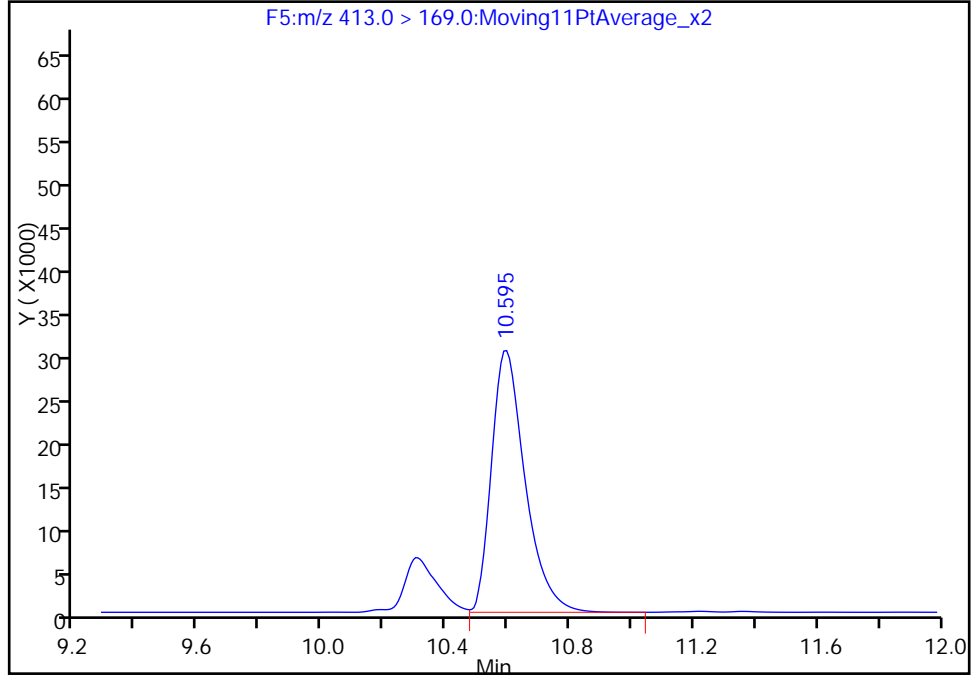
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Injection Date: 02-Jun-2016 17:07:24 Instrument ID: A6
Lims ID: 320-18986-A-14-A Lab Sample ID: 320-18986-14
Client ID: MCFSMW-5_0516 DUP
Operator ID: JRB ALS Bottle#: 47 Worklist Smp#: 74
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

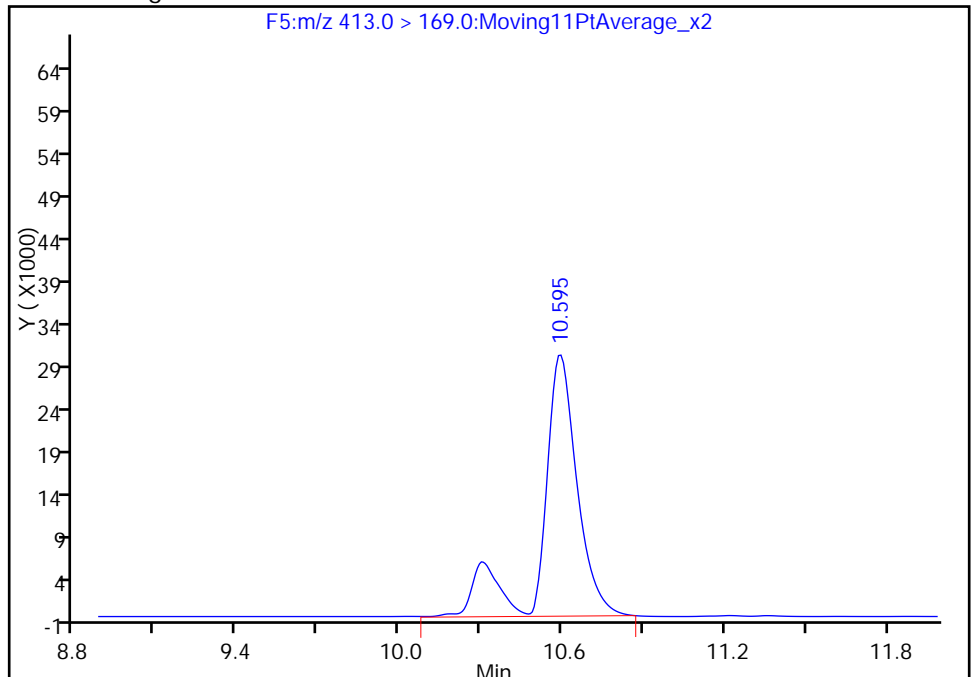
RT: 10.60
Area: 228150
Amount: 10.343450
Amount Units: ng/ml

Processing Integration Results



RT: 10.60
Area: 272890
Amount: 11.206342
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: MCFSMW-3_0516 Lab Sample ID: 320-18986-15
 Matrix: Water Lab File ID: 28MAY2016A6A_072.d
 Analysis Method: WS-LC-0025 Date Collected: 05/16/2016 13:56
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 552 (mL) Date Analyzed: 05/29/2016 16:58
 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.: 111859 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	43		2.3	1.8	0.83
375-85-9	Perfluoroheptanoic acid (PFHpA)	30		2.3	1.8	0.73
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1300	J M	2.3	1.8	0.79
375-95-1	Perfluorononanoic acid (PFNA)	7.2		2.3	1.8	0.59
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	790	J M	3.6	2.7	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	120	M	2.3	1.8	0.68

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	92		25-150
STL00990	13C4 PFOA	98		25-150
STL00991	13C4 PFOS	91		25-150
STL01892	13C4-PFHpA	88		25-150
STL00995	13C5 PFNA	75		25-150
STL00994	18O2 PFHxS	79		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_072.d
 Lims ID: 320-18986-A-15-A
 Client ID: MCFSMW-3_0516
 Sample Type: Client
 Inject. Date: 29-May-2016 16:58:13 ALS Bottle#: 43 Worklist Smp#: 71
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-15-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 17:07:40 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: barnettj Date: 01-Jun-2016 16:56:00

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.071	7.085	-0.014	1.000	673579	23.7				
D 6 13C2 PFHxA										
315.0 > 270.0	8.220	8.236	-0.016		2694094	46.2		92.3	73038	
D 8 13C4-PFHpA										
367.0 > 322.0	9.463	9.474	-0.011		2718659	43.9		87.7	49885	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.463	9.475	-0.012	1.000	1115832	16.8			121	
D 11 18O2 PFHxS										
403.0 > 84.0	9.504	9.507	-0.003		1068641	37.4		79.1	18996	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.504	9.507	-0.003	1.000	15205220	735.8				EM EM
D 12 13C4 PFOA										
417.0 > 372.0	10.577	10.586	-0.009		3297680	49.0		97.9	218235	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.586	10.587	-0.001	1.000	4568778	68.1			1010	M
413.0 > 169.0	10.586	10.587	-0.001	1.000	1765592		2.59(0.00-0.00)		2406	M
D 16 13C4 PFOS										
503.0 > 80.0	11.535	11.543	-0.008		1535092	43.7		91.4	17700	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.543	11.545	-0.002	1.000	17552039	435.4			6165	EM
499.0 > 99.0	11.535	11.545	-0.010	0.999	8416278		2.09(0.00-0.00)		2835	M
D 17 13C5 PFNA										
468.0 > 423.0	11.553	11.562	-0.009		2332314	37.6		75.2	55722	
18 Perfluorononanoic acid										
463.0 > 419.0	11.561	11.563	-0.002	1.000	156625	3.98			61.7	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

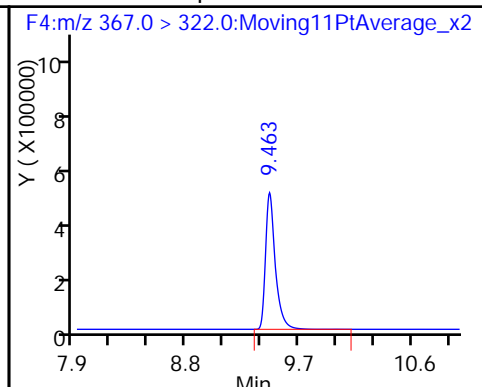
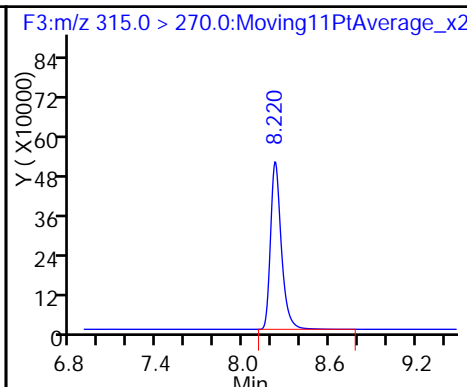
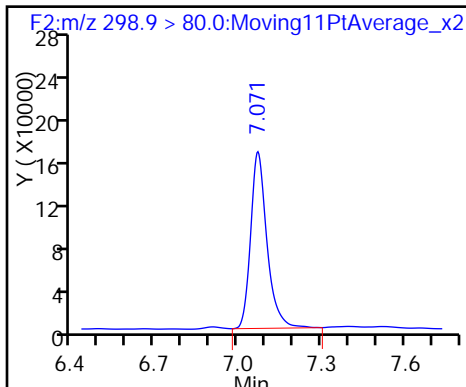
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_072.d
Injection Date: 29-May-2016 16:58:13 Instrument ID: A6
Lims ID: 320-18986-A-15-A Lab Sample ID: 320-18986-15
Client ID: MCFSMW-3_0516
Operator ID: JRB ALS Bottle#: 43 Worklist Smp#: 71
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxA

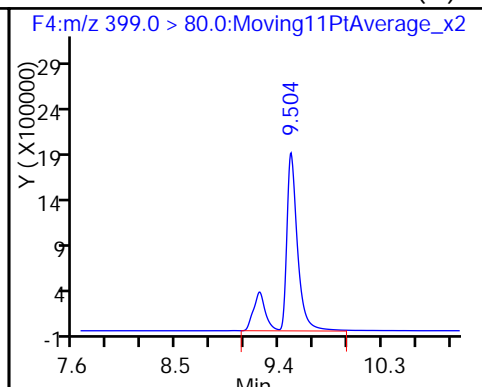
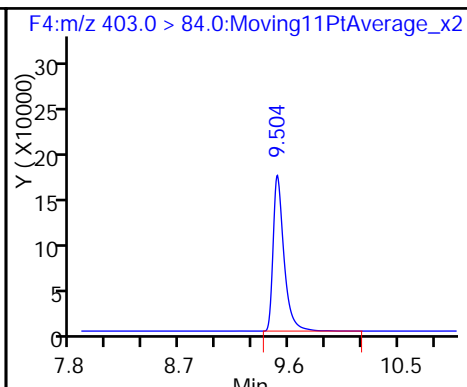
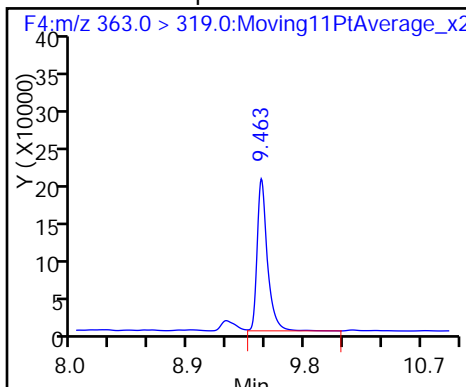
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid

D 11 18O2 PFHxS

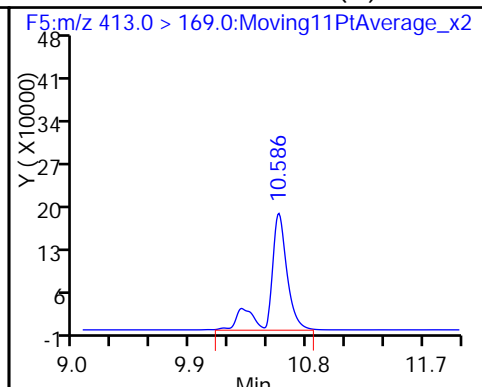
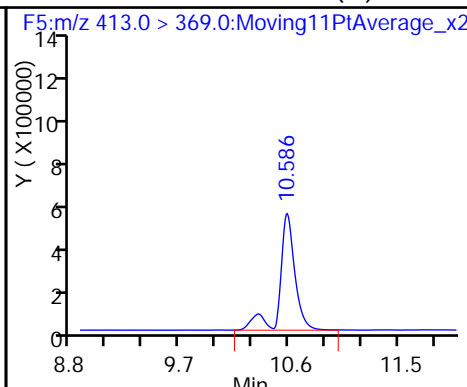
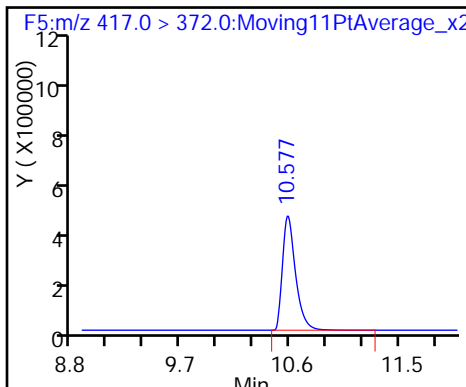
41 Perfluorohexanesulfonic acid (M)



D 12 13C4 PFOA

13 Perfluorooctanoic acid (M)

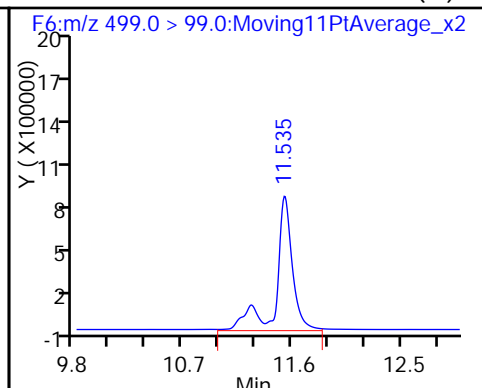
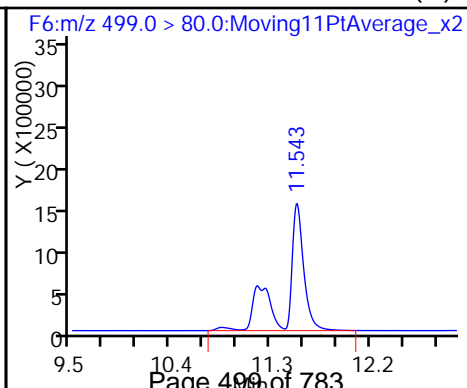
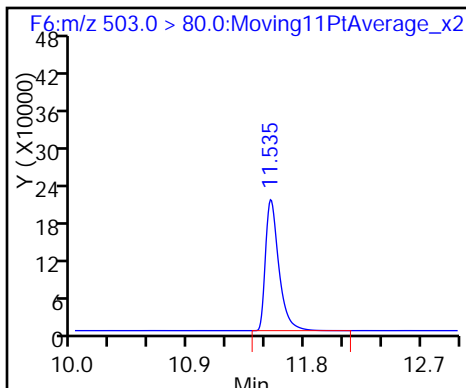
13 Perfluorooctanoic acid (M)



D 16 13C4 PFOS

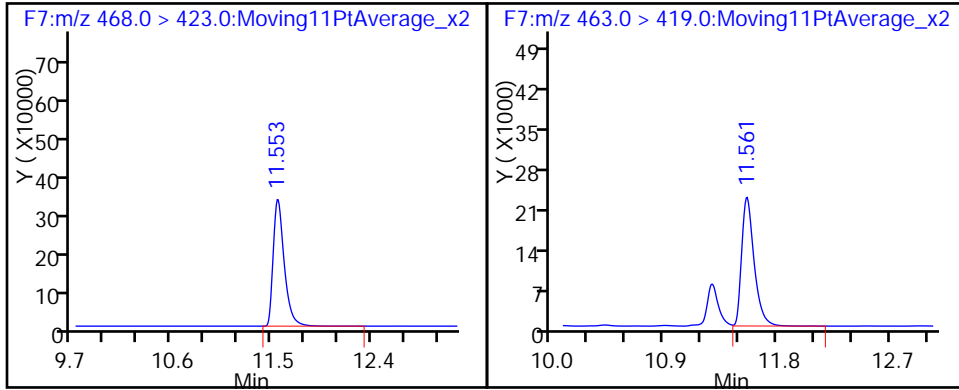
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid



TestAmerica Sacramento

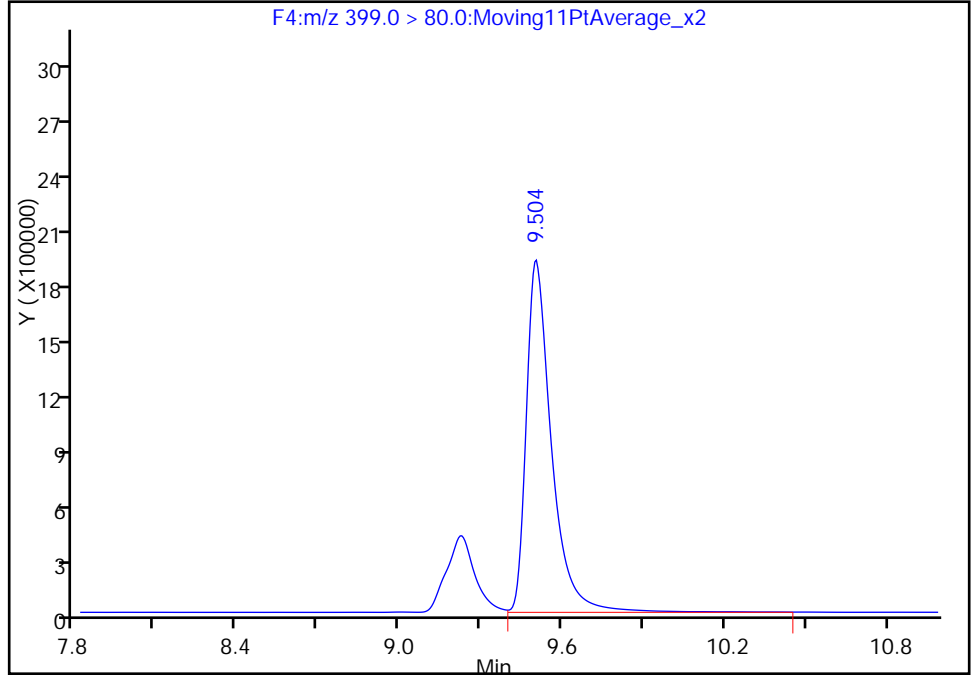
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Injection Date: 29-May-2016 16:58:13 Instrument ID: A6
Lims ID: 320-18986-A-15-A Lab Sample ID: 320-18986-15
Client ID: MCFSMW-3_0516
Operator ID: JRB ALS Bottle#: 43 Worklist Smp#: 71
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

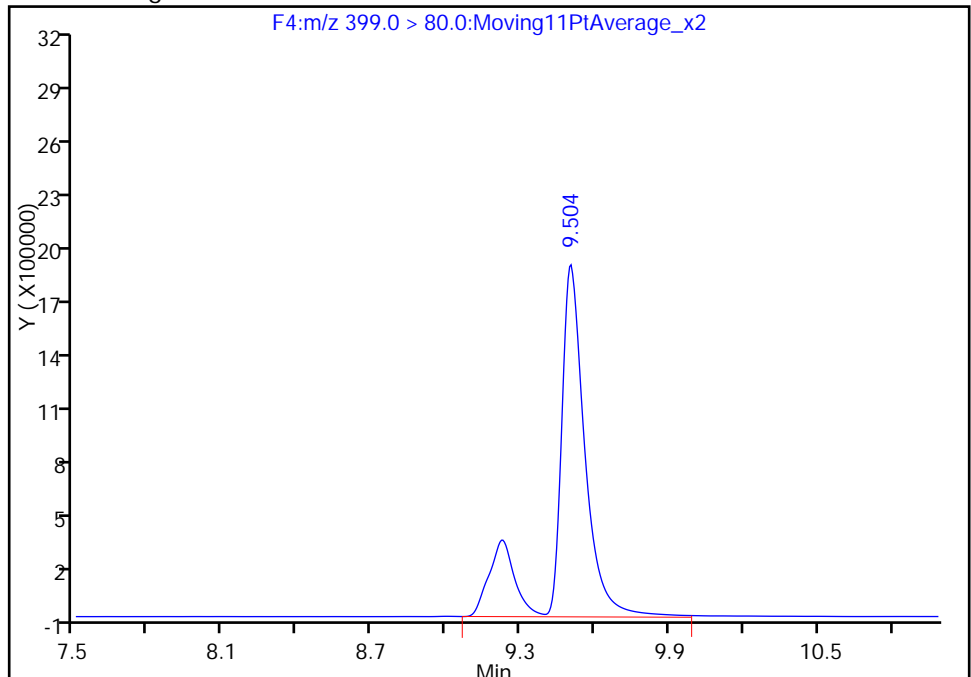
RT: 9.50
Area: 12236879
Amount: 592.1869
Amount Units: ng/ml

Processing Integration Results



RT: 9.50
Area: 15205220
Amount: 735.8357
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 01-Jun-2016 16:56:00
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

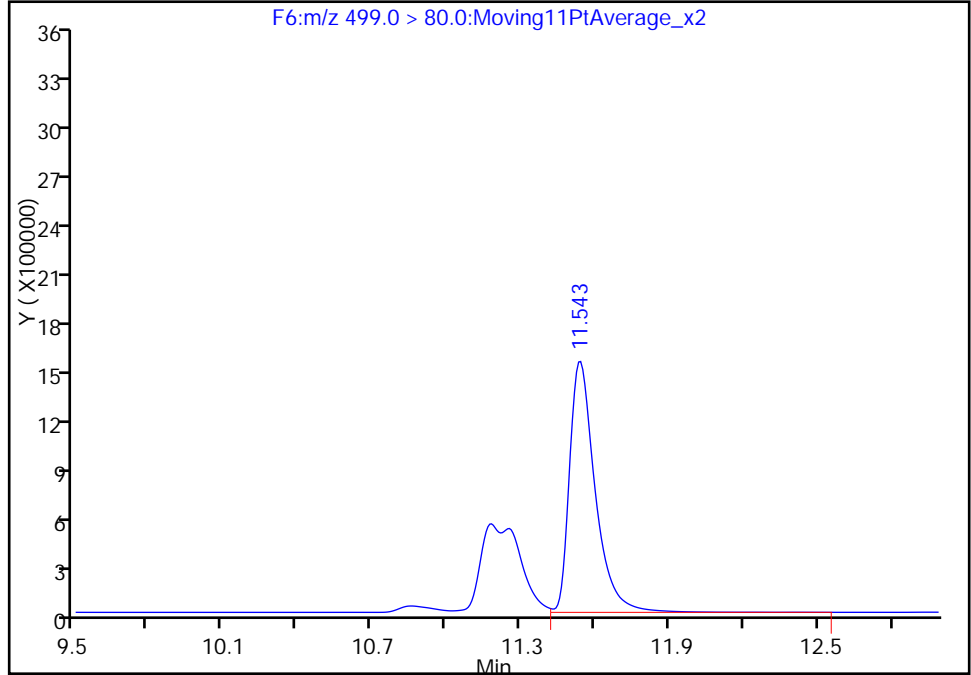
Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_072.d
Injection Date: 29-May-2016 16:58:13 Instrument ID: A6
Lims ID: 320-18986-A-15-A Lab Sample ID: 320-18986-15
Client ID: MCFSMW-3_0516
Operator ID: JRB ALS Bottle#: 43 Worklist Smp#: 71
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

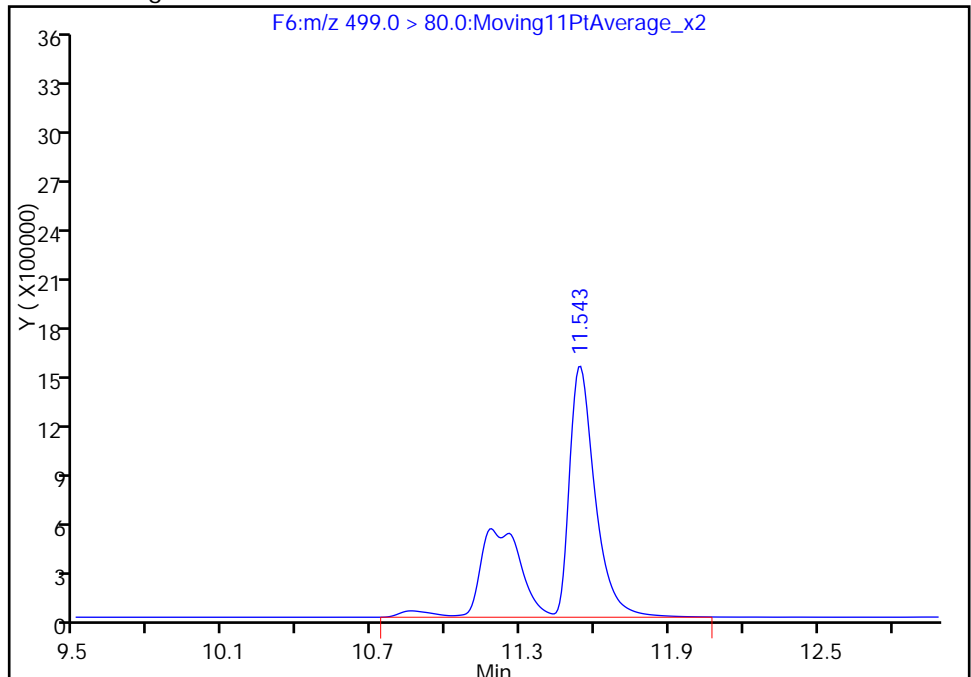
RT: 11.54
Area: 11158077
Amount: 276.7582
Amount Units: ng/ml

Processing Integration Results



RT: 11.54
Area: 17552039
Amount: 435.3502
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 01-Jun-2016 16:56:00
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

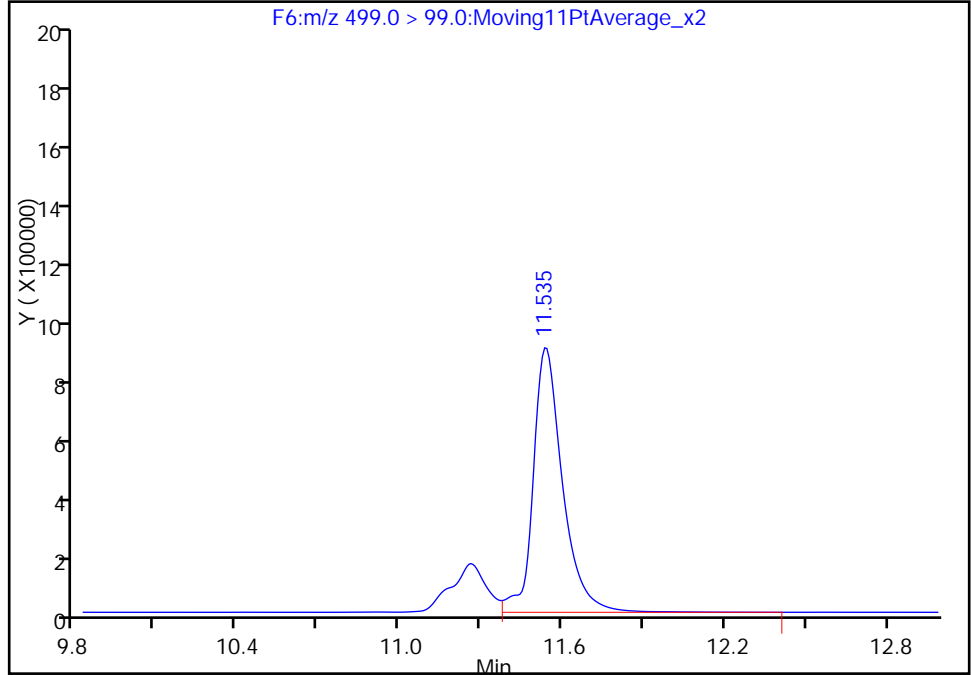
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Injection Date: 29-May-2016 16:58:13 Instrument ID: A6
Lims ID: 320-18986-A-15-A Lab Sample ID: 320-18986-15
Client ID: MCFSMW-3_0516
Operator ID: JRB ALS Bottle#: 43 Worklist Smp#: 71
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

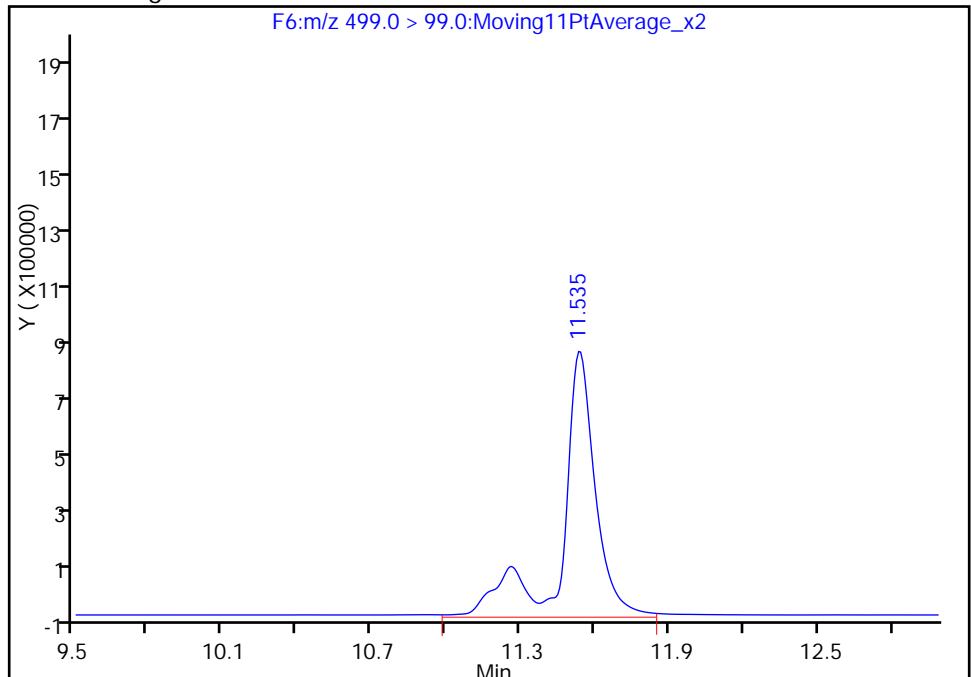
RT: 11.53
Area: 6620380
Amount: 276.7582
Amount Units: ng/ml

Processing Integration Results



RT: 11.53
Area: 8416278
Amount: 435.3502
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 01-Jun-2016 16:56:00

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

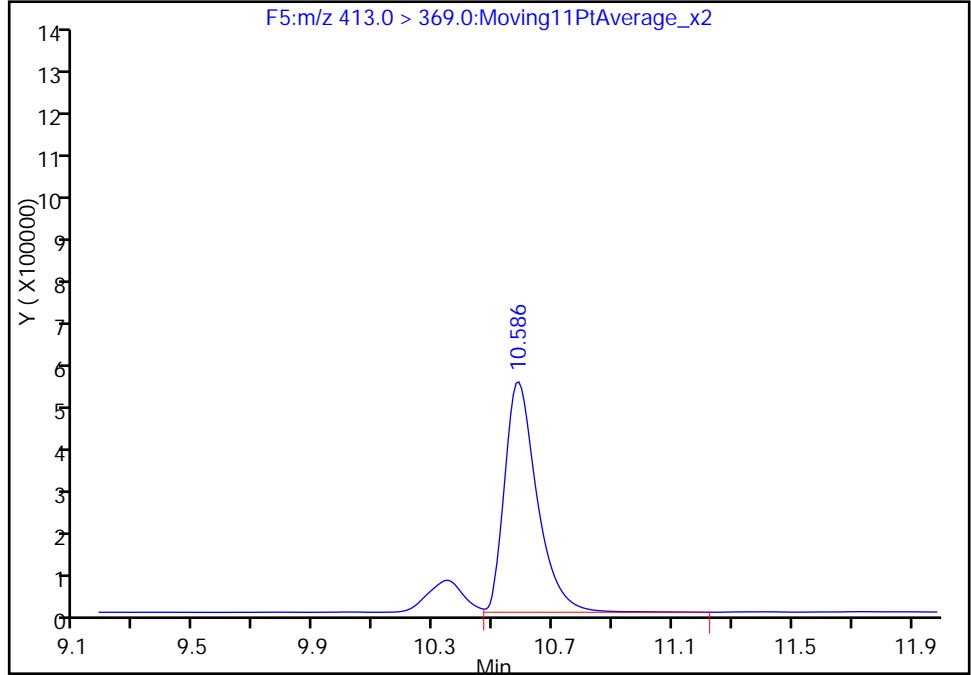
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Injection Date: 29-May-2016 16:58:13 Instrument ID: A6
Lims ID: 320-18986-A-15-A Lab Sample ID: 320-18986-15
Client ID: MCFSMW-3_0516
Operator ID: JRB ALS Bottle#: 43 Worklist Smp#: 71
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:M/RM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

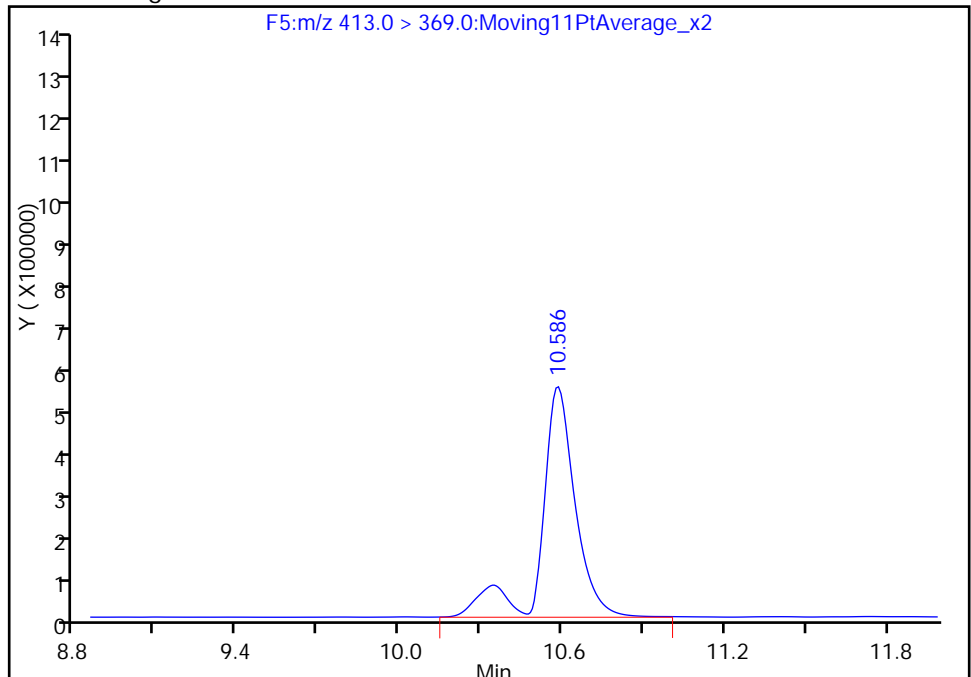
RT: 10.59
Area: 3964192
Amount: 59.130180
Amount Units: ng/ml

Processing Integration Results



RT: 10.59
Area: 4568778
Amount: 68.148229
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 01-Jun-2016 16:56:00
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

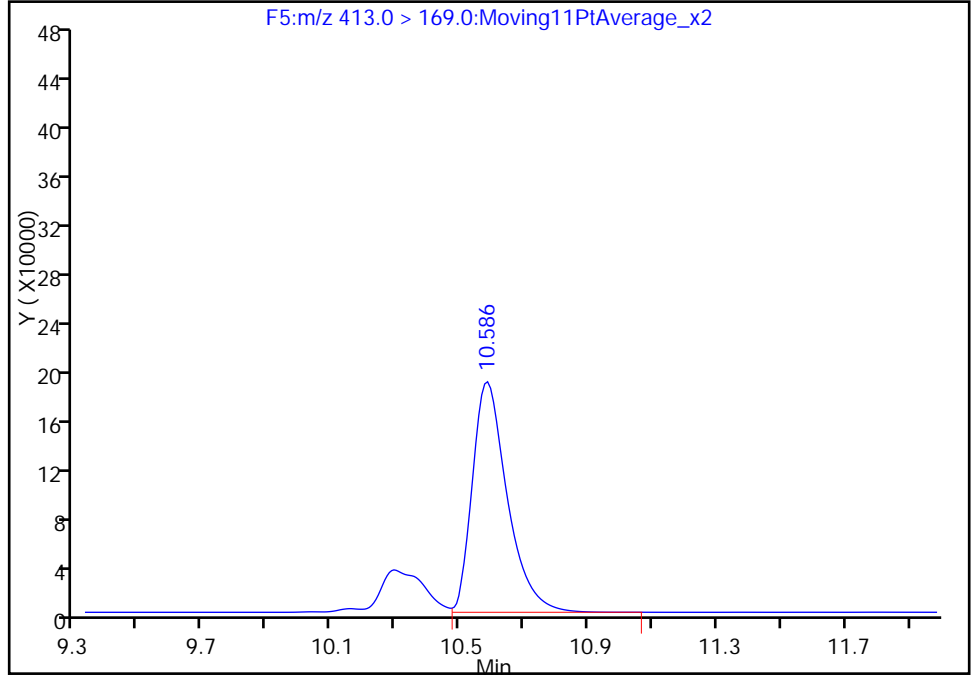
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Injection Date: 29-May-2016 16:58:13 Instrument ID: A6
Lims ID: 320-18986-A-15-A Lab Sample ID: 320-18986-15
Client ID: MCFSMW-3_0516
Operator ID: JRB ALS Bottle#: 43 Worklist Smp#: 71
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

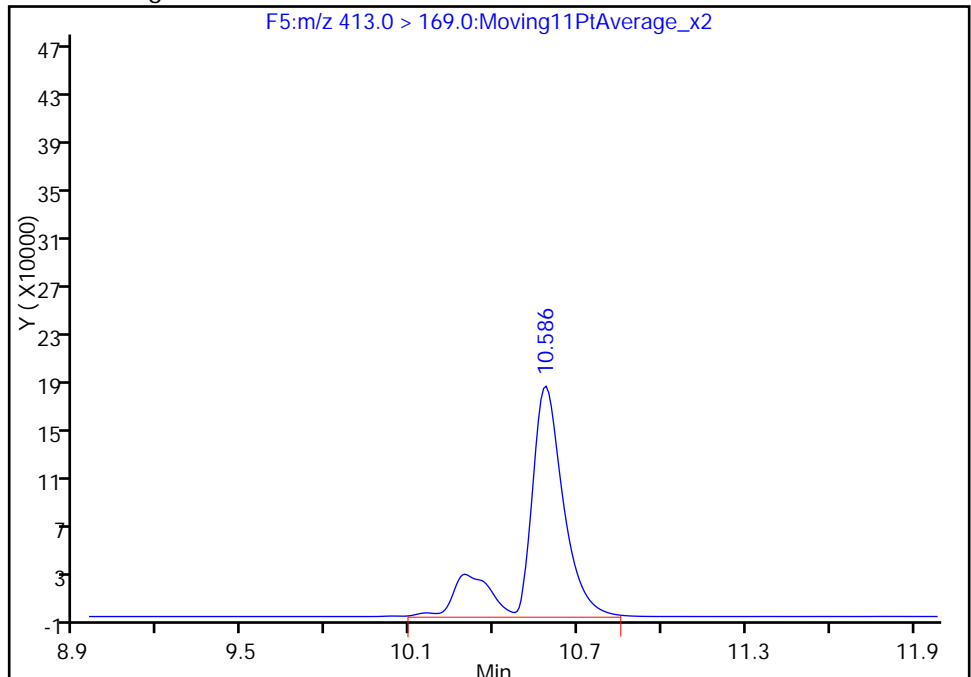
RT: 10.59
Area: 1416805
Amount: 59.130180
Amount Units: ng/ml

Processing Integration Results



RT: 10.59
Area: 1765592
Amount: 68.148229
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: MCFSMW-3_0516 DL Lab Sample ID: 320-18986-15 DL
 Matrix: Water Lab File ID: 31MAY2016A6A_140.d
 Analysis Method: WS-LC-0025 Date Collected: 05/16/2016 13:56
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 552 (mL) Date Analyzed: 06/02/2016 13:55
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 4
 Injection Volume: 15 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 112205 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	<i>Perfluorobutanesulfonic acid (PFBS)</i>	36	D	9.1	7.2	3.3
375-85-9	<i>Perfluoroheptanoic acid (PFHpA)</i>	30	D	9.1	7.2	2.9
355-46-4	<i>Perfluorohexanesulfonic acid (PFHxS)</i>	1400	D M	9.1	7.2	3.2
375-95-1	<i>Perfluorononanoic acid (PFNA)</i>	5.7	J D	9.1	7.2	2.4
1763-23-1	<i>Perfluorooctanesulfonic acid (PFOS)</i>	690	D M	14	11	4.6
335-67-1	<i>Perfluorooctanoic acid (PFOA)</i>	120	D M	9.1	7.2	2.7

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	115		25-150
STL00990	13C4 PFOA	117		25-150
STL00991	13C4 PFOS	115		25-150
STL01892	13C4-PFHpA	103		25-150
STL00995	13C5 PFNA	100		25-150
STL00994	18O2 PFHxS	101		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_140.d
 Lims ID: 320-18986-A-15-A
 Client ID: MCFSMW-3_0516
 Sample Type: Client
 Inject. Date: 02-Jun-2016 13:55:29 ALS Bottle#: 38 Worklist Smp#: 66
 Injection Vol: 15.0 ul Dil. Factor: 4.0000
 Sample Info: 320-18986-a-15-a 4X
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Jun-2016 17:18:05 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 02-Jun-2016 15:59:43

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.088	7.099	-0.011	1.000	202976	4.99				
D 6 13C2 PFHxA										
315.0 > 270.0	8.230	8.252	-0.022		884436	14.4		28.9	29170	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.481	9.494	-0.013	1.000	362759	4.19			164	
D 8 13C4-PFHpA										
367.0 > 322.0	9.481	9.495	-0.014		884353	12.9		25.8	75986	
D 11 18O2 PFHxS										
403.0 > 84.0	9.517	9.532	-0.015		369758	12.0		25.3	28081	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.517	9.533	-0.016	1.000	5523011	188.6				M
D 12 13C4 PFOA										
417.0 > 372.0	10.604	10.612	-0.008		1067103	14.7		29.3	70942	
13 Perfluorooctanoic acid										M
413.0 > 369.0	10.604	10.612	-0.008	1.000	1425358	16.3			138	M
413.0 > 169.0	10.604	10.612	-0.008	1.000	517620		2.75(0.00-0.00)		45.3	M
D 16 13C4 PFOS										
503.0 > 80.0	11.568	11.568	0.0		546890	13.8		28.8	15463	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.568	11.571	-0.003	1.000	5351936	94.7			25.4	M
499.0 > 99.0	11.568	11.571	-0.003	1.000	2483083		2.16(0.00-0.00)		97.7	M
D 17 13C5 PFNA										
468.0 > 423.0	11.586	11.589	-0.003		834380	12.5		25.0	60223	
18 Perfluorononanoic acid										
463.0 > 419.0	11.586	11.589	-0.003	1.000	45445	0.7881			115	

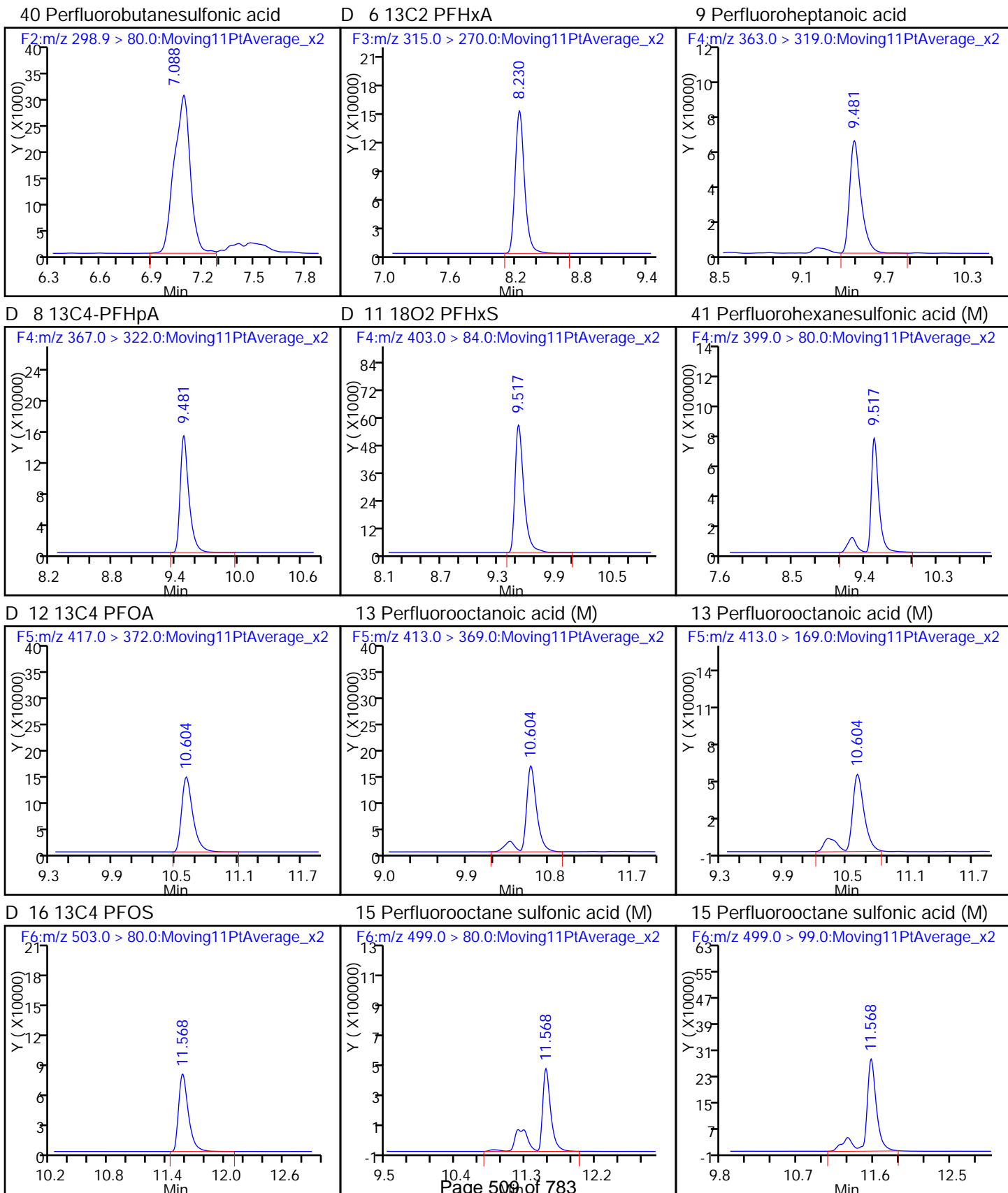
QC Flag Legend

Review Flags

M - Manually Integrated

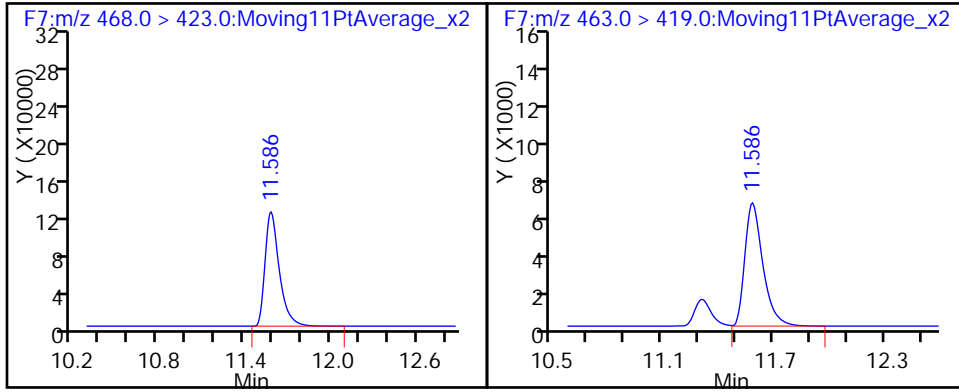
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_140.d
Injection Date: 02-Jun-2016 13:55:29 Instrument ID: A6
Lims ID: 320-18986-A-15-A Lab Sample ID: 320-18986-15
Client ID: MCFSMW-3_0516
Operator ID: JRB ALS Bottle#: 38 Worklist Smp#: 66
Injection Vol: 15.0 ul Dil. Factor: 4.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL



D 17 13C5 PFNA

18 Perfluorononanoic acid



TestAmerica Sacramento

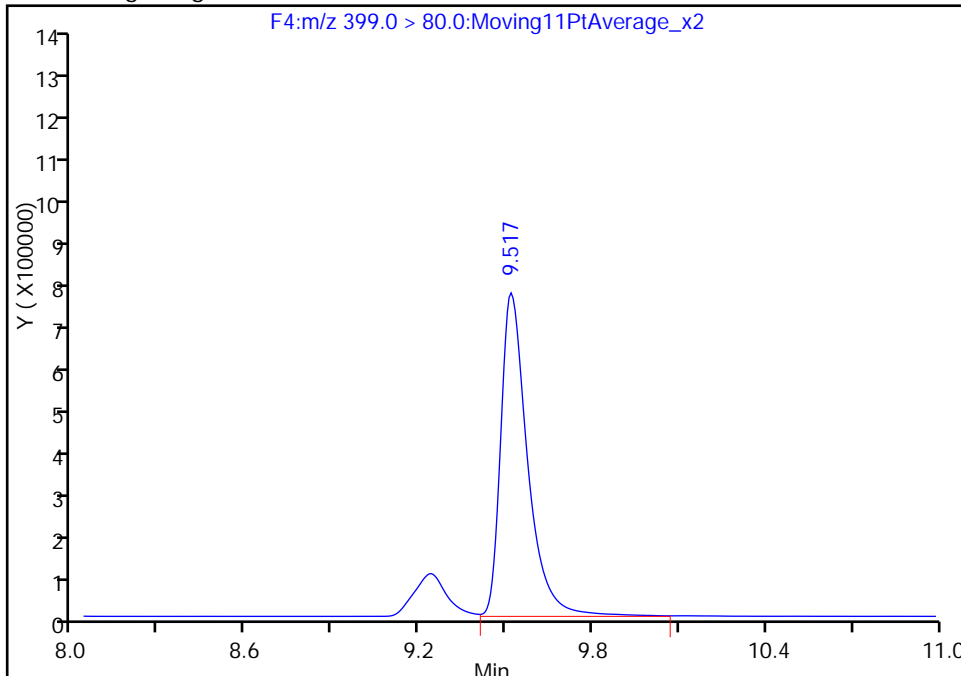
Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_140.d
Injection Date: 02-Jun-2016 13:55:29 Instrument ID: A6
Lims ID: 320-18986-A-15-A Lab Sample ID: 320-18986-15
Client ID: MCFSMW-3_0516
Operator ID: JRB ALS Bottle#: 38 Worklist Smp#: 66
Injection Vol: 15.0 ul Dil. Factor: 4.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

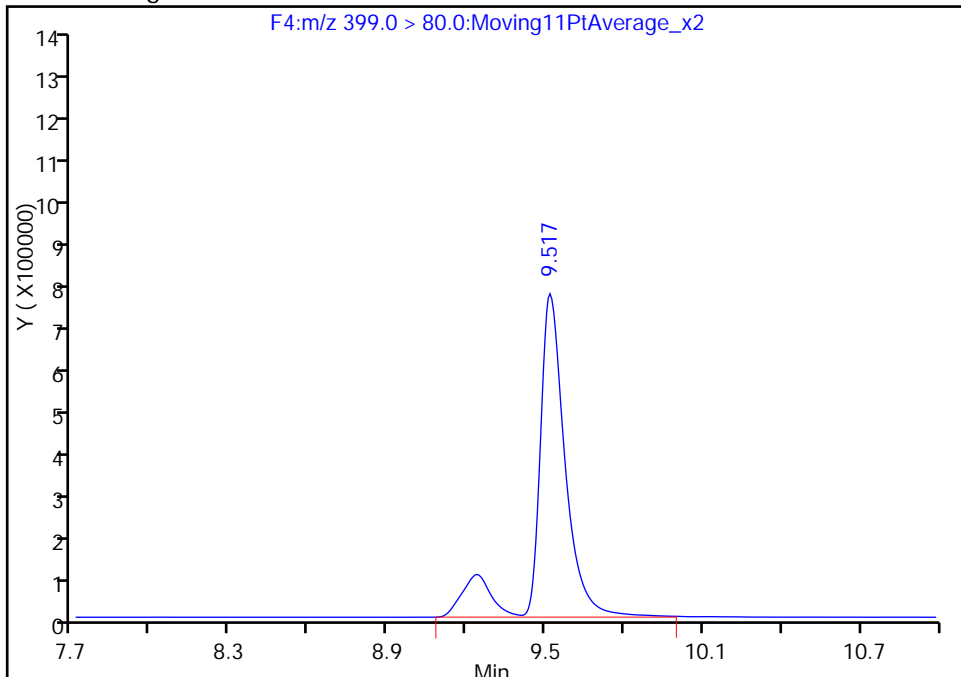
RT: 9.52
Area: 4785636
Amount: 163.4032
Amount Units: ng/ml

Processing Integration Results



RT: 9.52
Area: 5523011
Amount: 188.5805
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 02-Jun-2016 15:59:43
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

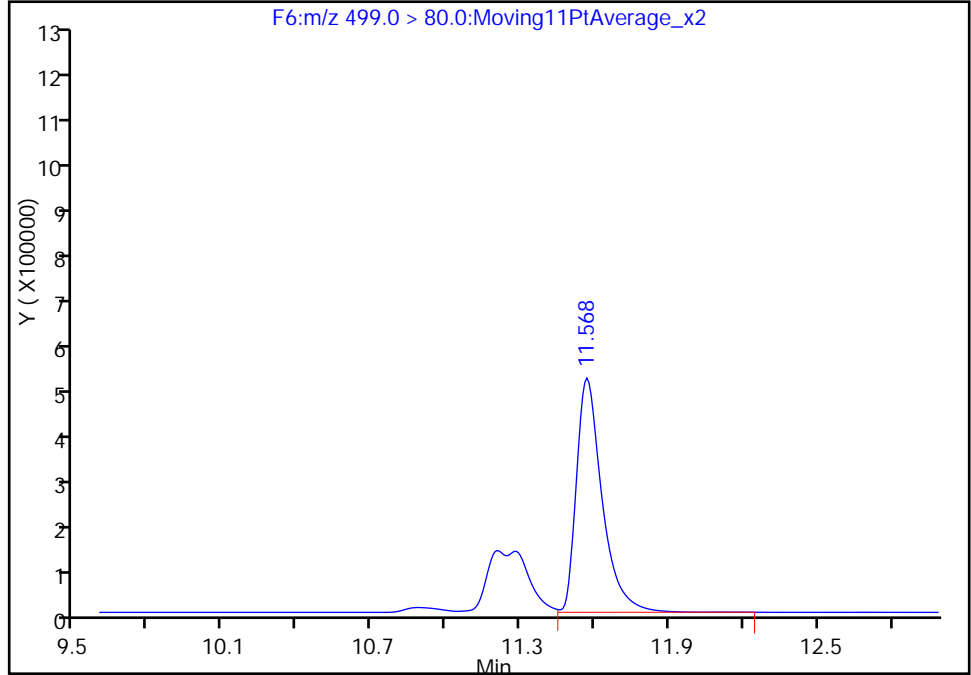
Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_140.d
Injection Date: 02-Jun-2016 13:55:29 Instrument ID: A6
Lims ID: 320-18986-A-15-A Lab Sample ID: 320-18986-15
Client ID: MCFSMW-3_0516
Operator ID: JRB ALS Bottle#: 38 Worklist Smp#: 66
Injection Vol: 15.0 ul Dil. Factor: 4.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

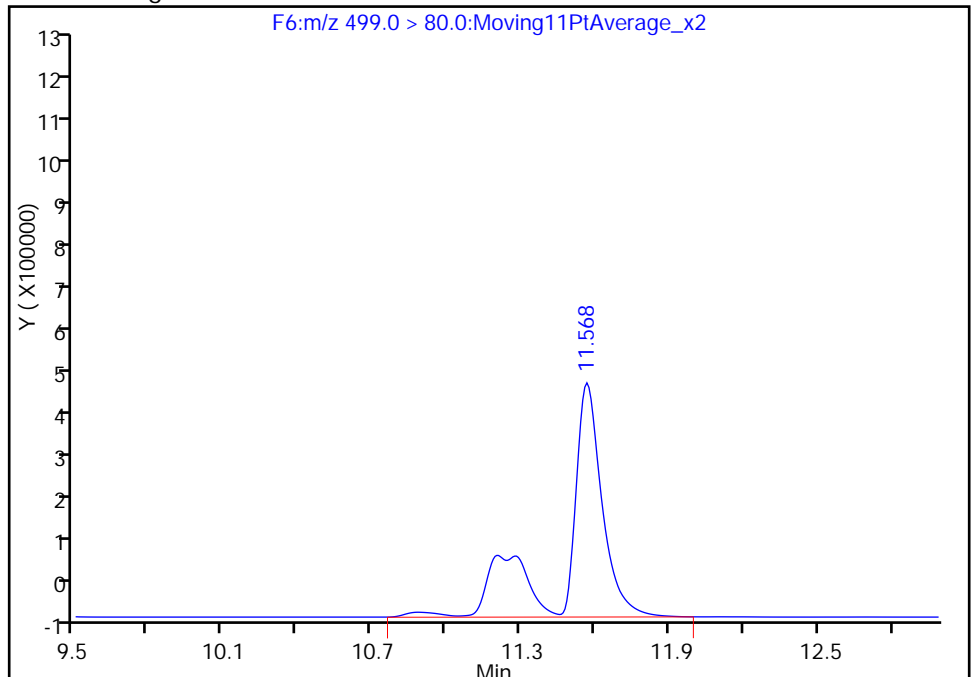
RT: 11.57
Area: 3694266
Amount: 65.342116
Amount Units: ng/ml

Processing Integration Results



RT: 11.57
Area: 5351936
Amount: 94.662058
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 02-Jun-2016 15:59:43
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

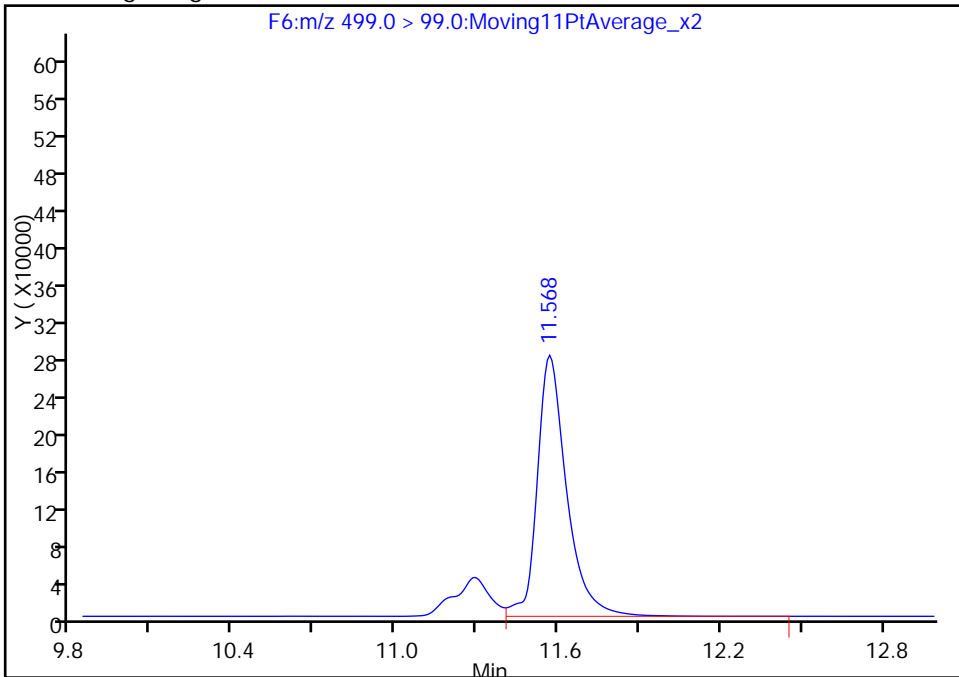
Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_140.d
Injection Date: 02-Jun-2016 13:55:29 Instrument ID: A6
Lims ID: 320-18986-A-15-A Lab Sample ID: 320-18986-15
Client ID: MCFSMW-3_0516
Operator ID: JRB ALS Bottle#: 38 Worklist Smp#: 66
Injection Vol: 15.0 ul Dil. Factor: 4.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

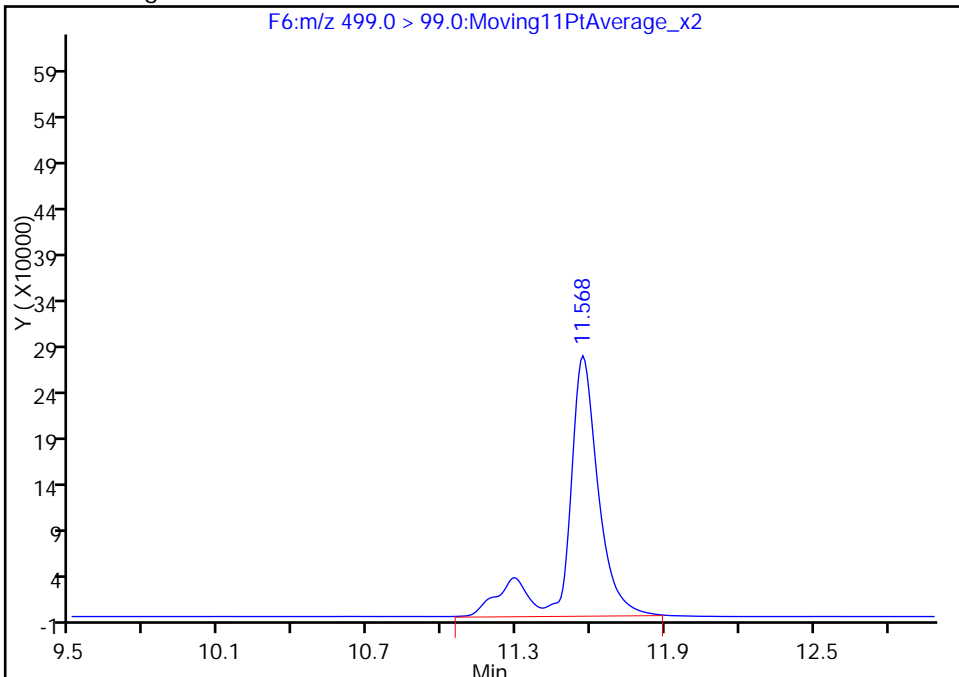
RT: 11.57
Area: 2120969
Amount: 65.342116
Amount Units: ng/ml

Processing Integration Results



RT: 11.57
Area: 2483083
Amount: 94.662058
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

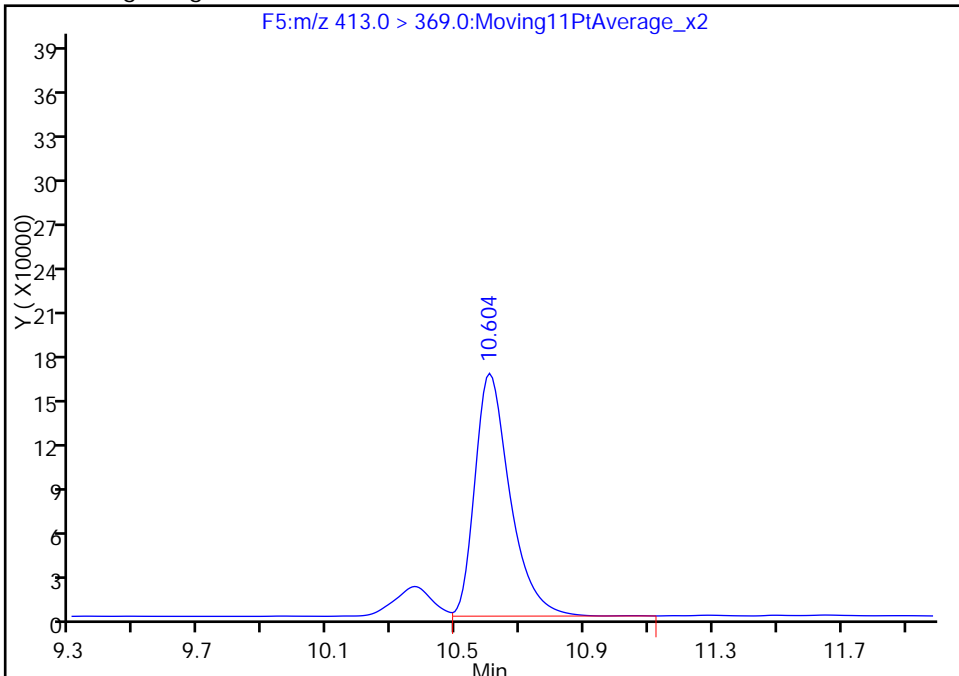
Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_140.d
Injection Date: 02-Jun-2016 13:55:29 Instrument ID: A6
Lims ID: 320-18986-A-15-A Lab Sample ID: 320-18986-15
Client ID: MCFSMW-3_0516
Operator ID: JRB ALS Bottle#: 38 Worklist Smp#: 66
Injection Vol: 15.0 ul Dil. Factor: 4.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

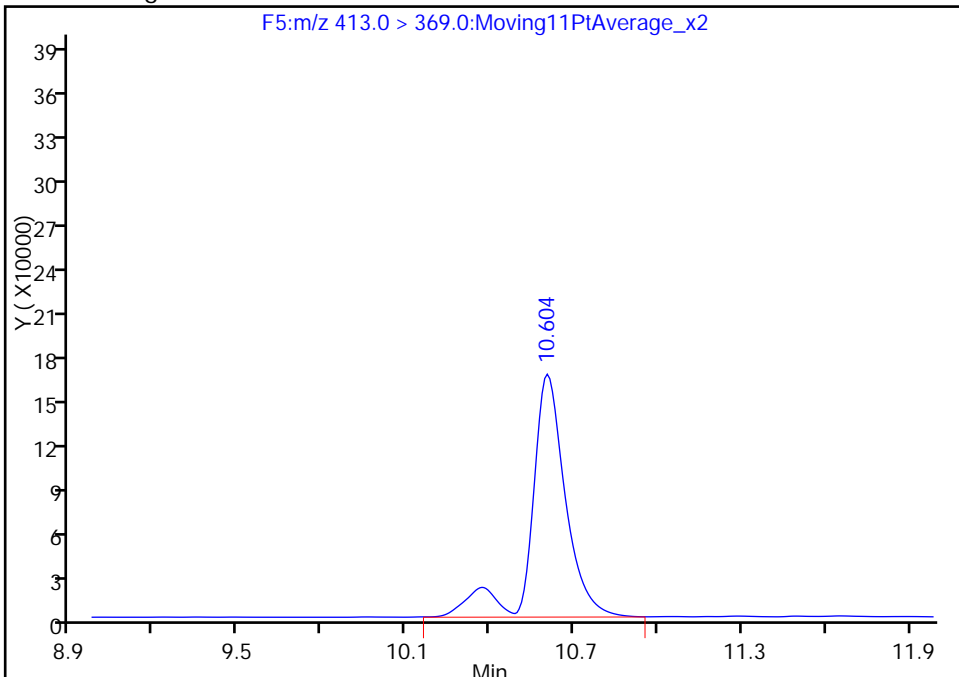
RT: 10.60
Area: 1260404
Amount: 14.382905
Amount Units: ng/ml

Processing Integration Results



RT: 10.60
Area: 1425358
Amount: 16.265251
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 02-Jun-2016 15:59:43
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

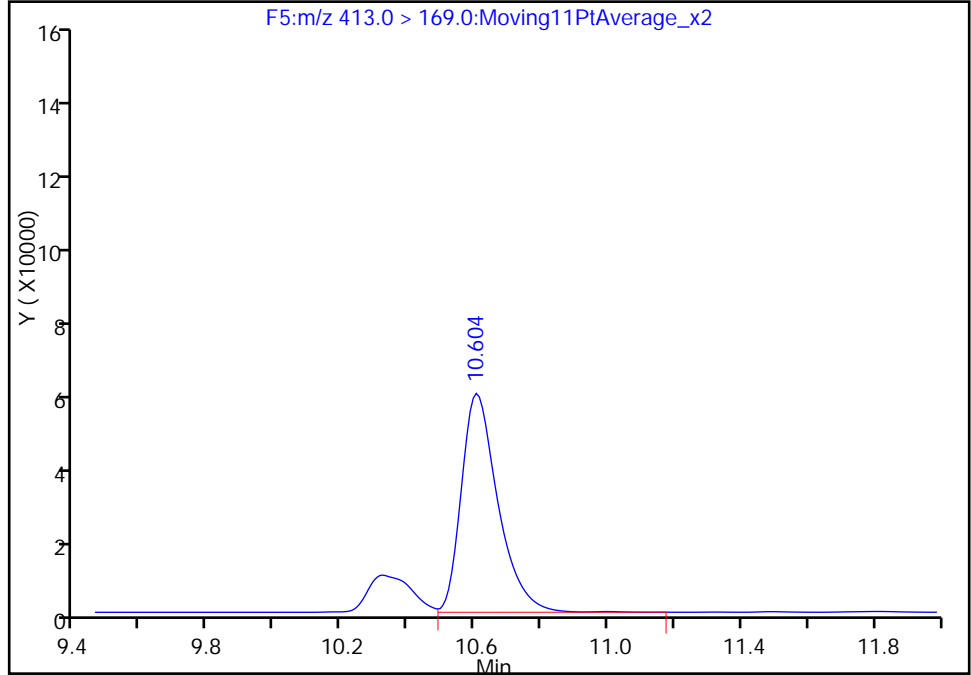
Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_140.d
Injection Date: 02-Jun-2016 13:55:29 Instrument ID: A6
Lims ID: 320-18986-A-15-A Lab Sample ID: 320-18986-15
Client ID: MCFSMW-3_0516
Operator ID: JRB ALS Bottle#: 38 Worklist Smp#: 66
Injection Vol: 15.0 ul Dil. Factor: 4.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

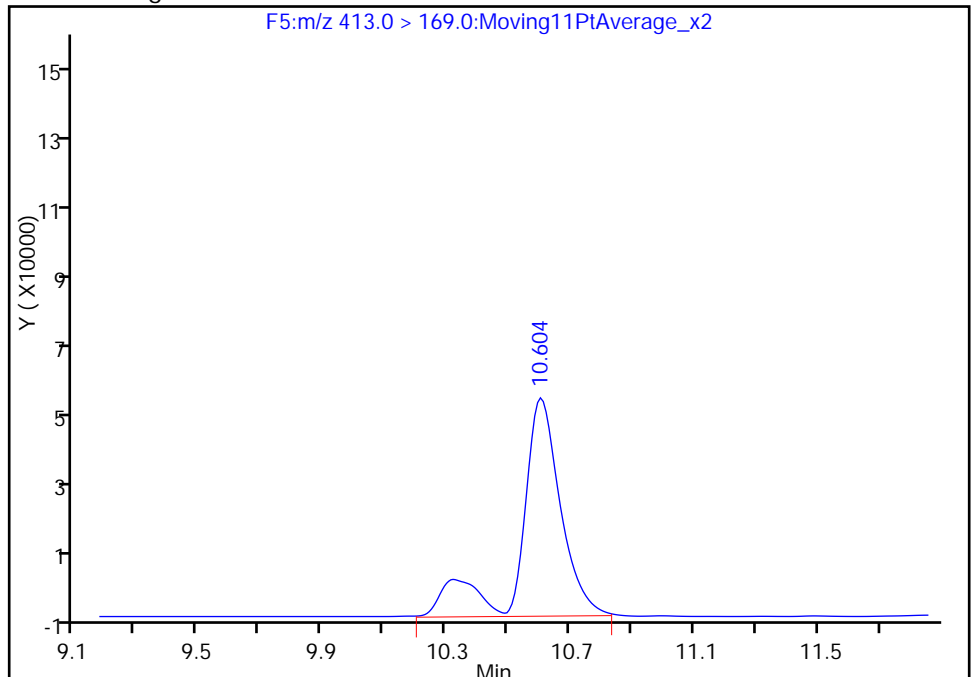
RT: 10.60
Area: 434480
Amount: 14.382905
Amount Units: ng/ml

Processing Integration Results



RT: 10.60
Area: 517620
Amount: 16.265251
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 02-Jun-2016 15:59:43

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: MCFSMW-16_0516 Lab Sample ID: 320-18986-16
 Matrix: Water Lab File ID: 28MAY2016A6A_073.d
 Analysis Method: WS-LC-0025 Date Collected: 05/16/2016 15:46
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 450.9(mL) Date Analyzed: 05/29/2016 17:19
 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.: 111859 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	30		2.8	2.2	1.0
375-85-9	Perfluoroheptanoic acid (PFHpA)	37		2.8	2.2	0.89
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	560	M	2.8	2.2	0.96
375-95-1	Perfluorononanoic acid (PFNA)	2.8		2.8	2.2	0.73
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	910	J M	4.4	3.3	1.4
335-67-1	Perfluorooctanoic acid (PFOA)	330	M	2.8	2.2	0.83

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	131		25-150
STL00990	13C4 PFOA	109		25-150
STL00991	13C4 PFOS	132		25-150
STL01892	13C4-PFHpA	130		25-150
STL00995	13C5 PFNA	75		25-150
STL00994	18O2 PFHxS	156	Q	25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_073.d
 Lims ID: 320-18986-A-16-A
 Client ID: MCFSMW-16_0516
 Sample Type: Client
 Inject. Date: 29-May-2016 17:19:30 ALS Bottle#: 44 Worklist Smp#: 72
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-16-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 17:07:40 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: barnettj Date: 01-Jun-2016 16:57:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.078	7.085	-0.007	1.000	763192	13.6				
D 6 13C2 PFHxA										
315.0 > 270.0	8.225	8.236	-0.011		3826816	65.6		131	15260	
D 8 13C4-PFHpA										
367.0 > 322.0	9.470	9.474	-0.004		4040481	65.2		130	34853	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.470	9.475	-0.005	1.000	1657497	16.8			169	
D 11 18O2 PFHxS										
403.0 > 84.0	9.505	9.507	-0.002		2110830	73.9		156	2480	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.505	9.507	-0.002	1.000	10240100	250.9				M
D 12 13C4 PFOA										
417.0 > 372.0	10.586	10.586	0.0		3680852	54.7		109	21856	
13 Perfluorooctanoic acid										M
413.0 > 369.0	10.586	10.587	-0.001	1.000	11263831	150.5			1694	M
413.0 > 169.0	10.586	10.587	-0.001	1.000	4495525		2.51(0.00-0.00)		1345	M
D 16 13C4 PFOS										
503.0 > 80.0	11.543	11.543	0.0		2222339	63.2		132	3038	
15 Perfluorooctane sulfonic acid										EM
499.0 > 80.0	11.552	11.545	0.007	1.000	24050109	412.1			3560	EM
499.0 > 99.0	11.543	11.545	-0.002	0.999	11828530		2.03(0.00-0.00)		1590	M
D 17 13C5 PFNA										
468.0 > 423.0	11.561	11.562	-0.001		2311811	37.3		74.5	27467	
18 Perfluorononanoic acid										
463.0 > 419.0	11.561	11.563	-0.002	1.000	48748	1.25			131	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

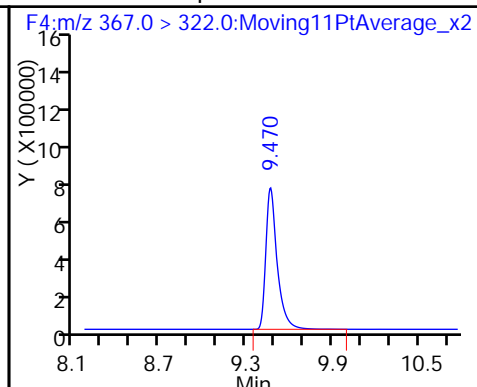
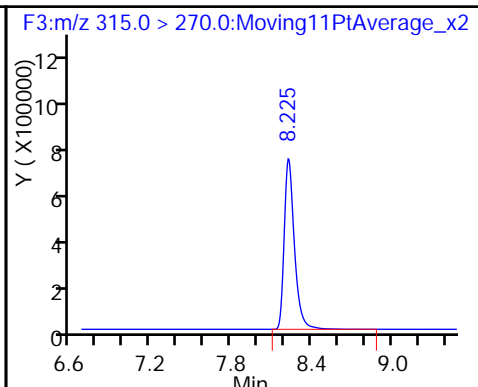
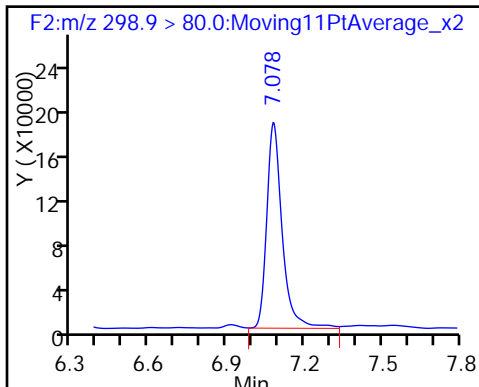
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_073.d
Injection Date: 29-May-2016 17:19:30 Instrument ID: A6
Lims ID: 320-18986-A-16-A Lab Sample ID: 320-18986-16
Client ID: MCFSMW-16_0516
Operator ID: JRB ALS Bottle#: 44 Worklist Smp#: 72
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxA

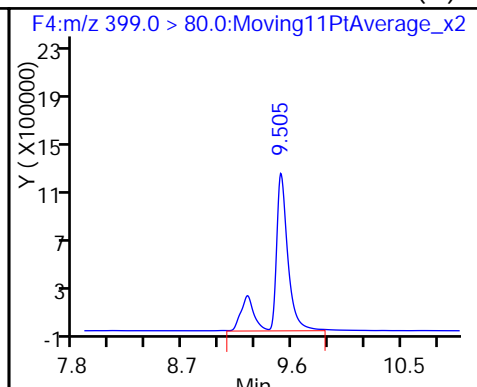
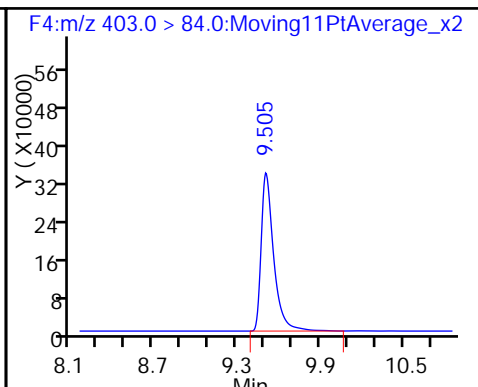
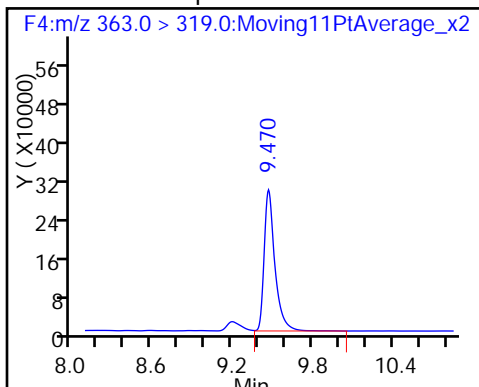
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid

D 11 18O2 PFHxS

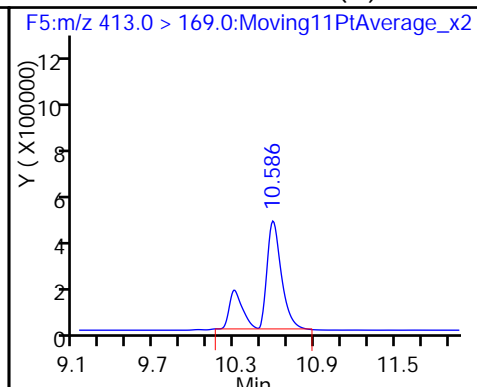
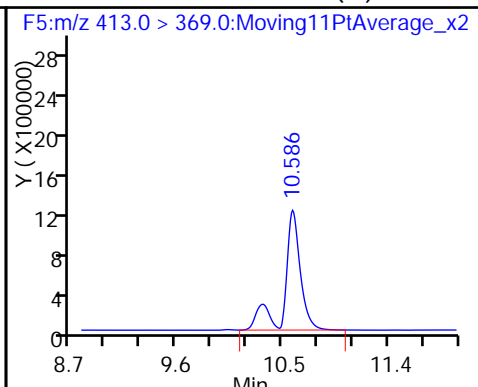
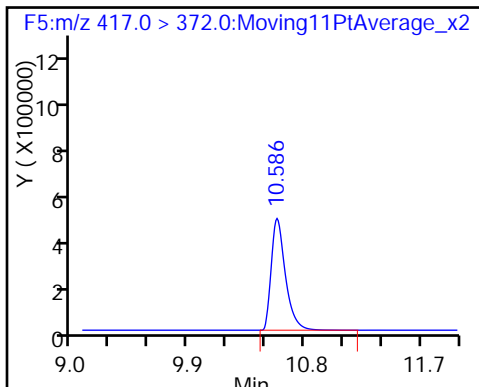
41 Perfluorohexanesulfonic acid (M)



D 12 13C4 PFOA

13 Perfluorooctanoic acid (M)

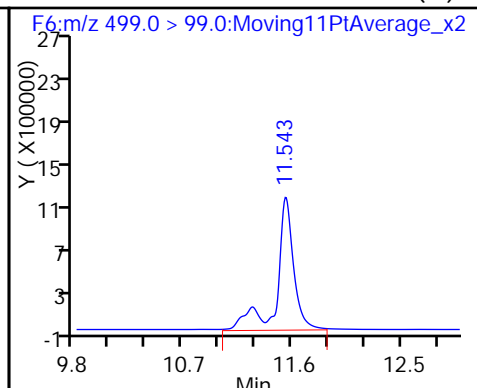
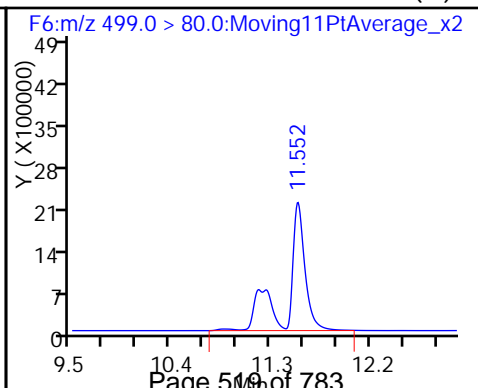
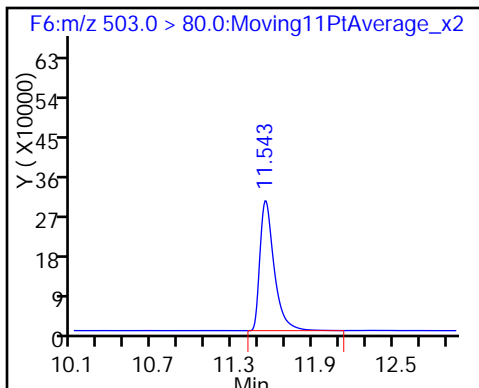
13 Perfluorooctanoic acid (M)



D 16 13C4 PFOS

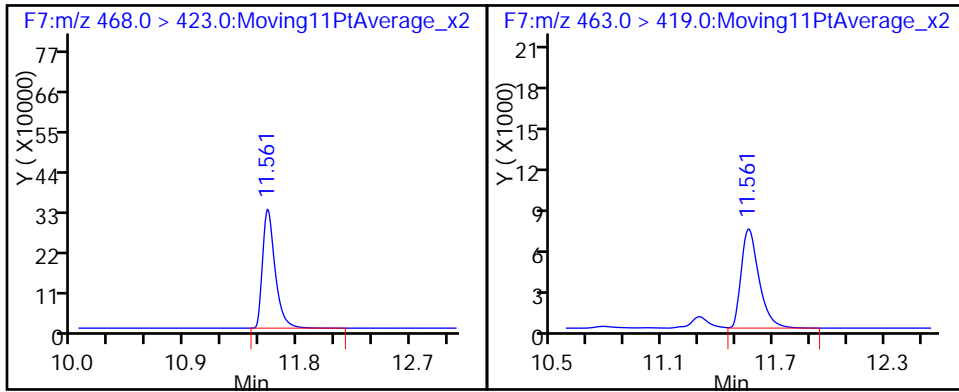
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid



TestAmerica Sacramento

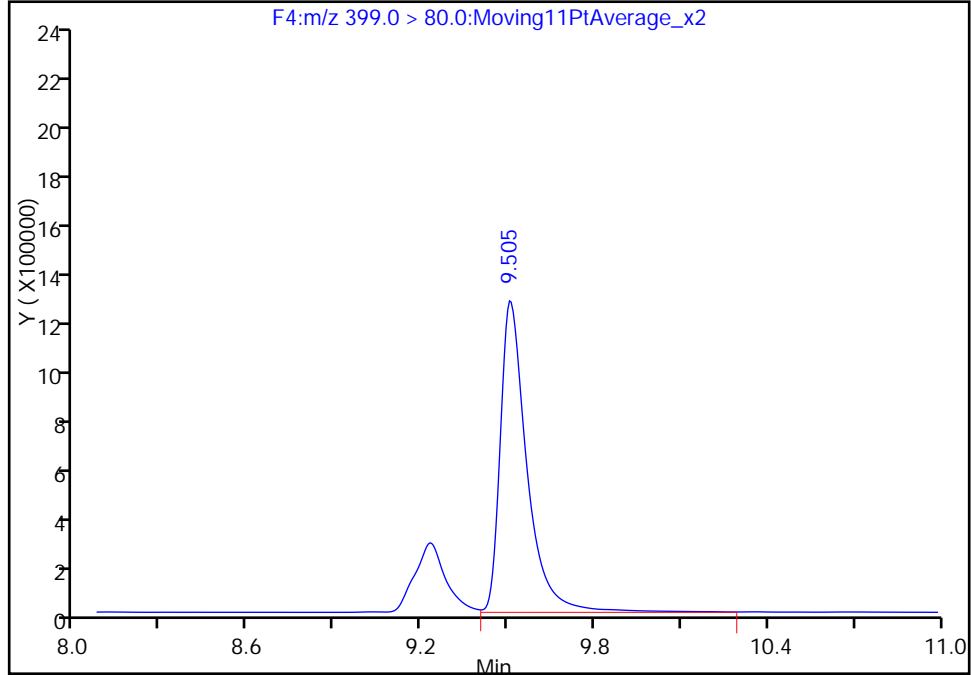
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Injection Date: 29-May-2016 17:19:30 Instrument ID: A6
Lims ID: 320-18986-A-16-A Lab Sample ID: 320-18986-16
Client ID: MCFSMW-16_0516
Operator ID: JRB ALS Bottle#: 44 Worklist Smp#: 72
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

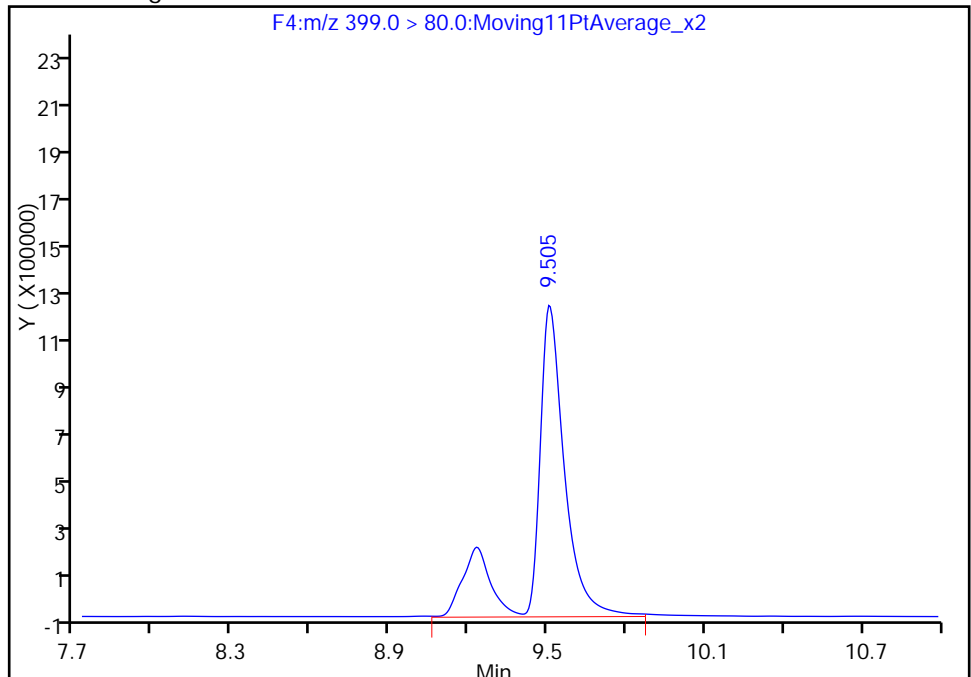
RT: 9.50
Area: 8204914
Amount: 201.0207
Amount Units: ng/ml

Processing Integration Results



RT: 9.50
Area: 10240100
Amount: 250.8828
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

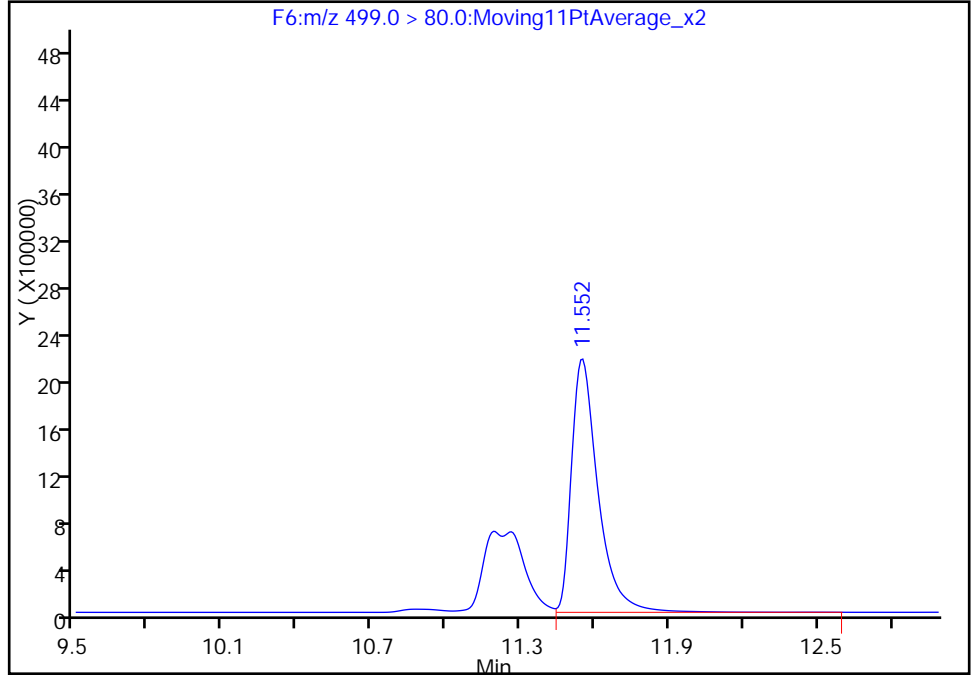
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Injection Date: 29-May-2016 17:19:30 Instrument ID: A6
Lims ID: 320-18986-A-16-A Lab Sample ID: 320-18986-16
Client ID: MCFSMW-16_0516
Operator ID: JRB ALS Bottle#: 44 Worklist Smp#: 72
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

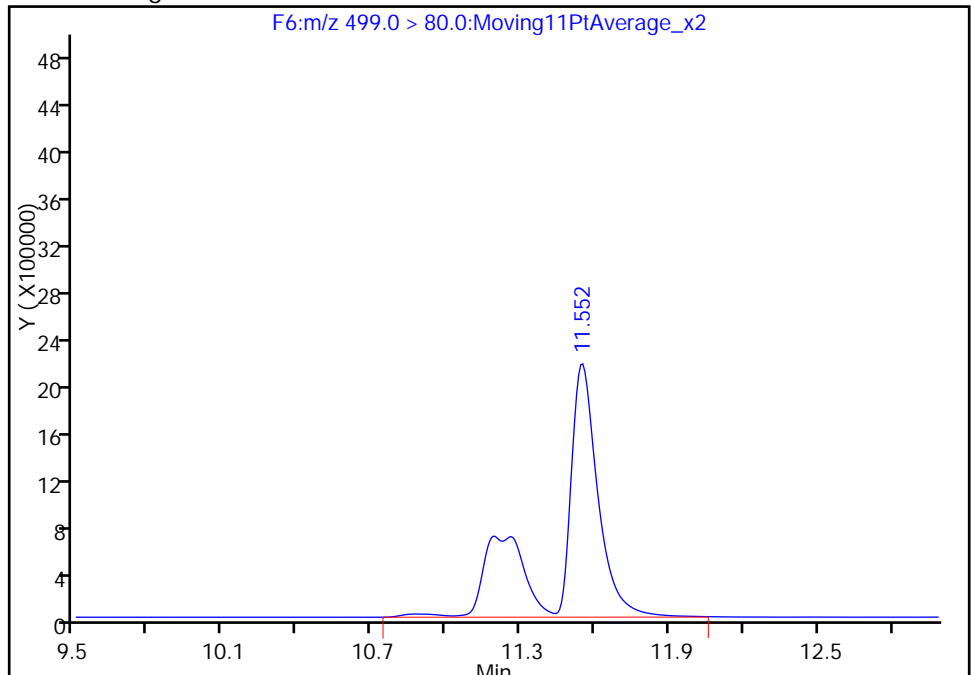
RT: 11.55
Area: 15972537
Amount: 273.6586
Amount Units: ng/ml

Processing Integration Results



RT: 11.55
Area: 24050109
Amount: 412.0523
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

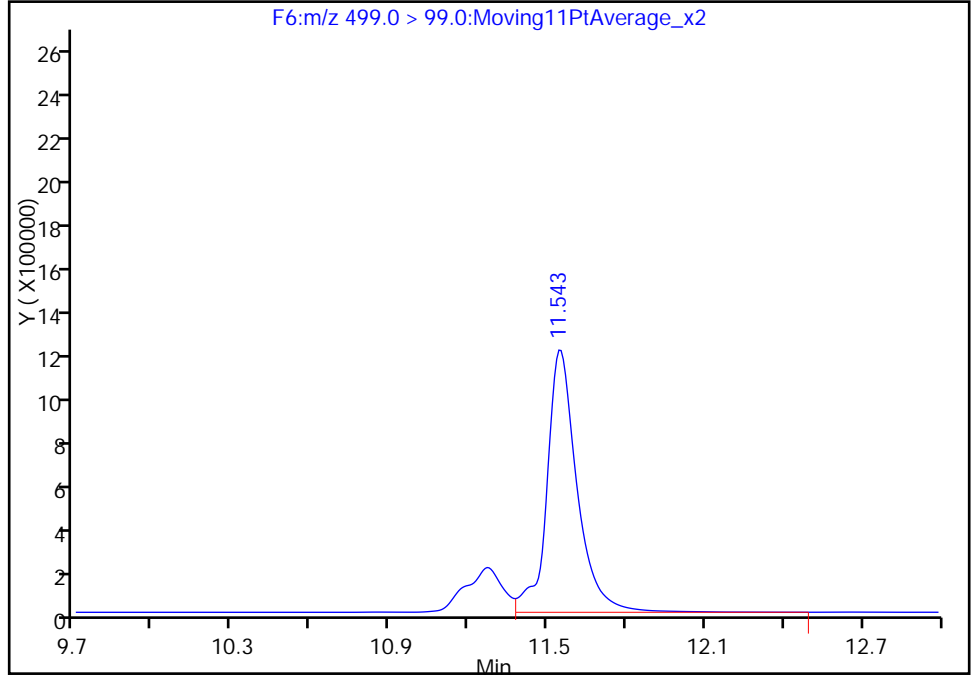
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Injection Date: 29-May-2016 17:19:30 Instrument ID: A6
Lims ID: 320-18986-A-16-A Lab Sample ID: 320-18986-16
Client ID: MCFSMW-16_0516
Operator ID: JRB ALS Bottle#: 44 Worklist Smp#: 72
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

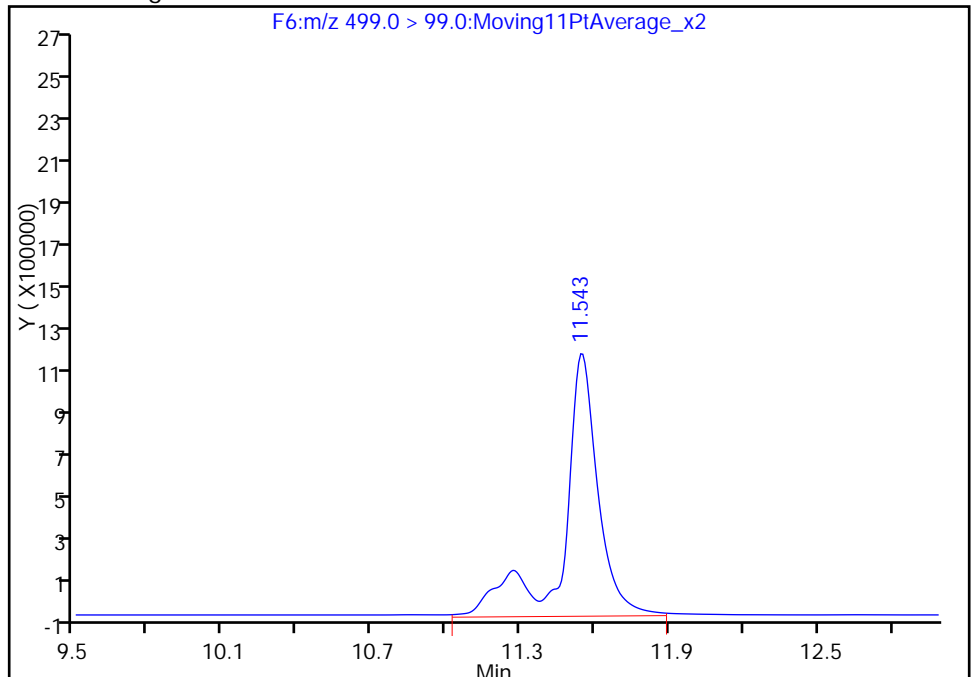
RT: 11.54
Area: 9575898
Amount: 273.6586
Amount Units: ng/ml

Processing Integration Results



RT: 11.54
Area: 11828530
Amount: 412.0523
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

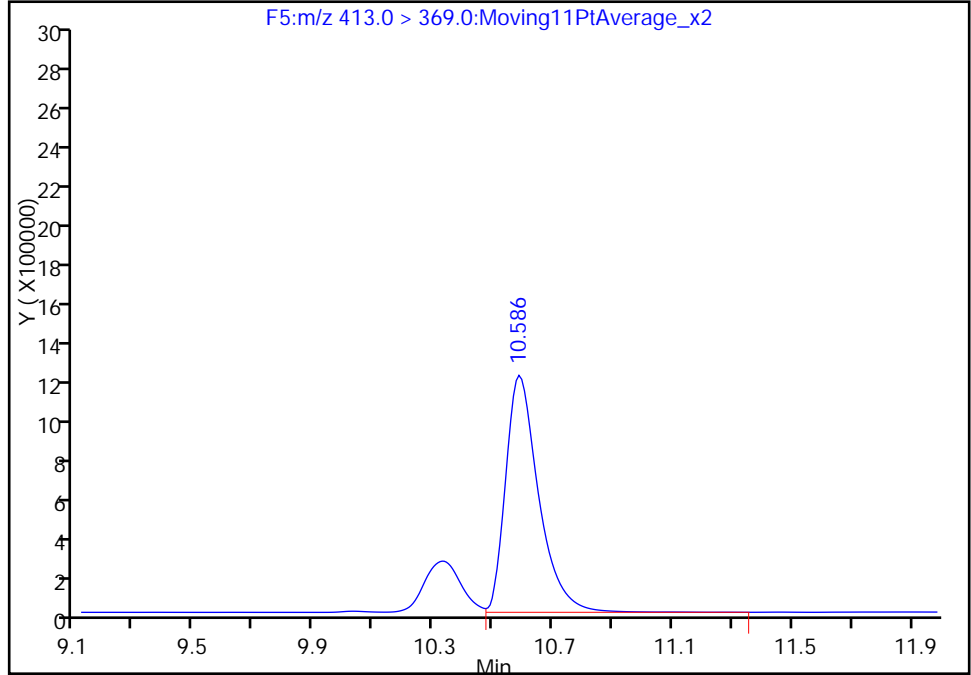
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Injection Date: 29-May-2016 17:19:30 Instrument ID: A6
Lims ID: 320-18986-A-16-A Lab Sample ID: 320-18986-16
Client ID: MCFSMW-16_0516
Operator ID: JRB ALS Bottle#: 44 Worklist Smp#: 72
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

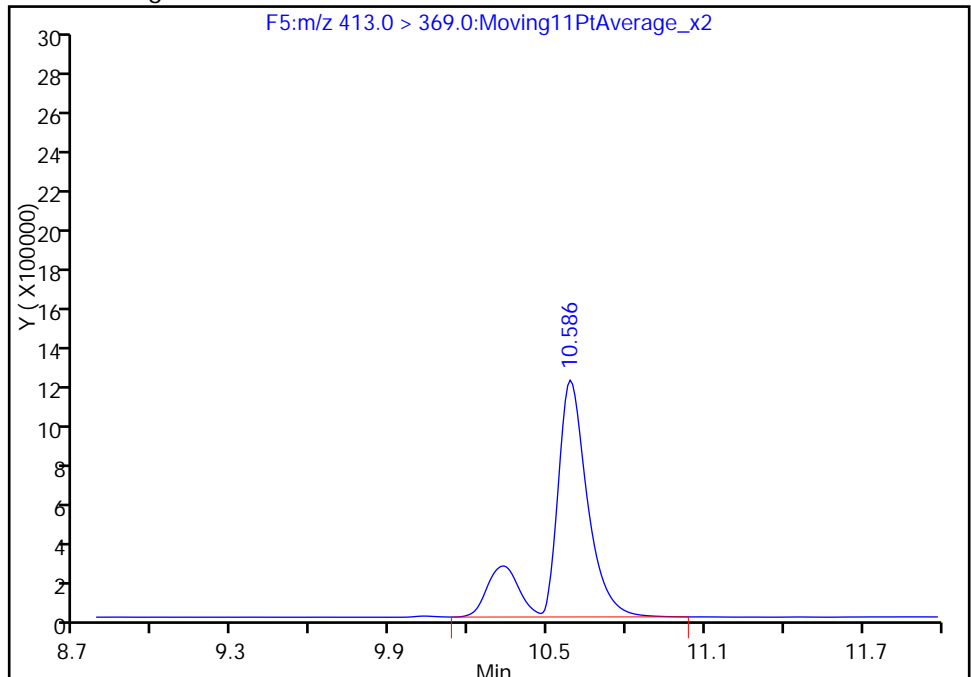
RT: 10.59
Area: 9154579
Amount: 122.3357
Amount Units: ng/ml

Processing Integration Results



RT: 10.59
Area: 11263831
Amount: 150.5223
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

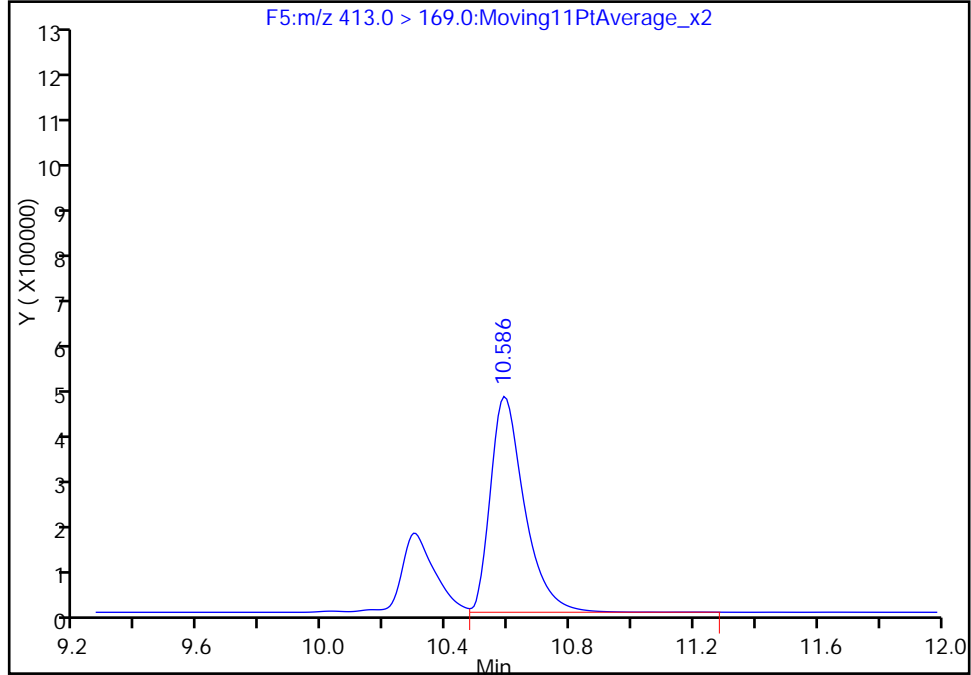
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Lims ID: 320-18986-A-16-A Lab Sample ID: 320-18986-16
Client ID: MCFSMW-16_0516
Operator ID: JRB ALS Bottle#: 44 Worklist Smp#: 72
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

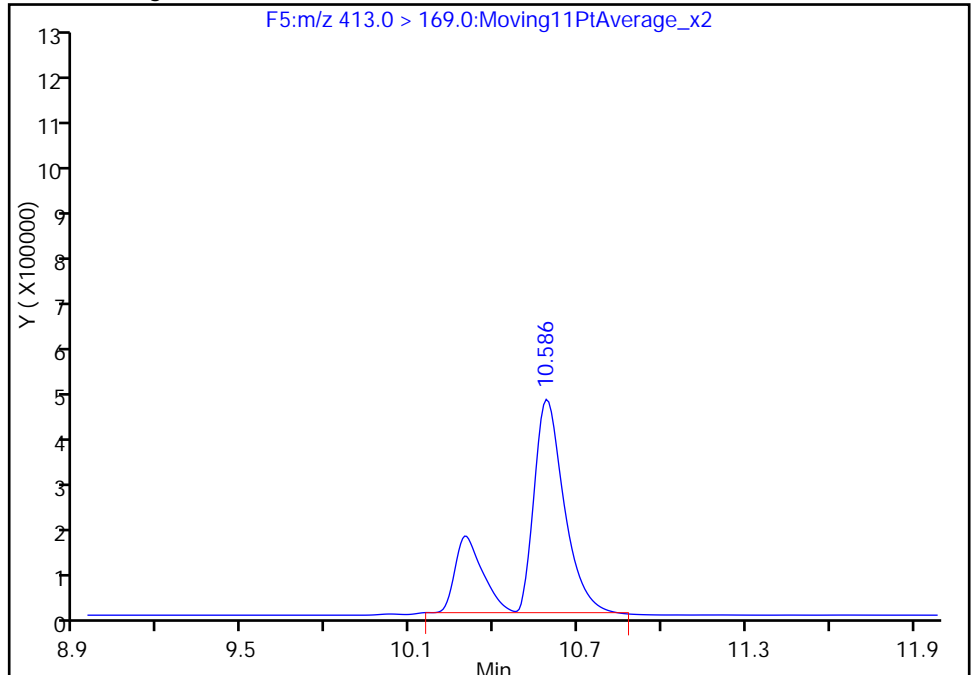
RT: 10.59
Area: 3512238
Amount: 122.3357
Amount Units: ng/ml

Processing Integration Results



RT: 10.59
Area: 4495525
Amount: 150.5223
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: MCFSMW-16_0516 DL Lab Sample ID: 320-18986-16 DL
 Matrix: Water Lab File ID: 31MAY2016A6A_141.d
 Analysis Method: WS-LC-0025 Date Collected: 05/16/2016 15:46
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 450.9(mL) Date Analyzed: 06/02/2016 14:16
 Con. Extract Vol.: 1.00(mL) Dilution Factor: 4
 Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 112205 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	<i>Perfluorobutanesulfonic acid (PFBS)</i>	23	D	11	8.9	4.1
375-85-9	<i>Perfluoroheptanoic acid (PFHpA)</i>	37	D	11	8.9	3.6
355-46-4	<i>Perfluorohexanesulfonic acid (PFHxS)</i>	480	D M	11	8.9	3.9
375-95-1	<i>Perfluorononanoic acid (PFNA)</i>	8.9	U	11	8.9	2.9
1763-23-1	<i>Perfluorooctanesulfonic acid (PFOS)</i>	750	D M	18	13	5.7
335-67-1	<i>Perfluorooctanoic acid (PFOA)</i>	310	D M	11	8.9	3.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		25-150
STL00990	13C4 PFOA	84		25-150
STL00991	13C4 PFOS	111		25-150
STL01892	13C4-PFHpA	91		25-150
STL00995	13C5 PFNA	62		25-150
STL00994	18O2 PFHxS	118		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_141.d
 Lims ID: 320-18986-A-16-A
 Client ID: MCFSMW-16_0516
 Sample Type: Client
 Inject. Date: 02-Jun-2016 14:16:47 ALS Bottle#: 39 Worklist Smp#: 67
 Injection Vol: 15.0 ul Dil. Factor: 4.0000
 Sample Info: 320-18986-a-16-a 4X
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Jun-2016 17:18:05 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 02-Jun-2016 17:12:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.081	7.099	-0.018	1.000	124079	2.62				
D 6 13C2 PFHxA										
315.0 > 270.0	8.236	8.252	-0.016		742485	12.1		24.2	64150	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.487	9.494	-0.007	1.000	320851	4.18			213	
D 8 13C4-PFHpA										
367.0 > 322.0	9.487	9.495	-0.008		784891	11.4		22.9	68306	
D 11 18O2 PFHxS										
403.0 > 84.0	9.517	9.532	-0.015		430927	14.0		29.5	34411	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.524	9.533	-0.009	1.000	1841199	53.9				M
D 12 13C4 PFOA										
417.0 > 372.0	10.604	10.612	-0.008		760991	10.5		20.9	50190	
13 Perfluorooctanoic acid										M
413.0 > 369.0	10.604	10.612	-0.008	1.000	2213720	35.4			724	M
413.0 > 169.0	10.604	10.612	-0.008	1.000	884190		2.50(0.00-0.00)		1116	M
D 16 13C4 PFOS										
503.0 > 80.0	11.568	11.568	0.0		526697	13.3		27.8	24844	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.568	11.571	-0.003	1.000	4626586	85.0			1750	M
499.0 > 99.0	11.568	11.571	-0.003	1.000	2339813		1.98(0.00-0.00)		5636	M
D 17 13C5 PFNA										
468.0 > 423.0	11.586	11.589	-0.003		515605	7.73		15.5	37207	
18 Perfluorononanoic acid										
463.0 > 419.0	11.594	11.589	0.005	1.000	6493	0.1822			27.0	

QC Flag Legend

Review Flags

M - Manually Integrated

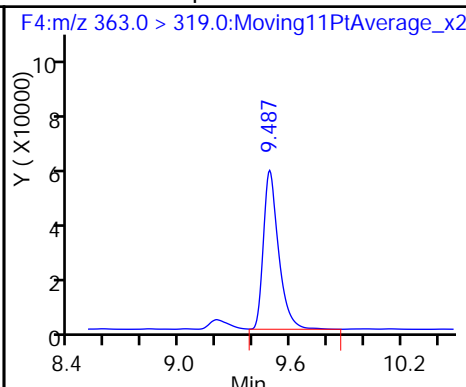
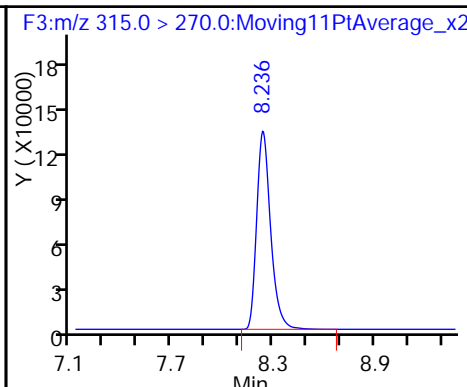
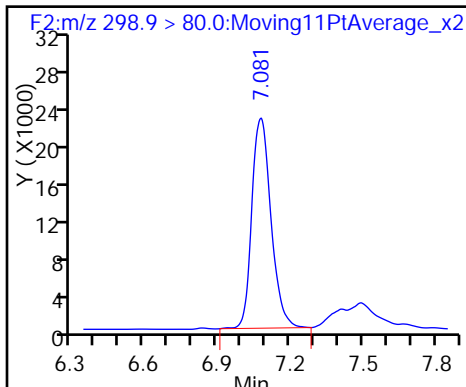
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_141.d
Injection Date: 02-Jun-2016 14:16:47 Instrument ID: A6
Lims ID: 320-18986-A-16-A Lab Sample ID: 320-18986-16
Client ID: MCFSMW-16_0516
Operator ID: JRB ALS Bottle#: 39 Worklist Smp#: 67
Injection Vol: 15.0 ul Dil. Factor: 4.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxA

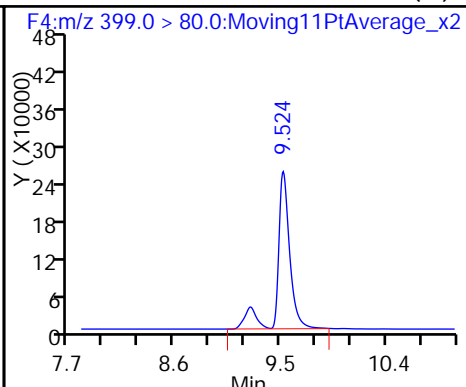
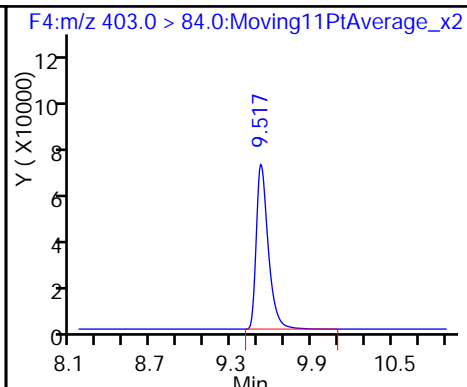
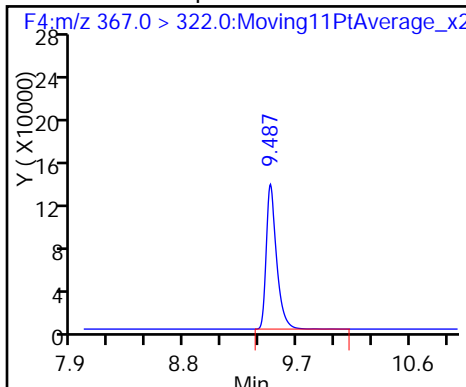
9 Perfluoroheptanoic acid



D 8 13C4-PFHpA

D 11 18O2 PFHxS

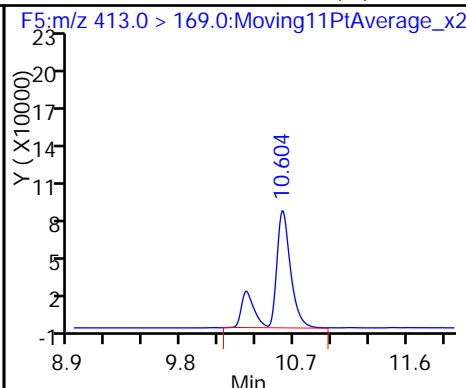
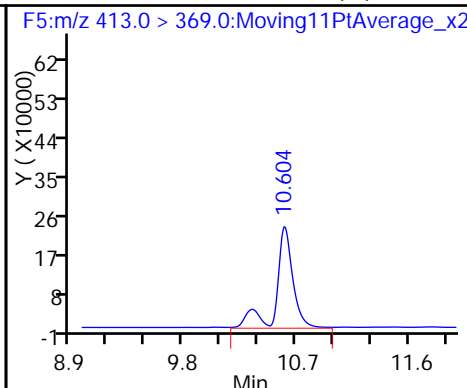
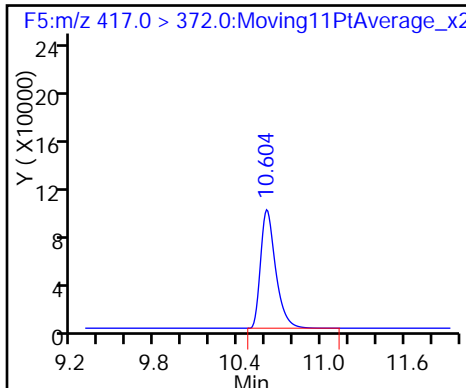
41 Perfluorohexanesulfonic acid (M)



D 12 13C4 PFOA

13 Perfluorooctanoic acid (M)

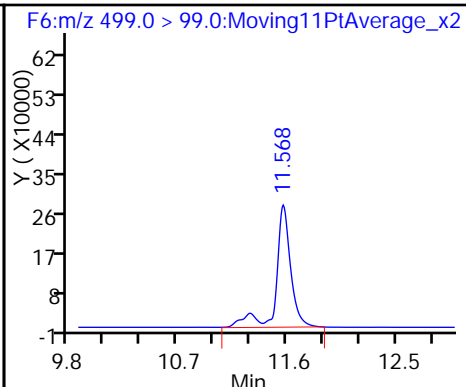
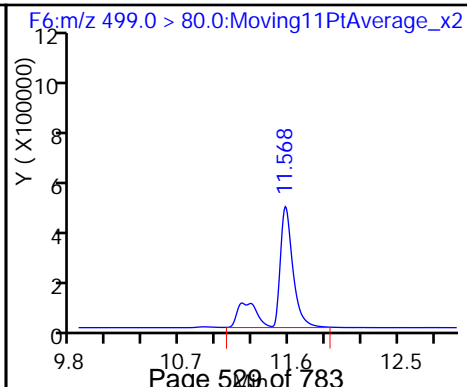
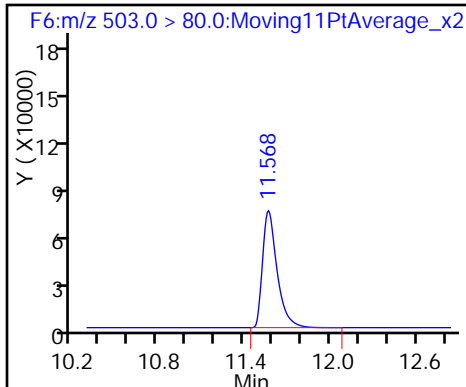
13 Perfluorooctanoic acid (M)



D 16 13C4 PFOS

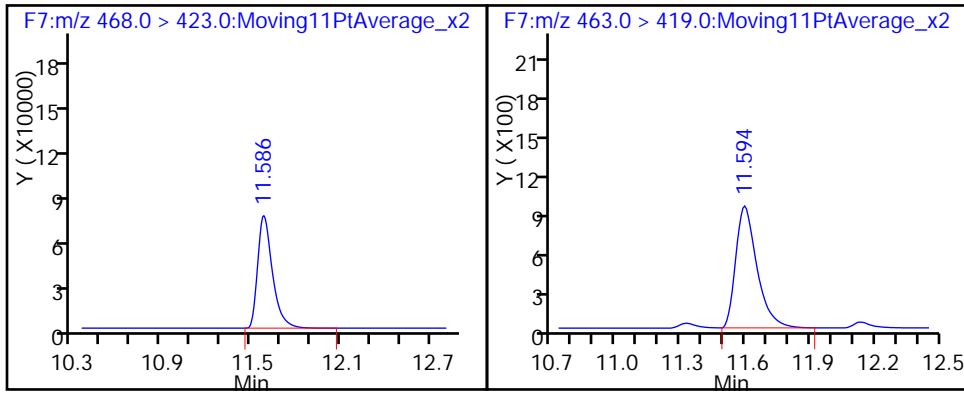
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid



TestAmerica Sacramento

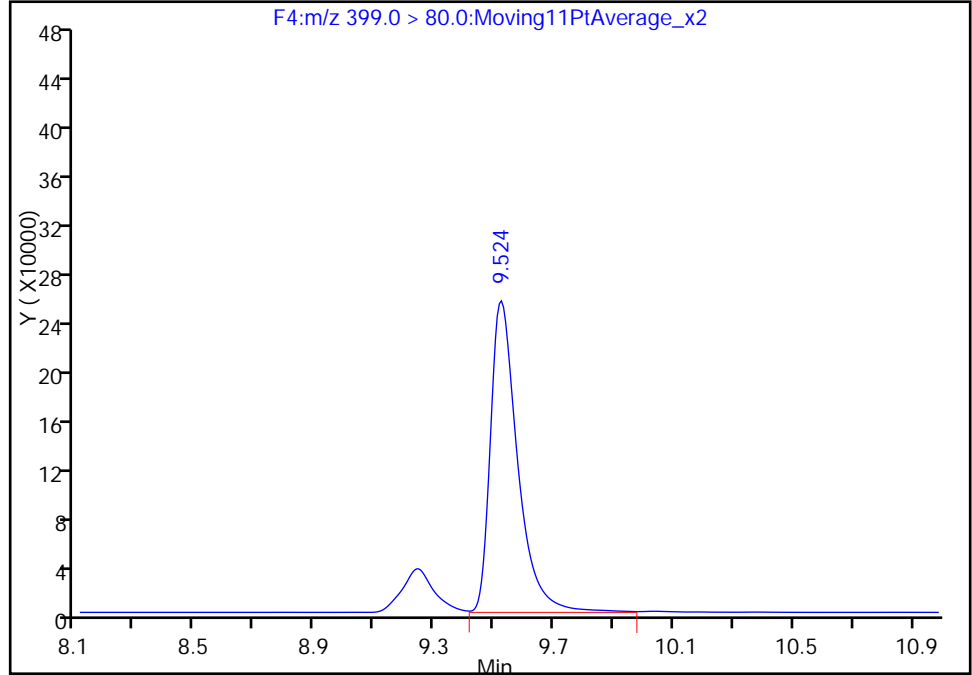
Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_141.d
Injection Date: 02-Jun-2016 14:16:47 Instrument ID: A6
Lims ID: 320-18986-A-16-A Lab Sample ID: 320-18986-16
Client ID: MCFSMW-16_0516
Operator ID: JRB ALS Bottle#: 39 Worklist Smp#: 67
Injection Vol: 15.0 ul Dil. Factor: 4.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

