



**Groundwater Sample Results,
Combined Level 2 and Level 4 Laboratory Report,
Electronic Data Deliverable, Data Validation Report,
and the Sample Location Report, SDG 320-16660-1**

*Naval Weapons Station Earle
Colts Neck, New Jersey*

July 2019

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NWS EARLE
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REVISED LABORATORY DATA PACKAGE, 320-16660-1, NWS EARLE NJ
1/15/2016
TEST AMERICA

ANALYTICAL REPORT

Job Number: 320-16660-1

Job Description: NWS Earle Site 46

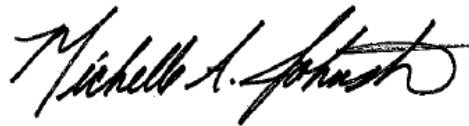
For:

Earth Toxics, Inc

PO BOX 3382

Logan, UT 84321

Attention: Mike Dryden



Approved for release.
Michelle A Johnston
Project Manager II
1/15/2016 1:37 PM

Michelle A Johnston, Project Manager II
4955 Yarrow Street, Arvada, CO, 80002

(303)736-0110

michelle.johnston@testamericainc.com

01/15/2016

Revision: 1

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

The test results in this report relate only to the samples in this report and meet all requirements of NELAP, 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.

TestAmerica Laboratories, Inc.

TestAmerica Sacramento 880 Riverside Parkway, West Sacramento, CA 95605

Tel (916) 373-5600 Fax (916) 372-1059 www.testamericainc.com



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Definitions/Glossary

Client: Earth Toxics, Inc
Project/Site: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Qualifiers

LCMS

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

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: NWS Earle Site 46
Report Number: 320-16660-1

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.

Revision - 01/15/2016

The Perfluorinated Hydrocarbons (PFCs) section of the case narrative was revised to include a comment explaining the SOP deviation performed by the laboratory.

Sample Receipt

Seven samples were received on 12/31/2015 11:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.6°C. No anomalies were encountered during sample receipt.

Perfluorinated Hydrocarbons (PFCs)

Samples 46MW01_1215 (320-16660-1), 46MW02_1215 (320-16660-2), 46MW03_1215 (320-16660-3), 46MW03_1215X (320-16660-4), 46MW04_1215 (320-16660-5), 46MW05_1215 (320-16660-6) and EB123015 (320-16660-7) were analyzed for Perfluorinated Hydrocarbons (PFC) in accordance with WS-LC-0025. The samples were prepared on 01/05/2016 and analyzed on 01/07/2016 and 01/08/2016.

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

A deviation from the Standard Operating Procedure (SOP) occurred. Details are as follows: SOP WS-LC-0025 revision 1.5 section 4.5 discusses how there can be both branched and linear isomers for PFOS. The last sentence in this section states the laboratory would exclude the early eluting peak (branched isomers) from any peak integration of PFOS, until further information was available. In November of 2015 the laboratory started to incorporate the branched isomers due to increased experience with the methodology/compounds and to provide the most conservative impact to the environment.

Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for the following sample: 46MW02_1215 (320-16660-2). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recovery.

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to analytes present above the linear calibration curve, samples 46MW02_1215 (320-16660-2), 46MW04_1215 (320-16660-5) and 46MW05_1215 (320-16660-6) had to be analyzed at dilutions. Surrogate recoveries and Internal Standard recoveries could not be accurately calculated for the diluted analyses because the extracts were diluted beyond the ability to reliably quantitate recoveries. The reporting limits and method detection limits have been adjusted relative to the dilutions required.

Perfluorobutanesulfonic acid (PFBS) was detected in method blank MB 320-97259/1-A at a level that was less than one half the reporting limit; therefore, corrective action was deemed unnecessary. The value should be considered an estimate, and has been flagged "J" in accordance with the DOD QSM.

The MS/MSD associated with prep batch 320-97259 was performed on sample 46MW04_1215 (320-16660-5). The MS/MSD exhibited spike compound recoveries outside the control limits for Perfluorobutanesulfonic acid (PFBS). In addition, the MS/MSD spike compound recoveries and RPD data could not be reliably calculated for Perfluorohexanesulfonic acid (PFHxS) and Perfluorooctanesulfonic acid (PFOS) because the sample concentrations were greater than four times the spike amounts. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary. The associated data in the parent sample have been flagged "J" in accordance with the DOD QSM.

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: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Client Sample ID: 46MW01_1215

Lab Sample ID: 320-16660-1

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	1.5	J	2.6	2.1	0.91	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	50	M	4.2	3.2	1.3	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 46MW02_1215

Lab Sample ID: 320-16660-2

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	12		2.6	2.1	0.95	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	8.3		2.6	2.1	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	320		2.6	2.1	0.90	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	4.5		2.6	2.1	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1600	M J	4.1	3.1	1.3	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	29		2.6	2.1	0.77	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	8.8	J D	13	10	4.7	ng/L	5		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	7.1	J D	13	10	4.1	ng/L	5		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	340	D M	13	10	4.5	ng/L	5		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA) - DL	6.9	J D	13	10	3.4	ng/L	5		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	1500	D M	21	15	6.6	ng/L	5		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA) - DL	29	D	13	10	3.9	ng/L	5		WS-LC-0025	Total/NA

Client Sample ID: 46MW03_1215

Lab Sample ID: 320-16660-3

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	1.8	J	2.6	2.1	0.97	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	46	M	2.6	2.1	0.92	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	21	M	4.2	3.2	1.4	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 46MW03_1215X

Lab Sample ID: 320-16660-4

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	1.4	J	2.3	1.8	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	37	M	2.3	1.8	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	18	M	3.6	2.7	1.2	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 46MW04_1215

Lab Sample ID: 320-16660-5

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

Client: Earth Toxics, Inc
Project/Site: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Client Sample ID: 46MW04_1215 (Continued)

Lab Sample ID: 320-16660-5

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	33		2.2	1.8	0.82	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	17		2.2	1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	880	J M	2.2	1.8	0.78	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	15		2.2	1.8	0.58	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3300	J M	3.6	2.7	1.1	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	33		2.2	1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	28	D J	22	18	8.2	ng/L	10		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	16	J D	22	18	7.2	ng/L	10		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	830	D J	22	18	7.8	ng/L	10		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA) - DL	13	J D	22	18	5.8	ng/L	10		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	2800	D M J	36	27	11	ng/L	10		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA) - DL	33	D	22	18	6.7	ng/L	10		WS-LC-0025	Total/NA

Client Sample ID: 46MW05_1215

Lab Sample ID: 320-16660-6

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	70		2.6	2.1	0.97	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	39		2.6	2.1	0.85	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1600	M J	2.6	2.1	0.92	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	1.0	J	2.6	2.1	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2000	M J	4.2	3.2	1.3	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	94		2.6	2.1	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	55	D	13	11	4.8	ng/L	5		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	41	D	13	11	4.2	ng/L	5		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	1500	D M	13	11	4.6	ng/L	5		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	1900	D M	21	16	6.7	ng/L	5		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA) - DL	100	D	13	11	3.9	ng/L	5		WS-LC-0025	Total/NA

Client Sample ID: EB123015

Lab Sample ID: 320-16660-7

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	2.5	M	2.2	1.8	0.78	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: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Client Sample ID: EB123015 (Continued)

Lab Sample ID: 320-16660-7

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	3.9	M	3.6	2.7	1.1	ng/L	1		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: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Client Sample ID: 46MW01_1215

Lab Sample ID: 320-16660-1

Date Collected: 12/30/15 11:15

Matrix: Water

Date Received: 12/31/15 11:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	2.1	U	2.6	2.1	0.96	ng/L		01/07/16 19:49	1
Perfluoroheptanoic acid (PFHpA)	2.1	U	2.6	2.1	0.84	ng/L		01/07/16 19:49	1
Perfluorohexanesulfonic acid (PFHxS)	1.5	J	2.6	2.1	0.91	ng/L		01/07/16 19:49	1
Perfluorononanoic acid (PFNA)	2.1	U	2.6	2.1	0.69	ng/L		01/07/16 19:49	1
Perfluorooctanesulfonic acid (PFOS)	50	M	4.2	3.2	1.3	ng/L		01/07/16 19:49	1
Perfluorooctanoic acid (PFOA)	2.1	U	2.6	2.1	0.79	ng/L		01/07/16 19:49	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	67		25 - 150	01/05/16 08:39	01/07/16 19:49	1
13C4 PFOA	61		25 - 150	01/05/16 08:39	01/07/16 19:49	1
13C4 PFOS	108		25 - 150	01/05/16 08:39	01/07/16 19:49	1
13C4-PFHpA	69		25 - 150	01/05/16 08:39	01/07/16 19:49	1
18O2 PFHxS	109		25 - 150	01/05/16 08:39	01/07/16 19:49	1
13C5 PFNA	61		25 - 150	01/05/16 08:39	01/07/16 19:49	1

Client Sample Results

Client: Earth Toxics, Inc
 Project/Site: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Client Sample ID: 46MW02_1215

Lab Sample ID: 320-16660-2

Date Collected: 12/30/15 10:00

Matrix: Water

Date Received: 12/31/15 11:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	12		2.6	2.1	0.95	ng/L		01/07/16 20:11	1
Perfluoroheptanoic acid (PFHpA)	8.3		2.6	2.1	0.83	ng/L		01/07/16 20:11	1
Perfluorohexanesulfonic acid (PFHxS)	320		2.6	2.1	0.90	ng/L		01/07/16 20:11	1
Perfluorononanoic acid (PFNA)	4.5		2.6	2.1	0.68	ng/L		01/07/16 20:11	1
Perfluorooctanesulfonic acid (PFOS)	1600	M J	4.1	3.1	1.3	ng/L		01/07/16 20:11	1
Perfluorooctanoic acid (PFOA)	29		2.6	2.1	0.77	ng/L		01/07/16 20:11	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	69		25 - 150	01/05/16 08:39	01/07/16 20:11	1
13C4 PFOA	70		25 - 150	01/05/16 08:39	01/07/16 20:11	1
13C4 PFOS	82		25 - 150	01/05/16 08:39	01/07/16 20:11	1
13C4-PFHpA	71		25 - 150	01/05/16 08:39	01/07/16 20:11	1
18O2 PFHxS	103		25 - 150	01/05/16 08:39	01/07/16 20:11	1
13C5 PFNA	52		25 - 150	01/05/16 08:39	01/07/16 20:11	1

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

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	8.8	J D	13	10	4.7	ng/L		01/08/16 14:08	5
Perfluoroheptanoic acid (PFHpA)	7.1	J D	13	10	4.1	ng/L		01/08/16 14:08	5
Perfluorohexanesulfonic acid (PFHxS)	340	D M	13	10	4.5	ng/L		01/08/16 14:08	5
Perfluorononanoic acid (PFNA)	6.9	J D	13	10	3.4	ng/L		01/08/16 14:08	5
Perfluorooctanesulfonic acid (PFOS)	1500	D M	21	15	6.6	ng/L		01/08/16 14:08	5
Perfluorooctanoic acid (PFOA)	29	D	13	10	3.9	ng/L		01/08/16 14:08	5

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	156	Q	25 - 150	01/05/16 08:39	01/08/16 14:08	5

Client Sample Results

Client: Earth Toxics, Inc
 Project/Site: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Client Sample ID: 46MW03_1215

Lab Sample ID: 320-16660-3

Date Collected: 12/30/15 13:45

Matrix: Water

Date Received: 12/31/15 11:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.8	J	2.6	2.1	0.97	ng/L		01/07/16 20:32	1
Perfluoroheptanoic acid (PFHpA)	2.1	U	2.6	2.1	0.85	ng/L		01/07/16 20:32	1
Perfluorohexanesulfonic acid (PFHxS)	46	M	2.6	2.1	0.92	ng/L		01/07/16 20:32	1
Perfluorononanoic acid (PFNA)	2.1	U	2.6	2.1	0.69	ng/L		01/07/16 20:32	1
Perfluorooctanesulfonic acid (PFOS)	21	M	4.2	3.2	1.4	ng/L		01/07/16 20:32	1
Perfluorooctanoic acid (PFOA)	2.1	U	2.6	2.1	0.79	ng/L		01/07/16 20:32	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C2 PFHxA	71		25 - 150				01/05/16 08:39	01/07/16 20:32	1
13C4 PFOA	63		25 - 150				01/05/16 08:39	01/07/16 20:32	1
13C4 PFOS	117		25 - 150				01/05/16 08:39	01/07/16 20:32	1
13C4-PFHpA	77		25 - 150				01/05/16 08:39	01/07/16 20:32	1
18O2 PFHxS	121		25 - 150				01/05/16 08:39	01/07/16 20:32	1
13C5 PFNA	57		25 - 150				01/05/16 08:39	01/07/16 20:32	1

Client Sample Results

Client: Earth Toxics, Inc
 Project/Site: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Client Sample ID: 46MW03_1215X

Lab Sample ID: 320-16660-4

Date Collected: 12/30/15 13:46

Matrix: Water

Date Received: 12/31/15 11:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.4	J	2.3	1.8	0.83	ng/L		01/07/16 20:53	1
Perfluoroheptanoic acid (PFHpA)	1.8	U	2.3	1.8	0.73	ng/L		01/07/16 20:53	1
Perfluorohexanesulfonic acid (PFHxS)	37	M	2.3	1.8	0.79	ng/L		01/07/16 20:53	1
Perfluorononanoic acid (PFNA)	1.8	U	2.3	1.8	0.59	ng/L		01/07/16 20:53	1
Perfluorooctanesulfonic acid (PFOS)	18	M	3.6	2.7	1.2	ng/L		01/07/16 20:53	1
Perfluorooctanoic acid (PFOA)	1.8	U	2.3	1.8	0.68	ng/L		01/07/16 20:53	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C2 PFHxA	75		25 - 150				01/05/16 08:39	01/07/16 20:53	1
13C4 PFOA	66		25 - 150				01/05/16 08:39	01/07/16 20:53	1
13C4 PFOS	117		25 - 150				01/05/16 08:39	01/07/16 20:53	1
13C4-PFHpA	76		25 - 150				01/05/16 08:39	01/07/16 20:53	1
18O2 PFHxS	120		25 - 150				01/05/16 08:39	01/07/16 20:53	1
13C5 PFNA	56		25 - 150				01/05/16 08:39	01/07/16 20:53	1

Client Sample Results

Client: Earth Toxics, Inc
Project/Site: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Client Sample ID: 46MW04_1215

Lab Sample ID: 320-16660-5

Date Collected: 12/30/15 14:15

Matrix: Water

Date Received: 12/31/15 11:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	33		2.2	1.8	0.82	ng/L		01/07/16 21:14	1
Perfluoroheptanoic acid (PFHpA)	17		2.2	1.8	0.72	ng/L		01/07/16 21:14	1
Perfluorohexanesulfonic acid (PFHxS)	880	J M	2.2	1.8	0.78	ng/L		01/07/16 21:14	1
Perfluorononanoic acid (PFNA)	15		2.2	1.8	0.58	ng/L		01/07/16 21:14	1
Perfluorooctanesulfonic acid (PFOS)	3300	J M	3.6	2.7	1.1	ng/L		01/07/16 21:14	1
Perfluorooctanoic acid (PFOA)	33		2.2	1.8	0.67	ng/L		01/07/16 21:14	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	82		25 - 150	01/05/16 08:39	01/07/16 21:14	1
13C4 PFOA	85		25 - 150	01/05/16 08:39	01/07/16 21:14	1
13C4 PFOS	57		25 - 150	01/05/16 08:39	01/07/16 21:14	1
13C4-PFHpA	76		25 - 150	01/05/16 08:39	01/07/16 21:14	1
18O2 PFHxS	95		25 - 150	01/05/16 08:39	01/07/16 21:14	1
13C5 PFNA	51		25 - 150	01/05/16 08:39	01/07/16 21:14	1

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

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	28	D J	22	18	8.2	ng/L		01/08/16 14:30	10
Perfluoroheptanoic acid (PFHpA)	16	J D	22	18	7.2	ng/L		01/08/16 14:30	10
Perfluorohexanesulfonic acid (PFHxS)	830	D J	22	18	7.8	ng/L		01/08/16 14:30	10
Perfluorononanoic acid (PFNA)	13	J D	22	18	5.8	ng/L		01/08/16 14:30	10
Perfluorooctanesulfonic acid (PFOS)	2800	D M J	36	27	11	ng/L		01/08/16 14:30	10
Perfluorooctanoic acid (PFOA)	33	D	22	18	6.7	ng/L		01/08/16 14:30	10

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	117		25 - 150	01/05/16 08:39	01/08/16 14:30	10
18O2 PFHxS	112		25 - 150	01/05/16 08:39	01/08/16 14:30	10

Client Sample Results

Client: Earth Toxics, Inc
 Project/Site: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Client Sample ID: 46MW05_1215

Lab Sample ID: 320-16660-6

Date Collected: 12/30/15 12:15

Matrix: Water

Date Received: 12/31/15 11:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	70		2.6	2.1	0.97	ng/L		01/07/16 22:18	1
Perfluoroheptanoic acid (PFHpA)	39		2.6	2.1	0.85	ng/L		01/07/16 22:18	1
Perfluorohexanesulfonic acid (PFHxS)	1600	M J	2.6	2.1	0.92	ng/L		01/07/16 22:18	1
Perfluorononanoic acid (PFNA)	1.0	J	2.6	2.1	0.69	ng/L		01/07/16 22:18	1
Perfluorooctanesulfonic acid (PFOS)	2000	M J	4.2	3.2	1.3	ng/L		01/07/16 22:18	1
Perfluorooctanoic acid (PFOA)	94		2.6	2.1	0.79	ng/L		01/07/16 22:18	1
Isotope Dilution	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac		
13C2 PFHxA	66		25 - 150		01/05/16 08:39	01/07/16 22:18	1		
13C4 PFOA	66		25 - 150		01/05/16 08:39	01/07/16 22:18	1		
13C4 PFOS	82		25 - 150		01/05/16 08:39	01/07/16 22:18	1		
13C4-PFHpA	58		25 - 150		01/05/16 08:39	01/07/16 22:18	1		
18O2 PFHxS	83		25 - 150		01/05/16 08:39	01/07/16 22:18	1		
13C5 PFNA	58		25 - 150		01/05/16 08:39	01/07/16 22:18	1		

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

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	55	D	13	11	4.8	ng/L		01/08/16 15:33	5
Perfluoroheptanoic acid (PFHpA)	41	D	13	11	4.2	ng/L		01/08/16 15:33	5
Perfluorohexanesulfonic acid (PFHxS)	1500	D M	13	11	4.6	ng/L		01/08/16 15:33	5
Perfluorononanoic acid (PFNA)	11	U	13	11	3.4	ng/L		01/08/16 15:33	5
Perfluorooctanesulfonic acid (PFOS)	1900	D M	21	16	6.7	ng/L		01/08/16 15:33	5
Perfluorooctanoic acid (PFOA)	100	D	13	11	3.9	ng/L		01/08/16 15:33	5
Isotope Dilution	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac		
13C4 PFOS	122		25 - 150		01/05/16 08:39	01/08/16 15:33	5		
18O2 PFHxS	124		25 - 150		01/05/16 08:39	01/08/16 15:33	5		

Client Sample Results

Client: Earth Toxics, Inc
 Project/Site: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Client Sample ID: EB123015

Lab Sample ID: 320-16660-7

Date Collected: 12/30/15 13:00

Matrix: Water

Date Received: 12/31/15 11:30

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.2	1.8	0.82	ng/L		01/07/16 22:39	1
Perfluoroheptanoic acid (PFHpA)	1.8	U	2.2	1.8	0.72	ng/L		01/07/16 22:39	1
Perfluorohexanesulfonic acid (PFHxS)	2.5	M	2.2	1.8	0.78	ng/L		01/07/16 22:39	1
Perfluorononanoic acid (PFNA)	1.8	U	2.2	1.8	0.59	ng/L		01/07/16 22:39	1
Perfluorooctanesulfonic acid (PFOS)	3.9	M	3.6	2.7	1.1	ng/L		01/07/16 22:39	1
Perfluorooctanoic acid (PFOA)	1.8	U	2.2	1.8	0.67	ng/L		01/07/16 22:39	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	95		25 - 150	01/05/16 08:39	01/07/16 22:39	1
13C4 PFOA	99		25 - 150	01/05/16 08:39	01/07/16 22:39	1
13C4 PFOS	128		25 - 150	01/05/16 08:39	01/07/16 22:39	1
13C4-PFHpA	105		25 - 150	01/05/16 08:39	01/07/16 22:39	1
18O2 PFHxS	118		25 - 150	01/05/16 08:39	01/07/16 22:39	1
13C5 PFNA	103		25 - 150	01/05/16 08:39	01/07/16 22:39	1

Default Detection Limits

Client: Earth Toxics, Inc
Project/Site: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

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

Isotope Dilution Summary

Client: Earth Toxics, Inc
 Project/Site: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)					
		³ C2 PFHx (25-150)	³ C4 PFO/ (25-150)	³ C4 PFO/ (25-150)	³ C4-PFHp (25-150)	¹⁸ O2 PFHx (25-150)	³ C5 PFNA (25-150)
320-16660-1	46MW01_1215	67	61	108	69	109	61
320-16660-2	46MW02_1215	69	70	82	71	103	52
320-16660-2 - DL	46MW02_1215			156 Q			
320-16660-3	46MW03_1215	71	63	117	77	121	57
320-16660-4	46MW03_1215X	75	66	117	76	120	56
320-16660-5	46MW04_1215	82	85	57	76	95	51
320-16660-5 - DL	46MW04_1215			117		112	
320-16660-5 MS	46MW04_1215	73	79	58	74	98	51
320-16660-5 MS - DL	46MW04_1215			130		118	
320-16660-5 MSD	46MW04_1215	57	57	47	54	74	35
320-16660-5 MSD - DL	46MW04_1215			123		117	
320-16660-6	46MW05_1215	66	66	82	58	83	58
320-16660-6 - DL	46MW05_1215			122		124	
320-16660-7	EB123015	95	99	128	105	118	103
LCS 320-97259/2-A	Lab Control Sample	93	95	128	102	123	97
MB 320-97259/1-A	Method Blank	91	96	127	97	119	93

Surrogate Legend

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

QC Sample Results

Client: Earth Toxics, Inc
Project/Site: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-97259/1-A
Matrix: Water
Analysis Batch: 97577

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 97259

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorobutanesulfonic acid (PFBS)	1.01	J	2.5	2.0	0.92	ng/L		01/07/16 16:17	1
Perfluoroheptanoic acid (PFHpA)	2.0	U	2.5	2.0	0.80	ng/L		01/07/16 16:17	1
Perfluorohexanesulfonic acid (PFHxS)	2.0	U	2.5	2.0	0.87	ng/L		01/07/16 16:17	1
Perfluorononanoic acid (PFNA)	2.0	U	2.5	2.0	0.65	ng/L		01/07/16 16:17	1
Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.3	ng/L		01/07/16 16:17	1
Perfluorooctanoic acid (PFOA)	2.0	U	2.5	2.0	0.75	ng/L		01/07/16 16:17	1

Isotope Dilution	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFHxA	91		25 - 150	01/05/16 08:39	01/07/16 16:17	1
13C4 PFOA	96		25 - 150	01/05/16 08:39	01/07/16 16:17	1
13C4 PFOS	127		25 - 150	01/05/16 08:39	01/07/16 16:17	1
13C4-PFHpA	97		25 - 150	01/05/16 08:39	01/07/16 16:17	1
18O2 PFHxS	119		25 - 150	01/05/16 08:39	01/07/16 16:17	1
13C5 PFNA	93		25 - 150	01/05/16 08:39	01/07/16 16:17	1

Lab Sample ID: LCS 320-97259/2-A
Matrix: Water
Analysis Batch: 97577

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 97259

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
Perfluorobutanesulfonic acid (PFBS)	35.4	32.2		ng/L		91	50 - 150
Perfluoroheptanoic acid (PFHpA)	40.0	37.4		ng/L		94	60 - 140
Perfluorohexanesulfonic acid (PFHxS)	37.8	32.3		ng/L		85	60 - 140
Perfluorononanoic acid (PFNA)	40.0	35.7		ng/L		89	60 - 140
Perfluorooctanesulfonic acid (PFOS)	38.2	35.5		ng/L		93	60 - 140
Perfluorooctanoic acid (PFOA)	40.0	32.2		ng/L		81	60 - 140

Isotope Dilution	LCS	LCS	Limits
	%Recovery	Qualifier	
13C2 PFHxA	93		25 - 150
13C4 PFOA	95		25 - 150
13C4 PFOS	128		25 - 150
13C4-PFHpA	102		25 - 150
18O2 PFHxS	123		25 - 150
13C5 PFNA	97		25 - 150

Lab Sample ID: 320-16660-5 MS
Matrix: Water
Analysis Batch: 97577

Client Sample ID: 46MW04_1215
Prep Type: Total/NA
Prep Batch: 97259

Analyte	Sample	Sample	Spike Added	MS	MS	Unit	D	%Rec	%Rec. Limits
	Result	Qualifier		Result	Qualifier				
Perfluorobutanesulfonic acid (PFBS)	33		31.5	60.6		ng/L		86	50 - 150
Perfluoroheptanoic acid (PFHpA)	17		35.7	52.3		ng/L		100	60 - 140
Perfluorohexanesulfonic acid (PFHxS)	880	J M	33.7	870	J M 4	ng/L		-25	60 - 140
Perfluorononanoic acid (PFNA)	15		35.7	47.9		ng/L		93	60 - 140

TestAmerica Sacramento

QC Sample Results

Client: Earth Toxics, Inc
Project/Site: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

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

Lab Sample ID: 320-16660-5 MS

Matrix: Water

Analysis Batch: 97577

Client Sample ID: 46MW04_1215

Prep Type: Total/NA

Prep Batch: 97259

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	3300	J M	34.1	3390	J M 4	ng/L		186	60 - 140
Perfluorooctanoic acid (PFOA)	33		35.7	64.0		ng/L		86	60 - 140
Isotope Dilution		MS %Recovery	MS Qualifier	Limits					
13C2 PFHxA		73		25 - 150					
13C4 PFOA		79		25 - 150					
13C4 PFOS		58		25 - 150					
13C4-PFHpA		74		25 - 150					
18O2 PFHxS		98		25 - 150					
13C5 PFNA		51		25 - 150					

Lab Sample ID: 320-16660-5 MSD

Matrix: Water

Analysis Batch: 97577

Client Sample ID: 46MW04_1215

Prep Type: Total/NA

Prep Batch: 97259

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanesulfonic acid (PFBS)	33		31.5	63.3		ng/L		95	50 - 150	4	30
Perfluoroheptanoic acid (PFHpA)	17		35.6	53.4		ng/L		103	60 - 140	2	30
Perfluorohexanesulfonic acid (PFHxS)	880	J M	33.7	851	J M 4	ng/L		-83	60 - 140	2	30
Perfluorononanoic acid (PFNA)	15		35.6	51.1		ng/L		102	60 - 140	6	30
Perfluorooctanesulfonic acid (PFOS)	3300	J M	34.1	3240	J M 4	ng/L		-262	60 - 140	5	30
Perfluorooctanoic acid (PFOA)	33		35.6	65.0		ng/L		89	60 - 140	2	30
Isotope Dilution		MSD %Recovery	MSD Qualifier	Limits							
13C2 PFHxA		57		25 - 150							
13C4 PFOA		57		25 - 150							
13C4 PFOS		47		25 - 150							
13C4-PFHpA		54		25 - 150							
18O2 PFHxS		74		25 - 150							
13C5 PFNA		35		25 - 150							

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

Lab Sample ID: 320-16660-5 MS

Matrix: Water

Analysis Batch: 97663

Client Sample ID: 46MW04_1215

Prep Type: Total/NA

Prep Batch: 97259

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanesulfonic acid (PFBS) - DL	28	D J	31.5	43.0	D J	ng/L		46	50 - 150
Perfluoroheptanoic acid (PFHpA) - DL	16	J D	35.7	46.1	D	ng/L		83	60 - 140
Perfluorohexanesulfonic acid (PFHxS) - DL	830	D J	33.7	976	D 4	ng/L		431	60 - 140
Perfluorononanoic acid (PFNA) - DL	13	J D	35.7	48.6	D	ng/L		99	60 - 140

TestAmerica Sacramento

QC Sample Results

Client: Earth Toxics, Inc
Project/Site: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

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

Lab Sample ID: 320-16660-5 MS

Matrix: Water

Analysis Batch: 97663

Client Sample ID: 46MW04_1215

Prep Type: Total/NA

Prep Batch: 97259

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec.	Limits
	Result	Qualifier		Result	Qualifier					
Perfluorooctanesulfonic acid (PFOS) - DL	2800	D M J	34.1	2790	D M 4	ng/L		35		60 - 140
Perfluorooctanoic acid (PFOA) - DL	33	D	35.7	60.6	D	ng/L		78		60 - 140
		MS MS								
Isotope Dilution	%Recovery	Qualifier	Limits							
13C4 PFOS - DL	130		25 - 150							
18O2 PFHxS - DL	118		25 - 150							

Lab Sample ID: 320-16660-5 MSD

Matrix: Water

Analysis Batch: 97663

Client Sample ID: 46MW04_1215

Prep Type: Total/NA

Prep Batch: 97259

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	Limits	RPD	Limit
	Result	Qualifier		Result	Qualifier						RPD	
Perfluorobutanesulfonic acid (PFBS) - DL	28	D J	31.5	42.0	D J	ng/L		43		50 - 150	2	30
Perfluoroheptanoic acid (PFHpA) - DL	16	J D	35.6	61.4	D	ng/L		126		60 - 140	28	30
Perfluorohexanesulfonic acid (PFHxS) - DL	830	D J	33.7	850	D 4	ng/L		58		60 - 140	14	30
Perfluorononanoic acid (PFNA) - DL	13	J D	35.6	39.6	D	ng/L		74		60 - 140	20	30
Perfluorooctanesulfonic acid (PFOS) - DL	2800	D M J	34.1	2710	D M 4	ng/L		-220		60 - 140	3	30
Perfluorooctanoic acid (PFOA) - DL	33	D	35.6	72.7	D	ng/L		112		60 - 140	18	30
		MSD MSD										
Isotope Dilution	%Recovery	Qualifier	Limits									
13C4 PFOS - DL	123		25 - 150									
18O2 PFHxS - DL	117		25 - 150									

QC Association Summary

Client: Earth Toxics, Inc
Project/Site: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

LCMS

Prep Batch: 97259

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-16660-1	46MW01_1215	Total/NA	Water	3535	
320-16660-2	46MW02_1215	Total/NA	Water	3535	
320-16660-2 - DL	46MW02_1215	Total/NA	Water	3535	
320-16660-3	46MW03_1215	Total/NA	Water	3535	
320-16660-4	46MW03_1215X	Total/NA	Water	3535	
320-16660-5 - DL	46MW04_1215	Total/NA	Water	3535	
320-16660-5	46MW04_1215	Total/NA	Water	3535	
320-16660-5 MS - DL	46MW04_1215	Total/NA	Water	3535	
320-16660-5 MS	46MW04_1215	Total/NA	Water	3535	
320-16660-5 MSD - DL	46MW04_1215	Total/NA	Water	3535	
320-16660-5 MSD	46MW04_1215	Total/NA	Water	3535	
320-16660-6 - DL	46MW05_1215	Total/NA	Water	3535	
320-16660-6	46MW05_1215	Total/NA	Water	3535	
320-16660-7	EB123015	Total/NA	Water	3535	
LCS 320-97259/2-A	Lab Control Sample	Total/NA	Water	3535	
MB 320-97259/1-A	Method Blank	Total/NA	Water	3535	

Analysis Batch: 97577

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-16660-1	46MW01_1215	Total/NA	Water	WS-LC-0025	97259
320-16660-2	46MW02_1215	Total/NA	Water	WS-LC-0025	97259
320-16660-3	46MW03_1215	Total/NA	Water	WS-LC-0025	97259
320-16660-4	46MW03_1215X	Total/NA	Water	WS-LC-0025	97259
320-16660-5	46MW04_1215	Total/NA	Water	WS-LC-0025	97259
320-16660-5 MS	46MW04_1215	Total/NA	Water	WS-LC-0025	97259
320-16660-5 MSD	46MW04_1215	Total/NA	Water	WS-LC-0025	97259
320-16660-6	46MW05_1215	Total/NA	Water	WS-LC-0025	97259
320-16660-7	EB123015	Total/NA	Water	WS-LC-0025	97259
LCS 320-97259/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	97259
MB 320-97259/1-A	Method Blank	Total/NA	Water	WS-LC-0025	97259

Analysis Batch: 97663

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-16660-2 - DL	46MW02_1215	Total/NA	Water	WS-LC-0025	97259
320-16660-5 - DL	46MW04_1215	Total/NA	Water	WS-LC-0025	97259
320-16660-5 MS - DL	46MW04_1215	Total/NA	Water	WS-LC-0025	97259
320-16660-5 MSD - DL	46MW04_1215	Total/NA	Water	WS-LC-0025	97259
320-16660-6 - DL	46MW05_1215	Total/NA	Water	WS-LC-0025	97259

Lab Chronicle

Client: Earth Toxics, Inc
 Project/Site: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Client Sample ID: 46MW01_1215

Lab Sample ID: 320-16660-1

Date Collected: 12/30/15 11:15

Matrix: Water

Date Received: 12/31/15 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			476.1 mL	1.00 mL	97259	01/05/16 08:39	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	476.1 mL	1.00 mL	97577	01/07/16 19:49	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: 46MW02_1215

Lab Sample ID: 320-16660-2

Date Collected: 12/30/15 10:00

Matrix: Water

Date Received: 12/31/15 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			484.2 mL	1.00 mL	97259	01/05/16 08:39	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	484.2 mL	1.00 mL	97577	01/07/16 20:11	JRB	TAL SAC
Instrument ID: A6										
Total/NA	Prep	3535	DL		484.2 mL	1.00 mL	97259	01/05/16 08:39	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025	DL	5	484.2 mL	1.00 mL	97663	01/08/16 14:08	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: 46MW03_1215

Lab Sample ID: 320-16660-3

Date Collected: 12/30/15 13:45

Matrix: Water

Date Received: 12/31/15 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			471.7 mL	1.00 mL	97259	01/05/16 08:39	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	471.7 mL	1.00 mL	97577	01/07/16 20:32	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: 46MW03_1215X

Lab Sample ID: 320-16660-4

Date Collected: 12/30/15 13:46

Matrix: Water

Date Received: 12/31/15 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			551.4 mL	1.00 mL	97259	01/05/16 08:39	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	551.4 mL	1.00 mL	97577	01/07/16 20:53	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: 46MW04_1215

Lab Sample ID: 320-16660-5

Date Collected: 12/30/15 14:15

Matrix: Water

Date Received: 12/31/15 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			560.1 mL	1.00 mL	97259	01/05/16 08:39	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	560.1 mL	1.00 mL	97577	01/07/16 21:14	JRB	TAL SAC
Instrument ID: A6										
Total/NA	Prep	3535	DL		560.1 mL	1.00 mL	97259	01/05/16 08:39	HJA	TAL SAC

TestAmerica Sacramento

Lab Chronicle

Client: Earth Toxics, Inc
 Project/Site: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Client Sample ID: 46MW04_1215
Date Collected: 12/30/15 14:15
Date Received: 12/31/15 11:30

Lab Sample ID: 320-16660-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	WS-LC-0025	DL	10	560.1 mL	1.00 mL	97663	01/08/16 14:30	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: 46MW05_1215
Date Collected: 12/30/15 12:15
Date Received: 12/31/15 11:30

Lab Sample ID: 320-16660-6
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			474 mL	1.00 mL	97259	01/05/16 08:39	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	474 mL	1.00 mL	97577	01/07/16 22:18	JRB	TAL SAC
Instrument ID: A6										
Total/NA	Prep	3535	DL		474 mL	1.00 mL	97259	01/05/16 08:39	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025	DL	5	474 mL	1.00 mL	97663	01/08/16 15:33	JRB	TAL SAC
Instrument ID: A6										

Client Sample ID: EB123015
Date Collected: 12/30/15 13:00
Date Received: 12/31/15 11:30

Lab Sample ID: 320-16660-7
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			556.9 mL	1.00 mL	97259	01/05/16 08:39	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	556.9 mL	1.00 mL	97577	01/07/16 22:39	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: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

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	01-31-16
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: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

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: NWS Earle Site 46

TestAmerica Job ID: 320-16660-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-16660-1	46MW01_1215	Water	12/30/15 11:15	12/31/15 11:30
320-16660-2	46MW02_1215	Water	12/30/15 10:00	12/31/15 11:30
320-16660-3	46MW03_1215	Water	12/30/15 13:45	12/31/15 11:30
320-16660-4	46MW03_1215X	Water	12/30/15 13:46	12/31/15 11:30
320-16660-5	46MW04_1215	Water	12/30/15 14:15	12/31/15 11:30
320-16660-6	46MW05_1215	Water	12/30/15 12:15	12/31/15 11:30
320-16660-7	EB123015	Water	12/30/15 13:00	12/31/15 11:30

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 97577

Lab Sample ID: 320-16660-1 Client Sample ID: 46MW01_1215

Date Analyzed: 01/07/16 19:49 Lab File ID: 06JAN2016A6A_078.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	11.39	Isomers	westendor fc	01/08/16 09:01

Lab Sample ID: 320-16660-2 Client Sample ID: 46MW02_1215

Date Analyzed: 01/07/16 20:11 Lab File ID: 06JAN2016A6A_079.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	11.38	Isomers	westendor fc	01/08/16 09:02

Lab Sample ID: 320-16660-3 Client Sample ID: 46MW03_1215

Date Analyzed: 01/07/16 20:32 Lab File ID: 06JAN2016A6A_080.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.34	Isomers	westendor fc	01/08/16 09:13
Perfluorooctanesulfonic acid (PFOS)	11.38	Isomers	westendor fc	01/08/16 09:13

Lab Sample ID: 320-16660-4 Client Sample ID: 46MW03_1215X

Date Analyzed: 01/07/16 20:53 Lab File ID: 06JAN2016A6A_081.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.34	Isomers	westendor fc	01/08/16 09:14
Perfluorooctanesulfonic acid (PFOS)	11.38	Isomers	westendor fc	01/08/16 09:14

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 97577

Lab Sample ID: 320-16660-5 Client Sample ID: 46MW04_1215

Date Analyzed: 01/07/16 21:14 Lab File ID: 06JAN2016A6A_082.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.34	Isomers	westendor fc	01/08/16 09:15
Perfluorooctanesulfonic acid (PFOS)	11.37	Isomers	westendor fc	01/08/16 09:15

Lab Sample ID: 320-16660-5 MS Client Sample ID: 46MW04_1215 MS

Date Analyzed: 01/07/16 21:35 Lab File ID: 06JAN2016A6A_083.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.33	Isomers	westendor fc	01/08/16 09:16
Perfluorooctanesulfonic acid (PFOS)	11.36	Isomers	westendor fc	01/08/16 09:16

Lab Sample ID: 320-16660-5 MSD Client Sample ID: 46MW04_1215 MSD

Date Analyzed: 01/07/16 21:57 Lab File ID: 06JAN2016A6A_084.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.34	Isomers	westendor fc	01/08/16 09:17
Perfluorooctanesulfonic acid (PFOS)	11.37	Isomers	westendor fc	01/08/16 09:17

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 97577

Lab Sample ID: 320-16660-6 Client Sample ID: 46MW05_1215

Date Analyzed: 01/07/16 22:18 Lab File ID: 06JAN2016A6A_085.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.33	Isomers	westendor fc	01/08/16 09:18
Perfluorooctanesulfonic acid (PFOS)	11.02	Isomers	westendor fc	01/08/16 09:18

Lab Sample ID: 320-16660-7 Client Sample ID: EB123015

Date Analyzed: 01/07/16 22:39 Lab File ID: 06JAN2016A6A_086.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.33	Isomers	westendor fc	01/08/16 09:19
Perfluorooctanesulfonic acid (PFOS)	11.36	Isomers	westendor fc	01/08/16 09:19

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 97663

Lab Sample ID: 320-16660-2 DL Client Sample ID: 46MW02_1215 DL

Date Analyzed: 01/08/16 14:08 Lab File ID: 08JAN2016A6A_010.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.37	Isomers	westendor fc	01/08/16 15:08
Perfluorooctanesulfonic acid (PFOS)	11.41	Isomers	westendor fc	01/08/16 15:08

Lab Sample ID: 320-16660-5 DL Client Sample ID: 46MW04_1215 DL

Date Analyzed: 01/08/16 14:30 Lab File ID: 08JAN2016A6A_011.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	11.39	Isomers	westendor fc	01/08/16 15:10

Lab Sample ID: 320-16660-5 MS DL Client Sample ID: 46MW04_1215 MS DL

Date Analyzed: 01/08/16 14:51 Lab File ID: 08JAN2016A6A_012.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	11.39	Isomers	westendor fc	01/08/16 15:49

Lab Sample ID: 320-16660-5 MSD DL Client Sample ID: 46MW04_1215 MSD DL

Date Analyzed: 01/08/16 15:12 Lab File ID: 08JAN2016A6A_013.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	11.39	Isomers	westendor fc	01/08/16 15:50

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 97663

Lab Sample ID: 320-16660-6 DL Client Sample ID: 46MW05_1215 DL

Date Analyzed: 01/08/16 15:33 Lab File ID: 08JAN2016A6A_014.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.35	Isomers	westendorfc	01/08/16 16:42
Perfluorooctanesulfonic acid (PFOS)	11.05	Isomers	westendorfc	01/08/16 16:42

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	1802 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
LCMPFudA_00005	0.2 mL	13C2 PFUnA	1 ug/mL					
.LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)	13C2-PFHxDA	50 ug/mL	
.LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)	13C2-PFTeDA	50 ug/mL	
.LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpa0515			(Purchased Reagent)	13C4-PFHpA	50 ug/mL	
.LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)	13C5-PFPeA	50 ug/mL	
.LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)	13C8 FOSA	50 ug/mL	
.LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)	13C4 PFBA	50 ug/mL	
.LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)	13C2 PFDA	50 ug/mL	
.LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)	13C2 PFDoA	50 ug/mL	
.LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)	13C2 PFHxA	50 ug/mL	
.LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)	1802 PFHxS	47.3 ug/mL	
.LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)	13C5 PFNA	50 ug/mL	
.LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)	13C4 PFOA	50 ug/mL	
.LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)	13C4 PFOS	47.8 ug/mL	
.LCMPFudA_00005	10/31/19	Wellington Laboratories, Lot MPFudA1014			(Purchased Reagent)	13C2 PFUnA	50 ug/mL	
LCPFC-L1_00018	06/29/16	12/30/15	MeOH/H2O, Lot 90285	5 mL	LCMPFCSU_00024	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							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		
					LCPFCSP_00040	25 uL	Perfluorobutyric acid	0.5 ng/mL
		Perfluorobutanesulfonic acid (PFBS)	0.442 ng/mL					
		Perfluorodecanoic acid	0.5 ng/mL					

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFCSP_00040	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFCSP_00039	0.5 mL	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0946 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							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_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL					
...LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFDA 00003	06/18/18		Wellington Laboratories, Lot PFDA0613		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA 00003	01/03/18		Wellington Laboratories, Lot PFDoA0113		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDSA 00001	09/13/18		Wellington Laboratories, Lot LPFDS0913		(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00004	05/09/19		Wellington Laboratories, Lot PFHpA0514		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA 00001	11/21/17		Wellington Laboratories, Lot LPFHpS1112		(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA 00003	05/09/19		Wellington Laboratories, Lot PFHxA0514		(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA 00004	11/28/17		Wellington Laboratories, Lot PFHxDA0707		(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxSA_00001	05/09/19		Wellington Laboratories, Lot LPFHxS0514		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
...LCPFNA 00004	05/09/19		Wellington Laboratories, Lot PFNA0514		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA 00004	10/11/18		Wellington Laboratories, Lot PFOA1013		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA 00004	04/25/17		Wellington Laboratories, Lot 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 00005	07/31/18		Wellington Laboratories, Lot FOSA0714I		(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA 00003	01/03/18		Wellington Laboratories, Lot PFPeA0113		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA 00003	06/19/18		Wellington Laboratories, Lot PFTeDA0613		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA 00003	12/10/18		Wellington Laboratories, Lot PFTrDA1213		(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA 00003	06/19/18		Wellington Laboratories, Lot PFUdA0613		(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L2_00018	06/29/16	12/30/15	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00024	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
					13C2 PFUnA	50 ng/mL		
					LCPFCSP_00040	50 uL	Perfluorobutyric acid	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							Perfluorodecanoic acid	1 ng/mL
							Perfluorododecanoic acid	1 ng/mL
							Perfluorodecane Sulfonic acid	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic Acid	0.952 ng/mL
							Perfluorohexanoic acid	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
Perfluorohexanesulfonic acid (PFHxS)	0.946 ng/mL							
Perfluorononanoic acid (PFNA)	1 ng/mL							

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

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_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL	
					LCM2PFTeDA 00003	0.2 mL	13C2-PFTeDA	1 ug/mL	
					LCM4PFHFA 00003	0.2 mL	13C4-PFHFA	1 ug/mL	
					LCM5PFPEA 00004	0.2 mL	13C5-PFPeA	1 ug/mL	
					LCM8FOSA 00006	0.2 mL	13C8 FOSA	1 ug/mL	
					LCMPFBA 00004	0.2 mL	13C4 PFBA	1 ug/mL	
					LCMPFDA 00004	0.2 mL	13C2 PFDA	1 ug/mL	
					LCMPFDoA 00004	0.2 mL	13C2 PFDoA	1 ug/mL	
					LCMPFHxA 00005	0.2 mL	13C2 PFHxA	1 ug/mL	
					LCMPFHxS 00004	0.2 mL	18O2 PFHxS	0.946 ug/mL	
					LCMPFNA 00003	0.2 mL	13C5 PFNA	1 ug/mL	
					LCMPFOA 00007	0.2 mL	13C4 PFOA	1 ug/mL	
					LCMPFOS 00009	0.2 mL	13C4 PFOS	0.956 ug/mL	
					LCMPFUDa 00005	0.2 mL	13C2 PFUnA	1 ug/mL	
..LCM2PFHxDA 00003	11/29/17		Wellington Laboratories, Lot M2PFHxDA1112				(Purchased Reagent)	13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA 00003	11/29/17		Wellington Laboratories, Lot M2PFTeDA1112				(Purchased Reagent)	13C2-PFTeDA	50 ug/mL
..LCM4PFHFA 00003	05/22/20		Wellington Laboratories, Lot M4PFHFA0515				(Purchased Reagent)	13C4-PFHFA	50 ug/mL
..LCM5PFPEA 00004	05/22/20		Wellington Laboratories, Lot M5PFPeA0515				(Purchased Reagent)	13C5-PFPeA	50 ug/mL
..LCM8FOSA 00006	12/15/16		Wellington Laboratories, Lot M8FOSA1214I				(Purchased Reagent)	13C8 FOSA	50 ug/mL
..LCMPFBA 00004	10/31/19		Wellington Laboratories, Lot MPFBA1014				(Purchased Reagent)	13C4 PFBA	50 ug/mL
..LCMPFDA 00004	04/13/19		Wellington Laboratories, Lot MPFDA0414				(Purchased Reagent)	13C2 PFDA	50 ug/mL
..LCMPFDoA 00004	07/17/19		Wellington Laboratories, Lot MPFDoA0714				(Purchased Reagent)	13C2 PFDoA	50 ug/mL
..LCMPFHxA 00005	04/13/19		Wellington Laboratories, Lot MPFHxA0414				(Purchased Reagent)	13C2 PFHxA	50 ug/mL
..LCMPFHxS 00004	07/25/18		Wellington Laboratories, Lot MPFHxS0713				(Purchased Reagent)	18O2 PFHxS	47.3 ug/mL
..LCMPFNA 00003	04/13/19		Wellington Laboratories, Lot MPFNA0414				(Purchased Reagent)	13C5 PFNA	50 ug/mL
..LCMPFOA 00007	04/10/20		Wellington Laboratories, Lot MPFOA0415				(Purchased Reagent)	13C4 PFOA	50 ug/mL
..LCMPFOS 00009	05/15/20		Wellington Laboratories, Lot MPFOS0515				(Purchased Reagent)	13C4 PFOS	47.8 ug/mL
..LCMPFUDa 00005	10/31/19		Wellington Laboratories, Lot MPFUDa1014				(Purchased Reagent)	13C2 PFUnA	50 ug/mL
.LCPFCSP_00040	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFCSP_00039	0.5 mL	Perfluorobutyric acid	0.1 ug/mL	
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL	
							Perfluorodecanoic acid	0.1 ug/mL	
							Perfluorododecanoic acid	0.1 ug/mL	
							Perfluorodecane Sulfonic acid	0.0964 ug/mL	
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL	
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL	
							Perfluorohexanoic acid	0.1 ug/mL	

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

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_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00003	03/05/18		Wellington Laboratories, Lot PFBA0313		(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBSA_00001	10/09/19		Wellington Laboratories, Lot LPFBS1014		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00003	06/18/18		Wellington Laboratories, Lot PFDA0613		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00003	01/03/18		Wellington Laboratories, Lot PFDoA0113		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDSA_00001	09/13/18		Wellington Laboratories, Lot LPFDS0913		(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00004	05/09/19		Wellington Laboratories, Lot PFHpA0514		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00001	11/21/17		Wellington Laboratories, Lot LPFHpS1112		(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00003	05/09/19		Wellington Laboratories, Lot PFHxA0514		(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17		Wellington Laboratories, Lot PFHxDA0707		(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxSA_00001	05/09/19		Wellington Laboratories, Lot LPFHxS0514		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFNA 00004	05/09/19		Wellington Laboratories, Lot PFNA0514		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA 00004	10/11/18		Wellington Laboratories, Lot PFOA1013		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA 00004	04/25/17		Wellington Laboratories, Lot PFODA0807		(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS_00004	06/20/19		Wellington Laboratories, Lot LPFOS0614		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
...LCPFOSA 00005	07/31/18		Wellington Laboratories, Lot FOSA0714I		(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA 00003	01/03/18		Wellington Laboratories, Lot PFPeA0113		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA 00003	06/19/18		Wellington Laboratories, Lot PFTeDA0613		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA 00003	12/10/18		Wellington Laboratories, Lot 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_00016	06/29/16	12/30/15	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00024	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
							LCPFCSP_00040	250 uL
					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.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	1802 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL					
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)	13C2-PFHxDA	50 ug/mL	
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)	13C2-PFTeDA	50 ug/mL	
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)	13C4-PFHpA	50 ug/mL	
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)	13C5-PFPeA	50 ug/mL	
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)	13C8 FOSA	50 ug/mL	
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)	13C4 PFBA	50 ug/mL	
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)	13C2 PFDA	50 ug/mL	
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)	13C2 PFDoA	50 ug/mL	
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)	13C2 PFHxA	50 ug/mL	
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)	1802 PFHxS	47.3 ug/mL	
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)	13C5 PFNA	50 ug/mL	
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)	13C4 PFOA	50 ug/mL	
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)	13C4 PFOS	47.8 ug/mL	
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)	13C2 PFUnA	50 ug/mL	
.LCPFCSP_00040	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFCSP_00039	0.5 mL	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0946 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							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.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00003	03/05/18		Wellington Laboratories, Lot PFBA0313		(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBSA_00001	10/09/19		Wellington Laboratories, Lot LFFBS1014		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00003	06/18/18		Wellington Laboratories, Lot PFDA0613		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00003	01/03/18		Wellington Laboratories, Lot PFDoA0113		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDSA_00001	09/13/18		Wellington Laboratories, Lot 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_00004	10/11/18		Wellington Laboratories, Lot PFOA1013		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00004	04/25/17		Wellington Laboratories, Lot PFODA0807		(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
...LCPFOS_00004	06/20/19		Wellington Laboratories, Lot LFFOS0614		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
...LCPFOSA_00005	07/31/18		Wellington Laboratories, Lot FOSA0714I		(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00003	01/03/18		Wellington Laboratories, Lot PFPeA0113		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00003	06/19/18		Wellington Laboratories, Lot PFTeDA0613		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00003	12/10/18		Wellington Laboratories, Lot PFTTrDA1213		(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
...LCPFuDA_00003	06/19/18		Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)	Perfluoroundecanoic acid	50 ug/mL		
LCPFC-L4_00017	06/29/16	12/30/15	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00024	250 uL	13C2-PFHxDA	50 ng/mL		
							13C2-PFTeDA	50 ng/mL		
							13C4-PFHpA	50 ng/mL		
							13C5-PFPeA	50 ng/mL		
							13C8 FOSA	50 ng/mL		
							13C4 PFBA	50 ng/mL		
							13C2 PFDA	50 ng/mL		
							13C2 PFDoA	50 ng/mL		
							13C2 PFHxA	50 ng/mL		
							18O2 PFHxS	47.3 ng/mL		
							13C5 PFNA	50 ng/mL		
							13C4 PFOA	50 ng/mL		
							13C4 PFOS	47.8 ng/mL		
							13C2 PFUnA	50 ng/mL		
					LCPFCSP_00039	100 uL	Perfluorobutyric acid	20 ng/mL		
							Perfluorobutanesulfonic acid (PFBS)	17.68 ng/mL		
							Perfluorodecanoic acid	20 ng/mL		
							Perfluorododecanoic acid	20 ng/mL		
							Perfluorodecane Sulfonic acid (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_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL		
							LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
							LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
							LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
							LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
							LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
							LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
							LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
							LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxS_00004	0.2 mL	1802 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17		Wellington Laboratories, Lot M2PFTeDA1112		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20		Wellington Laboratories, Lot M4PFHhPA0515		(Purchased Reagent)		13C4-PFHhPA	50 ug/mL
..LCM5PFPEA_00004	05/22/20		Wellington Laboratories, Lot M5PFPeA0515		(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16		Wellington Laboratories, Lot M8FOSA1214I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19		Wellington Laboratories, Lot MPFBA1014		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19		Wellington Laboratories, Lot MPFDA0414		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19		Wellington Laboratories, Lot MPFDoA0714		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19		Wellington Laboratories, Lot MPFHxA0414		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18		Wellington Laboratories, Lot MPFHxS0713		(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19		Wellington Laboratories, Lot MPFNA0414		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20		Wellington Laboratories, Lot MPFOA0415		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20		Wellington Laboratories, Lot MPFOS0515		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19		Wellington Laboratories, Lot MPFUdA1014		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
..LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHhPA_00004	0.1 mL	Perfluoroheptanoic acid (PFHhPA)	1 ug/mL
					LCPFHhSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00003	03/05/18		Wellington Laboratories, Lot PFBA0313		(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBSA_00001	10/09/19		Wellington Laboratories, Lot LPFBS1014		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00003	06/18/18		Wellington Laboratories, Lot PFDA0613		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00003	01/03/18		Wellington Laboratories, Lot PFDoA0113		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDSA_00001	09/13/18		Wellington Laboratories, Lot LPFDS0913		(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

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SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHpA_00004	05/09/19		Wellington Laboratories, Lot PFHpA0514		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00001	11/21/17		Wellington Laboratories, Lot LPFHpS1112		(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00003	05/09/19		Wellington Laboratories, Lot PFHxA0514		(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17		Wellington Laboratories, Lot PFHxDA0707		(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxSA_00001	05/09/19		Wellington Laboratories, Lot LPFHxS0514		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
..LCPFNA_00004	05/09/19		Wellington Laboratories, Lot PFNA0514		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00004	10/11/18		Wellington Laboratories, Lot PFOA1013		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00004	04/25/17		Wellington Laboratories, Lot 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_00005	07/31/18		Wellington Laboratories, Lot FOSA0714I		(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18		Wellington Laboratories, Lot PFPeA0113		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00003	06/19/18		Wellington Laboratories, Lot PFTeDA0613		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00003	12/10/18		Wellington Laboratories, Lot 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_00016	06/29/16	12/30/15	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00024	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00039	250 uL	Perfluorobutyric acid	50 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ng/mL
							Perfluorodecanoic acid	50 ng/mL
							Perfluorododecanoic acid	50 ng/mL
							Perfluorodecane Sulfonic acid	48.2 ng/mL
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluoroheptanesulfonic Acid	47.6 ng/mL
Perfluorohexanoic acid	50 ng/mL							
Perfluorohexadecanoic acid	50 ng/mL							
Perfluorohexanesulfonic acid (PFHxS)	47.3 ng/mL							
Perfluorononanoic acid (PFNA)	50 ng/mL							
Perfluorooctanoic acid (PFOA)	50 ng/mL							
Perfluorooctadecanoic acid	50 ng/mL							

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	47.8 ng/mL
							Perfluorooctane Sulfonamide	50 ng/mL
							Perfluoropentanoic acid	50 ng/mL
							Perfluorotetradecanoic acid	50 ng/mL
							Perfluorotridecanoic acid	50 ng/mL
							Perfluoroundecanoic acid	50 ng/mL
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpa	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUDa_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17		Wellington Laboratories, Lot M2PFTeDA1112		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20		Wellington Laboratories, Lot M4PFHPA0515		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA_00004	05/22/20		Wellington Laboratories, Lot M5PFPeA0515		(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16		Wellington Laboratories, Lot M8FOSA1214I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19		Wellington Laboratories, Lot MPFBA1014		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19		Wellington Laboratories, Lot MPFDA0414		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19		Wellington Laboratories, Lot MPFDoA0714		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19		Wellington Laboratories, Lot MPFHxA0414		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18		Wellington Laboratories, Lot MPFHxS0713		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19		Wellington Laboratories, Lot MPFNA0414		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20		Wellington Laboratories, Lot MPFOA0415		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20		Wellington Laboratories, Lot MPFOS0515		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa_00005	10/31/19		Wellington Laboratories, Lot MPFUDa1014		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpa_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUDA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00003	03/05/18		Wellington Laboratories, Lot PFBA0313		(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBSA_00001	10/09/19		Wellington Laboratories, Lot LPFBS1014		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00003	06/18/18		Wellington Laboratories, Lot PFDA0613		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00003	01/03/18		Wellington Laboratories, Lot PFDoA0113		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDSA_00001	09/13/18		Wellington Laboratories, Lot LPFDS0913		(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00004	05/09/19		Wellington Laboratories, Lot PFHpA0514		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00001	11/21/17		Wellington Laboratories, Lot LPFHpS1112		(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00003	05/09/19		Wellington Laboratories, Lot PFHxA0514		(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17		Wellington Laboratories, Lot PFHxDA0707		(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxSA_00001	05/09/19		Wellington Laboratories, Lot LPFHxS0514		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
..LCPFNA_00004	05/09/19		Wellington Laboratories, Lot PFNA0514		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00004	10/11/18		Wellington Laboratories, Lot PFOA1013		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00004	04/25/17		Wellington Laboratories, Lot PFODA0807		(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS_00004	06/20/19		Wellington Laboratories, Lot LPFOS0614		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA_00005	07/31/18		Wellington Laboratories, Lot FOSA0714I		(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18		Wellington Laboratories, Lot PFPeA0113		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00003	06/19/18		Wellington Laboratories, Lot PFTeDA0613		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00003	12/10/18		Wellington Laboratories, Lot PFTrDA1213		(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUDA_00003	06/19/18		Wellington Laboratories, Lot PFUDA0613		(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L6_00015	06/29/16	12/30/15	MeOH/H2O, Lot 090285	2 mL	LCMPFCSU_00024	100 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFCSP_00039	400 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
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
							LCM2PFTeDA 00003	1 ug/mL
							LCM4PFHPA 00003	1 ug/mL
							LCM5PFPEA 00004	1 ug/mL
							LCM8FOSA 00006	1 ug/mL
							LCMPFBA 00004	1 ug/mL
							LCMPFDA 00004	1 ug/mL
							LCMPFDoA 00004	1 ug/mL
							LCMPFHxA 00005	1 ug/mL
							LCMPFHxS 00004	0.946 ug/mL
							LCMPFNA 00003	1 ug/mL
							LCMPFOA 00007	1 ug/mL
							LCMPFOS 00009	0.956 ug/mL
							LCMPFUdA 00005	1 ug/mL
							..LCM2PFHxDA 00003	11/29/17
..LCM2PFTeDA 00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112	(Purchased Reagent)	13C2-PFTeDA	50 ug/mL			
..LCM4PFHPA 00003	05/22/20	Wellington Laboratories, Lot M4PFHPA0515	(Purchased Reagent)	13C4-PFHPA	50 ug/mL			
..LCM5PFPEA 00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515	(Purchased Reagent)	13C5-PFPeA	50 ug/mL			
..LCM8FOSA 00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I	(Purchased Reagent)	13C8 FOSA	50 ug/mL			
..LCMPFBA 00004	10/31/19	Wellington Laboratories, Lot MPFBA1014	(Purchased Reagent)	13C4 PFBA	50 ug/mL			
..LCMPFDA 00004	04/13/19	Wellington Laboratories, Lot MPFDA0414	(Purchased Reagent)	13C2 PFDA	50 ug/mL			
..LCMPFDoA 00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714	(Purchased Reagent)	13C2 PFDoA	50 ug/mL			
..LCMPFHxA 00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414	(Purchased Reagent)	13C2 PFHxA	50 ug/mL			

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFHxS 00004	07/25/18		Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)	18O2 PFHxS	47.3 ug/mL
..LCMPFNA 00003	04/13/19		Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)	13C5 PFNA	50 ug/mL
..LCMPFOA 00007	04/10/20		Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)	13C4 PFOA	50 ug/mL
..LCMPFOS 00009	05/15/20		Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)	13C4 PFOS	47.8 ug/mL
..LCMPFUdA 00005	10/31/19		Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)	13C2 PFUnA	50 ug/mL
..LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBFA 00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBFA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA 00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA 00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA 00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00004	0.1 mL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA 00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA 00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBFA 00003	03/05/18		Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)	Perfluorobutyric acid	50 ug/mL
..LCPFBFA_00001	10/09/19		Wellington Laboratories, Lot LFBFA1014			(Purchased Reagent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA 00003	06/18/18		Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)	Perfluorodecanoic acid	50 ug/mL
..LCPFDoA 00003	01/03/18		Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)	Perfluorododecanoic acid	50 ug/mL
..LCPFDSA 00001	09/13/18		Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)	Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00004	05/09/19		Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA 00001	11/21/17		Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA 00003	05/09/19		Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)	Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA 00004	11/28/17		Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)	Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxSA_00001	05/09/19		Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)	Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
..LCPFNA 00004	05/09/19		Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)	Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA 00004	10/11/18		Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA 00004	04/25/17		Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)	Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS_00004	06/20/19		Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)	Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA 00005	07/31/18		Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)	Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA 00003	01/03/18		Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)	Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA 00003	06/19/18		Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)	Perfluorotetradecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFTrDA_00003	12/10/18		Wellington Laboratories, Lot PFTrDA1213		(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00003	06/19/18		Wellington Laboratories, Lot PFUdA0613		(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L7_00015	06/29/16	12/30/15	MeOH/H2O, Lot 090285	2 mL	LCMPFCSU_00024	100 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00039	800 uL	Perfluorobutyric acid	400 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	353.6 ng/mL
							Perfluorodecanoic acid	400 ng/mL
							Perfluorododecanoic acid	400 ng/mL
							Perfluorodecane Sulfonic acid	385.6 ng/mL
							Perfluoroheptanoic acid (PFHpA)	400 ng/mL
							Perfluoroheptanesulfonic Acid	380.8 ng/mL
							Perfluorohexanoic acid	400 ng/mL
							Perfluorohexadecanoic acid	400 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	378.4 ng/mL
							Perfluorononanoic acid (PFNA)	400 ng/mL
							Perfluorooctanoic acid (PFOA)	400 ng/mL
							Perfluorooctandecanoic acid	400 ng/mL
Perfluorooctanesulfonic acid (PFOS)	382.4 ng/mL							
Perfluorooctane Sulfonamide	400 ng/mL							
Perfluoropentanoic acid	400 ng/mL							
Perfluorotetradecanoic acid	400 ng/mL							
Perfluorotridecanoic acid	400 ng/mL							
Perfluoroundecanoic acid	400 ng/mL							
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	1802 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17		Wellington Laboratories, Lot M2PFTeDA1112		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHFA_00003	05/22/20		Wellington Laboratories, Lot M4PFHFA0515		(Purchased Reagent)		13C4-PFHFA	50 ug/mL
..LCM5PFPEA_00004	05/22/20		Wellington Laboratories, Lot M5PFPeA0515		(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16		Wellington Laboratories, Lot M8FOSA1214I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19		Wellington Laboratories, Lot MPFBA1014		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19		Wellington Laboratories, Lot MPFDA0414		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19		Wellington Laboratories, Lot MPFDoA0714		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19		Wellington Laboratories, Lot MPFHxA0414		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18		Wellington Laboratories, Lot MPFHxS0713		(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19		Wellington Laboratories, Lot MPFNA0414		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20		Wellington Laboratories, Lot MPFOA0415		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20		Wellington Laboratories, Lot MPFOS0515		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19		Wellington Laboratories, Lot MPFUdA1014		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
..LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00003	03/05/18		Wellington Laboratories, Lot PFBA0313		(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBSA_00001	10/09/19		Wellington Laboratories, Lot LPFBS1014		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00003	06/18/18		Wellington Laboratories, Lot PFDA0613		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00003	01/03/18		Wellington Laboratories, Lot PFDoA0113		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
..LCPFDSA_00001	09/13/18		Wellington Laboratories, Lot LPFDS0913		(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL		
..LCPFHpA_00004	05/09/19		Wellington Laboratories, Lot PFHpA0514		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL		
..LCPFHpSA_00001	11/21/17		Wellington Laboratories, Lot LPFHpS1112		(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL		
..LCPFHxA_00003	05/09/19		Wellington Laboratories, Lot PFHxA0514		(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL		
..LCPFHxDA_00004	11/28/17		Wellington Laboratories, Lot PFHxDA0707		(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL		
..LCPFHxSA_00001	05/09/19		Wellington Laboratories, Lot LPFHxS0514		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL		
..LCPFNA_00004	05/09/19		Wellington Laboratories, Lot PFNA0514		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL		
..LCPFOA_00004	10/11/18		Wellington Laboratories, Lot PFOA1013		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL		
..LCPFODA_00004	04/25/17		Wellington Laboratories, Lot PFODA0807		(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL		
..LCPFOS_00004	06/20/19		Wellington Laboratories, Lot LPFOS0614		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL		
..LCPFOSA_00005	07/31/18		Wellington Laboratories, Lot FOSA0714I		(Purchased Reagent)		Perfluorooctane Sulfonylamide	50 ug/mL		
..LCPFPeA_00003	01/03/18		Wellington Laboratories, Lot PFPeA0113		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL		
..LCPFTeDA_00003	06/19/18		Wellington Laboratories, Lot PFTeDA0613		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL		
..LCPFTrDA_00003	12/10/18		Wellington Laboratories, Lot 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_00015	06/16/16	12/22/15	MeOH/H2O, Lot 09285	5 mL	LCMPFCSU_00023	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_00005	125 uL	Perfluoroheptanoic acid (PFHpA)	50 ng/mL							
		Perfluorononanoic acid (PFNA)	50 ng/mL							
		Perfluorooctanesulfonic acid (PFOS)	47.75 ng/mL							
		Perfluorooctanoic acid (PFOA)	50 ng/mL							
.LCMPFCSU_00023	06/21/16	12/21/15	Methanol, Lot Baker 115491	5 mL	LCM2PFHxDA_00002	0.1 mL	13C2-PFHxDA	1 ug/mL		
							LCM2PFTeDA_00003	0.1 mL	13C2-PFTeDA	1 ug/mL
							LCM4PFHPA_00003	0.1 mL	13C4-PFHpA	1 ug/mL
							LCM5PFPEA_00004	0.1 mL	13C5-PFPeA	1 ug/mL
							LCM8FOSA_00006	0.1 mL	13C8 FOSA	1 ug/mL
							LCMPFBA_00004	0.1 mL	13C4 PFBA	1 ug/mL
							LCMPFDA_00005	0.1 mL	13C2 PFDA	1 ug/mL
							LCMPFDoA_00003	0.1 mL	13C2 PFDoA	1 ug/mL
LCMPFHxA_00006	0.1 mL	13C2 PFHxA	1 ug/mL							

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxS_00004	0.1 mL	1802 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.1 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.1 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.1 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00004	0.1 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00002	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHPA0515			(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00005	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00003	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00006	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00004	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFACMXB_00005	06/20/19	Wellington Laboratories, Lot PFACMXB0614			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.91 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00003	0.1 mL	Perfluorobutane Sulfonate	0.884 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDoS_00003	0.1 mL	PFDoS (Perflouro-1-dodecanesulfonate)	0.968 ug/mL
					LCPFDS_00003	0.1 mL	Perfluorodecane Sulfonate	0.964 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpa_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00005	0.1 mL	Perfluoroheptane Sulfonate	0.952 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS_00003	0.1 mL	Perfluorohexane Sulfonate	0.946 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00002	0.1 mL	PFNS (Perflouro-1-nonanesulfonate)	0.96 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFPeS_00002	0.1 mL	PFPeS (Perfluoro-1-pentanesulfonate)	0.938 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
.LCPFBA_00003	03/05/18		Wellington Laboratories, Lot PFBA0313		(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
.LCPFBS_00003	10/09/19		Wellington Laboratories, Lot LFPBS1014		(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
.LCPFBSA_00001	10/09/19		Wellington Laboratories, Lot LFPBS1014		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00003	06/18/18		Wellington Laboratories, Lot PFDA0613		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
.LCPFDoA_00003	01/03/18		Wellington Laboratories, Lot PFDoA0113		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
.LCPFDoS_00003	10/06/16		Wellington Laboratories, Lot LFPDoS1011		(Purchased Reagent)		PFDoS (Perfluoro-1-dodecanesulfonate)	48.4 ug/mL
.LCPFDS_00003	09/13/18		Wellington Laboratories, Lot LFPDS0913		(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
.LCPFDSA_00001	09/13/18		Wellington Laboratories, Lot LFPDS0913		(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
.LCPFHpA_00004	05/09/19		Wellington Laboratories, Lot PFHpA0514		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpS_00005	01/28/19		Wellington Laboratories, Lot LFPFHpS0114		(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
.LCPFHpSA_00001	11/21/17		Wellington Laboratories, Lot LFPFHpS1112		(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
.LCPFHxA_00003	05/09/19		Wellington Laboratories, Lot PFHxA0514		(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
.LCPFHxDA_00004	11/28/17		Wellington Laboratories, Lot PFHxDA0707		(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS_00003	05/09/19		Wellington Laboratories, Lot LFPFHxS0514		(Purchased Reagent)		Perfluorohexane Sulfonate	47.3 ug/mL
.LCPFHxSA_00001	05/09/19		Wellington Laboratories, Lot LFPFHxS0514		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
.LCPFNA_00004	05/09/19		Wellington Laboratories, Lot PFNA0514		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFNS_00002	07/04/17		Wellington Laboratories, Lot LFPFNS0712		(Purchased Reagent)		PFNS (Perfluoro-1-nonanesulfonate)	48 ug/mL
.LCPFOA_00004	10/11/18		Wellington Laboratories, Lot PFOA1013		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00004	04/25/17		Wellington Laboratories, Lot PFODA0807		(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS_00004	06/20/19		Wellington Laboratories, Lot LFPFOS0614		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
.LCPFOSA_00005	07/31/18		Wellington Laboratories, Lot FOSA0714I		(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
.LCPFPeA_00003	01/03/18		Wellington Laboratories, Lot PFPeA0113		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
.LCPFPeS_00002	07/04/17		Wellington Laboratories, Lot LFPPeS0712		(Purchased Reagent)		PFPeS (Perfluoro-1-pentanesulfonate)	46.9 ug/mL
.LCPFTeDA_00003	06/19/18		Wellington Laboratories, Lot PFTeDA0613		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
.LCPFTrDA_00003	12/10/18		Wellington Laboratories, Lot PFTTrDA1213		(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
.LCPFUdA_00003	06/19/18		Wellington Laboratories, Lot PFUdA0613		(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL

Reagent

LCM2PFHxDA_00002

Rec: 8/14/14 SKV

318141
ID: LCM2PFHxDA_00002
Exp: 11/29/17 Prod: SKV
13C2-PFHxDA at 50ug/ml

Scanned: 8/18/14 SKV

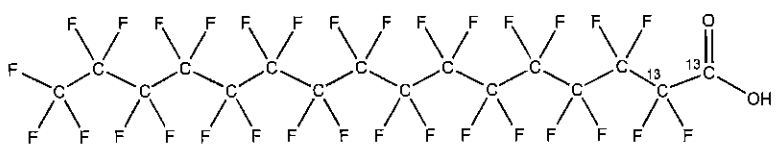


WELLINGTON LABORATORIES

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) 11/29/2012
EXPIRY DATE: (mm/dd/yyyy) 11/29/2017
RECOMMENDED STORAGE: Store ampoule in a cool, dark place


DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:  **Date:** 01/10/2013
B.G. Chittim (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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.

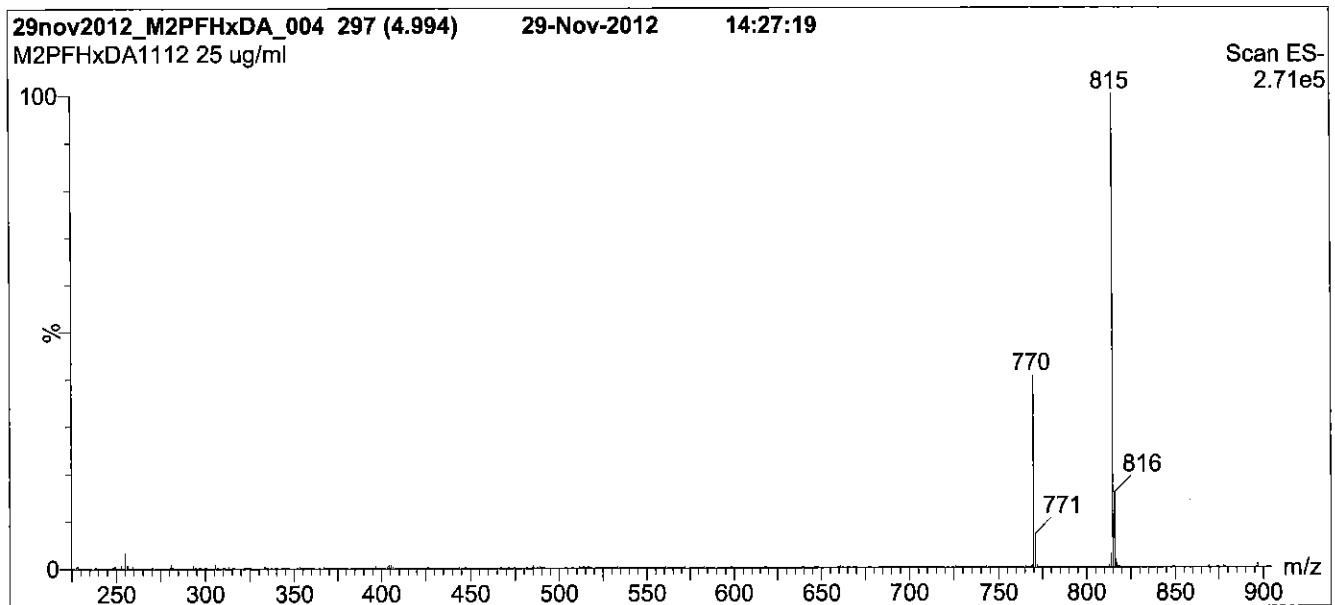
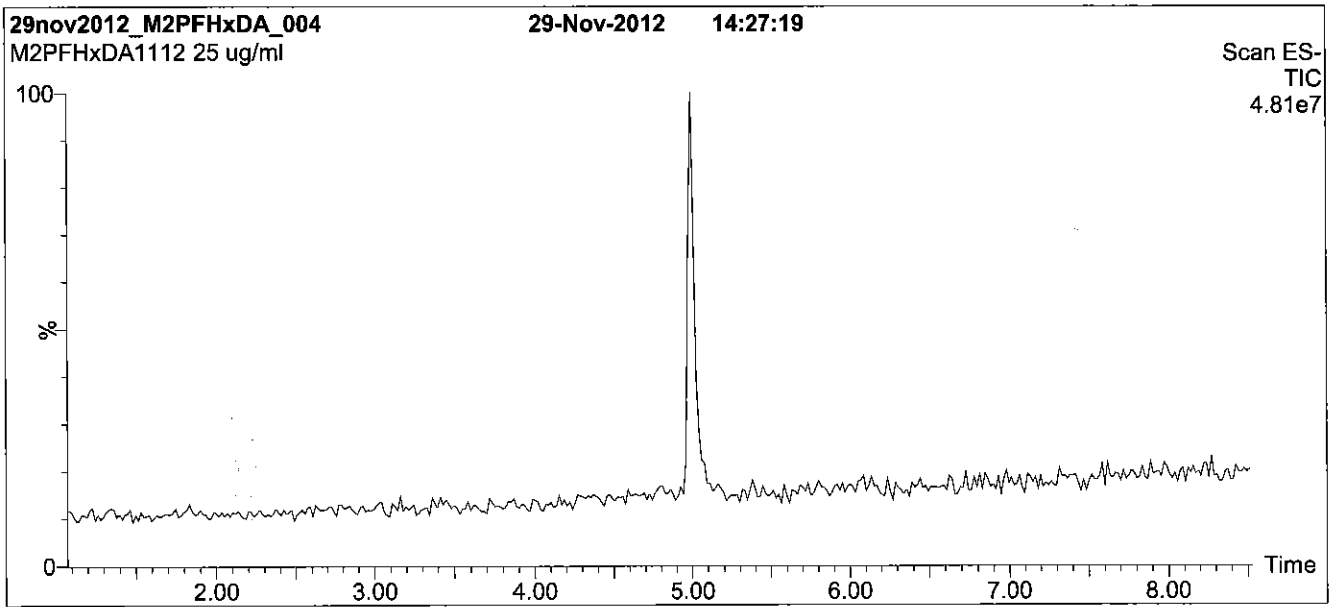
QUALITY MANAGEMENT:

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: 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 μm, 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

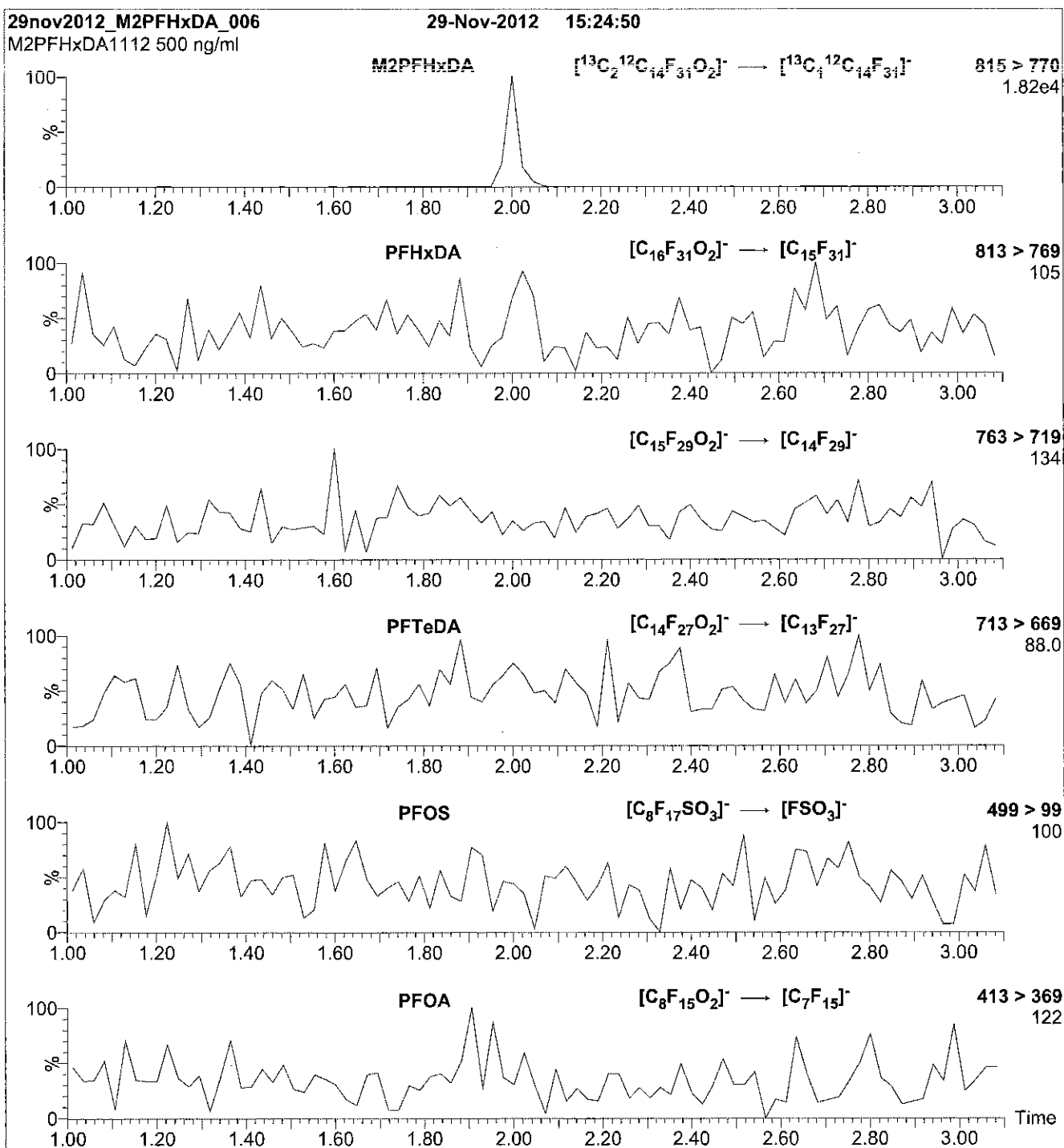
Flow: 300 μl/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml M2PFHxDA)

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

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

MS Parameters

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

Reagent

LCM2PFHxDA_00003

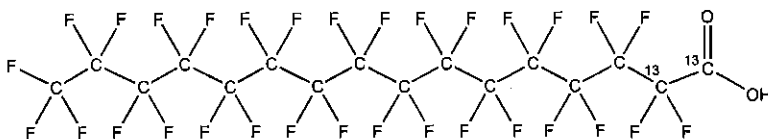


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₂ ¹² C ₁₄ HF ₃₁ O ₂	MOLECULAR WEIGHT:	816.11
CONCENTRATION:	50 ± 2.5 µg/ml	SOLVENT(S):	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	ISOTOPIC PURITY:	≥99% ¹³ C (1,2- ¹³ C ₂)
LAST TESTED: (mm/dd/yyyy)	11/29/2012		
EXPIRY DATE: (mm/dd/yyyy)	11/29/2017		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		


DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:  **Date:** 04/01/2015
 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.

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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:

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

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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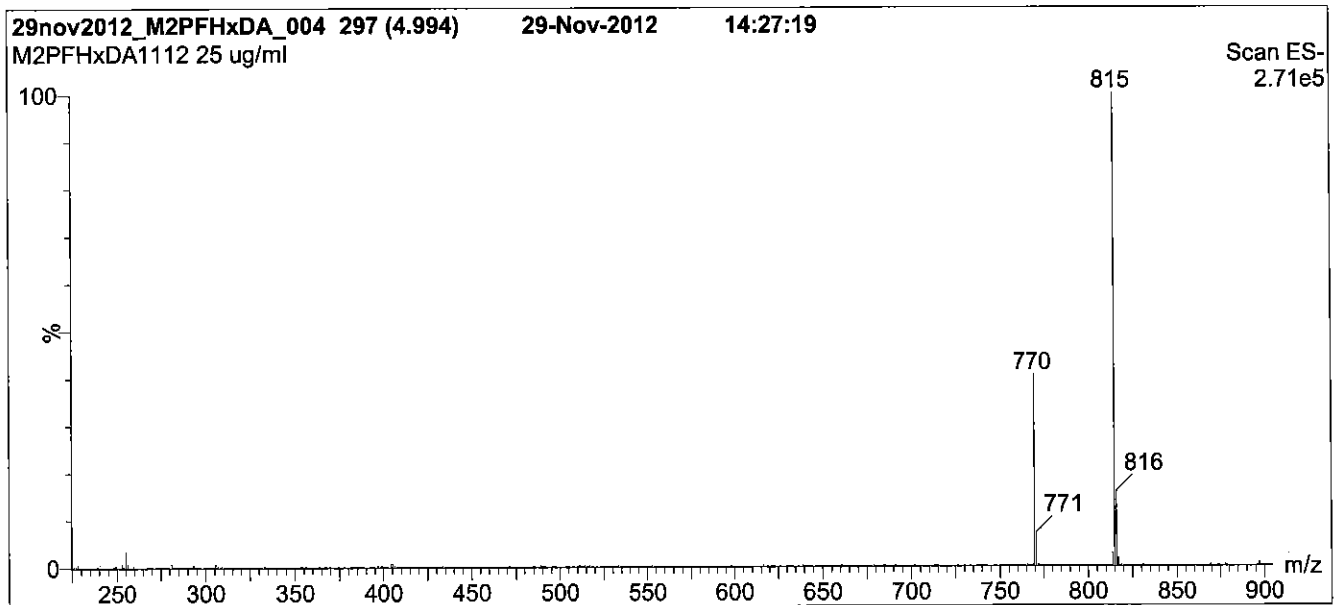
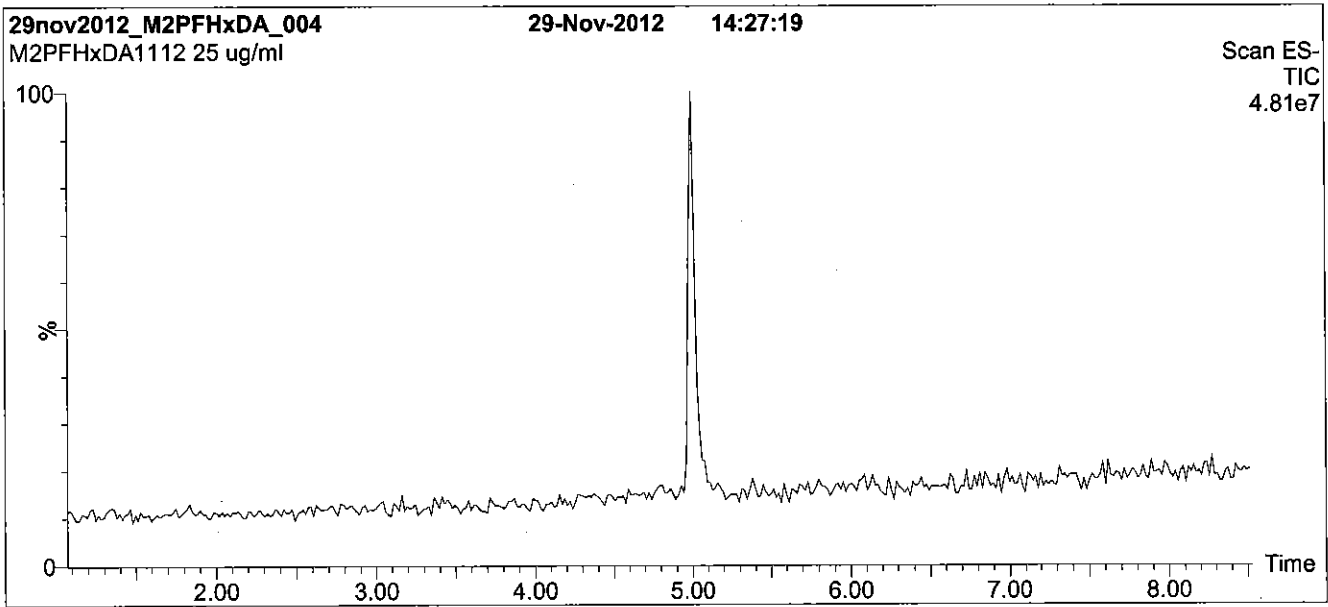
QUALITY MANAGEMENT:

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).