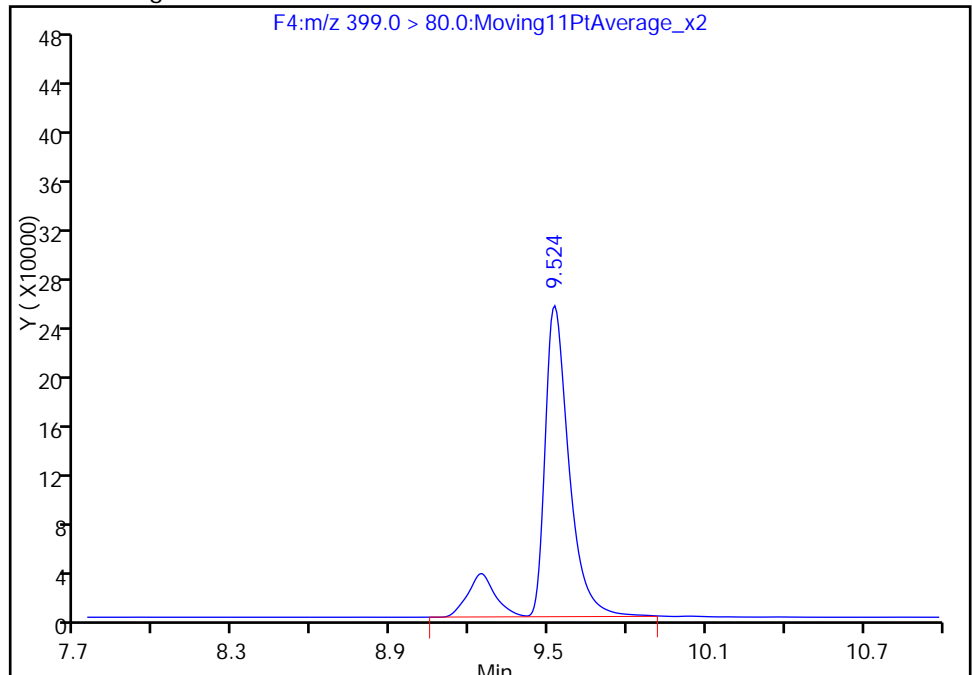
RT: 9.52
Area: 1605036
Amount: 47.024003
Amount Units: ng/ml

Processing Integration Results



RT: 9.52
Area: 1841199
Amount: 53.943056
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 02-Jun-2016 17:12:18
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

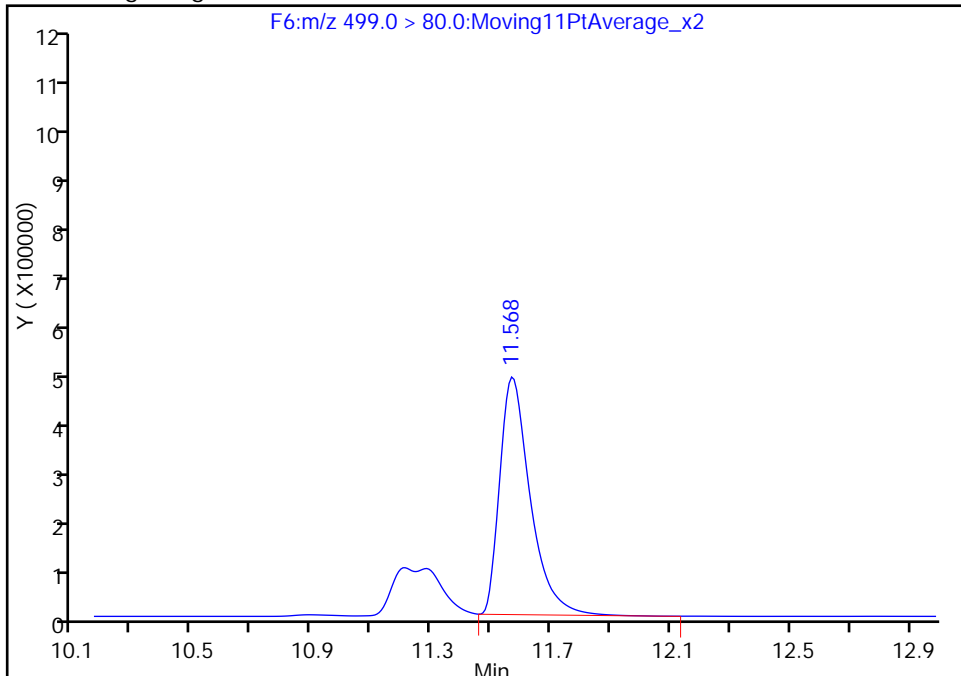
Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_141.d
Injection Date: 02-Jun-2016 14:16:47 Instrument ID: A6
Lims ID: 320-18986-A-16-A Lab Sample ID: 320-18986-16
Client ID: MCFSMW-16_0516
Operator ID: JRB ALS Bottle#: 39 Worklist Smp#: 67
Injection Vol: 15.0 ul Dil. Factor: 4.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

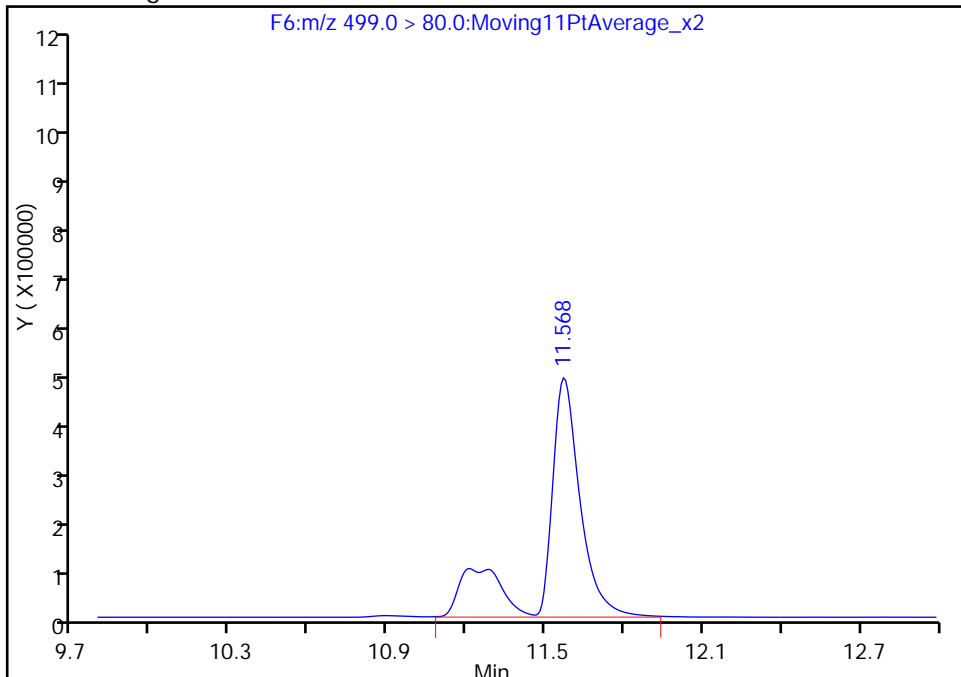
RT: 11.57
Area: 3431598
Amount: 63.023218
Amount Units: ng/ml

Processing Integration Results



RT: 11.57
Area: 4626586
Amount: 84.969841
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 02-Jun-2016 17:12:18
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

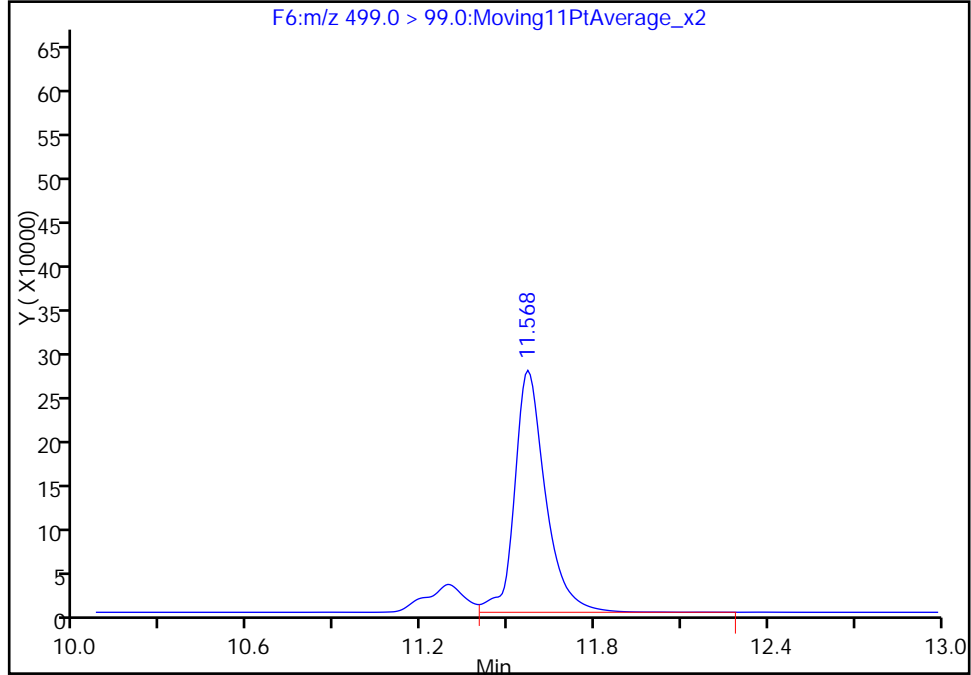
Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_141.d
Injection Date: 02-Jun-2016 14:16:47 Instrument ID: A6
Lims ID: 320-18986-A-16-A Lab Sample ID: 320-18986-16
Client ID: MCFSMW-16_0516
Operator ID: JRB ALS Bottle#: 39 Worklist Smp#: 67
Injection Vol: 15.0 ul Dil. Factor: 4.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

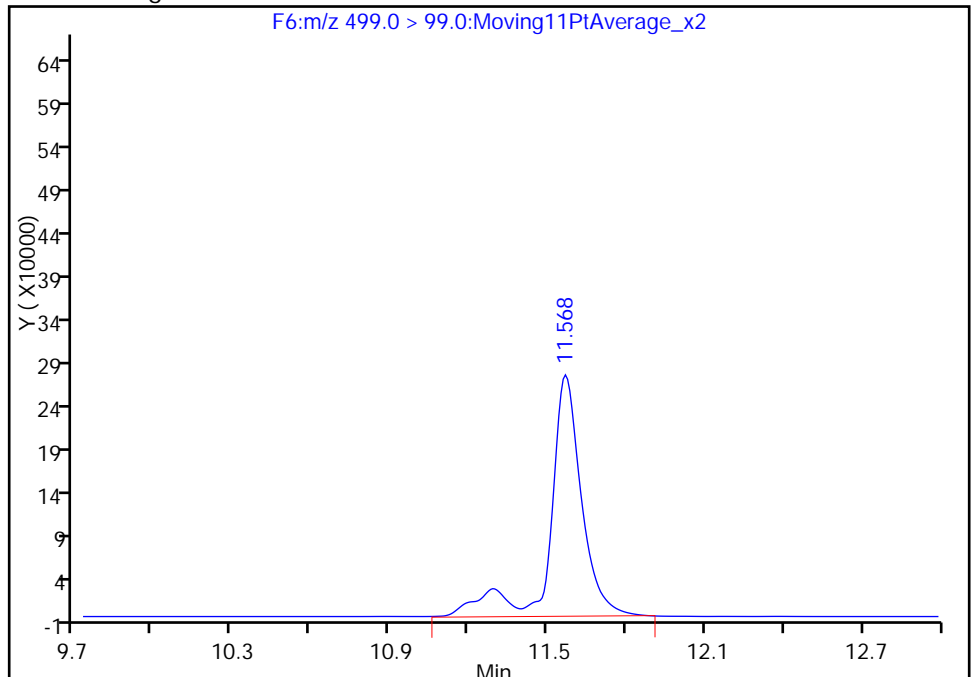
RT: 11.57
Area: 2058299
Amount: 63.023218
Amount Units: ng/ml

Processing Integration Results



RT: 11.57
Area: 2339813
Amount: 84.969841
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

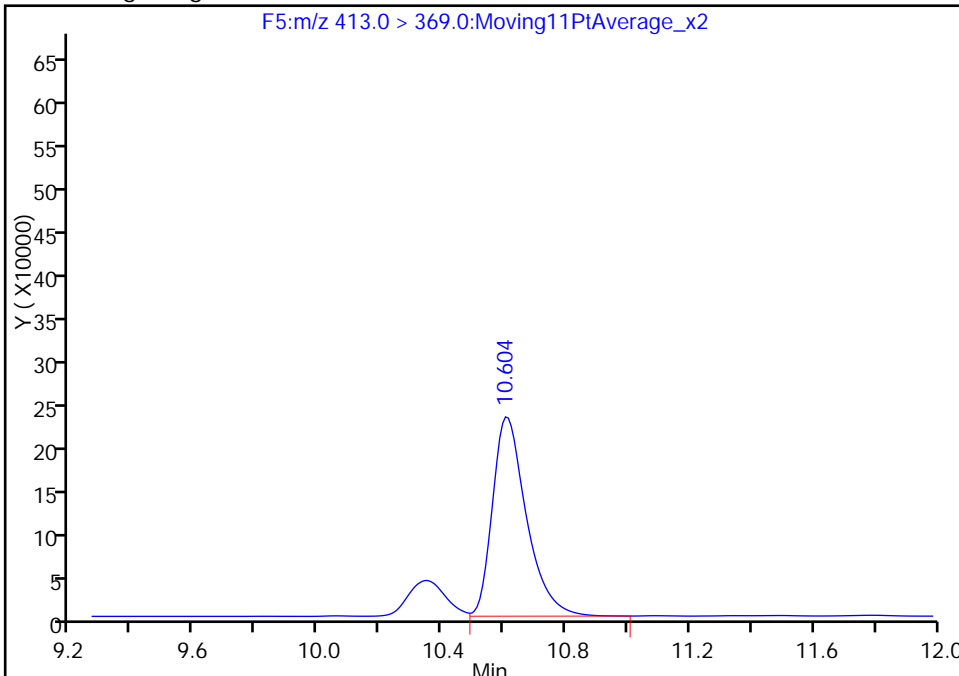
Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_141.d
Injection Date: 02-Jun-2016 14:16:47 Instrument ID: A6
Lims ID: 320-18986-A-16-A Lab Sample ID: 320-18986-16
Client ID: MCFSMW-16_0516
Operator ID: JRB ALS Bottle#: 39 Worklist Smp#: 67
Injection Vol: 15.0 ul Dil. Factor: 4.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:M/RM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

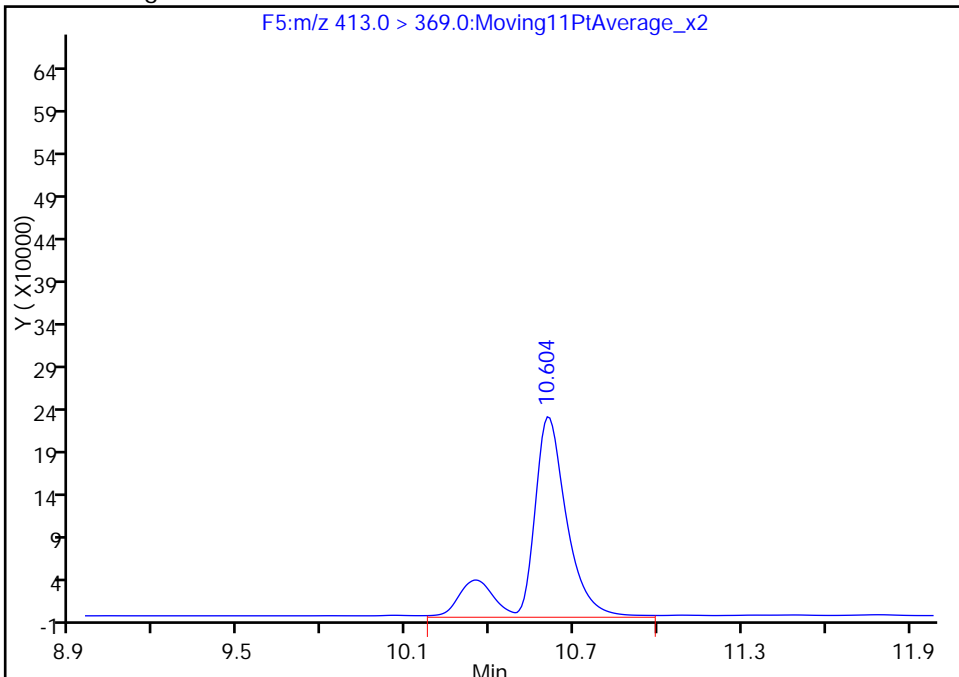
RT: 10.60
Area: 1773578
Amount: 28.380101
Amount Units: ng/ml

Processing Integration Results



RT: 10.60
Area: 2213720
Amount: 35.423081
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 02-Jun-2016 17:12:18
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

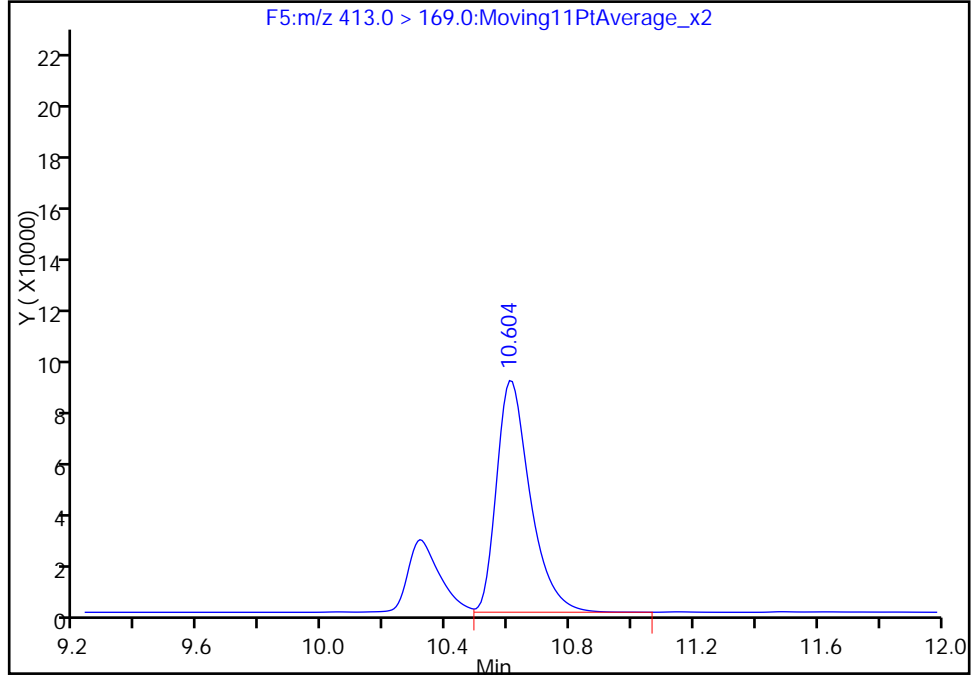
Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_141.d
Injection Date: 02-Jun-2016 14:16:47 Instrument ID: A6
Lims ID: 320-18986-A-16-A Lab Sample ID: 320-18986-16
Client ID: MCFSMW-16_0516
Operator ID: JRB ALS Bottle#: 39 Worklist Smp#: 67
Injection Vol: 15.0 ul Dil. Factor: 4.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

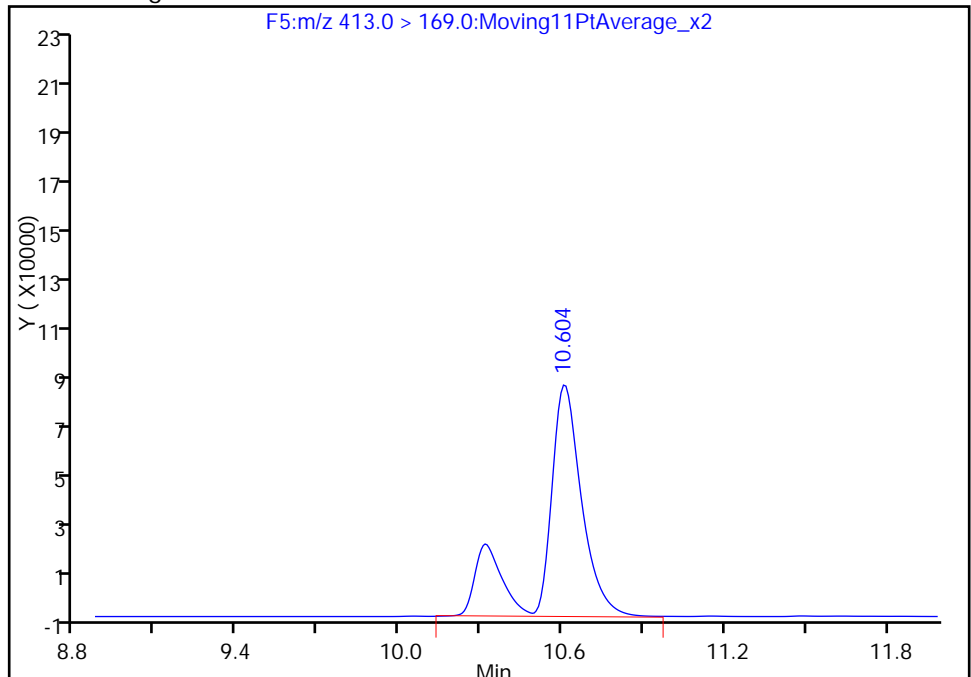
RT: 10.60
Area: 684960
Amount: 28.380101
Amount Units: ng/ml

Processing Integration Results



RT: 10.60
Area: 884190
Amount: 35.423081
Amount Units: ng/ml

Manual Integration Results



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

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1 Analy Batch No.: 111859

SDG No.: _____

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/28/2016 13:56 Calibration End Date: 05/28/2016 19:41 Calibration ID: 21828

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-111859/2	28MAY2016A6A_003.d
Level 2	STD 320-111859/3	28MAY2016A6A_004.d
Level 3	STD 320-111859/4	28MAY2016A6A_005.d
Level 4	STD 320-111859/5	28MAY2016A6A_006.d
Level 5	STD 320-111859/6	28MAY2016A6A_007.d
Level 6	STD 320-111859/10	28MAY2016A6A_011.d
Level 7	STD 320-111859/11	28MAY2016A6A_012.d

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7				RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	++++	5.800	5.800	5.797	5.797	5.794	5.794				5.549 - 6.049	5.797
Perfluoropentanoic acid (PFPeA)	6.960	6.960	6.960	6.955	6.964	6.955	6.960				6.710 - 7.210	6.959
Perfluorobutanesulfonic acid (PFBS)	7.088	7.085	7.088	7.081	7.087	7.081	7.085				6.836 - 7.336	7.085
Perfluorohexanoic acid (PFHxA)	8.236	8.230	8.236	8.236	8.235	8.236	8.236				7.985 - 8.485	8.235
Perfluoroheptanoic acid (PFHpA)	++++	9.475	9.475	9.475	9.488	9.470	9.469				9.227 - 9.727	9.475
Perfluorohexanesulfonic acid (PFHxS)	9.499	9.510	9.505	9.504	9.518	9.505	9.504				9.257 - 9.757	9.506
Perfluorooctanoic acid (PFOA)	10.586	10.577	10.586	10.586	10.584	10.596	10.595				10.334 - 10.834	10.587
Perfluoroheptanesulfonic Acid (PFHpS)	++++	10.586	10.586	10.595	10.593	10.605	10.604				10.343 - 10.843	10.595
Perfluorooctanesulfonic acid (PFOS)	++++	11.543	11.543	11.535	11.541	11.543	11.552				11.295 - 11.795	11.543
Perfluorononanoic acid (PFNA)	++++	11.561	11.561	11.553	11.559	11.570	11.569				11.311 - 11.811	11.562
Perfluorodecanoic acid (PFDA)	12.393	12.383	12.393	12.393	12.396	12.393	12.393				12.142 - 12.642	12.392
Perfluorooctane Sulfonamide (FOSA)	++++	13.004	13.004	13.004	12.998	13.004	12.994				12.753 - 13.253	13.001
Perfluorodecanesulfonic acid (PFDS)	13.041	13.050	13.050	13.050	13.047	13.050	13.050				12.797 - 13.297	13.048
Perfluoroundecanoic acid (PFUnA)	++++	13.094	13.094	13.094	13.091	13.102	13.093				12.843 - 13.343	13.095
Perfluorododecanoic acid (PFDoA)	13.685	13.676	13.685	13.685	13.684	13.685	13.694				13.433 - 13.933	13.685
Perfluorotetradecanoic Acid (PFTriA)	14.182	14.182	14.182	14.182	14.182	14.190	14.189				13.932 - 14.432	14.184
Perfluorotetradecanoic acid (PFTeA)	14.615	14.602	14.609	14.609	14.604	14.609	14.615				14.358 - 14.858	14.609
Perfluoro-n-hexadecanoic acid (PFHxDA)	++++	15.200	15.205	15.199	15.199	15.200	15.204				14.953 - 15.453	15.201
Perfluoro-n-octadecanoic acid (PFODA)	15.476	15.476	15.471	15.466	15.476	15.471	15.476				15.223 - 15.723	15.473
13C4 PFBA	5.797	5.794	5.797	5.794	5.797	5.794	5.794				5.546 - 6.046	5.795
13C5-PFPeA	6.960	6.955	6.960	6.955	6.959	6.955	6.955				6.708 - 7.208	6.957
13C2 PFHxA	8.236	8.236	8.236	8.236	8.240	8.236	8.236				7.987 - 8.487	8.237
13C4-PFHpA	9.469	9.475	9.475	9.475	9.482	9.470	9.469				9.225 - 9.725	9.474
18O2 PFHxS	9.499	9.505	9.505	9.510	9.518	9.505	9.504				9.257 - 9.757	9.507
13C4 PFOA	10.586	10.577	10.586	10.586	10.584	10.596	10.586				10.334 - 10.834	10.586
13C4 PFOS	11.543	11.543	11.543	11.535	11.541	11.543	11.552				11.291 - 11.791	11.543
13C5 PFNA	11.561	11.561	11.561	11.553	11.559	11.570	11.569				11.309 - 11.809	11.562
13C2 PFDA	12.393	12.383	12.393	12.393	12.396	12.393	12.393				12.142 - 12.642	12.392
13C8 FOSA	12.994	13.004	13.004	13.004	12.998	13.004	12.994				12.751 - 13.251	13.000
13C2 PFUnA	13.094	13.094	13.094	13.094	13.091	13.102	13.093				12.843 - 13.343	13.095
13C2 PFDoA	13.685	13.676	13.685	13.685	13.684	13.685	13.694				13.433 - 13.933	13.685
13C2-PFTeDA	14.615	14.602	14.609	14.609	14.604	14.609	14.615				14.358 - 14.858	14.609
13C2-PFHxDA	15.214	15.200	15.205	15.199	15.199	15.200	15.204				14.953 - 15.453	15.203

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

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1 Analy Batch No.: 111859

SDG No.: _____

Instrument ID: A6 GC Column: Acquity ID: 2.1 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/28/2016 13:56 Calibration End Date: 05/28/2016 19:41 Calibration ID: 21828

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-111859/2	28MAY2016A6A_003.d
Level 2	STD 320-111859/3	28MAY2016A6A_004.d
Level 3	STD 320-111859/4	28MAY2016A6A_005.d
Level 4	STD 320-111859/5	28MAY2016A6A_006.d
Level 5	STD 320-111859/6	28MAY2016A6A_007.d
Level 6	STD 320-111859/10	28MAY2016A6A_011.d
Level 7	STD 320-111859/11	28MAY2016A6A_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	25921 22592	27346 20601	25850 18422	26383	Ave		23873.6514			14.2			50.0			
13C5-PFPeA	57695 57146	63659 47447	58811 39168	57427	Ave		54479.0114			15.2			50.0			
13C2 PFHxA	62996 58257	67716 49982	62984 43925	62629	Ave		58355.5029			14.5			50.0			
13C4-PFHpA	67058 63301	71757 49885	71809 42603	67489	Ave		61986.1343			18.3			50.0			
18O2 PFHxS	30830 29062	33079 23793	31556 19842	31685	Ave		28549.4624			17.1			50.0			
13C4 PFOA	81187 64505	82654 50078	75850 43270	73928	Ave		67353.0857			22.9			50.0			
13C4 PFOS	39944 34820	42535 28239	40183 23007	37320	Ave		35149.7908			20.2			50.0			
13C5 PFNA	70225 63801	72535 48106	67254 41306	71016	Ave		62034.7171			19.9			50.0			
13C2 PFDA	54351 48805	58945 40482	57792 32432	55657	Ave		49780.6914			20.0			50.0			
13C8 FOSA	116810 106764	134408 96250	127985 79030	122232	Ave		111925.606			17.3			50.0			
13C2 PFUnA	78044 66811	84545 56671	79228 46951	75995	Ave		69749.2943			19.6			50.0			
13C2 PFDoA	90231 79234	101863 68113	93415 62339	86895	Ave		83155.5886			17.0			50.0			
13C2-PFTeDA	78434 72642	84816 66913	81602 56664	78529	Ave		74228.7457			13.1			50.0			
13C2-PFHxDA	122698 119125	130918 103428	122655 95177	123808	Ave		116829.777			10.9			50.0			

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

CURVE EVALUATION

Lab Name: TestAmerica SacramentoJob No.: 320-18986-1Analy Batch No.: 111859

SDG No.: _____

Instrument ID: A6GC Column: Acquity ID: 2.1 (mm)Heated Purge: (Y/N) NCalibration Start Date: 05/28/2016 13:56Calibration End Date: 05/28/2016 19:41Calibration ID: 21828

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R ² OR COD	#	MIN R ² OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
Perfluorobutanoic acid (PFBA)	++++ 35050	34507 30102	37067	37051	37511	AveID		1.5160			11.5		35.0				
Perfluoropentanoic acid (PFPeA)	86722 54596	83015 46076	67911	63880	65821	AveID		1.2219			11.3		35.0				
Perfluorobutanesulfonic acid (PFBS)	38704 32013	38320 28747	39105	34921	36970	AveID		1.2602			9.1		50.0				
Perfluorohexanoic acid (PFHxA)	63732 58233	67663 51013	72900	65111	69013	AveID		1.1027			7.4		35.0				
Perfluoroheptanoic acid (PFHpA)	++++ 58921	140457 51604	90174	72506	73744	L1ID	0.5448	1.1915						0.9990		0.9900	
Perfluorohexanesulfonic acid (PFHxS)	31548 22127	26484 18502	28389	26157	28795	AveID		0.9146			8.9		35.0				
Perfluorooctanoic acid (PFOA)	70072 52607	85957 45646	81590	70373	69629	AveID		1.0165			7.9		35.0				
Perfluoroheptanesulfonic Acid (PFHpS)	++++ 23561	25977 18849	32233	29577	28601	AveID		0.7801			10.8		50.0				
Perfluorooctanesulfonic acid (PFOS)	++++ 36173	44626 29881	55829	44270	46240	AveID		1.2554			9.6		35.0				
Perfluorononanoic acid (PFNA)	++++ 41505	58658 37135	59738	52047	55765	AveID		0.8443			7.5		35.0				
Perfluorodecanoic acid (PFDA)	82176 49588	72848 43863	75965	64472	65900	AveID		1.3069			8.8		35.0				
Perfluorooctane Sulfonamide (FOSA)	++++ 78980	94333 69758	107760	86344	96345	AveID		0.8093			10.7		35.0				
Perfluorodecanesulfonic acid (PFDS)	22871 22387	27464 18208	33840	32635	33324	L1ID	-0.051	0.8070						0.9970		0.9900	
Perfluoroundecanoic acid (PFUnA)	++++ 56245	125195 48384	94857	74387	72921	L2ID	0.4629	1.0300						0.9970		0.9900	
Perfluorododecanoic acid (PFDoA)	61484 60089	74884 52718	75807	71289	70161	AveID		0.8088			9.4		35.0				
Perfluorotridecanoic Acid (PFTriA)	116262 71474	108908 61399	122047	99986	92945	AveID		1.1460			10.6		50.0				
Perfluorotetradecanoic acid (PFTeA)	166074 63427	128745 53904	90626	73242	74265	L2ID	0.4631	0.8761						0.9960		0.9900	
Perfluoro-n-hexadecanoic acid (PFHxDA)	++++ 107310	291704 92385	160664	130657	134820	L2ID	1.3220	1.5262						0.9960		0.9900	
Perfluoro-n-octadecanoic acid (PFODA)	138978 114733	122791 116142	129321	119191	135866	AveID		1.5377			15.0		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.: 320-18986-1 Analy Batch No.: 111859

SDG No.: _____

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/28/2016 13:56 Calibration End Date: 05/28/2016 19:41 Calibration ID: 21828

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-111859/2	28MAY2016A6A_003.d
Level 2	STD 320-111859/3	28MAY2016A6A_004.d
Level 3	STD 320-111859/4	28MAY2016A6A_005.d
Level 4	STD 320-111859/5	28MAY2016A6A_006.d
Level 5	STD 320-111859/6	28MAY2016A6A_007.d
Level 6	STD 320-111859/10	28MAY2016A6A_011.d
Level 7	STD 320-111859/11	28MAY2016A6A_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	1296043 1030072	1367288 921081	1292505	1319168	1129621	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C5-PFPeA	Ave	2884762 2372336	3182936 1958386	2940572	2871357	2857305	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFHxA	Ave	3149793 2499100	3385798 2196254	3149210	3131441	2912830	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C4-PFHpA	Ave	3352885 2494258	3587871 2130133	3590466	3374470	3165064	50.0 50.0	50.0 50.0	50.0	50.0	50.0
1802 PFHxS	Ave	1458256 1125402	1564640 938514	1492582	1498717	1374616	47.3 47.3	47.3 47.3	47.3	47.3	47.3
13C4 PFOA	Ave	4059325 2503906	4132713 2163488	3792495	3696388	3225265	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C4 PFOS	Ave	1909302 1349842	2033174 1099749	1920727	1783907	1664419	47.8 47.8	47.8 47.8	47.8	47.8	47.8
13C5 PFNA	Ave	3511246 2405278	3626734 2065307	3362723	3550811	3190052	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDA	Ave	2717556 2024121	2947259 1621605	2889575	2782870	2440256	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C8 FOSA	Ave	5840499 4812502	6720392 3951484	6399261	6111613	5338211	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFUnA	Ave	3902187 2833534	4227249 2347573	3961419	3799760	3340531	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDoA	Ave	4511545 3405671	5093128 3116941	4670748	4344747	3961676	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFTeDA	Ave	3921714 3345667	4240820 2833190	4080123	3926467	3632080	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFHxDA	Ave	6134883 5171420	6545892 4758827	6132732	6190424	5956244	50.0 50.0	50.0 50.0	50.0	50.0	50.0

Curve Type Legend:

Ave = Average

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica SacramentoJob No.: 320-18986-1Analy Batch No.: 111859

SDG No.: _____

Instrument ID: A6GC Column: AcquityID: 2.1(mm)Heated Purge: (Y/N) NCalibration Start Date: 05/28/2016 13:56Calibration End Date: 05/28/2016 19:41Calibration ID: 21828

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-111859/2	28MAY2016A6A_003.d
Level 2	STD 320-111859/3	28MAY2016A6A_004.d
Level 3	STD 320-111859/4	28MAY2016A6A_005.d
Level 4	STD 320-111859/5	28MAY2016A6A_006.d
Level 5	STD 320-111859/6	28MAY2016A6A_007.d
Level 6	STD 320-111859/10	28MAY2016A6A_011.d
Level 7	STD 320-111859/11	28MAY2016A6A_012.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7				LVL 6	LVL 7			
Perfluorobutanoic acid (PFBA)		AveID	++++ 7009910	34507 12040963	185334	741026	1875570	++++ 200	1.00 400	5.00	20.0	50.0
Perfluoropentanoic acid (PFPeA)		AveID	43361 10919228	83015 18430262	339555	1277608	3291069	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorobutanesulfonic acid (PFBS)		AveID	17107 5659839	33875 10165048	172844	617407	1634091	0.442 177	0.884 354	4.42	17.7	44.2
Perfluorohexanoic acid (PFHxA)		AveID	31866 11646564	67663 20405381	364501	1302223	3450640	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoroheptanoic acid (PFHpA)		L1ID	++++ 11784227	140457 20641461	450868	1450124	3687199	++++ 200	1.00 400	5.00	20.0	50.0
Perfluorohexanesulfonic acid (PFHxS)		AveID	14922 4186378	25054 7001101	134280	494894	1361989	0.473 189	0.946 378	4.73	18.9	47.3
Perfluorooctanoic acid (PFOA)		AveID	35036 10521352	85957 18258509	407952	1407454	3481430	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	++++ 4485928	24730 7177688	153430	563150	1361416	++++ 190	0.952 381	4.76	19.0	47.6
Perfluorooctanesulfonic acid (PFOS)		AveID	++++ 6916291	42662 11426654	266861	846435	2210260	++++ 191	0.956 382	4.78	19.1	47.8
Perfluorononanoic acid (PFNA)		AveID	++++ 8301026	58658 14853862	298691	1040937	2788226	++++ 200	1.00 400	5.00	20.0	50.0
Perfluorodecanoic acid (PFDA)		AveID	41088 9917621	72848 17545327	379826	1289431	3294984	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorooctane Sulfonamide (FOSA)		AveID	++++ 15796057	94333 27903019	538799	1726883	4817228	++++ 200	1.00 400	5.00	20.0	50.0
Perfluorodecanesulfonic acid (PFDS)		L1ID	11024 4316122	26475 7020978	163110	629202	1606213	0.482 193	0.964 386	4.82	19.3	48.2
Perfluoroundecanoic acid (PFUnA)		L2ID	++++ 11249044	125195 19353671	474285	1487744	3646070	++++ 200	1.00 400	5.00	20.0	50.0
Perfluorododecanoic acid (PFDoA)		AveID	30742 12017863	74884 21087337	379036	1425770	3508060	0.500 200	1.00 400	5.00	20.0	50.0

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1 Analy Batch No.: 111859

SDG No.: _____

Instrument ID: A6 GC Column: Acquity ID: 2.1 (mm) Heated Purge: (Y/N) NCalibration Start Date: 05/28/2016 13:56 Calibration End Date: 05/28/2016 19:41 Calibration ID: 21828

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7				LVL 6	LVL 7			
Perfluorotridecanoic Acid (PFTriA)		AveID	58131 14294825	108908 24559689	610235	1999729	4647252	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorotetradecanoic acid (PFTeA)		L2ID	83037 12685494	128745 21561674	453131	1464843	3713233	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	++++ 21462072	291704 36953897	803321	2613147	6740979	++++ 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-octadecanoic acid (PFODA)		AveID	69489 22946617	122791 46456813	646607	2383815	6793291	0.500 200	1.00 400	5.00	20.0	50.0

Curve Type Legend:

AveID = Average isotope dilution L1ID = Linear 1/conc IsoDil L2ID = Linear 1/conc^2 IsoDil
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TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_003.d
 Lims ID: Std L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 28-May-2016 13:56:43 ALS Bottle#: 9 Worklist Smp#: 2
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L1
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 14:41:00 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj Date: 29-May-2016 15:03:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.797	5.796	0.001	1296043	54.3		109	8578	
2 Perfluorobutyric acid	212.9 > 169.0	5.800	5.799	0.001	12057	0.3068		61.4	1007	
D 3 13C5-PFPeA	267.9 > 223.0	6.960	6.958	0.002	2884762	53.0		106	6978	
4 Perfluoropentanoic acid	262.9 > 219.0	6.960	6.960	0.0	43361	0.6151		123	7.1	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.088	7.086	0.002	17107	0.4403		99.6		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.088	7.086	0.002	17107	NC			11.4	
	298.9 > 99.0	7.085	7.086	-0.001	7451		2.30(0.00-0.00)		14.7	
7 Perfluorohexanoic acid	313.0 > 269.0	8.236	8.235	0.001	31866	0.4587		91.7	1031	
D 6 13C2 PFHxA	315.0 > 270.0	8.236	8.237	-0.001	3149793	54.0		108	9986	
D 8 13C4-PFHpA	367.0 > 322.0	9.469	9.475	-0.006	3352885	54.1		108	9010	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.469	9.477	-0.008	41905	0.0673		13.5	639	
D 11 18O2 PFHxS	403.0 > 84.0	9.499	9.507	-0.008	1458256	51.1		108	6391	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.499	9.507	-0.008	14922	NC			216	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.499	9.507	-0.008	14922	0.5292		112		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.586	10.584	0.002		4059325	60.3		121	107502	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.586	10.584	0.002	1.000	35036	0.4245		84.9	20.2	
413.0 > 169.0	10.586	10.584	0.002	1.000	12236		2.86(0.00-0.00)	84.9	22.7	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.604	10.593	0.011	1.000	6854	NC			479	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.604	10.593	0.011	1.000	6854	0.2200		46.2		
D 16 13C4 PFOS										
503.0 > 80.0	11.543	11.541	0.002		1909302	54.3		114	45538	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.560	11.545	0.015	1.000	24436	0.4873		102	852	
499.0 > 99.0	11.543	11.545	-0.002	0.999	8094		3.02(0.00-0.00)	102	591	
D 17 13C5 PFNA										
468.0 > 423.0	11.561	11.559	0.002		3511246	56.6		113	15003	
18 Perfluorononanoic acid										
463.0 > 419.0	11.569	11.561	0.008	1.000	25485	0.4298		86.0	210	
D 19 13C2 PFDA										
515.0 > 470.0	12.393	12.392	0.001		2717556	54.6		109	165177	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.393	12.392	0.001	1.000	41088	0.5784		116	2553	
D 23 13C8 FOSA										
506.0 > 78.0	12.994	13.001	-0.007		5840499	52.2		104	1778	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.004	13.003	0.001	1.000	44329	0.4689		93.8	2941	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.041	13.047	-0.006	1.000	11024	0.4051		84.0		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.041	13.047	-0.006	1.000	11024	NC			818	
D 26 13C2 PFUnA										
565.0 > 520.0	13.094	13.093	0.001		3902187	55.9		112	61810	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.094	13.093	0.001	1.000	63507	0.3407		68.1	4489	
D 28 13C2 PFDaA										
615.0 > 570.0	13.685	13.683	0.002		4511545	54.3		109	17639	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.685	13.683	0.002	1.000	30742	0.4212		84.2	48.0	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.182	14.182	0.0	1.000	58131	0.5622		112	48.5	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.615	14.608	0.007		3921714	52.8		106	14707	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.615	14.608	0.007	1.000	83037	0.5218		104	24.5	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.214	15.203	0.011		6134883	52.5		105	8626	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.214	15.203	0.011	1.000	208523	0.6480		130	242	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.476	15.473	0.003	1.000	69489	0.5008	100	54.6	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L1_00019

Amount Added: 1.00

Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_003.d

Injection Date: 28-May-2016 13:56:43

Instrument ID: A6

Lims ID: Std L1

Client ID:

Operator ID: JRB

ALS Bottle#: 9

Worklist Smp#: 2

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

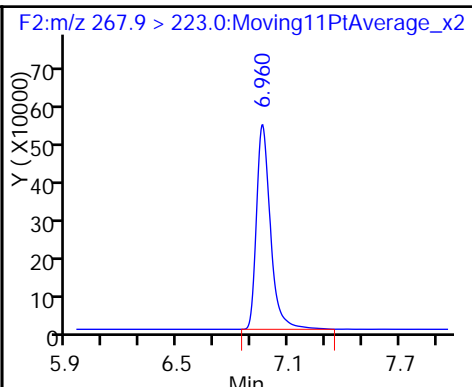
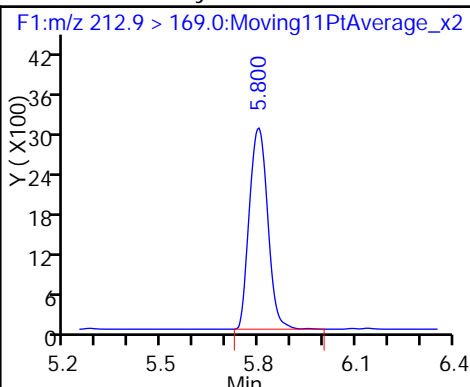
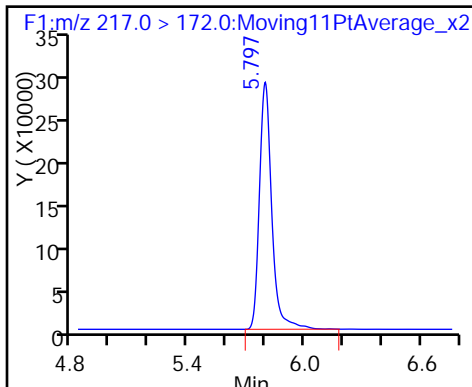
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

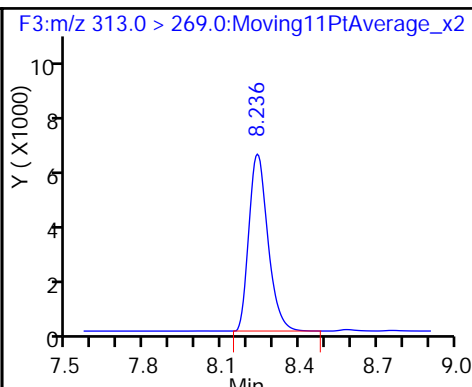
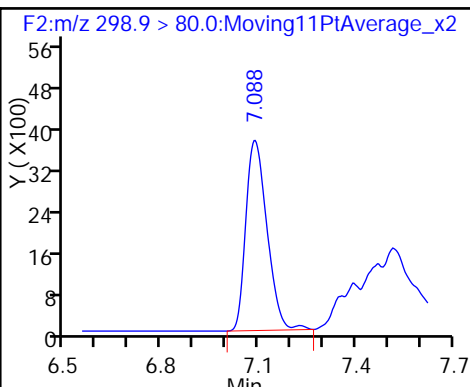
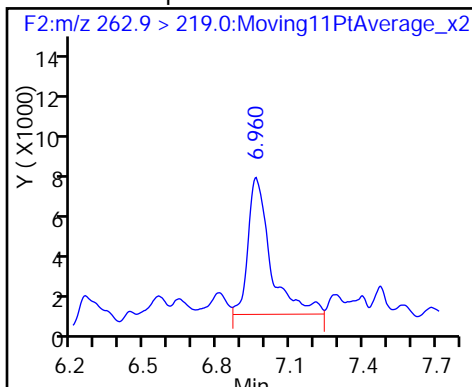
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

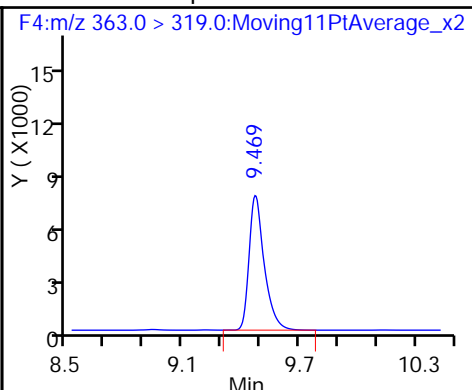
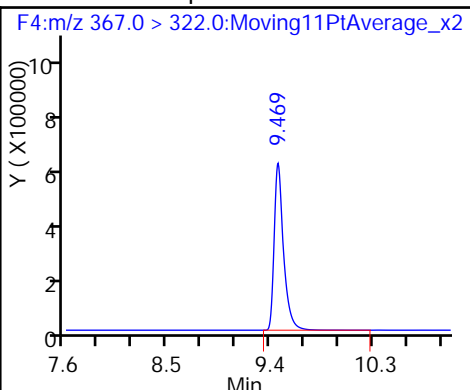
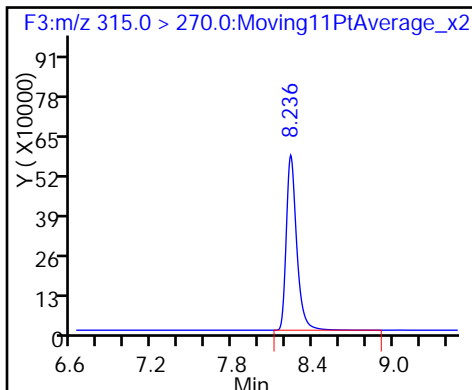
7 Perfluorohexanoic acid



D 6 13C2 PFHxA

D 8 13C4-PFHpA

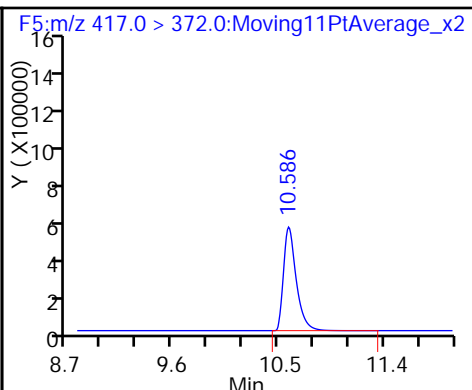
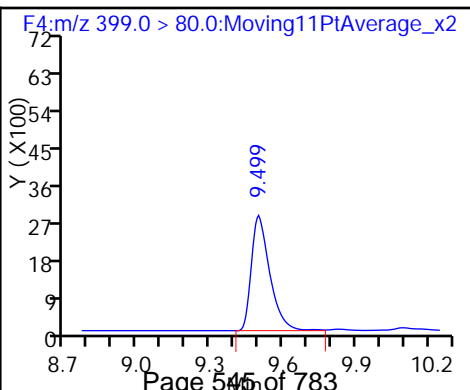
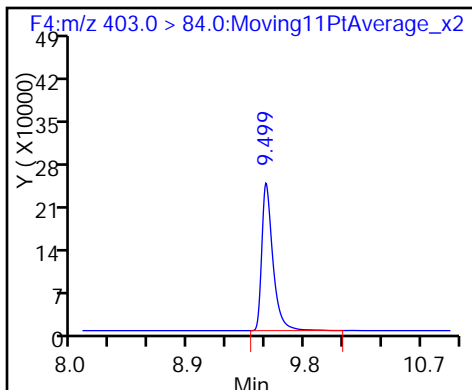
9 Perfluoroheptanoic acid

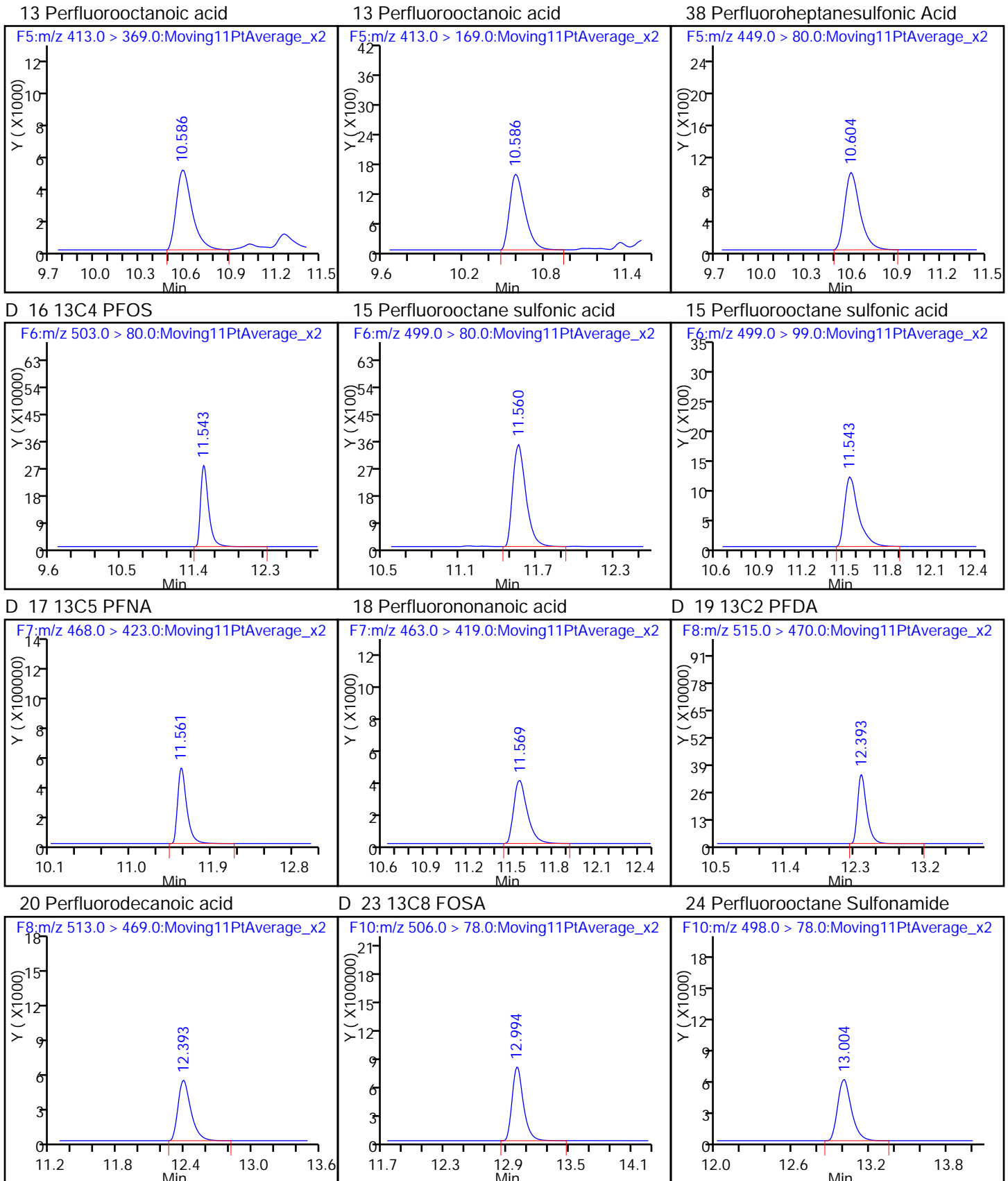


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

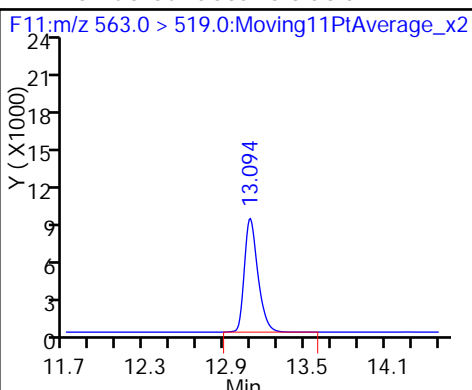
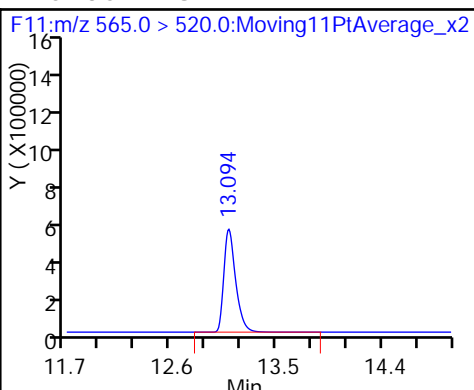
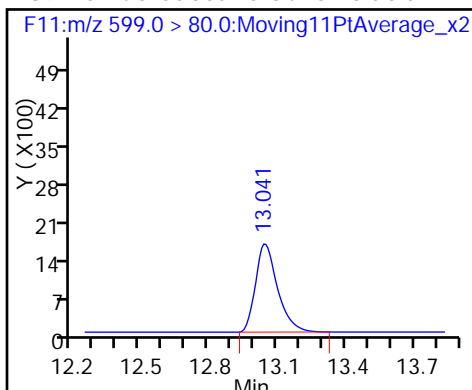




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

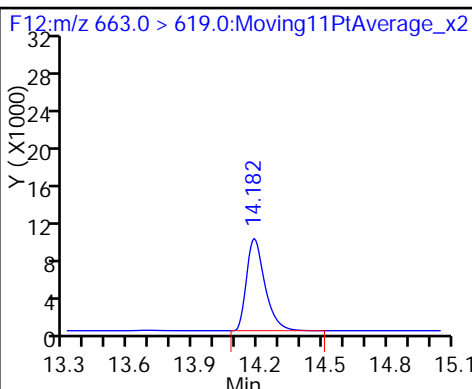
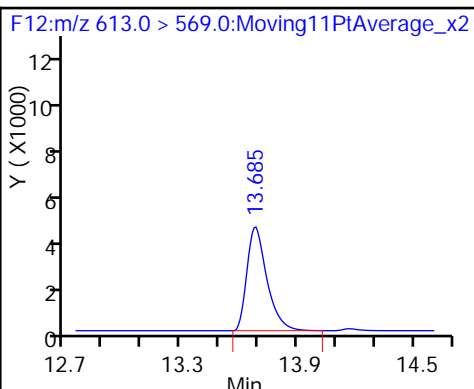
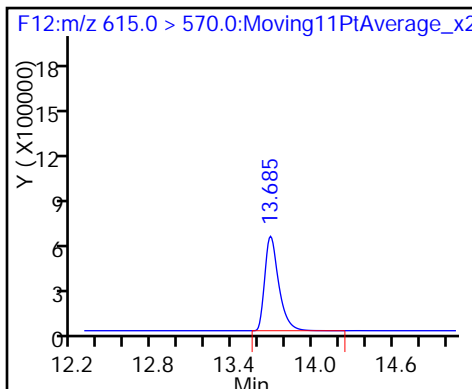
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

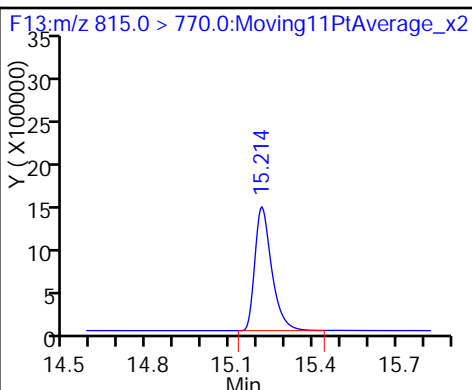
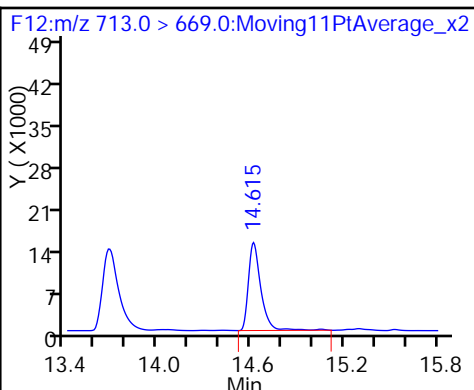
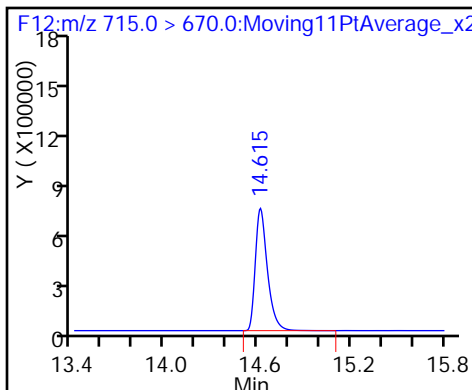
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

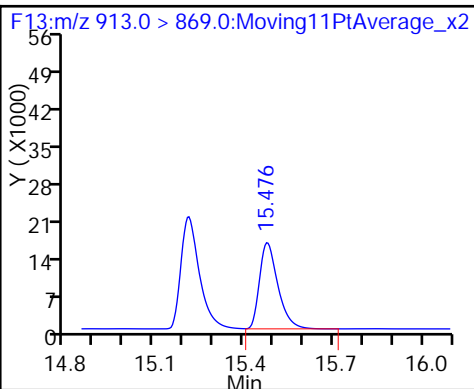
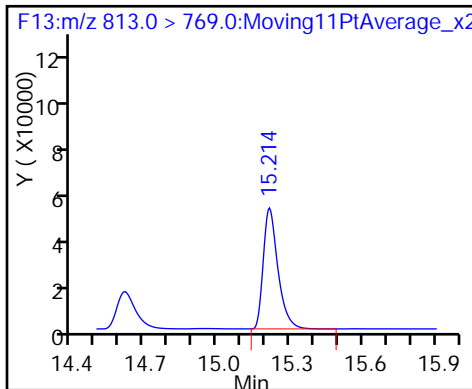
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_004.d
 Lims ID: Std L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 28-May-2016 14:17:58 ALS Bottle#: 10 Worklist Smp#: 3
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L2
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 14:41:04 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.794	5.796	-0.002		1367288	57.3		115	43220	
2 Perfluorobutyric acid										
212.9 > 169.0	5.800	5.799	0.001	1.000	34507	0.8324		83.2	1559	
D 3 13C5-PFPeA										
267.9 > 223.0	6.955	6.958	-0.003		3182936	58.4		117	4413	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.960	6.960	0.0	1.000	83015	1.07		107	14.5	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.085	7.086	-0.001	1.000	33875	0.8126		91.9		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.085	7.086	-0.001	1.000	33875	NC			15.2	
298.9 > 99.0	7.085	7.086	-0.001	1.000	13100		2.59(0.00-0.00)		28.0	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.230	8.235	-0.005	1.000	67663	0.9061		90.6	6376	
D 6 13C2 PFHxA										
315.0 > 270.0	8.236	8.237	-0.001		3385798	58.0		116	9389	
D 8 13C4-PFHpA										
367.0 > 322.0	9.475	9.475	0.0		3587871	57.9		116	51631	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.475	9.477	-0.002	1.000	140457	1.19		119	2493	
D 11 18O2 PFHxS										
403.0 > 84.0	9.505	9.507	-0.002		1564640	54.8		116	3091	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.510	9.507	0.003	1.000	25054	NC			159	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.510	9.507	0.003	1.000	25054	0.8281		87.5		
D 12 13C4 PFOA										
417.0 > 372.0	10.577	10.584	-0.007		4132713	61.4		123	91201	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.577	10.584	-0.007	1.000	85957	1.02		102	68.8	
413.0 > 169.0	10.586	10.584	0.002	1.001	32556		2.64(0.00-0.00)	102	93.0	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.586	10.593	-0.007	1.000	24730	NC			1714	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.586	10.593	-0.007	1.000	24730	0.7453		78.3		
D 16 13C4 PFOS										
503.0 > 80.0	11.543	11.541	0.002		2033174	57.8		121	96334	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.543	11.545	-0.002	1.000	42662	0.7989		83.6	251	
499.0 > 99.0	11.543	11.545	-0.002	1.000	25676		1.66(0.00-0.00)	83.6	469	
D 17 13C5 PFNA										
468.0 > 423.0	11.561	11.559	0.002		3626734	58.5		117	13622	
18 Perfluorononanoic acid										
463.0 > 419.0	11.561	11.561	0.0	1.000	58658	0.9578		95.8	4331	
D 19 13C2 PFDA										
515.0 > 470.0	12.383	12.392	-0.009		2947259	59.2		118	29864	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.383	12.392	-0.009	1.000	72848	0.9456		94.6	4528	
D 23 13C8 FOSA										
506.0 > 78.0	13.004	13.001	0.003		6720392	60.0		120	7091	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.004	13.003	0.001	1.000	94333	0.8672		86.7	1586	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.050	13.047	0.003	1.000	26475	0.8344		86.6		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.050	13.047	0.003	1.000	26475	NC			1823	
D 26 13C2 PFUnA										
565.0 > 520.0	13.094	13.093	0.001		4227249	60.6		121	18844	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.094	13.093	0.001	1.000	125195	0.9883		98.8	6042	
D 28 13C2 PFDoA										
615.0 > 570.0	13.676	13.683	-0.007		5093128	61.2		122	22500	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.676	13.683	-0.007	1.000	74884	0.9089		90.9	84.2	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.182	14.182	0.0	1.000	108908	0.9329		93.3	88.5	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.602	14.608	-0.006		4240820	57.1		114	12579	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.602	14.608	-0.006	1.000	128745	0.9141		91.4	52.6	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.200	15.203	-0.003		6545892	56.0		112	9201	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.200	15.203	-0.003	1.000	291704	1.01		101	120	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.476	15.473	0.003	1.000	122791	0.7839		78.4	81.1	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC-L2_00020

Amount Added: 1.00

Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_004.d

Injection Date: 28-May-2016 14:17:58

Instrument ID: A6

Lims ID: Std L2

Client ID:

Operator ID: JRB

ALS Bottle#: 10

Worklist Smp#: 3

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

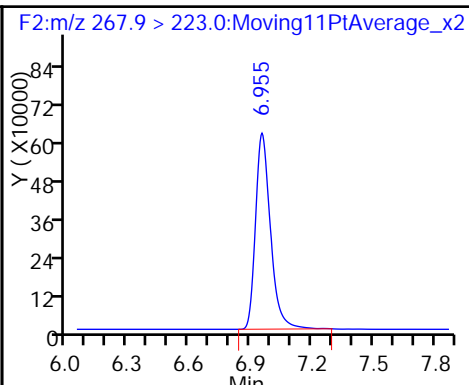
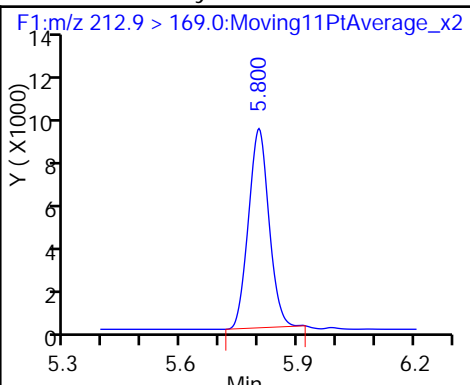
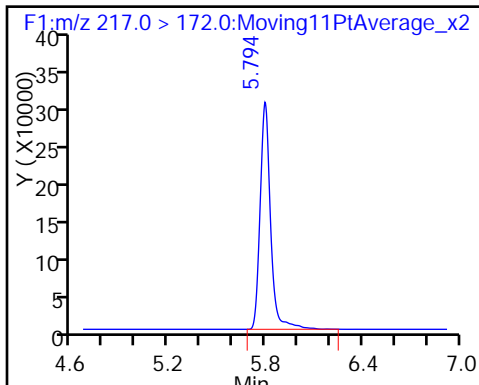
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

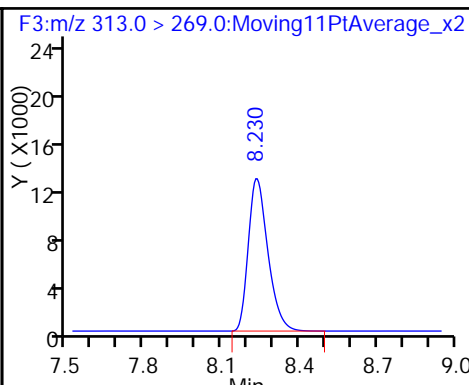
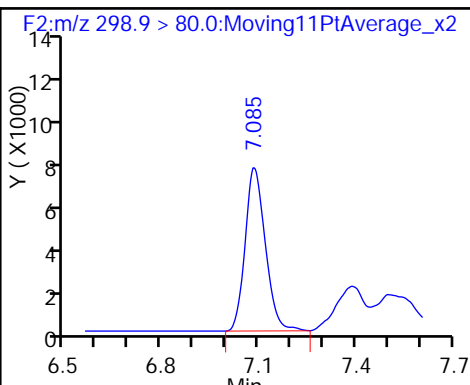
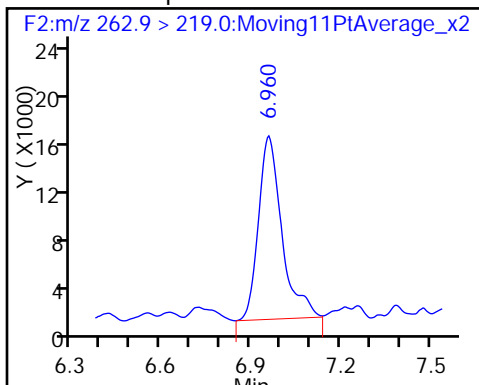
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

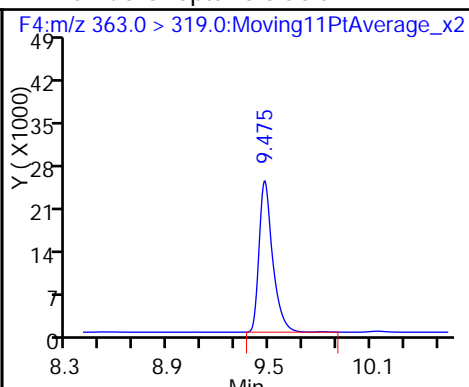
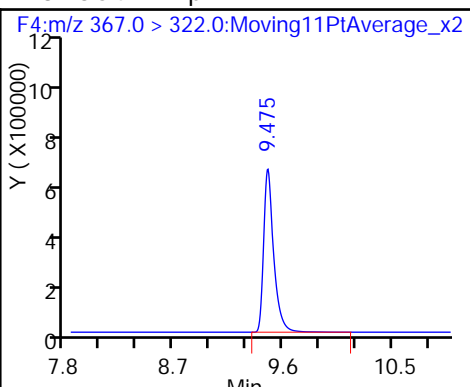
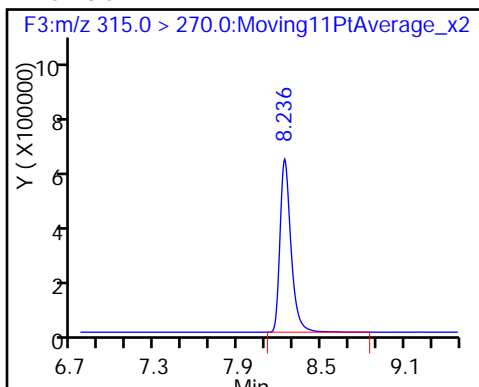
7 Perfluorohexanoic acid



D 6 13C2 PFHxA

D 8 13C4-PFHpA

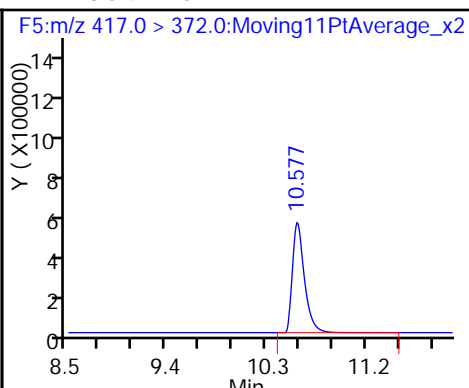
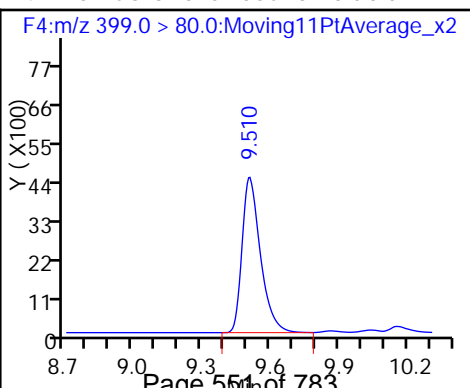
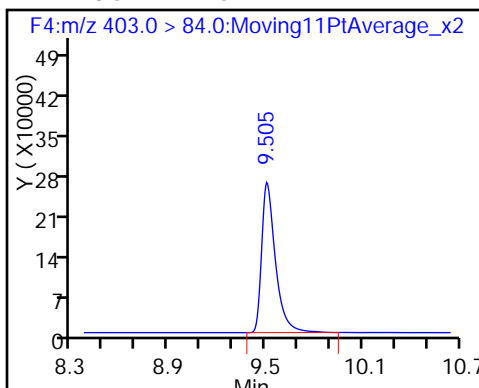
9 Perfluoroheptanoic acid

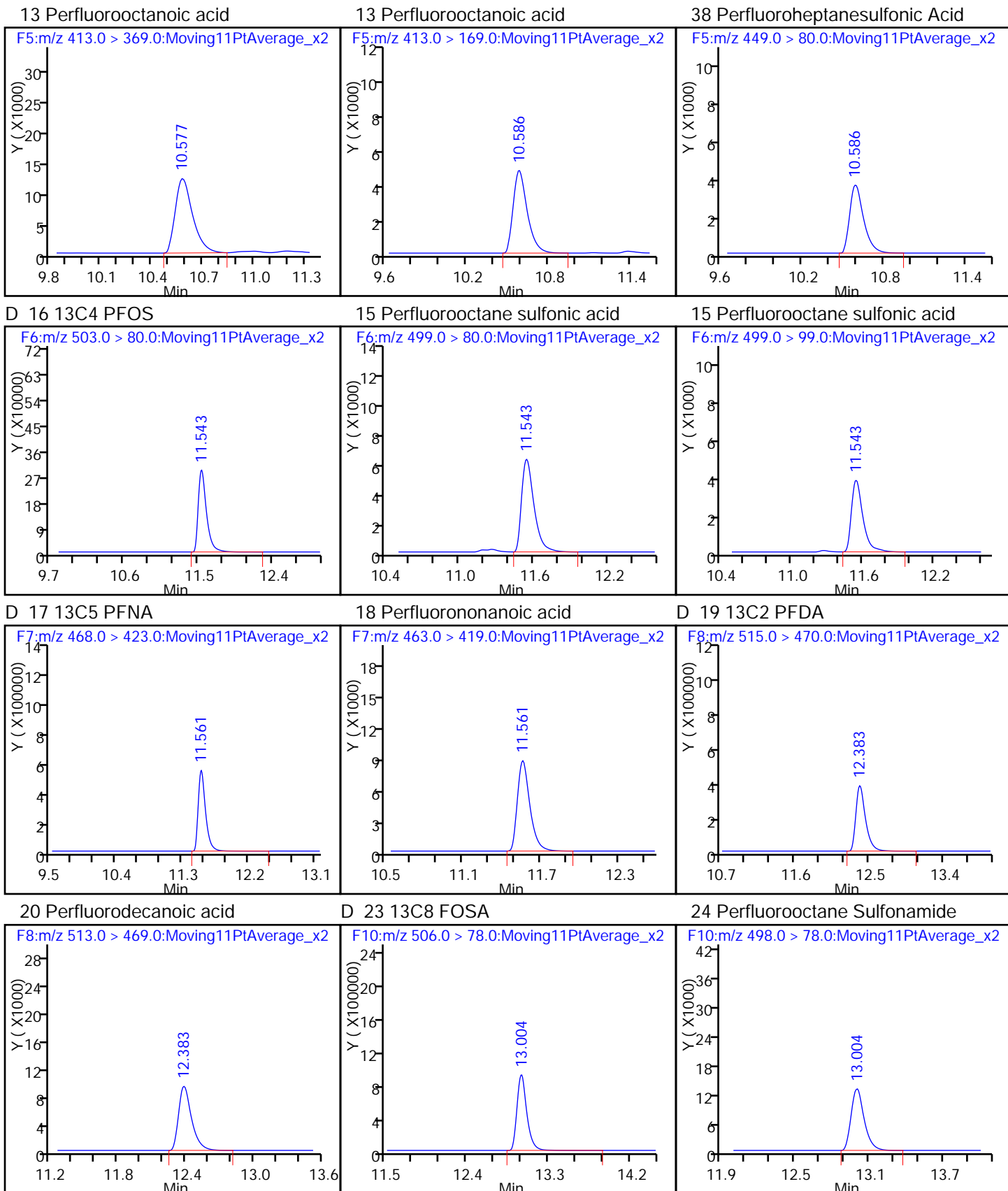


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

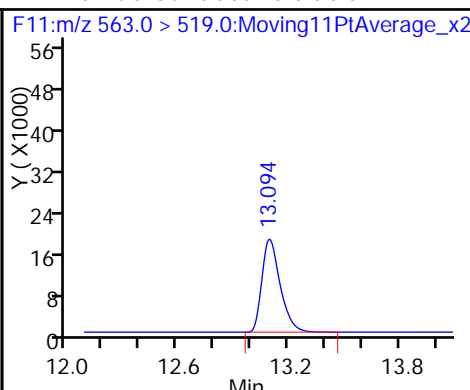
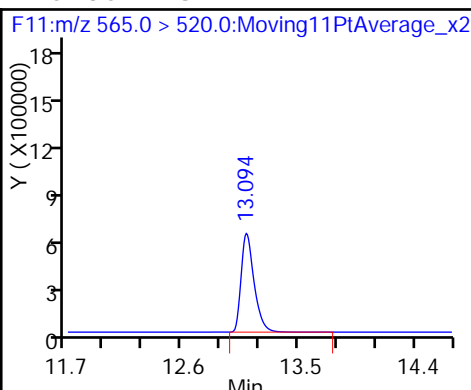
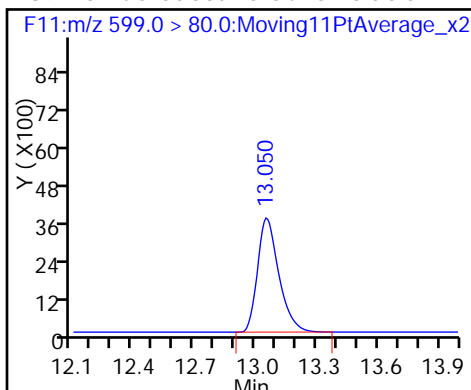




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

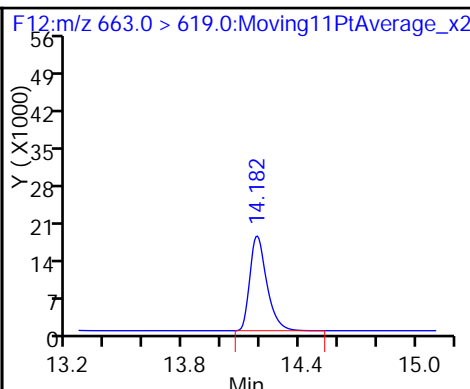
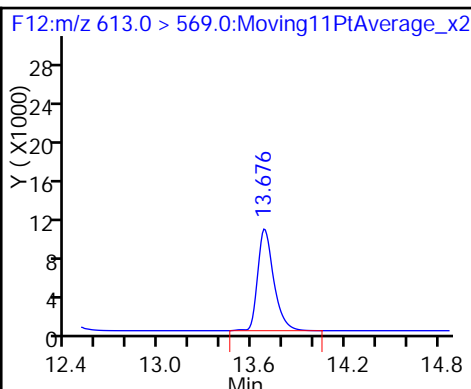
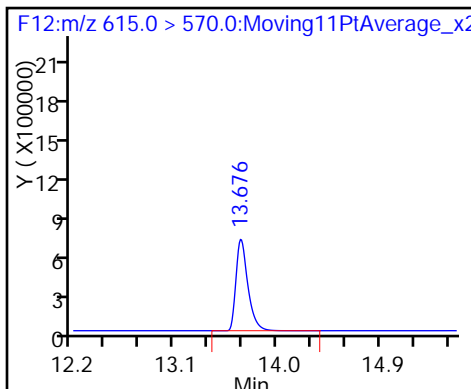
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

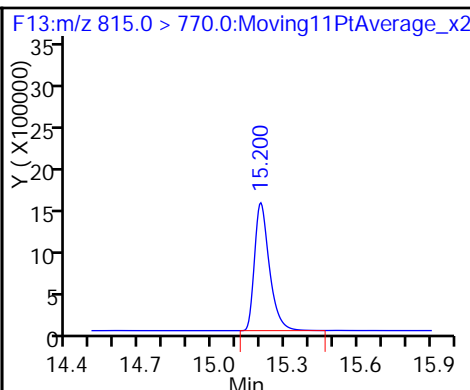
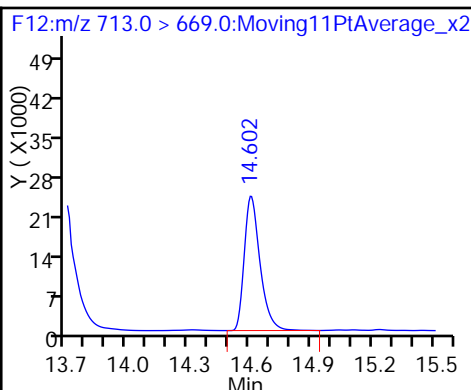
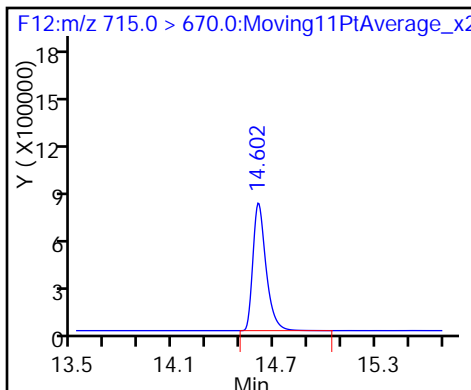
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

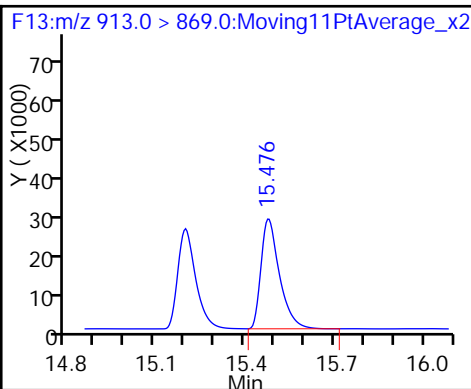
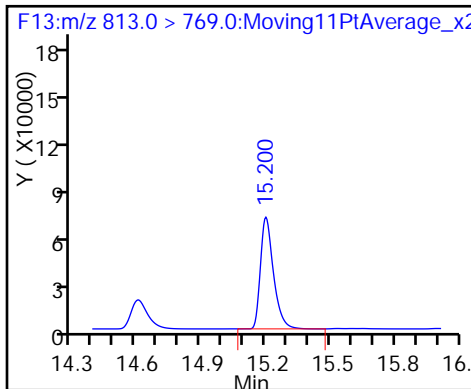
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_005.d
 Lims ID: Std L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 28-May-2016 14:39:14 ALS Bottle#: 11 Worklist Smp#: 4
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L3
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 14:41:07 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.797	5.796	0.001	1292505	54.1		108	3585	
2 Perfluorobutyric acid	212.9 > 169.0	5.800	5.799	0.001	185334	4.73		94.6	1755	
D 3 13C5-PFPeA	267.9 > 223.0	6.960	6.958	0.002	2940572	54.0		108	56615	
4 Perfluoropentanoic acid	262.9 > 219.0	6.960	6.960	0.0	339555	4.73		94.5	84.2	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.088	7.086	0.002	172844	4.35		98.3		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.088	7.086	0.002	172844	NC			76.6	
	298.9 > 99.0	7.088	7.086	0.002	79169		2.18(0.00-0.00)		113	
7 Perfluorohexanoic acid	313.0 > 269.0	8.236	8.235	0.001	364501	5.25		105	1356	
D 6 13C2 PFHxA	315.0 > 270.0	8.236	8.237	-0.001	3149210	54.0		108	17417	
D 8 13C4-PFHpA	367.0 > 322.0	9.475	9.475	0.0	3590466	57.9		116	44472	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.475	9.477	-0.002	450868	4.81		96.2	5580	
D 11 18O2 PFHxS	403.0 > 84.0	9.505	9.507	-0.002	1492582	52.3		111	81595	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.505	9.507	-0.002	134280	NC			810	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.505	9.507	-0.002	134280	4.65		98.4		
D 12 13C4 PFOA	417.0 > 372.0	10.586	10.584	0.002	3792495	56.3		113	70587	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.586	10.584	0.002	1.000	407952	5.29		106	343	
413.0 > 169.0	10.586	10.584	0.002	1.000	146406		2.79(0.00-0.00)	106	124	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.586	10.593	-0.007	1.000	153430	NC			10141	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.586	10.593	-0.007	1.000	153430	4.89		103		
D 16 13C4 PFOS										
503.0 > 80.0	11.543	11.541	0.002		1920727	54.6		114	15236	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.543	11.545	-0.002	1.000	266861	5.29		111	680	
499.0 > 99.0	11.543	11.545	-0.002	1.000	121645		2.19(0.00-0.00)	111	6037	
D 17 13C5 PFNA										
468.0 > 423.0	11.561	11.559	0.002		3362723	54.2		108	43320	
18 Perfluorononanoic acid										
463.0 > 419.0	11.561	11.561	0.0	1.000	298691	5.26		105	21314	
D 19 13C2 PFDA										
515.0 > 470.0	12.393	12.392	0.001		2889575	58.0		116	12176	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.393	12.392	0.001	1.000	379826	5.03		101	23061	
D 23 13C8 FOSA										
506.0 > 78.0	13.004	13.001	0.003		6399261	57.2		114	6677	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.004	13.003	0.001	1.000	538799	5.20		104	23527	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.050	13.047	0.003	1.000	163110	5.09		106		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.050	13.047	0.003	1.000	163110	NC			11323	
D 26 13C2 PFUnA										
565.0 > 520.0	13.094	13.093	0.001		3961419	56.8		114	46839	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.094	13.093	0.001	1.000	474285	5.36		107	13634	
D 28 13C2 PFDoA										
615.0 > 570.0	13.685	13.683	0.002		4670748	56.2		112	23598	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.685	13.683	0.002	1.000	379036	5.02		100	439	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.182	14.182	0.0	1.000	610235	5.70		114	279	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.609	14.608	0.001		4080123	55.0		110	15309	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.609	14.608	0.001	1.000	453131	5.01		100	189	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.205	15.203	0.002		6132732	52.5		105	7942	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.205	15.203	0.002	1.000	803321	4.77		95.4	740	
36 Perfluorooctadecanoic acid										
913.0 > 869.0	15.471	15.473	-0.002	1.000	646607	4.50		90.0	477	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC-L3_00017

Amount Added: 1.00

Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_005.d

Injection Date: 28-May-2016 14:39:14

Instrument ID: A6

Lims ID: Std L3

Client ID:

Operator ID: JRB

ALS Bottle#: 11

Worklist Smp#: 4

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

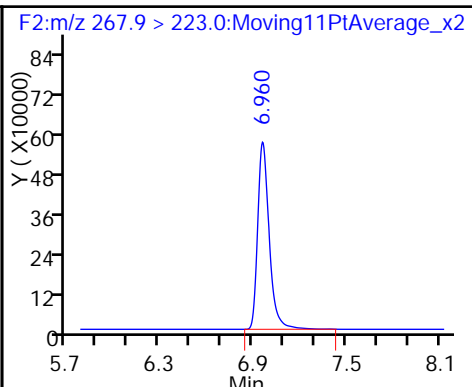
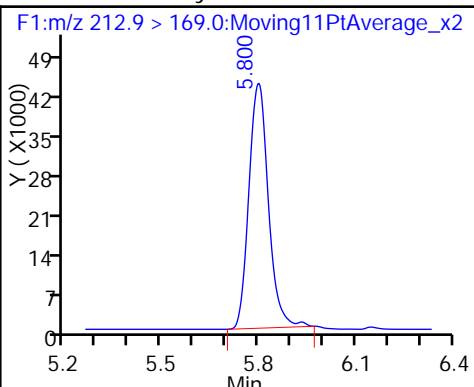
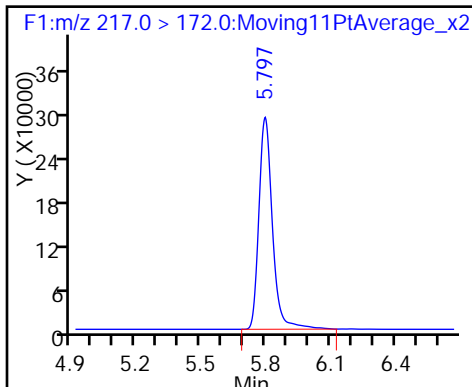
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

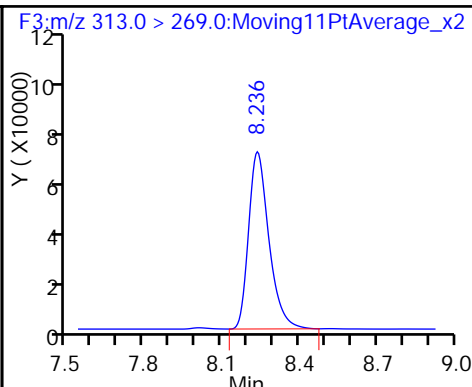
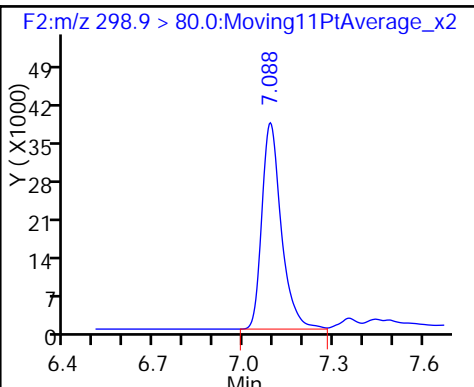
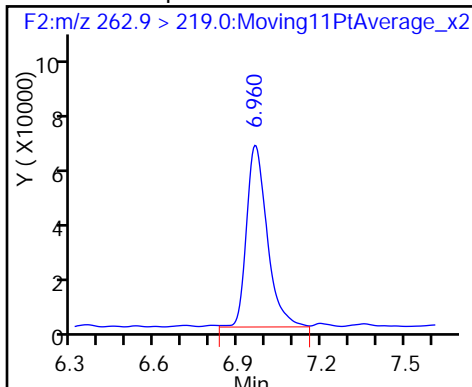
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

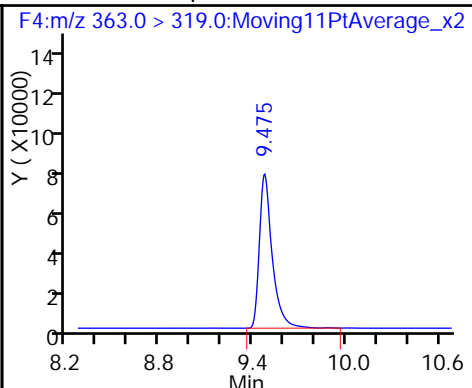
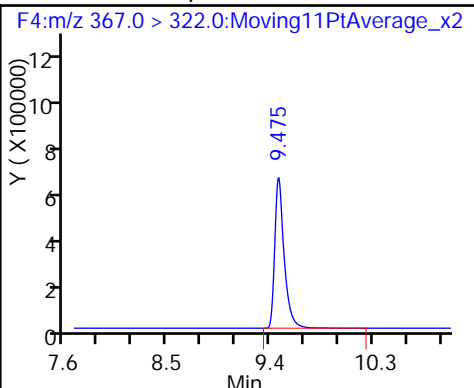
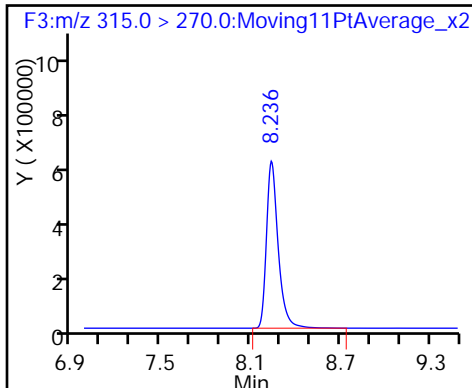
7 Perfluorohexanoic acid



D 6 13C2 PFHxA

D 8 13C4-PFHpA

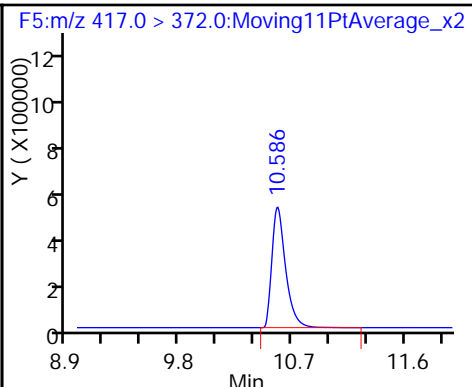
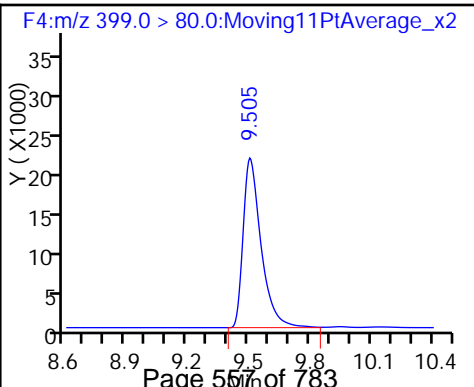
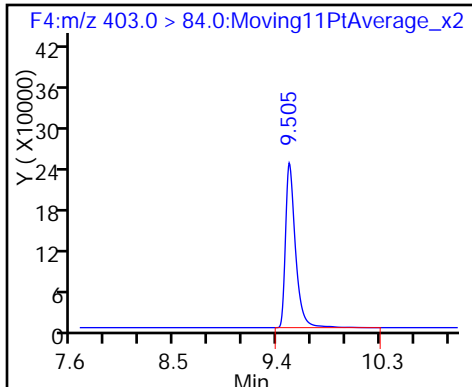
9 Perfluoroheptanoic acid

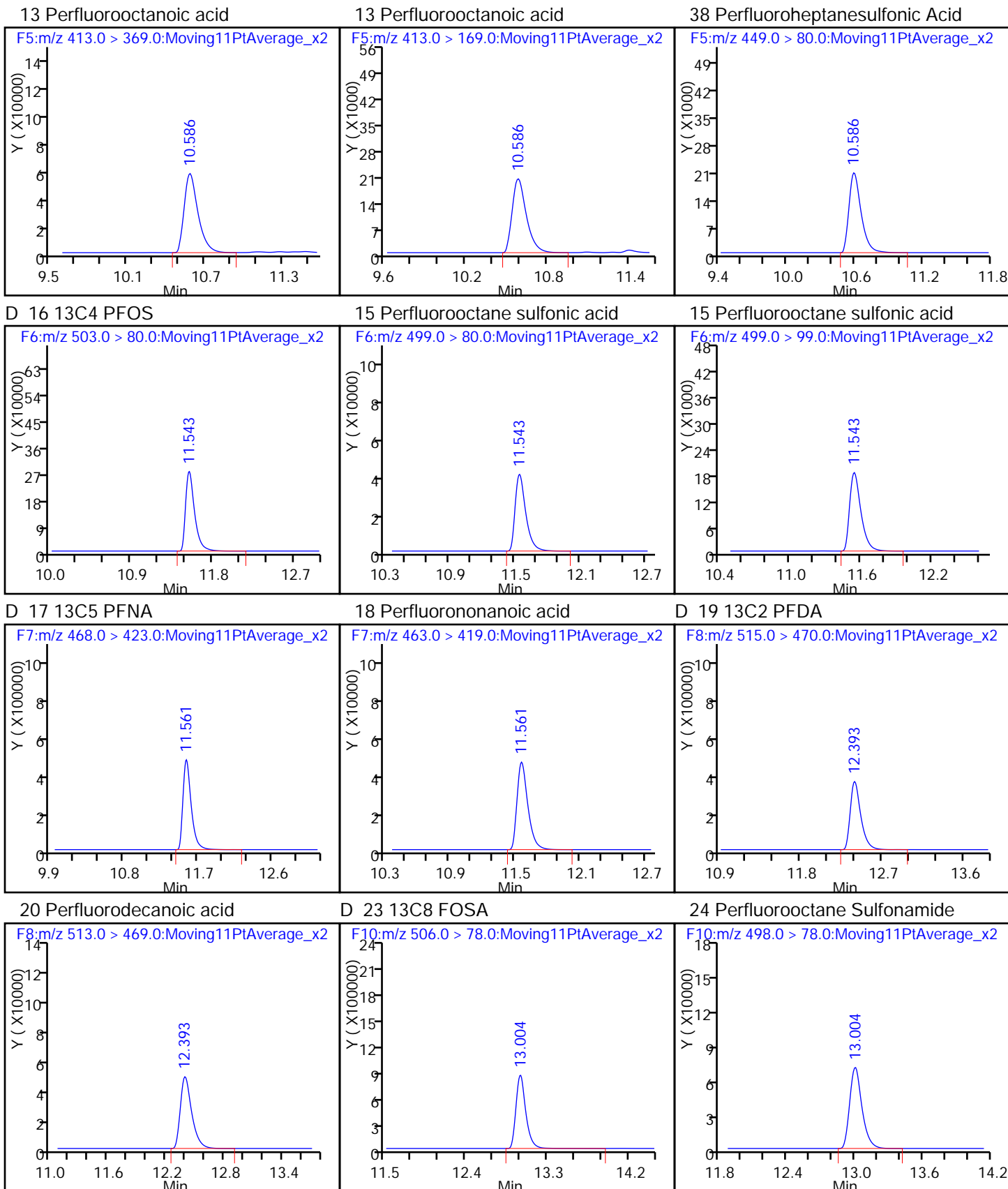


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

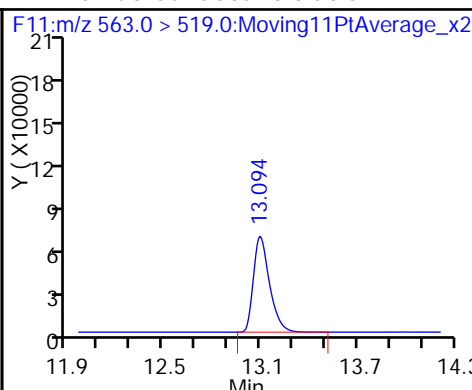
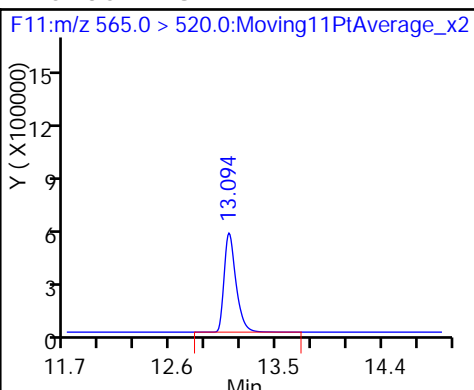
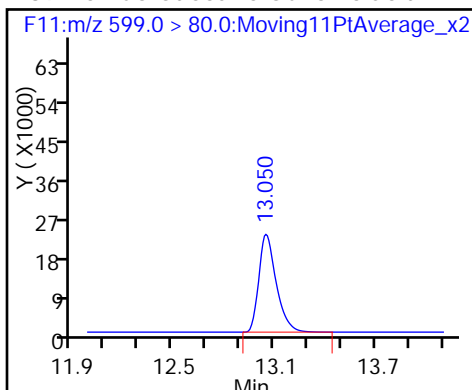




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUa

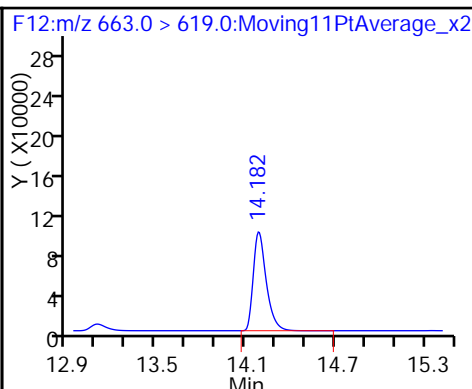
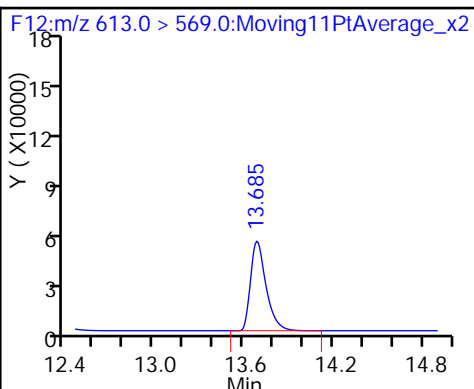
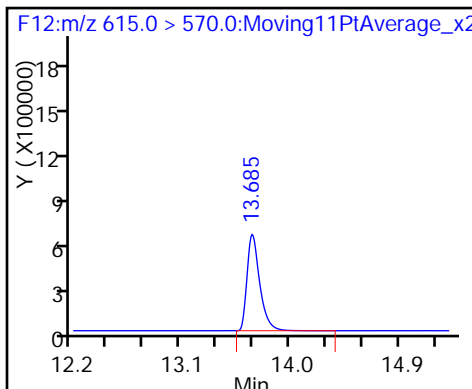
27 Perfluoroundecanoic acid



D 28 13C2 PFDa

29 Perfluorododecanoic acid

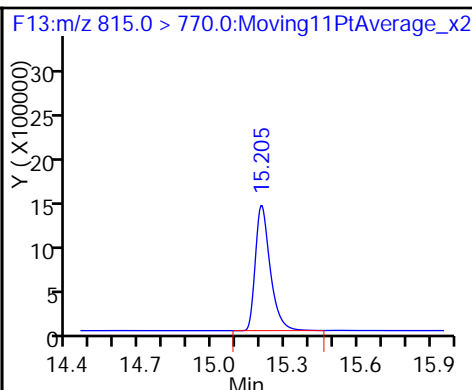
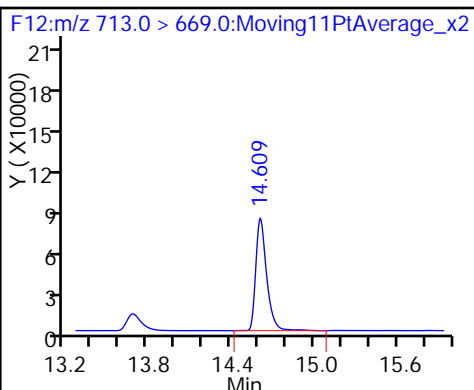
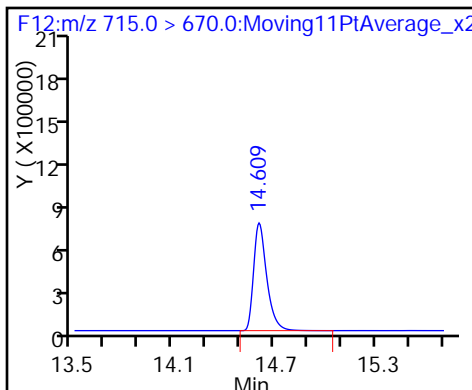
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

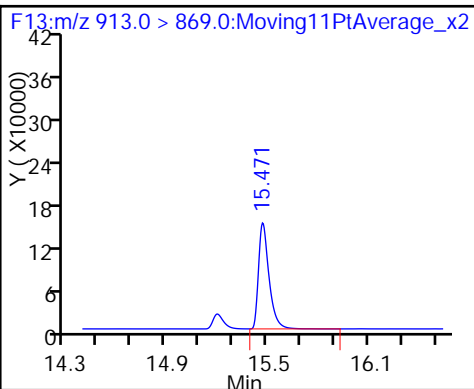
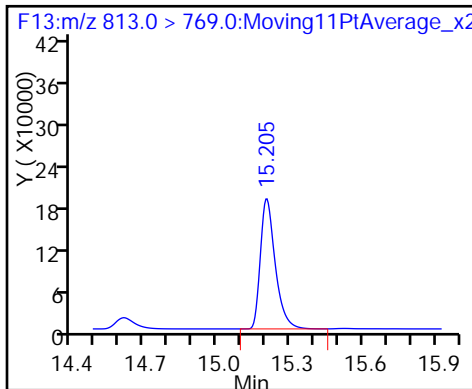
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_006.d
 Lims ID: Std L4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 28-May-2016 15:00:29 ALS Bottle#: 12 Worklist Smp#: 5
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L4
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 14:41:10 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj Date: 29-May-2016 15:15:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.794	5.796	-0.002	1319168	55.3		111	5525	
2 Perfluorobutyric acid	212.9 > 169.0	5.797	5.799	-0.002	741026	18.5		92.6	55064	
D 3 13C5-PFPeA	267.9 > 223.0	6.955	6.958	-0.003	2871357	52.7		105	3513	
4 Perfluoropentanoic acid	262.9 > 219.0	6.955	6.960	-0.005	1277608	18.2		91.0	248	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.081	7.086	-0.005	617407	15.5		87.5		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.081	7.086	-0.005	617407	NC			182	
	298.9 > 99.0	7.081	7.086	-0.005	306756		2.01(0.00-0.00)		478	
7 Perfluorohexanoic acid	313.0 > 269.0	8.236	8.235	0.001	1302223	18.9		94.3	5460	
D 6 13C2 PFHxA	315.0 > 270.0	8.236	8.237	-0.001	3131441	53.7		107	14125	
D 8 13C4-PFHpA	367.0 > 322.0	9.475	9.475	0.0	3374470	54.4		109	24252	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.475	9.477	-0.002	1450124	17.6		87.9	19247	
D 11 18O2 PFHxS	403.0 > 84.0	9.510	9.507	0.003	1498717	52.5		111	81816	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.504	9.507	-0.003	494894	NC			1455	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.504	9.507	-0.003	494894	17.1		90.3		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.586	10.584	0.002		3696388	54.9		110	13389	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.586	10.584	0.002	1.000	1407454	18.7		93.6	499	
413.0 > 169.0	10.586	10.584	0.002	1.000	495895		2.84(0.00-0.00)	93.6	769	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.595	10.593	0.002	1.000	563150	NC			36166	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.595	10.593	0.002	1.000	563150	19.3		102		
D 16 13C4 PFOS										
503.0 > 80.0	11.535	11.541	-0.006		1783907	50.8		106	126613	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.535	11.545	-0.010	1.000	846435	18.1		94.5	1022	
499.0 > 99.0	11.535	11.545	-0.010	1.000	434769		1.95(0.00-0.00)	94.5	3694	
D 17 13C5 PFNA										
468.0 > 423.0	11.553	11.559	-0.006		3550811	57.2		114	64024	
18 Perfluorononanoic acid										
463.0 > 419.0	11.553	11.561	-0.008	1.000	1040937	17.4		86.8	9363	
D 19 13C2 PFDA										
515.0 > 470.0	12.393	12.392	0.001		2782870	55.9		112	169613	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.393	12.392	0.001	1.000	1289431	17.7		88.6	26240	
D 23 13C8 FOSA										
506.0 > 78.0	13.004	13.001	0.003		6111613	54.6		109	4247	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.004	13.003	0.001	1.000	1726883	17.5		87.3	15196	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.050	13.047	0.003	1.000	629202	21.0		109		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.050	13.047	0.003	1.000	629202	NC			12726	
D 26 13C2 PFUnA										
565.0 > 520.0	13.094	13.093	0.001		3799760	54.5		109	60417	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.094	13.093	0.001	1.000	1487744	18.6		92.8	42349	
D 28 13C2 PFDaA										
615.0 > 570.0	13.685	13.683	0.002		4344747	52.2		104	17845	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.685	13.683	0.002	1.000	1425770	20.3		101	2792	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.182	14.182	0.0	1.000	1999729	20.1		100	1505	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.609	14.608	0.001		3926467	52.9		106	11430	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.609	14.608	0.001	1.000	1464843	18.7		93.6	695	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.199	15.203	-0.004		6190424	53.0		106	10742	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.199	15.203	-0.004	1.000	2613147	18.8		94.2	1446	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.466	15.473	-0.007	1.000	2383815	17.8	89.2	1622	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00020

Amount Added: 1.00

Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_006.d

Injection Date: 28-May-2016 15:00:29

Instrument ID: A6

Lims ID: Std L4

Client ID:

Operator ID: JRB

ALS Bottle#: 12

Worklist Smp#: 5

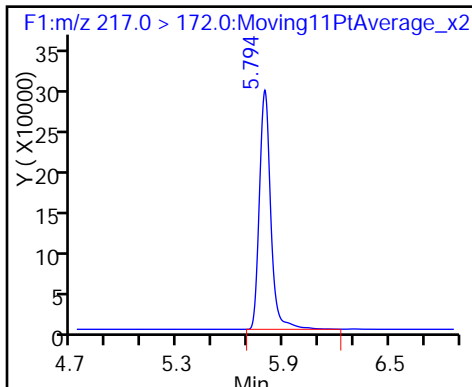
Injection Vol: 15.0 ul

Dil. Factor: 1.0000

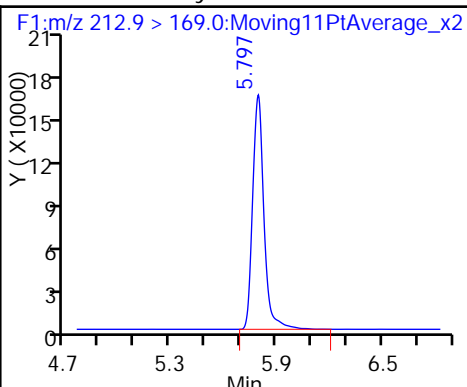
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Limit Group: LC PFC_DOD ICAL

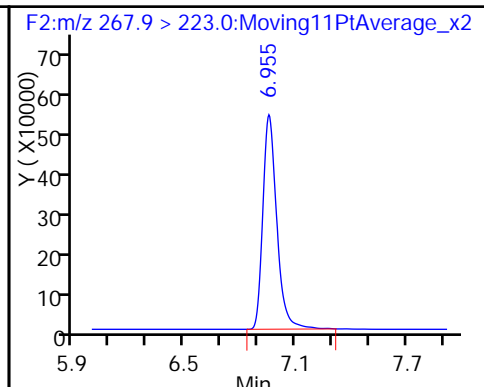
D 1 13C4 PFBA



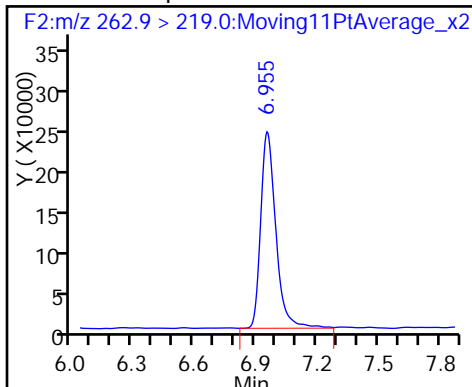
2 Perfluorobutyric acid



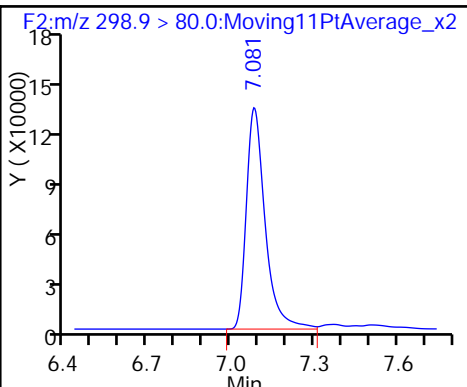
D 3 13C5-PFPeA



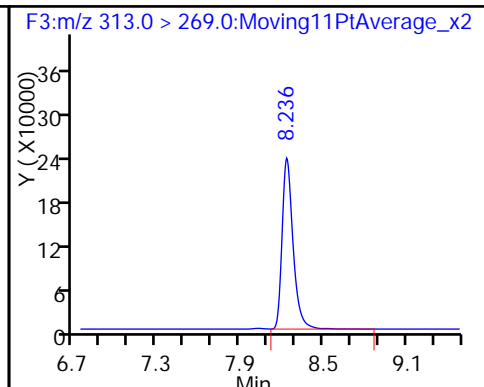
4 Perfluoropentanoic acid



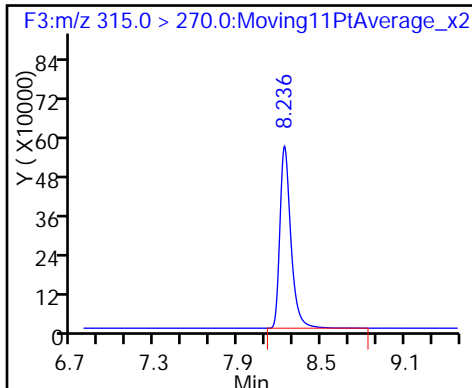
40 Perfluorobutanesulfonic acid



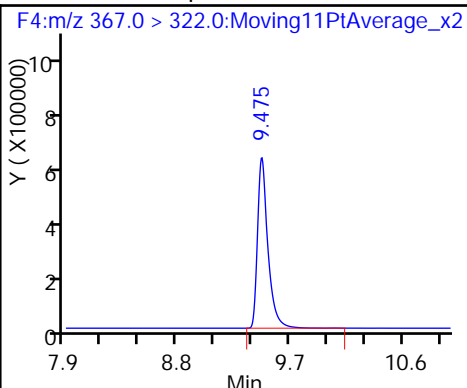
7 Perfluorohexanoic acid



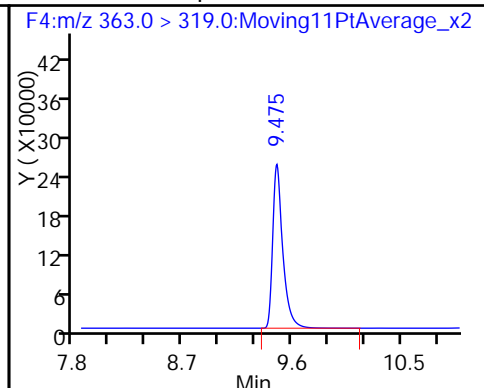
D 6 13C2 PFHxA



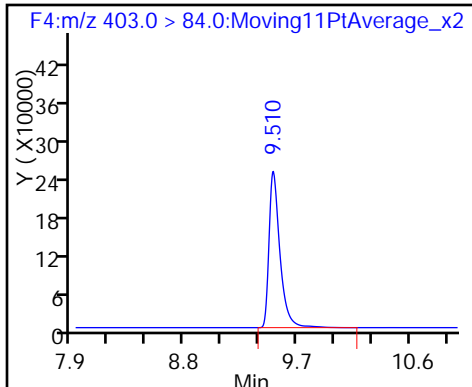
D 8 13C4-PFHpA



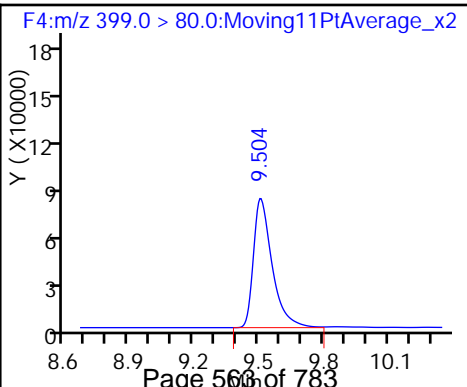
9 Perfluoroheptanoic acid



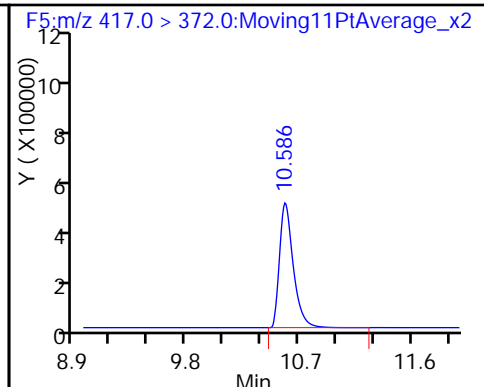
D 11 18O2 PFHxS

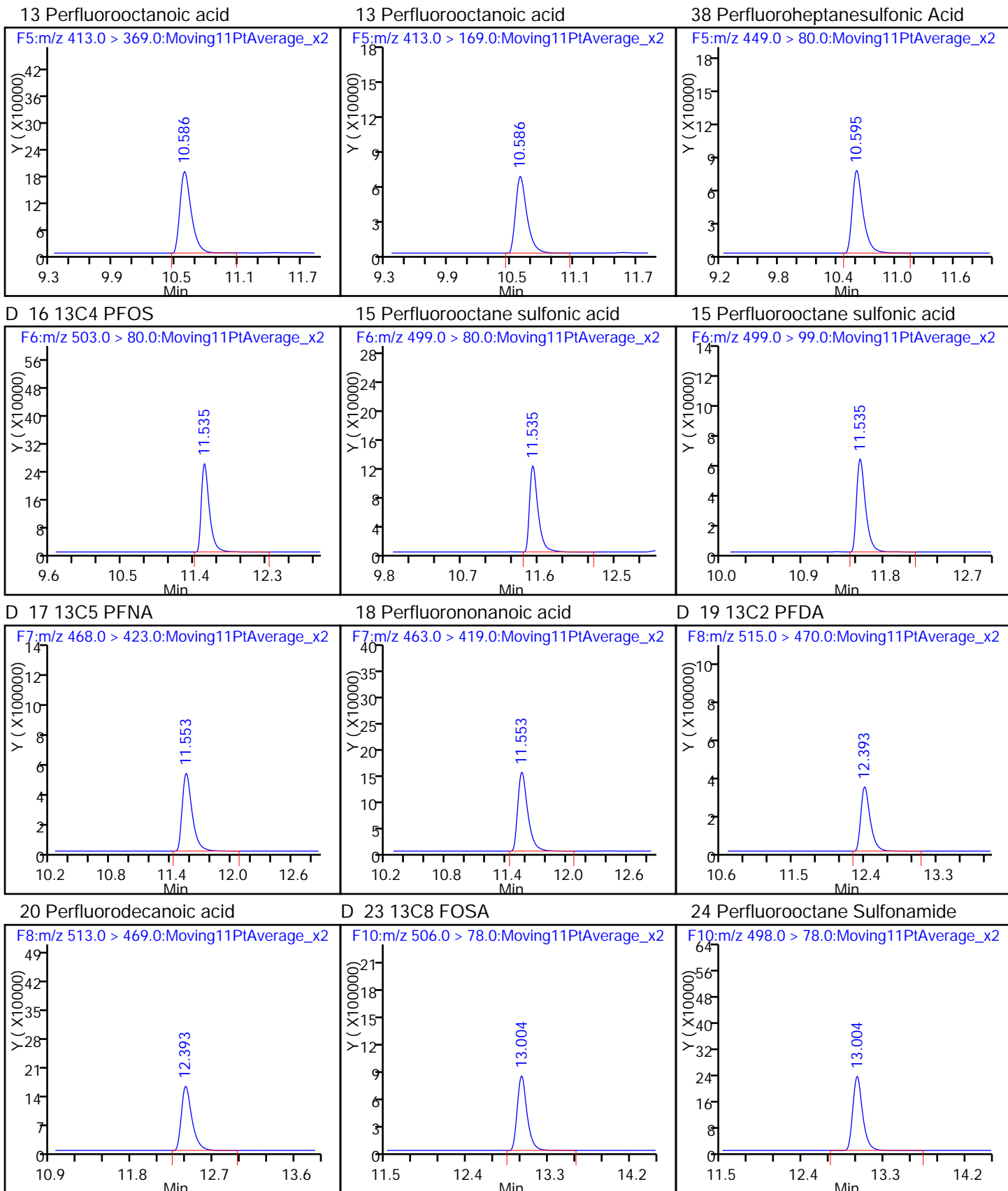


41 Perfluorohexanesulfonic acid



D 12 13C4 PFOA

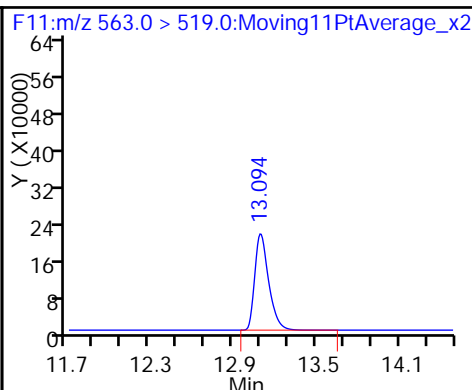
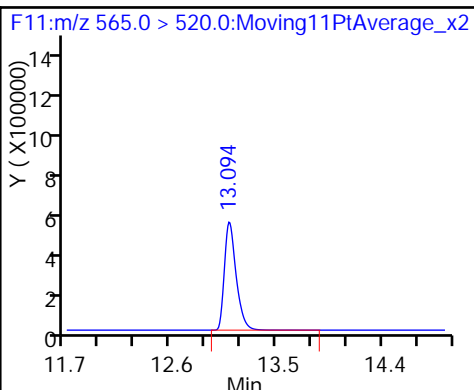
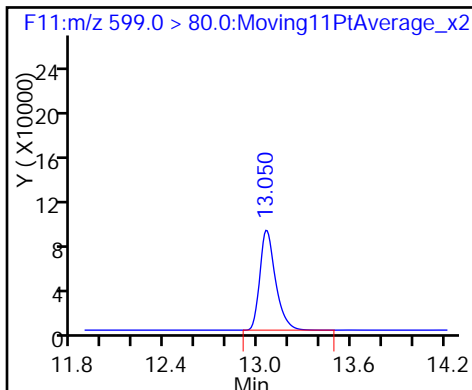




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

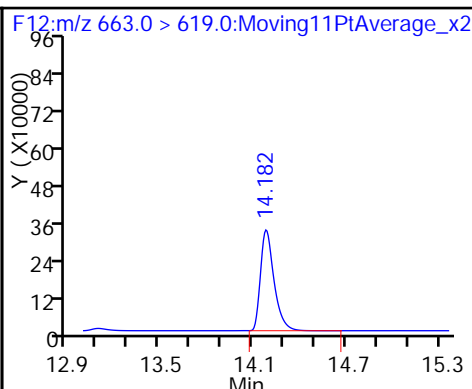
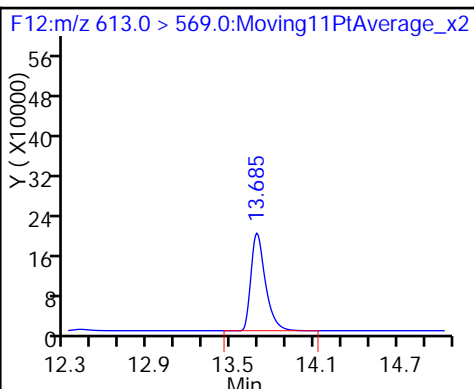
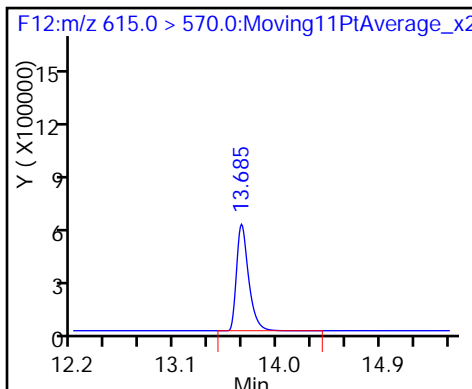
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

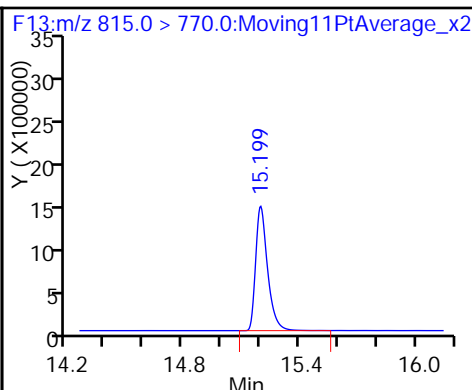
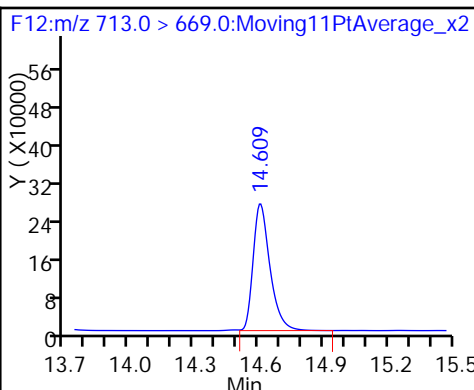
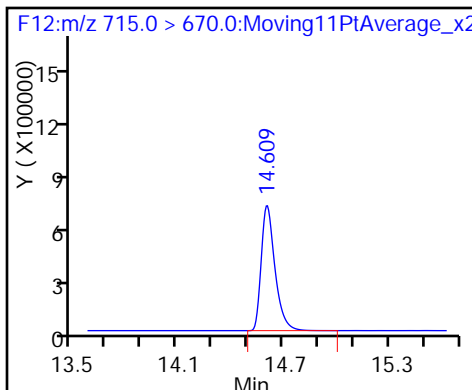
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

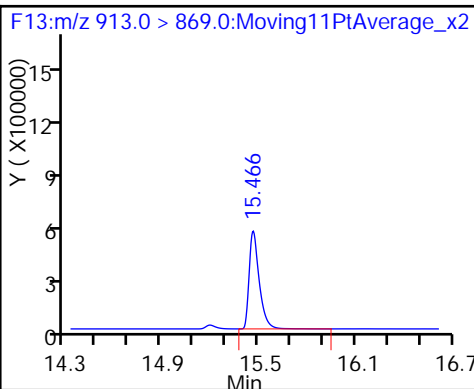
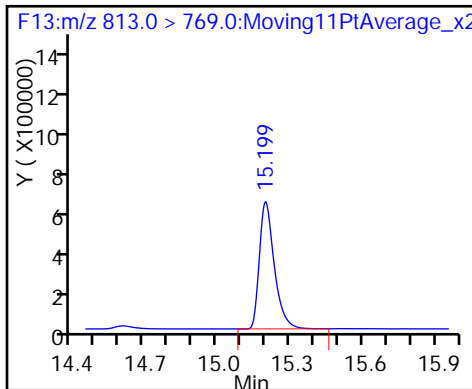
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_007.d
 Lims ID: Std L5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 28-May-2016 15:22:40 ALS Bottle#: 13 Worklist Smp#: 6
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L5
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 14:41:13 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.797	5.796	0.001	1129621	47.3		94.6	546	
2 Perfluorobutyric acid	212.9 > 169.0	5.797	5.799	-0.002	1875570	54.8		110	2424	
D 3 13C5-PFPeA	267.9 > 223.0	6.959	6.958	0.001	2857305	52.4		105	66145	
4 Perfluoropentanoic acid	262.9 > 219.0	6.964	6.960	0.004	3291069	47.1		94.3	761	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.087	7.086	0.001	1634091	44.6		101		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.087	7.086	0.001	1634091	NC			605	
	298.9 > 99.0	7.087	7.086	0.001	860536		1.90(0.00-0.00)		640	
7 Perfluorohexanoic acid	313.0 > 269.0	8.235	8.235	0.0	3450640	53.7		107	1242	
D 6 13C2 PFHxA	315.0 > 270.0	8.240	8.237	0.003	2912830	49.9		99.8	254744	
D 8 13C4-PFHpA	367.0 > 322.0	9.482	9.475	0.007	3165064	51.1		102	19341	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.488	9.477	0.011	3687199	48.4		96.9	38800	
D 11 18O2 PFHxS	403.0 > 84.0	9.518	9.507	0.011	1374616	48.1		102	3729	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.518	9.507	0.011	1361989	NC			2111	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.518	9.507	0.011	1361989	51.2		108		
D 12 13C4 PFOA	417.0 > 372.0	10.584	10.584	0.0	3225265	47.9		95.8	41049	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.584	10.584	0.0	1.000	3481430	53.1		106	937	
413.0 > 169.0	10.584	10.584	0.0	1.000	1322078		2.63(0.00-0.00)	106	1202	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.593	10.593	0.0	1.000	1361416	NC			43067	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.593	10.593	0.0	1.000	1361416	50.1		105		
D 16 13C4 PFOS										
503.0 > 80.0	11.541	11.541	0.0		1664419	47.4		99.1	32422	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.541	11.545	-0.004	1.000	2210260	50.6		106	822	
499.0 > 99.0	11.541	11.545	-0.004	1.000	1241512		1.78(0.00-0.00)	106	2097	
D 17 13C5 PFNA										
468.0 > 423.0	11.559	11.559	0.0		3190052	51.4		103	20762	
18 Perfluorononanoic acid										
463.0 > 419.0	11.559	11.561	-0.002	1.000	2788226	51.8		104	13084	
D 19 13C2 PFDA										
515.0 > 470.0	12.396	12.392	0.004		2440256	49.0		98.0	142432	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.396	12.392	0.004	1.000	3294984	51.7		103	38277	
D 23 13C8 FOSA										
506.0 > 78.0	12.998	13.001	-0.003		5338211	47.7		95.4	1915	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.998	13.003	-0.005	1.000	4817228	55.8		112	4271	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.047	13.047	0.0	1.000	1606213	57.2		119		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.047	13.047	0.0	1.000	1606213	NC			7978	
D 26 13C2 PFUnA										
565.0 > 520.0	13.091	13.093	-0.002		3340531	47.9		95.8	6097	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.091	13.093	-0.002	1.000	3646070	52.5		105	18349	
D 28 13C2 PFDoA										
615.0 > 570.0	13.684	13.683	0.001		3961676	47.6		95.3	19545	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.684	13.683	0.001	1.000	3508060	54.7		109	4580	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.182	14.182	0.0	1.000	4647252	51.2		102	2314	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.604	14.608	-0.004		3632080	48.9		97.9	9593	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.604	14.608	-0.004	1.000	3713233	53.0		106	1612	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.199	15.203	-0.004		5956244	51.0		102	6609	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.199	15.203	-0.004	1.000	6740979	54.9		110	3426	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.476	15.473	0.003	1.000	6793291	55.8		112	3956	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC-L5_00018

Amount Added: 1.00

Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_007.d

Injection Date: 28-May-2016 15:22:40

Instrument ID: A6

Lims ID: Std L5

Client ID:

Operator ID: JRB

ALS Bottle#: 13

Worklist Smp#: 6

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

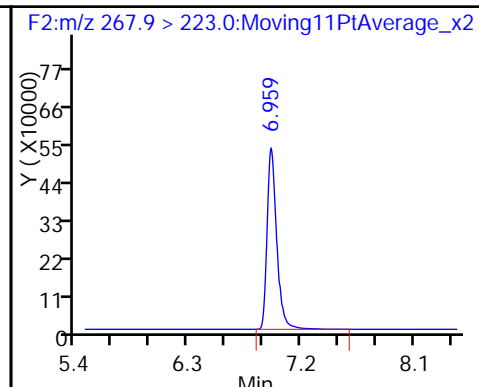
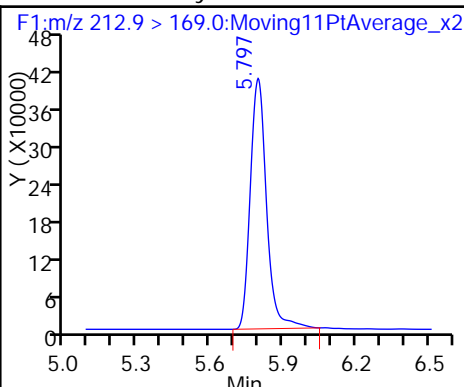
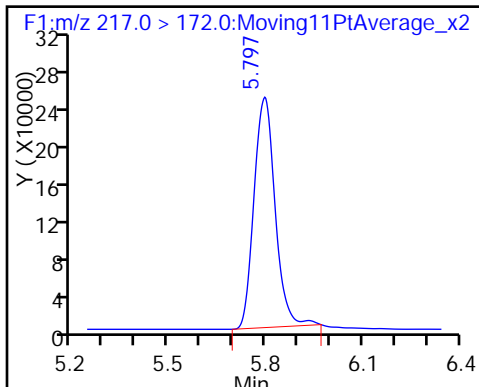
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

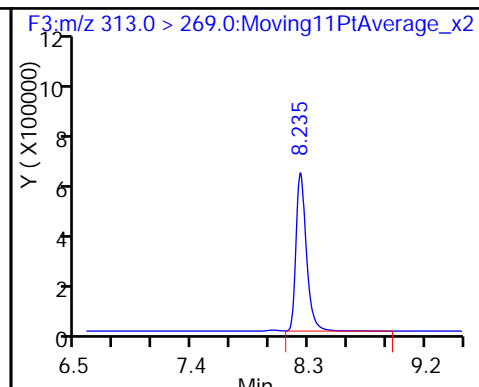
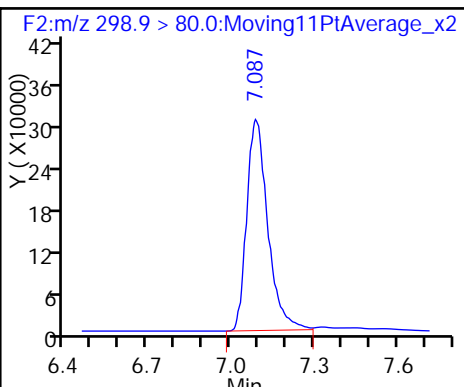
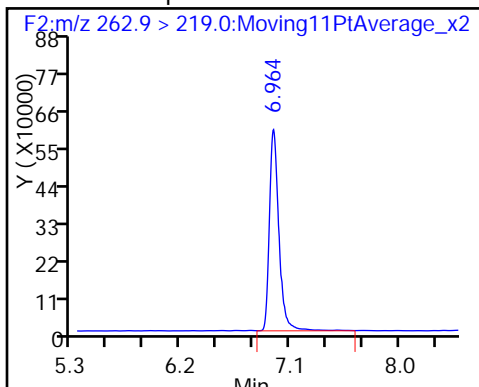
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

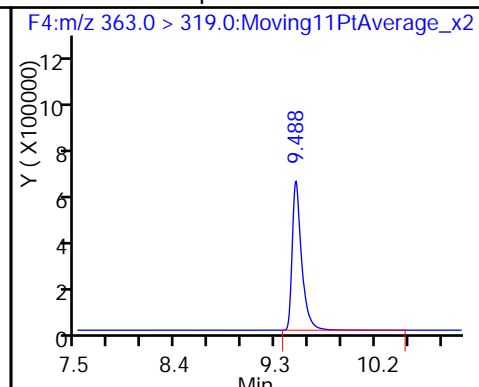
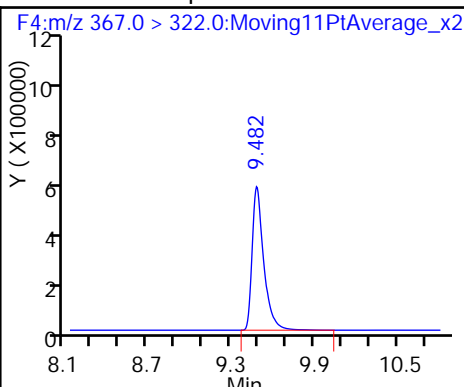
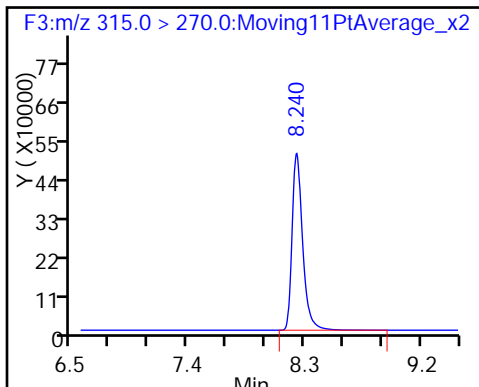
7 Perfluorohexanoic acid



D 6 13C2 PFHxA

D 8 13C4-PFHpA

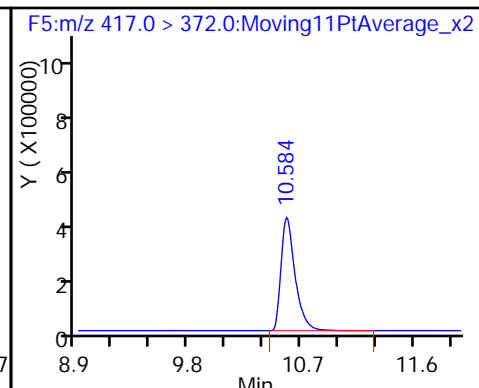
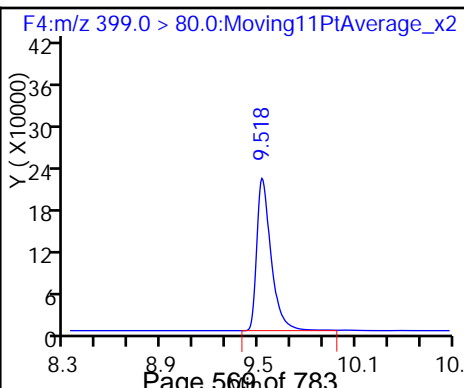
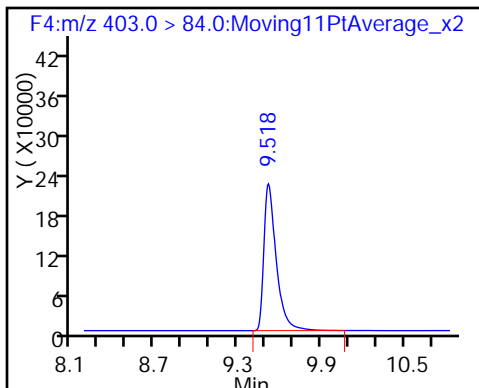
9 Perfluoroheptanoic acid

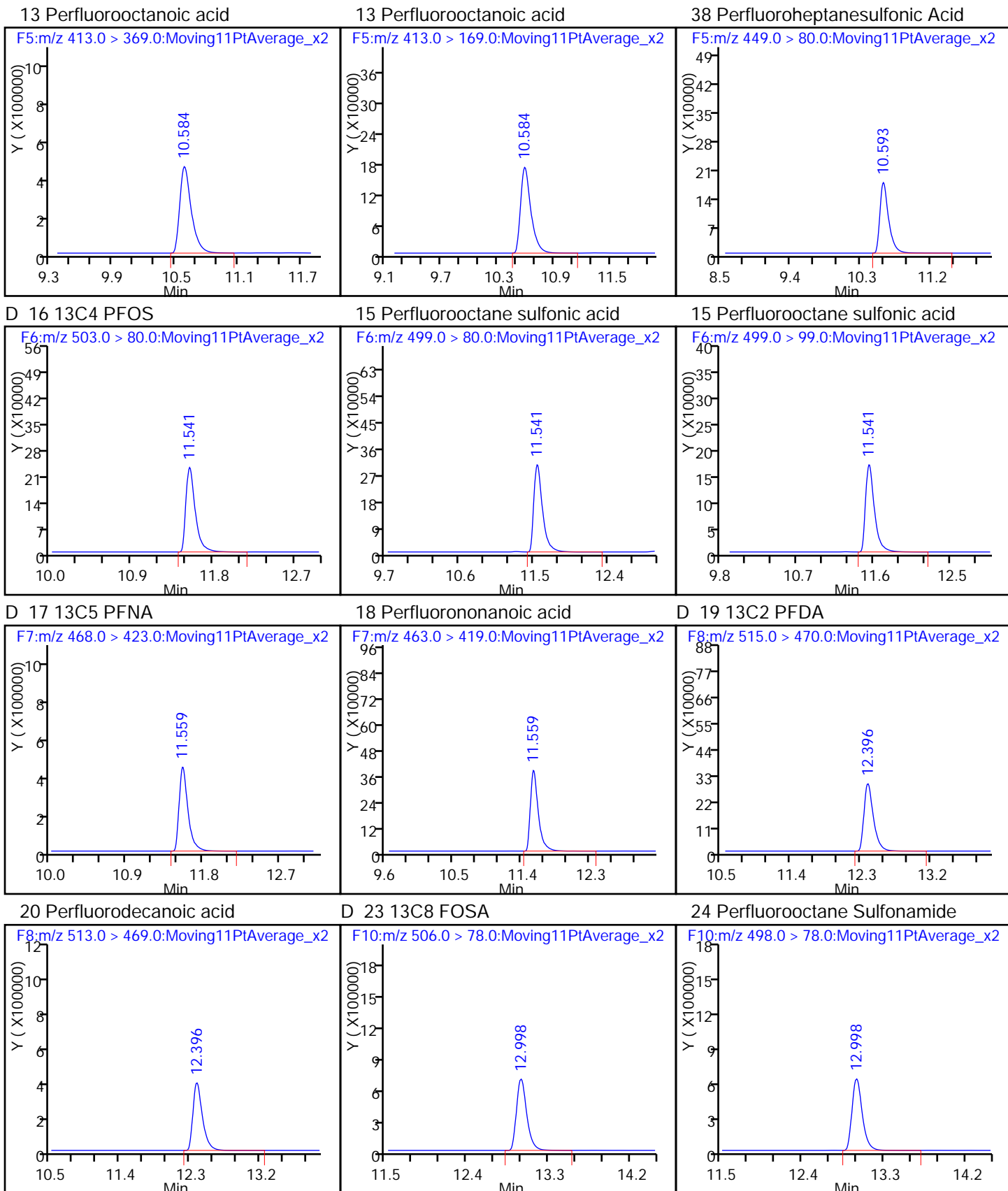


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

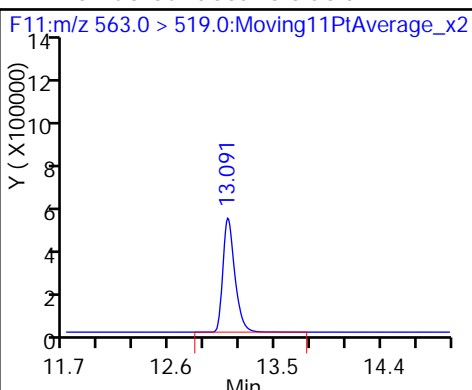
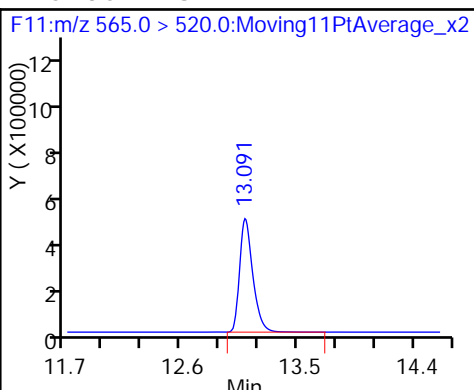
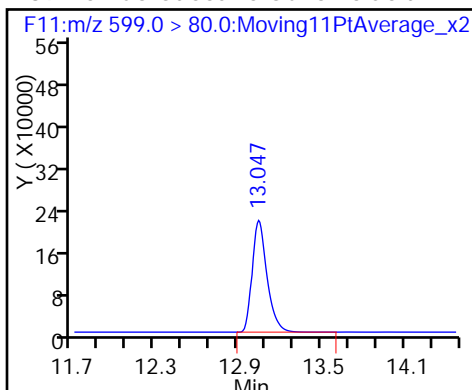




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

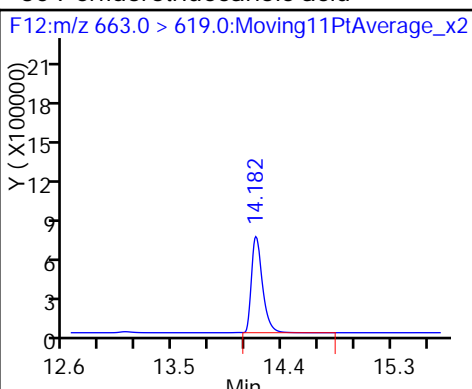
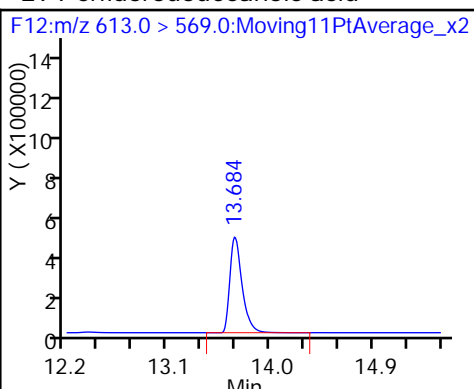
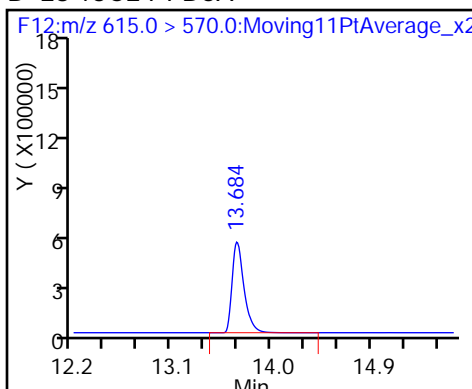
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

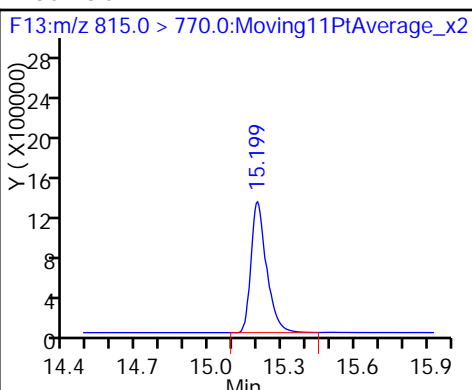
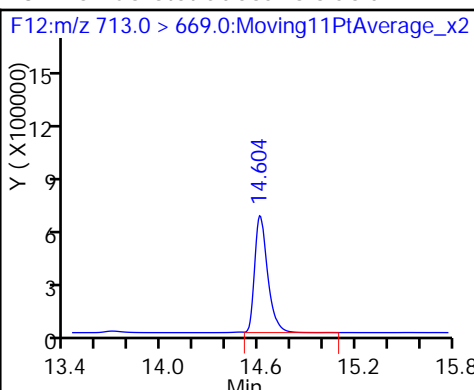
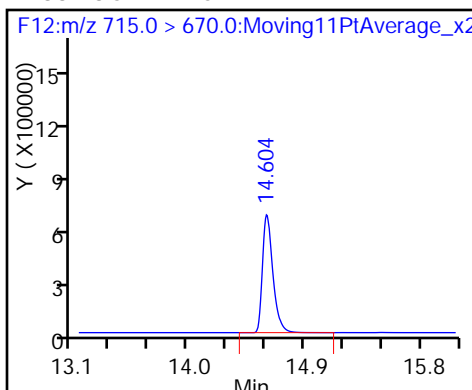
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

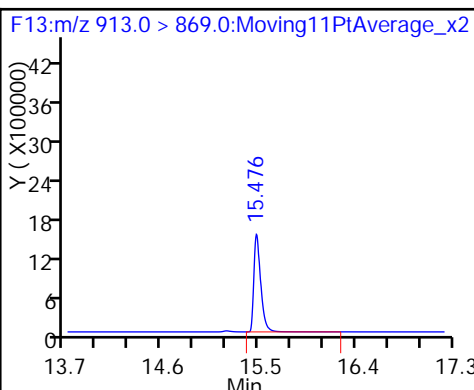
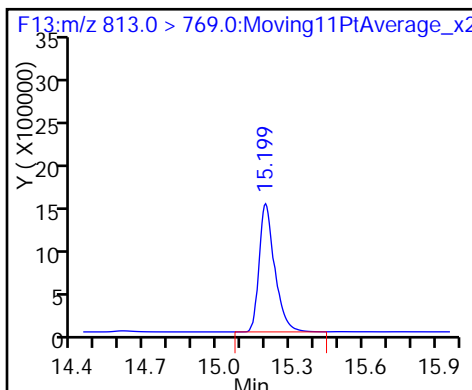
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_011.d
 Lims ID: Std L6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 28-May-2016 19:20:17 ALS Bottle#: 14 Worklist Smp#: 10
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L6
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 14:41:17 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj

Date: 29-May-2016 15:37:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.794	5.795	-0.001	1030072	43.1		86.3	646	
2 Perfluorobutyric acid	212.9 > 169.0	5.794	5.797	-0.003	1.000	7009910	224.5	112	26769	
D 3 13C5-PFPeA	267.9 > 223.0	6.955	6.957	-0.002	2372336	43.5		87.1	1907	
4 Perfluoropentanoic acid	262.9 > 219.0	6.955	6.959	-0.004	1.000	10919228	188.3	94.2	2071	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.081	7.085	-0.004	1.000	5659839	188.8	107		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.081	7.085	-0.004	1.000	5659839	NC		987	
	298.9 > 99.0	7.085	7.085	0.0	1.000	2809951	2.01(0.00-0.00)		651	
7 Perfluorohexanoic acid	313.0 > 269.0	8.236	8.235	0.001	1.000	11646564	211.3	106	2025	
D 6 13C2 PFHxA	315.0 > 270.0	8.236	8.236	0.0	2499100	42.8		85.7	5682	
D 8 13C4-PFHpA	367.0 > 322.0	9.470	9.474	-0.004	2494258	40.2		80.5	13302	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.470	9.475	-0.005	1.000	11784227	197.8	98.9	9429	
D 11 18O2 PFHxS	403.0 > 84.0	9.505	9.507	-0.002	1125402	39.4		83.3	35595	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.505	9.507	-0.002	1.000	4186378	NC		1379	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.505	9.507	-0.002	1.000	4186378	192.4	102		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.596	10.586	0.010		2503906	37.2		74.4	26130	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.596	10.587	0.009	1.000	10521352	206.7		103	1525	
413.0 > 169.0	10.596	10.587	0.009	1.000	3972655		2.65(0.00-0.00)	103	5294	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.605	10.596	0.009	1.000	4485928	NC			6687	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.605	10.596	0.009	1.000	4485928	203.6		107		
D 16 13C4 PFOS										
503.0 > 80.0	11.543	11.543	0.0		1349842	38.4		80.3	1721	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.543	11.545	-0.002	1.000	6916291	195.1		102	472	
499.0 > 99.0	11.543	11.545	-0.002	1.000	3751382		1.84(0.00-0.00)	102	2890	
D 17 13C5 PFNA										
468.0 > 423.0	11.570	11.562	0.008		2405278	38.8		77.5	83453	
18 Perfluorononanoic acid										
463.0 > 419.0	11.570	11.563	0.007	1.000	8301026	204.4		102	25149	
D 19 13C2 PFDA										
515.0 > 470.0	12.393	12.392	0.001		2024121	40.7		81.3	121813	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.393	12.392	0.001	1.000	9917621	187.5		93.7	7532	
D 23 13C8 FOSA										
506.0 > 78.0	13.004	13.000	0.004		4812502	43.0		86.0	2559	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.004	13.002	0.002	1.000	15796057	202.8		101	1351	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.050	13.048	0.002	1.000	4316122	189.4		98.3		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.050	13.048	0.002	1.000	4316122	NC			17817	
D 26 13C2 PFUnA										
565.0 > 520.0	13.102	13.094	0.008		2833534	40.6		81.2	30671	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.102	13.094	0.008	1.000	11249044	192.3		96.1	11348	
D 28 13C2 PFDaA										
615.0 > 570.0	13.685	13.685	0.0		3405671	41.0		81.9	19100	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.685	13.685	0.0	1.000	12017863	218.1		109	8837	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.190	14.184	0.006	1.000	14294825	183.1		91.6	4032	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.609	14.609	0.0		3345667	45.1		90.1	11255	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.609	14.609	0.0	1.000	12685494	212.0		106	2494	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.200	15.203	-0.003		5171420	44.3		88.5	7010	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.200	15.203	-0.003	1.000	21462072	205.6		103	4196	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.471	15.473	-0.002	1.000	22946617	219.1	110	5385	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L6_00017

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_011.d

Injection Date: 28-May-2016 19:20:17

Instrument ID: A6

Lims ID: Std L6

Client ID:

Operator ID: JRB

ALS Bottle#: 14

Worklist Smp#: 10

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

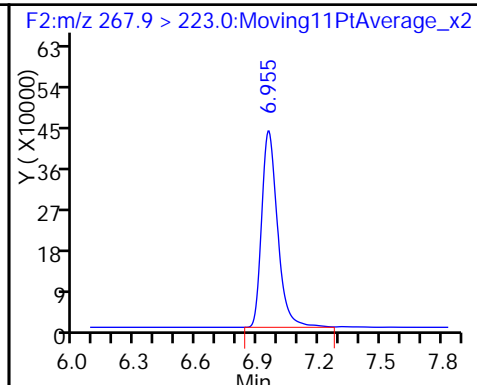
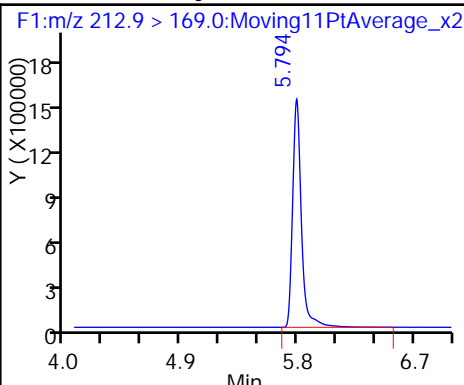
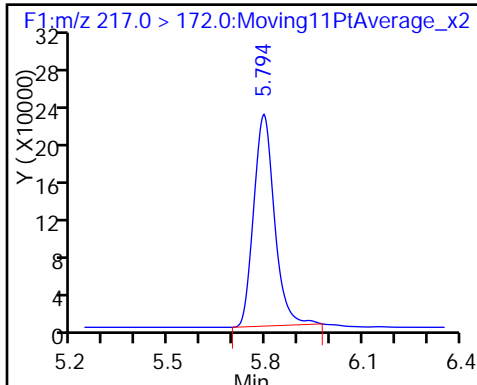
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

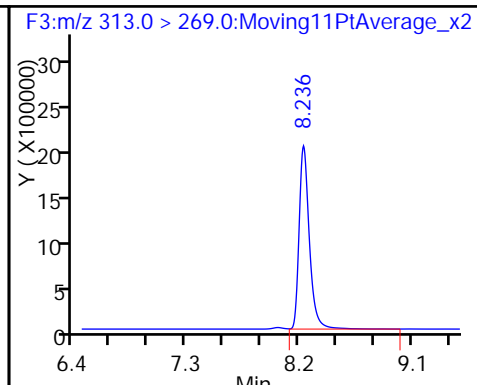
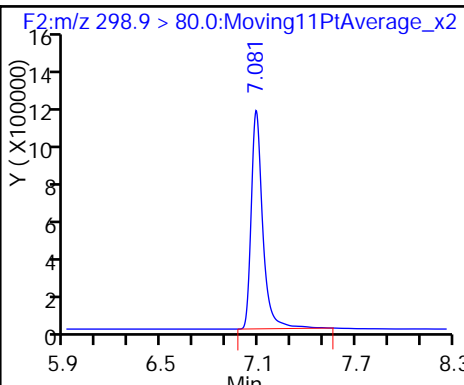
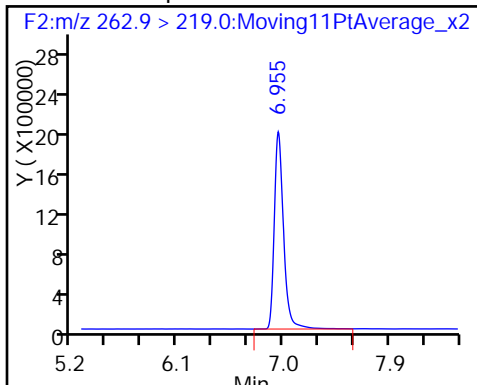
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

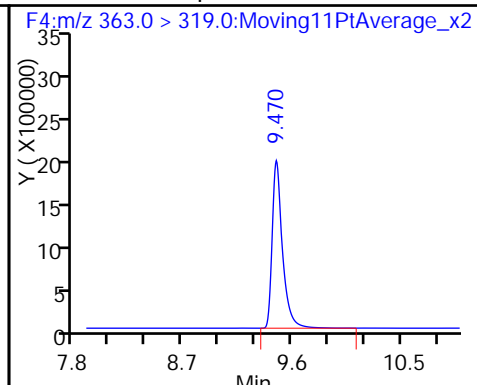
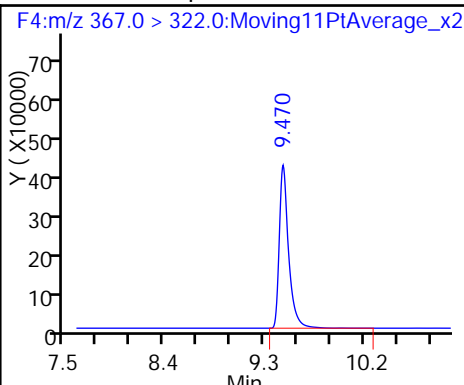
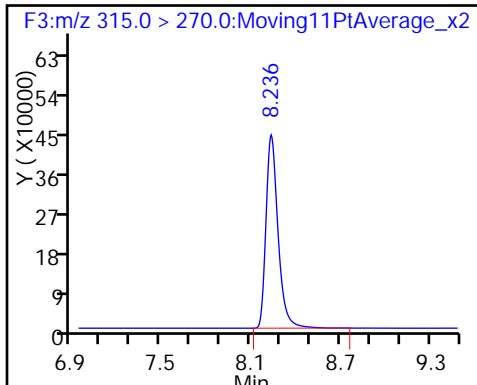
7 Perfluorohexanoic acid



D 6 13C2 PFHxA

D 8 13C4-PFHpA

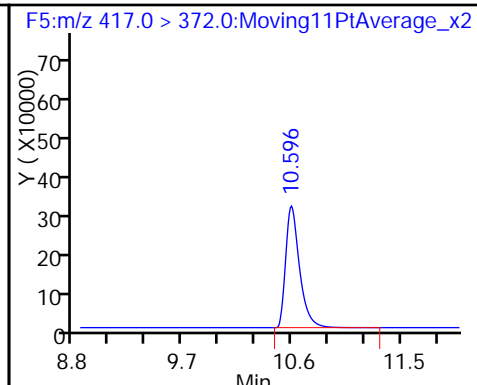
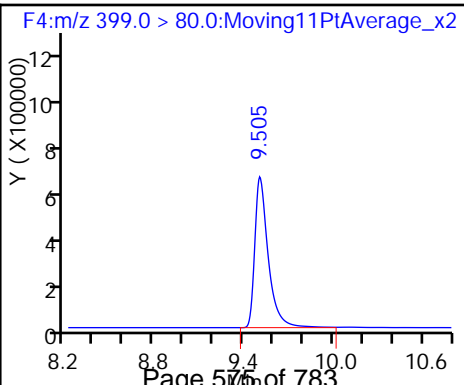
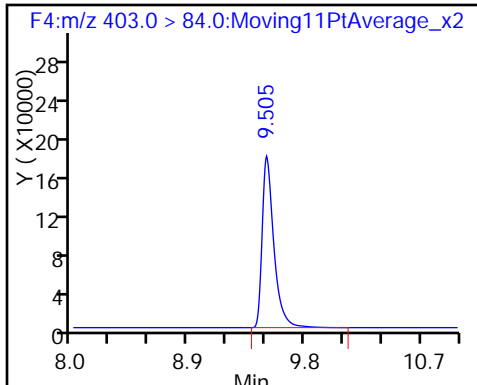
9 Perfluoroheptanoic acid

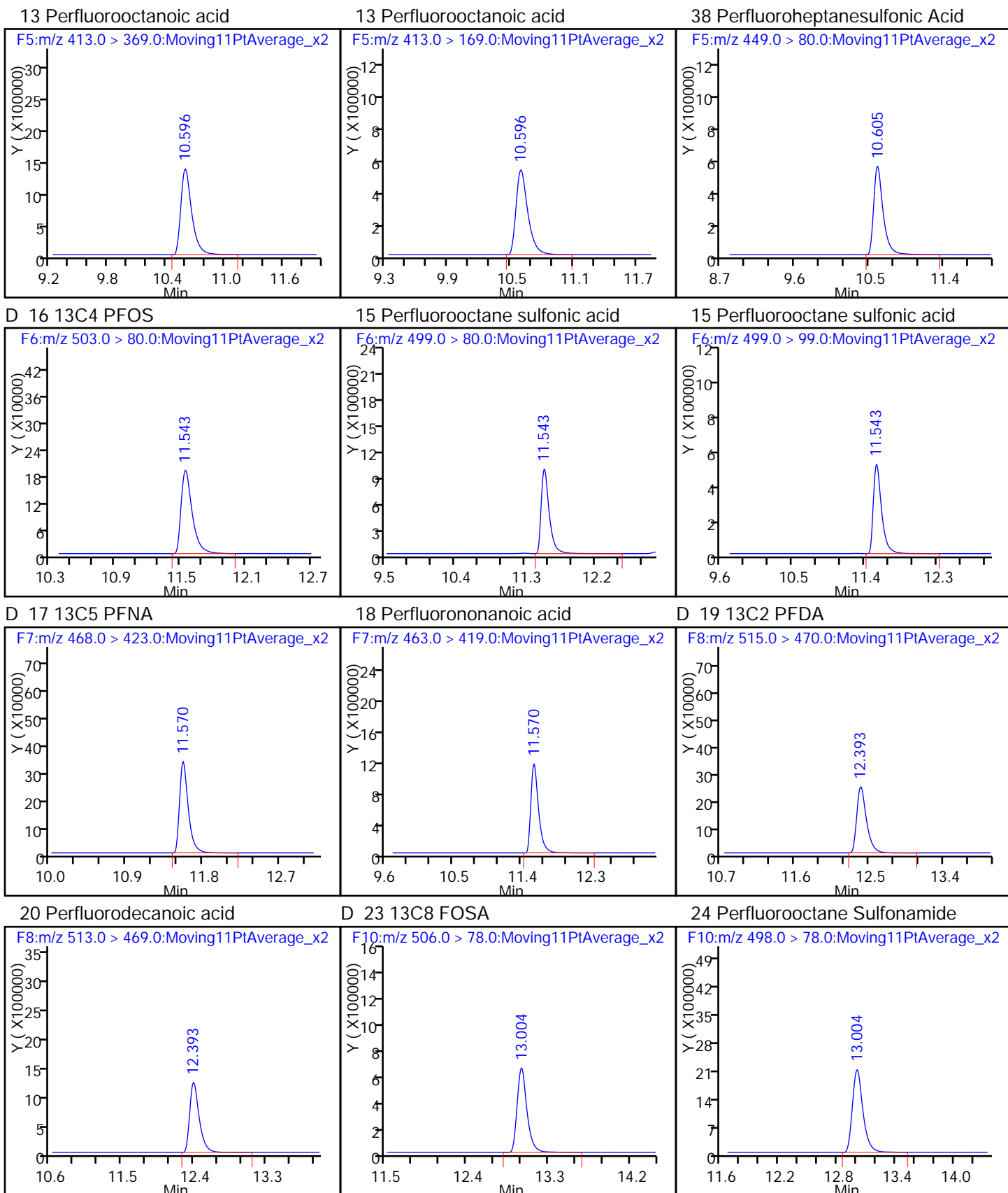


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

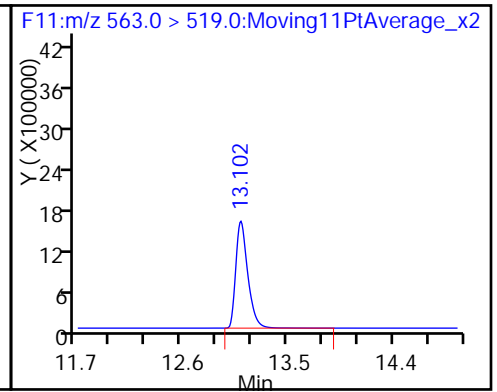
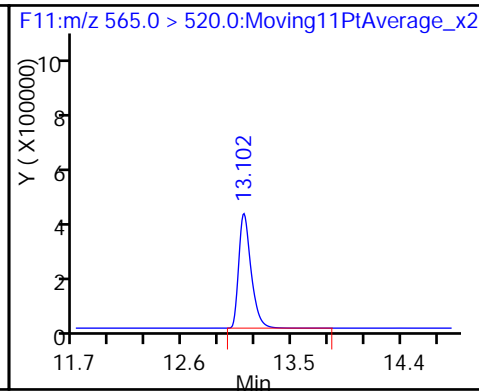
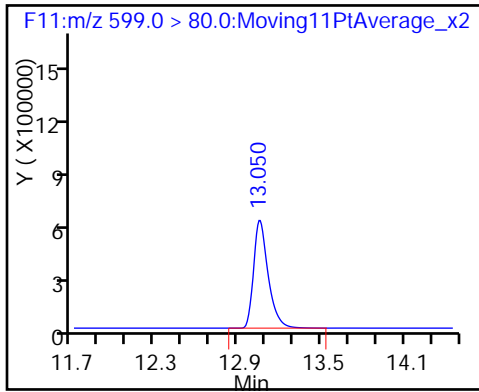




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

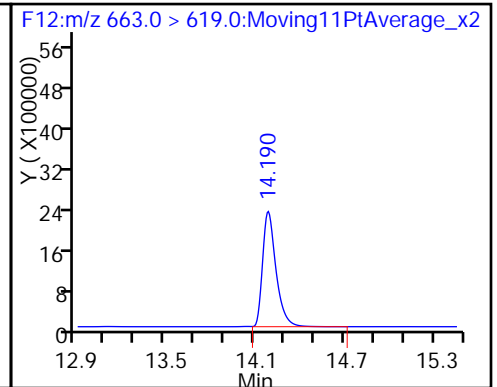
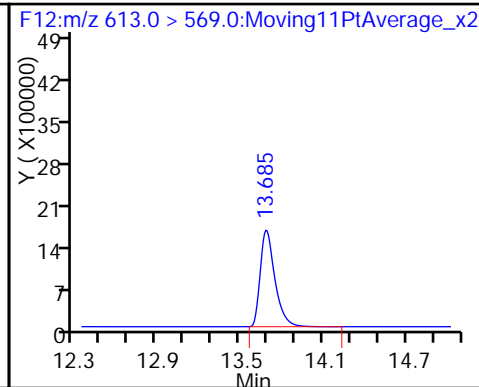
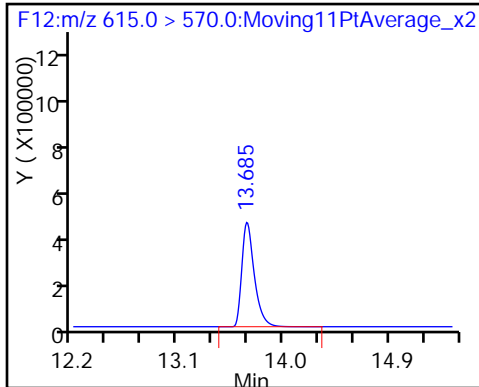
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

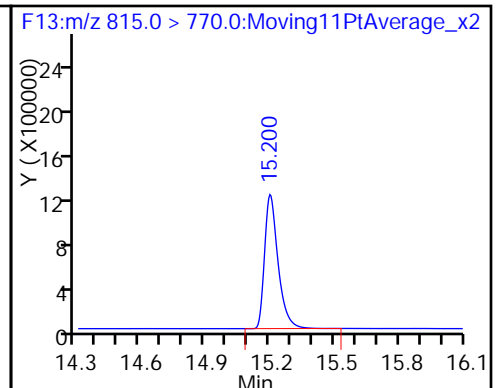
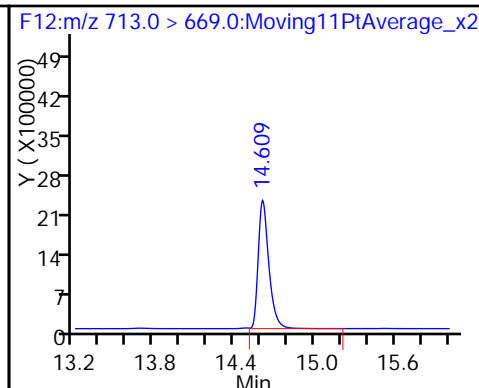
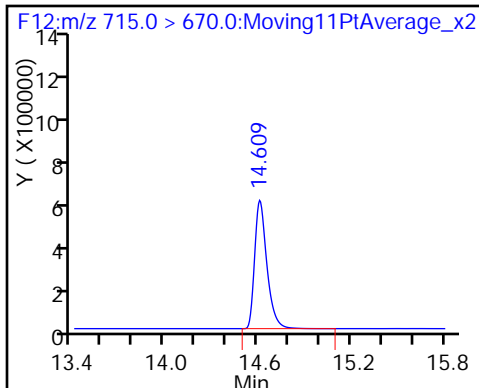
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

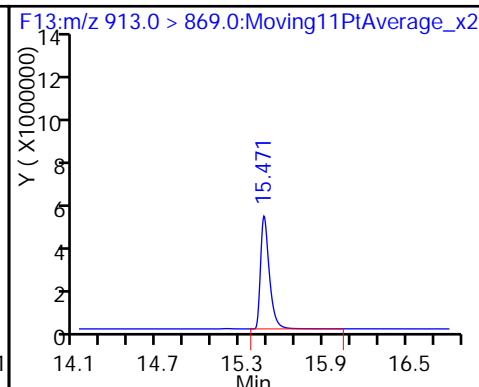
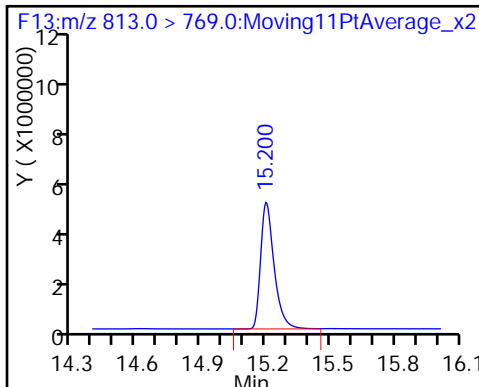
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Lims ID: Std L7
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 28-May-2016 19:41:34 ALS Bottle#: 15 Worklist Smp#: 11
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L7
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9

Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 14:41:21 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.794	5.795	-0.001		921081	38.6		77.2	629	
2 Perfluorobutyric acid										
212.9 > 169.0	5.794	5.797	-0.003	1.000	12040963	431.2		108	21815	
D 3 13C5-PFPeA										
267.9 > 223.0	6.955	6.957	-0.002		1958386	35.9		71.9	1962	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.960	6.959	0.001	1.000	18430262	385.1		96.3	2993	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.085	7.085	0.0	1.000	10165048	406.5		115		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.085	7.085	0.0	1.000	10165048	NC			1530	
298.9 > 99.0	7.085	7.085	0.0	1.000	5062927		2.01(0.00-0.00)		9623	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.236	8.235	0.001	1.000	20405381	421.3		105	2021	
D 6 13C2 PFHxA										
315.0 > 270.0	8.236	8.236	0.0		2196254	37.6		75.3	38679	
D 8 13C4-PFHpA										
367.0 > 322.0	9.469	9.474	-0.005		2130133	34.4		68.7	19827	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.469	9.475	-0.006	1.000	20641461	406.2		102	26320	
D 11 18O2 PFHxS										
403.0 > 84.0	9.504	9.507	-0.003		938514	32.9		69.5	48189	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.504	9.507	-0.003	1.000	7001101	NC			2487	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.504	9.507	-0.003	1.000	7001101	385.8		102		
D 12 13C4 PFOA										
417.0 > 372.0	10.586	10.586	0.0		2163488	32.1		64.2	68056	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.595	10.587	0.008	1.000	18258509	415.1		104	8809	
413.0 > 169.0	10.595	10.587	0.008	1.000	6705845		2.72(0.00-0.00)	104	3472	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.604	10.596	0.008	1.000	7177688	NC			5957	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.604	10.596	0.008	1.000	7177688	399.9		105		
D 16 13C4 PFOS										
503.0 > 80.0	11.552	11.543	0.009		1099749	31.3		65.5	6925	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.552	11.545	0.007	1.000	11426654	395.6		103	486	
499.0 > 99.0	11.552	11.545	0.007	1.000	6398016		1.79(0.00-0.00)	103	2024	
D 17 13C5 PFNA										
468.0 > 423.0	11.569	11.562	0.007		2065307	33.3		66.6	31365	
18 Perfluorononanoic acid										
463.0 > 419.0	11.569	11.563	0.006	1.000	14853862	425.9		106	7857	
D 19 13C2 PFDA										
515.0 > 470.0	12.393	12.392	0.001		1621605	32.6		65.1	38475	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.393	12.392	0.001	1.000	17545327	413.9		103	7015	
D 23 13C8 FOSA										
506.0 > 78.0	12.994	13.000	-0.006		3951484	35.3		70.6	8154	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.994	13.002	-0.008	1.000	27903019	436.3		109	1770	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.050	13.048	0.002	1.000	7020978	378.2		98.1		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.050	13.048	0.002	1.000	7020978	NC			15970	
D 26 13C2 PFUnA										
565.0 > 520.0	13.093	13.094	-0.001		2347573	33.7		67.3	36606	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.093	13.094	-0.001	1.000	19353671	399.7		99.9	9302	
D 28 13C2 PFDoA										
615.0 > 570.0	13.694	13.685	0.009		3116941	37.5		75.0	13808	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.694	13.685	0.009	1.000	21087337	418.2		105	6265	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.189	14.184	0.005	1.000	24559689	343.8		85.9	3938	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.615	14.609	0.006		2833190	38.2		76.3	9359	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.615	14.609	0.006	1.000	21561674	394.2		98.6	3916	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.204	15.203	0.001		4758827	40.7		81.5	5780	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.204	15.203	0.001	1.000	36953897	387.5		96.9	3483	
36 Perfluorooctadecanoic acid										
913.0 > 869.0	15.476	15.473	0.003	1.000	46456813	484.6		121	6187	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC-L7_00017

Amount Added: 1.00

Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d

Injection Date: 28-May-2016 19:41:34

Instrument ID: A6

Lims ID: Std L7

Client ID:

Operator ID: JRB

ALS Bottle#: 15

Worklist Smp#: 11

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

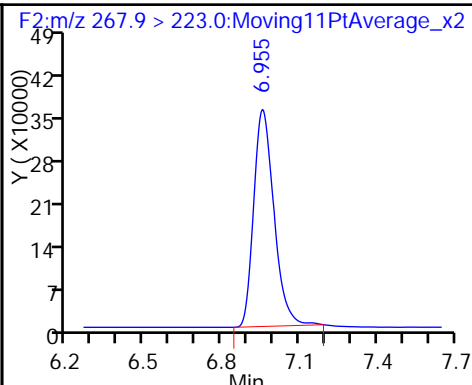
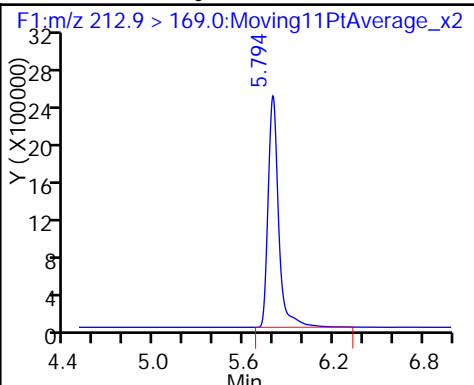
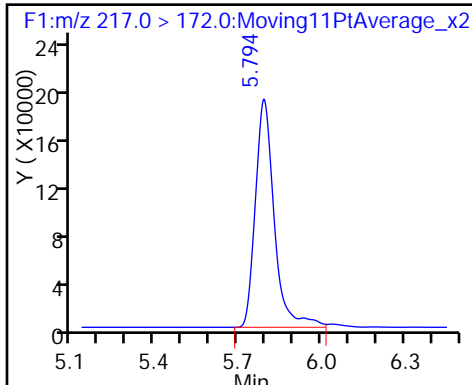
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

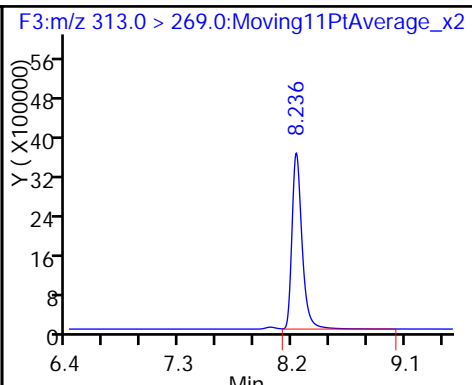
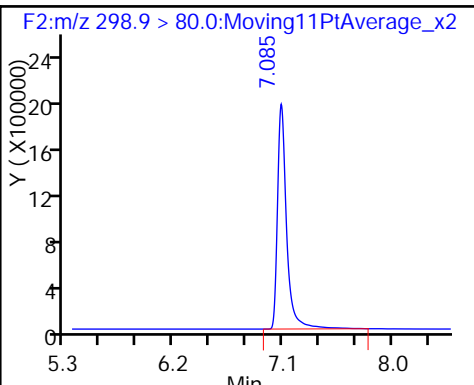
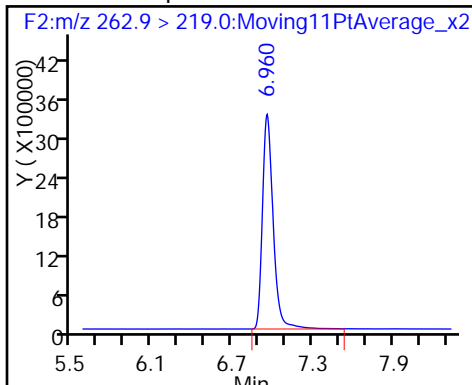
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

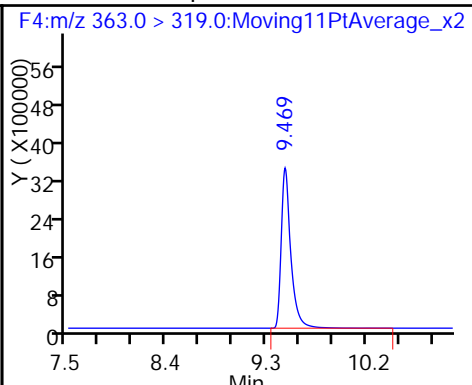
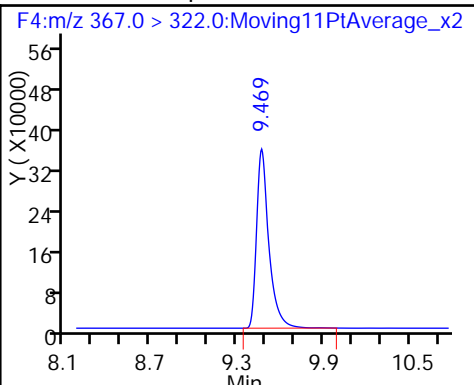
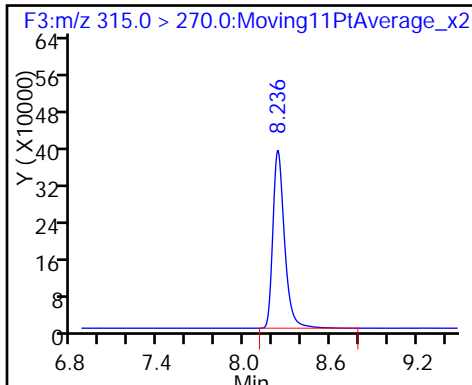
7 Perfluorohexanoic acid



D 6 13C2 PFHxA

D 8 13C4-PFHpA

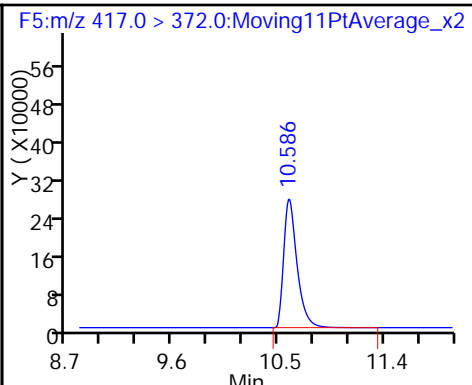
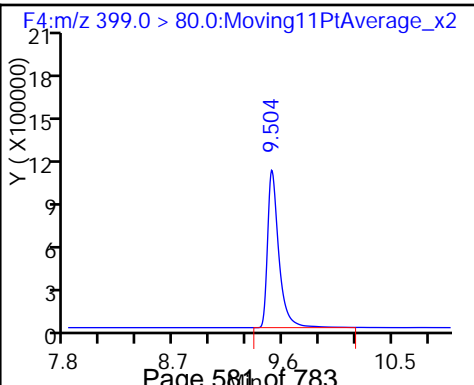
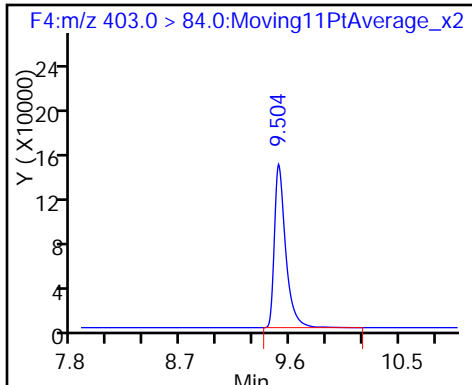
9 Perfluoroheptanoic acid

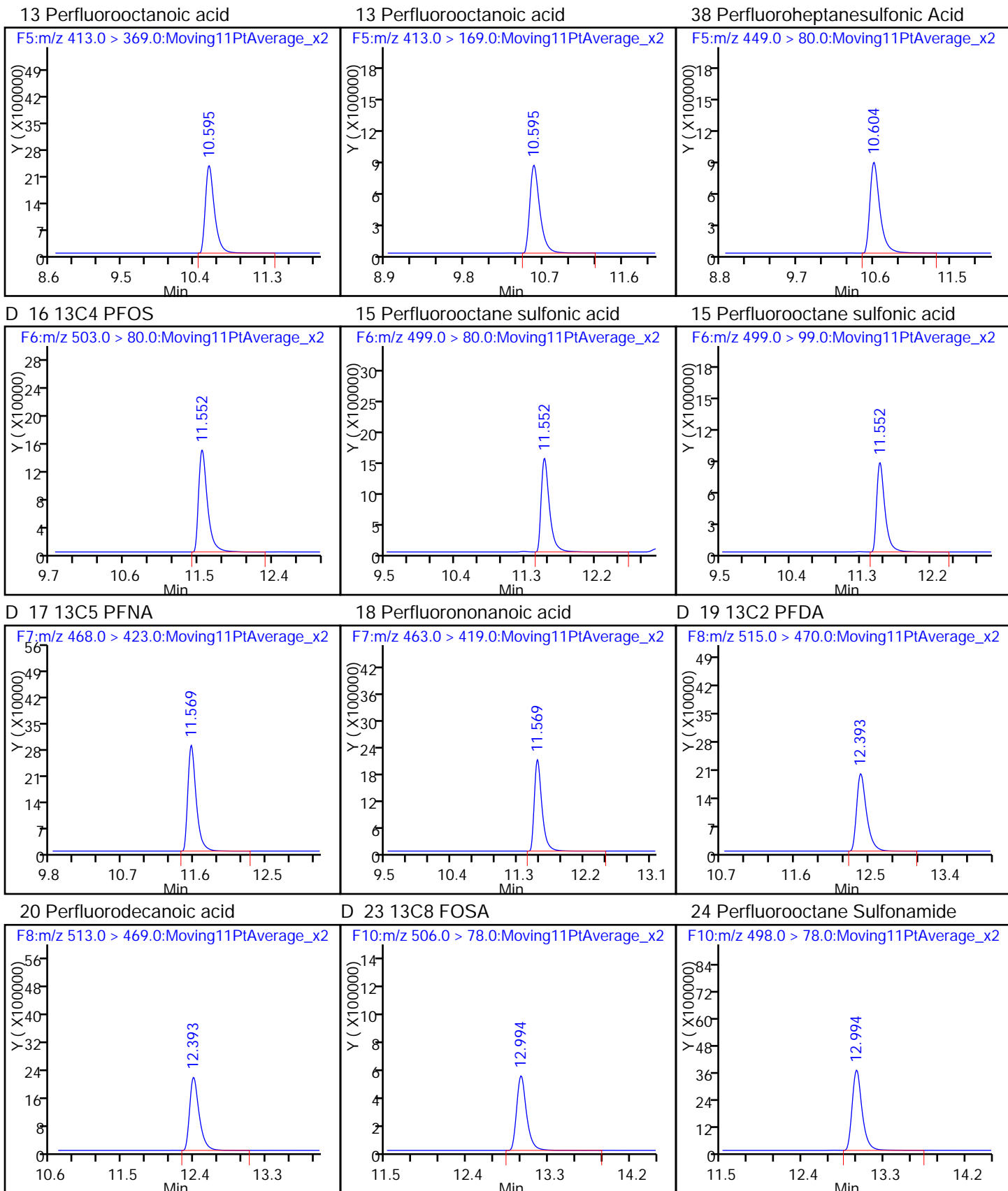


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

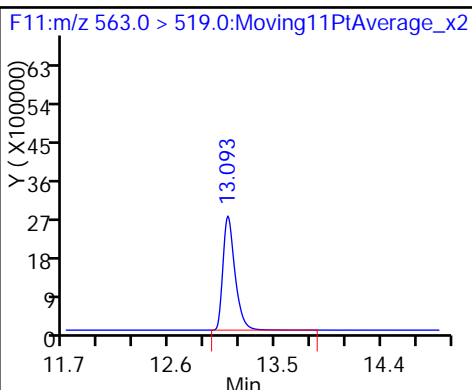
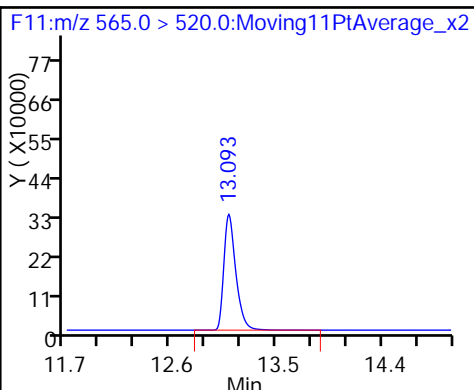
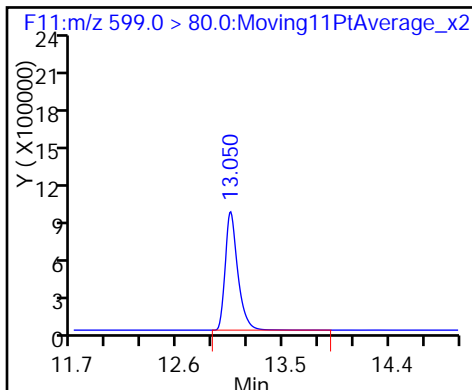




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

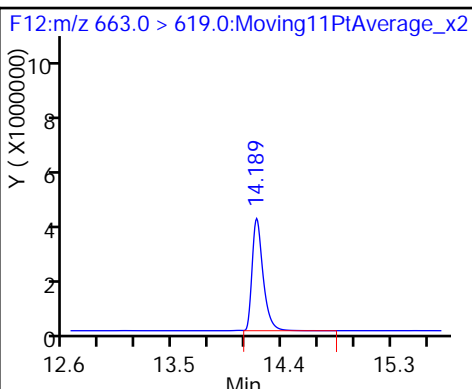
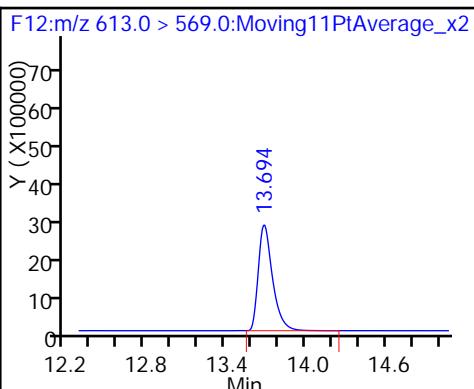
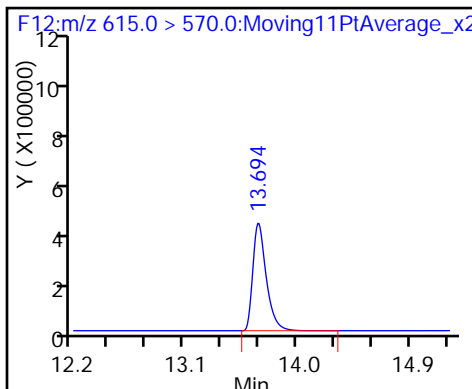
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

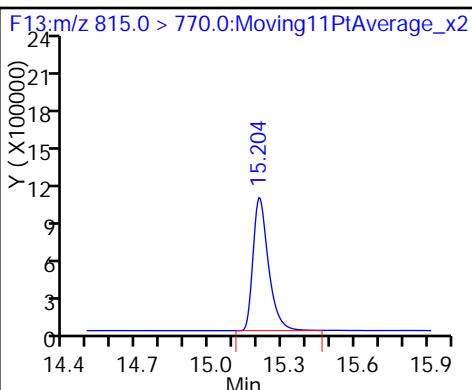
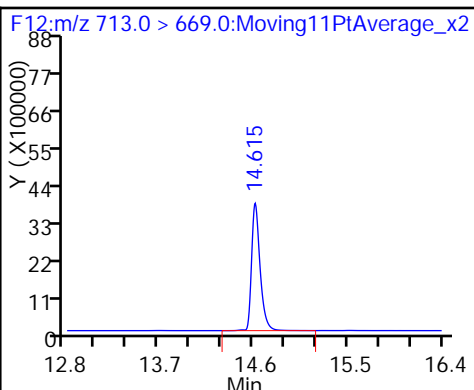
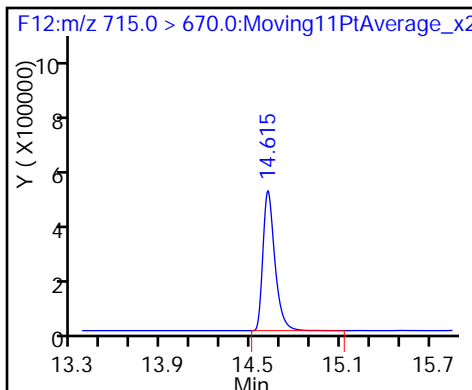
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

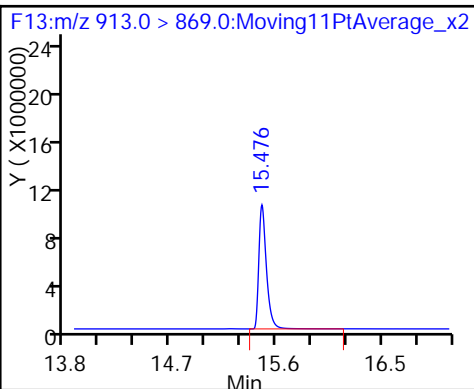
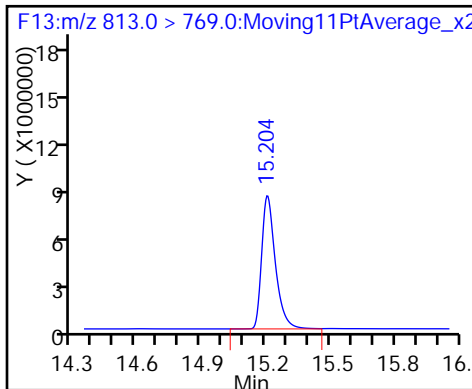
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



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

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1 Analy Batch No.: 112007

SDG No.: _____

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/31/2016 12:51 Calibration End Date: 05/31/2016 14:59 Calibration ID: 21842

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-112007/3	31MAY2016A6A_003.d
Level 2	STD 320-112007/4	31MAY2016A6A_004.d
Level 3	STD 320-112007/5	31MAY2016A6A_005.d
Level 4	STD 320-112007/6	31MAY2016A6A_006.d
Level 5	STD 320-112007/7	31MAY2016A6A_007.d
Level 6	STD 320-112007/8	31MAY2016A6A_008.d
Level 7	STD 320-112007/9	31MAY2016A6A_009.d

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7				RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	++++	5.809	5.806	5.803	5.803	5.800	5.800				5.556 - 6.056	5.804
Perfluoropentanoic acid (PFPeA)	6.974	6.969	6.974	6.969	6.969	6.964	6.969				6.720 - 7.220	6.970
Perfluorobutanesulfonic acid (PFBS)	7.106	7.102	7.102	7.095	7.095	7.095	7.095				6.849 - 7.349	7.099
Perfluorohexanoic acid (PFHxA)	8.252	8.258	8.252	8.252	8.252	8.252	8.252				8.003 - 8.503	8.253
Perfluoroheptanoic acid (PFHpA)	++++	9.499	9.498	9.493	9.493	9.487	9.493				9.244 - 9.744	9.494
Perfluorohexanesulfonic acid (PFHxS)	9.538	9.538	9.531	9.532	9.531	9.532	9.532				9.283 - 9.783	9.533
Perfluorooctanoic acid (PFOA)	10.623	10.614	10.614	10.605	10.614	10.614	10.605				10.362 - 10.862	10.613
Perfluoroheptanesulfonic Acid (PFHpS)	++++	10.632	10.623	10.614	10.614	10.623	10.614				10.372 - 10.872	10.620
Perfluorooctanesulfonic acid (PFOS)	++++	11.585	11.568	11.569	11.577	11.560	11.560				11.321 - 11.821	11.570
Perfluorononanoic acid (PFNA)	++++	11.595	11.586	11.586	11.594	11.586	11.578				11.339 - 11.839	11.588
Perfluorodecanoic acid (PFDA)	12.434	12.425	12.424	12.424	12.424	12.414	12.414				12.173 - 12.673	12.423
Perfluorooctane Sulfonamide (FOSA)	++++	13.021	13.013	13.021	13.013	13.021	13.013				12.768 - 13.268	13.017
Perfluorodecanesulfonic acid (PFDS)	++++	13.084	13.076	13.075	13.076	13.084	13.076				12.831 - 13.331	13.079
Perfluoroundecanoic acid (PFUnA)	++++	13.128	13.120	13.119	13.120	13.128	13.120				12.874 - 13.374	13.123
Perfluorododecanoic acid (PFDoA)	13.730	13.719	13.730	13.701	13.721	13.710	13.712				13.468 - 13.968	13.718
Perfluorotetradecanoic Acid (PFTriA)	14.228	14.227	14.228	14.204	14.220	14.211	14.220				13.970 - 14.470	14.220
Perfluorotetradecanoic acid (PFTeA)	14.655	14.647	14.648	14.640	14.642	14.634	14.642				14.394 - 14.894	14.644
Perfluoro-n-hexadecanoic acid (PFHxDA)	++++	15.228	15.225	15.223	15.220	15.218	15.220				14.973 - 15.473	15.222
Perfluoro-n-octadecanoic acid (PFODA)	15.496	15.495	15.491	15.495	15.491	15.495	15.486				15.243 - 15.743	15.493
13C4 PFBA	5.806	5.806	5.803	5.803	5.803	5.800	5.800				5.553 - 6.053	5.803
13C5-PFPeA	6.969	6.974	6.969	6.969	6.969	6.964	6.964				6.718 - 7.218	6.968
13C2 PFHxA	8.252	8.258	8.252	8.252	8.252	8.247	8.252				8.002 - 8.502	8.252
13C4-PFHpA	9.499	9.499	9.498	9.493	9.493	9.487	9.493				9.245 - 9.745	9.495
18O2 PFHxS	9.531	9.538	9.531	9.532	9.531	9.532	9.532				9.282 - 9.782	9.532
13C4 PFOA	10.623	10.614	10.614	10.605	10.614	10.614	10.605				10.362 - 10.862	10.613
13C4 PFOS	11.577	11.577	11.568	11.569	11.568	11.560	11.560				11.318 - 11.818	11.568
13C5 PFNA	11.594	11.595	11.586	11.586	11.594	11.586	11.578				11.339 - 11.839	11.588
13C2 PFDA	12.434	12.425	12.424	12.424	12.424	12.414	12.414				12.173 - 12.673	12.423
13C8 FOSA	13.031	13.021	13.013	13.021	13.013	13.021	13.013				12.769 - 13.269	13.019
13C2 PFUnA	13.137	13.128	13.120	13.119	13.120	13.128	13.120				12.874 - 13.374	13.125
13C2 PFDoA	13.730	13.719	13.730	13.701	13.721	13.710	13.712				13.468 - 13.968	13.718
13C2-PFTeDA	14.648	14.647	14.648	14.640	14.642	14.634	14.642				14.393 - 14.893	14.643
13C2-PFHxDA	15.229	15.228	15.225	15.223	15.220	15.218	15.220				14.973 - 15.473	15.223

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

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1 Analy Batch No.: 112007

SDG No.: _____

Instrument ID: A6 GC Column: Acquity ID: 2.1 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/31/2016 12:51 Calibration End Date: 05/31/2016 14:59 Calibration ID: 21842

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-112007/3	31MAY2016A6A_003.d
Level 2	STD 320-112007/4	31MAY2016A6A_004.d
Level 3	STD 320-112007/5	31MAY2016A6A_005.d
Level 4	STD 320-112007/6	31MAY2016A6A_006.d
Level 5	STD 320-112007/7	31MAY2016A6A_007.d
Level 6	STD 320-112007/8	31MAY2016A6A_008.d
Level 7	STD 320-112007/9	31MAY2016A6A_009.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	26623 24710	26024 20959	27520 18411	26440	Ave		24383.8886			13.9			50.0			
13C5-PFPeA	78502 63903	68112 50506	72941 42270	68565	Ave		63542.7229			20.1			50.0			
13C2 PFHxA	69769 63597	62953 51253	68090 45007	68302	Ave		61281.6400			15.5			50.0			
13C4-PFHpA	80576 68813	76180 50484	81722 46127	76607	Ave		68644.1886			21.2			50.0			
1802 PFHxS	33221 33189	31989 24378	38672 20418	34000	Ave		30838.2543			20.3			50.0			
13C4 PFOA	90986 71597	83136 49411	89983 42396	81809	Ave		72759.8914			26.8			50.0			
13C4 PFOS	47814 39933	45431 28108	47631 23944	45087	Ave		39706.8410			24.6			50.0			
13C5 PFNA	79942 65326	78040 49641	77750 43535	72387	Ave		66660.2314			22.0			50.0			
13C2 PFDA	62869 51695	59243 37699	67593 32661	56797	Ave		52651.0400			24.7			50.0			
13C8 FOSA	139000 132571	133977 97359	151253 86558	136690	Ave		125343.880			19.0			50.0			
13C2 PFUnA	91904 75837	88051 53797	87410 45776	83653	Ave		75204.1086			24.2			50.0			
13C2 PFDoA	105358 92411	97012 72670	108647 61718	97291	Ave		90729.5114			19.0			50.0			
13C2-PFTeDA	93696 83332	84115 65519	96573 57157	87249	Ave		81091.4857			17.9			50.0			
13C2-PFHxDa	139468 132878	129655 104471	143265 94863	137329	Ave		125989.854			14.9			50.0			

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

CURVE EVALUATION

Lab Name: TestAmerica SacramentoJob No.: 320-18986-1Analy Batch No.: 112007

SDG No.: _____

Instrument ID: A6GC Column: Acquity ID: 2.1(mm)Heated Purge: (Y/N) NCalibration Start Date: 05/31/2016 12:51Calibration End Date: 05/31/2016 14:59Calibration ID: 21842

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R ² OR COD	#	MIN R ² OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
Perfluorobutanoic acid (PFBA)	++++ 33601	30976 28810	45392	38248	42491	AveID		1.5290			12.4		35.0				
Perfluoropentanoic acid (PFPeA)	101330 58090	76403 49537	79525	74326	75305	AveID		1.1553			6.1		35.0				
Perfluorobutanesulfonic acid (PFBS)	40595 34562	45609 30506	43279	39116	42236	AveID		1.3002			11.3		50.0				
Perfluorohexanoic acid (PFHxA)	66462 59812	71362 52176	84440	74747	72989	AveID		1.1278			7.9		35.0				
Perfluoroheptanoic acid (PFHpA)	++++ 59210	110770 51781	102300	79372	85732	L1ID	0.3353	1.1425						0.9990		0.9900	
Perfluorohexanesulfonic acid (PFHxS)	30093 23000	30416 19411	37049	31032	31023	AveID		0.9366			2.1		35.0				
Perfluorooctanoic acid (PFOA)	97714 53605	82635 45105	87733	77186	75211	AveID		1.0265			5.4		35.0				
Perfluoroheptanesulfonic Acid (PFHpS)	++++ 23376	22462 19466	39215	35368	33685	L2ID	-0.316	0.8358						0.9980		0.9900	
Perfluorooctanesulfonic acid (PFOS)	++++ 37809	45840 29893	57676	52986	56851	AveID		1.2354			11.6		35.0				
Perfluorononanoic acid (PFNA)	++++ 42549	76977 36104	66098	54643	59164	AveID		0.8639			9.0		35.0				
Perfluorodecanoic acid (PFDA)	66094 49487	79213 42529	86265	67160	69048	AveID		1.2568			8.3		35.0				
Perfluorooctane Sulfonamide (FOSA)	++++ 84278	94929 70539	121772	106269	104798	AveID		0.7937			6.5		35.0				
Perfluorodecanesulfonic acid (PFDS)	++++ 23434	40392 19162	43138	36285	33762	L1ID	0.1509	0.8132						0.9990		0.9900	
Perfluoroundecanoic acid (PFUnA)	++++ 57176	127094 50080	96218	78611	77745	L2ID	0.4149	1.0227						0.9960		0.9900	
Perfluorododecanoic acid (PFDoA)	80640 63739	82131 53329	95456	76941	77686	AveID		0.8376			5.2		35.0				
Perfluorotridecanoic Acid (PFTriA)	119404 71732	119146 61710	137603	98527	109019	AveID		1.1153			10.4		50.0				
Perfluorotetradecanoic acid (PFTTeA)	147048 64372	112219 55440	110490	84044	82336	L2ID	0.2540	0.8966						0.9980		0.9900	
Perfluoro-n-hexadecanoic acid (PFHxDA)	++++ 106839	287385 92683	187061	141940	148168	L2ID	1.4797	1.4713						0.9980		0.9900	
Perfluoro-n-octadecanoic acid (PFODA)	150480 113182	139236 106090	136273	130243	145290	AveID		1.4722			10.6		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.: 320-18986-1 Analy Batch No.: 112007

SDG No.: _____

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/31/2016 12:51 Calibration End Date: 05/31/2016 14:59 Calibration ID: 21842

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-112007/3	31MAY2016A6A_003.d
Level 2	STD 320-112007/4	31MAY2016A6A_004.d
Level 3	STD 320-112007/5	31MAY2016A6A_005.d
Level 4	STD 320-112007/6	31MAY2016A6A_006.d
Level 5	STD 320-112007/7	31MAY2016A6A_007.d
Level 6	STD 320-112007/8	31MAY2016A6A_008.d
Level 7	STD 320-112007/9	31MAY2016A6A_009.d

ANALYTE	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
		LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
		LVL 6	LVL 7				LVL 6	LVL 7			
13C4 PFBA	Ave	1331127 1047944	1301198 920558	1376019	1322004	1235511	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C5-PFPeA	Ave	3925096 2525317	3405590 2113511	3647062	3428245	3195132	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFHxA	Ave	3488446 2562636	3147638 2250360	3404519	3415124	3179851	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C4-PFHpA	Ave	4028812 2524194	3809003 2306360	4086096	3830335	3440666	50.0 50.0	50.0 50.0	50.0	50.0	50.0
1802 PFHxS	Ave	1571368 1153063	1513092 965792	1829184	1608216	1569831	47.3 47.3	47.3 47.3	47.3	47.3	47.3
13C4 PFOA	Ave	4549323 2470567	4156783 2119790	4499170	4090464	3579865	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C4 PFOS	Ave	2285487 1343585	2171603 1144504	2276752	2155157	1908821	47.8 47.8	47.8 47.8	47.8	47.8	47.8
13C5 PFNA	Ave	3997110 2482043	3902011 2176766	3887506	3619357	3266288	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDA	Ave	3143437 1884965	2962171 1633067	3379637	2839856	2584731	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C8 FOSA	Ave	6949998 4867961	6698828 4327875	7562660	6834485	6628551	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFUnA	Ave	4595181 2689857	4402566 2288823	4370522	4182650	3791839	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDoA	Ave	5267912 3633475	4850596 3085918	5432350	4864529	4620549	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFTeDA	Ave	4684783 3275932	4205754 2857848	4828661	4362467	4166575	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFHxDA	Ave	6973385 5223563	6482747 4743139	7163241	6866465	6643909	50.0 50.0	50.0 50.0	50.0	50.0	50.0

Curve Type Legend:

Ave = Average

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica SacramentoJob No.: 320-18986-1Analy Batch No.: 112007

SDG No.: _____

Instrument ID: A6GC Column: AcquityID: 2.1(mm)Heated Purge: (Y/N) NCalibration Start Date: 05/31/2016 12:51Calibration End Date: 05/31/2016 14:59Calibration ID: 21842

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-112007/3	31MAY2016A6A_003.d
Level 2	STD 320-112007/4	31MAY2016A6A_004.d
Level 3	STD 320-112007/5	31MAY2016A6A_005.d
Level 4	STD 320-112007/6	31MAY2016A6A_006.d
Level 5	STD 320-112007/7	31MAY2016A6A_007.d
Level 6	STD 320-112007/8	31MAY2016A6A_008.d
Level 7	STD 320-112007/9	31MAY2016A6A_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7				LVL 6	LVL 7			
Perfluorobutanoic acid (PFBA)		AveID	++++ 6720179	30976 11523989	226960	764950	2124537	++++ 200	1.00 400	5.00	20.0	50.0
Perfluoropentanoic acid (PFPeA)		AveID	50665 11617905	76403 19814969	397624	1486524	3765270	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorobutanesulfonic acid (PFBS)		AveID	17943 6110567	40318 10786825	191295	691572	1866850	0.442 177	0.884 354	4.42	17.7	44.2
Perfluorohexanoic acid (PFHxA)		AveID	33231 11962395	71362 20870280	422198	1494943	3649464	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoroheptanoic acid (PFHpA)		L1ID	++++ 11841967	110770 20712505	511502	1587434	4286583	++++ 200	1.00 400	5.00	20.0	50.0
Perfluorohexanesulfonic acid (PFHxS)		AveID	14234 4351661	28774 7345254	175241	587126	1467407	0.473 189	0.946 378	4.73	18.9	47.3
Perfluorooctanoic acid (PFOA)		AveID	48857 10721047	82635 18041857	438664	1543711	3760545	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoroheptanesulfonic Acid (PFHpS)		L2ID	++++ 4450812	21384 7412646	186662	673415	1603386	++++ 190	0.952 381	4.76	19.0	47.6
Perfluorooctanesulfonic acid (PFOS)		AveID	++++ 7229088	43823 11431237	275691	1013086	2717455	++++ 191	0.956 382	4.78	19.1	47.8
Perfluorononanoic acid (PFNA)		AveID	++++ 8509750	76977 14441472	330489	1092851	2958176	++++ 200	1.00 400	5.00	20.0	50.0
Perfluorodecanoic acid (PFDA)		AveID	33047 9897323	79213 17011559	431327	1343196	3452418	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorooctane Sulfonamide (FOSA)		AveID	++++ 16855550	94929 28215564	608860	2125370	5239897	++++ 200	1.00 400	5.00	20.0	50.0
Perfluorodecanesulfonic acid (PFDS)		L1ID	++++ 4518038	38938 7388958	207924	699570	1627317	++++ 193	0.964 386	4.82	19.3	48.2
Perfluoroundecanoic acid (PFUnA)		L2ID	++++ 11435145	127094 20032158	481092	1572228	3887233	++++ 200	1.00 400	5.00	20.0	50.0
Perfluorododecanoic acid (PFDoA)		AveID	40320 12747780	82131 21331668	477282	1538810	3884314	0.500 200	1.00 400	5.00	20.0	50.0

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1 Analy Batch No.: 112007

SDG No.: _____

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) NCalibration Start Date: 05/31/2016 12:51 Calibration End Date: 05/31/2016 14:59 Calibration ID: 21842

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7				LVL 6	LVL 7			
Perfluorotridecanoic Acid (PFTriA)		AveID	59702 14346430	119146 24683868	688014	1970539	5450962	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorotetradecanoic acid (PFTeA)		L2ID	73524 12874426	112219 22175922	552449	1680871	4116786	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	++++ 21367734	287385 37073350	935306	2838801	7408407	++++ 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-octadecanoic acid (PFODA)		AveID	75240 22636301	139236 42435932	681363	2604852	7264490	0.500 200	1.00 400	5.00	20.0	50.0

Curve Type Legend:

AveID = Average isotope dilution L1ID = Linear 1/conc IsoDil L2ID = Linear 1/conc^2 IsoDil
--

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_003.d
 Lims ID: Std L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 31-May-2016 12:51:48 ALS Bottle#: 9 Worklist Smp#: 3
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L1
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9
 Method: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 14:12:58 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: barnettj Date: 31-May-2016 16:13:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.806	5.803	0.003	1331127	54.6		109	583	
2 Perfluorobutyric acid	212.9 > 169.0	5.819	5.806	0.013	13906	0.3416		68.3	693	
D 3 13C5-PFPeA	267.9 > 223.0	6.969	6.968	0.001	3925096	61.8		124	11143	
4 Perfluoropentanoic acid	262.9 > 219.0	6.974	6.970	0.004	50665	0.5586		112	38.6	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.106	7.099	0.007	17943	0.4154		94.0		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.106	7.099	0.007	17943	NC			8.6	
	298.9 > 99.0	7.113	7.099	0.014	6555		2.74(0.00-0.00)		20.9	
D 6 13C2 PFHxA	315.0 > 270.0	8.252	8.252	0.0	3488446	56.9		114	62698	
7 Perfluorohexanoic acid	313.0 > 269.0	8.252	8.253	-0.001	33231	0.4223		84.5	3095	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.493	9.494	-0.001	33507	0.0705		14.1	1286	
D 8 13C4-PFHpA	367.0 > 322.0	9.499	9.495	0.004	4028812	58.7		117	28638	
D 11 18O2 PFHxS	403.0 > 84.0	9.531	9.532	-0.001	1571368	51.0		108	16549	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.538	9.533	0.005	14234	NC			127	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.538	9.533	0.005	14234	0.4575		96.7		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.623	10.612	0.011		4549323	62.5		125	13875	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.623	10.612	0.011	1.000	48857	0.5231		105	50.4	
413.0 > 169.0	10.623	10.612	0.011	1.000	13214		3.70(0.00-0.00)	105	15.9	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.632	10.622	0.010	1.000	13716	NC			955	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.632	10.622	0.010	1.000	13716	0.7215		152		
D 16 13C4 PFOS										
503.0 > 80.0	11.577	11.568	0.009		2285487	57.6		120	22927	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.577	11.571	0.006	1.000	26660	0.4513		94.4	285	
499.0 > 99.0	11.585	11.571	0.014	1.001	15622		1.71(0.00-0.00)	94.4	559	
D 17 13C5 PFNA										
468.0 > 423.0	11.594	11.589	0.005		3997110	60.0		120	70209	
18 Perfluorononanoic acid										
463.0 > 419.0	11.594	11.589	0.005	1.000	22966	0.3325		66.5	1691	
D 19 13C2 PFDA										
515.0 > 470.0	12.434	12.423	0.011		3143437	59.7		119	63563	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.434	12.423	0.011	1.000	33047	0.4182		83.6	2075	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.022	13.018	0.004	1.000	45567	0.4130		82.6	3139	
D 23 13C8 FOSA										
506.0 > 78.0	13.031	13.019	0.012		6949998	55.4		111	4270	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.094	13.081	0.013	1.000	10222	0.0774		16.1		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.094	13.081	0.013	1.000	10222	NC			715	
D 26 13C2 PFUnA										
565.0 > 520.0	13.137	13.124	0.013		4595181	61.1		122	44194	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.137	13.124	0.013	1.000	79413	0.4393		87.9	5774	
D 28 13C2 PFDaA										
615.0 > 570.0	13.730	13.718	0.012		5267912	58.1		116	29976	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.730	13.718	0.012	1.000	40320	0.4569		91.4	41.0	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.228	14.220	0.008	1.000	59702	0.5081		102	127	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.648	14.643	0.005		4684783	57.8		116	10225	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.655	14.644	0.011	1.000	73524	0.4951		99.0	62.8	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.229	15.223	0.006		6973385	55.3		111	10112	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.229	15.223	0.006	1.000	243520	0.5653		113	742	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.496	15.493	0.003	1.000	75240	0.4851	97.0	185	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L1_00019

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_003.d

Injection Date: 31-May-2016 12:51:48

Instrument ID: A6

Lims ID: Std L1

Client ID:

Operator ID: JRB

ALS Bottle#: 9

Worklist Smp#: 3

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

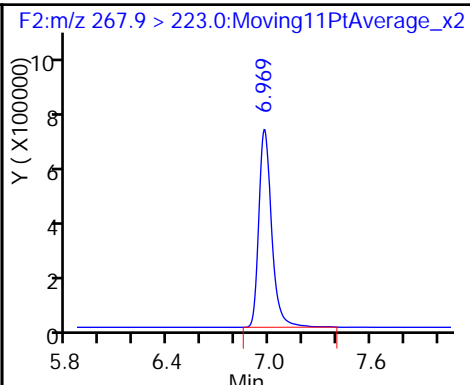
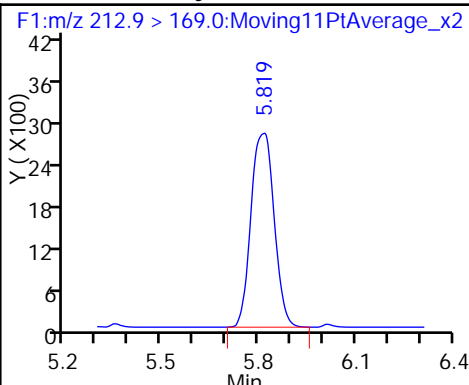
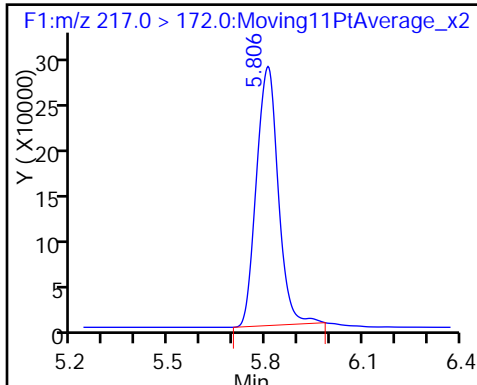
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

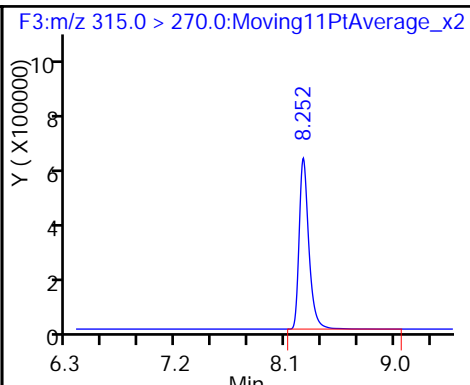
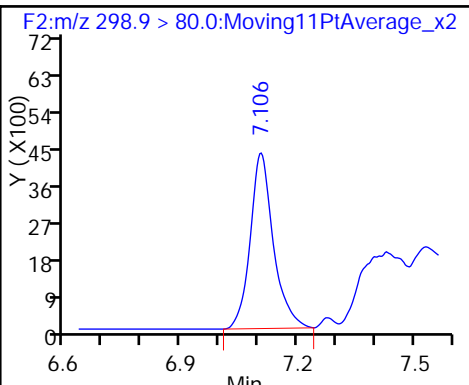
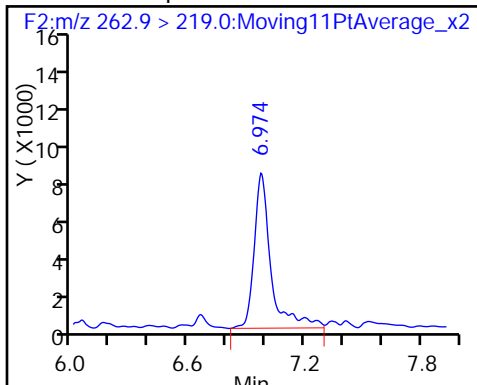
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

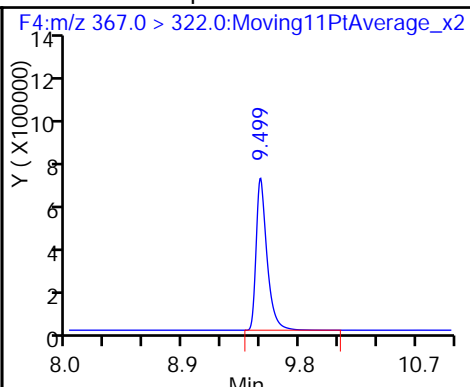
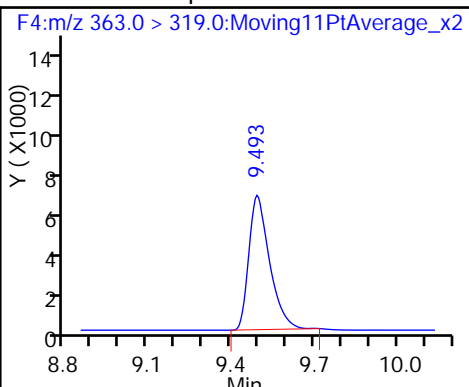
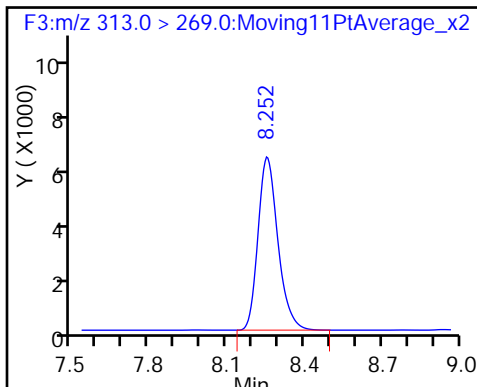
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

9 Perfluoroheptanoic acid

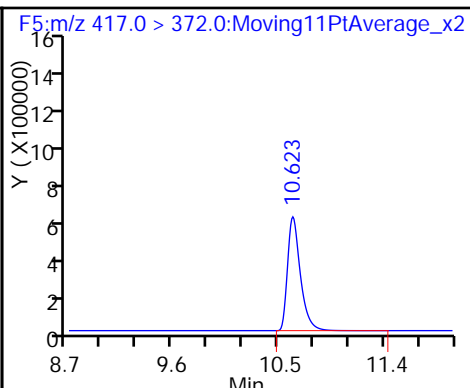
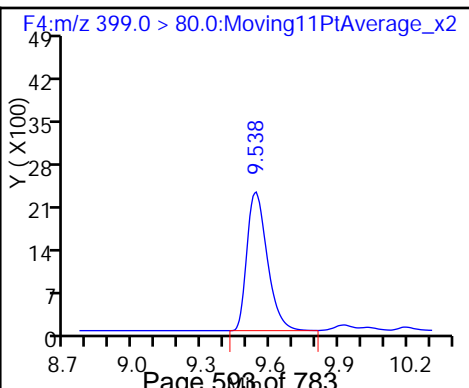
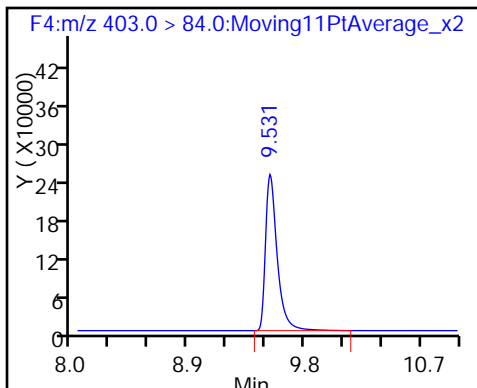
D 8 13C4-PFHpA

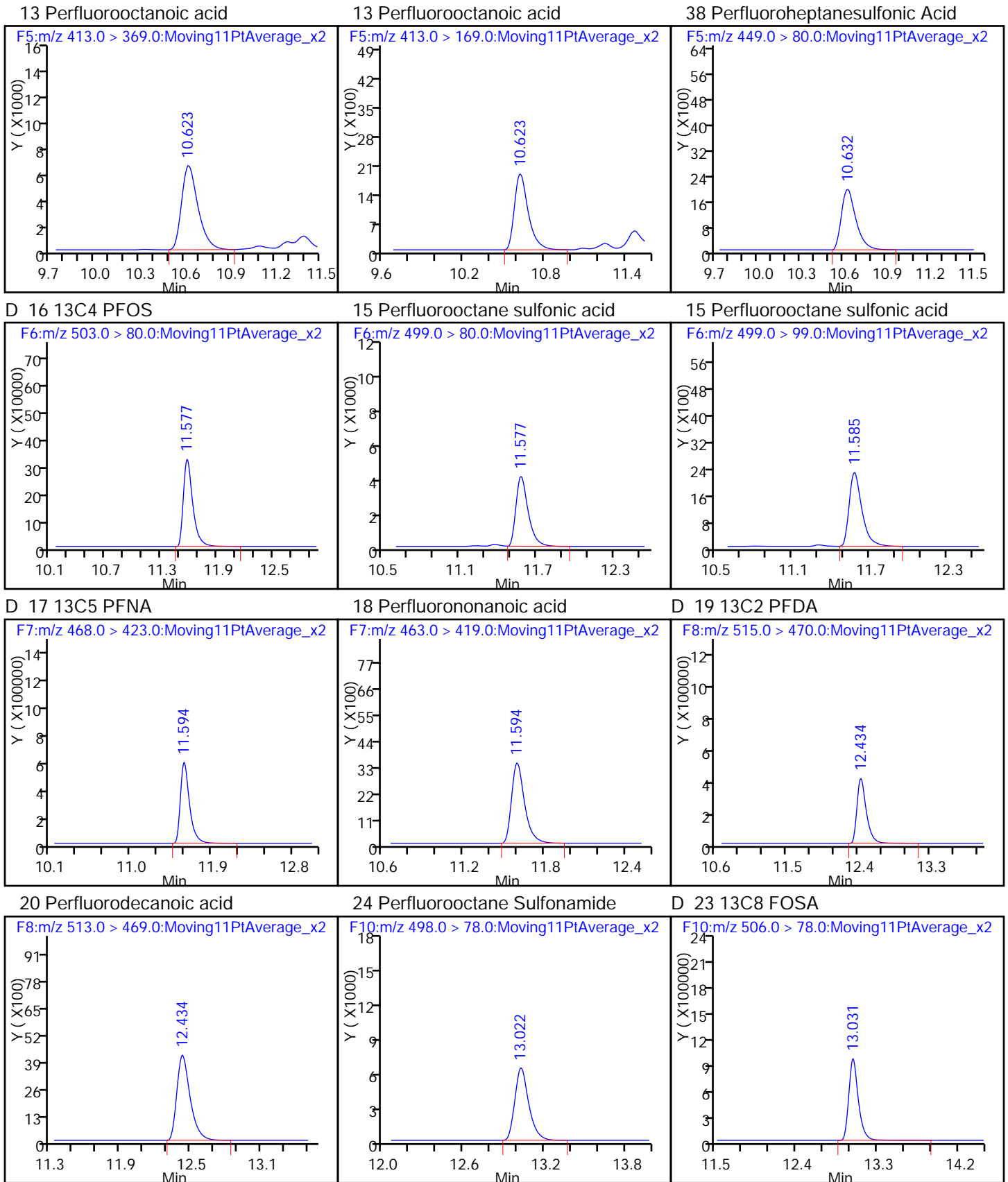


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

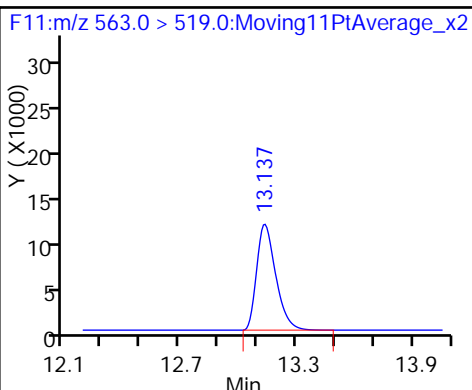
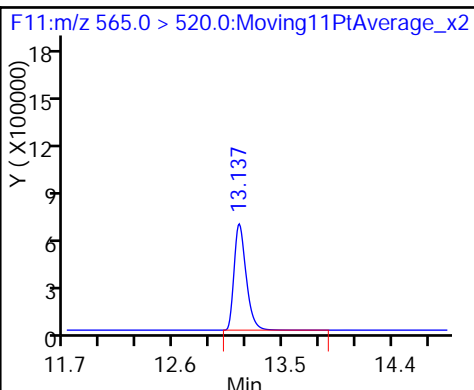
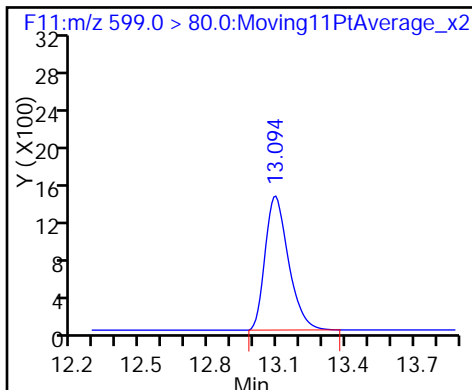




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

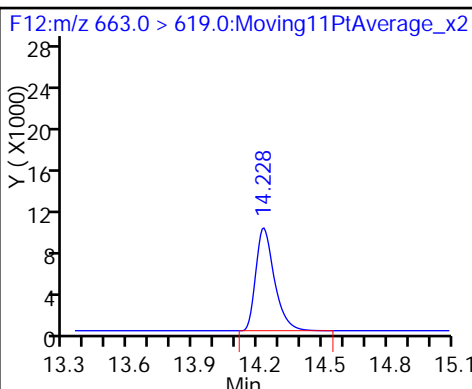
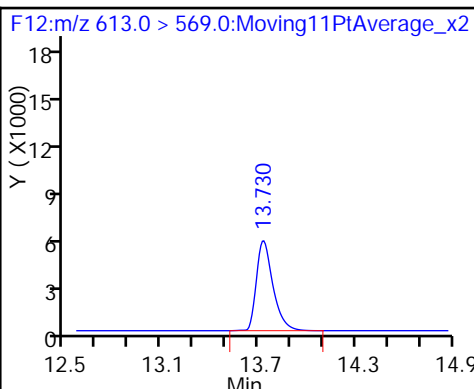
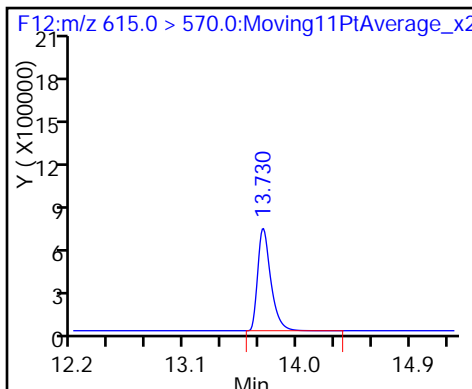
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

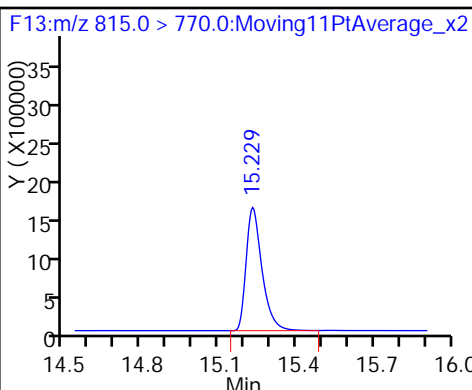
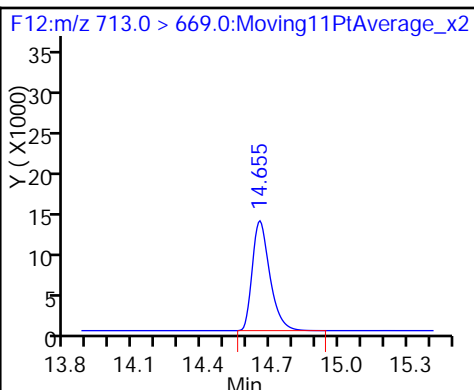
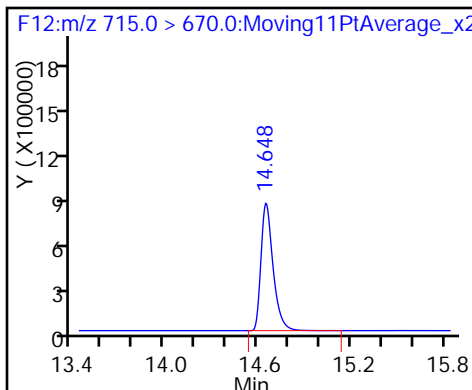
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

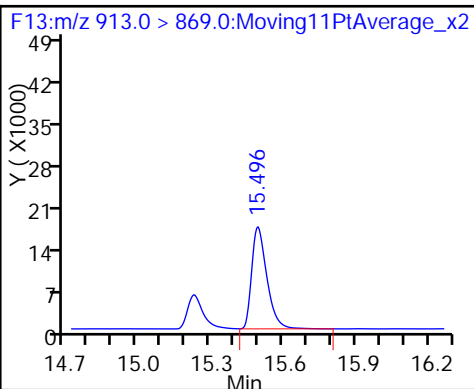
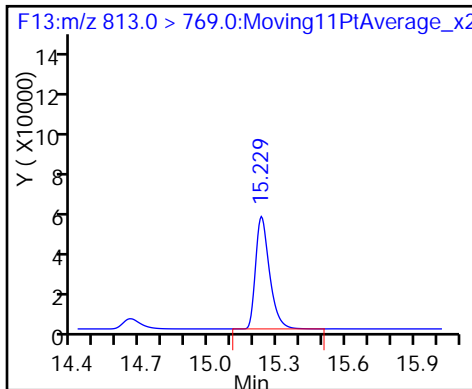
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_004.d
 Lims ID: Std L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 31-May-2016 13:13:05 ALS Bottle#: 10 Worklist Smp#: 4
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L2
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9
 Method: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 14:13:01 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: barnettj Date: 31-May-2016 16:20:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.806	5.803	0.003	1301198	53.4		107	10042	
2 Perfluorobutyric acid	212.9 > 169.0	5.809	5.806	0.003	30976	0.7785		77.8	977	
D 3 13C5-PFPeA	267.9 > 223.0	6.974	6.968	0.006	3405590	53.6		107	3399	
4 Perfluoropentanoic acid	262.9 > 219.0	6.969	6.970	-0.001	76403	0.9709		97.1	52.9	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.102	7.099	0.003	40318	0.9693		110		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.102	7.099	0.003	40318	NC			23.0	
	298.9 > 99.0	7.102	7.099	0.003	21372		1.89(0.00-0.00)		68.7	
D 6 13C2 PFHxA	315.0 > 270.0	8.258	8.252	0.006	3147638	51.4		103	9930	
7 Perfluorohexanoic acid	313.0 > 269.0	8.258	8.253	0.005	71362	1.01		101	6738	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.499	9.494	0.005	110770	0.9792		97.9	9430	
D 8 13C4-PFHpA	367.0 > 322.0	9.499	9.495	0.004	3809003	55.5		111	217555	
D 11 18O2 PFHxS	403.0 > 84.0	9.538	9.532	0.006	1513092	49.1		104	6808	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.538	9.533	0.005	28774	NC			110	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.538	9.533	0.005	28774	0.9604		102		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.614	10.612	0.002		4156783	57.1		114	5449	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.614	10.612	0.002	1.000	82635	0.9683		96.8	44.0	
413.0 > 169.0	10.623	10.612	0.011	1.001	37155		2.22(0.00-0.00)	96.8	131	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.632	10.622	0.010	1.000	21384	NC			1453	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.632	10.622	0.010	1.000	21384	0.9414		98.9		
D 16 13C4 PFOS										
503.0 > 80.0	11.577	11.568	0.009		2171603	54.7		114	101988	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.585	11.571	0.014	1.000	43823	0.7808		81.7	233	
499.0 > 99.0	11.577	11.571	0.006	0.999	29380		1.49(0.00-0.00)	81.7	2146	
D 17 13C5 PFNA										
468.0 > 423.0	11.595	11.589	0.006		3902011	58.5		117	29144	
18 Perfluorononanoic acid										
463.0 > 419.0	11.595	11.589	0.006	1.000	76977	1.14		114	5547	
D 19 13C2 PFDA										
515.0 > 470.0	12.425	12.423	0.002		2962171	56.3		113	25747	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.425	12.423	0.002	1.000	79213	1.06		106	4830	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.021	13.018	0.003	1.000	94929	0.8927		89.3	3193	
D 23 13C8 FOSA										
506.0 > 78.0	13.021	13.019	0.002		6698828	53.4		107	7749	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.084	13.081	0.003	1.000	38938	0.8685		90.1		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.084	13.081	0.003	1.000	38938	NC			2875	
D 26 13C2 PFUnA										
565.0 > 520.0	13.128	13.124	0.004		4402566	58.5		117	90464	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.128	13.124	0.004	1.000	127094	1.01		101	9305	
D 28 13C2 PFDaA										
615.0 > 570.0	13.719	13.718	0.001		4850596	53.5		107	14103	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.719	13.718	0.001	1.000	82131	1.01		101	261	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.227	14.220	0.007	1.000	119146	1.10		110	202	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.647	14.643	0.004		4205754	51.9		104	6513	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.647	14.644	0.003	1.000	112219	1.01		101	43.1	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.228	15.223	0.005		6482747	51.5		103	8800	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.228	15.223	0.005	1.000	287385	1.01		101	128	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.495	15.493	0.002	1.000	139236	0.9749	97.5	282	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L2_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_004.d

Injection Date: 31-May-2016 13:13:05

Instrument ID: A6

Lims ID: Std L2

Client ID:

Operator ID: JRB

ALS Bottle#: 10

Worklist Smp#: 4

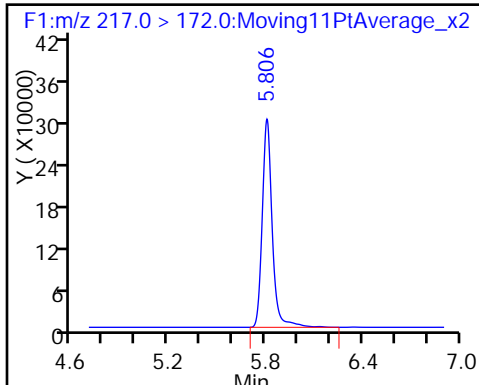
Injection Vol: 15.0 ul

Dil. Factor: 1.0000

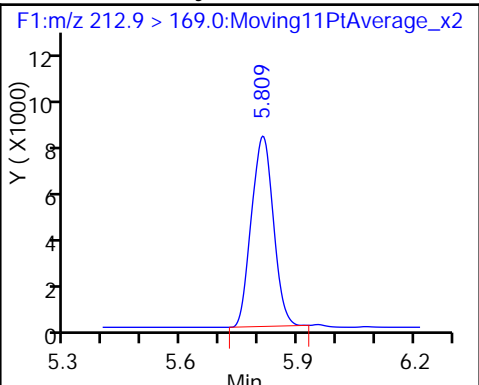
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Limit Group: LC PFC_DOD ICAL

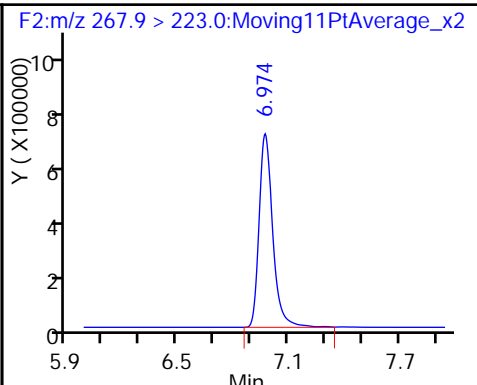
D 1 13C4 PFBA



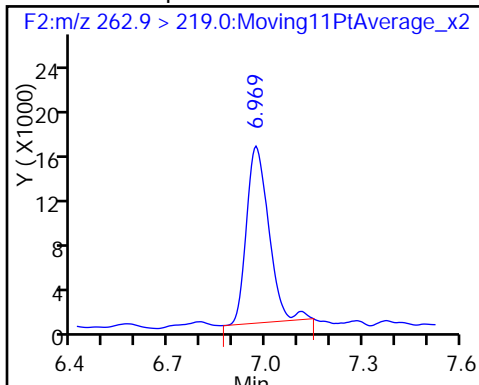
2 Perfluorobutyric acid



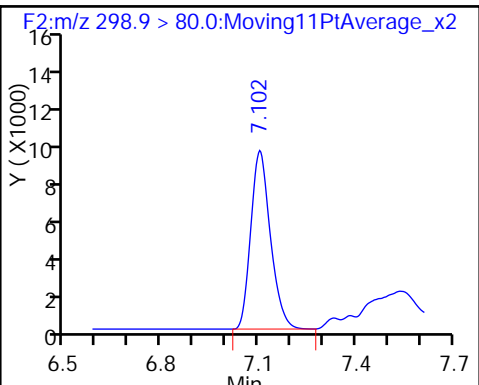
D 3 13C5-PFPeA



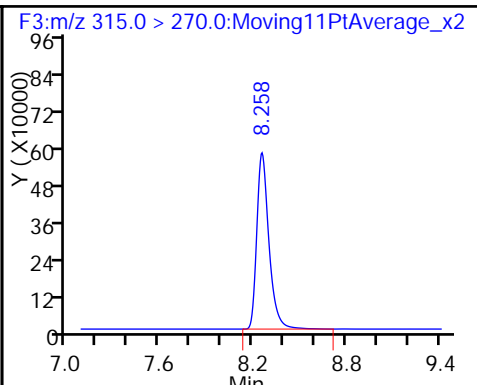
4 Perfluoropentanoic acid



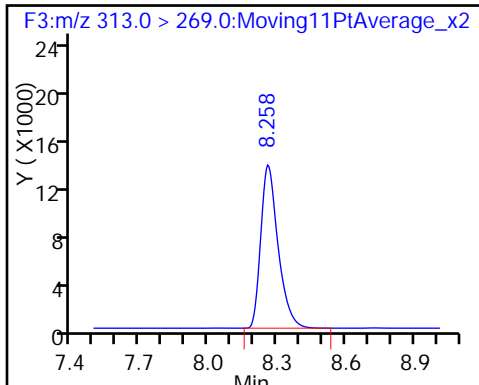
40 Perfluorobutanesulfonic acid



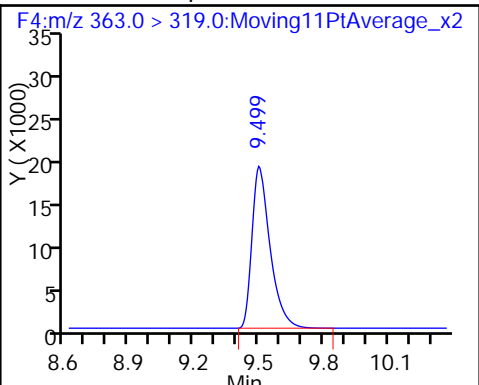
D 6 13C2 PFHxA



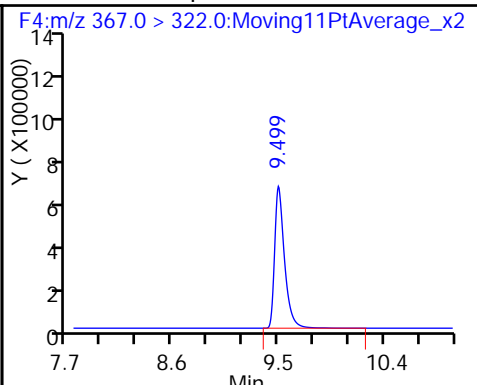
7 Perfluorohexanoic acid



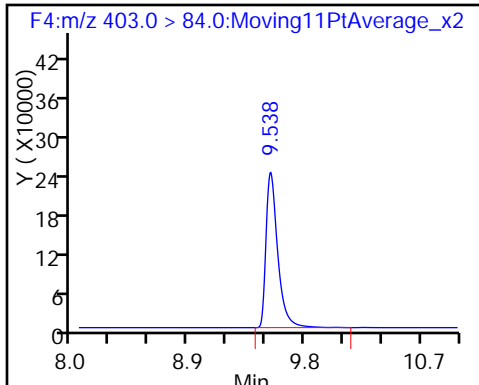
9 Perfluoroheptanoic acid



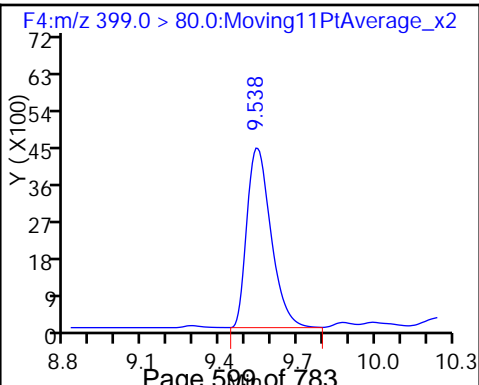
D 8 13C4-PFHpA



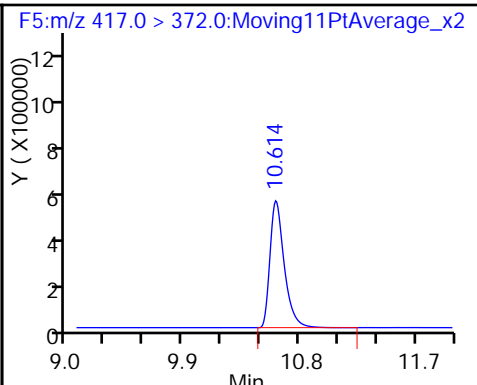
D 11 18O2 PFHxS

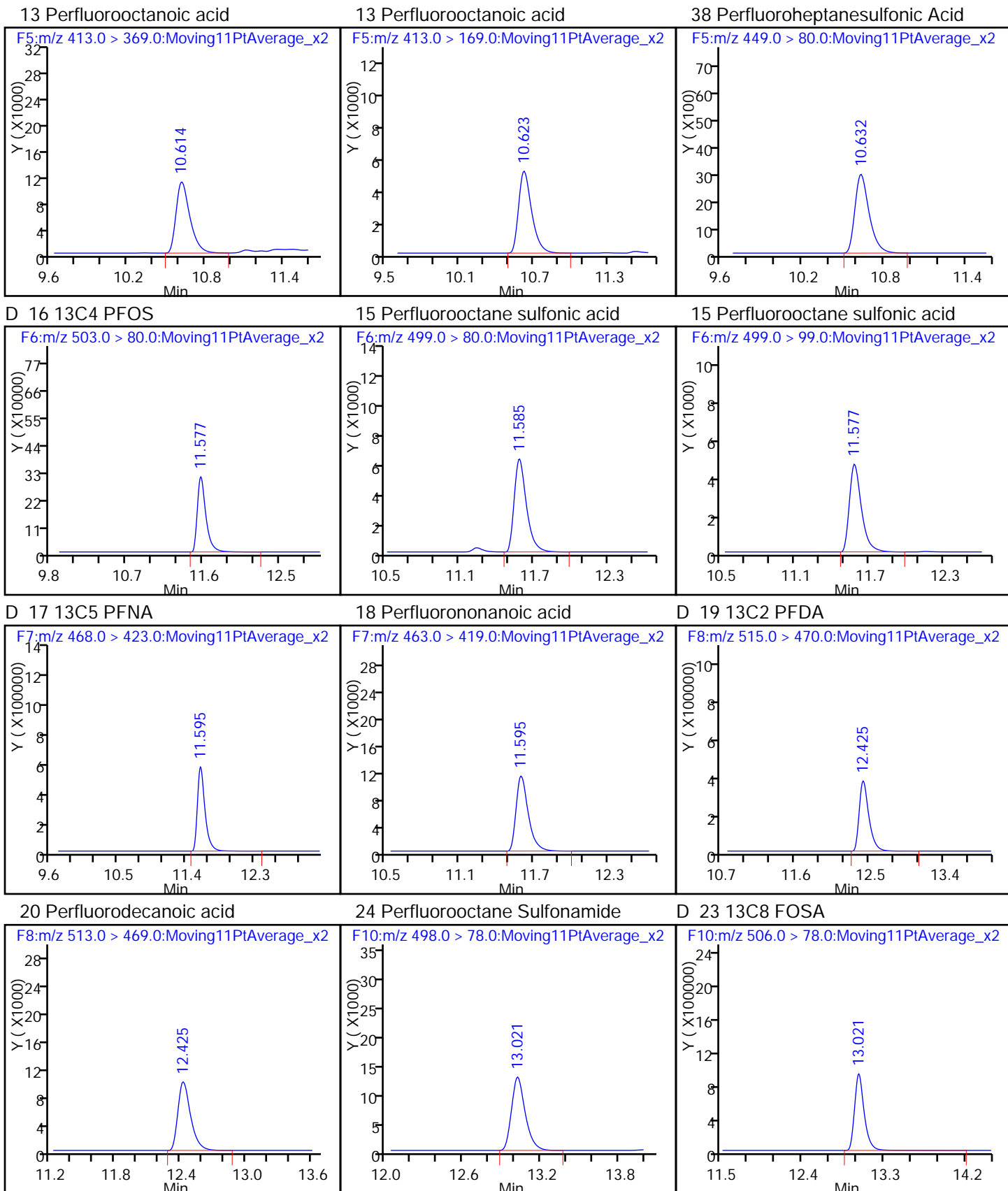


41 Perfluorohexanesulfonic acid



D 12 13C4 PFOA

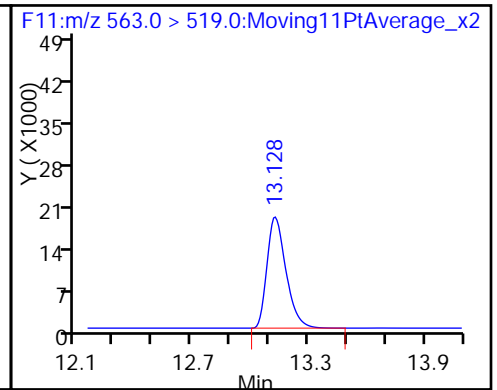
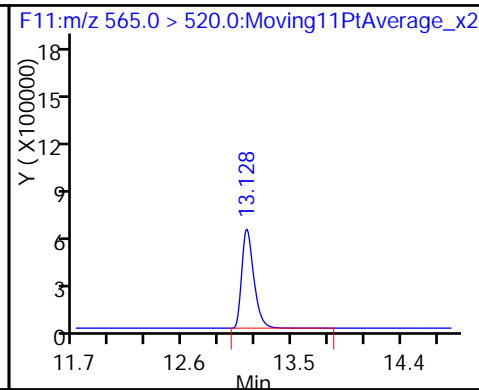
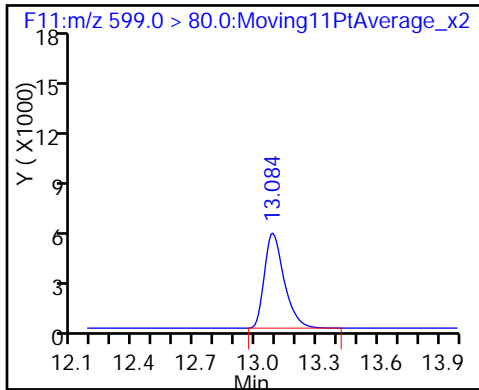