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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

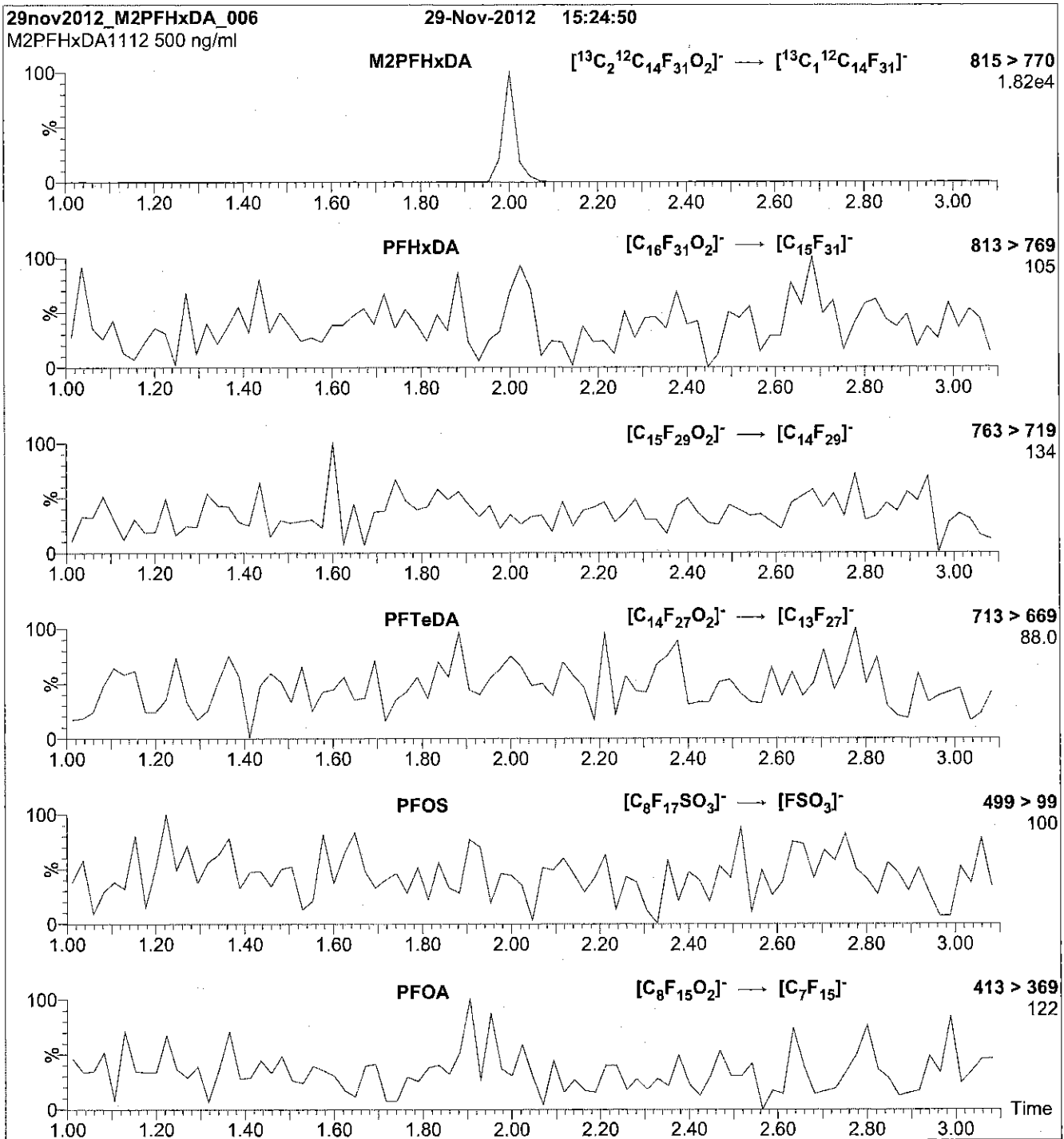
Flow: 300 μ l/min

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_00003

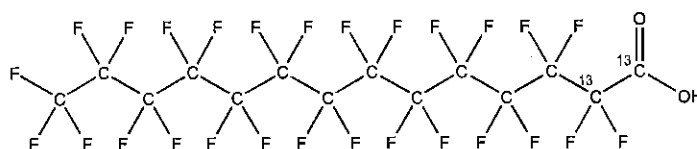
r: 2/1/15 Stv



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFTeDA **LOT NUMBER:** M2PFTeDA1112
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) 11/29/2012
EXPIRY DATE: (mm/dd/yyyy) 11/29/2017
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

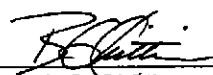
DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

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LIMITED WARRANTY:

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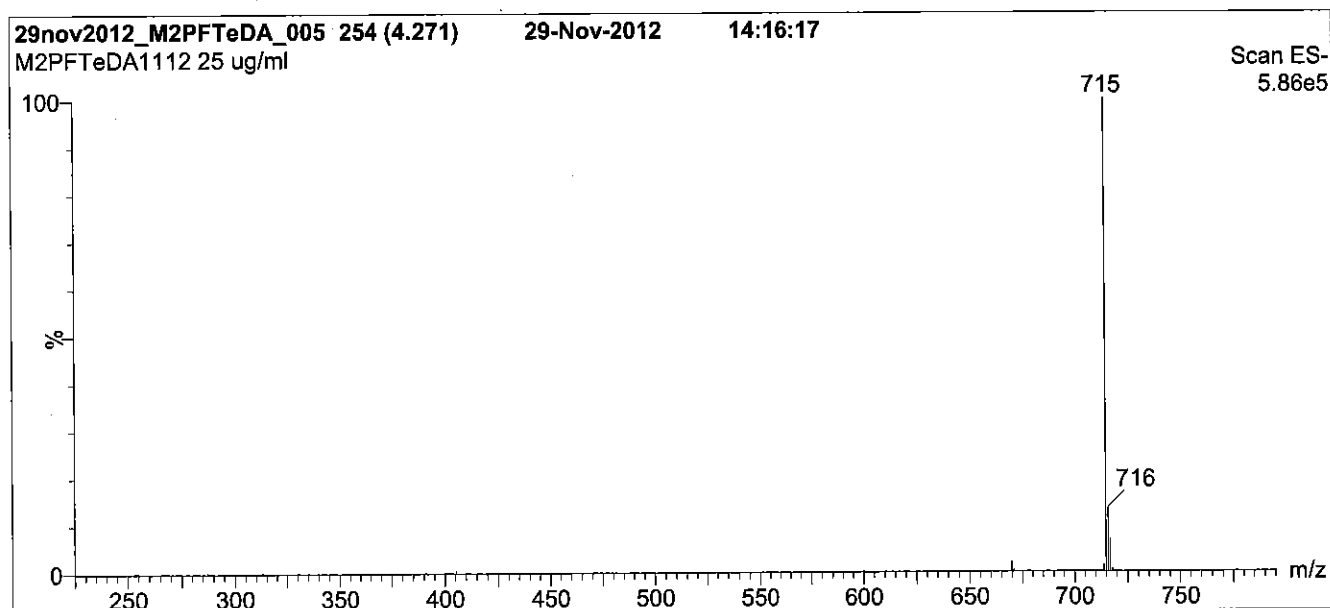
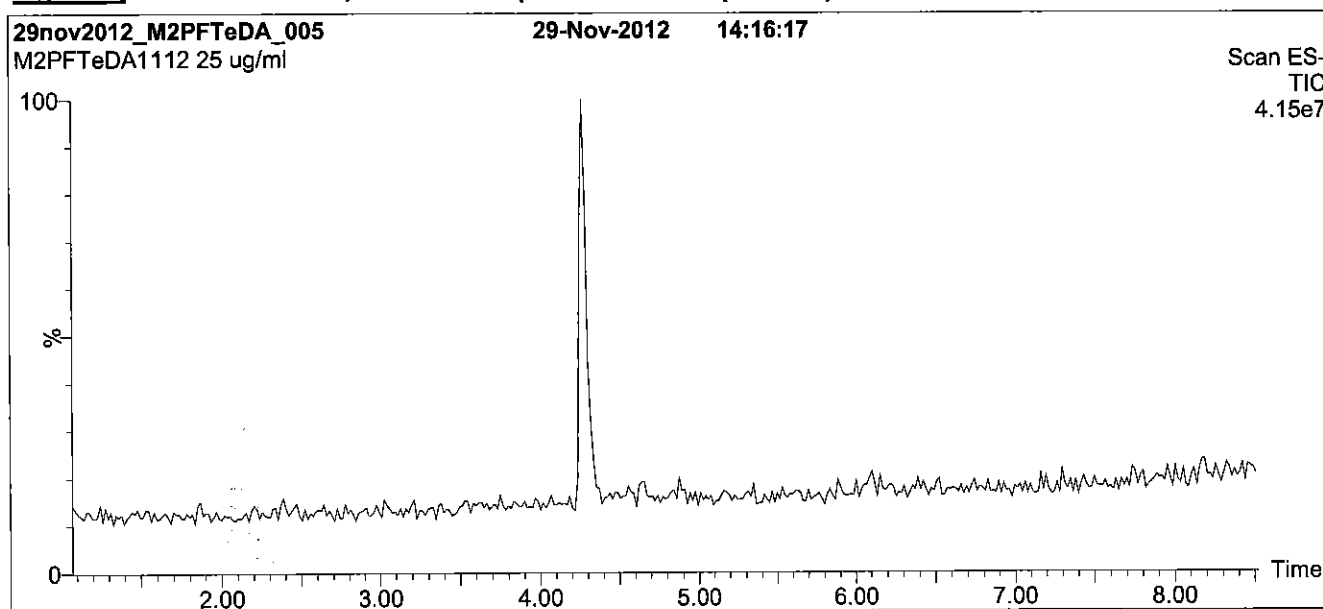
QUALITY MANAGEMENT:

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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: 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

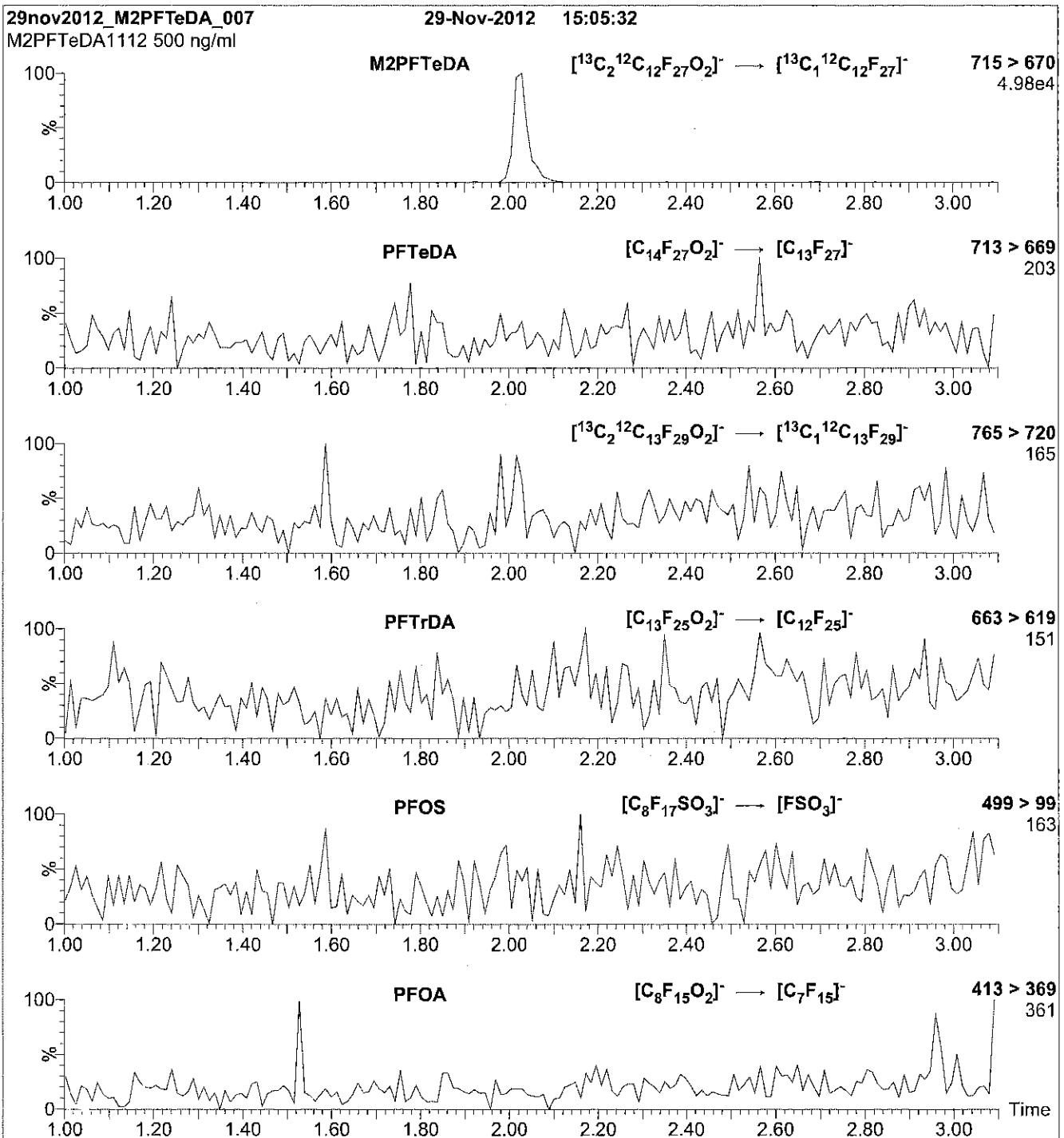
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

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

Reagent

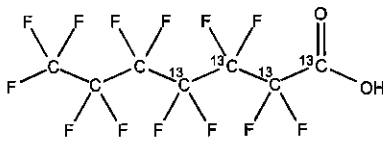
LCM4PFHPA_00003



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M4PFHpA **LOT NUMBER:** M4PFHpA0515
COMPOUND: Perfluoro-n-[1,2,3,4-¹³C₄]heptanoic acid
STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₄¹²C₃HF₁₃O₂ **MOLECULAR WEIGHT:** 368.03
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) 05/22/2015
EXPIRY DATE: (mm/dd/yyyy) 05/22/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____

B.G. Chittim

Date: 05/25/2015
 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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

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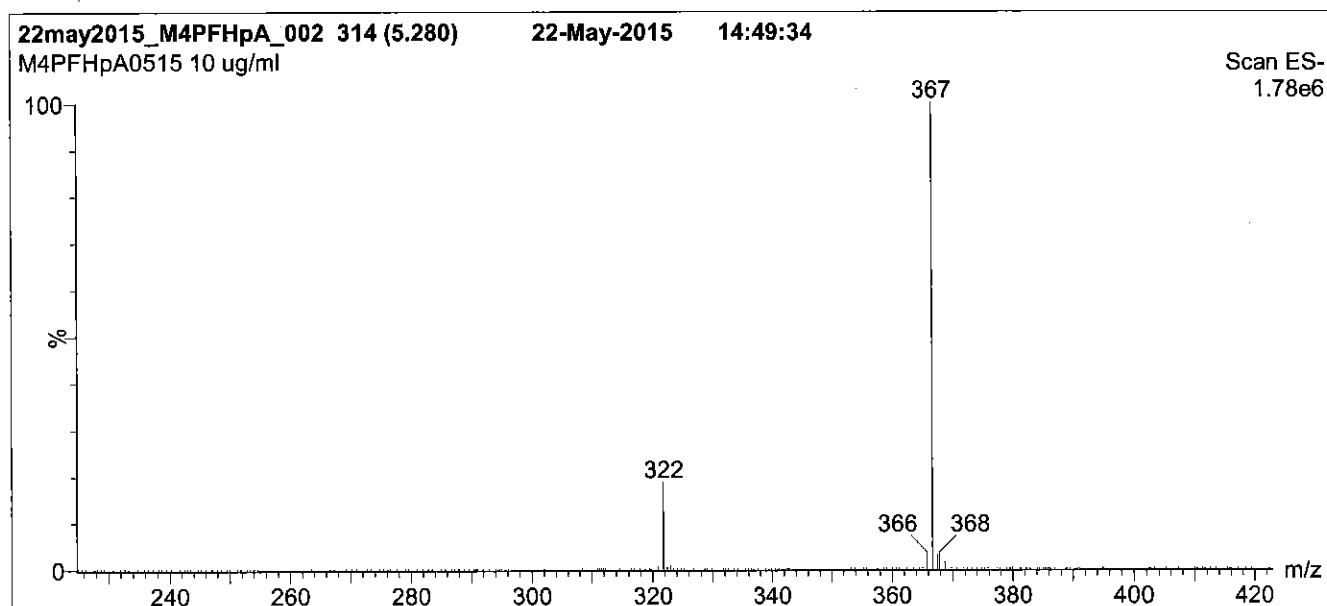
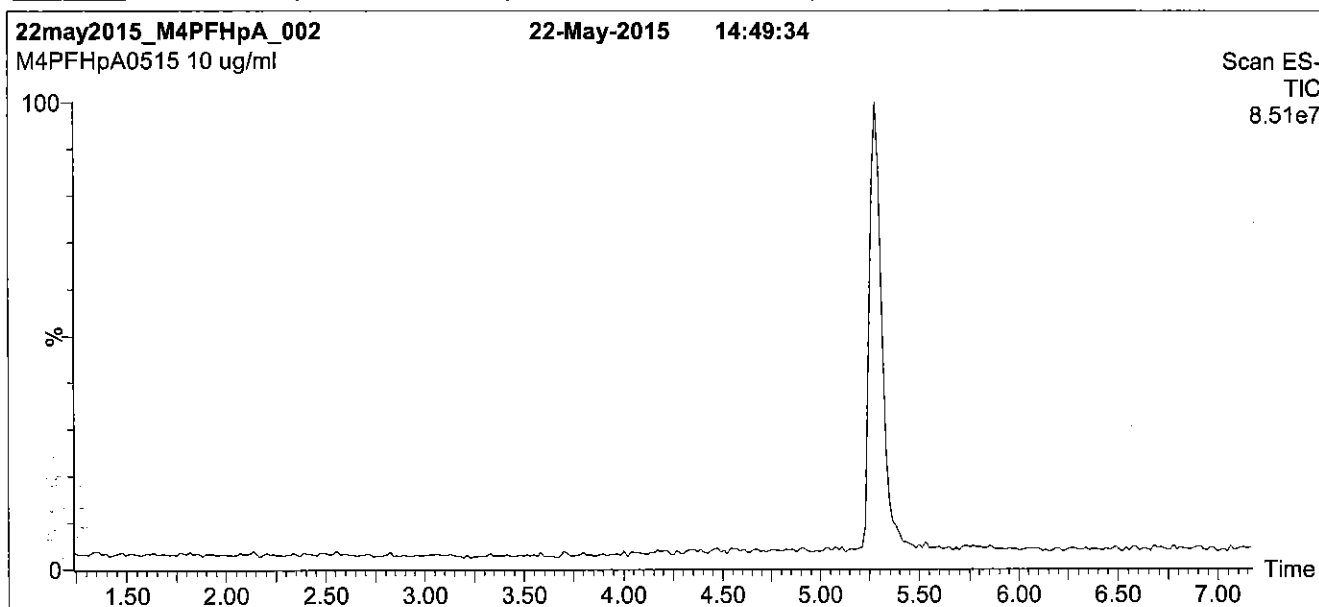
QUALITY MANAGEMENT:

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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

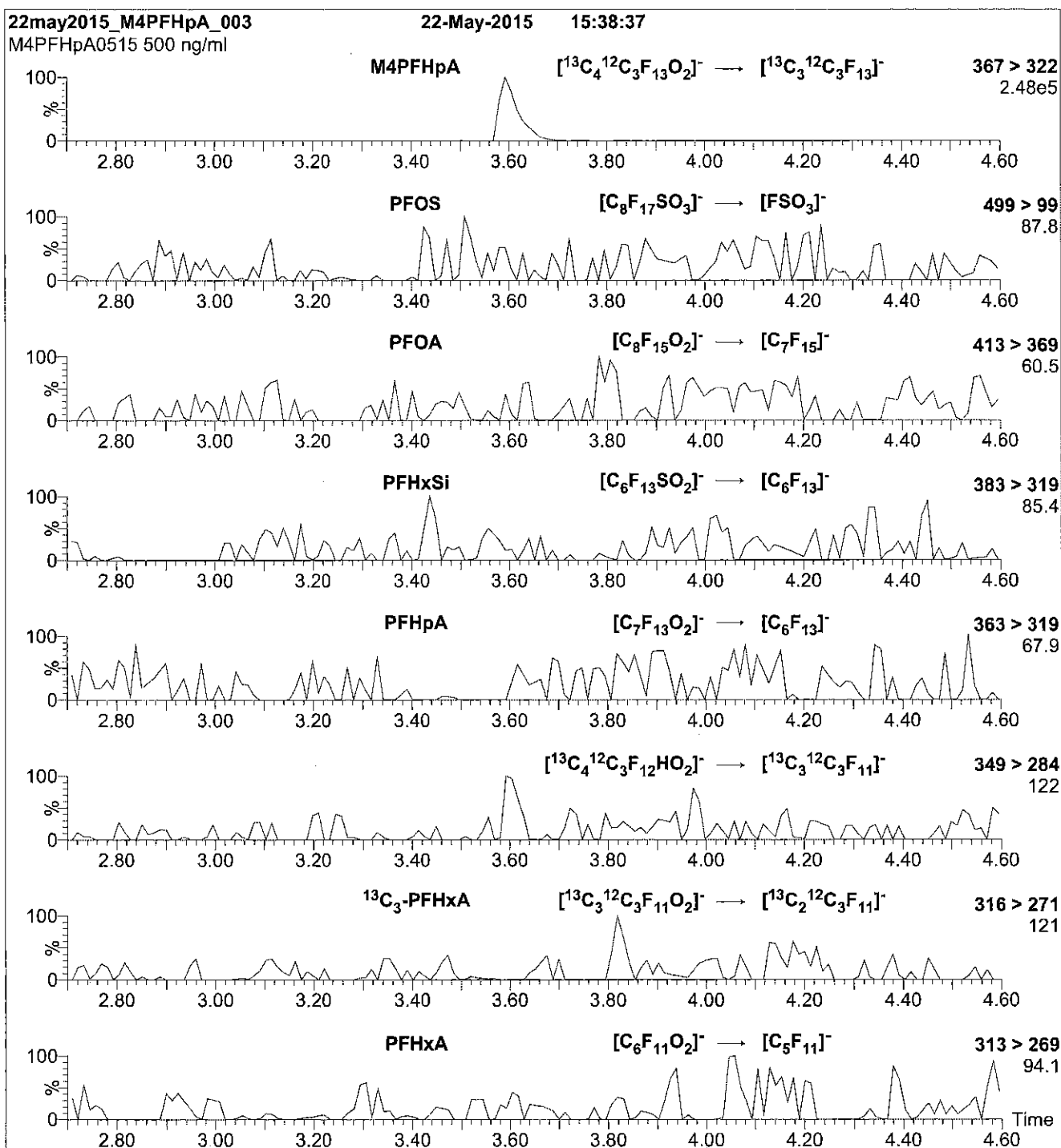
Flow: 300 μ l/min

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

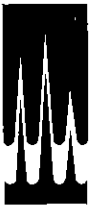
MS Parameters

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

Reagent

LCM5PFPEA_00004

17 11/10/15 SRF



WELLINGTON LABORATORIES

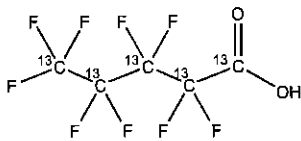
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: M5PFPeA0515

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₆HF₉O₂
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

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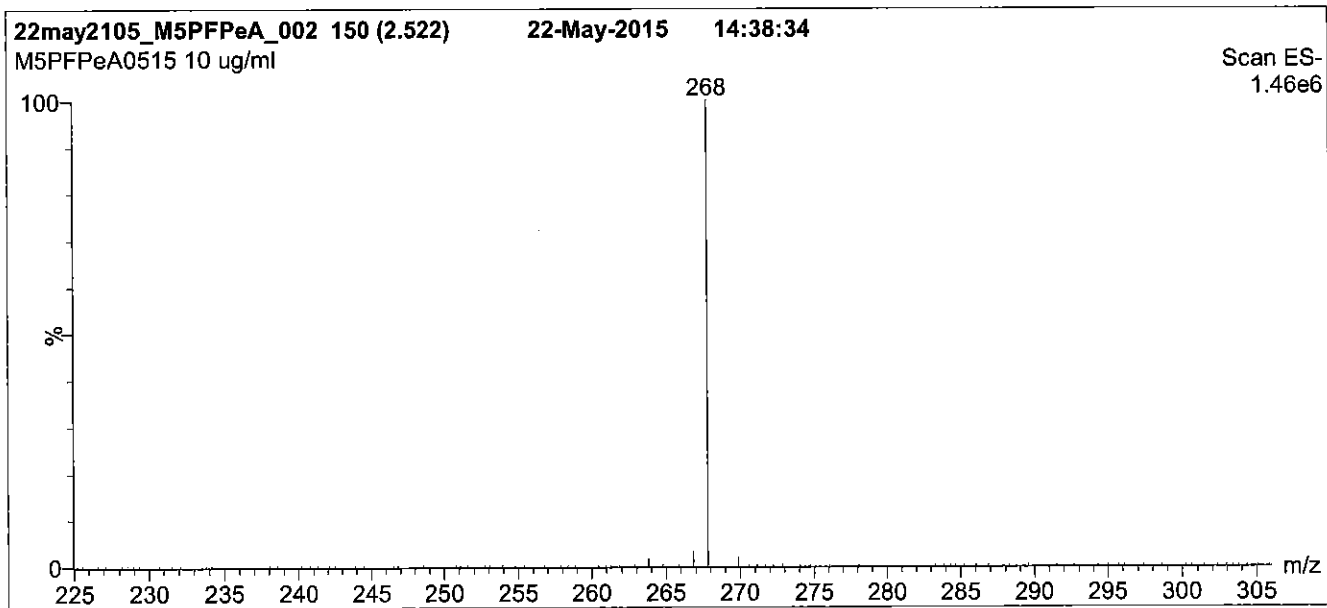
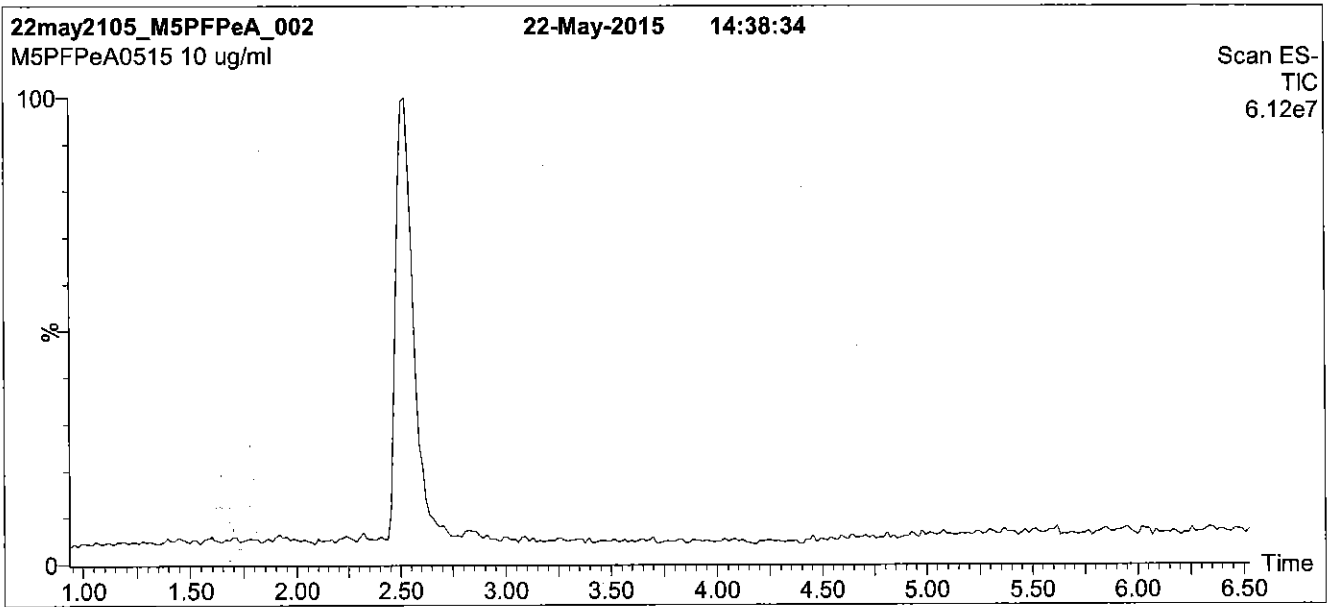
QUALITY MANAGEMENT:

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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

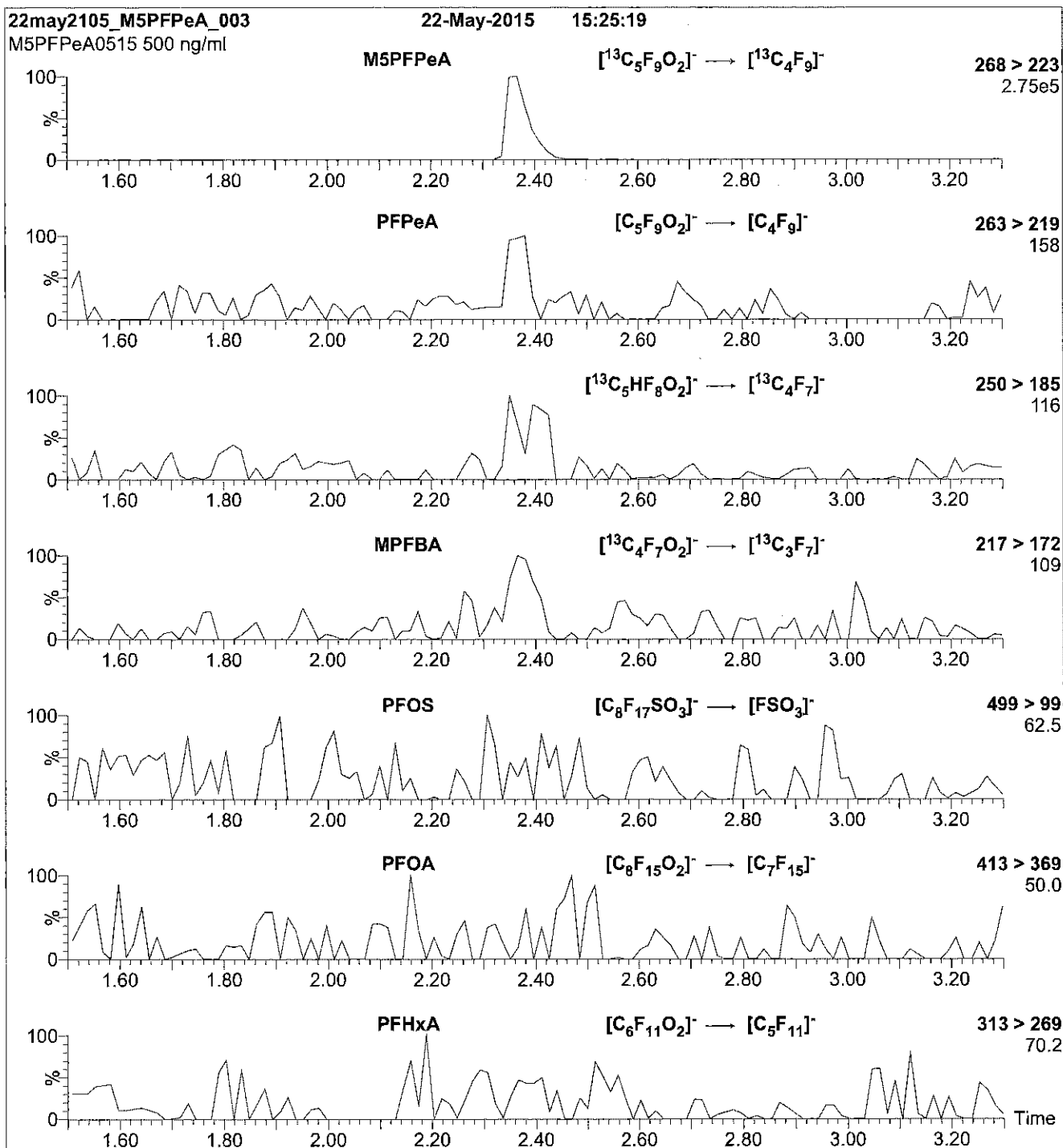
Flow: 300 μ l/min

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_00006

rec: 9/15/15 sv



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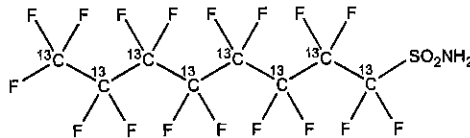
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: M8FOSA1214I

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₈H₂F₁₇NO₂S
CONCENTRATION: 50 ± 2.5 µg/ml
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/15/2014
EXPIRY DATE: (mm/dd/yyyy) 12/15/2016
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: 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.

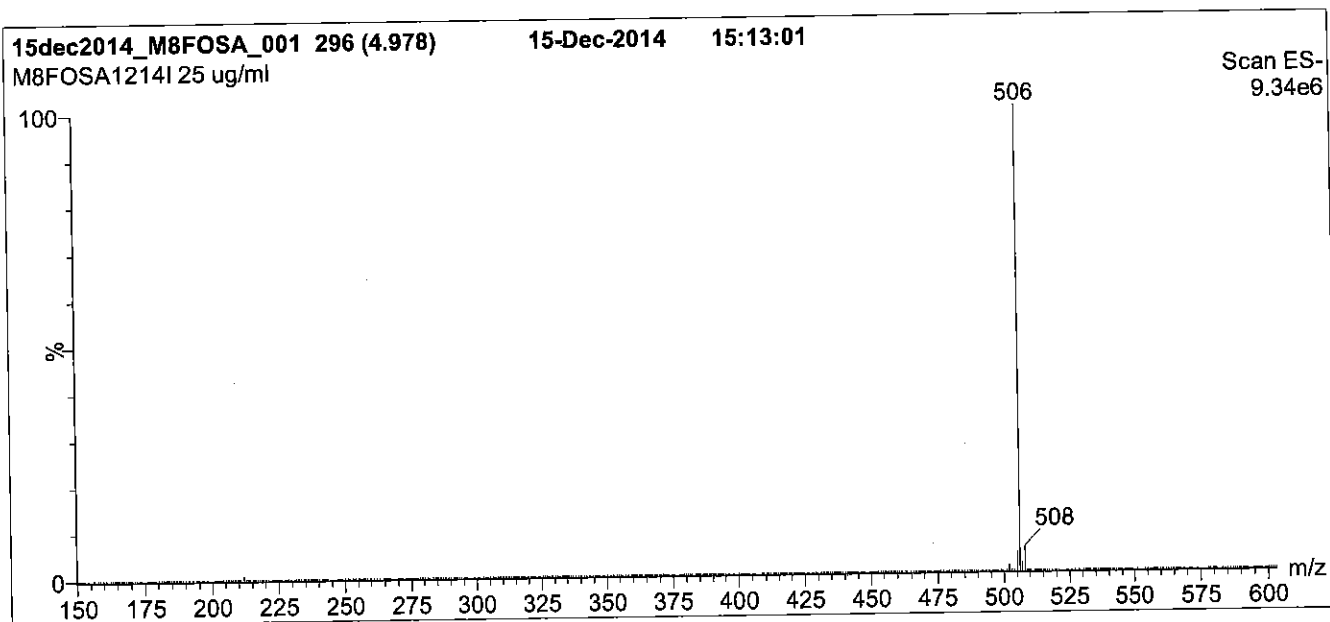
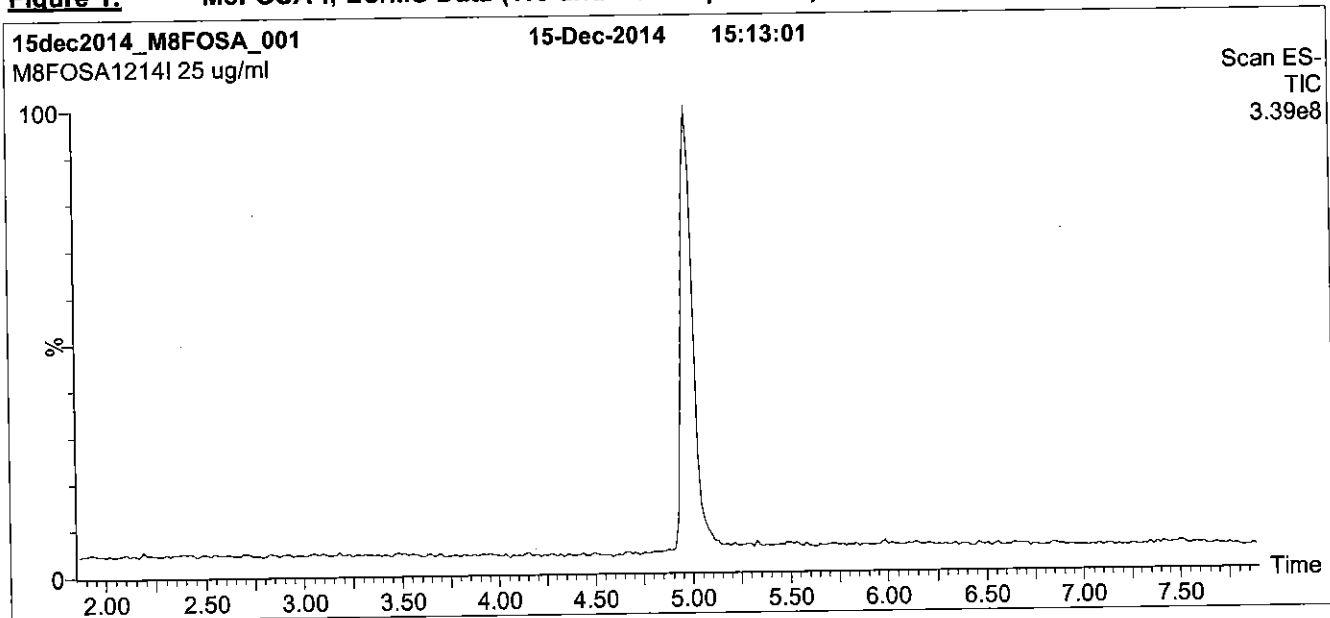
QUALITY MANAGEMENT:

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

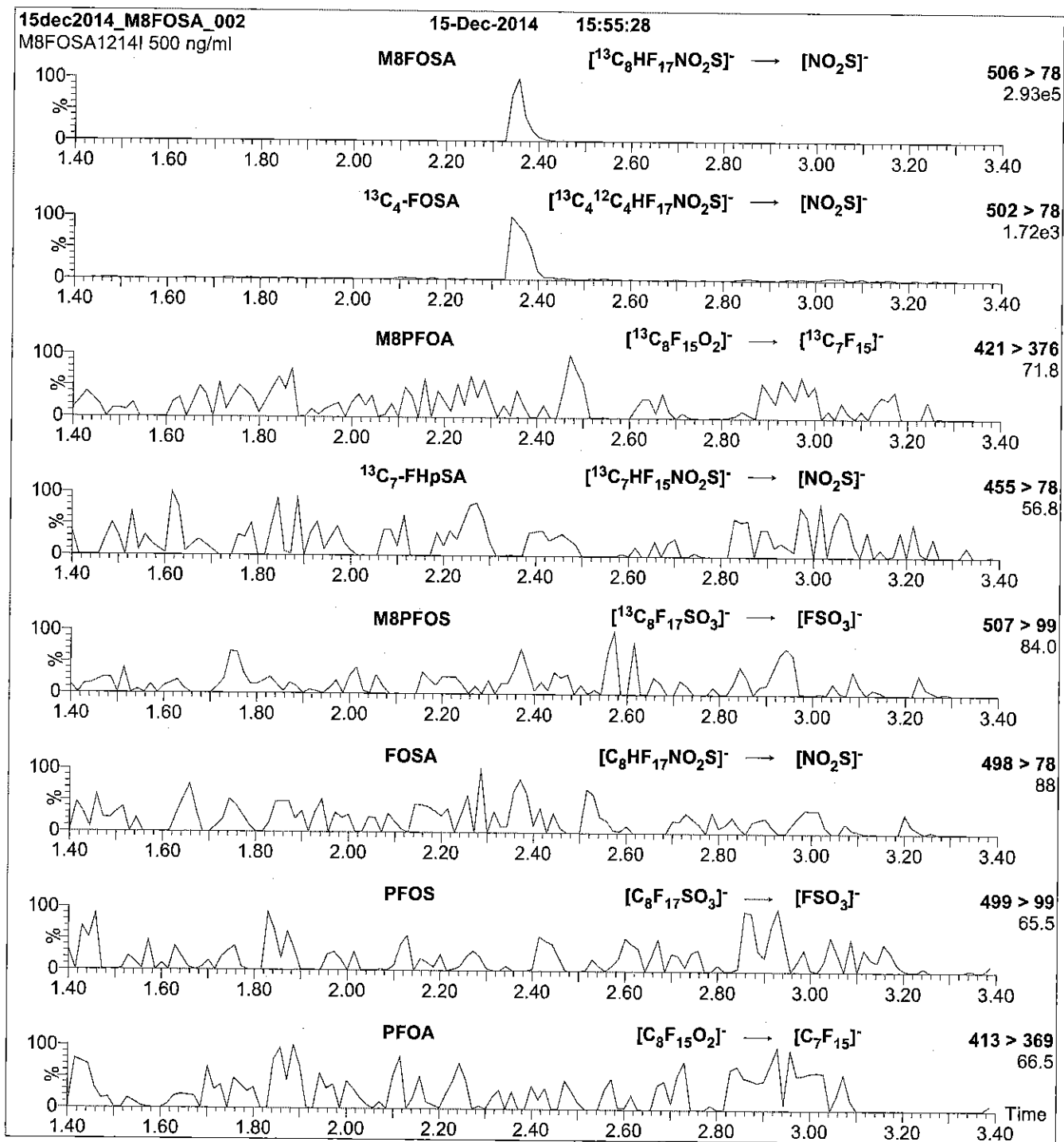
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Reagent

LCMPFBA_00004

V: 12/15 SW



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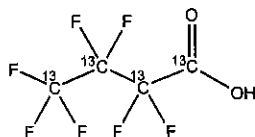
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

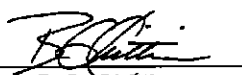
DOCUMENTATION/ DATA ATTACHED:

- 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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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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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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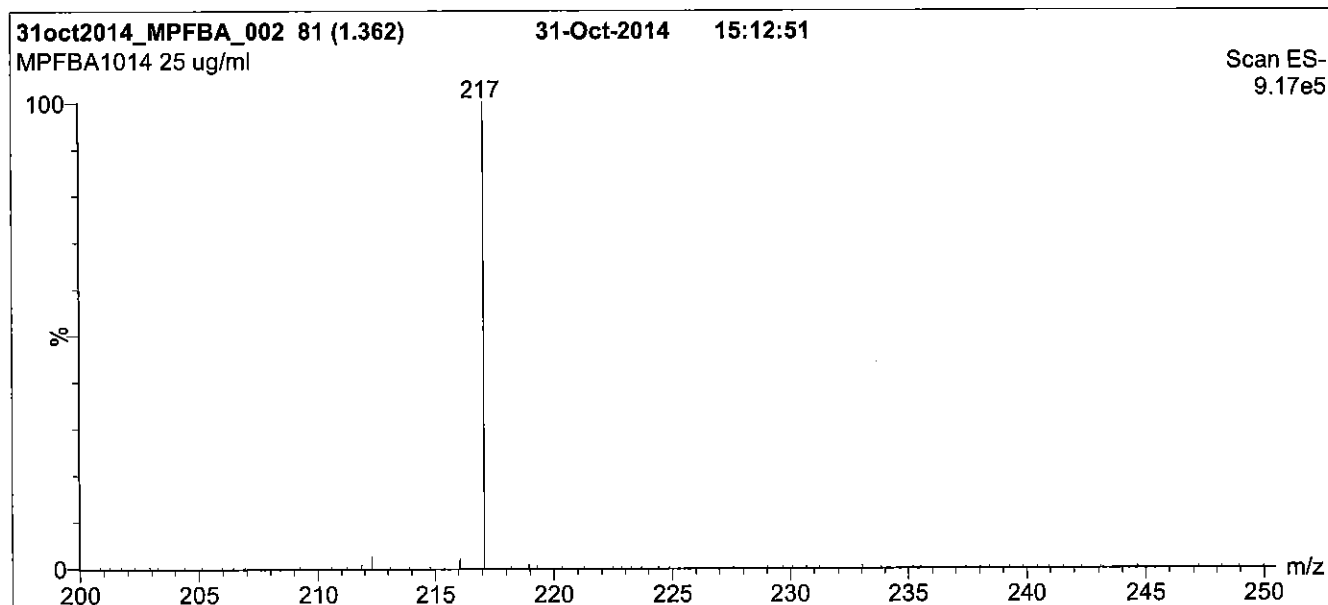
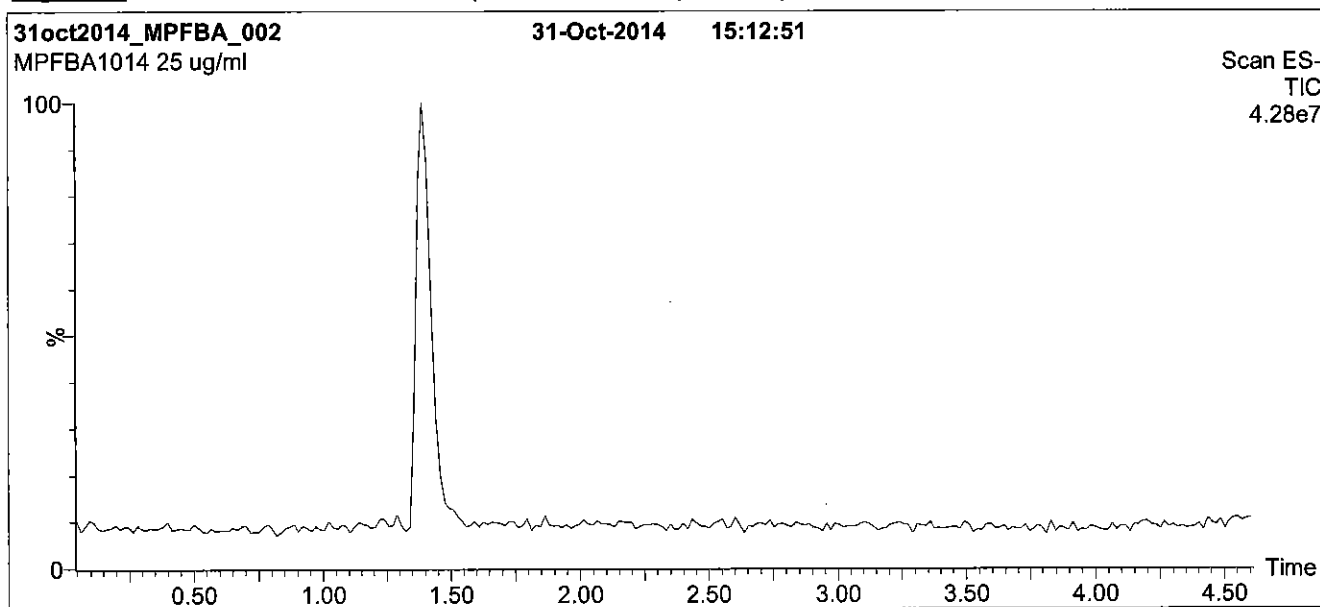
QUALITY MANAGEMENT:

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: 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

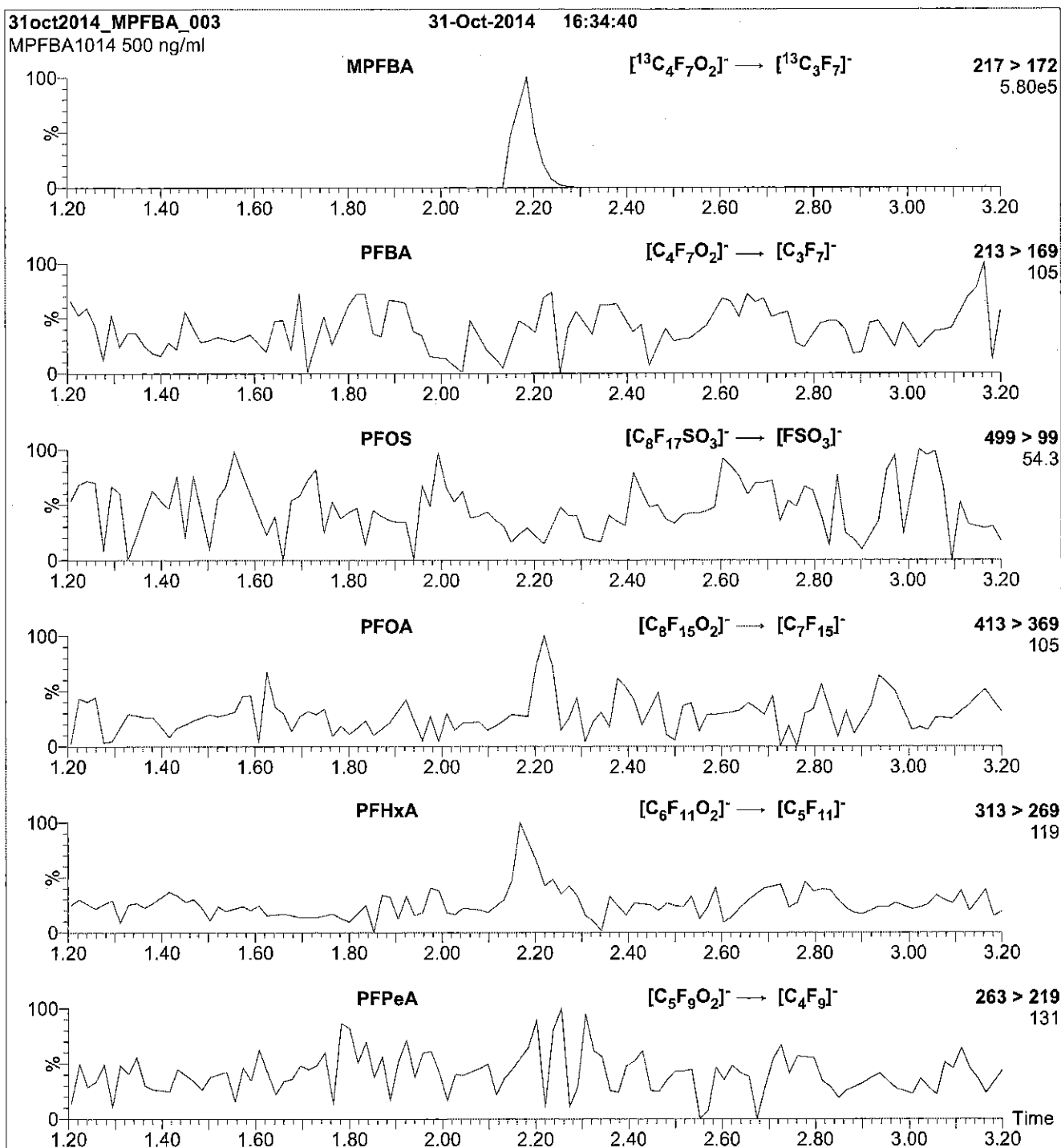
Flow: 300 μ l/min

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_00004

2011
 R: 10-20-~~2011~~
 Rec. 10-20-2011



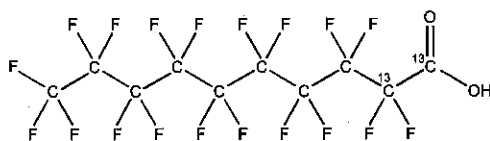
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LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

12LCMS0262
 LCM PFDA-00001

PRODUCT CODE: MPFDA **LOT NUMBER:** MPFDA0411
COMPOUND: Perfluoro-n-[1,2-¹³C₂]decanoic acid

STRUCTURE: **CAS #** Not available



MOLECULAR FORMULA: $^{13}\text{C}_2^{12}\text{C}_8\text{HF}_{19}\text{O}_2$ **MOLECULAR WEIGHT:** 516.07
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** $\geq 99\% ^{13}\text{C}$
LAST TESTED: (mm/dd/yyyy) 04/07/2011 (1,2-¹³C₂)
EXPIRY DATE: (mm/dd/yyyy) 04/07/2014
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of ¹³C₁-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:
 B.G. Chittim

Date: 04/19/2011
 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

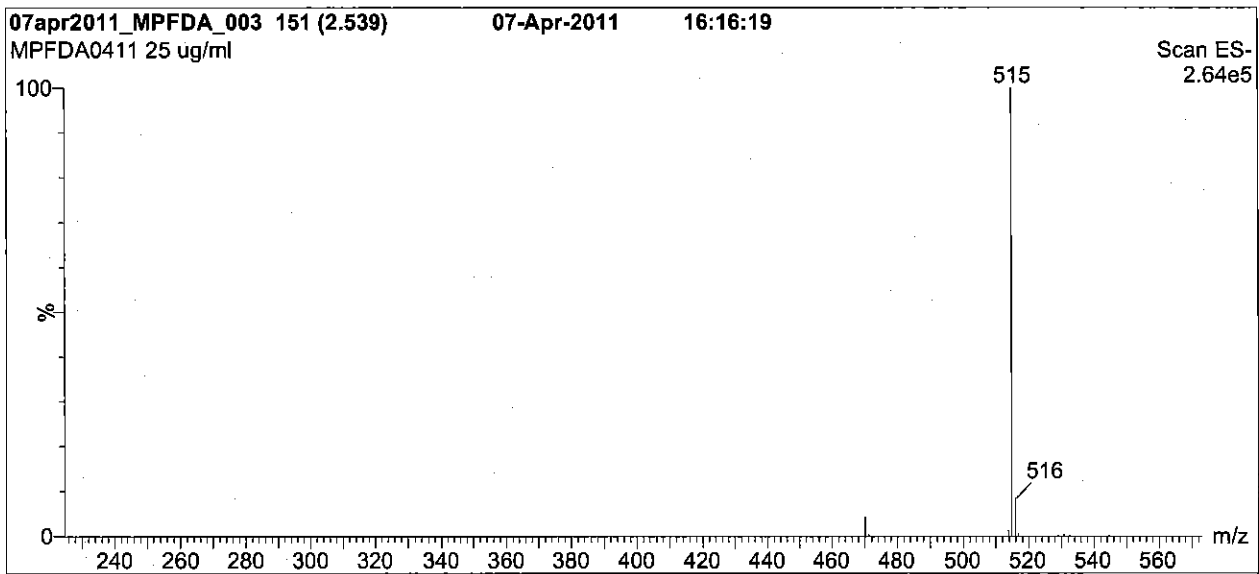
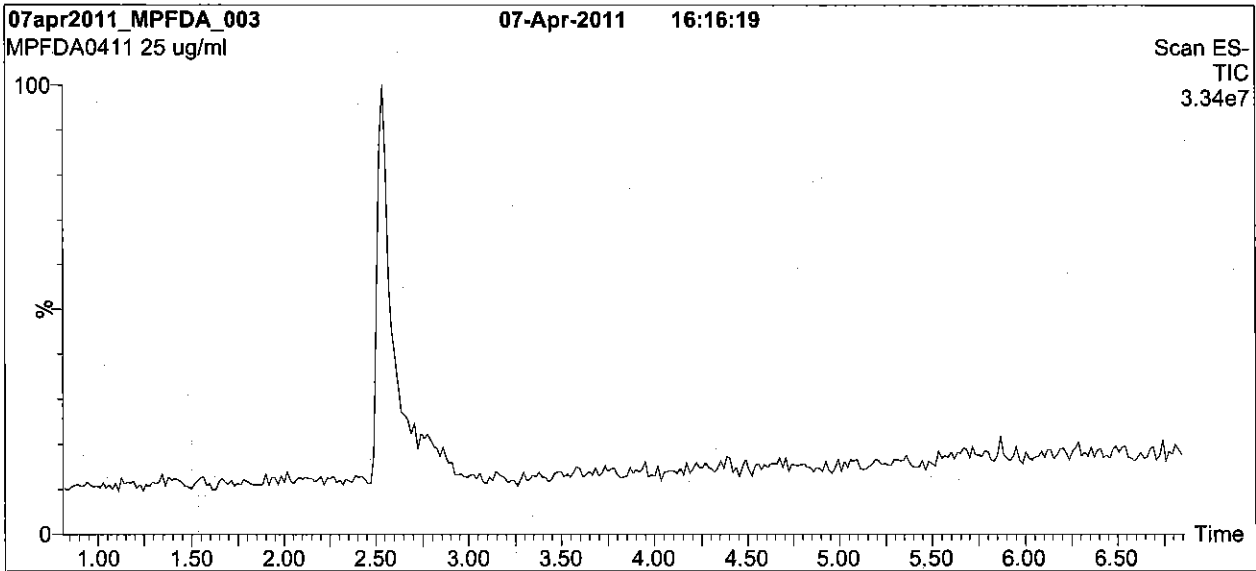
Ongoing stability studies of this product have demonstrated stability in its composition and concentration for the period of time specified by the expiry date in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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

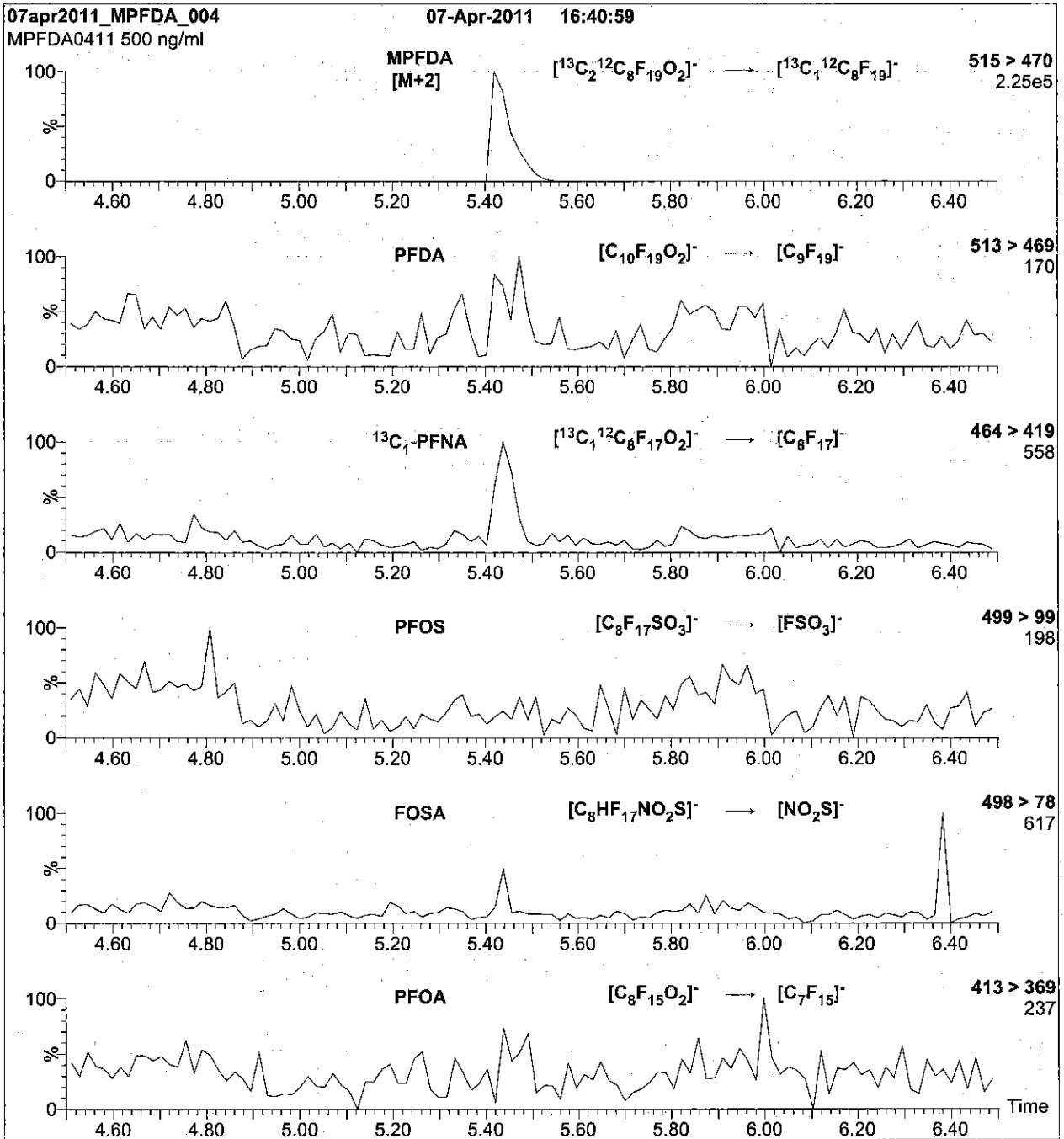
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 70% (80:20 MeOH:ACN) / 30% H_2O
(both with 10 mM NH_4OAc buffer)

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

MS Parameters

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

Reagent

LCMPFDA_00005

PC 4/15/15 SKV



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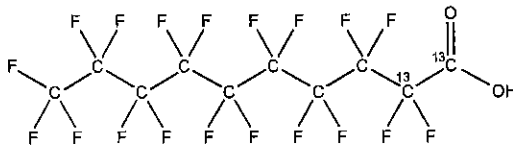
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFDA0414

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) 04/13/2014
EXPIRY DATE: (mm/dd/yyyy) 04/13/2019

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.
- Contains ~ 0.1% of ¹³C₁-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:
B.G. Chittim

Date: 04/15/2014
(mm/dd/yyyy)

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

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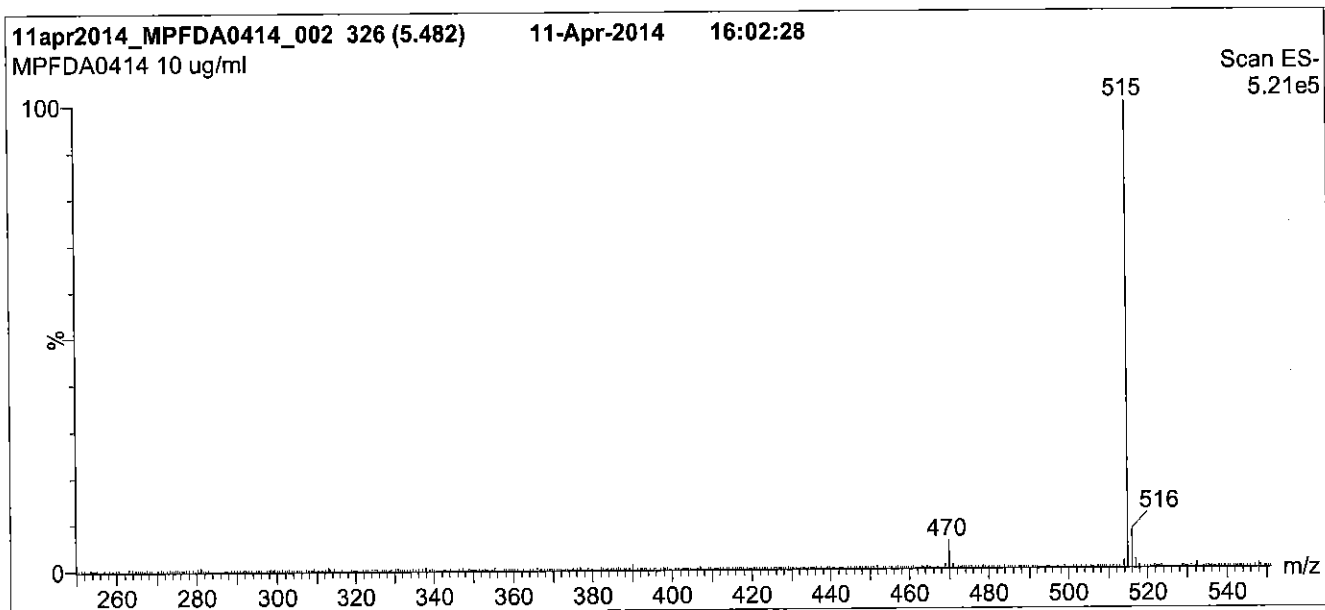
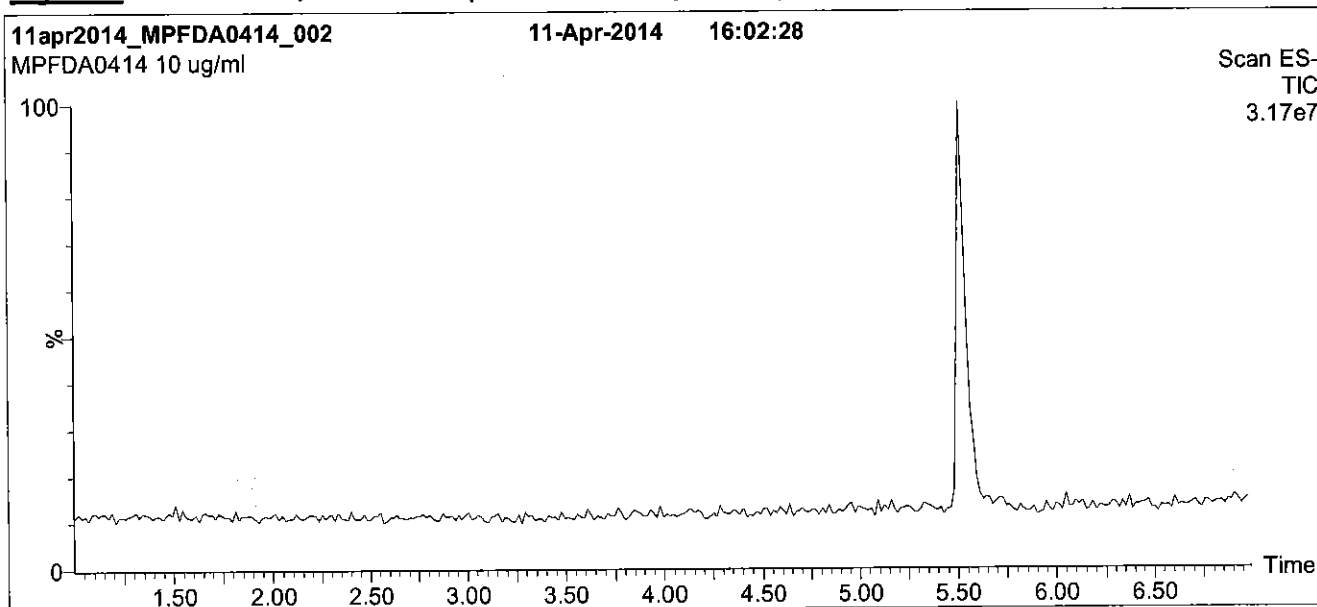
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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

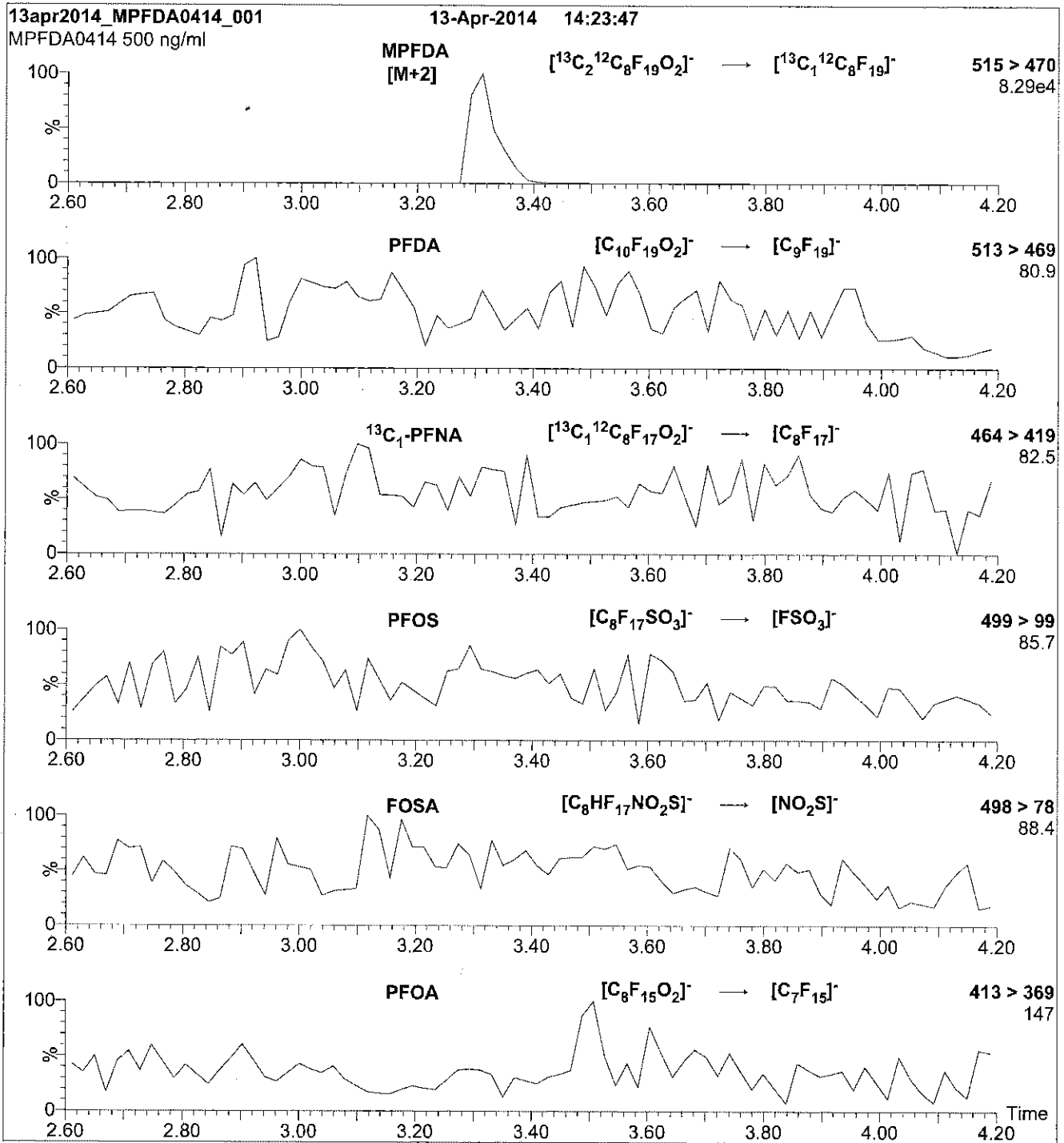
Flow: 300 μ l/min

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



Conditions for Figure 2:

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

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

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

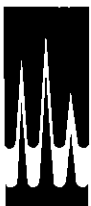
MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 13

Reagent

LCMPFD_oA_00003

P, 2/11/15 SKV

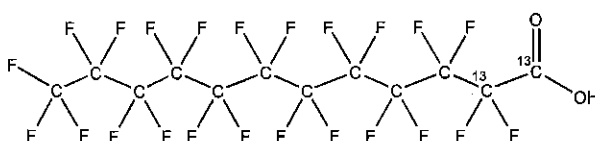


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE: **CAS #:** Not available



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

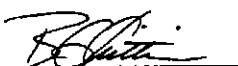
DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim **Date:** 07/21/2014
(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.

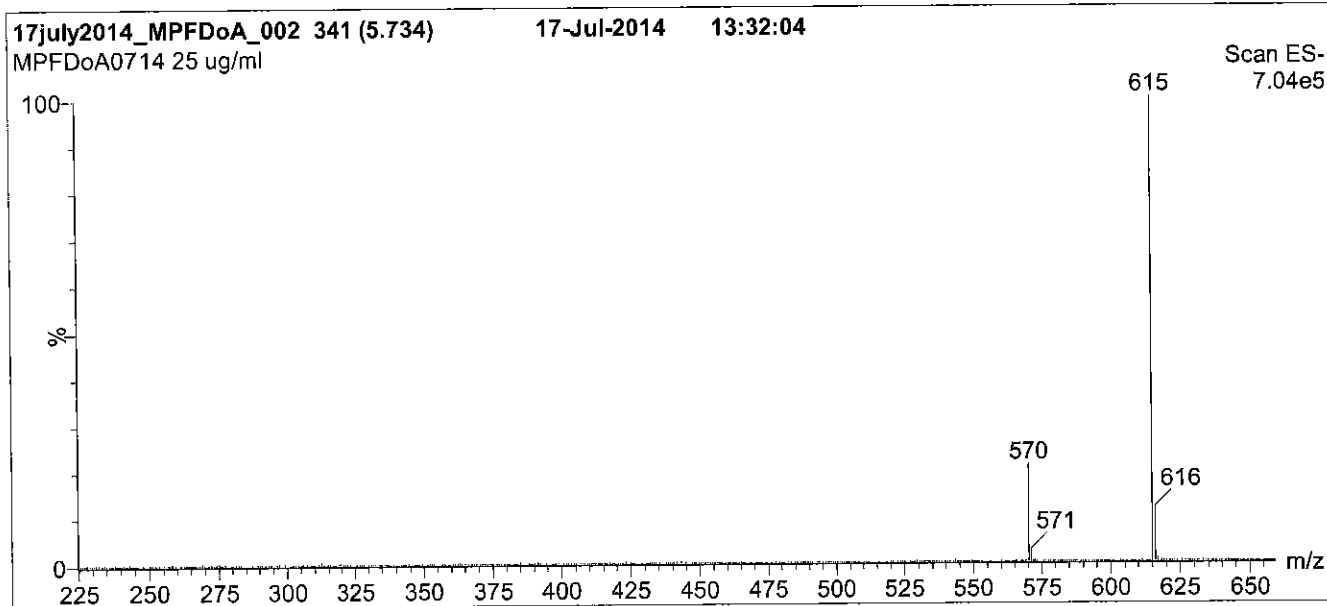
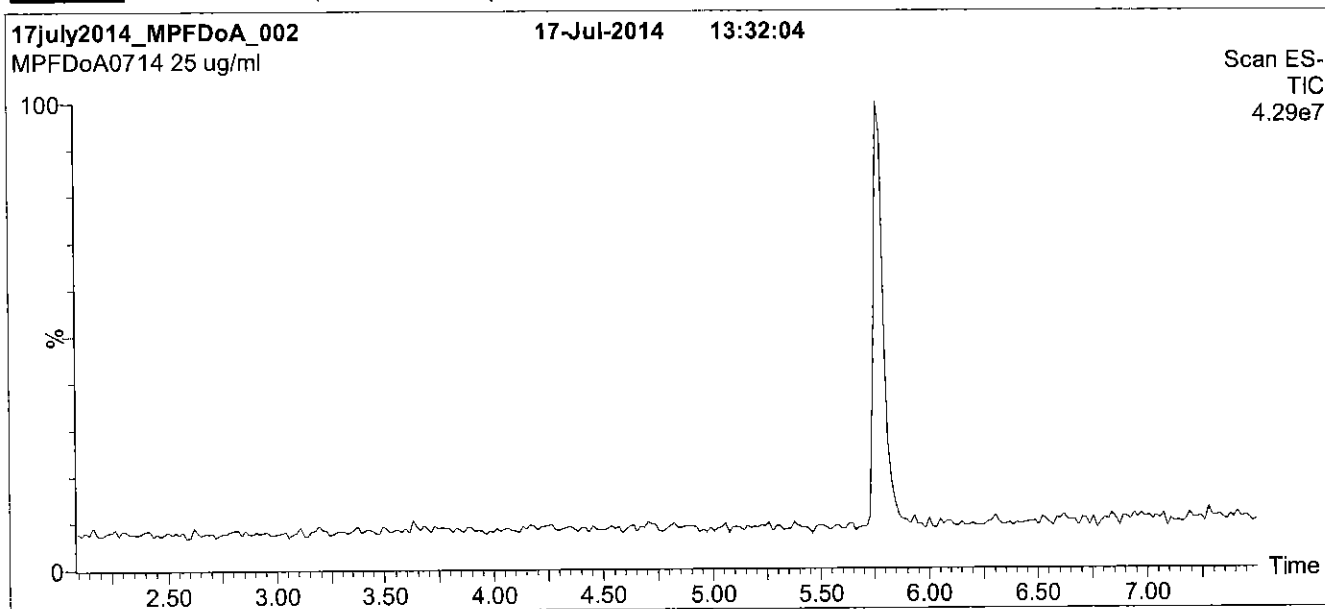
QUALITY MANAGEMENT:

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: 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

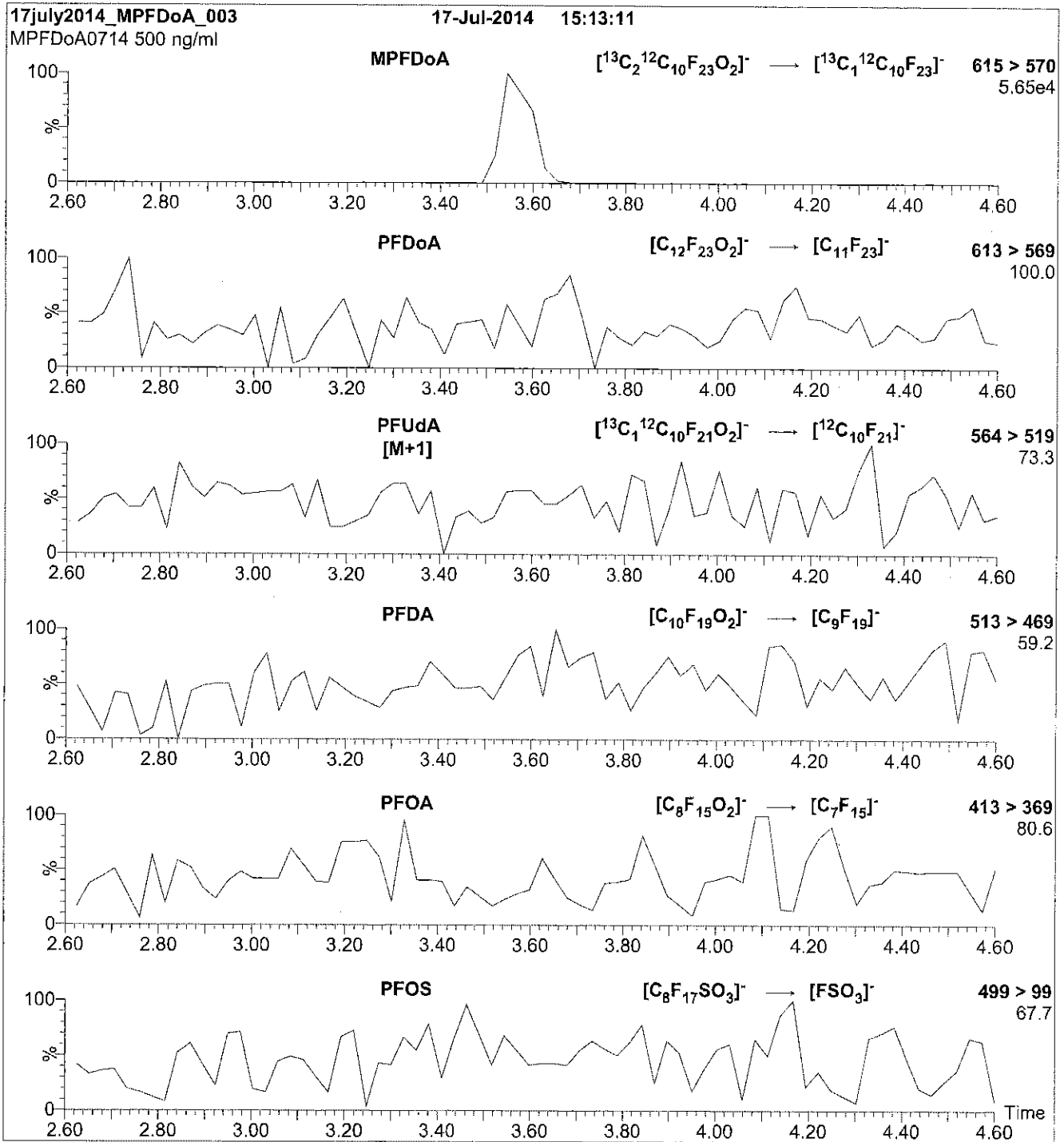
Flow: 300 μ l/min

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_00004

V: 14/10/15 SK



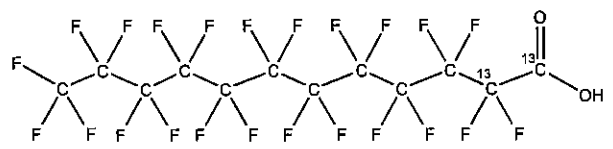
**WELLINGTON
LABORATORIES**

**CERTIFICATE OF ANALYSIS
DOCUMENTATION**

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

LOT NUMBER: MPFDoA0714

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₀HF₂₃O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 616.08
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.

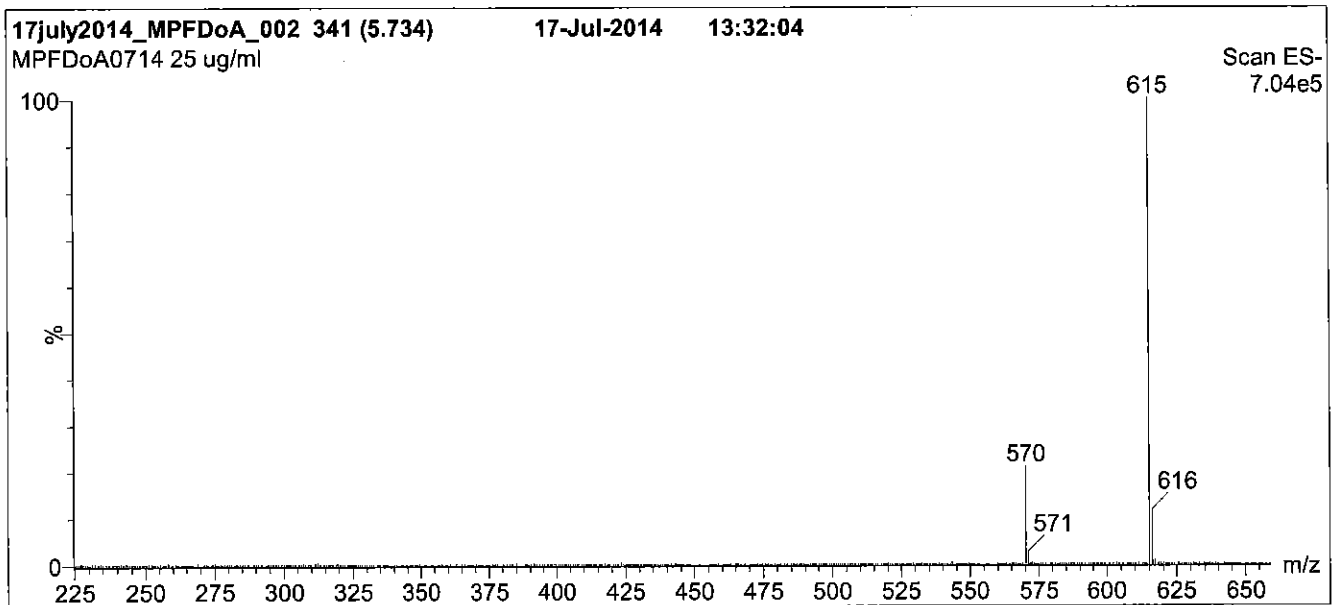
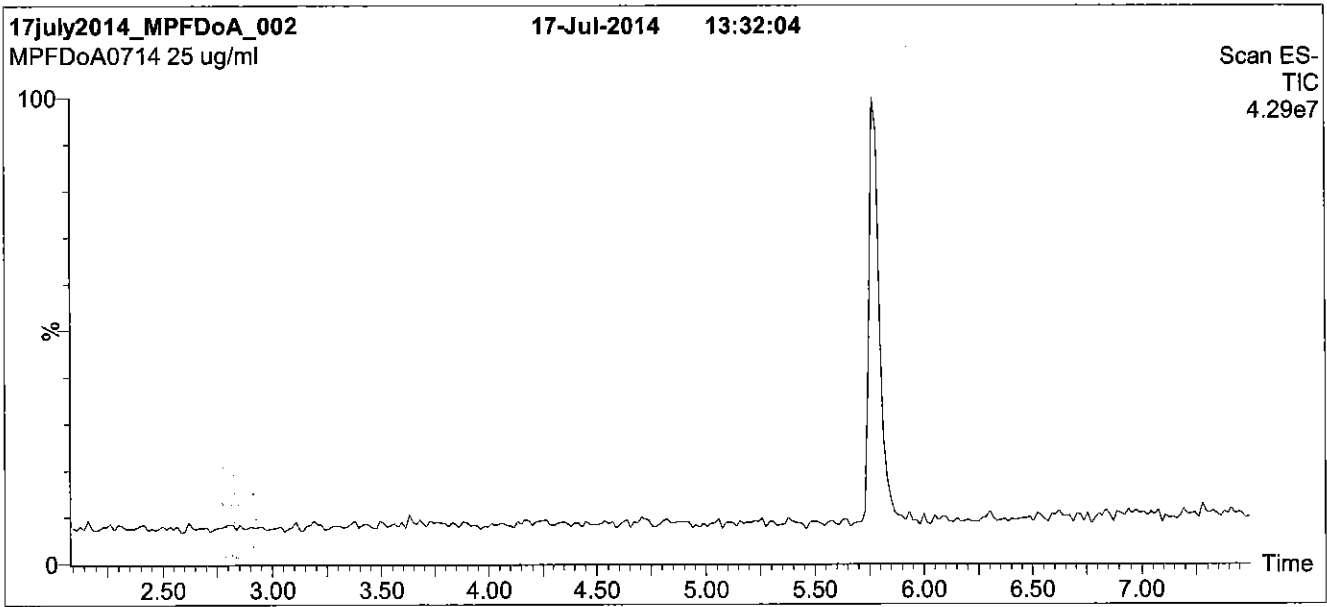
QUALITY MANAGEMENT:

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).



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: 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

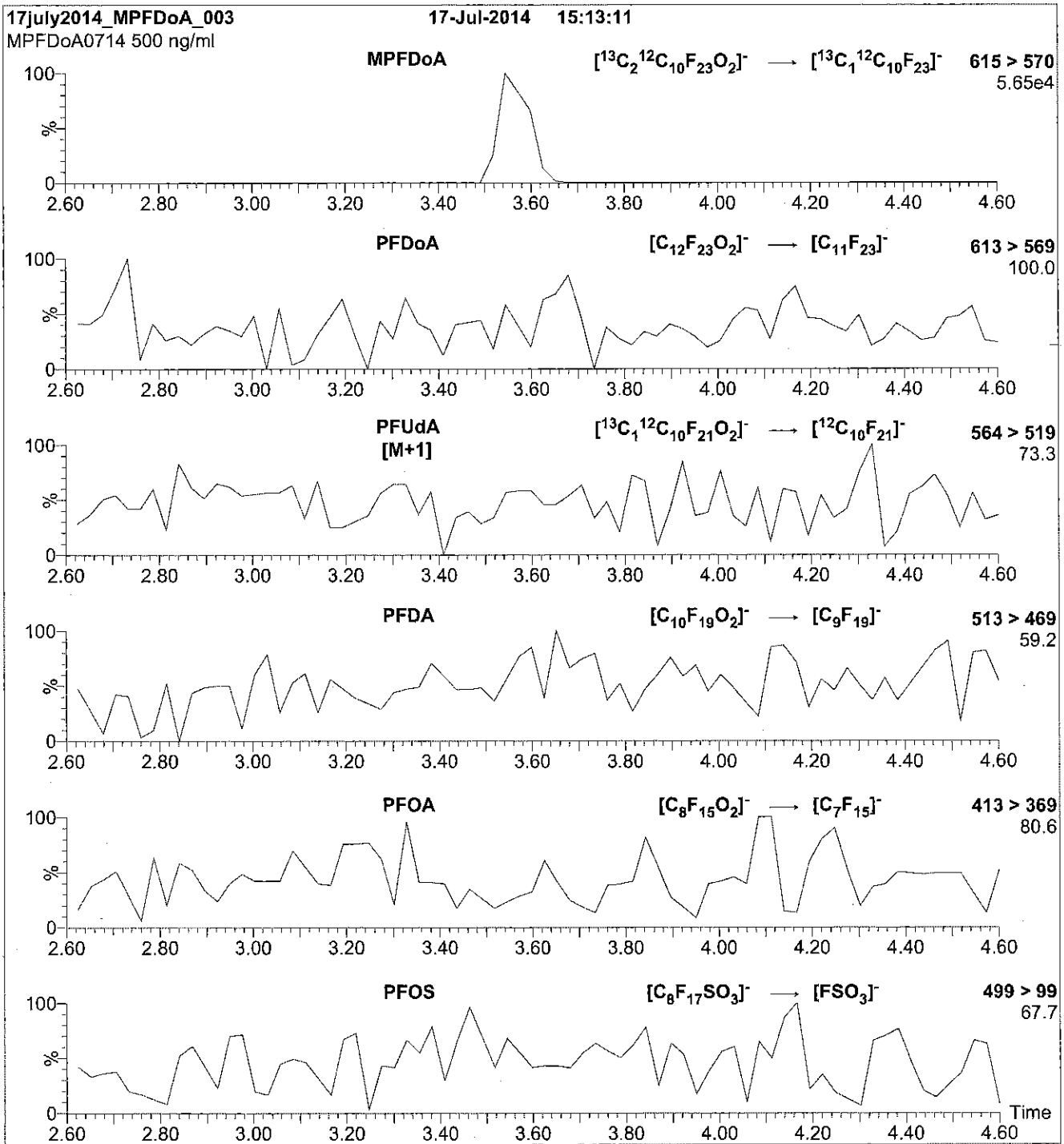
Flow: 300 μ l/min

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

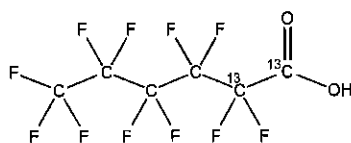
LCMPFHxA_00006



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxA
COMPOUND: Perfluoro-n-[1,2-¹³C₂]hexanoic acid
LOT NUMBER: MPFHxA0414
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%
ISOTOPIC PURITY: ≥99%¹³C
 (1,2-¹³C₂)
LAST TESTED: (mm/dd/yyyy) 04/13/2014
EXPIRY DATE: (mm/dd/yyyy) 04/13/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:


B.G. Chittim

Date: 04/15/2014

(mm/dd/yyyy)

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

INTENDED USE:

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SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

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

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

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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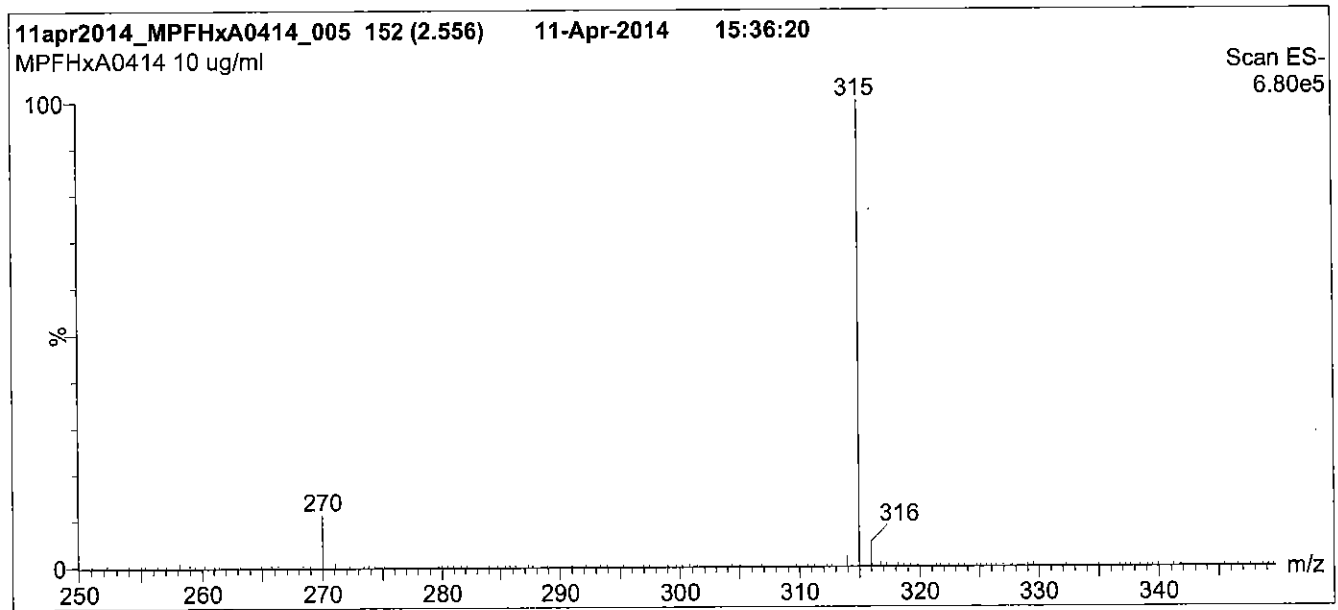
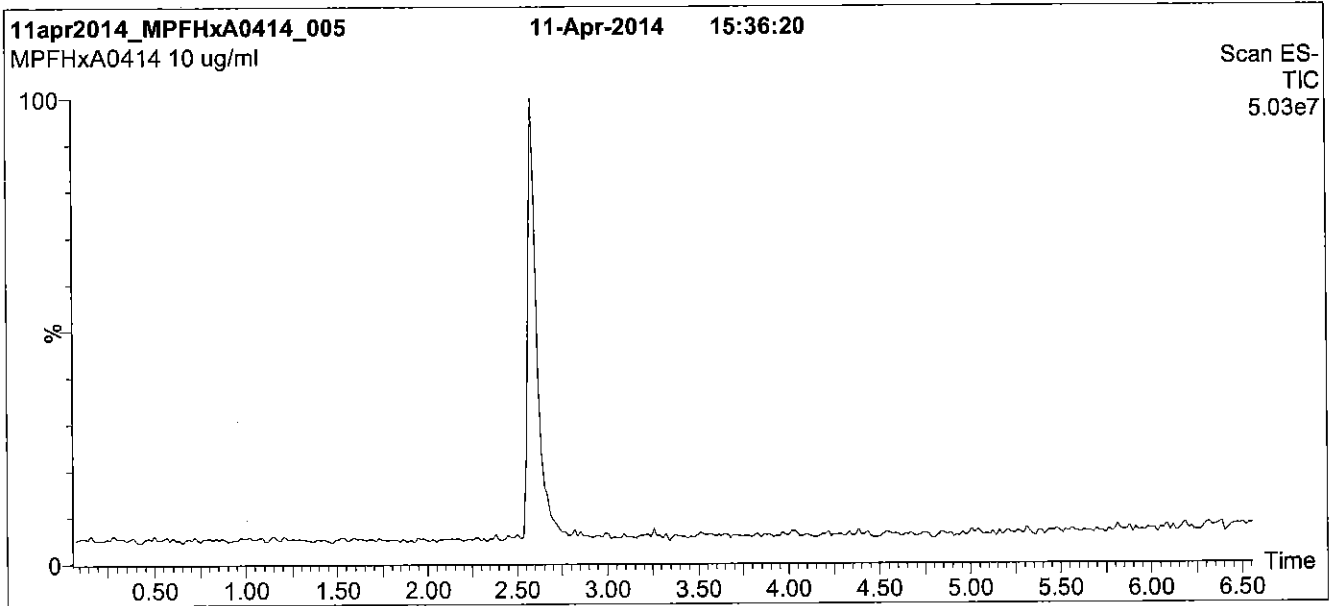
QUALITY MANAGEMENT:

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: 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

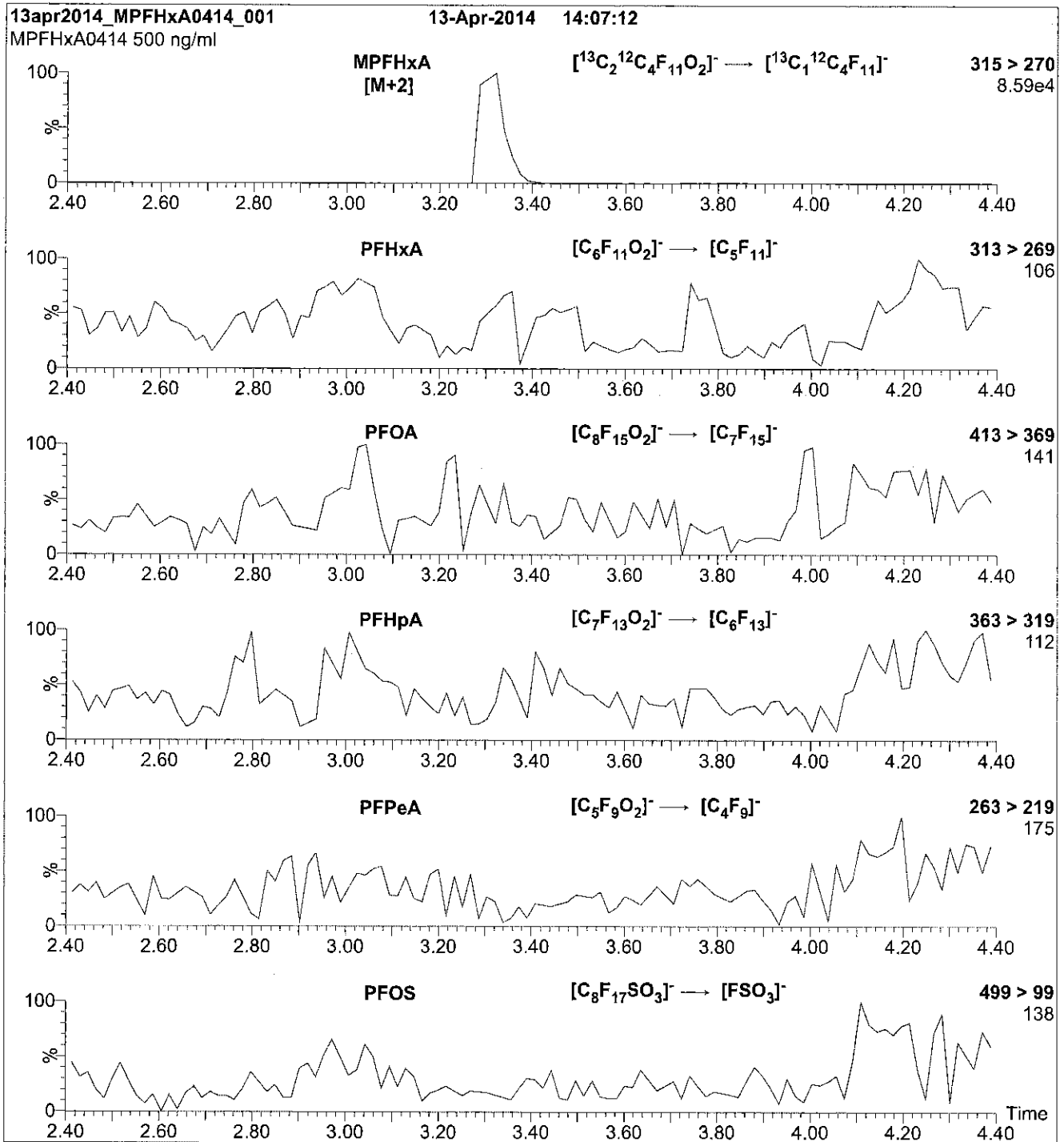
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
 10 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) = 3.43e-3
 Collision Energy (eV) = 10

Reagent

LCMPFHXS_00004

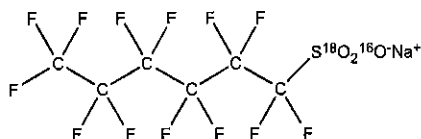


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxS **LOT NUMBER:** MPFHxS0713
COMPOUND: Sodium perfluoro-1-hexane^[18O₂]sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: C₆F₁₃S¹⁸O₂¹⁶O⁻Na⁺ **MOLECULAR WEIGHT:** 426.10
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
 47.3 ± 2.4 µg/ml (MPFHxS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** >94% (¹⁸O₂)
LAST TESTED: (mm/dd/yyyy) 07/25/2013
EXPIRY DATE: (mm/dd/yyyy) 07/25/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS (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: 03/30/2015
(mm/dd/yyyy)

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

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.

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.

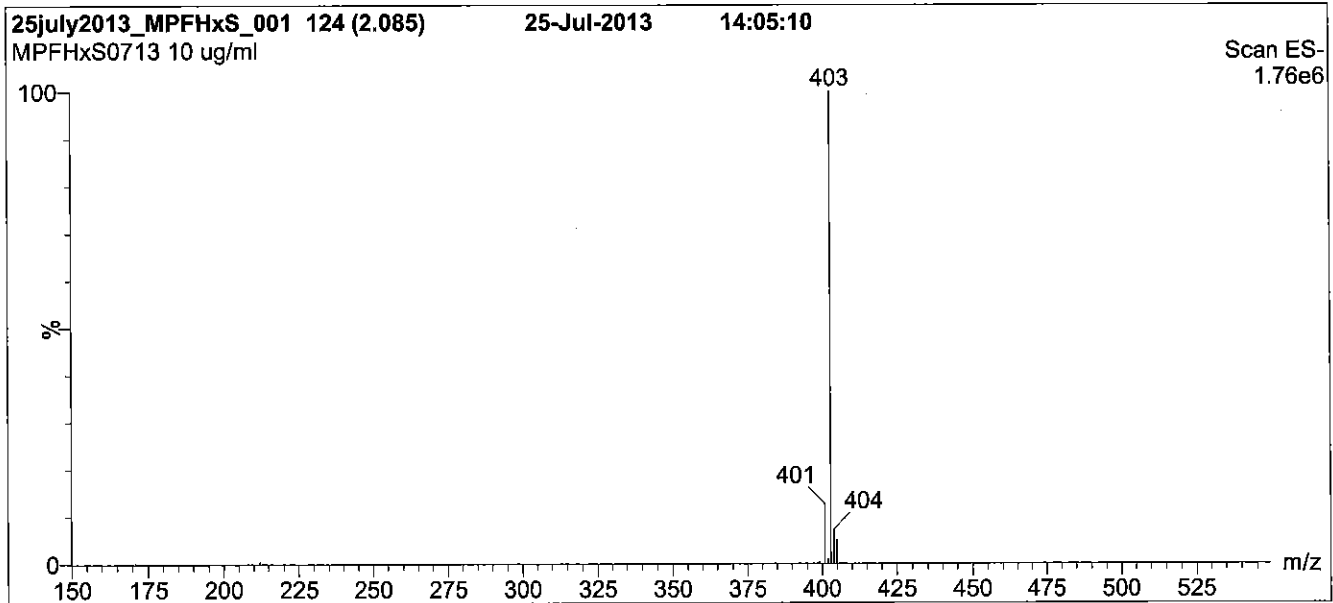
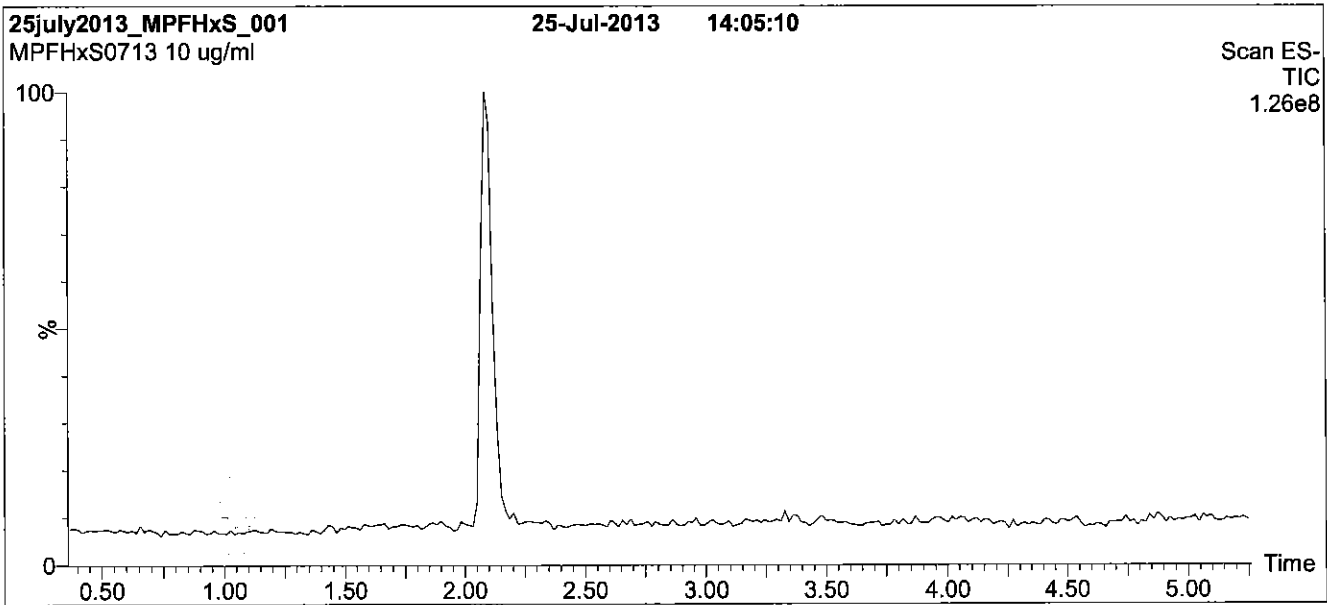
QUALITY MANAGEMENT:

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

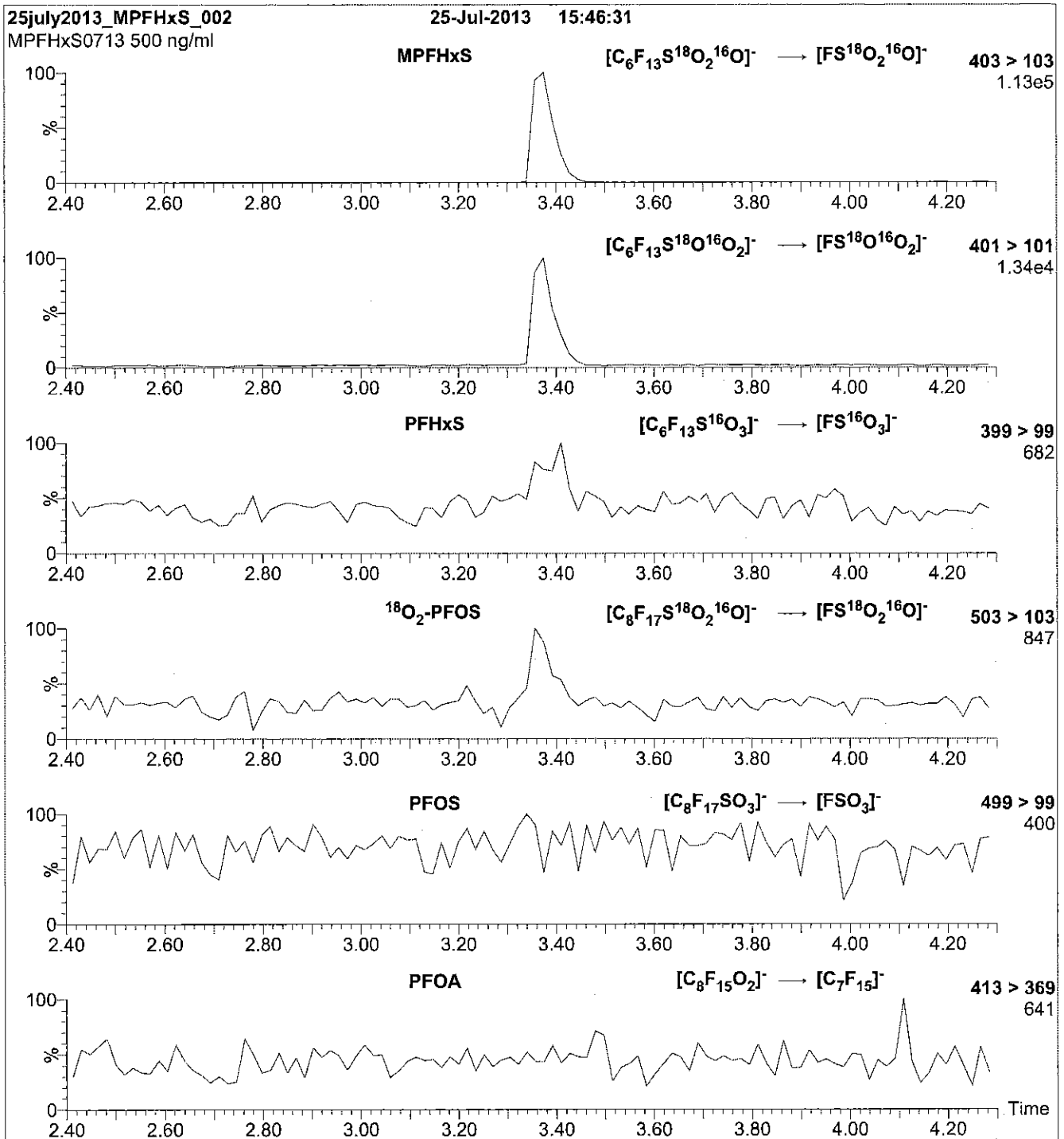
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Reagent

LCMPFNA_00003

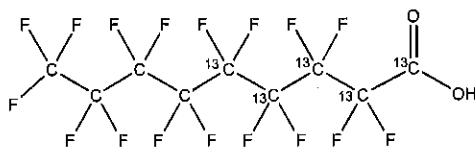


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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFNA **LOT NUMBER:** MPFNA0414
COMPOUND: Perfluoro-n-[1,2,3,4,5-¹³C₅]nonanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $^{13}\text{C}_5^{12}\text{C}_4\text{HF}_{17}\text{O}_2$ **MOLECULAR WEIGHT:** 469.04
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** $\geq 99\%^{13}\text{C}$
LAST TESTED: (mm/dd/yyyy) 04/13/2014 (1,2,3,4,5-¹³C₅)
EXPIRY DATE: (mm/dd/yyyy) 04/13/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 04/13/2014
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

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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.