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUa

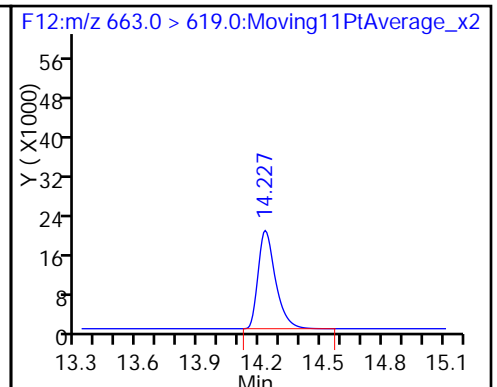
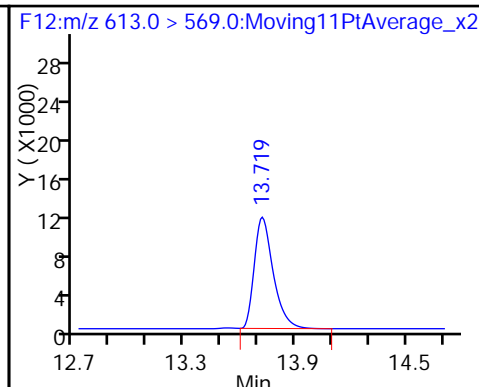
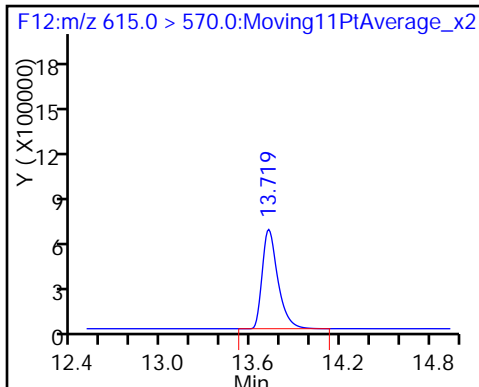
27 Perfluoroundecanoic acid



D 28 13C2 PFDa

29 Perfluorododecanoic acid

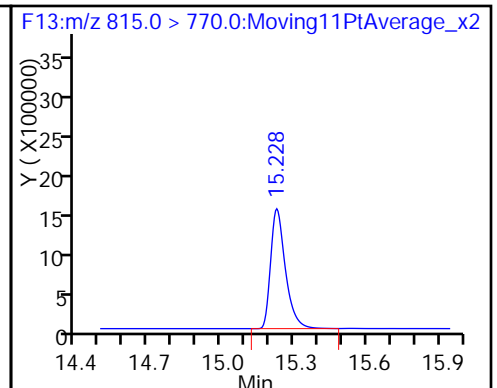
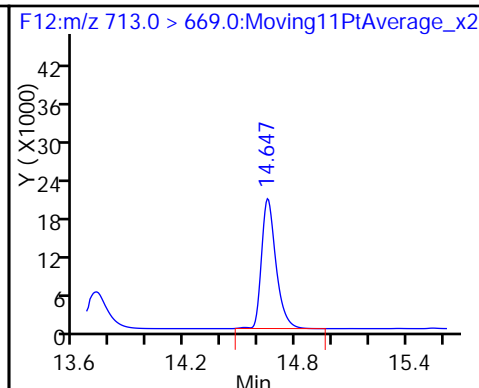
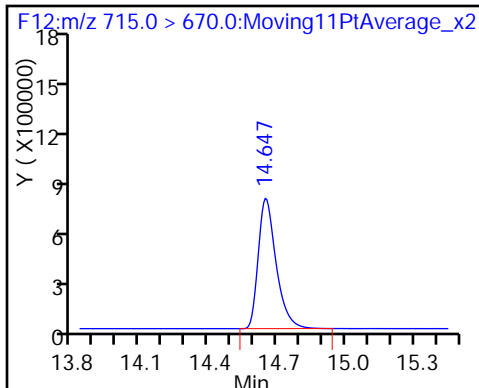
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

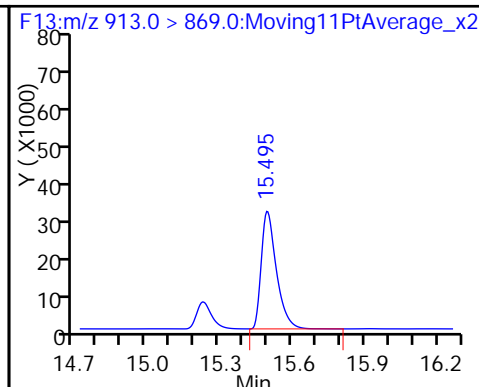
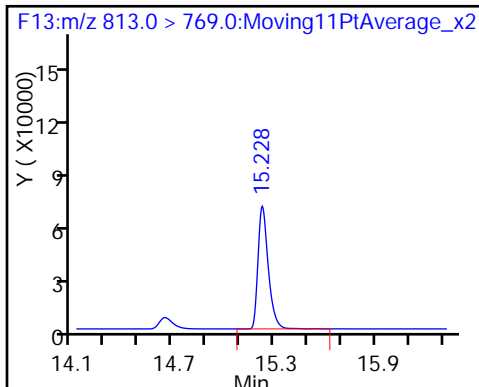
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_005.d
 Lims ID: Std L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 31-May-2016 13:34:22 ALS Bottle#: 11 Worklist Smp#: 5
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L3
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9
 Method: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 14:13:05 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.803	5.803	0.0	1376019	56.4		113	141569	
2 Perfluorobutyric acid	212.9 > 169.0	5.806	5.806	0.0	226960	5.39		108	8222	
D 3 13C5-PFPeA	267.9 > 223.0	6.969	6.968	0.001	3647062	57.4		115	9847	
4 Perfluoropentanoic acid	262.9 > 219.0	6.974	6.970	0.004	397624	4.72		94.4	146	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.102	7.099	0.003	191295	3.80		86.1		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.102	7.099	0.003	191295	NC			87.1	
	298.9 > 99.0	7.099	7.099	0.0	103225		1.85(0.00-0.00)		139	
D 6 13C2 PFHxA	315.0 > 270.0	8.252	8.252	0.0	3404519	55.6		111	7609	
7 Perfluorohexanoic acid	313.0 > 269.0	8.252	8.253	-0.001	422198	5.50		110	6345	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.498	9.494	0.004	511502	5.18		104	21767	
D 8 13C4-PFHpA	367.0 > 322.0	9.498	9.495	0.003	4086096	59.5		119	23293	
D 11 18O2 PFHxS	403.0 > 84.0	9.531	9.532	-0.001	1829184	59.3		125	3506	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.531	9.533	-0.002	175241	NC			505	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.531	9.533	-0.002	175241	4.84		102		
D 12 13C4 PFOA	417.0 > 372.0	10.614	10.612	0.002	4499170	61.8		124	98027	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.614	10.612	0.002	1.000	438664	4.75		95.0	252	
413.0 > 169.0	10.614	10.612	0.002	1.000	151535		2.89(0.00-0.00)	95.0	203	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.623	10.622	0.001	1.000	186662	NC			12345	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.623	10.622	0.001	1.000	186662	5.07		106		
D 16 13C4 PFOS										
503.0 > 80.0	11.568	11.568	0.0		2276752	57.3		120	159851	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.568	11.571	-0.003	1.000	275691	4.69		98.0	1285	
499.0 > 99.0	11.568	11.571	-0.003	1.000	160311		1.72(0.00-0.00)	98.0	11252	
D 17 13C5 PFNA										
468.0 > 423.0	11.586	11.589	-0.003		3887506	58.3		117	9266	
18 Perfluorononanoic acid										
463.0 > 419.0	11.586	11.589	-0.003	1.000	330489	4.92		98.4	4328	
D 19 13C2 PFDA										
515.0 > 470.0	12.424	12.423	0.001		3379637	64.2		128	34431	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.424	12.423	0.001	1.000	431327	5.08		102	26552	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.013	13.018	-0.005	1.000	608860	5.07		101	40649	
D 23 13C8 FOSA										
506.0 > 78.0	13.013	13.019	-0.006		7562660	60.3		121	7004	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.076	13.081	-0.005	1.000	207924	5.18		108		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.076	13.081	-0.005	1.000	207924	NC			14878	
D 26 13C2 PFUnA										
565.0 > 520.0	13.120	13.124	-0.004		4370522	58.1		116	11210	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.120	13.124	-0.004	1.000	481092	4.98		99.5	23236	
D 28 13C2 PFDoA										
615.0 > 570.0	13.730	13.718	0.012		5432350	59.9		120	23930	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.730	13.718	0.012	1.000	477282	5.24		105	1125	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.228	14.220	0.008	1.000	688014	5.68		114	389	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.648	14.643	0.005		4828661	59.5		119	17366	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.648	14.644	0.004	1.000	552449	5.39		108	131	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.225	15.223	0.002		7163241	56.9		114	9261	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.225	15.223	0.002	1.000	935306	4.85		96.9	1329	
36 Perfluorooctadecanoic acid										
913.0 > 869.0	15.491	15.493	-0.002	1.000	681363	4.26		85.2	1027	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC-L3_00017

Amount Added: 1.00

Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_005.d

Injection Date: 31-May-2016 13:34:22

Instrument ID: A6

Lims ID: Std L3

Client ID:

Operator ID: JRB

ALS Bottle#: 11

Worklist Smp#: 5

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

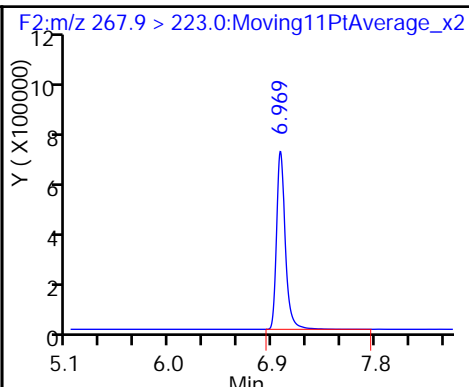
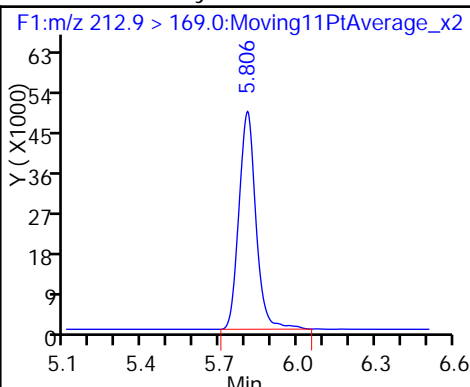
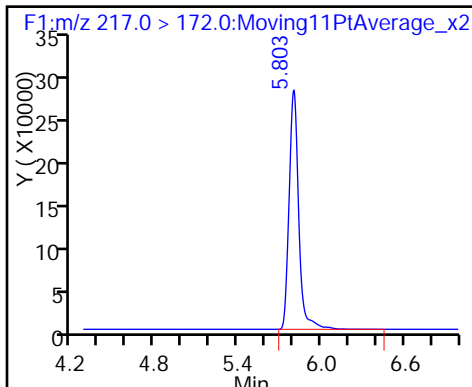
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

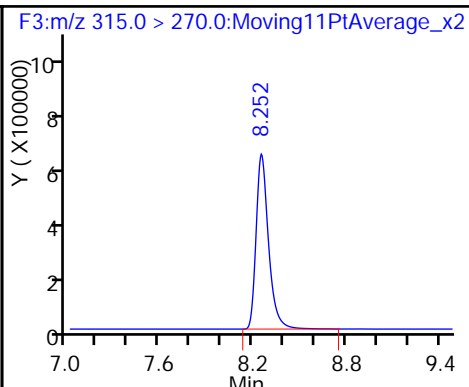
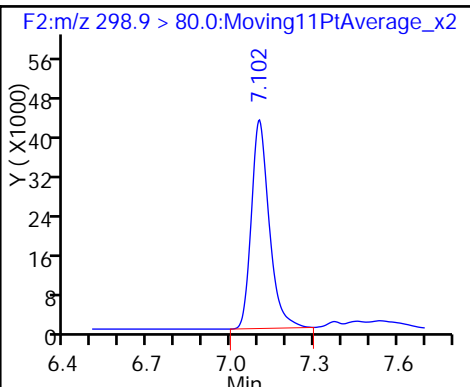
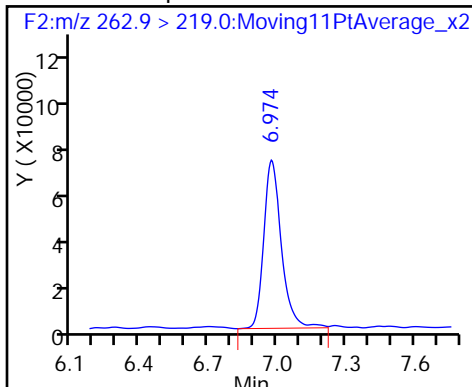
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

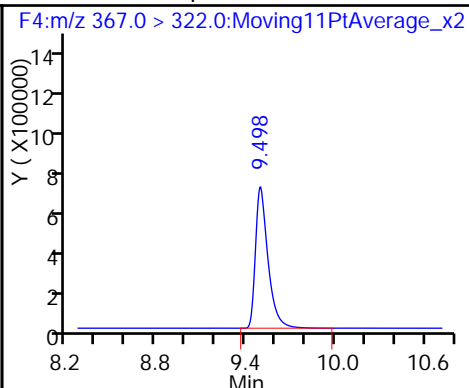
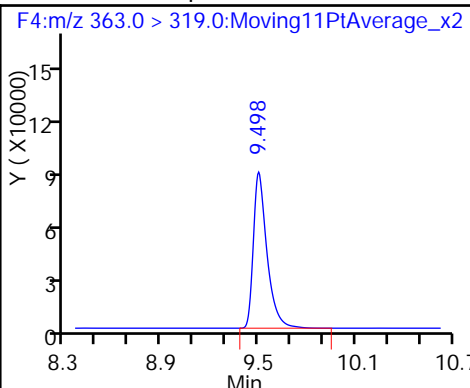
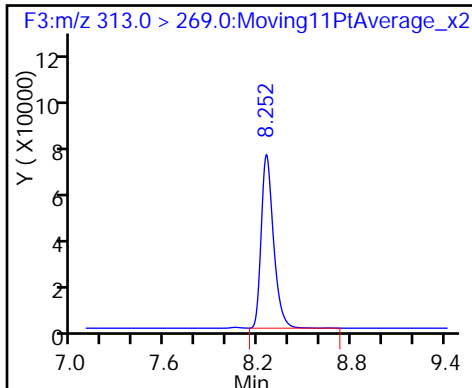
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

9 Perfluoroheptanoic acid

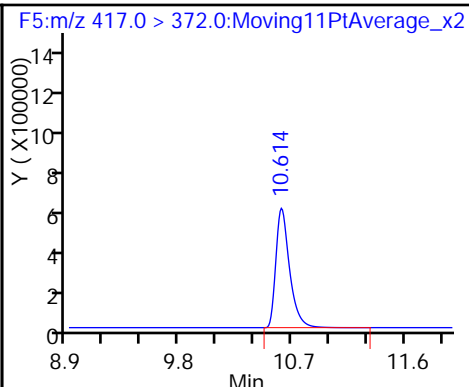
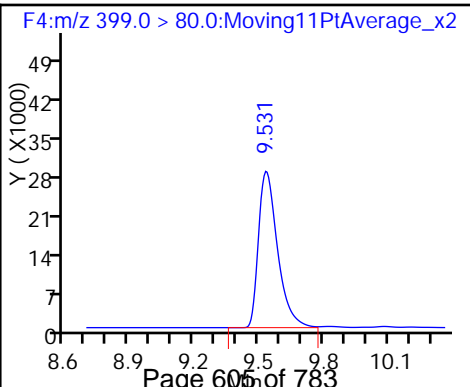
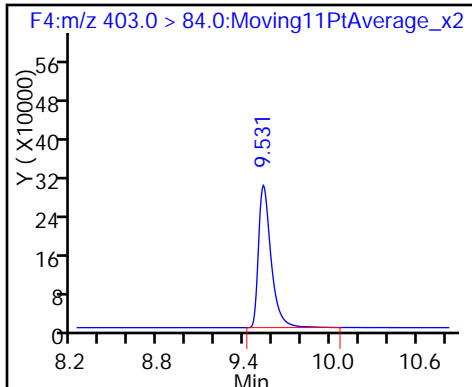
D 8 13C4-PFHpA

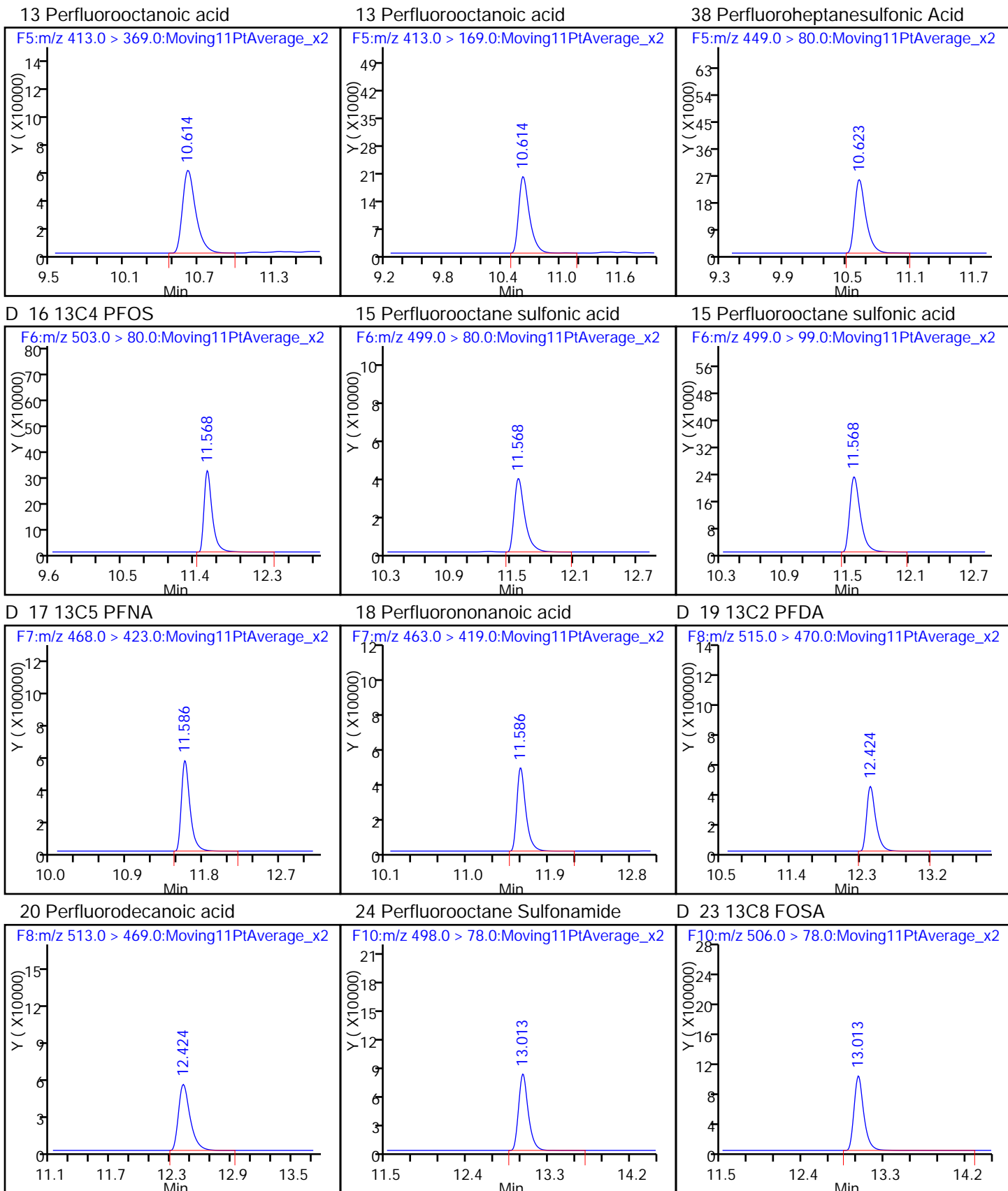


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

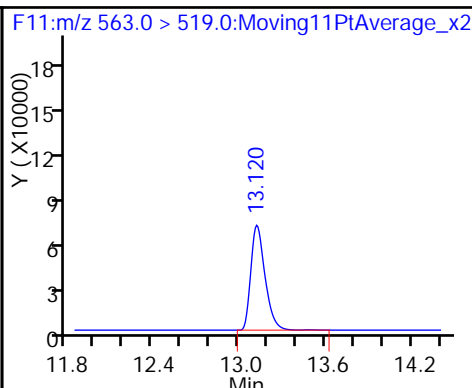
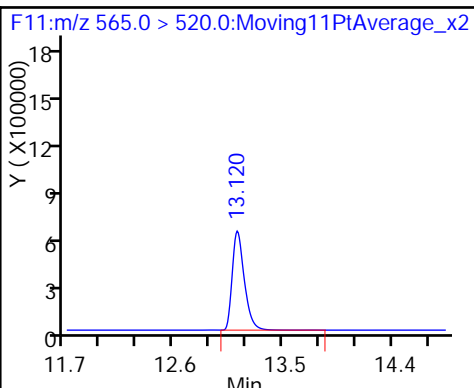
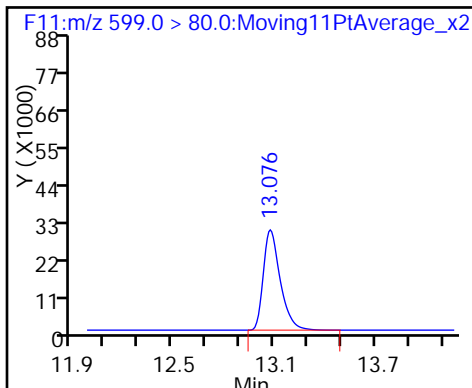




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

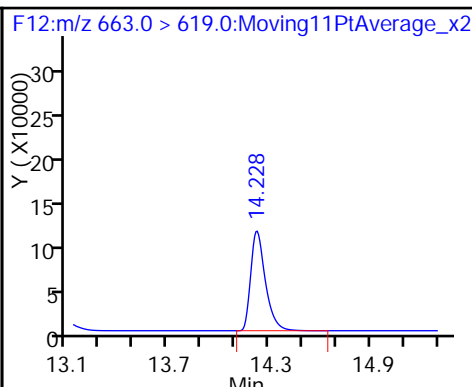
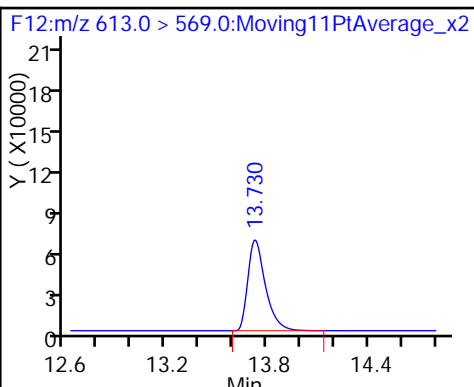
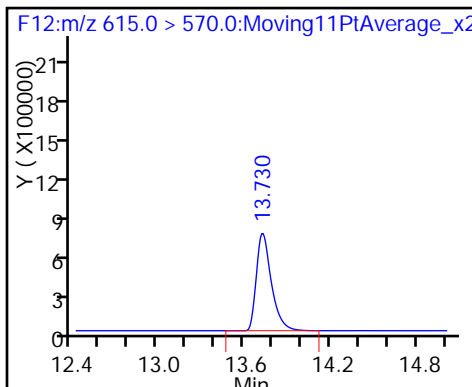
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

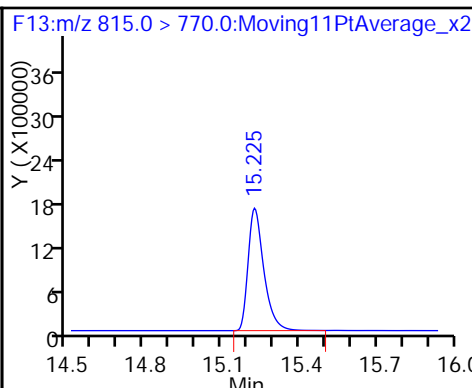
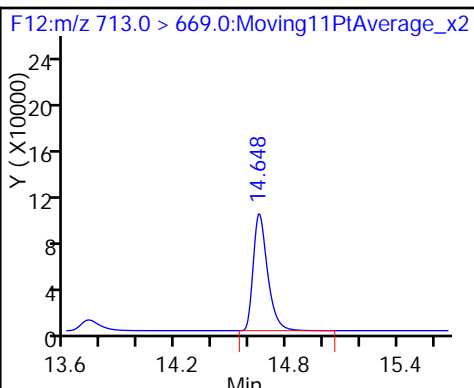
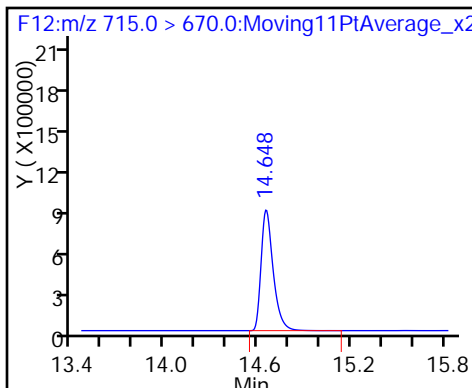
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

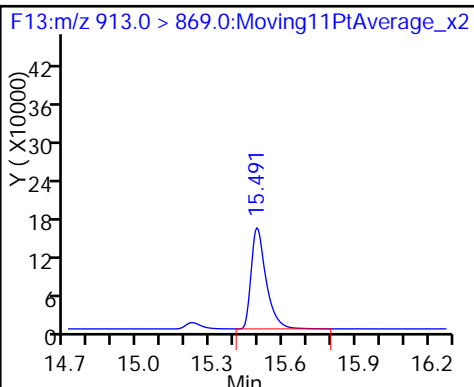
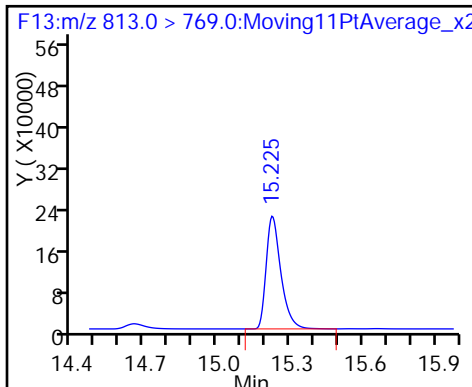
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_006.d
 Lims ID: Std L4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 31-May-2016 13:55:37 ALS Bottle#: 12 Worklist Smp#: 6
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L4
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9
 Method: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 14:13:08 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: barnettj Date: 31-May-2016 16:09:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.803	5.803	0.0	1322004	54.2		108	22046	
2 Perfluorobutyric acid	212.9 > 169.0	5.803	5.806	-0.003	1.000	764950	18.9	94.6	11892	
D 3 13C5-PFPeA	267.9 > 223.0	6.969	6.968	0.001	3428245	54.0		108	12537	
4 Perfluoropentanoic acid	262.9 > 219.0	6.969	6.970	-0.001	1.000	1486524	18.8	93.8	492	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.095	7.099	-0.004	1.000	691572	15.6	88.5		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.095	7.099	-0.004	1.000	691572	NC		177	
	298.9 > 99.0	7.095	7.099	-0.004	1.000	340981	2.03(0.00-0.00)		723	
D 6 13C2 PFHxA	315.0 > 270.0	8.252	8.252	0.0	3415124	55.7		111	13962	
7 Perfluorohexanoic acid	313.0 > 269.0	8.252	8.253	-0.001	1.000	1494943	19.4	97.0	1269	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.493	9.494	-0.001	1.000	1587434	17.8	89.2	67466	
D 8 13C4-PFHpA	367.0 > 322.0	9.493	9.495	-0.002	3830335	55.8		112	16528	
D 11 18O2 PFHxS	403.0 > 84.0	9.532	9.532	0.0	1608216	52.2		110	9170	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.532	9.533	-0.001	1.000	587126	NC		1221	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.532	9.533	-0.001	1.000	587126	18.4	97.4		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.605	10.612	-0.007		4090464	56.2		112	133672	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.605	10.612	-0.007	1.000	1543711	18.4		91.9	339	
413.0 > 169.0	10.614	10.612	0.002	1.001	594177		2.60(0.00-0.00)	91.9	343	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.614	10.622	-0.008	1.000	673415	NC			44226	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.614	10.622	-0.008	1.000	673415	18.2		95.8		
D 16 13C4 PFOS										
503.0 > 80.0	11.569	11.568	0.001		2155157	54.3		114	33409	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.569	11.571	-0.002	1.000	1013086	18.2		95.1	220	
499.0 > 99.0	11.569	11.571	-0.002	1.000	534706		1.89(0.00-0.00)	95.1	871	
D 17 13C5 PFNA										
468.0 > 423.0	11.586	11.589	-0.003		3619357	54.3		109	255914	
18 Perfluorononanoic acid										
463.0 > 419.0	11.586	11.589	-0.003	1.000	1092851	17.5		87.4	77278	
D 19 13C2 PFDA										
515.0 > 470.0	12.424	12.423	0.001		2839856	53.9		108	49434	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.424	12.423	0.001	1.000	1343196	18.8		94.1	81561	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.021	13.018	0.003	1.000	2125370	19.6		98.0	5049	
D 23 13C8 FOSA										
506.0 > 78.0	13.021	13.019	0.002		6834485	54.5		109	5796	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.075	13.081	-0.006	1.000	699570	18.9		98.0		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.075	13.081	-0.006	1.000	699570	NC			33169	
D 26 13C2 PFUnA										
565.0 > 520.0	13.119	13.124	-0.005		4182650	55.6		111	16961	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.119	13.124	-0.005	1.000	1572228	18.0		89.9	56405	
D 28 13C2 PFDaA										
615.0 > 570.0	13.701	13.718	-0.017		4864529	53.6		107	21462	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.701	13.718	-0.017	1.000	1538810	18.9		94.4	971	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.204	14.220	-0.016	1.000	1970539	18.2		90.8	1500	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.640	14.643	-0.003		4362467	53.8		108	10824	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.640	14.644	-0.004	1.000	1680871	19.0		94.9	1272	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.223	15.223	0.0		6866465	54.5		109	10752	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.223	15.223	0.0	1.000	2838801	18.8		94.1	2876	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.495	15.493	0.002	1.000	2604852	18.2	90.9	1668	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_006.d

Injection Date: 31-May-2016 13:55:37

Instrument ID: A6

Lims ID: Std L4

Client ID:

Operator ID: JRB

ALS Bottle#: 12

Worklist Smp#: 6

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

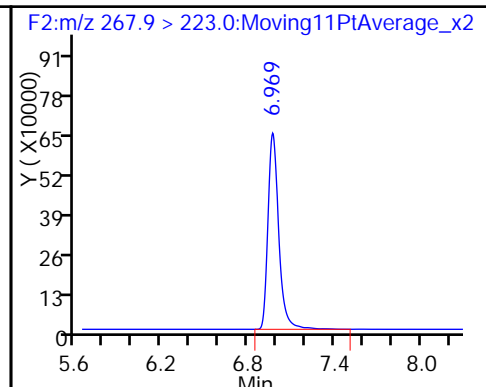
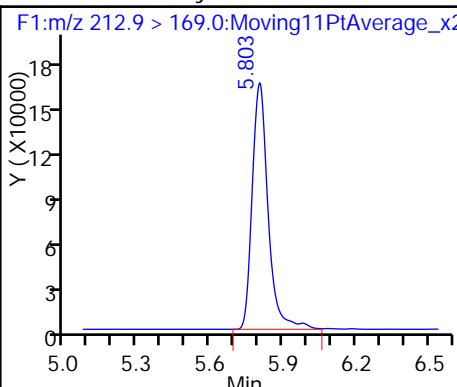
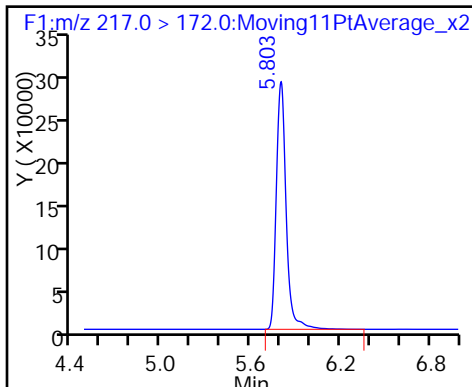
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

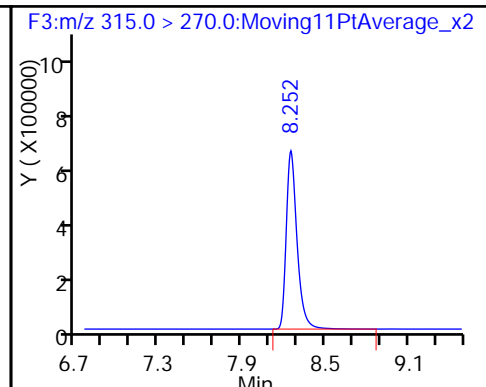
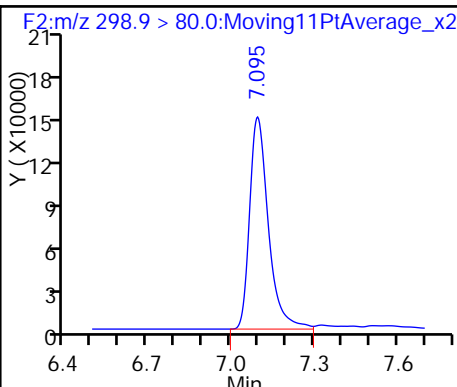
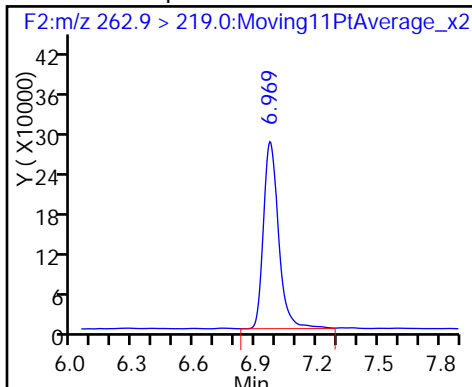
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

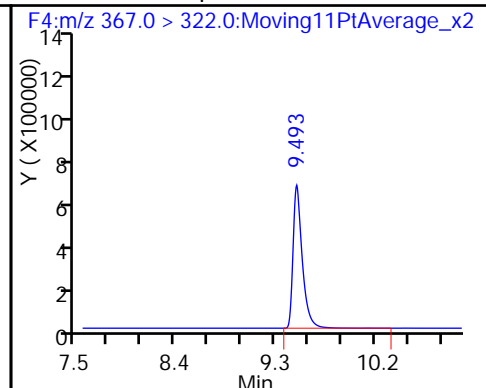
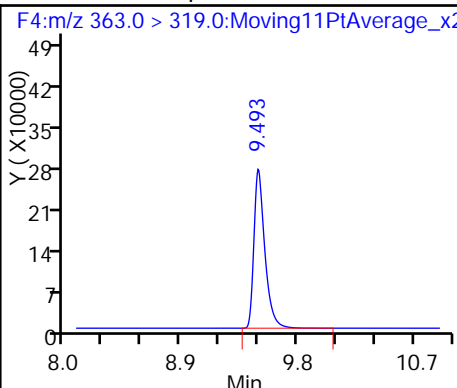
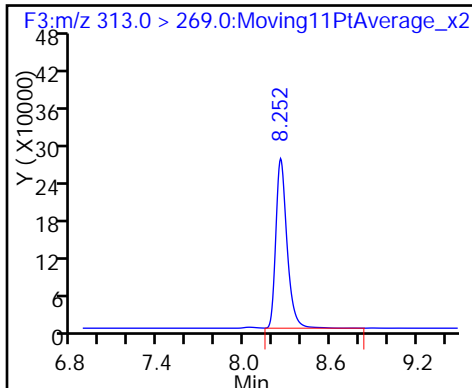
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

9 Perfluoroheptanoic acid

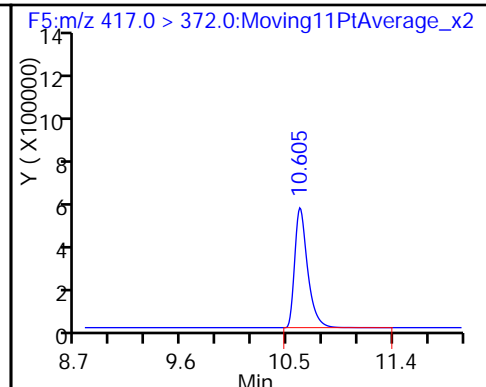
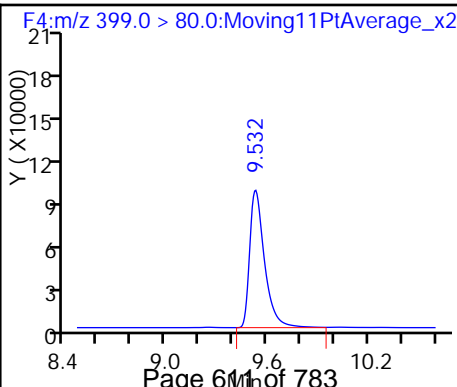
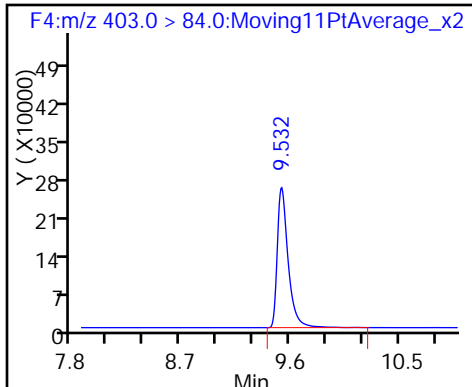
D 8 13C4-PFHpA

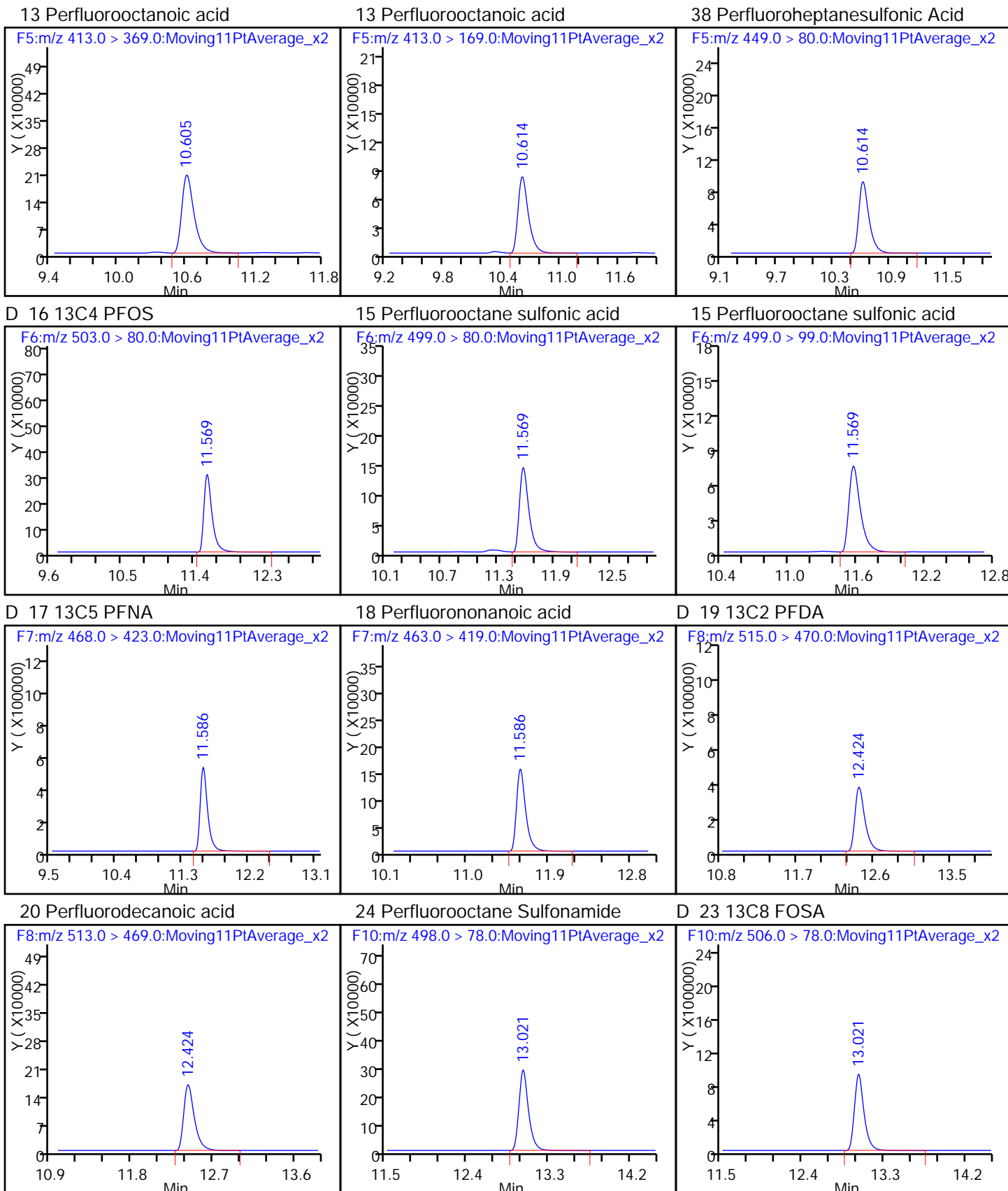


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

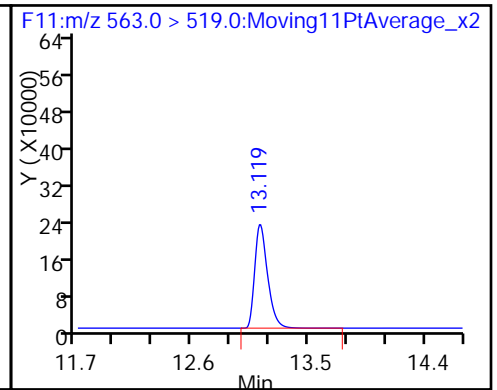
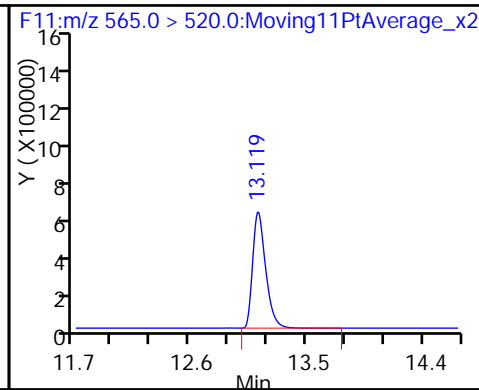
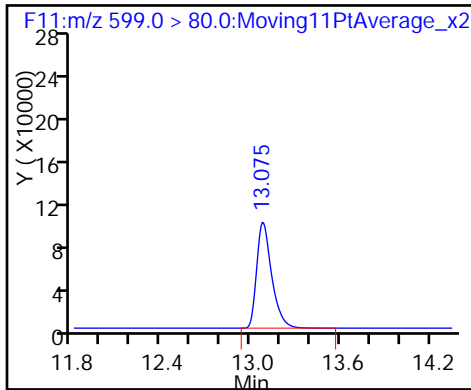




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

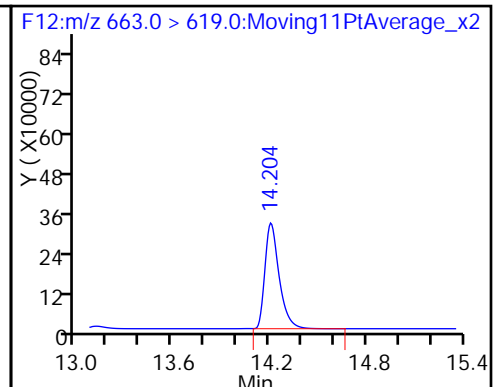
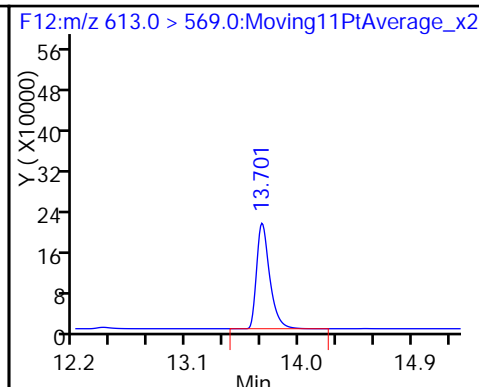
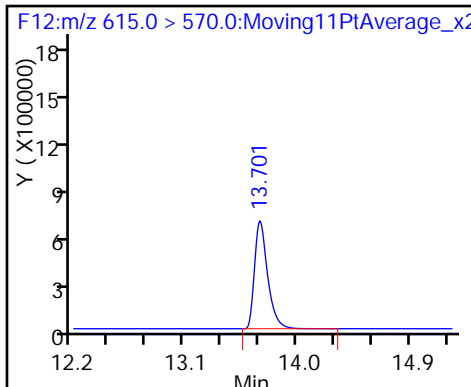
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

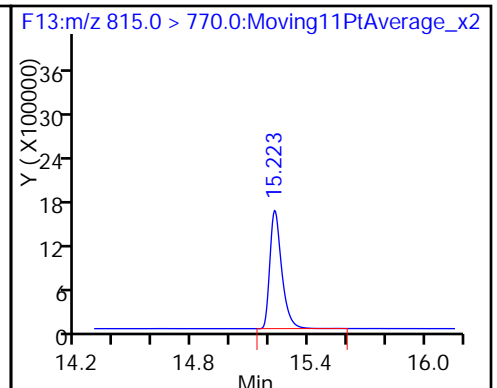
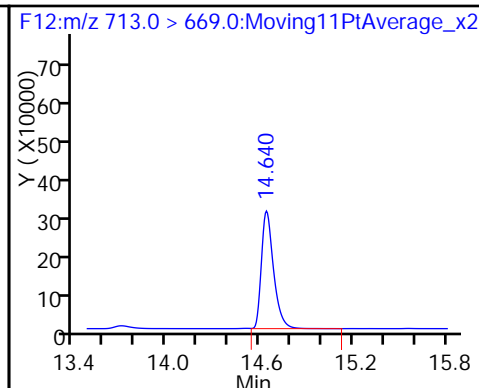
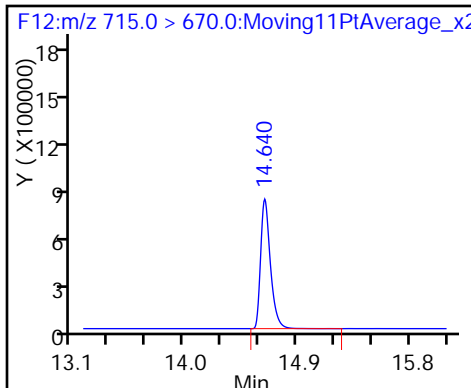
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

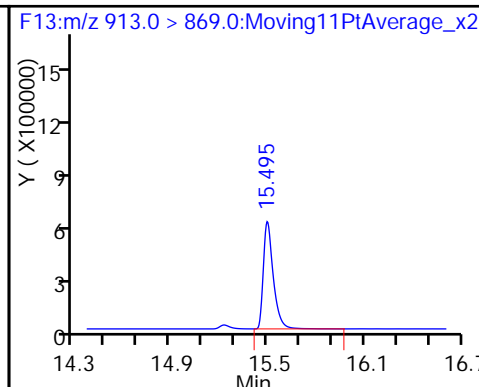
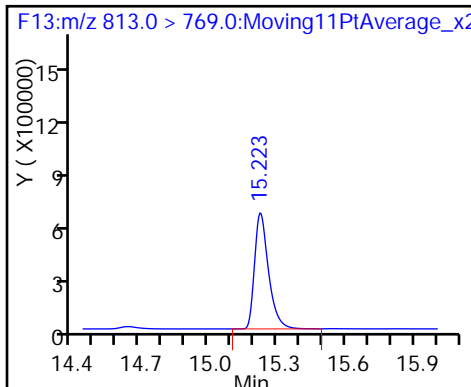
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_007.d
 Lims ID: Std L5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 31-May-2016 14:16:53 ALS Bottle#: 13 Worklist Smp#: 7
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L5
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9
 Method: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 14:13:11 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.803	5.803	0.0		1235511	50.7		101	3862	
2 Perfluorobutyric acid										
212.9 > 169.0	5.803	5.806	-0.003	1.000	2124537	56.2		112	5884	
D 3 13C5-PFPeA										
267.9 > 223.0	6.969	6.968	0.001		3195132	50.3		101	30850	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.969	6.970	-0.001	1.000	3765270	51.0		102	970	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.095	7.099	-0.004	1.000	1866850	43.3		97.9		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.095	7.099	-0.004	1.000	1866850	NC			494	
298.9 > 99.0	7.095	7.099	-0.004	1.000	932402		2.00(0.00-0.00)		635	
D 6 13C2 PFHxA										
315.0 > 270.0	8.252	8.252	0.0		3179851	51.9		104	94579	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.252	8.253	-0.001	1.000	3649464	50.9		102	1102	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.493	9.494	-0.001	1.000	4286583	54.2		108	15329	
D 8 13C4-PFHpA										
367.0 > 322.0	9.493	9.495	-0.002		3440666	50.1		100	296291	
D 11 18O2 PFHxS										
403.0 > 84.0	9.531	9.532	-0.001		1569831	50.9		108	12640	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.531	9.533	-0.002	1.000	1467407	NC			1530	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.531	9.533	-0.002	1.000	1467407	47.2		99.8		
D 12 13C4 PFOA										
417.0 > 372.0	10.614	10.612	0.002		3579865	49.2		98.4	6918	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.614	10.612	0.002	1.000	3760545	51.2		102	1975	
413.0 > 169.0	10.614	10.612	0.002	1.000	1423500		2.64(0.00-0.00)	102	2295	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.614	10.622	-0.008	1.000	1603386	NC			13591	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.614	10.622	-0.008	1.000	1603386	48.4		102		
D 16 13C4 PFOS										
503.0 > 80.0	11.568	11.568	0.0		1908821	48.1		101	17665	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.577	11.571	0.006	1.000	2717455	55.1		115	326	
499.0 > 99.0	11.577	11.571	0.006	1.000	1468906		1.85(0.00-0.00)	115	536	
D 17 13C5 PFNA										
468.0 > 423.0	11.594	11.589	0.005		3266288	49.0		98.0	2908	
18 Perfluorononanoic acid										
463.0 > 419.0	11.594	11.589	0.005	1.000	2958176	52.4		105	69186	
D 19 13C2 PFDA										
515.0 > 470.0	12.424	12.423	0.001		2584731	49.1		98.2	62920	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.424	12.423	0.001	1.000	3452418	53.1		106	34926	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.013	13.018	-0.005	1.000	5239897	49.8		99.6	2888	
D 23 13C8 FOSA										
506.0 > 78.0	13.013	13.019	-0.006		6628551	52.9		106	10705	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.076	13.081	-0.005	1.000	1627317	49.9		104		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.076	13.081	-0.005	1.000	1627317	NC			32726	
D 26 13C2 PFUnA										
565.0 > 520.0	13.120	13.124	-0.004		3791839	50.4		101	45313	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.120	13.124	-0.004	1.000	3887233	49.7		99.4	13230	
D 28 13C2 PFDoA										
615.0 > 570.0	13.721	13.718	0.003		4620549	50.9		102	21675	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.721	13.718	0.003	1.000	3884314	50.2		100	6305	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.220	14.220	0.0	1.000	5450962	52.9		106	4345	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.642	14.643	-0.001		4166575	51.4		103	8206	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.642	14.644	-0.002	1.000	4116786	49.4		98.8	1558	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.220	15.223	-0.003		6643909	52.7		105	9304	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.220	15.223	-0.003	1.000	7408407	53.5		107	3980	
36 Perfluorooctadecanoic acid										
913.0 > 869.0	15.491	15.493	-0.002	1.000	7264490	53.4		107	3654	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC-L5_00018

Amount Added: 1.00

Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_007.d

Injection Date: 31-May-2016 14:16:53

Instrument ID: A6

Lims ID: Std L5

Client ID:

Operator ID: JRB

ALS Bottle#: 13

Worklist Smp#: 7

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

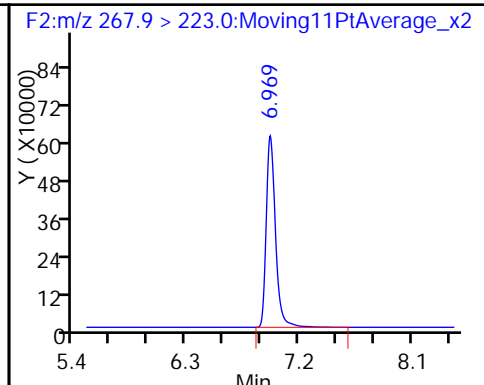
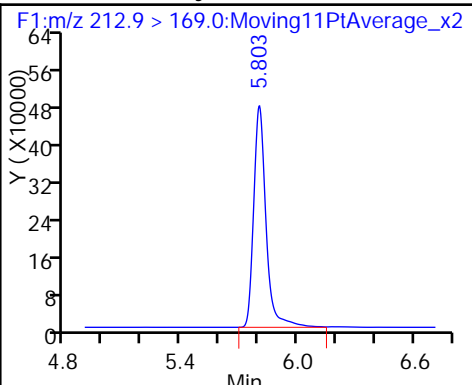
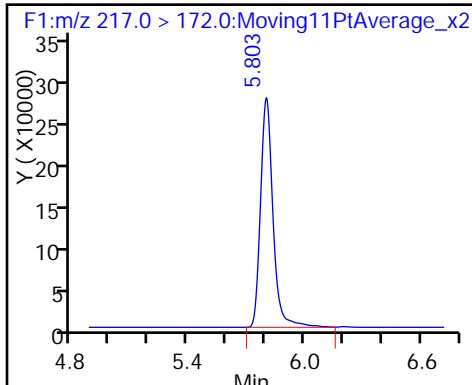
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

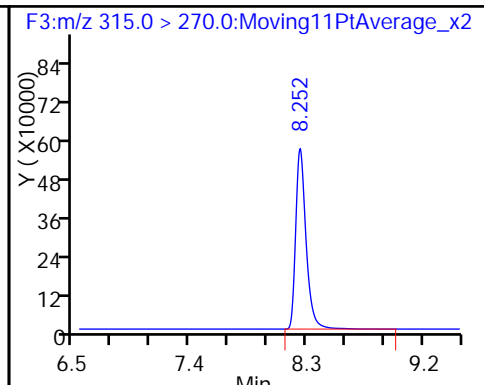
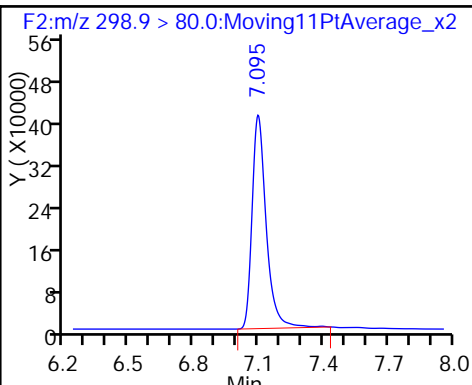
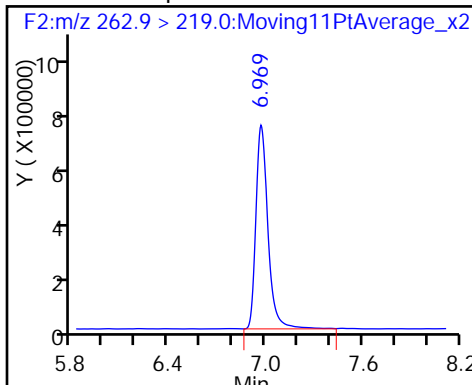
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

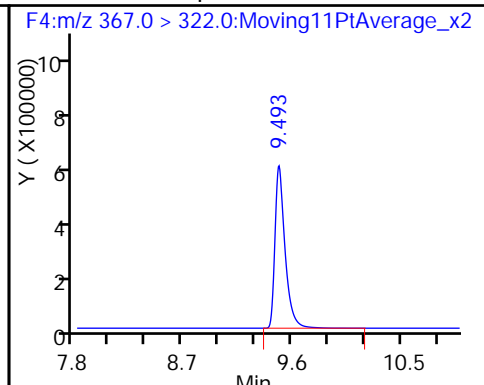
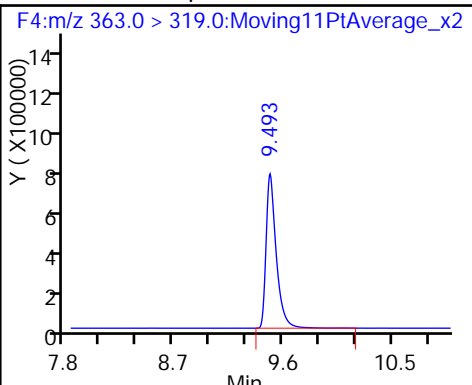
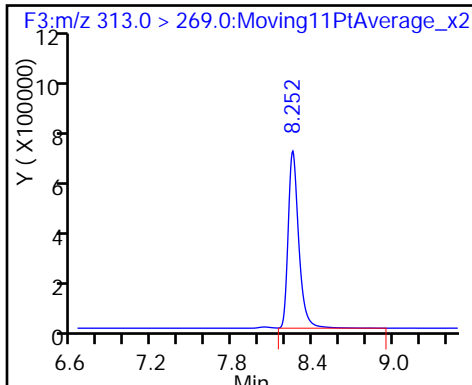
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

9 Perfluoroheptanoic acid

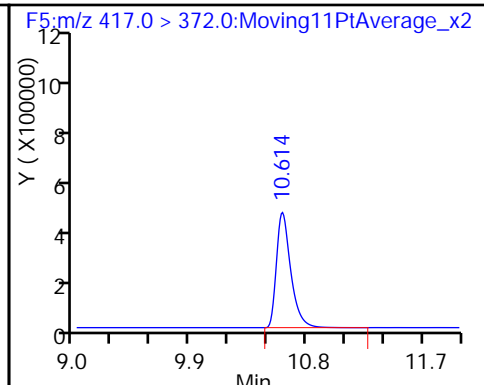
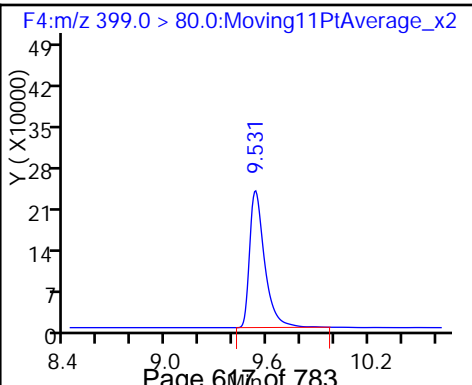
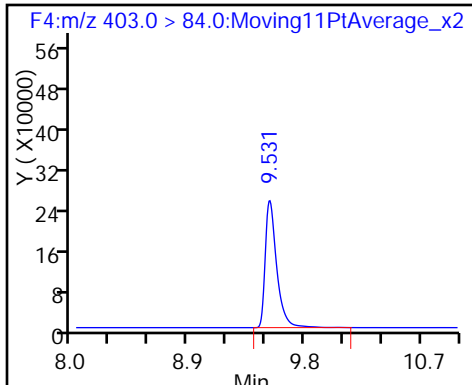
D 8 13C4-PFHpA

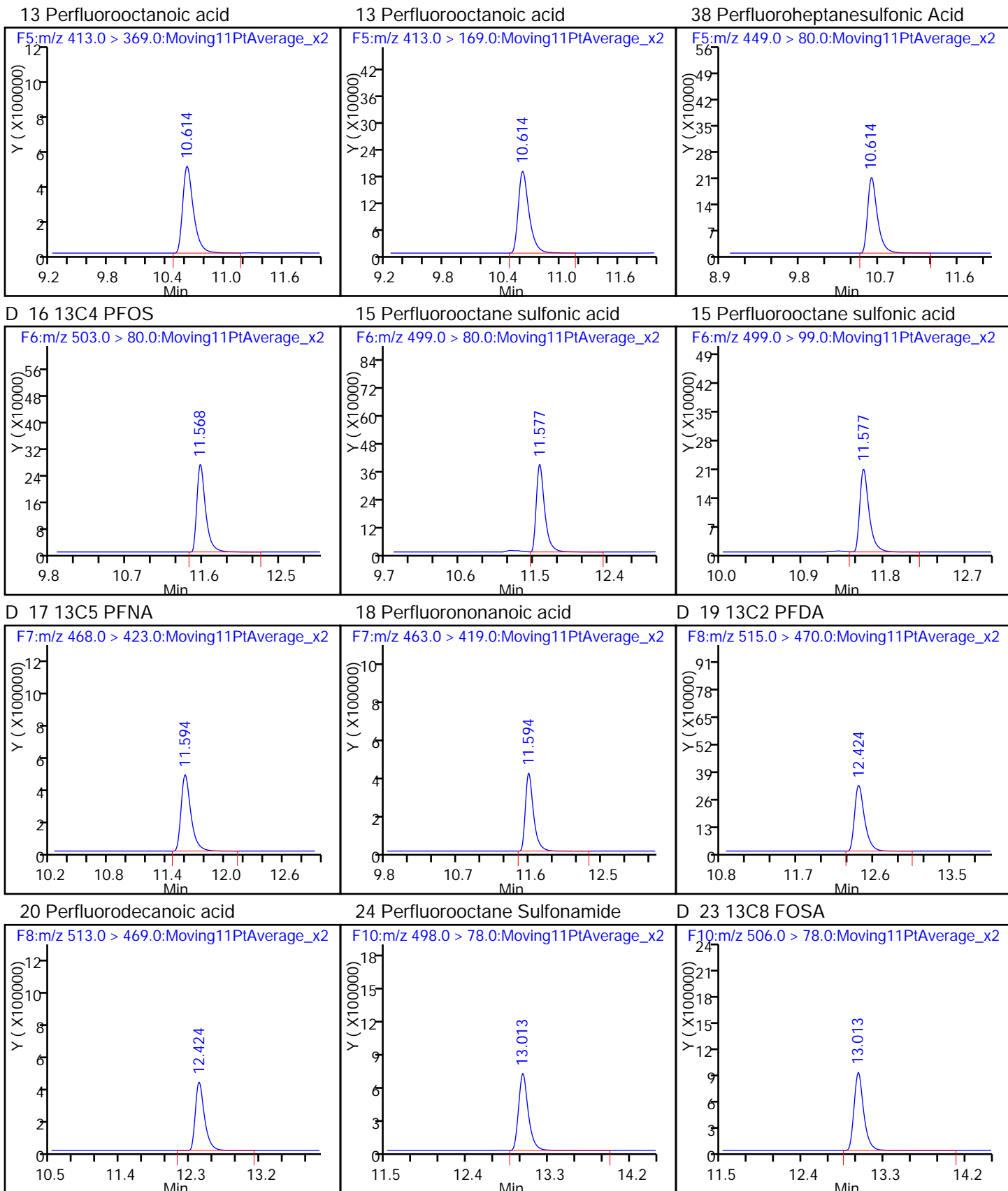


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

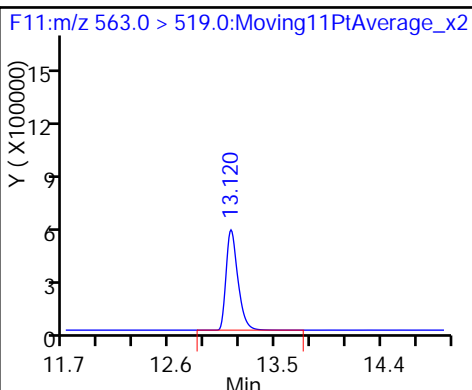
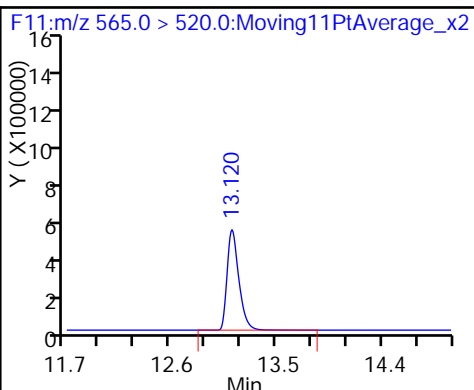
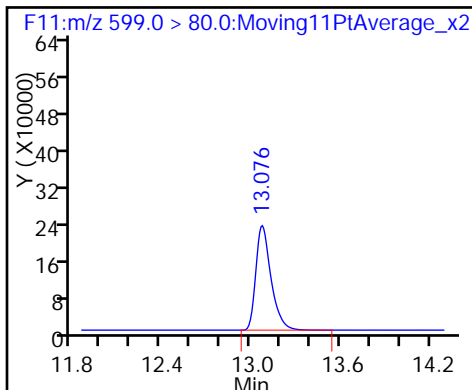




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

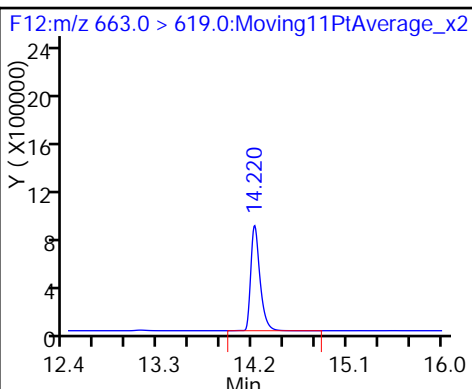
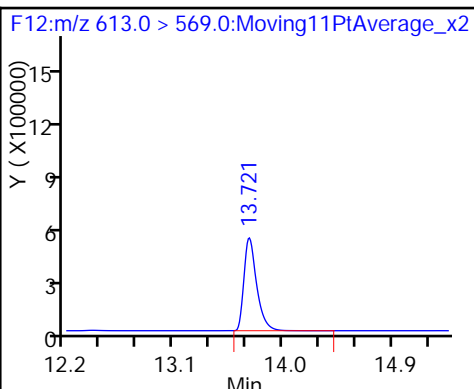
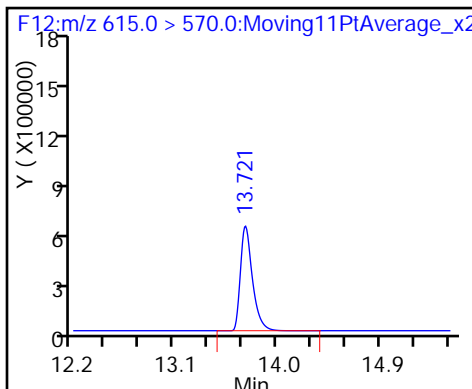
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

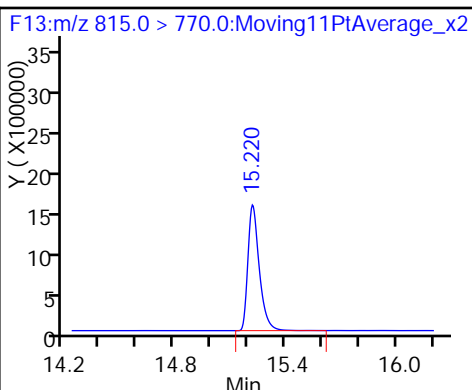
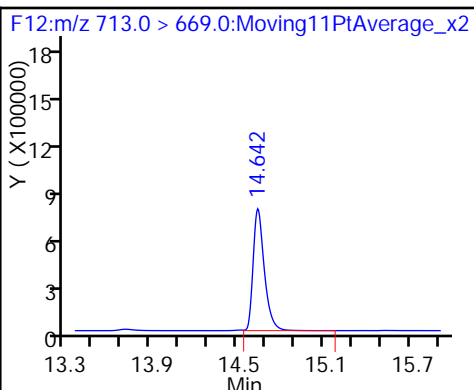
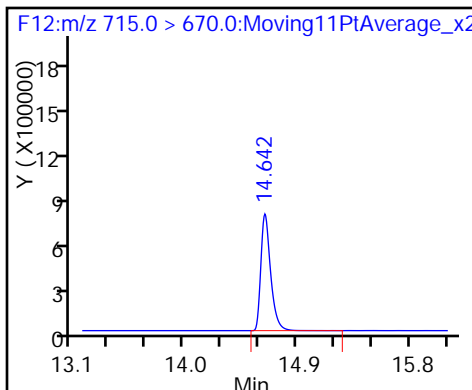
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

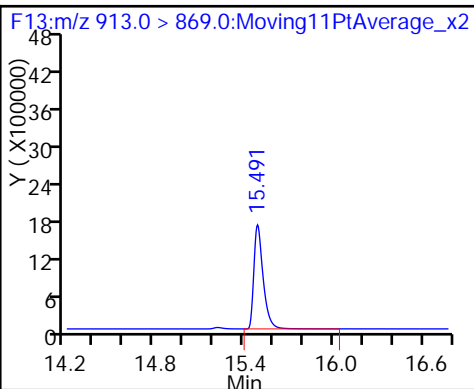
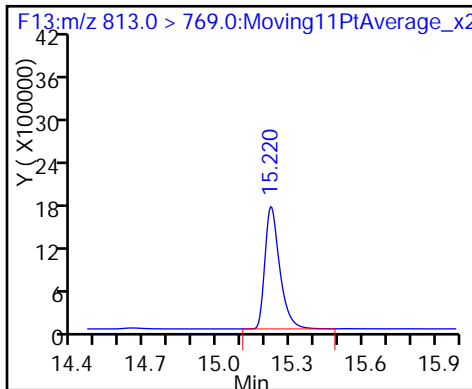
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxD A



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_008.d
 Lims ID: Std L6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 31-May-2016 14:38:09 ALS Bottle#: 14 Worklist Smp#: 8
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L6
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9
 Method: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 14:13:14 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.800	5.803	-0.003		1047944	43.0		86.0	110955	
2 Perfluorobutyric acid										
212.9 > 169.0	5.800	5.806	-0.006	1.000	6720179	209.7		105	3482	
D 3 13C5-PFPeA										
267.9 > 223.0	6.964	6.968	-0.004		2525317	39.7		79.5	8362	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.964	6.970	-0.006	1.000	11617905	199.1		99.6	4615	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.095	7.099	-0.004	1.000	6110567	192.8		109		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.095	7.099	-0.004	1.000	6110567	NC			734	
298.9 > 99.0	7.092	7.099	-0.007	1.000	2847225		2.15(0.00-0.00)		829	
D 6 13C2 PFHxA										
315.0 > 270.0	8.247	8.252	-0.005		2562636	41.8		83.6	6964	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.252	8.253	-0.001	1.000	11962395	207.0		103	1786	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.487	9.494	-0.007	1.000	11841967	205.0		103	8777	
D 8 13C4-PFHpA										
367.0 > 322.0	9.487	9.495	-0.008		2524194	36.8		73.5	16875	
D 11 18O2 PFHxS										
403.0 > 84.0	9.532	9.532	0.0		1153063	37.4		79.1	6298	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.532	9.533	-0.001	1.000	4351661	NC			2929	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.532	9.533	-0.001	1.000	4351661	190.6		101		
D 12 13C4 PFOA										
417.0 > 372.0	10.614	10.612	0.002		2470567	34.0		67.9	5830	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.614	10.612	0.002	1.000	10721047	211.4		106	2973	
413.0 > 169.0	10.614	10.612	0.002	1.000	3924112		2.73(0.00-0.00)	106	9019	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.623	10.622	0.001	1.000	4450812	NC			3860	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.623	10.622	0.001	1.000	4450812	189.8		99.7		
D 16 13C4 PFOS										
503.0 > 80.0	11.560	11.568	-0.008		1343585	33.8		70.8	90210	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.560	11.571	-0.011	1.000	7229088	208.2		109	976	
499.0 > 99.0	11.560	11.571	-0.011	1.000	3873072		1.87(0.00-0.00)	109	2426	
D 17 13C5 PFNA										
468.0 > 423.0	11.586	11.589	-0.003		2482043	37.2		74.5	68727	
18 Perfluorononanoic acid										
463.0 > 419.0	11.586	11.589	-0.003	1.000	8509750	198.4		99.2	10207	
D 19 13C2 PFDA										
515.0 > 470.0	12.414	12.423	-0.009		1884965	35.8		71.6	8135	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.414	12.423	-0.009	1.000	9897323	208.9		104	25190	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.021	13.018	0.003	1.000	16855550	218.1		109	1303	
D 23 13C8 FOSA										
506.0 > 78.0	13.021	13.019	0.002		4867961	38.8		77.7	6339	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.084	13.081	0.003	1.000	4518038	197.5		102		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.084	13.081	0.003	1.000	4518038	NC			11987	
D 26 13C2 PFUnA										
565.0 > 520.0	13.128	13.124	0.004		2689857	35.8		71.5	18213	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.128	13.124	0.004	1.000	11435145	207.4		104	12138	
D 28 13C2 PFDoA										
615.0 > 570.0	13.710	13.718	-0.008		3633475	40.0		80.1	23178	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.710	13.718	-0.008	1.000	12747780	209.4		105	10597	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.211	14.220	-0.009	1.000	14346430	177.0		88.5	4833	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.634	14.643	-0.009		3275932	40.4		80.8	4793	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.634	14.644	-0.010	1.000	12874426	197.3		98.7	3427	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.218	15.223	-0.005		5223563	41.5		82.9	5009	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.218	15.223	-0.005	1.000	21367734	198.8		99.4	4527	
36 Perfluorooctadecanoic acid										
913.0 > 869.0	15.495	15.493	0.002	1.000	22636301	211.6		106	5157	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC-L6_00017

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_008.d

Injection Date: 31-May-2016 14:38:09

Instrument ID: A6

Lims ID: Std L6

Client ID:

Operator ID: JRB

ALS Bottle#: 14

Worklist Smp#: 8

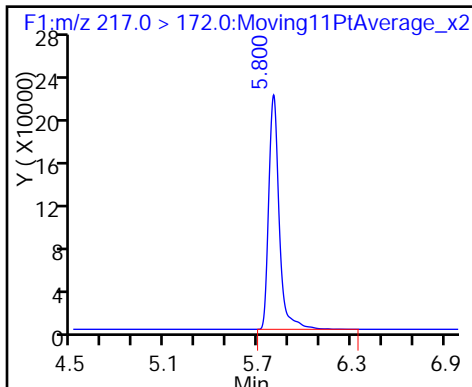
Injection Vol: 15.0 ul

Dil. Factor: 1.0000

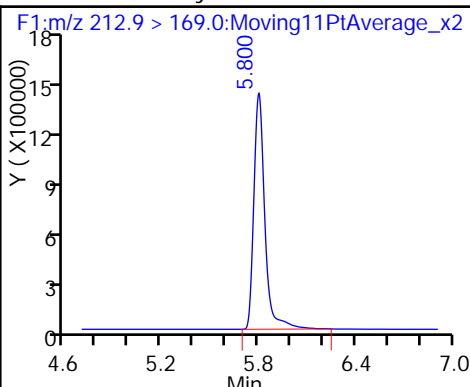
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

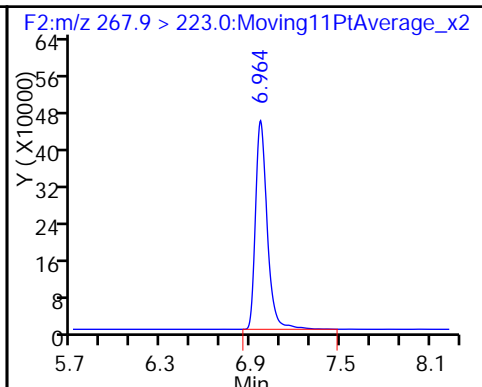
D 1 13C4 PFBA



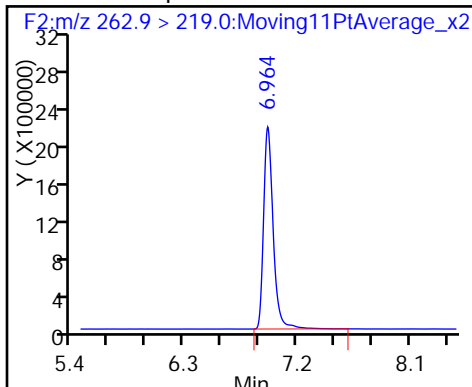
2 Perfluorobutyric acid



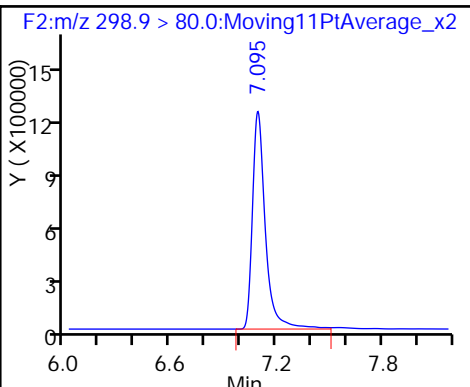
D 3 13C5-PFPeA



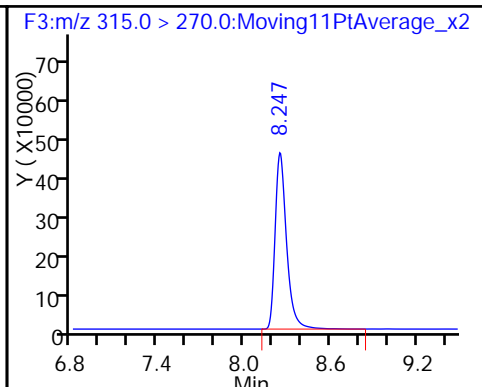
4 Perfluoropentanoic acid



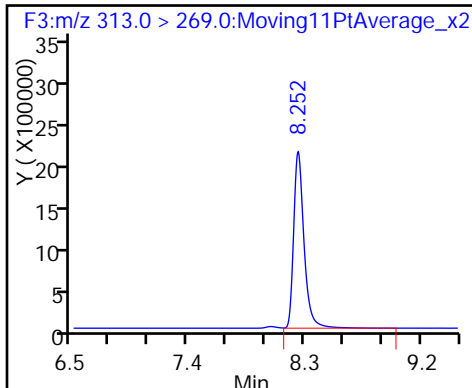
40 Perfluorobutanesulfonic acid



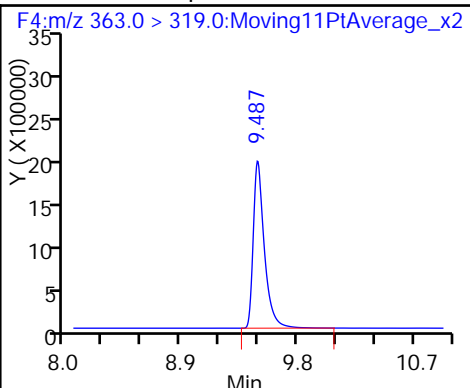
D 6 13C2 PFHxA



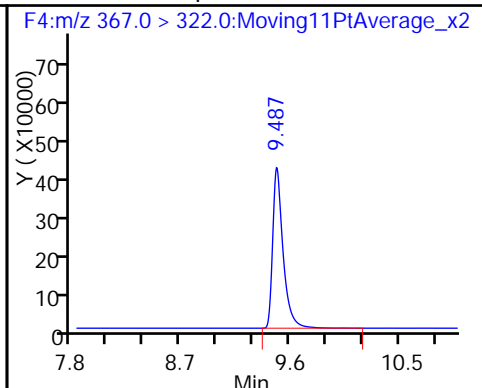
7 Perfluorohexanoic acid



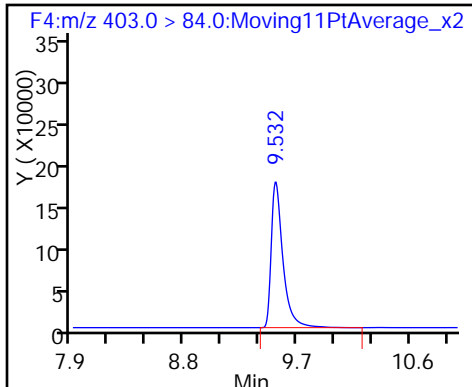
9 Perfluoroheptanoic acid



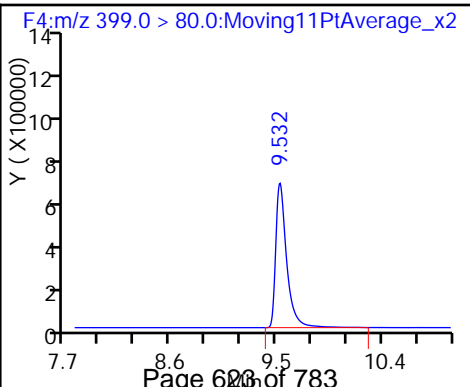
D 8 13C4-PFHpA



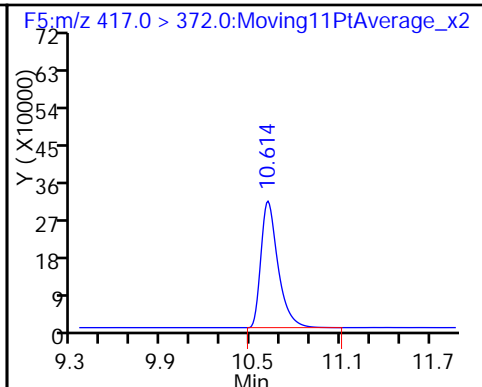
D 11 18O2 PFHxS

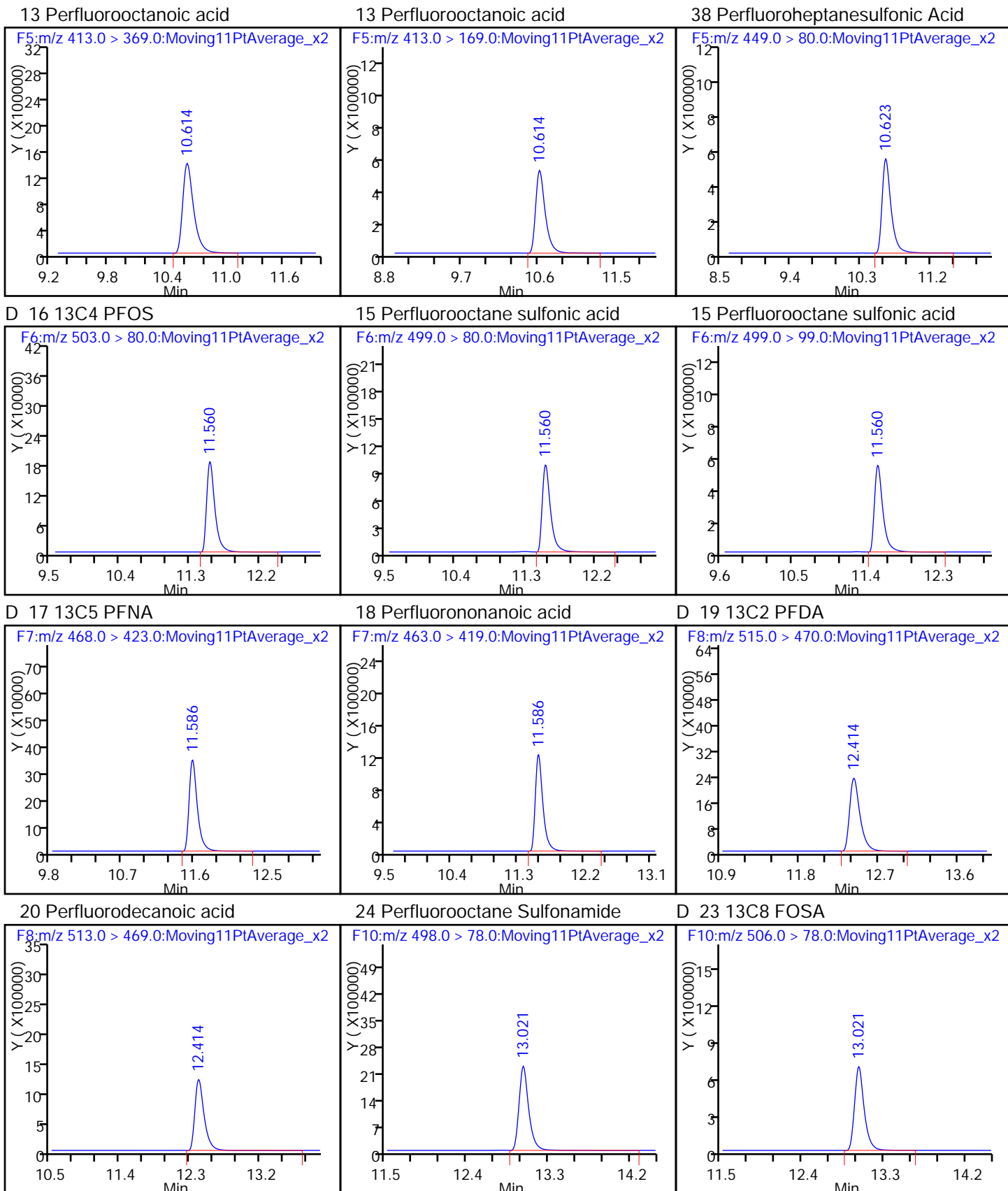


41 Perfluorohexanesulfonic acid



D 12 13C4 PFOA

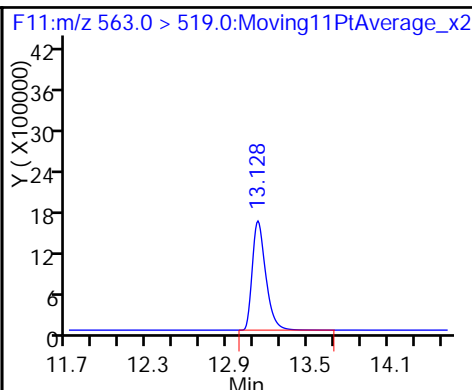
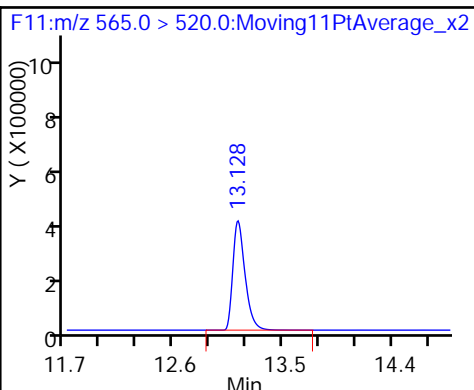
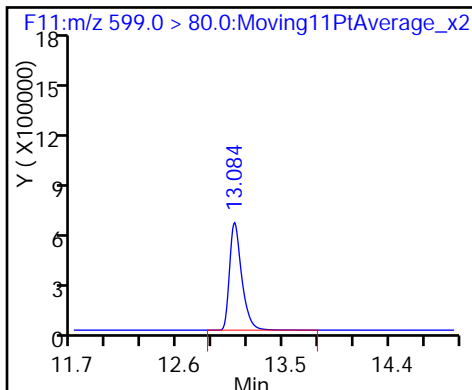




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUa

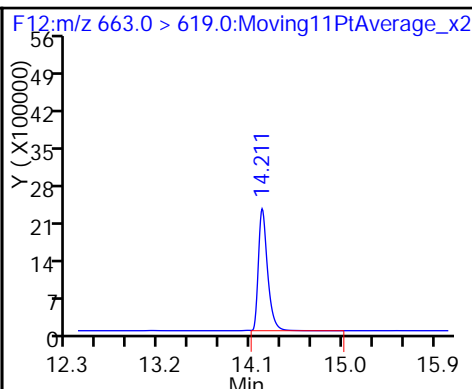
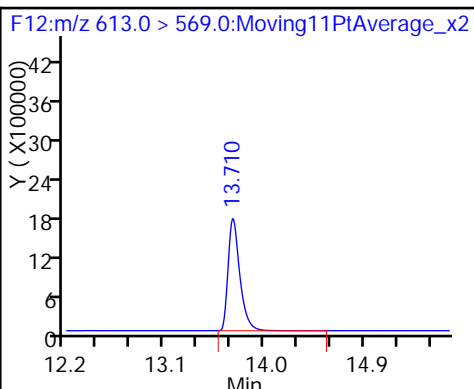
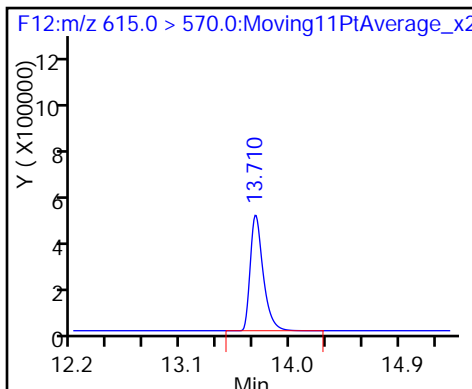
27 Perfluoroundecanoic acid



D 28 13C2 PFDa

29 Perfluorododecanoic acid

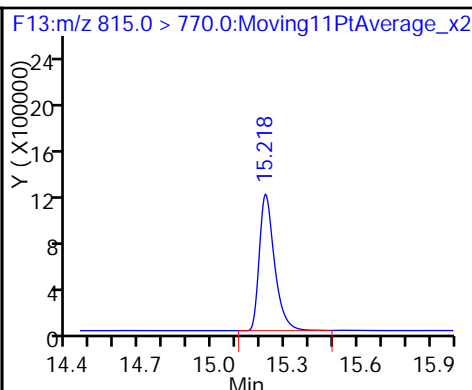
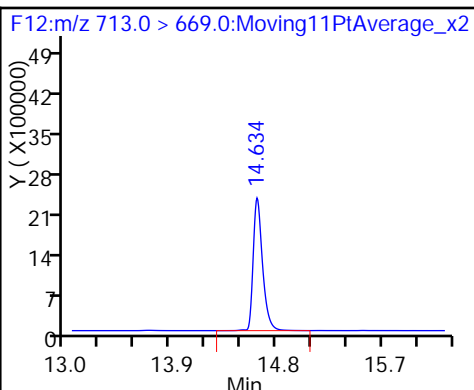
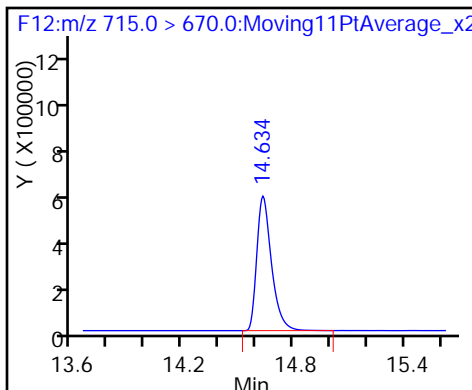
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

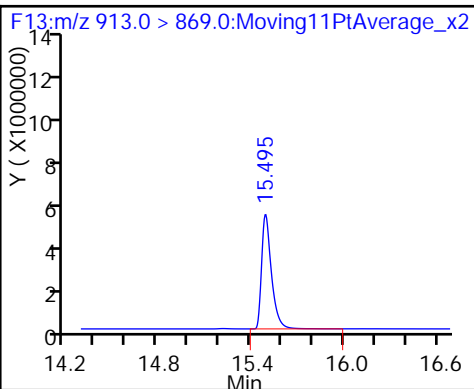
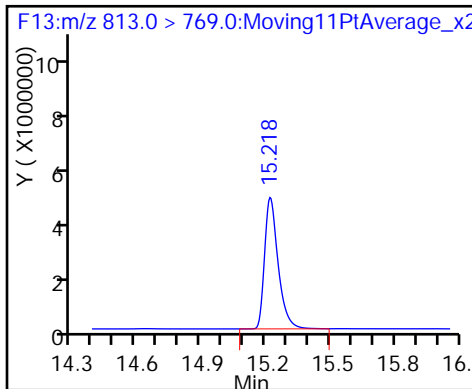
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Lims ID: Std L7
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 31-May-2016 14:59:27 ALS Bottle#: 15 Worklist Smp#: 9
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L7
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9

Method: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 14:13:17 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.800	5.803	-0.003		920558	37.8		75.5	5065	
2 Perfluorobutyric acid										
212.9 > 169.0	5.800	5.806	-0.006	1.000	11523989	409.4		102	24027	
D 3 13C5-PFPeA										
267.9 > 223.0	6.964	6.968	-0.004		2113511	33.3		66.5	7344	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.969	6.970	-0.001	1.000	19814969	405.7		101	7096	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.095	7.099	-0.004	1.000	10786825	406.3		115		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.095	7.099	-0.004	1.000	10786825	NC			2424	
298.9 > 99.0	7.095	7.099	-0.004	1.000	4989671		2.16(0.00-0.00)		2957	
D 6 13C2 PFHxA										
315.0 > 270.0	8.252	8.252	0.0		2250360	36.7		73.4	80570	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.252	8.253	-0.001	1.000	20870280	411.2		103	709	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.493	9.494	-0.001	1.000	20712505	392.7		98.2	7773	
D 8 13C4-PFHpA										
367.0 > 322.0	9.493	9.495	-0.002		2306360	33.6		67.2	64904	
D 11 18O2 PFHxS										
403.0 > 84.0	9.532	9.532	0.0		965792	31.3		66.2	48915	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.532	9.533	-0.001	1.000	7345254	NC			3061	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.532	9.533	-0.001	1.000	7345254	384.1		102		
D 12 13C4 PFOA										
417.0 > 372.0	10.605	10.612	-0.007		2119790	29.1		58.3	17652	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.605	10.612	-0.007	1.000	18041857	414.6		104	2116	
413.0 > 169.0	10.605	10.612	-0.007	1.000	6621828		2.72(0.00-0.00)	104	1770	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.614	10.622	-0.008	1.000	7412646	NC			4189	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.614	10.622	-0.008	1.000	7412646	370.8		97.4		
D 16 13C4 PFOS										
503.0 > 80.0	11.560	11.568	-0.008		1144504	28.8		60.3	21935	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.560	11.571	-0.011	1.000	11431237	386.5		101	1062	
499.0 > 99.0	11.560	11.571	-0.011	1.000	6547181		1.75(0.00-0.00)	101	2209	
D 17 13C5 PFNA										
468.0 > 423.0	11.578	11.589	-0.011		2176766	32.7		65.3	99535	
18 Perfluorononanoic acid										
463.0 > 419.0	11.578	11.589	-0.011	1.000	14441472	384.0		96.0	14871	
D 19 13C2 PFDA										
515.0 > 470.0	12.414	12.423	-0.009		1633067	31.0		62.0	39094	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.414	12.423	-0.009	1.000	17011559	414.4		104	5345	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.013	13.018	-0.005	1.000	28215564	410.7		103	1516	
D 23 13C8 FOSA										
506.0 > 78.0	13.013	13.019	-0.006		4327875	34.5		69.1	3809	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.076	13.081	-0.005	1.000	7388958	379.3		98.4		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.076	13.081	-0.005	1.000	7388958	NC			11562	
D 26 13C2 PFUnA										
565.0 > 520.0	13.120	13.124	-0.004		2288823	30.4		60.9	161967	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.120	13.124	-0.004	1.000	20032158	427.5		107	19704	
D 28 13C2 PFDoA										
615.0 > 570.0	13.712	13.718	-0.006		3085918	34.0		68.0	11769	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.712	13.718	-0.006	1.000	21331668	412.6		103	5962	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.220	14.220	0.0	1.000	24683868	358.6		89.6	4213	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.642	14.643	-0.001		2857848	35.2		70.5	8865	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.642	14.644	-0.002	1.000	22175922	400.5		100	2285	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.220	15.223	-0.003		4743139	37.6		75.3	5121	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.220	15.223	-0.003	1.000	37073350	407.3		102	3469	
36 Perfluorooctadecanoic acid										
913.0 > 869.0	15.486	15.493	-0.007	1.000	42435932	467.1		117	5239	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC-L7_00017

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d

Injection Date: 31-May-2016 14:59:27

Instrument ID: A6

Lims ID: Std L7

Client ID:

Operator ID: JRB

ALS Bottle#: 15

Worklist Smp#: 9

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

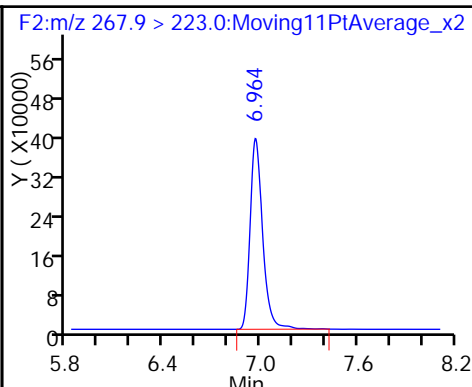
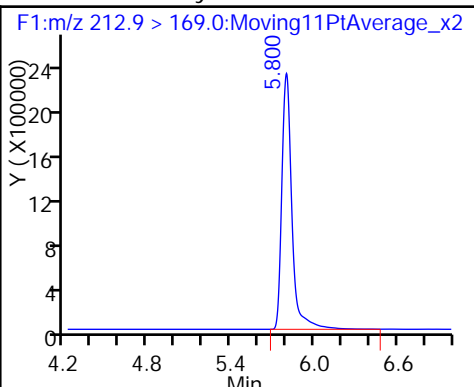
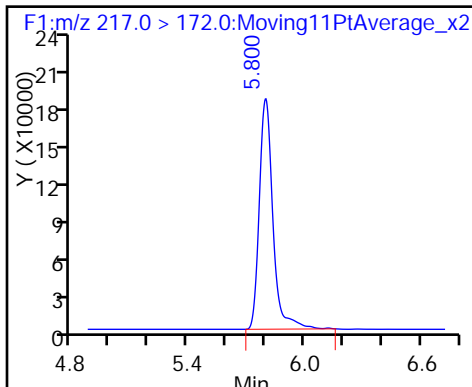
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

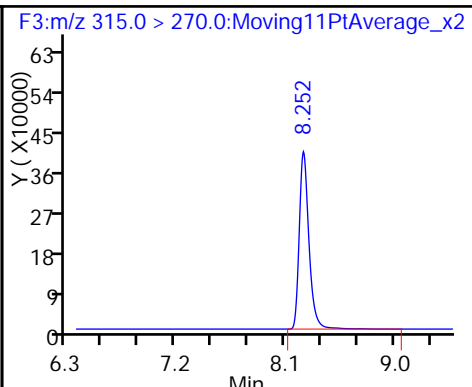
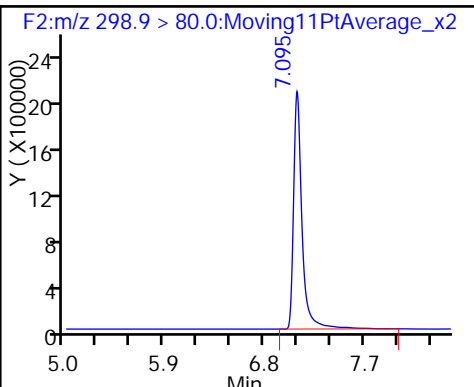
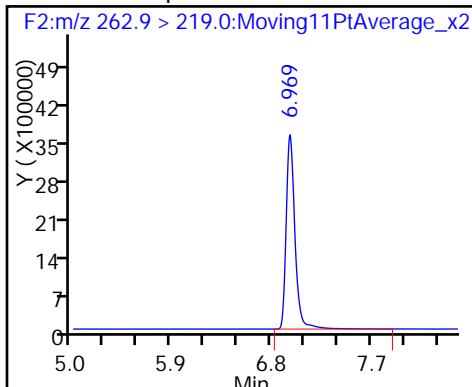
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

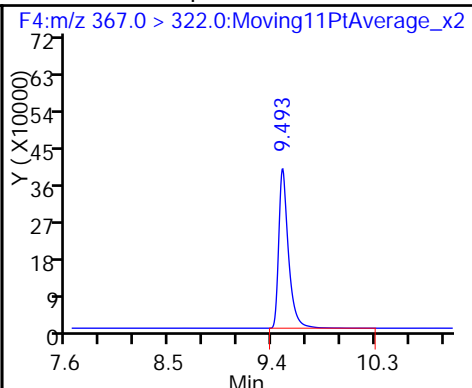
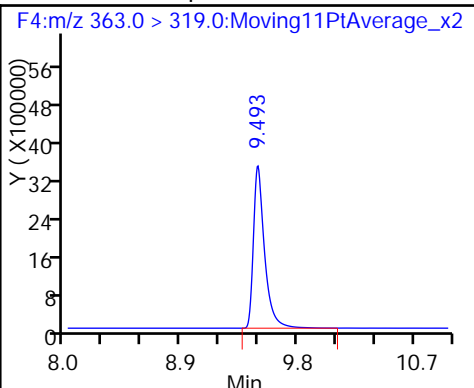
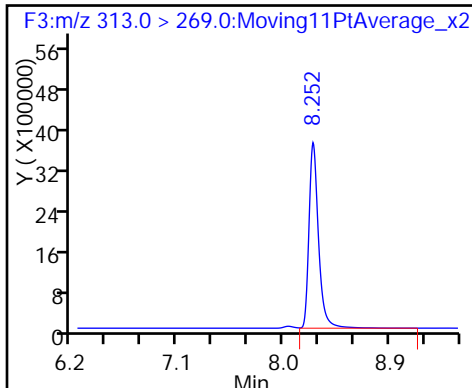
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

9 Perfluoroheptanoic acid

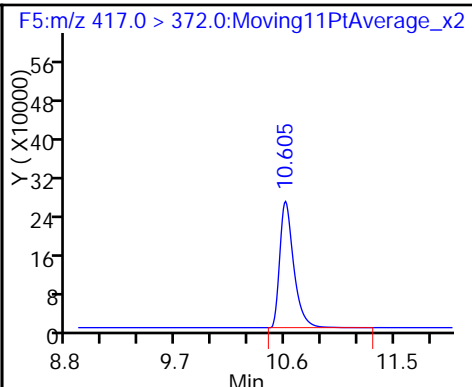
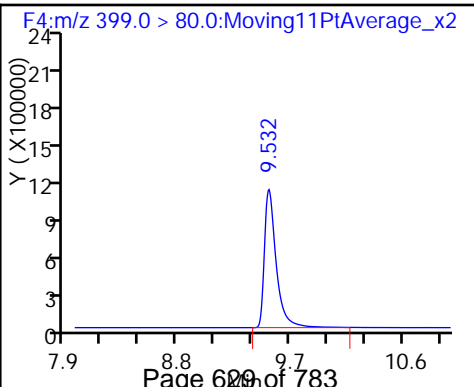
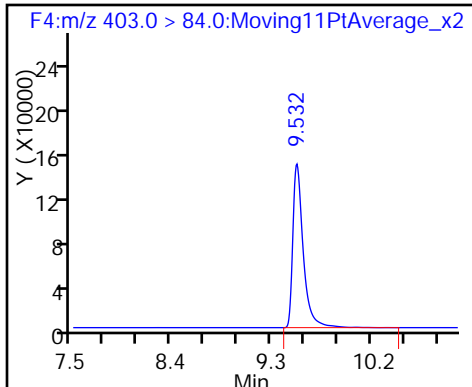
D 8 13C4-PFHpA

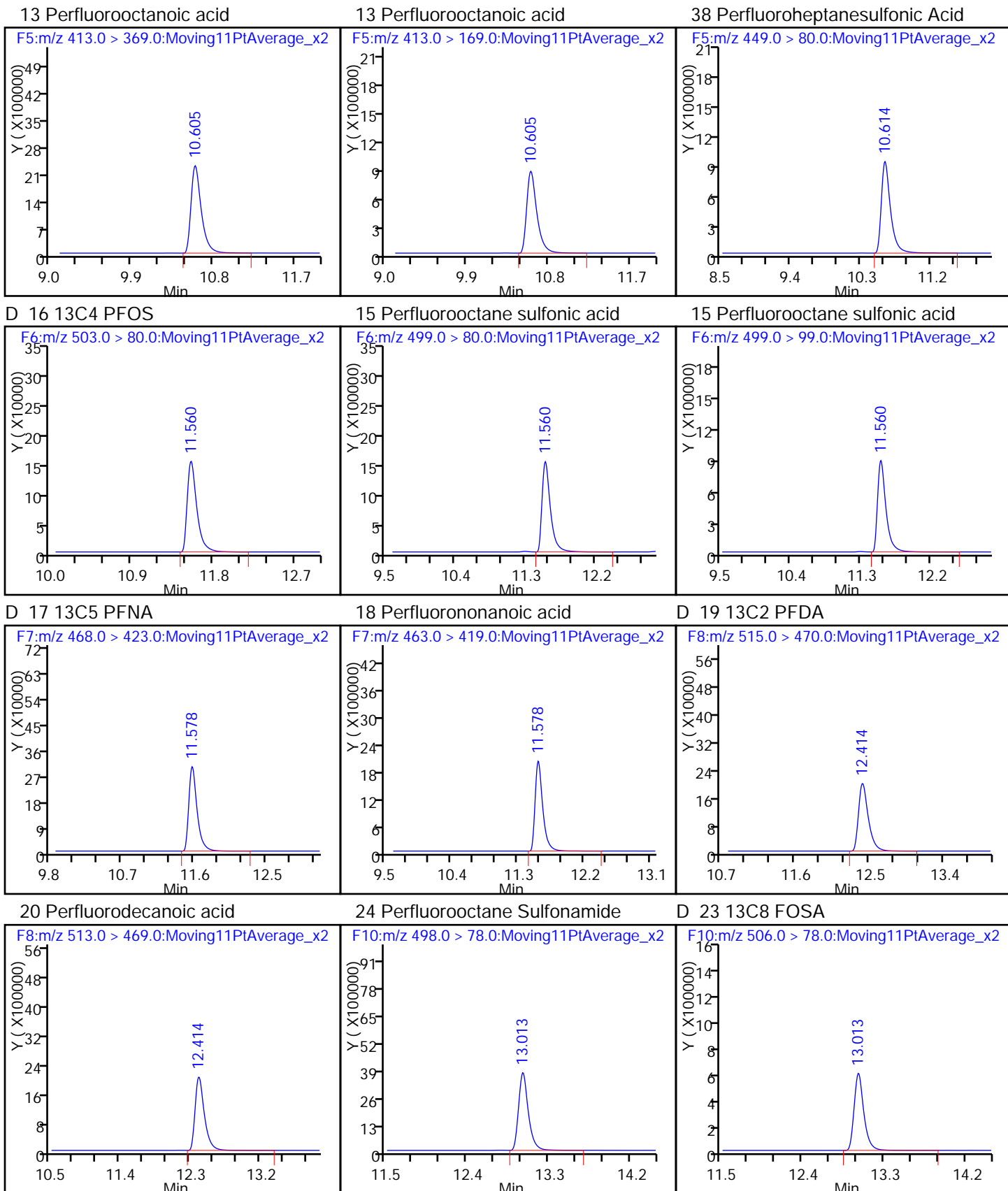


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

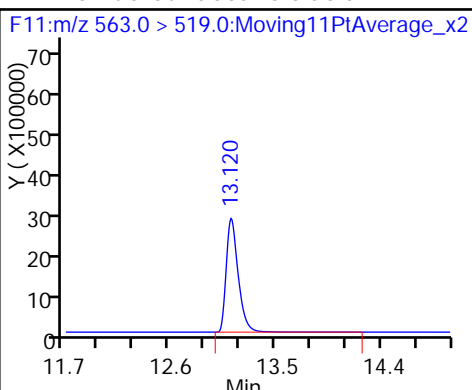
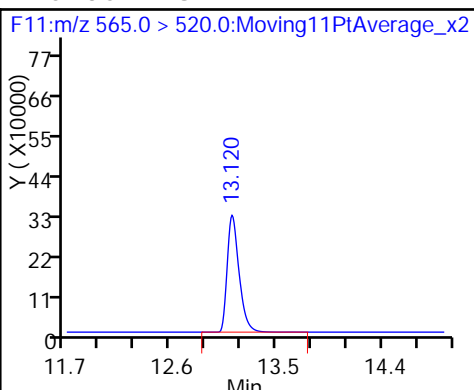
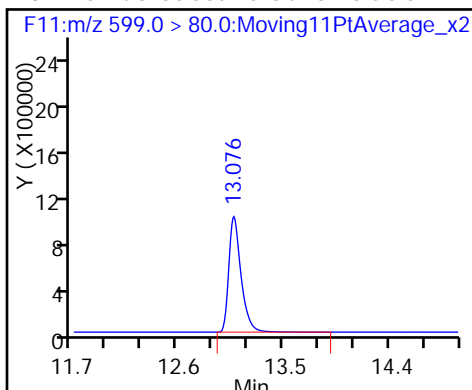




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

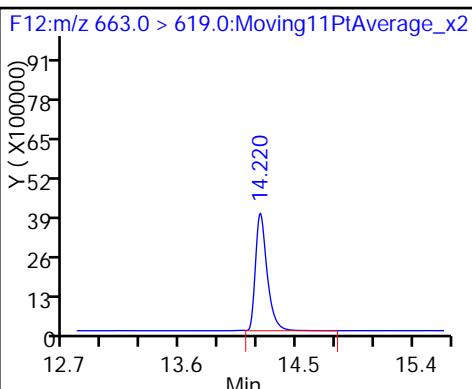
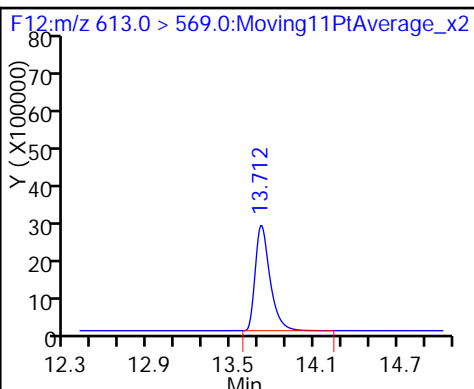
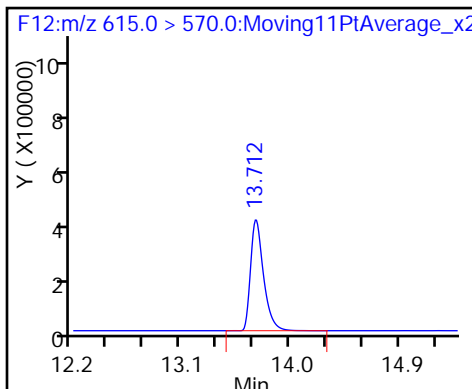
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

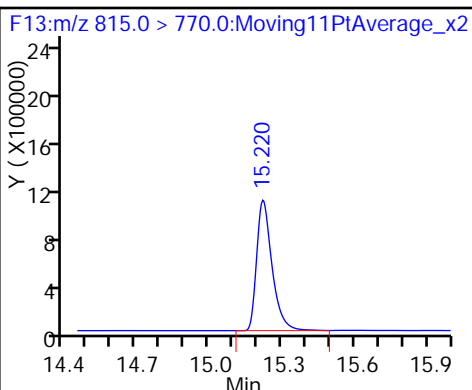
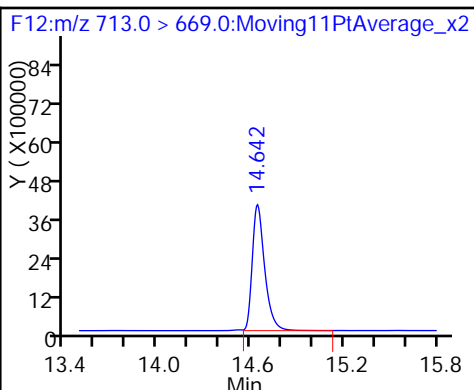
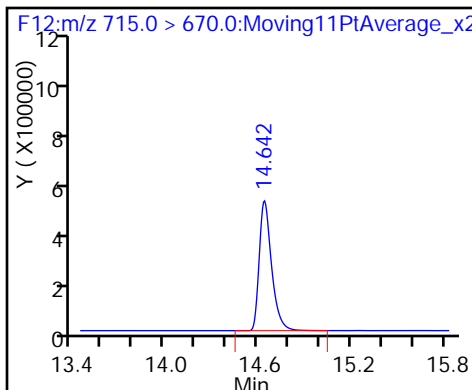
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

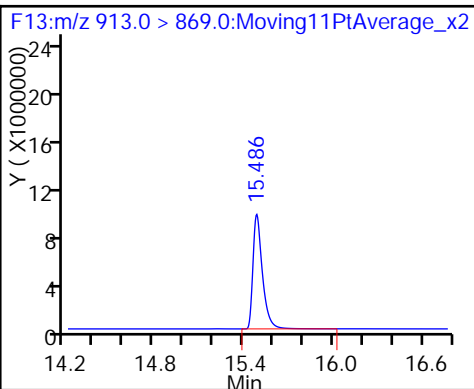
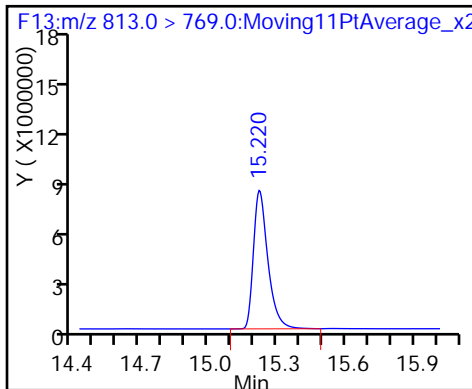
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Lab Sample ID: ICV 320-111859/13 Calibration Date: 05/28/2016 20:24
 Instrument ID: A6 Calib Start Date: 05/28/2016 13:56
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/28/2016 19:41
 Lab File ID: 28MAY2016A6A_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	1.516	1.411		46.5	50.0	-6.9	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.222	1.115		45.6	50.0	-8.7	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.260	1.201		42.2	44.3	-4.7	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.103	1.073		48.7	50.0	-2.7	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.157		48.1	50.0	-3.8	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.9146	0.9012		46.6	47.3	-1.5	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.016	0.9330		45.9	50.0	-8.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.255	1.089		41.4	47.8	-13.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8443	0.8371		49.6	50.0	-0.9	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.307	1.182		45.2	50.0	-9.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.8093	0.7538		46.6	50.0	-6.9	25.0
Perfluorodecanesulfonic acid (PFDS)	L1ID		0.8086		48.4	48.3	0.3	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		0.9907		47.6	50.0	-4.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8088	0.8117		50.2	50.0	0.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.146	1.099		48.0	50.0	-4.1	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.8653		48.9	50.0	-2.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.453		46.7	50.0	-6.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.538	1.400		45.5	50.0	-9.0	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_014.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 28-May-2016 20:24:07 ALS Bottle#: 16 Worklist Smp#: 13
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A4*sub6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 14:41:28 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj Date: 29-May-2016 15:17:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.791	5.795	-0.004	1345461	56.4		113	5149	
2 Perfluorobutyric acid	212.9 > 169.0	5.791	5.797	-0.006	1898494	46.5			81562	
D 3 13C5-PFPeA	267.9 > 223.0	6.955	6.957	-0.002	2836156	52.1		104	13701	
4 Perfluoropentanoic acid	262.9 > 219.0	6.955	6.959	-0.004	3162462	45.6			558	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.085	7.085	0.0	1571946	42.2				
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.085	7.085	0.0	1571946	NC			298	
	298.9 > 99.0	7.081	7.085	-0.004	790668		1.99(0.00-0.00)		865	
7 Perfluorohexanoic acid	313.0 > 269.0	8.236	8.235	0.001	3328444	48.7			2903	
D 6 13C2 PFHxA	315.0 > 270.0	8.236	8.236	0.0	3100977	53.1		106	92517	
D 8 13C4-PFHpA	367.0 > 322.0	9.475	9.474	0.001	3154250	50.9		102	36446	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.481	9.475	0.006	3649130	48.1			32992	
D 11 18O2 PFHxS	403.0 > 84.0	9.510	9.507	0.003	1398522	49.0		104	112341	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.510	9.507	0.003	1259046	NC			1725	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.510	9.507	0.003	1259046	46.6				

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.595	10.586	0.009		3429017	50.9		102	26052	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.595	10.587	0.008	1.000	3199381	45.9			1119	
413.0 > 169.0	10.595	10.587	0.008	1.000	1196827		2.67(0.00-0.00)		1474	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.595	10.596	-0.001	1.000	1253871	NC			26946	
D 16 13C4 PFOS										
503.0 > 80.0	11.552	11.543	0.009		1880077	53.5		112	88288	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.552	11.545	0.007	1.000	2046118	41.4			377	
499.0 > 99.0	11.552	11.545	0.007	1.000	1145031		1.79(0.00-0.00)		31902	
D 17 13C5 PFNA										
468.0 > 423.0	11.569	11.562	0.007		3140085	50.6		101	63325	
18 Perfluorononanoic acid										
463.0 > 419.0	11.569	11.563	0.006	1.000	2628413	49.6			12905	
D 19 13C2 PFDA										
515.0 > 470.0	12.383	12.392	-0.009		2546608	51.2		102	9150	M
20 Perfluorodecanoic acid										
513.0 > 469.0	12.393	12.392	0.001	1.000	3010601	45.2			52124	M
D 23 13C8 FOSA										
506.0 > 78.0	12.994	13.000	-0.006		5793483	51.8		104	3670	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.994	13.002	-0.008	1.000	4366919	46.6			3072	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.041	13.048	-0.007	1.000	1534458	48.4				
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.041	13.048	-0.007	1.000	1534458	NC			5412	
D 26 13C2 PFUnA										
565.0 > 520.0	13.085	13.094	-0.009		3548066	50.9		102	100590	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.085	13.094	-0.009	1.000	3515059	47.6			10588	
D 28 13C2 PFDoA										
615.0 > 570.0	13.675	13.685	-0.010		4304208	51.8		104	16757	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.675	13.685	-0.010	1.000	3493754	50.2			3582	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.174	14.184	-0.010	1.000	4730865	48.0			2583	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.602	14.609	-0.007		3682610	49.6		99.2	22467	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.602	14.609	-0.007	1.000	3724365	48.9			1338	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.194	15.203	-0.009		6044801	51.7		103	8165	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.194	15.203	-0.009	1.000	6255470	46.7			4064	
36 Perfluorooctadecanoic acid										
913.0 > 869.0	15.476	15.473	0.003	1.000	6025232	45.5			2941	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFCIC_00017

Amount Added: 1.00

Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_014.d

Injection Date: 28-May-2016 20:24:07

Instrument ID: A6

Lims ID: ICV

Client ID:

Operator ID: JRB

ALS Bottle#: 16

Worklist Smp#: 13

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

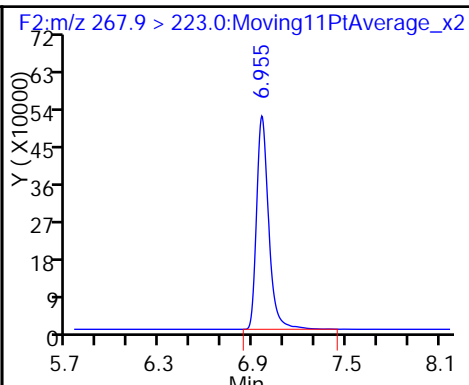
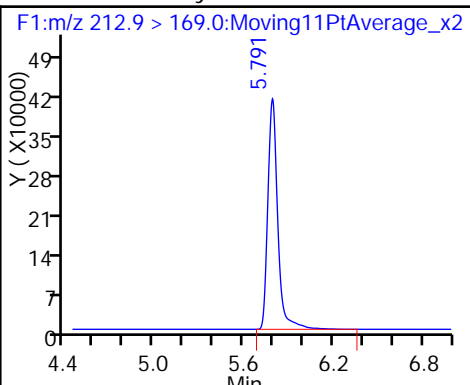
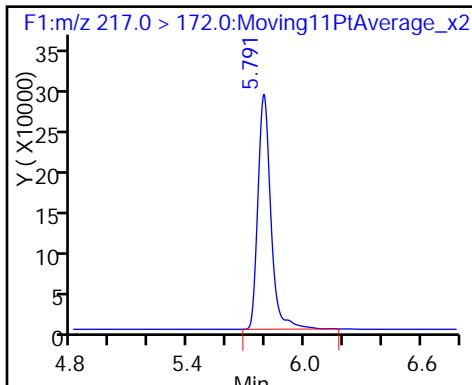
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

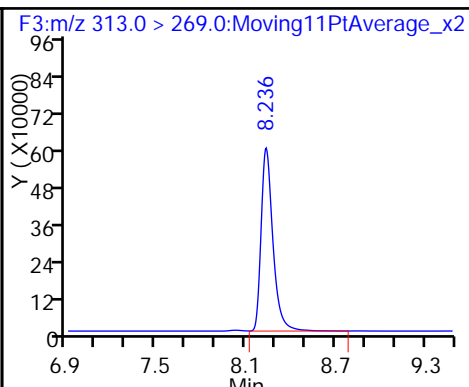
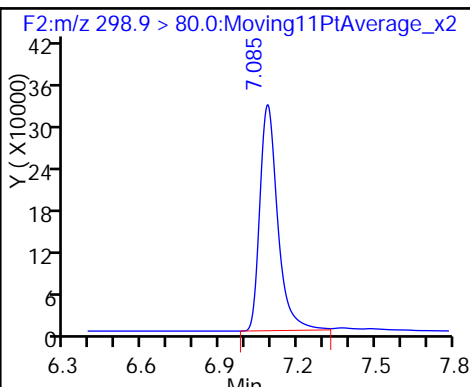
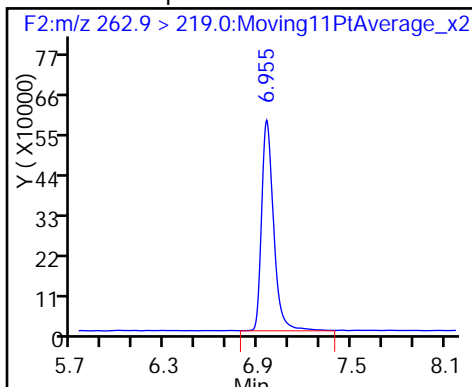
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

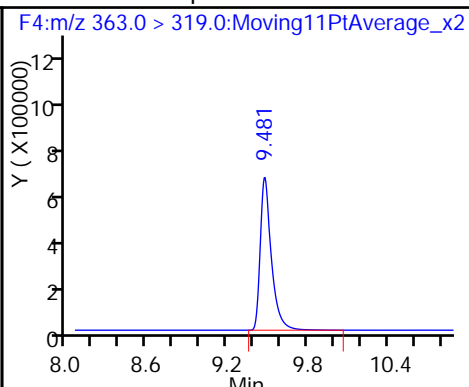
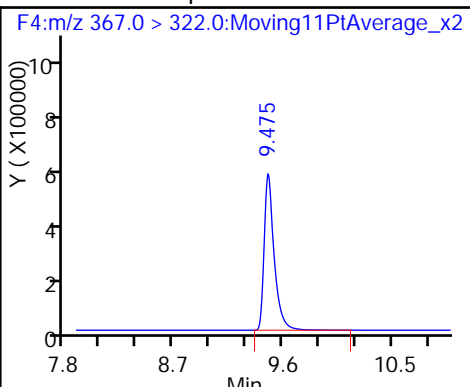
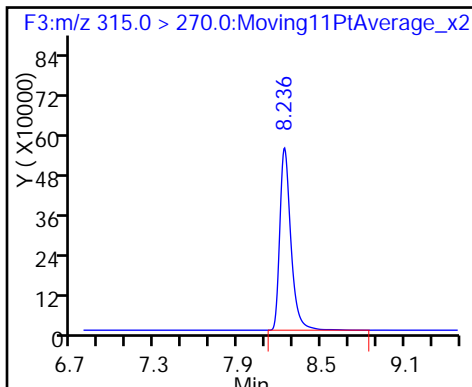
7 Perfluorohexanoic acid