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

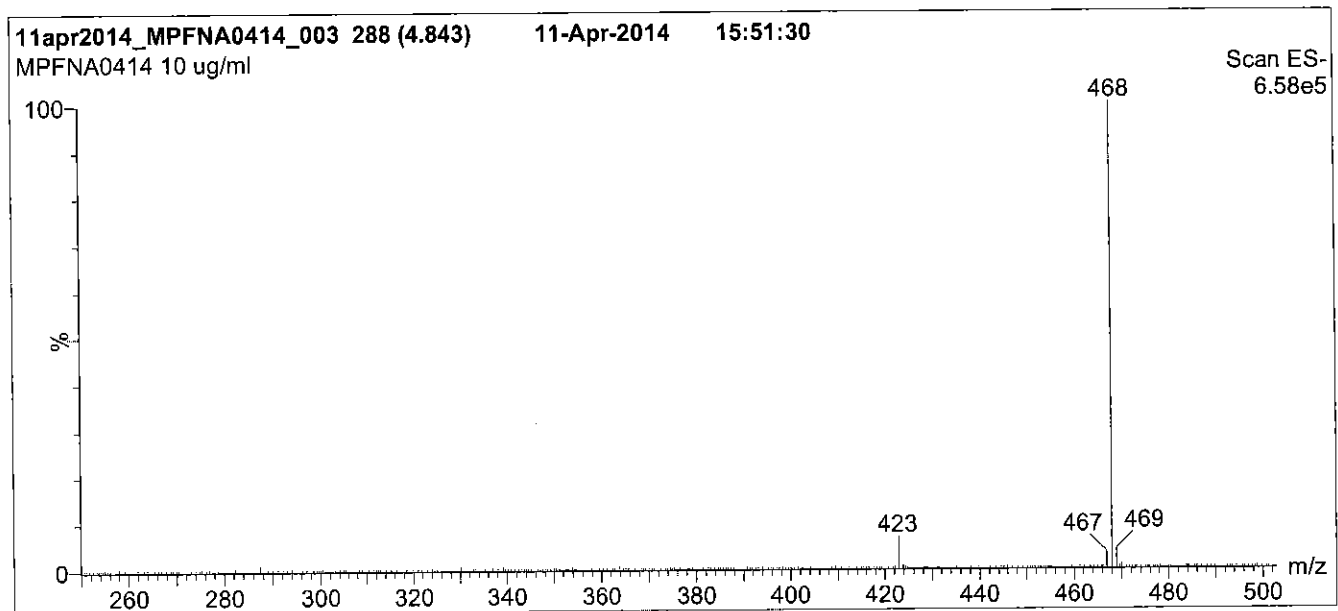
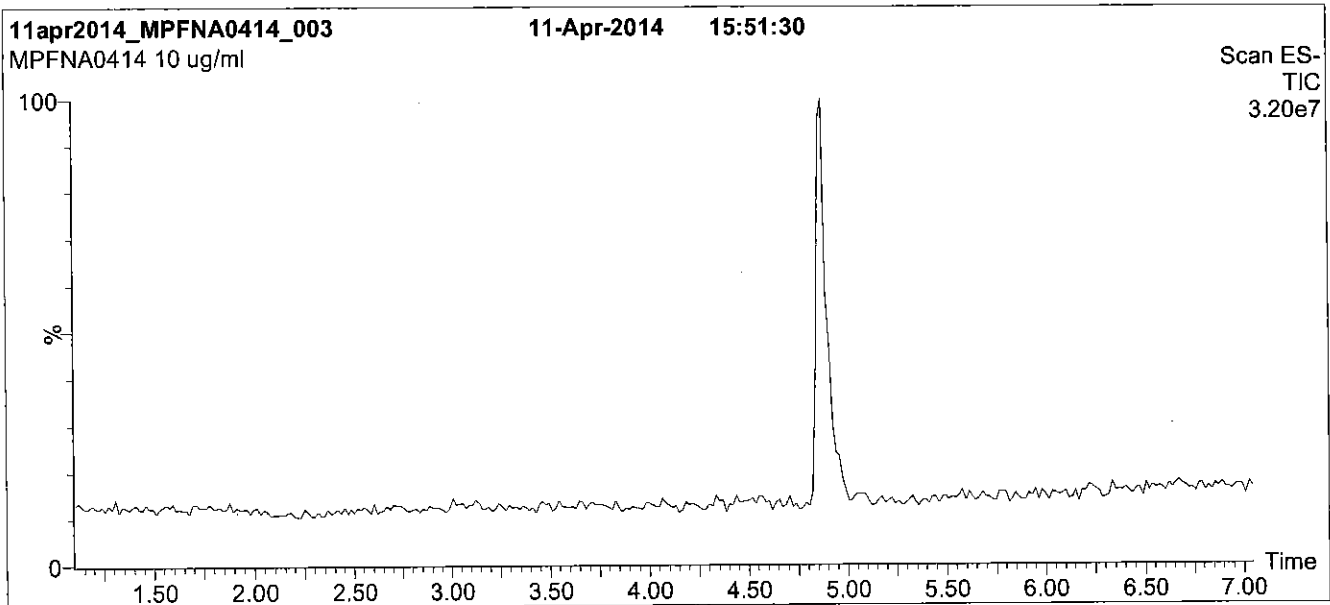
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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

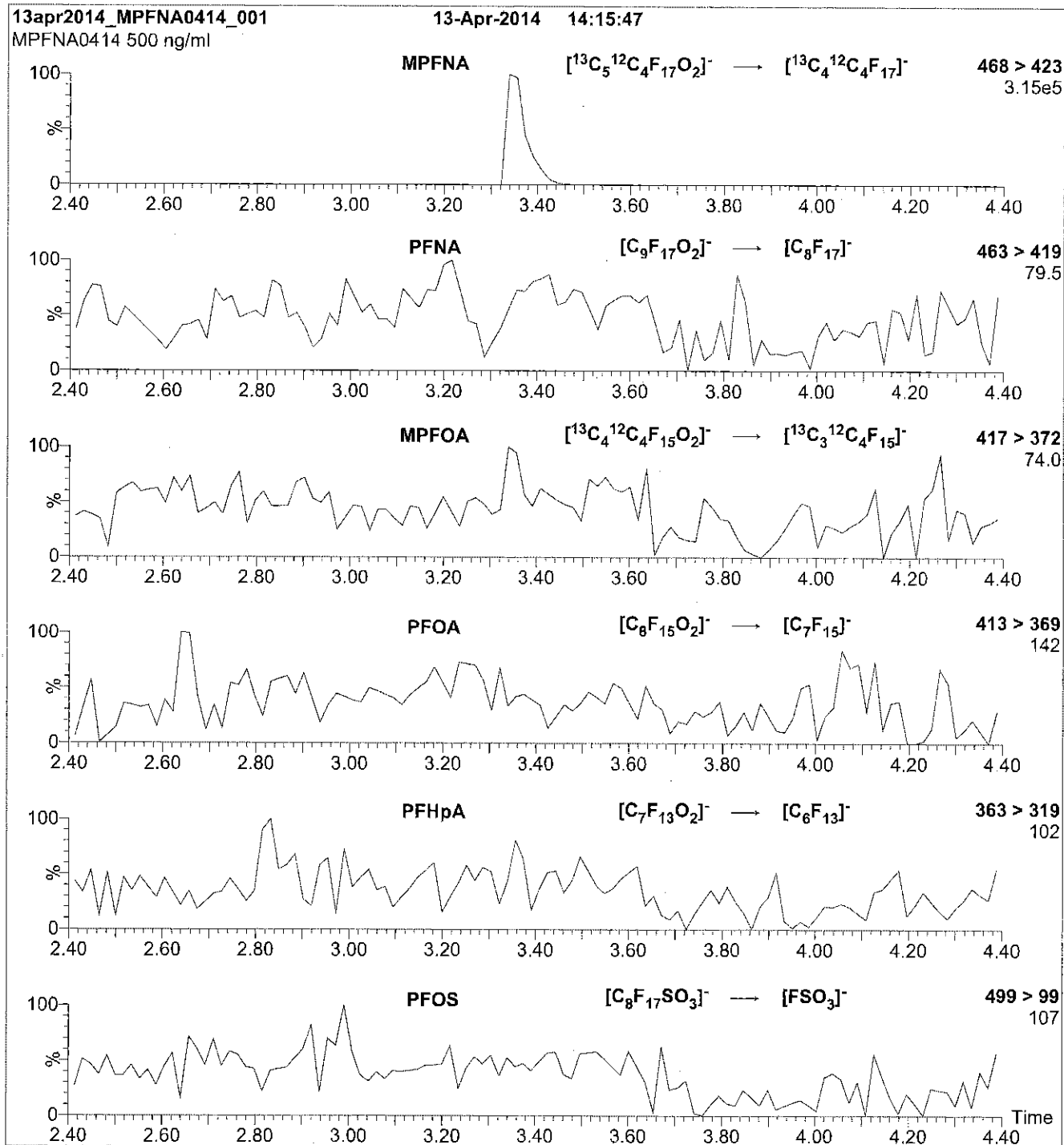
Flow: 300 μ l/min

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_00007

r: 9/5/15 SV



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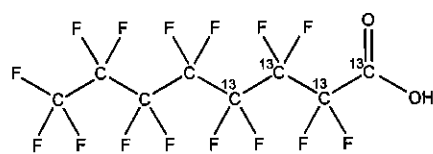
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFOA0415

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) 04/10/2015
EXPIRY DATE: (mm/dd/yyyy) 04/10/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:
B.G. Chittim

Date: 04/10/2015
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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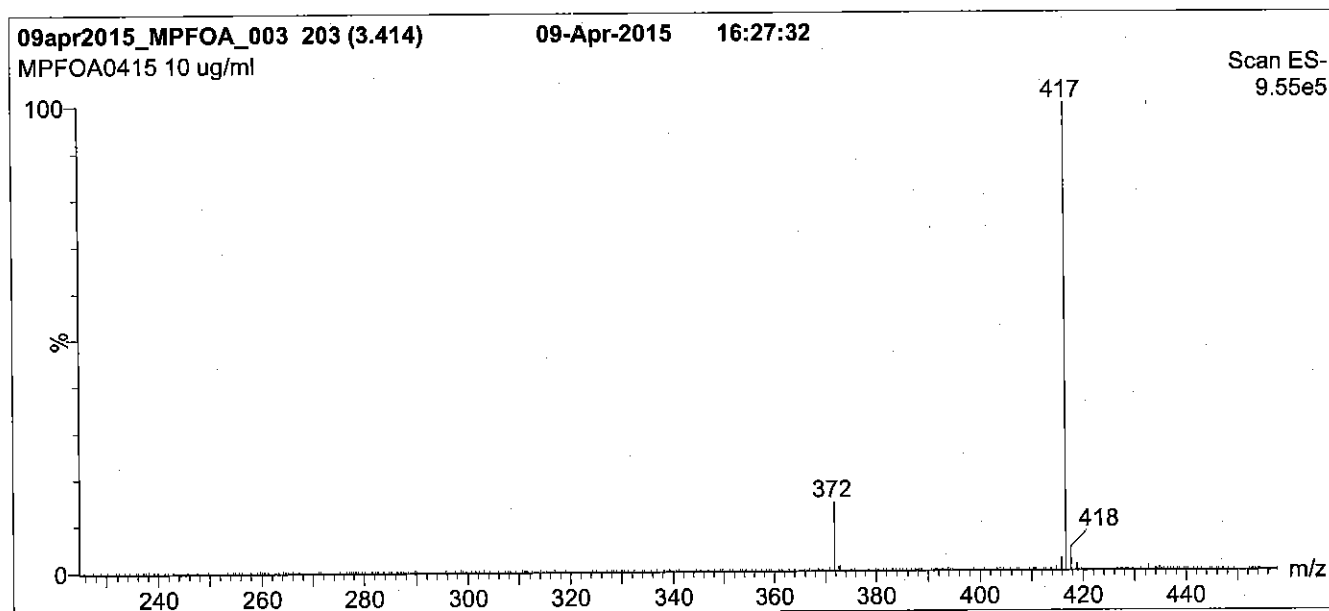
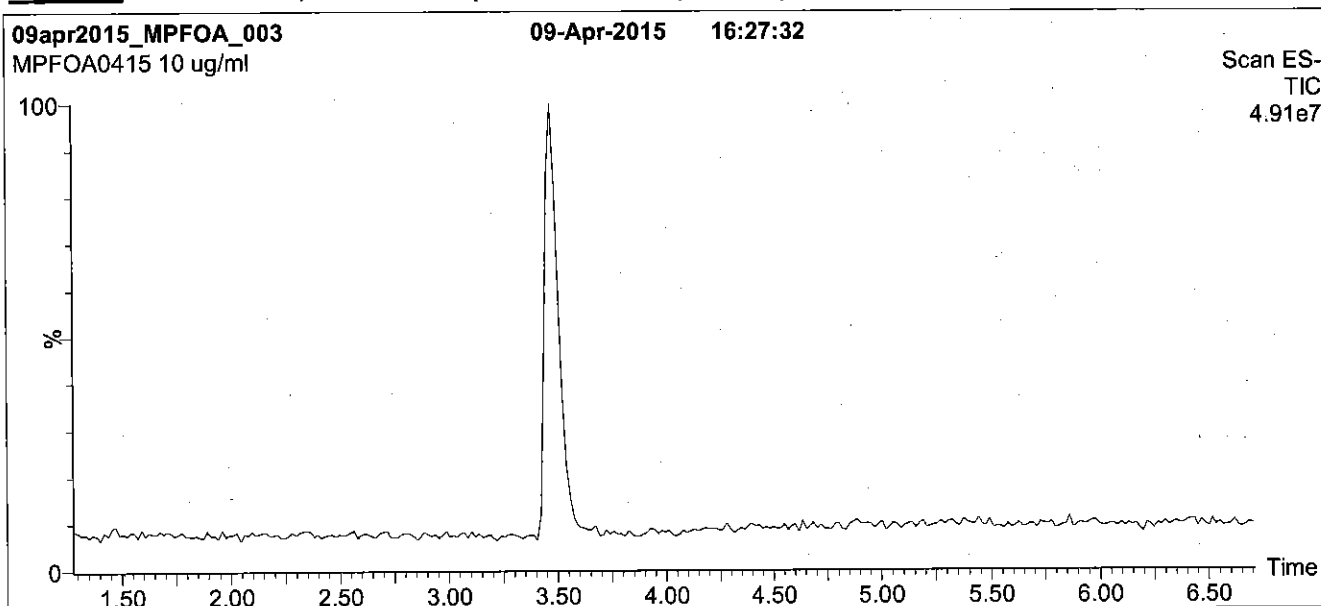
QUALITY MANAGEMENT:

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: 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: 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

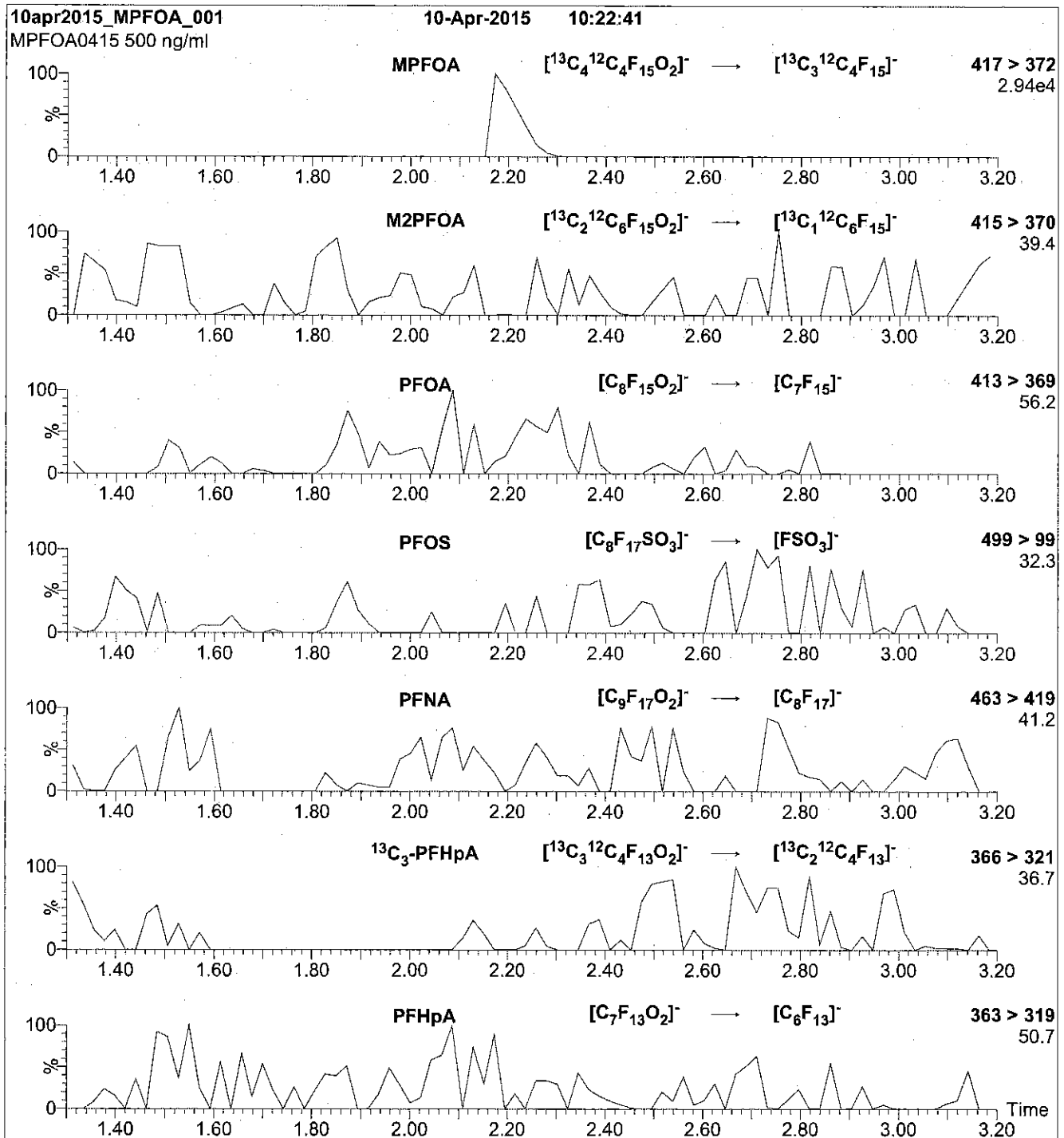
Flow: 300 μ l/min

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

Reagent

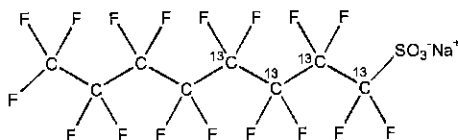
LCMPFOS_00009



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0515
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
LAST TESTED: (mm/dd/yyyy) 05/15/2015 (1,2,3,4-¹³C₄)
EXPIRY DATE: (mm/dd/yyyy) 05/15/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 05/28/2015
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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TRACEABILITY:

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LIMITED WARRANTY:

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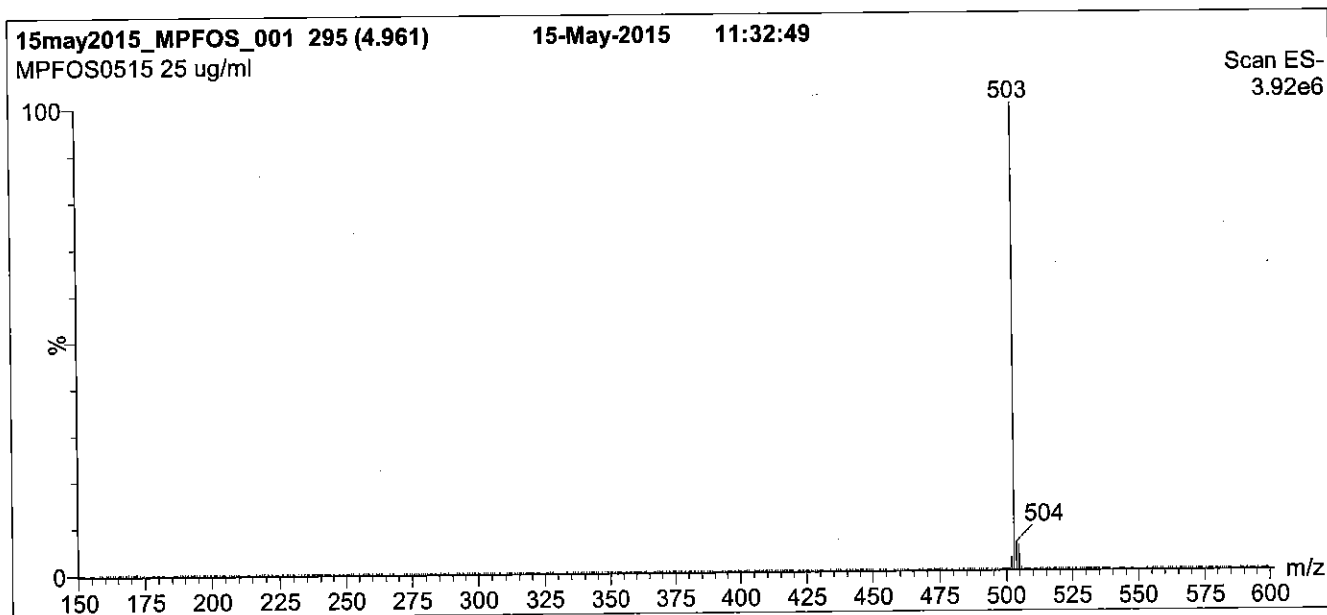
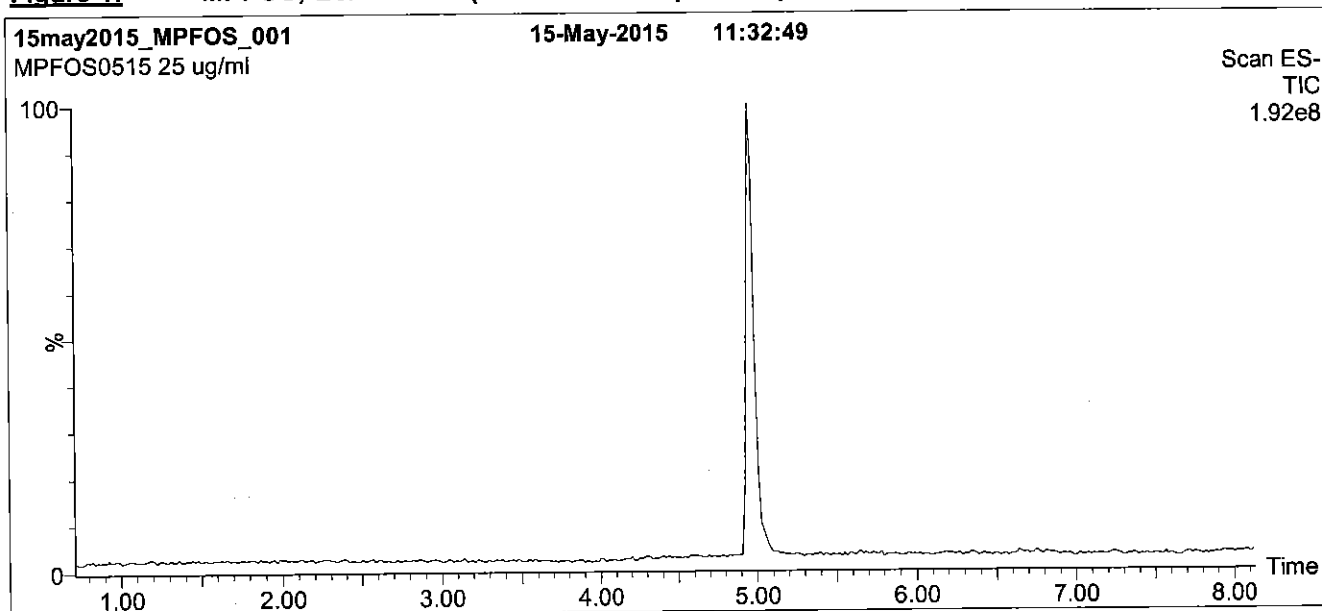
QUALITY MANAGEMENT:

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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: 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

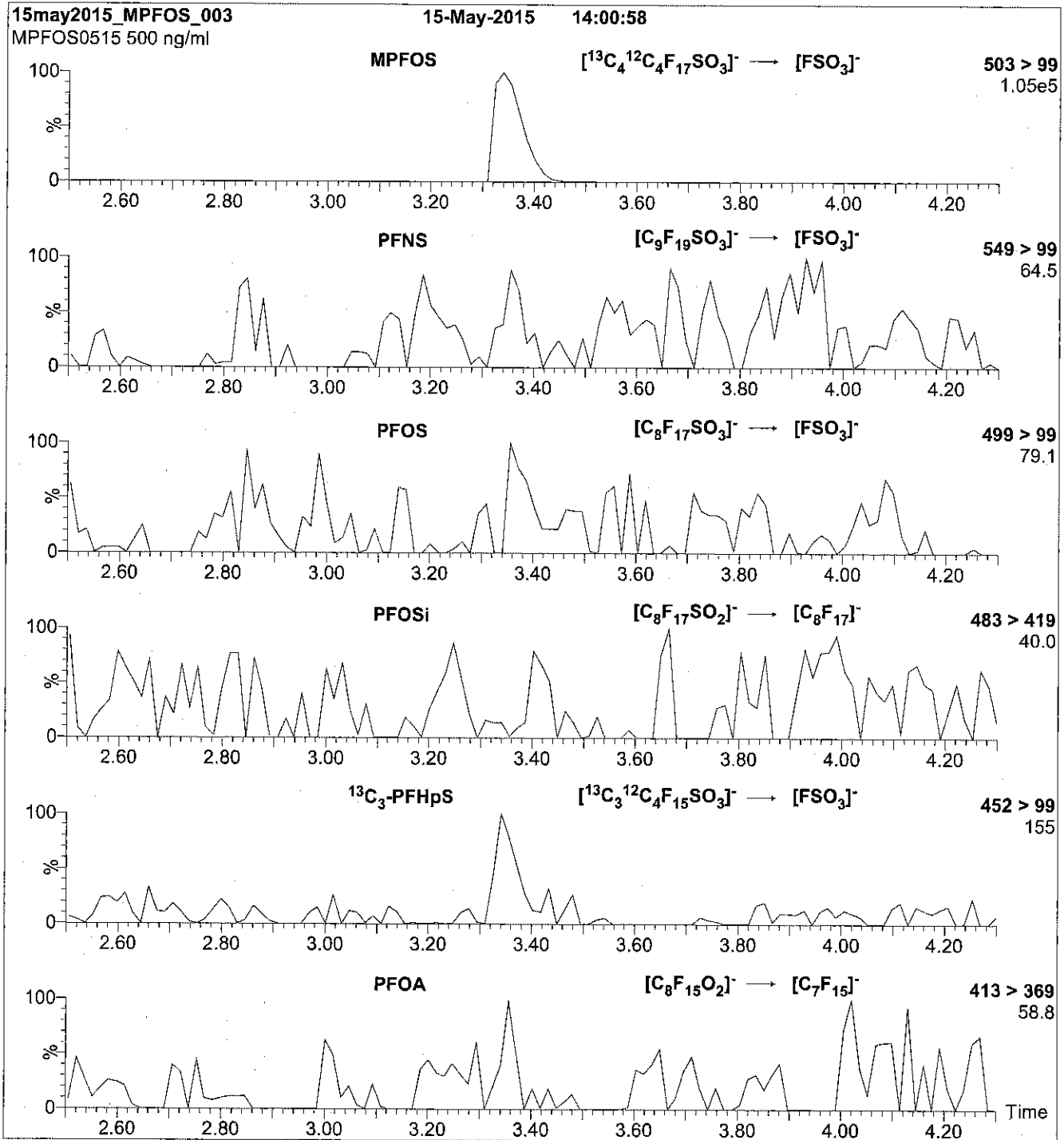
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = $3.35\text{e-}3$
 Collision Energy (eV) = 40

Reagent

LCMPFUdA_00004

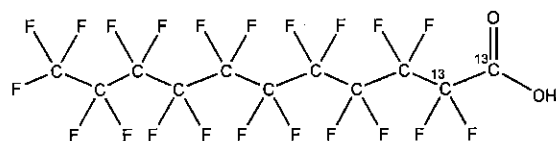
1:415/5 stu



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFUdA **LOT NUMBER:** MPFUdA1014
COMPOUND: Perfluoro-n-[1,2-¹³C₂]undecanoic acid
STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₉HF₂₁O₂ **MOLECULAR WEIGHT:** 566.08
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) 10/31/2014
EXPIRY DATE: (mm/dd/yyyy) 10/31/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

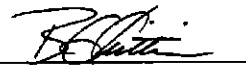
DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Presence of 1-¹³C₁-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: 11/03/2014
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2, \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.

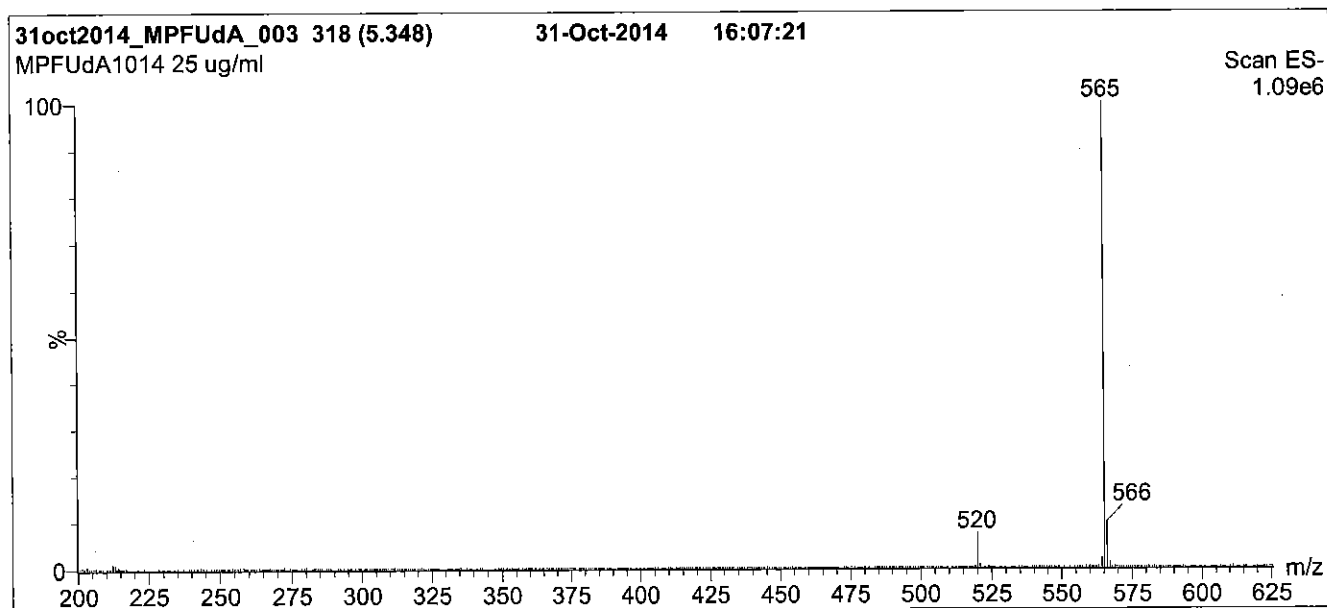
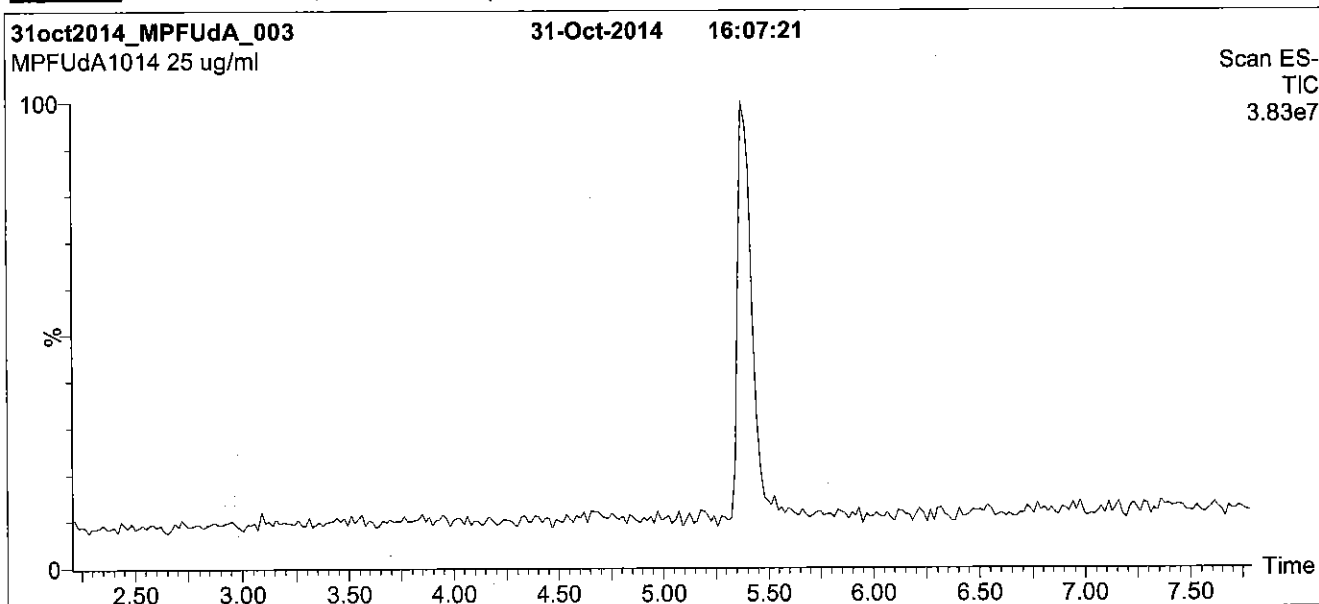
QUALITY MANAGEMENT:

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: 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

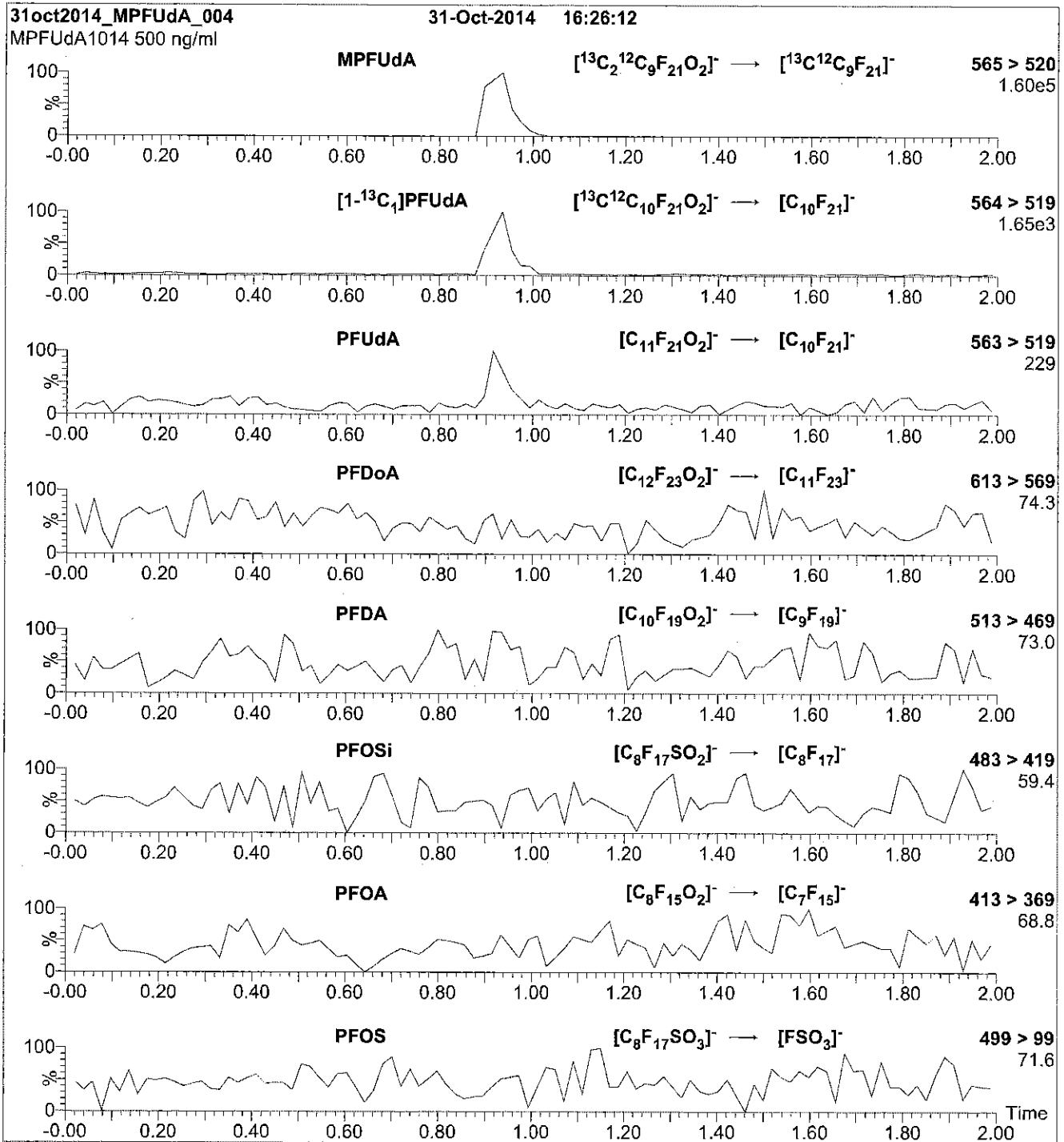
Flow: 300 μ l/min

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

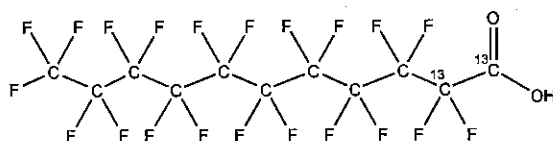
LCMPFUdA_00005



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFUdA **LOT NUMBER:** MPFUdA1014
COMPOUND: Perfluoro-n-[1,2-¹³C₂]undecanoic acid
STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₉HF₂₁O₂ **MOLECULAR WEIGHT:** 566.08
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) 10/31/2014
EXPIRY DATE: (mm/dd/yyyy) 10/31/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Presence of 1-¹³C₁-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

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.

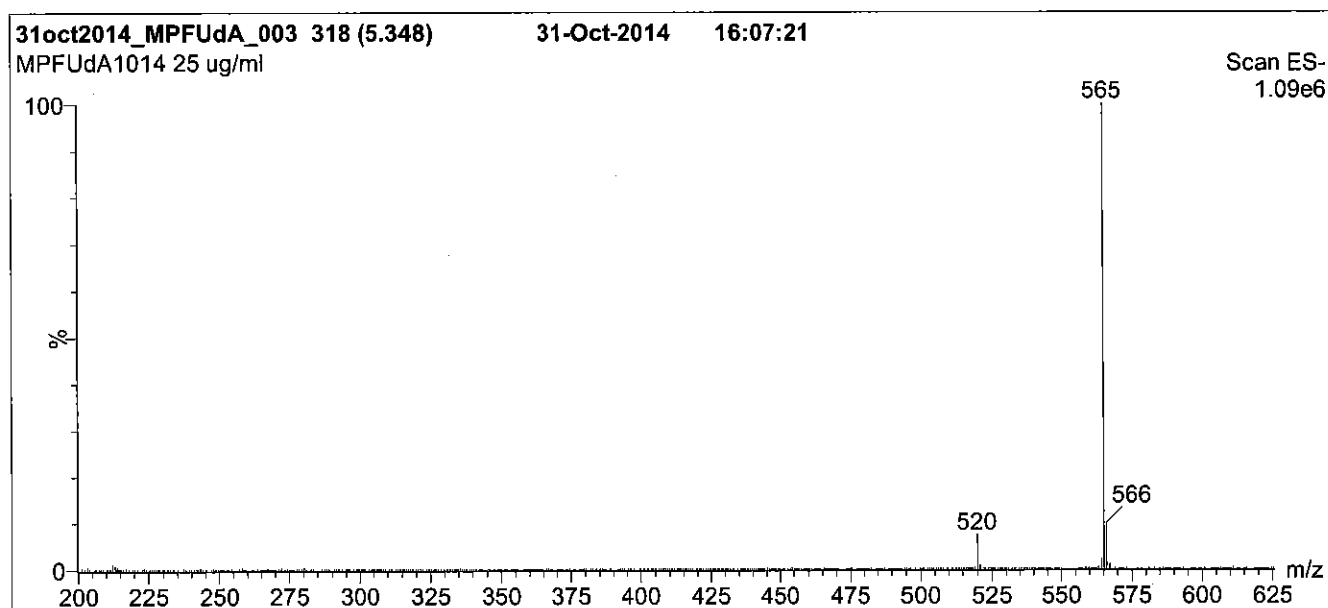
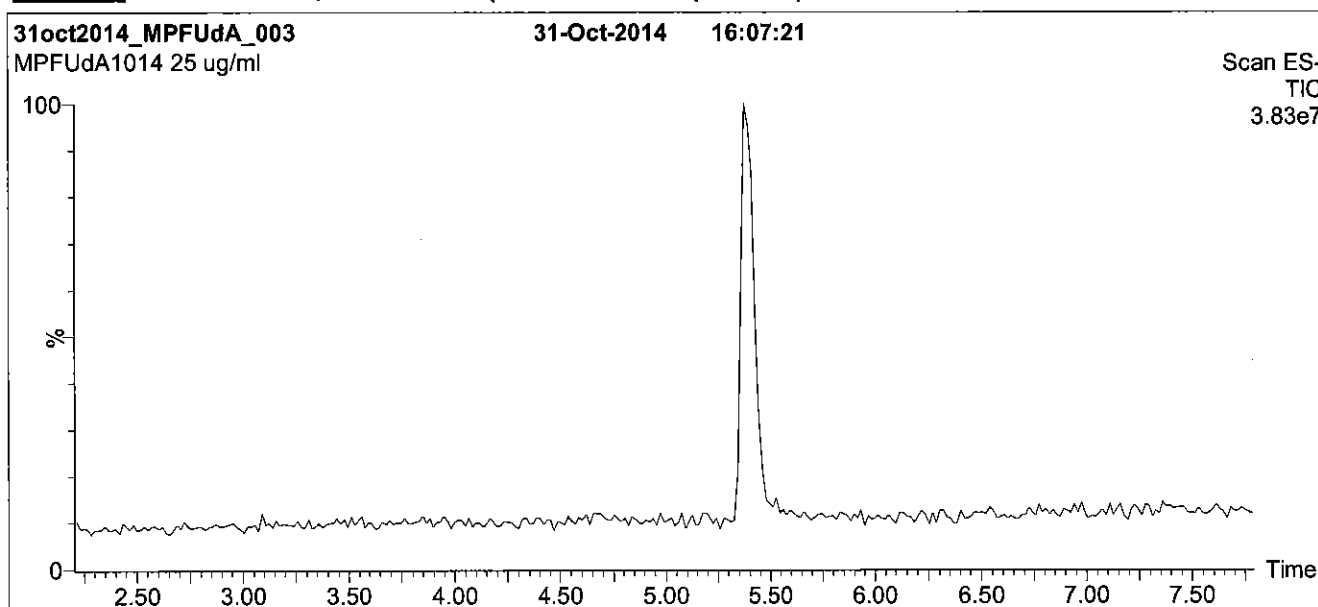
QUALITY MANAGEMENT:

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: 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

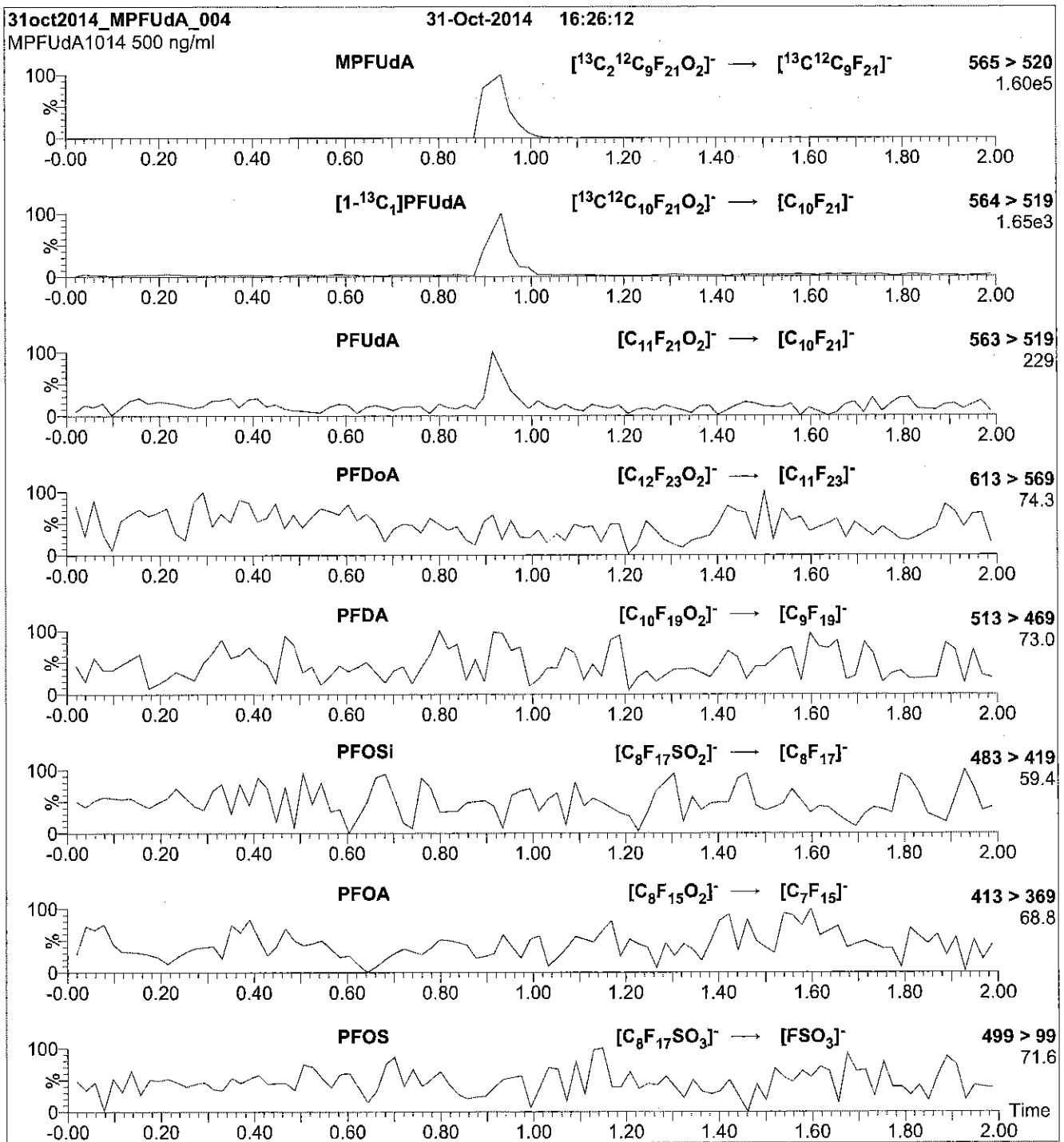
Flow: 300 μ l/min

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_00005

P: 3/27/15 SKV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXB

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

<u>PRODUCT CODE:</u>	PFAC-MXB
<u>LOT NUMBER:</u>	PFACMXB0614
<u>SOLVENT(S):</u>	Methanol / Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	06/13/2014
<u>LAST TESTED:</u> (mm/dd/yyyy)	06/20/2014
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	06/20/2019
<u>RECOMMENDED STORAGE:</u>	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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2, \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.

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:


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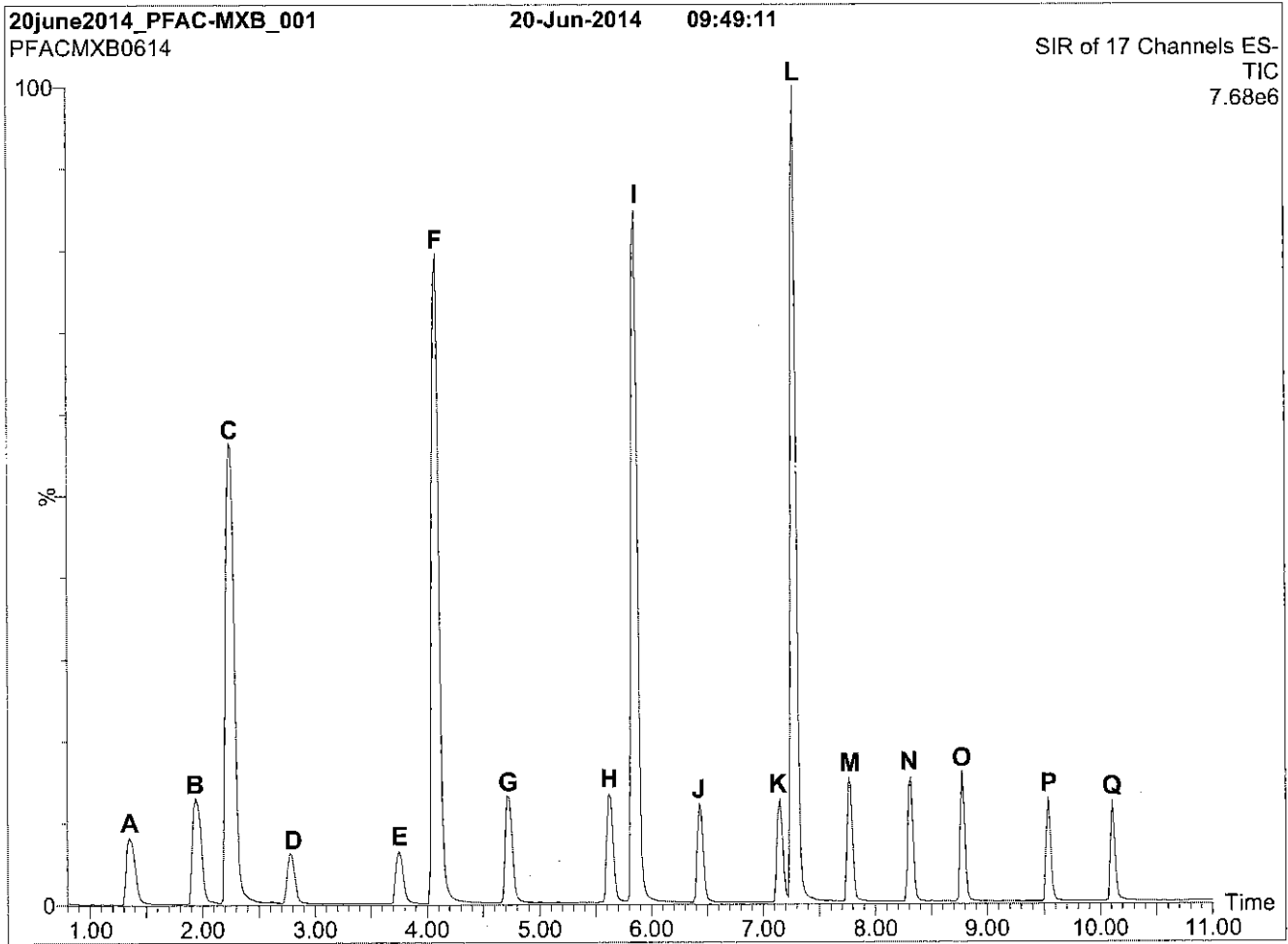
Table A: PFAC-MXB; Components and Concentrations (ng/ml, ± 5% in Methanol / Water (<1%))

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-butanefulfonate	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: 06/20/2014
(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 μm, 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 3.5 min
before returning to initial conditions in 0.5 min.
Time: 15 min

Flow: 300 μl/min

MS Parameters

Experiment: SIR of 17 Channels

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = variable (10-70)
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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

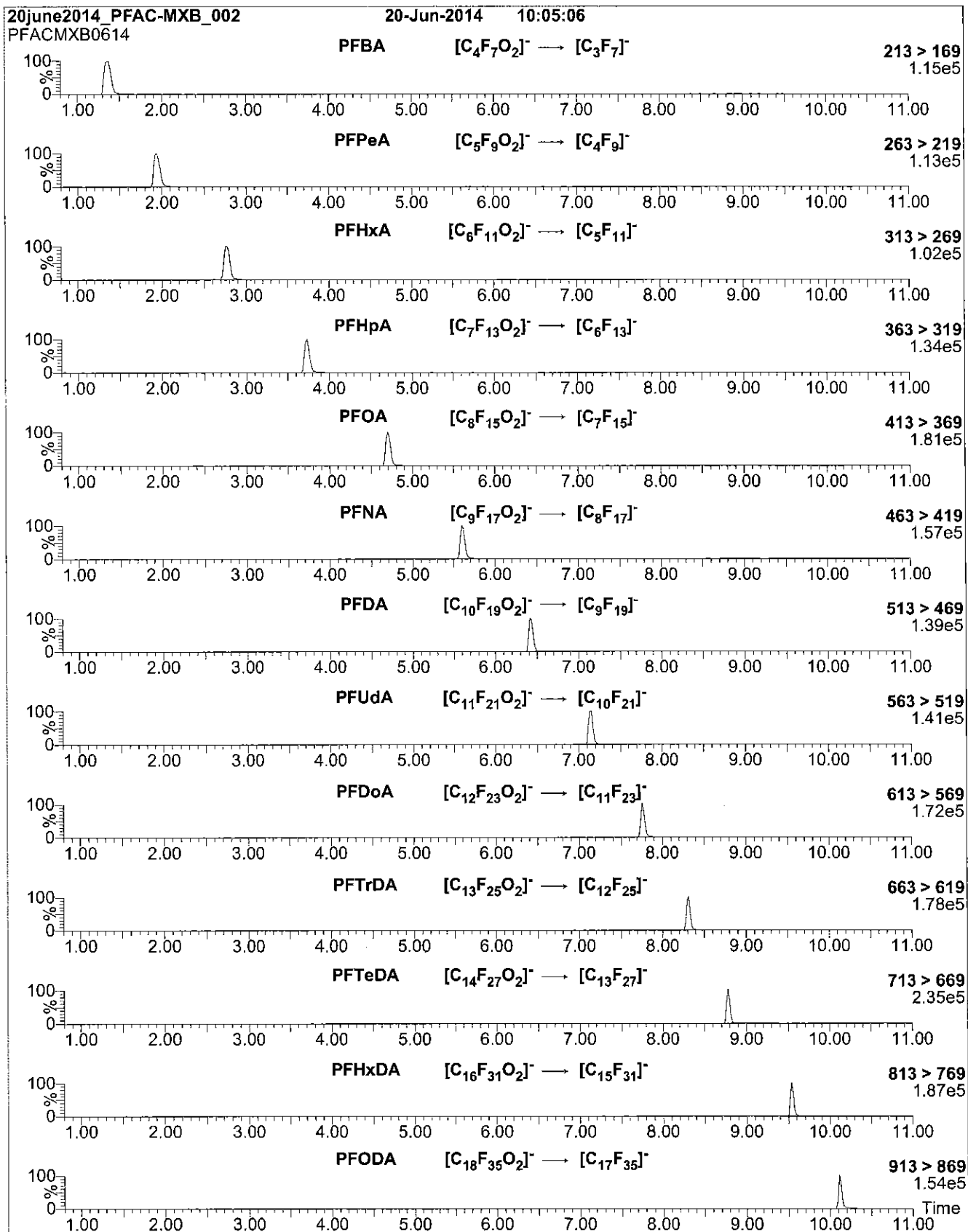
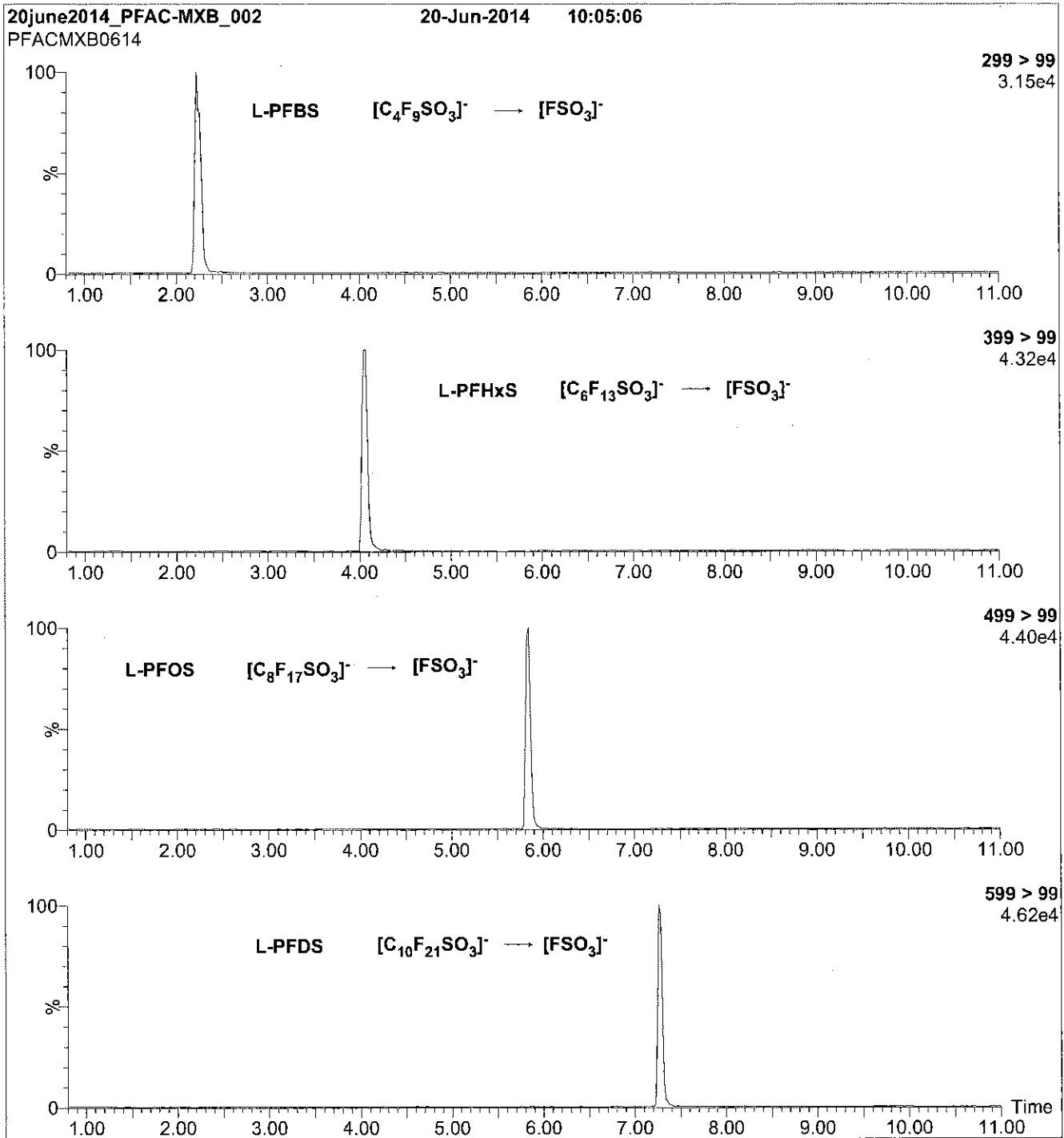


Figure 3: PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figures 2 and 3:

Injection: on-column (PFAC-MXB)

Mobile phase: Same as Figure 1

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.50e-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

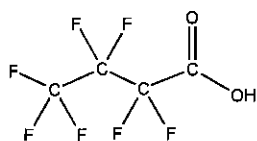
COMPOUND:

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

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.

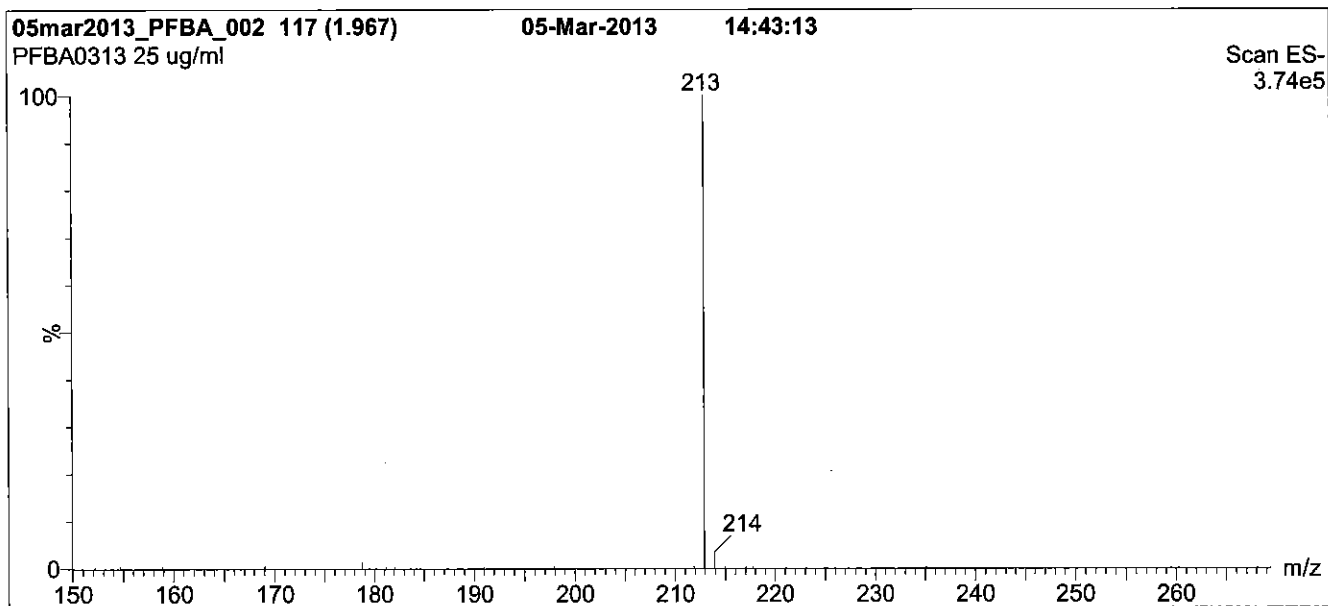
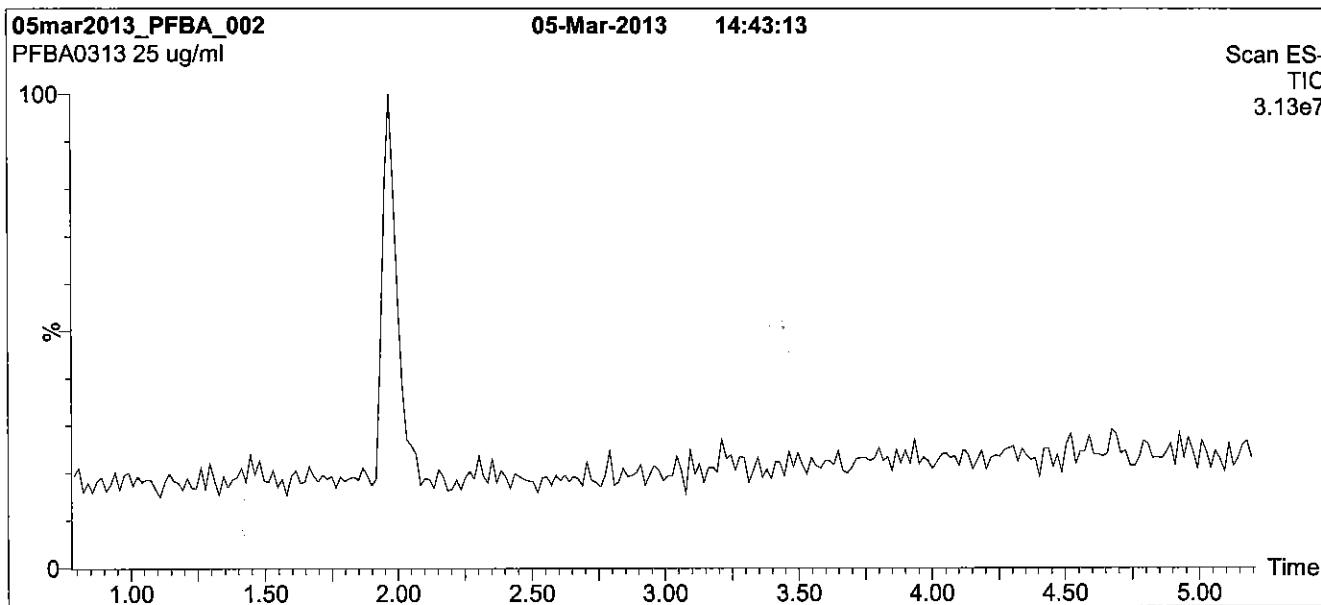
QUALITY MANAGEMENT:

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).



****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: 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

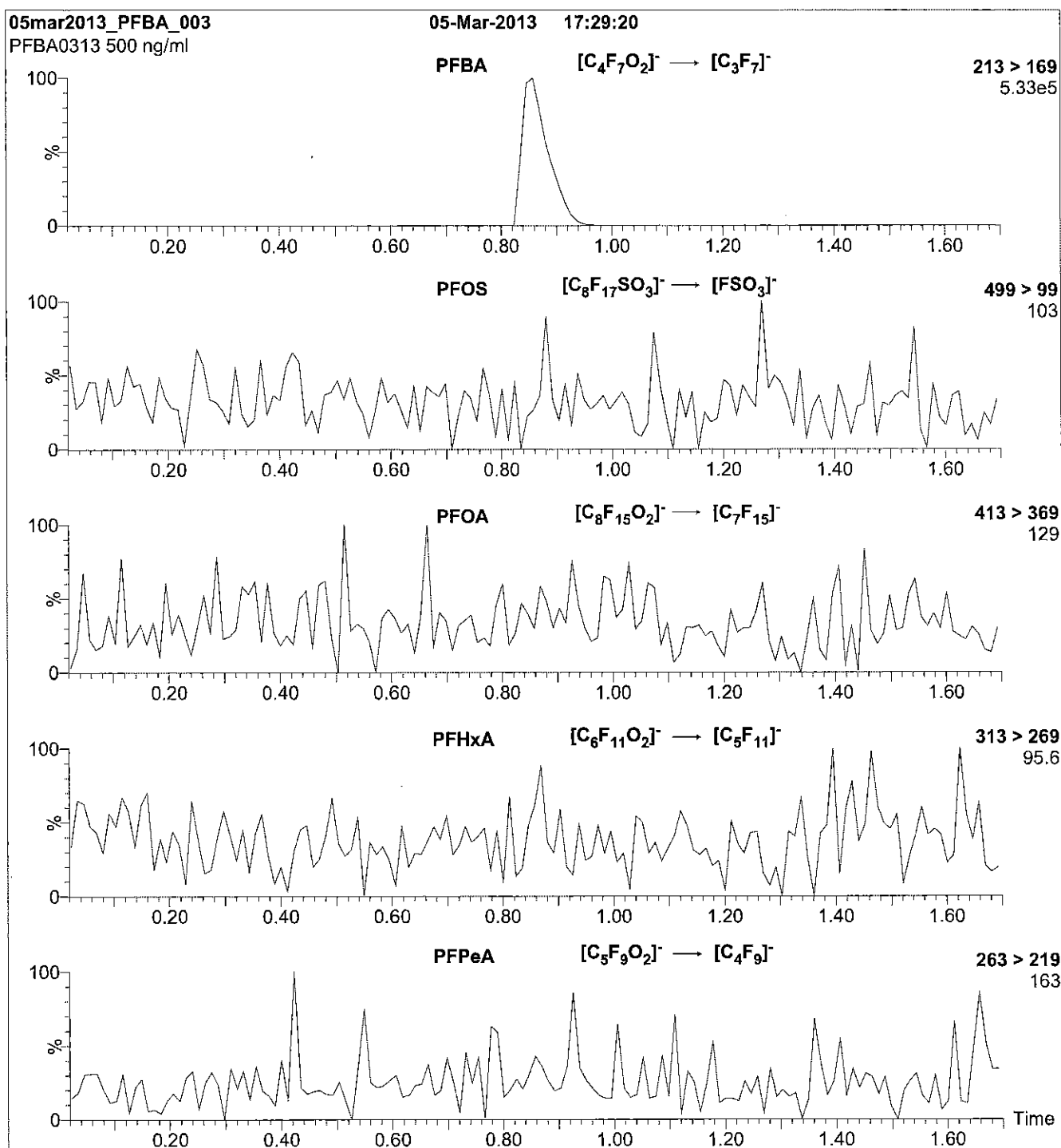
Flow: 300 μ l/min

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

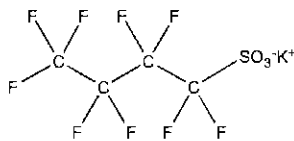
LCPFBS_00003



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:

B.G. Chittim

Date: 10/17/2014
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

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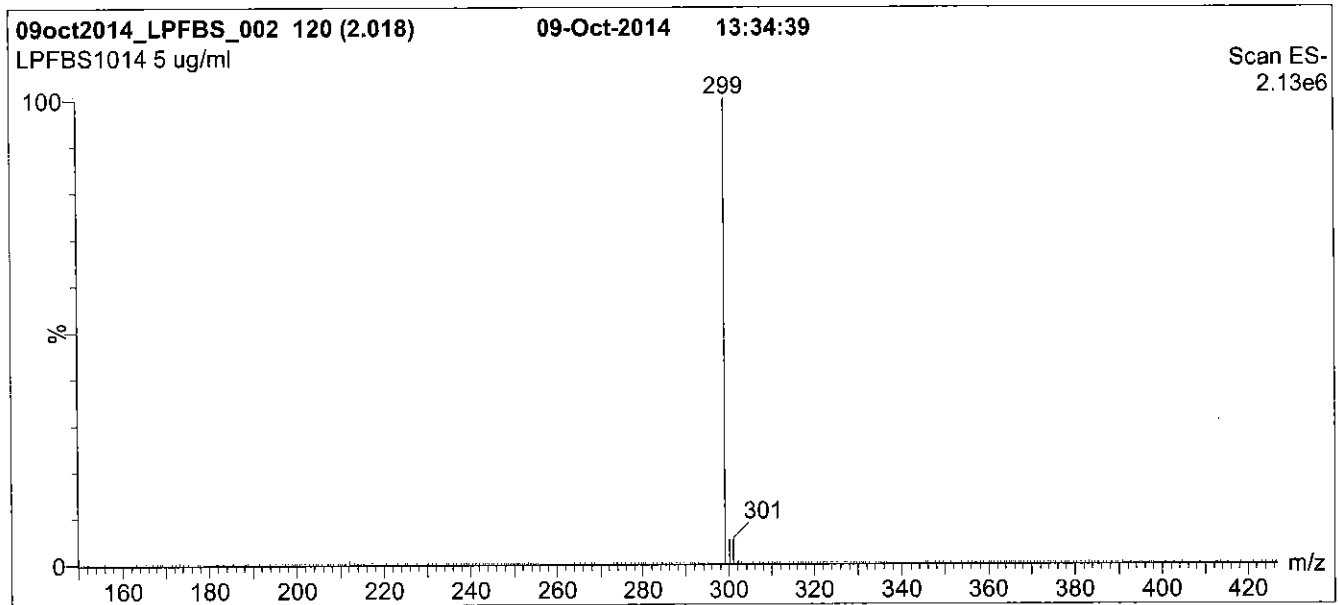
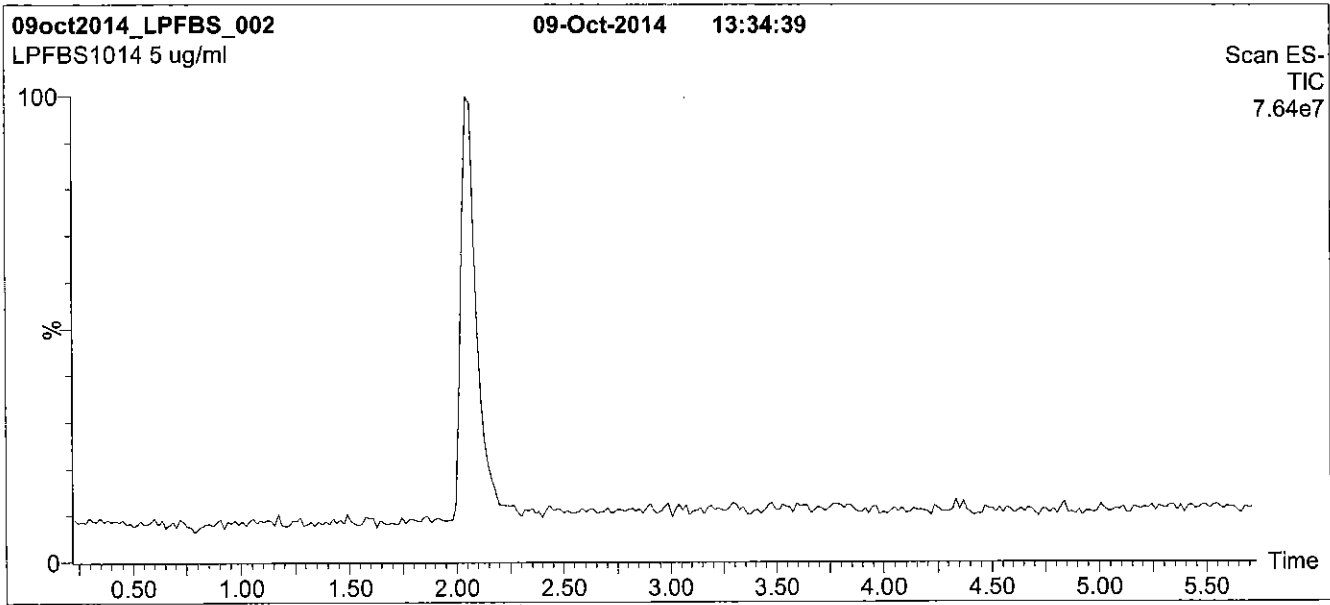
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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

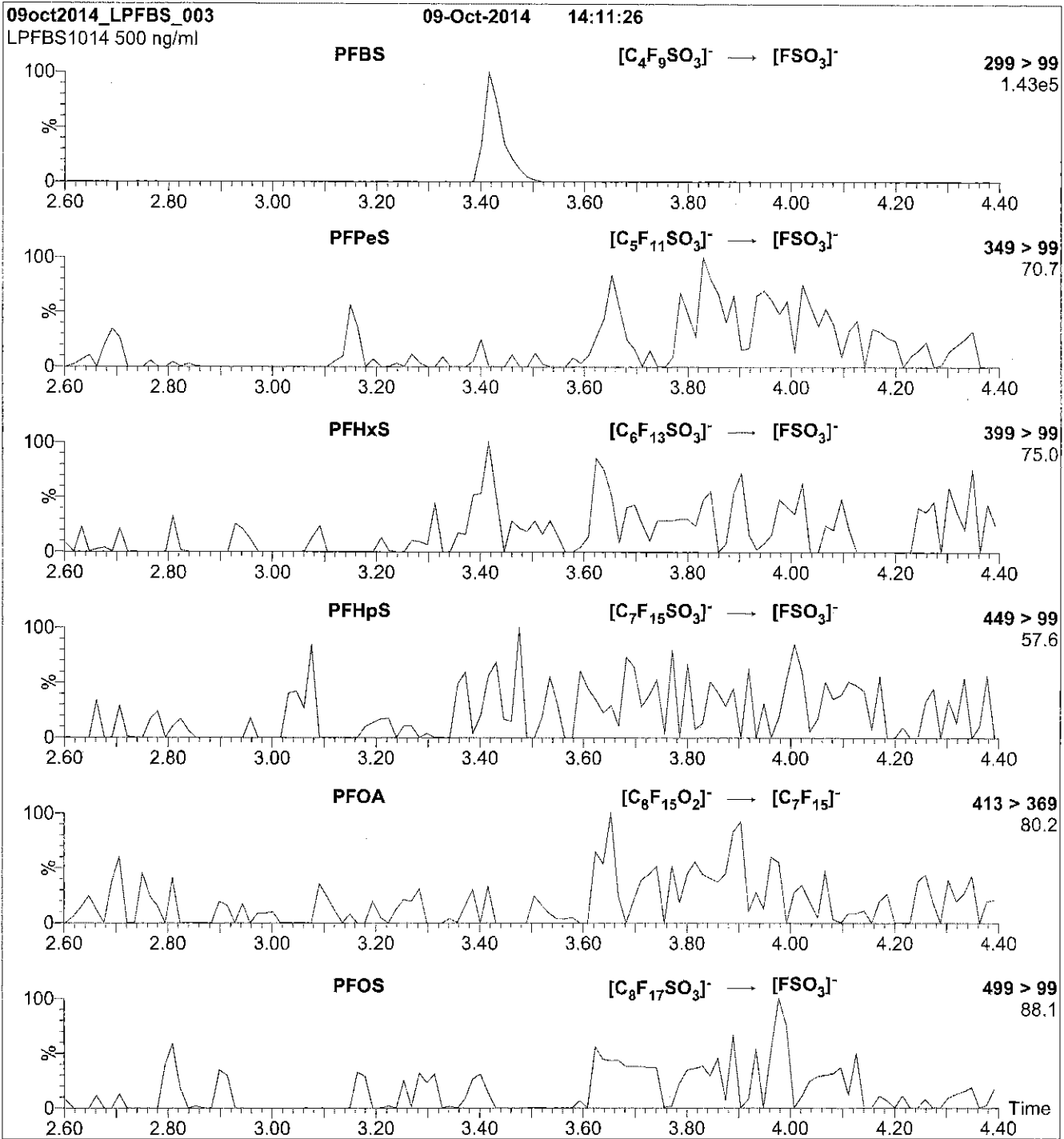
Flow: 300 μ l/min

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_00003

rec 7/16/14



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDA

LOT NUMBER:

PFDA0613

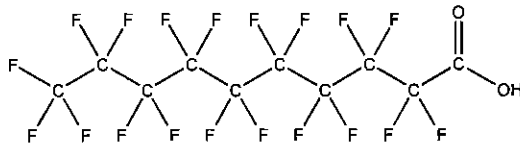
COMPOUND:

Perfluoro-n-decanoic acid

STRUCTURE:

CAS #:

335-76-2



MOLECULAR FORMULA:

C₁₀H_{F₁₉}O₂

MOLECULAR WEIGHT:

514.08

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol
Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

06/19/2013

EXPIRY DATE: (mm/dd/yyyy)

06/19/2018

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.4% PFNA and ~ 0.1% PFOA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 07/03/2013

(mm/dd/yyyy)

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

INTENDED USE:

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LIMITED WARRANTY:

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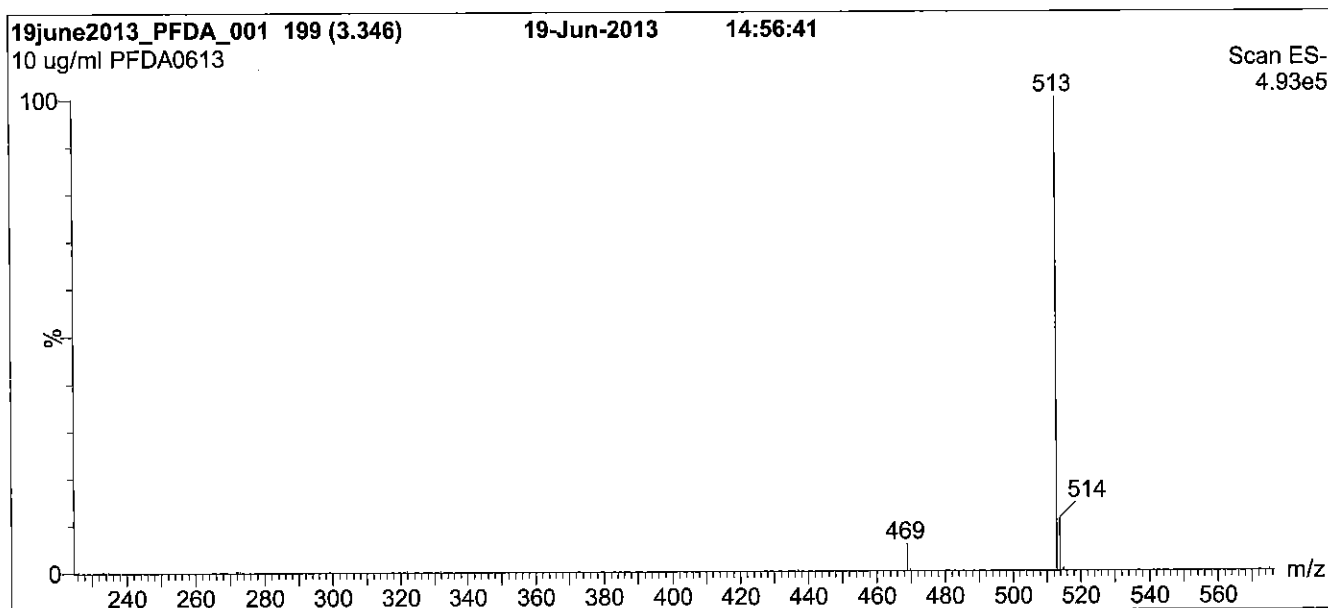
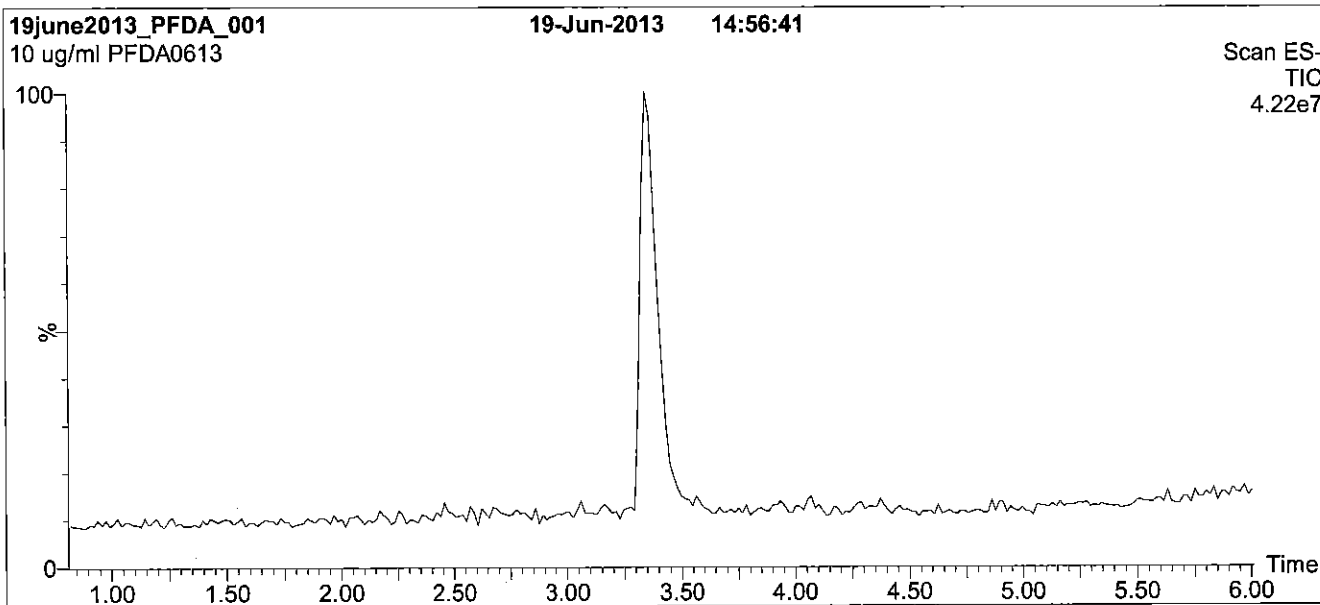
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈,
 1.7 μm, 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

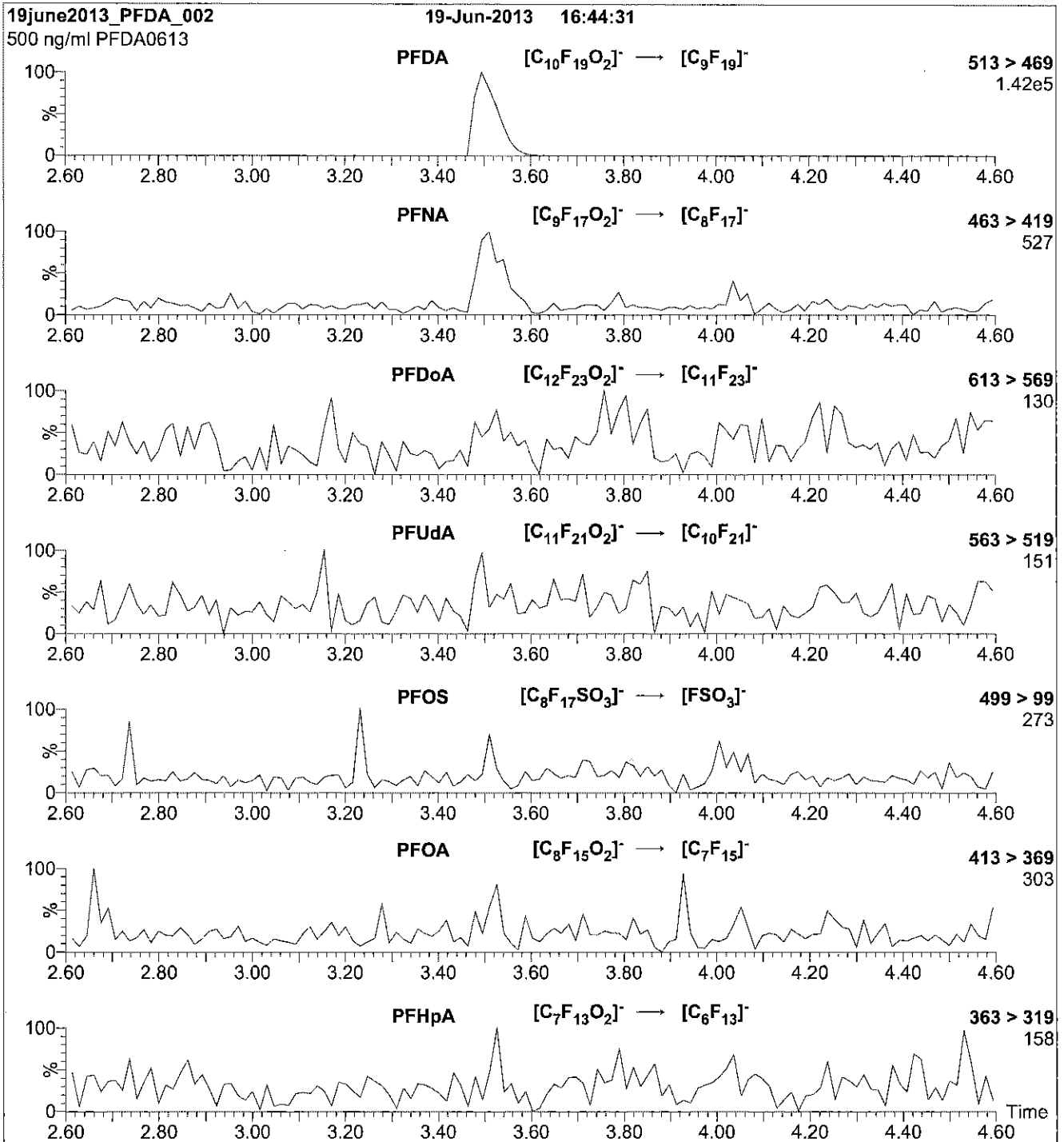
Flow: 300 μl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 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) = 3.58e-3
Collision Energy (eV) = 13

Reagent

LCPFDoA_00003

Rec 7/1/15



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDoA

LOT NUMBER:

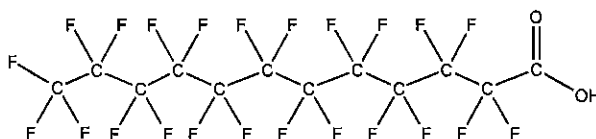
PFDoA0113

COMPOUND:

Perfluoro-n-dodecanoic acid

STRUCTURE:**CAS #:**

307-55-1

**MOLECULAR FORMULA:**C₁₂HF₂₃O₂**MOLECULAR WEIGHT:**

614.10

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/03/2013

EXPIRY DATE: (mm/dd/yyyy)

01/03/2018

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

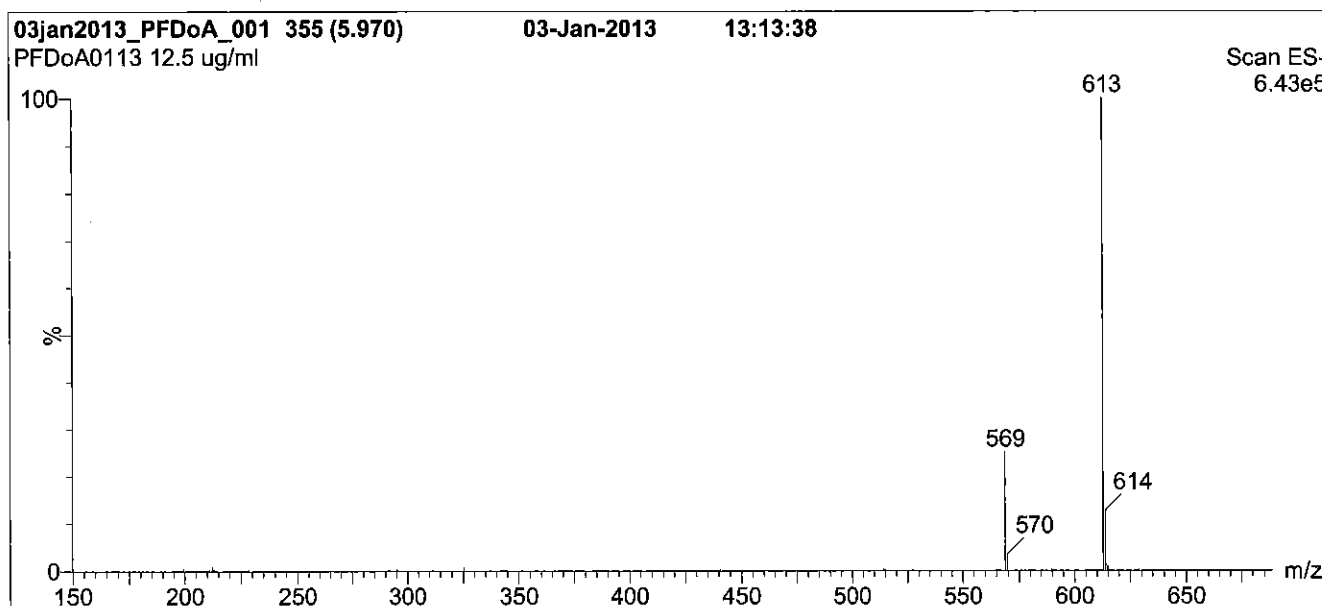
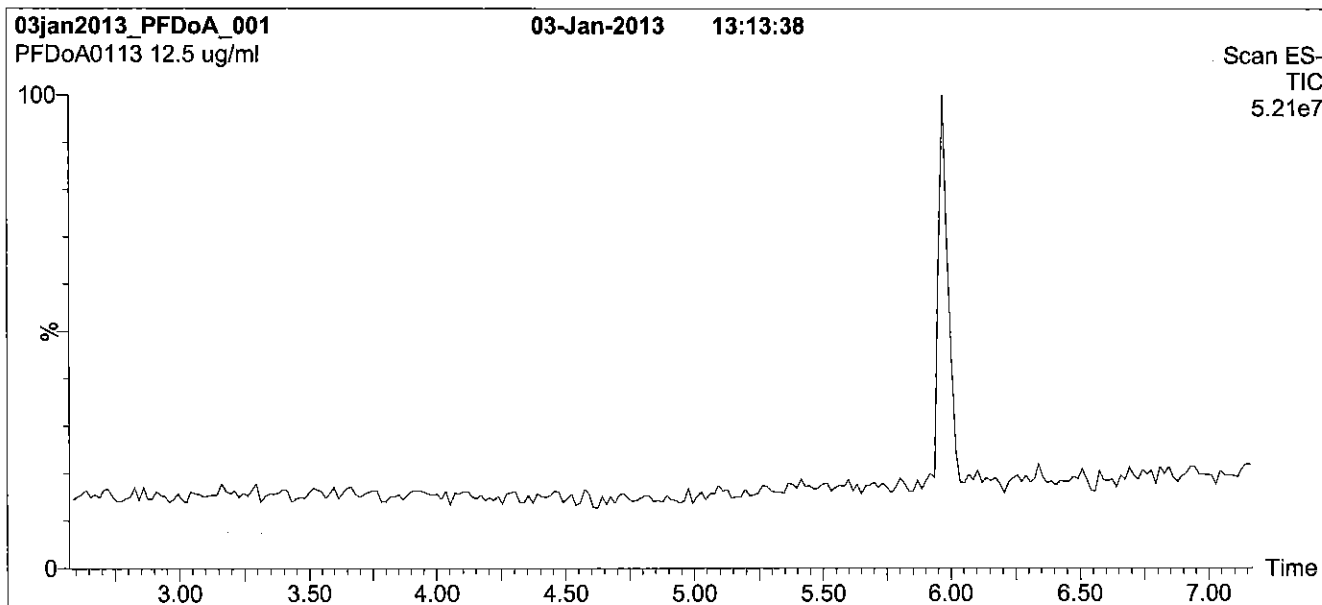
B.G. Chittim

Date: 02/01/2013

(mm/dd/yyyy)

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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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 2 min.
 Return to initial conditions in 0.5 min.
 Time: 10 min

Flow: 300 μ l/min

MS Parameters

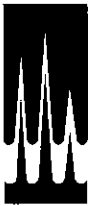
Experiment: Full Scan (150 - 850 amu)

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

Reagent

LCPFDoS_00003

P. 21/11/15 87

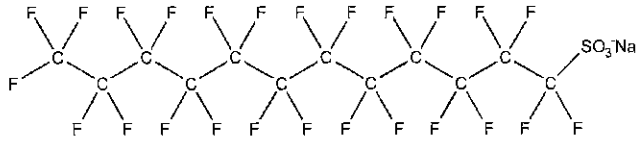


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: C₁₂F₂₅SO₃Na **MOLECULAR WEIGHT:** 722.14
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
48.4 ± 2.4 µg/ml (PFDoS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/06/2011
EXPIRY DATE: (mm/dd/yyyy) 10/06/2016
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

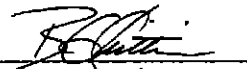
DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.3% of sodium perfluoro-1-tetradecanesulfonate and ~ 0.8% of perfluoro-n-dodecanoic acid (PFDoA).

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

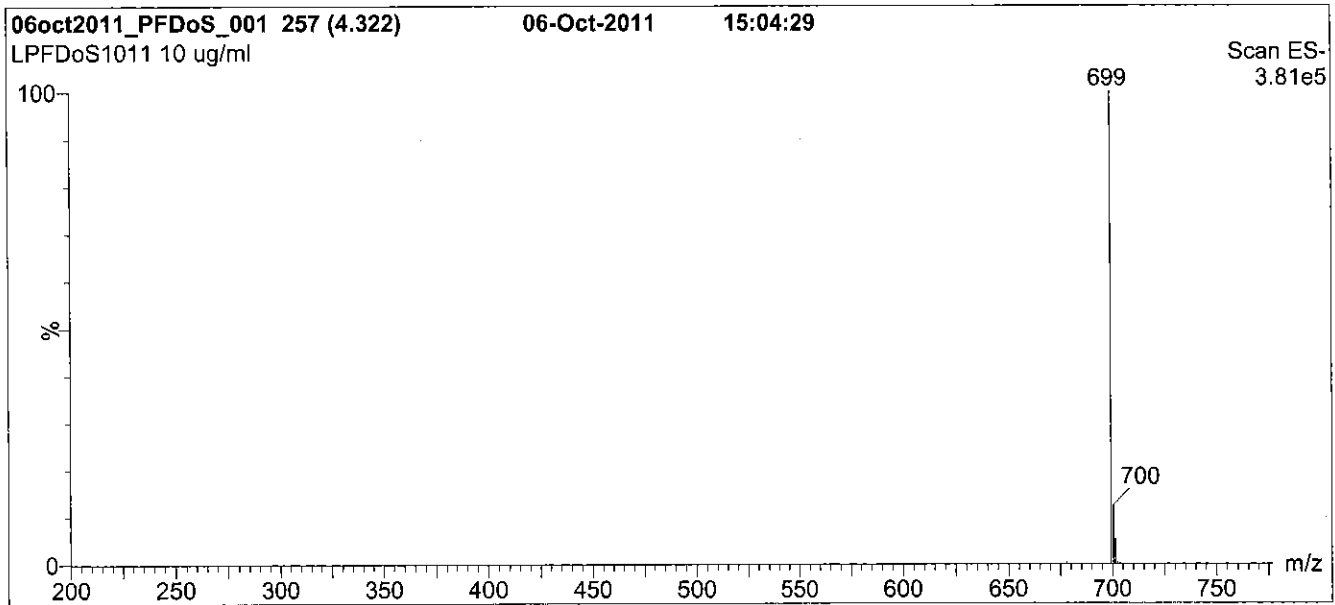
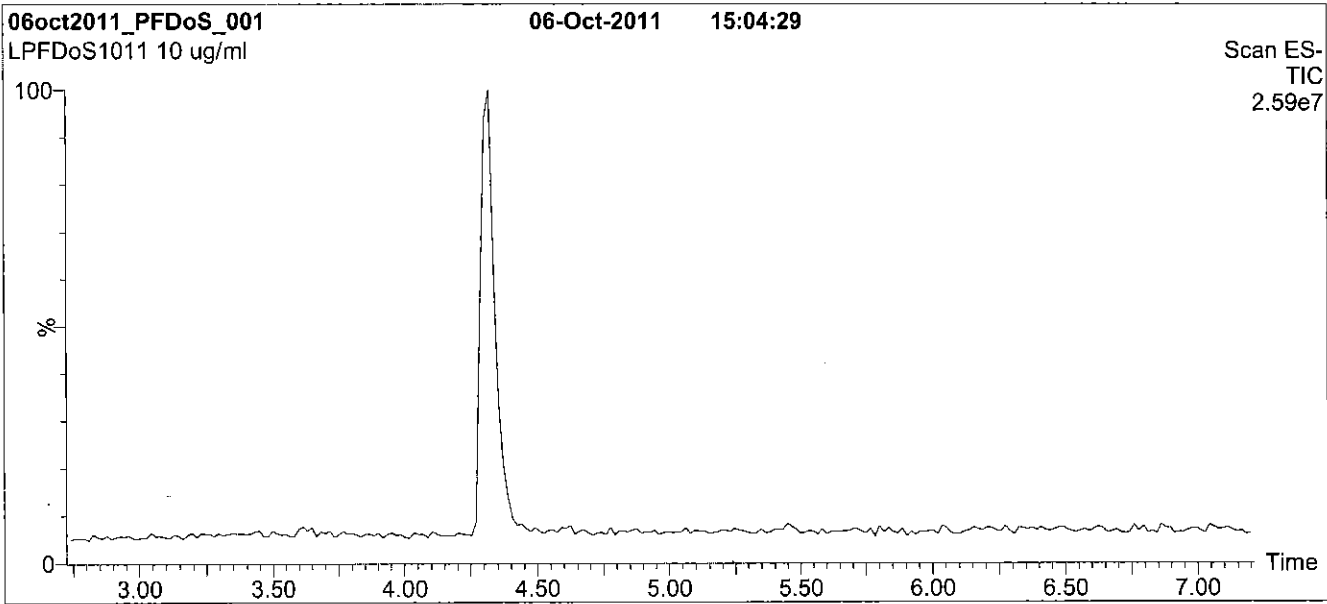
QUALITY MANAGEMENT:

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-PFDoS; 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

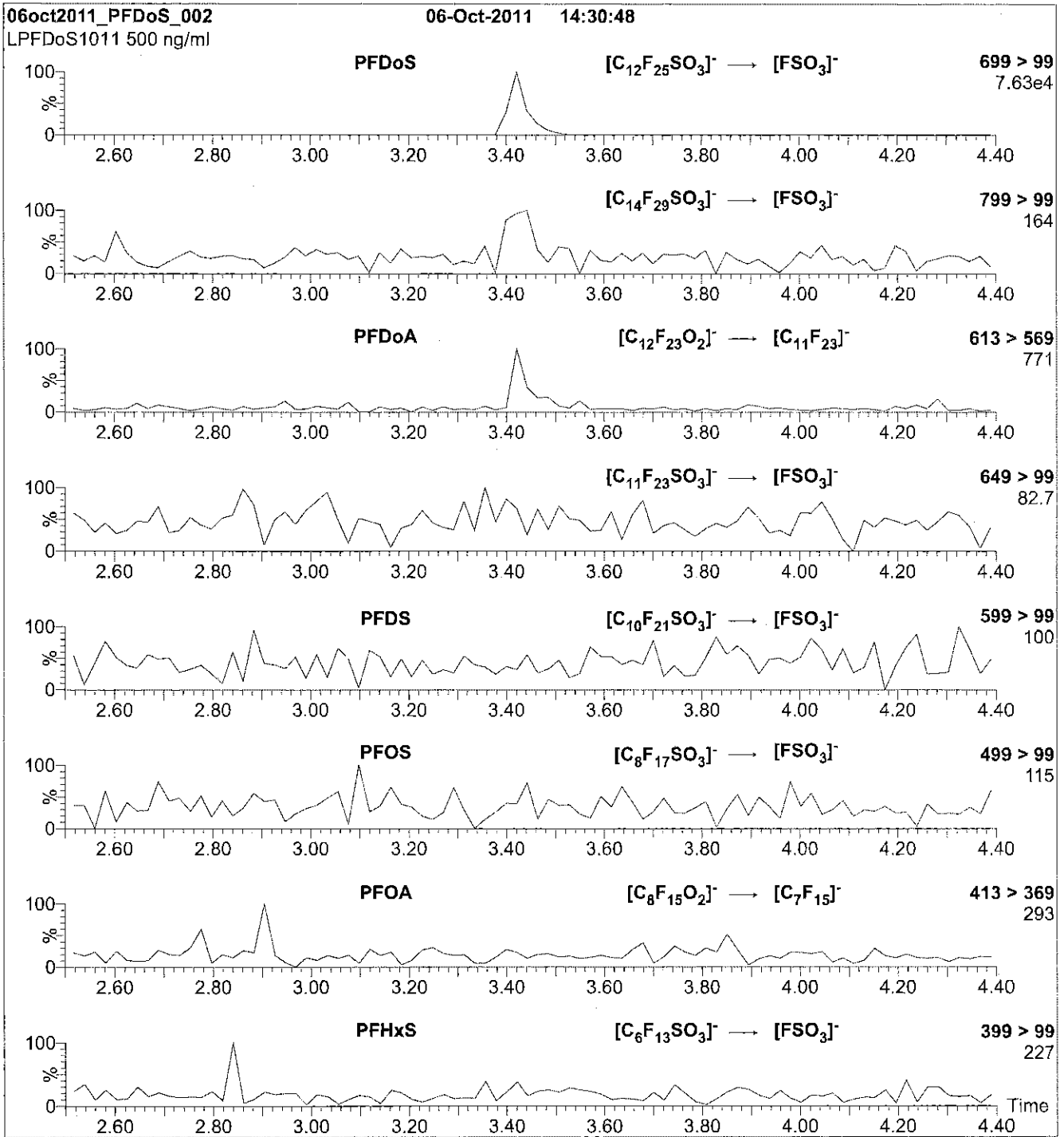
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (200 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

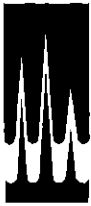
MS Parameters

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

Reagent

LCPFDS_00003

P: 2/11/15 SV



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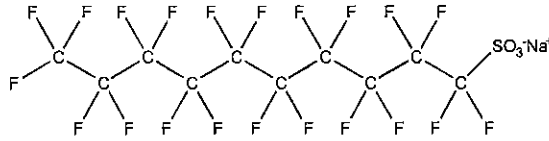
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFDS
COMPOUND: Sodium perfluoro-1-decanesulfonate

LOT NUMBER: LPFDS0913

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: C₁₀F₂₁SO₃Na
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
48.2 ± 2.4 µg/ml (PFDS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/13/2013
EXPIRY DATE: (mm/dd/yyyy) 09/13/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 622.13
SOLVENT(S): Methanol

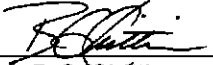
DOCUMENTATION/ DATA ATTACHED:

- 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: 09/23/2013
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2, \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.

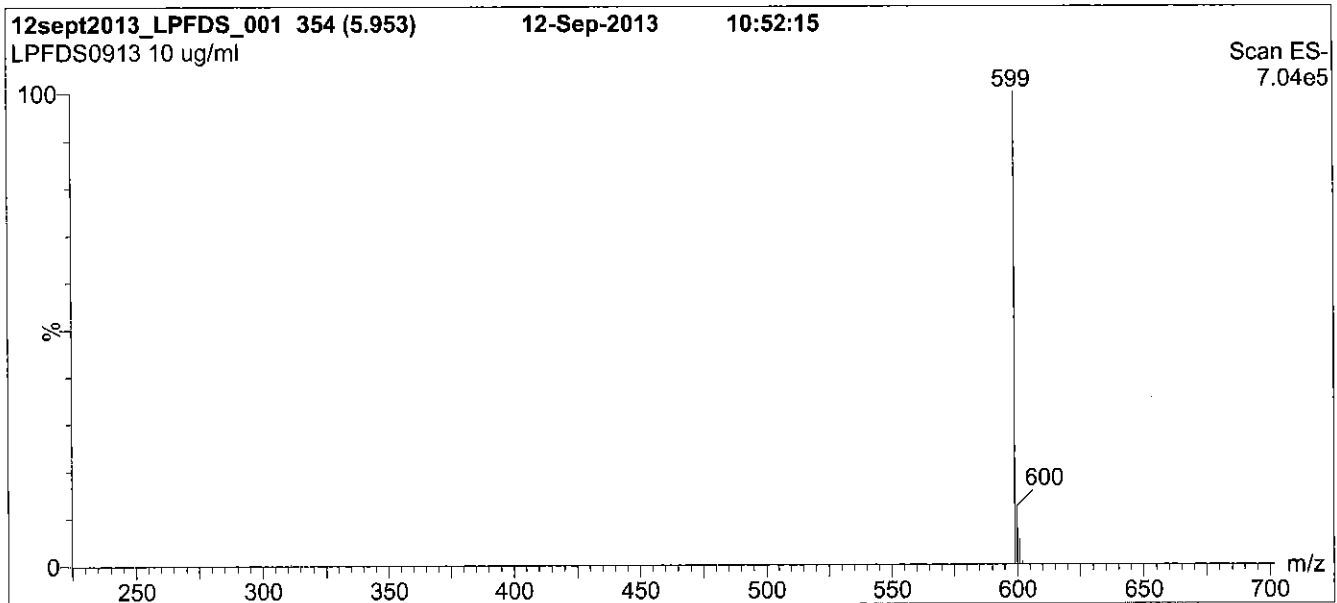
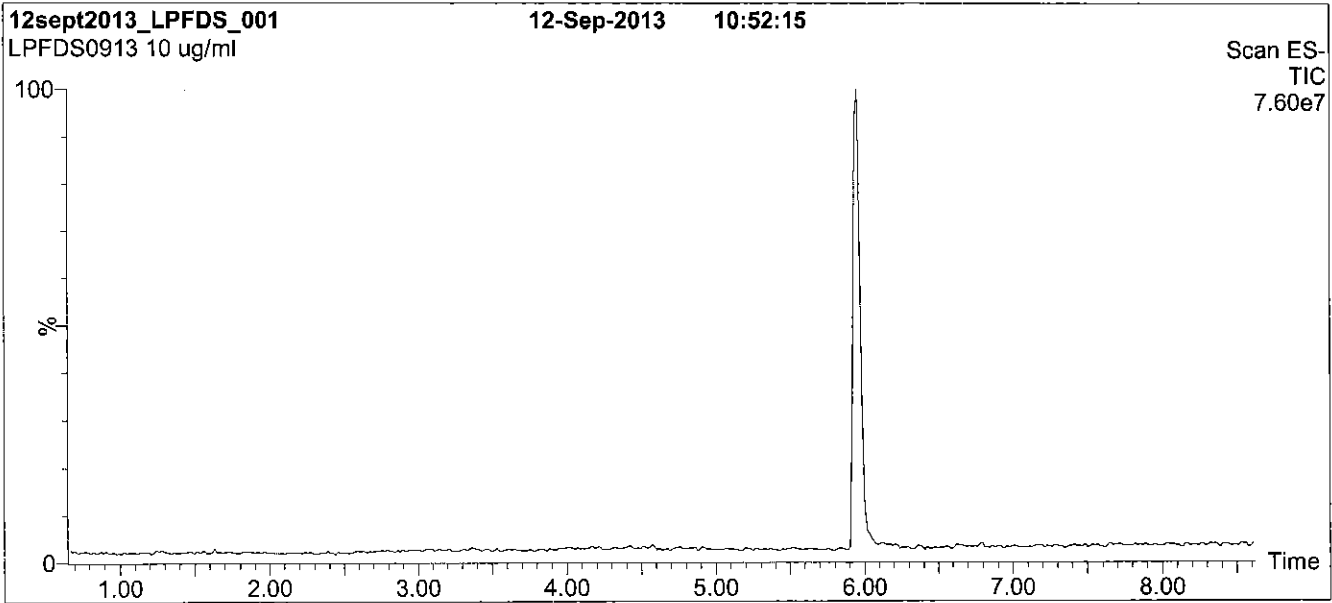
QUALITY MANAGEMENT:

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-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: 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: 11 min

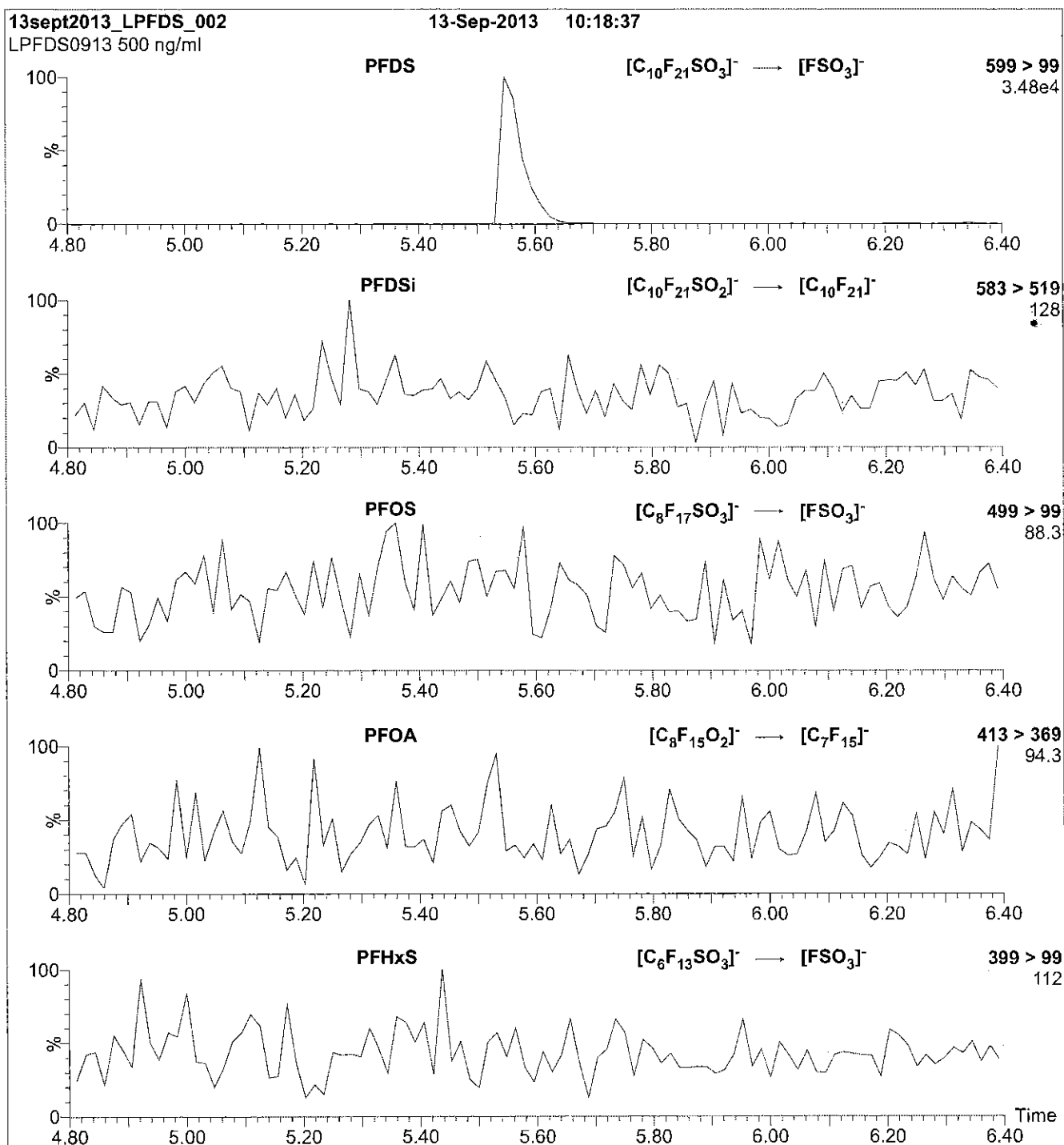
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
 10 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) = 3.78e-3
 Collision Energy (eV) = 50

Reagent

LCPFHpA_00004

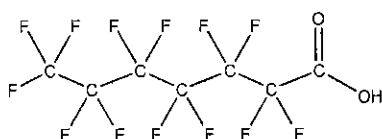


PRODUCT CODE: PFHpA
COMPOUND: Perfluoro-n-heptanoic acid

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.

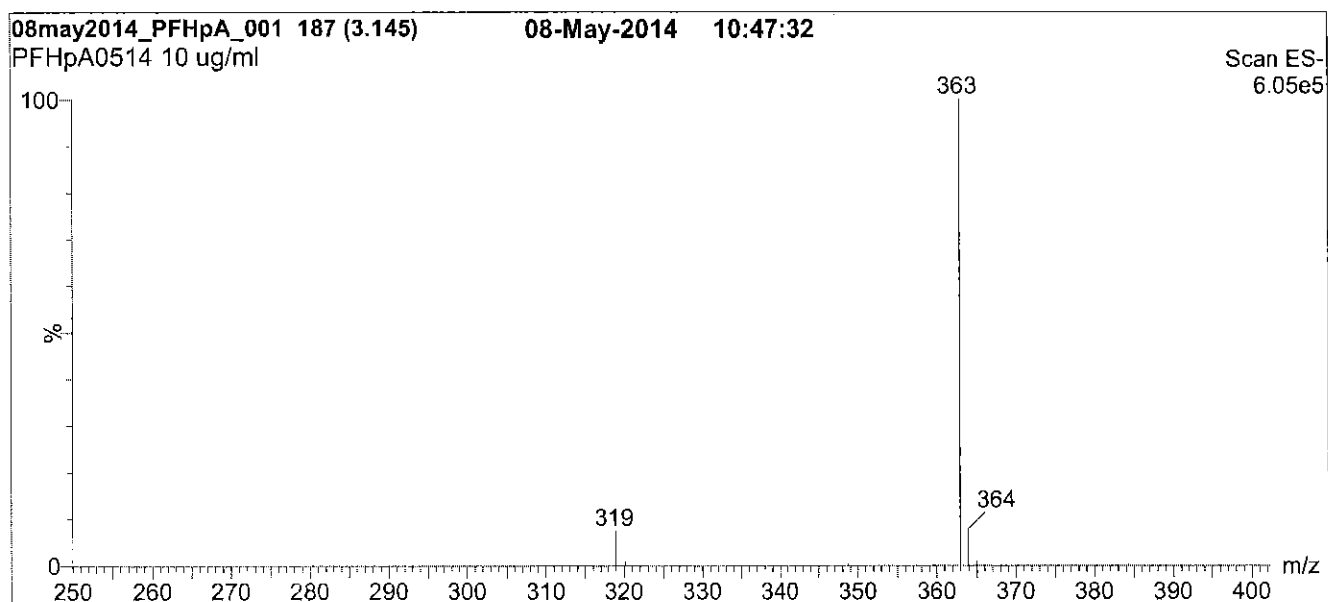
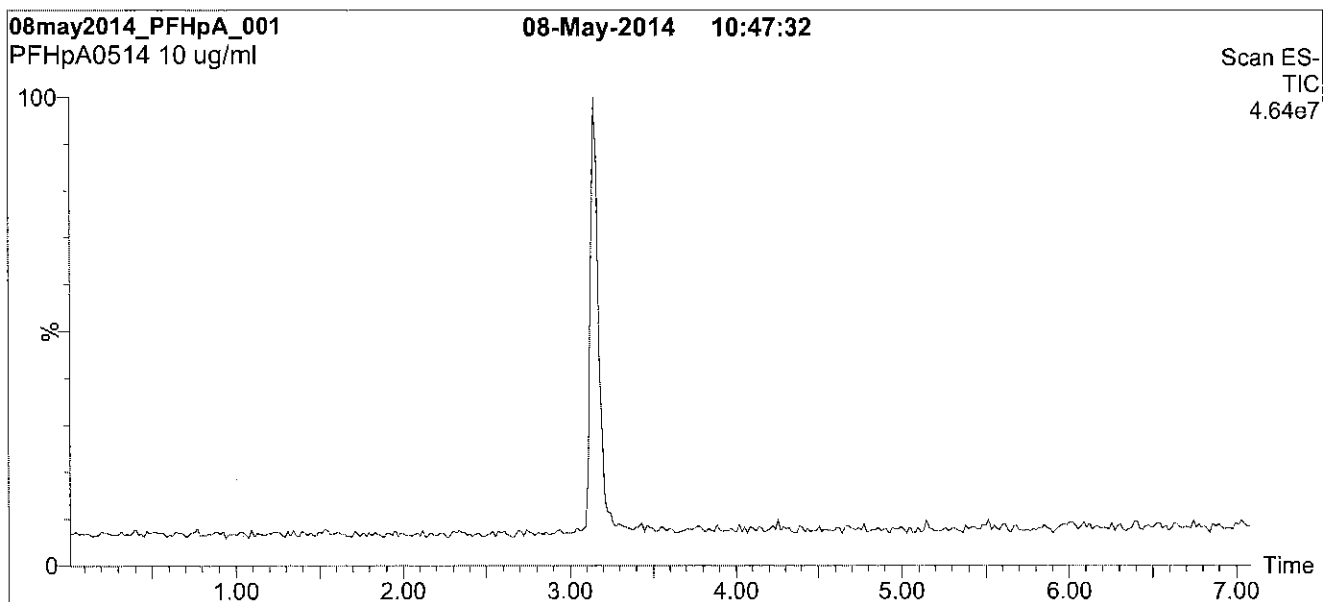
QUALITY MANAGEMENT:

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

Figure 1: 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

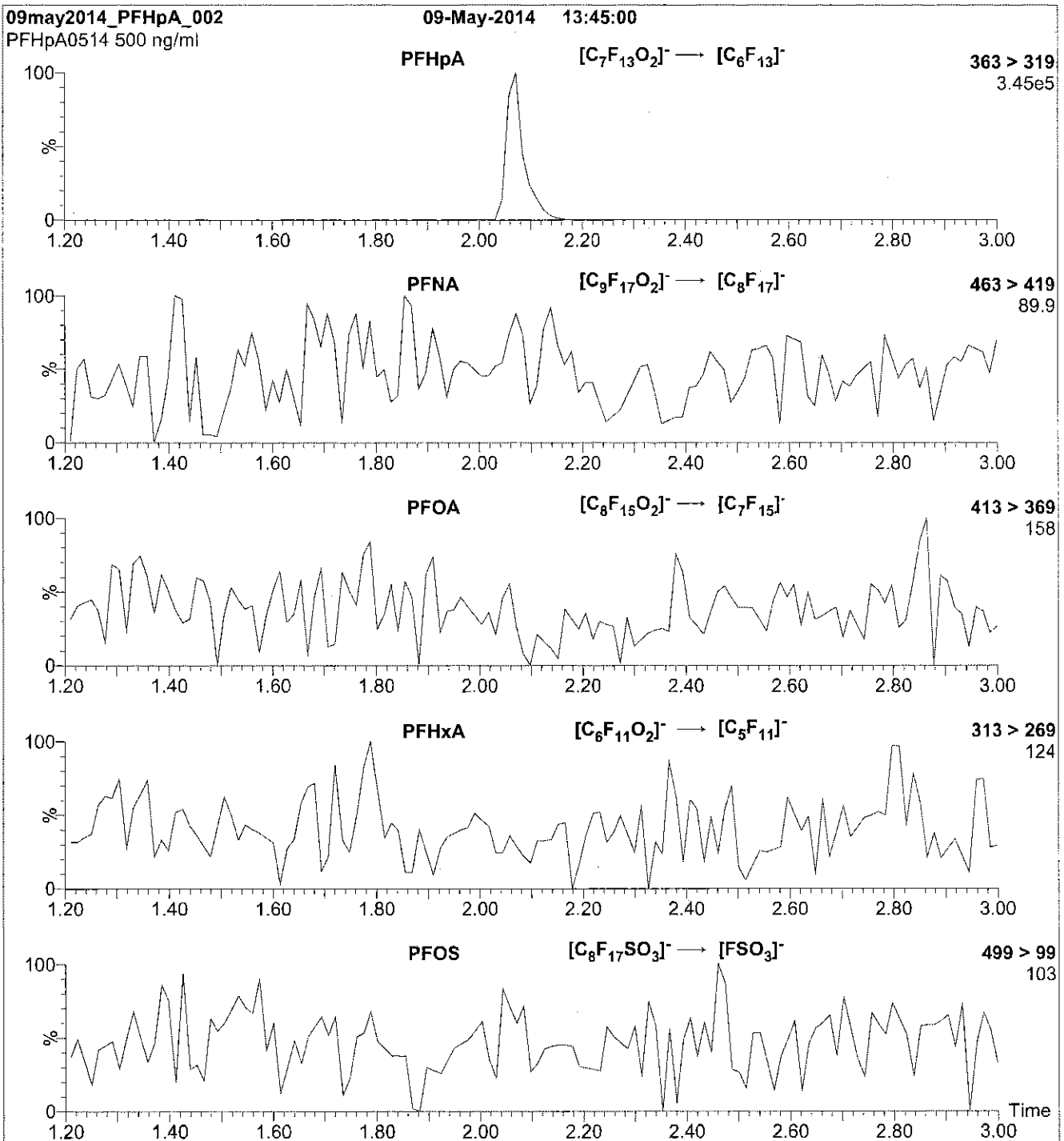
Flow: 300 μ l/min

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

LCPFHps_00005

R: 4/15/15 SW



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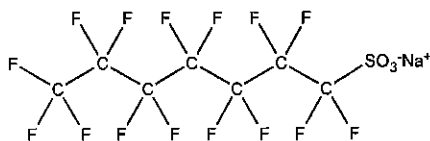
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFHpS
COMPOUND: Sodium perfluoro-1-heptanesulfonate

LOT NUMBER: LPFHpS0114

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: C₇F₁₅SO₃Na
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
47.6 ± 2.4 µg/ml (PFHPS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/28/2014
EXPIRY DATE: (mm/dd/yyyy) 01/28/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 472.10
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.
- Contains ~ 0.1% of L-PFHxS (C₅F₁₃SO₃Na) and ~ 0.2% of L-PFOS (C₈F₁₇SO₃Na).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 03/27/2015

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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.

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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.

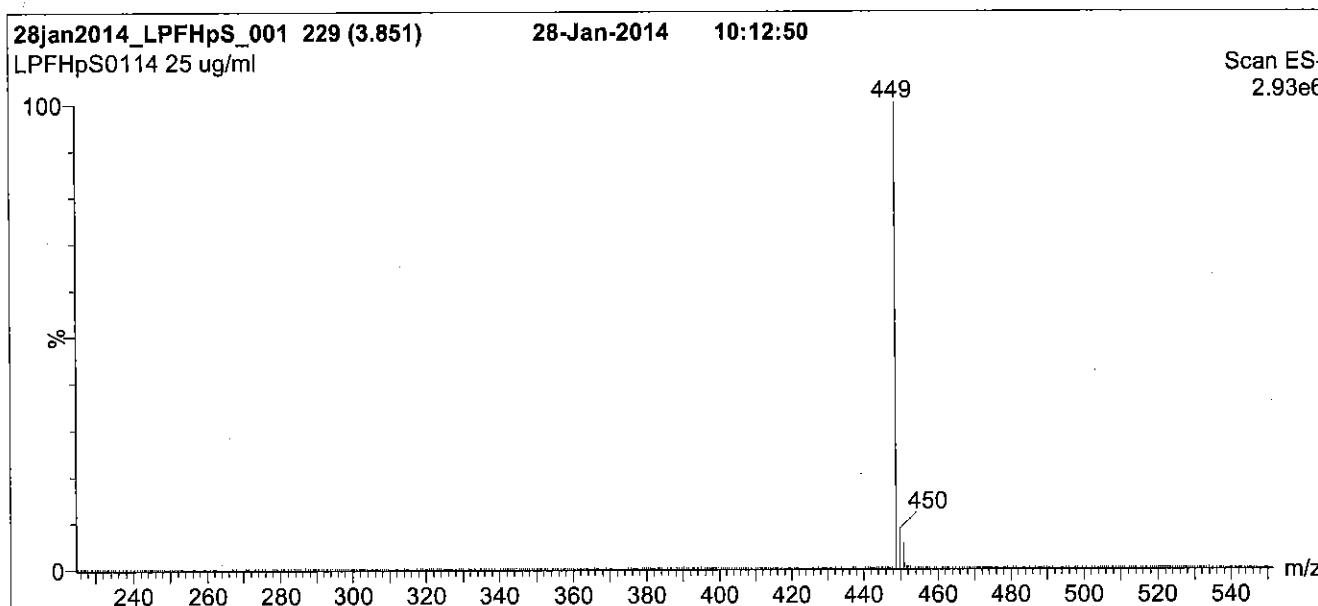
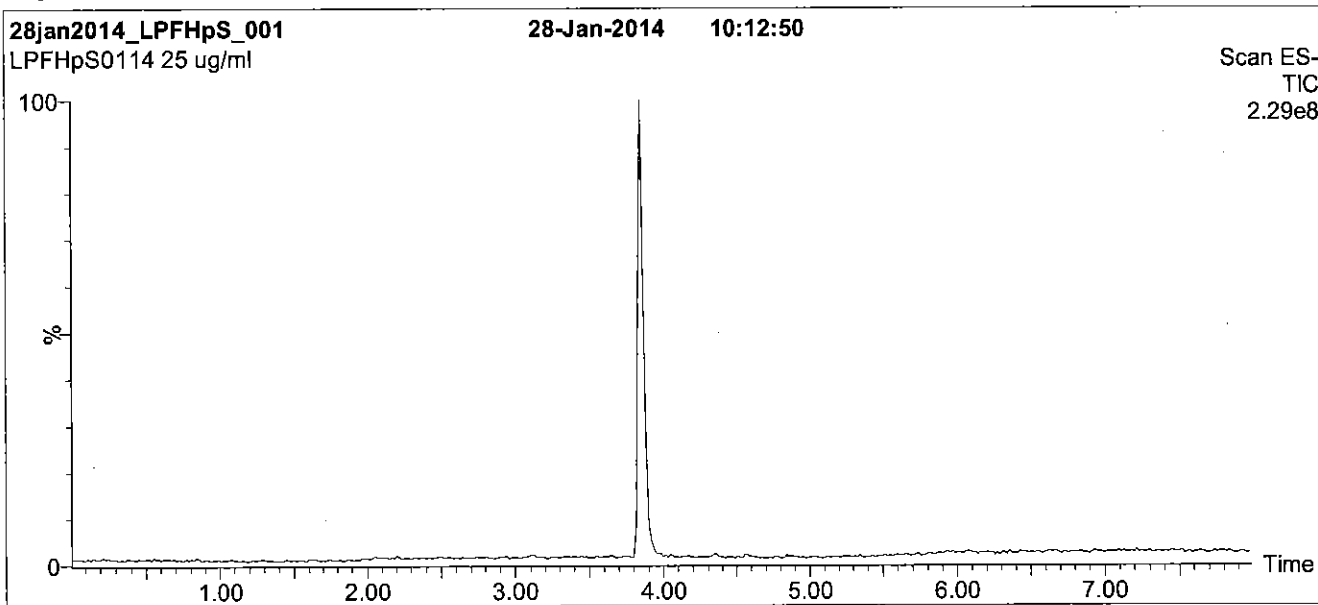
QUALITY MANAGEMENT:

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).



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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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
 1.5 min before returning to initial conditions in 0.5 min.
 Time: 10 min

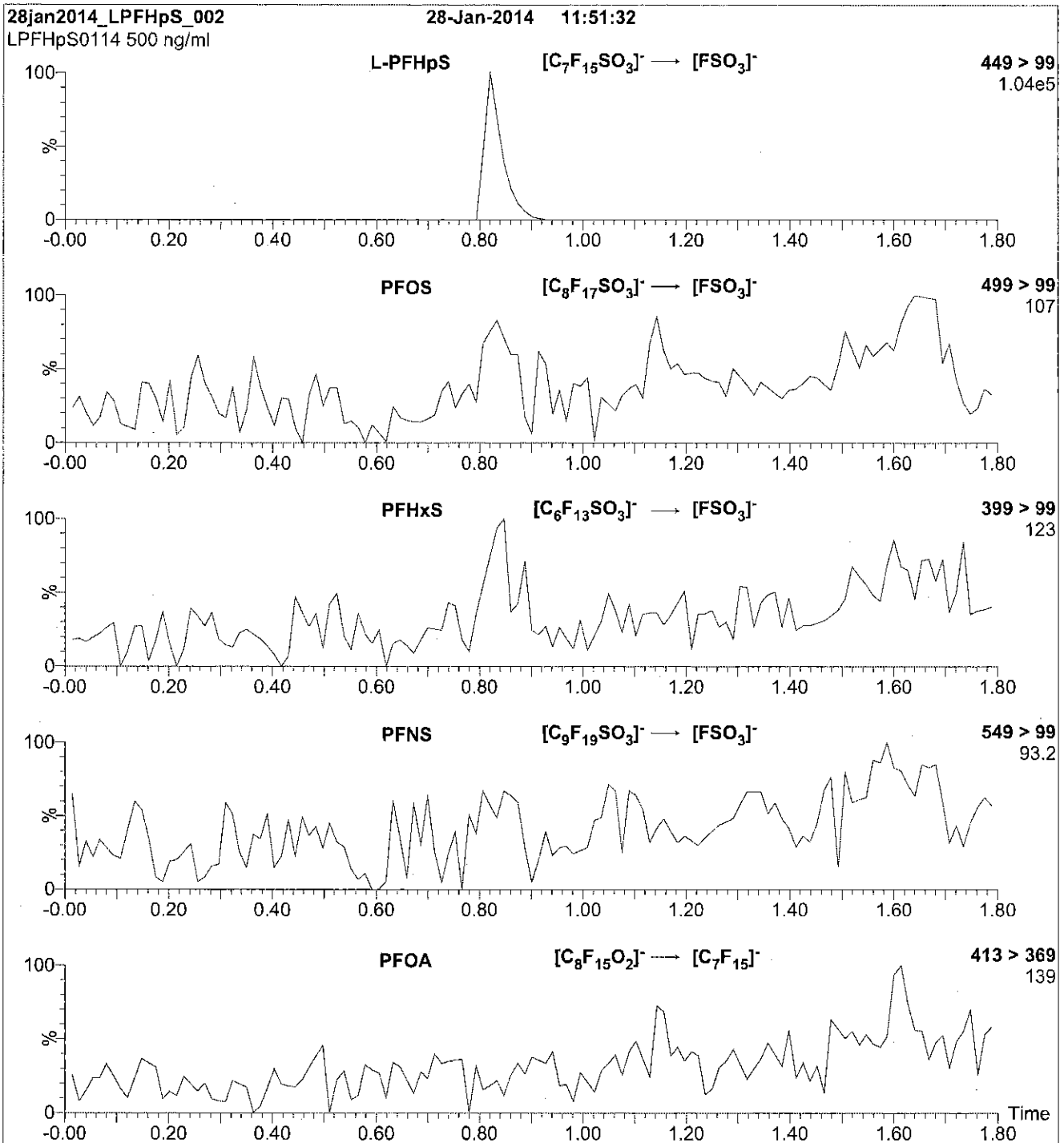
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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) = 35

Reagent

LCPFHxA_00003

V# 2/11/15 SW



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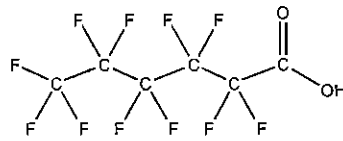
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: PFHxA0514

STRUCTURE:

CAS #: 307-24-4



MOLECULAR FORMULA: C₆HF₁₁O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 314.05
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

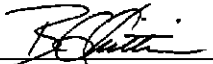
DOCUMENTATION/ DATA ATTACHED:

- 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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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:

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LIMITED WARRANTY:

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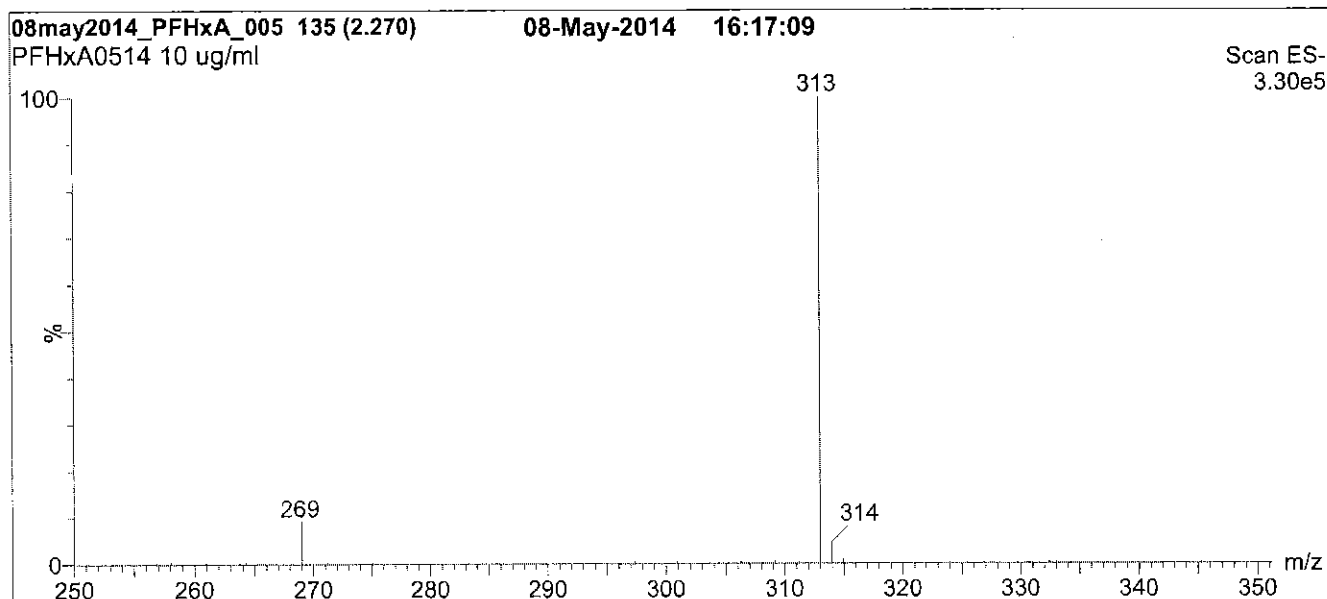
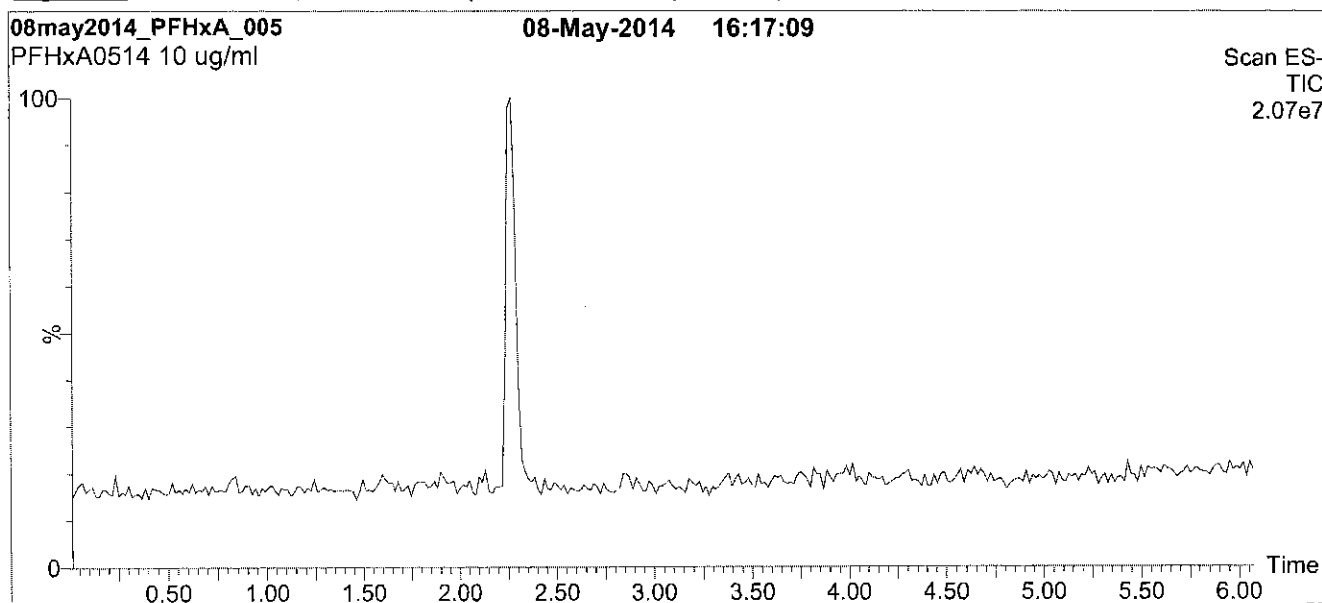
QUALITY MANAGEMENT:

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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

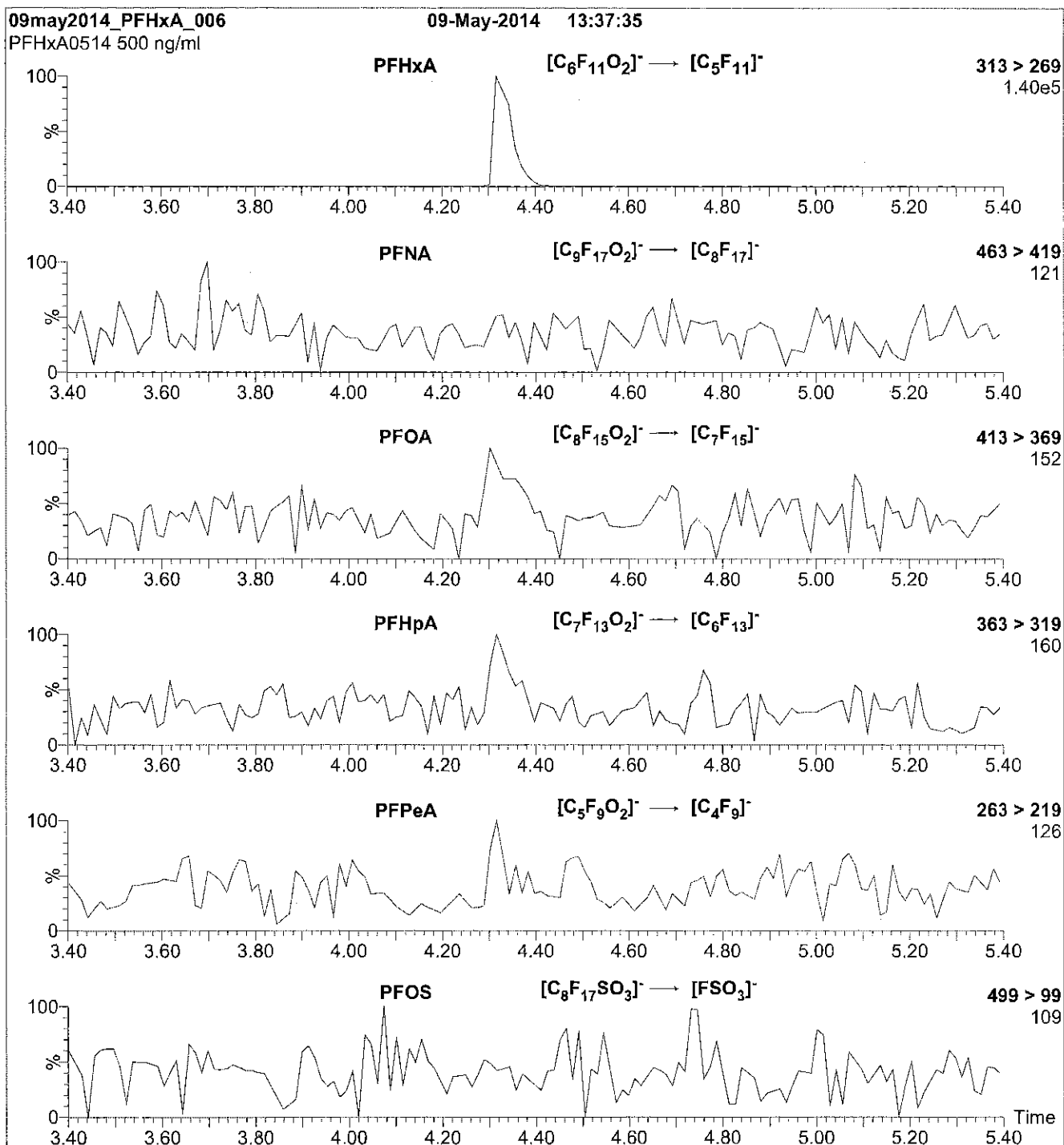
Flow: 300 μ l/min

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

LCPFHXS_00003



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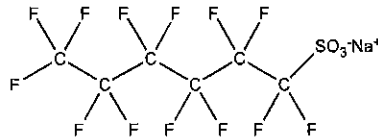
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFHxS
COMPOUND: Sodium perfluoro-1-hexanesulfonate

LOT NUMBER: LPFHxS0514

STRUCTURE:

CAS #: 82382-12-5



MOLECULAR FORMULA: C₆F₁₃SO₃Na
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
 47.3 ± 2.4 µg/ml (PFHxS anion)
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

MOLECULAR WEIGHT: 422.10
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: 05/16/2014
 (mm/dd/yyyy)

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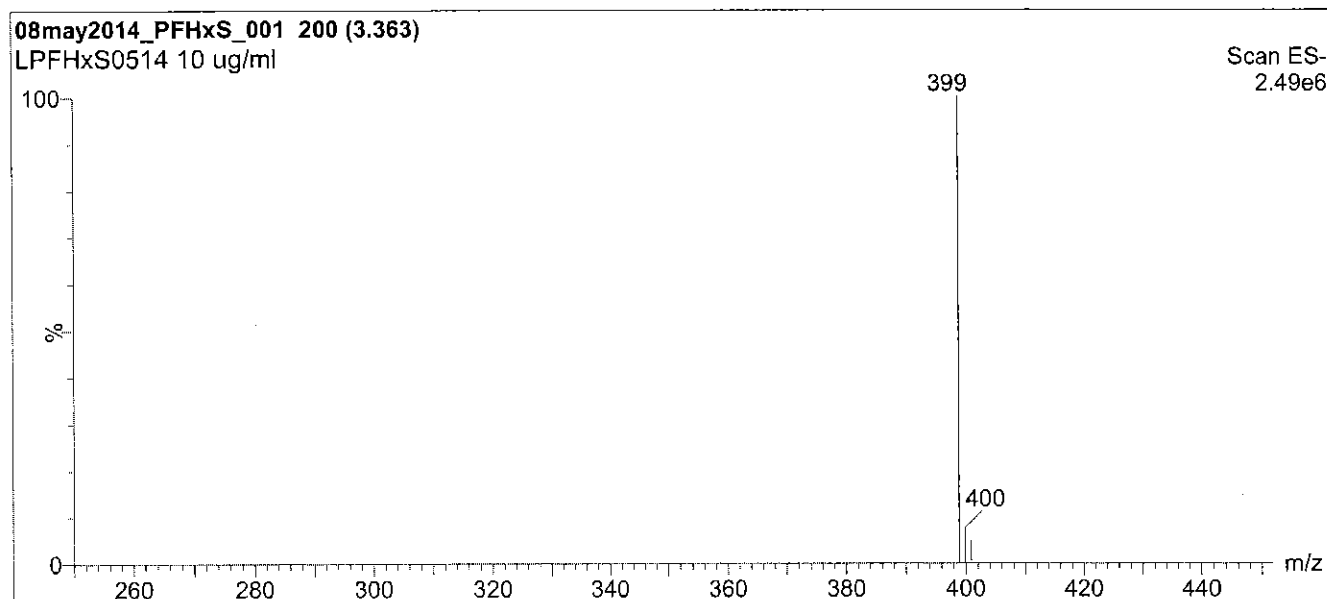
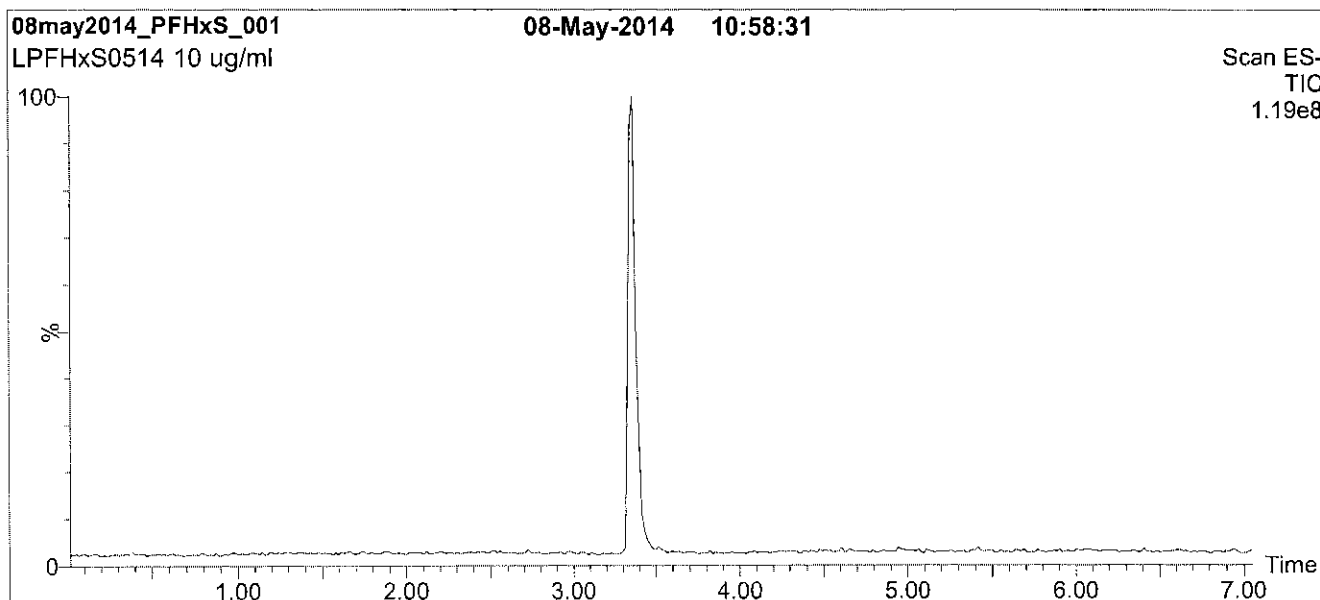
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH 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

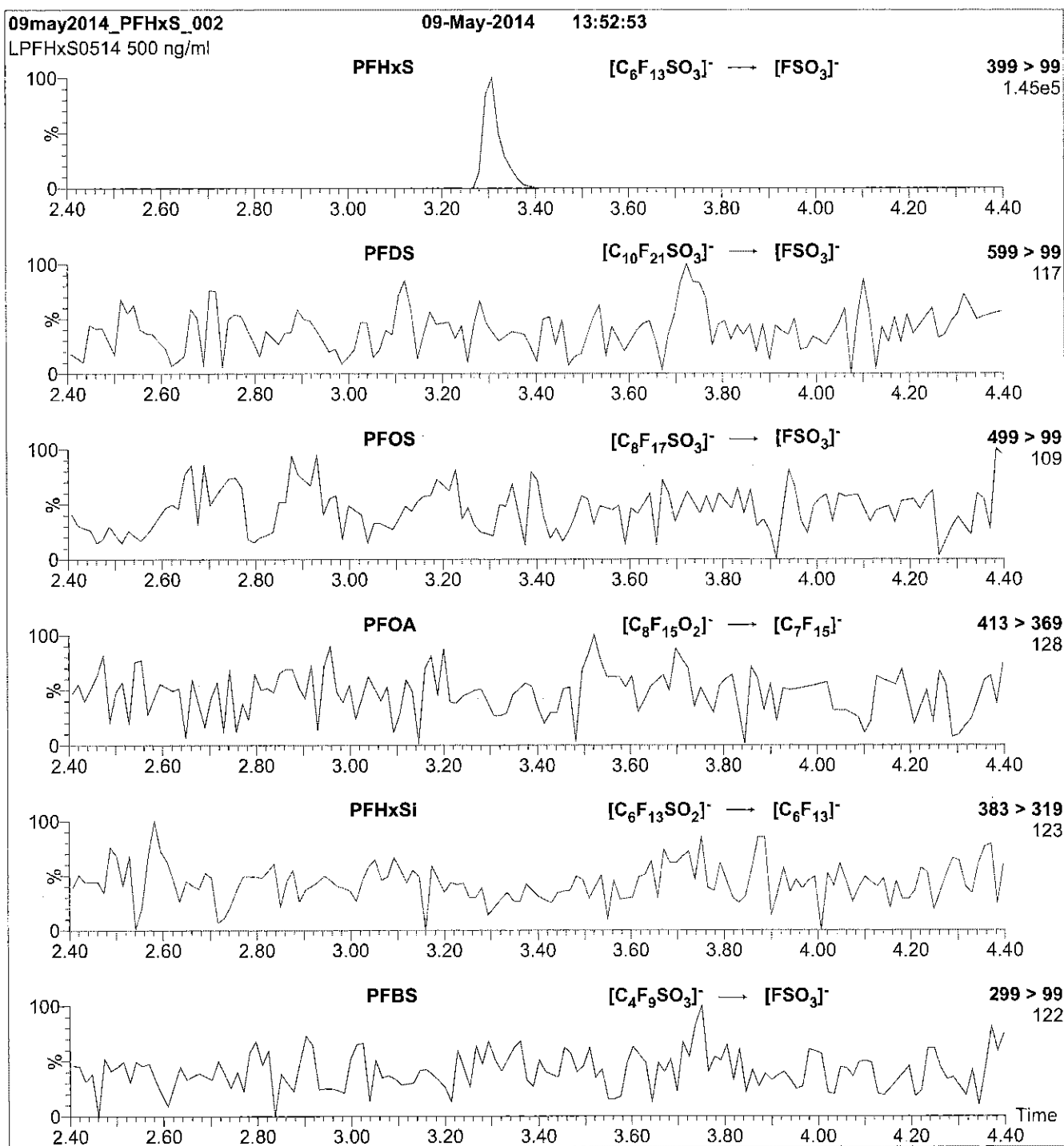
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 950 amu)

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

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



Conditions for Figure 2:

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

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) = 30

Reagent

LCPFNA_00004

r: 3/27/15 ✓
s:



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFNA

LOT NUMBER:

PFNA0514

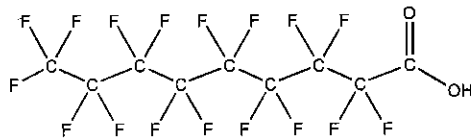
COMPOUND:

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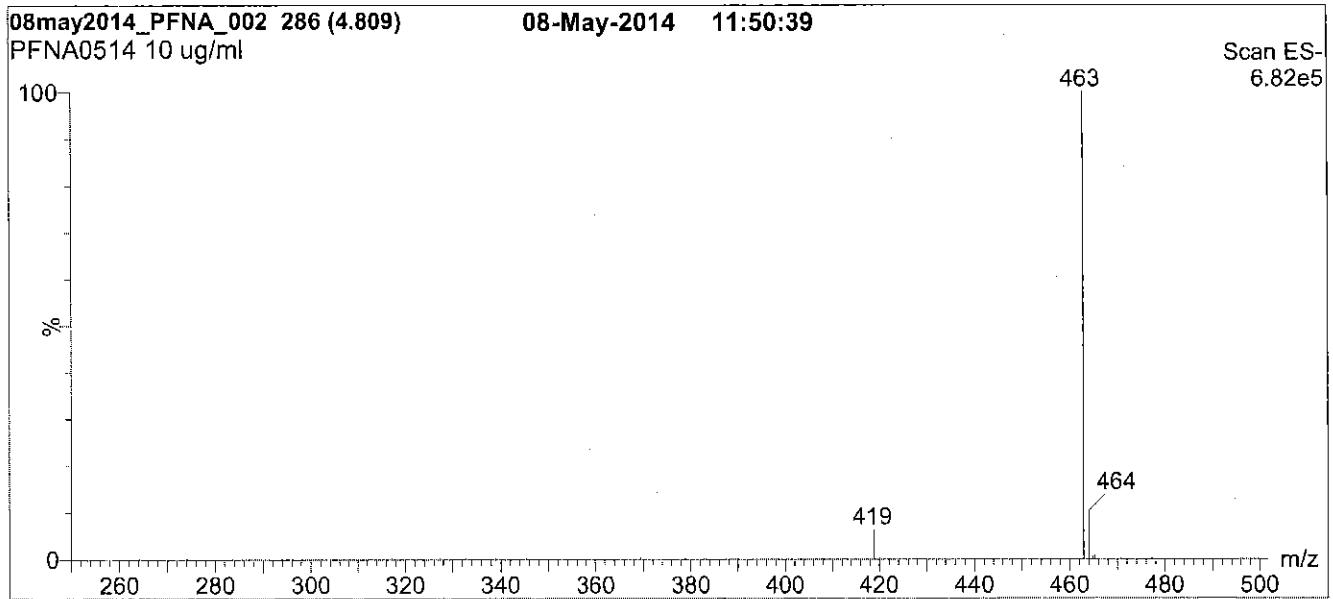
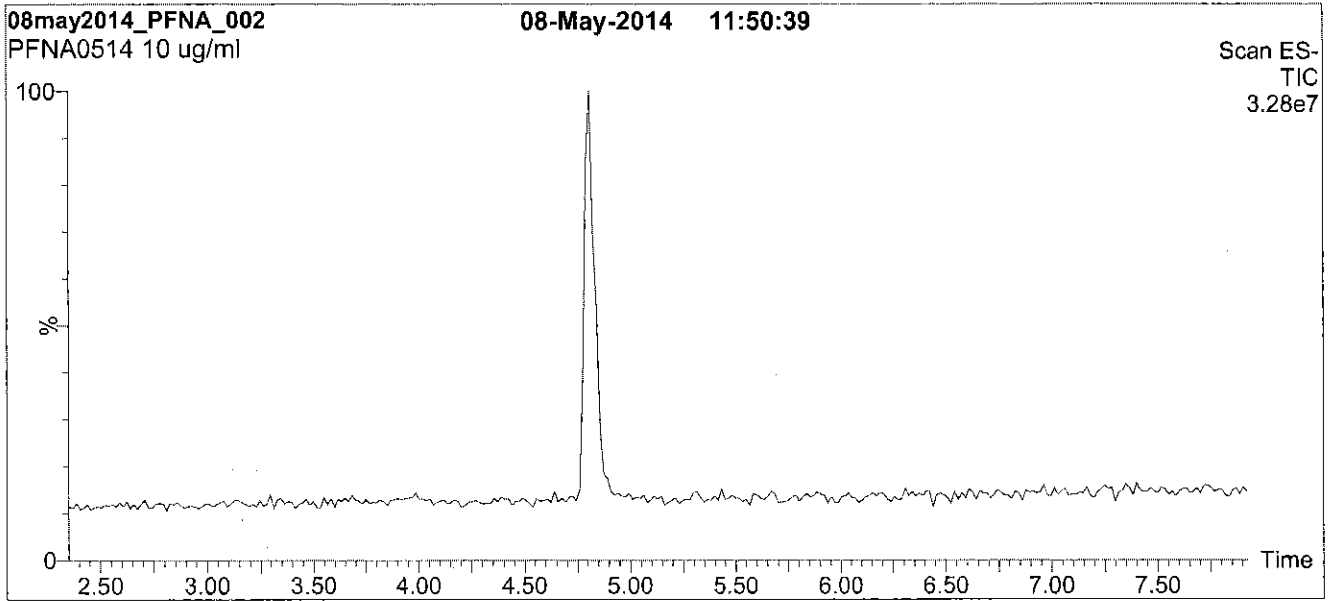
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Figure 1: PFNA; LC/MS Data (TIC and Mass Spectrum)



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

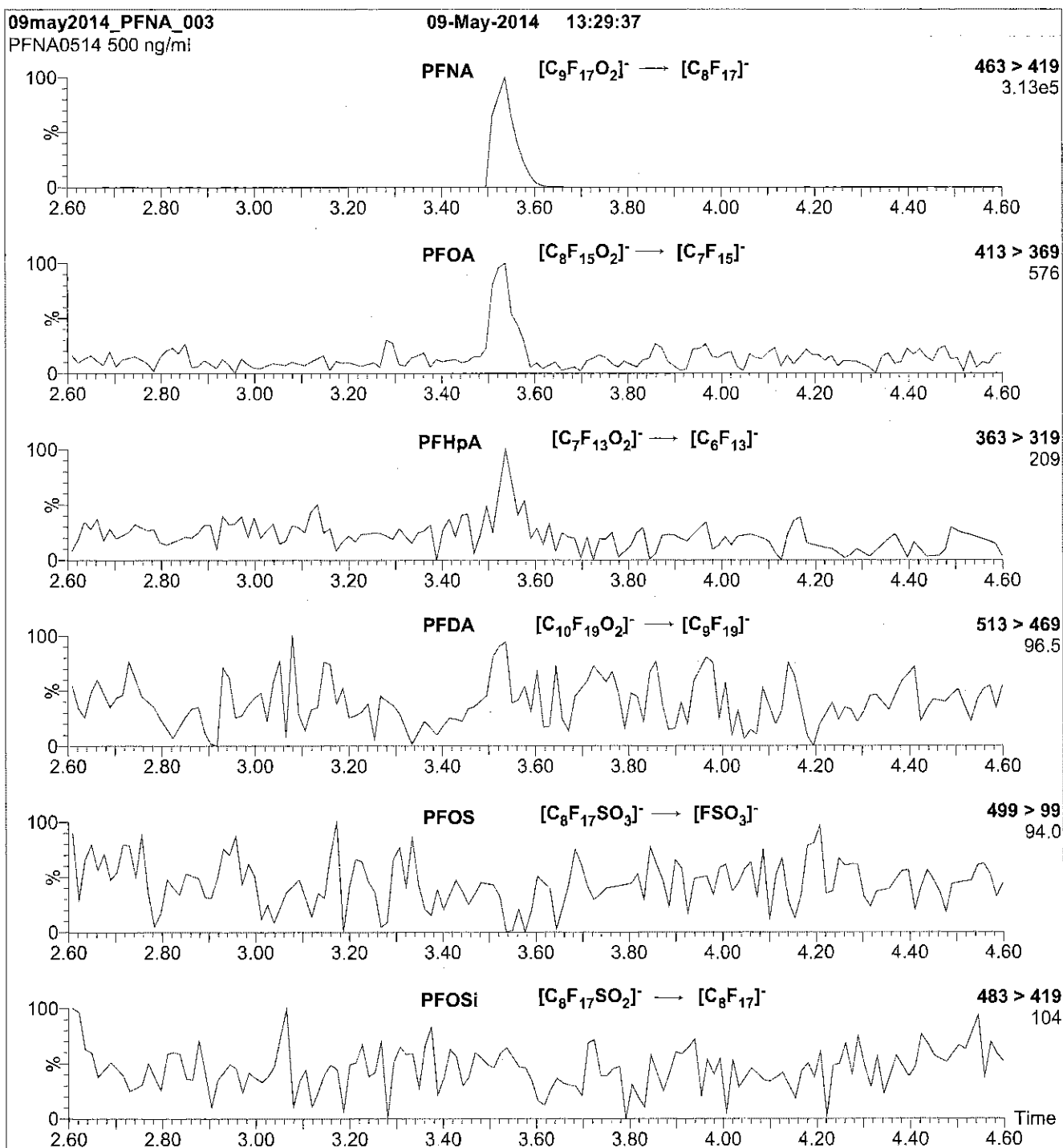
Flow: 300 μ l/min

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

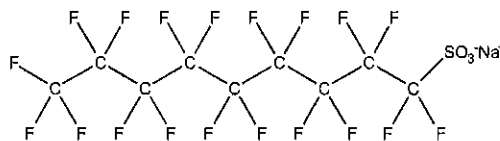
LCPFNS_00002



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CERTIFICATE OF ANALYSIS DOCUMENTATION

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



MOLECULAR FORMULA: C₉F₁₉SO₃Na **MOLECULAR WEIGHT:** 572.12
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
 48.0 ± 2.4 µg/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.

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Certified By: _____

B.G. Chittim

Date: 01/15/2013

(mm/dd/yyyy)

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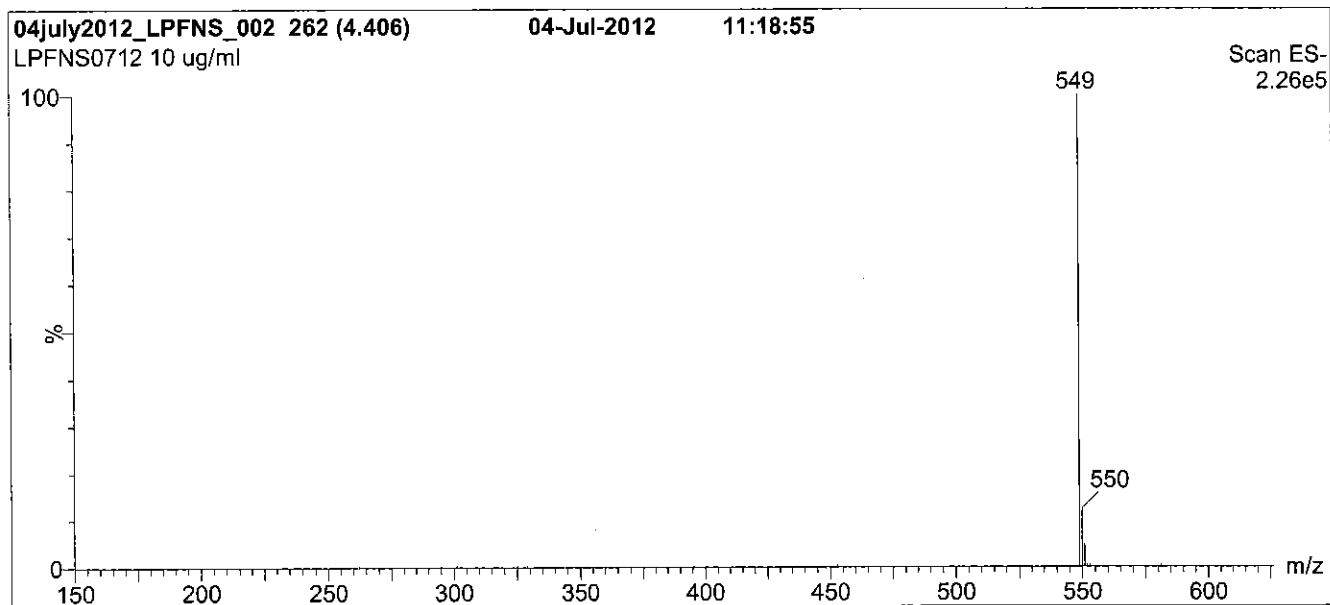
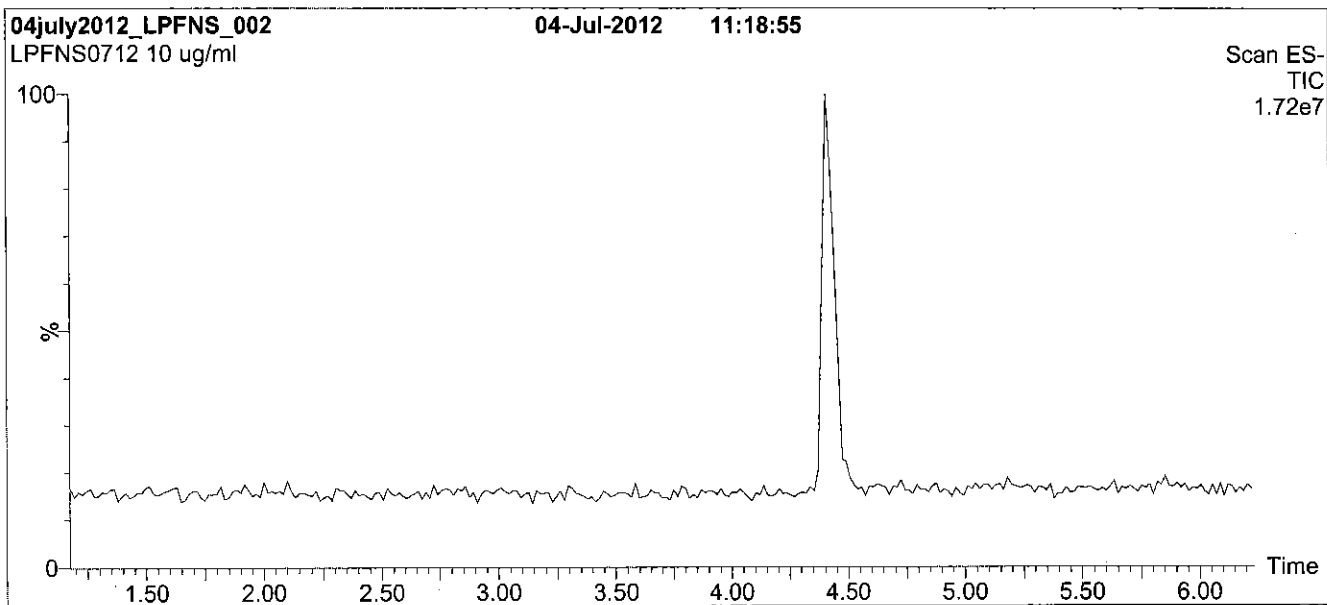
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Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

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

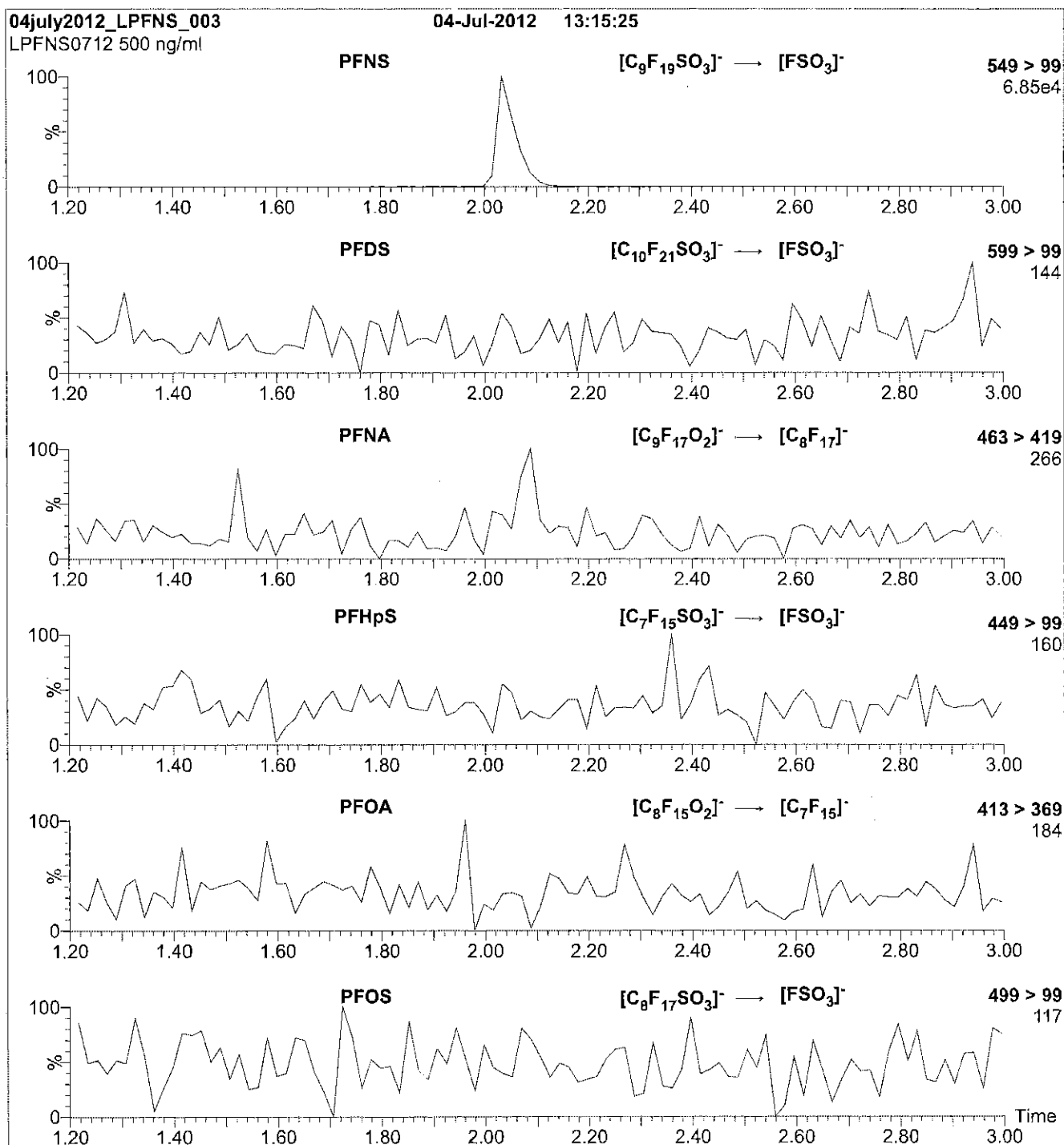
Flow: 300 μ l/min

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_00004



**WELLINGTON
LABORATORIES**

**CERTIFICATE OF ANALYSIS
DOCUMENTATION**

Rec 7/15/14

PRODUCT CODE:

PFOA

LOT NUMBER:

PFOA1013

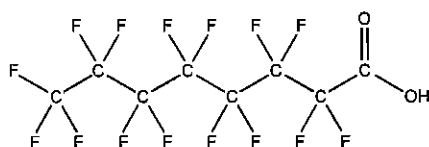
COMPOUND:

Perfluoro-n-octanoic acid

STRUCTURE:

CAS #:

335-67-1



MOLECULAR FORMULA:

$C_8H_{15}O_2$

MOLECULAR WEIGHT:

414.07

CONCENTRATION:

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

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/11/2013

EXPIRY DATE: (mm/dd/yyyy)

10/11/2018

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 10/18/2013

(mm/dd/yyyy)

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

INTENDED USE:

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.

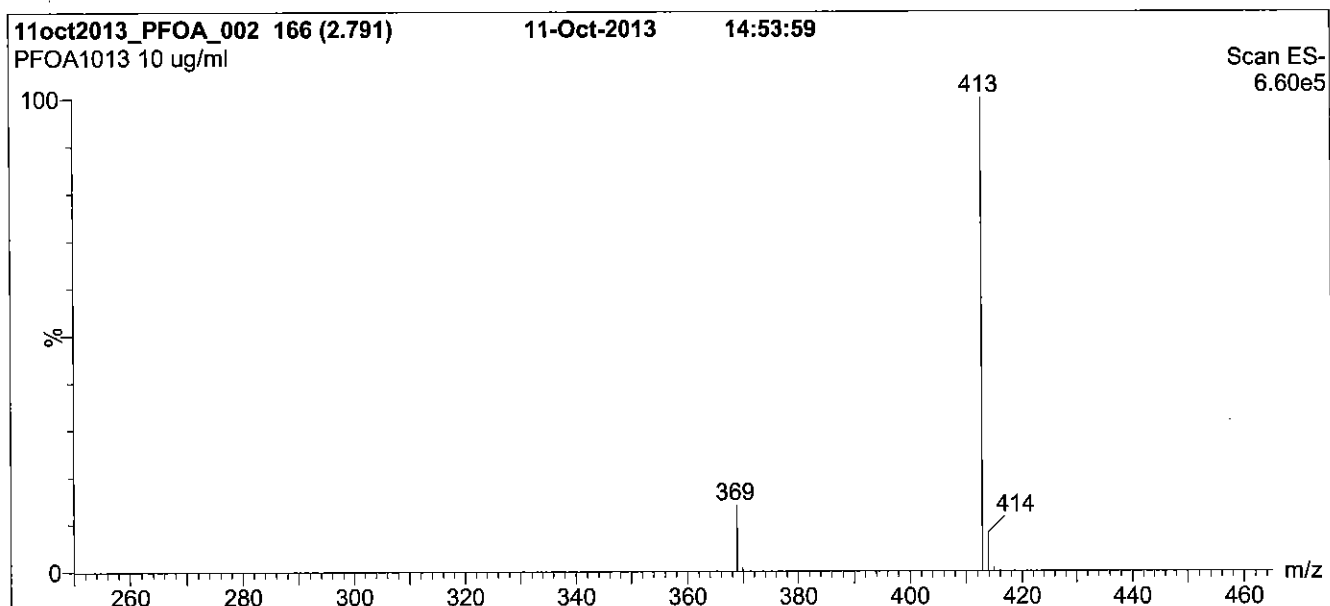
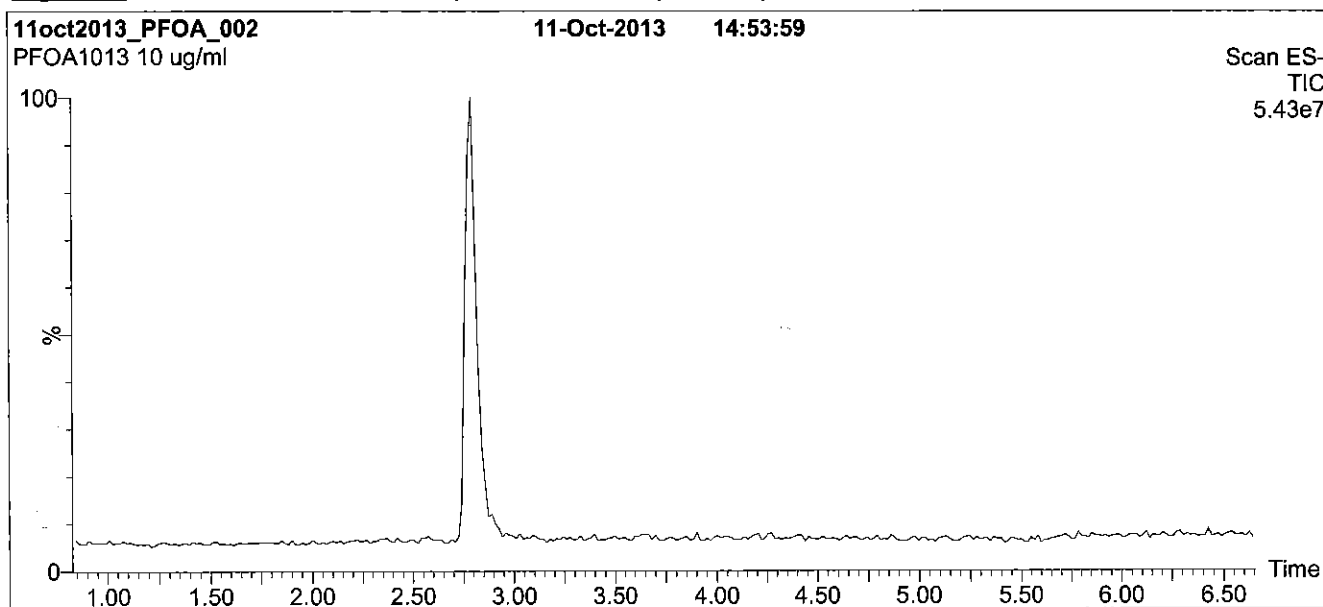
QUALITY MANAGEMENT:

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

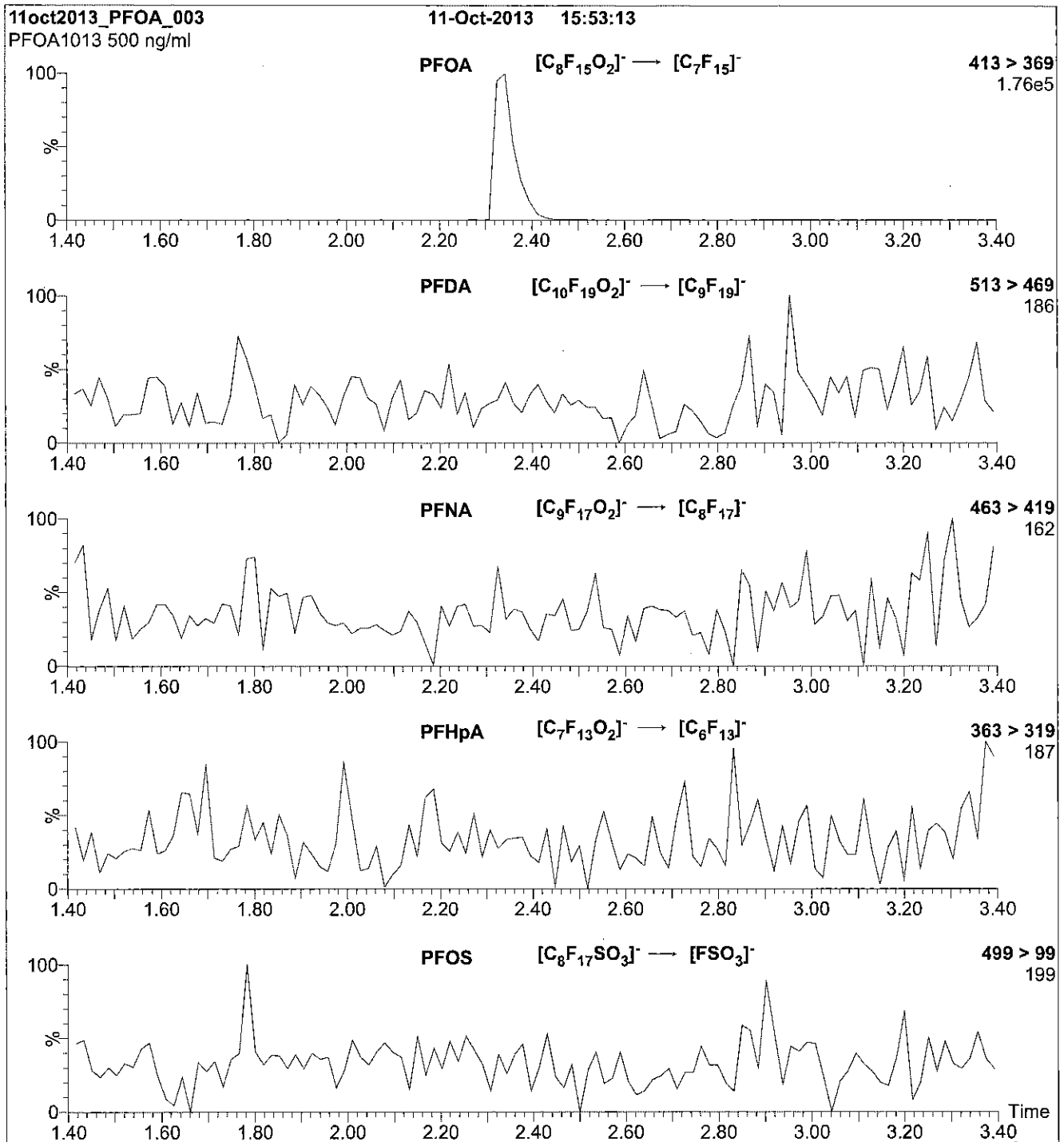
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 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) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCPFODA_00004

17 2/15 2

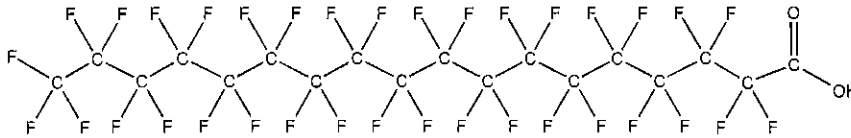


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

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



MOLECULAR FORMULA: C₁₈H₃₅F₃₅O₂ **MOLECULAR WEIGHT:** 914.15
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (4%)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/25/2014
EXPIRY DATE: (mm/dd/yyyy) 04/25/2017
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

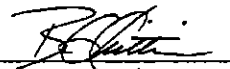
DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim **Date:** 04/28/2014
(mm/dd/yyyy)

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

INTENDED USE:

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:

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

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

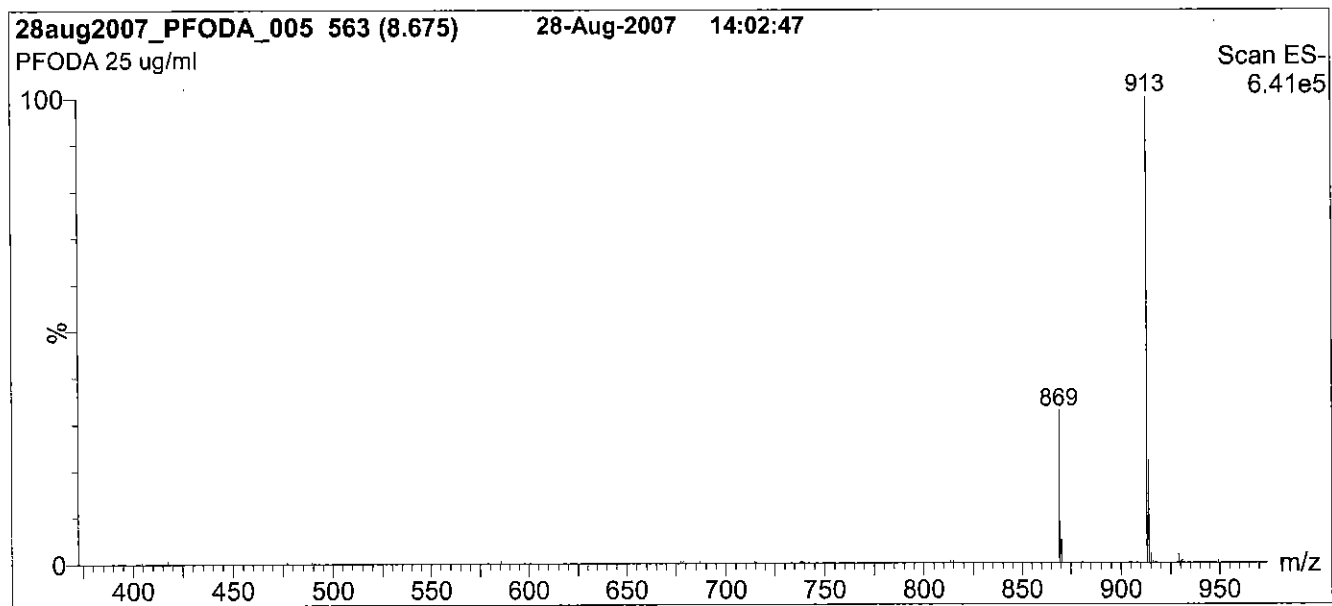
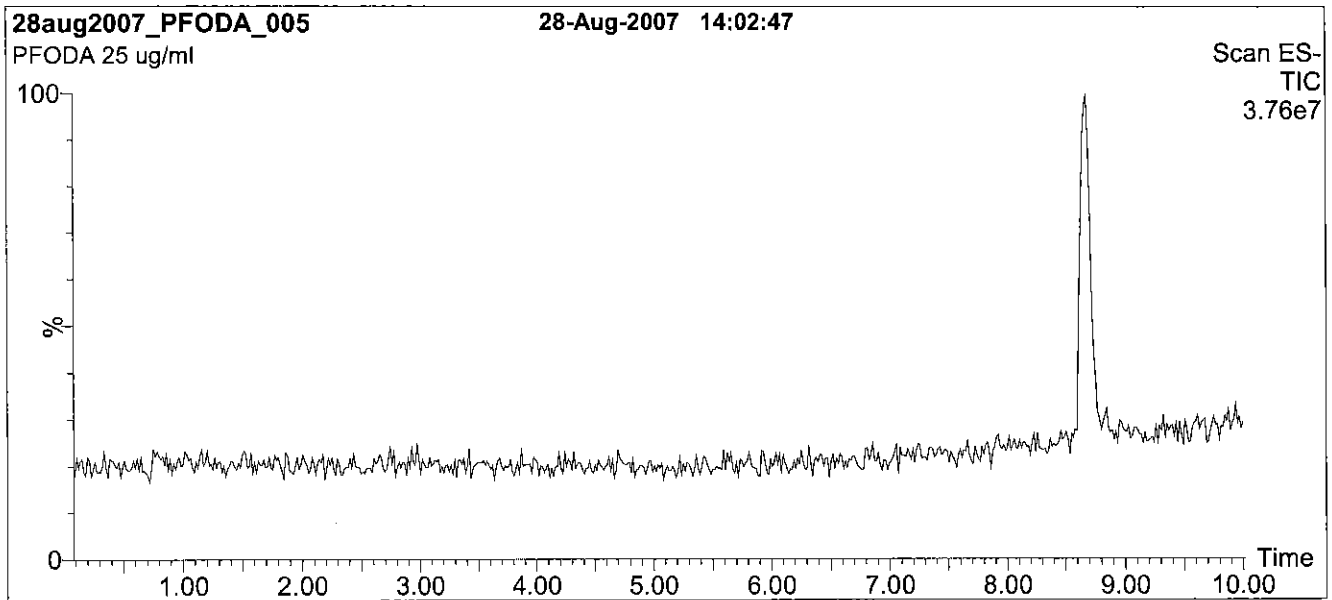
QUALITY MANAGEMENT:

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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

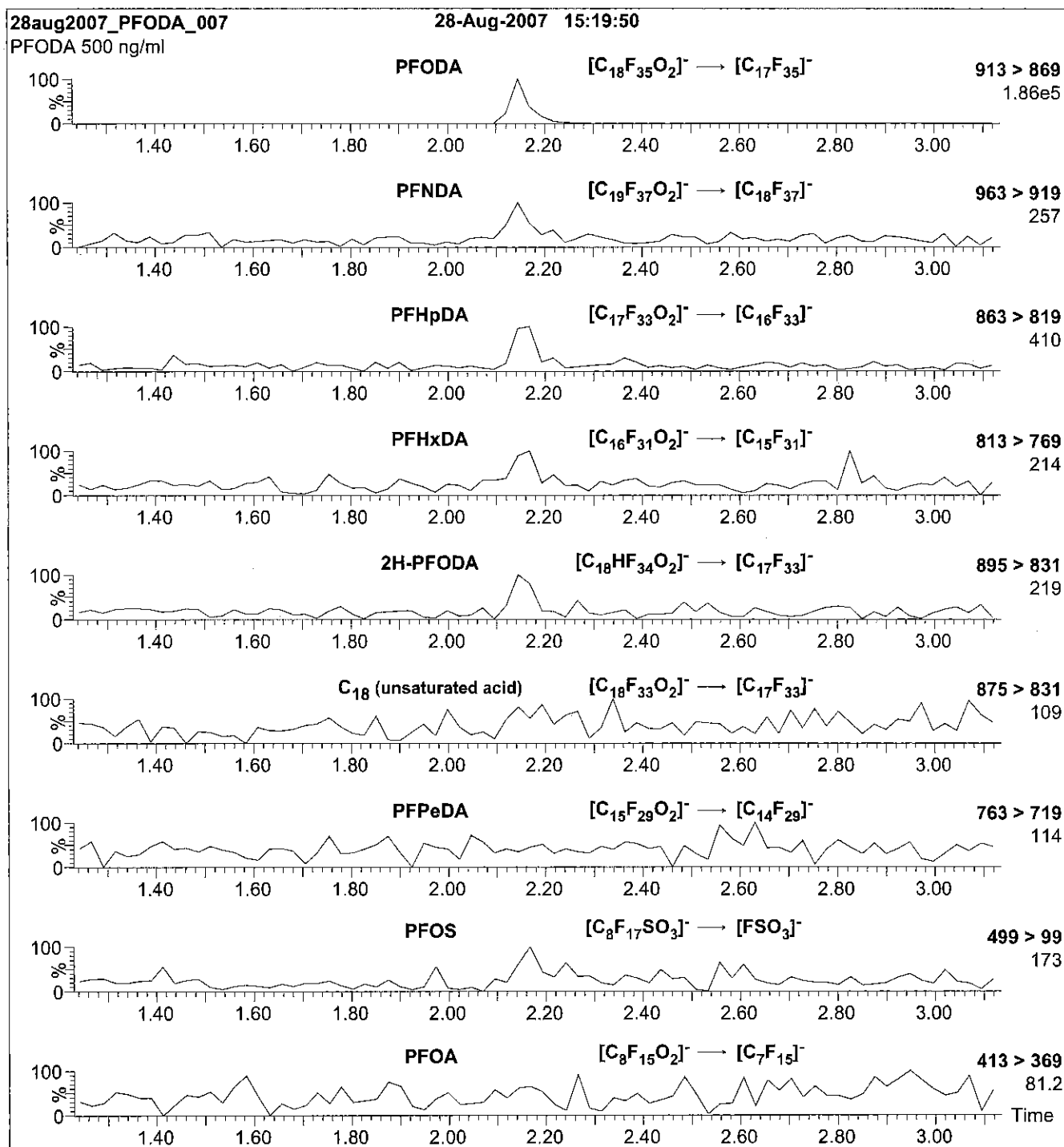
Flow: 300 μ l/min

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

LCPFOS_00004

3/17/15 SV



WELLINGTON LABORATORIES

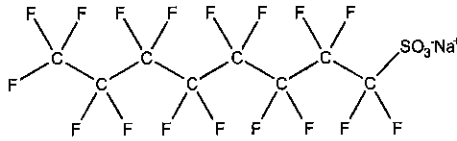
CERTIFICATE OF ANALYSIS DOCUMENTATION

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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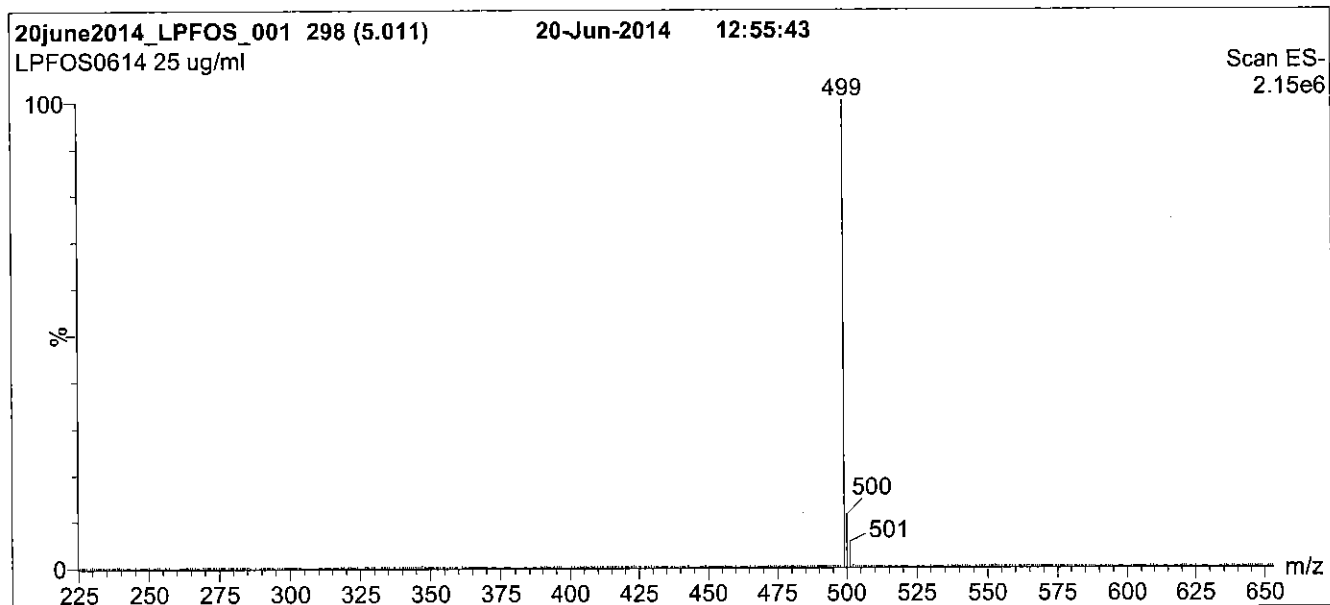
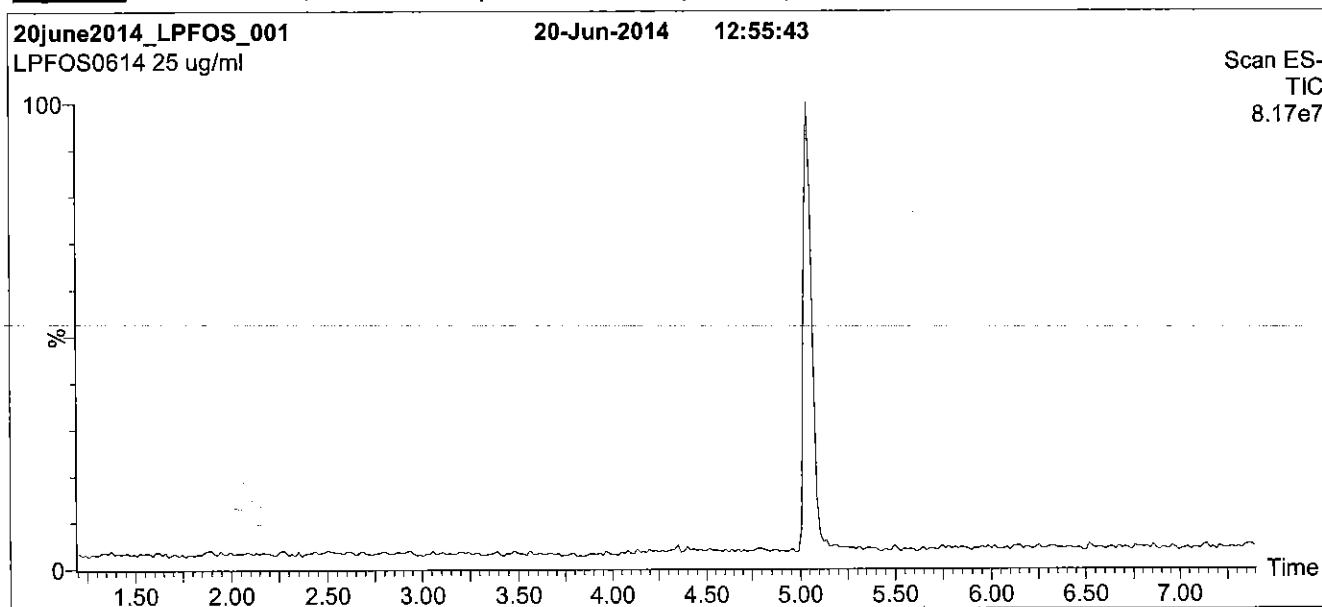
QUALITY MANAGEMENT:

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Figure 1: L-PFOS; 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 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

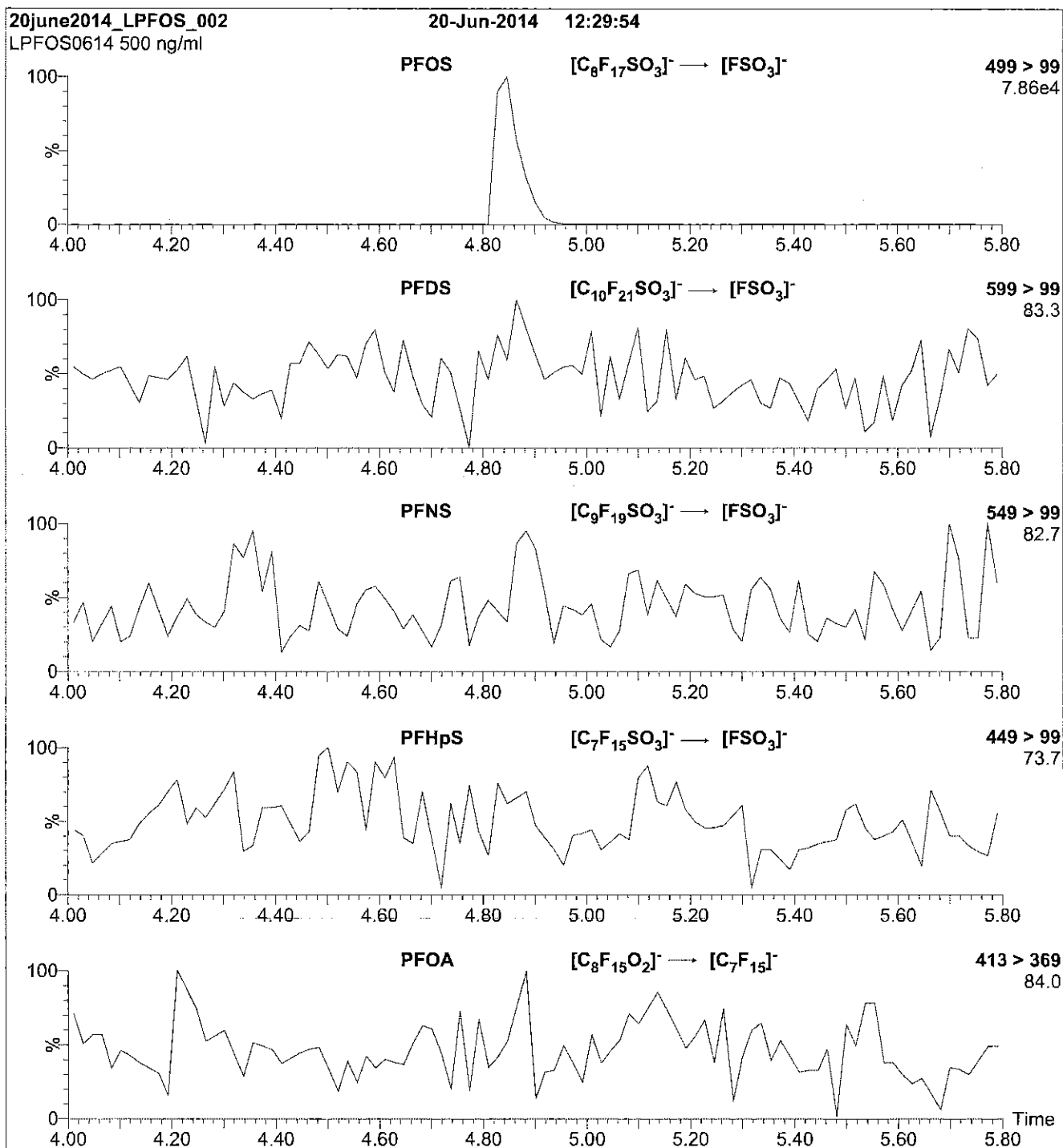
Flow: 300 μ l/min

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_00005

ri 2/11/15 BV

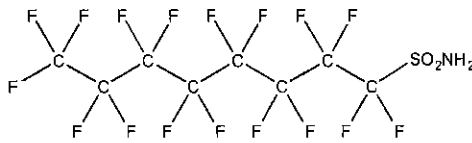


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FOSA-I **LOT NUMBER:** FOSA0714I
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) 07/31/2014
EXPIRY DATE: (mm/dd/yyyy) Stability studies ongoing
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim **Date:** 08/05/2014
(mm/dd/yyyy)

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

INTENDED USE:

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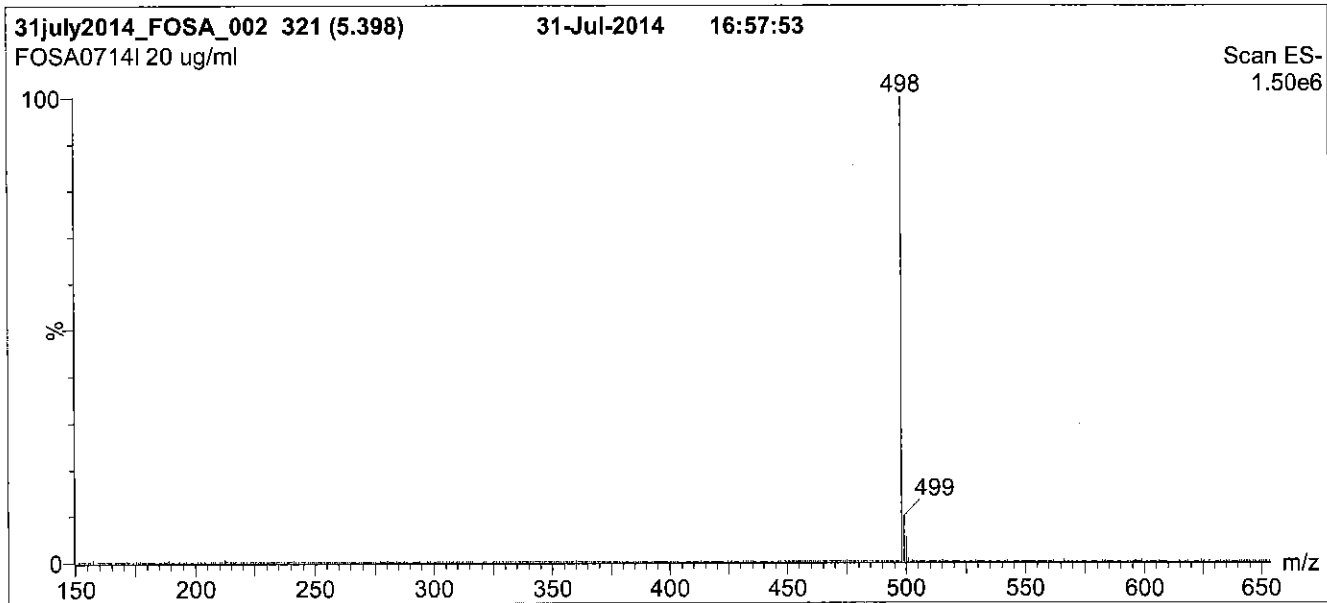
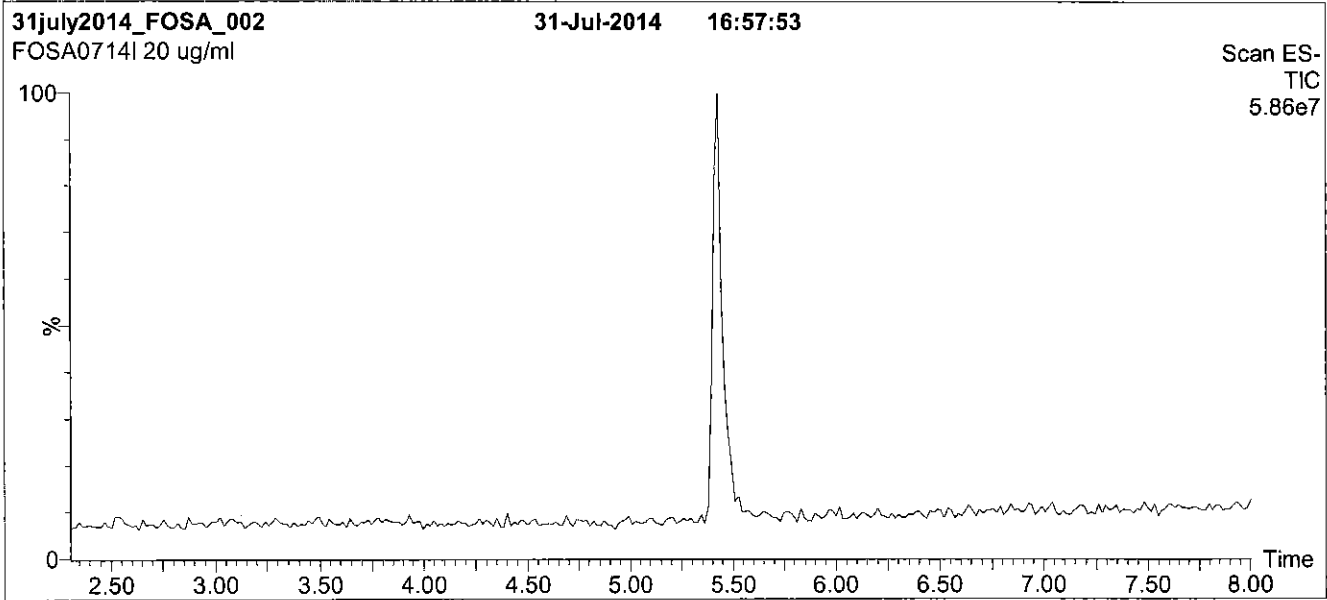
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Figure 1: FOSA-I; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH C₁₈
 1.7 μm, 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

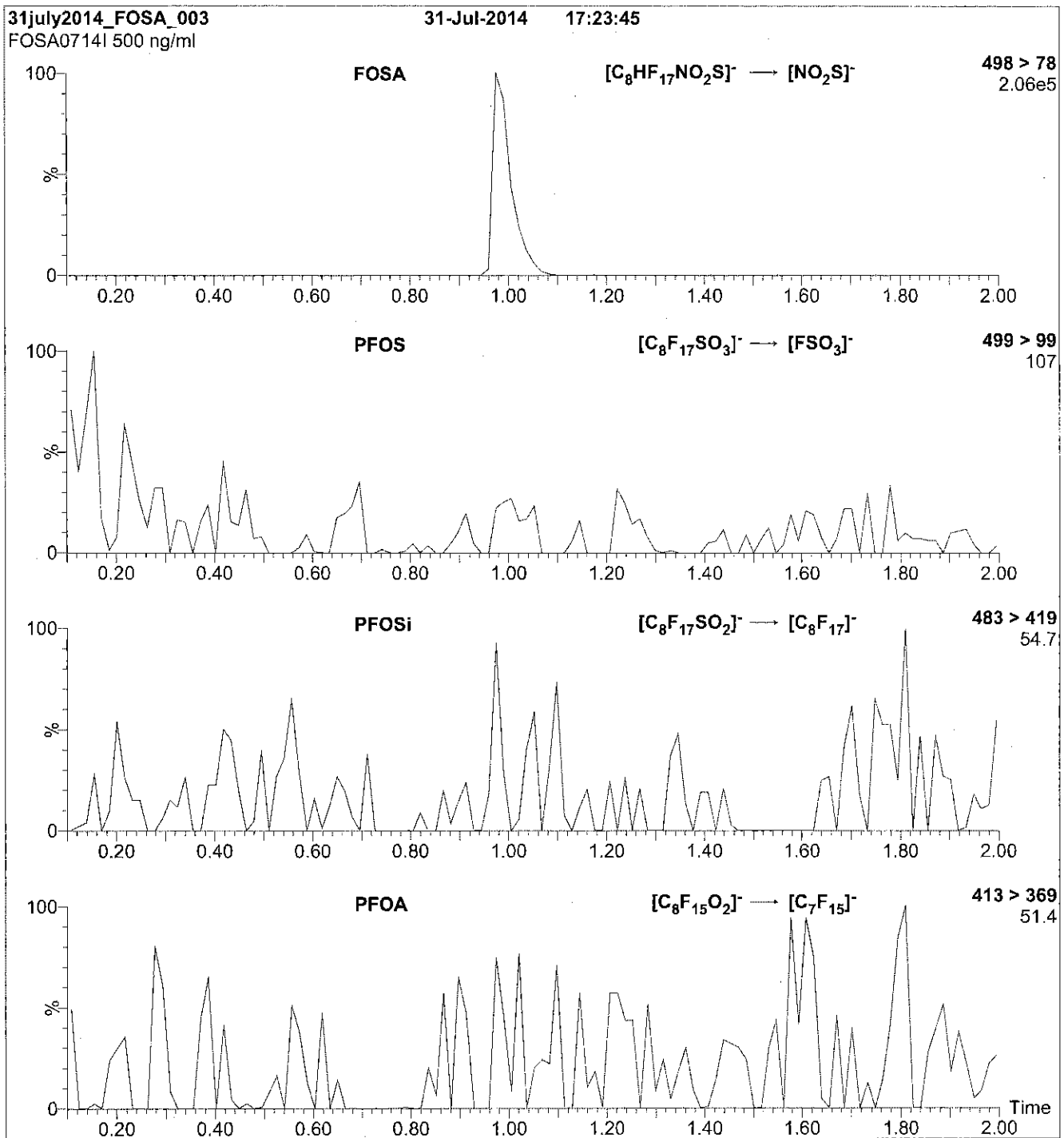
Flow: 300 μl/min

MS Parameters

Experiment: Full Scan (150 - 950 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 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) = 3.58e-3
Collision Energy (eV) = 30

Reagent

LCFPeA_00003

Rec 7/15/14



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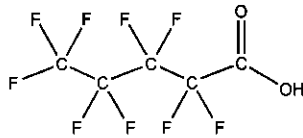
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFPeA
COMPOUND: Perfluoro-n-pentanoic acid

LOT NUMBER: PFPeA0113

STRUCTURE:

CAS #: 2706-90-3



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

MOLECULAR WEIGHT: 264.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/03/2013
EXPIRY DATE: (mm/dd/yyyy) 01/03/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

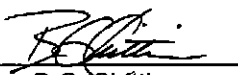
DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of C₅H₂F₈O₂ (hydrido - derivative) as measured by ¹⁹F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim
Date: 01/14/2013
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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.

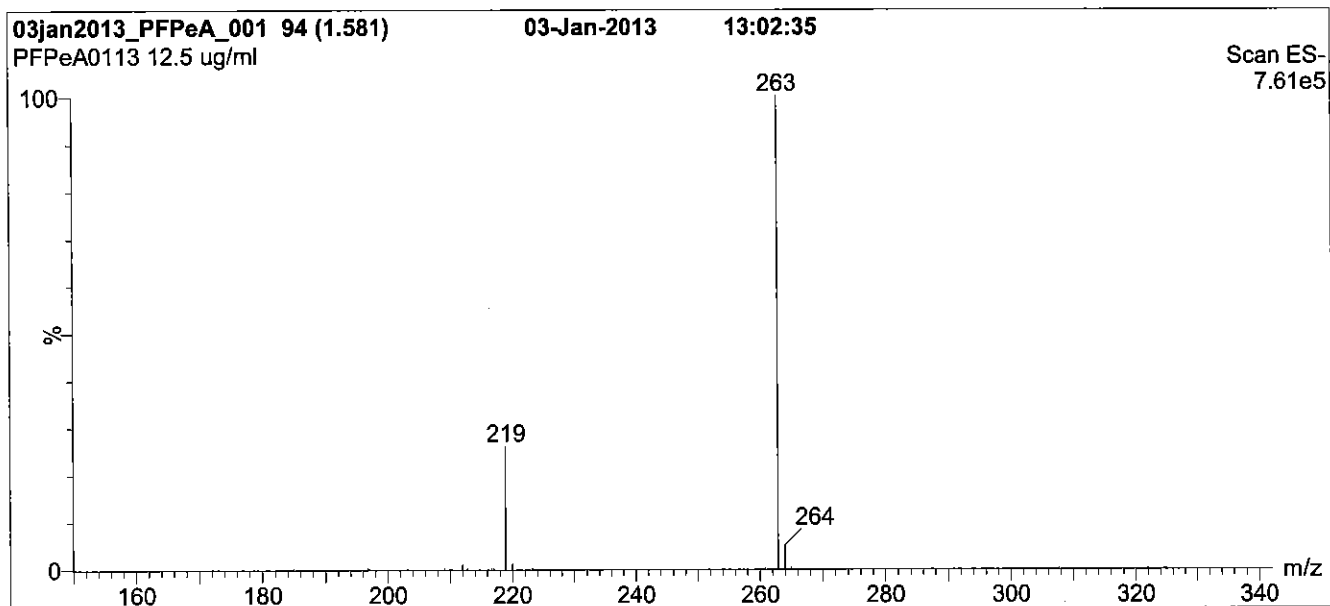
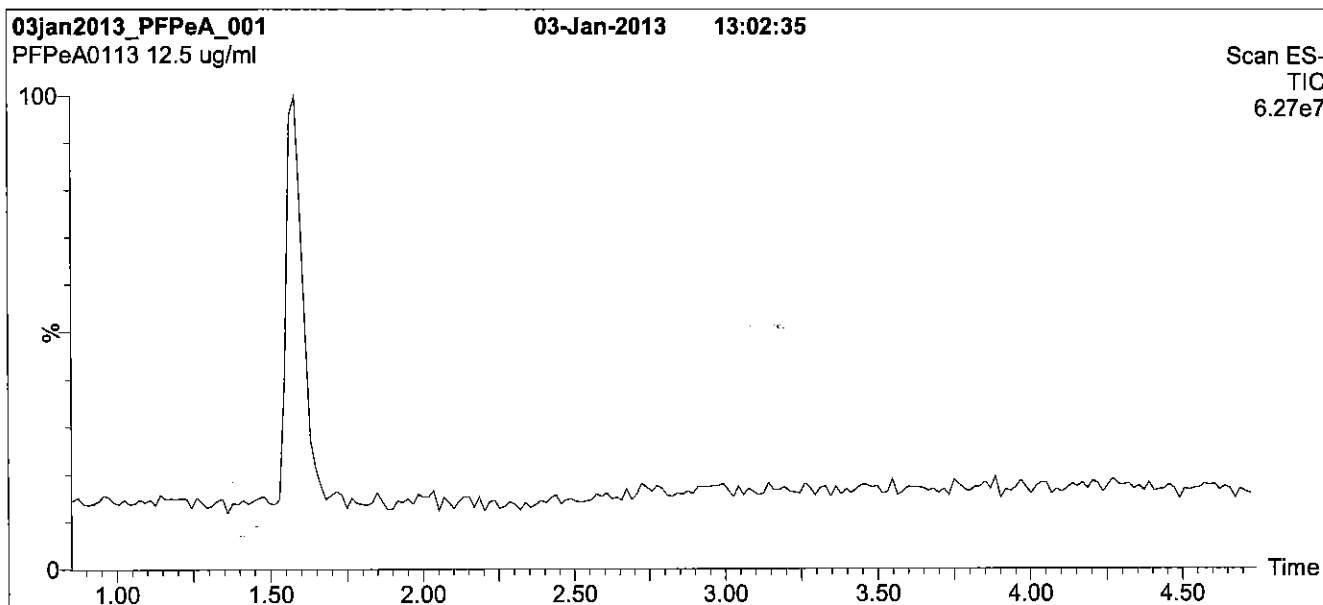
QUALITY MANAGEMENT:

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: 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: 40% (80:20 MeOH:ACN) / 60% 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

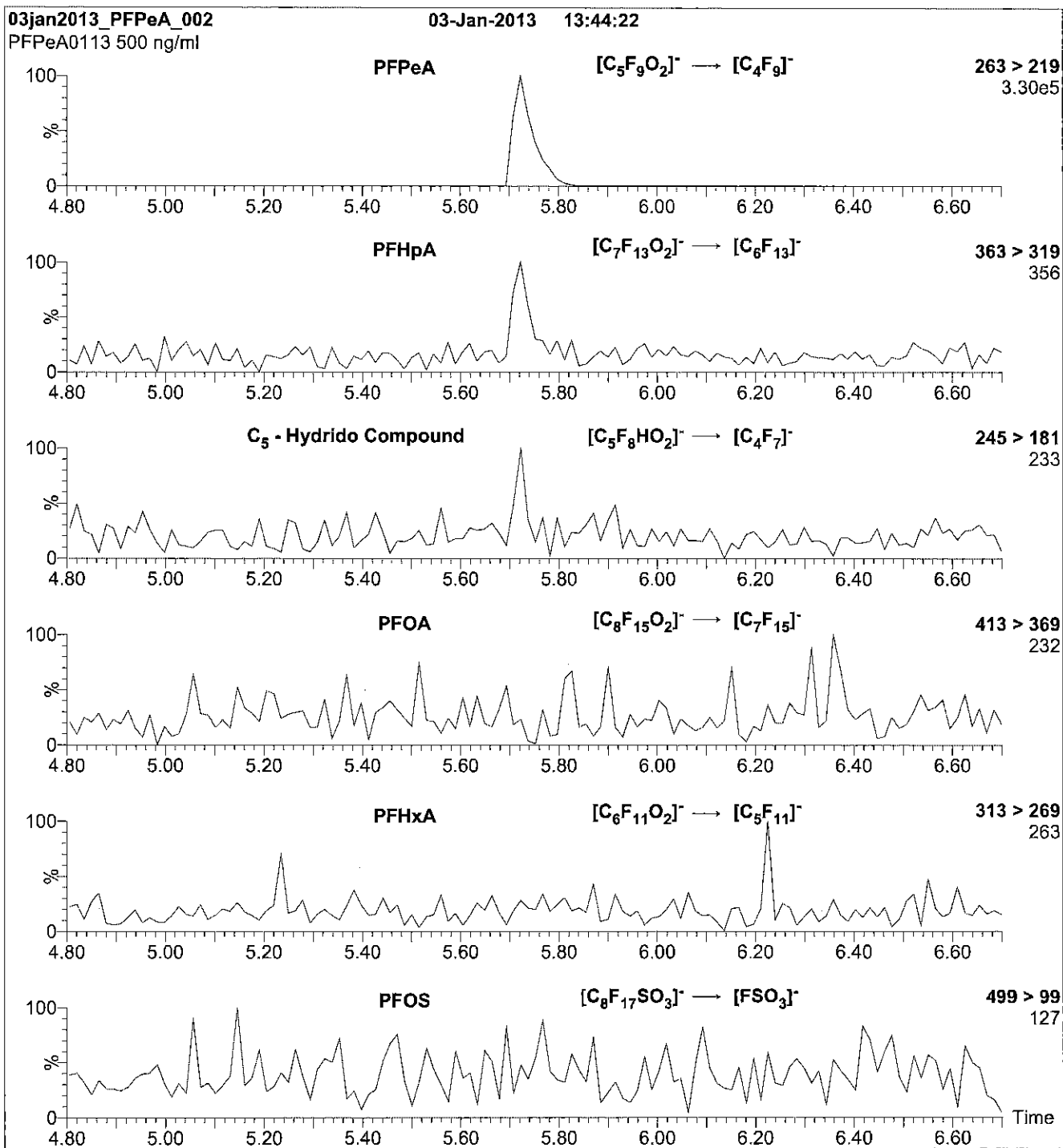
Flow: 300 μ l/min

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



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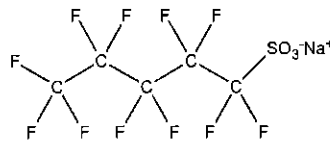
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

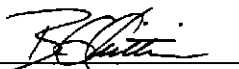
DOCUMENTATION/ DATA ATTACHED:

- 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

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

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.

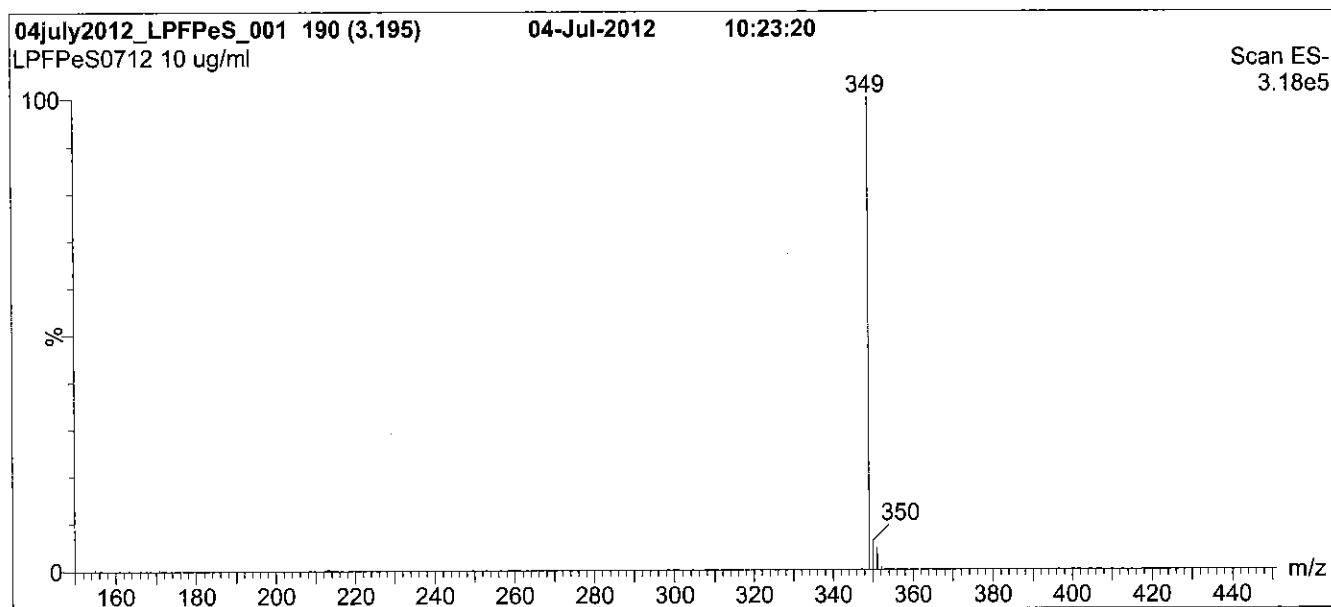
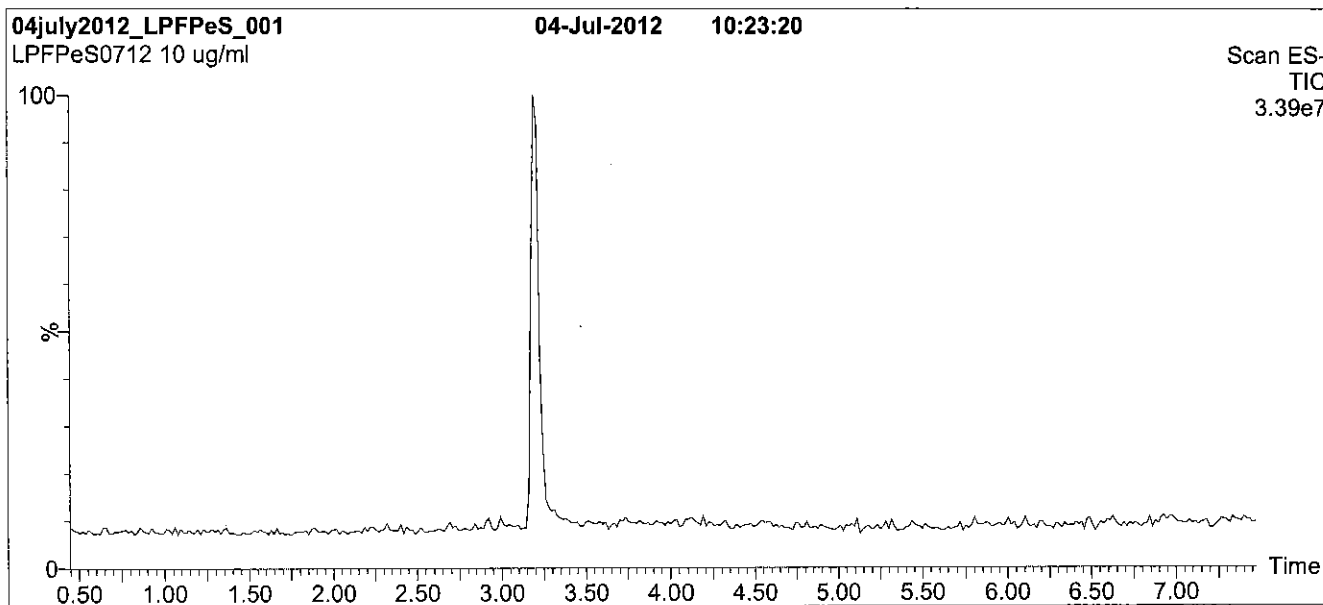
QUALITY MANAGEMENT:

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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

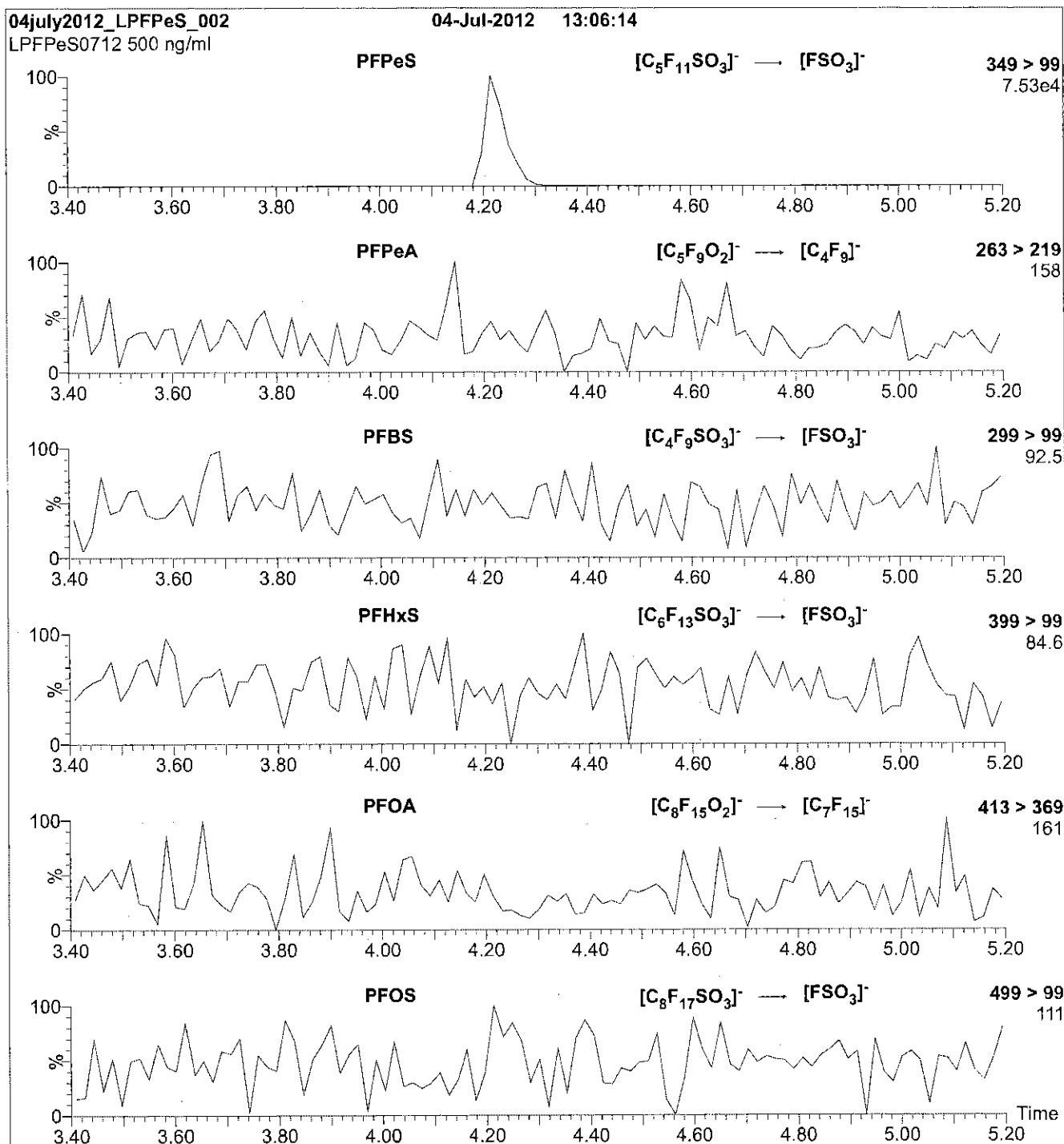
Flow: 300 μ l/min

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

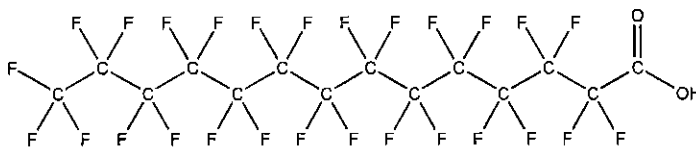


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CERTIFICATE OF ANALYSIS DOCUMENTATION

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:

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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:

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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:

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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:

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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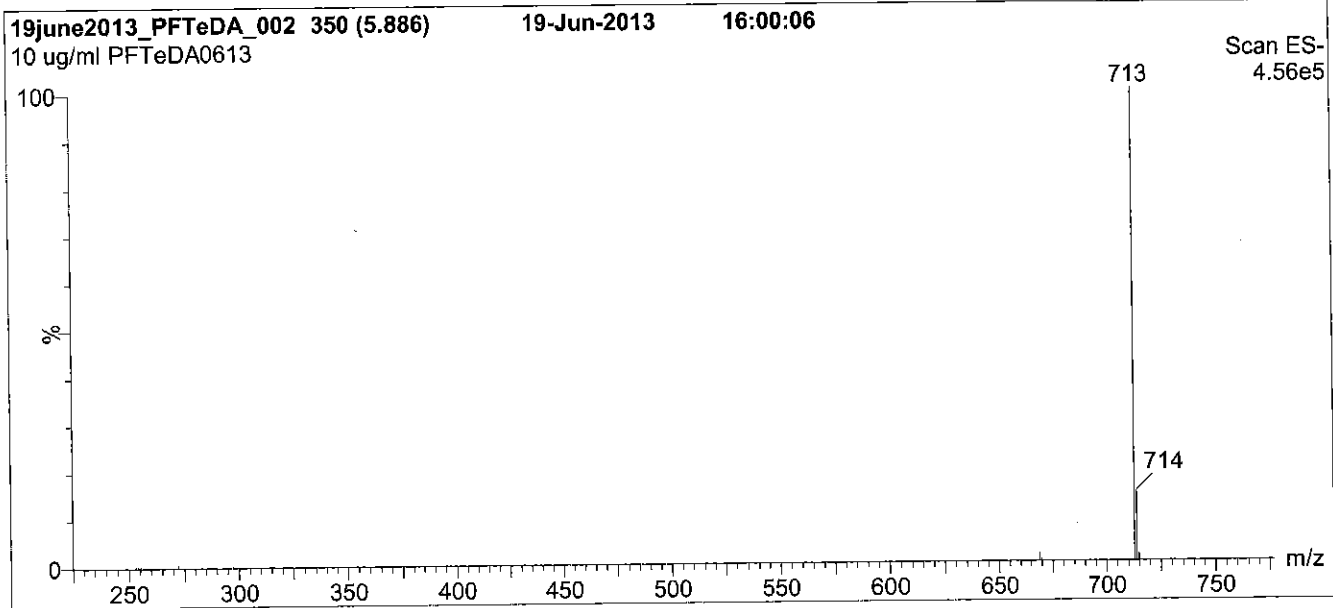
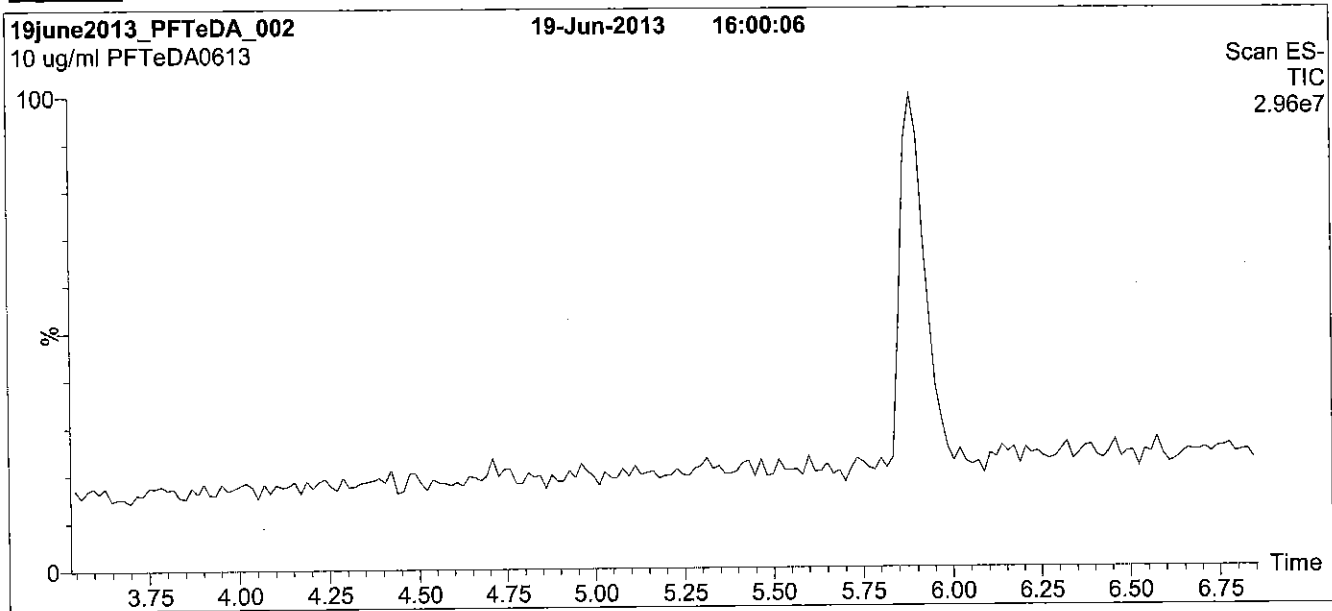
QUALITY MANAGEMENT:

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Figure 1: 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

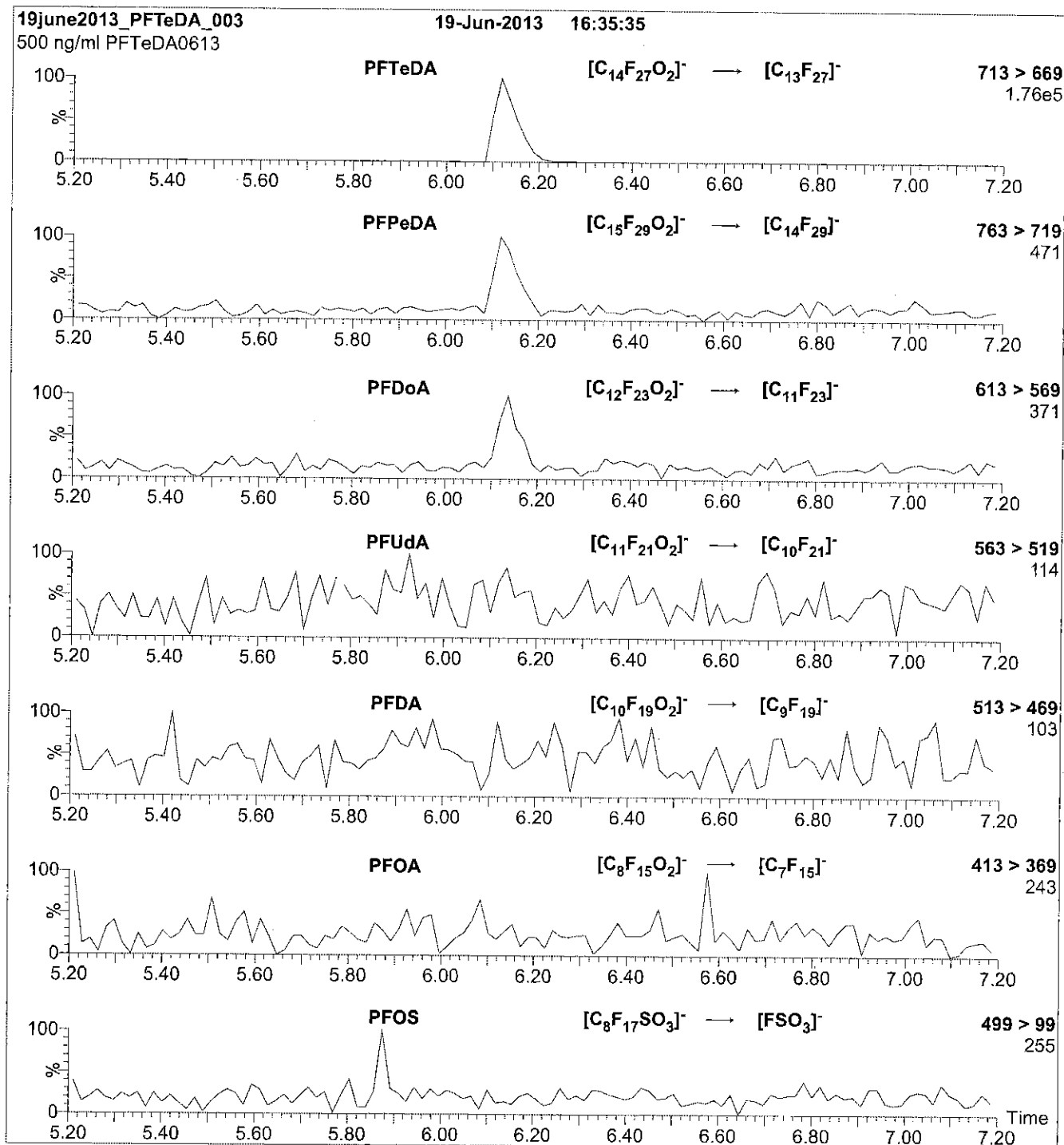
Flow: 300 μ l/min

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)

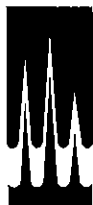
Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 14

Reagent

LCPFT_rDA_00003

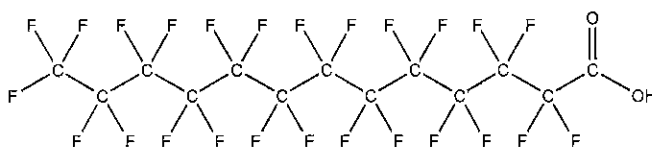


WELLINGTON LABORATORIES

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)

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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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:

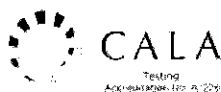
Ongoing stability studies of this product have demonstrated stability in its composition and concentration for the period of time specified by the expiry date in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

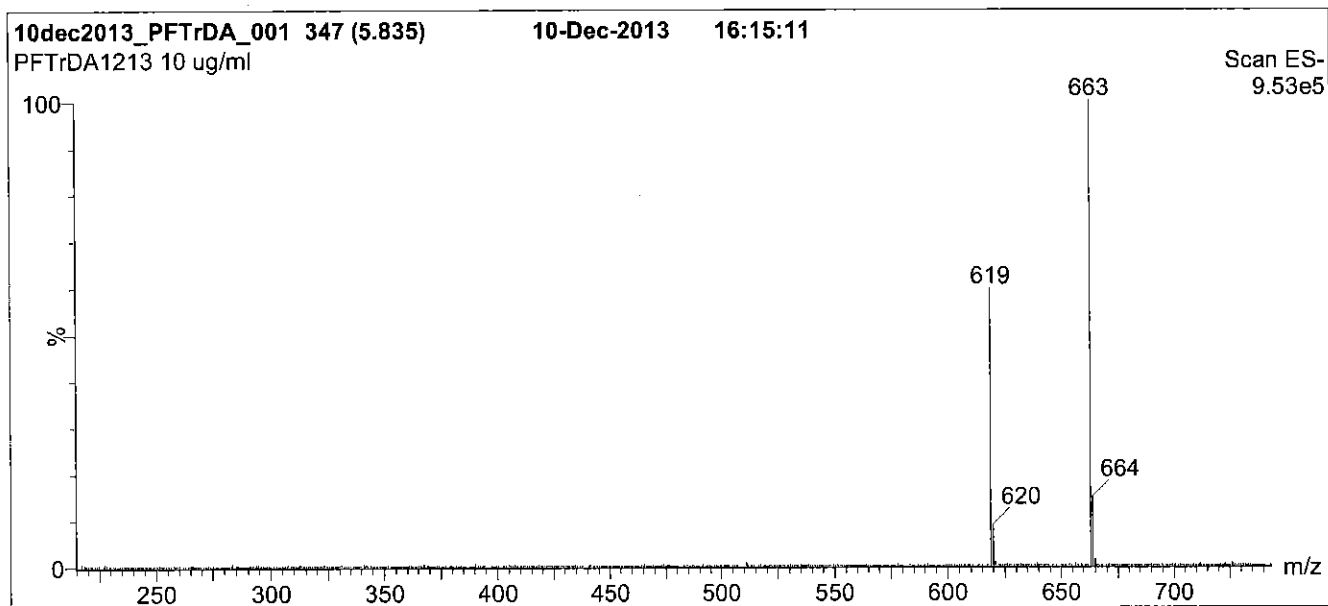
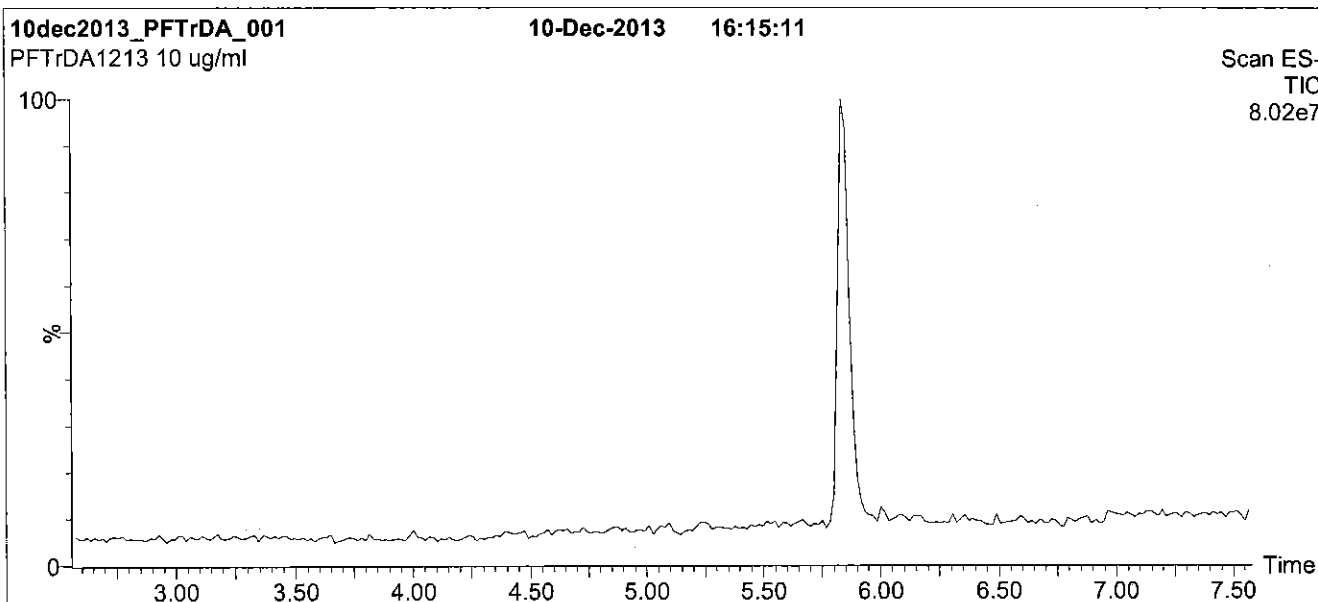
QUALITY MANAGEMENT:

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: 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

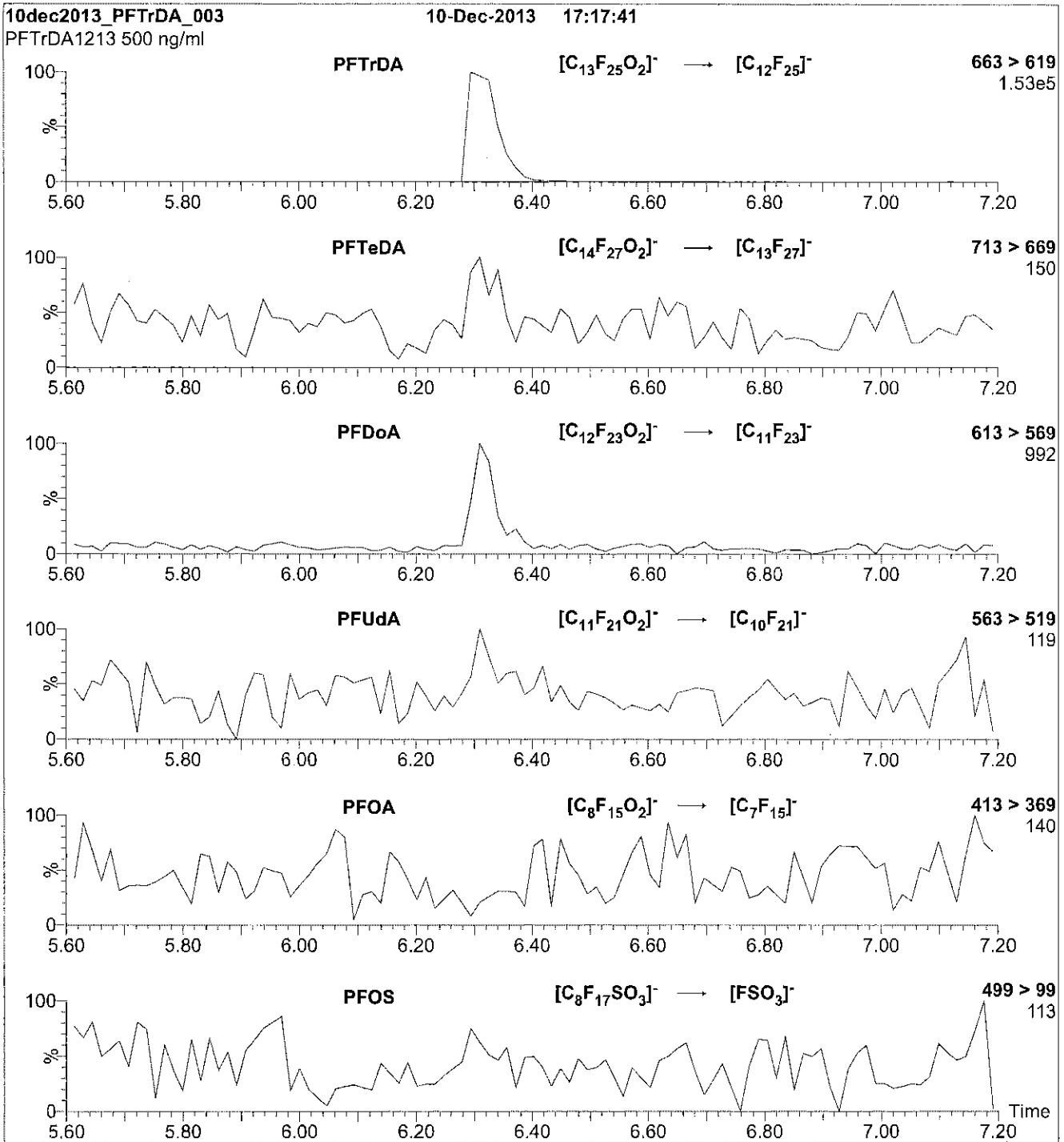
Flow: 300 μ l/min

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

LCPFUdA_00003

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:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

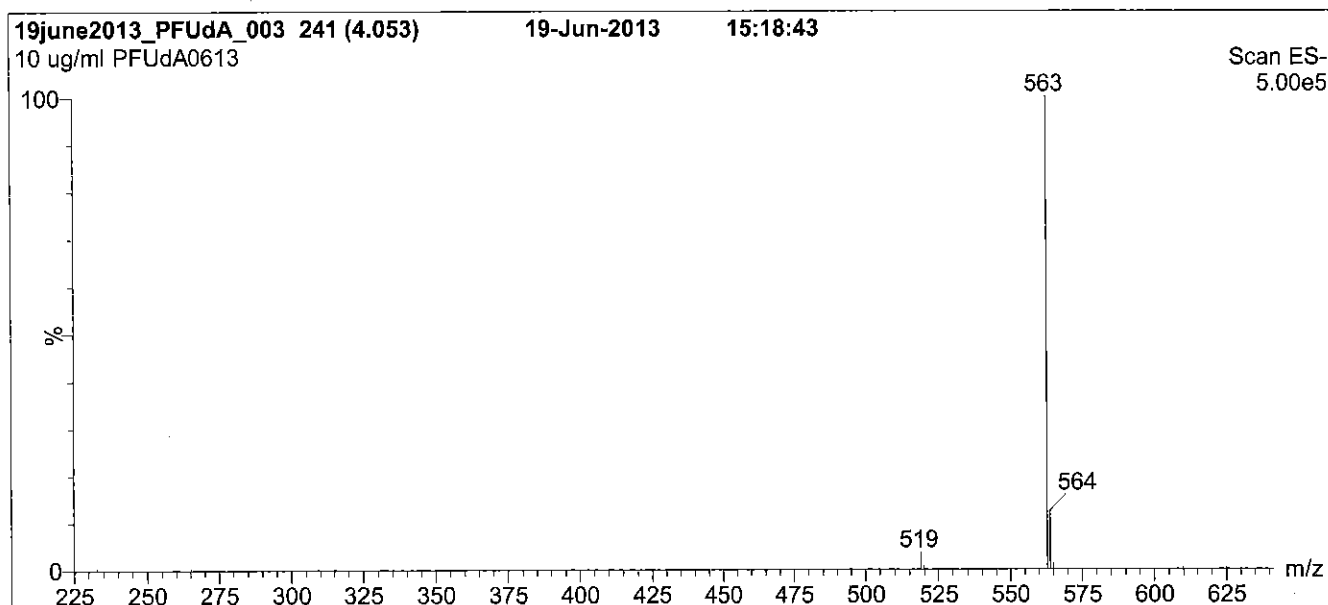
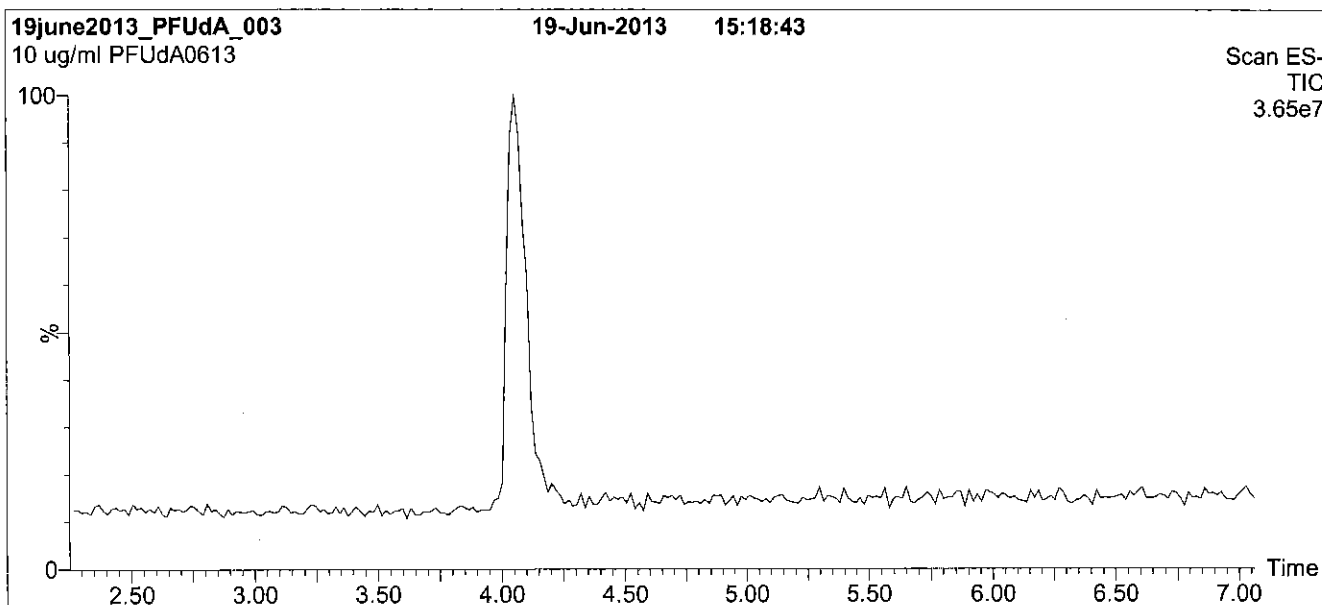
QUALITY MANAGEMENT:

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

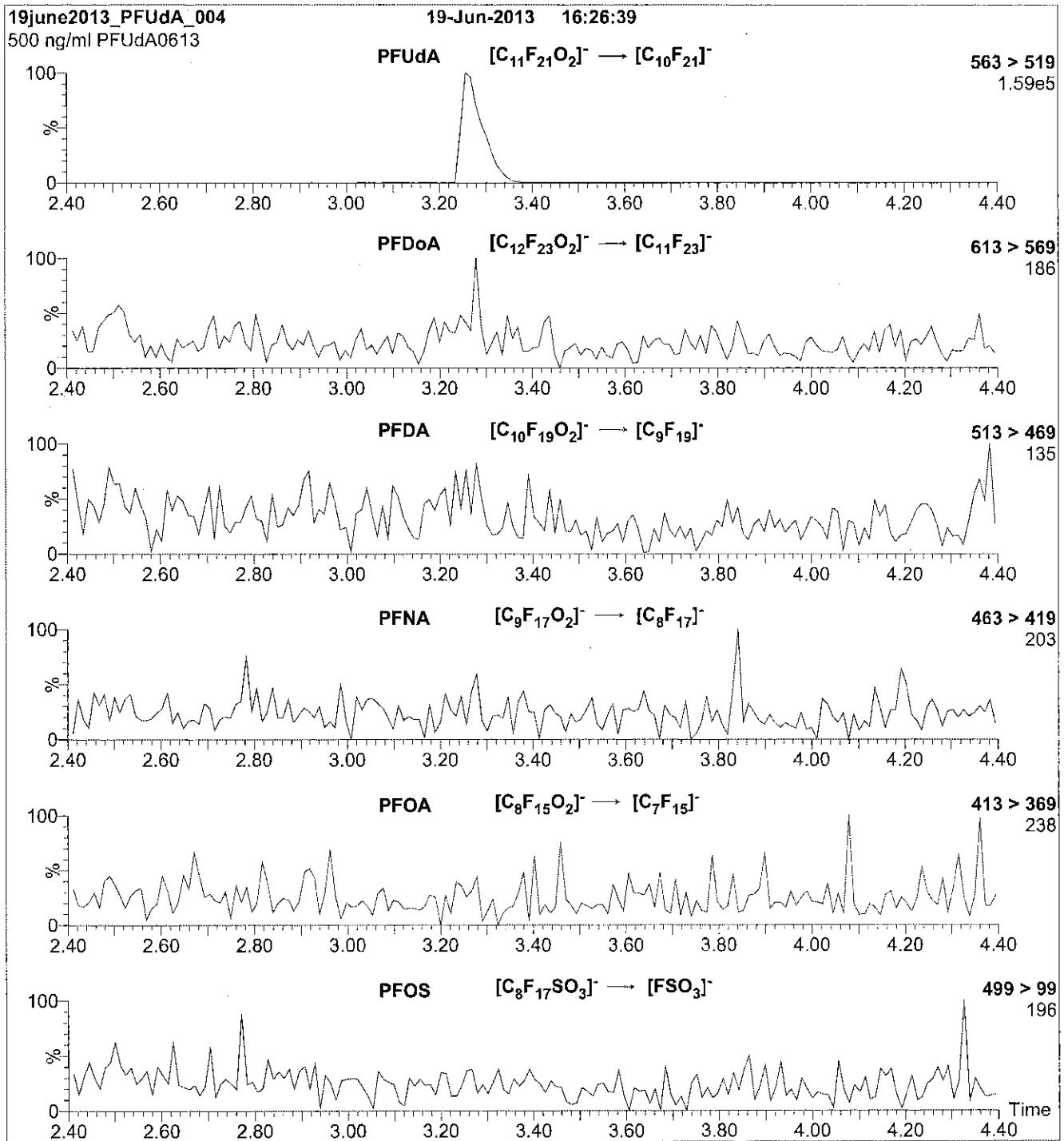
Flow: 300 μ l/min

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

Method PFC DOD

Perfluronated Hydrocarbons (LC/MS)
by Method PFC_DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1

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 #
46MW01_1215	320-16660-1	67	69	109	61	108	61
46MW02_1215	320-16660-2	69	71	103	70	82	52
46MW03_1215	320-16660-3	71	77	121	63	117	57
46MW03_1215X	320-16660-4	75	76	120	66	117	56
46MW04_1215	320-16660-5	82	76	95	85	57	51
46MW05_1215	320-16660-6	66	58	83	66	82	58
EB123015	320-16660-7	95	105	118	99	128	103
	MB 320-97259/1-A	91	97	119	96	127	93
	LCS 320-97259/2-A	93	102	123	95	128	97
46MW04_1215 MS	320-16660-5 MS	73	74	98	79	58	51
46MW04_1215 MSD	320-16660-5 MSD	57	54	74	57	47	35

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

QC LIMITS

25-150
25-150
25-150
25-150
25-150
25-150

Column to be used to flag recovery values

FORM II WS-LC-0025

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1

SDG No.: _____

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFHxS #	PFOS #
46MW04_1215 DL	320-16660-5 DL	112	117
46MW05_1215 DL	320-16660-6 DL	124	122
46MW04_1215 MS DL	320-16660-5 MS DL	118	130
46MW04_1215 MSD DL	320-16660-5 MSD DL	117	123

PFHxS = 1802 PFHxS
PFOS = 13C4 PFOS

QC LIMITS
25-150
25-150

Column to be used to flag recovery values

FORM II WS-LC-0025

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Matrix: Water

Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFOS #
46MW02_1215 DL	320-16660-2 DL	156 Q

PFOS = 13C4 PFOS

QC LIMITS
25-150

Column to be used to flag recovery values

FORM II WS-LC-0025

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 06JAN2016A6A_069.d
 Lab ID: LCS 320-97259/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
13C2 PFHxA	100	92.7	93	25-150	
13C4 PFOA	100	94.7	95	25-150	
13C4 PFOS	95.6	123	128	25-150	
13C4-PFHpA	100	102	102	25-150	
18O2 PFHxS	94.6	116	123	25-150	
Perfluorobutanesulfonic acid (PFBS)	35.4	32.2	91	50-150	
Perfluoroheptanoic acid (PFHpA)	40.0	37.4	94	60-140	
Perfluorohexanesulfonic acid (PFHxS)	37.8	32.3	85	60-140	
Perfluorononanoic acid (PFNA)	40.0	35.7	89	60-140	
Perfluorooctanesulfonic acid (PFOS)	38.2	35.5	93	60-140	
Perfluorooctanoic acid (PFOA)	40.0	32.2	81	60-140	
13C5 PFNA	100	97.0	97	25-150	

Column to be used to flag recovery and RPD values

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-16660-1

SDG No.: _____

Matrix: Water Level: Low

Lab File ID: 06JAN2016A6A_083.d

Lab ID: 320-16660-5 MS

Client ID: 46MW04_1215 MS

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC	QC LIMITS REC	#
13C2 PFHxA	89.2	73	65.4	73	25-150	
13C4 PFOA	89.2	76	70.5	79	25-150	
13C4 PFOS	85.2	49	49.8	58	25-150	
13C4-PFHpA	89.2	68	66.0	74	25-150	
18O2 PFHxS	84.3	80	82.9	98	25-150	
Perfluorobutanesulfonic acid (PFBS)	31.5	33	60.6	86	50-150	
Perfluoroheptanoic acid (PFHpA)	35.7	17	52.3	100	60-140	
Perfluorohexanesulfonic acid (PFHxS)	33.7	880	870	-25	60-140	J M 4
Perfluorononanoic acid (PFNA)	35.7	15	47.9	93	60-140	
Perfluorooctanesulfonic acid (PFOS)	34.1	3300	3390	186	60-140	J M 4
Perfluorooctanoic acid (PFOA)	35.7	33	64.0	86	60-140	
13C5 PFNA	89.2	46	45.4	51	25-150	

Column to be used to flag recovery and RPD values

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 08JAN2016A6A_012.d
 Lab ID: 320-16660-5 MS DL Client ID: 46MW04_1215 MS DL

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC	QC LIMITS REC	#
13C4 PFOS	85.2	100	111	130	25-150	
18O2 PFHxS	84.3	95	99.2	118	25-150	
Perfluorobutanesulfonic acid (PFBS)	31.5	28	43.0	46	50-150	D J
Perfluoroheptanoic acid (PFHpA)	35.7	16 J	46.1	83	60-140	D
Perfluorohexanesulfonic acid (PFHxS)	33.7	830	976	431	60-140	D 4
Perfluorononanoic acid (PFNA)	35.7	13 J	48.6	99	60-140	D
Perfluorooctanesulfonic acid (PFOS)	34.1	2800	2790	35	60-140	D M 4
Perfluorooctanoic acid (PFOA)	35.7	33	60.6	78	60-140	D

Column to be used to flag recovery and RPD values

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 06JAN2016A6A_084.d
 Lab ID: 320-16660-5 MSD Client ID: 46MW04_1215 MSD

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
13C2 PFHxA	89.1	50.4	57			25-150	
13C4 PFOA	89.1	50.8	57			25-150	
13C4 PFOS	85.1	40.1	47			25-150	
13C4-PFHpA	89.1	47.7	54			25-150	
18O2 PFHxS	84.3	62.4	74			25-150	
Perfluorobutanesulfonic acid (PFBS)	31.5	63.3	95	4	30	50-150	
Perfluoroheptanoic acid (PFHpA)	35.6	53.4	103	2	30	60-140	
Perfluorohexanesulfonic acid (PFHxS)	33.7	851	-83	2	30	60-140	J M 4
Perfluorononanoic acid (PFNA)	35.6	51.1	102	6	30	60-140	
Perfluorooctanesulfonic acid (PFOS)	34.1	3240	-262	5	30	60-140	J M 4
Perfluorooctanoic acid (PFOA)	35.6	65.0	89	2	30	60-140	
13C5 PFNA	89.1	30.9	35			25-150	

Column to be used to flag recovery and RPD values

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 08JAN2016A6A_013.d
 Lab ID: 320-16660-5 MSD DL Client ID: 46MW04_1215 MSD DL

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
13C4 PFOS	85.1	105	123			25-150	
18O2 PFHxS	84.3	98.3	117			25-150	
Perfluorobutanesulfonic acid (PFBS)	31.5	42.0	43	2	30	50-150	D J
Perfluoroheptanoic acid (PFHpA)	35.6	61.4	126	28	30	60-140	D
Perfluorohexanesulfonic acid (PFHxS)	33.7	850	58	14	30	60-140	D 4
Perfluorononanoic acid (PFNA)	35.6	39.6	74	20	30	60-140	D
Perfluorooctanesulfonic acid (PFOS)	34.1	2710	-220	3	30	60-140	D M 4
Perfluorooctanoic acid (PFOA)	35.6	72.7	112	18	30	60-140	D

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Lab File ID: 06JAN2016A6A_068.d Lab Sample ID: MB 320-97259/1-A
 Matrix: Water Date Extracted: 01/05/2016 08:39
 Instrument ID: A6 Date Analyzed: 01/07/2016 16:17
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-97259/2-A	06JAN2016A6 A 069.d	01/07/2016 16:38
46MW01_1215	320-16660-1	06JAN2016A6 A 078.d	01/07/2016 19:49
46MW02_1215	320-16660-2	06JAN2016A6 A 079.d	01/07/2016 20:11
46MW03_1215	320-16660-3	06JAN2016A6 A 080.d	01/07/2016 20:32
46MW03_1215X	320-16660-4	06JAN2016A6 A 081.d	01/07/2016 20:53
46MW04_1215	320-16660-5	06JAN2016A6 A 082.d	01/07/2016 21:14
46MW04_1215 MS	320-16660-5 MS	06JAN2016A6 A 083.d	01/07/2016 21:35
46MW04_1215 MSD	320-16660-5 MSD	06JAN2016A6 A 084.d	01/07/2016 21:57
46MW05_1215	320-16660-6	06JAN2016A6 A 085.d	01/07/2016 22:18
EB123015	320-16660-7	06JAN2016A6 A 086.d	01/07/2016 22:39
46MW02_1215 DL	320-16660-2 DL	08JAN2016A6 A 010.d	01/08/2016 14:08
46MW04_1215 DL	320-16660-5 DL	08JAN2016A6 A 011.d	01/08/2016 14:30
46MW04_1215 MS DL	320-16660-5 MS DL	08JAN2016A6 A 012.d	01/08/2016 14:51
46MW04_1215 MSD DL	320-16660-5 MSD DL	08JAN2016A6 A 013.d	01/08/2016 15:12
46MW05_1215 DL	320-16660-6 DL	08JAN2016A6 A 014.d	01/08/2016 15:33

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Client Sample ID: 46MW01_1215 Lab Sample ID: 320-16660-1
 Matrix: Water Lab File ID: 06JAN2016A6A_078.d
 Analysis Method: WS-LC-0025 Date Collected: 12/30/2015 11:15
 Extraction Method: 3535 Date Extracted: 01/05/2016 08:39
 Sample wt/vol: 476.1(mL) Date Analyzed: 01/07/2016 19:49
 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.: 97577 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.1	U	2.6	2.1	0.96
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.1	U	2.6	2.1	0.84
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.5	J	2.6	2.1	0.91
375-95-1	Perfluorononanoic acid (PFNA)	2.1	U	2.6	2.1	0.69
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	50	M	4.2	3.2	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	2.1	U	2.6	2.1	0.79

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	67		25-150
STL00990	13C4 PFOA	61		25-150
STL00991	13C4 PFOS	108		25-150
STL01892	13C4-PFHpA	69		25-150
STL00994	18O2 PFHxS	109		25-150
STL00995	13C5 PFNA	61		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_078.d
 Lims ID: 320-16660-D-1-A Lab Sample ID: 320-16660-1
 Client ID: 46MW01_1215
 Sample Type: Client
 Inject. Date: 07-Jan-2016 19:49:47 ALS Bottle#: 35 Worklist Smp#: 50
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-16660-D-1-A
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 14:53:40 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 08-Jan-2016 09:01:47

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	8.094	8.100	-0.006	1098872	33.6		67.2	2821	
D 8 13C4-PFHpA	367.0 > 322.0	9.323	9.331	-0.008	1188113	34.6		69.3	3684	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.346	9.363	-0.017	6434	0.7015				
D 11 18O2 PFHxS	403.0 > 84.0	9.352	9.363	-0.011	746766	51.4		109	2280	
D 12 13C4 PFOA	417.0 > 372.0	10.434	10.452	-0.018	1187028	30.7		61.4	4824	
13 Perfluorooctanoic acid	413.0 > 369.0	10.434	10.453	-0.019	5595	0.2198			4.7	
	413.0 > 169.0	10.420	10.453	-0.033	1931		2.90(0.00-0.00)		2.9	
D 16 13C4 PFOS	503.0 > 80.0	11.386	11.405	-0.019	966853	51.7		108	3145	
15 Perfluorooctane sulfonic acid	499.0 > 80.0	11.386	11.408	-0.022	468280	23.9			341	M
	499.0 > 99.0	11.386	11.408	-0.022	219726		2.13(0.00-0.00)		291	M
D 17 13C5 PFNA	468.0 > 423.0	11.409	11.427	-0.018	976798	30.4		60.9	2567	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_078.d

Injection Date: 07-Jan-2016 19:49:47

Instrument ID: A6

Lims ID: 320-16660-D-1-A

Lab Sample ID: 320-16660-1

Client ID: 46MW01_1215

Operator ID: JRB

ALS Bottle#: 35

Worklist Smp#: 50

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

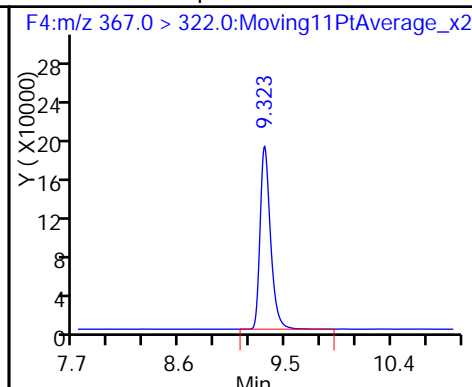
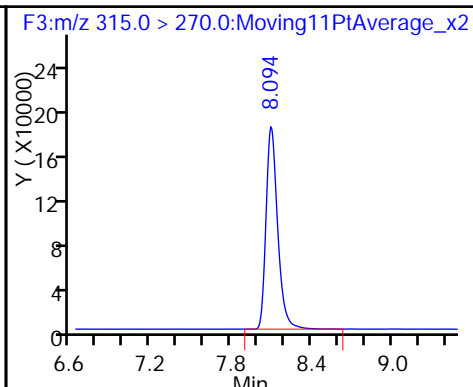
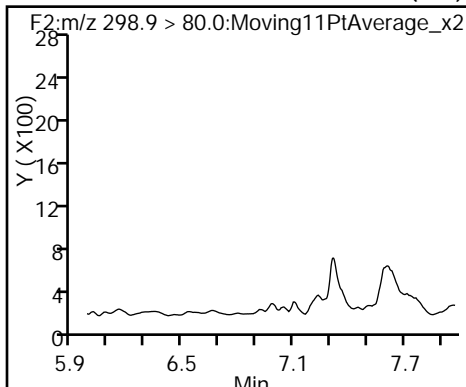
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid (ND)

D 6 13C2 PFHxA

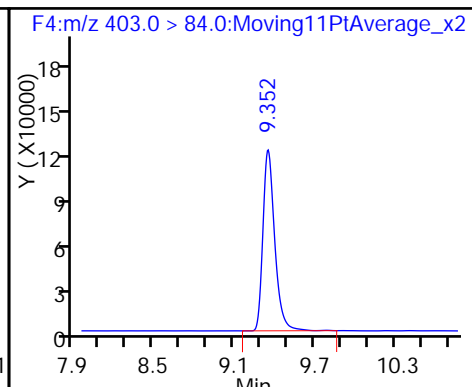
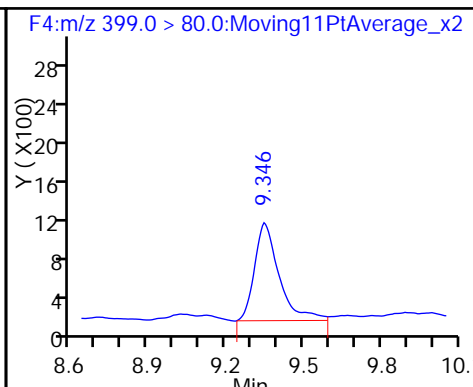
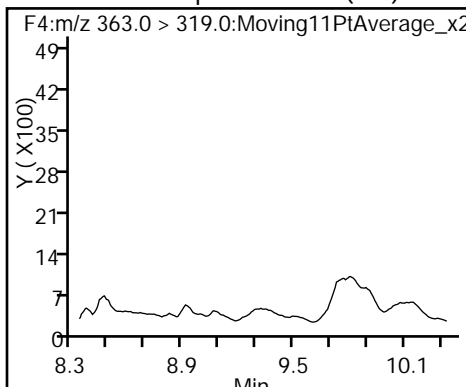
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid (ND)

41 Perfluorohexanesulfonic acid

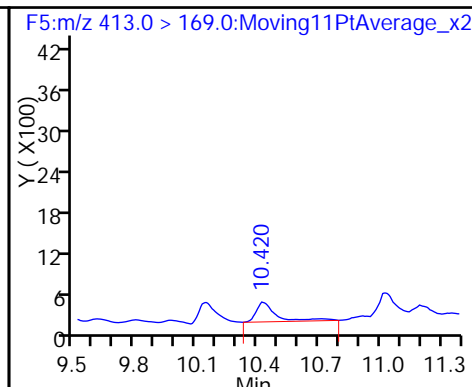
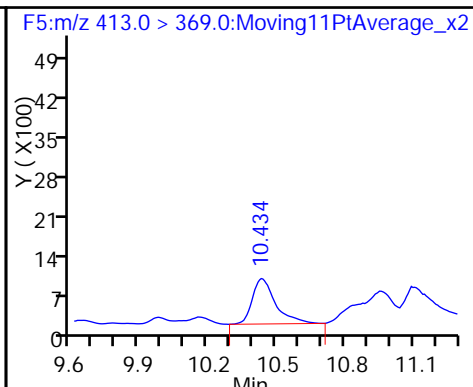
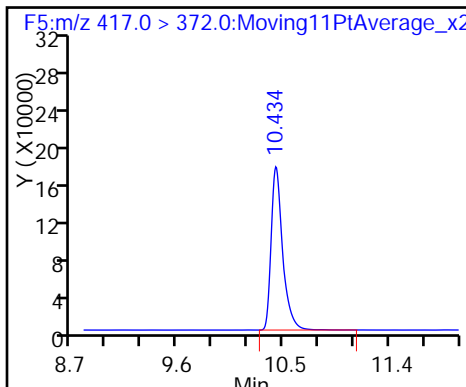
D 11 18O2 PFHxS



D 12 13C4 PFOA

13 Perfluorooctanoic acid

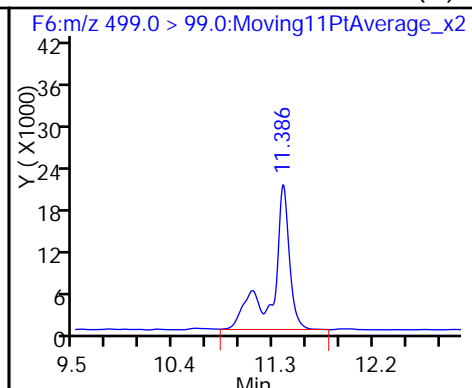
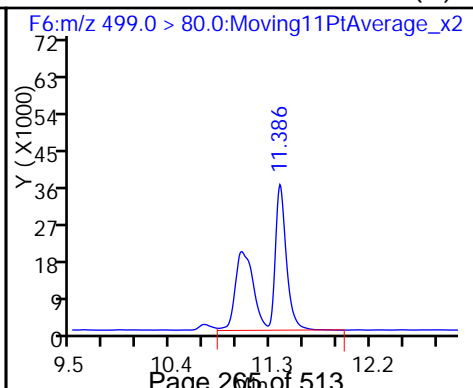
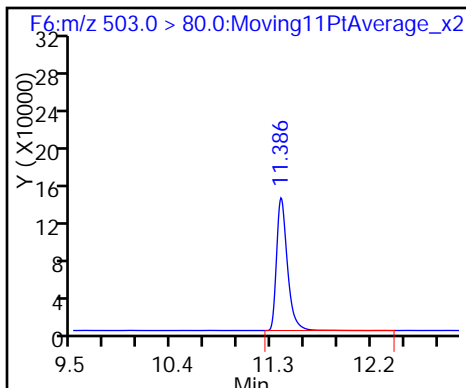
13 Perfluorooctanoic acid



D 16 13C4 PFOS

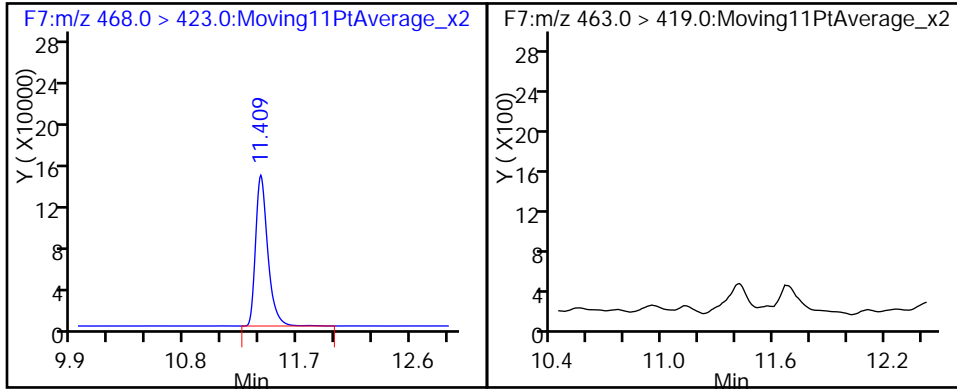
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid (ND)



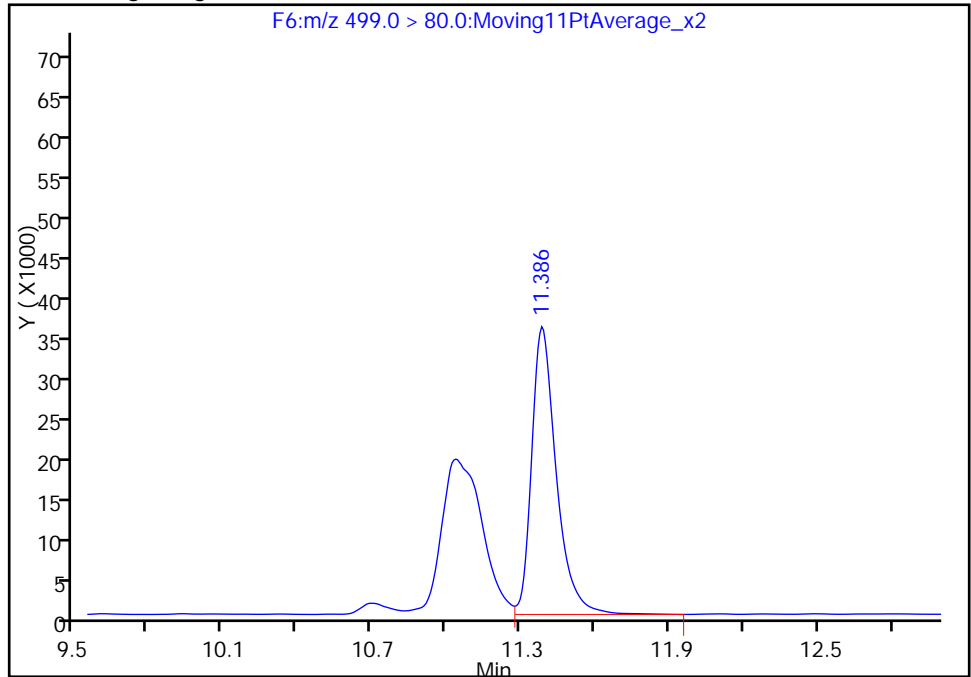
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_078.d
Injection Date: 07-Jan-2016 19:49:47 Instrument ID: A6
Lims ID: 320-16660-D-1-A Lab Sample ID: 320-16660-1
Client ID: 46MW01_1215
Operator ID: JRB ALS Bottle#: 35 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

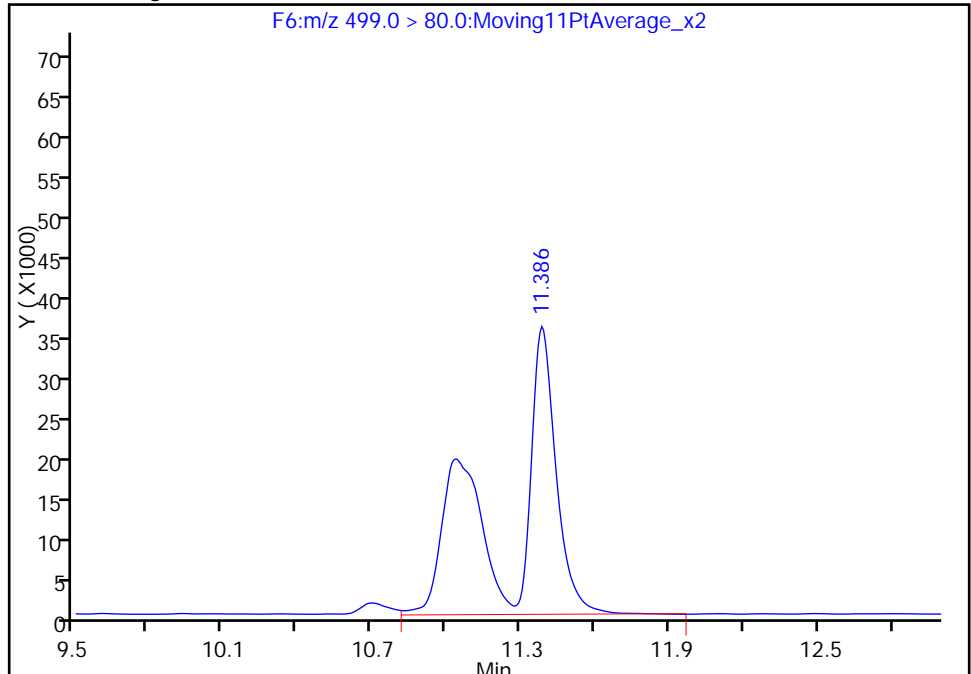
RT: 11.39
Area: 247563
Amount: 12.627136
Amount Units: ng/ml

Processing Integration Results



RT: 11.39
Area: 468280
Amount: 23.884971
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:01:47
Audit Action: Manually Integrated
Audit Reason: Isomers

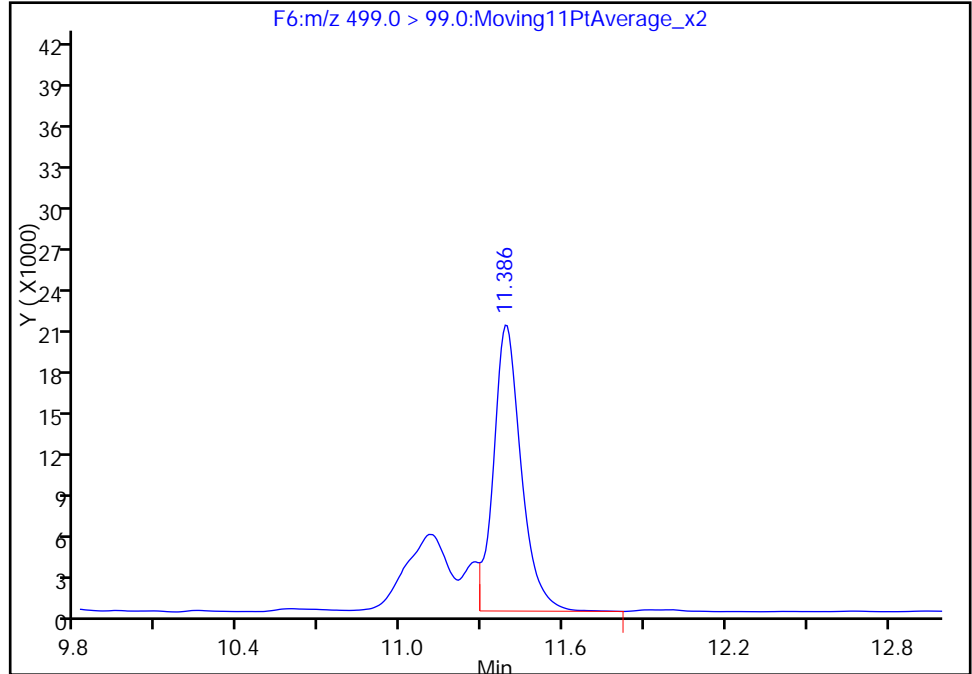
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_078.d
Injection Date: 07-Jan-2016 19:49:47 Instrument ID: A6
Lims ID: 320-16660-D-1-A Lab Sample ID: 320-16660-1
Client ID: 46MW01_1215
Operator ID: JRB ALS Bottle#: 35 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:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

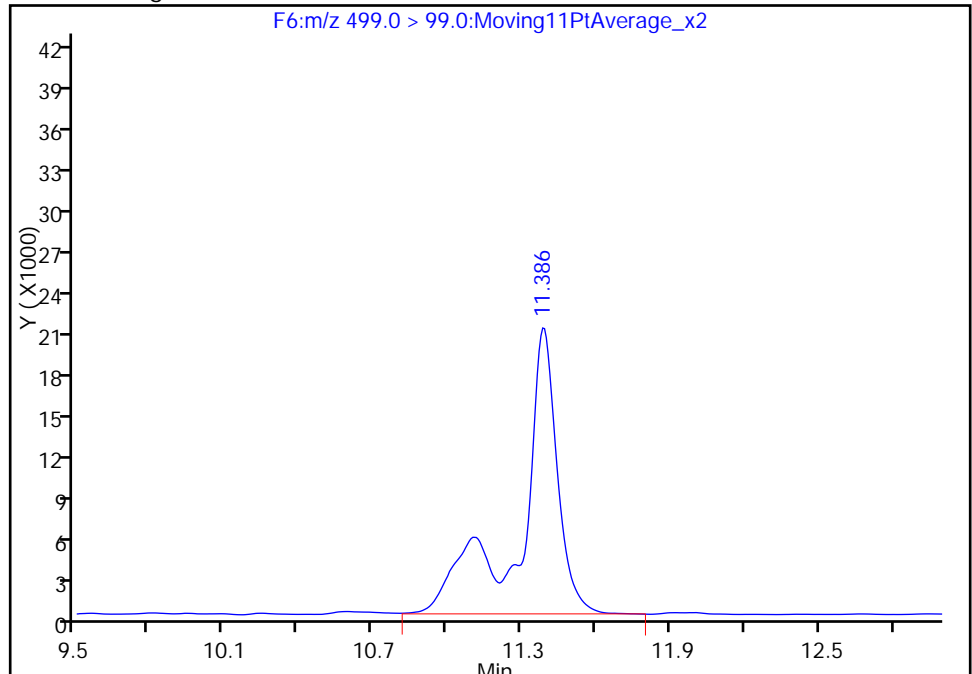
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Amount: 12.627136
Amount Units: ng/ml

Processing Integration Results



RT: 11.39
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Amount: 23.884971
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:01:47
Audit Action: Manually Integrated
Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Client Sample ID: 46MW02_1215 Lab Sample ID: 320-16660-2
 Matrix: Water Lab File ID: 06JAN2016A6A_079.d
 Analysis Method: WS-LC-0025 Date Collected: 12/30/2015 10:00
 Extraction Method: 3535 Date Extracted: 01/05/2016 08:39
 Sample wt/vol: 484.2 (mL) Date Analyzed: 01/07/2016 20:11
 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.: 97577 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	12		2.6	2.1	0.95
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.3		2.6	2.1	0.83
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	320		2.6	2.1	0.90
375-95-1	Perfluorononanoic acid (PFNA)	4.5		2.6	2.1	0.68
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1600	M J	4.1	3.1	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	29		2.6	2.1	0.77

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	69		25-150
STL00990	13C4 PFOA	70		25-150
STL00991	13C4 PFOS	82		25-150
STL01892	13C4-PFHpA	71		25-150
STL00994	18O2 PFHxS	103		25-150
STL00995	13C5 PFNA	52		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_079.d
 Lims ID: 320-16660-D-2-A Lab Sample ID: 320-16660-2
 Client ID: 46MW02_1215
 Sample Type: Client
 Inject. Date: 07-Jan-2016 20:11:01 ALS Bottle#: 36 Worklist Smp#: 51
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-16660-D-2-A
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 14:53:40 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 08-Jan-2016 09:02:56

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	6.978	6.976	0.002	1.000	89327	5.60				
D 6 13C2 PFHxA										
315.0 > 270.0	8.094	8.100	-0.006		1135295	34.7		69.4	4085	
D 8 13C4-PFHpA										
367.0 > 322.0	9.317	9.331	-0.014		1215891	35.5		70.9	3870	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.317	9.335	-0.018	1.000	103494	4.04			63.9	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.346	9.363	-0.017	1.000	1364774	157.2				
D 11 18O2 PFHxS										
403.0 > 84.0	9.346	9.363	-0.017		707105	48.7		103	1978	
D 12 13C4 PFOA										
417.0 > 372.0	10.427	10.452	-0.025		1355694	35.0		70.1	2353	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.427	10.453	-0.026	1.000	413892	14.2			115	
413.0 > 169.0	10.434	10.453	-0.019	1.001	147224		2.81(0.00-0.00)		91.1	
D 16 13C4 PFOS										
503.0 > 80.0	11.379	11.405	-0.026		731400	39.1		81.8	1694	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.379	11.408	-0.029	1.000	11346892	765.1			214	EM
499.0 > 99.0	11.379	11.408	-0.029	1.000	4853808		2.34(0.00-0.00)		1400	M
D 17 13C5 PFNA										
468.0 > 423.0	11.401	11.427	-0.026		835587	26.0		52.1	2274	
18 Perfluorononanoic acid										
463.0 > 419.0	11.401	11.431	-0.030	1.000	31209	2.19			35.8	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_079.d

Injection Date: 07-Jan-2016 20:11:01

Instrument ID: A6

Lims ID: 320-16660-D-2-A

Lab Sample ID: 320-16660-2

Client ID: 46MW02_1215

Operator ID: JRB

ALS Bottle#: 36

Worklist Smp#: 51

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

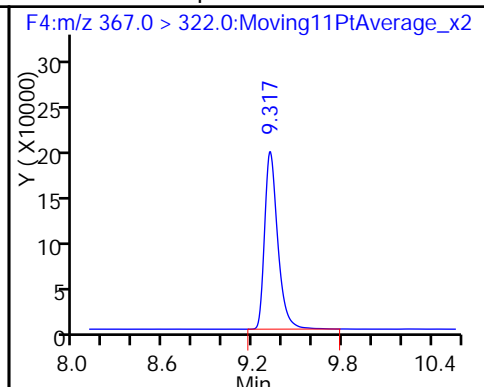
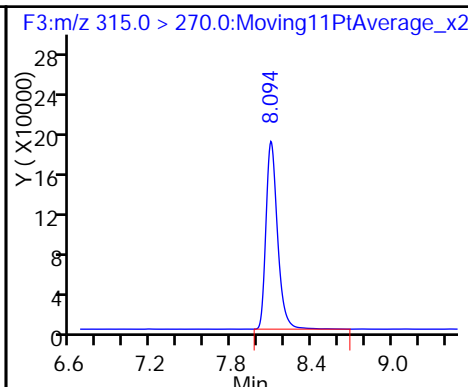
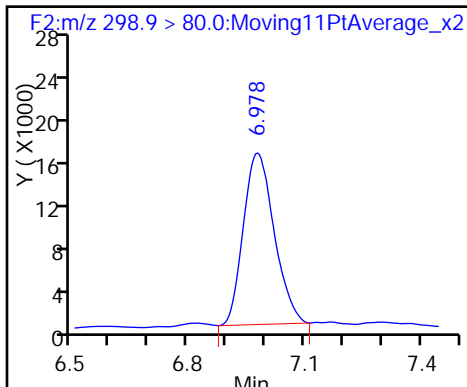
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxA

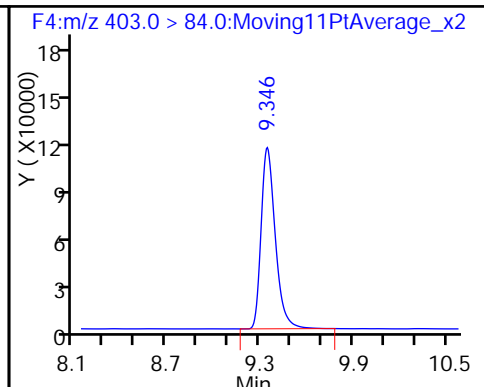
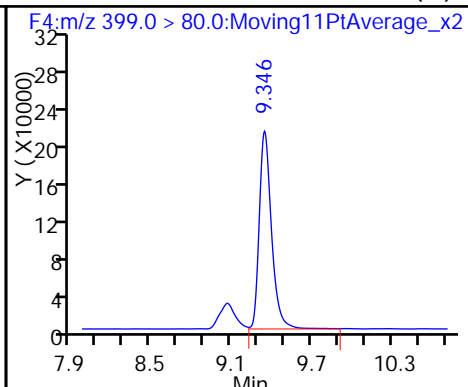
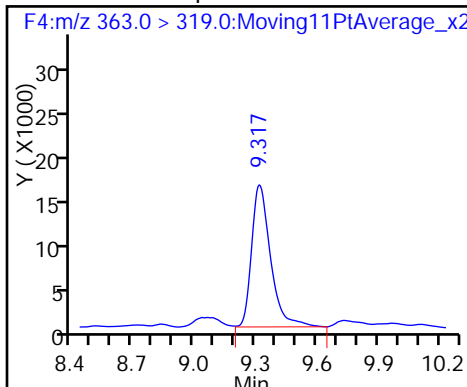
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid

41 Perfluorohexanesulfonic acid (M)

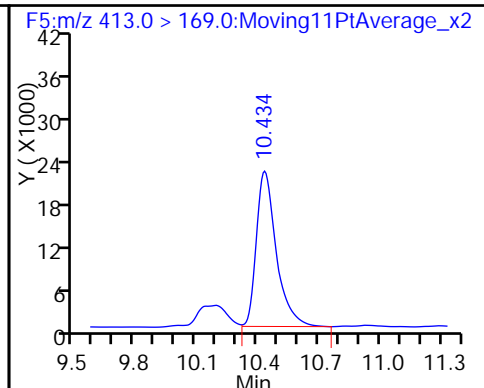
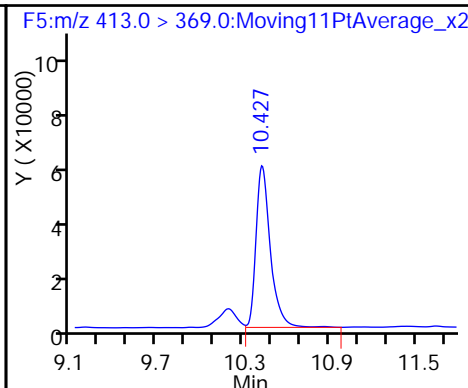
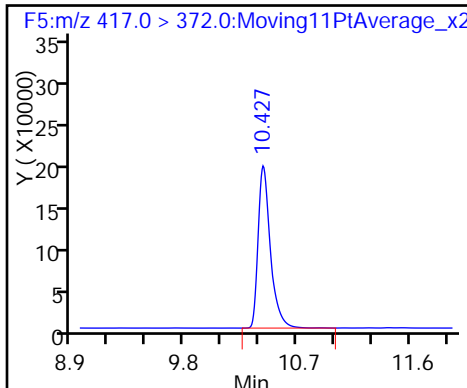
D 11 18O2 PFHxS



D 12 13C4 PFOA

13 Perfluorooctanoic acid

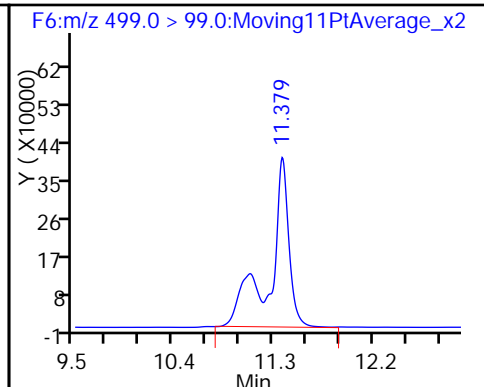
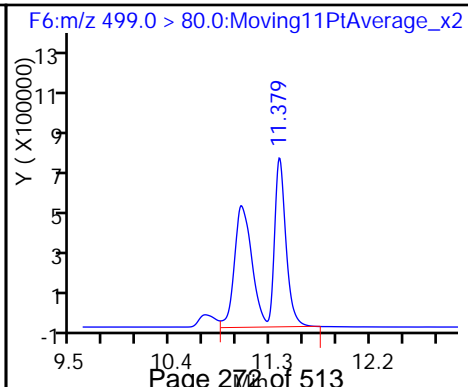
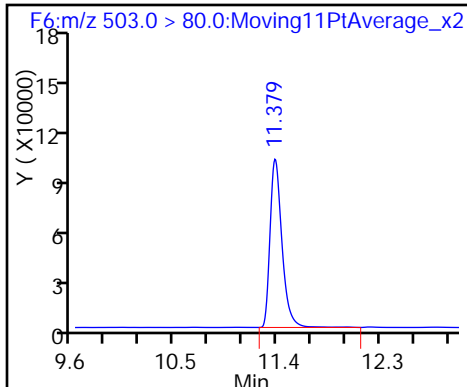
13 Perfluorooctanoic acid



D 16 13C4 PFOS

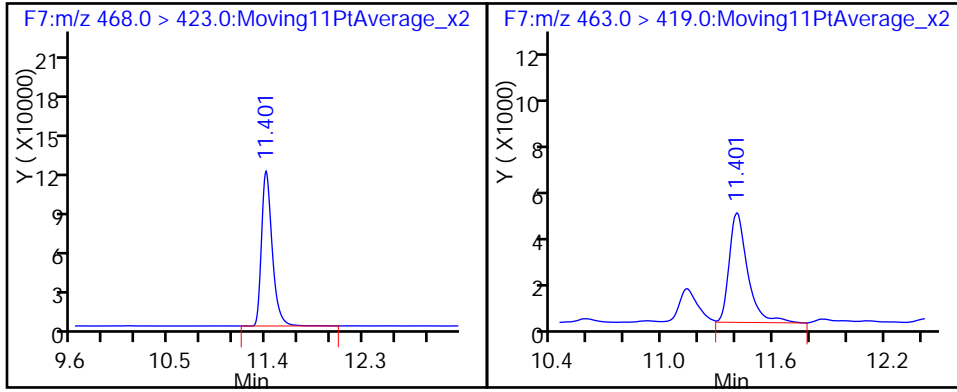
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid



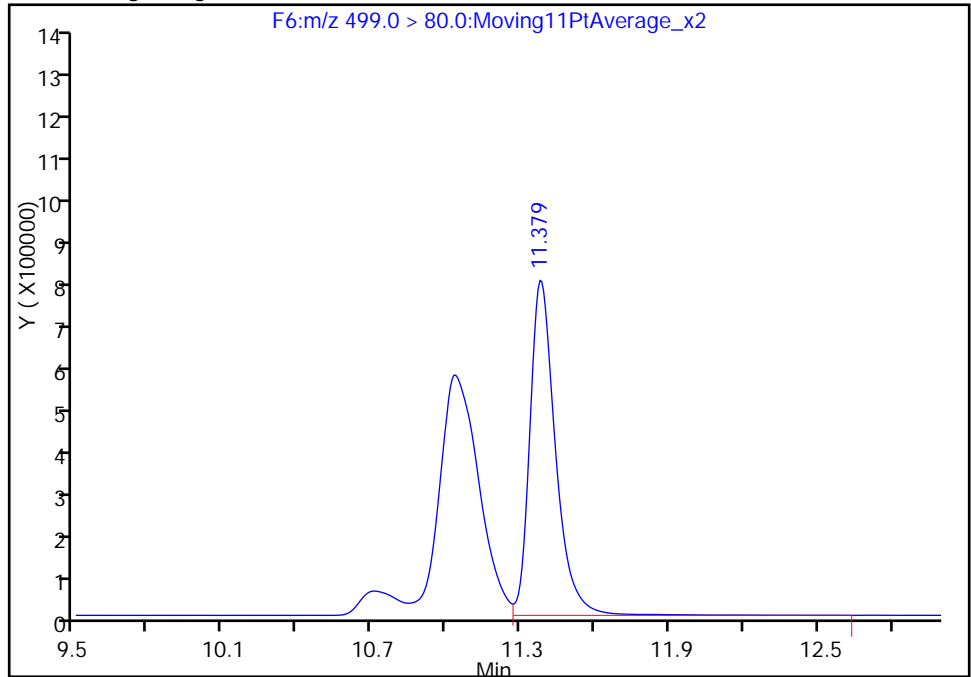
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_079.d
Injection Date: 07-Jan-2016 20:11:01 Instrument ID: A6
Lims ID: 320-16660-D-2-A Lab Sample ID: 320-16660-2
Client ID: 46MW02_1215
Operator ID: JRB ALS Bottle#: 36 Worklist Smp#: 51
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

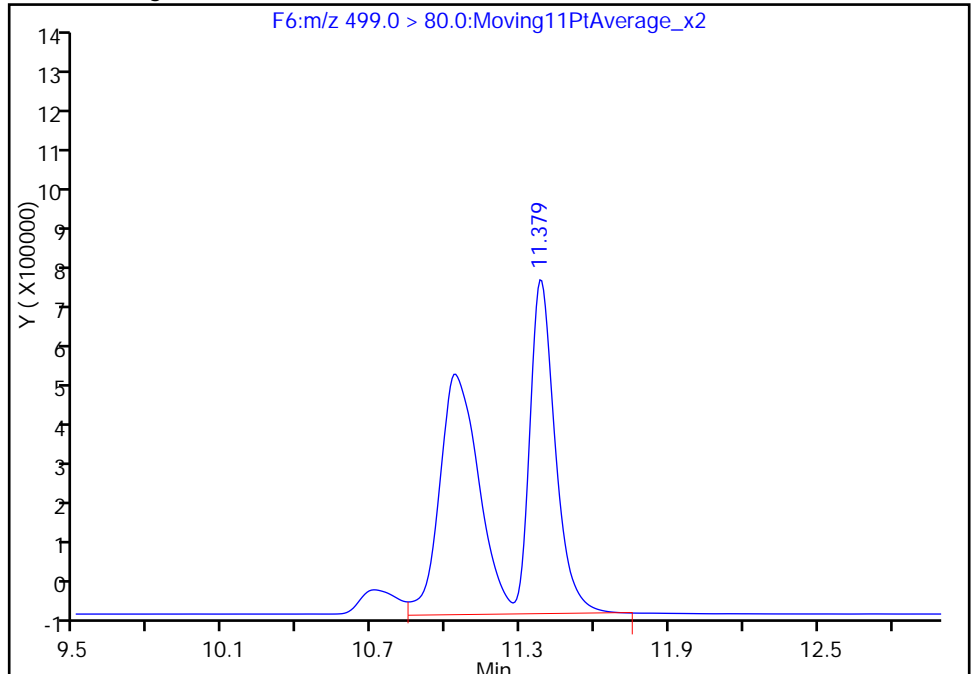
RT: 11.38
Area: 5462407
Amount: 368.3059
Amount Units: ng/ml

Processing Integration Results



RT: 11.38
Area: 11346892
Amount: 765.0706
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:02:56
Audit Action: Manually Integrated
Audit Reason: Isomers

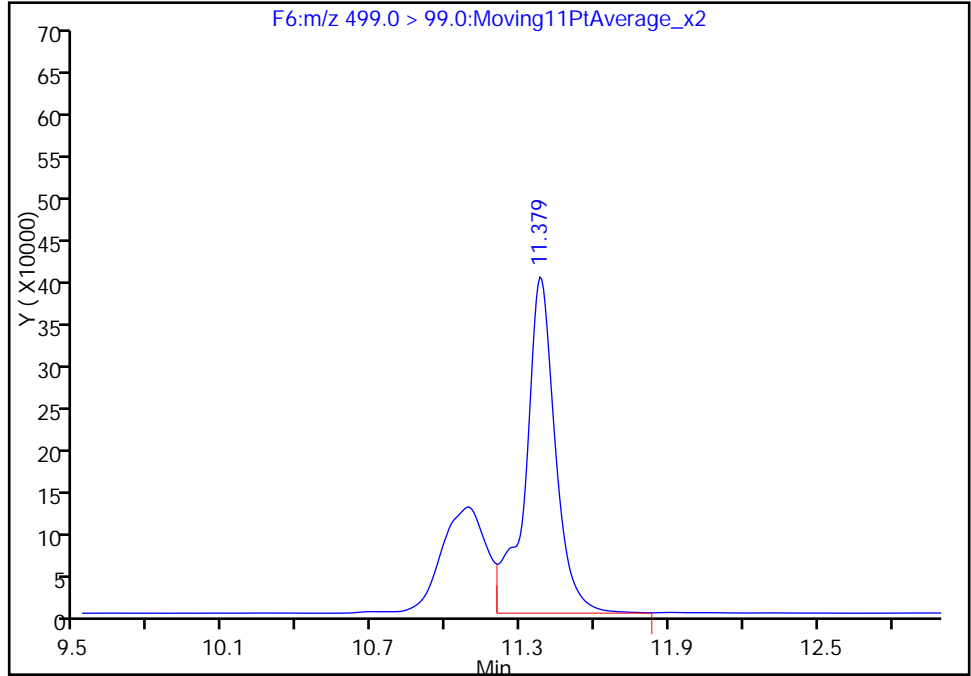
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_079.d
Injection Date: 07-Jan-2016 20:11:01 Instrument ID: A6
Lims ID: 320-16660-D-2-A Lab Sample ID: 320-16660-2
Client ID: 46MW02_1215
Operator ID: JRB ALS Bottle#: 36 Worklist Smp#: 51
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

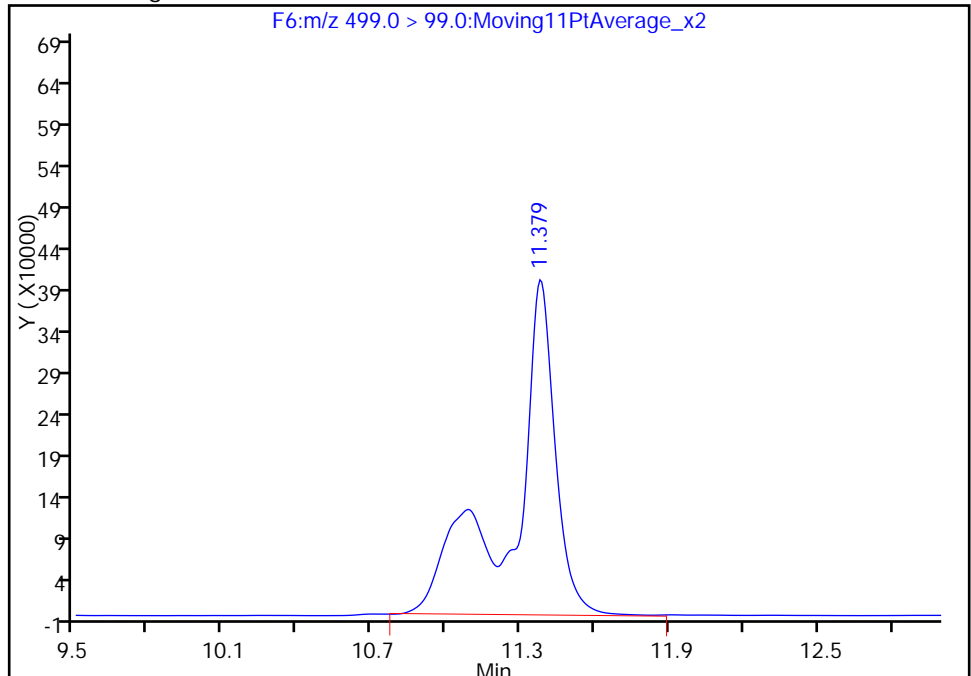
RT: 11.38
Area: 3337419
Amount: 368.3059
Amount Units: ng/ml

Processing Integration Results



RT: 11.38
Area: 4853808
Amount: 765.0706
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Client Sample ID: 46MW02_1215 DL Lab Sample ID: 320-16660-2 DL
 Matrix: Water Lab File ID: 08JAN2016A6A_010.d
 Analysis Method: WS-LC-0025 Date Collected: 12/30/2015 10:00
 Extraction Method: 3535 Date Extracted: 01/05/2016 08:39
 Sample wt/vol: 484.2 (mL) Date Analyzed: 01/08/2016 14:08
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 5
 Injection Volume: 15 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 97663 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	<i>Perfluorobutanesulfonic acid (PFBS)</i>	8.8	J D	13	10	4.7
375-85-9	<i>Perfluoroheptanoic acid (PFHpA)</i>	7.1	J D	13	10	4.1
355-46-4	<i>Perfluorohexanesulfonic acid (PFHxS)</i>	340	D M	13	10	4.5
375-95-1	<i>Perfluorononanoic acid (PFNA)</i>	6.9	J D	13	10	3.4
1763-23-1	<i>Perfluorooctanesulfonic acid (PFOS)</i>	1500	D M	21	15	6.6
335-67-1	<i>Perfluorooctanoic acid (PFOA)</i>	29	D	13	10	3.9

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	156	Q	25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_010.d
 Lims ID: 320-16660-D-2-A Lab Sample ID: 320-16660-2
 Client ID: 46MW02_1215
 Sample Type: Client
 Inject. Date: 08-Jan-2016 14:08:58 ALS Bottle#: 33 Worklist Smp#: 4
 Injection Vol: 15.0 ul Dil. Factor: 5.0000
 Sample Info: 320-16660-D-2-A 5x
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 11-Jan-2016 09:49:51 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 08-Jan-2016 15:08:26

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.005	6.976	0.029	1.000	23332	0.8532			
D 6 13C2 PFHxA	315.0 > 270.0	8.122	8.100	0.022		344825	10.5	21.1	803	
D 8 13C4-PFHpA	367.0 > 322.0	9.340	9.331	0.009		417129	12.2	24.3	982	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.346	9.335	0.011	1.000	39228	0.6895		19.2	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.370	9.363	0.007	1.000	494507	33.2			M M
D 11 18O2 PFHxS	403.0 > 84.0	9.376	9.363	0.013		242616	16.7	35.3	679	
D 12 13C4 PFOA	417.0 > 372.0	10.455	10.452	0.003		415132	10.7	21.5	1042	
13 Perfluorooctanoic acid	413.0 > 369.0	10.455	10.453	0.002	1.000	123782	2.78		40.2	
	413.0 > 169.0	10.455	10.453	0.002	1.000	46323	2.67(0.00-0.00)		36.5	
D 16 13C4 PFOS	503.0 > 80.0	11.407	11.405	0.002		278878	14.9	31.2	893	
15 Perfluorooctane sulfonic acid	499.0 > 80.0	11.407	11.408	-0.001	1.000	4036673	142.8		217	M
	499.0 > 99.0	11.407	11.408	-0.001	1.000	1735836	2.33(0.00-0.00)		1483	M
D 17 13C5 PFNA	468.0 > 423.0	11.430	11.427	0.003		276836	8.63	17.3	879	
18 Perfluorononanoic acid	463.0 > 419.0	11.430	11.431	-0.001	1.000	15687	0.6644		18.4	

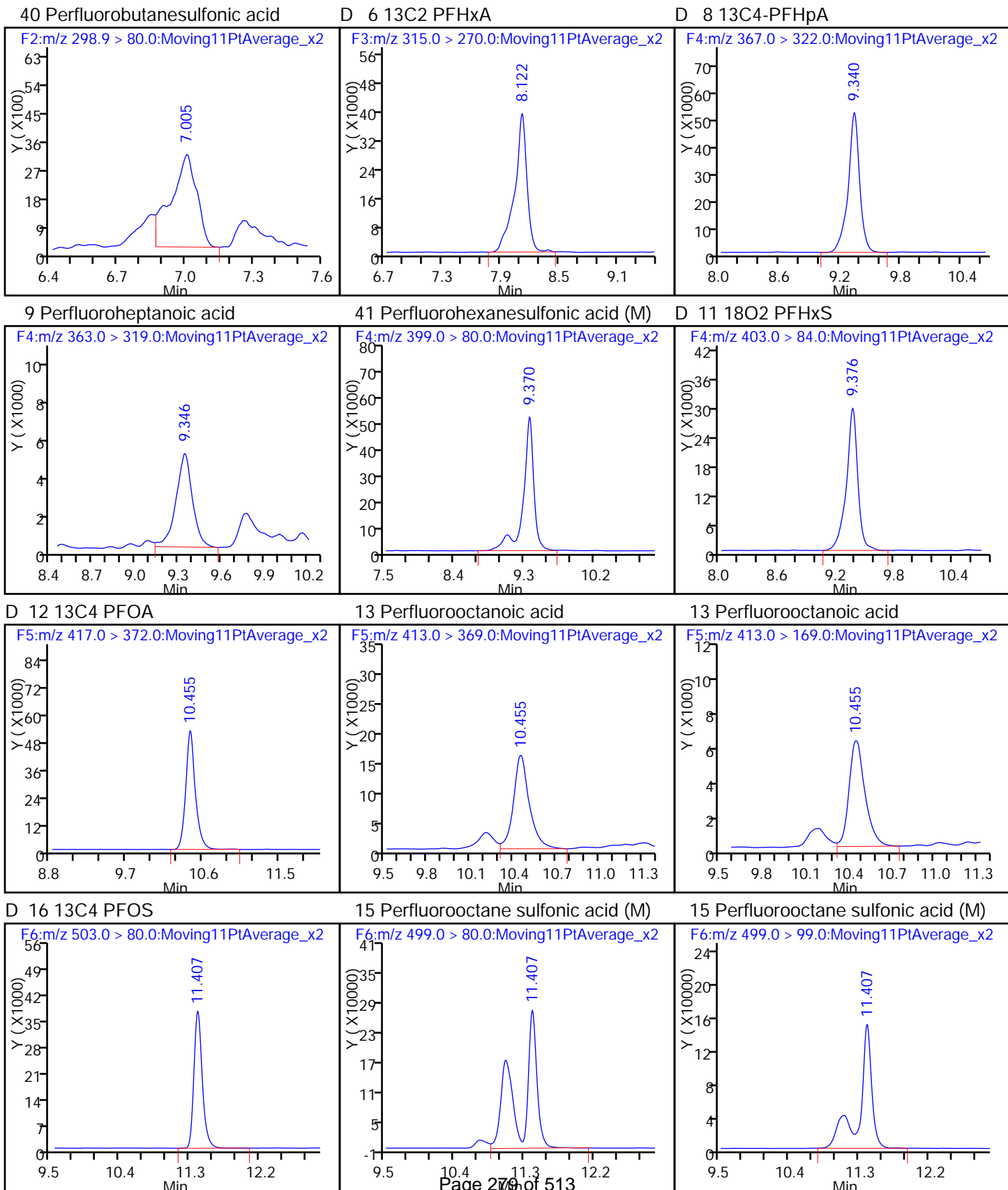
QC Flag Legend

Review Flags

M - Manually Integrated

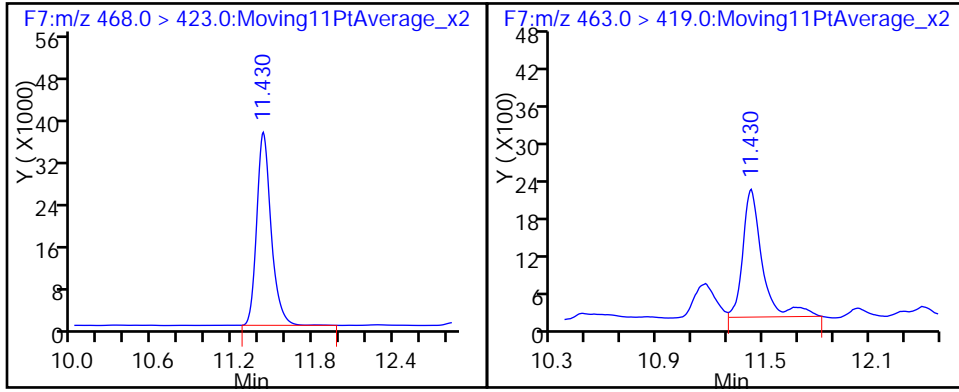
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_010.d
Injection Date: 08-Jan-2016 14:08:58 Instrument ID: A6
Lims ID: 320-16660-D-2-A Lab Sample ID: 320-16660-2
Client ID: 46MW02_1215
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 4
Injection Vol: 15.0 ul Dil. Factor: 5.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL



D 17 13C5 PFNA

18 Perfluorononanoic acid



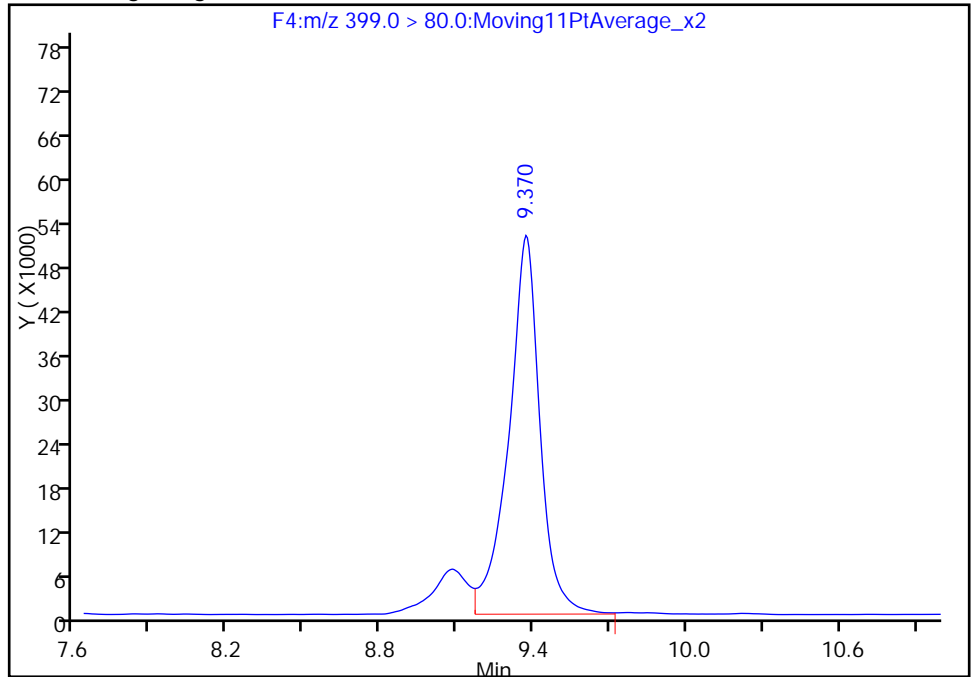
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_010.d
Injection Date: 08-Jan-2016 14:08:58 Instrument ID: A6
Lims ID: 320-16660-D-2-A Lab Sample ID: 320-16660-2
Client ID: 46MW02_1215
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 4
Injection Vol: 15.0 ul Dil. Factor: 5.0000
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

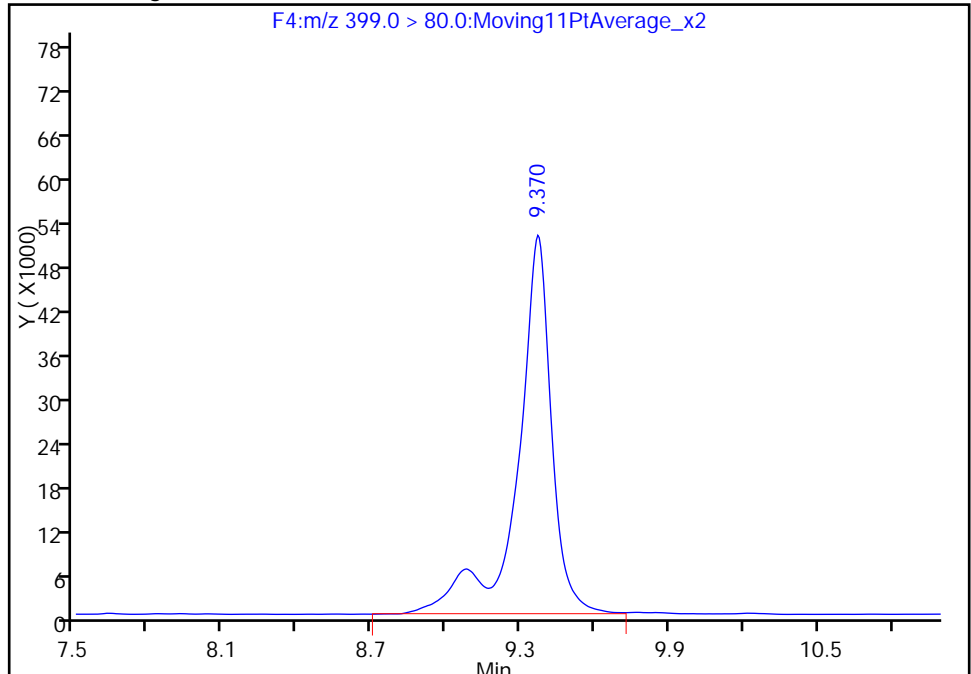
RT: 9.37
Area: 436882
Amount: 29.324389
Amount Units: ng/ml

Processing Integration Results



RT: 9.37
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Amount: 33.192294
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 15:08:26
Audit Action: Manually Integrated
Audit Reason: Isomers

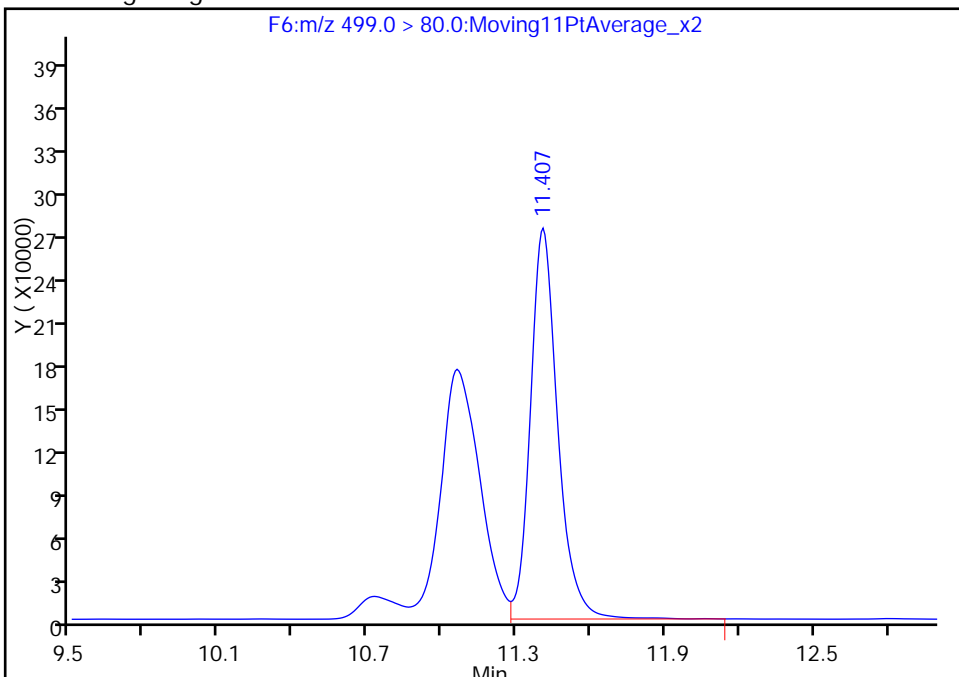
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_010.d
Injection Date: 08-Jan-2016 14:08:58 Instrument ID: A6
Lims ID: 320-16660-D-2-A Lab Sample ID: 320-16660-2
Client ID: 46MW02_1215
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 4
Injection Vol: 15.0 ul Dil. Factor: 5.0000
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

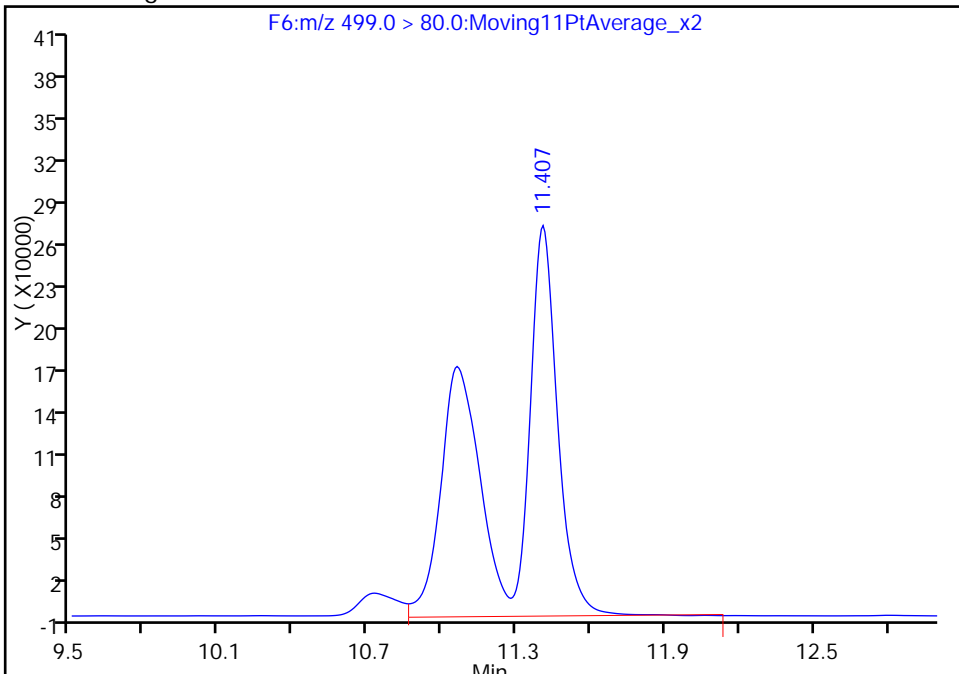
RT: 11.41
Area: 2105405
Amount: 74.461359
Amount Units: ng/ml

Processing Integration Results



RT: 11.41
Area: 4036673
Amount: 142.7641
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 15:08:26
Audit Action: Manually Integrated
Audit Reason: Isomers

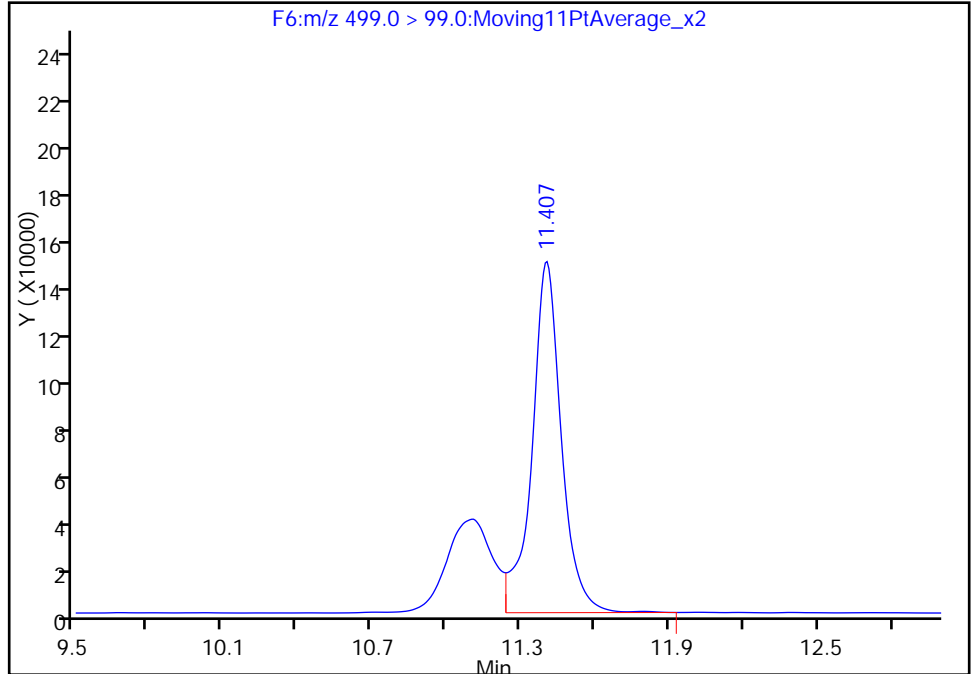
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_010.d
Injection Date: 08-Jan-2016 14:08:58 Instrument ID: A6
Lims ID: 320-16660-D-2-A Lab Sample ID: 320-16660-2
Client ID: 46MW02_1215
Operator ID: JRB ALS Bottle#: 33 Worklist Smp#: 4
Injection Vol: 15.0 ul Dil. Factor: 5.0000
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

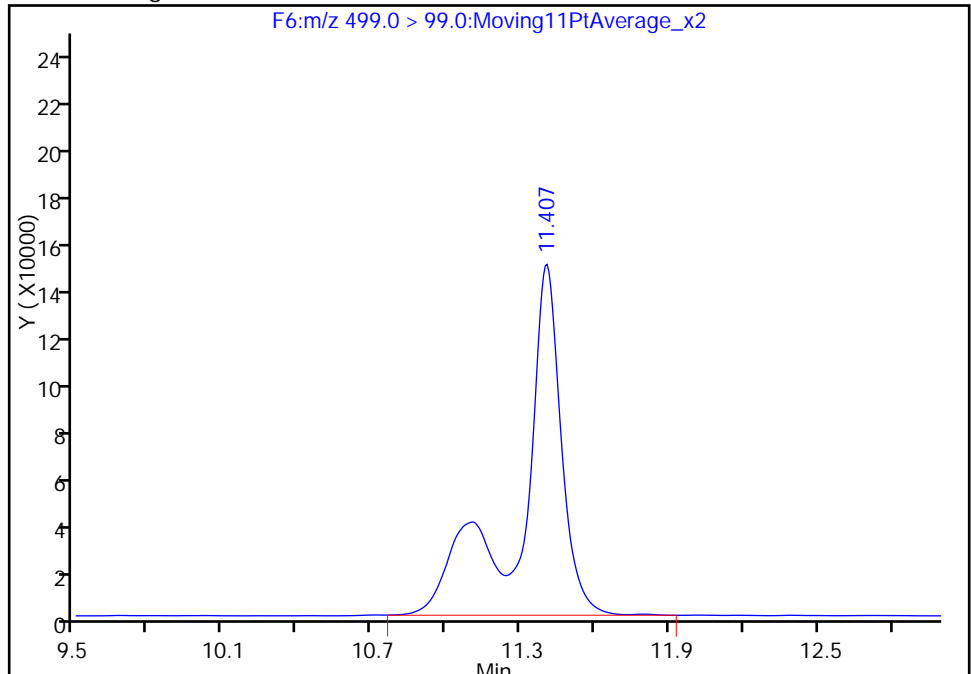
RT: 11.41
Area: 1233642
Amount: 74.461359
Amount Units: ng/ml

Processing Integration Results



RT: 11.41
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Amount: 142.7641
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Client Sample ID: 46MW03_1215 Lab Sample ID: 320-16660-3
 Matrix: Water Lab File ID: 06JAN2016A6A_080.d
 Analysis Method: WS-LC-0025 Date Collected: 12/30/2015 13:45
 Extraction Method: 3535 Date Extracted: 01/05/2016 08:39
 Sample wt/vol: 471.7 (mL) Date Analyzed: 01/07/2016 20:32
 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.: 97577 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	J	2.6	2.1	0.97
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.1	U	2.6	2.1	0.85
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	46	M	2.6	2.1	0.92
375-95-1	Perfluorononanoic acid (PFNA)	2.1	U	2.6	2.1	0.69
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	M	4.2	3.2	1.4
335-67-1	Perfluorooctanoic acid (PFOA)	2.1	U	2.6	2.1	0.79

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	71		25-150
STL00990	13C4 PFOA	63		25-150
STL00991	13C4 PFOS	117		25-150
STL01892	13C4-PFHpA	77		25-150
STL00994	18O2 PFHxS	121		25-150
STL00995	13C5 PFNA	57		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_080.d
 Lims ID: 320-16660-B-3-A Lab Sample ID: 320-16660-3
 Client ID: 46MW03_1215
 Sample Type: Client
 Inject. Date: 07-Jan-2016 20:32:15 ALS Bottle#: 37 Worklist Smp#: 52
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-16660-B-3-A
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 14:53:40 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 08-Jan-2016 09:13:40

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	6.964	6.976	-0.012	1.000	16033	0.8544				
D 6 13C2 PFHxA										
315.0 > 270.0	8.089	8.100	-0.011		1166839	35.7		71.4	3753	
D 8 13C4-PFHpA										
367.0 > 322.0	9.311	9.331	-0.020		1316520	38.4		76.8	4457	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.311	9.335	-0.024	1.000	2616	-0.1598			3.0	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.340	9.363	-0.023	1.000	220539	21.6				M
D 11 18O2 PFHxS										
403.0 > 84.0	9.340	9.363	-0.023		832347	57.3		121	2688	
D 12 13C4 PFOA										
417.0 > 372.0	10.427	10.452	-0.025		1217299	31.5		62.9	4658	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.427	10.453	-0.026	1.000	3381	0.1295			2.4	
D 16 13C4 PFOS										
503.0 > 80.0	11.378	11.405	-0.027		1049433	56.1		117	5189	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.378	11.408	-0.030	1.000	211404	9.93			119	M
499.0 > 99.0	11.386	11.408	-0.022	1.001	101328		2.09(0.00-0.00)		154	M
D 17 13C5 PFNA										
468.0 > 423.0	11.394	11.427	-0.033		920041	28.7		57.4	2328	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_080.d

Injection Date: 07-Jan-2016 20:32:15

Instrument ID: A6

Lims ID: 320-16660-B-3-A

Lab Sample ID: 320-16660-3

Client ID: 46MW03_1215

Operator ID: JRB

ALS Bottle#: 37

Worklist Smp#: 52

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

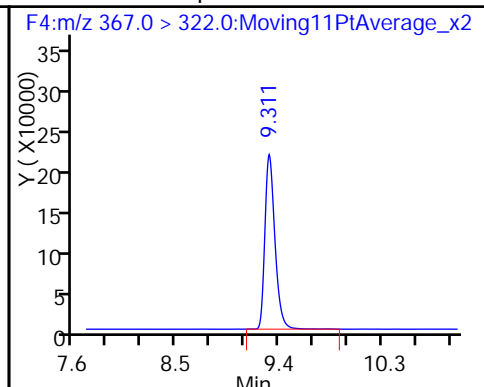
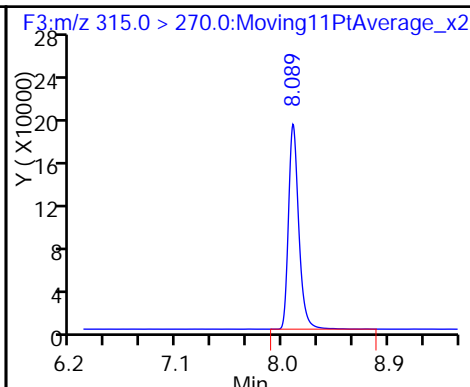
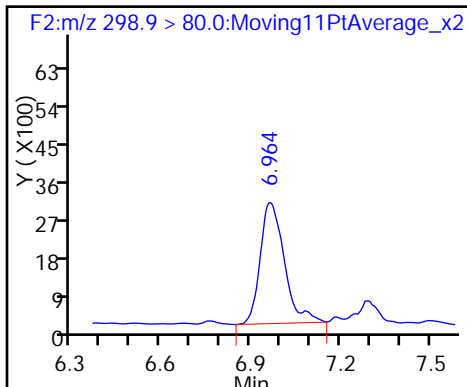
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxA

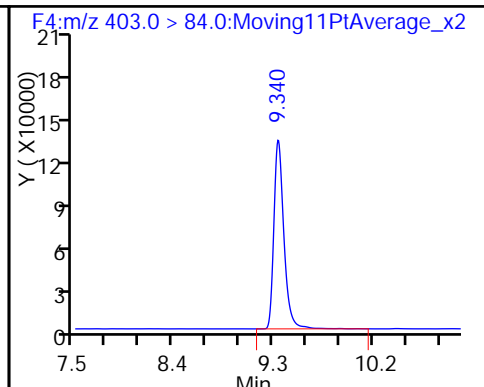
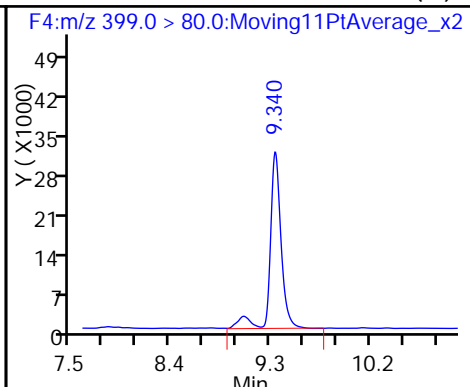
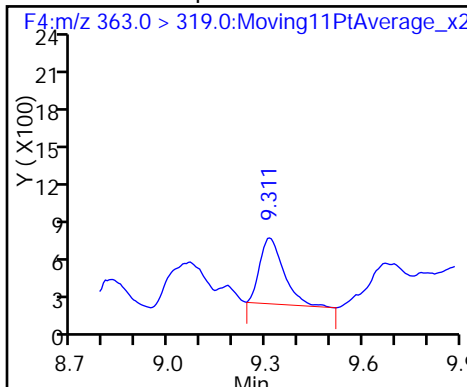
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid

41 Perfluorohexanesulfonic acid (M)

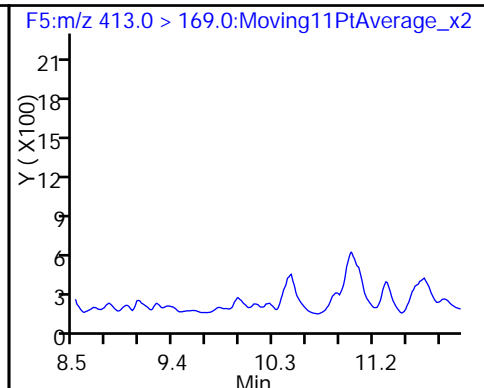
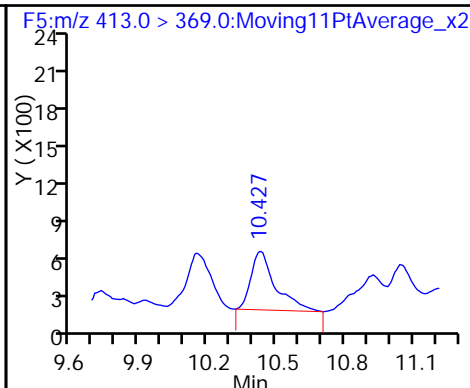
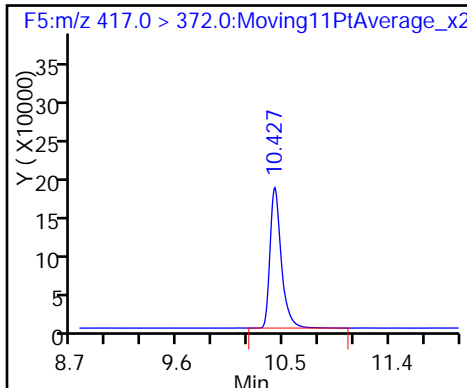
D 11 18O2 PFHxS



D 12 13C4 PFOA

13 Perfluorooctanoic acid

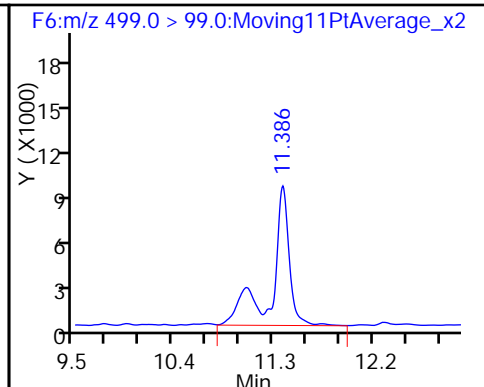
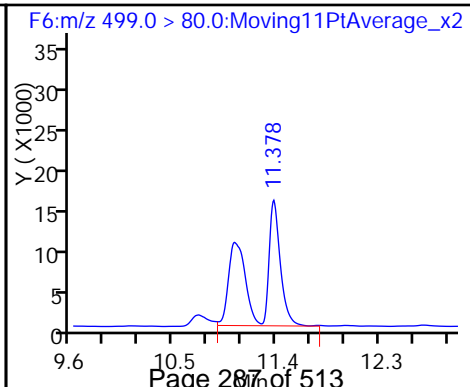
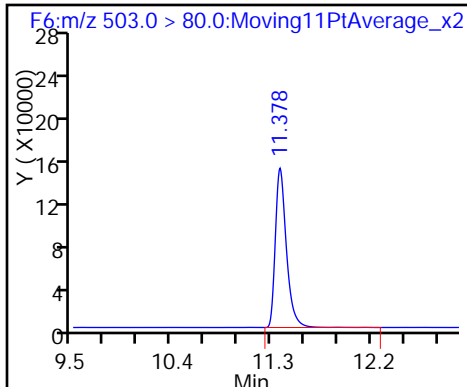
13 Perfluorooctanoic acid



D 16 13C4 PFOS

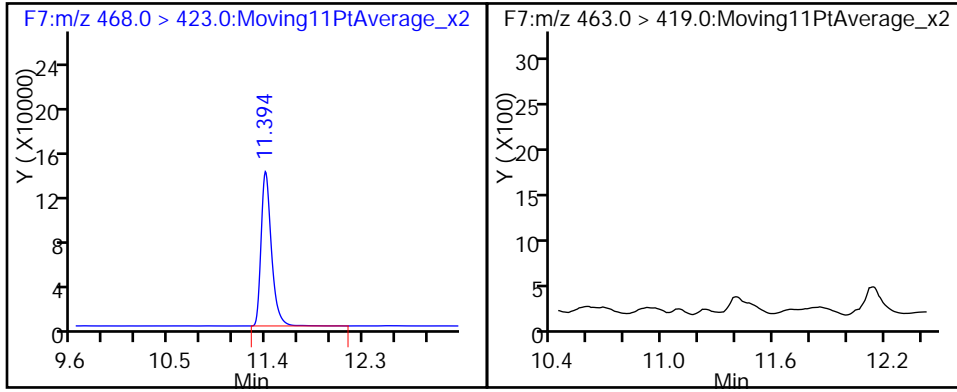
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid (ND)



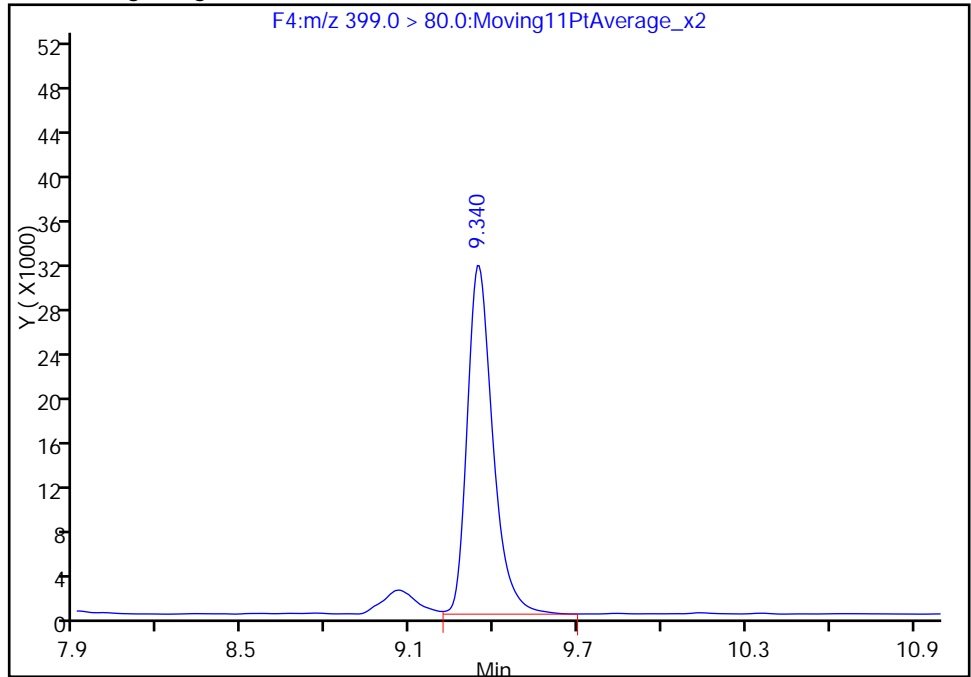
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_080.d
Injection Date: 07-Jan-2016 20:32:15 Instrument ID: A6
Lims ID: 320-16660-B-3-A Lab Sample ID: 320-16660-3
Client ID: 46MW03_1215
Operator ID: JRB ALS Bottle#: 37 Worklist Smp#: 52
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

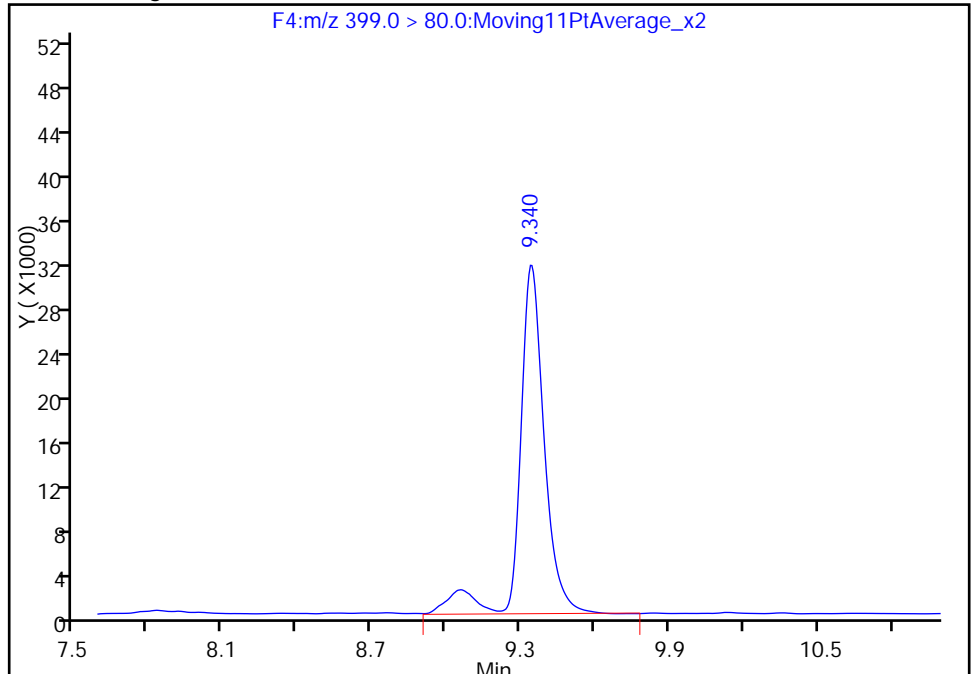
RT: 9.34
Area: 202377
Amount: 19.797530
Amount Units: ng/ml

Processing Integration Results



RT: 9.34
Area: 220539
Amount: 21.574227
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:13:40
Audit Action: Manually Integrated
Audit Reason: Isomers

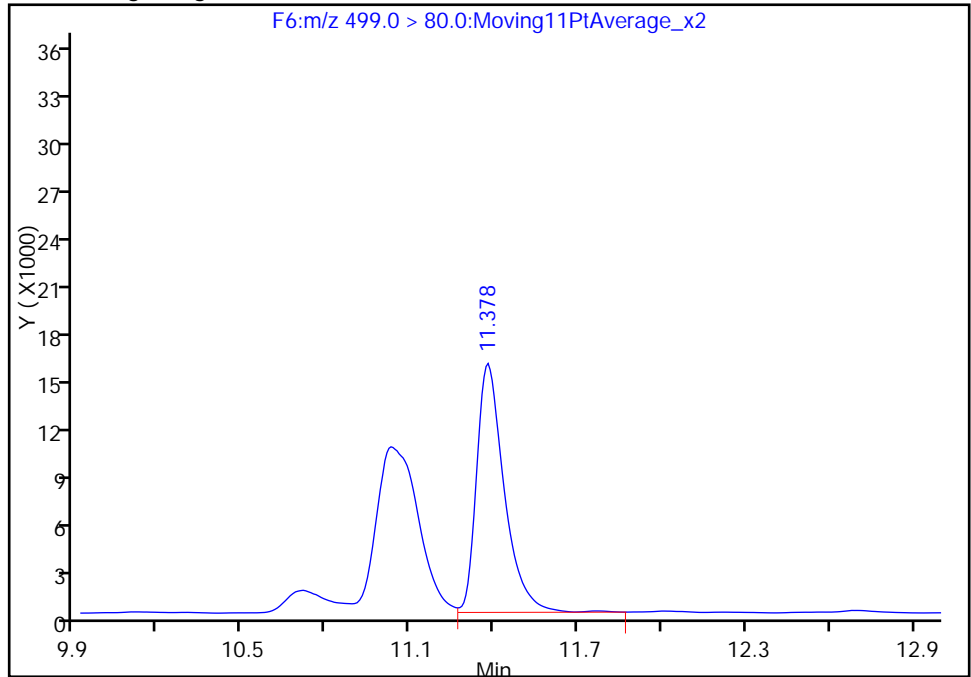
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_080.d
Injection Date: 07-Jan-2016 20:32:15 Instrument ID: A6
Lims ID: 320-16660-B-3-A Lab Sample ID: 320-16660-3
Client ID: 46MW03_1215
Operator ID: JRB ALS Bottle#: 37 Worklist Smp#: 52
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

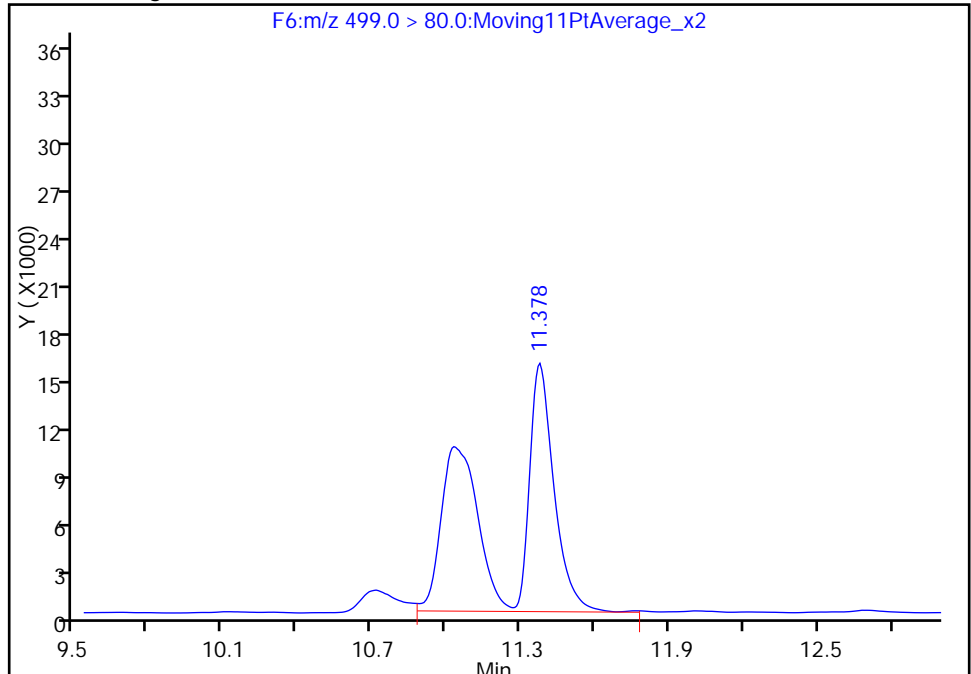
RT: 11.38
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Amount: 4.996059
Amount Units: ng/ml

Processing Integration Results



RT: 11.38
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Amount: 9.934318
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:13:40
Audit Action: Manually Integrated
Audit Reason: Isomers

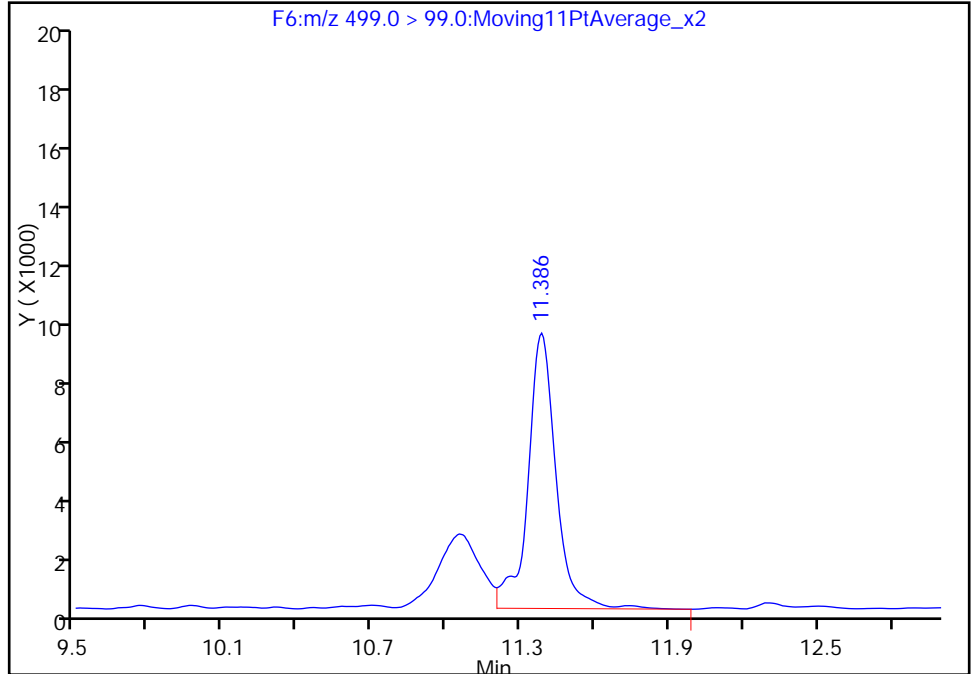
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_080.d
Injection Date: 07-Jan-2016 20:32:15 Instrument ID: A6
Lims ID: 320-16660-B-3-A Lab Sample ID: 320-16660-3
Client ID: 46MW03_1215
Operator ID: JRB ALS Bottle#: 37 Worklist Smp#: 52
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

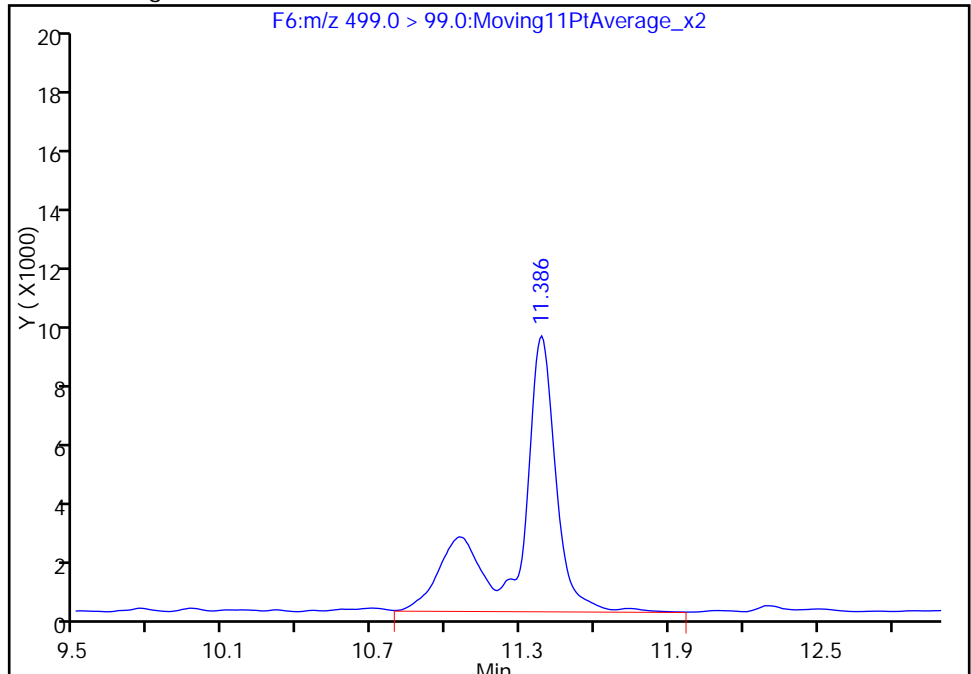
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Amount: 4.996059
Amount Units: ng/ml

Processing Integration Results



RT: 11.39
Area: 101328
Amount: 9.934318
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Client Sample ID: 46MW03_1215X Lab Sample ID: 320-16660-4
 Matrix: Water Lab File ID: 06JAN2016A6A_081.d
 Analysis Method: WS-LC-0025 Date Collected: 12/30/2015 13:46
 Extraction Method: 3535 Date Extracted: 01/05/2016 08:39
 Sample wt/vol: 551.4 (mL) Date Analyzed: 01/07/2016 20:53
 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.: 97577 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.4	J	2.3	1.8	0.83
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	U	2.3	1.8	0.73
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	37	M	2.3	1.8	0.79
375-95-1	Perfluorononanoic acid (PFNA)	1.8	U	2.3	1.8	0.59
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	18	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	75		25-150
STL00990	13C4 PFOA	66		25-150
STL00991	13C4 PFOS	117		25-150
STL01892	13C4-PFHpA	76		25-150
STL00994	18O2 PFHxS	120		25-150
STL00995	13C5 PFNA	56		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_081.d
 Lims ID: 320-16660-A-4-A Lab Sample ID: 320-16660-4
 Client ID: 46MW03_1215X
 Sample Type: Client
 Inject. Date: 07-Jan-2016 20:53:29 ALS Bottle#: 38 Worklist Smp#: 53
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-16660-A-4-A
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 14:53:40 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 08-Jan-2016 09:14:14

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	6.964	6.976	-0.012	1.000	13920	0.7504				
D 6 13C2 PFHxA										
315.0 > 270.0	8.089	8.100	-0.011		1219487	37.3		74.6	3196	
D 8 13C4-PFHpA										
367.0 > 322.0	9.311	9.331	-0.020		1310743	38.2		76.4	6360	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.311	9.335	-0.024	1.000	3568	-0.1226			2.9	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.341	9.363	-0.022	1.000	206218	20.4				M
D 11 18O2 PFHxS										
403.0 > 84.0	9.341	9.363	-0.022		822839	56.6		120	2104	
D 12 13C4 PFOA										
417.0 > 372.0	10.420	10.452	-0.032		1269700	32.8		65.6	4506	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.420	10.453	-0.033	1.000	4538	0.1667			4.1	
413.0 > 169.0	10.413	10.453	-0.040	0.999	1995		2.27(0.00-0.00)		2.9	
D 16 13C4 PFOS										
503.0 > 80.0	11.371	11.405	-0.034		1046318	56.0		117	3044	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.379	11.408	-0.029	1.000	206896	9.75			115	M
499.0 > 99.0	11.371	11.408	-0.037	0.999	84917		2.44(0.00-0.00)		104	M
D 17 13C5 PFNA										
468.0 > 423.0	11.394	11.427	-0.033		899474	28.0		56.1	3062	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_081.d

Injection Date: 07-Jan-2016 20:53:29

Instrument ID: A6

Lims ID: 320-16660-A-4-A

Lab Sample ID: 320-16660-4

Client ID: 46MW03_1215X

Operator ID: JRB

ALS Bottle#: 38

Worklist Smp#: 53

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

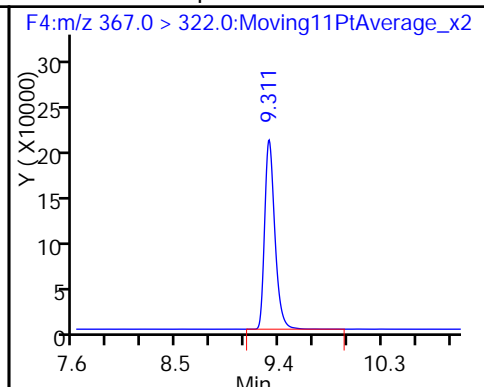
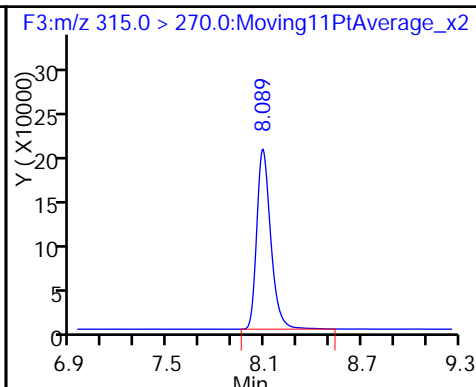
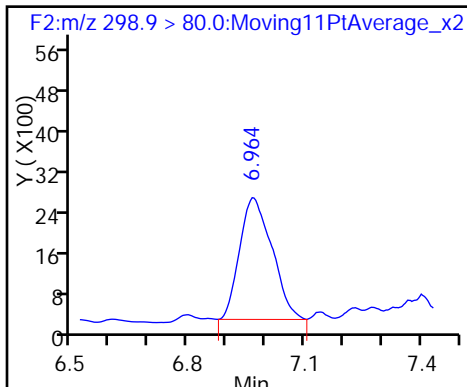
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxA

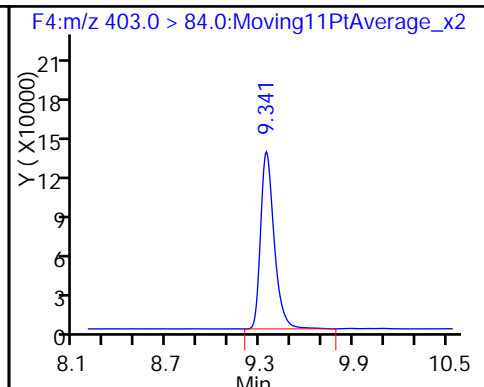
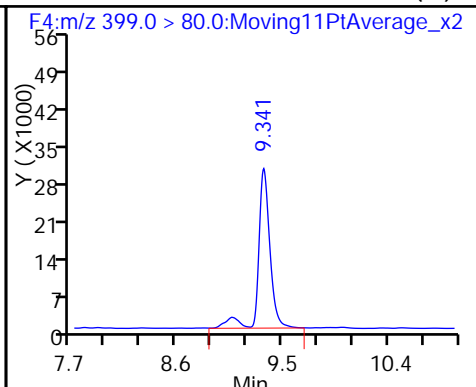
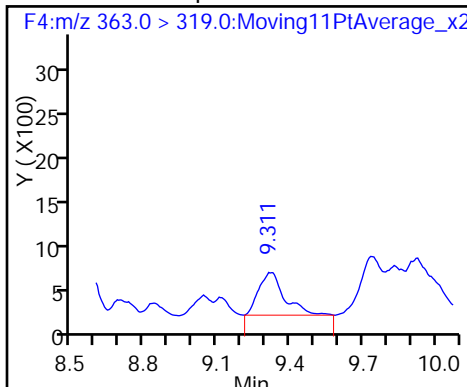
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid

41 Perfluorohexanesulfonic acid (M)

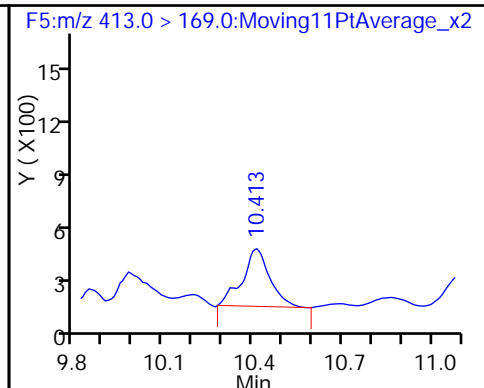
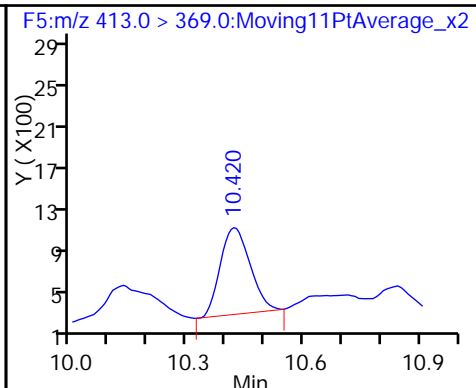
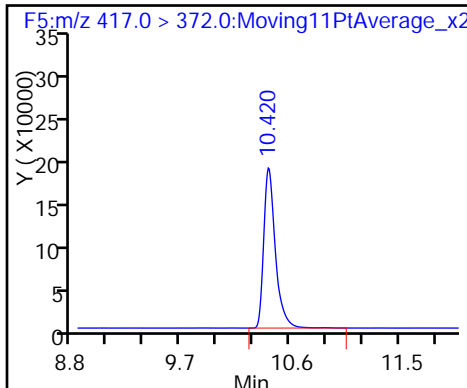
D 11 18O2 PFHxS



D 12 13C4 PFOA

13 Perfluorooctanoic acid

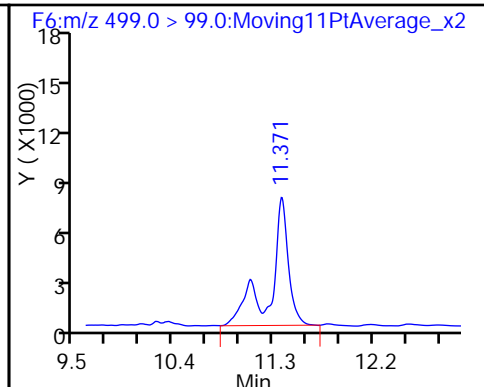
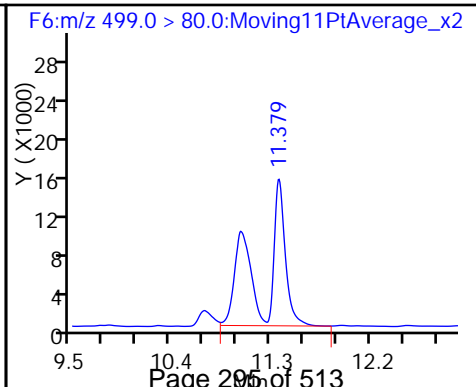
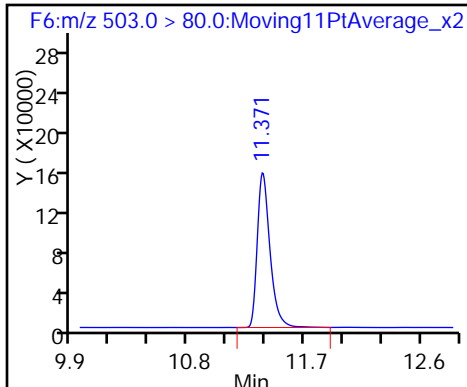
13 Perfluorooctanoic acid



D 16 13C4 PFOS

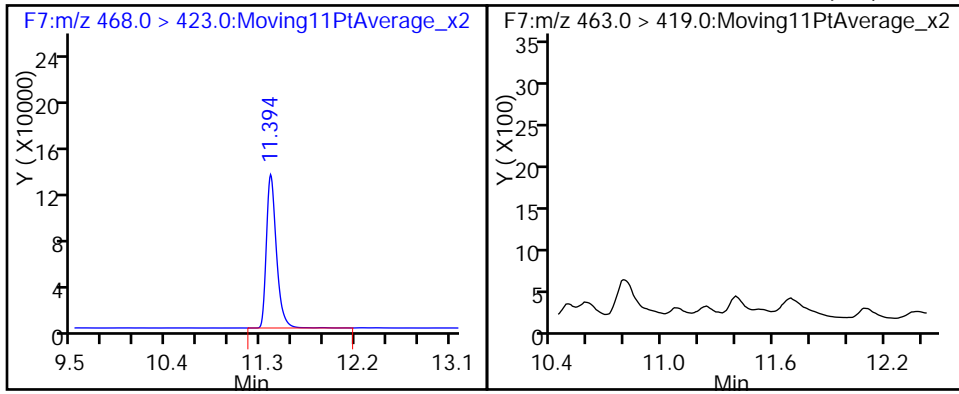
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid (ND)



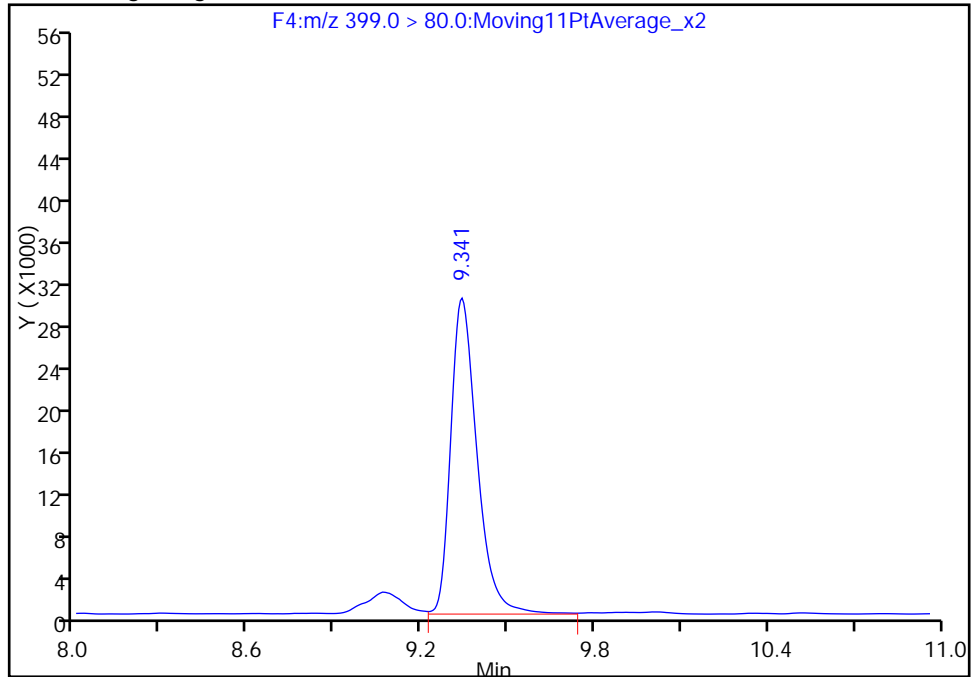
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_081.d
Injection Date: 07-Jan-2016 20:53:29 Instrument ID: A6
Lims ID: 320-16660-A-4-A Lab Sample ID: 320-16660-4
Client ID: 46MW03_1215X
Operator ID: JRB ALS Bottle#: 38 Worklist Smp#: 53
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

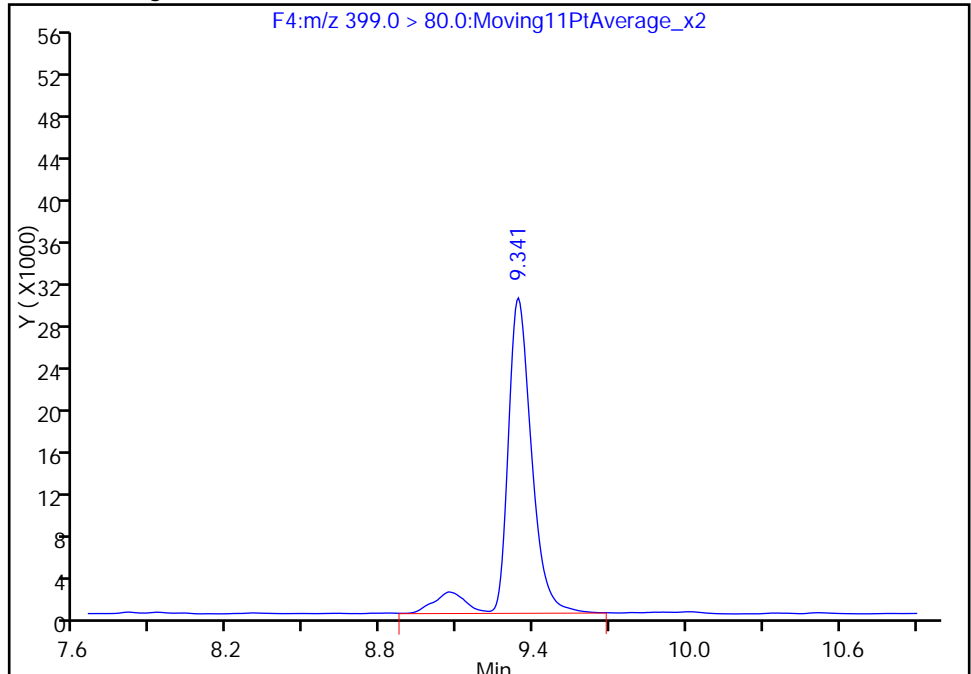
RT: 9.34
Area: 190283
Amount: 18.829526
Amount Units: ng/ml

Processing Integration Results



RT: 9.34
Area: 206218
Amount: 20.406380
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:14:14
Audit Action: Manually Integrated
Audit Reason: Isomers

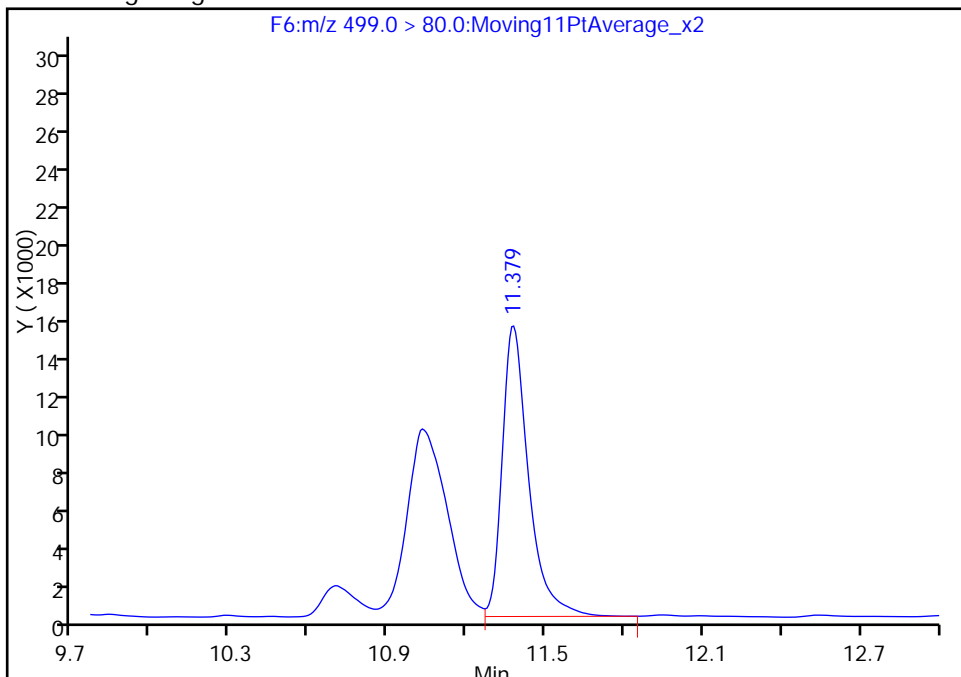
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_081.d
Injection Date: 07-Jan-2016 20:53:29 Instrument ID: A6
Lims ID: 320-16660-A-4-A Lab Sample ID: 320-16660-4
Client ID: 46MW03_1215X
Operator ID: JRB ALS Bottle#: 38 Worklist Smp#: 53
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

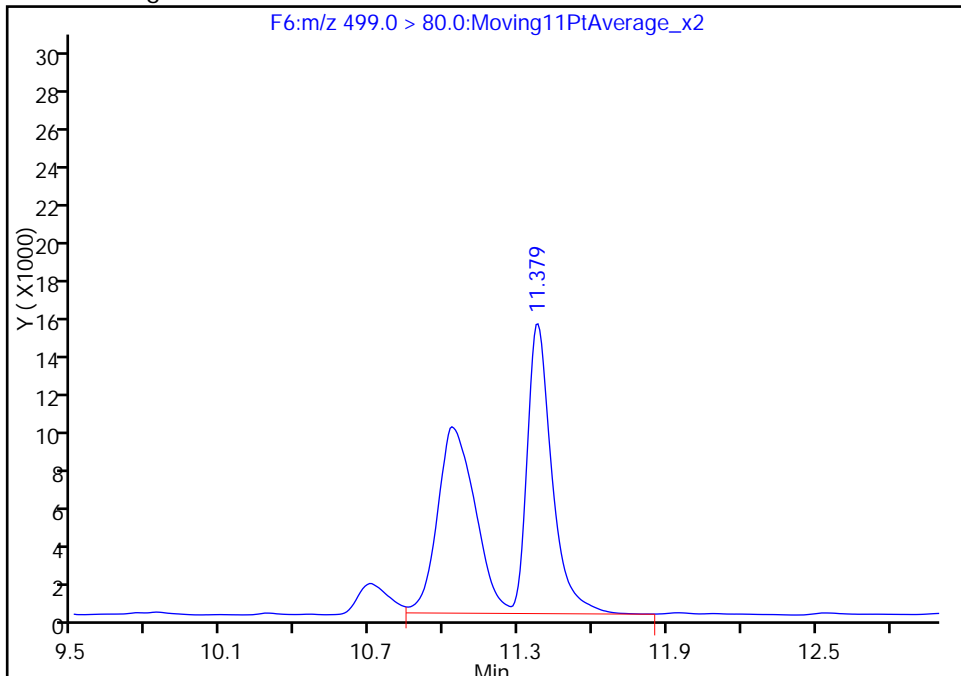
RT: 11.38
Area: 105376
Amount: 4.966582
Amount Units: ng/ml

Processing Integration Results



RT: 11.38
Area: 206896
Amount: 9.751422
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:14:14
Audit Action: Manually Integrated
Audit Reason: Isomers

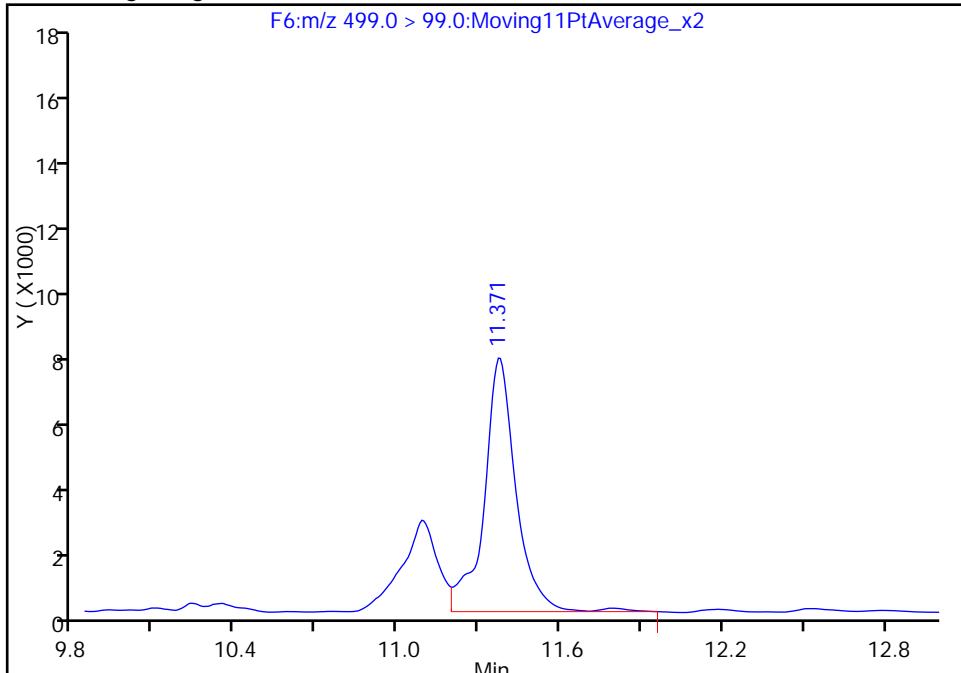
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_081.d
Injection Date: 07-Jan-2016 20:53:29 Instrument ID: A6
Lims ID: 320-16660-A-4-A Lab Sample ID: 320-16660-4
Client ID: 46MW03_1215X
Operator ID: JRB ALS Bottle#: 38 Worklist Smp#: 53
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

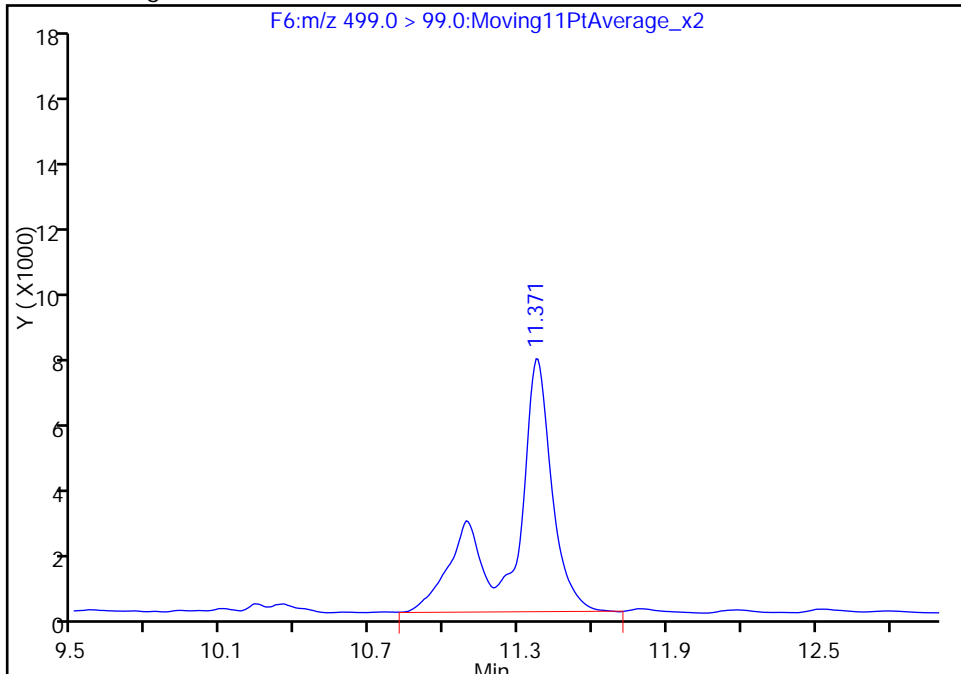
RT: 11.37
Area: 61403
Amount: 4.966582
Amount Units: ng/ml

Processing Integration Results



RT: 11.37
Area: 84917
Amount: 9.751422
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:14:14
Audit Action: Manually Integrated
Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Client Sample ID: 46MW04_1215 Lab Sample ID: 320-16660-5
 Matrix: Water Lab File ID: 06JAN2016A6A_082.d
 Analysis Method: WS-LC-0025 Date Collected: 12/30/2015 14:15
 Extraction Method: 3535 Date Extracted: 01/05/2016 08:39
 Sample wt/vol: 560.1(mL) Date Analyzed: 01/07/2016 21:14
 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.: 97577 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33		2.2	1.8	0.82
375-85-9	Perfluoroheptanoic acid (PFHpA)	17		2.2	1.8	0.72
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	880	J M	2.2	1.8	0.78
375-95-1	Perfluorononanoic acid (PFNA)	15		2.2	1.8	0.58
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3300	J M	3.6	2.7	1.1
335-67-1	Perfluorooctanoic acid (PFOA)	33		2.2	1.8	0.67

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	82		25-150
STL00990	13C4 PFOA	85		25-150
STL00991	13C4 PFOS	57		25-150
STL01892	13C4-PFHpA	76		25-150
STL00994	18O2 PFHxS	95		25-150
STL00995	13C5 PFNA	51		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_082.d
 Lims ID: 320-16660-A-5-A Lab Sample ID: 320-16660-5
 Client ID: 46MW04_1215
 Sample Type: Client
 Inject. Date: 07-Jan-2016 21:14:44 ALS Bottle#: 39 Worklist Smp#: 54
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-16660-A-5-A
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 14:53:40 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 08-Jan-2016 09:15:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.748	5.763	-0.015	434489	23.6		47.2	1243	
2 Perfluorobutyric acid	212.9 > 169.0	5.748	5.763	-0.015	135880	11.3			44.6	
D 3 13C5-PFPeA	267.9 > 223.0	6.850	6.863	-0.013	1424769	41.0		81.9	3091	
4 Perfluoropentanoic acid	262.9 > 219.0	6.850	6.864	-0.014	504325	17.5			89.0	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.960	6.976	-0.016	275646	NC			6.6	
	298.9 > 99.0	6.964	6.976	-0.012	146972		1.88(0.00-0.00)		118	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.960	6.976	-0.016	275646	18.7				
22 PFPeS (Perflouro-1-pentanesulfonat	349.0 > 80.0	7.888	7.799	0.089	19508	NC			3.0	
D 6 13C2 PFHxA	315.0 > 270.0	8.083	8.100	-0.017	1341368	41.0		82.0	3639	
7 Perfluorohexanoic acid	313.0 > 269.0	8.089	8.102	-0.013	1000951	34.6			163	
D 8 13C4-PFHpA	367.0 > 322.0	9.300	9.331	-0.031	1299660	37.9		75.8	3184	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.300	9.335	-0.035	247078	9.34			97.7	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.335	9.363	-0.028	3319739	NC			2632	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.335	9.363	-0.028	3954709	492.0				EM
										EM
D 11 18O2 PFHxS	403.0 > 84.0	9.335	9.363	-0.028	454432	45.0		95.2	1305	

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	10.420	10.452	-0.032		1649840	42.7		85.3	4267	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.420	10.453	-0.033	1.000	659837	18.7			109	
413.0 > 169.0	10.420	10.453	-0.033	1.000	250187		2.64(0.00-0.00)		81.5	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.420	10.456	-0.036	1.000	107506	20.3				
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.420	10.456	-0.036	1.000	107506	NC			56.3	
D 16 13C4 PFOS										
503.0 > 80.0	11.371	11.405	-0.034		512997	27.4		57.4	900	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.371	11.408	-0.037	1.000	19390771	1864.1			695	EM
499.0 > 99.0	11.371	11.408	-0.037	1.000	9567040		2.03(0.00-0.00)		2754	EM M
D 17 13C5 PFNA										
468.0 > 423.0	11.394	11.427	-0.033		824204	25.7		51.4	1830	
18 Perfluorononanoic acid										
463.0 > 419.0	11.394	11.431	-0.037	1.000	114930	8.18			78.9	
21 PFNS (Perflouro-1-nonanesulfonate)										
549.0 > 80.0	11.833	11.893	-0.060	1.000	66180	NC			21.9	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.218	12.260	-0.042	1.000	86854	3.46			114	
D 19 13C2 PFDA										
515.0 > 470.0	12.218	12.262	-0.044		1193409	38.7		77.3	2887	
D 23 13C8 FOSA										
506.0 > 78.0	12.788	12.805	-0.017		527221	12.4		24.7	1330	
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.934	12.978	-0.044	1.000	23626	0.0258			45.3	
D 26 13C2 PFUnA										
565.0 > 520.0	12.923	12.979	-0.056		1600036	42.4		84.9	2795	
D 28 13C2 PFDoA										
615.0 > 570.0	13.528	13.597	-0.069		887780	21.0		41.9	1882	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.489	14.548	-0.059		835847	21.6		43.3	969	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.496	14.549	-0.053	1.000	11204	0.4019			7.6	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.119	15.177	-0.058	1.000	168823	3.07			268	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.119	15.177	-0.058		1482086	30.2		60.4	2360	

QC Flag Legend

Processing Flags

NC - Not Calibrated

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_082.d

Injection Date: 07-Jan-2016 21:14:44

Instrument ID: A6

Lims ID: 320-16660-A-5-A

Lab Sample ID: 320-16660-5

Client ID: 46MW04_1215

Operator ID: JRB

ALS Bottle#: 39

Worklist Smp#: 54

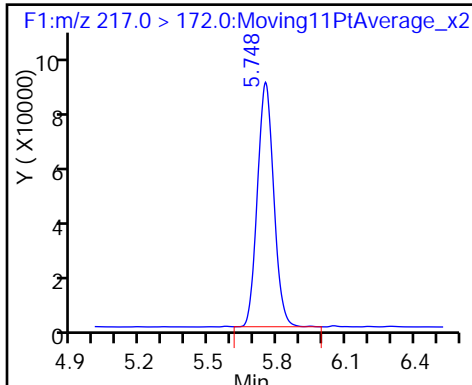
Injection Vol: 15.0 ul

Dil. Factor: 1.0000

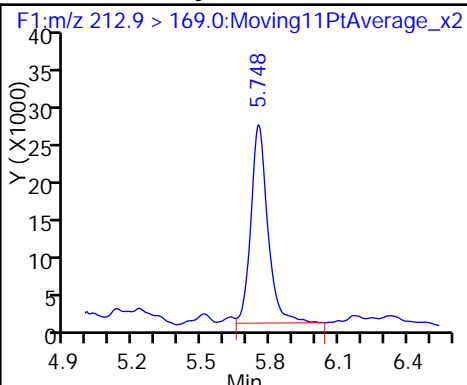
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

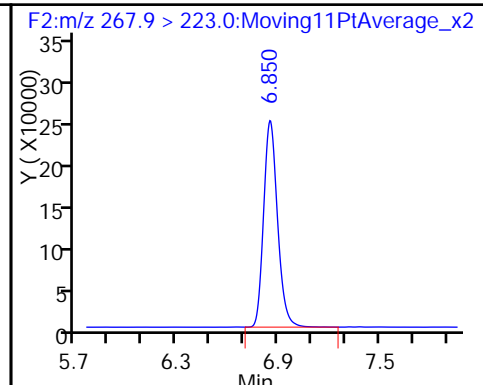
D 1 13C4 PFBA



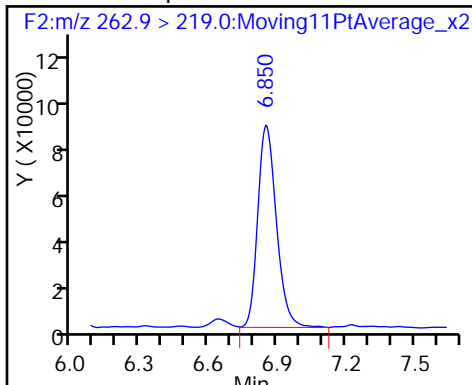
2 Perfluorobutyric acid



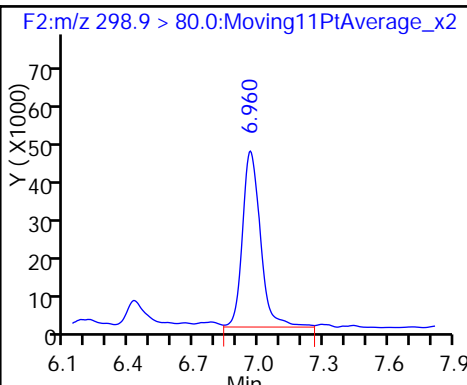
D 3 13C5-PFPeA



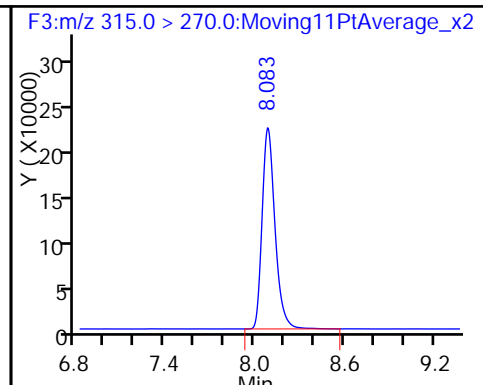
4 Perfluoropentanoic acid



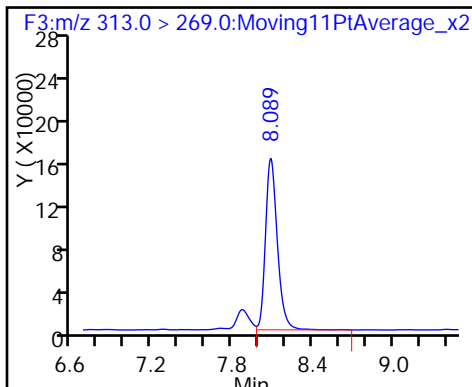
40 Perfluorobutanesulfonic acid



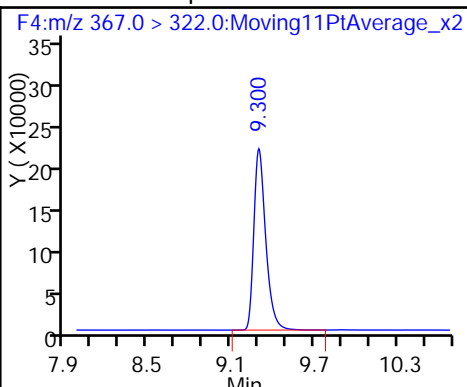
D 6 13C2 PFHxA



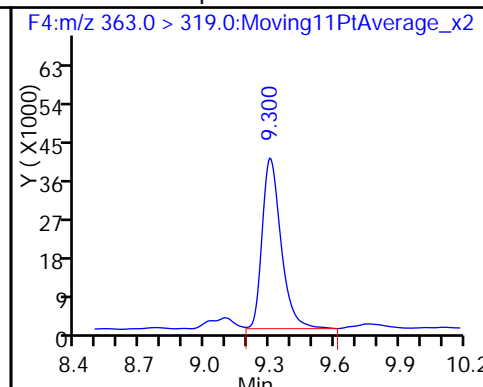
7 Perfluorohexanoic acid



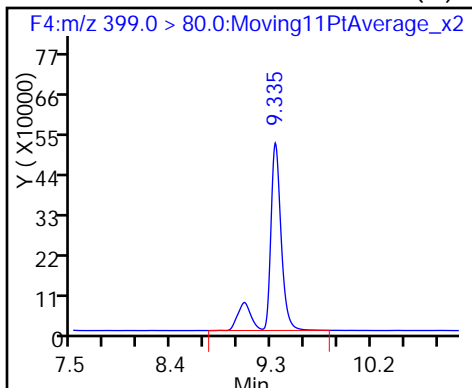
D 8 13C4-PFHpA



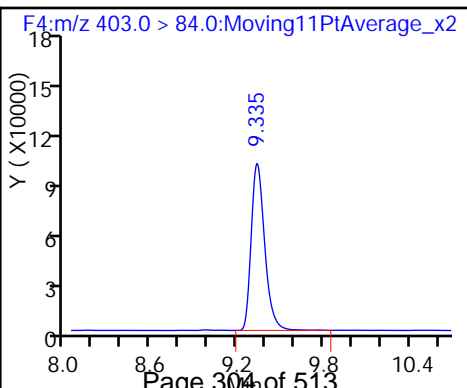
9 Perfluoroheptanoic acid



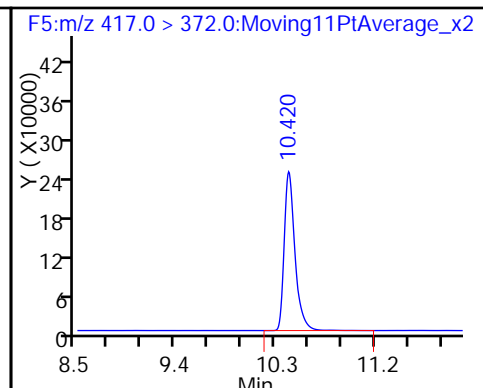
41 Perfluorohexanesulfonic acid (M)