D 6 13C2 PFHxA

D 8 13C4-PFHpA

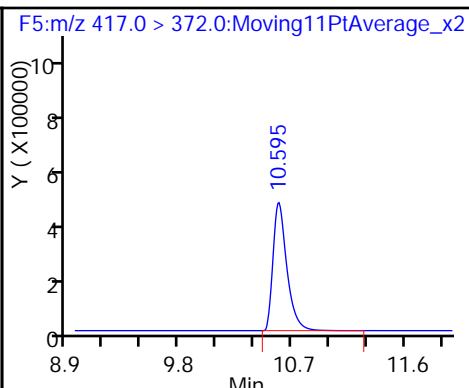
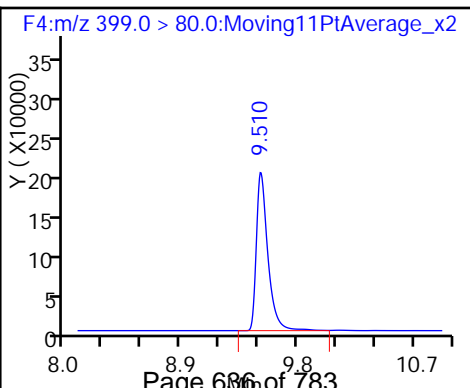
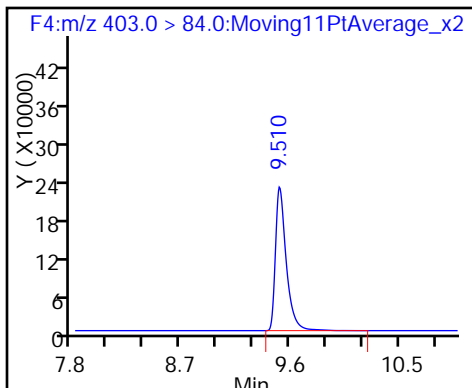
9 Perfluoroheptanoic acid

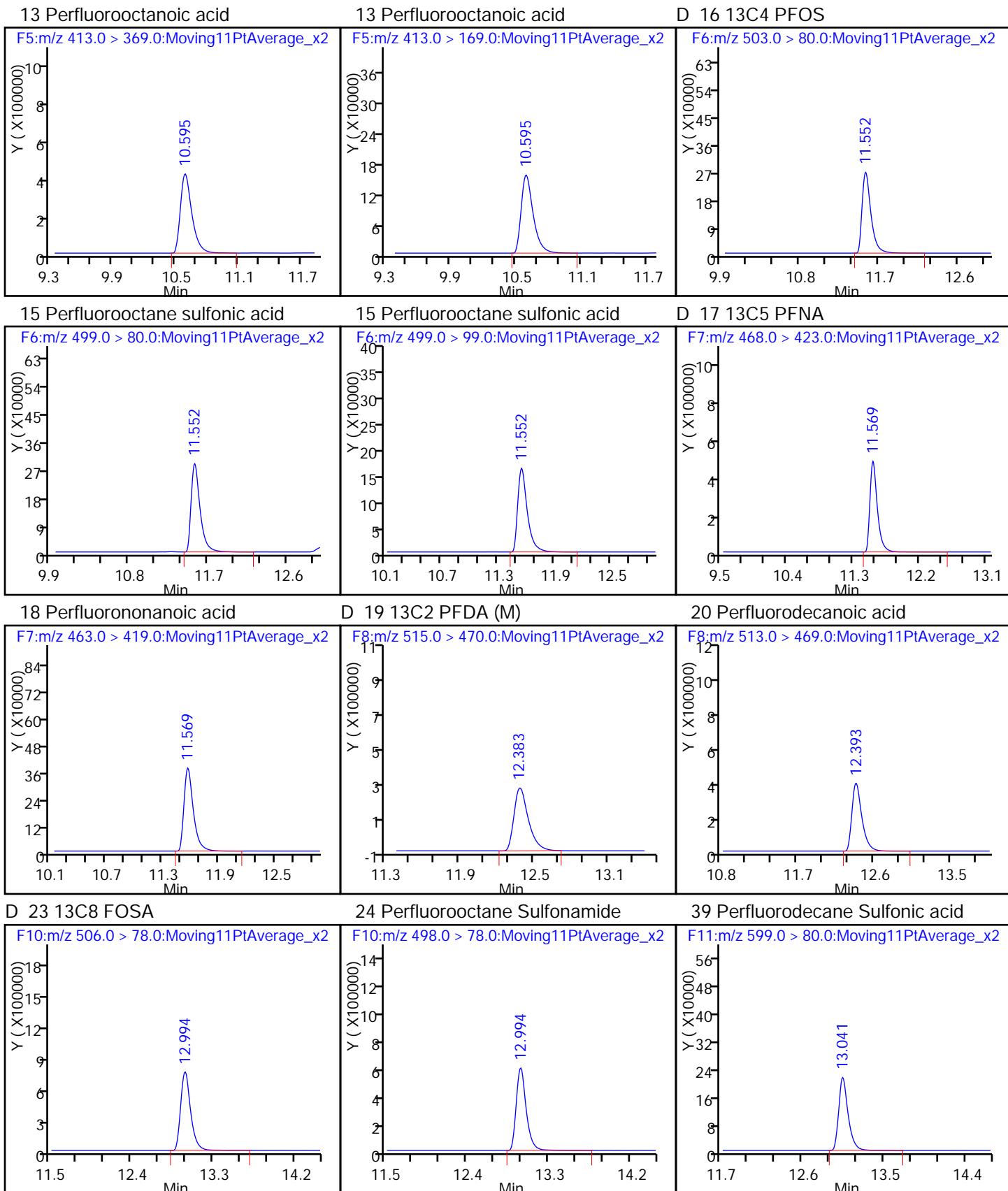


D 11 18O2 PFHxS

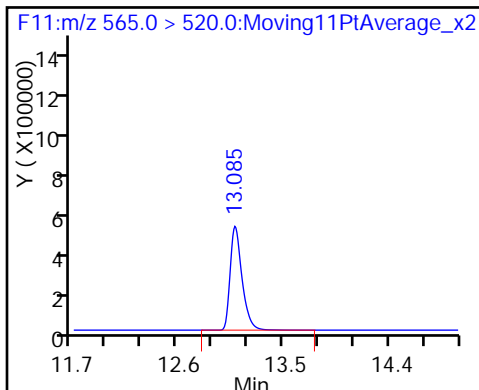
41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

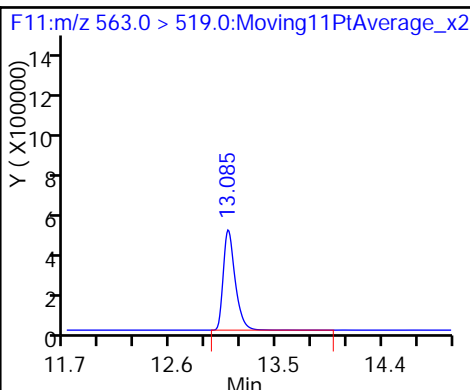




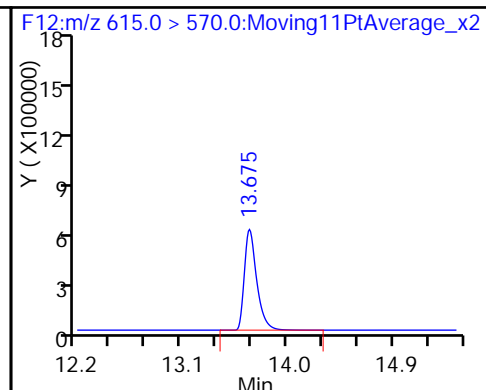
D 26 13C2 PFUnA



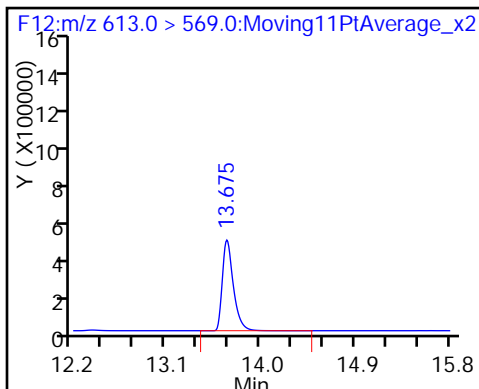
27 Perfluoroundecanoic acid



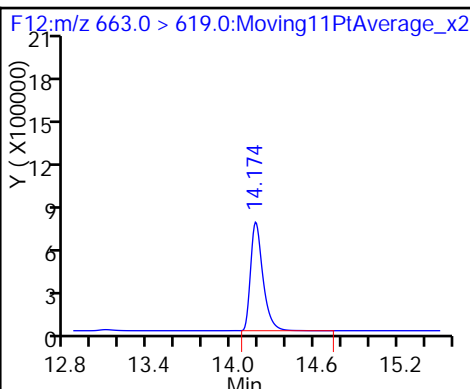
D 28 13C2 PFDaA



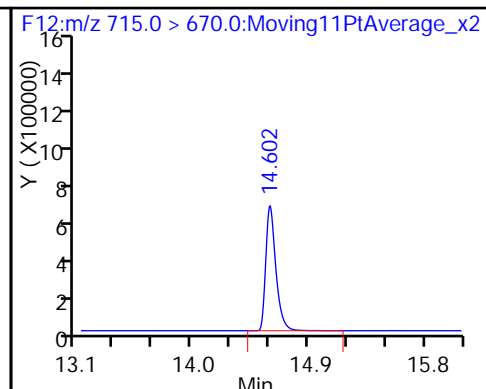
29 Perfluorododecanoic acid



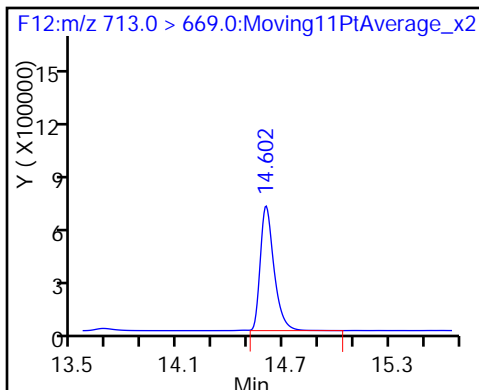
30 Perfluorotridecanoic acid



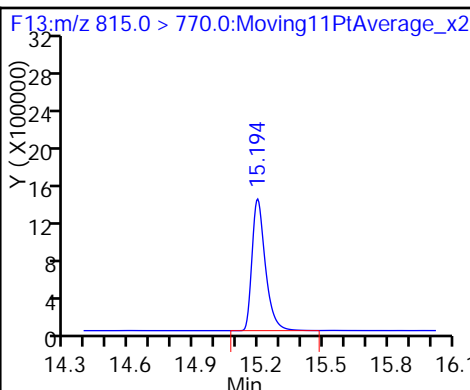
D 33 13C2-PFTeDA



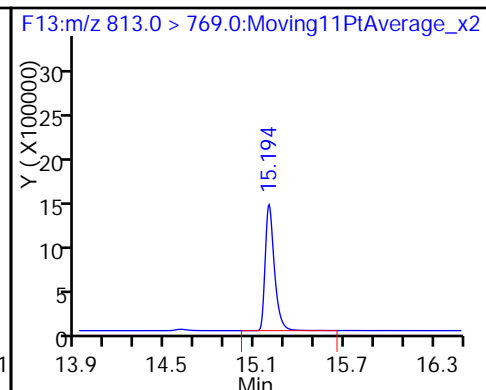
32 Perfluorotetradecanoic acid



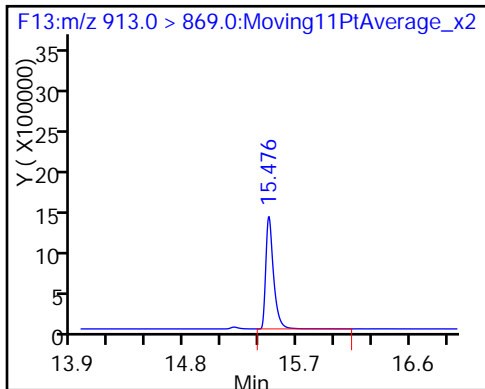
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Lab Sample ID: CCV 320-111859/38 Calibration Date: 05/29/2016 05:16
 Instrument ID: A6 Calib Start Date: 05/28/2016 13:56
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/28/2016 19:41
 Lab File ID: 28MAY2016A6A_039.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.516	1.468		19.4	20.0	-3.2	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.222	0.997		16.3	20.0	-18.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.260	1.180		16.6	17.7	-6.4	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.103	1.153		20.9	20.0	4.6	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.059		17.3	20.0	-13.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.9146	0.8646		17.9	18.9	-5.5	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.016	1.039		20.4	20.0	2.2	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.7801	0.7966		19.4	19.0	2.1	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.255	1.249		19.0	19.1	-0.5	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8443	0.7501		17.8	20.0	-11.2	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.307	1.201		18.4	20.0	-8.1	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.8093	0.7769		19.2	20.0	-4.0	25.0
Perfluorodecanesulfonic acid (PFDS)	L1ID		0.8200		19.7	19.3	1.9	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		0.9207		17.4	20.0	-12.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8088	0.7363		18.2	20.0	-9.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.146	0.9933		17.3	20.0	-13.3	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.7662		17.0	20.0	-15.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.408		17.6	20.0	-12.1	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.538	1.090		14.2	20.0	-29.1*	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_039.d
 Lims ID: CCV L4
 Client ID:
 Sample Type: CCV
 Inject. Date: 29-May-2016 05:16:08 ALS Bottle#: 12 Worklist Smp#: 38
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L4 CCV L4
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 14:41:57 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj Date: 29-May-2016 15:21:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.791	5.795	-0.004	1266911	53.1		106	5763	
2 Perfluorobutyric acid	212.9 > 169.0	5.797	5.797	0.0	743829	19.4		96.8	52800	
D 3 13C5-PFPeA	267.9 > 223.0	6.951	6.957	-0.006	3164140	58.1		116	7193	
4 Perfluoropentanoic acid	262.9 > 219.0	6.955	6.959	-0.004	1261621	16.3		81.6	276	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.081	7.085	-0.004	668190	16.6		93.6		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.081	7.085	-0.004	668190	NC			157	
	298.9 > 99.0	7.078	7.085	-0.007	326655		2.05(0.00-0.00)		224	
7 Perfluorohexanoic acid	313.0 > 269.0	8.236	8.235	0.001	1468066	20.9		105	1661	
D 6 13C2 PFHxA	315.0 > 270.0	8.236	8.236	0.0	3182346	54.5		109	35888	
D 8 13C4-PFHpA	367.0 > 322.0	9.475	9.474	0.001	3391741	54.7		109	32902	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.475	9.475	0.0	1436487	17.3		86.6	20962	
D 11 18O2 PFHxS	403.0 > 84.0	9.510	9.507	0.003	1515107	53.1		112	20798	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.510	9.507	0.003	523970	NC			1186	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.510	9.507	0.003	523970	17.9		94.5		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.586	10.586	0.0		3917293	58.2		116	257522	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.586	10.587	-0.001	1.000	1628478	20.4		102	230	
413.0 > 169.0	10.586	10.587	-0.001	1.000	632804		2.57(0.00-0.00)		245	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.596	10.596	0.0	1.000	619007	NC			7229	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.596	10.596	0.0	1.000	619007	19.4		102		
D 16 13C4 PFOS										
503.0 > 80.0	11.543	11.543	0.0		1950886	55.5		116	93247	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.543	11.545	-0.002	1.000	974412	19.0		99.5	564	
499.0 > 99.0	11.543	11.545	-0.002	1.000	518759		1.88(0.00-0.00)		1041	
D 17 13C5 PFNA										
468.0 > 423.0	11.561	11.562	-0.001		3485312	56.2		112	41470	
18 Perfluorononanoic acid										
463.0 > 419.0	11.561	11.563	-0.002	1.000	1045767	17.8		88.8	50130	
D 19 13C2 PFDA										
515.0 > 470.0	12.393	12.392	0.001		2758162	55.4		111	167379	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.393	12.392	0.001	1.000	1324839	18.4		91.9	80443	
D 23 13C8 FOSA										
506.0 > 78.0	12.994	13.000	-0.006		5840348	52.2		104	3986	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.994	13.002	-0.008	1.000	1814958	19.2		96.0	12048	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.040	13.048	-0.008	1.000	645209	19.7		102		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.040	13.048	-0.008	1.000	645209	NC			30097	
D 26 13C2 PFUnA										
565.0 > 520.0	13.084	13.094	-0.010		3972883	57.0		114	31480	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.084	13.094	-0.010	1.000	1463171	17.4		87.1	23028	
D 28 13C2 PFDaA										
615.0 > 570.0	13.682	13.685	-0.003		4824529	58.0		116	31339	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.682	13.685	-0.003	1.000	1420878	18.2		91.0	1607	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.181	14.184	-0.003	1.000	1916807	17.3		86.7	1664	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.601	14.609	-0.008		3950667	53.2		106	25916	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.601	14.609	-0.008	1.000	1478612	17.0		84.8	653	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.193	15.203	-0.010		6288622	53.8		108	8830	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.193	15.203	-0.010	1.000	2717112	17.6		87.9	2118	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.475	15.473	0.002	1.000	2103963	14.2	70.9	1443	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00020

Amount Added: 1.00

Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_039.d

Injection Date: 29-May-2016 05:16:08

Instrument ID: A6

Lims ID: CCV L4

Client ID:

Operator ID: JRB

ALS Bottle#: 12

Worklist Smp#: 38

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

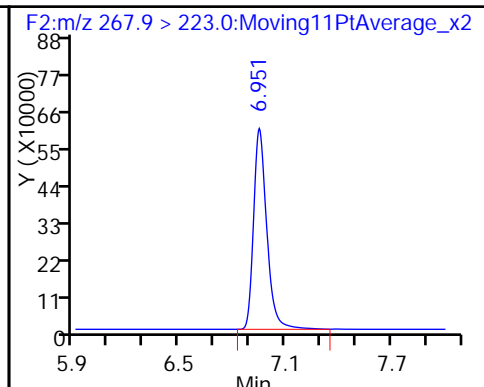
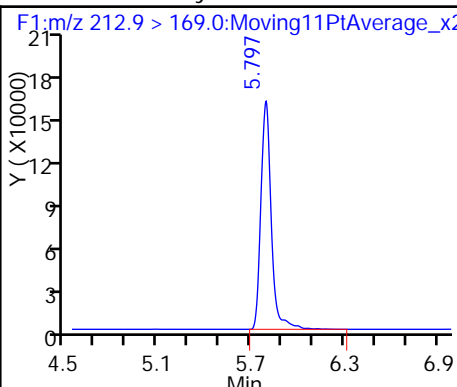
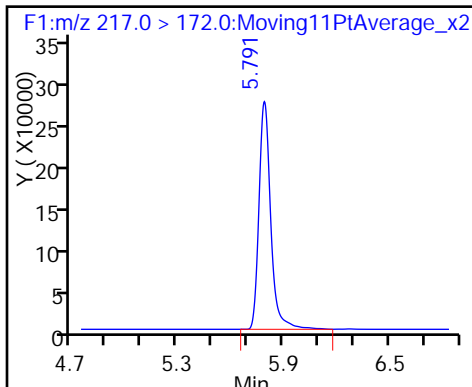
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

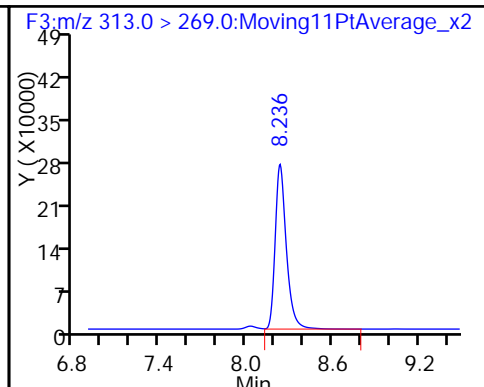
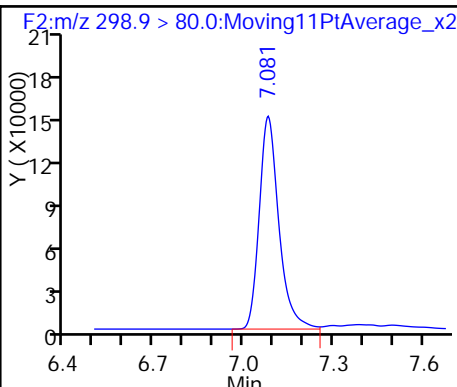
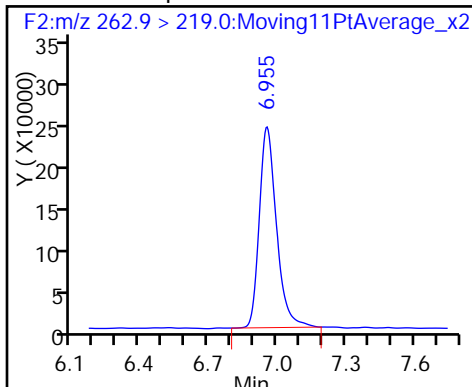
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

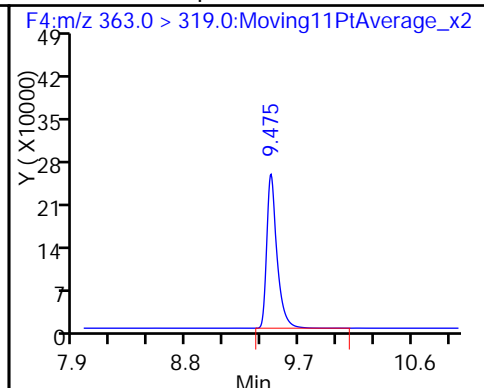
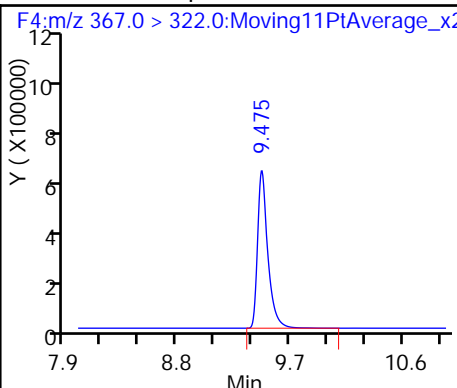
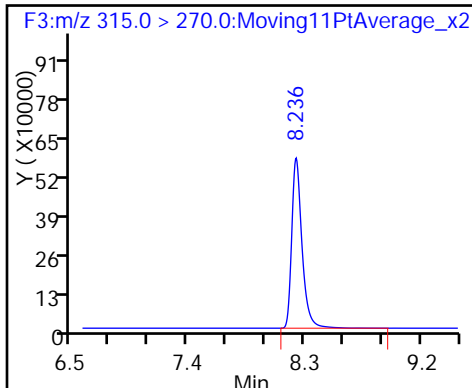
7 Perfluorohexanoic acid



D 6 13C2 PFHxA

D 8 13C4-PFHpA

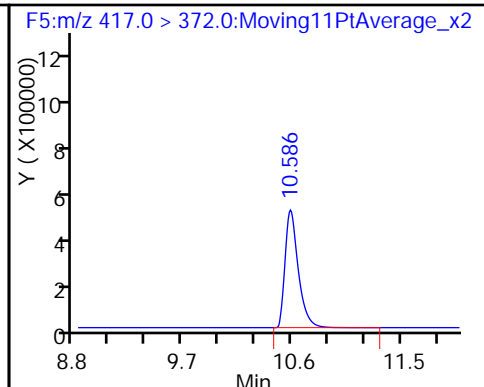
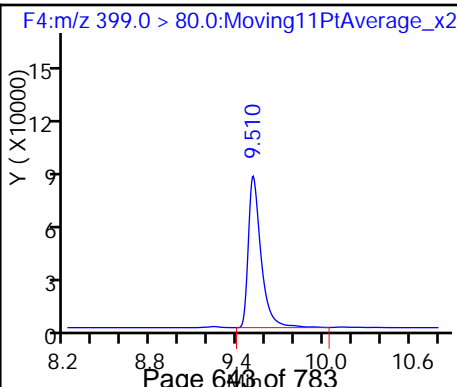
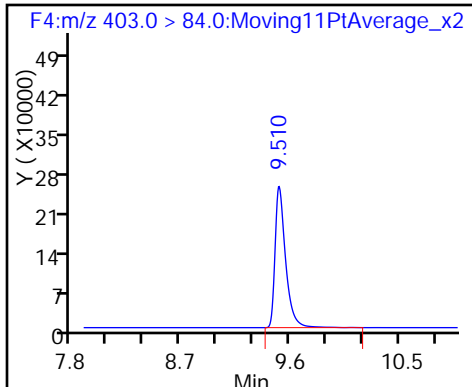
9 Perfluoroheptanoic acid

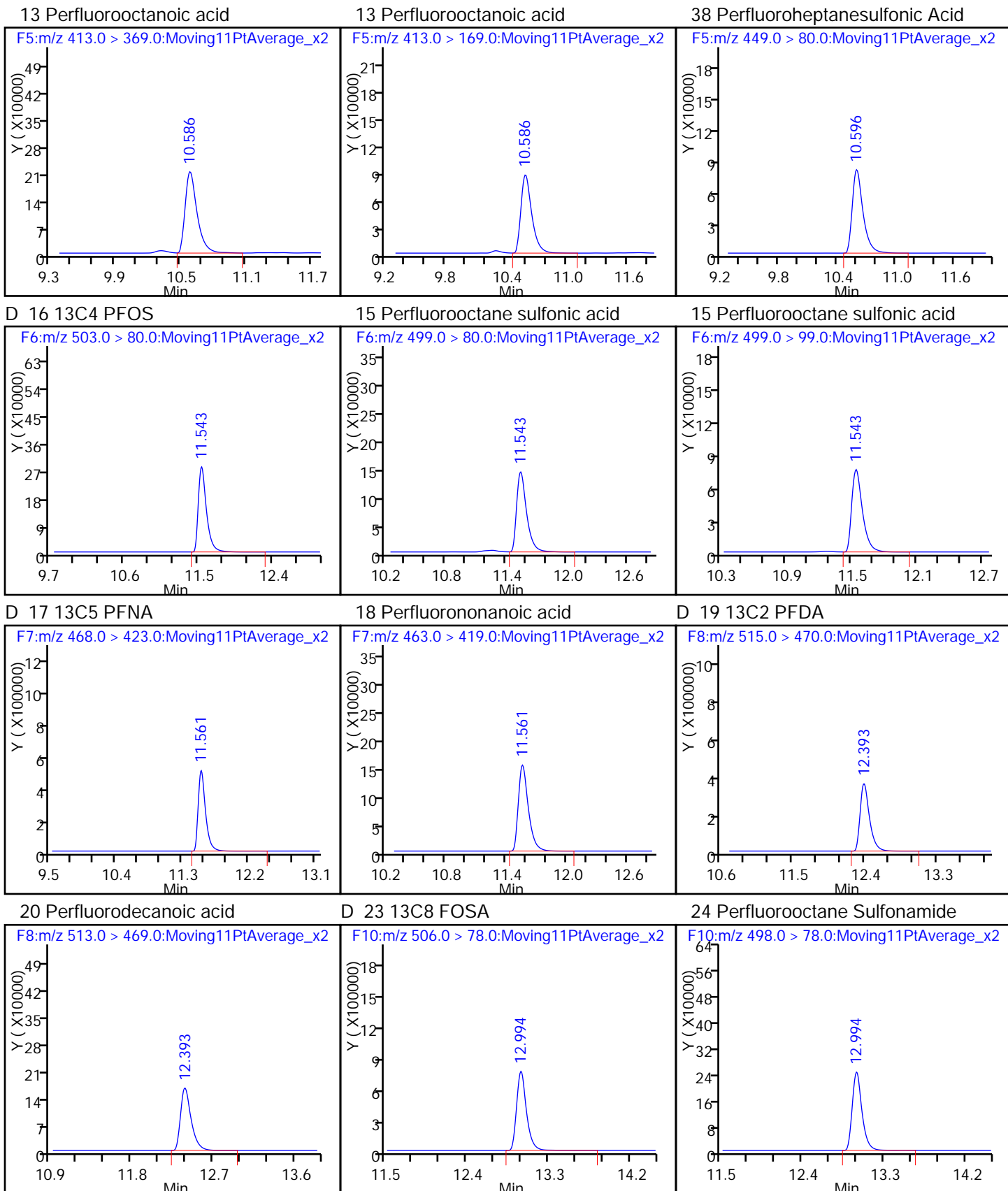


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

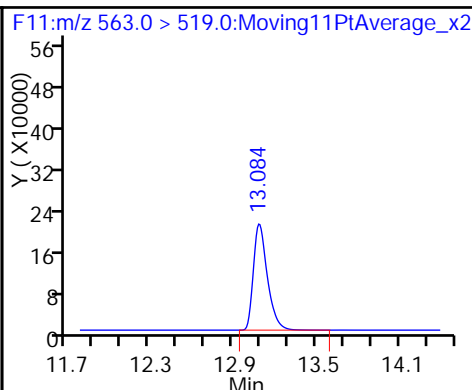
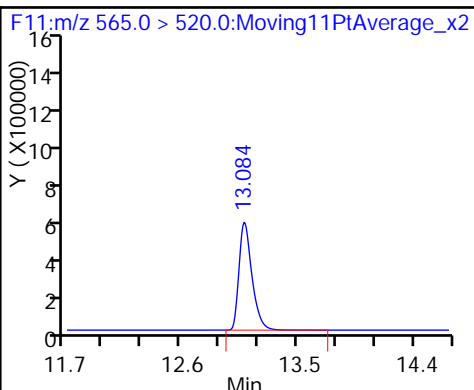
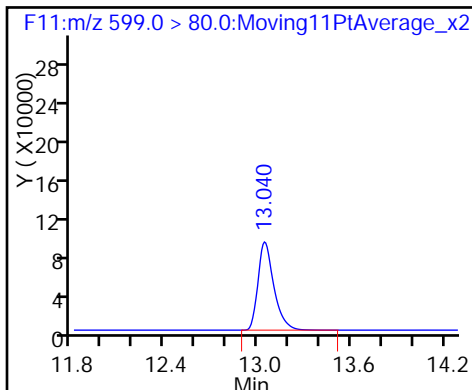




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUa

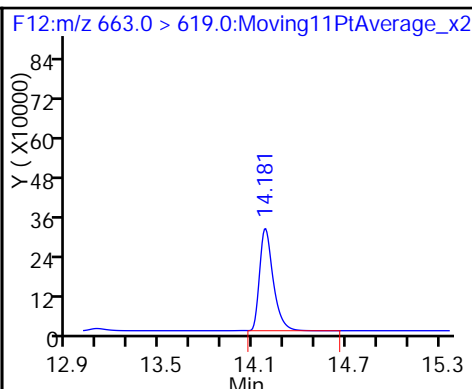
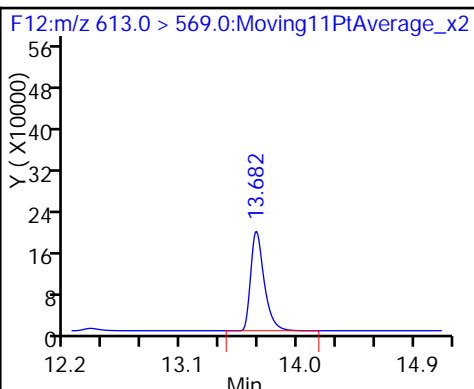
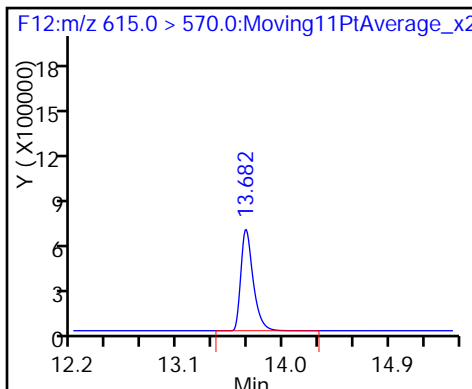
27 Perfluoroundecanoic acid



D 28 13C2 PFDa

29 Perfluorododecanoic acid

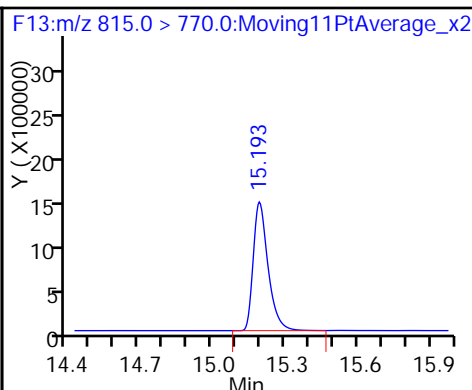
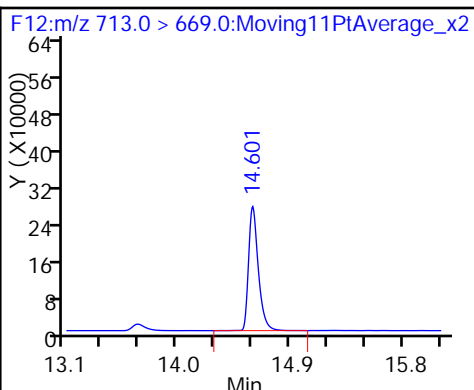
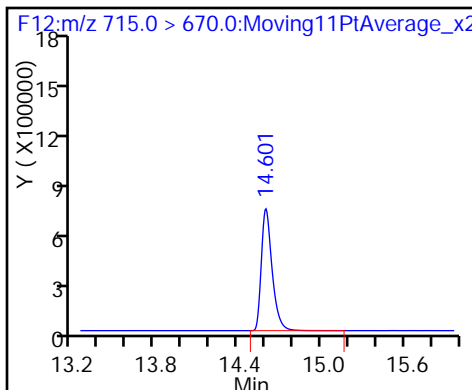
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

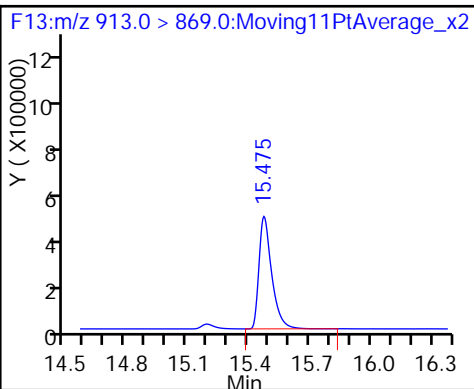
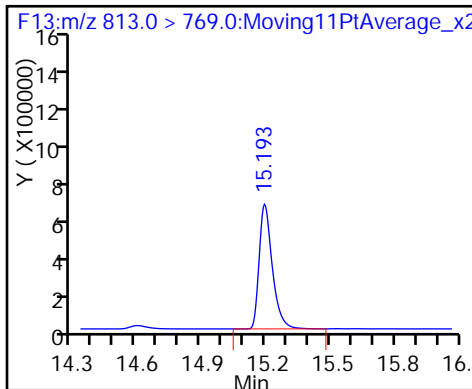
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Lab Sample ID: CCV 320-111859/52 Calibration Date: 05/29/2016 10:14
 Instrument ID: A6 Calib Start Date: 05/28/2016 13:56
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/28/2016 19:41
 Lab File ID: 28MAY2016A6A_053.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.516	1.668		55.0	50.0	10.0	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.222	1.156		47.3	50.0	-5.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.260	1.331		46.7	44.2	5.6	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.103	1.205		54.6	50.0	9.3	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.213		50.4	50.0	0.9	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.9146	0.9179		47.5	47.3	0.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.016	1.023		50.3	50.0	0.7	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.7801	0.9933		60.6	47.6	27.3*	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.255	1.464		55.7	47.8	16.6	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8443	0.9084		53.8	50.0	7.6	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.307	1.355		51.8	50.0	3.7	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.8093	0.8897		55.0	50.0	9.9	25.0
Perfluorodecanesulfonic acid (PFDS)	L1ID		0.9012		53.9	48.2	11.8	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		1.052		50.6	50.0	1.2	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8088	0.8552		52.9	50.0	5.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.146	1.161		50.7	50.0	1.3	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.8967		50.6	50.0	1.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.487		47.9	50.0	-4.3	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.538	1.301		42.3	50.0	-15.4	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_053.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 29-May-2016 10:14:01 ALS Bottle#: 13 Worklist Smp#: 52
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5 CCV L5
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub5
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 15:08:54 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj Date: 29-May-2016 15:26:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.797	5.795	0.002	1298258	54.4		109	83936	
2 Perfluorobutyric acid	212.9 > 169.0	5.797	5.797	0.0	1.000	2164906	55.0	110	41793	
D 3 13C5-PFPeA	267.9 > 223.0	6.955	6.957	-0.002	3015023	55.3		111	78953	
4 Perfluoropentanoic acid	262.9 > 219.0	6.955	6.959	-0.004	1.000	3485095	47.3	94.6	1025	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.085	7.085	0.0	1.000	1928398	46.7	106		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.085	7.085	0.0	1.000	1928398	NC		734	
	298.9 > 99.0	7.085	7.085	0.0	1.000	904036	2.13(0.00-0.00)		306	
7 Perfluorohexanoic acid	313.0 > 269.0	8.230	8.235	-0.005	1.000	3744279	54.6	109	1252	
D 6 13C2 PFHxA	315.0 > 270.0	8.230	8.236	-0.006	3107983	53.3		107	8801	
D 8 13C4-PFHpA	367.0 > 322.0	9.475	9.474	0.001	3328502	53.7		107	144121	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.475	9.475	0.0	1.000	4037462	50.4	101	26746	
D 11 18O2 PFHxS	403.0 > 84.0	9.510	9.507	0.003	1550720	54.3		115	51310	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.510	9.507	0.003	1.000	1423331	NC		3823	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.510	9.507	0.003	1.000	1423331	47.5	100		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.586	10.586	0.0		3682619	54.7		109	36583	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.586	10.587	-0.001	1.000	3768743	50.3		101	2993	
413.0 > 169.0	10.586	10.587	-0.001	1.000	1327098		2.84(0.00-0.00)		1133	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.595	10.596	-0.001	1.000	1774667	NC			28736	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.595	10.596	-0.001	1.000	1774667	60.6		127		
D 16 13C4 PFOS										
503.0 > 80.0	11.552	11.543	0.009		1794153	51.0		107	125409	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.552	11.545	0.007	1.000	2626567	55.7		117	148	
499.0 > 99.0	11.552	11.545	0.007	1.000	1440264		1.82(0.00-0.00)		404	
D 17 13C5 PFNA										
468.0 > 423.0	11.569	11.562	0.007		3203071	51.6		103	13658	
18 Perfluorononanoic acid										
463.0 > 419.0	11.578	11.563	0.015	1.000	2909575	53.8		108	18582	
D 19 13C2 PFDA										
515.0 > 470.0	12.404	12.392	0.012		2536737	51.0		102	34421	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.404	12.392	0.012	1.000	3436833	51.8		104	19955	
D 23 13C8 FOSA										
506.0 > 78.0	13.013	13.000	0.013		5731317	51.2		102	2902	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.013	13.002	0.011	1.000	5099160	55.0		110	1952	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.058	13.048	0.010	1.000	1630359	53.9		112		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.058	13.048	0.010	1.000	1630359	NC			46035	
D 26 13C2 PFUnA										
565.0 > 520.0	13.102	13.094	0.008		3697328	53.0		106	75266	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.102	13.094	0.008	1.000	3888603	50.6		101	34497	
D 28 13C2 PFDoA										
615.0 > 570.0	13.685	13.685	0.0		4555933	54.8		110	24842	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.685	13.685	0.0	1.000	3896298	52.9		106	4466	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.182	14.184	-0.002	1.000	5290561	50.7		101	3261	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.615	14.609	0.006		3865803	52.1		104	11445	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.615	14.609	0.006	1.000	4085178	50.6		101	1312	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.205	15.203	0.002		6211071	53.2		106	9136	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.205	15.203	0.002	1.000	6775657	47.9		95.7	4020	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.476	15.473	0.003	1.000	5925348	42.3	84.6	2589	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00018

Amount Added: 1.00

Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_053.d

Injection Date: 29-May-2016 10:14:01

Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: JRB

ALS Bottle#: 13

Worklist Smp#: 52

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

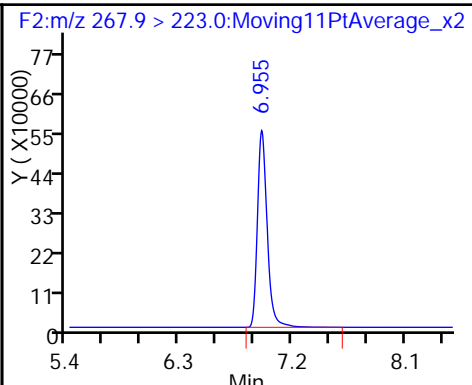
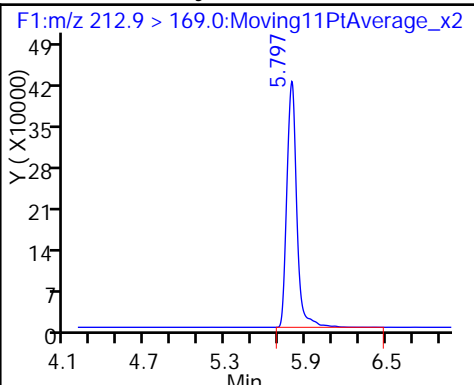
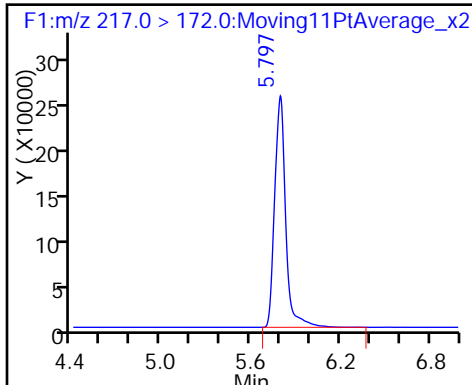
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

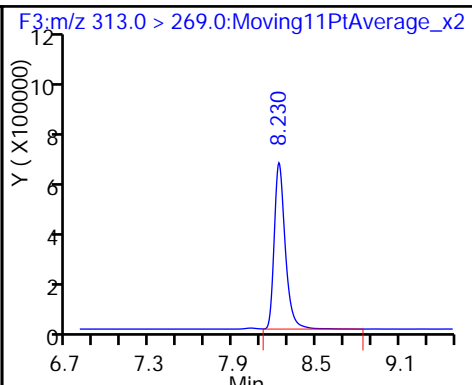
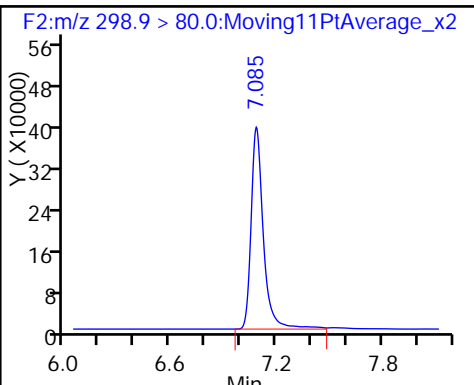
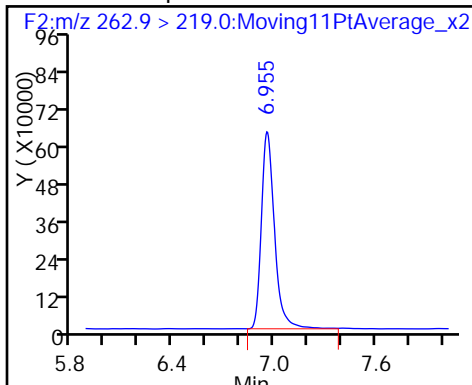
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

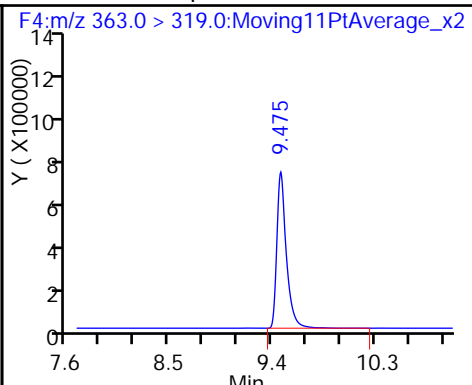
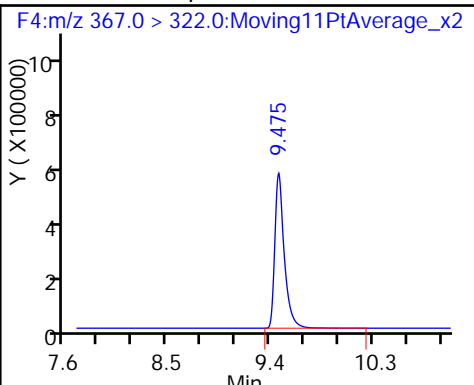
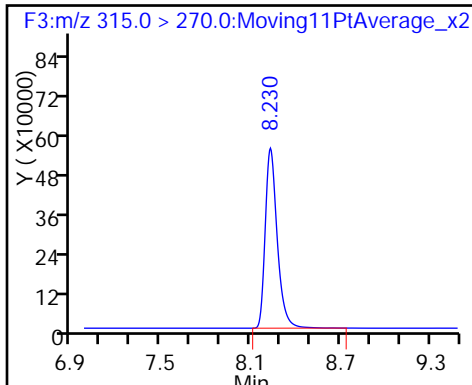
7 Perfluorohexanoic acid



D 6 13C2 PFHxA

D 8 13C4-PFHpA

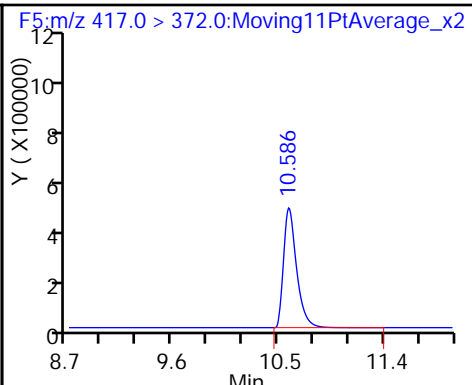
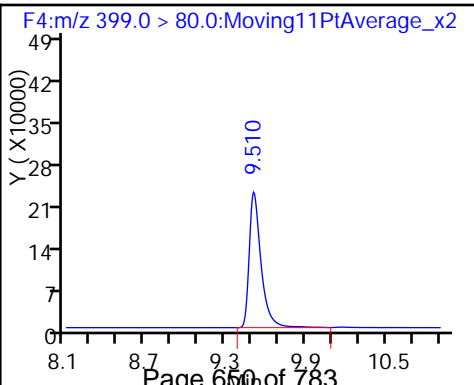
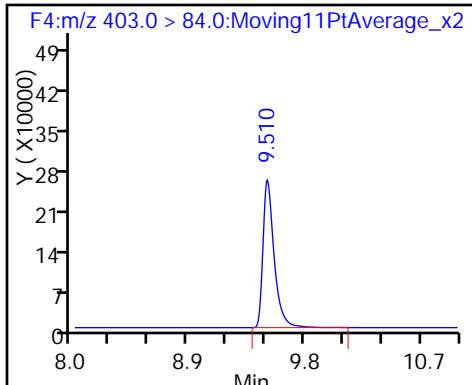
9 Perfluoroheptanoic acid

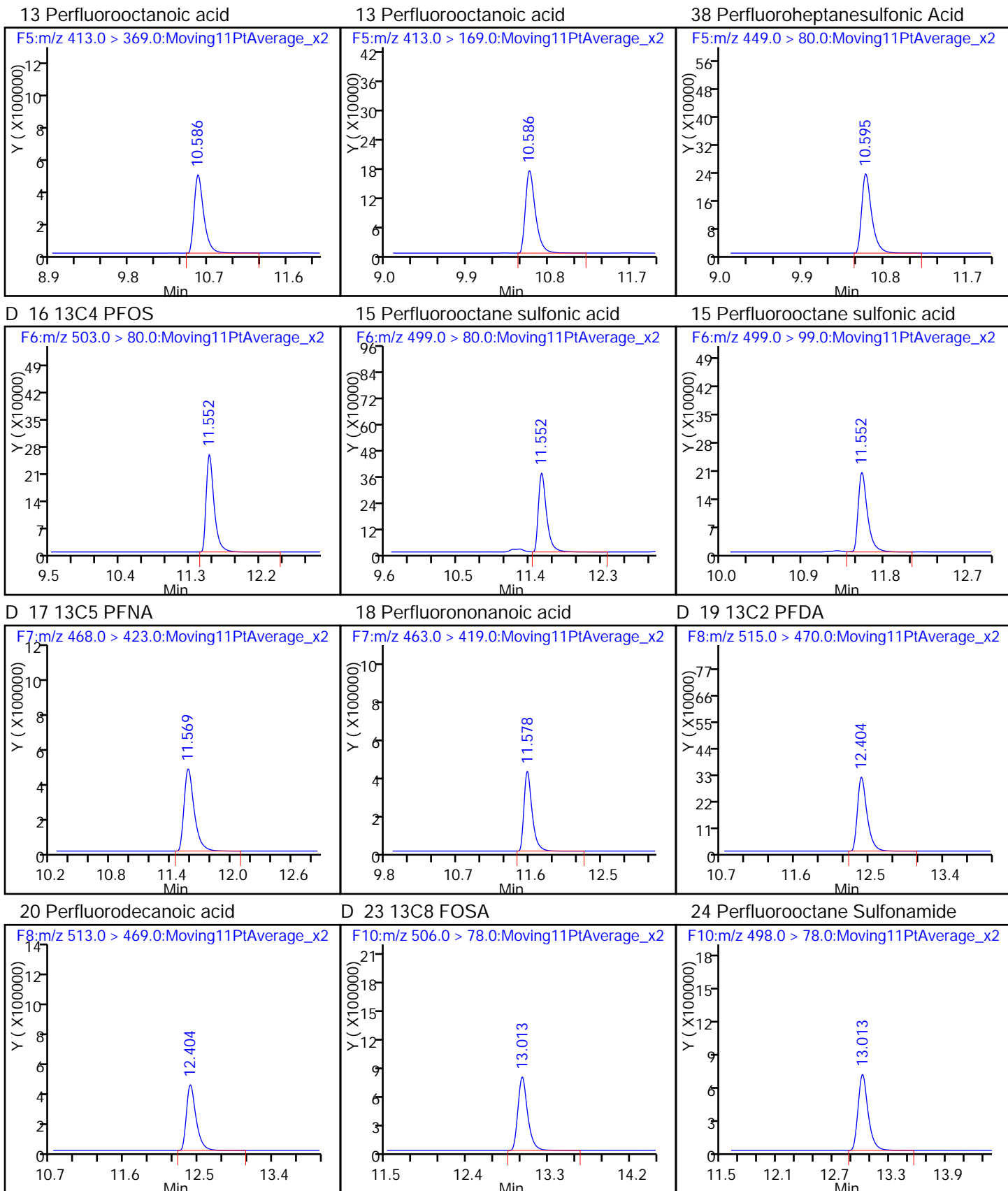


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

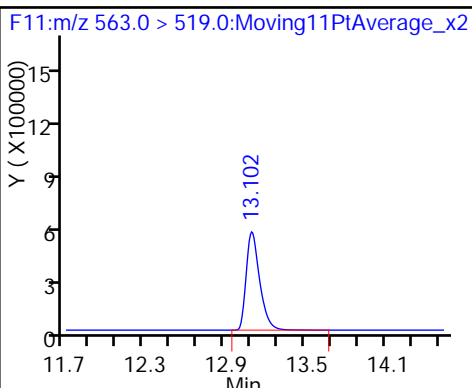
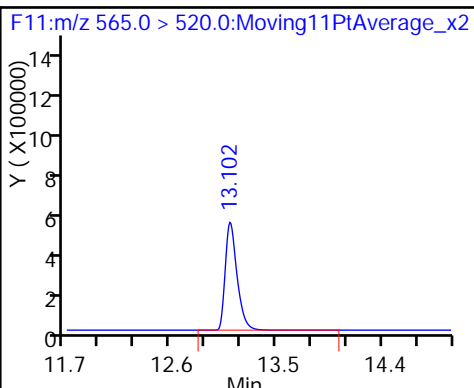
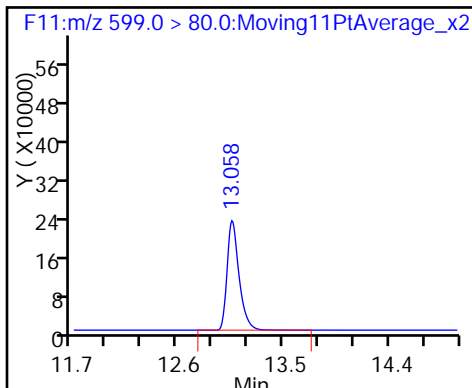




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

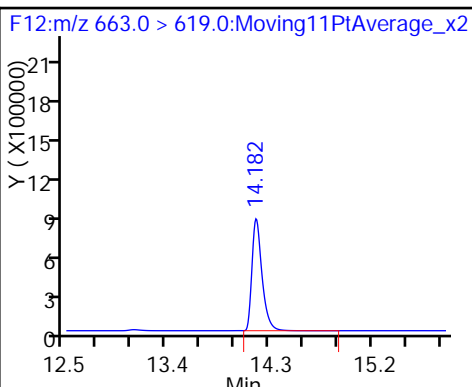
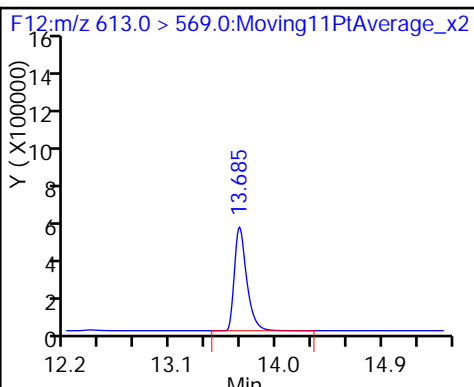
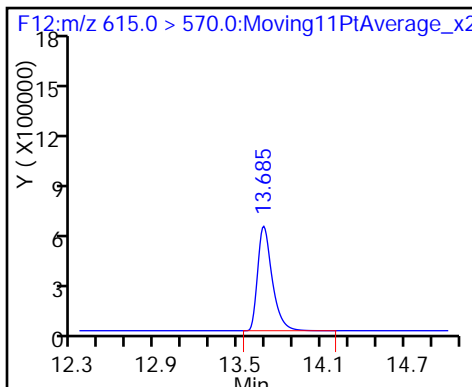
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

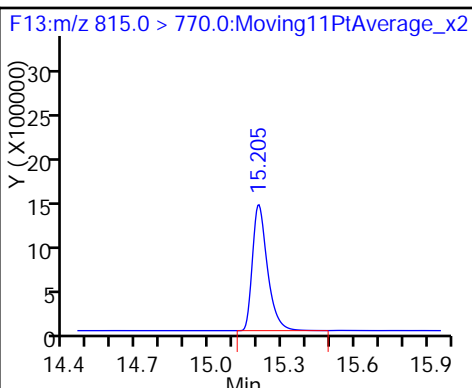
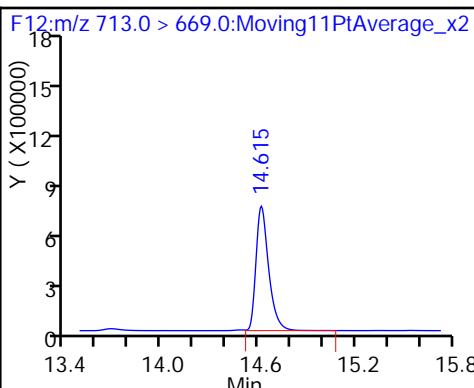
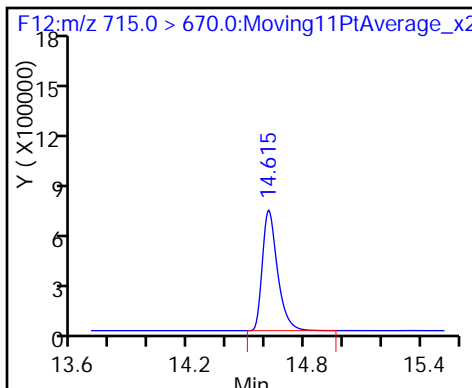
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

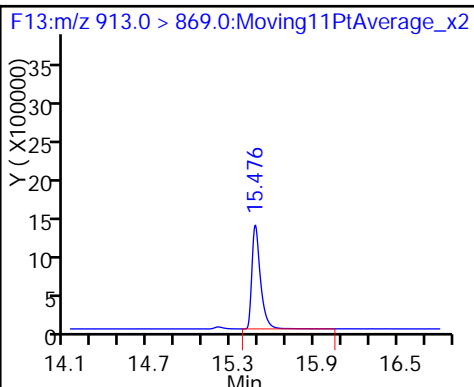
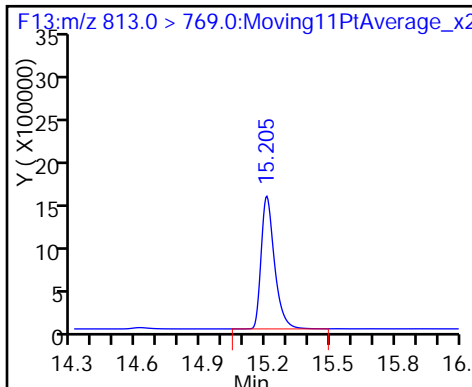
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Lab Sample ID: CCV 320-111859/64 Calibration Date: 05/29/2016 14:29
 Instrument ID: A6 Calib Start Date: 05/28/2016 13:56
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/28/2016 19:41
 Lab File ID: 28MAY2016A6A_065.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.516	1.480		19.5	20.0	-2.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.222	1.064		17.4	20.0	-13.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.260	1.122		15.7	17.7	-11.0	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.103	1.095		19.9	20.0	-0.7	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.030		16.8	20.0	-15.8	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.9146	0.8822		18.2	18.9	-3.5	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.016	1.201		23.6	20.0	18.2	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.7801	0.7460		18.2	19.0	-4.4	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.255	1.365		20.8	19.1	8.7	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8443	0.8040		19.0	20.0	-4.8	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.307	1.163		17.8	20.0	-11.0	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.8093	0.8166		20.2	20.0	0.9	25.0
Perfluorodecanesulfonic acid (PFDS)	L1ID		0.8915		21.4	19.3	10.8	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		0.9892		18.8	20.0	-6.2	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8088	0.7819		19.3	20.0	-3.3	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.146	1.070		18.7	20.0	-6.6	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.8753		19.5	20.0	-2.7	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.478		18.5	20.0	-7.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.538	1.197		15.6	20.0	-22.2	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_065.d
 Lims ID: CCV L4
 Client ID:
 Sample Type: CCV
 Inject. Date: 29-May-2016 14:29:17 ALS Bottle#: 12 Worklist Smp#: 64
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L4 CCV L4
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 17:49:12 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.794	5.795	-0.001		1190249	49.9		99.7	15347	
2 Perfluorobutyric acid										
212.9 > 169.0	5.794	5.797	-0.003	1.000	704729	19.5		97.6	10348	
D 3 13C5-PFPeA										
267.9 > 223.0	6.955	6.957	-0.002		2908520	53.4		107	2638	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.955	6.959	-0.004	1.000	1237310	17.4		87.0	260	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.085	7.085	0.0	1.000	634039	15.7		89.0		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.085	7.085	0.0	1.000	634039	NC			164	
298.9 > 99.0	7.085	7.085	0.0	1.000	301296		2.10(0.00-0.00)		465	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.230	8.235	-0.005	1.000	1364485	19.9		99.3	545	
D 6 13C2 PFHxA										
315.0 > 270.0	8.230	8.236	-0.006		3114243	53.4		107	7203	
D 8 13C4-PFHpA										
367.0 > 322.0	9.470	9.474	-0.004		3177876	51.3		103	19449	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.475	9.475	0.0	1.000	1309196	16.8		84.2	22221	
D 11 18O2 PFHxS										
403.0 > 84.0	9.505	9.507	-0.002		1511922	53.0		112	7892	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.505	9.507	-0.002	1.000	533541	NC			2324	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.505	9.507	-0.002	1.000	533541	18.2		96.5		
D 12 13C4 PFOA										
417.0 > 372.0	10.586	10.586	0.0		3418224	50.8		102	88423	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.586	10.587	-0.001	1.000	1642499	23.6		118	258	
413.0 > 169.0	10.586	10.587	-0.001	1.000	561819		2.92(0.00-0.00)		112	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.596	10.596	0.0	1.000	532177	NC			22604	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.596	10.596	0.0	1.000	532177	18.2		95.6		
D 16 13C4 PFOS										
503.0 > 80.0	11.543	11.543	0.0		1790935	51.0		107	125918	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.543	11.545	-0.002	1.000	977889	20.8		109	172	
499.0 > 99.0	11.543	11.545	-0.002	1.000	518507		1.89(0.00-0.00)		514	
D 17 13C5 PFNA										
468.0 > 423.0	11.561	11.562	-0.001		3127771	50.4		101	9432	
18 Perfluorononanoic acid										
463.0 > 419.0	11.561	11.563	-0.002	1.000	1005905	19.0		95.2	71314	
D 19 13C2 PFDA										
515.0 > 470.0	12.393	12.392	0.001		2599199	52.2		104	158843	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.393	12.392	0.001	1.000	1209302	17.8		89.0	73673	
D 23 13C8 FOSA										
506.0 > 78.0	12.994	13.000	-0.006		5857575	52.3		105	7169	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.003	13.002	0.001	1.000	1913213	20.2		101	13267	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.049	13.048	0.001	1.000	644018	21.4		111		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.049	13.048	0.001	1.000	644018	NC			14990	
D 26 13C2 PFUnA										
565.0 > 520.0	13.093	13.094	-0.001		3738713	53.6		107	13601	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.093	13.094	-0.001	1.000	1479261	18.8		93.8	14026	
D 28 13C2 PFDoA										
615.0 > 570.0	13.682	13.685	-0.003		4404159	53.0		106	23909	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.682	13.685	-0.003	1.000	1377474	19.3		96.7	2185	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.181	14.184	-0.003	1.000	1884883	18.7		93.4	1491	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.608	14.609	-0.001		4069161	54.8		110	18140	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.608	14.609	-0.001	1.000	1541982	19.5		97.3	624	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.193	15.203	-0.010		6403936	54.8		110	8421	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.198	15.203	-0.005	1.000	2604210	18.5		92.5	2434	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.469	15.473	-0.004	1.000	2107949	15.6		77.8	1392	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC-L4_00020

Amount Added: 1.00

Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_065.d

Injection Date: 29-May-2016 14:29:17

Instrument ID: A6

Lims ID: CCV L4

Client ID:

Operator ID: JRB

ALS Bottle#: 12

Worklist Smp#: 64

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

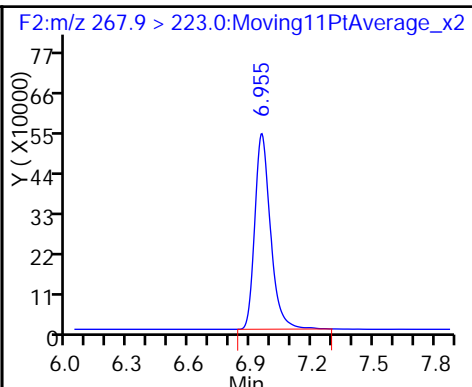
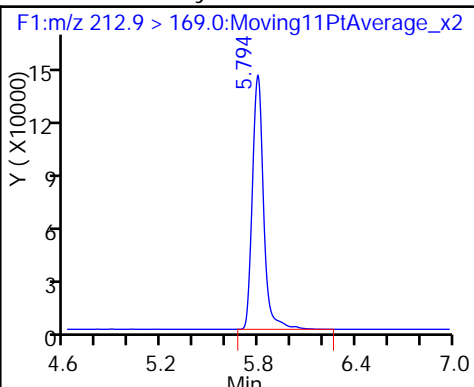
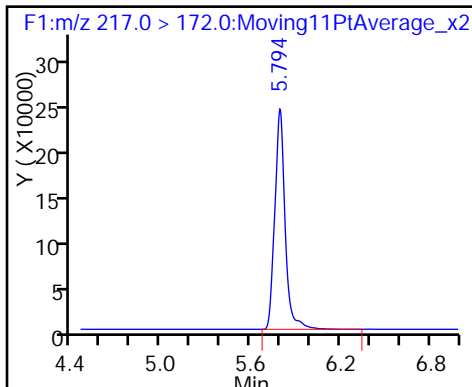
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

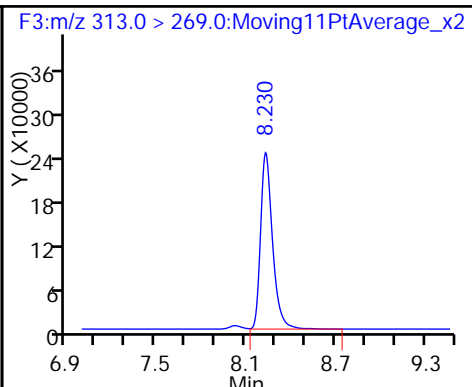
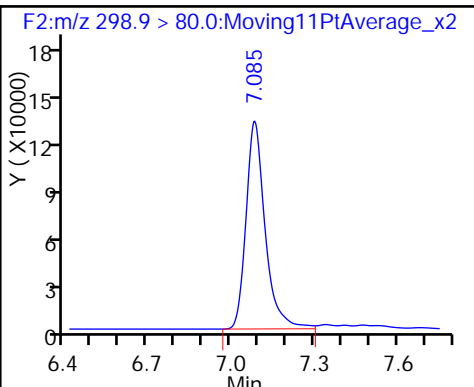
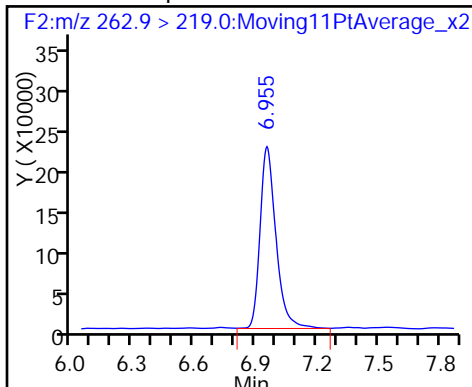
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

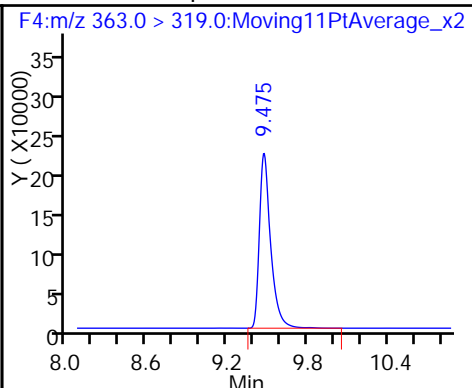
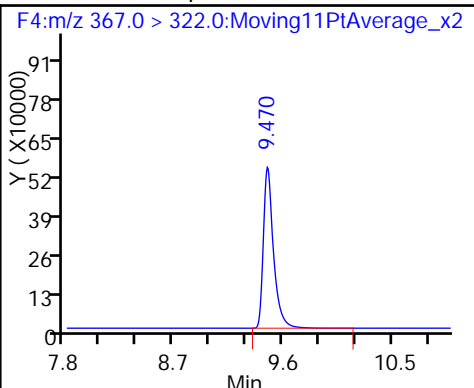
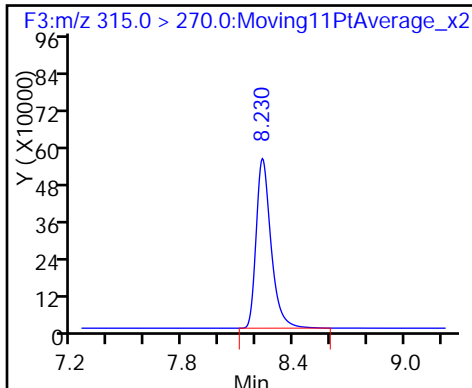
7 Perfluorohexanoic acid



D 6 13C2 PFHxA

D 8 13C4-PFHpA

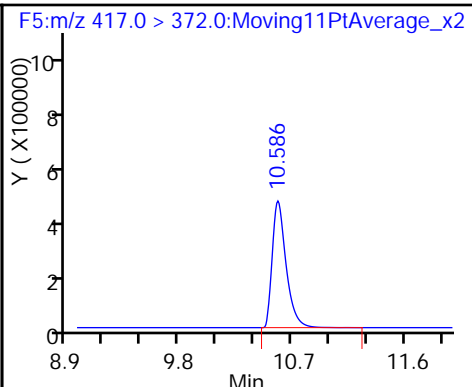
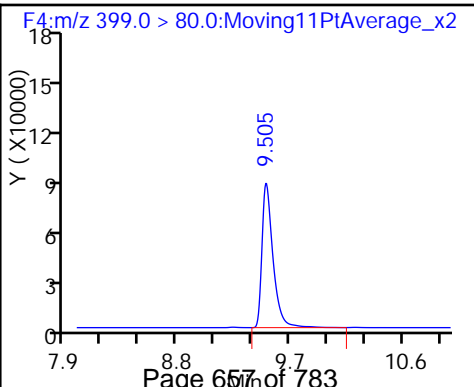
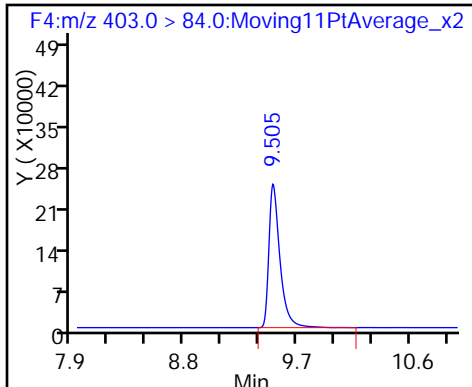
9 Perfluoroheptanoic acid

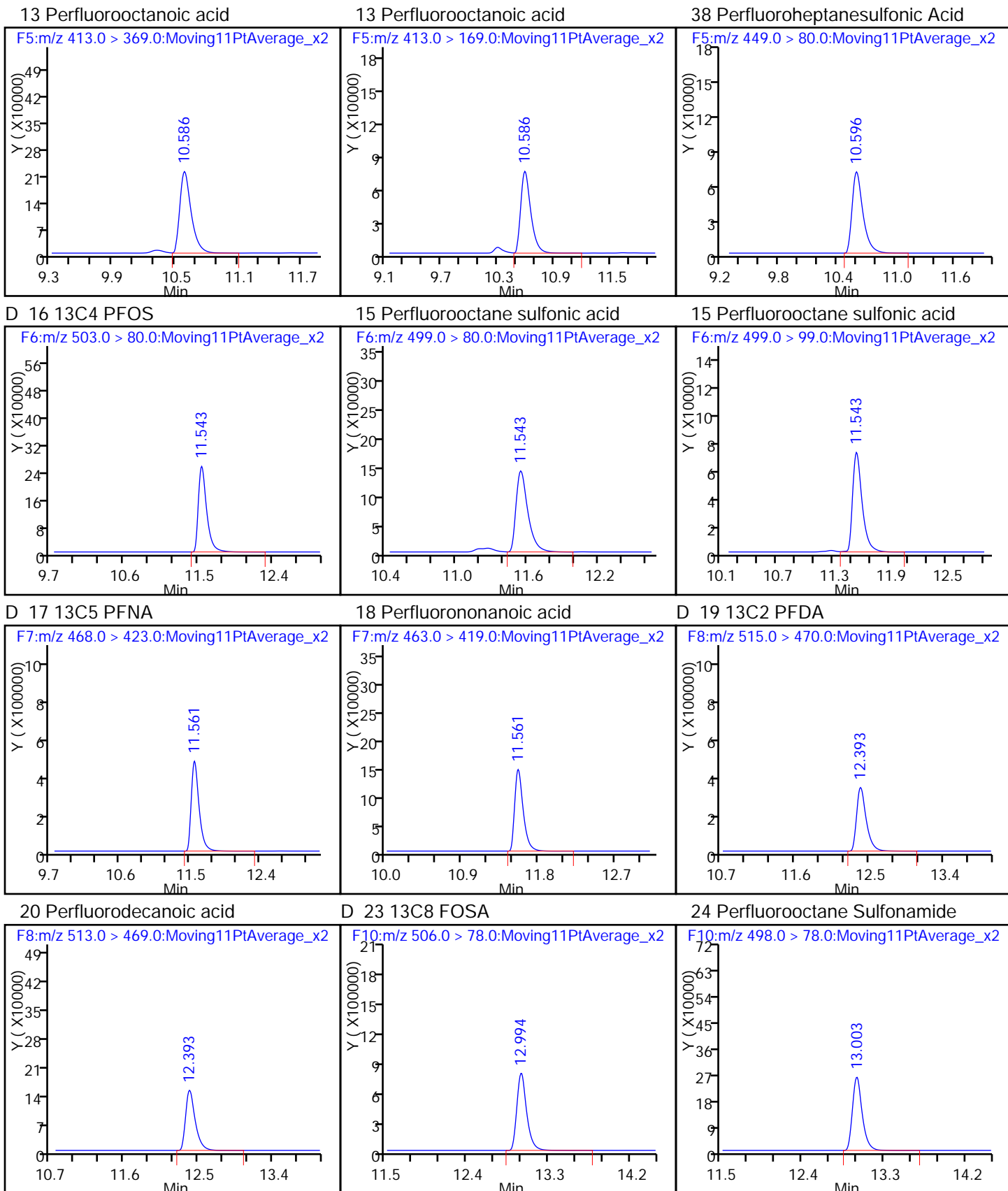


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

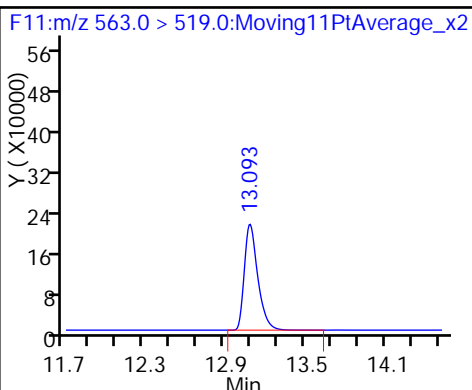
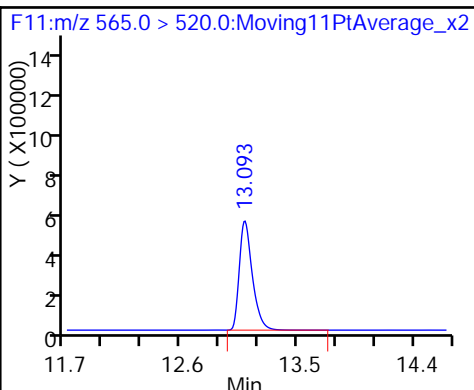
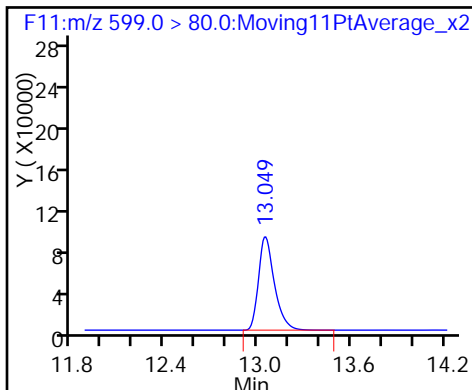




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUa

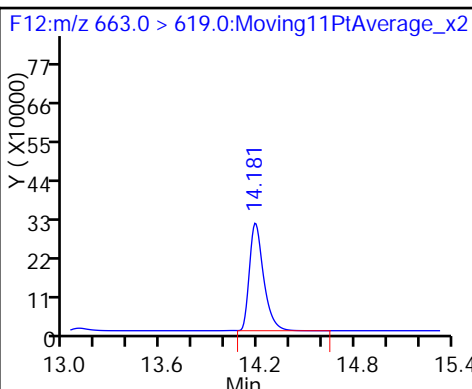
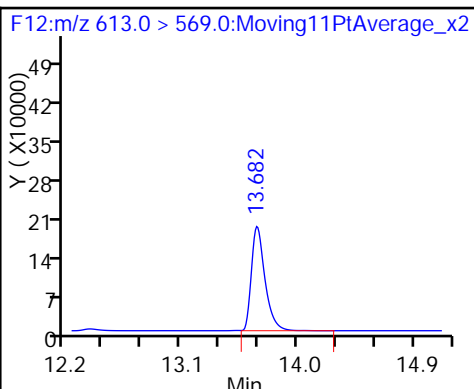
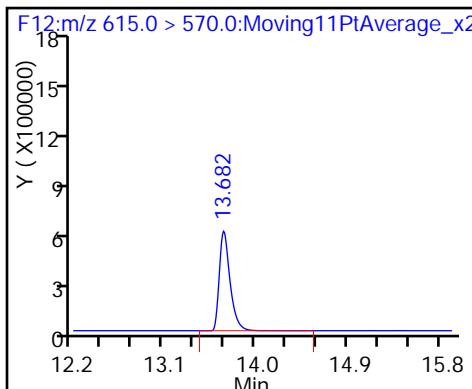
27 Perfluoroundecanoic acid



D 28 13C2 PFDa

29 Perfluorododecanoic acid

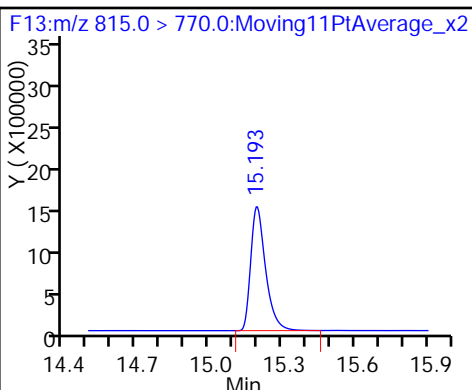
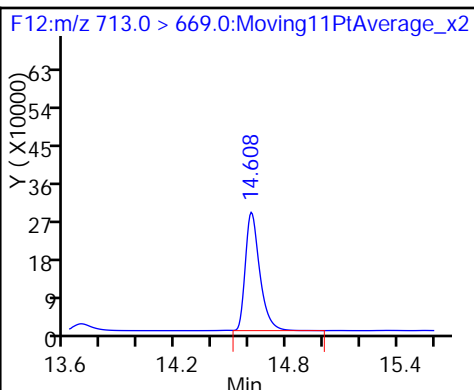
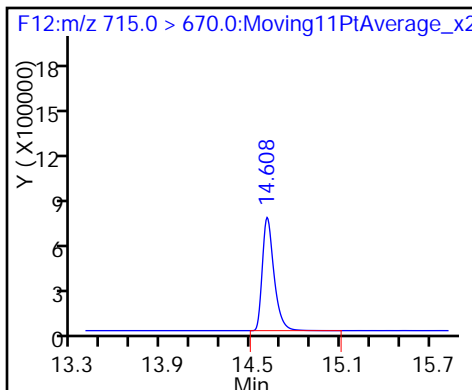
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

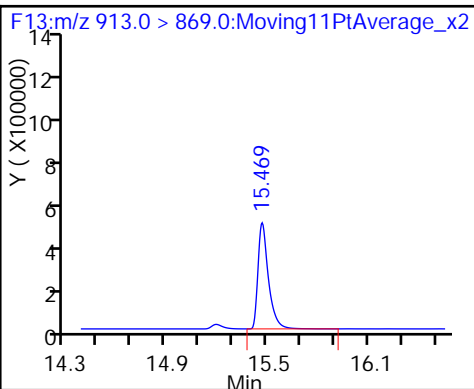
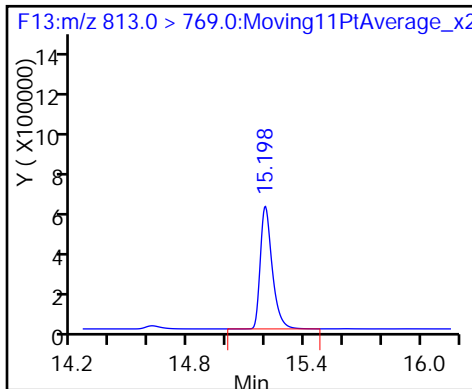
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Lab Sample ID: CCV 320-111859/76 Calibration Date: 05/29/2016 18:44
 Instrument ID: A6 Calib Start Date: 05/28/2016 13:56
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/28/2016 19:41
 Lab File ID: 28MAY2016A6A_077.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.516	1.638		54.0	50.0	8.0	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.222	1.163		47.6	50.0	-4.9	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.260	1.298		45.5	44.2	3.0	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.103	1.226		55.6	50.0	11.1	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.231		51.2	50.0	2.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.9146	0.9266		47.9	47.3	1.3	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.016	1.102		54.2	50.0	8.5	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.7801	0.8386		51.2	47.6	7.5	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.255	1.385		52.7	47.8	10.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8443	0.8806		52.2	50.0	4.3	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.307	1.328		50.8	50.0	1.6	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.8093	0.9000		55.6	50.0	11.2	25.0
Perfluorodecanesulfonic acid (PFDS)	L1ID		0.8237		49.3	48.2	2.2	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		1.040		50.0	50.0	0.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8088	0.9103		56.3	50.0	12.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.146	1.169		51.0	50.0	2.0	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.8784		49.6	50.0	-0.8	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.648		53.1	50.0	6.2	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.538	1.446		47.0	50.0	-5.9	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_077.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 29-May-2016 18:44:37 ALS Bottle#: 13 Worklist Smp#: 76
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5 CCV L5
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub5
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 17:08:51 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.791	5.795	-0.004		1302320	54.6		109	1815	
2 Perfluorobutyric acid										
212.9 > 169.0	5.794	5.797	-0.003	1.000	2133163	54.0		108	6856	
D 3 13C5-PFPeA										
267.9 > 223.0	6.951	6.957	-0.006		2890058	53.0		106	8279	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.951	6.959	-0.008	1.000	3359680	47.6		95.1	748	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.078	7.085	-0.007	1.000	1839105	45.5		103		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.078	7.085	-0.007	1.000	1839105	NC			682	
298.9 > 99.0	7.078	7.085	-0.007	1.000	871421		2.11(0.00-0.00)		999	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.230	8.235	-0.005	1.000	3634998	55.6		111	3829	
D 6 13C2 PFHxA										
315.0 > 270.0	8.230	8.236	-0.006		2965745	50.8		102	6626	
D 8 13C4-PFHpA										
367.0 > 322.0	9.469	9.474	-0.005		3225791	52.0		104	45921	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.469	9.475	-0.006	1.000	3971358	51.2		102	27206	
D 11 18O2 PFHxS										
403.0 > 84.0	9.504	9.507	-0.003		1516568	53.1		112	8715	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.504	9.507	-0.003	1.000	1405202	NC			3212	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.504	9.507	-0.003	1.000	1405202	47.9		101		
D 12 13C4 PFOA										
417.0 > 372.0	10.586	10.586	0.0		3296638	48.9		97.9	71151	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.586	10.587	-0.001	1.000	3634210	54.2		108	2228	
413.0 > 169.0	10.586	10.587	-0.001	1.000	1289792		2.82(0.00-0.00)		6417	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.595	10.596	-0.001	1.000	1523530	NC			97191	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.595	10.596	-0.001	1.000	1523530	51.2		108		
D 16 13C4 PFOS										
503.0 > 80.0	11.543	11.543	0.0		1824342	51.9		109	125376	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.543	11.545	-0.002	1.000	2527119	52.7		110	207	
499.0 > 99.0	11.543	11.545	-0.002	1.000	1404820		1.80(0.00-0.00)		641	
D 17 13C5 PFNA										
468.0 > 423.0	11.561	11.562	-0.001		3154537	50.9		102	4838	
18 Perfluorononanoic acid										
463.0 > 419.0	11.561	11.563	-0.002	1.000	2777983	52.2		104	131197	
D 19 13C2 PFDA										
515.0 > 470.0	12.393	12.392	0.001		2364035	47.5		95.0	143361	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.393	12.392	0.001	1.000	3138965	50.8		102	18071	
D 23 13C8 FOSA										
506.0 > 78.0	13.004	13.000	0.004		5432619	48.5		97.1	2757	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.004	13.002	0.002	1.000	4889313	55.6		111	2189	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.058	13.048	0.010	1.000	1515286	49.3		102		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.058	13.048	0.010	1.000	1515286	NC			9917	
D 26 13C2 PFUnA										
565.0 > 520.0	13.094	13.094	0.0		3404641	48.8		97.6	18478	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.094	13.094	0.0	1.000	3539456	50.0		100	82727	
D 28 13C2 PFDoA										
615.0 > 570.0	13.685	13.685	0.0		4240755	51.0		102	22240	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.685	13.685	0.0	1.000	3860533	56.3		113	7865	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.189	14.184	0.005	1.000	4957696	51.0		102	3155	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.609	14.609	0.0		3938158	53.1		106	13638	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.609	14.609	0.0	1.000	3725204	49.6		99.2	1558	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.189	15.203	-0.014		6167106	52.8		106	9069	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.189	15.203	-0.014	1.000	6988788	53.1		106	3679	
36 Perfluorooctadecanoic acid										
913.0 > 869.0	15.466	15.473	-0.007	1.000	6133226	47.0		94.1	3432	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC-L5_00018

Amount Added: 1.00

Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_077.d

Injection Date: 29-May-2016 18:44:37

Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: JRB

ALS Bottle#: 13

Worklist Smp#: 76

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

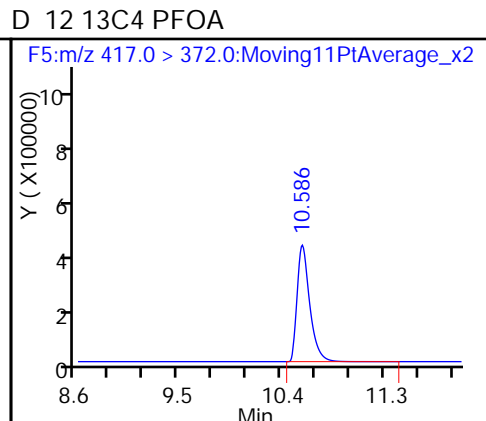
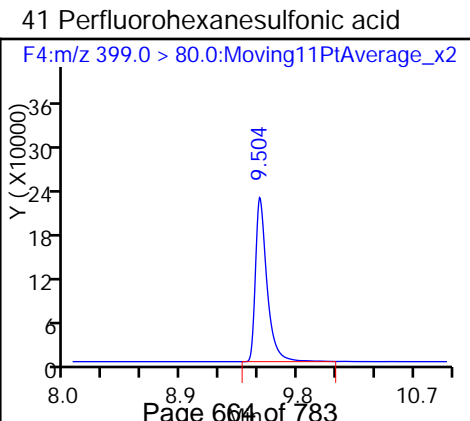
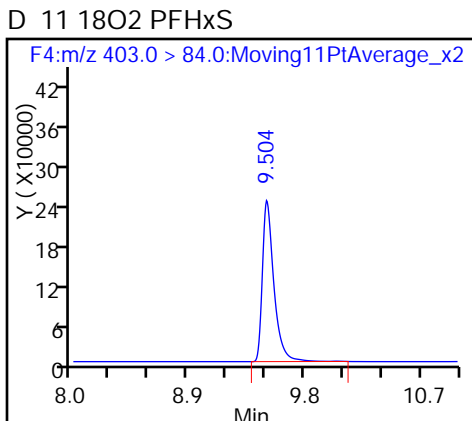
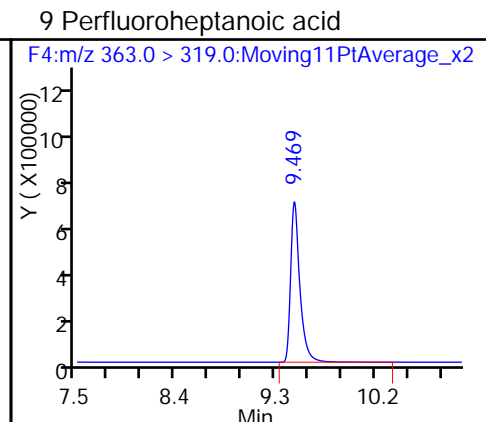
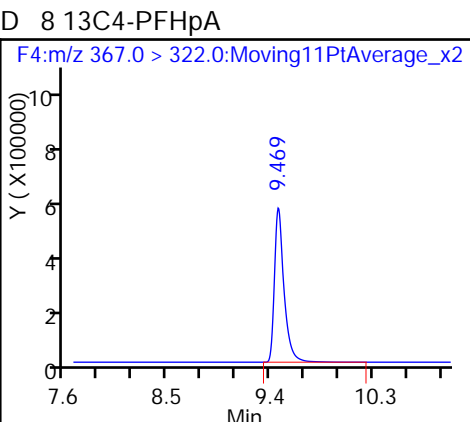
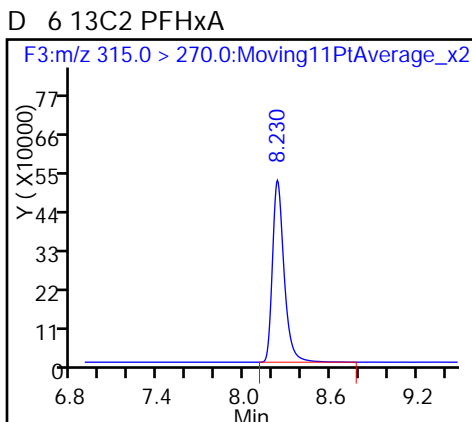
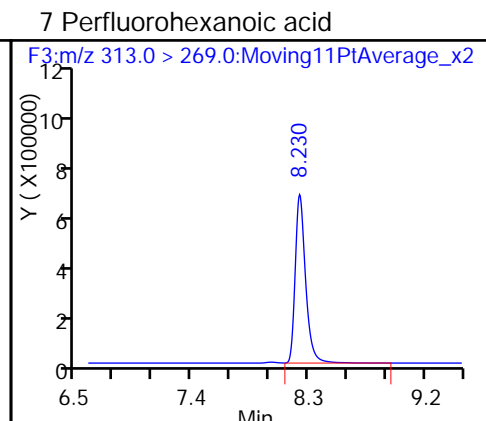
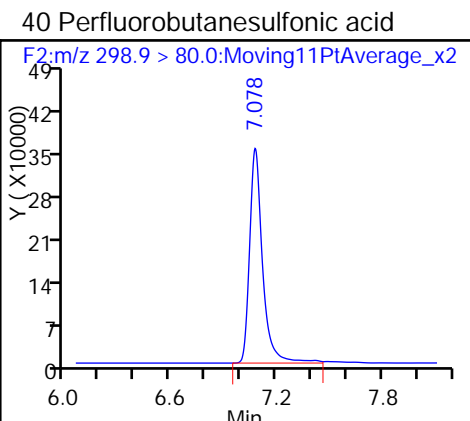
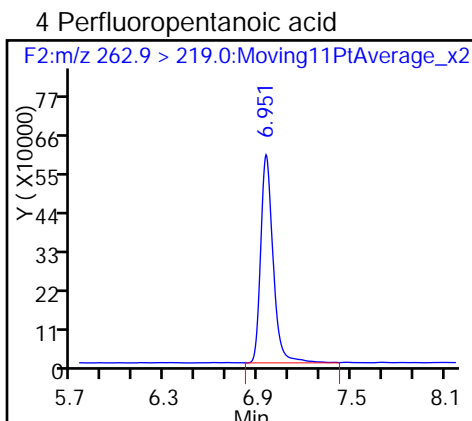
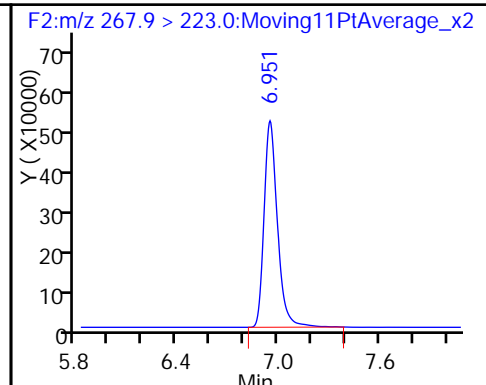
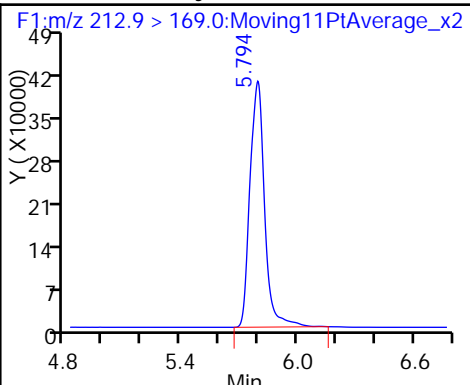
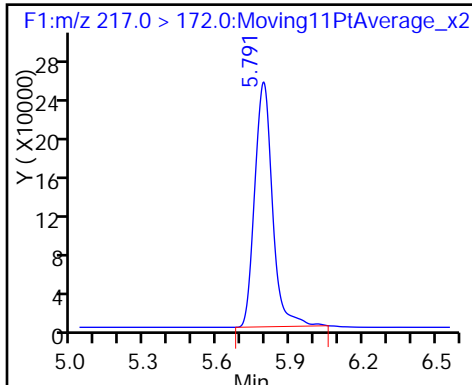
Method: PFAC_A6

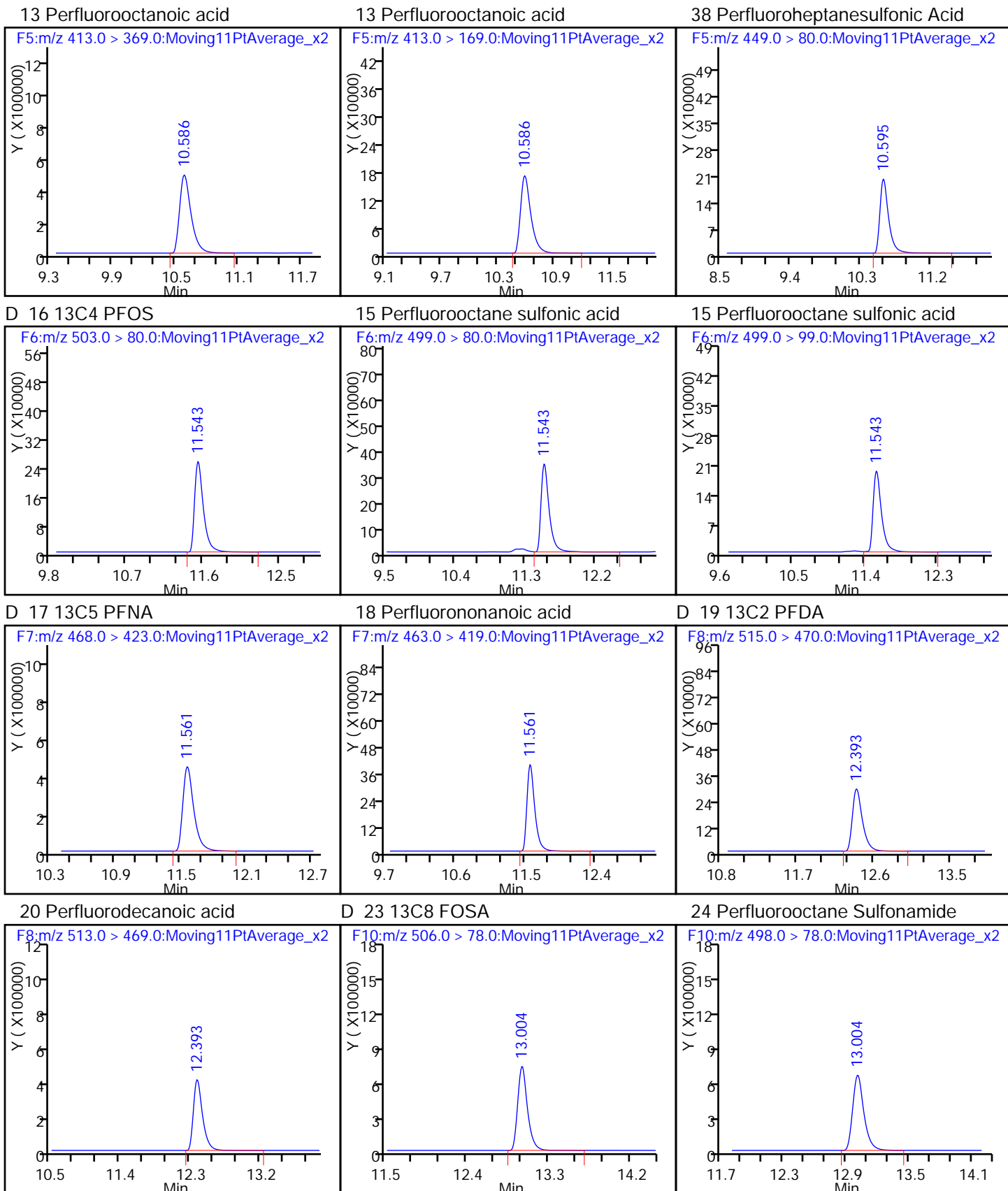
Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

D 3 13C5-PFPeA

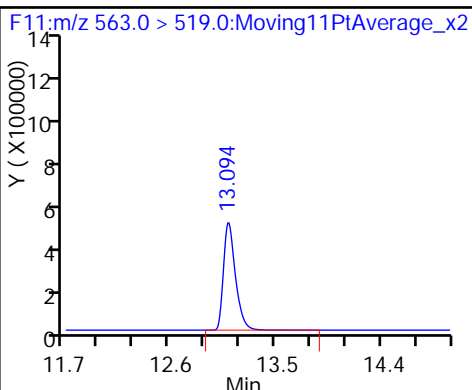
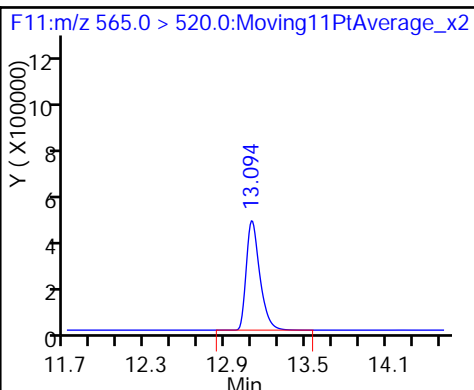
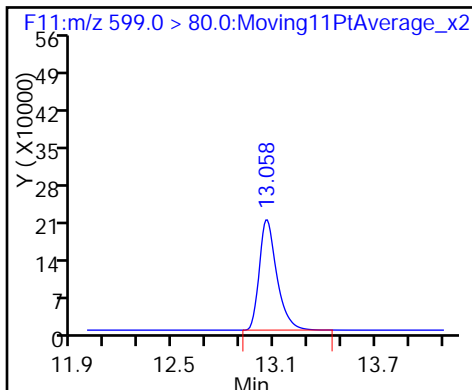




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

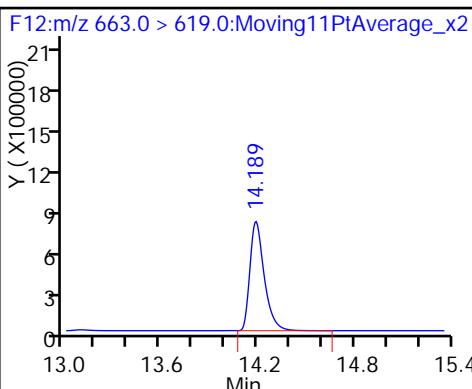
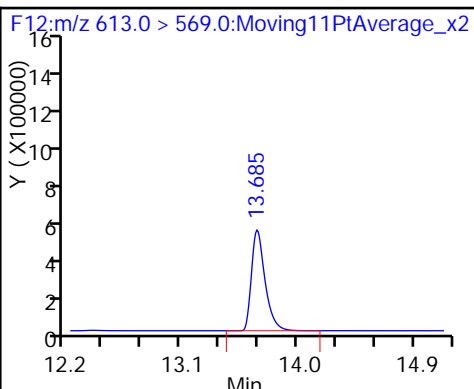
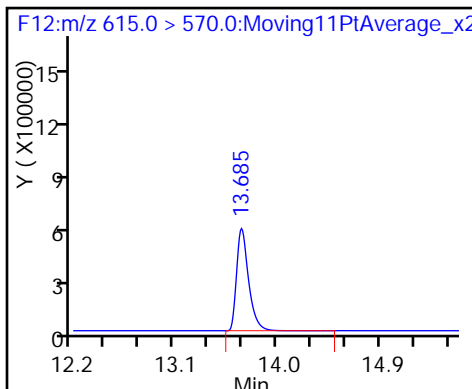
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

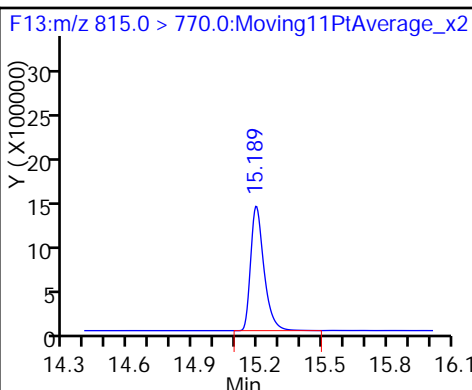
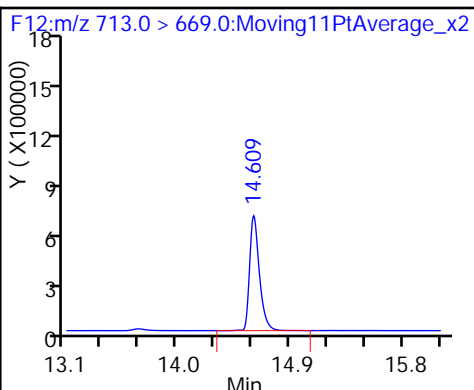
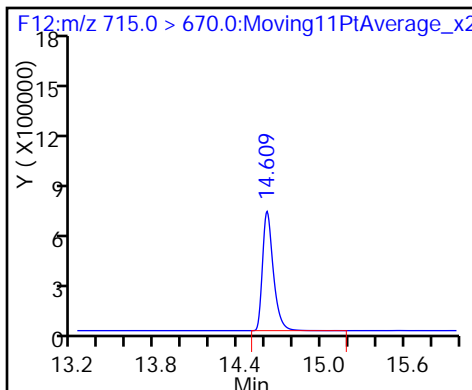
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

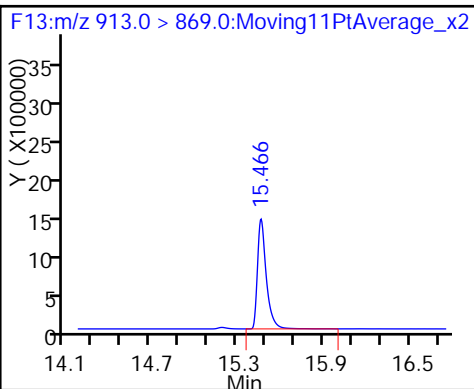
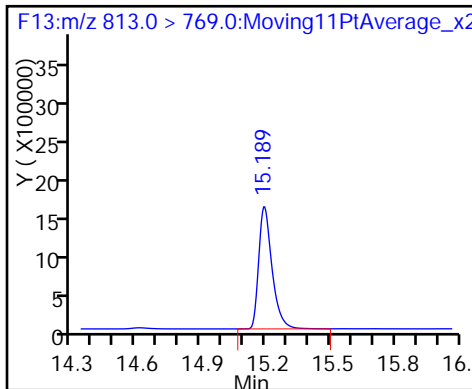
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Lab Sample ID: ICV 320-112007/12 Calibration Date: 05/31/2016 16:03
 Instrument ID: A6 Calib Start Date: 05/31/2016 12:51
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/31/2016 14:59
 Lab File ID: 31MAY2016A6A_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.529	1.527		49.9	50.0	-0.1	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.155	1.001		43.3	50.0	-13.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.300	1.253		42.6	44.3	-3.6	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.128	1.021		45.3	50.0	-9.4	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.084		47.1	50.0	-5.7	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.9366	0.8542		43.1	47.3	-8.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.027	0.9188		44.8	50.0	-10.5	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.235	1.037		40.1	47.8	-16.1	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8639	0.8394		48.6	50.0	-2.8	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.257	1.207		48.0	50.0	-3.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.7937	0.7330		46.2	50.0	-7.6	25.0
Perfluorodecanesulfonic acid (PFDS)	L1ID		0.8203		48.5	48.3	0.5	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		0.9291		45.0	50.0	-10.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8376	0.8214		49.0	50.0	-1.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.115	1.036		46.5	50.0	-7.1	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.8268		45.8	50.0	-8.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.414		47.1	50.0	-5.9	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.472	1.469		49.9	50.0	-0.2	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_012.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 31-May-2016 16:03:15 ALS Bottle#: 16 Worklist Smp#: 12
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A4*sub6

Method: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 14:13:27 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.800	5.803	-0.003	1309752	53.7		107	3113	
2 Perfluorobutyric acid	212.9 > 169.0	5.800	5.806	-0.006	1999668	49.9			10494	
D 3 13C5-PFPeA	267.9 > 223.0	6.960	6.968	-0.008	3377744	53.2		106	61556	
4 Perfluoropentanoic acid	262.9 > 219.0	6.964	6.970	-0.006	3379909	43.3			1102	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.092	7.099	-0.007	1845008	42.6				
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.092	7.099	-0.007	1845008	NC			179	
	298.9 > 99.0	7.092	7.099	-0.007	893476		2.06(0.00-0.00)		457	
D 6 13C2 PFHxA	315.0 > 270.0	8.241	8.252	-0.011	3387118	55.3		111	8844	
7 Perfluorohexanoic acid	313.0 > 269.0	8.241	8.253	-0.012	3459077	45.3			4331	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.481	9.494	-0.013	3998040	47.1			12262	
D 8 13C4-PFHpA	367.0 > 322.0	9.481	9.495	-0.014	3688077	53.7		107	57700	
D 11 18O2 PFHxS	403.0 > 84.0	9.517	9.532	-0.015	1574028	51.0		108	5704	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.517	9.533	-0.016	1343142	NC			1569	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.517	9.533	-0.016	1343142	43.1				
D 12 13C4 PFOA	417.0 > 372.0	10.595	10.612	-0.017	3896492	53.6		107	251925	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.595	10.612	-0.017	1.000	3579936	44.8			921	
413.0 > 169.0	10.595	10.612	-0.017	1.000	1357198		2.64(0.00-0.00)		3109	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.604	10.622	-0.018	1.000	1357113	NC			87398	
D 16 13C4 PFOS										
503.0 > 80.0	11.552	11.568	-0.016		1994664	50.2		105	92605	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.552	11.571	-0.019	1.000	2066216	40.1			461	
499.0 > 99.0	11.552	11.571	-0.019	1.000	1199599		1.72(0.00-0.00)		4977	
D 17 13C5 PFNA										
468.0 > 423.0	11.569	11.589	-0.020		3320087	49.8		99.6	33522	
18 Perfluorononanoic acid										
463.0 > 419.0	11.569	11.589	-0.020	1.000	2786864	48.6			17965	
D 19 13C2 PFDA										
515.0 > 470.0	12.404	12.423	-0.019		2705439	51.4		103	25277	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.404	12.423	-0.019	1.000	3266545	48.0			44220	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.994	13.018	-0.024	1.000	4604720	46.2			4201	
D 23 13C8 FOSA										
506.0 > 78.0	12.994	13.019	-0.025		6281963	50.1		100	3104	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.050	13.081	-0.031	1.000	1651558	48.5				
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.050	13.081	-0.031	1.000	1651558	NC			114722	
D 26 13C2 PFUnA										
565.0 > 520.0	13.093	13.124	-0.031		3845562	51.1		102	7905	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.093	13.124	-0.031	1.000	3572883	45.0			33651	
D 28 13C2 PFDaA										
615.0 > 570.0	13.685	13.718	-0.033		4674918	51.5		103	24363	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.685	13.718	-0.033	1.000	3839910	49.0			7576	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.182	14.220	-0.038	1.000	4845020	46.5			4524	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.609	14.643	-0.034		4091225	50.5		101	13305	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.609	14.644	-0.035	1.000	3865409	45.8			1976	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.209	15.223	-0.014		6290759	49.9		99.9	8392	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.209	15.223	-0.014	1.000	6611884	47.1			3827	
36 Perfluorooctadecanoic acid										
913.0 > 869.0	15.481	15.493	-0.012	1.000	6865782	49.9			3447	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFCIC_00017

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_012.d

Injection Date: 31-May-2016 16:03:15

Instrument ID: A6

Lims ID: ICV

Client ID:

Operator ID: JRB

ALS Bottle#: 16

Worklist Smp#: 12

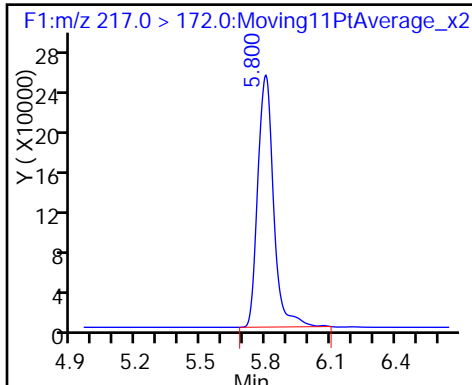
Injection Vol: 15.0 ul

Dil. Factor: 1.0000

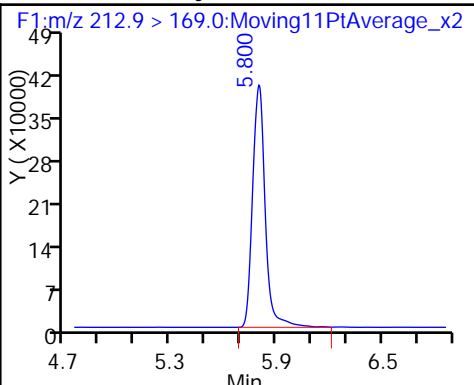
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

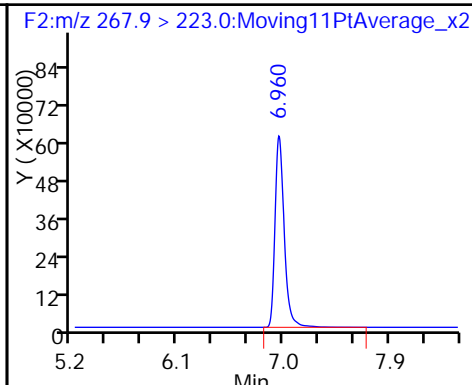
D 1 13C4 PFBA



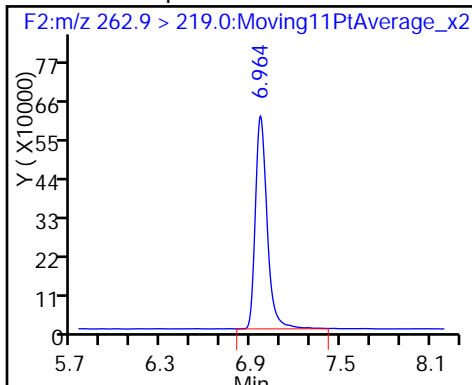
2 Perfluorobutyric acid



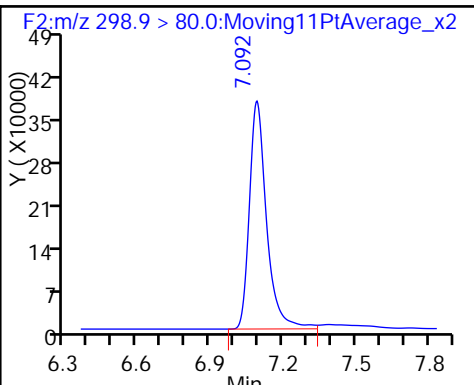
D 3 13C5-PFPeA



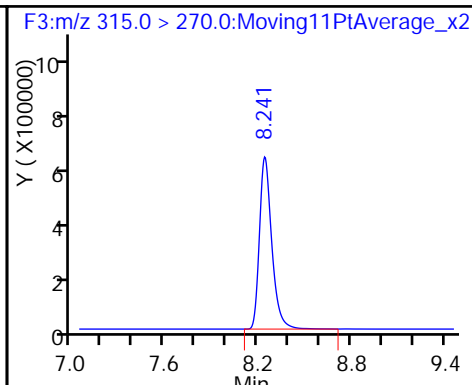
4 Perfluoropentanoic acid



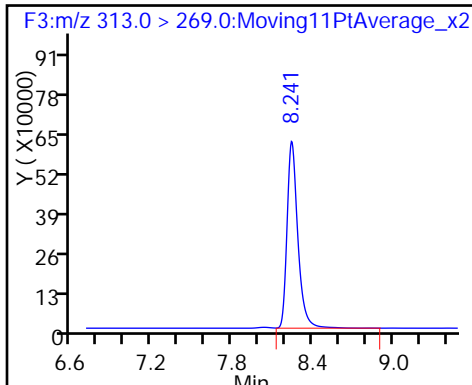
40 Perfluorobutanesulfonic acid



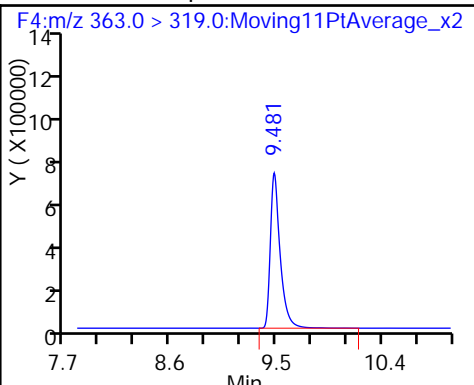
D 6 13C2 PFHxA



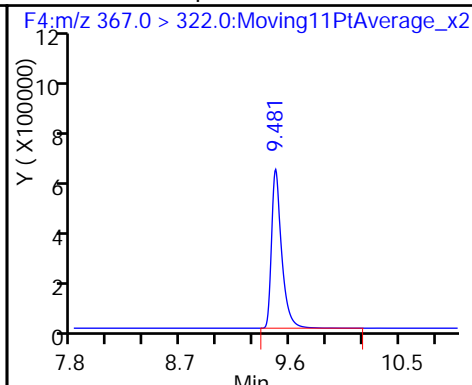
7 Perfluorohexanoic acid



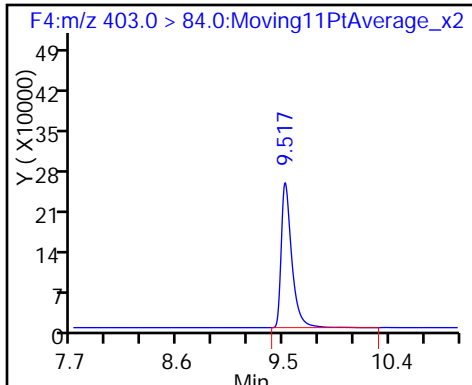
9 Perfluoroheptanoic acid



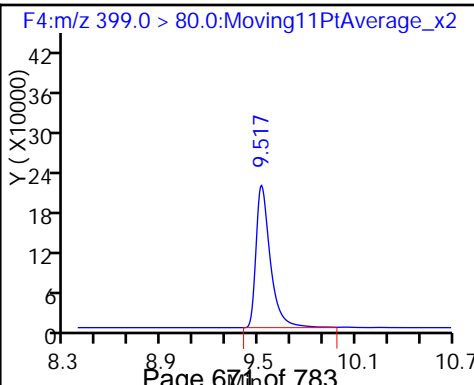
D 8 13C4-PFHpA



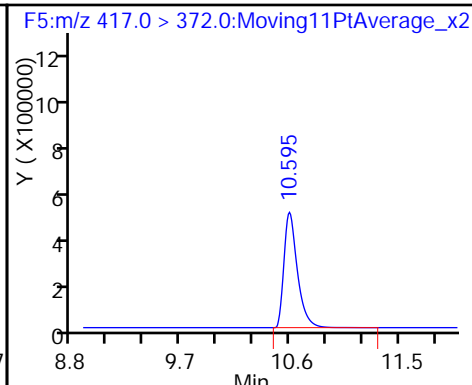
D 11 18O2 PFHxS

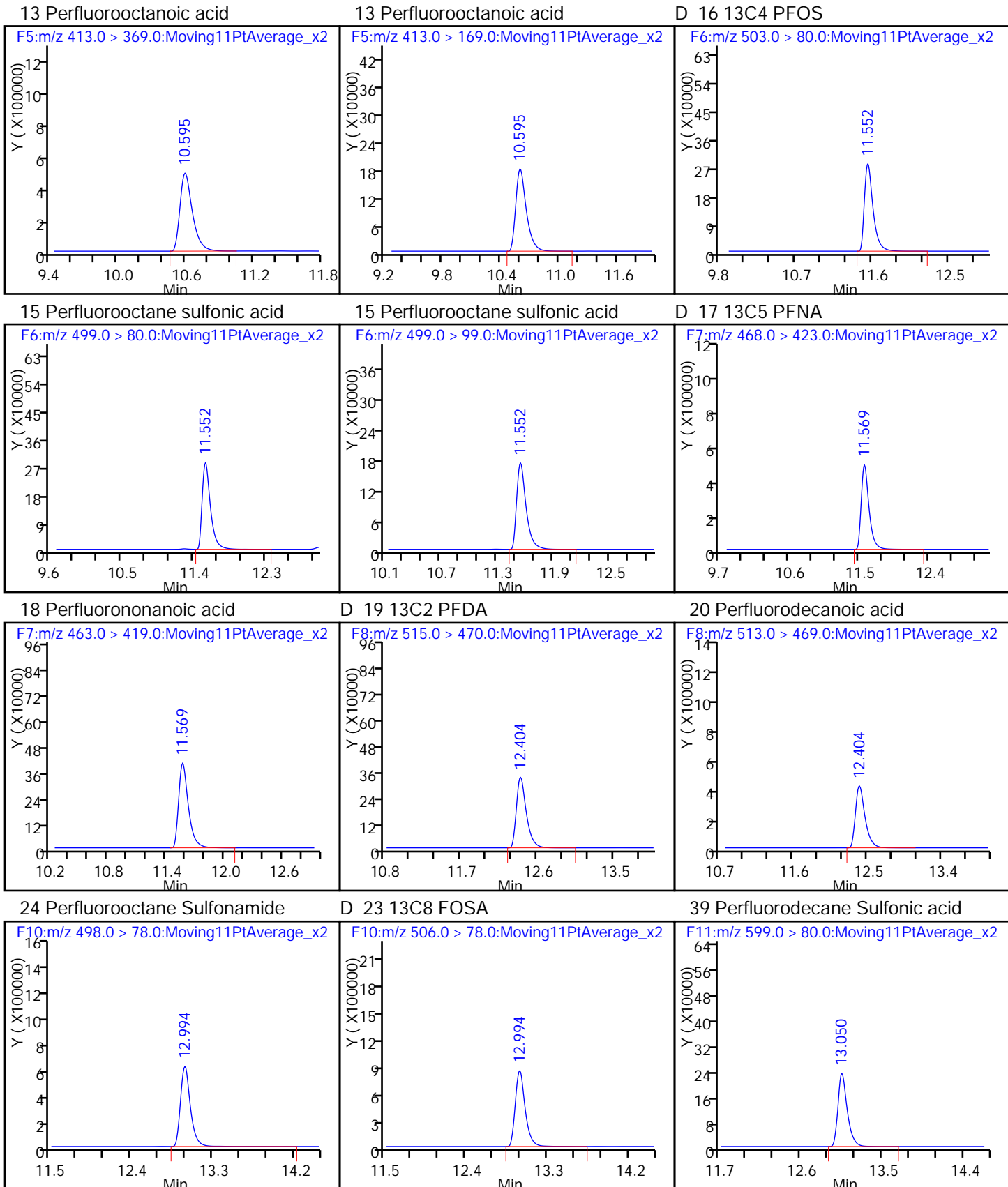


41 Perfluorohexanesulfonic acid

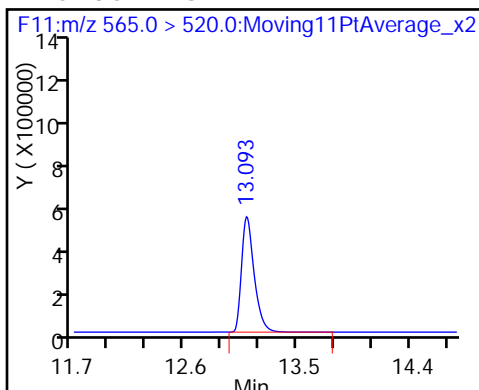


D 12 13C4 PFOA

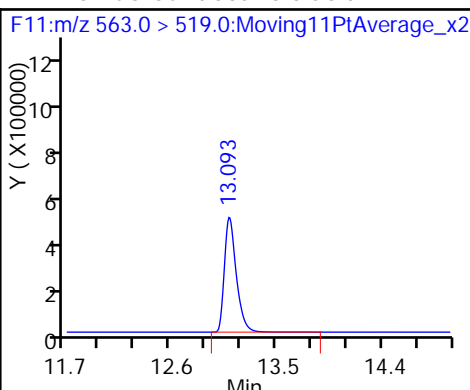




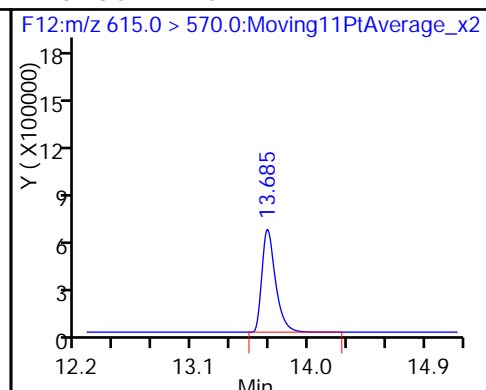
D 26 13C2 PFUnA



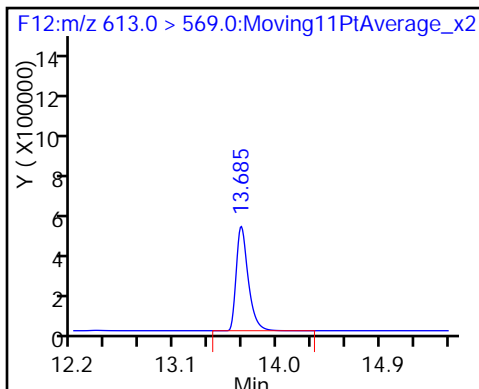
27 Perfluoroundecanoic acid



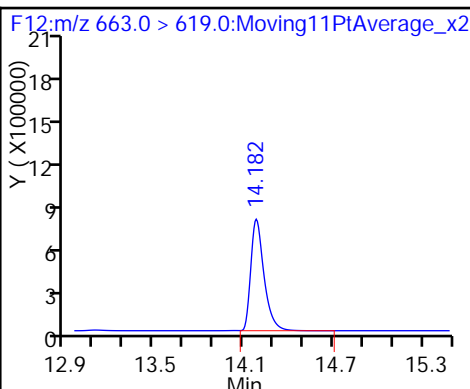
D 28 13C2 PFDoA



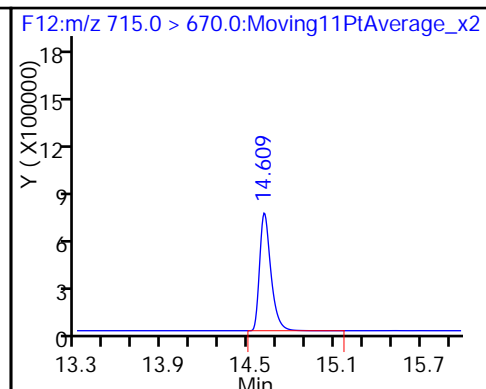
29 Perfluorododecanoic acid



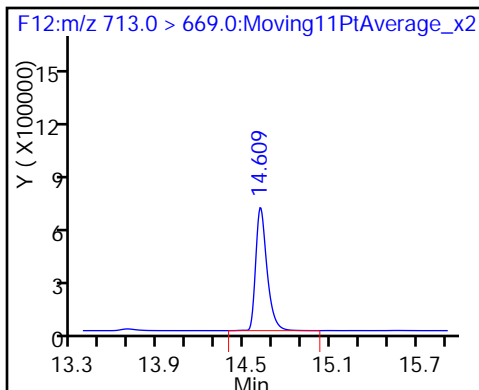
30 Perfluorotridecanoic acid



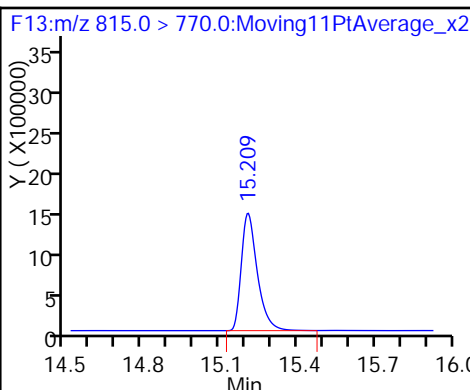
D 33 13C2-PFTeDA



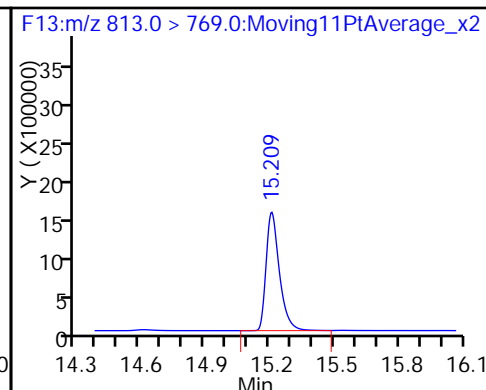
32 Perfluorotetradecanoic acid



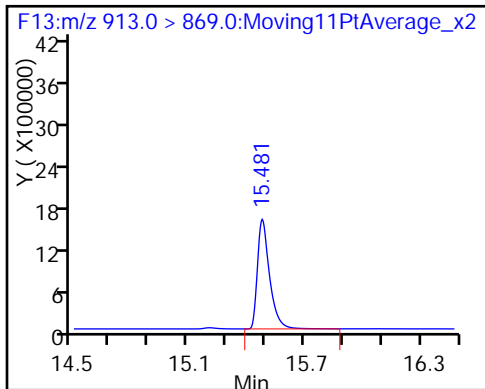
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Lab Sample ID: CCV 320-112007/37 Calibration Date: 06/01/2016 01:44
 Instrument ID: A6 Calib Start Date: 05/31/2016 12:51
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/31/2016 14:59
 Lab File ID: 31MAY2016A6A_039.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.529	1.422		18.6	20.0	-7.0	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.155	1.008		17.5	20.0	-12.7	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.300	1.286		17.5	17.7	-1.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.128	1.043		18.5	20.0	-7.5	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.057		18.2	20.0	-9.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.9366	0.9373		18.9	18.9	0.0	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.027	1.013		19.7	20.0	-1.3	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID		0.7874		18.3	19.0	-3.8	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.235	1.321		20.4	19.1	7.0	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8639	0.8258		19.1	20.0	-4.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.257	1.175		18.7	20.0	-6.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.7937	0.7641		19.3	20.0	-3.7	25.0
Perfluorodecanesulfonic acid (PFDS)	L1ID		0.7988		18.8	19.3	-2.7	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		1.016		19.5	20.0	-2.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8376	0.8066		19.3	20.0	-3.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.115	1.072		19.2	20.0	-3.9	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.8910		19.6	20.0	-2.0	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.588		20.6	20.0	2.9	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.472	1.407		19.1	20.0	-4.5	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_039.d
 Lims ID: CCV L4
 Client ID:
 Sample Type: CCV
 Inject. Date: 01-Jun-2016 01:44:50 ALS Bottle#: 12 Worklist Smp#: 37
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L4 CCV L4
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9
 Method: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 15:04:38 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: barnettj Date: 01-Jun-2016 10:24:08