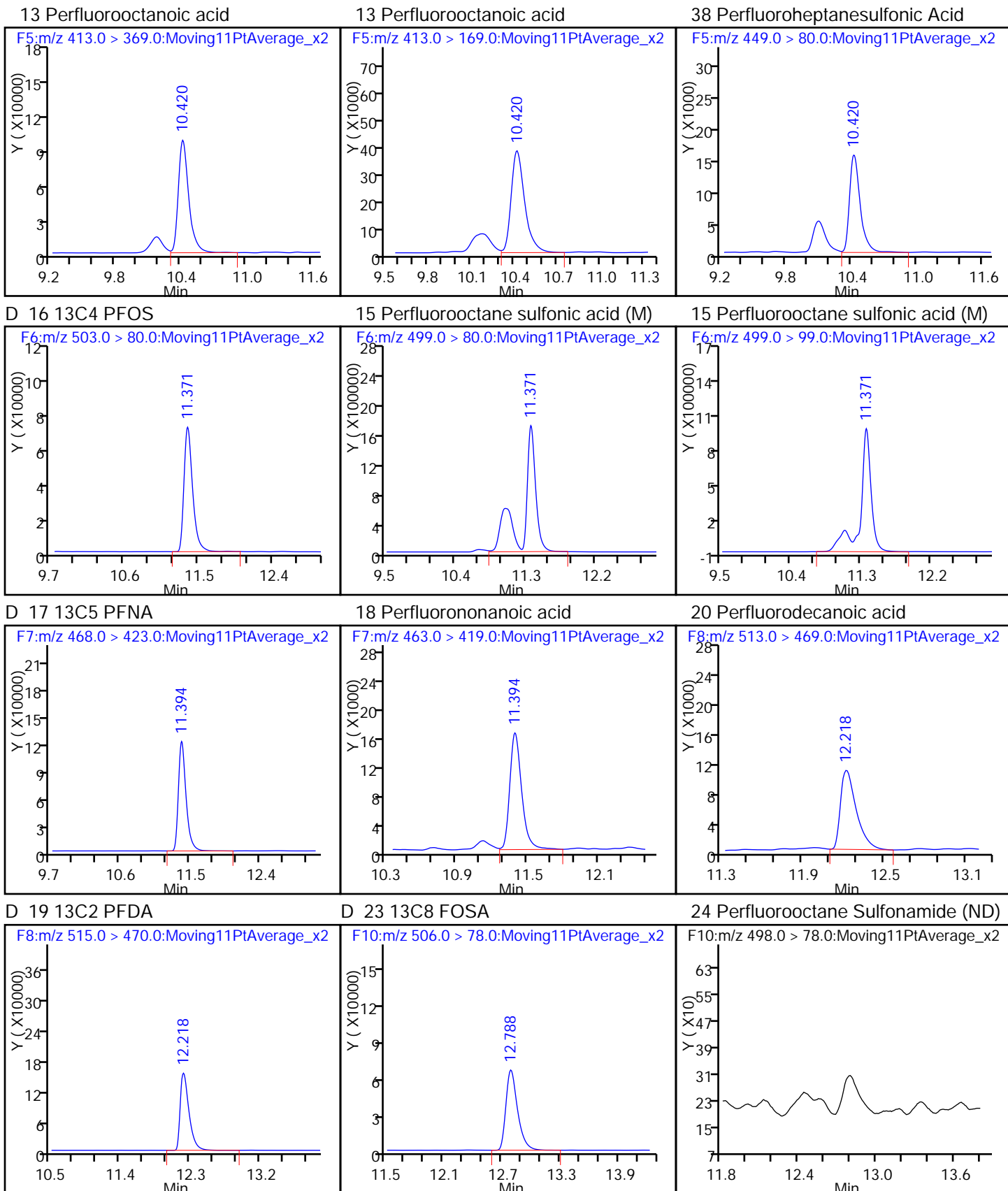


D 11 18O2 PFHxS



D 12 13C4 PFOA

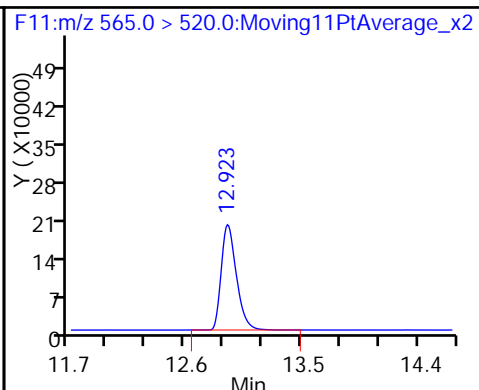
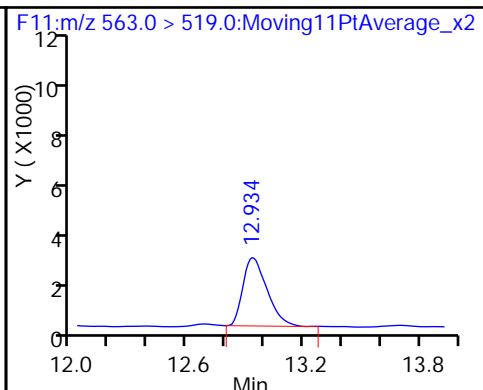
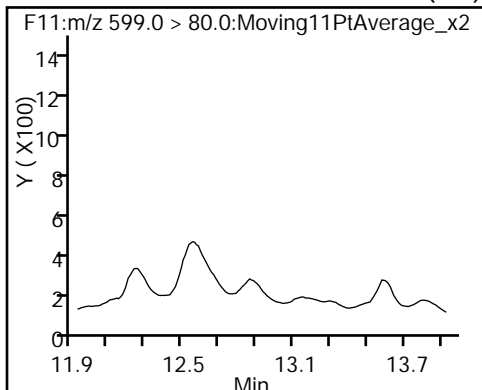




39 Perfluorodecane Sulfonic acid (ND)

27 Perfluoroundecanoic acid

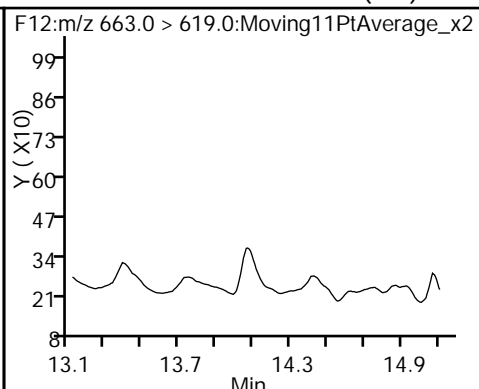
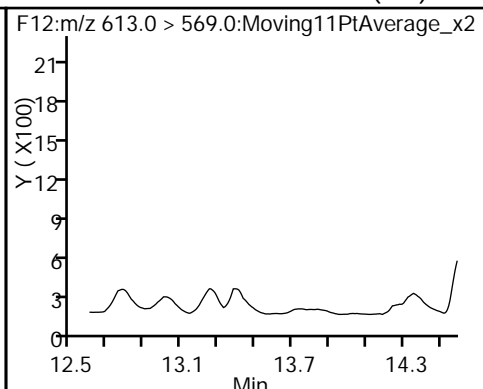
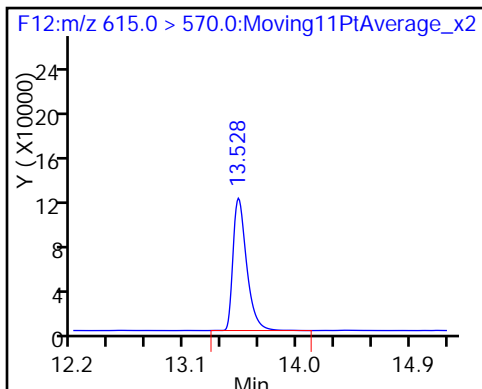
D 26 13C2 PFUnA



D 28 13C2 PFDaA

29 Perfluorododecanoic acid (ND)

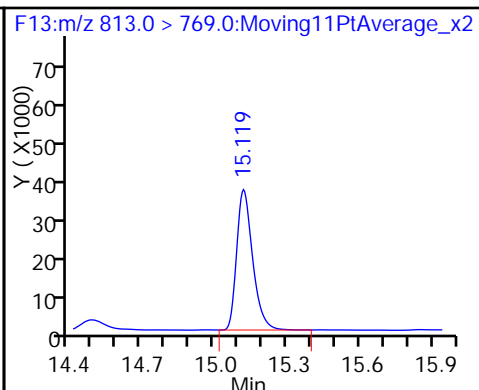
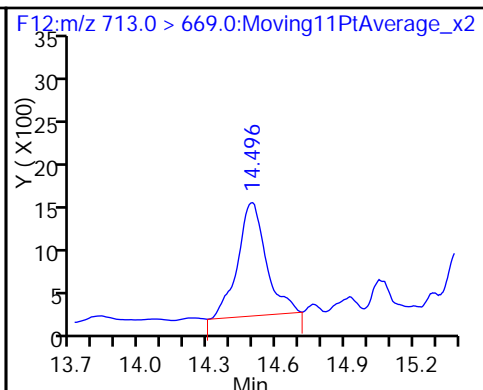
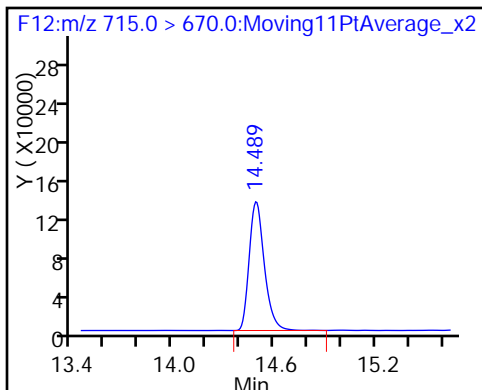
30 Perfluorotridecanoic acid (ND)



D 33 13C2-PFTeDA

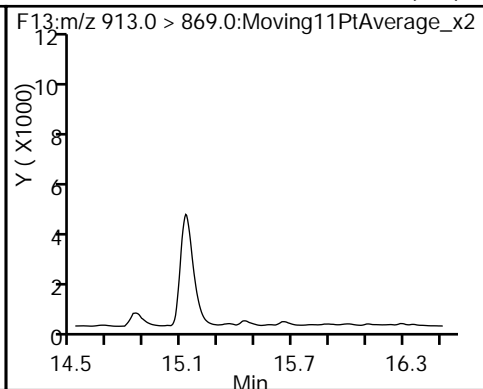
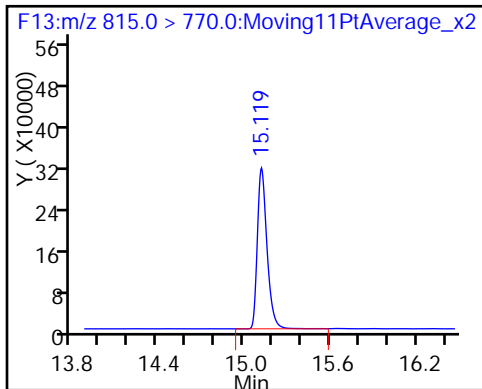
32 Perfluorotetradecanoic acid

34 Perfluorohexadecanoic acid



D 35 13C2-PFHxDA

36 Perfluorooctadecanoic acid (ND)



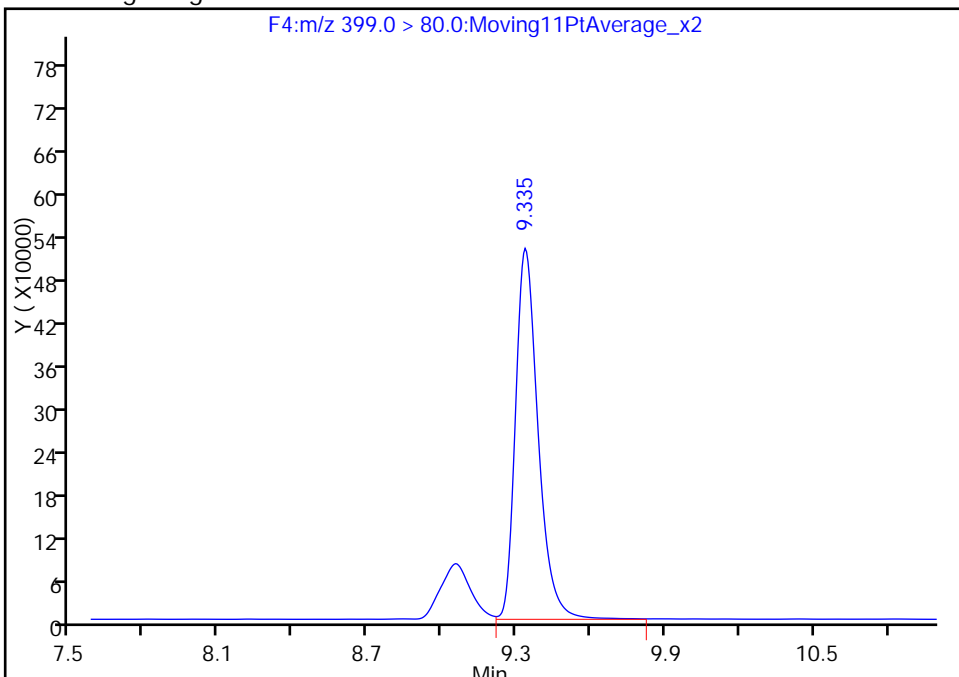
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_082.d
Injection Date: 07-Jan-2016 21:14:44 Instrument ID: A6
Lims ID: 320-16660-A-5-A Lab Sample ID: 320-16660-5
Client ID: 46MW04_1215
Operator ID: JRB ALS Bottle#: 39 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:M/RM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

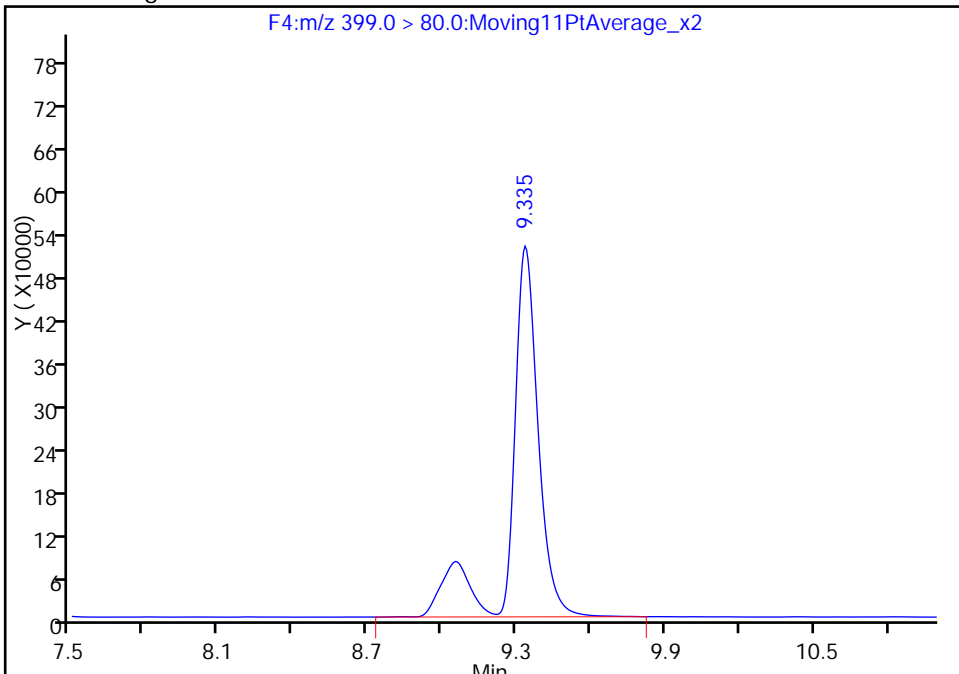
RT: 9.33
Area: 3319739
Amount: 413.0415
Amount Units: ng/ml

Processing Integration Results



RT: 9.33
Area: 3954709
Amount: 492.0444
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:15:40
Audit Action: Manually Integrated
Audit Reason: Isomers

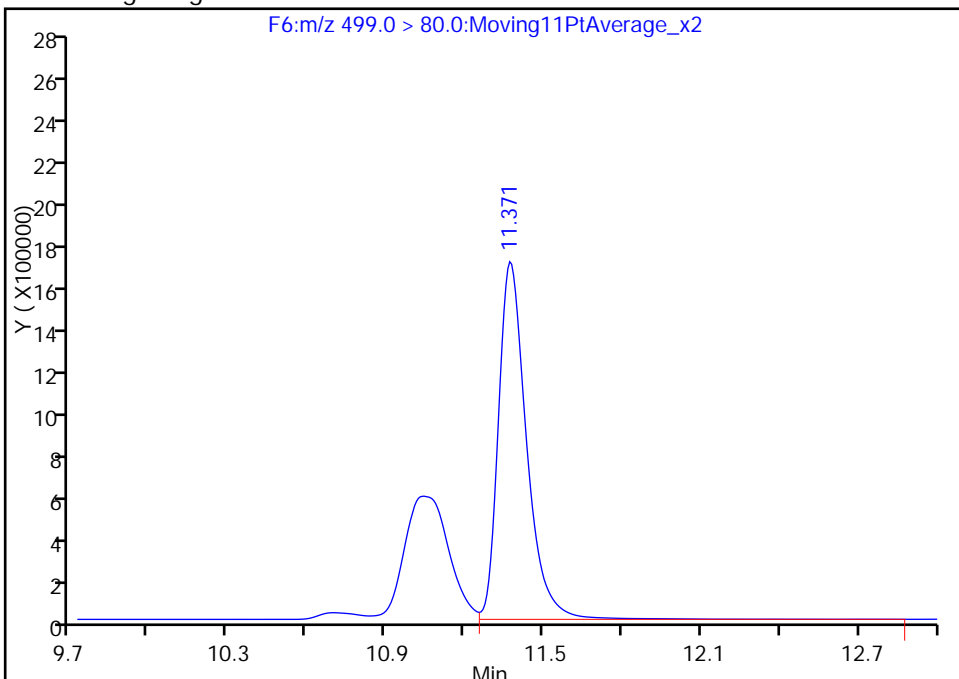
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_082.d
Injection Date: 07-Jan-2016 21:14:44 Instrument ID: A6
Lims ID: 320-16660-A-5-A Lab Sample ID: 320-16660-5
Client ID: 46MW04_1215
Operator ID: JRB ALS Bottle#: 39 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

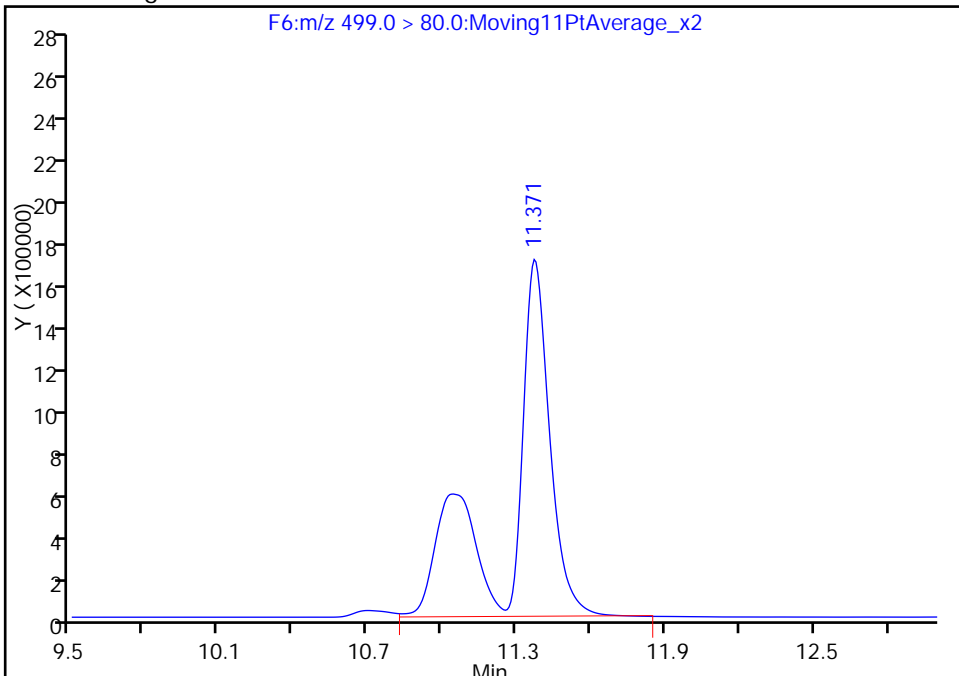
RT: 11.37
Area: 12794975
Amount: 1229.9974
Amount Units: ng/ml

Processing Integration Results



RT: 11.37
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Amount: 1864.0597
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:15:40
Audit Action: Manually Integrated
Audit Reason: Isomers

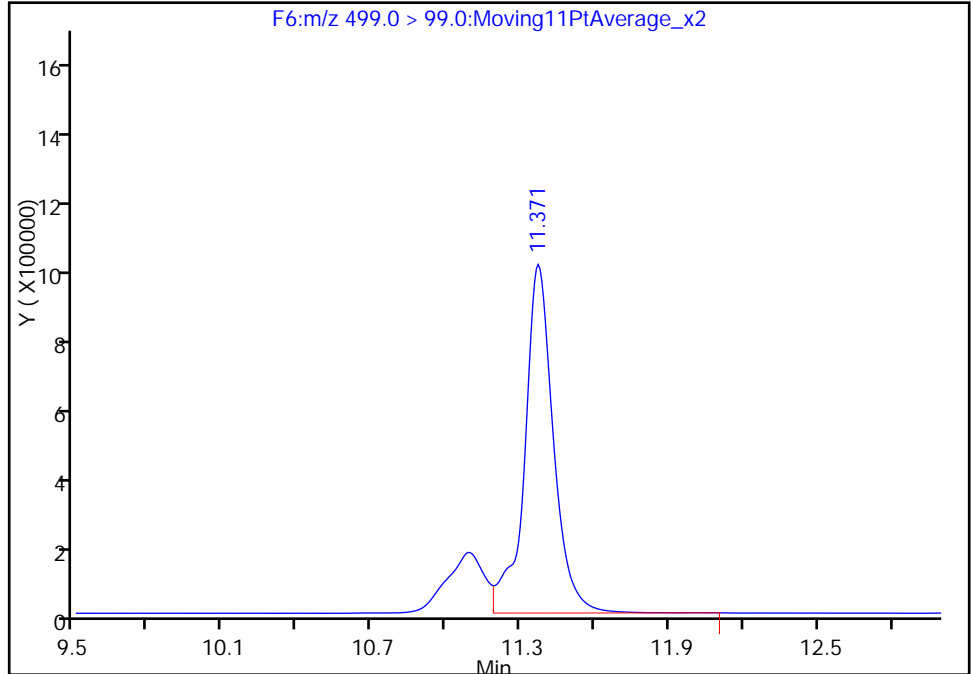
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_082.d
Injection Date: 07-Jan-2016 21:14:44 Instrument ID: A6
Lims ID: 320-16660-A-5-A Lab Sample ID: 320-16660-5
Client ID: 46MW04_1215
Operator ID: JRB ALS Bottle#: 39 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

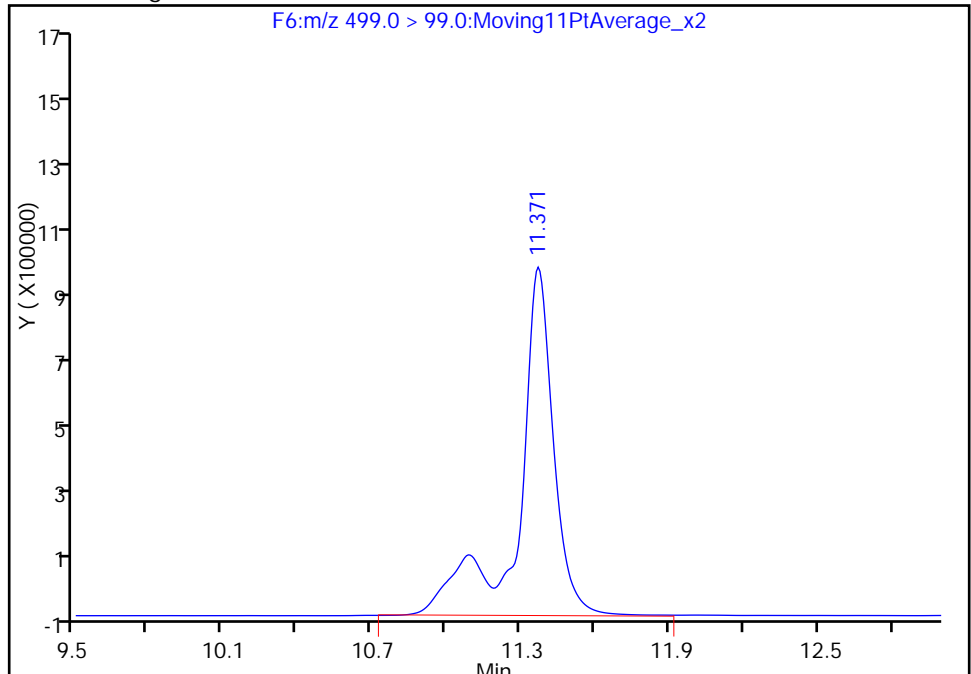
RT: 11.37
Area: 7800027
Amount: 1229.9974
Amount Units: ng/ml

Processing Integration Results



RT: 11.37
Area: 9567040
Amount: 1864.0597
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Client Sample ID: 46MW04_1215 DL Lab Sample ID: 320-16660-5 DL
 Matrix: Water Lab File ID: 08JAN2016A6A_011.d
 Analysis Method: WS-LC-0025 Date Collected: 12/30/2015 14:15
 Extraction Method: 3535 Date Extracted: 01/05/2016 08:39
 Sample wt/vol: 560.1(mL) Date Analyzed: 01/08/2016 14:30
 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.: 97663 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	<i>Perfluorobutanesulfonic acid (PFBS)</i>	28	D J	22	18	8.2
375-85-9	<i>Perfluoroheptanoic acid (PFHpA)</i>	16	J D	22	18	7.2
355-46-4	<i>Perfluorohexanesulfonic acid (PFHxS)</i>	830	D J	22	18	7.8
375-95-1	<i>Perfluorononanoic acid (PFNA)</i>	13	J D	22	18	5.8
1763-23-1	<i>Perfluorooctanesulfonic acid (PFOS)</i>	2800	D M J	36	27	11
335-67-1	<i>Perfluorooctanoic acid (PFOA)</i>	33	D	22	18	6.7

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	117		25-150
STL00994	18O2 PFHxS	112		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_011.d
 Lims ID: 320-16660-A-5-A Lab Sample ID: 320-16660-5
 Client ID: 46MW04_1215
 Sample Type: Client
 Inject. Date: 08-Jan-2016 14:30:11 ALS Bottle#: 34 Worklist Smp#: 5
 Injection Vol: 15.0 ul Dil. Factor: 10.0000
 Sample Info: 320-16660-A-5-A 10x
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 11-Jan-2016 09:49:51 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 08-Jan-2016 15:10:16

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	5.763	5.763	0.0	44956	2.44		4.9	67.4	
2 Perfluorobutyric acid	212.9 > 169.0	5.776	5.763	0.013	16613	1.34			12.6	
D 3 13C5-PFPeA	267.9 > 223.0	6.872	6.863	0.009	119309	3.43		6.9	63.8	
4 Perfluoropentanoic acid	262.9 > 219.0	6.877	6.864	0.013	58695	2.44			8.5	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.992	6.976	0.016	27694	NC			7.0	
	298.9 > 99.0	6.983	6.976	0.007	15515		1.78(0.00-0.00)		19.4	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.992	6.976	0.016	27694	1.59				
22 PFPeS (Perflouro-1-pentanesulfonat	349.0 > 80.0	7.942	7.799	0.143	1323	NC			3.8	
D 6 13C2 PFHxA	315.0 > 270.0	8.100	8.100	0.0	121703	3.72		7.4	129	
7 Perfluorohexanoic acid	313.0 > 269.0	8.105	8.102	0.003	90859	3.46			47.4	
D 8 13C4-PFHpA	367.0 > 322.0	9.323	9.331	-0.008	175628	5.12		10.2	444	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.323	9.335	-0.012	40922	0.9162			20.0	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.352	9.363	-0.011	439944	NC			683	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.352	9.363	-0.011	439944	46.5				
D 11 18O2 PFHxS	403.0 > 84.0	9.352	9.363	-0.011	77037	5.30		11.2	154	

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	10.434	10.452	-0.018		187788	4.85		9.7	446	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.434	10.453	-0.019	1.000	74014	1.84			31.6	
413.0 > 169.0	10.434	10.453	-0.019	1.000	32780		2.26(0.00-0.00)		26.9	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.441	10.456	-0.015	1.000	8160	0.7571				
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.441	10.456	-0.015	1.000	8160	NC			15.6	
D 16 13C4 PFOS										
503.0 > 80.0	11.386	11.405	-0.019		104642	5.60		11.7	397	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.386	11.408	-0.022	1.000	3304692	155.7			1026	M
499.0 > 99.0	11.386	11.408	-0.022	1.000	1610137		2.05(0.00-0.00)		2093	M
D 17 13C5 PFNA										
468.0 > 423.0	11.409	11.427	-0.018		129050	4.02		8.0	485	
18 Perfluorononanoic acid										
463.0 > 419.0	11.401	11.431	-0.030	1.000	16376	0.7440			26.1	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.249	12.260	-0.011	1.000	9581	0.3483			22.9	
D 19 13C2 PFDA										
515.0 > 470.0	12.238	12.262	-0.024		130795	4.24		8.5	252	
D 23 13C8 FOSA										
506.0 > 78.0	12.798	12.805	-0.007		53746	1.26		2.5	102	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.808	12.805	0.003	1.000	2640	0.2501			7.7	
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.964	12.978	-0.014	1.000	4956	-0.6201			8.0	
D 26 13C2 PFUnA										
565.0 > 520.0	12.954	12.979	-0.025		138268	3.67		7.3	266	
D 28 13C2 PFDoA										
615.0 > 570.0	13.574	13.597	-0.023		125261	2.96		5.9	225	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.565	13.597	-0.032	1.000	3305	0.1680			3.7	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.082	14.114	-0.032	1.000	1558	0.0612			4.9	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.524	14.548	-0.024		83183	2.15		4.3	254	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.517	14.549	-0.032	1.000	2428	-0.4548			2.1	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.149	15.177	-0.028	1.000	14465	-5.13			39.9	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.154	15.177	-0.023		137455	2.80		5.6	574	
36 Perfluorooctadecanoic acid										
913.0 > 869.0	15.476	15.517	-0.041	1.000	4264	0.1694			16.0	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_011.d

Injection Date: 08-Jan-2016 14:30:11

Instrument ID: A6

Lims ID: 320-16660-A-5-A

Lab Sample ID: 320-16660-5

Client ID: 46MW04_1215

Operator ID: JRB

ALS Bottle#: 34

Worklist Smp#: 5

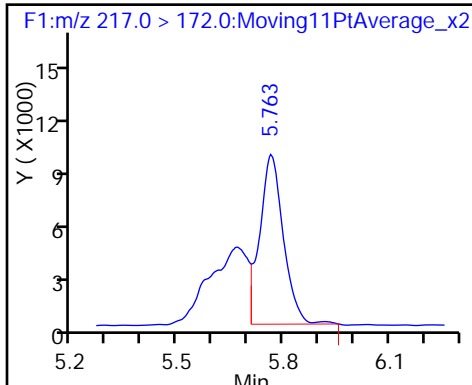
Injection Vol: 15.0 ul

Dil. Factor: 10.0000

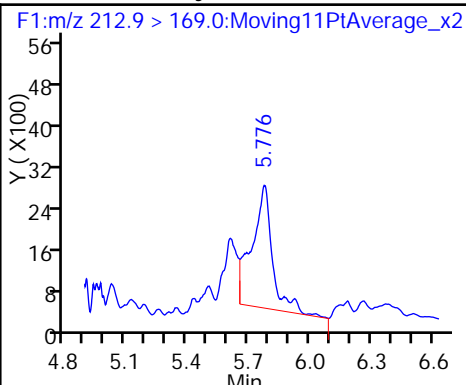
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

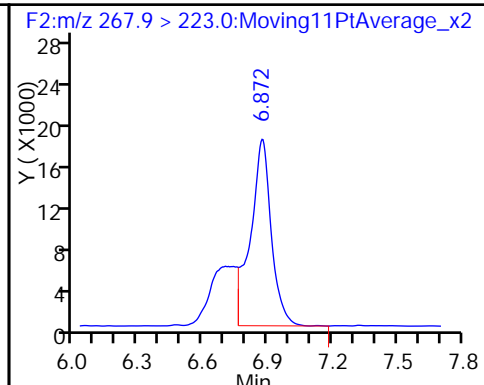
D 1 13C4 PFBA



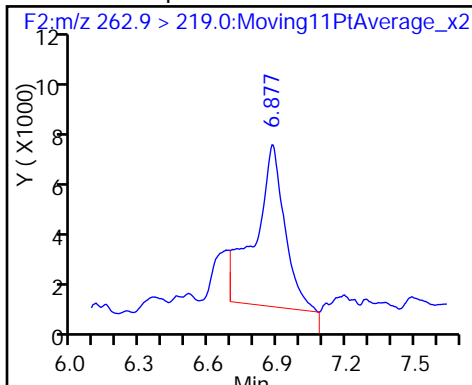
2 Perfluorobutyric acid



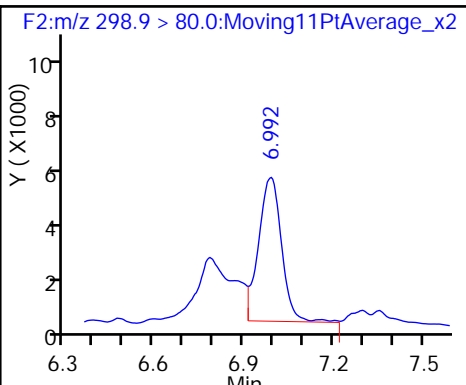
D 3 13C5-PFPeA



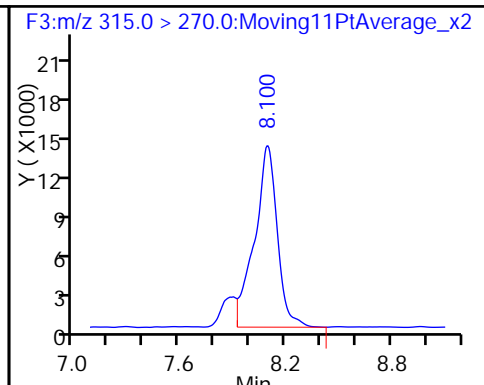
4 Perfluoropentanoic acid



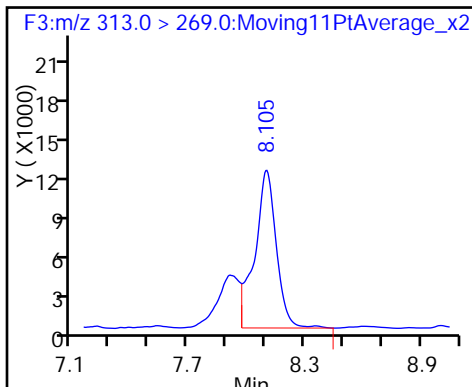
40 Perfluorobutanesulfonic acid



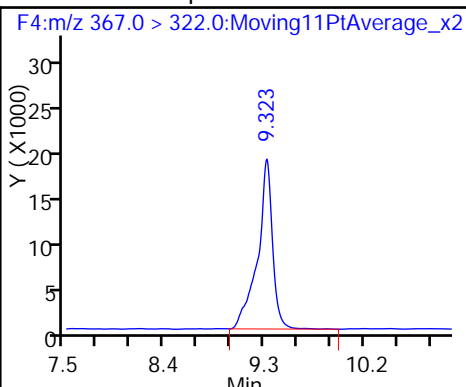
D 6 13C2 PFHxA



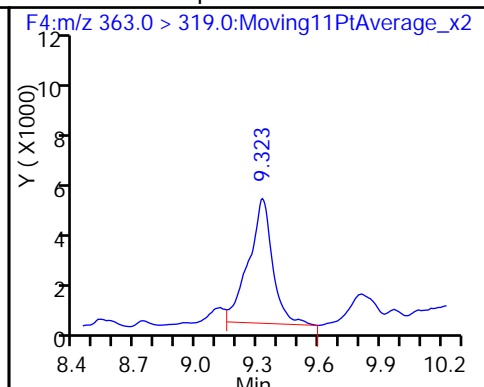
7 Perfluorohexanoic acid



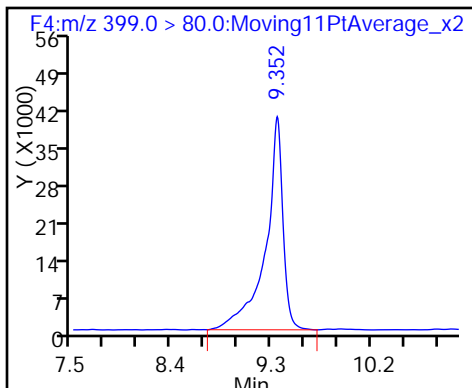
D 8 13C4-PFHpA



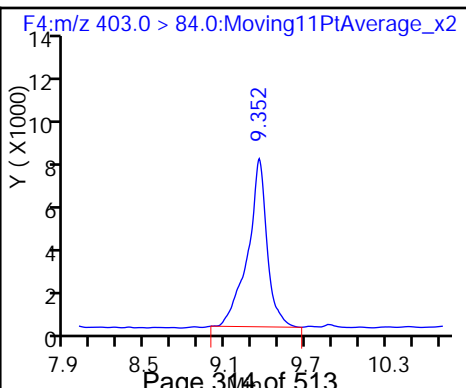
9 Perfluoroheptanoic acid



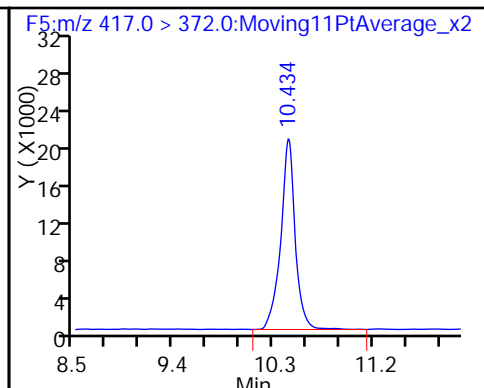
41 Perfluorohexanesulfonic acid

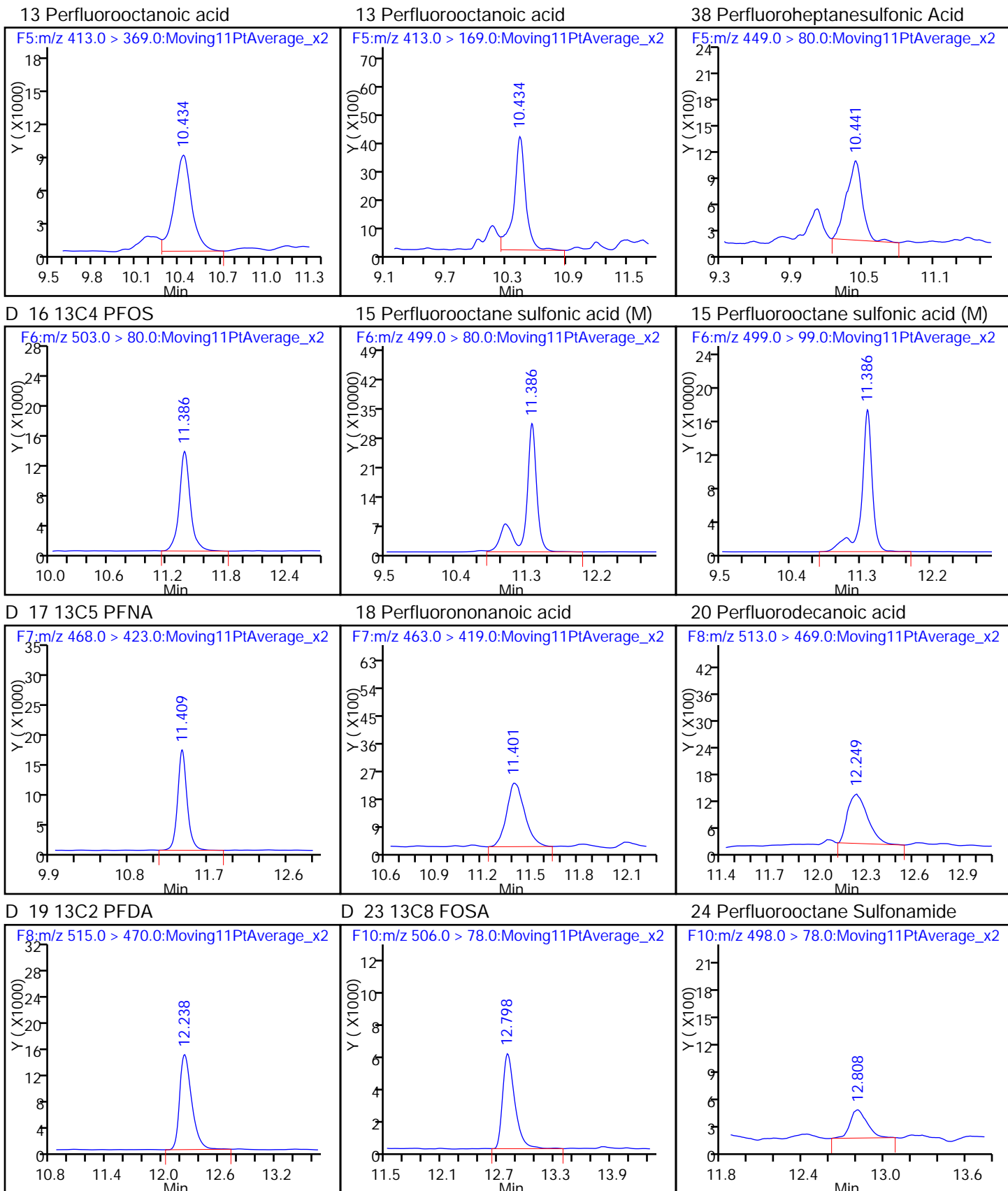


D 11 18O2 PFHxS



D 12 13C4 PFOA

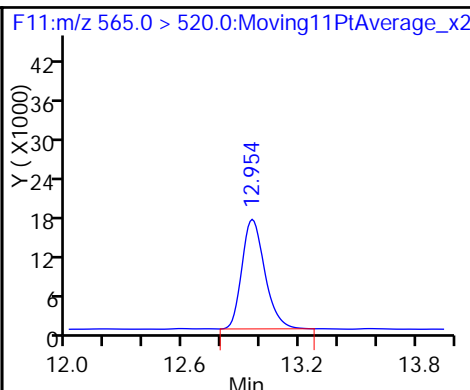
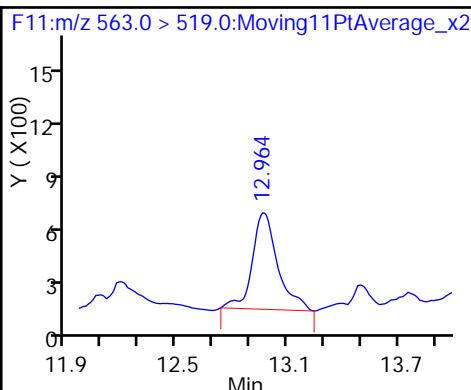
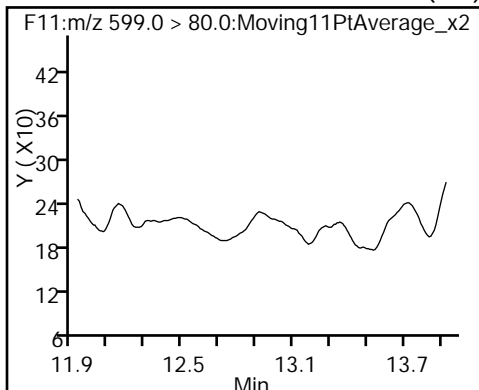




39 Perfluorodecane Sulfonic acid (ND)

27 Perfluoroundecanoic acid

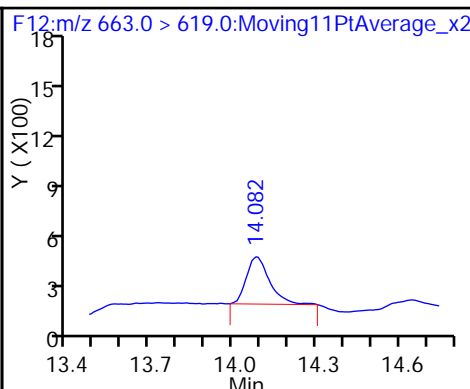
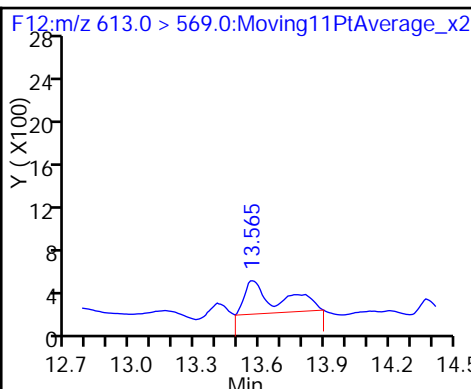
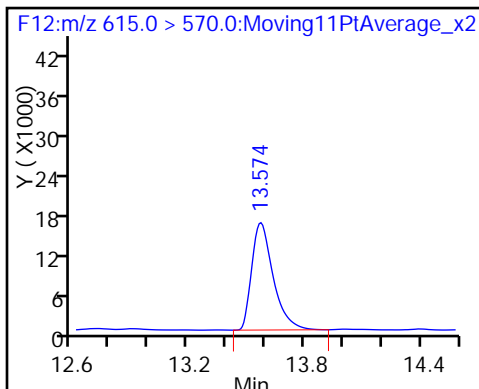
D 26 13C2 PFUnA



D 28 13C2 PFDaA

29 Perfluorododecanoic acid

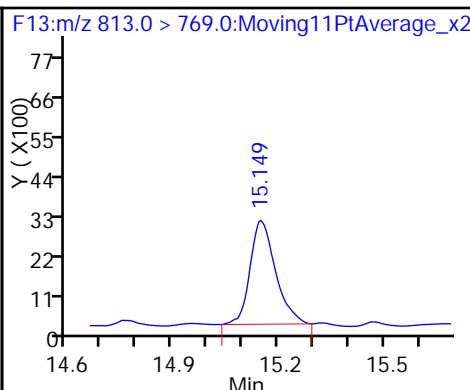
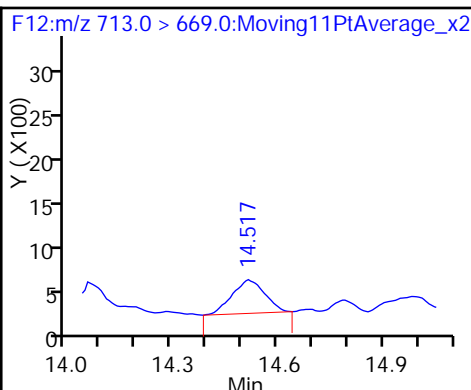
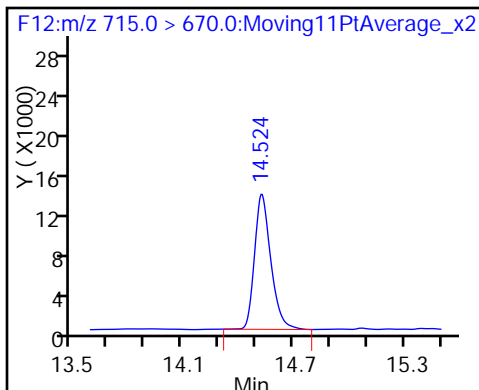
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

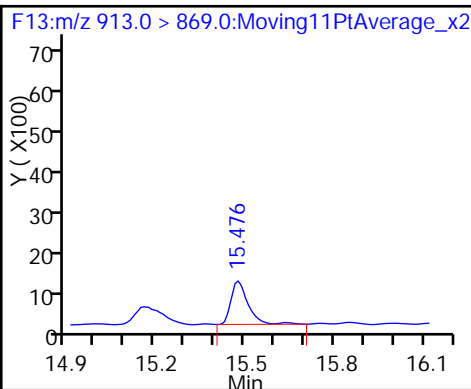
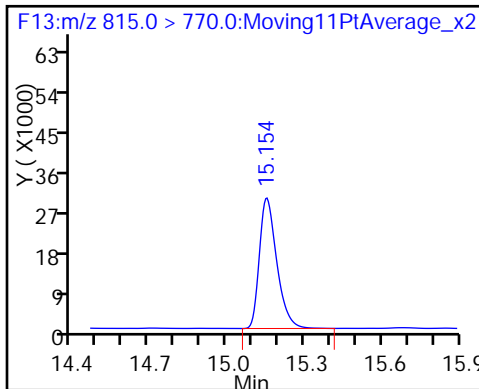
32 Perfluorotetradecanoic acid

34 Perfluorohexadecanoic acid



D 35 13C2-PFHxDA

36 Perfluorooctadecanoic acid



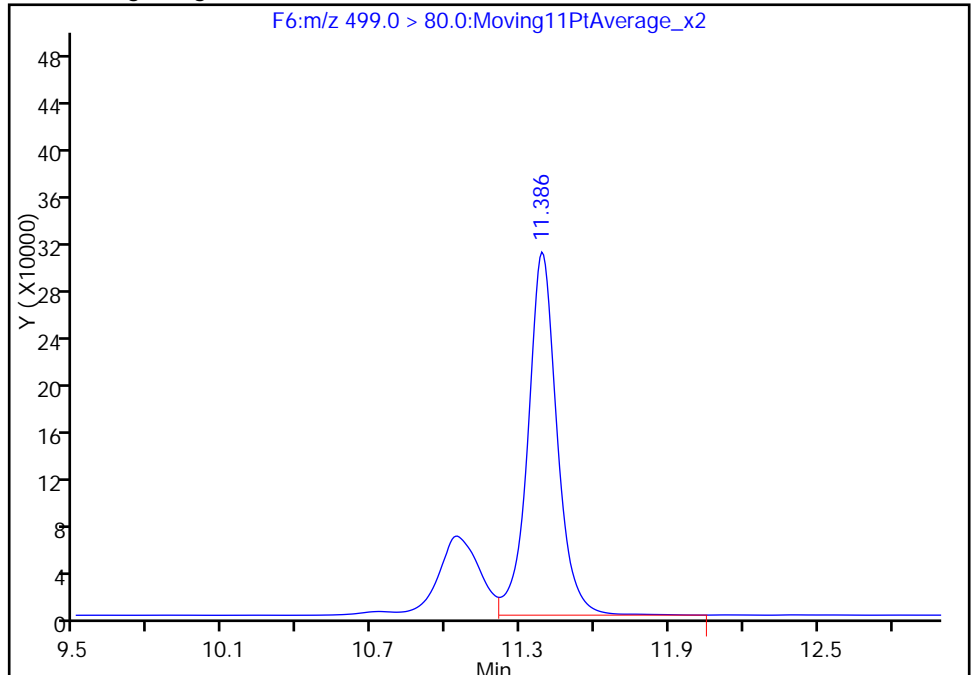
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_011.d
Injection Date: 08-Jan-2016 14:30:11 Instrument ID: A6
Lims ID: 320-16660-A-5-A Lab Sample ID: 320-16660-5
Client ID: 46MW04_1215
Operator ID: JRB ALS Bottle#: 34 Worklist Smp#: 5
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:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

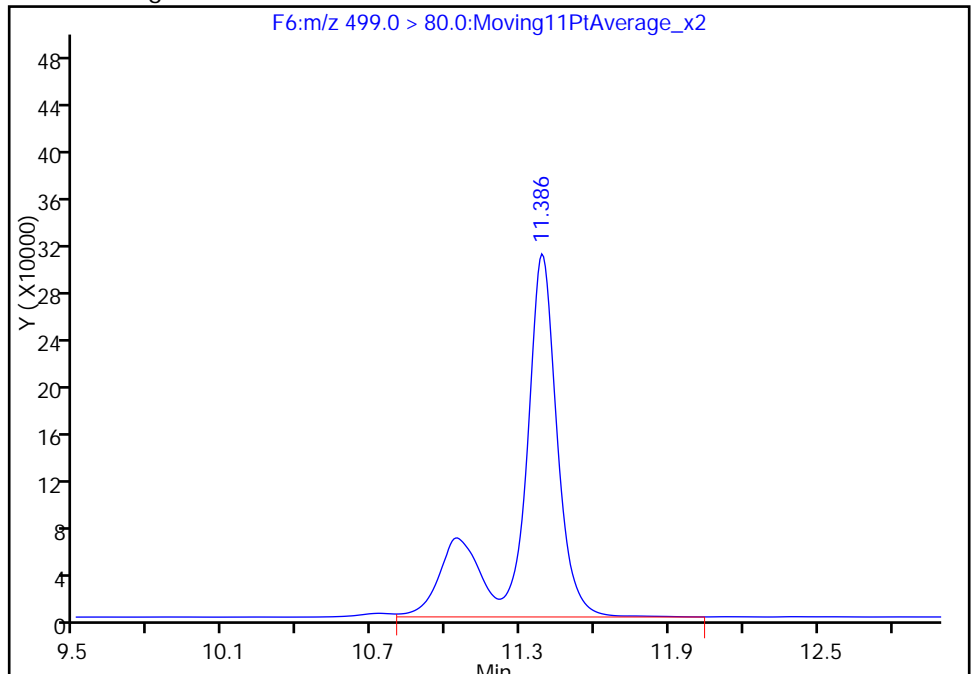
RT: 11.39
Area: 2533463
Amount: 119.3955
Amount Units: ng/ml

Processing Integration Results



RT: 11.39
Area: 3304692
Amount: 155.7416
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 15:10:16
Audit Action: Manually Integrated
Audit Reason: Isomers

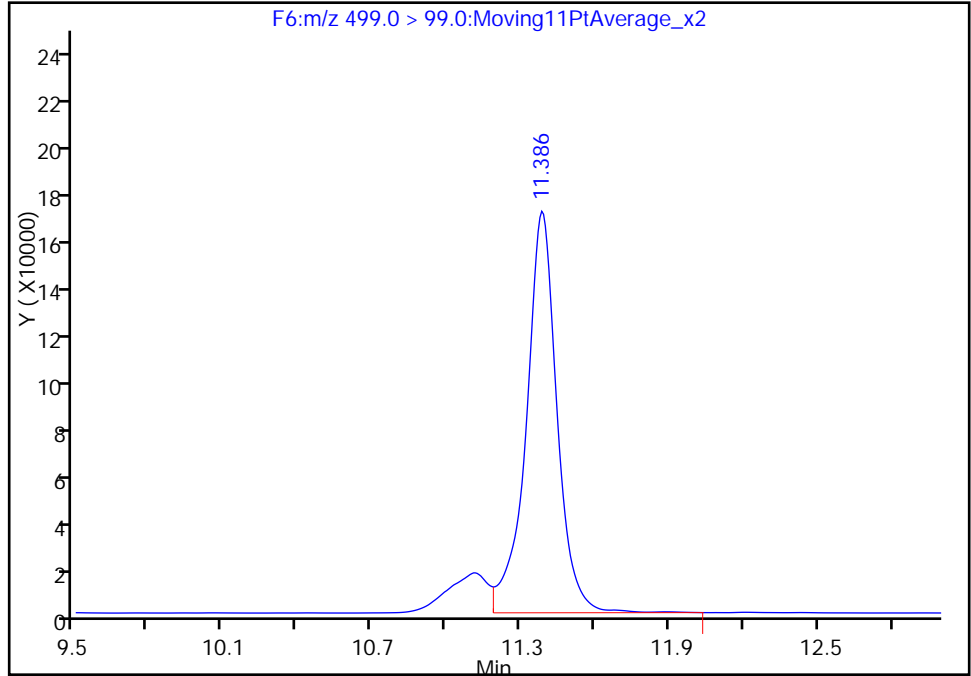
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_011.d
Injection Date: 08-Jan-2016 14:30:11 Instrument ID: A6
Lims ID: 320-16660-A-5-A Lab Sample ID: 320-16660-5
Client ID: 46MW04_1215
Operator ID: JRB ALS Bottle#: 34 Worklist Smp#: 5
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:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

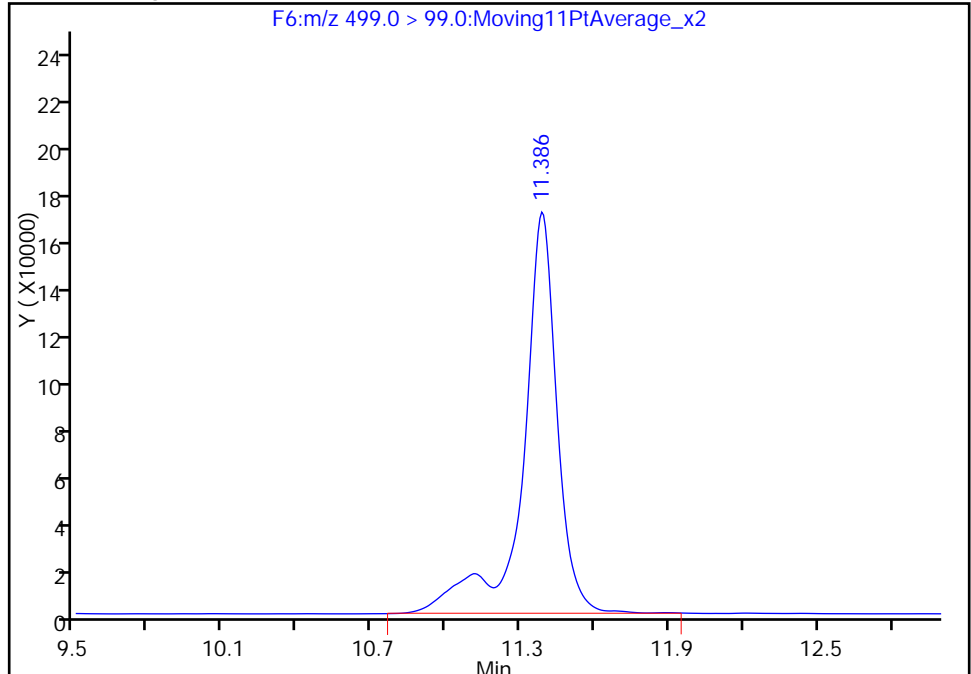
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Area: 1434500
Amount: 119.3955
Amount Units: ng/ml

Processing Integration Results



RT: 11.39
Area: 1610137
Amount: 155.7416
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 15:10:16
Audit Action: Manually Integrated
Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Client Sample ID: 46MW05_1215 Lab Sample ID: 320-16660-6
 Matrix: Water Lab File ID: 06JAN2016A6A_085.d
 Analysis Method: WS-LC-0025 Date Collected: 12/30/2015 12:15
 Extraction Method: 3535 Date Extracted: 01/05/2016 08:39
 Sample wt/vol: 474 (mL) Date Analyzed: 01/07/2016 22:18
 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.: 97577 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	70		2.6	2.1	0.97
375-85-9	Perfluoroheptanoic acid (PFHpA)	39		2.6	2.1	0.85
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1600	M J	2.6	2.1	0.92
375-95-1	Perfluorononanoic acid (PFNA)	1.0	J	2.6	2.1	0.69
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2000	M J	4.2	3.2	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	94		2.6	2.1	0.79

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	66		25-150
STL00990	13C4 PFOA	66		25-150
STL00991	13C4 PFOS	82		25-150
STL01892	13C4-PFHpA	58		25-150
STL00994	18O2 PFHxS	83		25-150
STL00995	13C5 PFNA	58		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_085.d
 Lims ID: 320-16660-A-6-A Lab Sample ID: 320-16660-6
 Client ID: 46MW05_1215
 Sample Type: Client
 Inject. Date: 07-Jan-2016 22:18:25 ALS Bottle#: 42 Worklist Smp#: 57
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-16660-A-6-A
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 14:53:40 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 08-Jan-2016 09:18:57

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	6.955	6.976	-0.021	1.000	423996	33.1			
D 6 13C2 PFHxA	315.0 > 270.0	8.078	8.100	-0.022		1080922	33.0	66.1	2922	
D 8 13C4-PFHpA	367.0 > 322.0	9.294	9.331	-0.037		1000072	29.2	58.3	3670	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.294	9.335	-0.041	1.000	368209	18.3		108	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.329	9.363	-0.034	1.000	5388269	772.6			EM EM
D 11 18O2 PFHxS	403.0 > 84.0	9.329	9.363	-0.034		567856	39.1	82.6	1242	
D 12 13C4 PFOA	417.0 > 372.0	10.413	10.452	-0.039		1273721	32.9	65.9	4224	
13 Perfluorooctanoic acid	413.0 > 369.0	10.413	10.453	-0.040	1.000	1218312	44.6		91.7	
	413.0 > 169.0	10.413	10.453	-0.040	1.000	446844	2.73(0.00-0.00)		63.5	
D 16 13C4 PFOS	503.0 > 80.0	11.364	11.405	-0.041		732720	39.2	82.0	1979	
15 Perfluorooctane sulfonic acid	499.0 > 80.0	11.017	11.408	-0.391	1.000	14198210	955.6		80.9	EM
	499.0 > 99.0	11.364	11.408	-0.044	1.032	5819344	2.44(0.00-0.00)		1594	M
D 17 13C5 PFNA	468.0 > 423.0	11.387	11.427	-0.040		927485	28.9	57.8	1963	
18 Perfluorononanoic acid	463.0 > 419.0	11.394	11.431	-0.037	1.000	7781	0.4919		9.2	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_085.d

Injection Date: 07-Jan-2016 22:18:25

Instrument ID: A6

Lims ID: 320-16660-A-6-A

Lab Sample ID: 320-16660-6

Client ID: 46MW05_1215

Operator ID: JRB

ALS Bottle#: 42

Worklist Smp#: 57

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

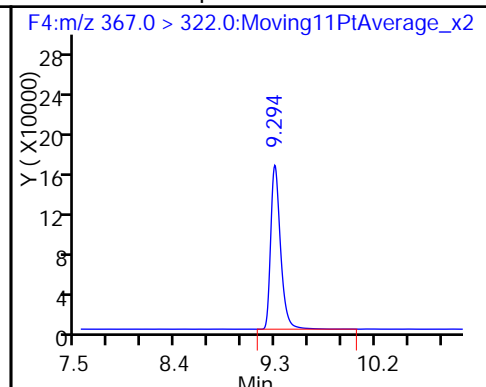
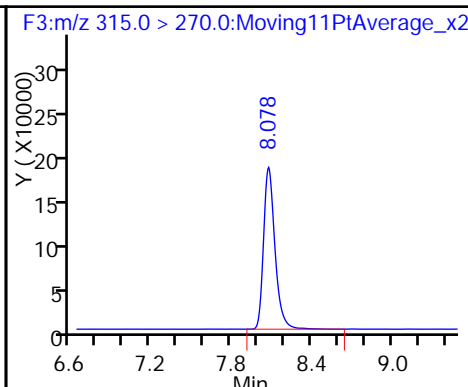
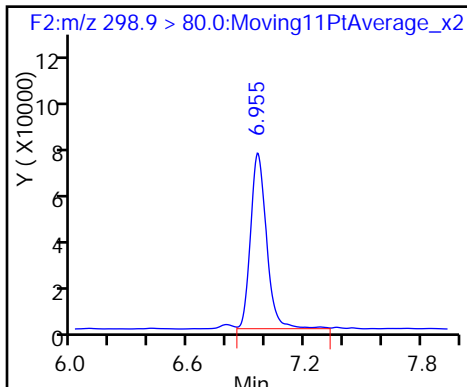
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxA

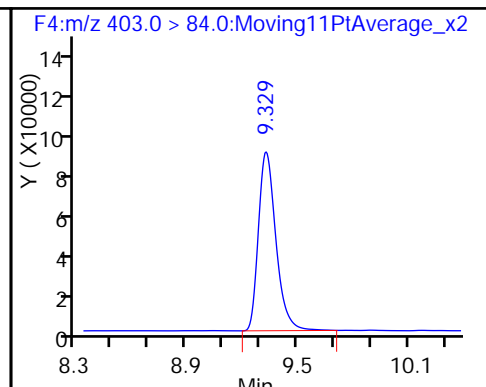
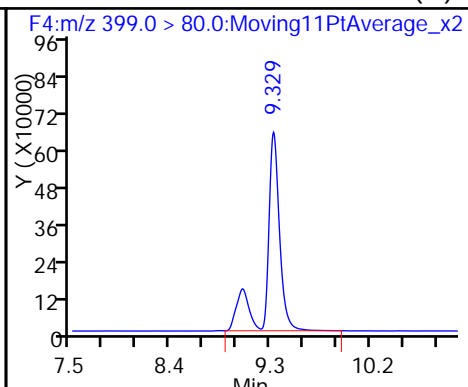
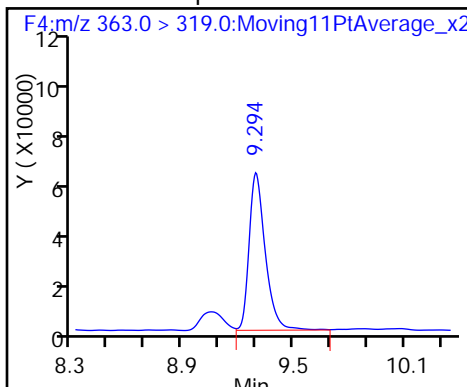
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid

41 Perfluorohexanesulfonic acid (M)

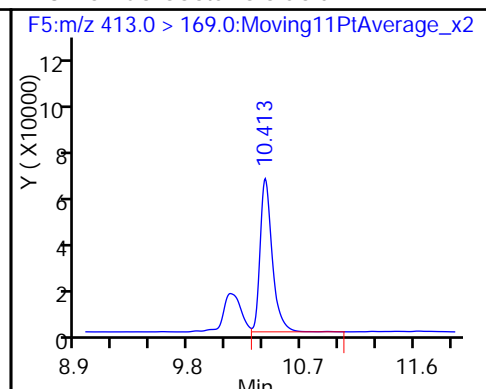
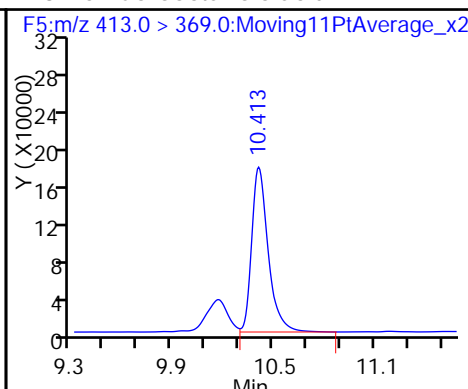
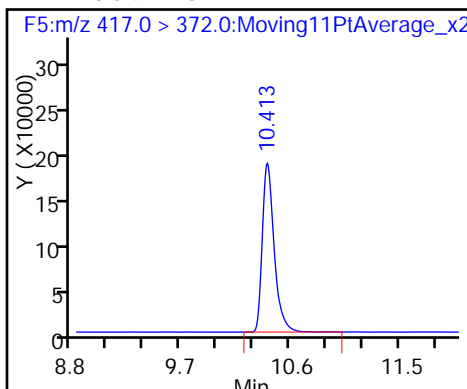
D 11 18O2 PFHxS



D 12 13C4 PFOA

13 Perfluorooctanoic acid

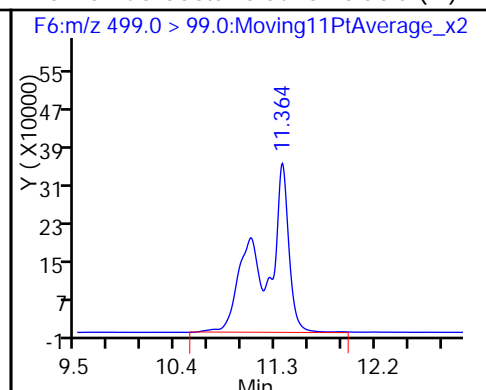
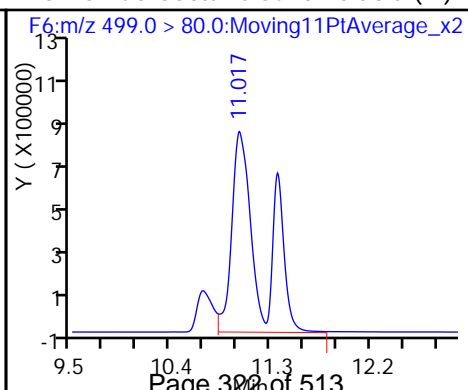
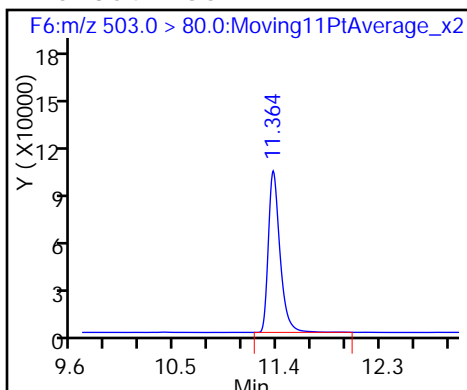
13 Perfluorooctanoic acid



D 16 13C4 PFOS

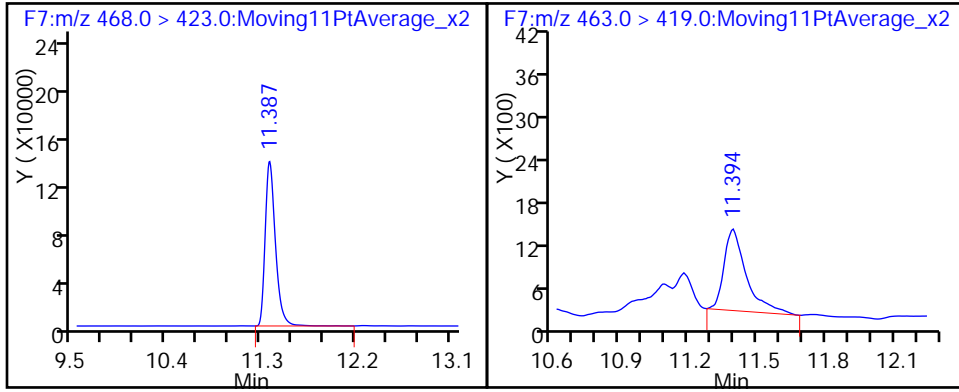
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid



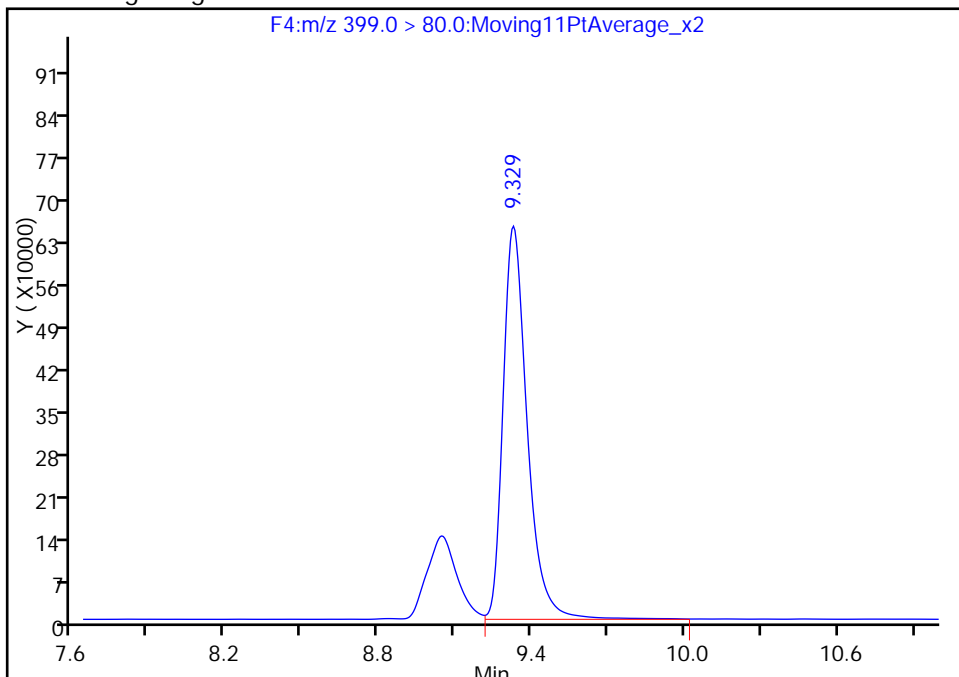
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_085.d
Injection Date: 07-Jan-2016 22:18:25 Instrument ID: A6
Lims ID: 320-16660-A-6-A Lab Sample ID: 320-16660-6
Client ID: 46MW05_1215
Operator ID: JRB ALS Bottle#: 42 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:M/RM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

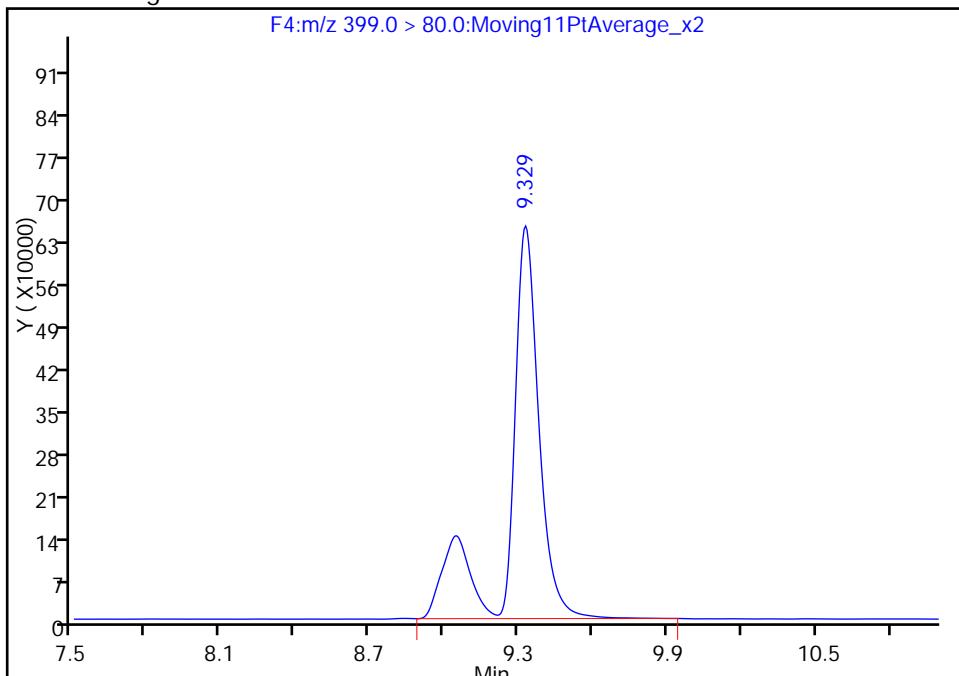
RT: 9.33
Area: 4317403
Amount: 619.0684
Amount Units: ng/ml

Processing Integration Results



RT: 9.33
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Amount: 772.6189
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:18:57
Audit Action: Manually Integrated
Audit Reason: Isomers

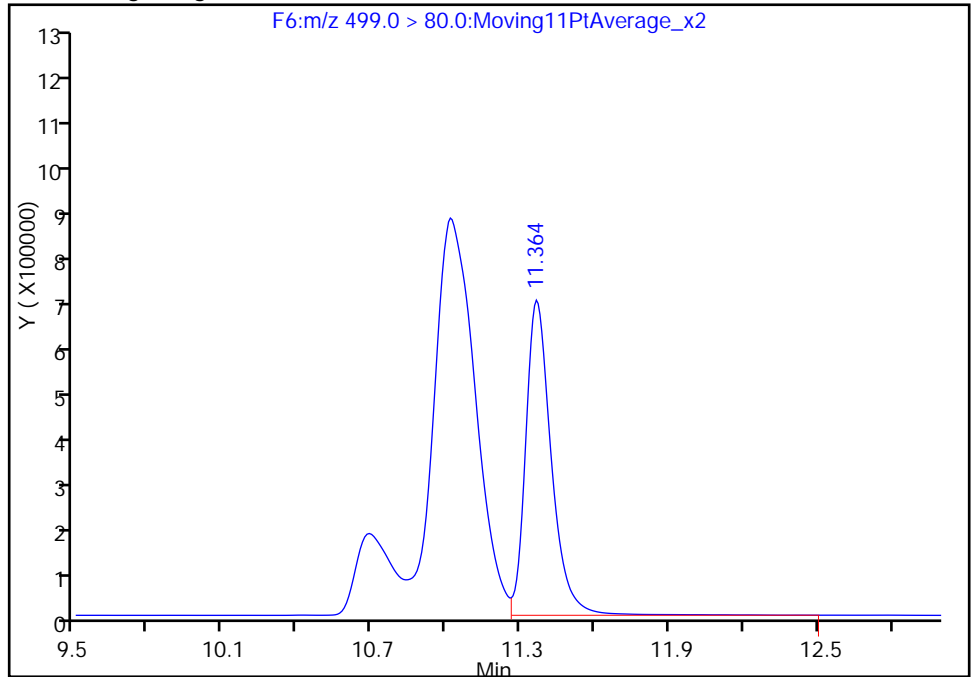
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_085.d
Injection Date: 07-Jan-2016 22:18:25 Instrument ID: A6
Lims ID: 320-16660-A-6-A Lab Sample ID: 320-16660-6
Client ID: 46MW05_1215
Operator ID: JRB ALS Bottle#: 42 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

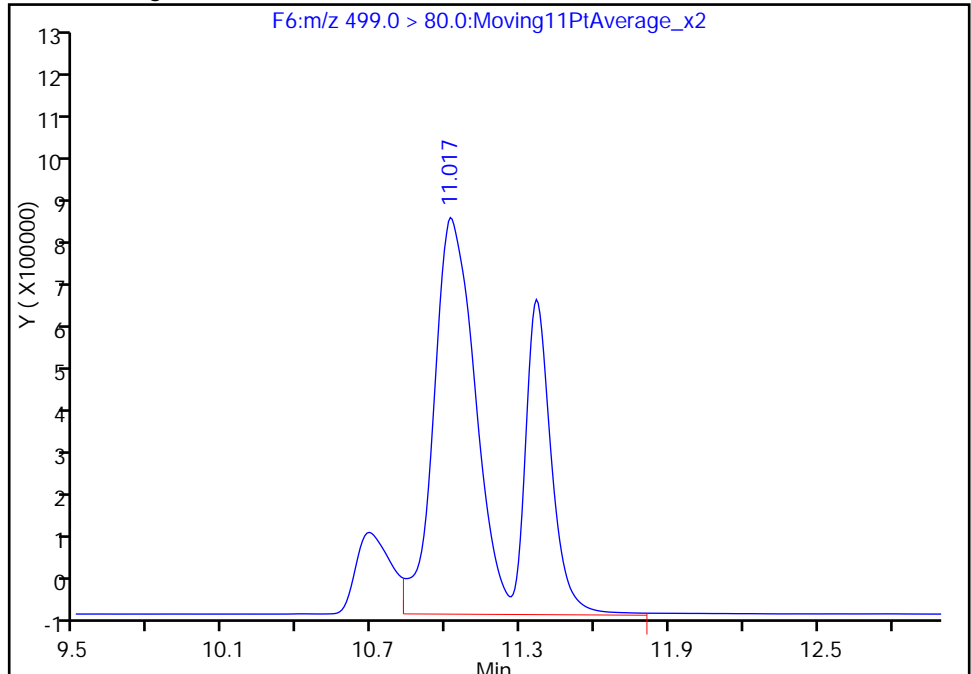
RT: 11.36
Area: 4679699
Amount: 314.9629
Amount Units: ng/ml

Processing Integration Results



RT: 11.02
Area: 14198210
Amount: 955.5977
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:18:57
Audit Action: Manually Integrated
Audit Reason: Isomers

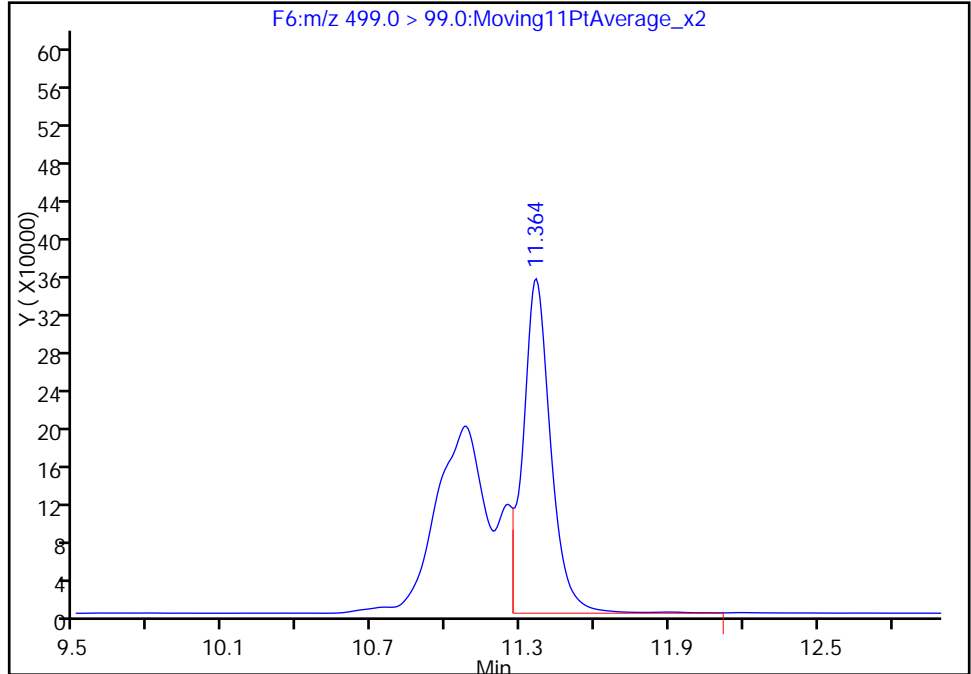
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_085.d
Injection Date: 07-Jan-2016 22:18:25 Instrument ID: A6
Lims ID: 320-16660-A-6-A Lab Sample ID: 320-16660-6
Client ID: 46MW05_1215
Operator ID: JRB ALS Bottle#: 42 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

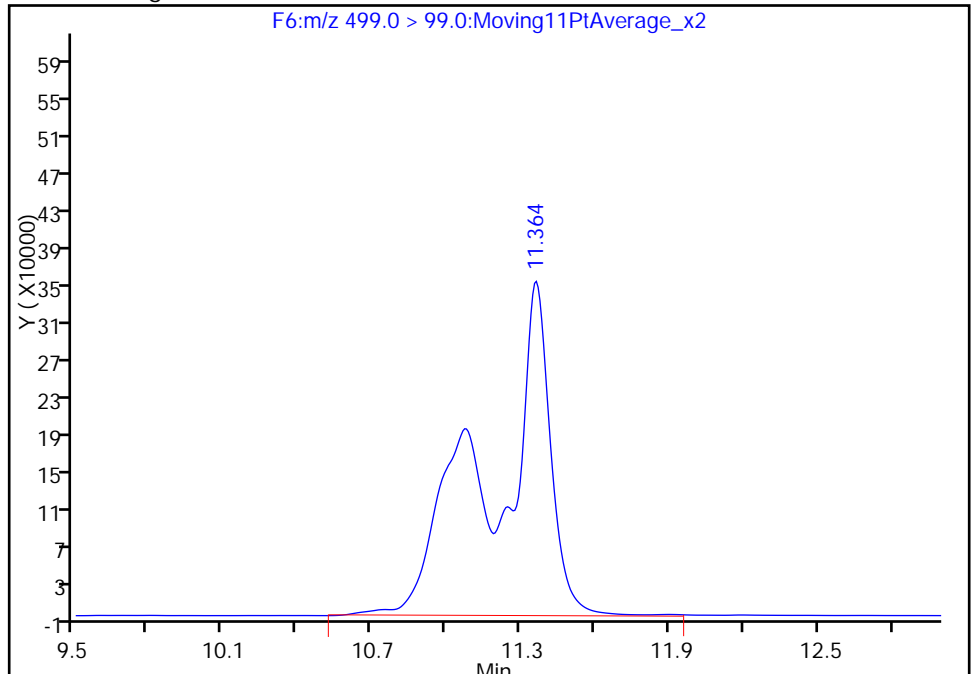
RT: 11.36
Area: 2732178
Amount: 314.9629
Amount Units: ng/ml

Processing Integration Results



RT: 11.36
Area: 5819344
Amount: 955.5977
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Client Sample ID: 46MW05_1215 DL Lab Sample ID: 320-16660-6 DL
 Matrix: Water Lab File ID: 08JAN2016A6A_014.d
 Analysis Method: WS-LC-0025 Date Collected: 12/30/2015 12:15
 Extraction Method: 3535 Date Extracted: 01/05/2016 08:39
 Sample wt/vol: 474 (mL) Date Analyzed: 01/08/2016 15:33
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 5
 Injection Volume: 15 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 97663 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	<i>Perfluorobutanesulfonic acid (PFBS)</i>	55	D	13	11	4.8
375-85-9	<i>Perfluoroheptanoic acid (PFHpA)</i>	41	D	13	11	4.2
355-46-4	<i>Perfluorohexanesulfonic acid (PFHxS)</i>	1500	D M	13	11	4.6
375-95-1	<i>Perfluorononanoic acid (PFNA)</i>	11	U	13	11	3.4
1763-23-1	<i>Perfluorooctanesulfonic acid (PFOS)</i>	1900	D M	21	16	6.7
335-67-1	<i>Perfluorooctanoic acid (PFOA)</i>	100	D	13	11	3.9

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	122		25-150
STL00994	18O2 PFHxS	124		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_014.d
 Lims ID: 320-16660-A-6-A Lab Sample ID: 320-16660-6
 Client ID: 46MW05_1215
 Sample Type: Client
 Inject. Date: 08-Jan-2016 15:33:50 ALS Bottle#: 37 Worklist Smp#: 8
 Injection Vol: 15.0 ul Dil. Factor: 5.0000
 Sample Info: 320-16660-A-6-A 5x
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 11-Jan-2016 09:49:51 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 08-Jan-2016 16:42:46

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	6.983	6.976	0.007	1.000	100384	5.20			
D 6 13C2 PFHxA	315.0 > 270.0	8.100	8.100	0.0		267079	8.17	16.3	627	
D 8 13C4-PFHpA	367.0 > 322.0	9.317	9.331	-0.014		271791	7.93	15.9	928	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.317	9.335	-0.018	1.000	110475	3.84		40.8	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.346	9.363	-0.017	1.000	1510673	143.8			M M
D 11 18O2 PFHxS	403.0 > 84.0	9.346	9.363	-0.017		171127	11.8	24.9	464	
D 12 13C4 PFOA	417.0 > 372.0	10.433	10.452	-0.019		315938	8.17	16.3	649	
13 Perfluorooctanoic acid	413.0 > 369.0	10.433	10.453	-0.020	1.000	322182	9.51		61.1	
	413.0 > 169.0	10.433	10.453	-0.020	1.000	121996	2.64(0.00-0.00)		53.5	
D 16 13C4 PFOS	503.0 > 80.0	11.393	11.405	-0.012		218700	11.7	24.5	390	
15 Perfluorooctane sulfonic acid	499.0 > 80.0	11.045	11.408	-0.363	1.000	4070001	183.6		86.1	M
	499.0 > 99.0	11.386	11.408	-0.022	1.031	1730919	2.35(0.00-0.00)		2934	M
D 17 13C5 PFNA	468.0 > 423.0	11.416	11.427	-0.011		251554	7.84	15.7	637	
18 Perfluorononanoic acid	463.0 > 419.0	11.394	11.431	-0.037	1.000	5123	0.2388		8.0	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_014.d

Injection Date: 08-Jan-2016 15:33:50

Instrument ID: A6

Lims ID: 320-16660-A-6-A

Lab Sample ID: 320-16660-6

Client ID: 46MW05_1215

Operator ID: JRB

ALS Bottle#: 37

Worklist Smp#: 8

Injection Vol: 15.0 ul

Dil. Factor: 5.0000

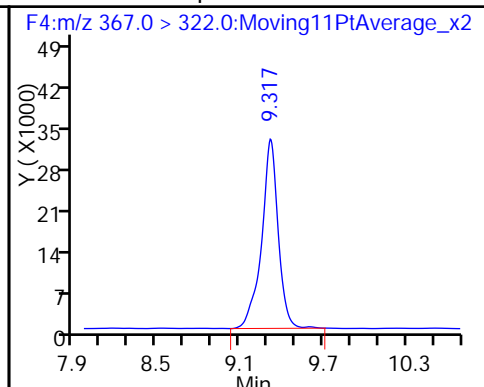
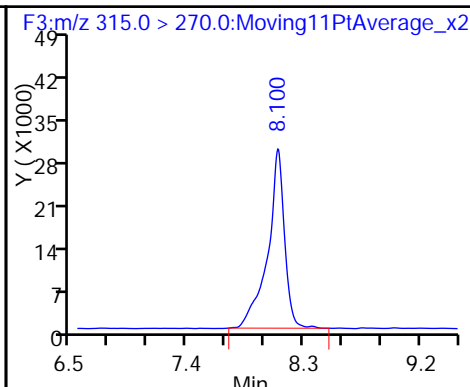
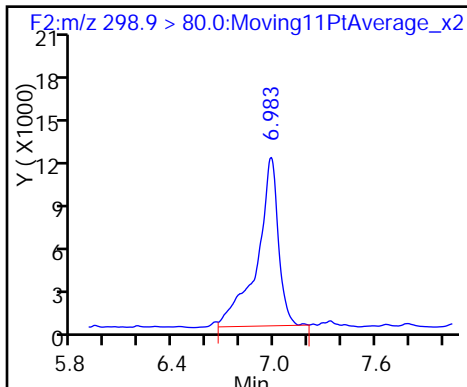
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid

D 6 13C2 PFHxA

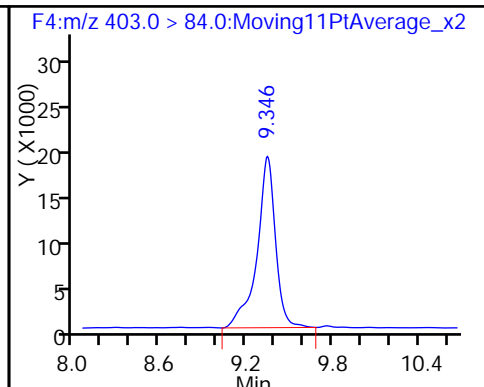
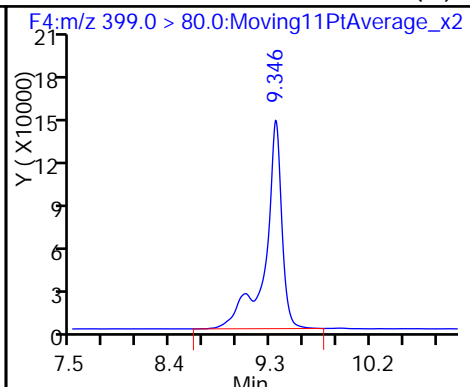
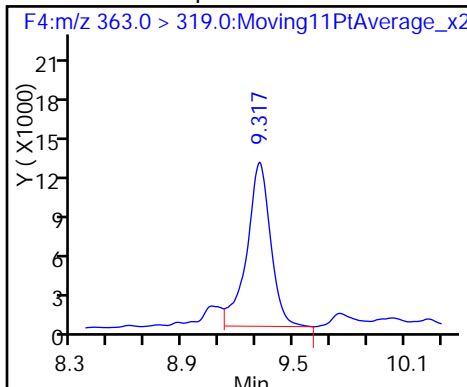
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid

41 Perfluorohexanesulfonic acid (M)

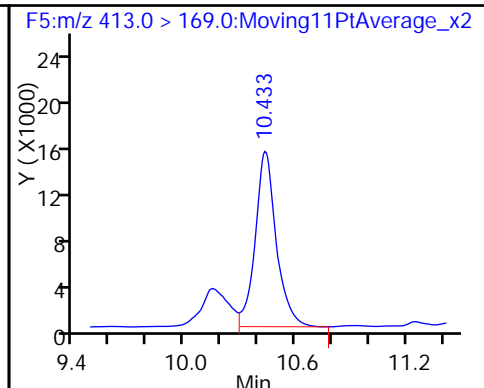
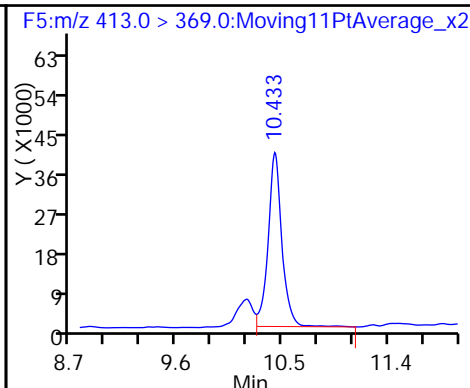
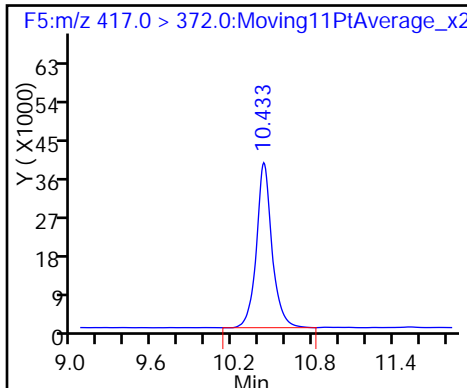
D 11 18O2 PFHxS



D 12 13C4 PFOA

13 Perfluorooctanoic acid

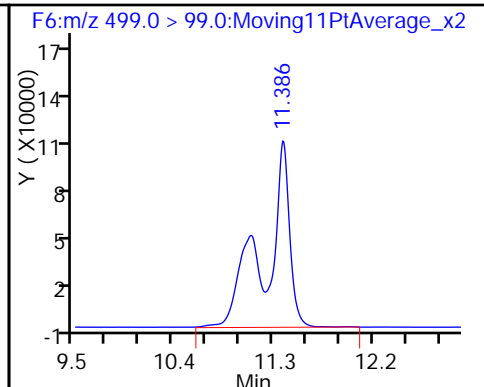
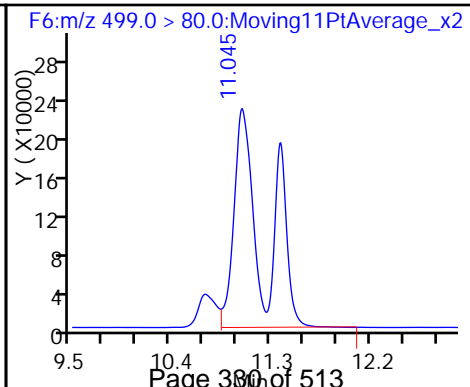
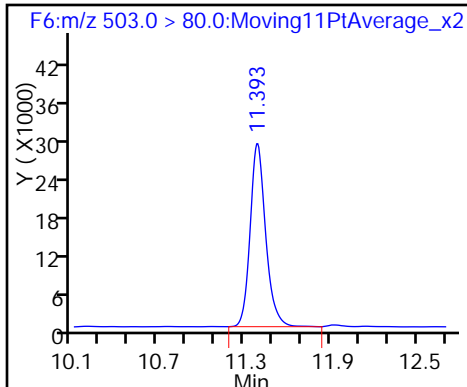
13 Perfluorooctanoic acid