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.794	5.803	-0.009	1322912	54.3		109	13821	
2 Perfluorobutyric acid	212.9 > 169.0	5.794	5.806	-0.012	752726	18.6		93.0	14297	
D 3 13C5-PFPeA	267.9 > 223.0	6.964	6.968	-0.004	3270053	51.5		103	8885	
4 Perfluoropentanoic acid	262.9 > 219.0	6.964	6.970	-0.006	1318858	17.5		87.3	251	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.092	7.099	-0.007	704656	17.5		98.9		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.092	7.099	-0.007	704656	NC			106	
	298.9 > 99.0	7.092	7.099	-0.007	338571		2.08(0.00-0.00)		141	
D 6 13C2 PFHxA	315.0 > 270.0	8.247	8.252	-0.005	3392034	55.4		111	34614	
7 Perfluorohexanoic acid	313.0 > 269.0	8.252	8.253	-0.001	1415671	18.5		92.5	1990	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.493	9.494	-0.001	1487741	18.2		91.0	9339	
D 8 13C4-PFHpA	367.0 > 322.0	9.487	9.495	-0.008	3519001	51.3		103	13718	
D 11 18O2 PFHxS	403.0 > 84.0	9.524	9.532	-0.008	1465793	47.5		100	5189	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.524	9.533	-0.009	549557	NC			954	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.524	9.533	-0.009	549557	18.9		100		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.604	10.612	-0.008		3907709	53.7		107	16945	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.604	10.612	-0.008	1.000	1583994	19.7		98.7	335	
413.0 > 169.0	10.604	10.612	-0.008	1.000	592384		2.67(0.00-0.00)		458	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.614	10.622	-0.008	1.000	615164	NC			20095	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.614	10.622	-0.008	1.000	615164	18.3		96.2		
D 16 13C4 PFOS										
503.0 > 80.0	11.560	11.568	-0.008		1961452	49.4		103	137665	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.560	11.571	-0.011	1.000	1036640	20.4		107	269	
499.0 > 99.0	11.560	11.571	-0.011	1.000	539121		1.92(0.00-0.00)		654	
D 17 13C5 PFNA										
468.0 > 423.0	11.578	11.589	-0.011		3536429	53.1		106	100458	
18 Perfluorononanoic acid										
463.0 > 419.0	11.578	11.589	-0.011	1.000	1168159	19.1		95.6	15254	
D 19 13C2 PFDA										
515.0 > 470.0	12.414	12.423	-0.009		2803309	53.2		106	170056	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.414	12.423	-0.009	1.000	1318037	18.7		93.5	80657	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.022	13.018	0.004	1.000	1847784	19.3		96.3	9204	
D 23 13C8 FOSA										
506.0 > 78.0	13.022	13.019	0.003		6045431	48.2		96.5	5881	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.076	13.081	-0.005	1.000	631992	18.8		97.3		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.076	13.081	-0.005	1.000	631992	NC			44647	
D 26 13C2 PFUnA										
565.0 > 520.0	13.120	13.124	-0.004		3873016	51.5		103	24207	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.120	13.124	-0.004	1.000	1574171	19.5		97.3	37838	
D 28 13C2 PFDaA										
615.0 > 570.0	13.703	13.718	-0.015		4718722	52.0		104	22122	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.703	13.718	-0.015	1.000	1522352	19.3		96.3	2244	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.205	14.220	-0.015	1.000	2022900	19.2		96.1	1577	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.628	14.643	-0.015		4290564	52.9		106	17153	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.628	14.644	-0.016	1.000	1681670	19.6		98.0	748	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.204	15.223	-0.019		6931865	55.0		110	7299	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.204	15.223	-0.019	1.000	2997236	20.6		103	2468	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.466	15.493	-0.027	1.000	2654917	19.1	95.5	1662	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_039.d

Injection Date: 01-Jun-2016 01:44:50

Instrument ID: A6

Lims ID: CCV L4

Client ID:

Operator ID: JRB

ALS Bottle#: 12

Worklist Smp#: 37

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

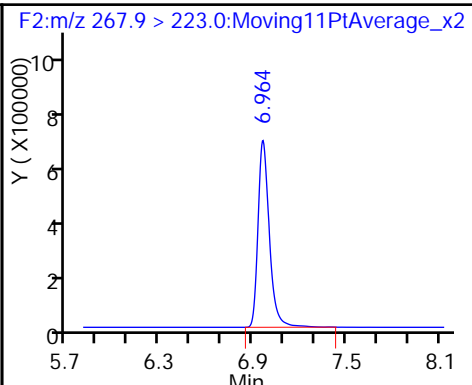
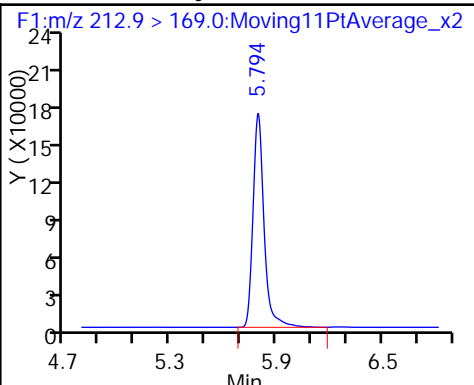
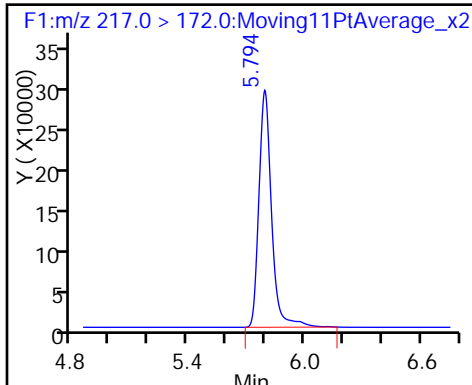
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

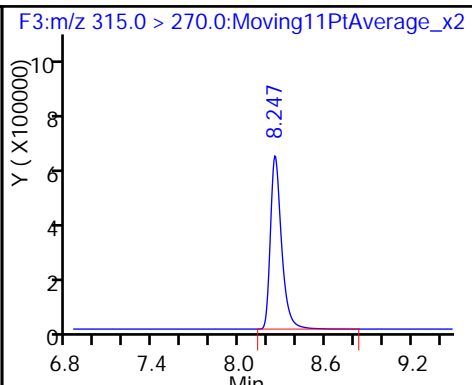
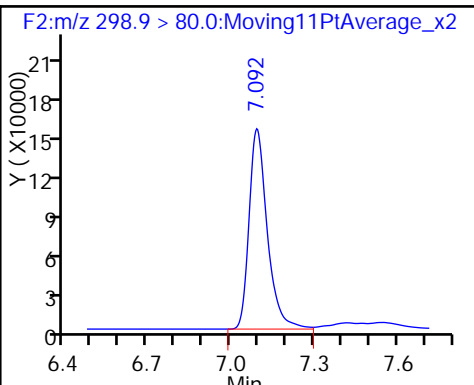
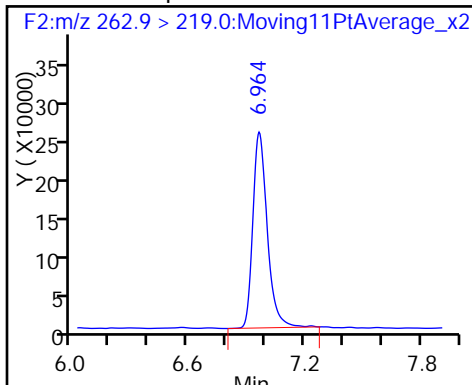
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

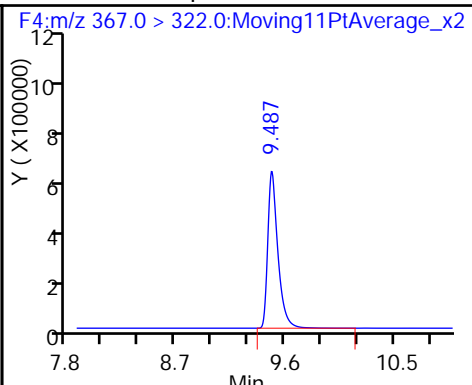
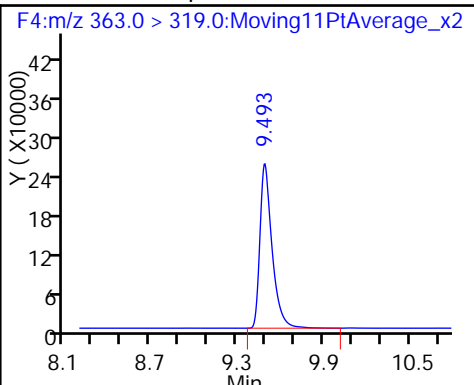
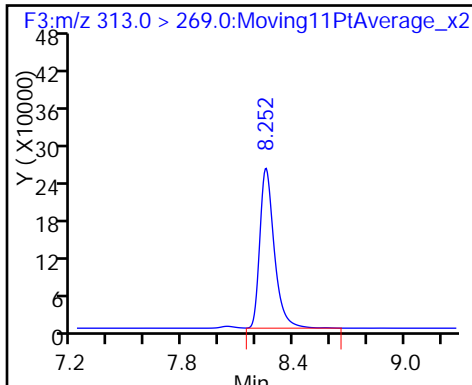
D 6 13C2 PFXa



7 Perfluorohexanoic acid

9 Perfluoroheptanoic acid

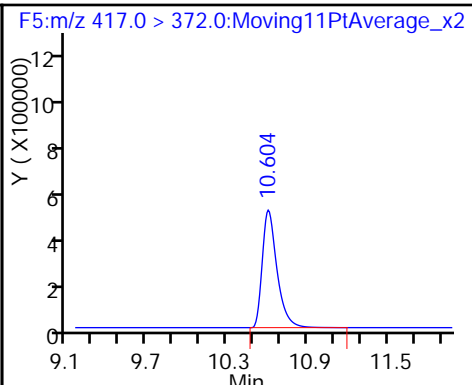
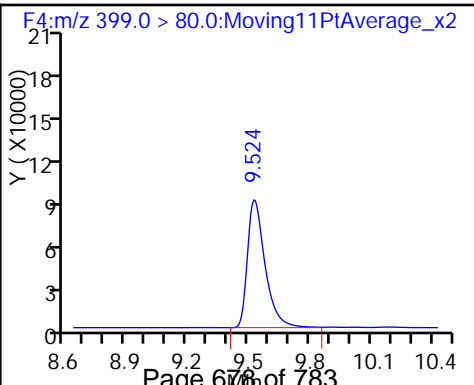
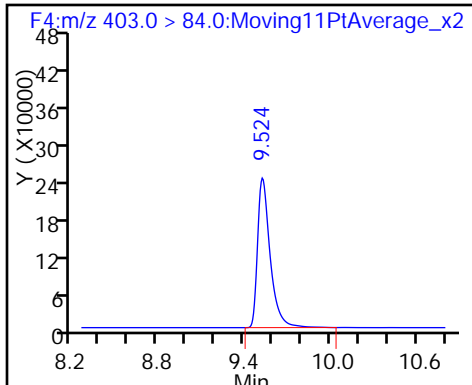
D 8 13C4-PFHpA

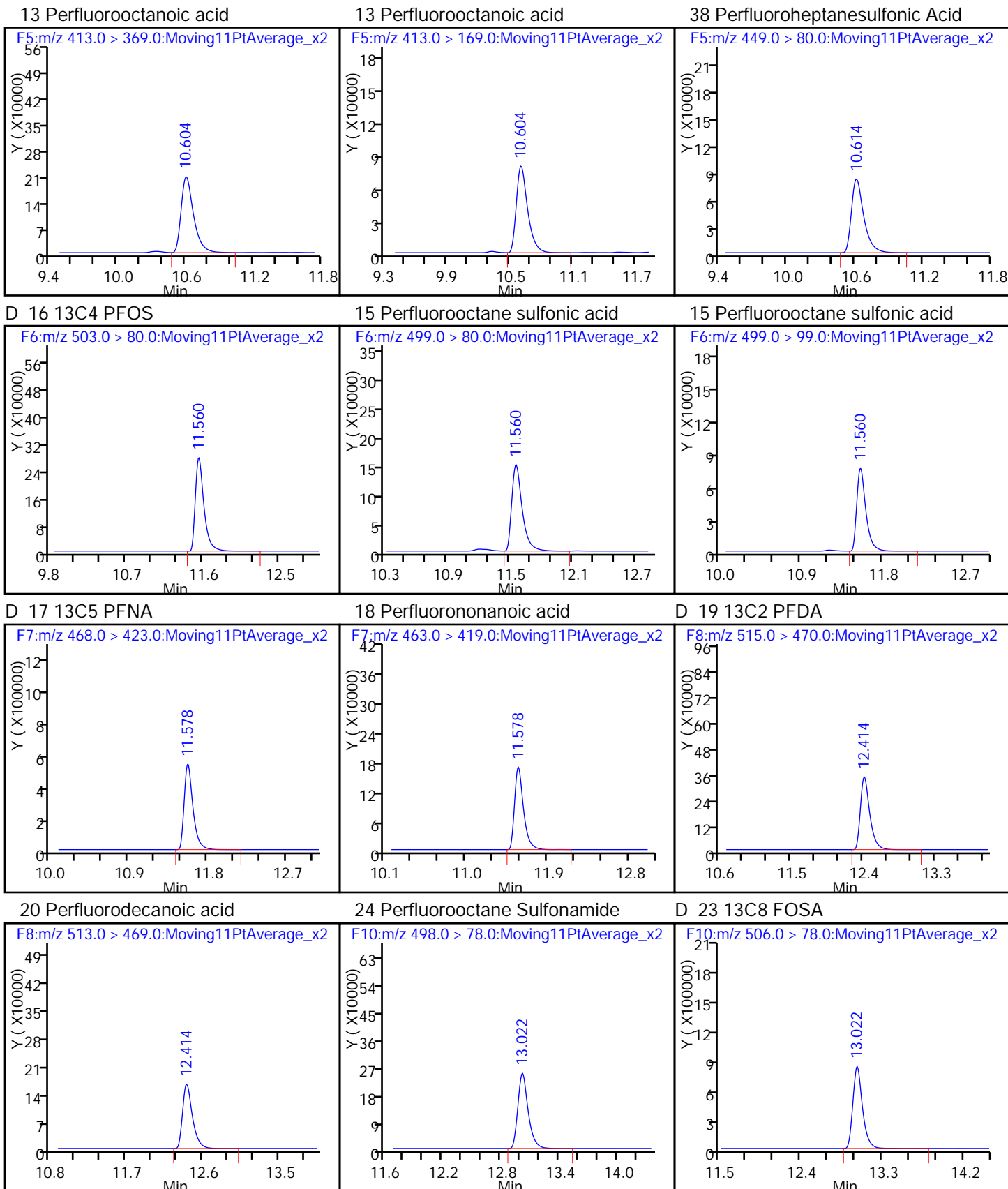


D 11 18O2 PFXs

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

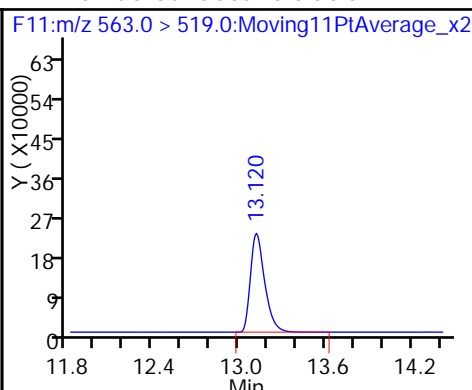
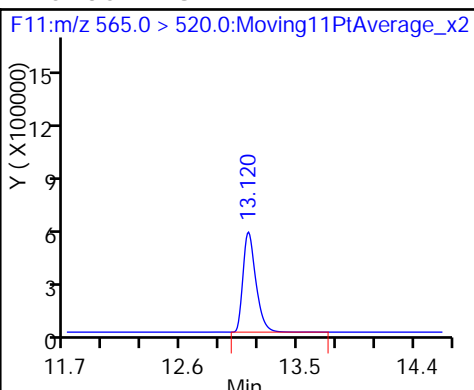
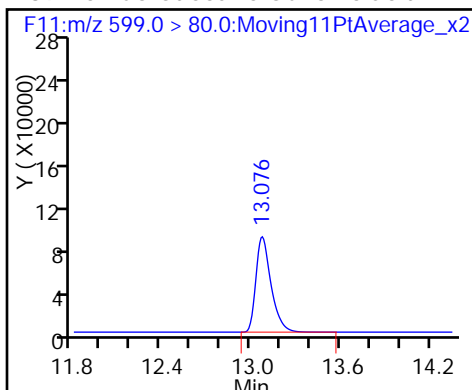




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

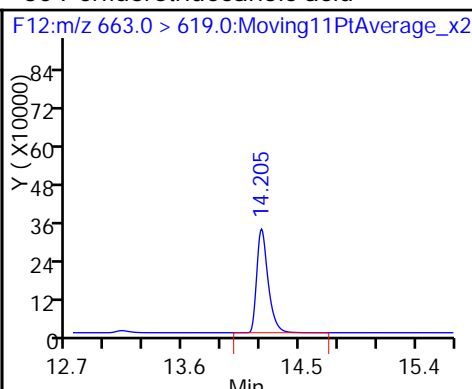
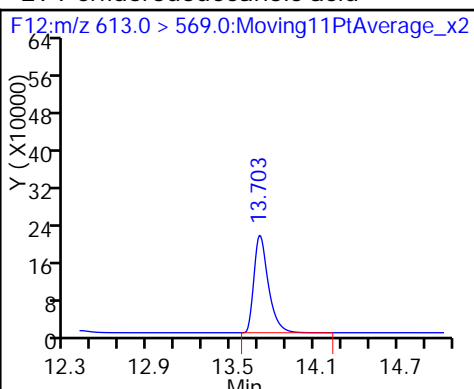
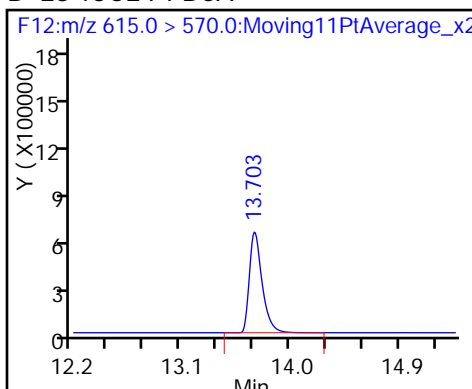
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

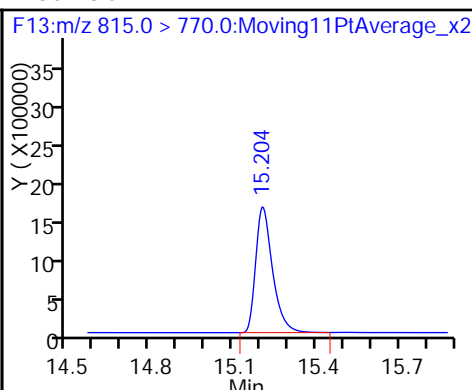
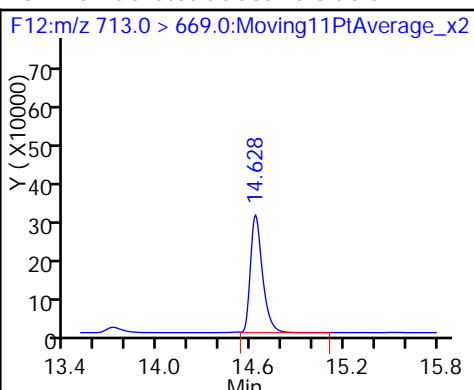
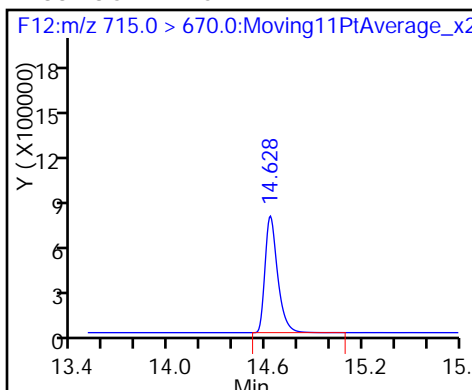
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

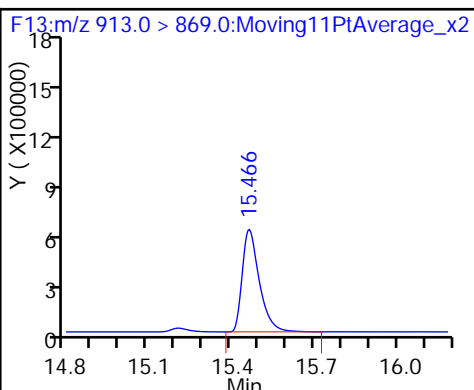
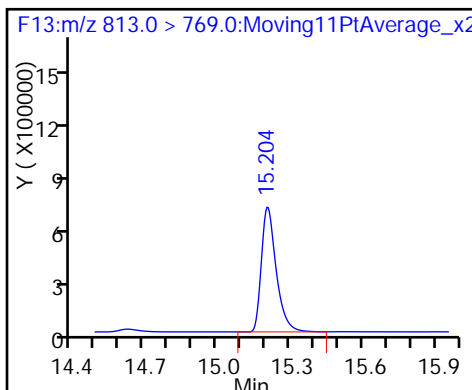
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Lab Sample ID: CCV 320-112007/49 Calibration Date: 06/01/2016 06:00
 Instrument ID: A6 Calib Start Date: 05/31/2016 12:51
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/31/2016 14:59
 Lab File ID: 31MAY2016A6A_051.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.529	1.672		54.7	50.0	9.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.155	1.108		48.0	50.0	-4.1	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.300	1.283		43.6	44.2	-1.4	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.128	1.169		51.8	50.0	3.6	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.263		55.0	50.0	9.9	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.9366	0.9436		47.7	47.3	0.7	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.027	1.012		49.3	50.0	-1.5	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID		0.8351		47.9	47.6	0.7	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.235	1.339		51.8	47.8	8.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8639	0.8549		49.5	50.0	-1.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.257	1.302		51.8	50.0	3.6	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.7937	0.8571		54.0	50.0	8.0	25.0
Perfluorodecanesulfonic acid (PFDS)	L1ID		0.8920		52.7	48.2	9.3	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		1.059		51.4	50.0	2.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8376	0.9115		54.4	50.0	8.8	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.115	1.205		54.0	50.0	8.0	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.9461		52.5	50.0	5.0	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.611		53.8	50.0	7.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.472	1.577		53.6	50.0	7.1	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_051.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 01-Jun-2016 06:00:14 ALS Bottle#: 13 Worklist Smp#: 49
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5 CCV L5
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub5
 Method: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 14:13:35 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.797	5.803	-0.006	1280024	52.5		105	3899	
2 Perfluorobutyric acid	212.9 > 169.0	5.800	5.806	-0.006	1.000	2139799	54.7	109	20260	
D 3 13C5-PFPeA	267.9 > 223.0	6.964	6.968	-0.004	3104956	48.9		97.7	15718	
4 Perfluoropentanoic acid	262.9 > 219.0	6.964	6.970	-0.006	1.000	3441735	48.0	95.9	775	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.095	7.099	-0.004	1.000	1808222	43.6	98.6		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.095	7.099	-0.004	1.000	1808222	NC		179	
	298.9 > 99.0	7.092	7.099	-0.007	1.000	869949	2.08(0.00-0.00)		250	
D 6 13C2 PFHxA	315.0 > 270.0	8.247	8.252	-0.005	3200567	52.2		104	8586	
7 Perfluorohexanoic acid	313.0 > 269.0	8.252	8.253	-0.001	1.000	3740229	51.8	104	3833	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.493	9.494	-0.001	1.000	4244993	55.0	110	29057	
D 8 13C4-PFHpA	367.0 > 322.0	9.493	9.495	-0.002	3362131	49.0		98.0	192920	
D 11 18O2 PFHxS	403.0 > 84.0	9.532	9.532	0.0	1508616	48.9		103	15122	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.532	9.533	-0.001	1.000	1423562	NC		1618	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.532	9.533	-0.001	1.000	1423562	47.7	101		
D 12 13C4 PFOA	417.0 > 372.0	10.605	10.612	-0.007	3693553	50.8		102	59592	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.605	10.612	-0.007	1.000	3736224	49.3		98.5	1715	
413.0 > 169.0	10.605	10.612	-0.007	1.000	1346230		2.78(0.00-0.00)		1571	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.614	10.622	-0.008	1.000	1592039	NC			34114	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.614	10.622	-0.008	1.000	1592039	47.9		101		
D 16 13C4 PFOS										
503.0 > 80.0	11.552	11.568	-0.016		1914343	48.2		101	19175	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.552	11.571	-0.019	1.000	2562339	51.8		108	291	
499.0 > 99.0	11.552	11.571	-0.019	1.000	1449547		1.77(0.00-0.00)		493	
D 17 13C5 PFNA										
468.0 > 423.0	11.578	11.589	-0.011		3322374	49.8		99.7	232728	
18 Perfluorononanoic acid										
463.0 > 419.0	11.578	11.589	-0.011	1.000	2840215	49.5		99.0	26548	
D 19 13C2 PFDA										
515.0 > 470.0	12.414	12.423	-0.009		2636408	50.1		100	80514	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.414	12.423	-0.009	1.000	3432888	51.8		104	13393	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.022	13.018	0.004	1.000	4993584	54.0		108	3052	
D 23 13C8 FOSA										
506.0 > 78.0	13.022	13.019	0.003		5826251	46.5		93.0	2632	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.076	13.081	-0.005	1.000	1721793	52.7		109		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.076	13.081	-0.005	1.000	1721793	NC			60440	
D 26 13C2 PFUnA										
565.0 > 520.0	13.120	13.124	-0.004		3705888	49.3		98.6	175541	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.120	13.124	-0.004	1.000	3924590	51.4		103	16436	
D 28 13C2 PFDoA										
615.0 > 570.0	13.712	13.718	-0.006		4435432	48.9		97.8	25099	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.712	13.718	-0.006	1.000	4042860	54.4		109	3892	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.205	14.220	-0.015	1.000	5342502	54.0		108	3405	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.635	14.643	-0.008		4123418	50.8		102	11026	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.635	14.644	-0.009	1.000	4196404	52.5		105	1649	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.210	15.223	-0.013		6385294	50.7		101	12336	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.210	15.223	-0.013	1.000	7146993	53.8		108	3778	
36 Perfluorooctadecanoic acid										
913.0 > 869.0	15.476	15.493	-0.017	1.000	6994627	53.6		107	3627	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC-L5_00018

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_051.d

Injection Date: 01-Jun-2016 06:00:14

Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: JRB

ALS Bottle#: 13

Worklist Smp#: 49

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

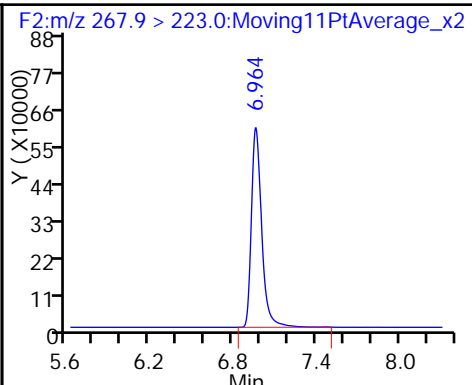
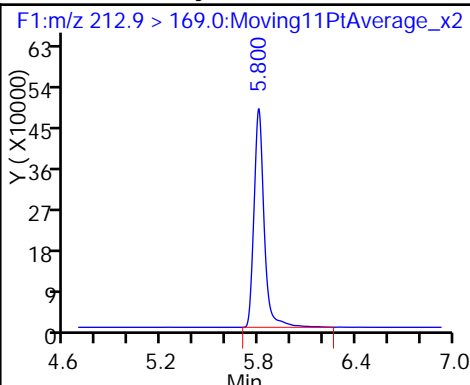
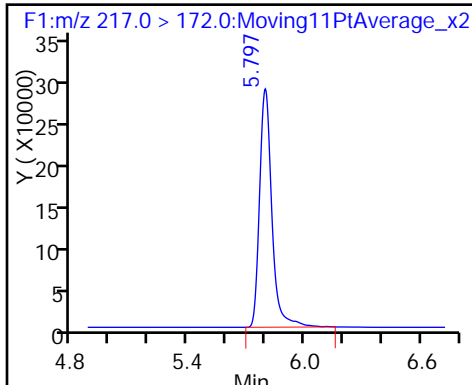
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

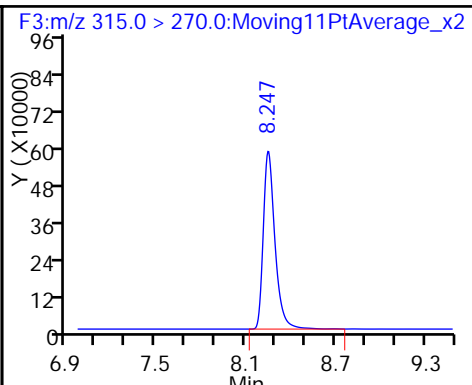
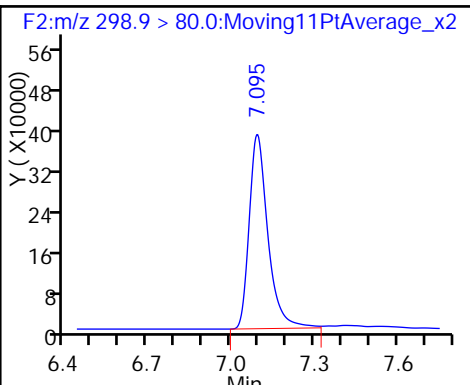
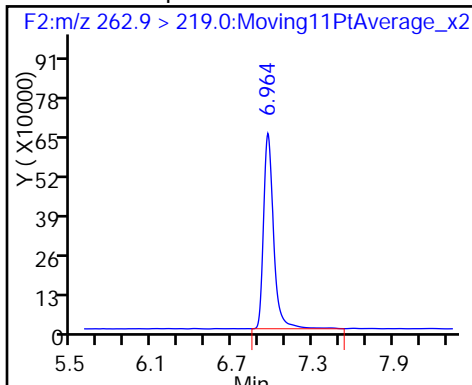
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

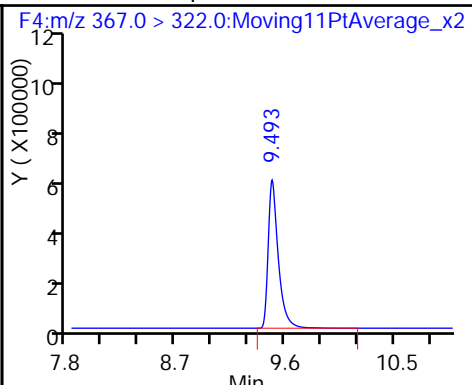
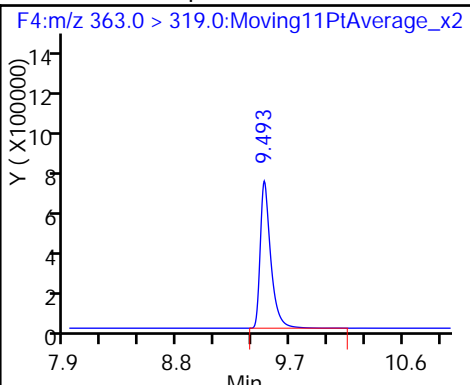
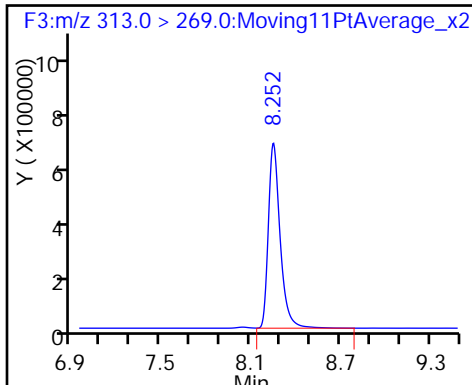
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

9 Perfluoroheptanoic acid

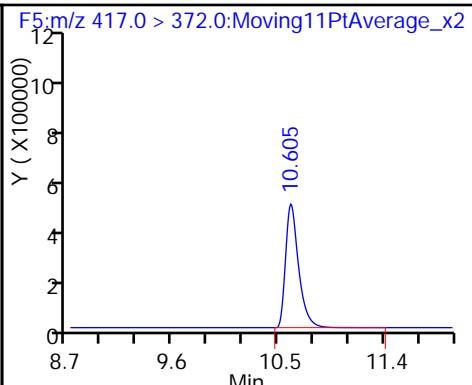
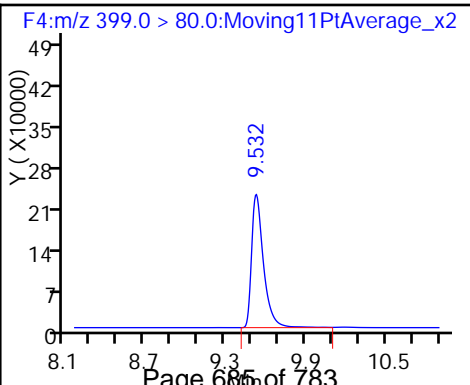
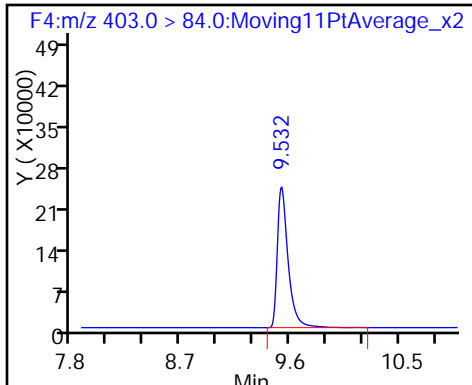
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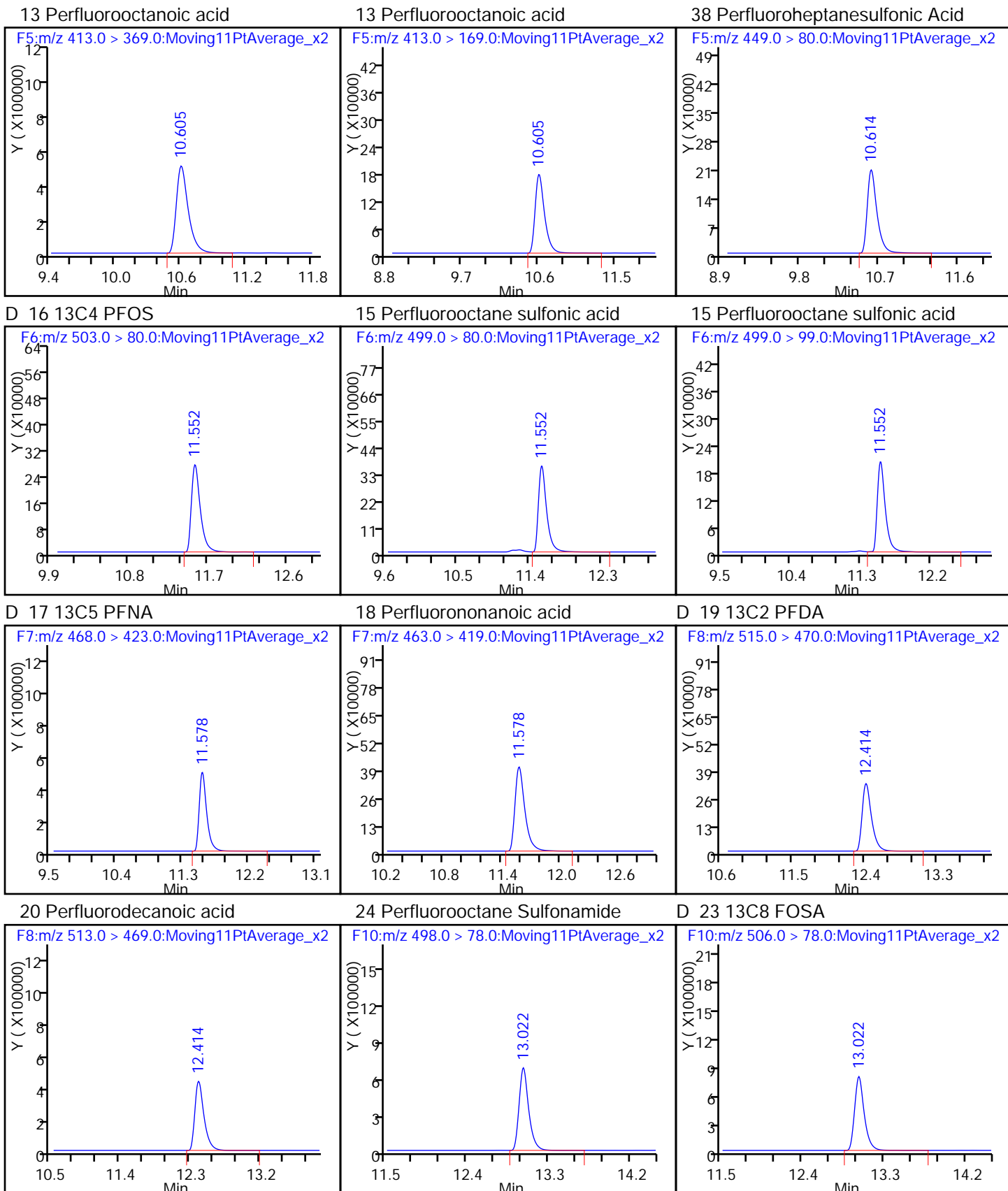


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

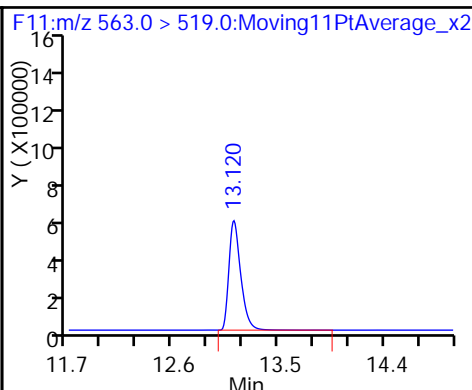
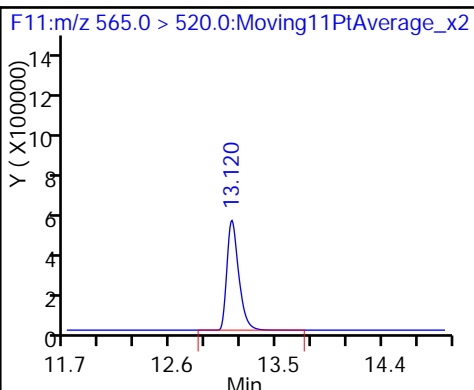
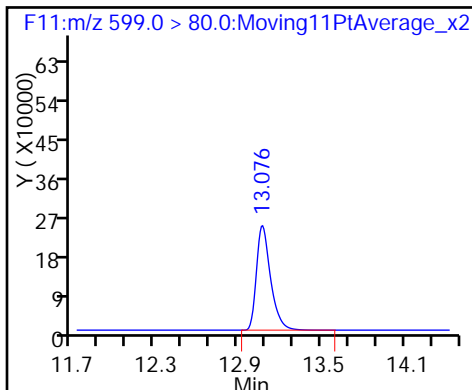




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

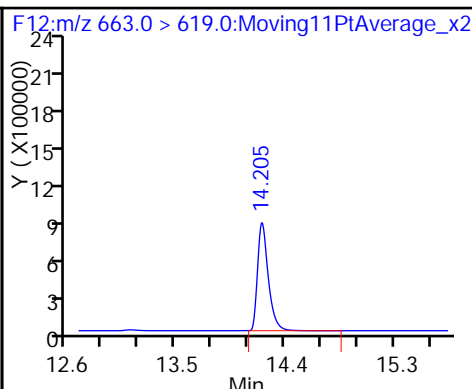
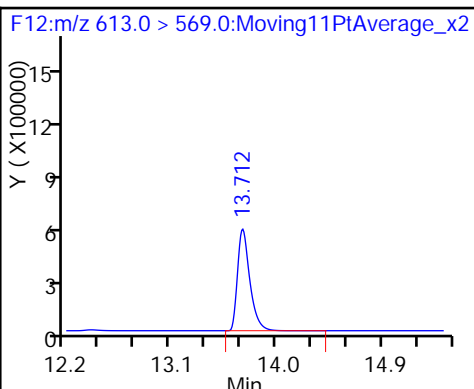
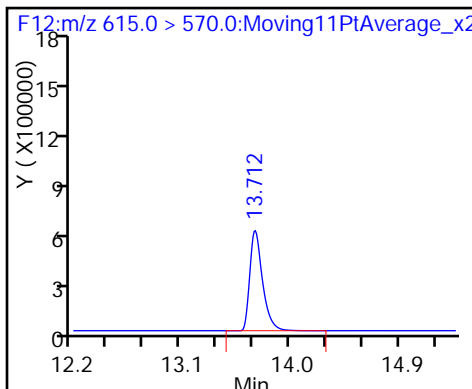
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

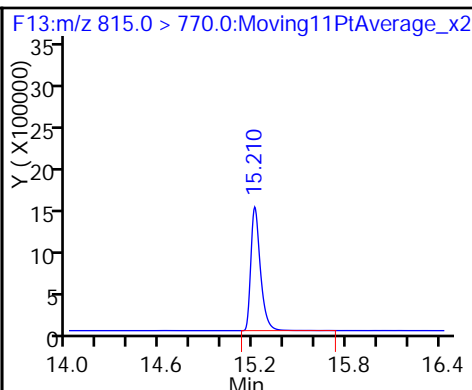
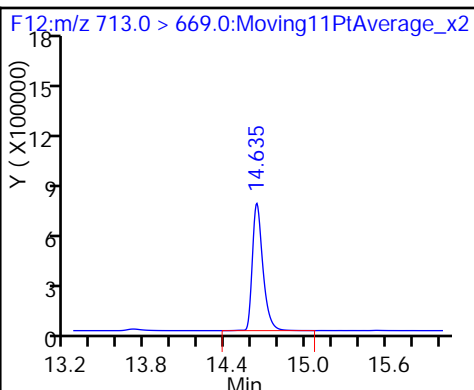
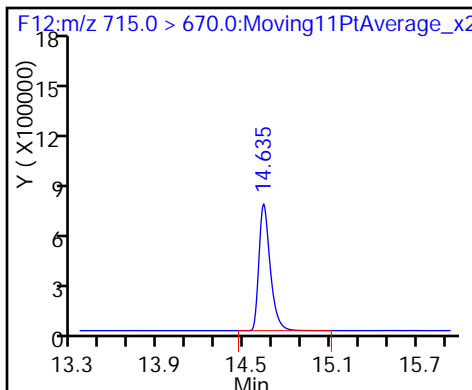
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

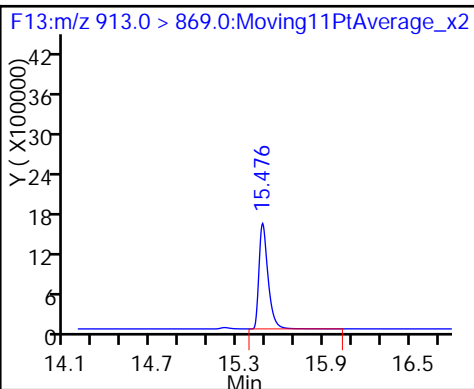
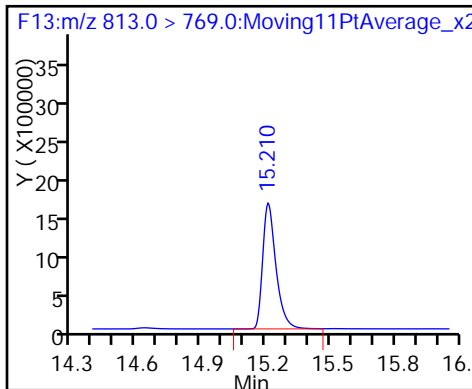
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Lab Sample ID: CCV 320-112007/63 Calibration Date: 06/01/2016 10:58
 Instrument ID: A6 Calib Start Date: 05/31/2016 12:51
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/31/2016 14:59
 Lab File ID: 31MAY2016A6A_065.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.529	1.394		18.2	20.0	-8.8	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.155	1.051		18.2	20.0	-9.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.300	1.138		15.5	17.7	-12.5	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.128	1.043		18.5	20.0	-7.5	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.052		18.1	20.0	-9.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.9366	0.7779		15.7	18.9	-16.9	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.027	0.9864		19.2	20.0	-3.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID		0.7517		17.5	19.0	-8.1	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.235	1.300		20.1	19.1	5.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8639	0.7777		18.0	20.0	-10.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.257	1.166		18.6	20.0	-7.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.7937	0.7840		19.8	20.0	-1.2	25.0
Perfluorodecanesulfonic acid (PFDS)	L1ID		0.8279		19.4	19.3	0.8	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		0.9525		18.2	20.0	-8.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8376	0.7485		17.9	20.0	-10.6	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.115	1.055		18.9	20.0	-5.4	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.7947		17.4	20.0	-12.8	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.487		19.2	20.0	-4.0	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.472	1.397		19.0	20.0	-5.1	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_065.d
 Lims ID: CCV L4
 Client ID:
 Sample Type: CCV
 Inject. Date: 01-Jun-2016 10:58:05 ALS Bottle#: 12 Worklist Smp#: 63
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L4 CCV L4
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub9
 Method: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 14:13:48 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: barnettj Date: 01-Jun-2016 13:57:21

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.794	5.803	-0.009	1290789	52.9		106	44455	
2 Perfluorobutyric acid	212.9 > 169.0	5.797	5.806	-0.009	1.000	719685	18.2	91.2	3789	
D 3 13C5-PFPeA	267.9 > 223.0	6.960	6.968	-0.008	2857551	45.0		89.9	6113	
4 Perfluoropentanoic acid	262.9 > 219.0	6.960	6.970	-0.010	1.000	1201527	18.2	91.0	438	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.088	7.099	-0.011	1.000	637922	15.5	87.5		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.088	7.099	-0.011	1.000	637922	NC		87.5	
	298.9 > 99.0	7.088	7.099	-0.011	1.000	285918	2.23(0.00-0.00)		93.7	
D 6 13C2 PFHxA	315.0 > 270.0	8.247	8.252	-0.005	3044321	49.7		99.4	36247	
7 Perfluorohexanoic acid	313.0 > 269.0	8.247	8.253	-0.006	1.000	1269805	18.5	92.5	2300	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.487	9.494	-0.007	1.000	1338864	18.1	90.6	5586	
D 8 13C4-PFHpA	367.0 > 322.0	9.487	9.495	-0.008	3180994	46.3		92.7	10029	
D 11 18O2 PFHxS	403.0 > 84.0	9.524	9.532	-0.008	1500183	48.6		103	5839	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.524	9.533	-0.009	1.000	466818	NC		355	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.524	9.533	-0.009	1.000	466818	15.7	83.1		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.605	10.612	-0.007		3499857	48.1		96.2	16914	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.605	10.612	-0.007	1.000	1380939	19.2		96.1	396	
413.0 > 169.0	10.605	10.612	-0.007	1.000	507606		2.72(0.00-0.00)		890	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.614	10.622	-0.008	1.000	547988	NC			13916	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.614	10.622	-0.008	1.000	547988	17.5		91.9		
D 16 13C4 PFOS										
503.0 > 80.0	11.560	11.568	-0.008		1830224	46.1		96.4	50304	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.569	11.571	-0.002	1.000	951922	20.1		105	153	
499.0 > 99.0	11.560	11.571	-0.011	0.999	510467		1.86(0.00-0.00)		1027	
D 17 13C5 PFNA										
468.0 > 423.0	11.578	11.589	-0.011		3160515	47.4		94.8	40303	
18 Perfluorononanoic acid										
463.0 > 419.0	11.578	11.589	-0.011	1.000	983121	18.0		90.0	1522	
D 19 13C2 PFDA										
515.0 > 470.0	12.414	12.423	-0.009		2512403	47.7		95.4	152336	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.414	12.423	-0.009	1.000	1171628	18.6		92.8	47607	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.031	13.018	0.013	1.000	1591479	19.8		98.8	36051	
D 23 13C8 FOSA										
506.0 > 78.0	13.031	13.019	0.012		5074944	40.5		81.0	2568	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.076	13.081	-0.005	1.000	611164	19.4		101		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.076	13.081	-0.005	1.000	611164	NC			43545	
D 26 13C2 PFUnA										
565.0 > 520.0	13.120	13.124	-0.004		3438489	45.7		91.4	14516	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.120	13.124	-0.004	1.000	1310059	18.2		91.1	93823	
D 28 13C2 PFDaA										
615.0 > 570.0	13.731	13.718	0.013		4509308	49.7		99.4	22097	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.731	13.718	0.013	1.000	1350082	17.9		89.4	2388	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.220	14.220	0.0	1.000	1903578	18.9		94.6	1314	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.648	14.643	0.005		3840376	47.4		94.7	10643	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.648	14.644	0.004	1.000	1433473	17.4		87.2	565	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.205	15.223	-0.018		6402690	50.8		102	7516	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.205	15.223	-0.018	1.000	2681681	19.2		96.0	2485	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
--------	----	--------	--------	--------	----------	--------------	---------------	------	-----	-------

36 Perfluorooctadecanoic acid
 913.0 > 869.0 15.466 15.493 -0.027 1.000 2520547 19.0 94.9 1574

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_065.d

Injection Date: 01-Jun-2016 10:58:05

Instrument ID: A6

Lims ID: CCV L4

Client ID:

Operator ID: JRB

ALS Bottle#: 12

Worklist Smp#: 63

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

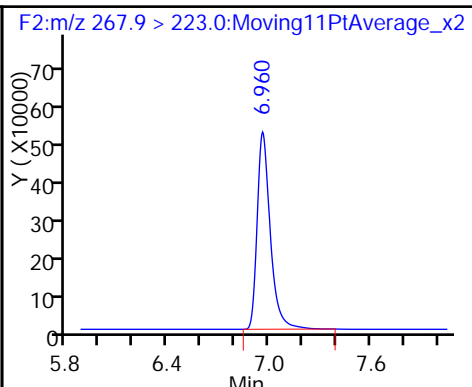
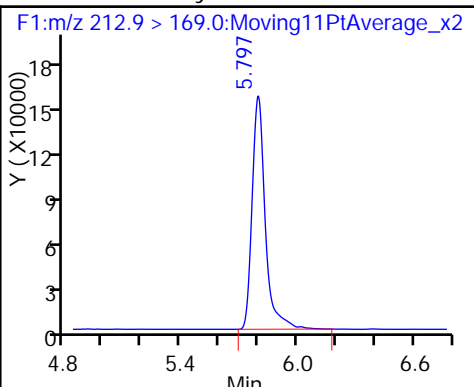
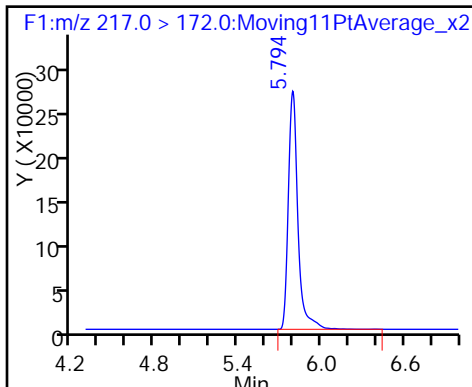
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

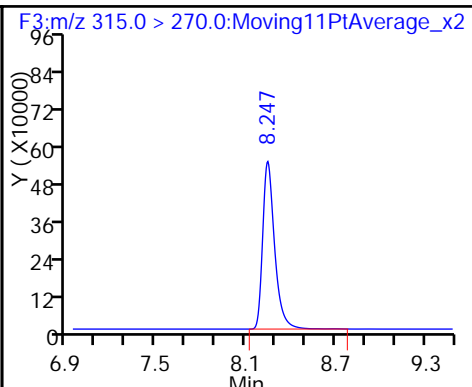
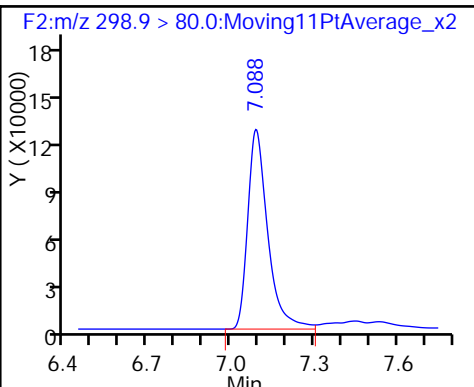
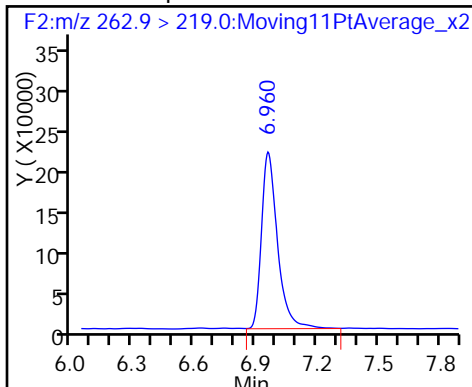
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

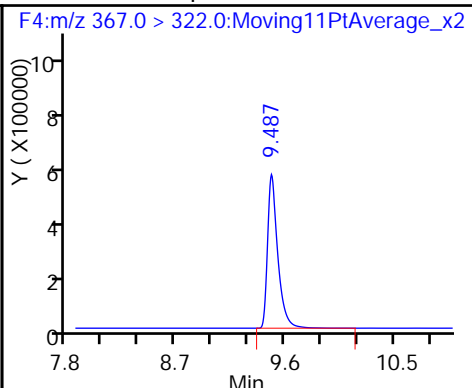
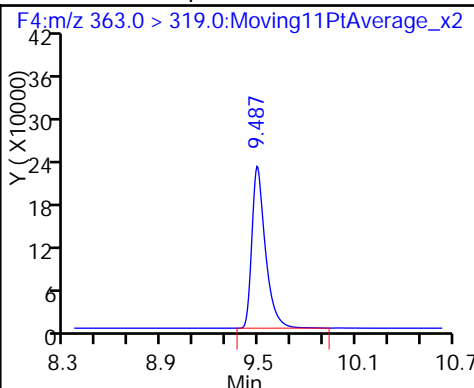
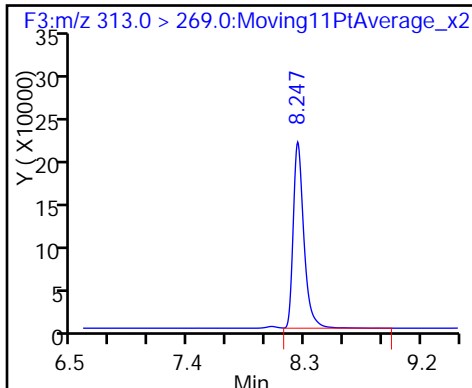
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

9 Perfluoroheptanoic acid

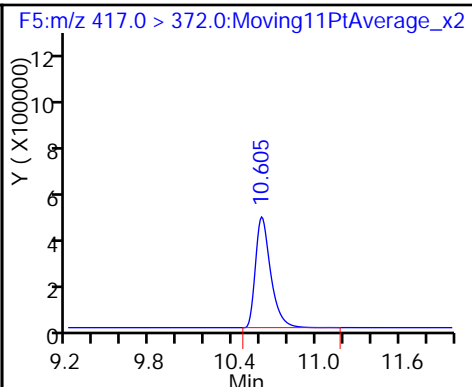
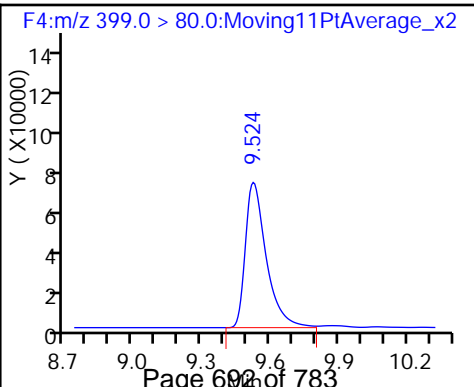
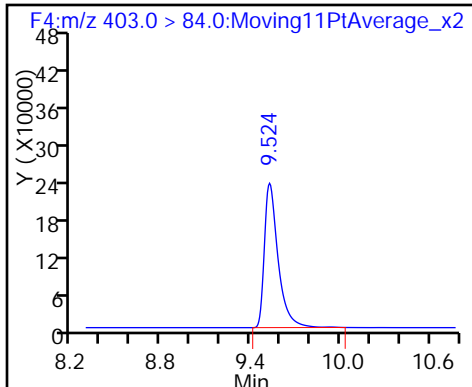
D 8 13C4-PFHpA

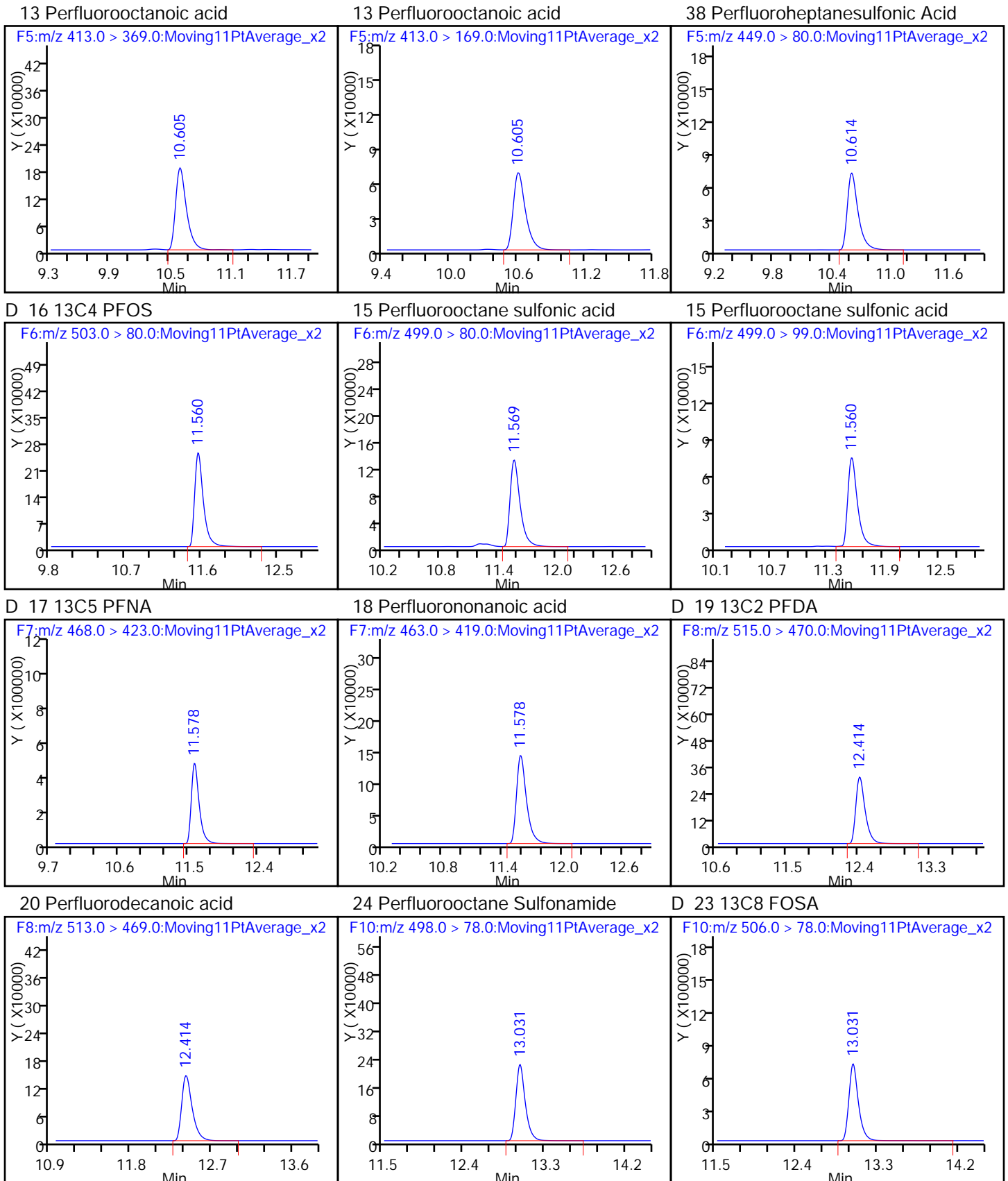


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

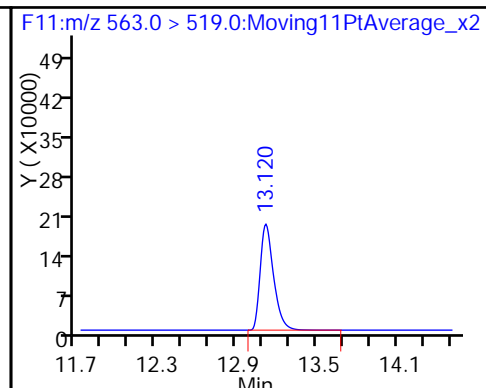
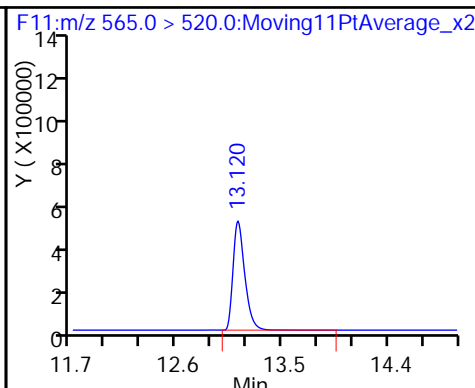
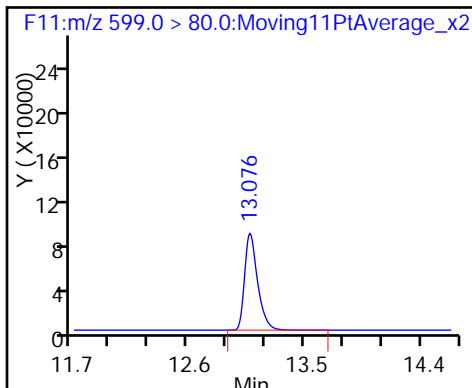




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

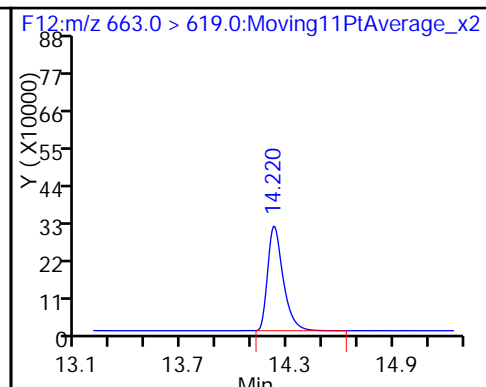
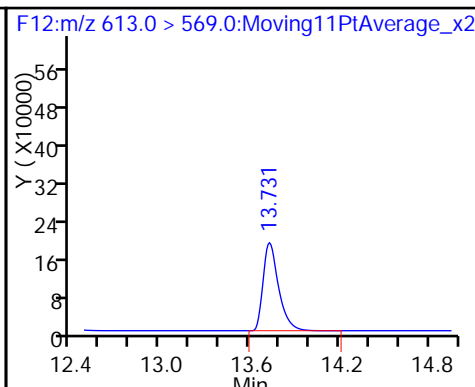
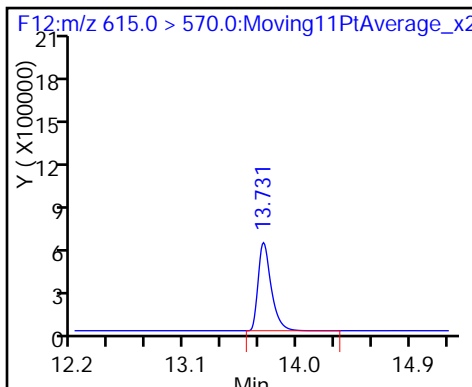
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

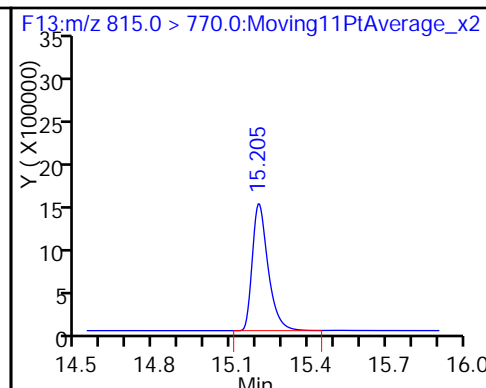
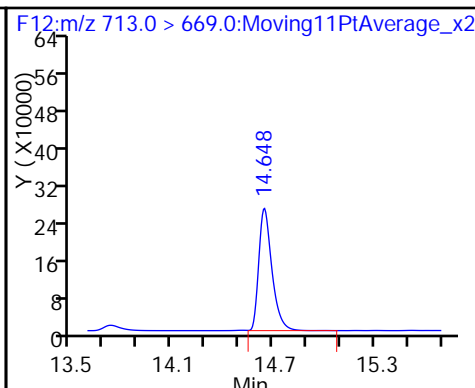
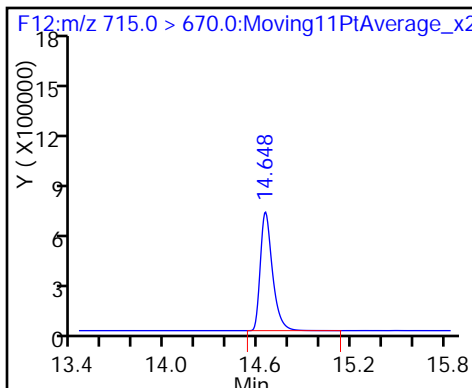
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

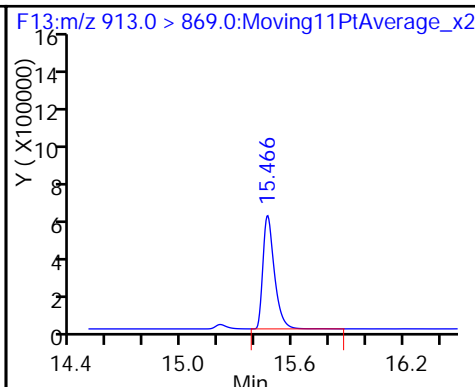
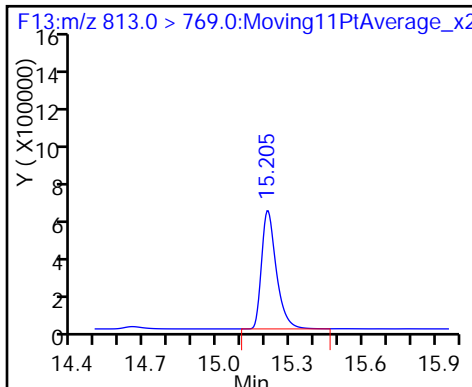
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Lab Sample ID: CCV 320-112007/74 Calibration Date: 06/01/2016 15:02
 Instrument ID: A6 Calib Start Date: 05/31/2016 12:51
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/31/2016 14:59
 Lab File ID: 31MAY2016A6A_076.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.529	1.635		53.5	50.0	7.0	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.155	1.194		51.7	50.0	3.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.300	1.306		44.4	44.2	0.4	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.128	1.219		54.0	50.0	8.1	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.201		52.3	50.0	4.5	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.9366	0.9547		48.2	47.3	1.9	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.027	1.025		49.9	50.0	-0.1	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID		0.8362		48.0	47.6	0.8	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.235	1.284		49.7	47.8	3.9	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8639	0.8401		48.6	50.0	-2.8	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.257	1.359		54.0	50.0	8.1	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.7937	0.8606		54.2	50.0	8.4	25.0
Perfluorodecanesulfonic acid (PFDS)	L1ID		0.8654		51.1	48.2	6.0	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		1.104		53.6	50.0	7.1	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8376	0.8246		49.2	50.0	-1.6	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.115	1.132		50.7	50.0	1.5	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.9328		51.7	50.0	3.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.584		52.8	50.0	5.6	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.472	1.522		51.7	50.0	3.4	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_076.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 01-Jun-2016 15:02:58 ALS Bottle#: 13 Worklist Smp#: 74
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5 CCV L5
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub5
 Method: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 16:32:08 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: barnettj Date: 01-Jun-2016 15:50:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.806	5.803	0.003	1191533	48.9		97.7	23709	
2 Perfluorobutyric acid	212.9 > 169.0	5.809	5.806	0.003	1948498	53.5		107	12222	
D 3 13C5-PFPeA	267.9 > 223.0	6.983	6.968	0.015	2862780	45.1		90.1	6510	
4 Perfluoropentanoic acid	262.9 > 219.0	6.983	6.970	0.013	3419036	51.7		103	904	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.113	7.099	0.014	1732752	44.4		100		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.113	7.099	0.014	1732752	NC			95.2	
	298.9 > 99.0	7.113	7.099	0.014	803152		2.16(0.00-0.00)		112	
D 6 13C2 PFHxA	315.0 > 270.0	8.268	8.252	0.016	2970456	48.5		96.9	57632	
7 Perfluorohexanoic acid	313.0 > 269.0	8.268	8.253	0.015	3620771	54.0		108	1911	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.510	9.494	0.016	3679198	52.3		105	13748	
D 8 13C4-PFHpA	367.0 > 322.0	9.510	9.495	0.015	3064214	44.6		89.3	33917	
D 11 18O2 PFHxS	403.0 > 84.0	9.552	9.532	0.020	1420262	46.1		97.4	16175	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.552	9.533	0.019	1355917	NC			3210	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.552	9.533	0.019	1355917	48.2		102		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.623	10.612	0.011		3227246	44.4		88.7	51442	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.632	10.612	0.020	1.000	3308883	49.9		99.9	528	
413.0 > 169.0	10.632	10.612	0.020	1.000	1273984		2.60(0.00-0.00)		766	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.642	10.622	0.020	1.000	1555813	NC			96966	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.642	10.622	0.020	1.000	1555813	48.0		101		
D 16 13C4 PFOS										
503.0 > 80.0	11.585	11.568	0.017		1868398	47.1		98.4	8773	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.594	11.571	0.023	1.000	2398478	49.7		104	199	
499.0 > 99.0	11.585	11.571	0.014	0.999	1399076		1.71(0.00-0.00)		1679	
D 17 13C5 PFNA										
468.0 > 423.0	11.603	11.589	0.014		3179328	47.7		95.4	219064	
18 Perfluorononanoic acid										
463.0 > 419.0	11.603	11.589	0.014	1.000	2670850	48.6		97.2	4287	
D 19 13C2 PFDA										
515.0 > 470.0	12.435	12.423	0.012		2267771	43.1		86.1	30442	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.435	12.423	0.012	1.000	3080780	54.0		108	28646	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.040	13.018	0.022	1.000	4497188	54.2		108	3325	
D 23 13C8 FOSA										
506.0 > 78.0	13.040	13.019	0.021		5225419	41.7		83.4	7931	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.085	13.081	0.004	1.000	1630436	51.1		106		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.085	13.081	0.004	1.000	1630436	NC			114497	
D 26 13C2 PFUnA										
565.0 > 520.0	13.129	13.124	0.005		3351879	44.6		89.1	36872	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.129	13.124	0.005	1.000	3700087	53.6		107	44111	
D 28 13C2 PFDoA										
615.0 > 570.0	13.712	13.718	-0.006		4300211	47.4		94.8	18261	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.712	13.718	-0.006	1.000	3545842	49.2		98.4	6045	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.213	14.220	-0.007	1.000	4867369	50.7		101	3146	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.635	14.643	-0.008		3653496	45.1		90.1	6340	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.635	14.644	-0.009	1.000	4011277	51.7		103	1599	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.215	15.223	-0.008		6219305	49.4		98.7	7920	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.215	15.223	-0.008	1.000	6811643	52.8		106	4231	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctadecanoic acid										
913.0 > 869.0	15.481	15.493	-0.012	1.000	6546779	51.7		103	3212	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00018

Amount Added: 1.00

Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_076.d

Injection Date: 01-Jun-2016 15:02:58

Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: JRB

ALS Bottle#: 13

Worklist Smp#: 74

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

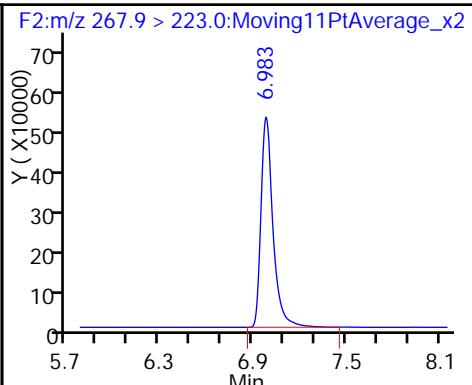
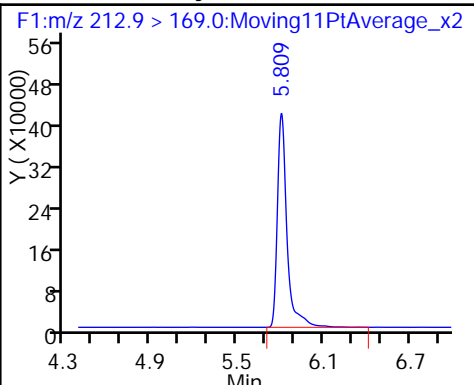
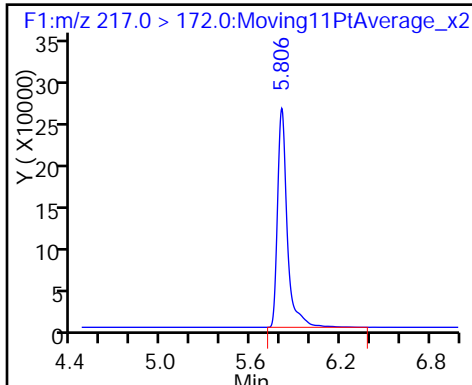
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

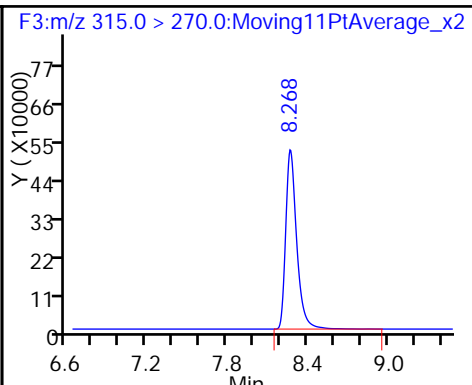
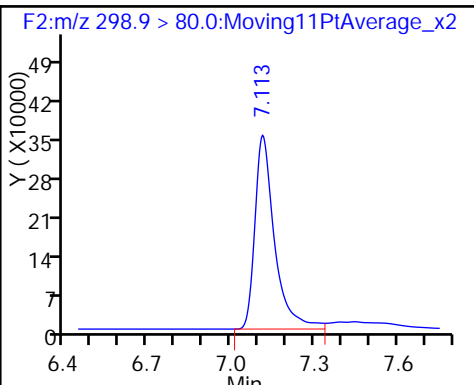
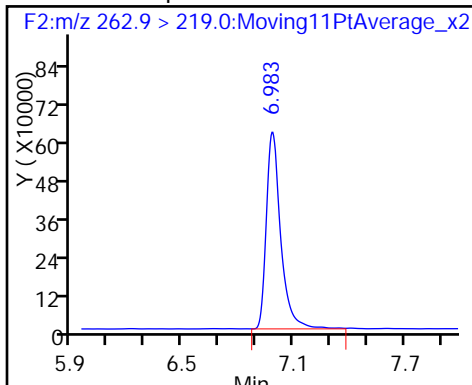
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

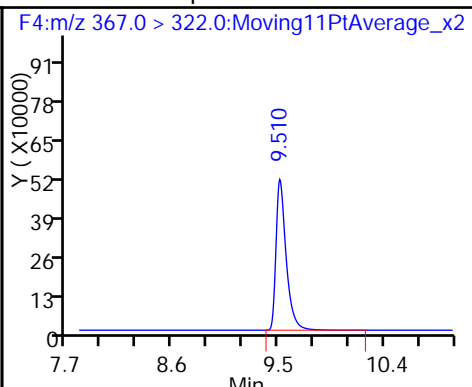
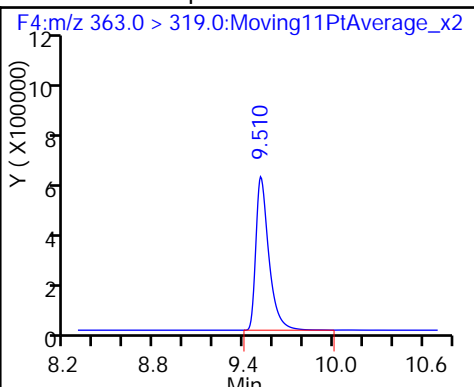
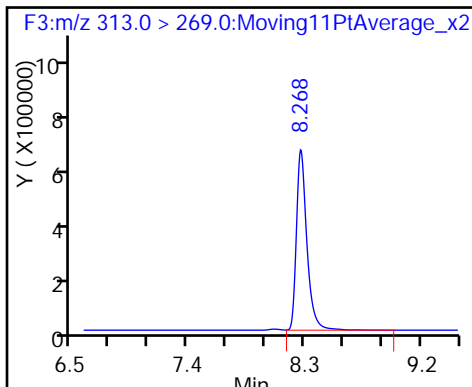
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

9 Perfluoroheptanoic acid

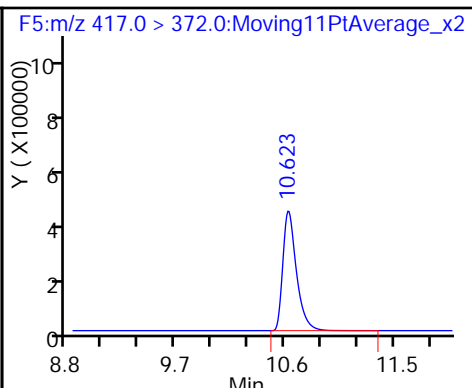
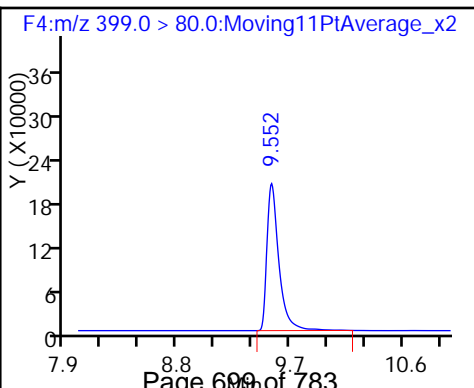
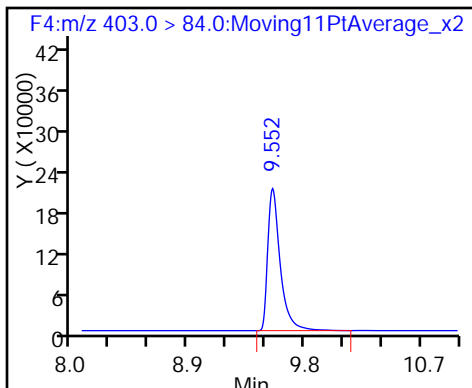
D 8 13C4-PFHpA

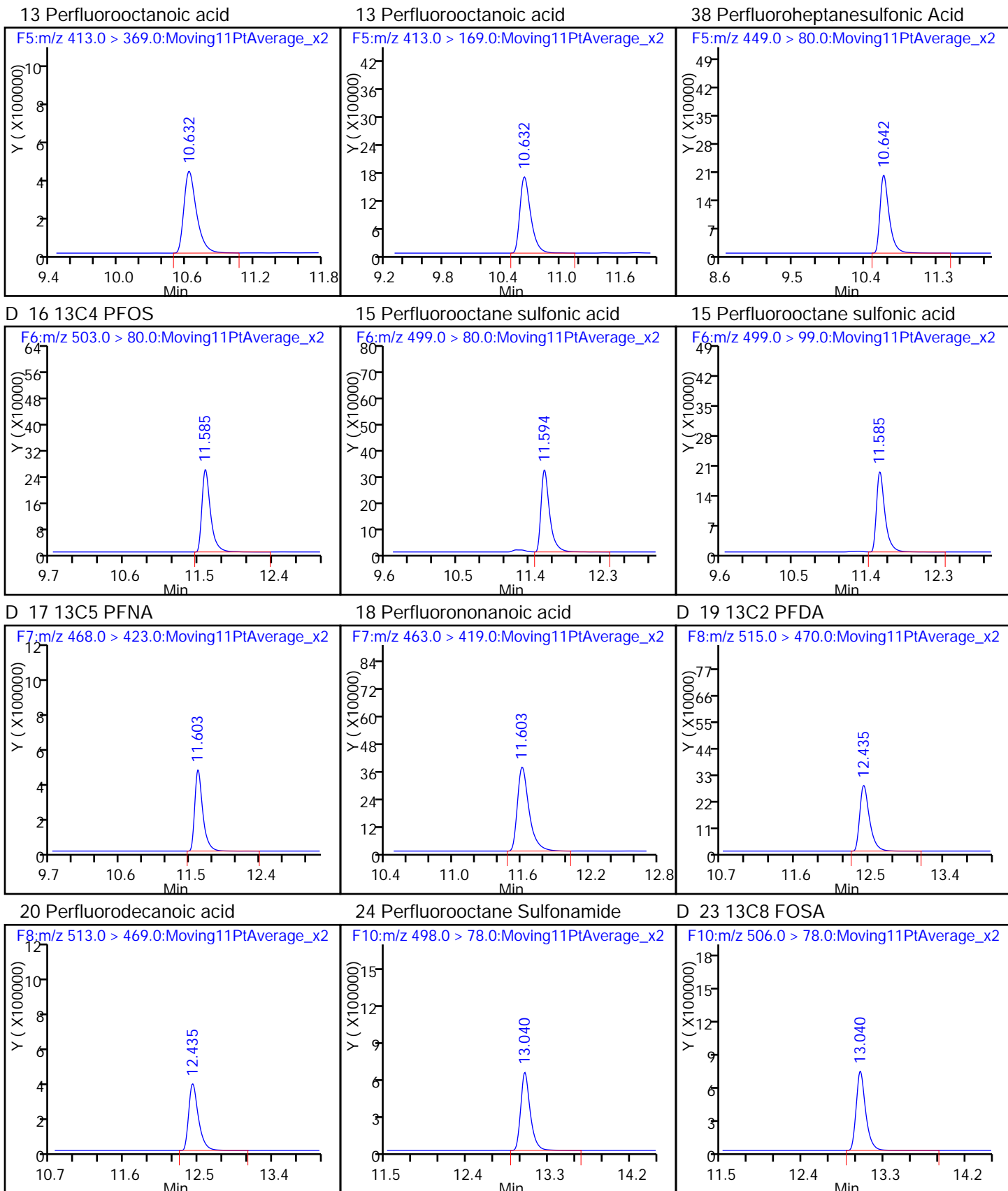


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

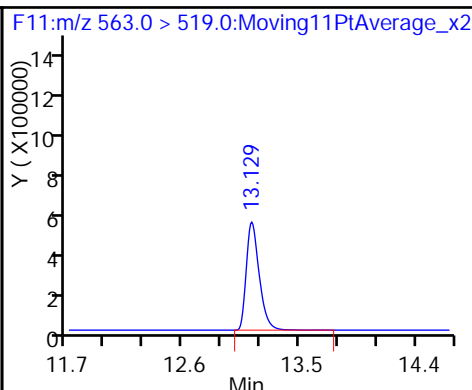
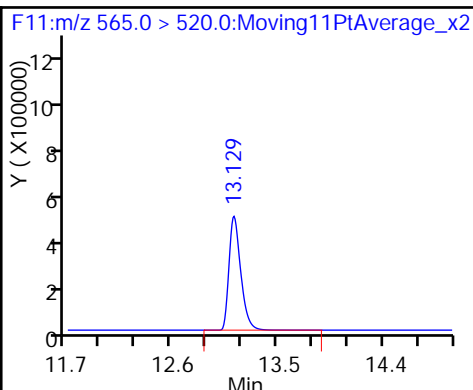
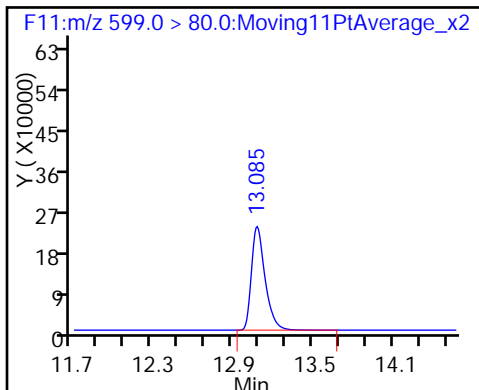




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

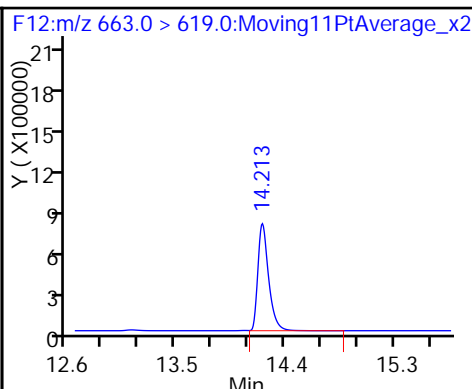
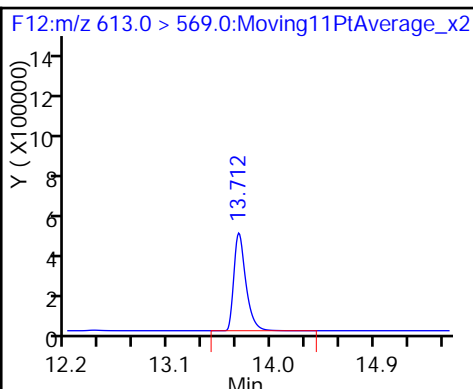
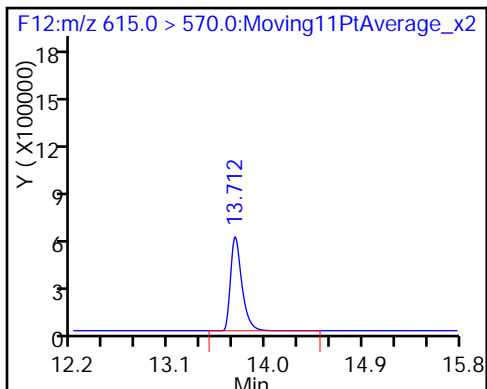
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

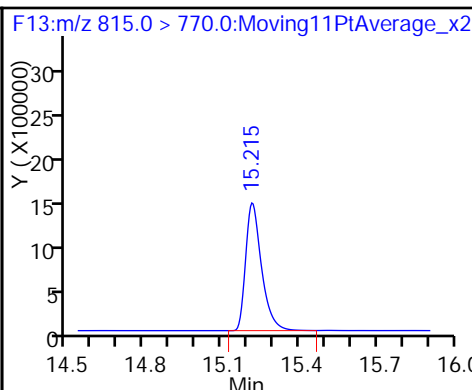
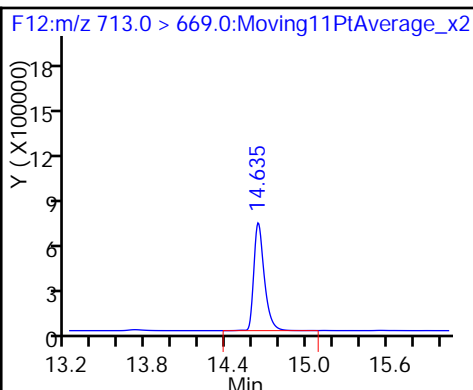
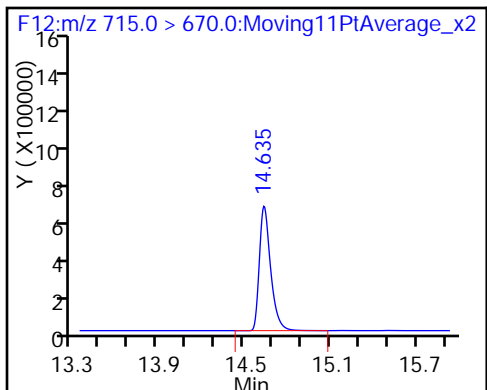
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

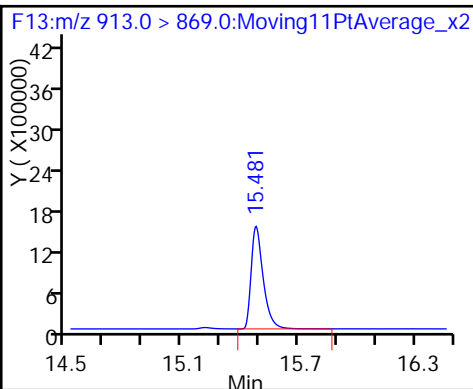
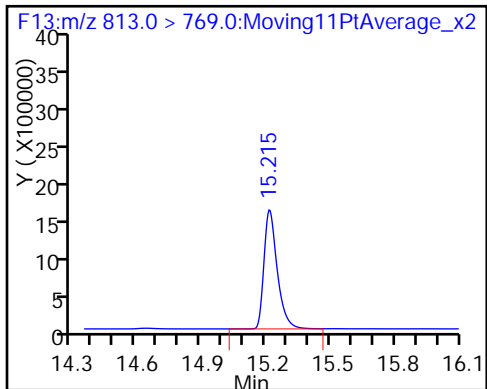
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxD A



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Lab Sample ID: CCV 320-112205/58 Calibration Date: 06/02/2016 11:00
 Instrument ID: A6 Calib Start Date: 05/31/2016 12:51
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/31/2016 14:59
 Lab File ID: 31MAY2016A6A_132.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.529	1.748		57.2	50.0	14.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.155	1.112		48.1	50.0	-3.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.300	1.413		48.0	44.2	8.6	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.128	1.208		53.5	50.0	7.1	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.207		52.5	50.0	5.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.9366	1.027		51.9	47.3	9.6	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.027	1.010		49.2	50.0	-1.6	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID		0.8521		48.9	47.6	2.7	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.235	1.352		52.3	47.8	9.5	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8639	0.9200		53.2	50.0	6.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.257	1.285		51.1	50.0	2.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.7937	0.8824		55.6	50.0	11.2	25.0
Perfluorodecanesulfonic acid (PFDS)	L1ID		0.8256		48.7	48.2	1.1	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		1.042		50.5	50.0	1.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8376	0.8873		53.0	50.0	5.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.115	1.158		51.9	50.0	3.8	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.9188		51.0	50.0	1.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.664		55.5	50.0	11.1	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.472	1.412		47.9	50.0	-4.1	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_132.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 02-Jun-2016 11:00:30 ALS Bottle#: 13 Worklist Smp#: 58
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5 CCV L5
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub5
 Method: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Jun-2016 11:48:51 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 02-Jun-2016 11:48:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.794	5.803	-0.009	1167069	47.9		95.7	420	
2 Perfluorobutyric acid	212.9 > 169.0	5.794	5.806	-0.012	1.000	2039616	57.2	114	22697	
D 3 13C5-PFPeA	267.9 > 223.0	6.955	6.968	-0.013	2908991	45.8		91.6	6373	
4 Perfluoropentanoic acid	262.9 > 219.0	6.960	6.970	-0.010	1.000	3233717	48.1	96.2	654	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.088	7.099	-0.011	1.000	1703044	48.0	109		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.088	7.099	-0.011	1.000	1703044	NC		217	
	298.9 > 99.0	7.088	7.099	-0.011	1.000	867758	1.96(0.00-0.00)		838	
D 6 13C2 PFHxA	315.0 > 270.0	8.241	8.252	-0.011	3063632	50.0		100.0	13835	
7 Perfluorohexanoic acid	313.0 > 269.0	8.247	8.253	-0.006	1.000	3699585	53.5	107	1806	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.487	9.494	-0.007	1.000	3696802	52.5	105	30957	
D 8 13C4-PFHpA	367.0 > 322.0	9.487	9.495	-0.008	3064032	44.6		89.3	7921	
D 11 18O2 PFHxS	403.0 > 84.0	9.524	9.532	-0.008	1290101	41.8		88.4	19400	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.524	9.533	-0.009	1.000	1324727	NC		564	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.524	9.533	-0.009	1.000	1324727	51.9	110		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.605	10.612	-0.007		3302313	45.4		90.8	19180	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.605	10.612	-0.007	1.000	3335182	49.2		98.4	1507	
413.0 > 169.0	10.605	10.612	-0.007	1.000	1184064		2.82(0.00-0.00)		1889	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.614	10.622	-0.008	1.000	1458339	NC			10091	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.614	10.622	-0.008	1.000	1458339	48.9		103		
D 16 13C4 PFOS										
503.0 > 80.0	11.569	11.568	0.001		1718744	43.3		90.6	13042	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.569	11.571	-0.002	1.000	2324042	52.3		109	696	
499.0 > 99.0	11.569	11.571	-0.002	1.000	1276175		1.82(0.00-0.00)		2421	
D 17 13C5 PFNA										
468.0 > 423.0	11.586	11.589	-0.003		2835142	42.5		85.1	48800	
18 Perfluorononanoic acid										
463.0 > 419.0	11.586	11.589	-0.003	1.000	2608373	53.2		106	24297	
D 19 13C2 PFDA										
515.0 > 470.0	12.424	12.423	0.001		2310385	43.9		87.8	138660	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.424	12.423	0.001	1.000	2968215	51.1		102	59338	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.040	13.018	0.022	1.000	4423804	55.6		111	3277	
D 23 13C8 FOSA										
506.0 > 78.0	13.040	13.019	0.021		5013242	40.0		80.0	6485	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.085	13.081	0.004	1.000	1430776	48.7		101		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.085	13.081	0.004	1.000	1430776	NC			67150	
D 26 13C2 PFUnA										
565.0 > 520.0	13.129	13.124	0.005		3307924	44.0		88.0	8784	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.129	13.124	0.005	1.000	3445505	50.5		101	15454	
D 28 13C2 PFDaA										
615.0 > 570.0	13.712	13.718	-0.006		4016920	44.3		88.5	45673	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.712	13.718	-0.006	1.000	3564154	53.0		106	5516	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.205	14.220	-0.015	1.000	4651636	51.9		104	4032	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.635	14.643	-0.008		3749647	46.2		92.5	13994	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.635	14.644	-0.009	1.000	3690766	51.0		102	1555	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.205	15.223	-0.018		5819418	46.2		92.4	8589	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.205	15.223	-0.018	1.000	6682641	55.5		111	4309	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.461	15.493	-0.032	1.000	5670370	47.9	95.9	3373	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00018

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_132.d

Injection Date: 02-Jun-2016 11:00:30

Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: JRB

ALS Bottle#: 13

Worklist Smp#: 58

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

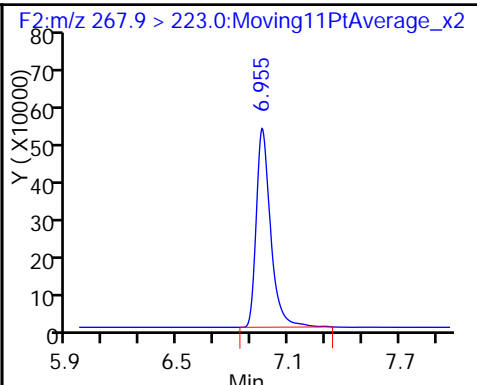
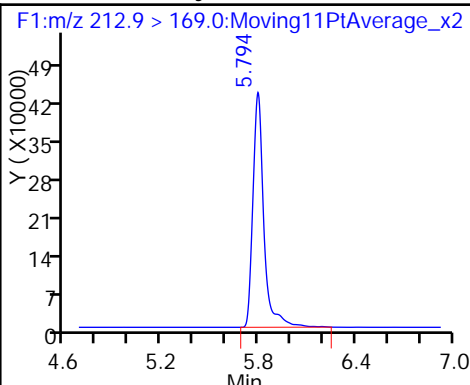
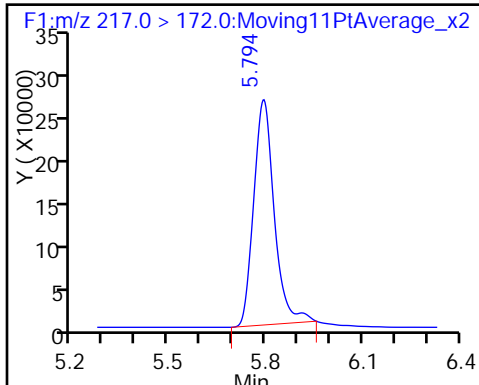
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

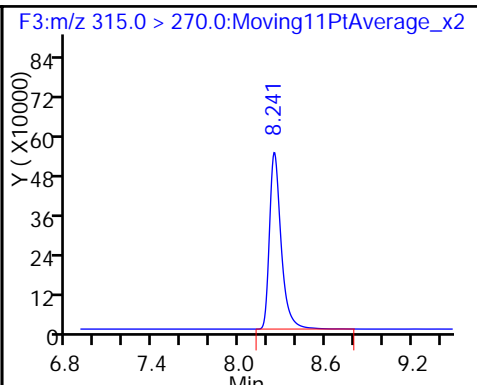
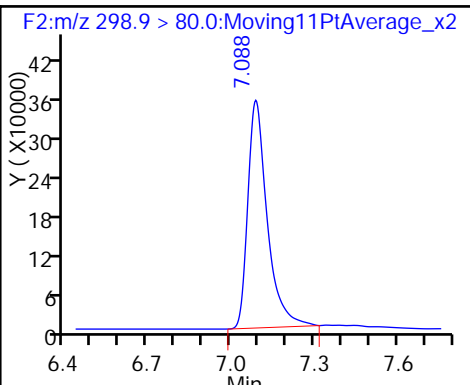
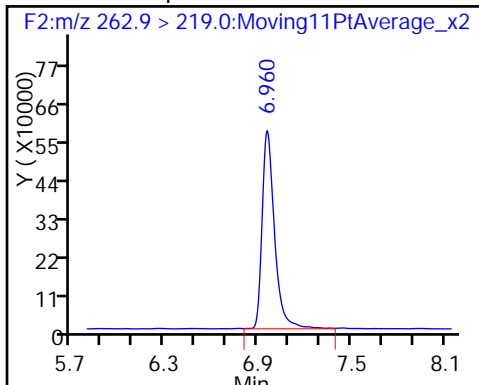
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

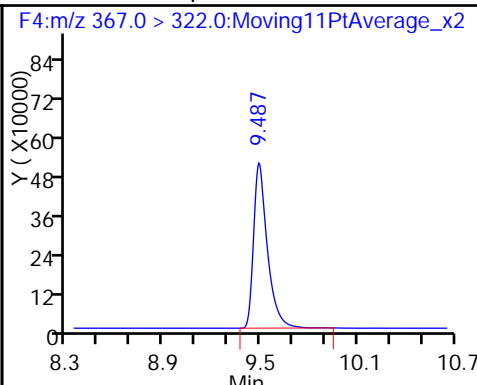
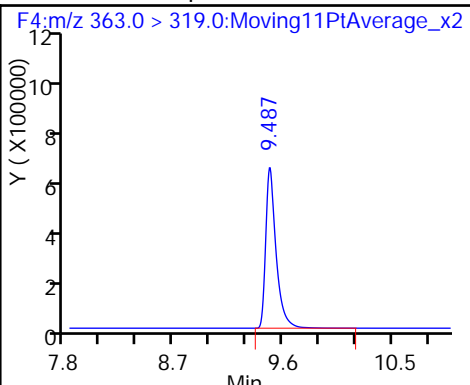
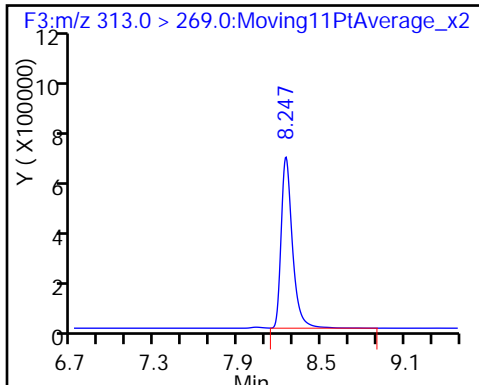
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

9 Perfluoroheptanoic acid

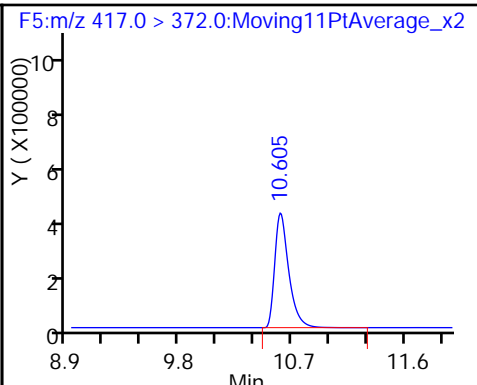
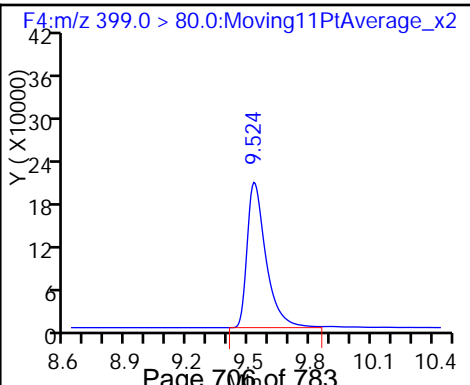
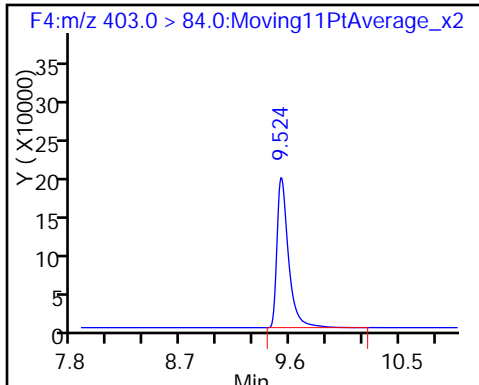
D 8 13C4-PFHpA

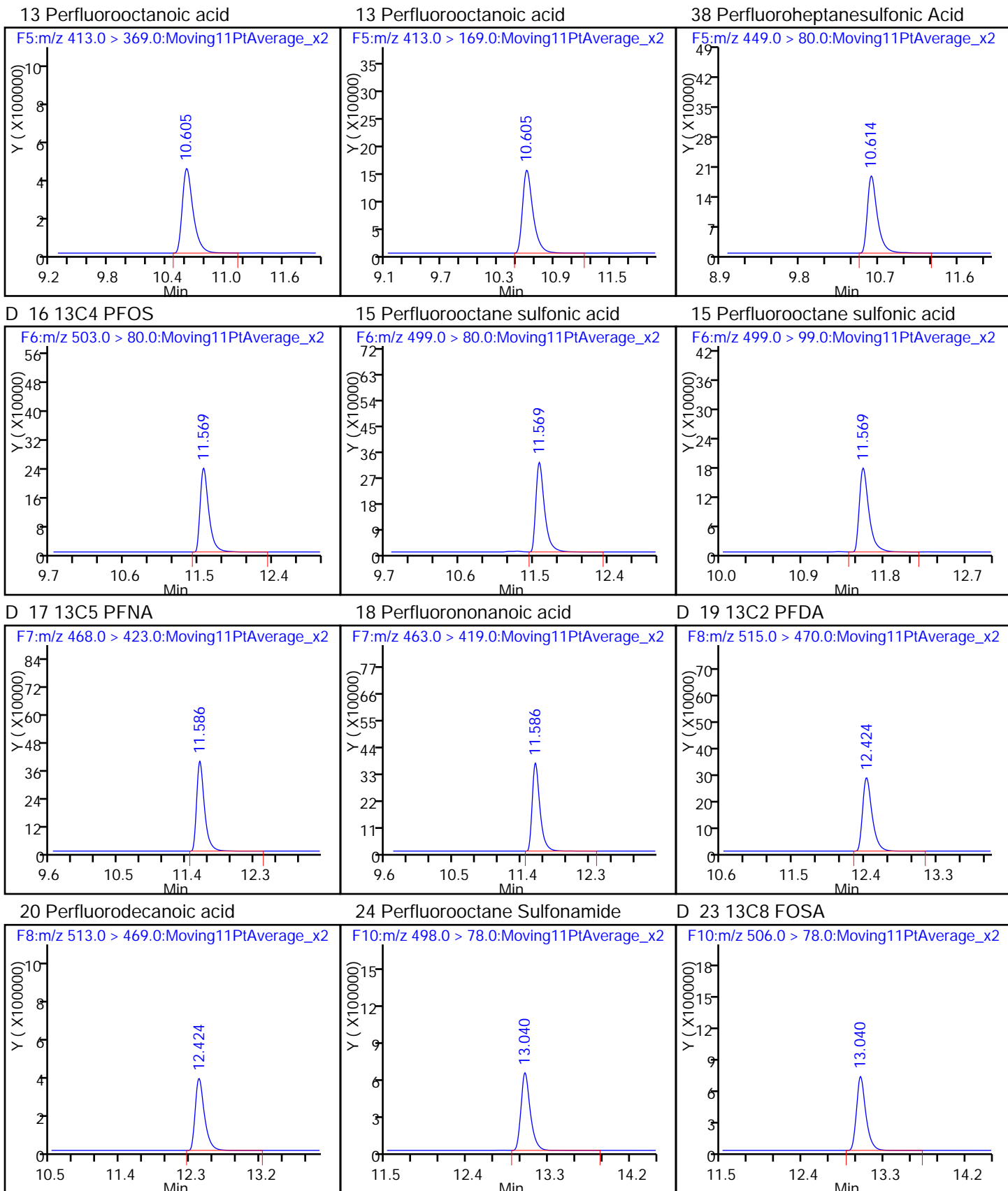


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

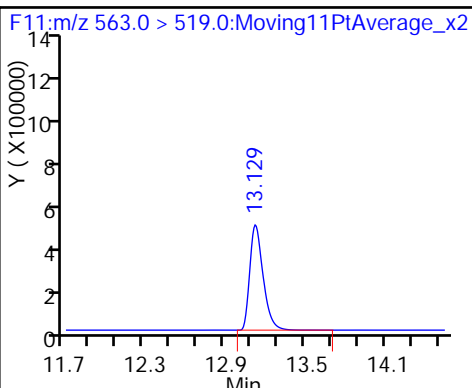
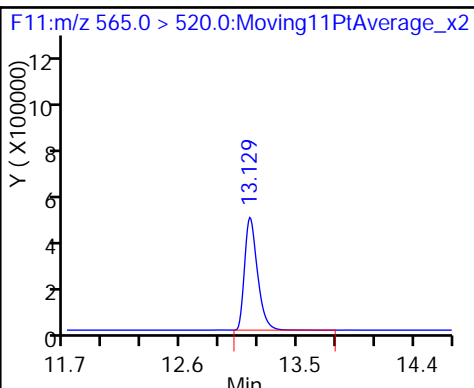
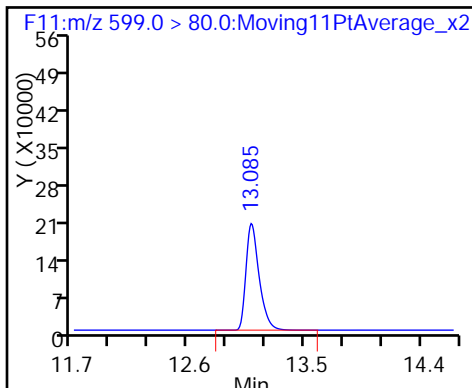




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

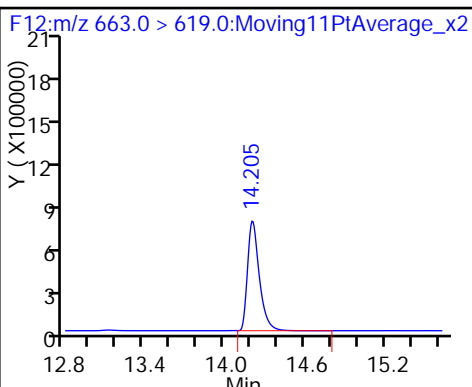
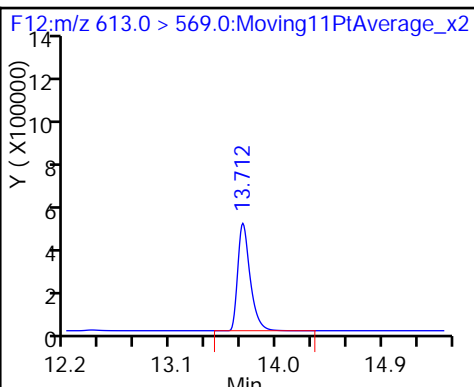
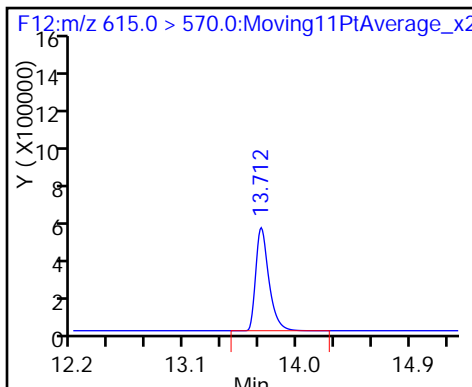
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

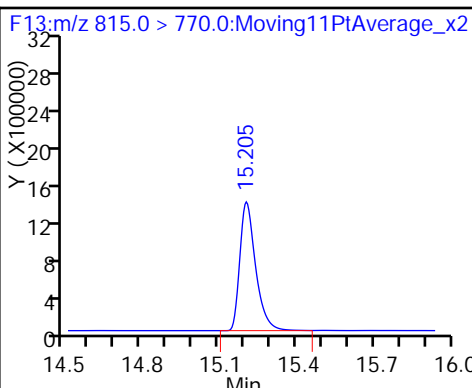
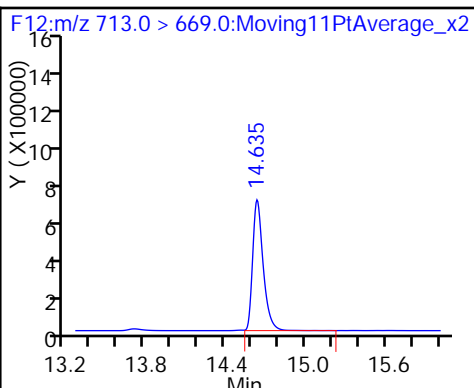
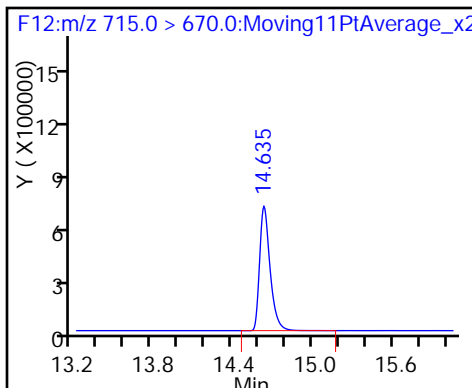
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

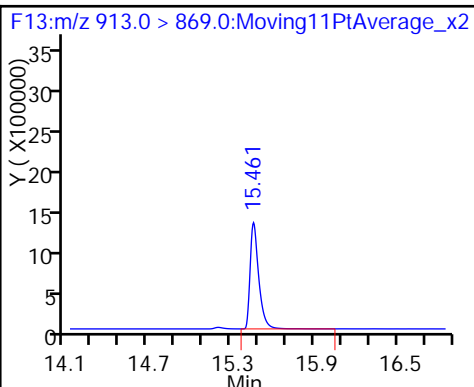
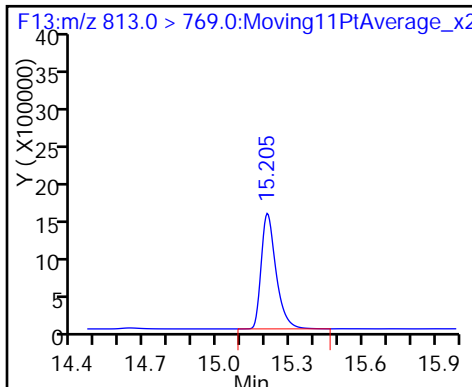
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Lab Sample ID: CCV 320-112205/69 Calibration Date: 06/02/2016 14:59
 Instrument ID: A6 Calib Start Date: 05/31/2016 12:51
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/31/2016 14:59
 Lab File ID: 31MAY2016A6A_143.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.529	1.474		48.2	50.0	-3.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.155	1.157		50.1	50.0	0.2	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.300	1.330		45.2	44.2	2.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.128	1.158		51.3	50.0	2.7	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.191		51.8	50.0	3.7	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.9366	0.9550		48.2	47.3	2.0	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.027	1.057		51.5	50.0	3.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID		0.8795		50.5	47.6	6.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.235	1.404		54.3	47.8	13.7	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8639	0.8480		49.1	50.0	-1.8	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.257	1.248		49.6	50.0	-0.7	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.7937	0.8545		53.8	50.0	7.7	25.0
Perfluorodecanesulfonic acid (PFDS)	L1ID		0.9079		53.6	48.2	11.3	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		1.120		54.3	50.0	8.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8376	0.8586		51.3	50.0	2.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.115	1.127		50.5	50.0	1.0	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.9086		50.4	50.0	0.8	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.615		53.9	50.0	7.8	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.472	1.383		47.0	50.0	-6.0	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_143.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 02-Jun-2016 14:59:19 ALS Bottle#: 13 Worklist Smp#: 69
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5 CCV L5
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub5
 Method: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 02-Jun-2016 15:59:45 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK018

First Level Reviewer: barnettj Date: 02-Jun-2016 15:46:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.791	5.803	-0.012	1268153	52.0		104	14341	
2 Perfluorobutyric acid	212.9 > 169.0	5.794	5.806	-0.012	1869650	48.2		96.4	293	
D 3 13C5-PFPeA	267.9 > 223.0	6.960	6.968	-0.008	2839731	44.7		89.4	14719	
4 Perfluoropentanoic acid	262.9 > 219.0	6.964	6.970	-0.006	3286740	50.1		100	604	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.095	7.099	-0.004	1744920	45.2		102		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.095	7.099	-0.004	1744920	NC			360	
	298.9 > 99.0	7.095	7.099	-0.004	863543		2.02(0.00-0.00)		868	
D 6 13C2 PFHxA	315.0 > 270.0	8.247	8.252	-0.005	3007129	49.1		98.1	5735	
7 Perfluorohexanoic acid	313.0 > 269.0	8.247	8.253	-0.006	3482715	51.3		103	1421	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.493	9.494	-0.001	3760375	51.8		104	13534	
D 8 13C4-PFHpA	367.0 > 322.0	9.493	9.495	-0.002	3156912	46.0		92.0	22475	
D 11 18O2 PFHxS	403.0 > 84.0	9.532	9.532	0.0	1403797	45.5		96.2	11299	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.532	9.533	-0.001	1340687	NC			873	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.532	9.533	-0.001	1340687	48.2		102		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.614	10.612	0.002		3238408	44.5		89.0	59280	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.614	10.612	0.002	1.000	3423793	51.5		103	1068	
413.0 > 169.0	10.614	10.612	0.002	1.000	1244876		2.75(0.00-0.00)		1967	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.623	10.622	0.001	1.000	1448856	NC			13081	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.623	10.622	0.001	1.000	1448856	50.5		106		
D 16 13C4 PFOS										
503.0 > 80.0	11.569	11.568	0.001		1654384	41.7		87.2	9390	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.569	11.571	-0.002	1.000	2323394	54.3		114	741	
499.0 > 99.0	11.569	11.571	-0.002	1.000	1226778		1.89(0.00-0.00)		4168	
D 17 13C5 PFNA										
468.0 > 423.0	11.586	11.589	-0.003		3093192	46.4		92.8	25483	
18 Perfluorononanoic acid										
463.0 > 419.0	11.586	11.589	-0.003	1.000	2622907	49.1		98.2	45784	
D 19 13C2 PFDA										
515.0 > 470.0	12.414	12.423	-0.009		2361896	44.9		89.7	9242	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.414	12.423	-0.009	1.000	2946768	49.6		99.3	22347	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.030	13.018	0.012	1.000	4252682	53.8		108	3447	
D 23 13C8 FOSA										
506.0 > 78.0	13.030	13.019	0.011		4976873	39.7		79.4	6715	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.075	13.081	-0.006	1.000	1514512	53.6		111		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.075	13.081	-0.006	1.000	1514512	NC			106434	
D 26 13C2 PFUnA										
565.0 > 520.0	13.119	13.124	-0.005		3204337	42.6		85.2	9106	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.119	13.124	-0.005	1.000	3587326	54.3		109	21311	
D 28 13C2 PFDoA										
615.0 > 570.0	13.710	13.718	-0.008		4117744	45.4		90.8	35042	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.710	13.718	-0.008	1.000	3535673	51.3		103	2488	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.212	14.220	-0.008	1.000	4639843	50.5		101	2777	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.634	14.643	-0.009		3740552	46.1		92.3	10592	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.634	14.644	-0.010	1.000	3741429	50.4		101	1565	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.213	15.223	-0.010		5934106	47.1		94.2	8115	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.213	15.223	-0.010	1.000	6651936	53.9		108	3789	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.470	15.493	-0.023	1.000	5696387	47.0	94.0	3034	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00018

Amount Added: 1.00

Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_143.d

Injection Date: 02-Jun-2016 14:59:19

Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: JRB

ALS Bottle#: 13

Worklist Smp#: 69

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

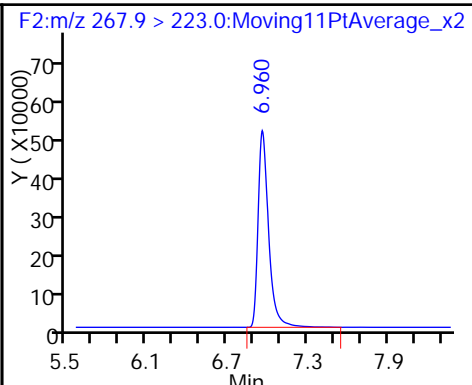
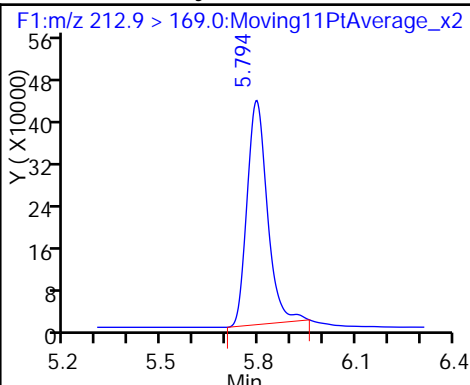
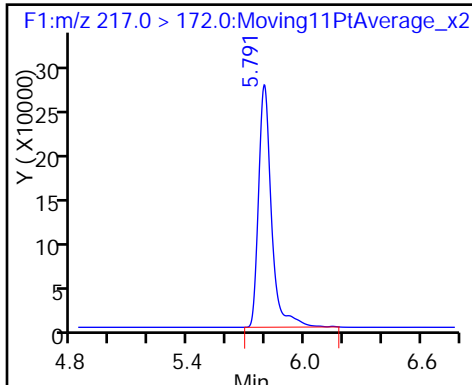
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

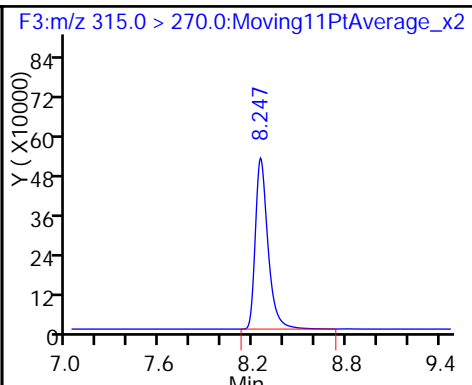
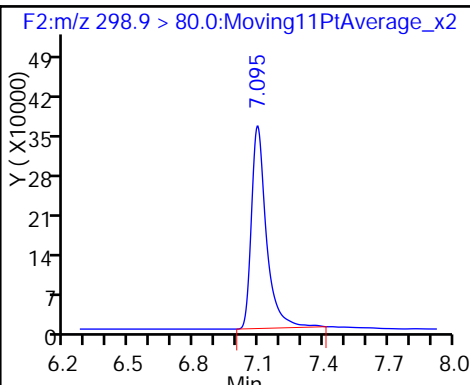
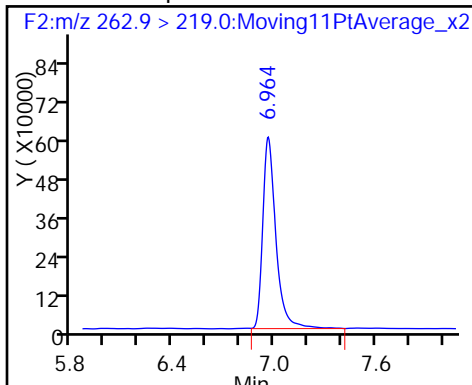
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

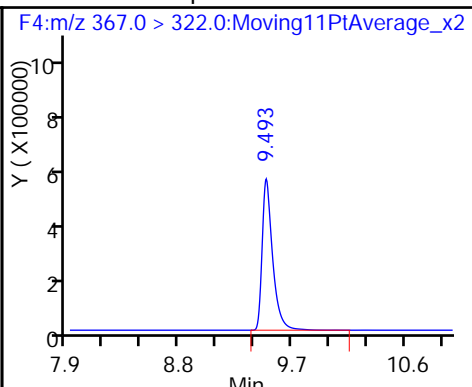
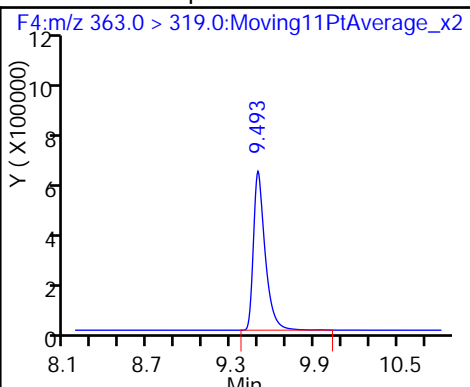
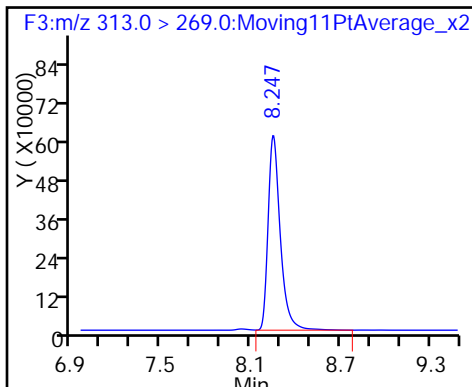
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

9 Perfluoroheptanoic acid

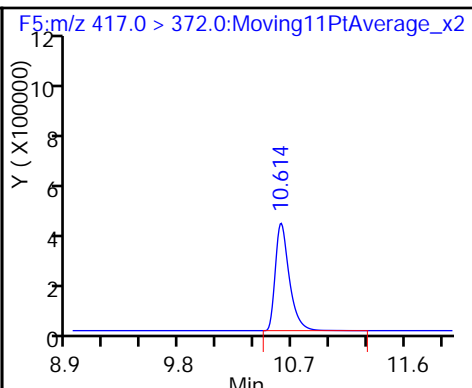
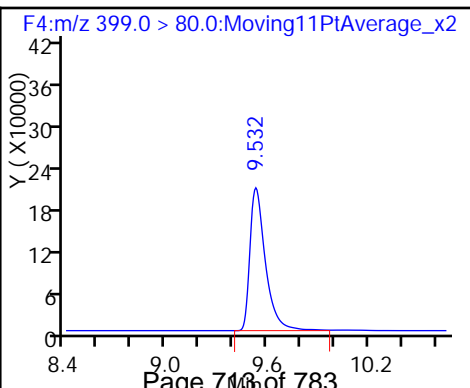
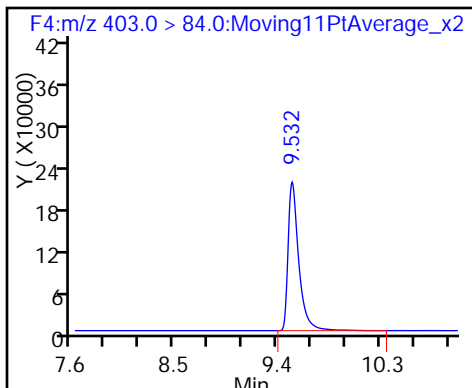
D 8 13C4-PFHpA

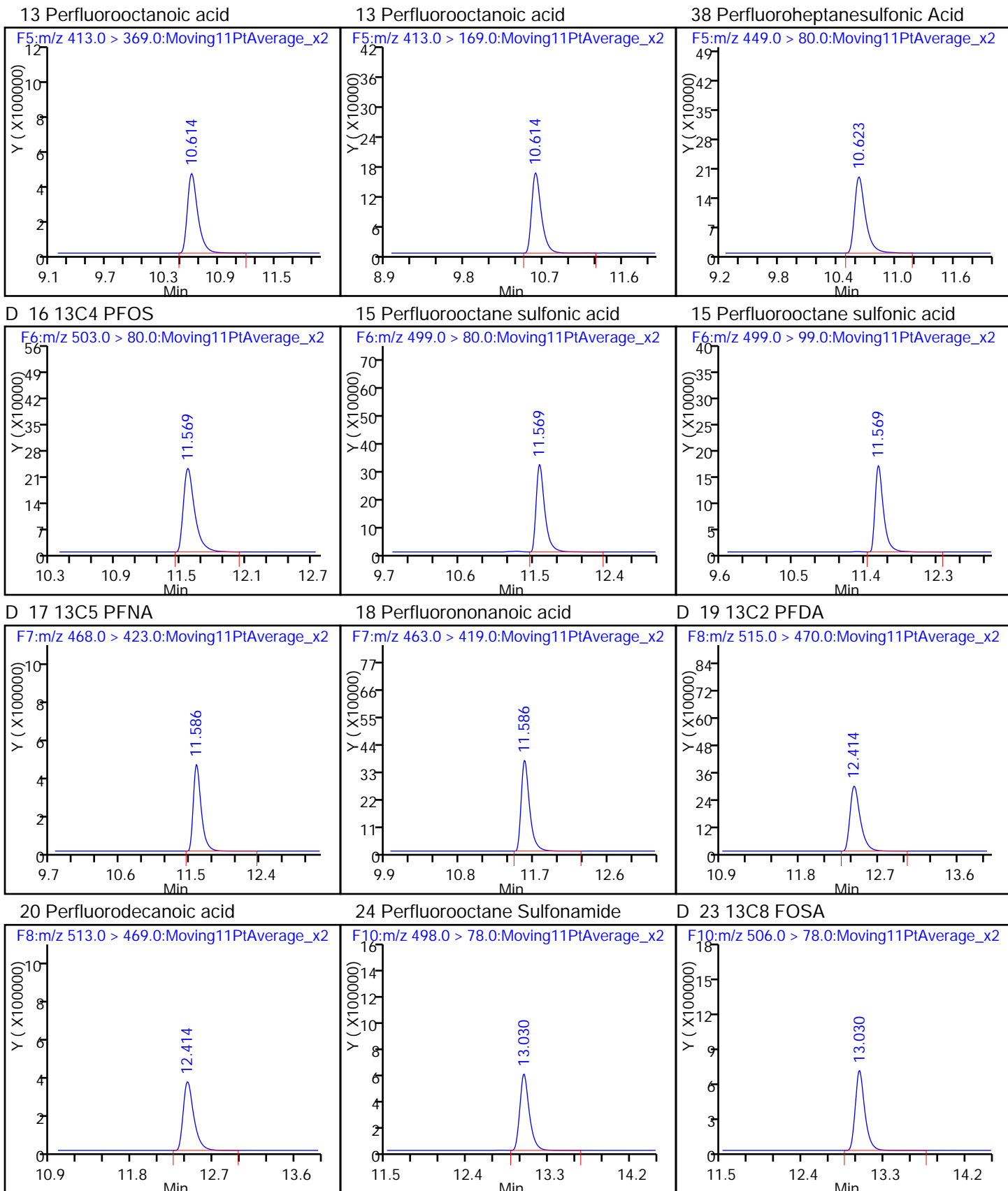


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

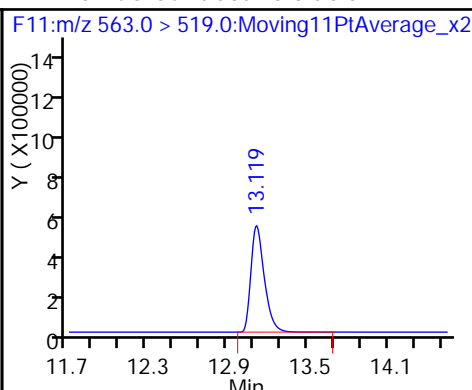
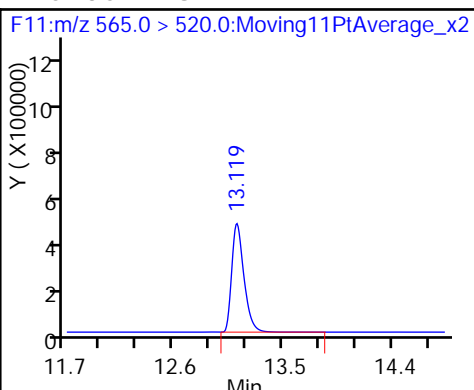
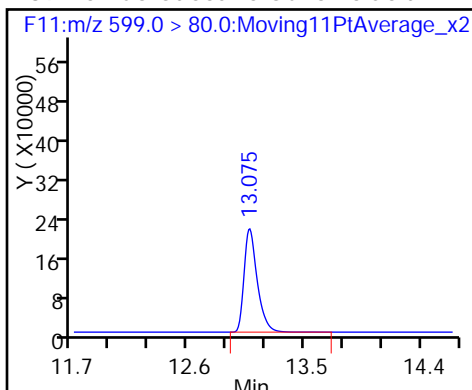




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

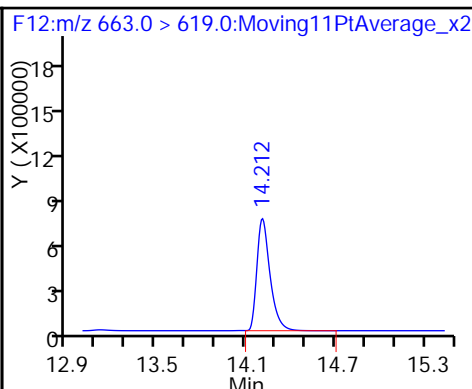
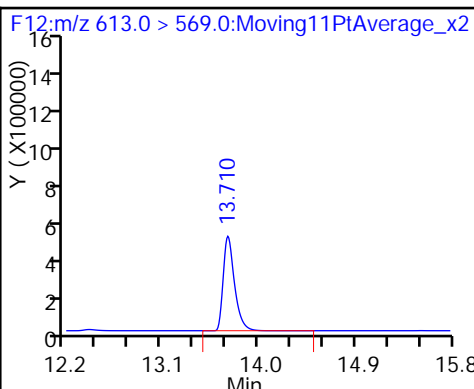
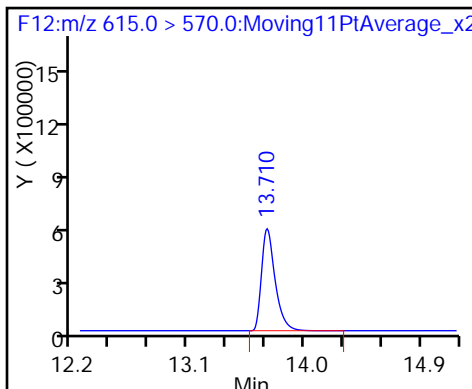
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

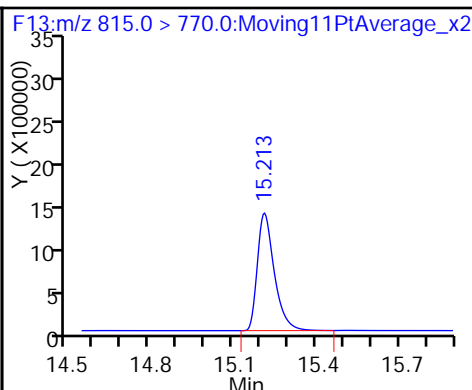
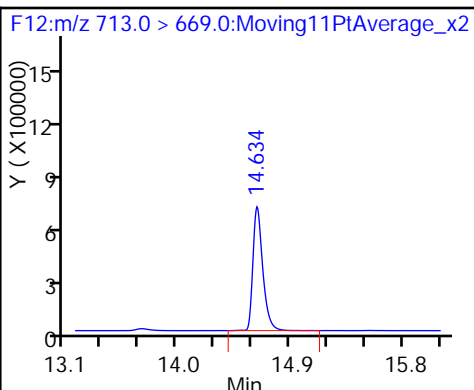
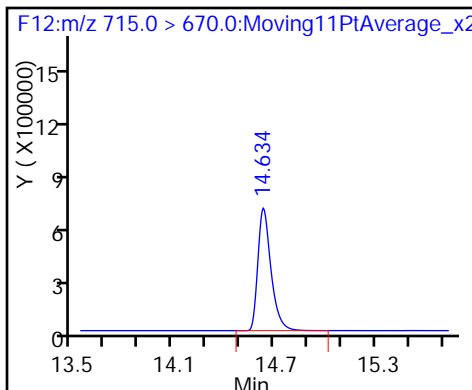
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

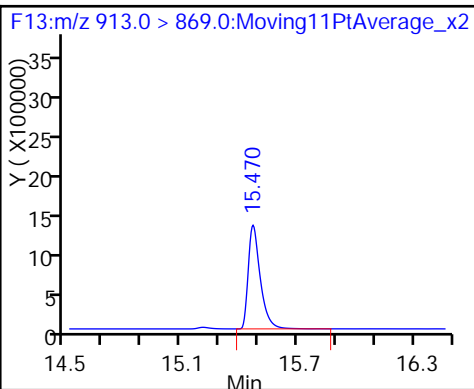
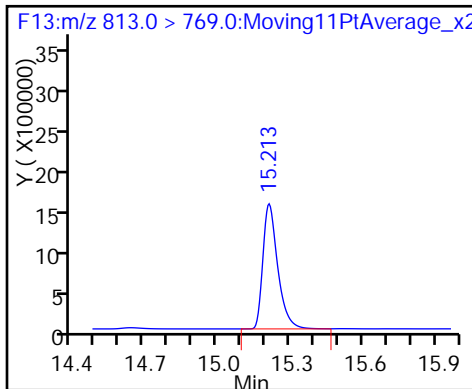
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Lab Sample ID: CCV 320-112205/76 Calibration Date: 06/02/2016 17:49
 Instrument ID: A6 Calib Start Date: 05/31/2016 12:51
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/31/2016 14:59
 Lab File ID: 31MAY2016A6A_150.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.529	1.651		54.0	50.0	8.0	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.155	1.169		50.6	50.0	1.1	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.300	1.326		45.1	44.2	2.0	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.128	1.226		54.4	50.0	8.7	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.243		54.1	50.0	8.2	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.9366	0.9412		47.5	47.3	0.5	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.027	1.079		52.5	50.0	5.1	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID		0.8927		51.2	47.6	7.6	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.235	1.387		53.7	47.8	12.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8639	0.8077		46.7	50.0	-6.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.257	1.402		55.8	50.0	11.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.7937	0.8671		54.6	50.0	9.2	25.0
Perfluorodecanesulfonic acid (PFDS)	L1ID		0.8334		49.2	48.2	2.1	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		1.015		49.2	50.0	-1.6	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8376	0.8422		50.3	50.0	0.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.115	1.093		49.0	50.0	-2.0	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.9182		50.9	50.0	1.8	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.551		51.7	50.0	3.4	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.472	1.463		49.7	50.0	-0.6	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_150.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 02-Jun-2016 17:49:53 ALS Bottle#: 13 Worklist Smp#: 76
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5 CCV L5
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub5
 Method: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 03-Jun-2016 09:53:31 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK032

First Level Reviewer: barnettj Date: 03-Jun-2016 09:49:15

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.794	5.803	-0.009	1326823	54.4		109	39266	
2 Perfluorobutyric acid	212.9 > 169.0	5.797	5.806	-0.009	2190955	54.0		108	23352	
D 3 13C5-PFPeA	267.9 > 223.0	6.960	6.968	-0.008	3079177	48.5		96.9	3809	
4 Perfluoropentanoic acid	262.9 > 219.0	6.960	6.970	-0.010	3598282	50.6		101	748	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.088	7.099	-0.011	1869147	45.1		102		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.088	7.099	-0.011	1869147	NC			324	
	298.9 > 99.0	7.088	7.099	-0.011	946453		1.97(0.00-0.00)		507	
D 6 13C2 PFHxA	315.0 > 270.0	8.247	8.252	-0.005	3135942	51.2		102	23730	
7 Perfluorohexanoic acid	313.0 > 269.0	8.247	8.253	-0.006	3845704	54.4		109	1175	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.493	9.494	-0.001	4140642	54.1		108	16113	
D 8 13C4-PFHpA	367.0 > 322.0	9.493	9.495	-0.002	3330632	48.5		97.0	18763	
D 11 18O2 PFHxS	403.0 > 84.0	9.524	9.532	-0.008	1508885	48.9		103	116098	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.531	9.533	-0.002	1420146	NC			1622	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.531	9.533	-0.002	1420146	47.5		100		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.604	10.612	-0.008		3402586	46.8		93.5	13514	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.604	10.612	-0.008	1.000	3670615	52.5		105	2505	
413.0 > 169.0	10.604	10.612	-0.008	1.000	1354963		2.71(0.00-0.00)		1383	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.614	10.622	-0.008	1.000	1579664	NC			17610	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.614	10.622	-0.008	1.000	1579664	51.2		108		
D 16 13C4 PFOS										
503.0 > 80.0	11.560	11.568	-0.008		1776963	44.8		93.6	39649	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.568	11.571	-0.003	1.000	2464200	53.7		112	668	
499.0 > 99.0	11.560	11.571	-0.011	0.999	1308134		1.88(0.00-0.00)		4313	
D 17 13C5 PFNA										
468.0 > 423.0	11.586	11.589	-0.003		3198600	48.0		96.0	8027	
18 Perfluorononanoic acid										
463.0 > 419.0	11.586	11.589	-0.003	1.000	2583627	46.7		93.5	89295	
D 19 13C2 PFDA										
515.0 > 470.0	12.414	12.423	-0.009		2310065	43.9		87.8	140117	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.414	12.423	-0.009	1.000	3237621	55.8		112	6152	M
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.022	13.018	0.004	1.000	4544644	54.6		109	3767	
D 23 13C8 FOSA										
506.0 > 78.0	13.013	13.019	-0.006		5241246	41.8		83.6	6293	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.058	13.081	-0.023	1.000	1493361	49.2		102		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.058	13.081	-0.023	1.000	1493361	NC			51816	
D 26 13C2 PFUnA										
565.0 > 520.0	13.102	13.124	-0.022		3601566	47.9		95.8	36619	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.102	13.124	-0.022	1.000	3654395	49.2		98.4	17425	
D 28 13C2 PFDoA										
615.0 > 570.0	13.685	13.718	-0.033		4410766	48.6		97.2	17689	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.685	13.718	-0.033	1.000	3714755	50.3		101	3898	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.182	14.220	-0.038	1.000	4820120	49.0		98.0	4007	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.602	14.643	-0.041		3997193	49.3		98.6	5505	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.602	14.644	-0.042	1.000	4050037	50.9		102	1666	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.184	15.223	-0.039		6053679	48.0		96.1	6179	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.184	15.223	-0.039	1.000	6842733	51.7		103	3630	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.456	15.493	-0.037	1.000	6453798	49.7	99.4	3927	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L5_00018

Amount Added: 1.00

Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20160602-31259.b\31MAY2016A6A_150.d

Injection Date: 02-Jun-2016 17:49:53

Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: JRB

ALS Bottle#: 13

Worklist Smp#: 76

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

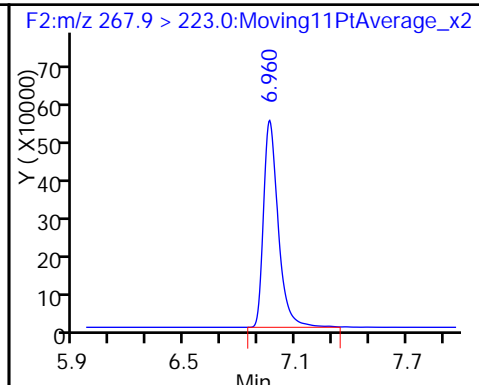
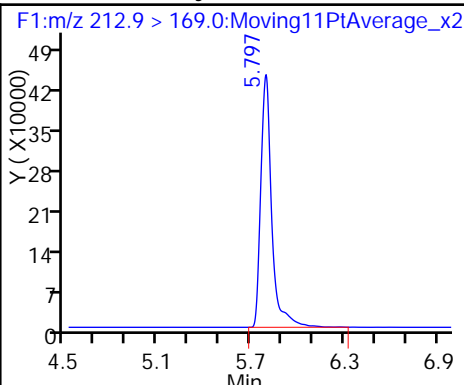
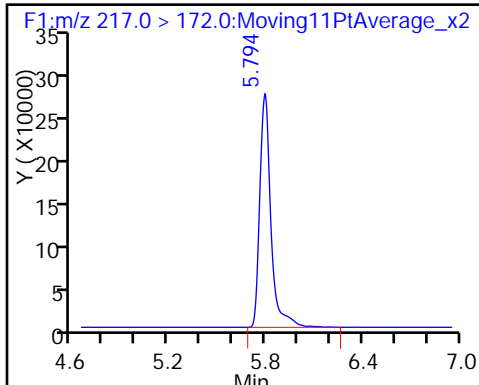
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

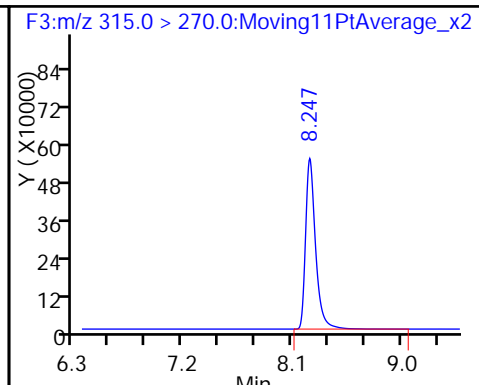
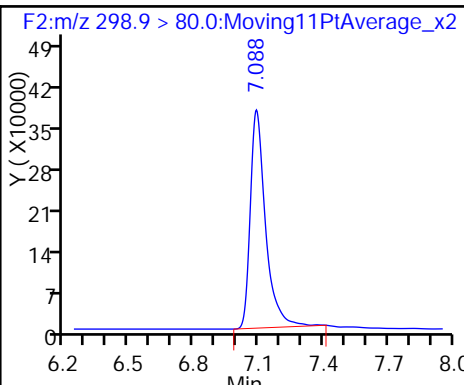
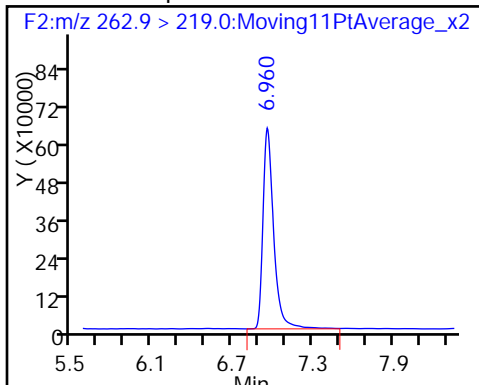
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

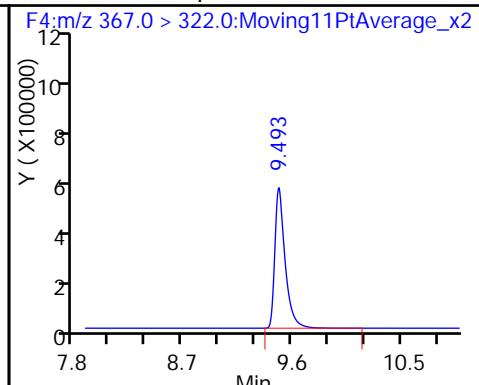
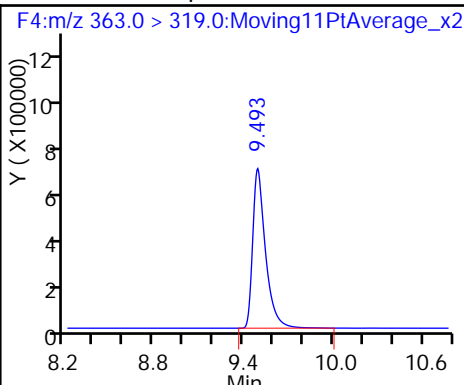
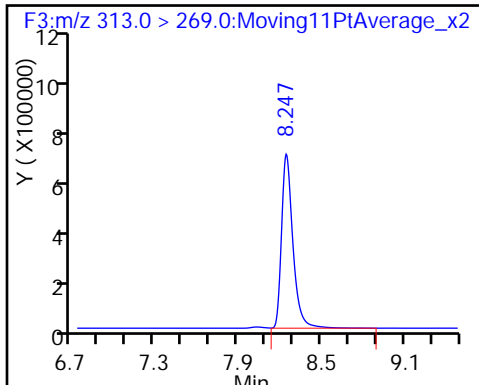
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

9 Perfluoroheptanoic acid

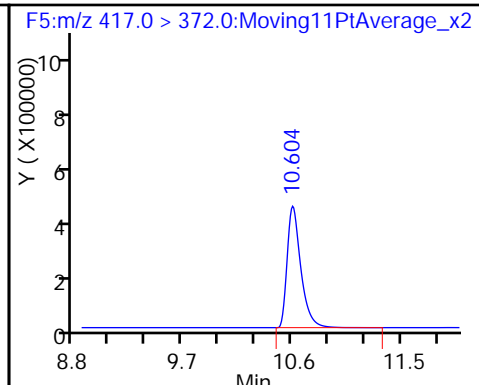
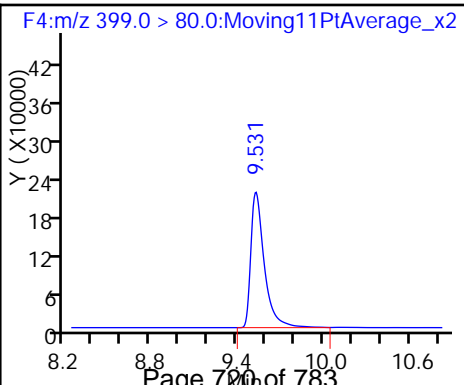
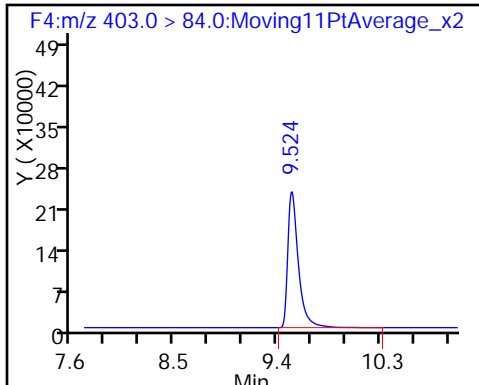
D 8 13C4-PFHpA

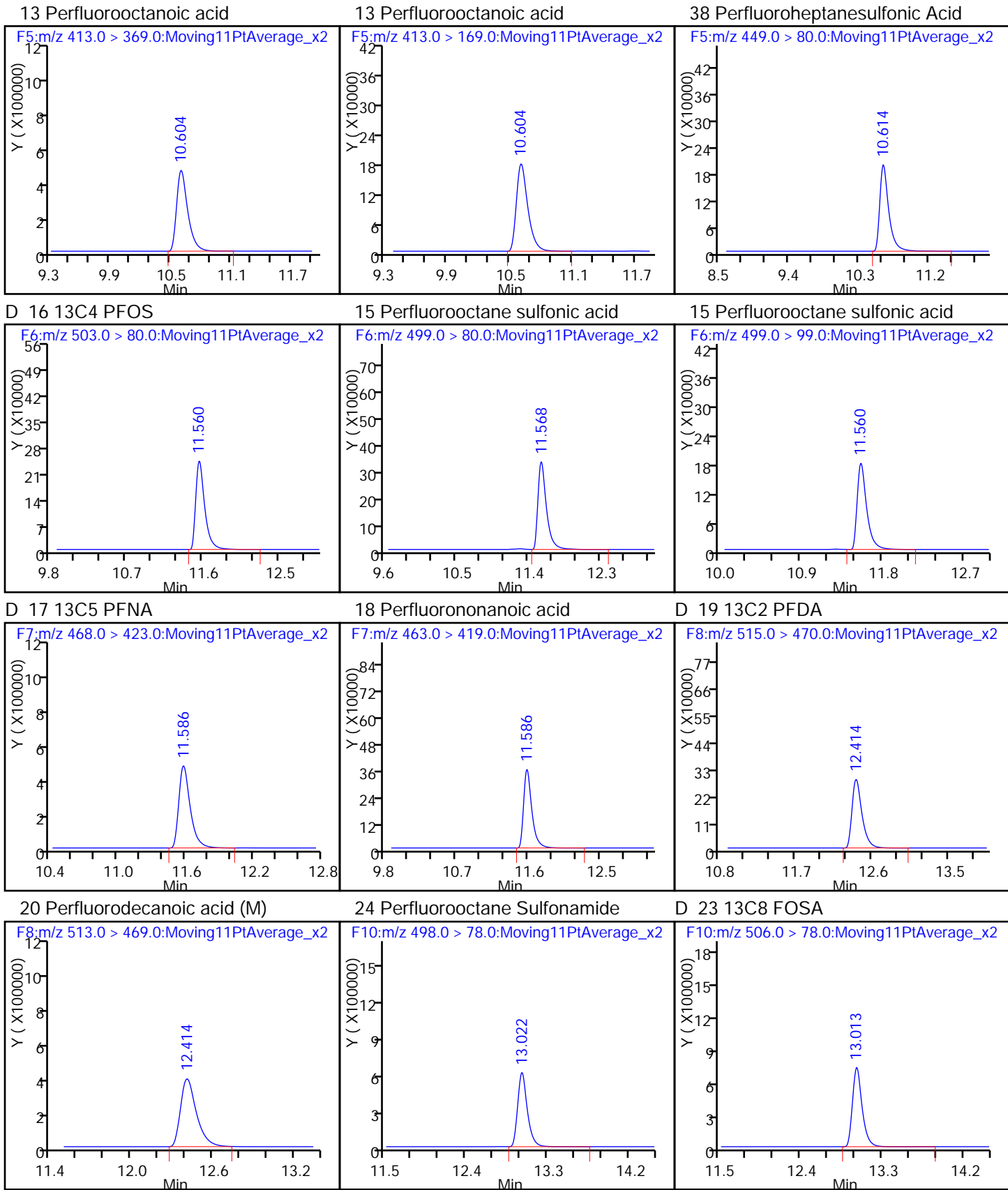


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

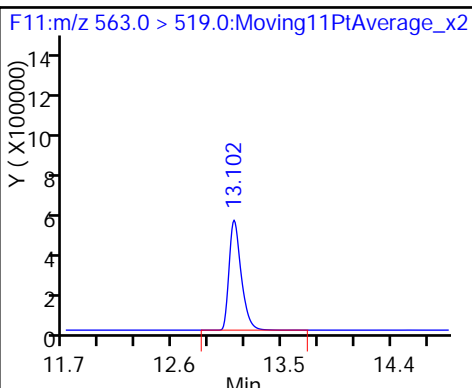
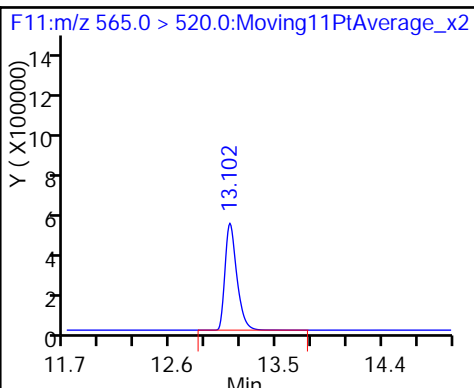
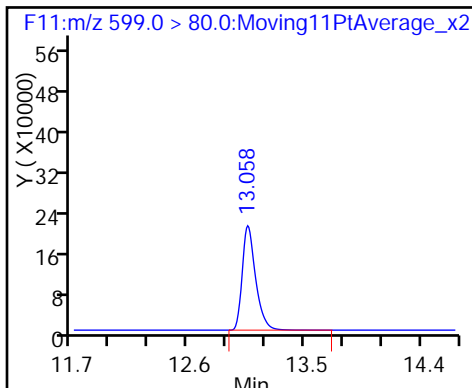




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

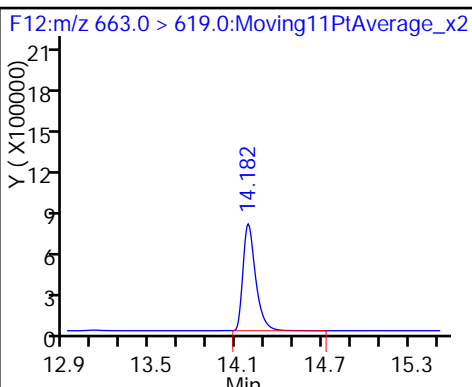
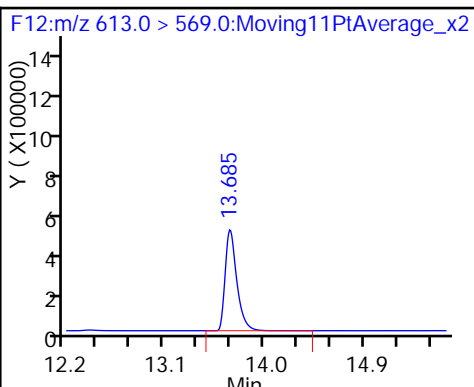
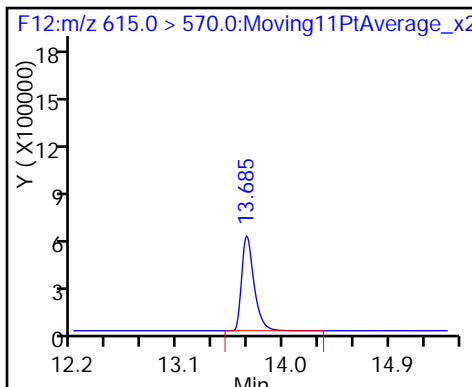
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

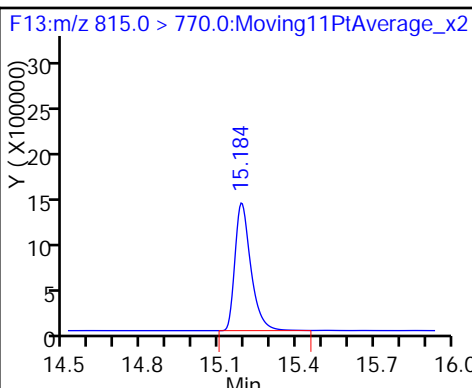
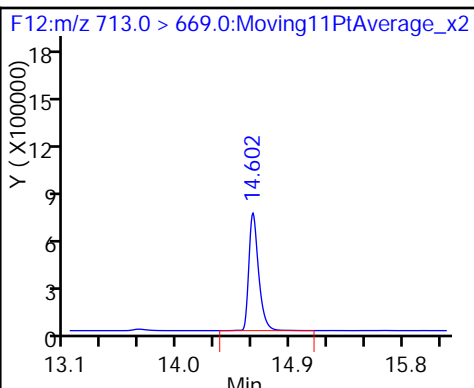
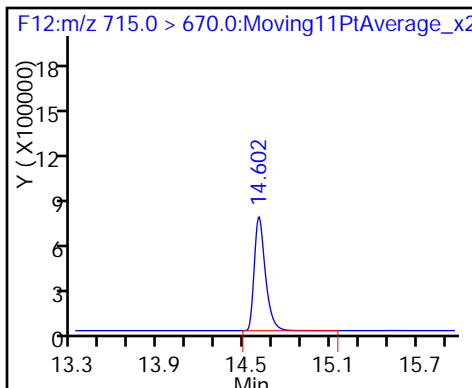
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

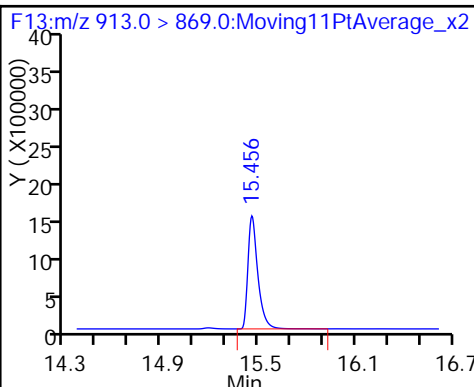
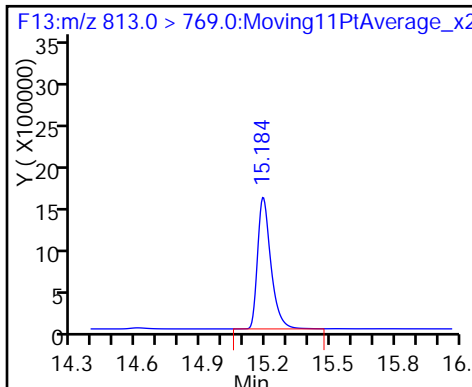
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



TestAmerica Sacramento

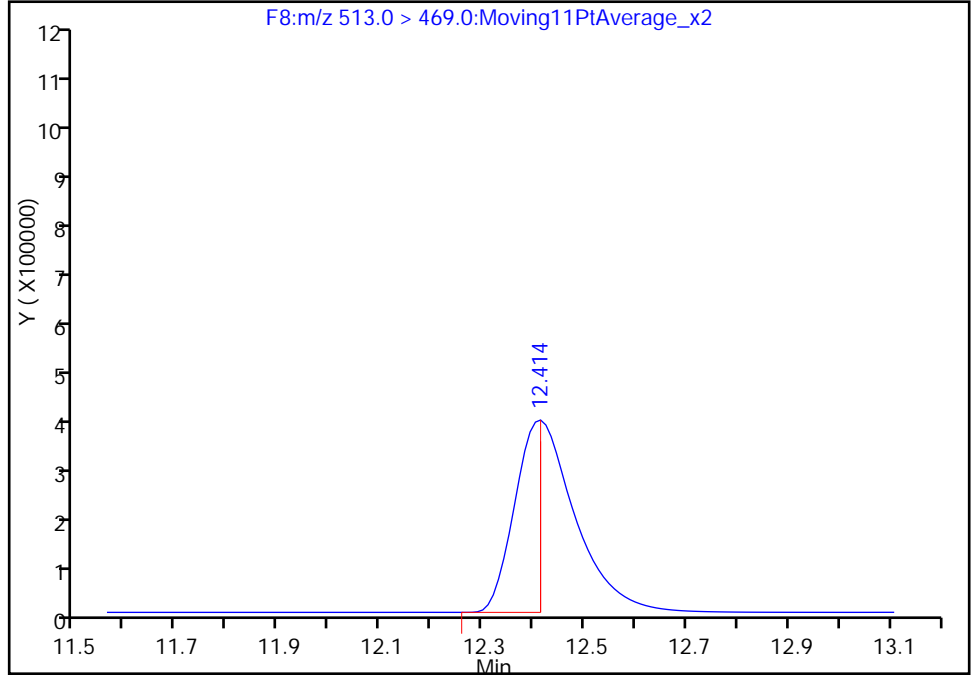
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Injection Date: 02-Jun-2016 17:49:53 Instrument ID: A6
Lims ID: CCV L5
Client ID:
Operator ID: JRB ALS Bottle#: 13 Worklist Smp#: 76
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F8:MRM

20 Perfluorodecanoic acid, CAS: 335-76-2

Signal: 1

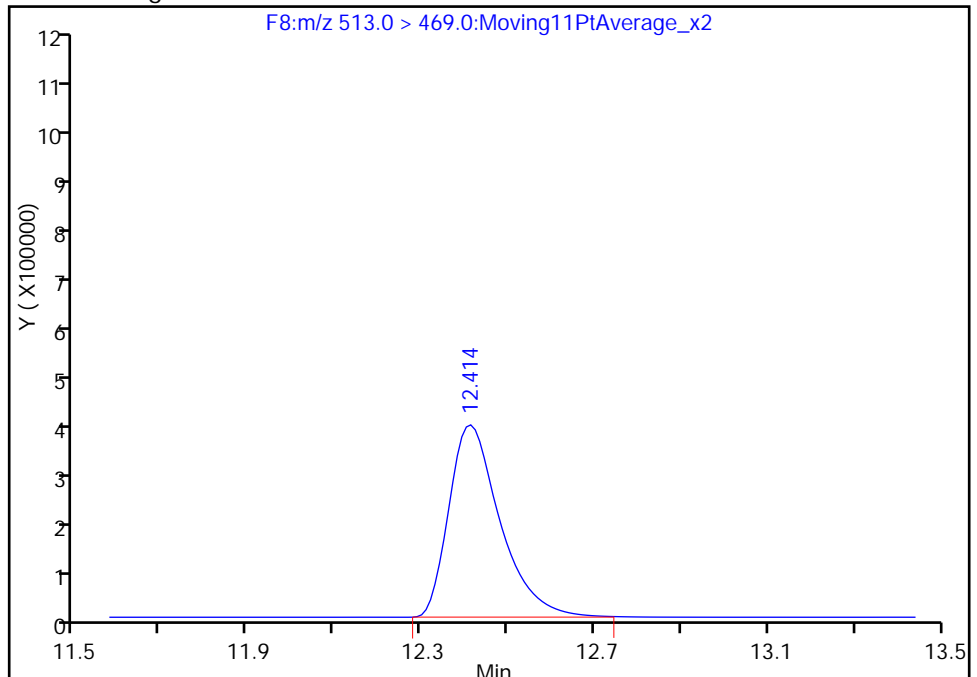
RT: 12.41
Area: 1350245
Amount: 23.253806
Amount Units: ng/ml

Processing Integration Results



RT: 12.41
Area: 3237621
Amount: 55.758037
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 03-Jun-2016 09:51:04
Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-110850/1-A
 Matrix: Water Lab File ID: 31MAY2016A6A_049.d
 Analysis Method: WS-LC-0025 Date Collected: _____
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 500.00 (mL) Date Analyzed: 06/01/2016 05:17
 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.: 112007 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 M	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	130		25-150
STL00990	13C4 PFOA	134		25-150
STL00991	13C4 PFOS	131		25-150
STL01892	13C4-PFHpA	130		25-150
STL00995	13C5 PFNA	132		25-150
STL00994	18O2 PFHxS	131		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_049.d
 Lims ID: MB 320-110850/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 01-Jun-2016 05:17:40 ALS Bottle#: 25 Worklist Smp#: 47
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-110850/1-a box 80
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 15:21:11 Calib Date: 31-May-2016 14:59:27
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: barnettj Date: 01-Jun-2016 15:21:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.797	5.803	-0.006	1550205	63.6		127	17551	
2 Perfluorobutyric acid	212.9 > 169.0	5.794	5.806	-0.012	8659	0.1827			48.5	
D 3 13C5-PFPeA	267.9 > 223.0	6.960	6.968	-0.008	3691750	58.1		116	15321	
D 6 13C2 PFHxA	315.0 > 270.0	8.247	8.252	-0.005	3978444	64.9		130	27887	
D 8 13C4-PFHpA	367.0 > 322.0	9.487	9.495	-0.008	4459041	65.0		130	9190	
D 11 18O2 PFHxS	403.0 > 84.0	9.524	9.532	-0.008	1914740	62.1		131	10682	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.531	9.533	-0.002	1229	NC			2.8	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.531	9.533	-0.002	1229	0.0324				
D 12 13C4 PFOA	417.0 > 372.0	10.604	10.612	-0.008	4866720	66.9		134	45463	
13 Perfluorooctanoic acid	413.0 > 369.0	10.604	10.612	-0.008	6599	0.0660			4.6	
	413.0 > 169.0	10.595	10.612	-0.017	2638		2.50(0.00-0.00)		4.2	
D 16 13C4 PFOS	503.0 > 80.0	11.577	11.568	0.009	2480882	62.5		131	70071	
15 Perfluorooctane sulfonic acid	499.0 > 80.0	11.577	11.571	0.006	10082	0.1572			70.6	M
	499.0 > 99.0	11.585	11.571	0.014	6089		1.66(0.00-0.00)		103	M
D 17 13C5 PFNA	468.0 > 423.0	11.594	11.589	0.005	4387151	65.8		132	78088	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C2 PFDA										
515.0 > 470.0	12.414	12.423	-0.009		3447521	65.5		131	69554	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.414	12.423	-0.009	1.000	15112	0.1744			938	
D 23 13C8 FOSA										
506.0 > 78.0	13.022	13.019	0.003		2682317	21.4		42.8	4253	
D 26 13C2 PFUnA										
565.0 > 520.0	13.120	13.124	-0.004		4630258	61.6		123	330488	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.120	13.124	-0.004	1.000	44033	0.0593			208	
D 28 13C2 PFDoA										
615.0 > 570.0	13.703	13.718	-0.015		5645250	62.2		124	35260	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.703	13.718	-0.015	1.000	1727	0.0183			3.2	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.197	14.220	-0.023	1.000	8995	0.0714			9.0	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.628	14.643	-0.015		4310543	53.2		106	10175	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.628	14.644	-0.016	1.000	44304	0.1544			12.9	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.209	15.223	-0.014		6139541	48.7		97.5	16038	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.209	15.223	-0.014	1.000	142095	-0.1503			66.6	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_049.d

Injection Date: 01-Jun-2016 05:17:40

Instrument ID: A6

Lims ID: MB 320-110850/1-A

Client ID:

Operator ID: JRB

ALS Bottle#: 25

Worklist Smp#: 47

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

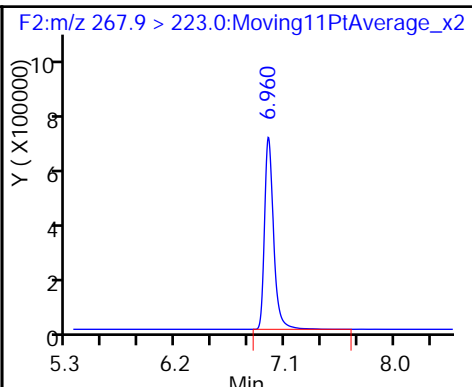
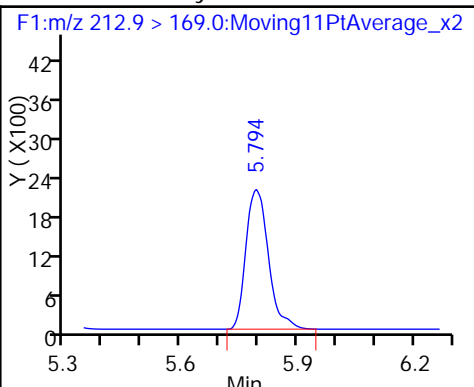
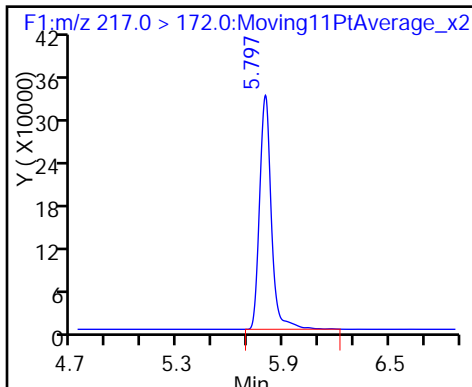
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

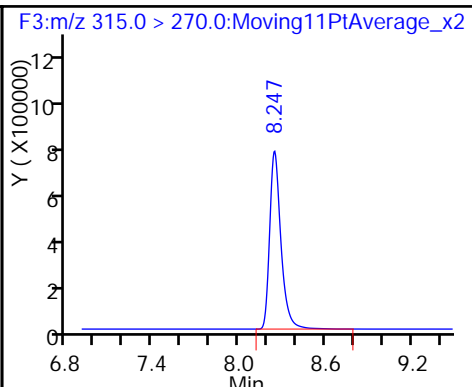
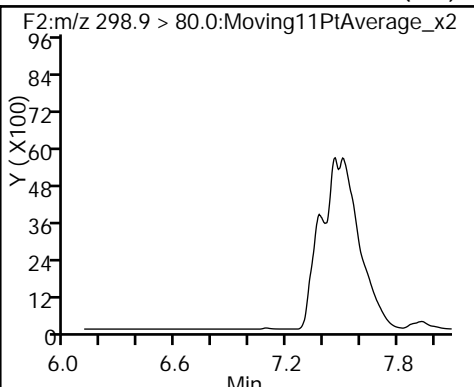
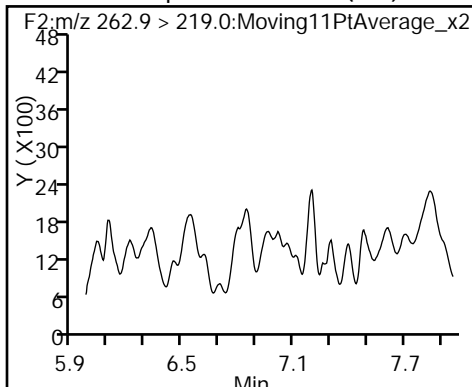
D 3 13C5-PFPeA



4 Perfluoropentanoic acid (ND)

40 Perfluorobutanesulfonic acid (ND)

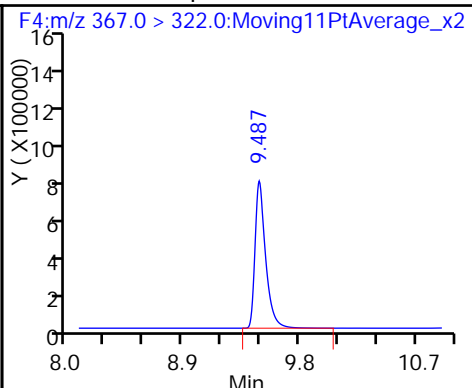
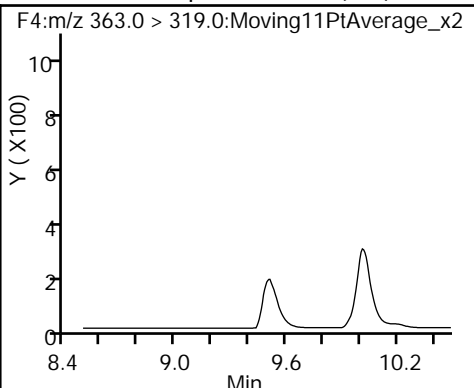
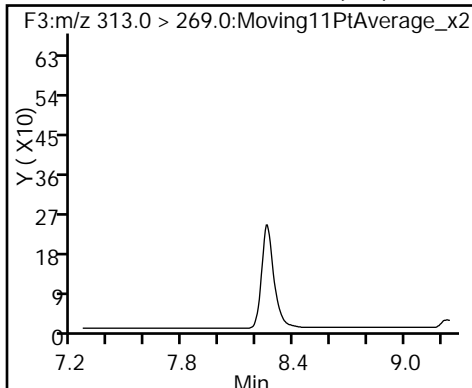
D 6 13C2 PFHxA



7 Perfluorohexanoic acid (ND)

9 Perfluoroheptanoic acid (ND)

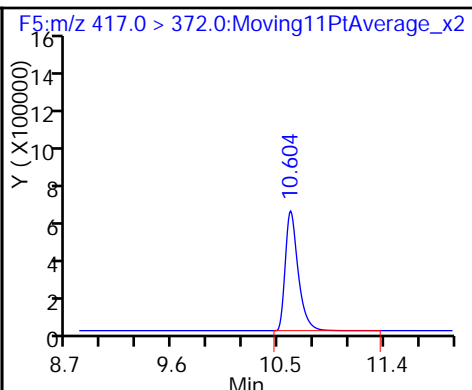
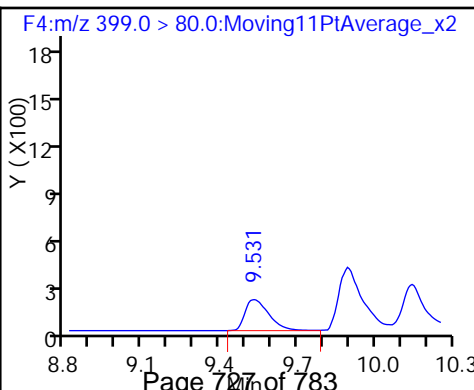
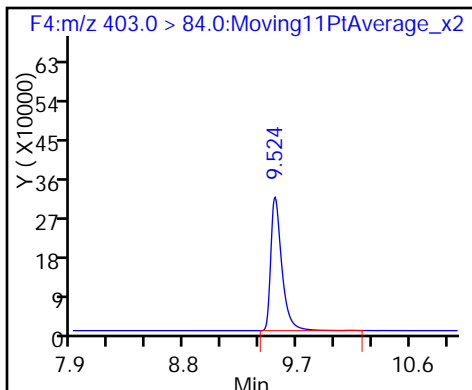
D 8 13C4-PFHpA

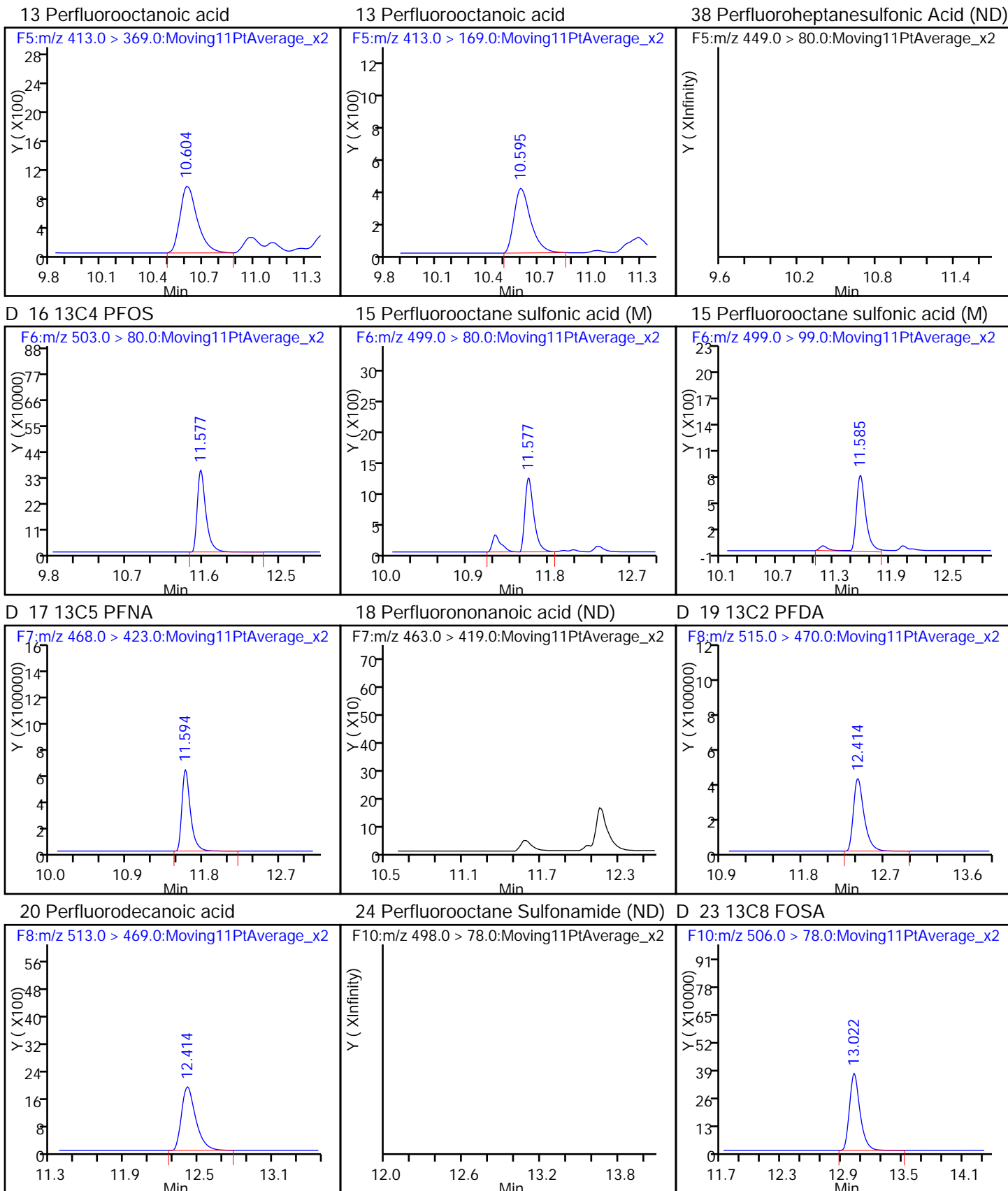


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

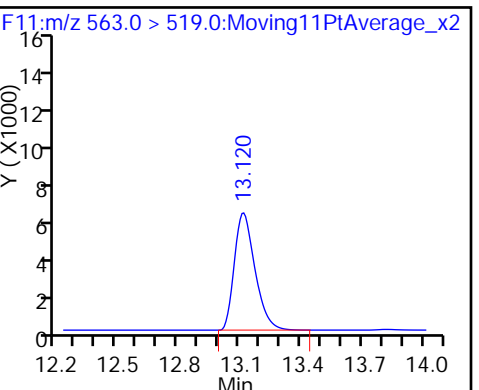
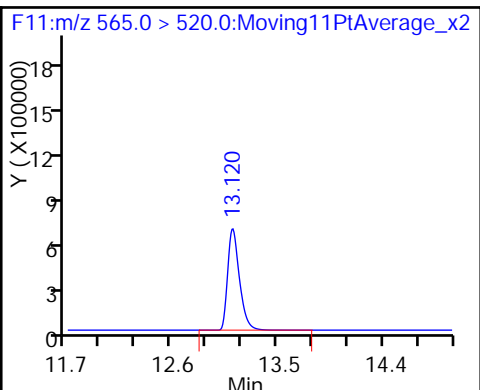
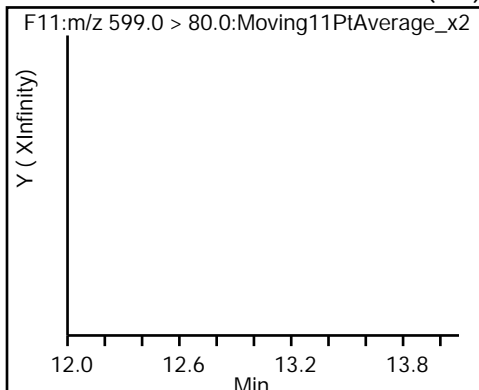
D 12 13C4 PFOA





39 Perfluorodecane Sulfonic acid (ND) D 26 13C2 PFUnA

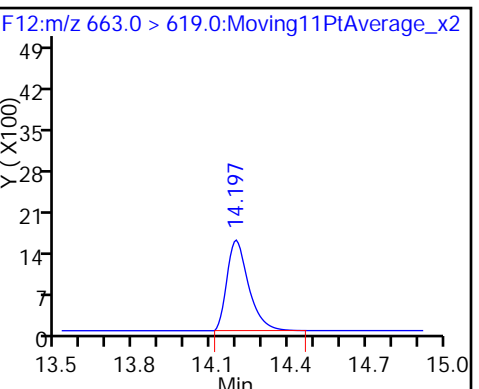
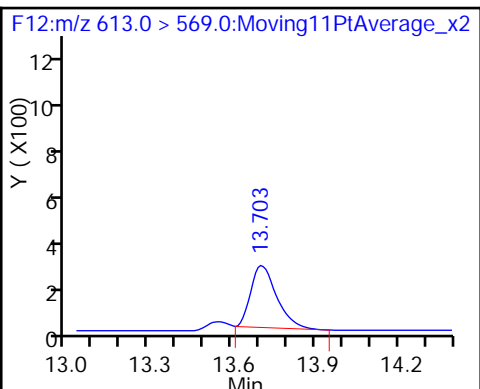
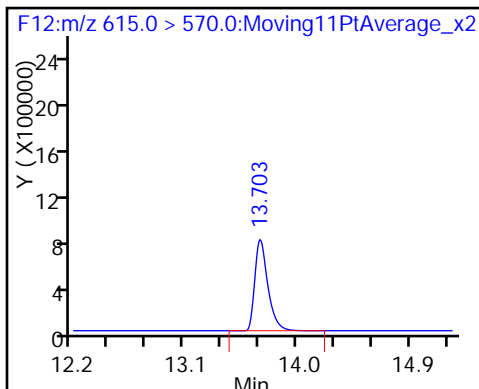
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

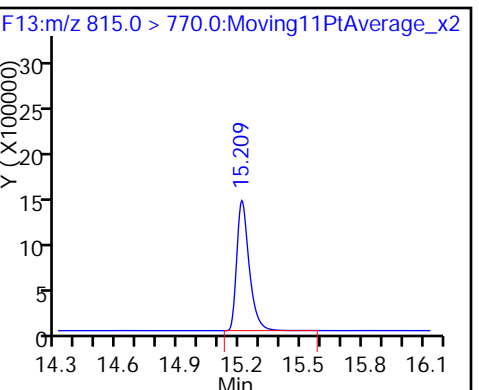
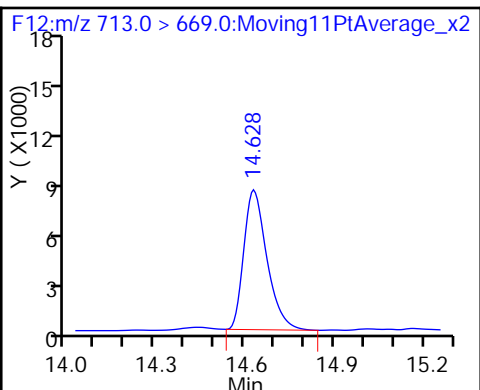
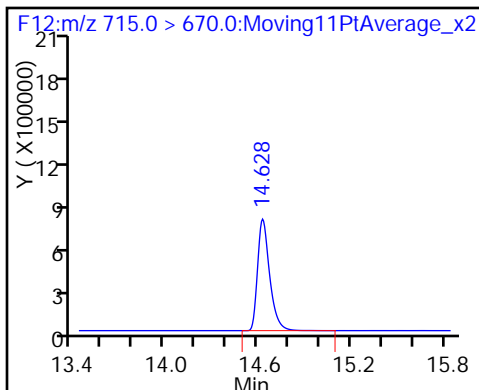
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

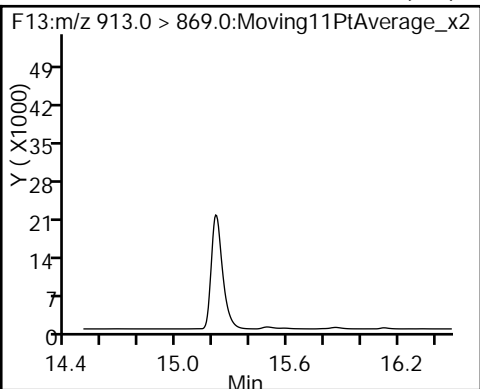
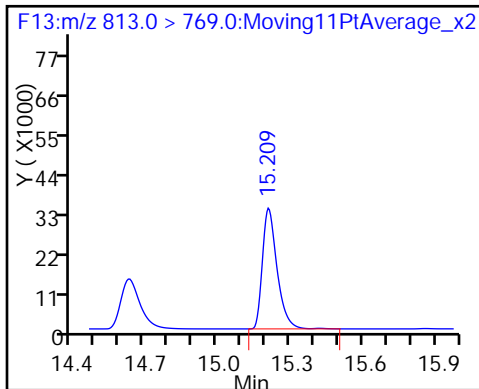
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid (ND)



TestAmerica Sacramento

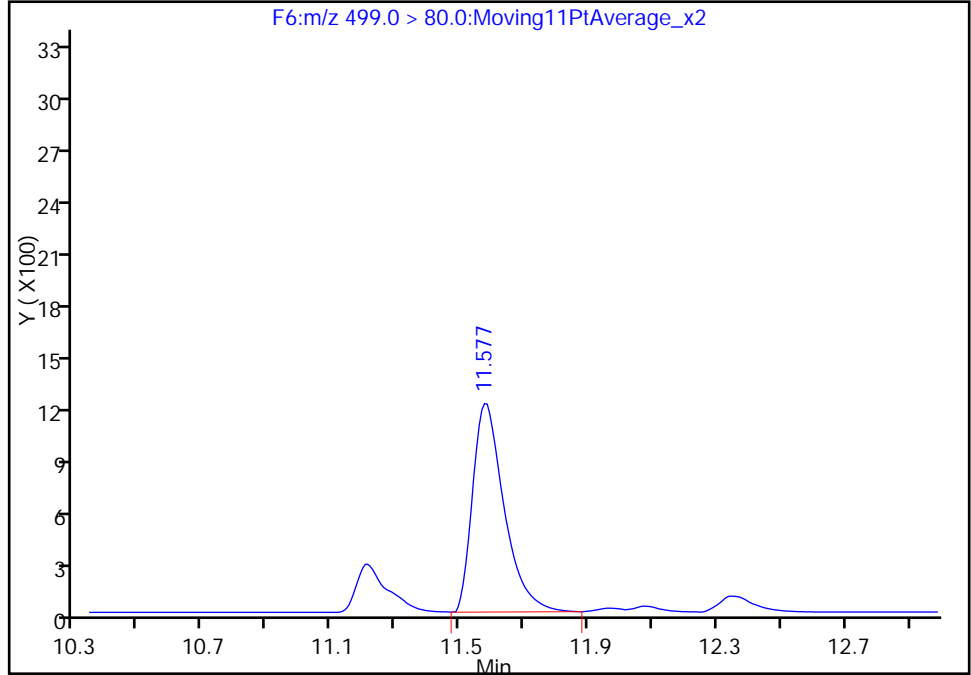
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Injection Date: 01-Jun-2016 05:17:40 Instrument ID: A6
Lims ID: MB 320-110850/1-A
Client ID:
Operator ID: JRB ALS Bottle#: 25 Worklist Smp#: 47
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

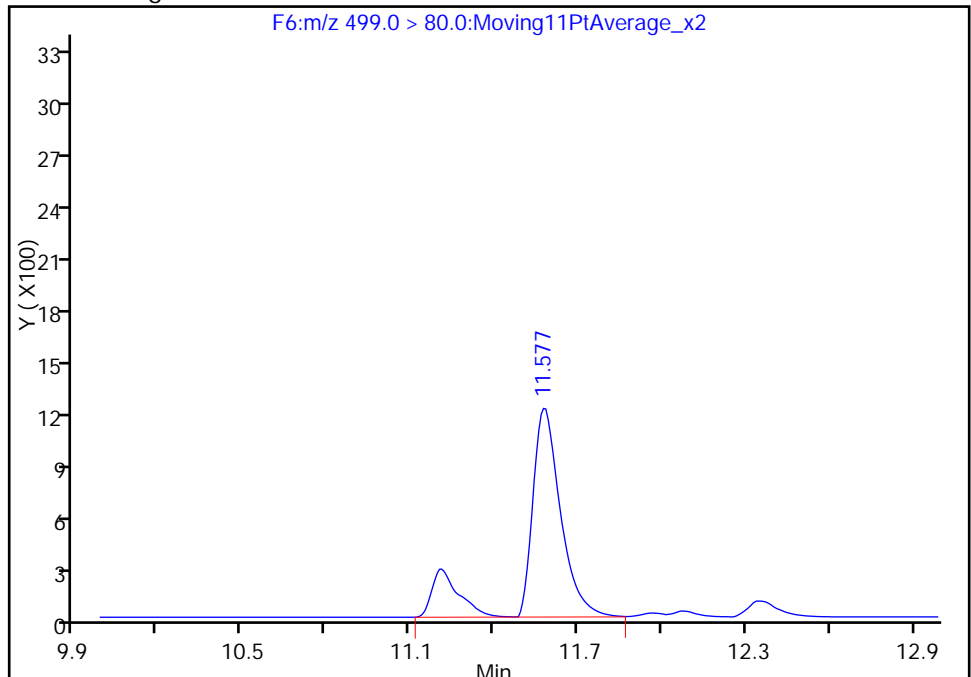
RT: 11.58
Area: 8211
Amount: 0.128060
Amount Units: ng/ml

Processing Integration Results



RT: 11.58
Area: 10082
Amount: 0.157241
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 01-Jun-2016 15:21:11
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

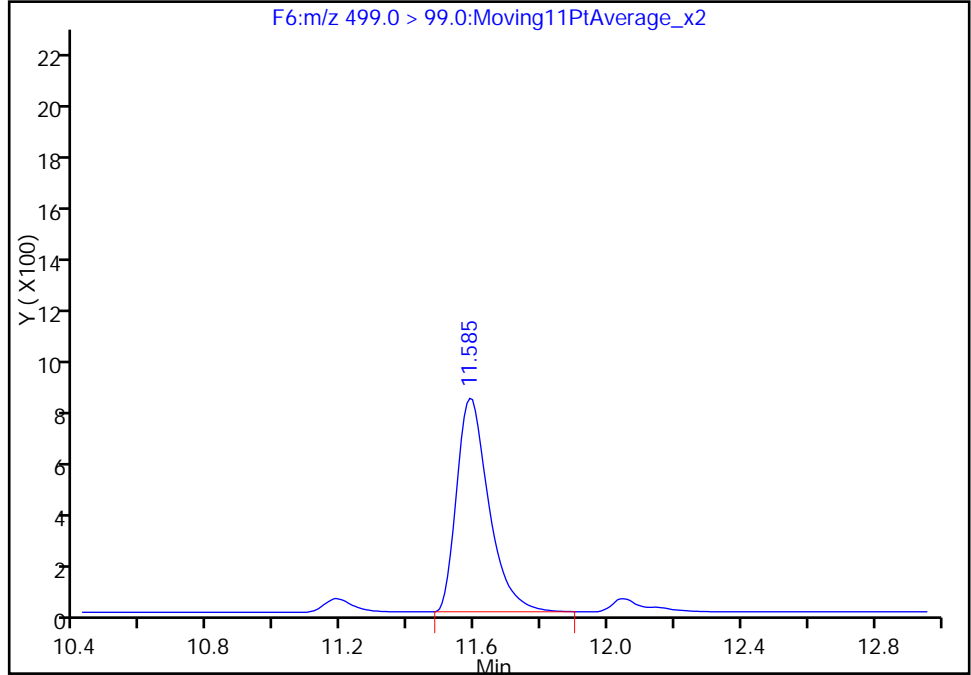
Data File: \\ChromNA\Sacramento\ChromData\A6\20160531-31217.b\31MAY2016A6A_049.d
Injection Date: 01-Jun-2016 05:17:40 Instrument ID: A6
Lims ID: MB 320-110850/1-A
Client ID:
Operator ID: JRB ALS Bottle#: 25 Worklist Smp#: 47
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

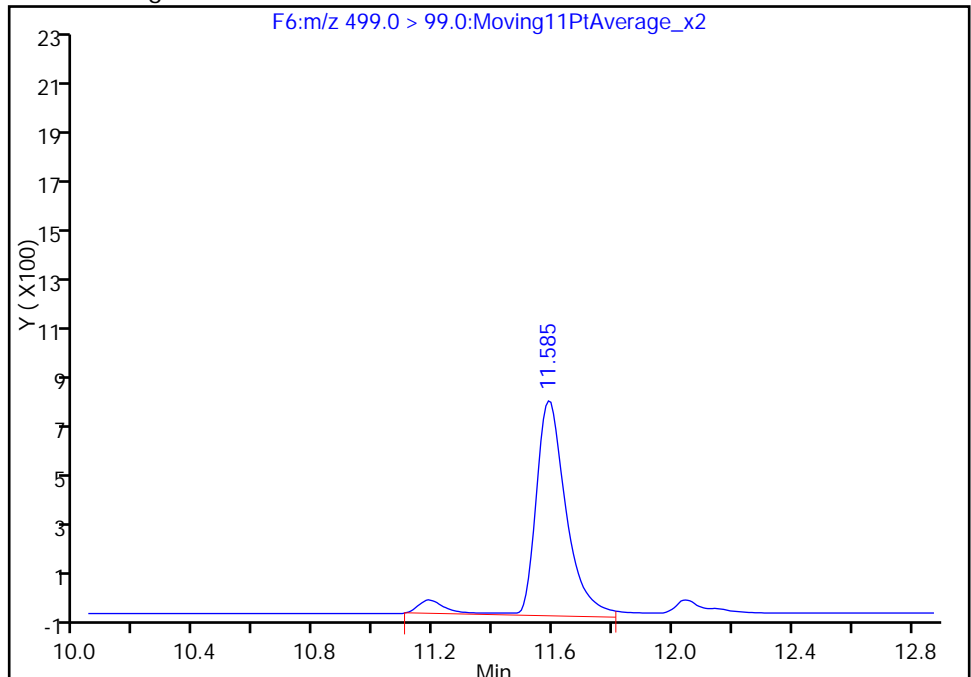
RT: 11.58
Area: 5499
Amount: 0.128060
Amount Units: ng/ml

Processing Integration Results



RT: 11.58
Area: 6089
Amount: 0.157241
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 320-110850/2-A
 Matrix: Water Lab File ID: 28MAY2016A6A_049.d
 Analysis Method: WS-LC-0025 Date Collected: _____
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 500.00 (mL) Date Analyzed: 05/29/2016 08:48
 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.: 111859 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	27.7		2.5	2.0	0.92
375-85-9	Perfluoroheptanoic acid (PFHpA)	30.5		2.5	2.0	0.80
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	24.6		2.5	2.0	0.87
375-95-1	Perfluorononanoic acid (PFNA)	30.9		2.5	2.0	0.65
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	24.3		4.0	3.0	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	33.0		2.5	2.0	0.75

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	122		25-150
STL00990	13C4 PFOA	125		25-150
STL00991	13C4 PFOS	129		25-150
STL01892	13C4-PFHpA	126		25-150
STL00995	13C5 PFNA	124		25-150
STL00994	18O2 PFHxS	135		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_049.d
 Lims ID: LCS 320-110850/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 29-May-2016 08:48:53 ALS Bottle#: 26 Worklist Smp#: 48
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-110850/2-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 31-May-2016 17:18:54 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK048

First Level Reviewer: barnettj Date: 31-May-2016 16:33:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.791	5.795	-0.004	1497251	62.7		125	5657	
2 Perfluorobutyric acid	212.9 > 169.0	5.791	5.797	-0.006	749142	16.5		82.5	8612	
D 3 13C5-PFPeA	267.9 > 223.0	6.951	6.957	-0.006	3329756	61.1		122	105761	
4 Perfluoropentanoic acid	262.9 > 219.0	6.951	6.959	-0.008	1226779	15.1		75.4	234	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.081	7.085	-0.004	673393	13.9		78.4		
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.081	7.085	-0.004	673393	NC			192	
	298.9 > 99.0	7.081	7.085	-0.004	337434		2.00(0.00-0.00)		695	
7 Perfluorohexanoic acid	313.0 > 269.0	8.225	8.235	-0.010	1367742	17.4		87.2	5749	
D 6 13C2 PFHxA	315.0 > 270.0	8.225	8.236	-0.011	3555674	60.9		122	24835	
D 8 13C4-PFHpA	367.0 > 322.0	9.463	9.474	-0.011	3893597	62.8		126	49200	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.463	9.475	-0.012	1458755	15.3		76.3	36604	
D 11 18O2 PFHxS	403.0 > 84.0	9.499	9.507	-0.008	1824025	63.9		135	102535	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.499	9.507	-0.008	433023	NC			51.1	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.499	9.507	-0.008	433023	12.3		67.5		
D 12 13C4 PFOA	417.0 > 372.0	10.586	10.586	0.0	4203206	62.4		125	92035	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.586	10.587	-0.001	1.000	1410289	16.5		82.5	971	
413.0 > 169.0	10.586	10.587	-0.001	1.000	501406		2.81(0.00-0.00)		841	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.586	10.596	-0.010	1.000	570927	NC			37815	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.586	10.596	-0.010	1.000	570927	16.2		85.1		
D 16 13C4 PFOS										
503.0 > 80.0	11.535	11.543	-0.008		2160153	61.5		129	61472	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.543	11.545	-0.002	1.000	689105	12.1		65.4	31.1	
499.0 > 99.0	11.535	11.545	-0.010	0.999	381712		1.81(0.00-0.00)		115	
D 17 13C5 PFNA										
468.0 > 423.0	11.553	11.562	-0.009		3837976	61.9		124	45794	
18 Perfluorononanoic acid										
463.0 > 419.0	11.553	11.563	-0.010	1.000	1001171	15.4		77.2	71953	
D 19 13C2 PFDA										
515.0 > 470.0	12.383	12.392	-0.009		3155093	63.4		127	48032	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.383	12.392	-0.009	1.000	1348322	16.3		81.7	33208	
D 23 13C8 FOSA										
506.0 > 78.0	12.994	13.000	-0.006		2720932	24.3		48.6	9901	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.994	13.002	-0.008	1.000	759911	17.3		86.3	2283	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.041	13.048	-0.007	1.000	663504	18.3		94.7		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.041	13.048	-0.007	1.000	663504	NC			7652	
D 26 13C2 PFUnA										
565.0 > 520.0	13.085	13.094	-0.009		4123103	59.1		118	48975	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.085	13.094	-0.009	1.000	1420740	16.3		81.4	33784	
D 28 13C2 PFDoA										
615.0 > 570.0	13.675	13.685	-0.010		4751646	57.1		114	38138	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.675	13.685	-0.010	1.000	1363295	17.7		88.7	1885	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.174	14.184	-0.010	1.000	1936709	17.8		88.9	1220	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.602	14.609	-0.007		4000943	53.9		108	18361	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.602	14.609	-0.007	1.000	1343822	15.6		78.1	445	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.200	15.203	-0.003		4623076	39.6		79.1	19213	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.200	15.203	-0.003	1.000	1746619	11.2		55.9	1654	
36 Perfluorooctadecanoic acid										
913.0 > 869.0	15.471	15.473	-0.002	1.000	692003	4.74		23.7	529	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_049.d

Injection Date: 29-May-2016 08:48:53

Instrument ID: A6

Lims ID: LCS 320-110850/2-A

Client ID:

Operator ID: JRB

ALS Bottle#: 26

Worklist Smp#: 48

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

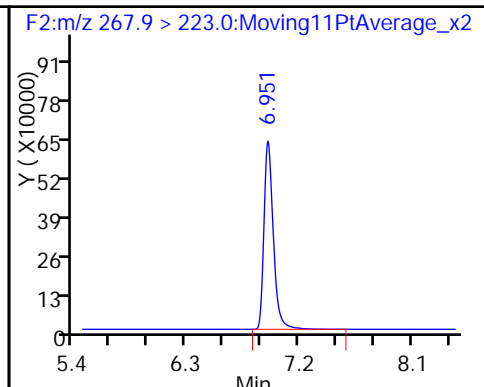
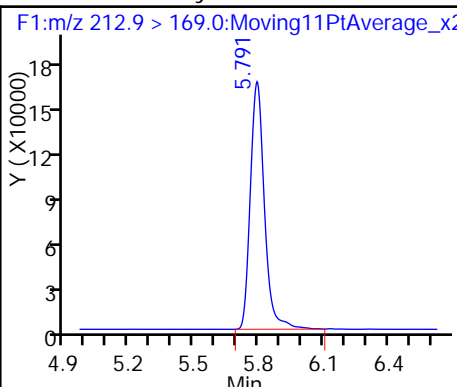
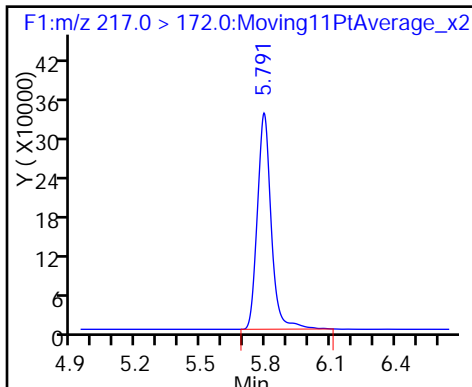
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

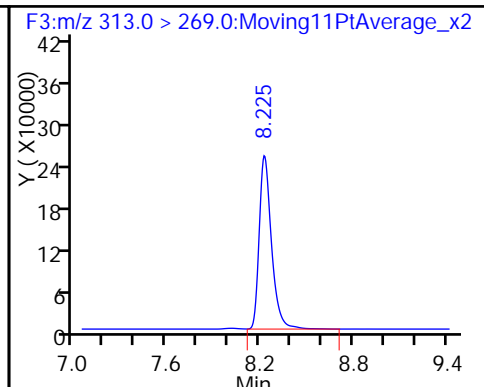
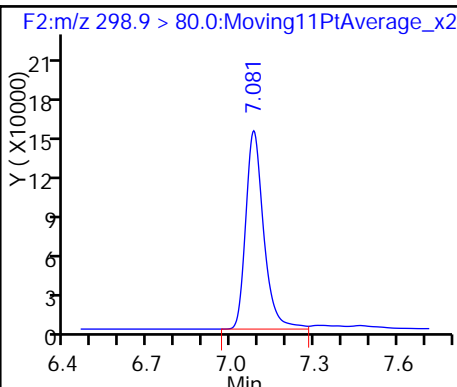
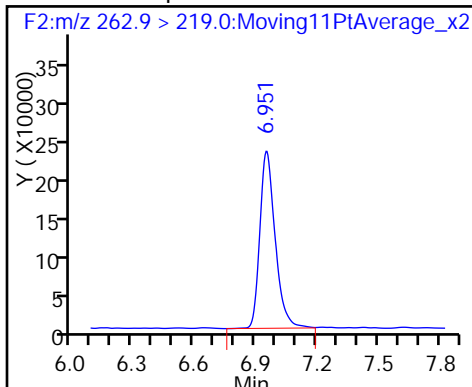
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

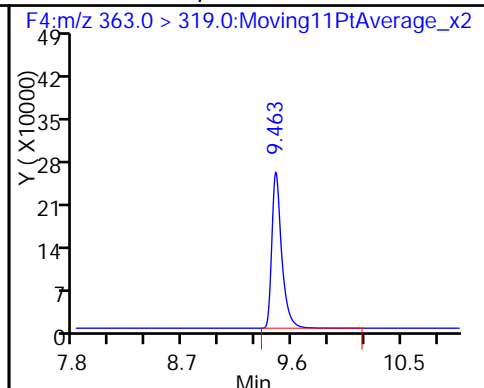
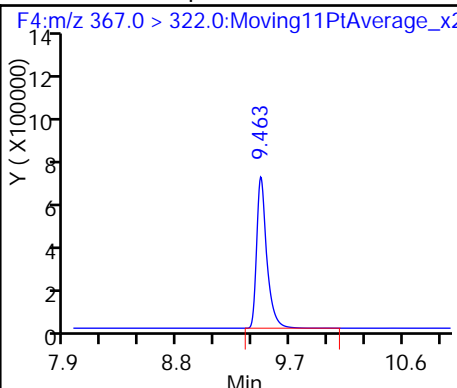
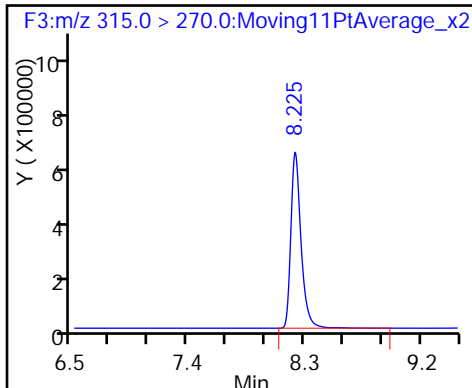
7 Perfluorohexanoic acid



D 6 13C2 PFHxA

D 8 13C4-PFHpA

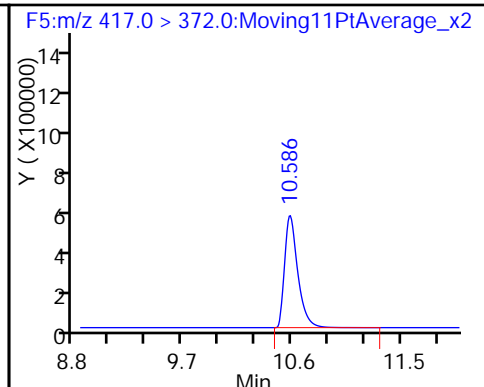
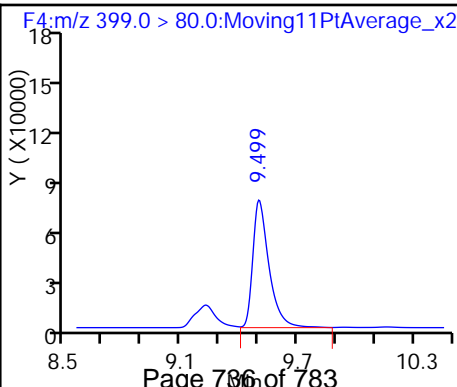
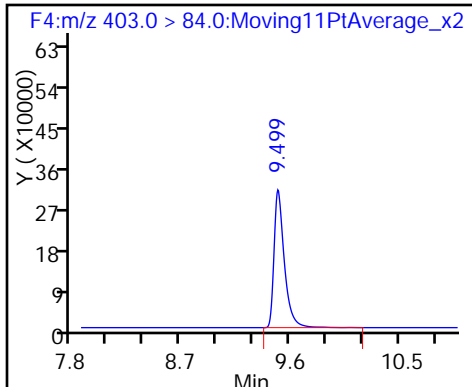
9 Perfluoroheptanoic acid

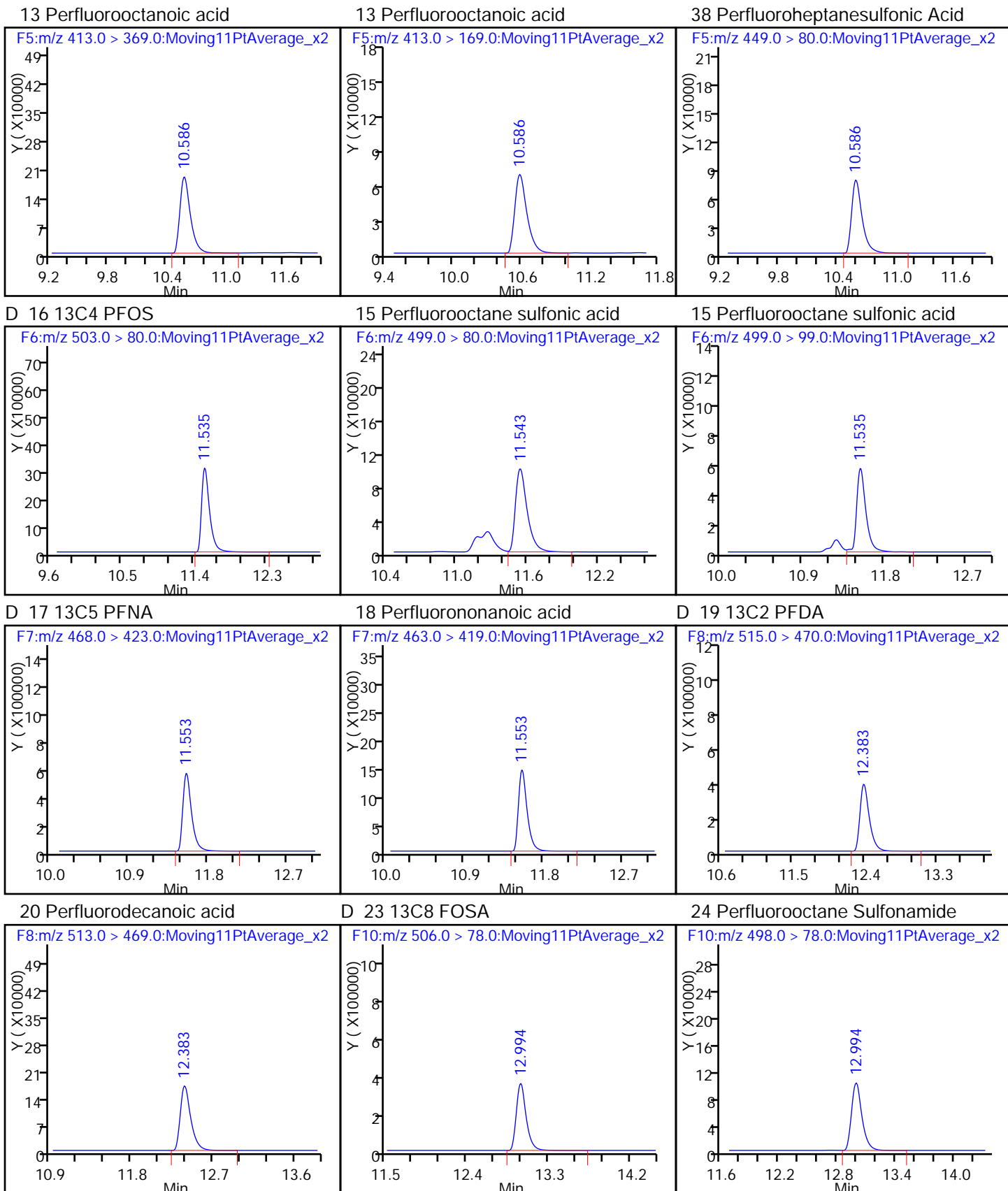


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid

D 12 13C4 PFOA

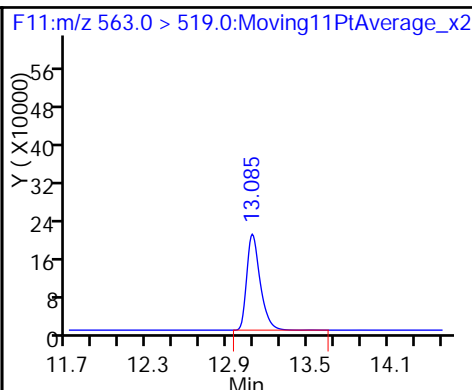
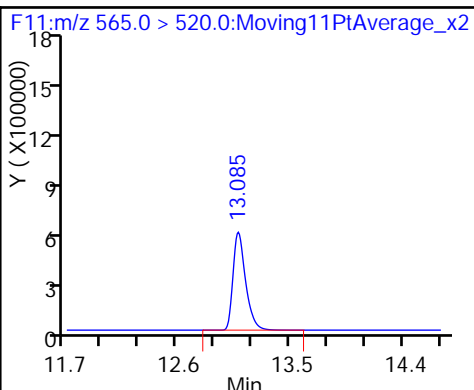
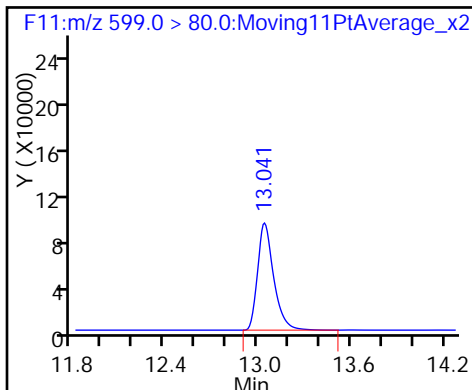




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

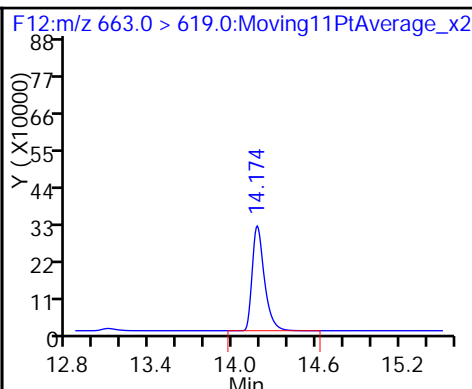
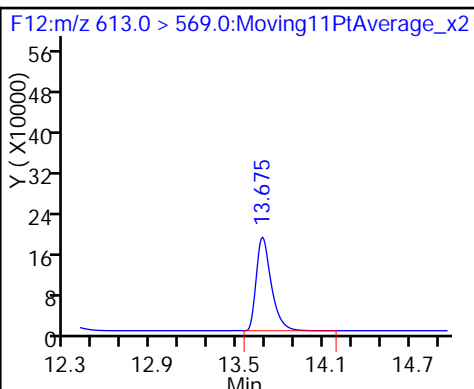
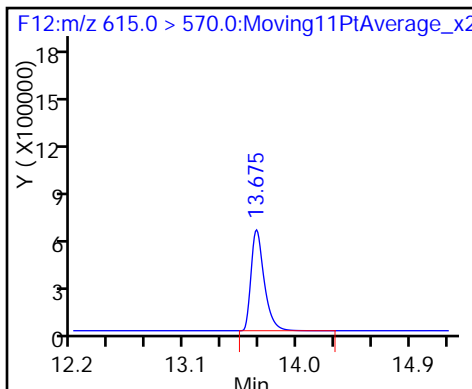
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

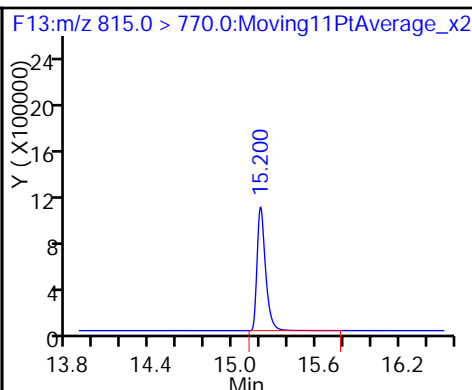
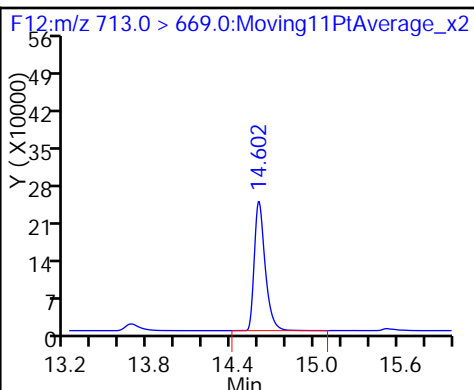
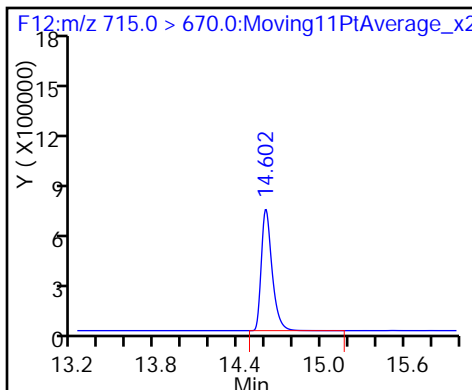
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

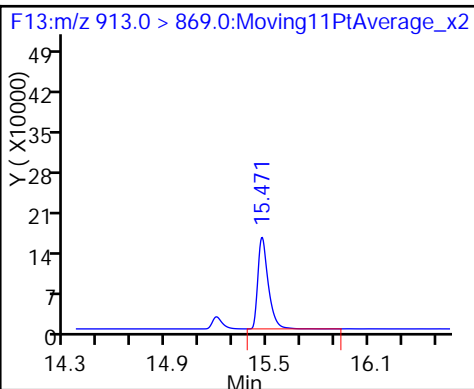
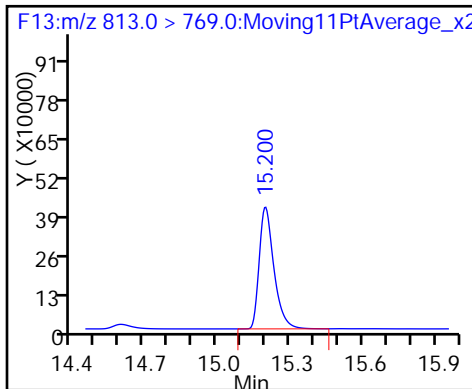
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: MCFSMW-4_0516 MS Lab Sample ID: 320-18986-12 MS
 Matrix: Water Lab File ID: 28MAY2016A6A_068.d
 Analysis Method: WS-LC-0025 Date Collected: 05/16/2016 11:11
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 523.8 (mL) Date Analyzed: 05/29/2016 15:33
 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.: 111859 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	47.5		2.4	1.9	0.88
375-85-9	Perfluoroheptanoic acid (PFHpA)	105		2.4	1.9	0.77
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	253	M	2.4	1.9	0.83
375-95-1	Perfluorononanoic acid (PFNA)	41.8		2.4	1.9	0.62
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	96.6	M	3.8	2.9	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	195	M	2.4	1.9	0.71

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	80		25-150
STL00990	13C4 PFOA	87		25-150
STL00991	13C4 PFOS	109		25-150
STL01892	13C4-PFHpA	86		25-150
STL00995	13C5 PFNA	85		25-150
STL00994	18O2 PFHxS	113		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_068.d
 Lims ID: 320-18986-A-12-B MS
 Client ID: MCFSMW-4_0516
 Sample Type: MS
 Inject. Date: 29-May-2016 15:33:07 ALS Bottle#: 39 Worklist Smp#: 67
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-12-b ms
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 17:07:40 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: barnettj Date: 01-Jun-2016 16:52:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.785	5.795	-0.010		601496	25.2		50.4	19860	
2 Perfluorobutyric acid										
212.9 > 169.0	5.785	5.797	-0.012	1.000	853266	46.8		234	76.6	
D 3 13C5-PFPeA										
267.9 > 223.0	6.937	6.957	-0.020		1978691	36.3		72.6	3123	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.941	6.959	-0.018	1.000	6453784	133.5		667	115	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.067	7.085	-0.018	1.000	1006815	24.9		141		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.067	7.085	-0.018	1.000	1006815	NC			127	
298.9 > 99.0	7.067	7.085	-0.018	1.000	483834		2.08(0.00-0.00)		210	
22 PFPeS (Perflouro-1-pentanesulfonat										
349.0 > 80.0	8.040	7.971	0.069	0.846	32866	NC			2.2	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.219	8.235	-0.016	1.000	5290330	102.9		515	470	
D 6 13C2 PFHxA										
315.0 > 270.0	8.219	8.236	-0.017		2330999	39.9		79.9	19428	
D 8 13C4-PFHpA										
367.0 > 322.0	9.458	9.474	-0.016		2659076	42.9		85.8	241012	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.464	9.475	-0.011	1.000	3510396	54.9		275	479	
D 11 18O2 PFHxS										
403.0 > 84.0	9.499	9.507	-0.008		1520206	53.2		113	33063	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.499	9.507	-0.008	1.000	3190028	NC			691	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.499	9.507	-0.008	1.000	3894555	132.5		728		M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.577	10.586	-0.009		2918339	43.3		86.7	14347	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.577	10.587	-0.010	1.000	6052003	102.0		510	1066	M
413.0 > 169.0	10.586	10.587	-0.001	1.001	2175500		2.78(0.00-0.00)		716	M
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.586	10.596	-0.010	1.000	540677	NC			181	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.586	10.596	-0.010	1.000	540677	18.0		94.8		
D 16 13C4 PFOS										
503.0 > 80.0	11.535	11.543	-0.008		1835797	52.2		109	1066	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.535	11.545	-0.010	1.000	2440470	50.6		273	1156	M
499.0 > 99.0	11.535	11.545	-0.010	1.000	1098041		2.22(0.00-0.00)		2958	M
D 17 13C5 PFNA										
468.0 > 423.0	11.553	11.562	-0.009		2626619	42.3		84.7	192295	
18 Perfluorononanoic acid										
463.0 > 419.0	11.553	11.563	-0.010	1.000	971855	21.9		110	852	
D 19 13C2 PFDA										
515.0 > 470.0	12.383	12.392	-0.009		1795800	36.1		72.1	110551	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.383	12.392	-0.009	1.000	739450	15.8		78.8	2127	
D 23 13C8 FOSA										
506.0 > 78.0	13.004	13.000	0.004		578477	5.17		10.3	25936	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	13.004	13.002	0.002	1.000	142615	15.2		76.2	3195	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.050	13.048	0.002	1.000	352803	11.4		59.4		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.050	13.048	0.002	1.000	352803	NC			5020	
D 26 13C2 PFUnA										
565.0 > 520.0	13.094	13.094	0.0		2241072	32.1		64.3	107957	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.094	13.094	0.0	1.000	773927	16.3		81.6	5133	
D 28 13C2 PFDaA										
615.0 > 570.0	13.685	13.685	0.0		2649793	31.9		63.7	13957	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.685	13.685	0.0	1.000	667313	15.6		77.8	1530	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.182	14.184	-0.002	1.000	1015704	16.7		83.6	2914	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.609	14.609	0.0		2592213	34.9		69.8	19307	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.609	14.609	0.0	1.000	911687	19.1		95.5	480	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.195	15.203	-0.008		3275272	28.0		56.1	13491	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.195	15.203	-0.008	1.000	1293447	15.1		75.6	2559	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.461	15.473	-0.012	1.000	1314650	16.1	80.7	2092	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_068.d

Injection Date: 29-May-2016 15:33:07

Instrument ID: A6

Lims ID: 320-18986-A-12-B MS

Client ID: MCFSMW-4_0516

Operator ID: JRB

ALS Bottle#: 39

Worklist Smp#: 67

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

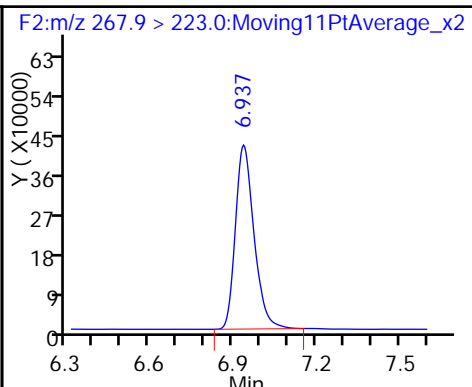
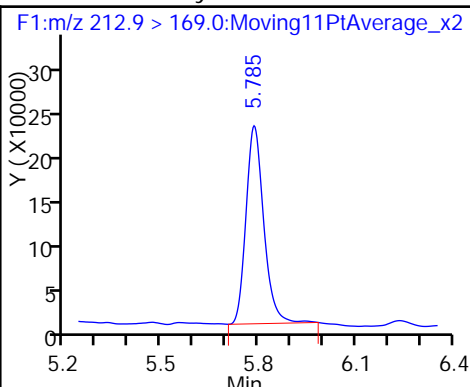
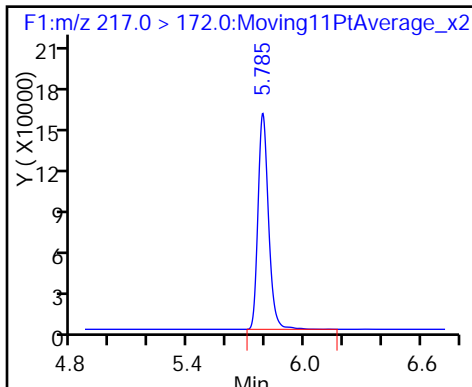
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

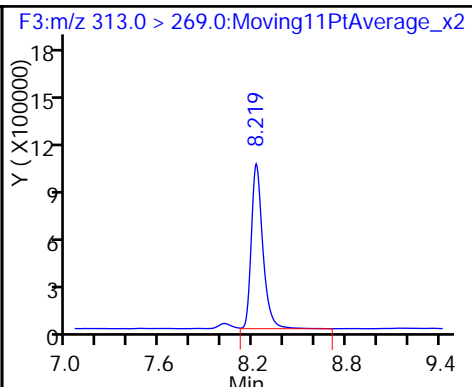
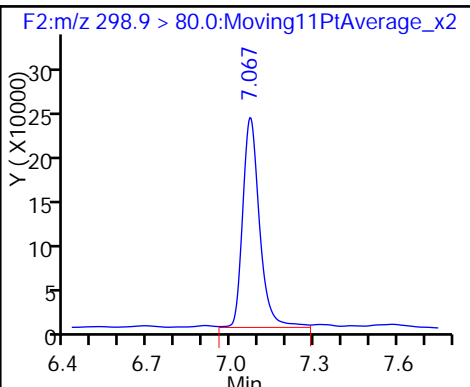
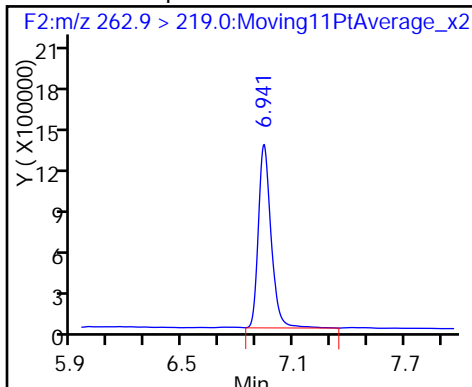
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

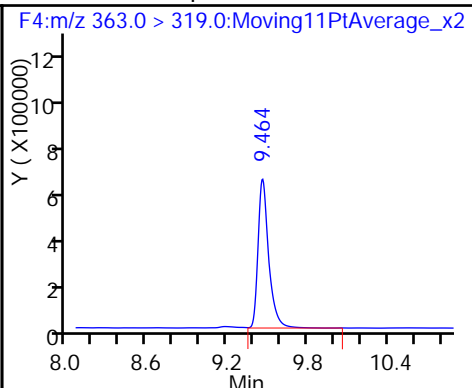
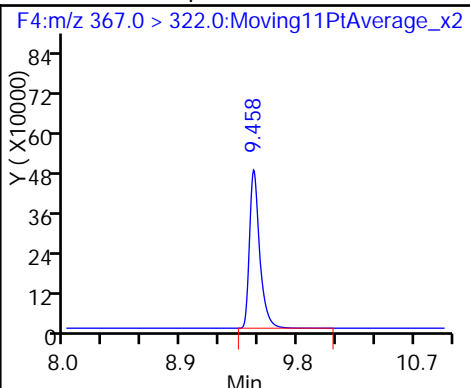
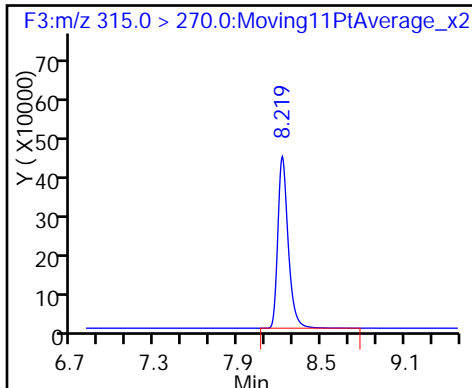
7 Perfluorohexanoic acid



D 6 13C2 PFHxA

D 8 13C4-PFHpA

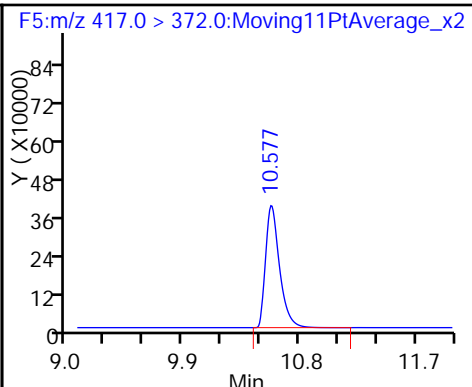
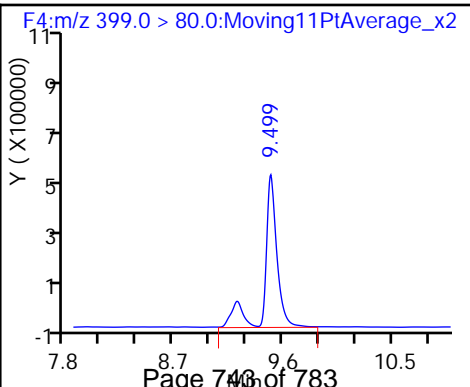
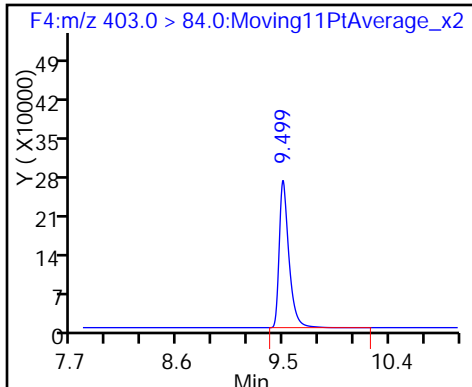
9 Perfluoroheptanoic acid

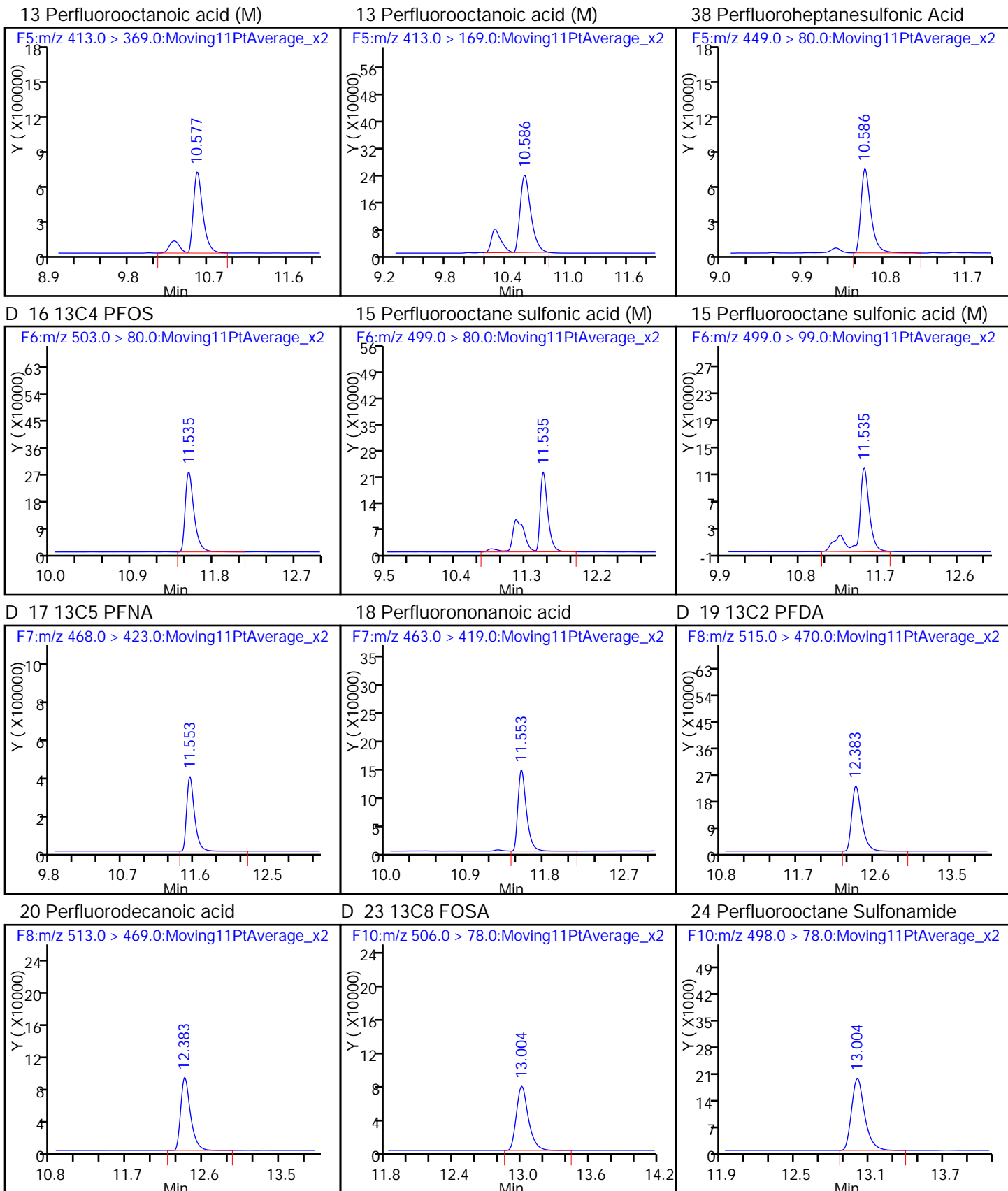


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid (M)

D 12 13C4 PFOA

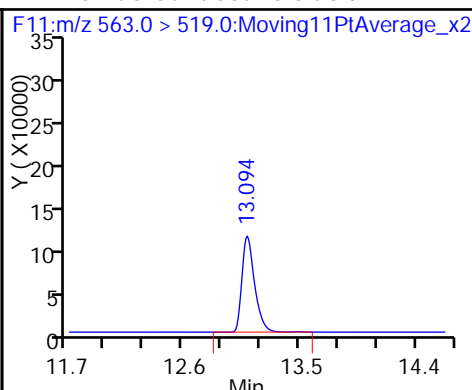
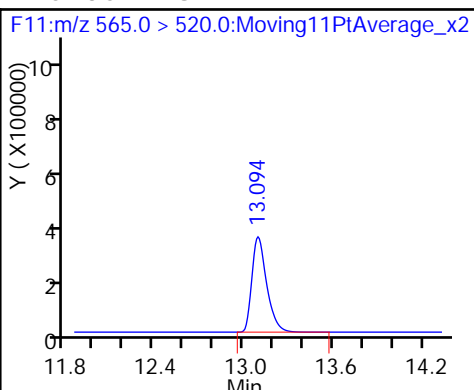
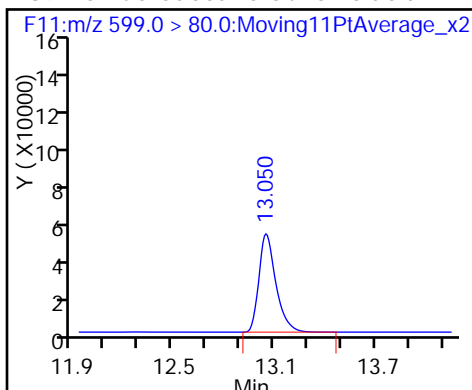




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUa

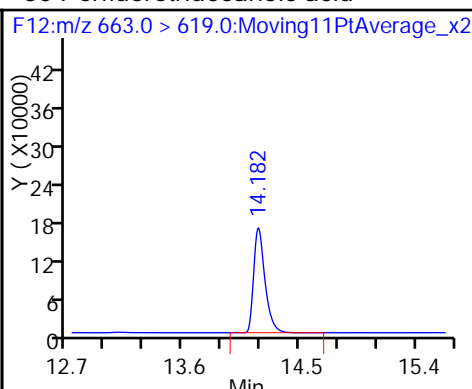
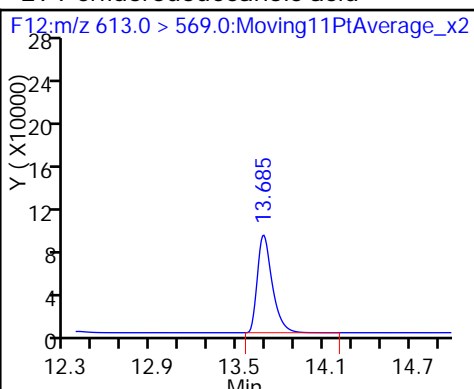
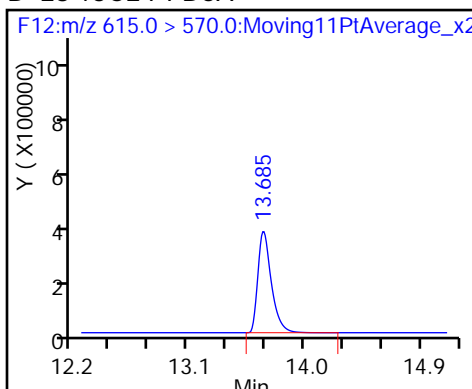
27 Perfluoroundecanoic acid



D 28 13C2 PFDa

29 Perfluorododecanoic acid

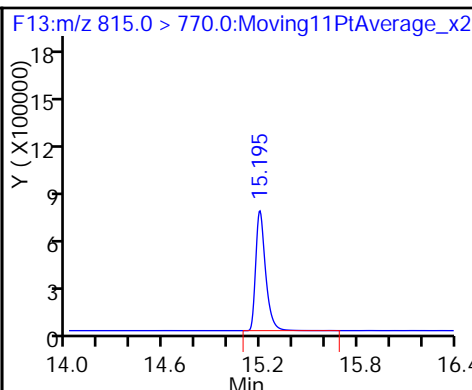
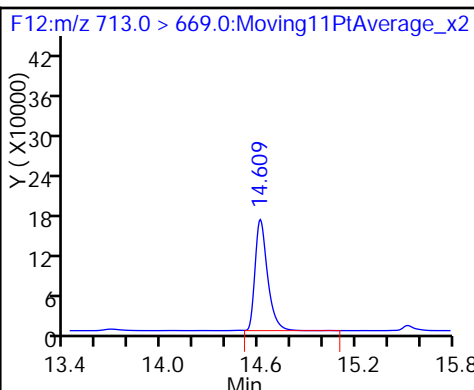
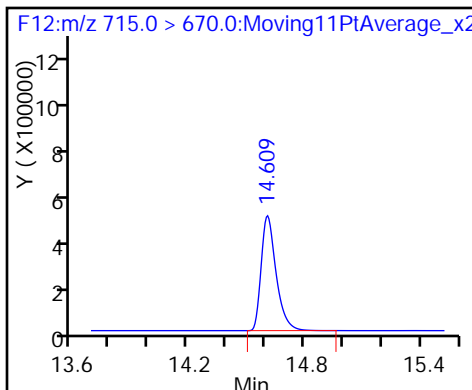
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

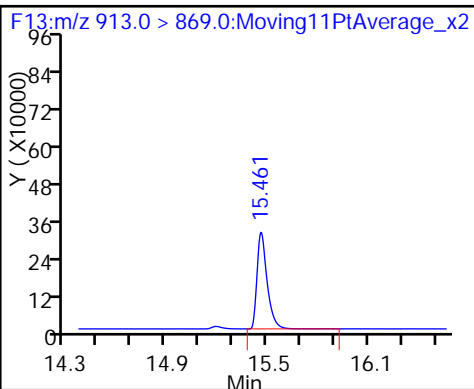
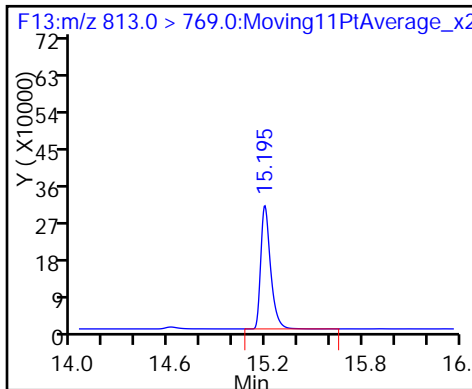
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



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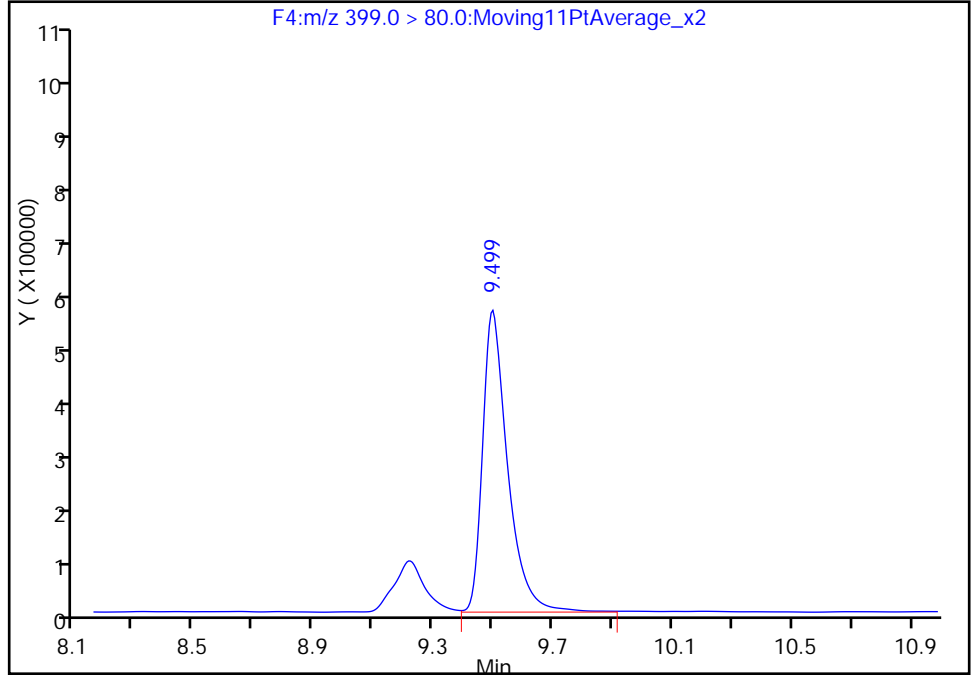
Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_068.d
Injection Date: 29-May-2016 15:33:07 Instrument ID: A6
Lims ID: 320-18986-A-12-B MS
Client ID: MCFSMW-4_0516
Operator ID: JRB ALS Bottle#: 39 Worklist Smp#: 67
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:M/RM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

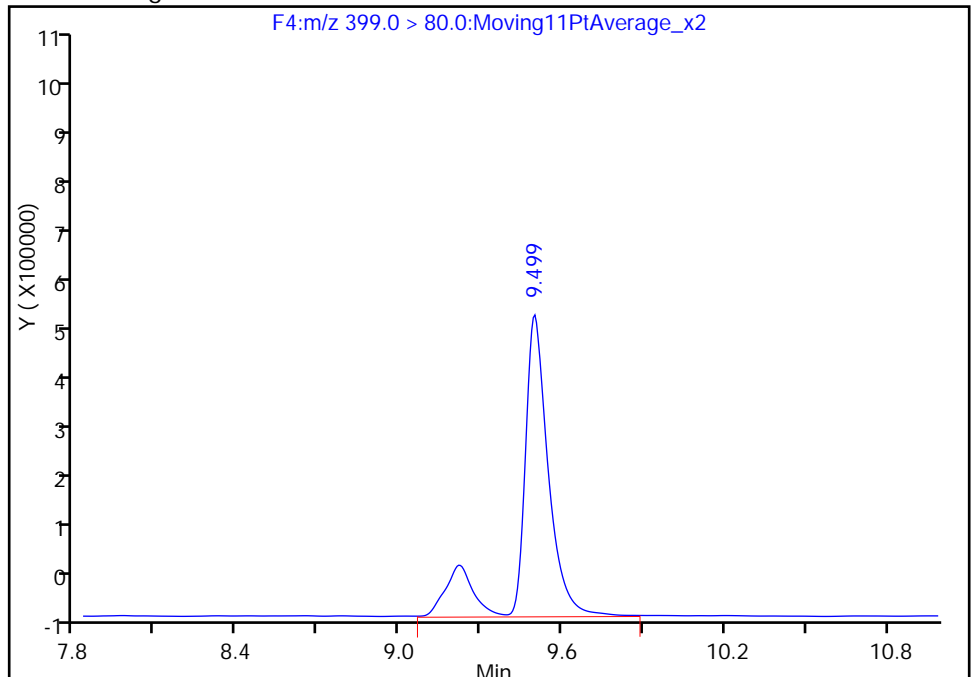
RT: 9.50
Area: 3190028
Amount: 108.5206
Amount Units: ng/ml

Processing Integration Results



RT: 9.50
Area: 3894555
Amount: 132.4876
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 01-Jun-2016 16:52:01
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

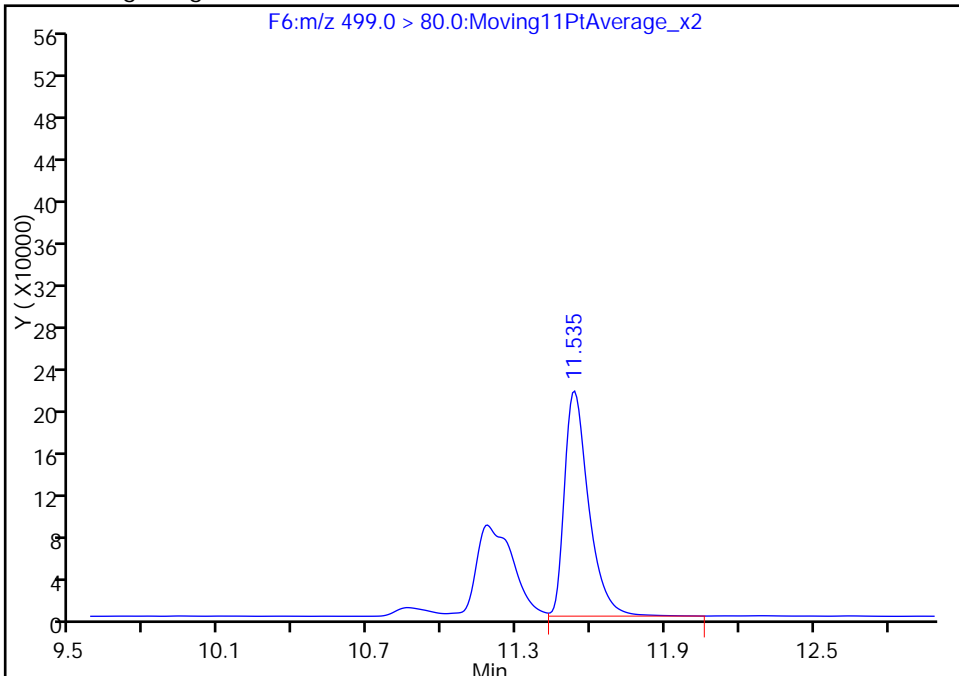
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Injection Date: 29-May-2016 15:33:07 Instrument ID: A6
Lims ID: 320-18986-A-12-B MS
Client ID: MCFSMW-4_0516
Operator ID: JRB ALS Bottle#: 39 Worklist Smp#: 67
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

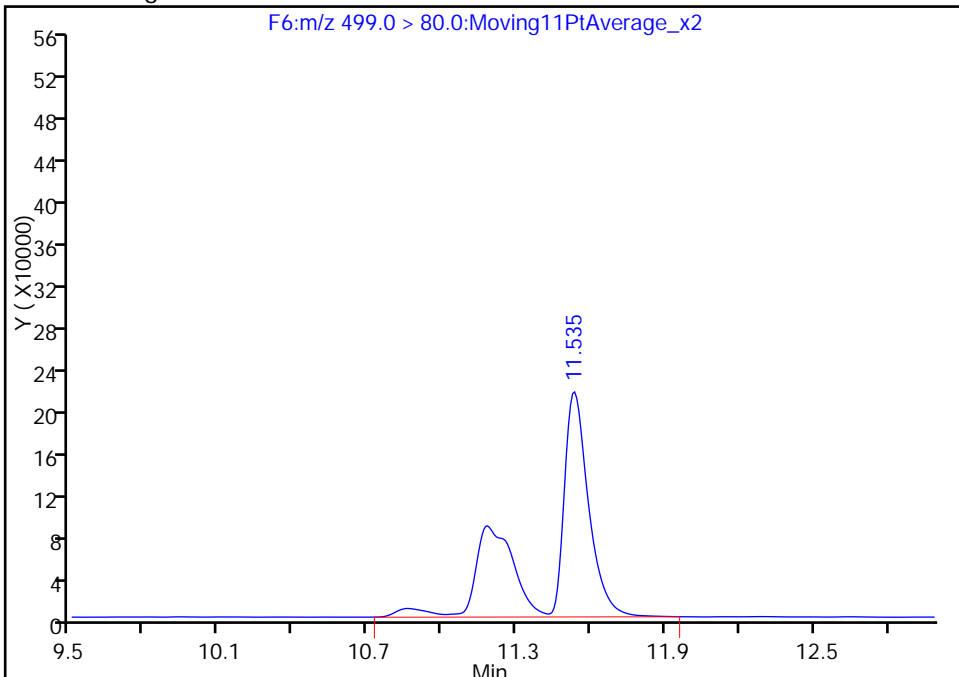
RT: 11.54
Area: 1469365
Amount: 30.475484
Amount Units: ng/ml

Processing Integration Results



RT: 11.54
Area: 2440470
Amount: 50.616766
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

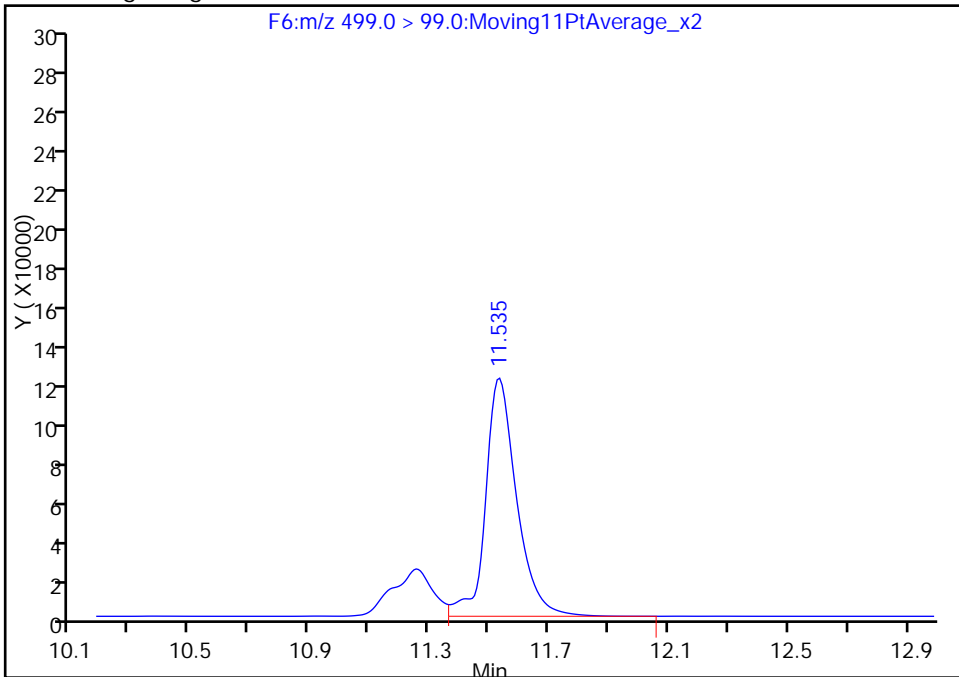
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Injection Date: 29-May-2016 15:33:07 Instrument ID: A6
Lims ID: 320-18986-A-12-B MS
Client ID: MCFSMW-4_0516
Operator ID: JRB ALS Bottle#: 39 Worklist Smp#: 67
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

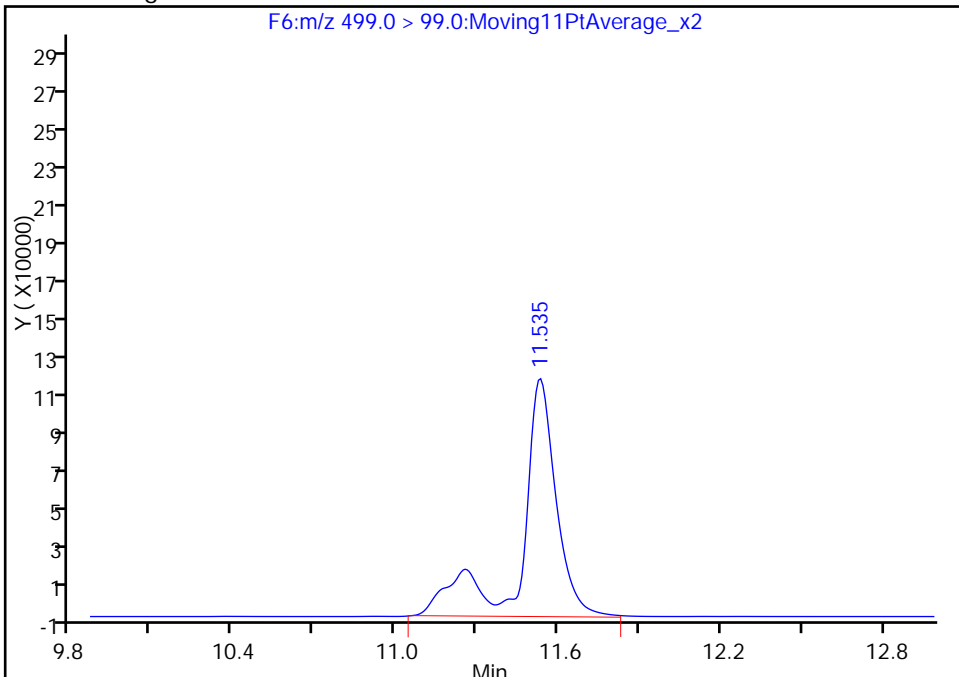
RT: 11.54
Area: 878321
Amount: 30.475484
Amount Units: ng/ml

Processing Integration Results



RT: 11.54
Area: 1098041
Amount: 50.616766
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

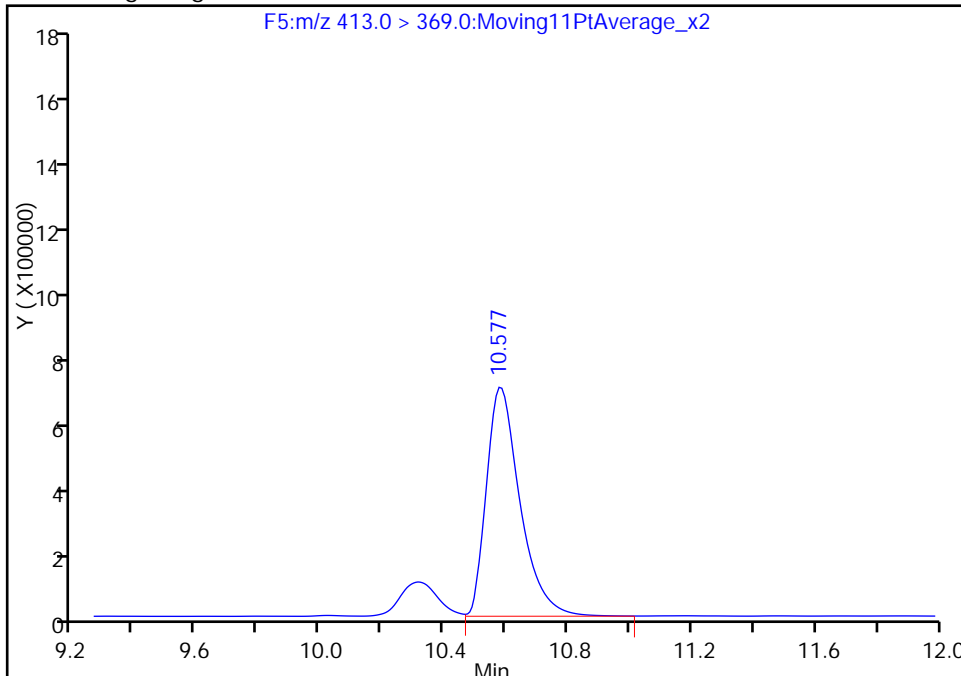
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Injection Date: 29-May-2016 15:33:07 Instrument ID: A6
Lims ID: 320-18986-A-12-B MS
Client ID: MCFSMW-4_0516
Operator ID: JRB ALS Bottle#: 39 Worklist Smp#: 67
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

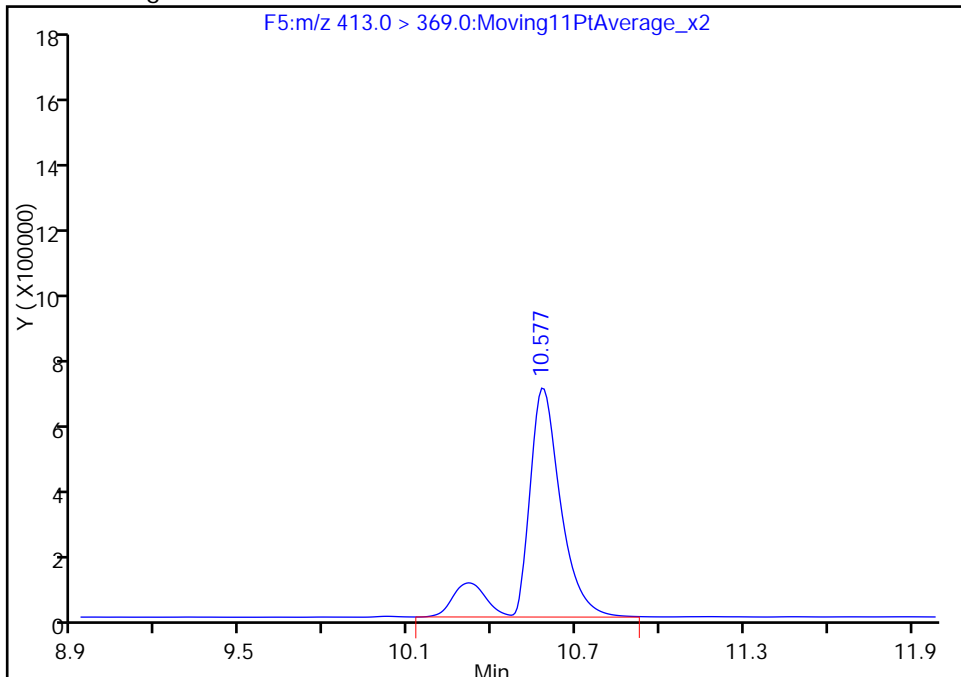
RT: 10.58
Area: 5205743
Amount: 87.742502
Amount Units: ng/ml

Processing Integration Results



RT: 10.58
Area: 6052003
Amount: 102.0062
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

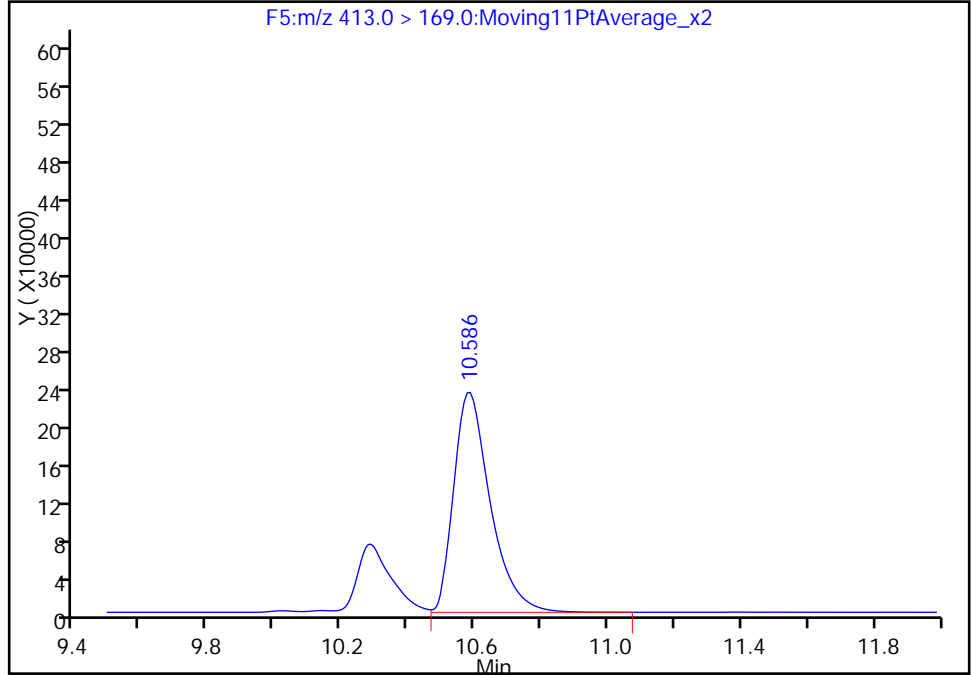
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Injection Date: 29-May-2016 15:33:07 Instrument ID: A6
Lims ID: 320-18986-A-12-B MS
Client ID: MCFSMW-4_0516
Operator ID: JRB ALS Bottle#: 39 Worklist Smp#: 67
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

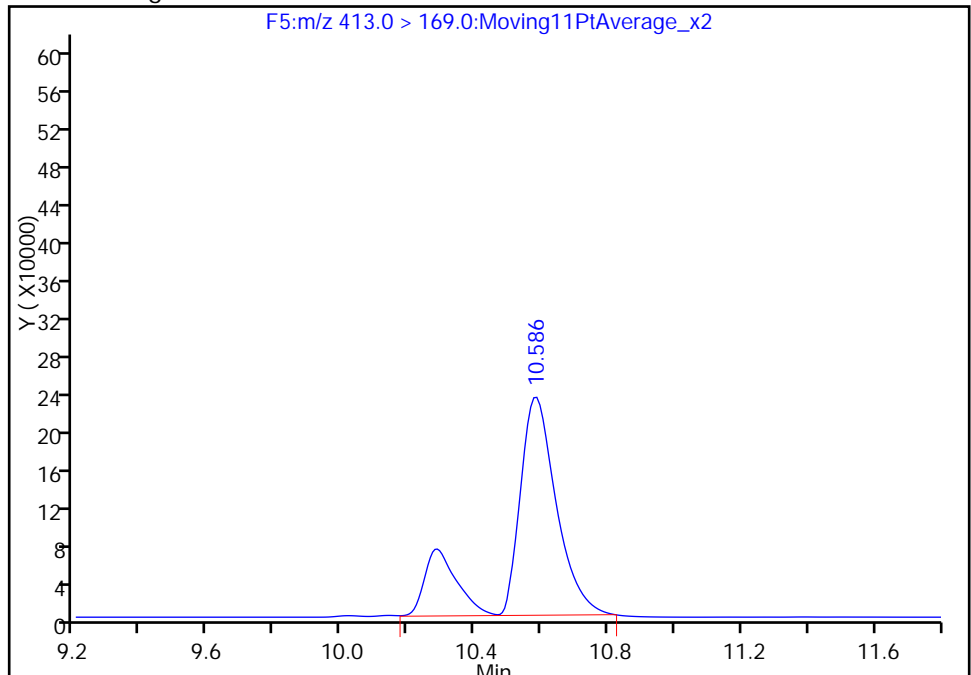
RT: 10.59
Area: 1757255
Amount: 87.742502
Amount Units: ng/ml

Processing Integration Results



RT: 10.59
Area: 2175500
Amount: 102.0062
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1
 SDG No.: _____
 Client Sample ID: MCFSMW-4_0516 MSD Lab Sample ID: 320-18986-12 MSD
 Matrix: Water Lab File ID: 28MAY2016A6A_069.d
 Analysis Method: WS-LC-0025 Date Collected: 05/16/2016 11:11
 Extraction Method: 3535 Date Extracted: 05/21/2016 11:40
 Sample wt/vol: 549.2 (mL) Date Analyzed: 05/29/2016 15:54
 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.: 111859 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	45.9		2.3	1.8	0.84
375-85-9	Perfluoroheptanoic acid (PFHpA)	105		2.3	1.8	0.73
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	248	M	2.3	1.8	0.79
375-95-1	Perfluorononanoic acid (PFNA)	40.2		2.3	1.8	0.60
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	101	M	3.6	2.7	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	185	M	2.3	1.8	0.68

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	78		25-150
STL00990	13C4 PFOA	87		25-150
STL00991	13C4 PFOS	119		25-150
STL01892	13C4-PFHpA	88		25-150
STL00995	13C5 PFNA	92		25-150
STL00994	18O2 PFHxS	110		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_069.d
 Lims ID: 320-18986-A-12-C MSD
 Client ID: MCFSMW-4_0516
 Sample Type: MSD
 Inject. Date: 29-May-2016 15:54:24 ALS Bottle#: 40 Worklist Smp#: 68
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-18986-a-12-c msd
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50°C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 01-Jun-2016 17:07:40 Calib Date: 28-May-2016 19:41:34
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_012.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: barnettj Date: 01-Jun-2016 16:53:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.782	5.795	-0.013		577598	24.2		48.4	7428	
2 Perfluorobutyric acid										
212.9 > 169.0	5.782	5.797	-0.015	1.000	857312	49.0		245	76.6	
D 3 13C5-PFPeA										
267.9 > 223.0	6.932	6.957	-0.025		1936190	35.5		71.1	10255	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.932	6.959	-0.027	1.000	6428917	135.9		679	110	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.064	7.085	-0.021	1.000	999596	25.2		142		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.064	7.085	-0.021	1.000	999596	NC			140	
298.9 > 99.0	7.061	7.085	-0.024	1.000	465644		2.15(0.00-0.00)		200	
22 PFPeS (Perflouro-1-pentanesulfonat										
349.0 > 80.0	8.024	7.971	0.053	0.845	46486	NC			3.4	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.209	8.235	-0.026	1.000	5142390	102.0		510	404	
D 6 13C2 PFHxA										
315.0 > 270.0	8.209	8.236	-0.027		2285168	39.2		78.3	72870	
D 8 13C4-PFHpA										
367.0 > 322.0	9.452	9.474	-0.022		2715923	43.8		87.6	167390	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.452	9.475	-0.023	1.000	3764245	57.7		289	584	
D 11 18O2 PFHxS										
403.0 > 84.0	9.493	9.507	-0.014		1489693	52.2		110	51741	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.493	9.507	-0.014	1.000	3206496	NC			645	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.493	9.507	-0.014	1.000	3206496	136.3		749		M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.568	10.586	-0.018		2939423	43.6		87.3	43830	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.568	10.587	-0.019	1.000	6073555	101.6		508	1155	M
413.0 > 169.0	10.568	10.587	-0.019	1.000	2409219		2.52(0.00-0.00)		1076	M
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.577	10.596	-0.019	1.000	532141	NC			180	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.577	10.596	-0.019	1.000	532141	16.3		85.6		
D 16 13C4 PFOS										
503.0 > 80.0	11.526	11.543	-0.017		1999849	56.9		119	1302	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.526	11.545	-0.019	1.000	2901856	55.2		298	1426	M
499.0 > 99.0	11.526	11.545	-0.019	1.000	1329207		2.18(0.00-0.00)		5012	M
D 17 13C5 PFNA										
468.0 > 423.0	11.544	11.562	-0.018		2864320	46.2		92.3	140605	
18 Perfluorononanoic acid										
463.0 > 419.0	11.553	11.563	-0.010	1.000	1067713	22.1		110	1131	
D 19 13C2 PFDA										
515.0 > 470.0	12.373	12.392	-0.019		2000092	40.2		80.4	123804	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.373	12.392	-0.019	1.000	944561	18.1		90.3	3344	
D 23 13C8 FOSA										
506.0 > 78.0	12.984	13.000	-0.016		643837	5.75		11.5	42136	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.984	13.002	-0.018	1.000	168941	16.2		81.1	2769	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.032	13.048	-0.016	1.000	425924	12.7		65.8		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.032	13.048	-0.016	1.000	425924	NC			19660	
D 26 13C2 PFUnA										
565.0 > 520.0	13.076	13.094	-0.018		2700076	38.7		77.4	18422	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.076	13.094	-0.018	1.000	936153	16.4		81.9	6078	
D 28 13C2 PFDaA										
615.0 > 570.0	13.675	13.685	-0.010		2923905	35.2		70.3	25162	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.675	13.685	-0.010	1.000	811560	17.2		85.8	2433	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.174	14.184	-0.010	1.000	1064744	15.9		79.4	2579	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.602	14.609	-0.007		2731929	36.8		73.6	15859	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.602	14.609	-0.007	1.000	883256	16.7		83.6	539	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.184	15.203	-0.019		3646088	31.2		62.4	21499	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.184	15.203	-0.019	1.000	1359289	14.4		71.8	2593	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.456	15.473	-0.017	1.000	1352415	15.0	75.2	2071	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160529-31180.b\28MAY2016A6A_069.d

Injection Date: 29-May-2016 15:54:24

Instrument ID: A6

Lims ID: 320-18986-A-12-C MSD

Client ID: MCFSMW-4_0516

Operator ID: JRB

ALS Bottle#: 40

Worklist Smp#: 68

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

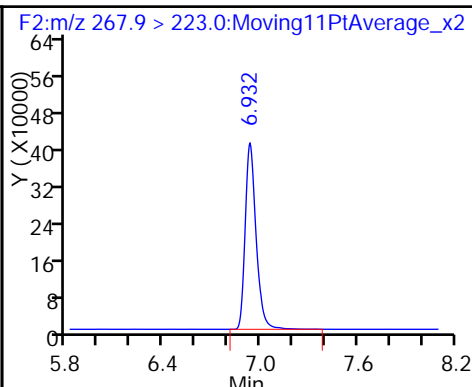
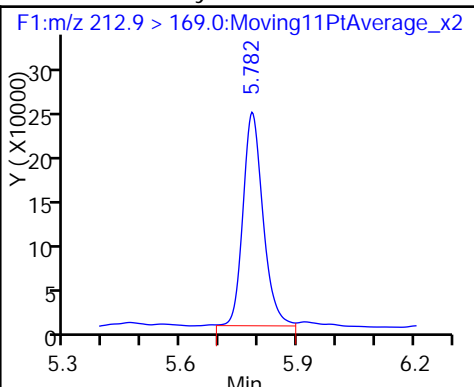
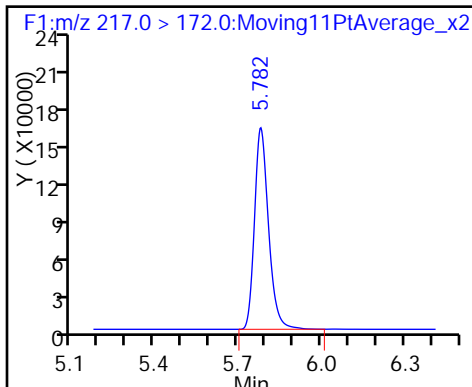
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

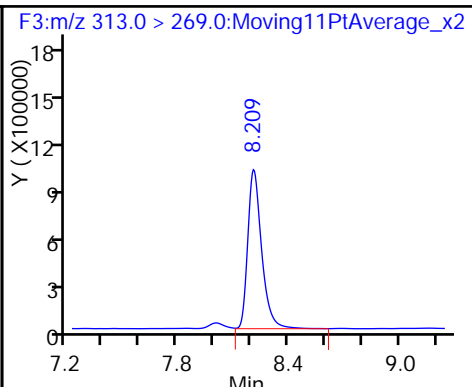
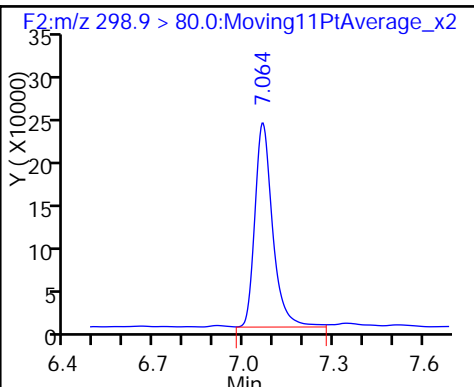
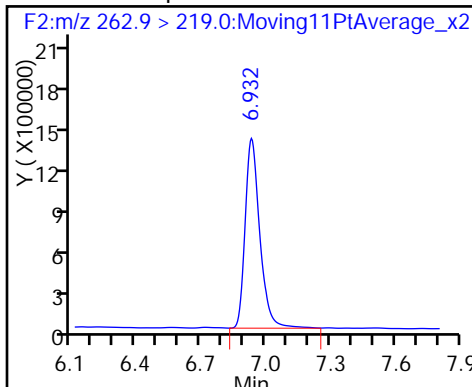
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

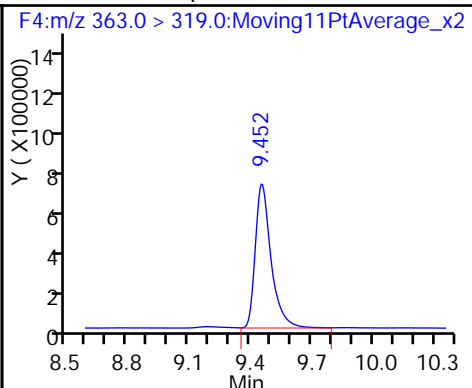
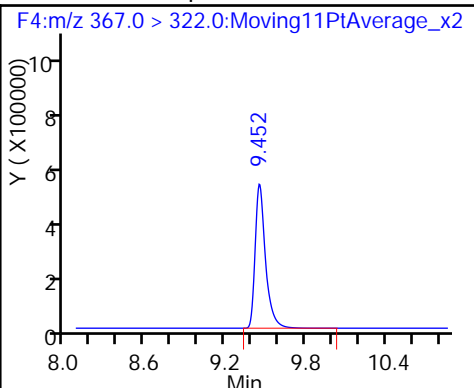
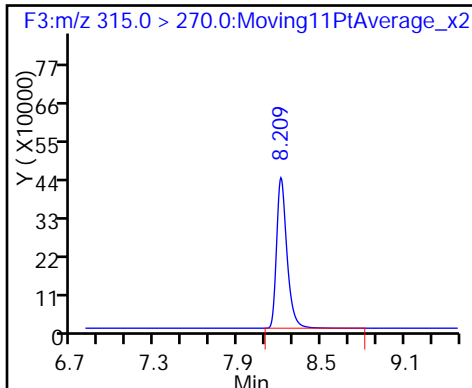
7 Perfluorohexanoic acid



D 6 13C2 PFHxA

D 8 13C4-PFHpA

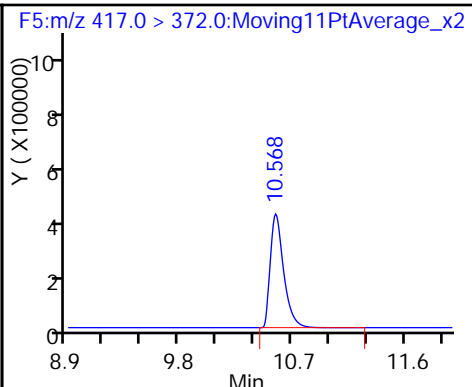
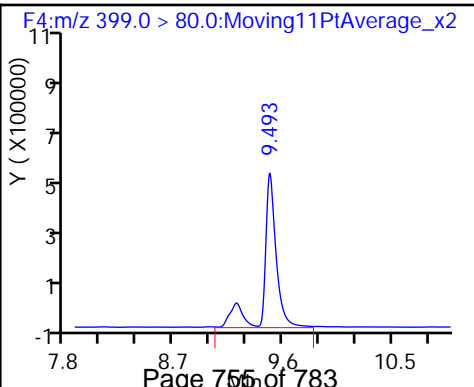
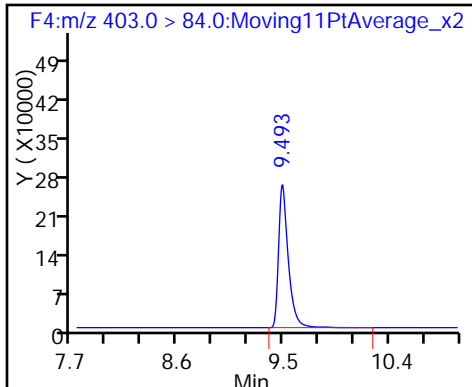
9 Perfluoroheptanoic acid

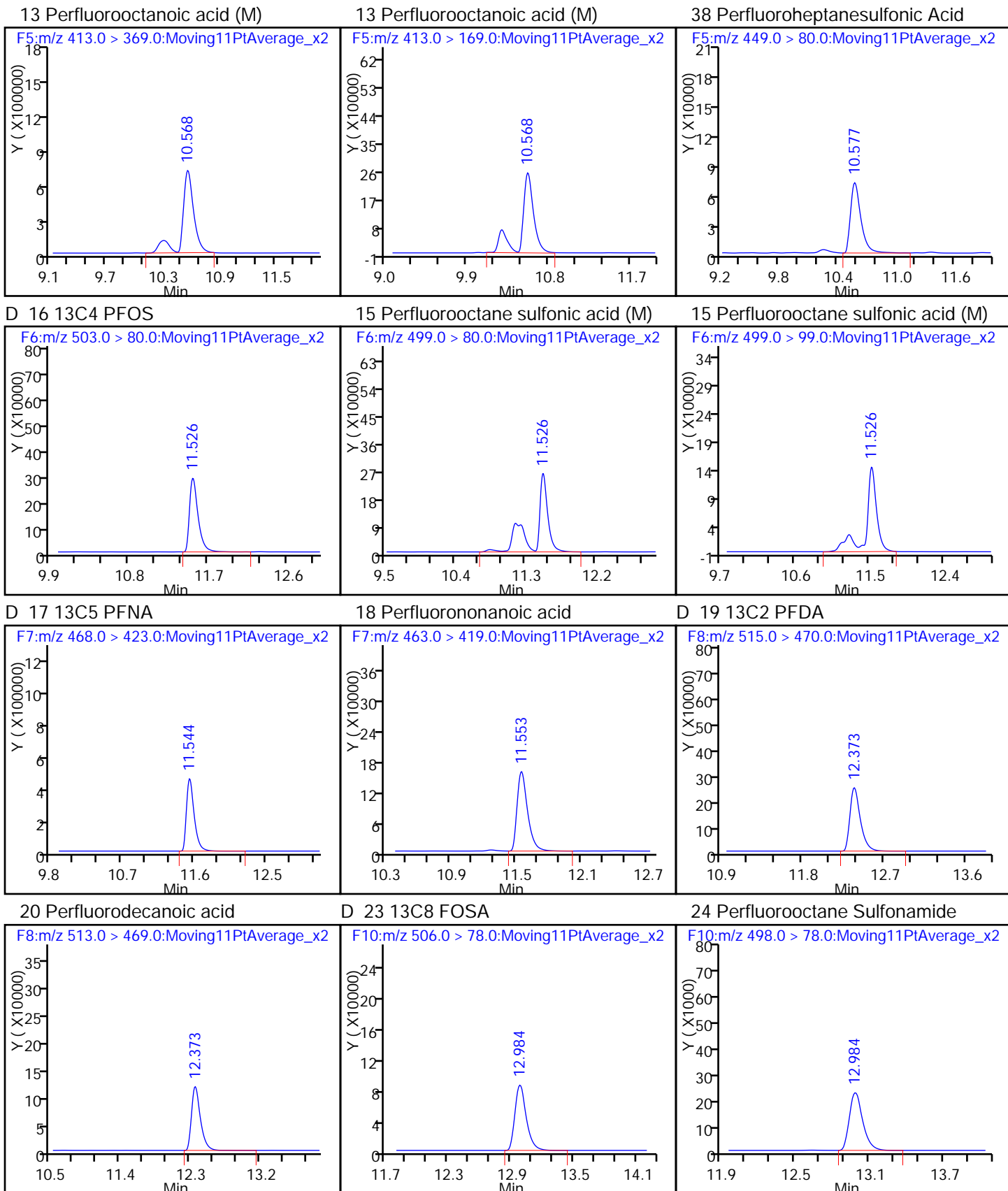


D 11 18O2 PFHxS

41 Perfluorohexanesulfonic acid (M)

D 12 13C4 PFOA

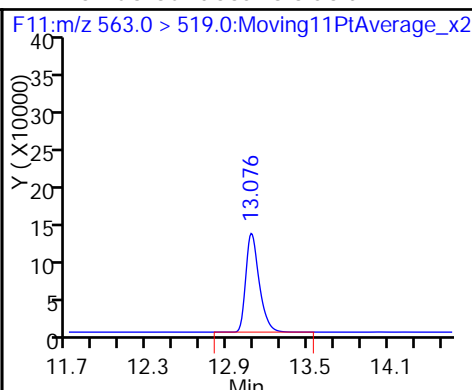
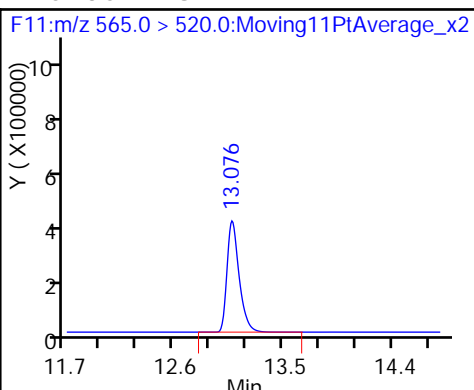
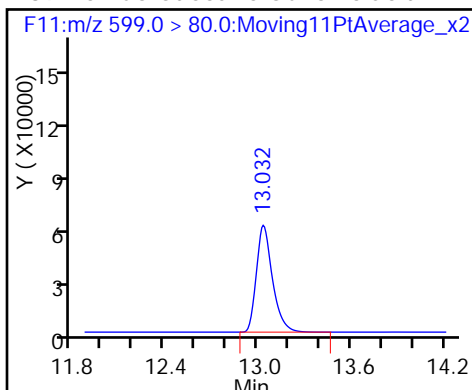




39 Perfluorodecane Sulfonic acid

D 26 13C2 PFUnA

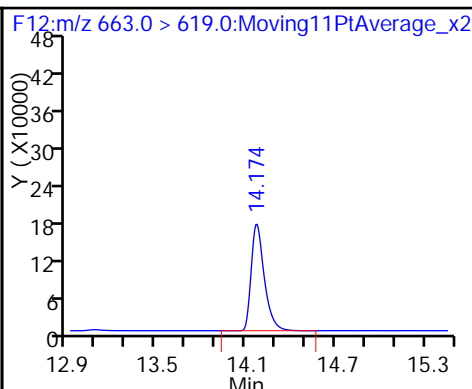
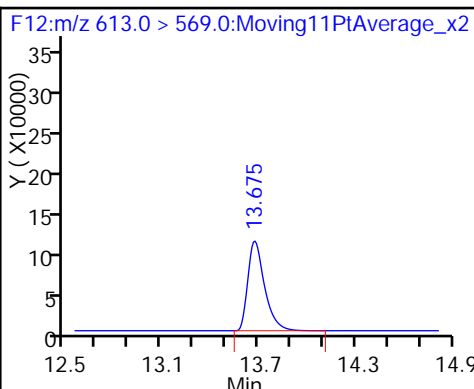
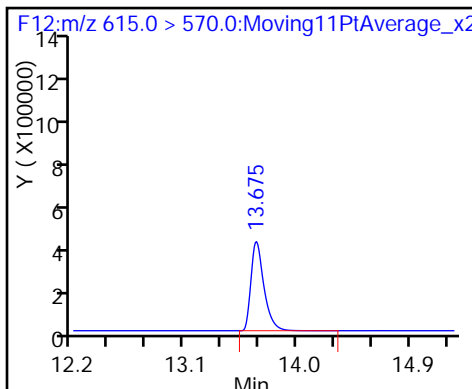
27 Perfluoroundecanoic acid



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

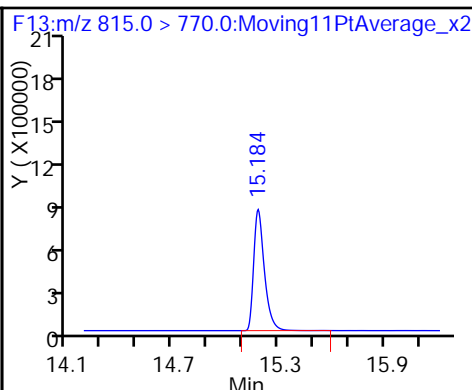
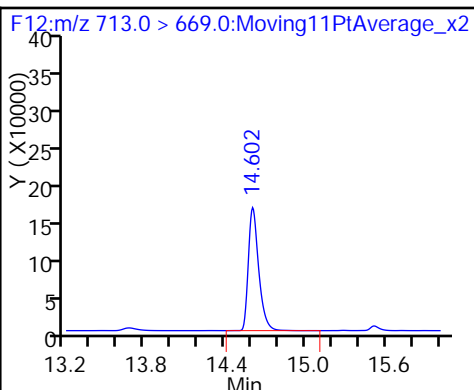
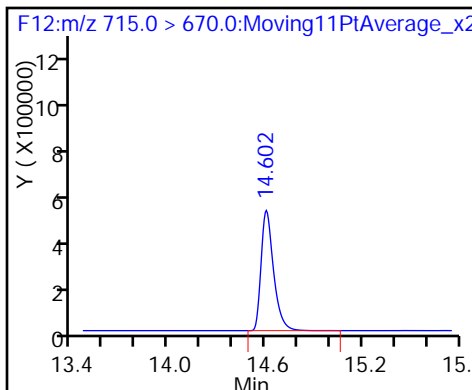
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

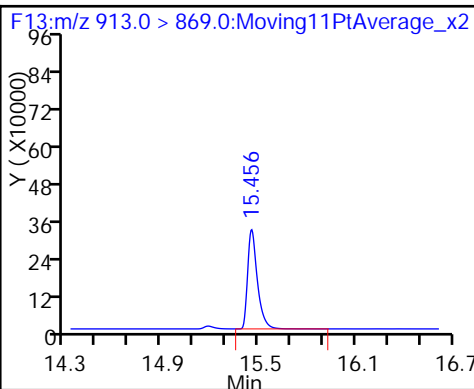
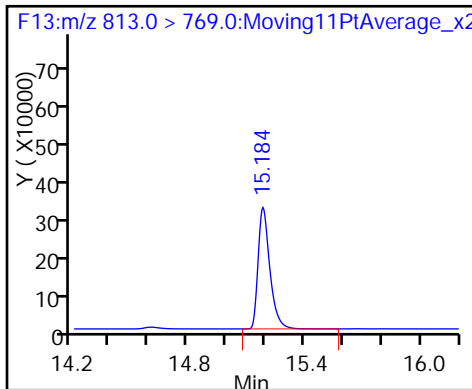
32 Perfluorotetradecanoic acid

D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid

36 Perfluorooctadecanoic acid



TestAmerica Sacramento

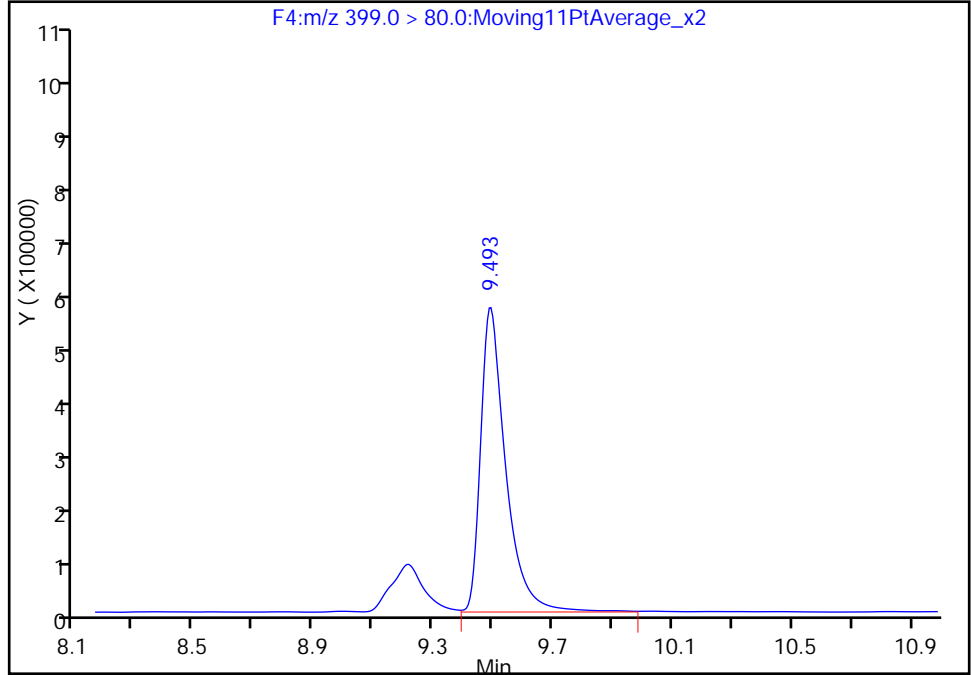
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Injection Date: 29-May-2016 15:54:24 Instrument ID: A6
Lims ID: 320-18986-A-12-C MSD
Client ID: MCFSMW-4_0516
Operator ID: JRB ALS Bottle#: 40 Worklist Smp#: 68
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:M/RM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

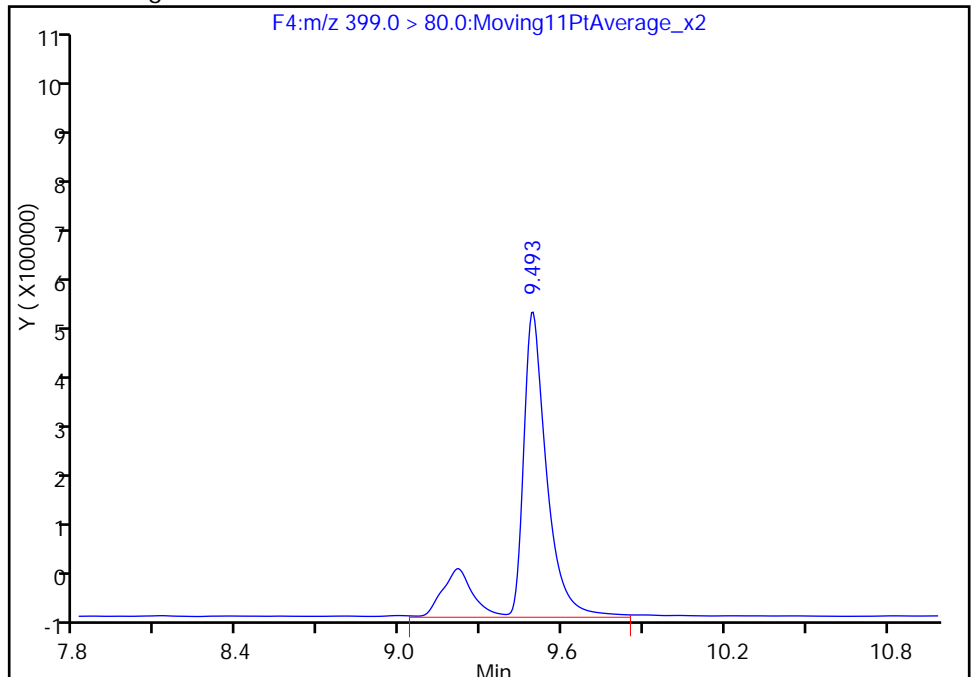
RT: 9.49
Area: 3206496
Amount: 111.3151
Amount Units: ng/ml

Processing Integration Results



RT: 9.49
Area: 3927420
Amount: 136.3423
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 01-Jun-2016 16:53:37
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

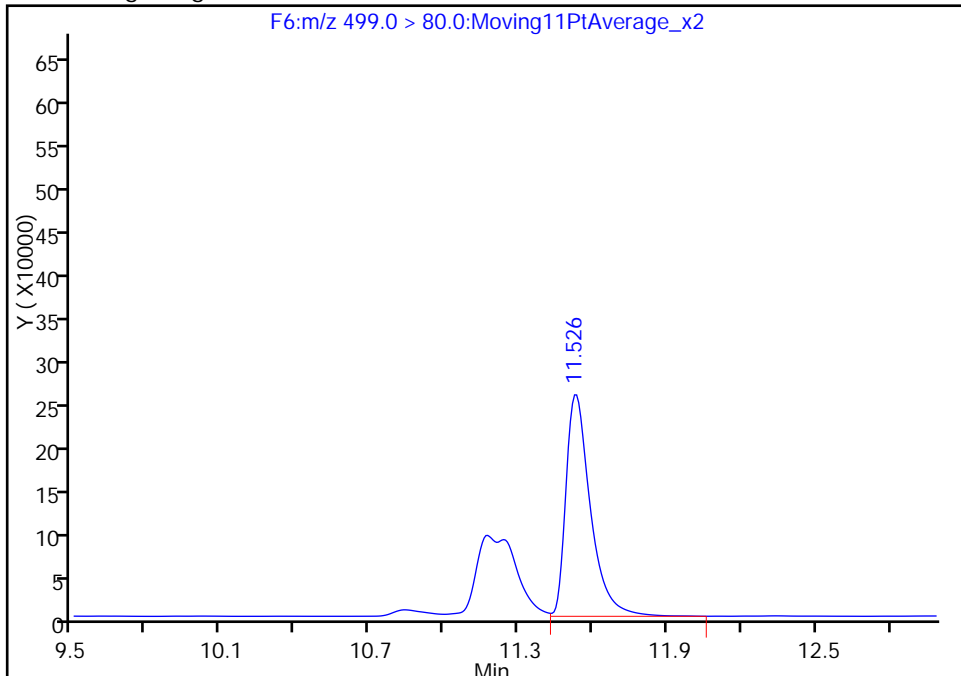
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Injection Date: 29-May-2016 15:54:24 Instrument ID: A6
Lims ID: 320-18986-A-12-C MSD
Client ID: MCFSMW-4_0516
Operator ID: JRB ALS Bottle#: 40 Worklist Smp#: 68
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:M/RM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

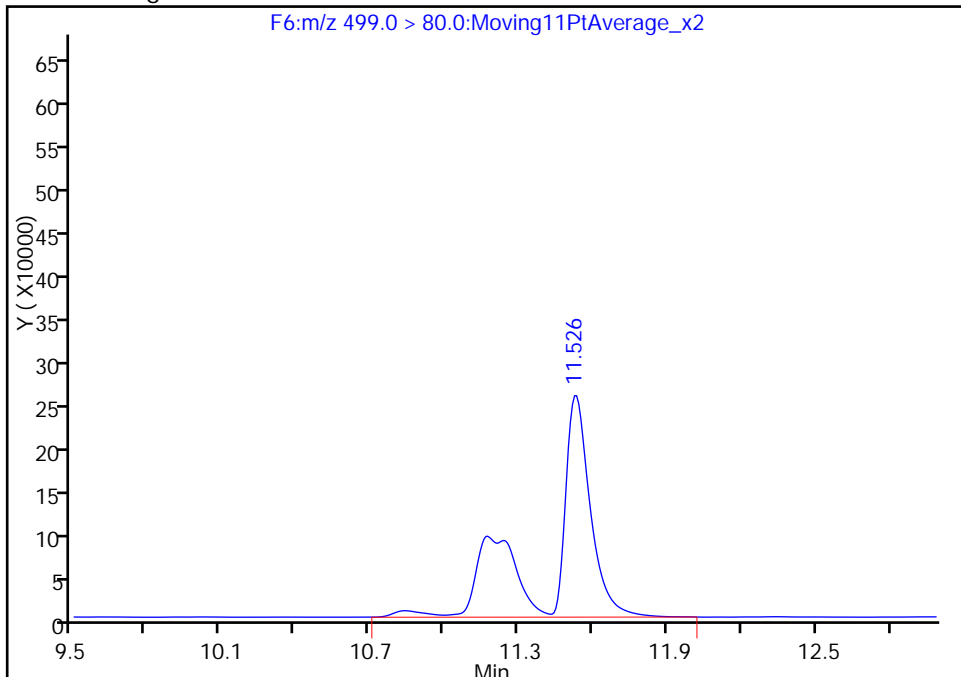
RT: 11.53
Area: 1780084
Amount: 33.891350
Amount Units: ng/ml

Processing Integration Results



RT: 11.53
Area: 2901856
Amount: 55.248975
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

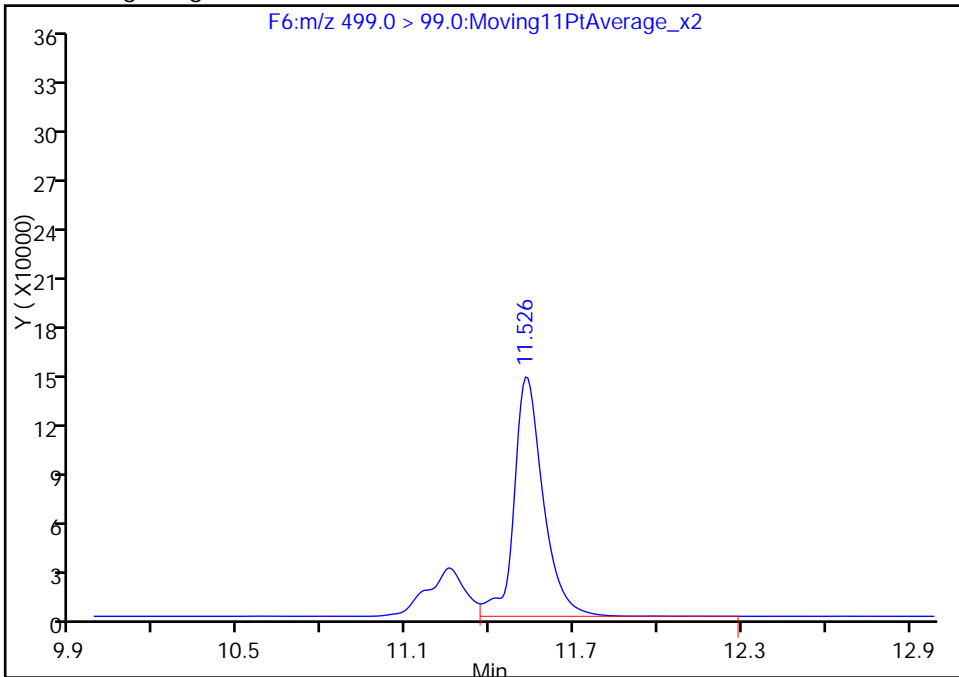
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Injection Date: 29-May-2016 15:54:24 Instrument ID: A6
Lims ID: 320-18986-A-12-C MSD
Client ID: MCFSMW-4_0516
Operator ID: JRB ALS Bottle#: 40 Worklist Smp#: 68
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

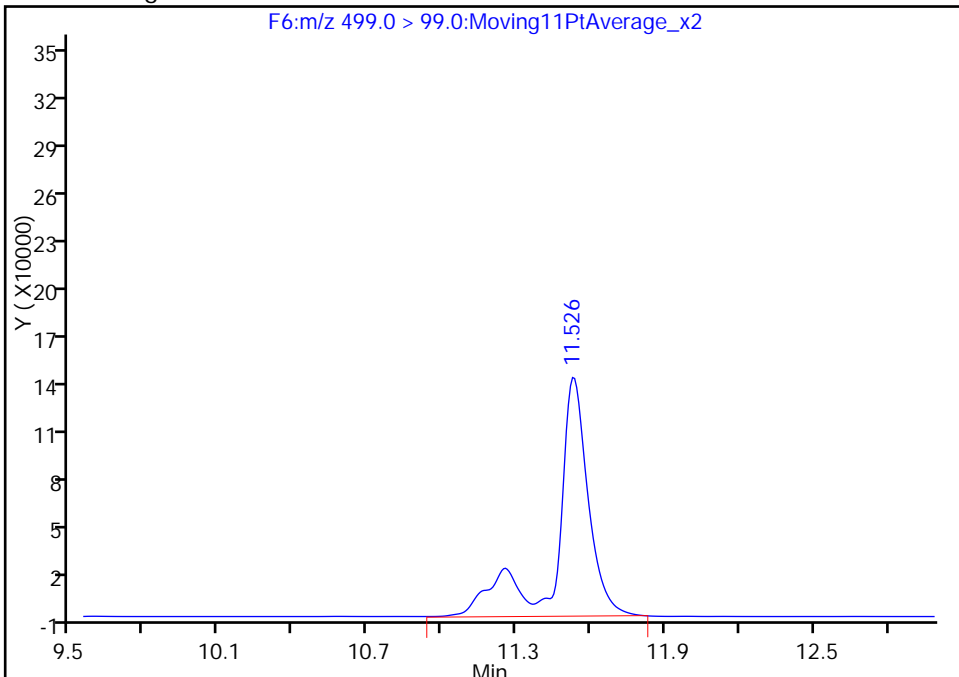
RT: 11.53
Area: 1059771
Amount: 33.891350
Amount Units: ng/ml

Processing Integration Results



RT: 11.53
Area: 1329207
Amount: 55.248975
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

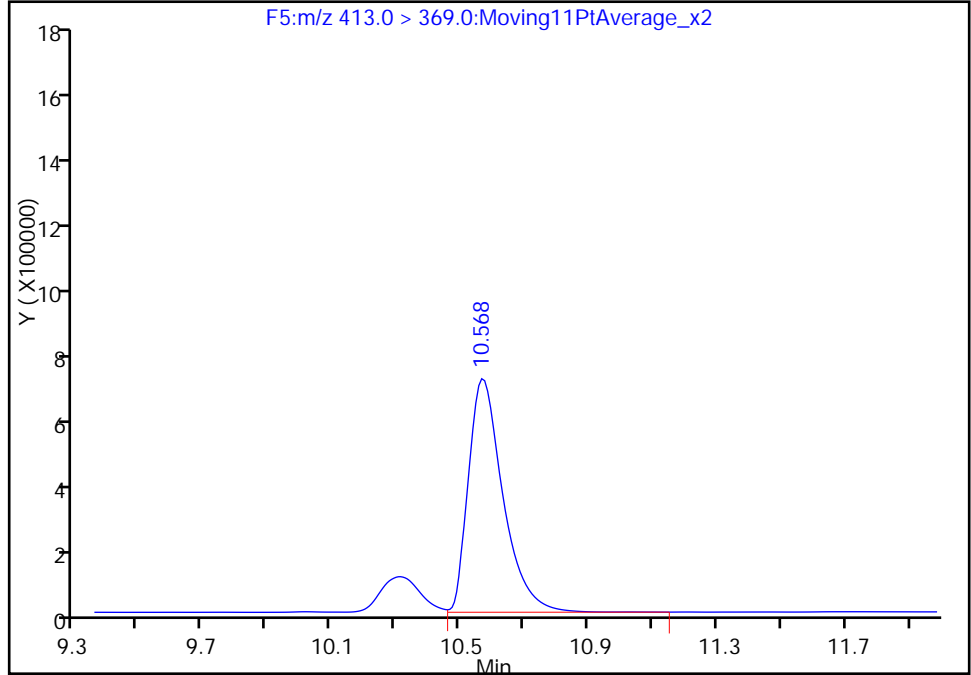
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Injection Date: 29-May-2016 15:54:24 Instrument ID: A6
Lims ID: 320-18986-A-12-C MSD
Client ID: MCFSMW-4_0516
Operator ID: JRB ALS Bottle#: 40 Worklist Smp#: 68
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

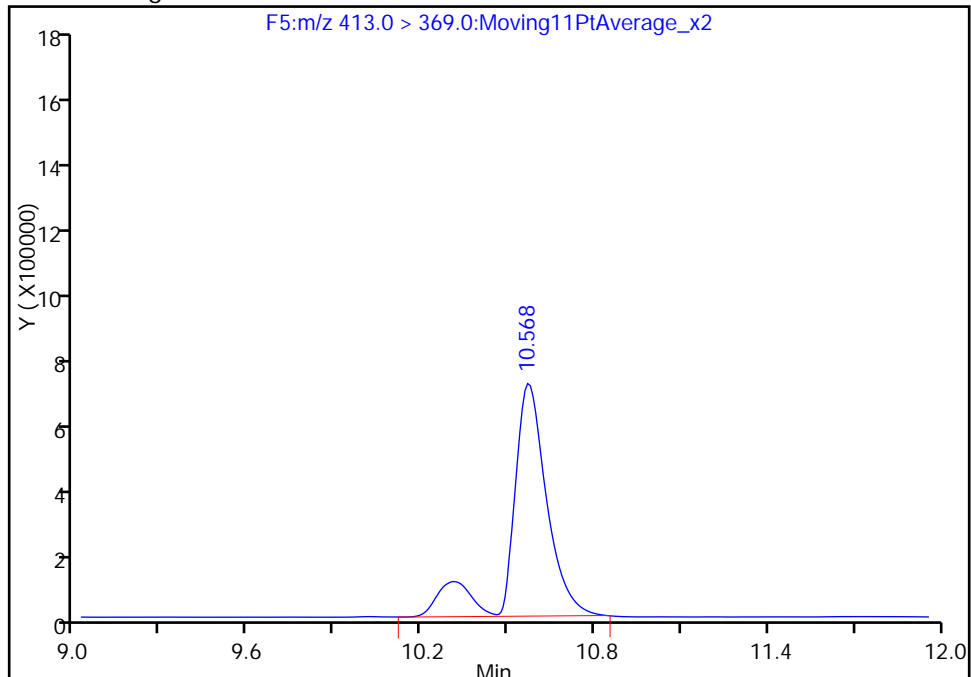
RT: 10.57
Area: 5282854
Amount: 88.403519
Amount Units: ng/ml

Processing Integration Results



RT: 10.57
Area: 6073555
Amount: 101.6351
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 01-Jun-2016 16:53:37
Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

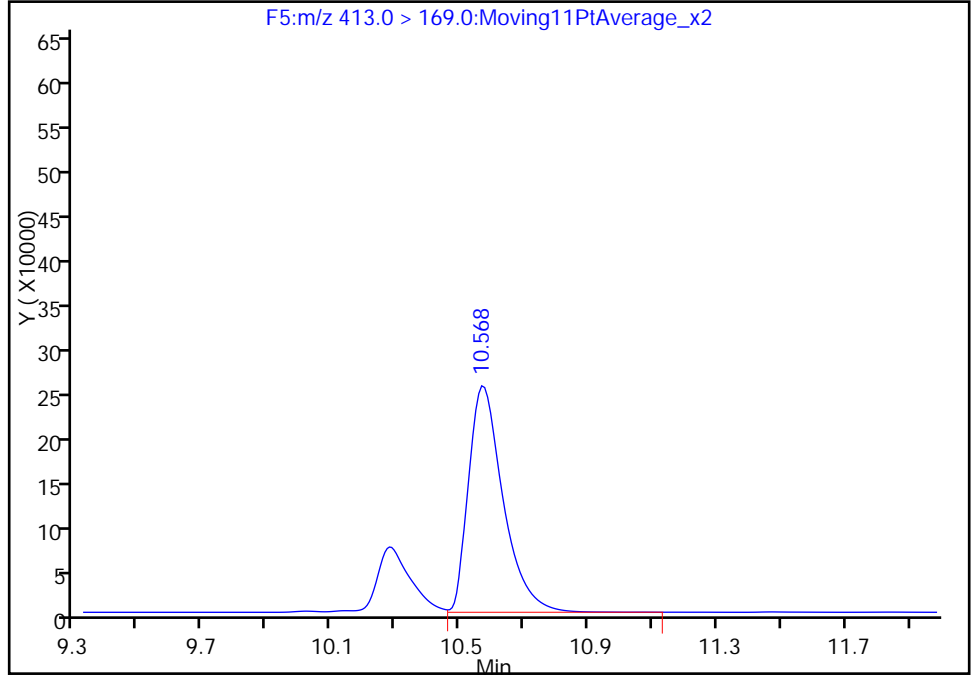
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Lims ID: 320-18986-A-12-C MSD
Client ID: MCFSMW-4_0516
Operator ID: JRB ALS Bottle#: 40 Worklist Smp#: 68
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

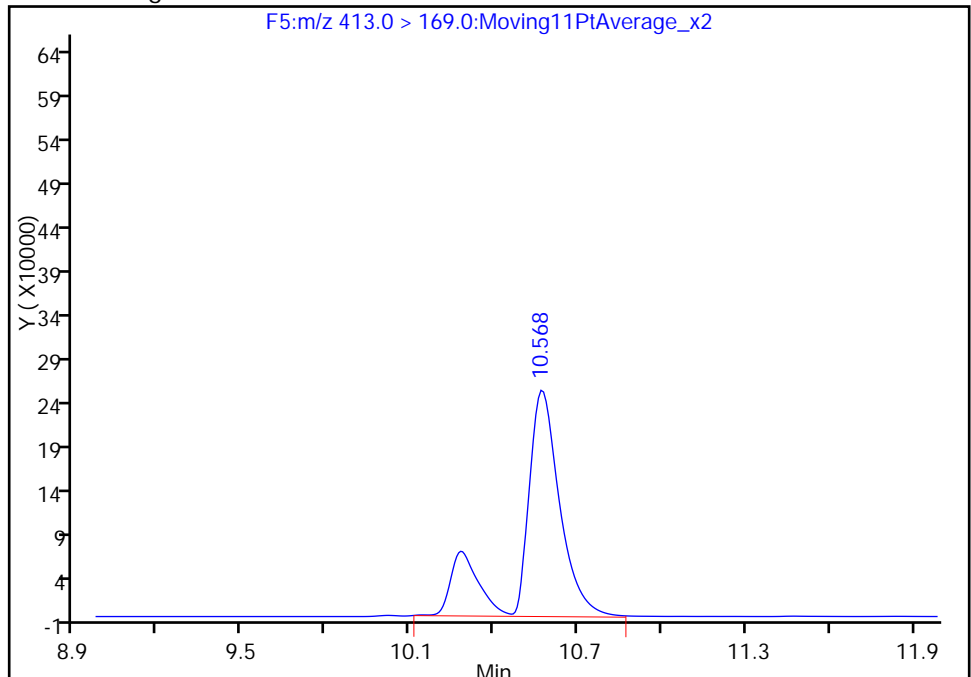
RT: 10.57
Area: 1899176
Amount: 88.403519
Amount Units: ng/ml

Processing Integration Results



RT: 10.57
Area: 2409219
Amount: 101.6351
Amount Units: ng/ml

Manual Integration Results



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1

SDG No.: _____

Instrument ID: A6 Start Date: 05/28/2016 13:56

Analysis Batch Number: 111859 End Date: 05/29/2016 20:31

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-111859/2 IC		05/28/2016 13:56	1	28MAY2016A6A_00 3.d	Acquity 2.1(mm)
STD 320-111859/3 IC		05/28/2016 14:17	1	28MAY2016A6A_00 4.d	Acquity 2.1(mm)
STD 320-111859/4 IC		05/28/2016 14:39	1	28MAY2016A6A_00 5.d	Acquity 2.1(mm)
STD 320-111859/5 IC		05/28/2016 15:00	1	28MAY2016A6A_00 6.d	Acquity 2.1(mm)
STD 320-111859/6 IC		05/28/2016 15:22	1	28MAY2016A6A_00 7.d	Acquity 2.1(mm)
STD 320-111859/10 IC		05/28/2016 19:20	1	28MAY2016A6A_01 1.d	Acquity 2.1(mm)
STD 320-111859/11 IC		05/28/2016 19:41	1	28MAY2016A6A_01 2.d	Acquity 2.1(mm)
ZZZZZ		05/28/2016 20:02	1		Acquity 2.1(mm)
ICV 320-111859/13		05/28/2016 20:24	1	28MAY2016A6A_01 4.d	Acquity 2.1(mm)
ZZZZZ		05/28/2016 20:45	1		Acquity 2.1(mm)
ZZZZZ		05/28/2016 21:06	1		Acquity 2.1(mm)
ZZZZZ		05/28/2016 21:27	1		Acquity 2.1(mm)
ZZZZZ		05/28/2016 21:49	1		Acquity 2.1(mm)
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ZZZZZ		05/28/2016 22:31	1		Acquity 2.1(mm)
ZZZZZ		05/28/2016 22:53	1		Acquity 2.1(mm)
ZZZZZ		05/28/2016 23:14	1		Acquity 2.1(mm)
ZZZZZ		05/28/2016 23:35	1		Acquity 2.1(mm)
ZZZZZ		05/28/2016 23:56	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 00:18	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 00:39	1		Acquity 2.1(mm)
CCV 320-111859/26		05/29/2016 01:00	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 01:22	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 01:43	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 02:04	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 02:25	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 02:47	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 03:08	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 03:29	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 03:51	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 04:12	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 04:33	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 04:54	1		Acquity 2.1(mm)
CCV 320-111859/38		05/29/2016 05:16	1	28MAY2016A6A_03 9.d	Acquity 2.1(mm)
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ZZZZZ		05/29/2016 05:58	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 06:19	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 06:41	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 07:02	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 07:23	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 08:27	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1

SDG No.: _____

Instrument ID: A6 Start Date: 05/28/2016 13:56

Analysis Batch Number: 111859 End Date: 05/29/2016 20:31

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
LCS 320-110850/2-A		05/29/2016 08:48	1	28MAY2016A6A_04 9.d	Acquity 2.1(mm)
320-18986-1		05/29/2016 09:10	1	28MAY2016A6A_05 0.d	Acquity 2.1(mm)
320-18986-2		05/29/2016 09:31	1	28MAY2016A6A_05 1.d	Acquity 2.1(mm)
ZZZZZ		05/29/2016 09:52	1		Acquity 2.1(mm)
CCV 320-111859/52		05/29/2016 10:14	1	28MAY2016A6A_05 3.d	Acquity 2.1(mm)
ZZZZZ		05/29/2016 10:35	1		Acquity 2.1(mm)
320-18986-3		05/29/2016 10:56	1	28MAY2016A6A_05 5.d	Acquity 2.1(mm)
320-18986-4		05/29/2016 11:17	1	28MAY2016A6A_05 6.d	Acquity 2.1(mm)
320-18986-5		05/29/2016 11:39	1	28MAY2016A6A_05 7.d	Acquity 2.1(mm)
320-18986-6		05/29/2016 12:00	1	28MAY2016A6A_05 8.d	Acquity 2.1(mm)
320-18986-7		05/29/2016 12:21	1	28MAY2016A6A_05 9.d	Acquity 2.1(mm)
320-18986-8		05/29/2016 12:42	1	28MAY2016A6A_06 0.d	Acquity 2.1(mm)
ZZZZZ		05/29/2016 13:04	1		Acquity 2.1(mm)
320-18986-10		05/29/2016 13:25	1	28MAY2016A6A_06 2.d	Acquity 2.1(mm)
320-18986-11		05/29/2016 13:46	1	28MAY2016A6A_06 3.d	Acquity 2.1(mm)
ZZZZZ		05/29/2016 14:08	1		Acquity 2.1(mm)
CCV 320-111859/64		05/29/2016 14:29	1	28MAY2016A6A_06 5.d	Acquity 2.1(mm)
ZZZZZ		05/29/2016 14:50	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 15:11	1		Acquity 2.1(mm)
320-18986-12 MS		05/29/2016 15:33	1	28MAY2016A6A_06 8.d	Acquity 2.1(mm)
320-18986-12 MSD		05/29/2016 15:54	1	28MAY2016A6A_06 9.d	Acquity 2.1(mm)
ZZZZZ		05/29/2016 16:15	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 16:36	1		Acquity 2.1(mm)
320-18986-15		05/29/2016 16:58	1	28MAY2016A6A_07 2.d	Acquity 2.1(mm)
320-18986-16		05/29/2016 17:19	1	28MAY2016A6A_07 3.d	Acquity 2.1(mm)
ZZZZZ		05/29/2016 17:40	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 18:02	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 18:23	1		Acquity 2.1(mm)
CCV 320-111859/76		05/29/2016 18:44	1	28MAY2016A6A_07 7.d	Acquity 2.1(mm)
ZZZZZ		05/29/2016 19:05	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 19:27	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 19:48	1		Acquity 2.1(mm)
ZZZZZ		05/29/2016 20:09	1		Acquity 2.1(mm)
CCV 320-111859/81		05/29/2016 20:31	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1

SDG No.: _____

Instrument ID: A6 Start Date: 05/31/2016 12:51

Analysis Batch Number: 112007 End Date: 06/01/2016 15:02

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-112007/3 IC		05/31/2016 12:51	1	31MAY2016A6A_00 3.d	Acquity 2.1(mm)
STD 320-112007/4 IC		05/31/2016 13:13	1	31MAY2016A6A_00 4.d	Acquity 2.1(mm)
STD 320-112007/5 IC		05/31/2016 13:34	1	31MAY2016A6A_00 5.d	Acquity 2.1(mm)
STD 320-112007/6 IC		05/31/2016 13:55	1	31MAY2016A6A_00 6.d	Acquity 2.1(mm)
STD 320-112007/7 IC		05/31/2016 14:16	1	31MAY2016A6A_00 7.d	Acquity 2.1(mm)
STD 320-112007/8 IC		05/31/2016 14:38	1	31MAY2016A6A_00 8.d	Acquity 2.1(mm)
STD 320-112007/9 IC		05/31/2016 14:59	1	31MAY2016A6A_00 9.d	Acquity 2.1(mm)
ZZZZZ		05/31/2016 15:20	1		Acquity 2.1(mm)
ZZZZZ		05/31/2016 15:42	1		Acquity 2.1(mm)
ICV 320-112007/12		05/31/2016 16:03	1	31MAY2016A6A_01 2.d	Acquity 2.1(mm)
ZZZZZ		05/31/2016 17:14	1		Acquity 2.1(mm)
ZZZZZ		05/31/2016 17:35	1		Acquity 2.1(mm)
ZZZZZ		05/31/2016 17:56	1		Acquity 2.1(mm)
ZZZZZ		05/31/2016 18:18	1		Acquity 2.1(mm)
ZZZZZ		05/31/2016 18:39	1		Acquity 2.1(mm)
ZZZZZ		05/31/2016 19:00	10		Acquity 2.1(mm)
ZZZZZ		05/31/2016 19:21	5		Acquity 2.1(mm)
ZZZZZ		05/31/2016 19:43	20		Acquity 2.1(mm)
ZZZZZ		05/31/2016 20:04	20		Acquity 2.1(mm)
ZZZZZ		05/31/2016 20:25	20		Acquity 2.1(mm)
ZZZZZ		05/31/2016 20:47	5		Acquity 2.1(mm)
ZZZZZ		05/31/2016 21:08	1		Acquity 2.1(mm)
CCV 320-112007/25		05/31/2016 21:29	1		Acquity 2.1(mm)
ZZZZZ		05/31/2016 21:50	1		Acquity 2.1(mm)
ZZZZZ		05/31/2016 22:12	20		Acquity 2.1(mm)
ZZZZZ		05/31/2016 22:33	1		Acquity 2.1(mm)
ZZZZZ		05/31/2016 22:54	5		Acquity 2.1(mm)
ZZZZZ		05/31/2016 23:15	5		Acquity 2.1(mm)
ZZZZZ		05/31/2016 23:37	5		Acquity 2.1(mm)
ZZZZZ		05/31/2016 23:58	5		Acquity 2.1(mm)
ZZZZZ		06/01/2016 00:19	10		Acquity 2.1(mm)
ZZZZZ		06/01/2016 00:41	10		Acquity 2.1(mm)
ZZZZZ		06/01/2016 01:02	10		Acquity 2.1(mm)
ZZZZZ		06/01/2016 01:23	1		Acquity 2.1(mm)
CCV 320-112007/37		06/01/2016 01:44	1	31MAY2016A6A_03 9.d	Acquity 2.1(mm)
ZZZZZ		06/01/2016 02:06	1		Acquity 2.1(mm)
ZZZZZ		06/01/2016 02:27	1		Acquity 2.1(mm)
ZZZZZ		06/01/2016 02:48	1		Acquity 2.1(mm)
ZZZZZ		06/01/2016 03:09	20		Acquity 2.1(mm)
ZZZZZ		06/01/2016 03:31	10		Acquity 2.1(mm)
ZZZZZ		06/01/2016 03:52	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1

SDG No.: _____

Instrument ID: A6 Start Date: 05/31/2016 12:51

Analysis Batch Number: 112007 End Date: 06/01/2016 15:02

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		06/01/2016 04:13	50		Acquity 2.1(mm)
MB 320-110850/1-A		06/01/2016 05:17	1	31MAY2016A6A_04 9.d	Acquity 2.1(mm)
ZZZZZ		06/01/2016 05:38	1		Acquity 2.1(mm)
CCV 320-112007/49		06/01/2016 06:00	1	31MAY2016A6A_05 1.d	Acquity 2.1(mm)
CCV 320-112007/63		06/01/2016 10:58	1	31MAY2016A6A_06 5.d	Acquity 2.1(mm)
ZZZZZ		06/01/2016 11:22	1		Acquity 2.1(mm)
320-18986-7 DL		06/01/2016 11:43	10	31MAY2016A6A_06 7.d	Acquity 2.1(mm)
320-18986-8 DL		06/01/2016 12:05	10	31MAY2016A6A_06 8.d	Acquity 2.1(mm)
ZZZZZ		06/01/2016 13:51	1		Acquity 2.1(mm)
ZZZZZ		06/01/2016 14:12	1		Acquity 2.1(mm)
ZZZZZ		06/01/2016 14:33	1		Acquity 2.1(mm)
CCV 320-112007/74		06/01/2016 15:02	1	31MAY2016A6A_07 6.d	Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1

SDG No.: _____

Instrument ID: A6 Start Date: 06/01/2016 15:02

Analysis Batch Number: 112205 End Date: 06/02/2016 17:49

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-112205/2		06/01/2016 15:02	1		Acquity 2.1 (mm)
ZZZZZ		06/01/2016 16:06	1		Acquity 2.1 (mm)
ZZZZZ		06/01/2016 19:45	1		Acquity 2.1 (mm)
CCV 320-112205/16		06/01/2016 20:07	1		Acquity 2.1 (mm)
CCV 320-112205/54		06/02/2016 09:35	1		Acquity 2.1 (mm)
ZZZZZ		06/02/2016 10:16	5		Acquity 2.1 (mm)
ZZZZZ		06/02/2016 10:39	1		Acquity 2.1 (mm)
CCV 320-112205/58		06/02/2016 11:00	1	31MAY2016A6A_13 2.d	Acquity 2.1 (mm)
ZZZZZ		06/02/2016 11:26	20		Acquity 2.1 (mm)
ZZZZZ		06/02/2016 11:47	40		Acquity 2.1 (mm)
ZZZZZ		06/02/2016 12:09	40		Acquity 2.1 (mm)
ZZZZZ		06/02/2016 12:30	40		Acquity 2.1 (mm)
ZZZZZ		06/02/2016 12:51	5		Acquity 2.1 (mm)
ZZZZZ		06/02/2016 13:12	20		Acquity 2.1 (mm)
ZZZZZ		06/02/2016 13:34	50		Acquity 2.1 (mm)
320-18986-15 DL		06/02/2016 13:55	4	31MAY2016A6A_14 0.d	Acquity 2.1 (mm)
320-18986-16 DL		06/02/2016 14:16	4	31MAY2016A6A_14 1.d	Acquity 2.1 (mm)
ZZZZZ		06/02/2016 14:38	1		Acquity 2.1 (mm)
CCV 320-112205/69		06/02/2016 14:59	1	31MAY2016A6A_14 3.d	Acquity 2.1 (mm)
ZZZZZ		06/02/2016 15:20	1		Acquity 2.1 (mm)
320-18986-9		06/02/2016 15:41	1	31MAY2016A6A_14 5.d	Acquity 2.1 (mm)
320-18986-12		06/02/2016 16:03	1	31MAY2016A6A_14 6.d	Acquity 2.1 (mm)
320-18986-13		06/02/2016 16:24	1	31MAY2016A6A_14 7.d	Acquity 2.1 (mm)
320-18986-14		06/02/2016 17:07	1	31MAY2016A6A_14 8.d	Acquity 2.1 (mm)
ZZZZZ		06/02/2016 17:28	1		Acquity 2.1 (mm)
CCV 320-112205/76		06/02/2016 17:49	1	31MAY2016A6A_15 0.d	Acquity 2.1 (mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18986-1

SDG No.: _____

Batch Number: 110850 Batch Start Date: 05/21/16 11:40 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 05/23/16 18:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00040	LCPFCSP 00049
MB 320-110850/1		3535, WS-LC-0025				500.00 mL	1.00 mL	50 uL	
LCS 320-110850/2		3535, WS-LC-0025				500.00 mL	1.00 mL	50 uL	20 uL
320-18986-A-1	FB051716	3535, WS-LC-0025	T	577.62 g	44.61 g	533 mL	1.00 mL	50 uL	
320-18986-A-2	EB051716	3535, WS-LC-0025	T	561.65 g	44.46 g	517.2 mL	1.00 mL	50 uL	
320-18986-A-3	MCFSMW-14_0516	3535, WS-LC-0025	T	580.59 g	44.99 g	535.6 mL	1.00 mL	50 uL	
320-18986-A-4	46MW03_0516	3535, WS-LC-0025	T	572.41 g	45.18 g	527.2 mL	1.00 mL	50 uL	
320-18986-A-5	46MW01_0516	3535, WS-LC-0025	T	554.23 g	45.09 g	509.1 mL	1.00 mL	50 uL	
320-18986-A-6	46MW02_0516	3535, WS-LC-0025	T	587.10 g	45.09 g	542 mL	1.00 mL	50 uL	
320-18986-A-7	46MW05_0516	3535, WS-LC-0025	T	553.52 g	44.39 g	509.1 mL	1.00 mL	50 uL	
320-18986-A-8	46MW04_0516	3535, WS-LC-0025	T	567.69 g	45.57 g	522.1 mL	1.00 mL	50 uL	
320-18986-A-9	MCFSMW-17_0516	3535, WS-LC-0025	T	500.15 g	43.90 g	456.3 mL	1.00 mL	50 uL	
320-18986-A-10	FB051616	3535, WS-LC-0025	T	593.98 g	44.66 g	549.3 mL	1.00 mL	50 uL	
320-18986-A-11	EB051616	3535, WS-LC-0025	T	581.11 g	45.25 g	535.9 mL	1.00 mL	50 uL	
320-18986-A-12	MCFSMW-4_0516	3535, WS-LC-0025	T	592.26 g	44.63 g	547.6 mL	1.00 mL	50 uL	
320-18986-A-12	MCFSMW-4_0516	3535, WS-LC-0025	T	569.10 g	45.26 g	523.8 mL	1.00 mL	50 uL	20 uL
MS 320-18986-A-12	MCFSMW-4_0516	3535, WS-LC-0025	T	594.07 g	44.86 g	549.2 mL	1.00 mL	50 uL	20 uL
MSD 320-18986-A-13	MCFSMW-5_0516	3535, WS-LC-0025	T	581.69 g	44.83 g	536.9 mL	1.00 mL	50 uL	
320-18986-A-14	MCFSMW-5_0516 DUP	3535, WS-LC-0025	T	581.77 g	44.76 g	537 mL	1.00 mL	50 uL	
320-18986-A-15	MCFSMW-3_0516	3535, WS-LC-0025	T	597.07 g	45.04 g	552 mL	1.00 mL	50 uL	
320-18986-A-16	MCFSMW-16_0516	3535, WS-LC-0025	T	494.89 g	43.96 g	450.9 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.: 320-18986-1

SDG No.: _____

Batch Number: 110850 Batch Start Date: 05/21/16 11:40 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 05/23/16 18:20

Batch Notes	
Balance ID	QA-070
Batch Comment	0.1N NaOH:624176,
H2O ID	5/21/16
Hexane ID	0000135581
Manifold ID	5,6
Methanol ID	625009
Pipette ID	EC15219
Analyst ID - Reagent Drop	JER
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	VPM
Solvent Lot #	626675
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002736075A

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.

HPLC/LCMS Data Review Checklist

Job Number(s): 18986

Work List ID(s): 31180, 31217, 31259

Extraction Batch: 110850

Analysis Batch(es): 111859, 112007, 112205

Delivery Rank: 4

Due Date: 5-31-16

A. Calibration/Instrument Run QC	1 st Level	2 nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch#	✓	✓	
2. ICAL, CCV Frequency & Criteria met.	✓	✓	
• RF _{average} criteria appropriate for the method.	✓	✓	
• Linear Regression criteria appropriate if required ($r \geq 0.995$).	✓	✓	
• Quadratic fit criteria appropriate if required ($r^2 \geq 0.990$).			✓
• For Linear Regression and Quadratic fit – Does the y-intercept support ½ the reporting limit as described in CA-Q-S-005?	✓	✓	
• All curve points show calculated concentrations.	✓	✓	
3. Peaks correctly ID'd by data system.	✓	✓	
5. Tune check frequency & criteria met and Tune check report attached.	✓	✓	
B. QA/QC			
1. Are all QC samples properly linked in TALS?	✓	✓	
2. Method blank, LCS/LCSD and MS/SD frequencies met.	✓	✓	
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.	✓	✓	
4. Are MS/MSD recoveries and RPD within control limits?	✓	✓	
5. Holding Times were met for prep and analytical.	✓	✓	
6. IS/Surrogate recoveries meet criteria or properly noted.	✓	✓	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# <u>53732</u>	✓	✓	
2. Do results make sense (e.g. dilutions, etc.)?	✓	✓	
3. Have all flags been reviewed for appropriateness?	✓	✓	
4. For level 3 and 4 reports, have forms and raw data been reviewed?		✓	
5. Was QC Checker run for this job?	✓	✓	

*Upon completion of this checklist, the reviewer must scan and attach the checklist to the TALS job.

1st Level (Analyst): JRB

Date: 6-3-16

2nd Level Reviewer: Meway

Date: 6/3/2016

80

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-110850

Analyst: Reed, Jonathan E



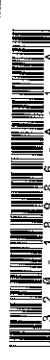

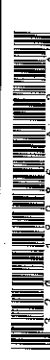





Batch Open: 5/21/2016 11:40:10AM

Method Code: 320-3535_IVWT-320

Batch End: 5-23-16 18:20

Solid-Phase Extraction (SPE)

Re 6/31

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs		Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
				Rcvd	Adj1 Adj2					
1 MB-320-110850/1 N/A	N/A		500.00 mL 1.00 mL			N/A	N/A	N/A		
2 LCS-320-110850/2 N/A	N/A		500.00 mL 1.00 mL			N/A	N/A	N/A		
3 320-18986-A-1 (PFC_IDA_DOD5)	N/A (320-18986-1)	577.62 g 44.61 g	533 mL 1.00 mL			5/25/16	5_Day_RUSH	4		
4 320-18986-A-2 (PFC_IDA_DOD5)	N/A (320-18986-1)	561.65 g 44.46 g	517.2 mL 1.00 mL			5/25/16	5_Day_RUSH	4		
5 320-18986-A-3 (PFC_IDA_DOD5)	N/A (320-18986-1)	580.59 g 44.99 g	535.6 mL 1.00 mL			5/25/16	5_Day_RUSH	4		
6 320-18986-A-4 (PFC_IDA_DOD5)	N/A (320-18986-1)	572.41 g 45.18 g	527.2 mL 1.00 mL			5/25/16	5_Day_RUSH	4		
7 320-18986-A-5 (PFC_IDA_DOD5)	N/A (320-18986-1)	554.23 g 45.09 g	509.1 mL 1.00 mL			5/25/16	5_Day_RUSH	4		
8 320-18986-A-6 (PFC_IDA_DOD5)	N/A (320-18986-1)	587.10 g 45.09 g	542 mL 1.00 mL			5/25/16	5_Day_RUSH	4		
9 320-18986-A-7 (PFC_IDA_DOD5)	N/A (320-18986-1)	553.52 g 44.39 g	509.1 mL 1.00 mL			5/25/16	5_Day_RUSH	4	10X	
10 320-18986-A-8 (PFC_IDA_DOD5)	N/A (320-18986-1)	567.69 g 45.57 g	522.1 mL 1.00 mL			5/25/16	5_Day_RUSH	4	10X	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)







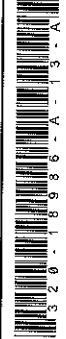
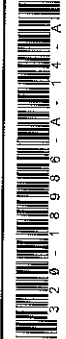

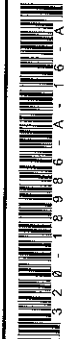
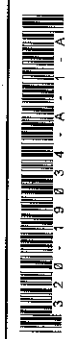

Analyst: Reed, Jonathan E

Batch Number: 320-110850

Batch Open: 5/21/2016 11:40:10AM

Method Code: 320-3535_IVWT-320

Batch End:

Line #	Sample ID	Weight (g)	Volume (mL)	Lot #	5_Day_RUSH	Date	Barcode
11	320-18986-A-9 (PFC_IDA_DOD5)	500.15 g 43.90 g	456.3 mL 1.00 mL	N/A (320-18986-1)	4	5/25/16	
12	320-18986-A-10 (PFC_IDA_DOD5)	593.98 g 44.66 g	549.3 mL 1.00 mL	N/A (320-18986-1)	4	5/25/16	
13	320-18986-A-11 (PFC_IDA_DOD5)	581.11 g 45.25 g	535.9 mL 1.00 mL	N/A (320-18986-1)	4	5/25/16	
14	320-18986-A-12 (PFC_IDA_DOD5)	592.26 g 44.63 g	547.6 mL 1.00 mL	N/A (320-18986-1)	4	5/25/16	
15	320-18986-A-12-MS (PFC_IDA_DOD5)	569.10 g 45.26 g	523.8 mL 1.00 mL	N/A (320-18986-1)	4	5/25/16	
16	320-18986-A-12-MSD (PFC_IDA_DOD5)	594.07 g 44.86 g	549.2 mL 1.00 mL	N/A (320-18986-1)	4	5/25/16	
17	320-18986-A-13 (PFC_IDA_DOD5)	581.69 g 44.83 g	536.9 mL 1.00 mL	N/A (320-18986-1)	4	5/25/16	
18	320-18986-A-14 (PFC_IDA_DOD5)	581.77 g 44.76 g	537 mL 1.00 mL	N/A (320-18986-1)	4	5/25/16	
19	320-18986-A-15 (PFC_IDA_DOD5)	597.07 g 45.04 g	552 mL 1.00 mL	N/A (320-18986-1)	4	5/25/16	
20	320-18986-A-16 (PFC_IDA_DOD5)	494.89 g 43.96 g	450.9 mL 1.00 mL	N/A (320-18986-1)	4	5/25/16	
21	320-19034-A-1 N/A	573.42 g 45.04 g	528.4 mL 1.00 mL	N/A	N/A	N/A	
22	320-19034-A-2 N/A	560.43 g 44.80 g	515.6 mL 1.00 mL	N/A	N/A	N/A	

4X
4X
40X
40X

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)



Batch Number: 320-110850

Batch Open: 5/21/2016 11:40:10AM

Analyst: Reed, Jonathan E

Method Code: 320-3535_IVWT-320

Batch End:

23	320-19034-A-3 N/A	N/A	562.00 g	517.3 mL				N/A	N/A	N/A	
			44.68 g	1.00 mL							
24	320-19034-A-4 N/A	N/A	556.49 g	511.9 mL				N/A	N/A	N/A	
			44.64 g	1.00 mL							

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-110850

Analyst: Reed, Jonathan E

Batch Open: 5/21/2016 11:40:10AM

Method Code: 320-3535_JVWT-320

Batch End:

	Batch Notes
Manifold ID	5,6
Methanol ID	625009
Hexane ID	0000135581
Sodium Hypochlorite ID	NA
First Start time	NA
First End time	NA
Balance ID	QA-070
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002736075A
H2O ID	5/21/16
Pipette ID	EC15219
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	626675
Analyst ID - Reagent Drop	JER
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	VPM
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
NaCl ID	NA

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-110850
Method Code: 320-3535_I/VWT-320

Analyst: Reed, Jonathan E

Batch Open: 5/21/2016 11:40:10AM

Batch End:

Lot Number: W51003025

Batch Comment: 0.1N NaOH:624176,

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Reed, Jonathan E

Batch Number: 320-110850

Batch Open: 5/21/2016 11:40:10AM

Method Code: 320-3535_IWWT-320

Batch End:

Comments

320-18986-A-1	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-2	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-3	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-4	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-5	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-6	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-7	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-8	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-9	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-10	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-11	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-12	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-12~MS	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-12~MSD	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-13	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-14	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-15	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-18986-A-16	Method Comments: Q5Rev111213_StdVarApp_30day disposal

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Reed, Jonathan E

Batch Number: 320-110850

Method Code: 320-3535_MWWT-320

Batch Open: 5/21/2016 11:40:10AM

Batch End:

Reagent Additions Worksheet

Sample ID	Reagent Name	Amount Added	Final Amount	By	Witness
MB 320-110850/1	LCMPFCSU_00040	50 uL	1.00 mL	<i>Jonathan Reed</i>	JPM 5-21-16
LCS 320-110850/2	LCMPFCSU_00040	50 uL	1.00 mL		
LCS 320-110850/2	LCPFCSU_00049	20 uL	1.00 mL		
320-18986-A-1	LCMPFCSU_00040	50 uL	1.00 mL		
320-18986-A-2	LCMPFCSU_00040	50 uL	1.00 mL		
320-18986-A-3	LCMPFCSU_00040	50 uL	1.00 mL		
320-18986-A-4	LCMPFCSU_00040	50 uL	1.00 mL		
320-18986-A-5	LCMPFCSU_00040	50 uL	1.00 mL		
320-18986-A-6	LCMPFCSU_00040	50 uL	1.00 mL		
320-18986-A-7	LCMPFCSU_00040	50 uL	1.00 mL		
320-18986-A-8	LCMPFCSU_00040	50 uL	1.00 mL		
320-18986-A-9	LCMPFCSU_00040	50 uL	1.00 mL		
320-18986-A-10	LCMPFCSU_00040	50 uL	1.00 mL		
320-18986-A-11	LCMPFCSU_00040	50 uL	1.00 mL		
320-18986-A-12	LCMPFCSU_00040	50 uL	1.00 mL		
320-18986-A-12 MS	LCMPFCSU_00040	50 uL	1.00 mL		
320-18986-A-12 MS	LCPFCSU_00049	20 uL	1.00 mL		
320-18986-A-12 MSD	LCMPFCSU_00040	50 uL	1.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-110850

Analyst: Reed, Jonathan E

Batch Open: 5/21/2016 11:40:10AM

Batch End:

Method Order: 320-3535_IJAWT-300

Sample ID	LCMPFCSU_00040	50 uL	1.00 mL	5-21-16	VPM 5-21-16
320-18986-A-13	LCMPFCSU_00040	50 uL	1.00 mL		
320-18986-A-14	LCMPFCSU_00040	50 uL	1.00 mL		
320-18986-A-15	LCMPFCSU_00040	50 uL	1.00 mL		
320-18986-A-16	LCMPFCSU_00040	50 uL	1.00 mL		
320-19034-A-1	LCMPFCSU_00040	50 uL	1.00 mL		
320-19034-A-2	LCMPFCSU_00040	50 uL	1.00 mL		
320-19034-A-3	LCMPFCSU_00040	50 uL	1.00 mL		
320-19034-A-4	LCMPFCSU_00040	50 uL	1.00 mL		

Other Reagents:

Reagent

Amount/Units

Lot#:

Preparation Batch Number(s): 320-110850 Test: PFC-1

Earliest Holding Time: 5/23/16

Sample List Tab		1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method		✓	✓
All necessary NCMs filed (including holding time)		NA	NA
Method/sample/login/QAS checked and correct		✓	✓
Worksheet Tab		1 st Level Reviewer	2 nd 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		1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS		✓	✓
All spike amounts correct and added to necessary samples and QC		✓	✓
Batch Information		1 st Level Reviewer	2 nd Level Reviewer
Date and time accurate and entered into TALS correctly		✓	✓
All necessary 'batch information' complete and entered into TALS correctly		✓	✓

1st Level Reviewer: HJA

Date: 5-24-16

2nd Level Reviewer: SNE

Date: 5/24/16

Comments: _____

Shipping and Receiving Documents

Chain of Custody Record

Client Information		Lab PM Johnston, Michelle A		Carrier Tracking No(s) 280-48902-18075 1	
Client Contact Mike Dryden		E-Mail michelle.johnston@testamericainc.com		Page Page 1 of 1	
Company Earth Toxics, Inc		Address: PO BOX 3382		Job #	
City Logan		State, Zip UT, 84321		Preservation Codes: A - HCL g - NaOH j - Zn Acetate k - Nitric Acid l - NaHSO4 m - MeOH n - Amchlor o - Ascorbic Acid p - Ice q - DI Water r - MCAA s - EDTA t - EDA Other:	
Phone: Email: mdryden@earthtoxics.com		Project # 28014493		Special Instructions/Note:	
Site: Groundwater		SSOW#		320-18986 Chain of Custody	
Due Date Requested:		TAT Requested (days):		Analysis Requested	
Purchase Order Requested		PO #		PFOS, PFOA, PFNA, PFHS, PFHxPA & PFBS	
WO #		Project #		Barcode	
Sample Date		Sample Time		Sample Type (C=Comp, G=Grab)	
Sample Date		Sample Time		Matrix (W=water, S=solid, O=wastewater, BT=Biological, AS=Asbestos)	
5-17-16		0805		W	
5-17-16		0810		W	
5-17-16		0911		W	
5-17-16		1011		W	
5-17-16		1121		W	
5-17-16		1231		W	
5-17-16		1226		W	
5-17-16		1436		W	
Sample Identification		Sample Date		Sample Time	
FB051716		5-17-16		0805	
EB051716		5-17-16		0810	
MCFSMW-14-0516		5-17-16		0911	
46MWD3-0516		5-17-16		1011	
46MW01-0516		5-17-16		1121	
46MW02-0516		5-17-16		1121	
46MW05-0516		5-17-16		1231	
46MW04-0516		5-17-16		1226	
MCFSMW-17-0516		5-17-16		1436	
Possible Hazard Identifier		Poison B		Unknown	
Non-Hazardable		Flammable		Skin Irritant	
Deliverable Requested: I, II, III, IV, Other (specify)		Empty XLT Relinquished by		Relinquished by	
Date/Time		Date		Time	
5-17-16 1600		5/17/16		1600	
5/18/16 1800		5/18/16		1800	
Company		Company		Company	
Kestrel		Kestrel		Kestrel	
OBER		OBER		OBER	
Received by		Received by		Received by	
Date/Time		Date/Time		Date/Time	
5/17/16 1600		5/17/16 1600		5/17/16 1600	
5/19/16 930		5/19/16 930		5/19/16 930	
Company		Company		Company	
Kestrel		Kestrel		Kestrel	
OBER		OBER		OBER	
Cooler Temperature(s) C and Other Remarks		Cooler Temperature(s) C and Other Remarks		Cooler Temperature(s) C and Other Remarks	
Custody Seal No.:		Custody Seal No.:		Custody Seal No.:	
Δ Yes Δ No		Δ Yes Δ No		Δ Yes Δ No	
* labeled 901 at 5-19-16		* labeled 901 at 5-19-16		* labeled 901 at 5-19-16	

Chain of Custody Record

Client Information Client Contact: Mike Dryden Company: Earth Toxics, Inc. Address: PO BOX 3382 City: Logan State, Zip: UT, 84321 Phone: [blank] Email: mdryden@earthtoxics.com Project Name: Ensafe-NWS - Earle, NJ PFCs Site: Groundwater		Lab PM: Johnstone, Michelle A E-Mail: michelle.johnstone@testamericainc.com Camer Tracking No(s): 280-48902-18075 1 Page: Page 1 of 2 Job #:	
Due Date Requested: TAT Requested (days): PO # Purchase Order Requested WO # Project # 28014493 SSOW#		Analysis Requested PFOS, PFOA, PFNA, PFHxS, PFHpA & PFBS 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 Other: 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)	
Sample Identification FB051616 EB051616 MCF5MW-4-0516 MCF5MW-5-0516 MCF5MW-5-0516 DUP MCF5MW-3-0516 MCF5MW-16-0516		Special Instructions/Note: Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months Special Instructions/QC Requirements:	
Sample Date 5-16-16 5-16-16 5-16-16 5-16-16 5-16-16 5-16-16	Sample Time 1000 1005 1111 1246 1246 1356	Sample Type (C=comp, G=grab) G G G G G G	Matrix (W=water, S=solid, O=soil, B=soil, A=air) W W W W W W
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant Deliverable Requested: I, II, III, IV, Other (specify)		Empty Kit Relinquished by: Relinquished by: [Signature] Relinquished by: [Signature] Relinquished by: [Signature]	
Date/Time 5-16-16 1705 5-17-16 1800		Date/Time 5/16/16 0980 5/19/16 0980	
Date/Time 5-16-16 1705 5-17-16 1800		Date/Time 5/16/16 0980 5/19/16 0980	
Relinquished by: [Signature] Relinquished by: [Signature]		Relinquished by: [Signature] Relinquished by: [Signature]	
Custody Seals Intact Δ Yes Δ No		Cooler Temperature(s) °C and Other Remarks: 6.8°C	

Login Sample Receipt Checklist

Client: Earth Toxics, Inc

Job Number: 320-18986-1

Login Number: 18986
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.	False	Cooler temperature outside required temperature criteria.
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.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Sample	Sample Name	Specific Method	CAS Number	Analyte	Result	Units	Qualifier	Limit	Reports To	Dilution	Result Basis	Batch	Sampled	Prepared	Analyzed	Analysis
320-18986-12	MCFSMW-4_0516	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	67	ng/L	M	1.2	MDL	1.0	Total	112205	5/16/2016 11:11 AM	5/21/2016 11:40 AM	6/2/2016 4:03 PM	Perfluorinated Hydrocarbons
320-18986-12	MCFSMW-4_0516	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	160	ng/L	M	0.68	MDL	1.0	Total	112205	5/16/2016 11:11 AM	5/21/2016 11:40 AM	6/2/2016 4:03 PM	Perfluorinated Hydrocarbons
320-18986-13	MCFSMW-5_0516	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	12	ng/L		0.85	MDL	1.0	Total	112205	5/16/2016 12:46 PM	5/21/2016 11:40 AM	6/2/2016 4:24 PM	Perfluorinated Hydrocarbons
320-18986-13	MCFSMW-5_0516	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	11	ng/L		0.75	MDL	1.0	Total	112205	5/16/2016 12:46 PM	5/21/2016 11:40 AM	6/2/2016 4:24 PM	Perfluorinated Hydrocarbons
320-18986-13	MCFSMW-5_0516	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	45	ng/L	M	0.81	MDL	1.0	Total	112205	5/16/2016 12:46 PM	5/21/2016 11:40 AM	6/2/2016 4:24 PM	Perfluorinated Hydrocarbons
320-18986-13	MCFSMW-5_0516	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	2.9	ng/L		0.61	MDL	1.0	Total	112205	5/16/2016 12:46 PM	5/21/2016 11:40 AM	6/2/2016 4:24 PM	Perfluorinated Hydrocarbons
320-18986-13	MCFSMW-5_0516	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	37	ng/L	M	1.2	MDL	1.0	Total	112205	5/16/2016 12:46 PM	5/21/2016 11:40 AM	6/2/2016 4:24 PM	Perfluorinated Hydrocarbons
320-18986-13	MCFSMW-5_0516	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	23	ng/L	M	0.70	MDL	1.0	Total	112205	5/16/2016 12:46 PM	5/21/2016 11:40 AM	6/2/2016 4:24 PM	Perfluorinated Hydrocarbons
320-18986-14	MCFSMW-5_0516 DUP	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	12	ng/L		0.85	MDL	1.0	Total	112205	5/16/2016 12:46 PM	5/21/2016 11:40 AM	6/2/2016 5:07 PM	Perfluorinated Hydrocarbons
320-18986-14	MCFSMW-5_0516 DUP	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	13	ng/L		0.75	MDL	1.0	Total	112205	5/16/2016 12:46 PM	5/21/2016 11:40 AM	6/2/2016 5:07 PM	Perfluorinated Hydrocarbons
320-18986-14	MCFSMW-5_0516 DUP	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	42	ng/L	M	0.81	MDL	1.0	Total	112205	5/16/2016 12:46 PM	5/21/2016 11:40 AM	6/2/2016 5:07 PM	Perfluorinated Hydrocarbons
320-18986-14	MCFSMW-5_0516 DUP	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	2.7	ng/L		0.61	MDL	1.0	Total	112205	5/16/2016 12:46 PM	5/21/2016 11:40 AM	6/2/2016 5:07 PM	Perfluorinated Hydrocarbons
320-18986-14	MCFSMW-5_0516 DUP	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	38	ng/L	M	1.2	MDL	1.0	Total	112205	5/16/2016 12:46 PM	5/21/2016 11:40 AM	6/2/2016 5:07 PM	Perfluorinated Hydrocarbons
320-18986-14	MCFSMW-5_0516 DUP	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	21	ng/L	M	0.70	MDL	1.0	Total	112205	5/16/2016 12:46 PM	5/21/2016 11:40 AM	6/2/2016 5:07 PM	Perfluorinated Hydrocarbons
320-18986-15	MCFSMW-3_0516	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	43	ng/L		0.83	MDL	1.0	Total	111859	5/16/2016 1:56 PM	5/21/2016 11:40 AM	5/29/2016 4:58 PM	Perfluorinated Hydrocarbons
320-18986-15	MCFSMW-3_0516	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	30	ng/L		0.73	MDL	1.0	Total	111859	5/16/2016 1:56 PM	5/21/2016 11:40 AM	5/29/2016 4:58 PM	Perfluorinated Hydrocarbons
320-18986-15	MCFSMW-3_0516	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1400	ng/L	D M	3.2	MDL	4.0	Total	112205	5/16/2016 1:56 PM	5/21/2016 11:40 AM	6/2/2016 1:55 PM	Perfluorinated Hydrocarbons
320-18986-15	MCFSMW-3_0516	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	7.2	ng/L		0.59	MDL	1.0	Total	111859	5/16/2016 1:56 PM	5/21/2016 11:40 AM	5/29/2016 4:58 PM	Perfluorinated Hydrocarbons
320-18986-15	MCFSMW-3_0516	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	690	ng/L	D M	4.6	MDL	4.0	Total	112205	5/16/2016 1:56 PM	5/21/2016 11:40 AM	6/2/2016 1:55 PM	Perfluorinated Hydrocarbons
320-18986-15	MCFSMW-3_0516	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	120	ng/L	M	0.68	MDL	1.0	Total	111859	5/16/2016 1:56 PM	5/21/2016 11:40 AM	5/29/2016 4:58 PM	Perfluorinated Hydrocarbons
320-18986-16	MCFSMW-16_0516	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	30	ng/L		1.0	MDL	1.0	Total	111859	5/16/2016 3:46 PM	5/21/2016 11:40 AM	5/29/2016 5:19 PM	Perfluorinated Hydrocarbons
320-18986-16	MCFSMW-16_0516	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	37	ng/L		0.89	MDL	1.0	Total	111859	5/16/2016 3:46 PM	5/21/2016 11:40 AM	5/29/2016 5:19 PM	Perfluorinated Hydrocarbons
320-18986-16	MCFSMW-16_0516	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	560	ng/L	M	0.96	MDL	1.0	Total	111859	5/16/2016 3:46 PM	5/21/2016 11:40 AM	5/29/2016 5:19 PM	Perfluorinated Hydrocarbons
320-18986-16	MCFSMW-16_0516	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	2.8	ng/L		0.73	MDL	1.0	Total	111859	5/16/2016 3:46 PM	5/21/2016 11:40 AM	5/29/2016 5:19 PM	Perfluorinated Hydrocarbons
320-18986-16	MCFSMW-16_0516	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	750	ng/L	D M	5.7	MDL	4.0	Total	112205	5/16/2016 3:46 PM	5/21/2016 11:40 AM	6/2/2016 2:16 PM	Perfluorinated Hydrocarbons
320-18986-16	MCFSMW-16_0516	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	330	ng/L	M	0.83	MDL	1.0	Total	111859	5/16/2016 3:46 PM	5/21/2016 11:40 AM	5/29/2016 5:19 PM	Perfluorinated Hydrocarbons



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:	_____
Organization:	_____
Email:	_____ Phone: _____

Record Information:

Installation:	_____
Program:	ERN BRAC Supporting: <input type="checkbox"/> MRP <input type="checkbox"/> LUC <input type="checkbox"/> RAD <input type="checkbox"/> POL
Document Title:	_____
AOC, SITE, SWMU, UST, UXO:	_____
Sample Delivery Groups (SDGs):	_____
Document Date:	_____ Number of Pages: _____
Contract Number:	_____ CTO/DO Number: _____
Author/Affiliation:	_____
Distribution/Availability Statement:	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/> 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: 320-18986-1
Matrix: Groundwater and 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 groundwater and potable water samples collected in May 2016 using the following reference documents:

- *Internal Draft Perfluorinated Compound Groundwater Investigation Sampling and Analysis Plan, Site 46 Military Sealift Command, Naval Weapons Station Earle Newport, Colts Neck, New Jersey*, Resolution Consultants (December 2015).
- Laboratory standard operating procedure (SOP) *Perfluorinated Compounds (PFCs) in Water, Soils, Sediments, and Tissue [Method 37 Modified]*, TestAmerica, Sacramento, California, WS-LC-0025, Revision 1.5, (November 2015).
- *Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data review*, United States Environmental Protection Agency, (September 2011).
- *Department of Defense Quality Systems Manual for Environmental Laboratories*, Version 5.0. (July 2013).

Validation was performed on potable water and quality control (QC) samples, summarized in Attachment A, Table A-1. Samples discussed in this validation report were analyzed and reported as definitive data. A full deliverable data packages, QC summaries and raw data, were submitted for data review.

The data were evaluated based on the following review elements:

- | | |
|---|--|
| * Data completeness | * Holding times |
| * Sample receipt and preservation | * Isotope dilution recoveries |
| * Initial calibration | * Laboratory method blanks |
| * Initial calibration verification | * Field Blanks |
| * Continuing calibration verification | * Field duplicate precision |
| * Laboratory control sample/laboratory control sample duplicate results | * Matrix spike/matrix spike duplicates (MS/MSDs) |
| | * 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

The following samples were received at the laboratory at a temperature of 6.8 degrees Celsius, which was slightly above the 0-6 degrees control limit: FB051616, EB051616, MCFSMW-4_0516, MCFSMW-5_0516, MCFSMW-5_0516 DUP, MCFSMW-3_0516, and MCFSMW-16_0516. All positive and undetected results were qualified as estimated "J" and "UJ"; respectively and may be biased low.

Overall Assessment

The data from SDG 320-18986-1 was reviewed independently from the laboratory to assess data quality. Seven samples were qualified as estimated due to slightly elevated receipt temperature and may be biased low. 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**

SDG	Lab Identification	Sample Identification	Location	Sample Date	Matrix
320189861	320-18986-1	FB051716		5/17/2016	Field Blank
320189861	320-18986-2	EB051716		5/17/2016	Equipment Blank
320189861	320-18986-3	MCFSMW-14_0516	MCFSMW14	5/17/2016	Groundwater
320189861	320-18986-4	46MW03_0516	46MW03	5/17/2016	Groundwater
320189861	320-18986-5	46MW01_0516	46MW01	5/17/2016	Groundwater
320189861	320-18986-6	46MW02_0516	46MW02	5/17/2016	Groundwater
320189861	320-18986-7	46MW05_0516	46MW05	5/17/2016	Groundwater
320189861	320-18986-8	46MW04_0516	46MW04	5/17/2016	Groundwater
320189861	320-18986-9	MCFSMW-17_0516	MCFSMW17	5/17/2016	Groundwater
320189861	320-18986-10	FB051616		5/16/2016	Field Blank
320189861	320-18986-11	EB051616		5/16/2016	Equipment Blank
320189861	320-18986-12	MCFSMW-4_0516	MCFSMW04	5/16/2016	Groundwater
320189861	320-18986-13	MCFSMW-5_0516	MCFSMW05	5/16/2016	Groundwater
320189861	320-18986-14	MCFSMW-5_0516 DUP	MCFSMW05	5/16/2016	Duplicate of MCFSMW-5_0516
320189861	320-18986-15	MCFSMW-3_0516	MCFSMW03	5/16/2016	Groundwater
320189861	320-18986-16	MCFSMW-16_0516	MCFSMW16	5/16/2016	Groundwater

Notes:

All samples were analyzed via laboratory standard operating procedure *Perfluorinated Compounds (PFCs) in Water, Soils, Sediments, and Tissue [Method 37 Modified]*, TestAmerica, Sacramento, California, WS-LC-0025, Revision 1.5, (November 2015) for the following select list of analytes: Perfluorobutanesulfonic Acid (PFBS), Perfluoroheptanoic Acid (PFHPA), Perfluorohexanesulfonic Acid (PFHXS), Perfluorononanoic Acid (PFNA), Perfluorooctane Sulfonic Acid (PFOS), and Perfluorooctanoic Acid (PFOA).

Attachment B
Final Validated Results after Data Review

**Table B-1
Perfluorinated Compound Results – May 2016**

				Sample Delivery Group								
				Lab Identification								
				Sample Identification								
				Sample Date								
				Sample Type								
Method	Analyte	CAS No	Units	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
TA_WS-LC-0025	PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	NG_L	1.9	U		1.9	U		1.9	U	
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	NG_L	1.9	U		1.9	U		1.9	U	
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	NG_L	1.9	U		1.9	U		0.94	J	
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	NG_L	1.9	U		1.9	U		1.9	U	
TA_WS-LC-0025	PERFLUOROOCTANE SULFONIC ACID (PFOS)	1763-23-1	NG_L	2.8	U		2.9	U		2.8	U	
TA_WS-LC-0025	PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	NG_L	1.9	U		1.9	U		1.9	U	

				Sample Delivery Group								
				Lab Identification								
				Sample Identification								
				Sample Date								
				Sample Type								
Method	Analyte	CAS No	Units	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
TA_WS-LC-0025	PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	NG_L	1.9	U		2	U		11		
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	NG_L	1.9	U		2	U		12		
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	NG_L	2.1	J		2	U		140		
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	NG_L	1.9	U		2	U		10		
TA_WS-LC-0025	PERFLUOROOCTANE SULFONIC ACID (PFOS)	1763-23-1	NG_L	3.1	J		3.5	J		330		
TA_WS-LC-0025	PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	NG_L	1.9	U		2	U		38		

**Table B-1 (Continued)
Perfluorinated Compound Results – May 2016**

				Sample Delivery Group			320189861			320189861			320189861		
				Lab Identification			320-18986-7			320-18986-8			320-18986-9		
				Sample Identification			46MW05_0516			46MW04_0516			MCFSMW-17_0516		
				Sample Date			5/17/2016			5/17/2016			5/17/2016		
				Sample Type			Groundwater			Groundwater			Groundwater		
Method	Analyte	CAS No	Units	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC			
TA_WS-LC-0025	PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	NG_L	56			21			2.1	J				
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	NG_L	23			11			6.4					
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	NG_L	740			770			12					
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	NG_L	2.2	J		8.6			2.2	U				
TA_WS-LC-0025	PERFLUOROOCTANE SULFONIC ACID (PFOS)	1763-23-1	NG_L	3100			2900			26					
TA_WS-LC-0025	PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	NG_L	130			30			26					

				Sample Delivery Group			320189861			320189861			320189861		
				Lab Identification			320-18986-10			320-18986-11			320-18986-12		
				Sample Identification			FB051616			EB051616			MCFSMW-4_0516		
				Sample Date			5/16/2016			5/16/2016			5/16/2016		
				Sample Type			Field Blank			Equipment Blank			Groundwater		
Method	Analyte	CAS No	Units	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC			
TA_WS-LC-0025	PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	NG_L	1.8	UJ	t	1.9	UJ	t	21	J	t			
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	NG_L	1.8	UJ	t	1.9	UJ	t	77	J	t			
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	NG_L	1.4	J	t	1.9	UJ	t	220	J	t			
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	NG_L	1.8	UJ	t	1.9	UJ	t	11	J	t			
TA_WS-LC-0025	PERFLUOROOCTANE SULFONIC ACID (PFOS)	1763-23-1	NG_L	10	J	t	7.6	J	t	67	J	t			
TA_WS-LC-0025	PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	NG_L	1.8	UJ	t	1.9	UJ	t	160	J	t			

**Table B-1 (Continued)
Perfluorinated Compound Results – May 2016**

				Sample Delivery Group			320189861			320189861		
				Lab Identification			320-18986-13			320-18986-14		
				Sample Identification			MCFSMW-5_0516			MCFSMW-5_0516DUP		
				Sample Date			5/16/2016			5/16/2016		
				Sample Type			Groundwater			Duplicate		
				Groundwater			Groundwater			Groundwater		
Method	Analyte	CAS No	Units	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
TA_WS-LC-0025	PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	NG_L	12	J	t	12	J	t	43	J	t
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	NG_L	11	J	t	13	J	t	30	J	t
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	NG_L	45	J	t	42	J	t	1400	J	t
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	NG_L	2.9	J	t	2.7	J	t	7.2	J	t
TA_WS-LC-0025	PERFLUOROOCTANE SULFONIC ACID (PFOS)	1763-23-1	NG_L	37	J	t	38	J	t	690	J	t
TA_WS-LC-0025	PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	NG_L	23	J	t	21	J	t	120	J	t

				Sample Delivery Group			320189861		
				Lab Identification			320-18986-16		
				Sample Identification			MCFSMW-16_0516		
				Sample Date			5/16/2016		
				Sample Type			Groundwater		
Method	Analyte	CAS No	Units	Result	Qual	RC	Result	Qual	RC
TA_WS-LC-0025	PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	NG_L	30	J	t			
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	NG_L	37	J	t			
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	NG_L	480	J	t			
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	NG_L	2.8	J	t			
TA_WS-LC-0025	PERFLUOROOCTANE SULFONIC ACID (PFOS)	1763-23-1	NG_L	750	J	t			
TA_WS-LC-0025	PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	NG_L	330	J	t			

Notes:

ng/L = Nanograms per liter

Qual = Final qualifier

RC = Data qualification reason code

U = **Undetected** — The parameter was analyzed but undetected.

J = **Estimated Value** — One or more quality control parameters were outside control limits or the analyte concentration was less than the limit of quantitation.

Qualification Reason Codes

t = Temperature preservation outlier

DODCMD_ID	INSTALLATION_ID	SDG	SITE_NAME	NORM_SITE_NAME	LOCATION_NAME	LOCATION_TYPE	LOCATION_TYPE_DESC	COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE	ANALYTICAL_METHOD_GRP_DESC
MID_ATLANTIC	EARLE_NWS	320189861								N62470-11-D-8013	WE09	RESOLUTION CONSULTANTS	EB051616	WQ	Water for QC samples	16-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320189861	SITE 00046	SITE 00046	MCFSMW14	WLM	Monitoring well	575518	509332	N62470-11-D-8013	WE09	RESOLUTION CONSULTANTS	MCFSMW-14_0516	WG	Ground water	17-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320189861	SITE 00046	SITE 00046	46MW02	WLM	Monitoring well	575683	509198.9999	N62470-11-D-8013	WE09	RESOLUTION CONSULTANTS	46MW02_0516	WG	Ground water	17-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320189861								N62470-11-D-8013	WE09	RESOLUTION CONSULTANTS	FB051616	WQ	Water for QC samples	16-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320189861	SITE 00046	SITE 00046	MCFSMW14	WLM	Monitoring well	575518	509332	N62470-11-D-8013	WE09	RESOLUTION CONSULTANTS	MCFSMW-14_0516	WG	Ground water	17-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320189861	SITE 00046	SITE 00046	MCFSMW04	WLM	Monitoring well	575468	508821	N62470-11-D-8013	WE09	RESOLUTION CONSULTANTS	MCFSMW-4_0516	WG	Ground water	16-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320189861								N62470-11-D-8013	WE09	RESOLUTION CONSULTANTS	EB051616	WQ	Water for QC samples	16-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320189861	SITE 00046	SITE 00046	46MW04	WLM	Monitoring well	575729	509071.0001	N62470-11-D-8013	WE09	RESOLUTION CONSULTANTS	46MW04_0516	WG	Ground water	17-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320189861	SITE 00046	SITE 00046	46MW05	WLM	Monitoring well	575824	508961	N62470-11-D-8013	WE09	RESOLUTION CONSULTANTS	46MW05_0516	WG	Ground water	17-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320189861	SITE 00046	SITE 00046	MCFSMW05	WLM	Monitoring well	575606	508855	N62470-11-D-8013	WE09	RESOLUTION CONSULTANTS	MCFSMW-5_0516	WG	Ground water	16-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320189861	SITE 00046	SITE 00046	MCFSMW03	WLM	Monitoring well	575579	508716	N62470-11-D-8013	WE09	RESOLUTION CONSULTANTS	MCFSMW-3_0516	WG	Ground water	16-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320189861								N62470-11-D-8013	WE09	RESOLUTION CONSULTANTS	FB051716	WQ	Water for QC samples	17-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320189861								N62470-11-D-8013	WE09	RESOLUTION CONSULTANTS	FB051716	WQ	Water for QC samples	17-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320189861	SITE 00046	SITE 00046	MCFSMW04	WLM	Monitoring well	575468	508821	N62470-11-D-8013	WE09	RESOLUTION CONSULTANTS	MCFSMW-4_0516	WG	Ground water	16-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320189861	SITE 00046	SITE 00046	MCFSMW05	WLM	Monitoring well	575606	508855	N62470-11-D-8013	WE09	RESOLUTION CONSULTANTS	MCFSMW-5_0516 DUP	WG	Ground water	16-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320189861	SITE 00046	SITE 00046	46MW04	WLM	Monitoring well	575729	509071.0001	N62470-11-D-8013	WE09	RESOLUTION CONSULTANTS	46MW04_0516	WG	Ground water	17-May-16	Perfluoroalkyl Compounds