D 16 13C4 PFOS

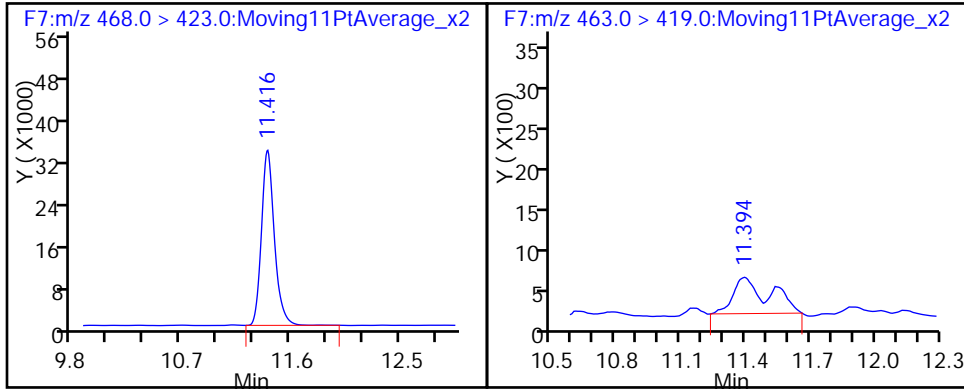
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid



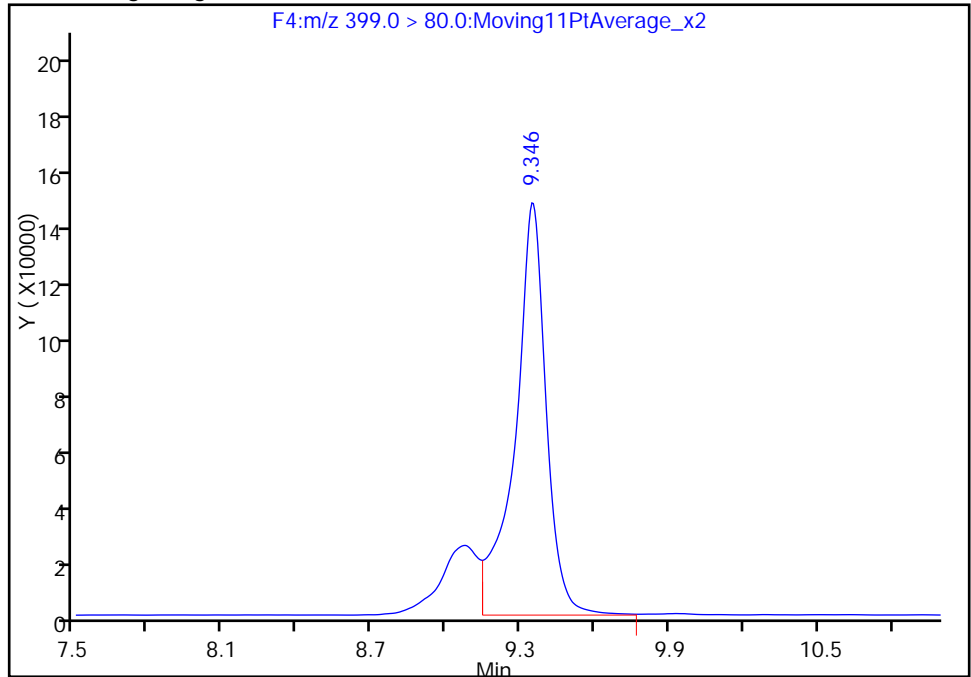
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_014.d
Injection Date: 08-Jan-2016 15:33:50 Instrument ID: A6
Lims ID: 320-16660-A-6-A Lab Sample ID: 320-16660-6
Client ID: 46MW05_1215
Operator ID: JRB ALS Bottle#: 37 Worklist Smp#: 8
Injection Vol: 15.0 ul Dil. Factor: 5.0000
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

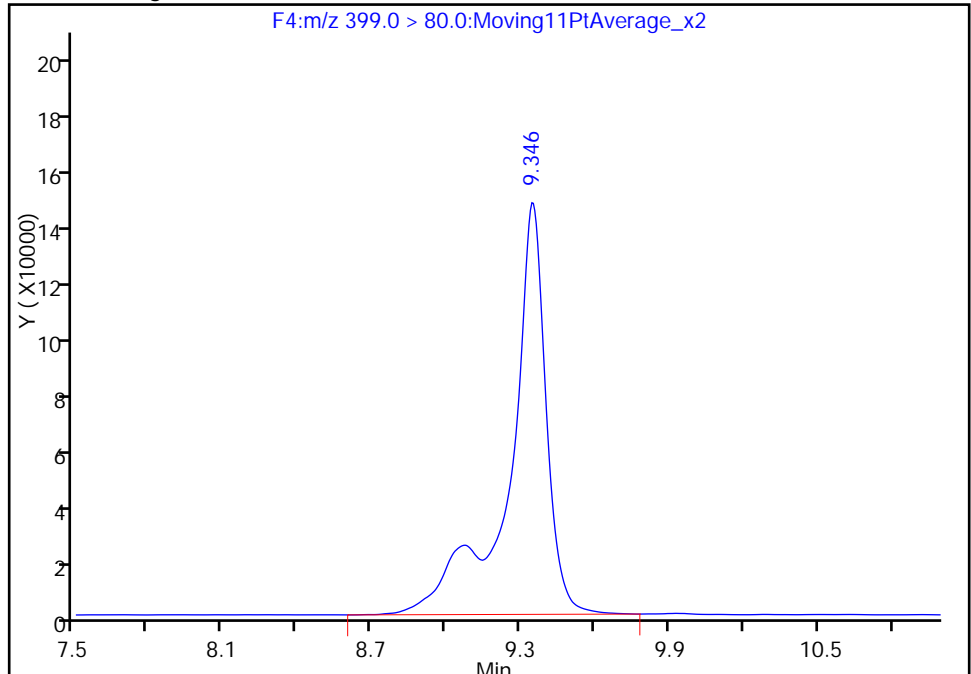
RT: 9.35
Area: 1258292
Amount: 119.7422
Amount Units: ng/ml

Processing Integration Results



RT: 9.35
Area: 1510673
Amount: 143.7594
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 16:42:46
Audit Action: Manually Integrated
Audit Reason: Isomers

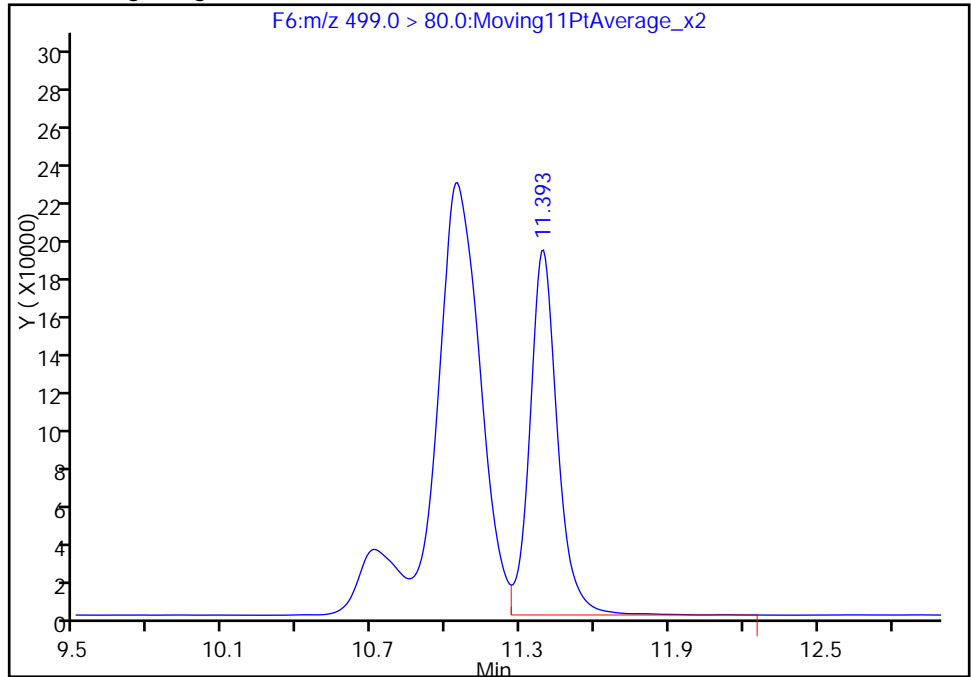
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_014.d
Injection Date: 08-Jan-2016 15:33:50 Instrument ID: A6
Lims ID: 320-16660-A-6-A Lab Sample ID: 320-16660-6
Client ID: 46MW05_1215
Operator ID: JRB ALS Bottle#: 37 Worklist Smp#: 8
Injection Vol: 15.0 ul Dil. Factor: 5.0000
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

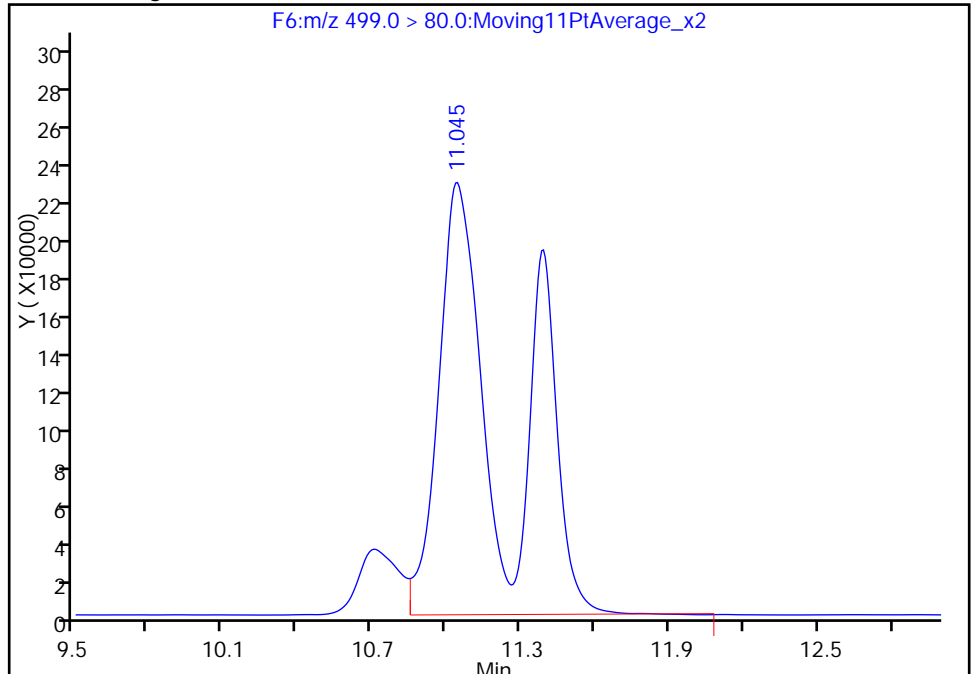
RT: 11.39
Area: 1479268
Amount: 66.712565
Amount Units: ng/ml

Processing Integration Results



RT: 11.05
Area: 4070001
Amount: 183.5504
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 16:42:46
Audit Action: Manually Integrated
Audit Reason: Isomers

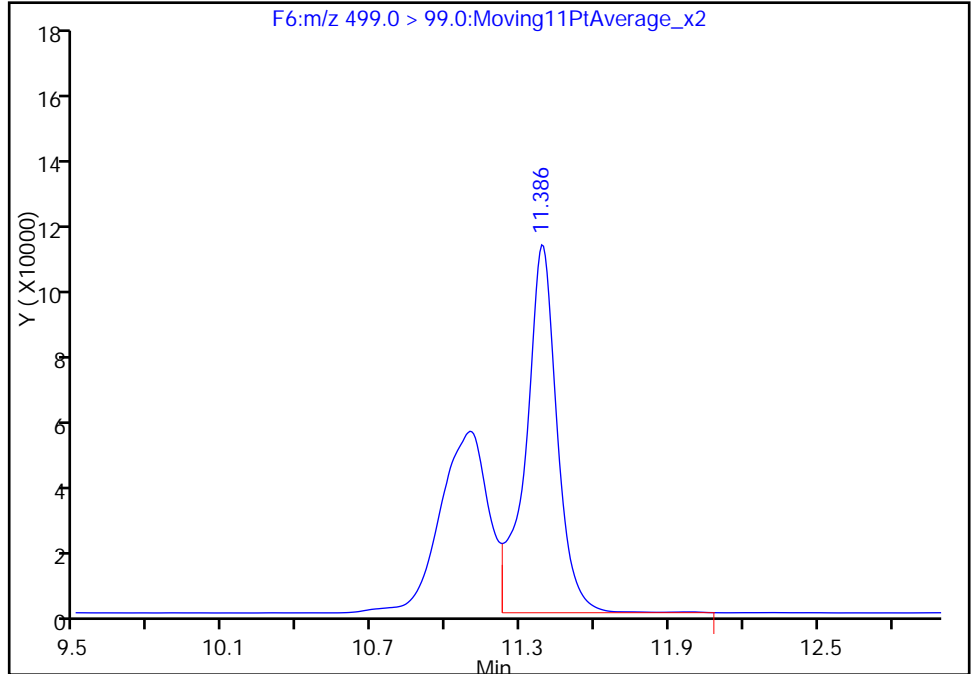
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_014.d
Injection Date: 08-Jan-2016 15:33:50 Instrument ID: A6
Lims ID: 320-16660-A-6-A Lab Sample ID: 320-16660-6
Client ID: 46MW05_1215
Operator ID: JRB ALS Bottle#: 37 Worklist Smp#: 8
Injection Vol: 15.0 ul Dil. Factor: 5.0000
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

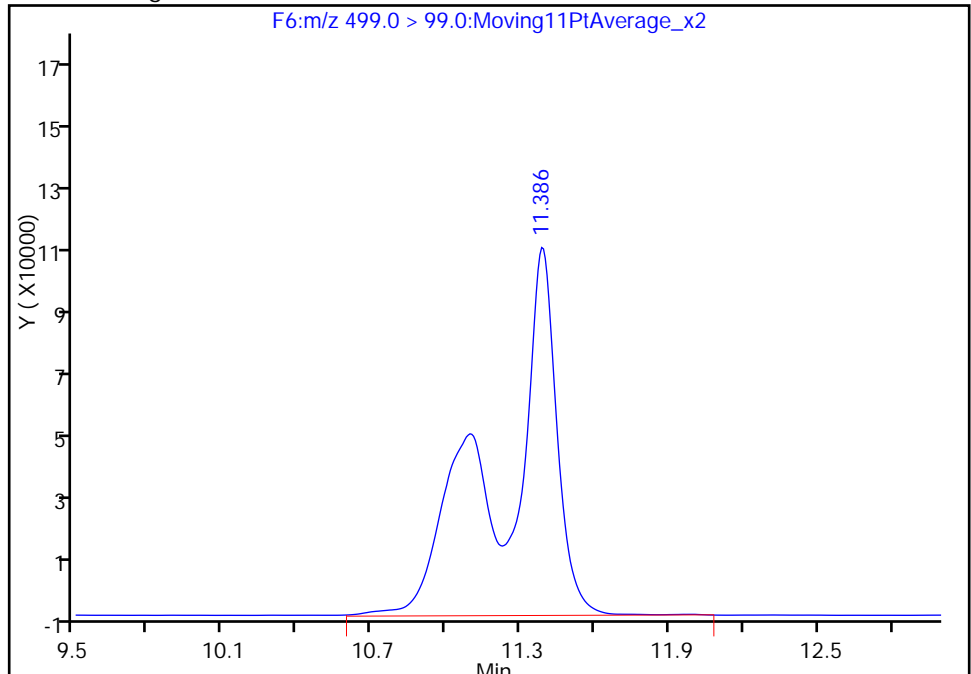
RT: 11.39
Area: 977105
Amount: 66.712565
Amount Units: ng/ml

Processing Integration Results



RT: 11.39
Area: 1730919
Amount: 183.5504
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Client Sample ID: EB123015 Lab Sample ID: 320-16660-7
 Matrix: Water Lab File ID: 06JAN2016A6A_086.d
 Analysis Method: WS-LC-0025 Date Collected: 12/30/2015 13:00
 Extraction Method: 3535 Date Extracted: 01/05/2016 08:39
 Sample wt/vol: 556.9(mL) Date Analyzed: 01/07/2016 22:39
 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.: 97577 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	U	2.2	1.8	0.82
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.8	U	2.2	1.8	0.72
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.5	M	2.2	1.8	0.78
375-95-1	Perfluorononanoic acid (PFNA)	1.8	U	2.2	1.8	0.59
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.9	M	3.6	2.7	1.1
335-67-1	Perfluorooctanoic acid (PFOA)	1.8	U	2.2	1.8	0.67

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		25-150
STL00990	13C4 PFOA	99		25-150
STL00991	13C4 PFOS	128		25-150
STL01892	13C4-PFHpA	105		25-150
STL00994	18O2 PFHxS	118		25-150
STL00995	13C5 PFNA	103		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_086.d
 Lims ID: 320-16660-A-7-A Lab Sample ID: 320-16660-7
 Client ID: EB123015
 Sample Type: Client
 Inject. Date: 07-Jan-2016 22:39:38 ALS Bottle#: 43 Worklist Smp#: 58
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-16660-A-7-A
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 14:53:40 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 08-Jan-2016 09:19:43

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	8.078	8.100	-0.022	1547659	47.3		94.6	3811	
D 8 13C4-PFHpA	367.0 > 322.0	9.300	9.331	-0.031	1792862	52.3		105	4901	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.288	9.335	-0.047	3241	-0.1688			3.0	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.329	9.363	-0.034	13599	1.37				M
D 11 18O2 PFHxS	403.0 > 84.0	9.329	9.363	-0.034	809071	55.7		118	1884	
D 12 13C4 PFOA	417.0 > 372.0	10.413	10.452	-0.039	1917454	49.6		99.1	3412	
13 Perfluorooctanoic acid	413.0 > 369.0	10.413	10.453	-0.040	2704	0.0658			2.5	
	413.0 > 169.0	10.427	10.453	-0.026	2313		1.17(0.00-0.00)		7.4	
D 16 13C4 PFOS	503.0 > 80.0	11.364	11.405	-0.041	1142882	61.1		128	5064	
15 Perfluorooctane sulfonic acid	499.0 > 80.0	11.364	11.408	-0.044	50872	2.20			49.2	M
	499.0 > 99.0	11.364	11.408	-0.044	22159		2.30(0.00-0.00)		22.5	M
D 17 13C5 PFNA	468.0 > 423.0	11.387	11.427	-0.040	1658397	51.7		103	4281	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_086.d

Injection Date: 07-Jan-2016 22:39:38

Instrument ID: A6

Lims ID: 320-16660-A-7-A

Lab Sample ID: 320-16660-7

Client ID: EB123015

Operator ID: JRB

ALS Bottle#: 43

Worklist Smp#: 58

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

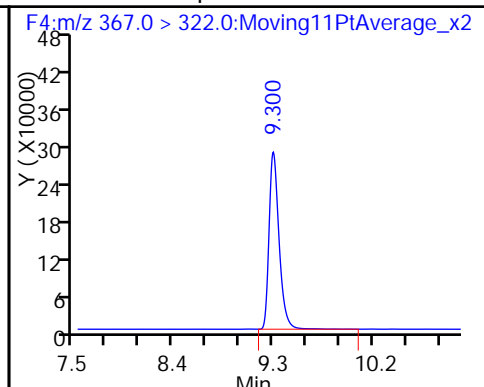
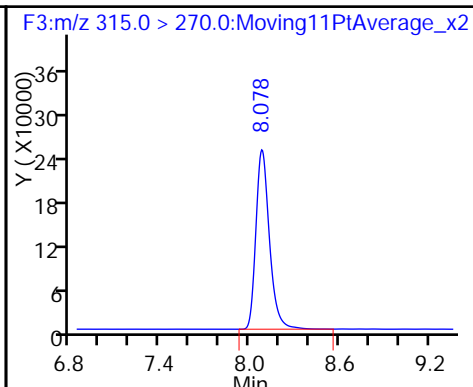
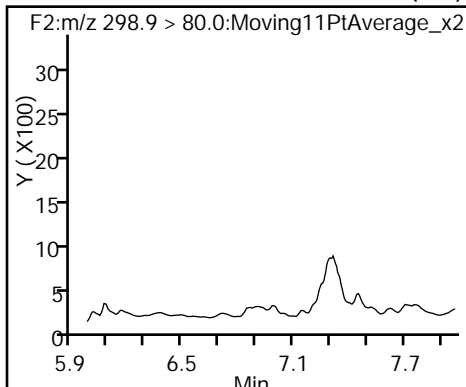
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

40 Perfluorobutanesulfonic acid (ND)

D 6 13C2 PFHxA

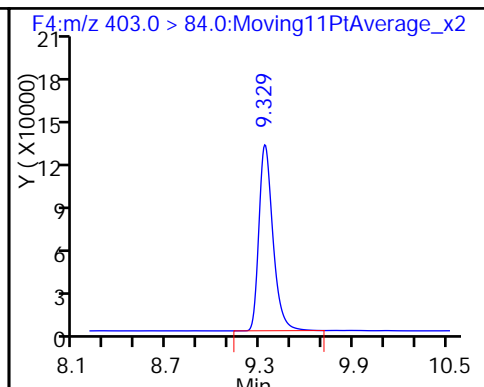
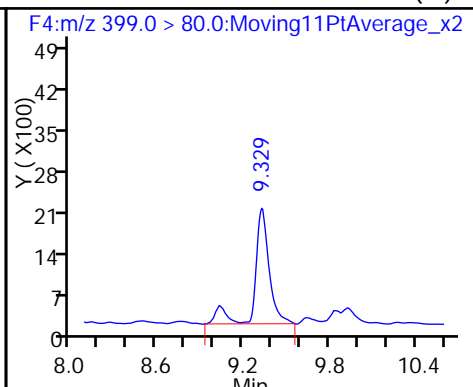
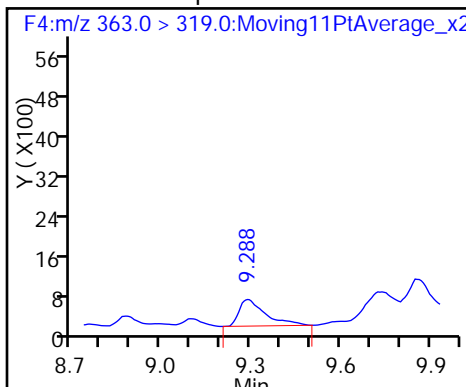
D 8 13C4-PFHpA



9 Perfluoroheptanoic acid

41 Perfluorohexanesulfonic acid (M)

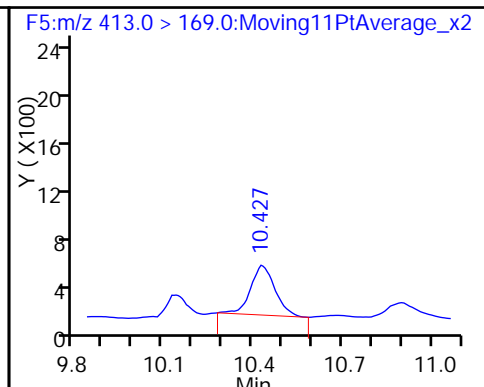
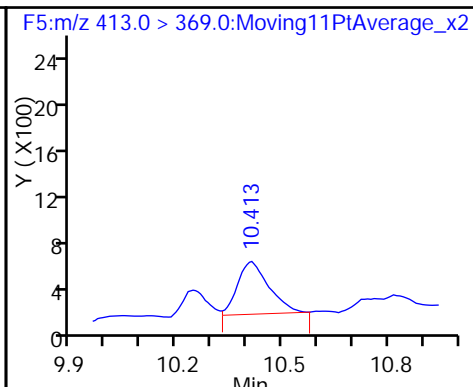
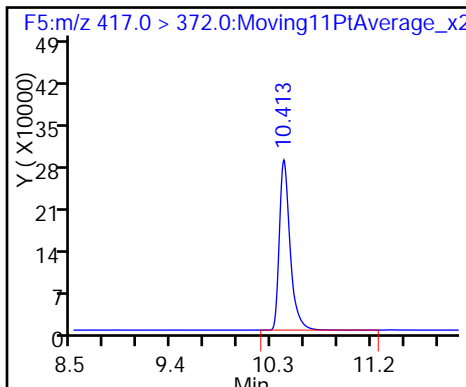
D 11 18O2 PFHxS



D 12 13C4 PFOA

13 Perfluorooctanoic acid

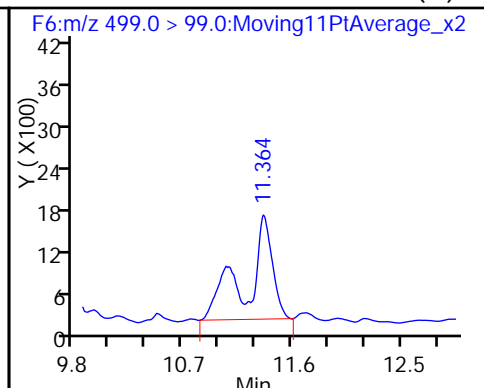
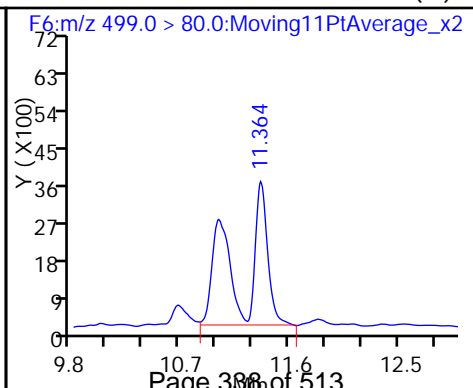
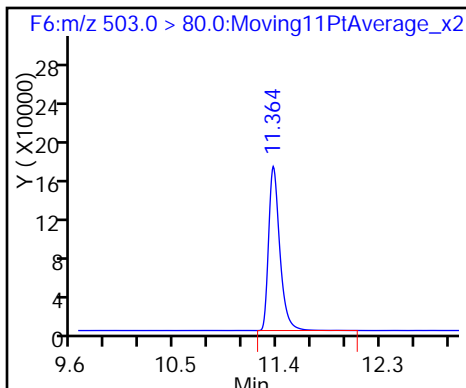
13 Perfluorooctanoic acid



D 16 13C4 PFOS

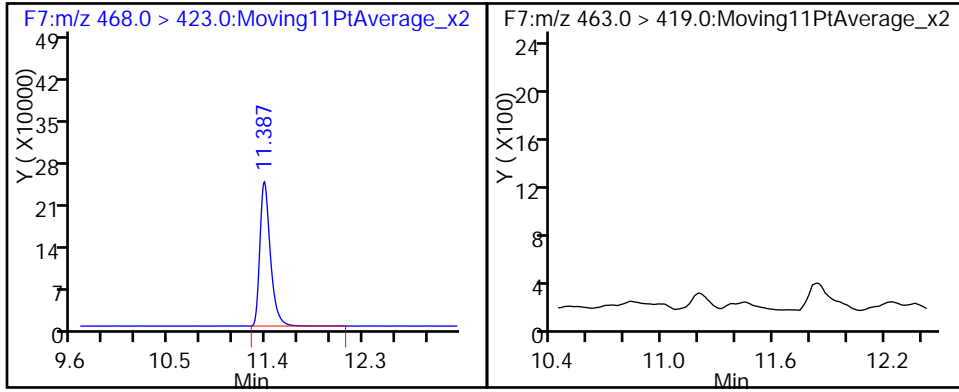
15 Perfluorooctane sulfonic acid (M)

15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA

18 Perfluorononanoic acid (ND)



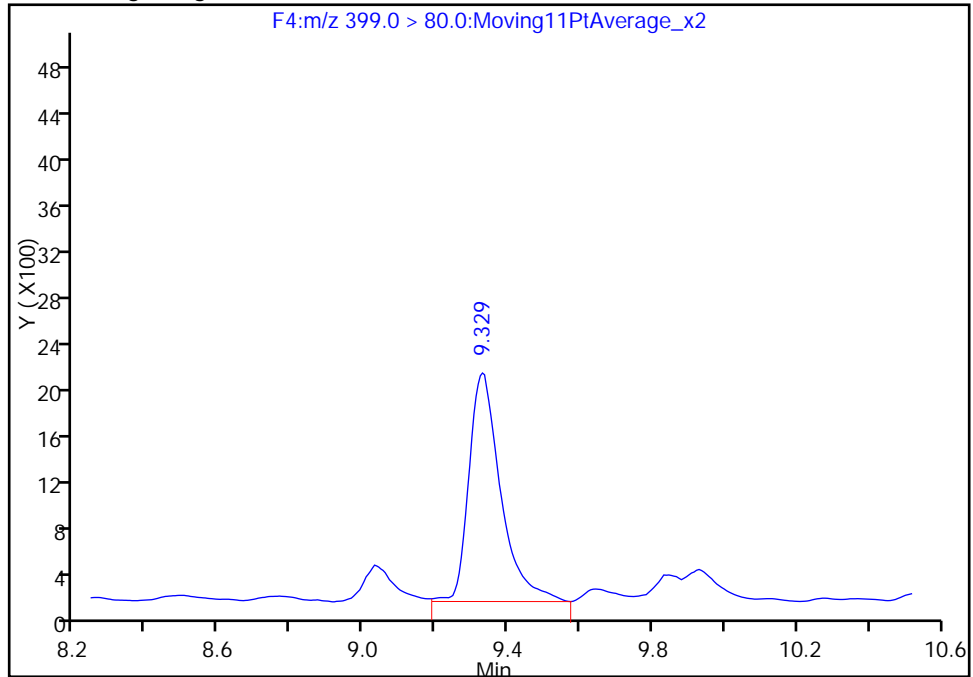
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_086.d
Injection Date: 07-Jan-2016 22:39:38 Instrument ID: A6
Lims ID: 320-16660-A-7-A Lab Sample ID: 320-16660-7
Client ID: EB123015
Operator ID: JRB ALS Bottle#: 43 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:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

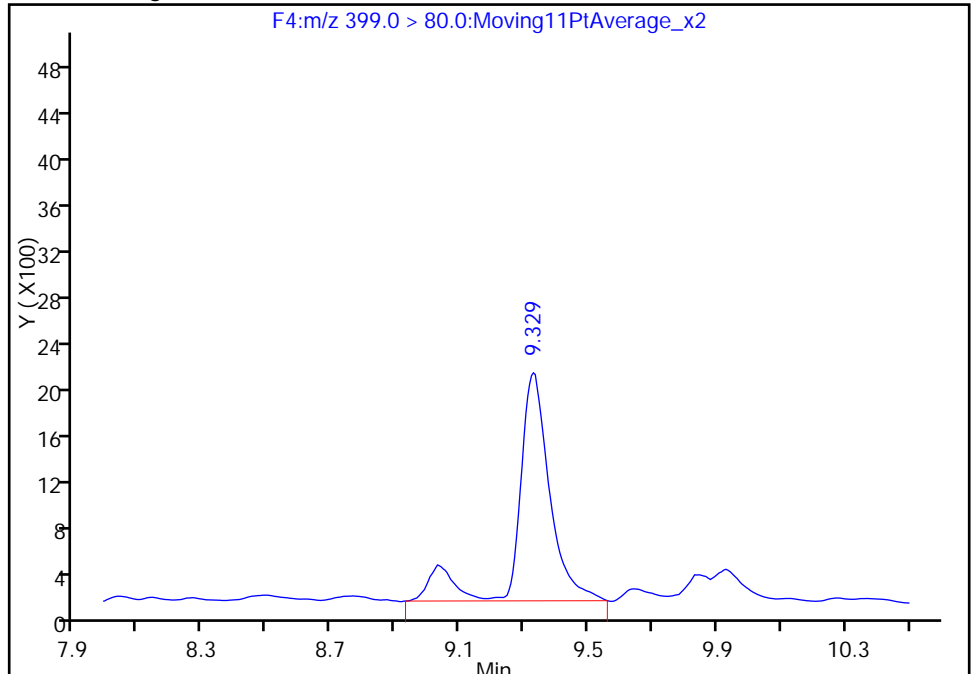
RT: 9.33
Area: 11953
Amount: 1.202942
Amount Units: ng/ml

Processing Integration Results



RT: 9.33
Area: 13599
Amount: 1.368594
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:19:43
Audit Action: Manually Integrated
Audit Reason: Isomers

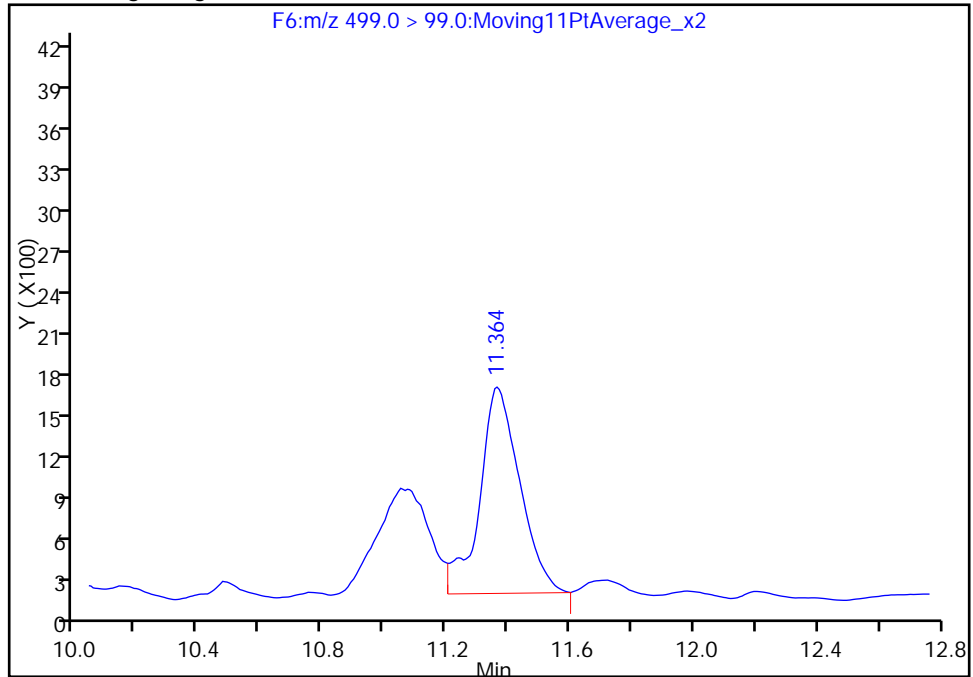
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_086.d
Injection Date: 07-Jan-2016 22:39:38 Instrument ID: A6
Lims ID: 320-16660-A-7-A Lab Sample ID: 320-16660-7
Client ID: EB123015
Operator ID: JRB ALS Bottle#: 43 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

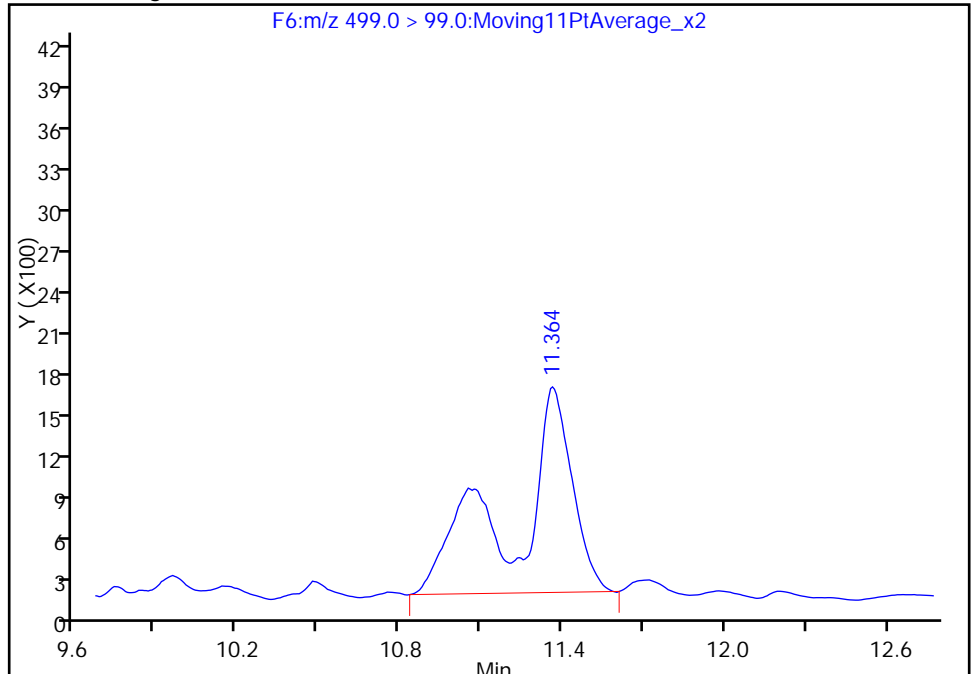
RT: 11.36
Area: 13408
Amount: 1.058938
Amount Units: ng/ml

Processing Integration Results



RT: 11.36
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Amount: 2.195114
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:19:43
Audit Action: Manually Integrated
Audit Reason: Isomers

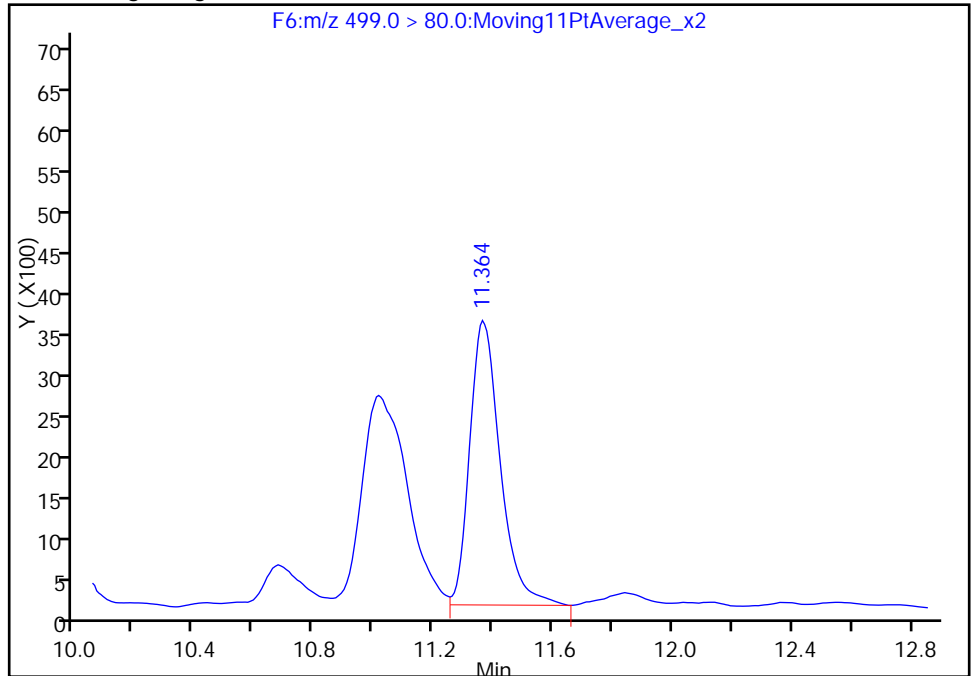
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_086.d
Injection Date: 07-Jan-2016 22:39:38 Instrument ID: A6
Lims ID: 320-16660-A-7-A Lab Sample ID: 320-16660-7
Client ID: EB123015
Operator ID: JRB ALS Bottle#: 43 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

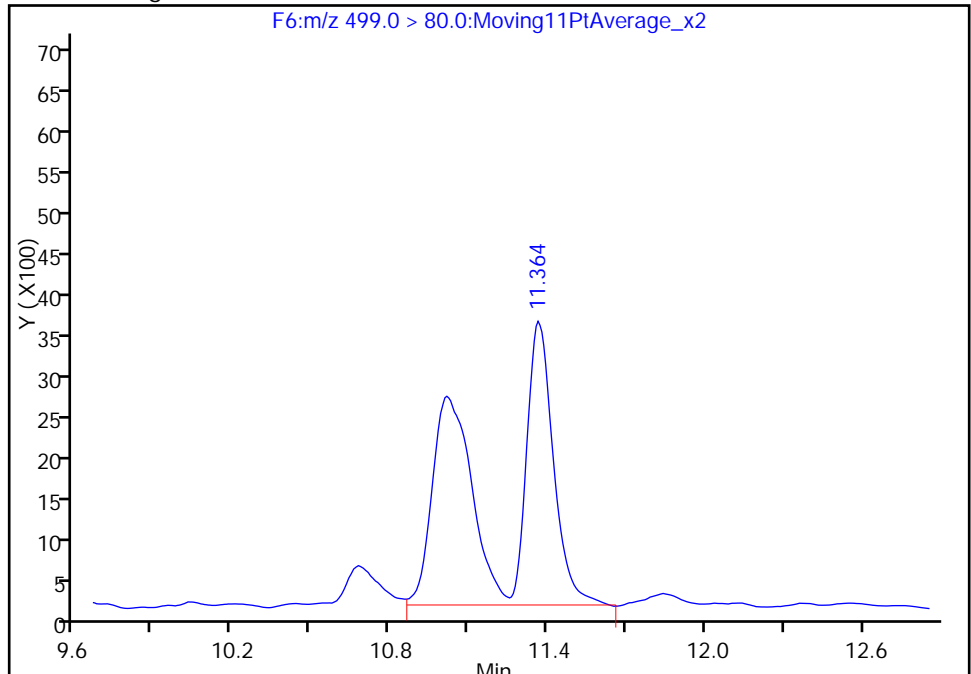
RT: 11.36
Area: 24541
Amount: 1.058938
Amount Units: ng/ml

Processing Integration Results



RT: 11.36
Area: 50872
Amount: 2.195114
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:19:43
Audit Action: Manually Integrated
Audit Reason: Isomers

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

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1 Analy Batch No.: 97425

SDG No.: _____

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/06/2016 11:00 Calibration End Date: 01/06/2016 14:07 Calibration ID: 18386

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-97425/4	06JAN2016A6A_003.d
Level 2	STD 320-97425/5	06JAN2016A6A_004.d
Level 3	STD 320-97425/6	06JAN2016A6A_005.d
Level 4	STD 320-97425/7	06JAN2016A6A_006.d
Level 5	STD 320-97425/8	06JAN2016A6A_007.d
Level 6	STD 320-97425/9	06JAN2016A6A_008.d
Level 7	STD 320-97425/10	06JAN2016A6A_009.d

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7				RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	++++	5.760	5.760	5.763	5.760	5.763	5.763				5.513 - 6.013	5.762
Perfluoropentanoic acid (PFPeA)	6.850	6.859	6.868	6.868	6.868	6.868	6.868				6.614 - 7.114	6.864
Perfluorobutanesulfonic acid (PFBS)	6.951	6.983	6.978	6.983	6.978	6.978	6.983				6.726 - 7.226	6.976
Perfluorohexanoic acid (PFHxA)	++++	8.105	8.105	8.111	8.105	8.105	8.105				7.852 - 8.352	8.106
Perfluoroheptanoic acid (PFHpA)	++++	9.340	9.340	9.340	9.335	9.335	9.335				9.085 - 9.585	9.338
Perfluorohexanesulfonic acid (PFHxS)	++++	9.369	9.364	9.370	9.364	9.364	9.370				9.113 - 9.613	9.367
Perfluorooctanoic acid (PFOA)	10.448	10.454	10.454	10.454	10.448	10.455	++++				10.203 - 10.703	10.452
Perfluoroheptanesulfonic Acid (PFHpS)	++++	10.461	10.454	10.454	10.448	10.455	10.455				10.206 - 10.706	10.455
Perfluorooctanesulfonic acid (PFOS)	++++	11.415	11.407	11.407	11.407	11.407	11.408				11.158 - 11.658	11.409
Perfluorononanoic acid (PFNA)	++++	11.437	11.430	11.430	11.430	11.430	11.430				11.181 - 11.681	11.431
Perfluorodecanoic acid (PFDA)	++++	12.259	12.259	12.259	12.259	12.259	12.259				12.010 - 12.510	12.259
Perfluorooctane Sulfonamide (FOSA)	12.808	12.808	12.798	12.808	12.798	12.808	12.808				12.555 - 13.055	12.805
Perfluorodecane Sulfonic acid	++++	12.933	12.934	12.923	12.923	12.923	12.923				12.679 - 13.179	12.927
Perfluoroundecanoic acid (PFUnA)	++++	12.985	12.975	12.975	12.975	12.975	12.975				12.728 - 13.228	12.977
Perfluorododecanoic acid (PFDoA)	++++	13.602	13.602	13.592	13.593	13.593	13.593				13.347 - 13.847	13.596
Perfluorotridecanoic Acid (PFTriA)	14.121	14.113	14.113	14.113	14.113	14.113	14.113				13.864 - 14.364	14.114
Perfluorotetradecanoic acid (PFTeA)	++++	14.556	14.550	14.543	14.543	14.543	14.543				14.299 - 14.799	14.546
Perfluoro-n-hexadecanoic acid (PFHxDA)	++++	15.179	15.179	15.174	15.175	15.174	15.175				14.927 - 15.427	15.176
Perfluoro-n-octadecanoic acid (PFODA)	15.526	15.521	15.521	15.516	15.511	15.511	15.511				15.267 - 15.767	15.517
13C4 PFBA	5.770	5.760	5.764	5.760	5.760	5.763	5.763				5.513 - 6.013	5.763
13C5-PFPeA	6.845	6.868	6.863	6.868	6.863	6.868	6.868				6.613 - 7.113	6.863
13C2 PFHxA	8.073	8.105	8.105	8.105	8.100	8.105	8.105				7.850 - 8.350	8.100
13C4-PFHpA	9.317	9.334	9.334	9.334	9.329	9.335	9.335				9.081 - 9.581	9.331
18O2 PFHxS	9.346	9.369	9.370	9.364	9.364	9.364	9.364				9.113 - 9.613	9.363
13C4 PFOA	10.448	10.454	10.454	10.454	10.448	10.448	++++				10.202 - 10.702	10.451
13C4 PFOS	11.407	11.407	11.407	11.407	11.400	11.400	11.408				11.155 - 11.655	11.405
13C5 PFNA	11.430	11.430	11.430	11.430	11.423	11.423	11.423				11.177 - 11.677	11.427
13C2 PFDA	12.269	12.269	12.259	12.259	12.259	12.259	12.259				12.012 - 12.512	12.262
13C8 FOSA	12.808	12.808	12.808	12.798	12.798	12.808	12.808				12.555 - 13.055	12.805
13C2 PFUnA	12.985	12.985	12.985	12.975	12.975	12.975	12.975				12.729 - 13.229	12.979
13C2 PFDoA	13.602	13.602	13.602	13.592	13.593	13.593	13.593				13.347 - 13.847	13.597
13C2-PFTeDA	14.556	14.550	14.550	14.550	14.543	14.543	14.543				14.298 - 14.798	14.548
13C2-PFHxDA	15.185	15.179	15.179	15.174	15.175	15.174	15.175				14.927 - 15.427	15.177

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

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1 Analy Batch No.: 97425

SDG No.: _____

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/06/2016 11:00 Calibration End Date: 01/06/2016 14:07 Calibration ID: 18386

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-97425/4	06JAN2016A6A_003.d
Level 2	STD 320-97425/5	06JAN2016A6A_004.d
Level 3	STD 320-97425/6	06JAN2016A6A_005.d
Level 4	STD 320-97425/7	06JAN2016A6A_006.d
Level 5	STD 320-97425/8	06JAN2016A6A_007.d
Level 6	STD 320-97425/9	06JAN2016A6A_008.d
Level 7	STD 320-97425/10	06JAN2016A6A_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	22006 19482	18358 16776	18493 14397	19333	Ave		18406.4514			12.9			50.0			
13C5-PFPeA	41415 36220	36075 31382	36080 26157	36098	Ave		34775.0943			13.7			50.0			
13C2 PFHxA	37308 35023	33477 28729	34858 24475	35081	Ave		32707.3343			13.7			50.0			
13C4-PFHpA	41596 35961	35607 28849	35888 25677	36467	Ave		34292.3743			15.5			50.0			
1802 PFHxS	17450 15501	14981 12677	14774 11207	15123	Ave		14530.3685			13.9			50.0			
13C4 PFOA	46930 37212	40201 29810	39436 ++++	38503	Ave		38682.0300			14.2			50.0			
13C4 PFOS	22523 20647	19610 15494	19146 13472	19993	Ave		18697.7585			16.7			50.0			
13C5 PFNA	38125 32365	35301 27084	33369 24124	34190	Ave		32079.9400			15.1			50.0			
13C2 PFDA	37350 31884	34249 26237	32644 22181	31464	Ave		30858.2714			16.5			50.0			
13C8 FOSA	48165 43393	43646 39780	42607 35461	45676	Ave		42675.3714			9.6			50.0			
13C2 PFUnA	45523 38348	41748 32204	38731 26569	40827	Ave		37707.1829			16.9			50.0			
13C2 PFDoA	51755 43289	42553 37648	43782 31988	45588	Ave		42371.9486			14.7			50.0			
13C2-PFTeDA	46263 39867	38119 36352	37871 33953	38041	Ave		38637.9086			9.9			50.0			
13C2-PFHxDA	58299 51737	47898 45288	48307 45126	46983	Ave		49090.8771			9.4			50.0			

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

CURVE EVALUATION

Lab Name: TestAmerica SacramentoJob No.: 320-16660-1Analy Batch No.: 97425

SDG No.: _____

Instrument ID: A6GC Column: Acquity ID: 2.1(mm)Heated Purge: (Y/N) NCalibration Start Date: 01/06/2016 11:00Calibration End Date: 01/06/2016 14:07Calibration ID: 18386

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)	++++ 23169	24140 20349	25810	26186	27631	AveID		1.3796			2.8		35.0				
Perfluoropentanoic acid (PFPeA)	42202 30054	42591 24863	36324	35570	35042	AveID		1.0096			7.9		35.0				
Perfluorobutanesulfonic acid (PFBS)	19715 13834	15569 11697	15199	16129	16506	AveID		1.0663			3.3		50.0				
Perfluorohexanoic acid (PFHxA)	++++ 31333	39883 24984	38147	36360	36202	AveID		1.0779			5.9		35.0				
Perfluoroheptanoic acid (PFHpA)	++++ 29196	43077 25146	37315	37686	35860	L1ID	0.2576	0.9904						1.0000		0.9900	
Perfluorohexanesulfonic acid (PFHxS)	++++ 7438.9	7664.9 6627.2	9293.0	9075.6	8781.6	AveID		0.5809			6.8		35.0				
Perfluorooctanoic acid (PFOA)	55320 30381	42731 ++++	45107	39218	37557	AveID		1.0721			6.8		35.0				
Perfluoroheptanesulfonic Acid (PFHpS)	++++ 7709.3	7770.0 6566.6	11766	9950.7	9504.7	AveID		0.4923			14.4		50.0				
Perfluorooctanesulfonic acid (PFOS)	++++ 15255	19101 12858	18248	20086	19508	AveID		0.9693			2.3		35.0				
Perfluorononanoic acid (PFNA)	++++ 23372	28953 20356	29188	28821	28235	AveID		0.8528			2.5		35.0				
Perfluorodecanoic acid (PFDA)	++++ 24880	40962 21244	36572	34870	31233	AveID		1.0517			9.8		35.0				
Perfluorooctane Sulfonamide (FOSA)	45166 39187	43795 33689	42437	45292	43789	AveID		0.9819			2.8		35.0				
Perfluorodecane Sulfonic acid	++++ 6769.0	8182.6 6131.0	10529	9466.3	9979.6	AveID		0.4693			9.8		50.0				
Perfluoroundecanoic acid (PFUnA)	++++ 27383	67003 23463	39623	37065	31640	L1ID	0.7047	0.8657						0.9990		0.9900	
Perfluorododecanoic acid (PFDoA)	++++ 29902	31774 25076	35508	35713	34241	AveID		0.7850			2.7		35.0				
Perfluorotridecanoic Acid (PFTriA)	54118 33598	45991 28608	51702	47074	42772	AveID		1.0164			10.1		50.0				
Perfluorotetradecanoic acid (PFTeA)	++++ 22249	48467 20751	26255	27849	25679	L1ID	0.3445	0.6237						0.9980		0.9900	
Perfluoro-n-hexadecanoic acid (PFHxDA)	++++ 42224	309262 38875	98663	58642	54457	L2ID	6.1613	1.0885						0.9940		0.9900	
Perfluoro-n-octadecanoic acid (PFODA)	51910 37000	43562 35518	41854	41405	45432	AveID		1.0048			6.5		50.0				

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1 Analy Batch No.: 97425

SDG No.: _____

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/06/2016 11:00 Calibration End Date: 01/06/2016 14:07 Calibration ID: 18386

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-97425/4	06JAN2016A6A_003.d
Level 2	STD 320-97425/5	06JAN2016A6A_004.d
Level 3	STD 320-97425/6	06JAN2016A6A_005.d
Level 4	STD 320-97425/7	06JAN2016A6A_006.d
Level 5	STD 320-97425/8	06JAN2016A6A_007.d
Level 6	STD 320-97425/9	06JAN2016A6A_008.d
Level 7	STD 320-97425/10	06JAN2016A6A_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	1100289 838778	917918 719839	924661	966659	974114	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C5-PFPeA	Ave	2070727 1569088	1803753 1307833	1804009	1804891	1810982	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFHxA	Ave	1865383 1436454	1673860 1223768	1742911	1754050	1751141	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C4-PFHpA	Ave	2079820 1442468	1780345 1283868	1794402	1823374	1798054	50.0 50.0	50.0 50.0	50.0	50.0	50.0
1802 PFHxS	Ave	825371 599642	708591 530090	698789	715340	733182	47.3 47.3	47.3 47.3	47.3	47.3	47.3
13C4 PFOA	Ave	2346513 1490496	2010054 +++++	1971801	1925127	1860618	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C4 PFOS	Ave	1076576 740605	937336 643966	915179	955663	986945	47.8 47.8	47.8 47.8	47.8	47.8	47.8
13C5 PFNA	Ave	1906270 1354219	1765061 1206211	1668440	1709507	1618271	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDA	Ave	1867484 1311848	1712440 1109038	1632183	1573185	1594217	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C8 FOSA	Ave	2408227 1989023	2182292 1773048	2130331	2283786	2169673	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFUnA	Ave	2276171 1610211	2087377 1328469	1936537	2041366	1917383	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDoA	Ave	2587745 1882387	2127674 1599382	2189120	2279400	2164474	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFTeDA	Ave	2313172 1817616	1905953 1697645	1893525	1902026	1993331	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFHxDA	Ave	2914936 2264391	2394888 2256284	2415341	2349134	2586833	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.: 320-16660-1Analy Batch No.: 97425

SDG No.: _____

Instrument ID: A6GC Column: Acquity ID: 2.1(mm)Heated Purge: (Y/N) NCalibration Start Date: 01/06/2016 11:00Calibration End Date: 01/06/2016 14:07Calibration ID: 18386

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-97425/4	06JAN2016A6A_003.d
Level 2	STD 320-97425/5	06JAN2016A6A_004.d
Level 3	STD 320-97425/6	06JAN2016A6A_005.d
Level 4	STD 320-97425/7	06JAN2016A6A_006.d
Level 5	STD 320-97425/8	06JAN2016A6A_007.d
Level 6	STD 320-97425/9	06JAN2016A6A_008.d
Level 7	STD 320-97425/10	06JAN2016A6A_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	++++ 4633772	24140 8139792	129049	523714	1381546	++++ 200	1.00 400	5.00	20.0	50.0
Perfluoropentanoic acid (PFPeA)		AveID	21101 6010884	42591 9945285	181620	711397	1752091	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorobutanesulfonic acid (PFBS)		AveID	8714 2445937	13763 4136098	67181	285156	729585	0.442 177	0.884 354	4.42	17.7	44.2
Perfluorohexanoic acid (PFHxA)		AveID	++++ 6266689	39883 9993754	190734	727190	1810095	++++ 200	1.00 400	5.00	20.0	50.0
Perfluoroheptanoic acid (PFHpA)		L1ID	++++ 5839203	43077 10058302	186574	753725	1793000	++++ 200	1.00 400	5.00	20.0	50.0
Perfluorohexanesulfonic acid (PFHxS)		AveID	++++ 1407431	7251 2507742	43956	171711	415372	++++ 189	0.946 378	4.73	18.9	47.3
Perfluorooctanoic acid (PFOA)		AveID	27660 6076103	42731 ++++	225535	784363	1877840	0.500 200	1.00 ++++	5.00	20.0	50.0
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	++++ 1467858	7397 2500568	56008	189461	452423	++++ 190	0.952 381	4.76	19.0	47.6
Perfluorooctanesulfonic acid (PFOS)		AveID	++++ 2916813	18261 4917016	87224	384036	932484	++++ 191	0.956 382	4.78	19.1	47.8
Perfluorononanoic acid (PFNA)		AveID	++++ 4674483	28953 8142347	145939	576424	1411768	++++ 200	1.00 400	5.00	20.0	50.0
Perfluorodecanoic acid (PFDA)		AveID	++++ 4976064	40962 8497438	182858	697392	1561638	++++ 200	1.00 400	5.00	20.0	50.0
Perfluorooctane Sulfonamide (FOSA)		AveID	22583 7837373	43795 13475405	212187	905836	2189426	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorodecane Sulfonic acid		AveID	++++ 1305054	7888 2364097	50751	182511	481016	++++ 193	0.964 386	4.82	19.3	48.2
Perfluoroundecanoic acid (PFUnA)		L1ID	++++ 5476584	67003 9385325	198113	741290	1581984	++++ 200	1.00 400	5.00	20.0	50.0
Perfluorododecanoic acid (PFDoA)		AveID	++++ 5980430	31774 10030582	177540	714262	1712069	++++ 200	1.00 400	5.00	20.0	50.0

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1 Analy Batch No.: 97425

SDG No.: _____

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) NCalibration Start Date: 01/06/2016 11:00 Calibration End Date: 01/06/2016 14:07 Calibration ID: 18386

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	27059 6719579	45991 11443058	258508	941479	2138582	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorotetradecanoic acid (PFTeA)		L1ID	++++ 4449710	48467 8300566	131273	556971	1283969	++++ 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	++++ 8444706	309262 15550097	493314	1172831	2722865	++++ 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-octadecanoic acid (PFODA)		AveID	25955 7400052	43562 14207142	209271	828096	2271591	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\20160106-27625.b\06JAN2016A6A_003.d
 Lims ID: Std L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 06-Jan-2016 11:00:14 ALS Bottle#: 17 Worklist Smp#: 4
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L1
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub5
 Method: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 09:42:13 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 06-Jan-2016 13:12:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.770	5.763	0.007	1100289	59.8		120	3539	
2 Perfluorobutyric acid	212.9 > 169.0	5.773	5.763	0.010	16932	0.5577		112	52.8	
D 3 13C5-PFPeA	267.9 > 223.0	6.845	6.863	-0.018	2070727	59.5		119	3613	
4 Perfluoropentanoic acid	262.9 > 219.0	6.850	6.864	-0.014	21101	0.5046		101	4.0	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.951	6.976	-0.025	8714	NC			22.2	
	298.9 > 99.0	6.960	6.976	-0.016	3275		2.66(0.00-0.00)		8.6	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.951	6.976	-0.025	8714	0.4683		106		
D 6 13C2 PFHxA	315.0 > 270.0	8.073	8.100	-0.027	1865383	57.0		114	5614	
7 Perfluorohexanoic acid	313.0 > 269.0	8.078	8.102	-0.024	42576	1.06		212	151	
D 8 13C4-PFHpA	367.0 > 322.0	9.317	9.331	-0.014	2079820	60.6		121	5858	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.323	9.335	-0.012	22331	0.2820		56.4	25.5	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.340	9.363	-0.023	5460	NC			23.2	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.340	9.363	-0.023	5460	0.5386		114		
D 11 18O2 PFHxS	403.0 > 84.0	9.346	9.363	-0.017	825371	56.8		120	2764	

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	10.448	10.452	-0.004		2346513	60.7		121	4027	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.448	10.453	-0.005	1.000	27660	0.5498		110	23.8	
413.0 > 169.0	10.448	10.453	-0.005	1.000	10714		2.58(0.00-0.00)	110	16.7	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.462	10.456	0.006	1.000	7077	0.6383		134		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.462	10.456	0.006	1.000	7077	NC			34.0	
D 16 13C4 PFOS										
503.0 > 80.0	11.407	11.405	0.002		1076576	57.6		120	3229	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.407	11.408	-0.001	1.000	14032	0.6428		134	39.3	
499.0 > 99.0	11.407	11.408	-0.001	1.000	6454		2.17(0.00-0.00)	134	22.8	
D 17 13C5 PFNA										
468.0 > 423.0	11.430	11.427	0.003		1906270	59.4		119	4548	
18 Perfluorononanoic acid										
463.0 > 419.0	11.430	11.431	-0.001	1.000	19151	0.5890		118	50.3	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.269	12.260	0.009	1.000	33222	0.8458		169	117	
D 19 13C2 PFDA										
515.0 > 470.0	12.269	12.262	0.007		1867484	60.5		121	4040	
D 23 13C8 FOSA										
506.0 > 78.0	12.808	12.805	0.003		2408227	56.4		113	1772	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.808	12.805	0.003	1.000	22583	0.4775		95.5	84.0	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.944	12.929	0.015	1.000	6581	NC			21.3	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.944	12.929	0.015	1.000	6581	0.6226		129		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.985	12.978	0.007	1.000	52610	0.5210		104	119	
D 26 13C2 PFUnA										
565.0 > 520.0	12.985	12.979	0.006		2276171	60.4		121	2191	
D 28 13C2 PFDaA										
615.0 > 570.0	13.602	13.597	0.005		2587745	61.1		122	2998	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.602	13.597	0.005	1.000	17179	0.4228		84.6	16.3	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.121	14.114	0.007	1.000	27059	0.5144		103	22.4	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.556	14.548	0.008		2313172	59.9		120	4195	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.563	14.549	0.014	1.000	36970	0.5930		119	14.0	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.185	15.177	0.008	1.000	405837	1.54		309	419	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.185	15.177	0.008		2914936	59.4		119	2803	

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	15.526	15.517	0.009	1.000	25955	0.4991	99.8	22.7	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L1_00018

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_003.d

Injection Date: 06-Jan-2016 11:00:14

Instrument ID: A6

Lims ID: Std L1

Client ID:

Operator ID: JRB

ALS Bottle#: 17

Worklist Smp#: 4

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

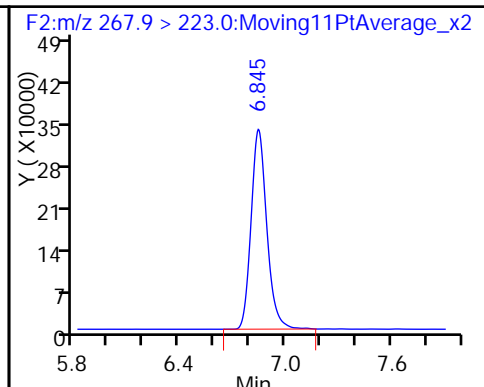
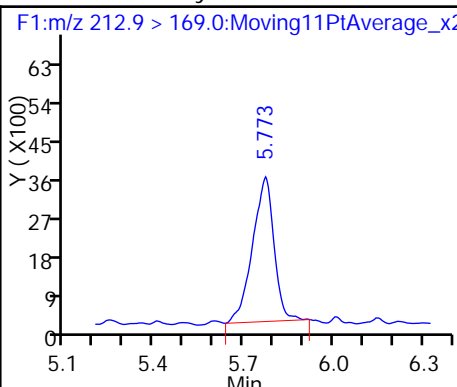
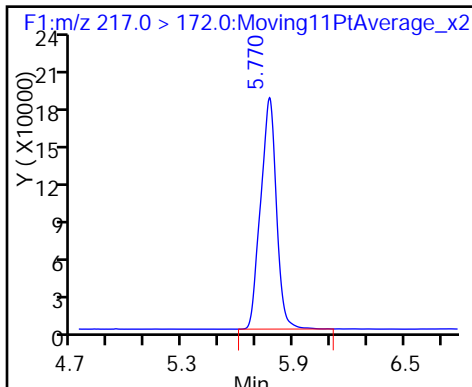
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

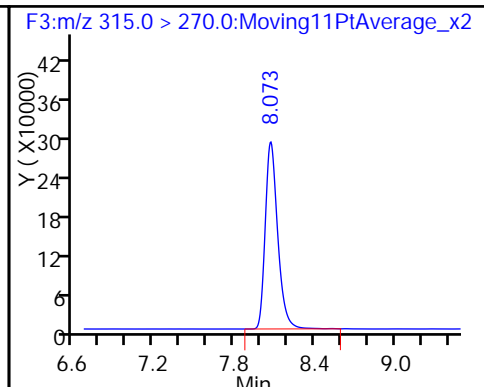
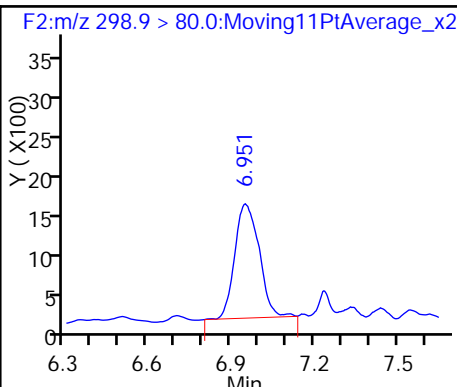
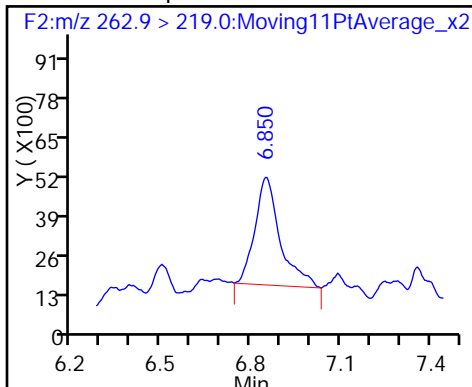
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

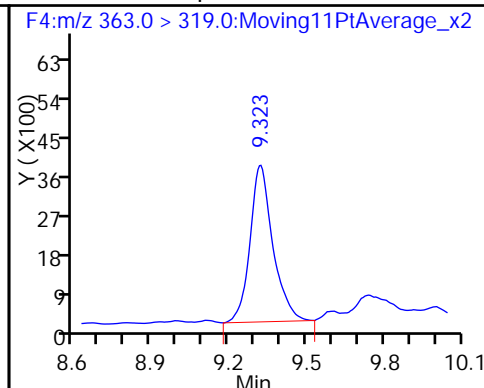
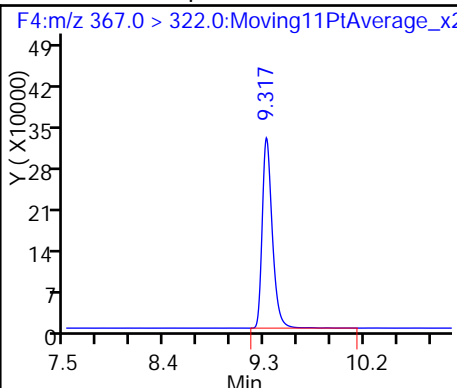
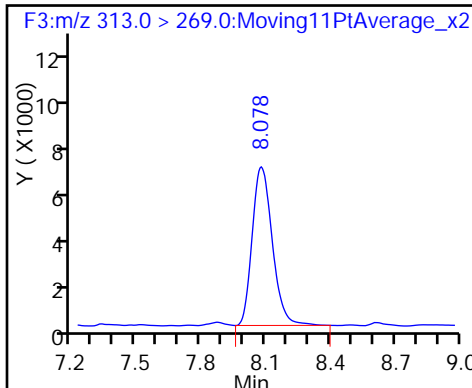
D 6 13C2 PFXa



7 Perfluorohexanoic acid

D 8 13C4-PFHpA

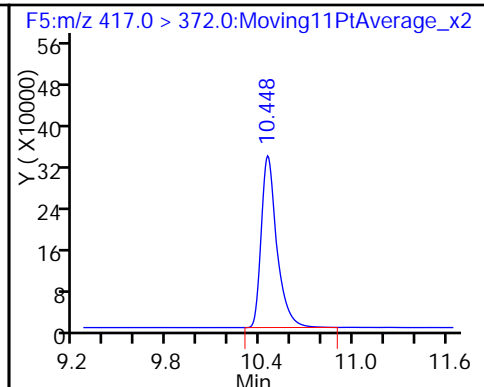
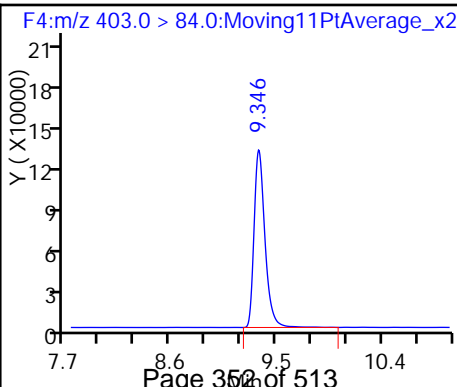
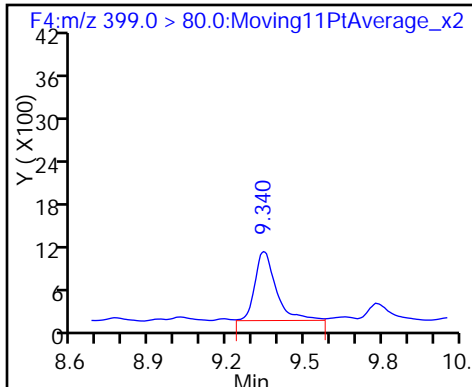
9 Perfluoroheptanoic acid

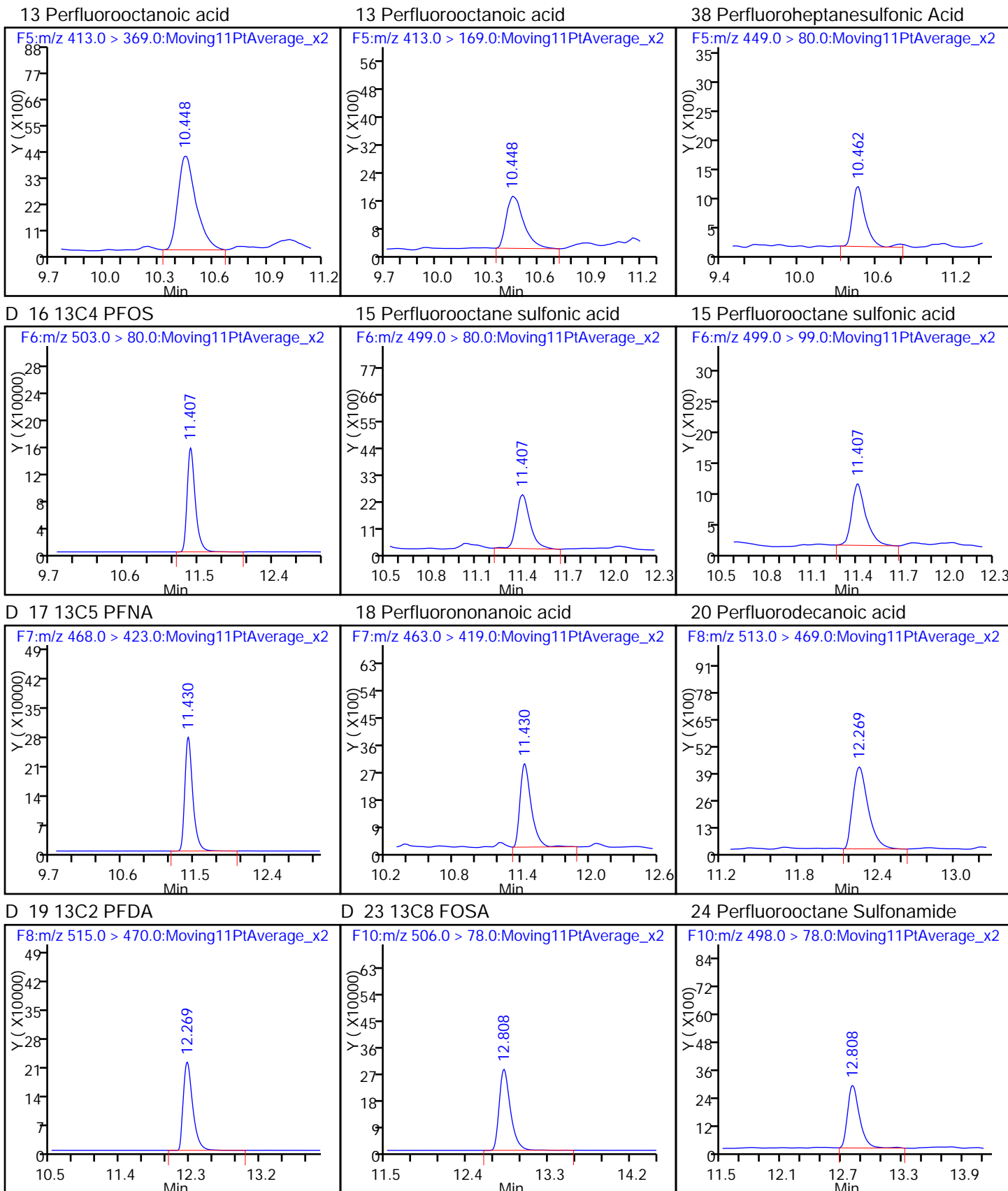


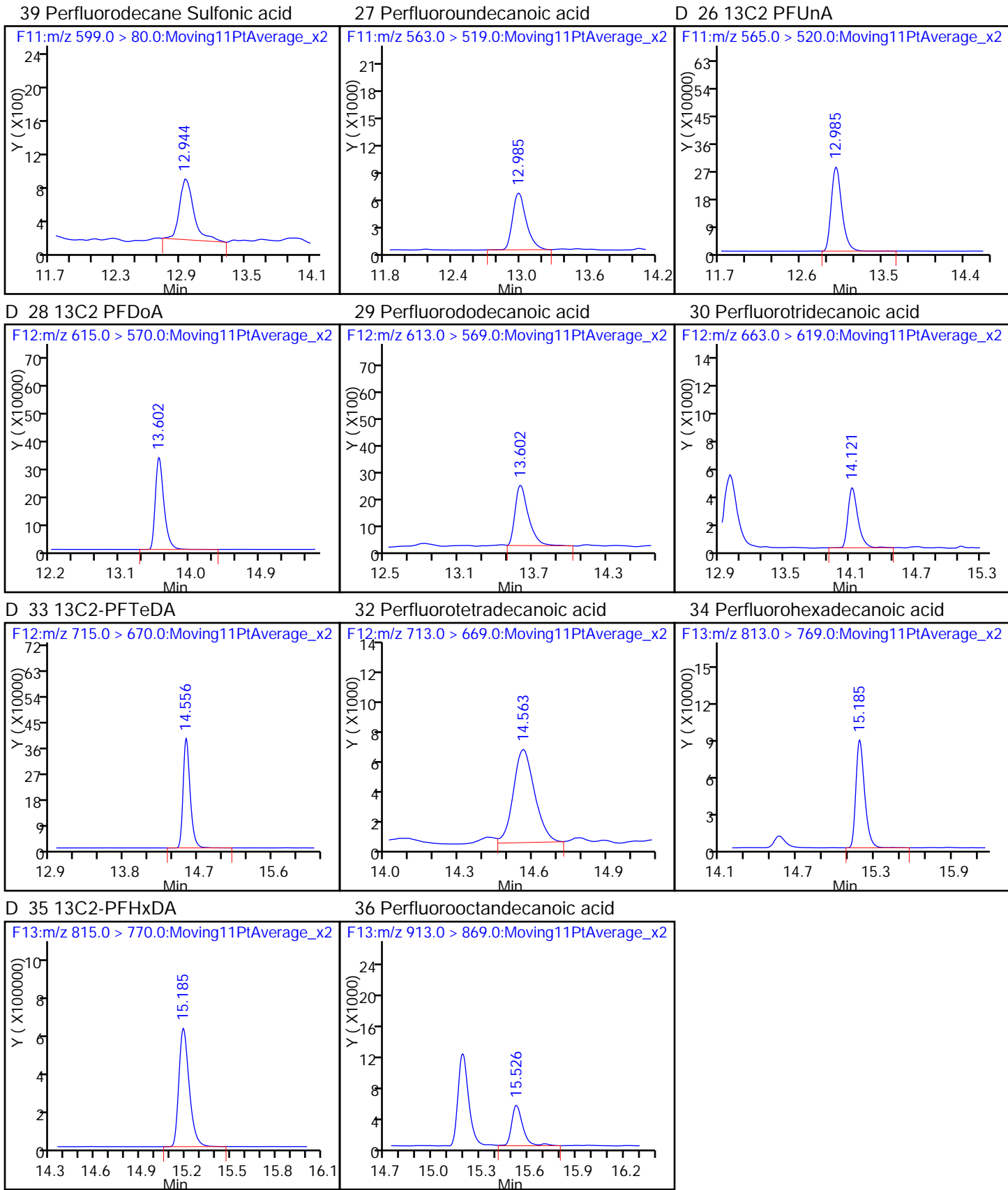
41 Perfluorohexanesulfonic acid

D 11 18O2 PFXs

D 12 13C4 PFOA







TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_004.d
 Lims ID: Std L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 06-Jan-2016 11:31:27 ALS Bottle#: 18 Worklist Smp#: 5
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L2
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub5
 Method: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 09:42:18 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 06-Jan-2016 13:47:28

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	5.760	5.763	-0.003	917918	49.9		99.7	3104	
2 Perfluorobutyric acid	212.9 > 169.0	5.760	5.763	-0.003	24140	0.9531		95.3	65.6	
D 3 13C5-PFPeA	267.9 > 223.0	6.868	6.863	0.005	1803753	51.9		104	3379	
4 Perfluoropentanoic acid	262.9 > 219.0	6.859	6.864	-0.005	42591	1.17		117	6.8	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.983	6.976	0.007	13763	NC			38.3	
	298.9 > 99.0	6.978	6.976	0.002	8379		1.64(0.00-0.00)		21.8	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.983	6.976	0.007	13763	0.8616		97.5		
D 6 13C2 PFHxA	315.0 > 270.0	8.105	8.100	0.005	1673860	51.2		102	3834	
7 Perfluorohexanoic acid	313.0 > 269.0	8.105	8.102	0.003	39883	1.11		111	140	
D 8 13C4-PFHpA	367.0 > 322.0	9.334	9.331	0.003	1780345	51.9		104	5290	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.340	9.335	0.005	43077	0.9614		96.1	41.8	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.369	9.363	0.006	7251	NC			23.5	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.369	9.363	0.006	7251	0.8332		88.1		
D 11 18O2 PFHxS	403.0 > 84.0	9.369	9.363	0.006	708591	48.8		103	2398	

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	10.454	10.452	0.002		2010054	52.0		104	5751	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.454	10.453	0.001	1.000	42731	0.99		99.1	37.3	
413.0 > 169.0	10.461	10.453	0.008	1.001	13495		3.17(0.00-0.00)	99.1	24.0	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.461	10.456	0.005	1.000	7397	0.7662		80.5		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.461	10.456	0.005	1.000	7397	NC			35.7	
D 16 13C4 PFOS										
503.0 > 80.0	11.407	11.405	0.002		937336	50.1		105	3003	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.415	11.408	0.007	1.000	18261	0.9607		100	34.5	
499.0 > 99.0	11.407	11.408	-0.001	0.999	11604		1.57(0.00-0.00)	100	42.3	
D 17 13C5 PFNA										
468.0 > 423.0	11.430	11.427	0.003		1765061	55.0		110	3758	
18 Perfluorononanoic acid										
463.0 > 419.0	11.437	11.431	0.006	1.000	28953	0.9617		96.2	63.4	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.259	12.260	-0.001	1.000	40962	1.14		114	106	
D 19 13C2 PFDA										
515.0 > 470.0	12.269	12.262	0.007		1712440	55.5		111	3573	
D 23 13C8 FOSA										
506.0 > 78.0	12.808	12.805	0.003		2182292	51.1		102	1665	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.808	12.805	0.003	1.000	43795	1.02		102	107	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.933	12.929	0.004	1.000	7888	NC			36.2	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.933	12.929	0.004	1.000	7888	0.8571		88.9		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.985	12.978	0.007	1.000	67003	1.04		104	90.3	
D 26 13C2 PFUnA										
565.0 > 520.0	12.985	12.979	0.006		2087377	55.4		111	2589	
D 28 13C2 PFDaA										
615.0 > 570.0	13.602	13.597	0.005		2127674	50.2		100	2878	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.602	13.597	0.005	1.000	31774	0.9511		95.1	24.2	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.113	14.114	-0.001	1.000	45991	1.06		106	37.9	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.550	14.548	0.002		1905953	49.3		98.7	3311	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.556	14.549	0.007	1.000	48467	1.27		127	17.4	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.179	15.177	0.002	1.000	309262	1.02		102	330	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.179	15.177	0.002		2394888	48.8		97.6	3611	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
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36 Perfluorooctadecanoic acid
 913.0 > 869.0 15.521 15.517 0.004 1.000 43562 1.02 102 46.3

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L2_00018

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_004.d

Injection Date: 06-Jan-2016 11:31:27

Instrument ID: A6

Lims ID: Std L2

Client ID:

Operator ID: JRB

ALS Bottle#: 18

Worklist Smp#: 5

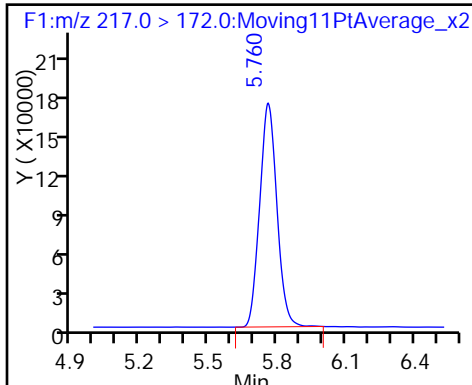
Injection Vol: 15.0 ul

Dil. Factor: 1.0000

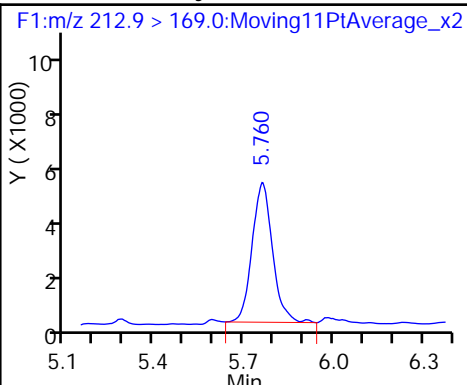
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

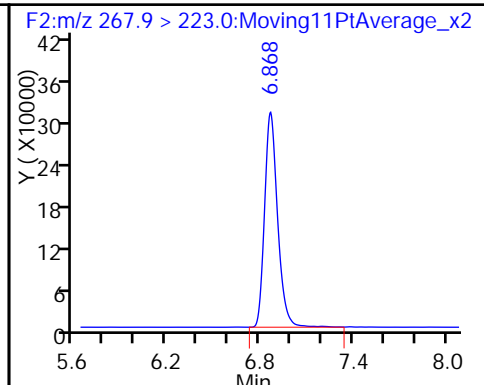
D 1 13C4 PFBA



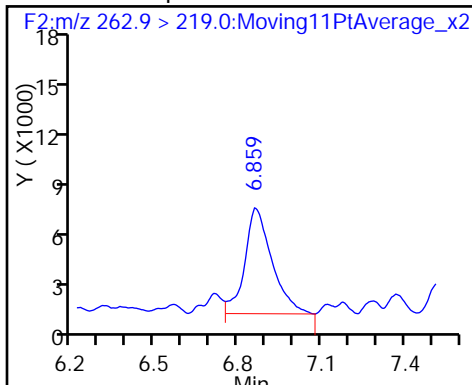
2 Perfluorobutyric acid



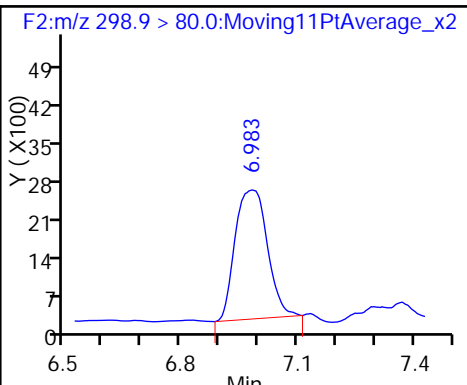
D 3 13C5-PFPeA



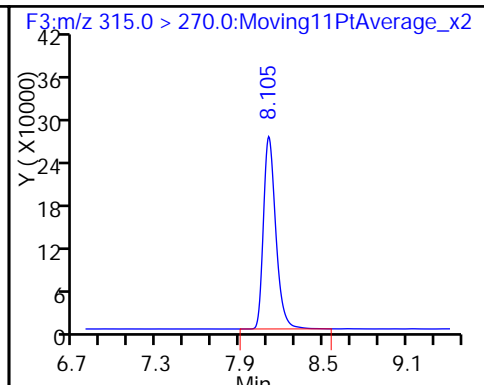
4 Perfluoropentanoic acid



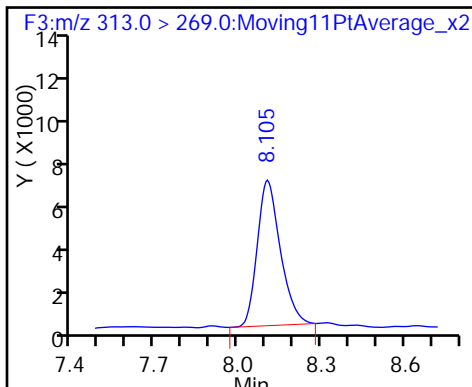
40 Perfluorobutanesulfonic acid



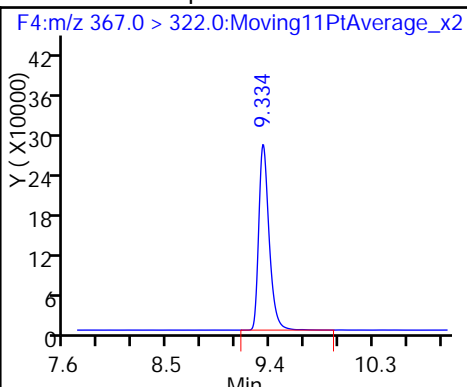
D 6 13C2 PFHxA



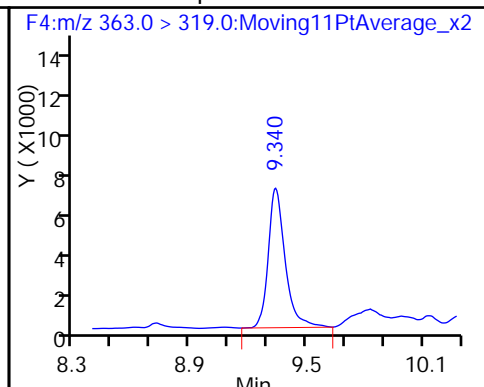
7 Perfluorohexanoic acid



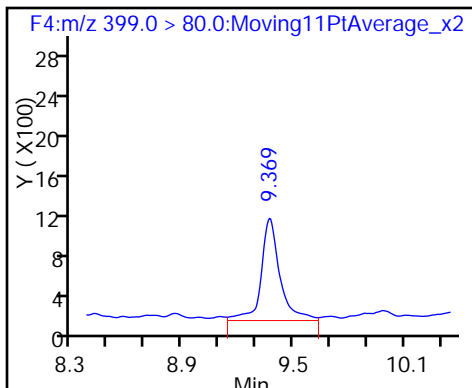
D 8 13C4-PFHpA



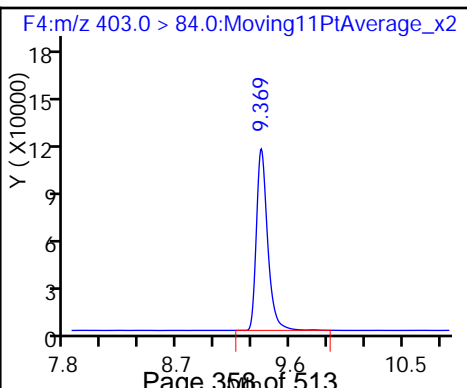
9 Perfluoroheptanoic acid



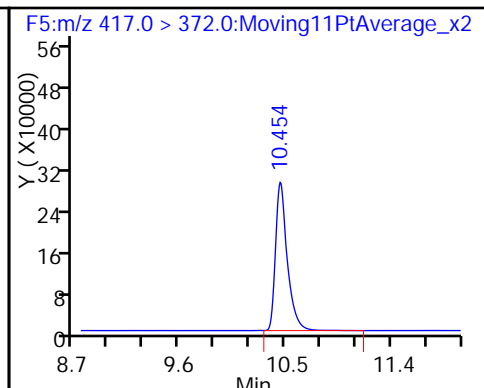
41 Perfluorohexanesulfonic acid

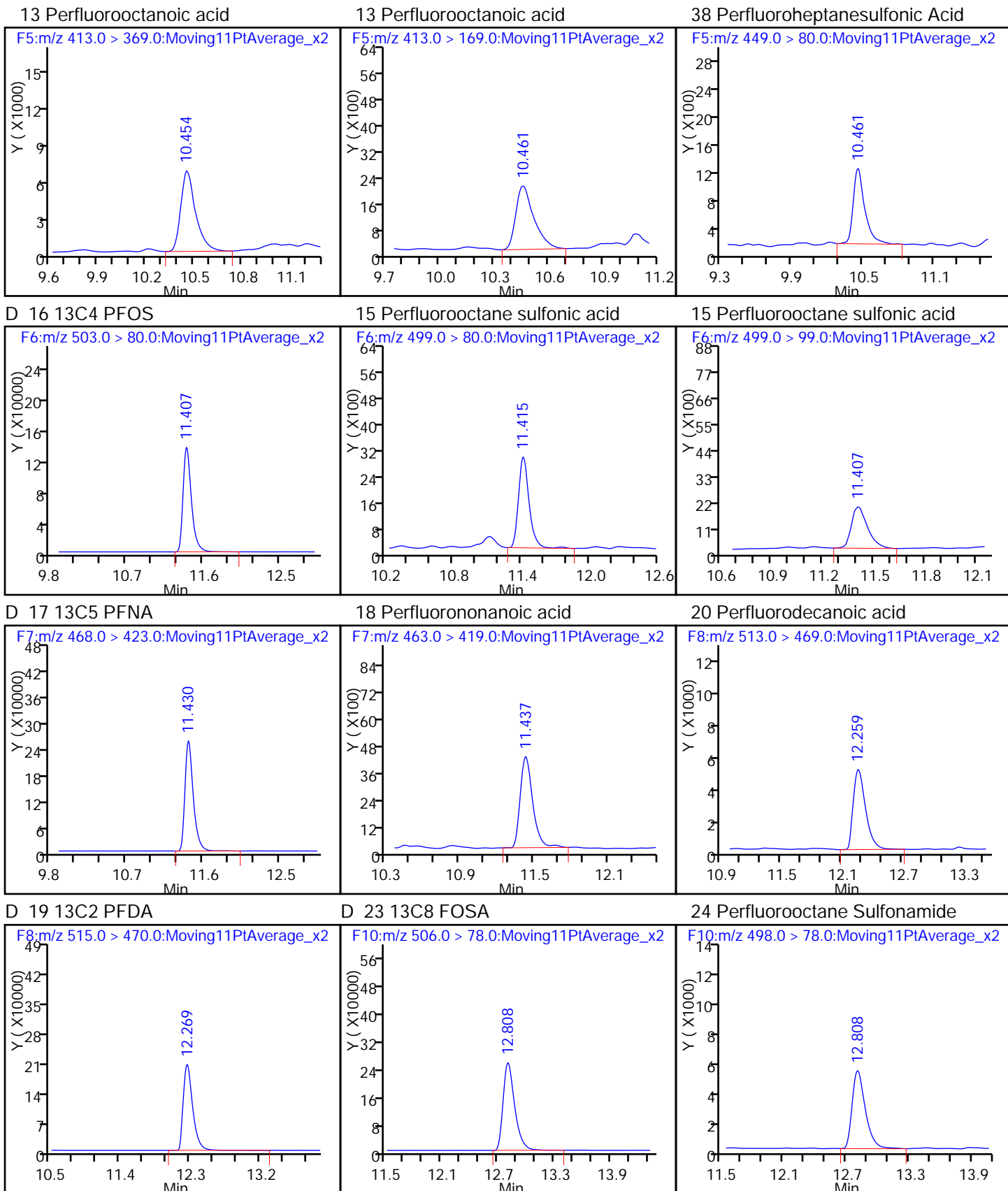


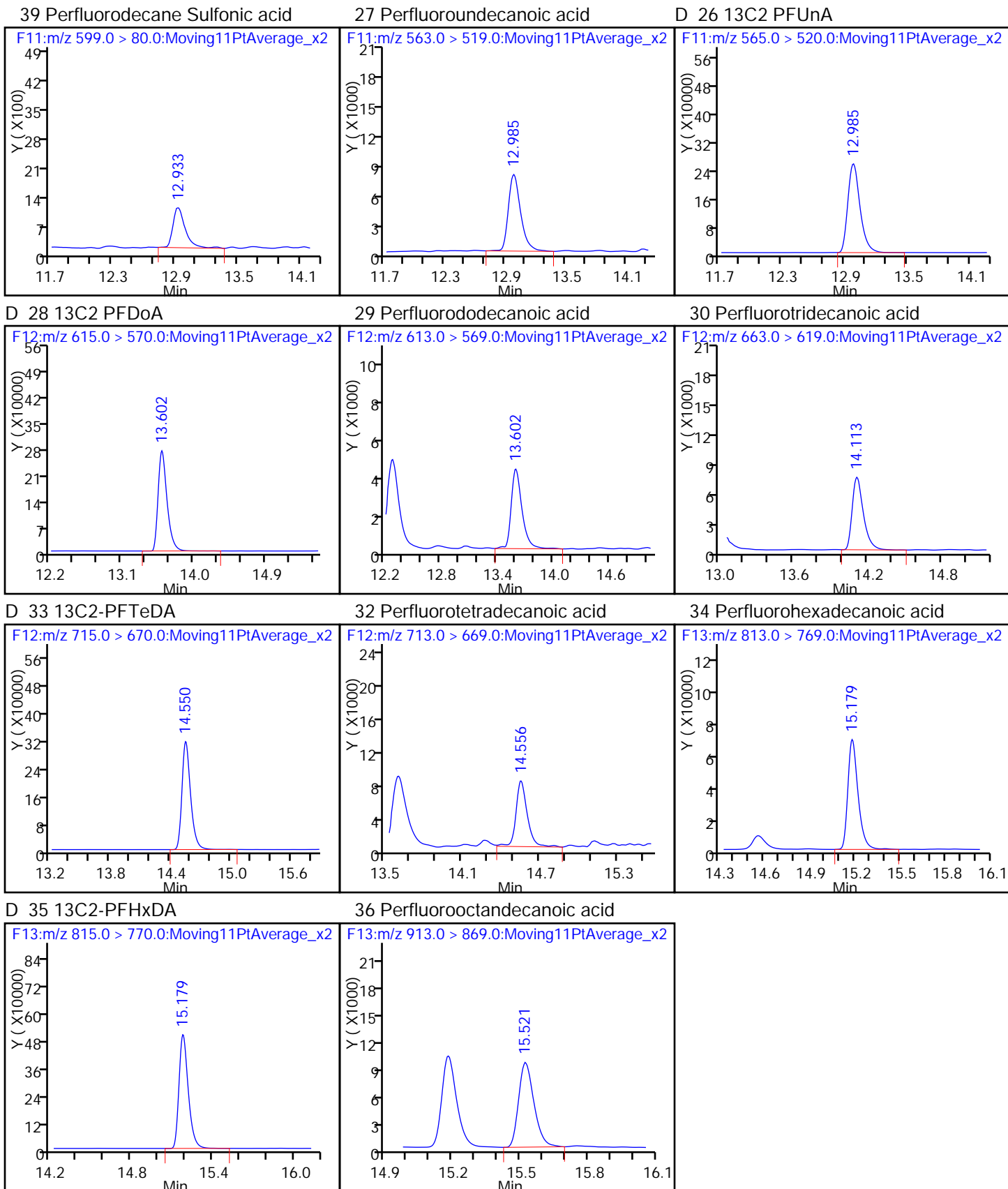
D 11 18O2 PFHxS



D 12 13C4 PFOA







TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_005.d
 Lims ID: Std L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 06-Jan-2016 12:02:41 ALS Bottle#: 19 Worklist Smp#: 6
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L3
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub5
 Method: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 09:42:22 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 06-Jan-2016 13:11:58

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	5.764	5.763	0.001	924661	50.2		100	3200	
2 Perfluorobutyric acid	212.9 > 169.0	5.760	5.763	-0.003	129049	5.06		101	399	
D 3 13C5-PFPeA	267.9 > 223.0	6.863	6.863	0.0	1804009	51.9		104	3173	
4 Perfluoropentanoic acid	262.9 > 219.0	6.868	6.864	0.004	181620	4.99		99.7	38.0	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.978	6.976	0.002	67181	NC			170	
	298.9 > 99.0	6.978	6.976	0.002	34118		1.97(0.00-0.00)		68.1	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.978	6.976	0.002	67181	4.26		96.5		
D 6 13C2 PFHxA	315.0 > 270.0	8.105	8.100	0.005	1742911	53.3		107	4549	
7 Perfluorohexanoic acid	313.0 > 269.0	8.105	8.102	0.003	190734	5.08		102	575	
D 8 13C4-PFHpA	367.0 > 322.0	9.334	9.331	0.003	1794402	52.3		105	3654	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.340	9.335	0.005	186574	4.99		99.8	182	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.364	9.363	0.001	43956	NC			137	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.364	9.363	0.001	43956	5.12		108		
D 11 18O2 PFHxS	403.0 > 84.0	9.370	9.363	0.007	698789	48.1		102	2254	

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	10.454	10.452	0.002		1971801	51.0		102	5017	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.454	10.453	0.001	1.000	225535	5.33		107	160	
413.0 > 169.0	10.454	10.453	0.001	1.000	73127		3.08(0.00-0.00)	107	95.4	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.454	10.456	-0.002	1.000	56008	5.94		125		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.454	10.456	-0.002	1.000	56008	NC			120	
D 16 13C4 PFOS										
503.0 > 80.0	11.407	11.405	0.002		915179	48.9		102	1884	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.407	11.408	-0.001	1.000	87224	4.70		98.3	194	
499.0 > 99.0	11.407	11.408	-0.001	1.000	45208		1.93(0.00-0.00)	98.3	88.8	
D 17 13C5 PFNA										
468.0 > 423.0	11.430	11.427	0.003		1668440	52.0		104	4039	
18 Perfluorononanoic acid										
463.0 > 419.0	11.430	11.431	-0.001	1.000	145939	5.13		103	369	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.259	12.260	-0.001	1.000	182858	5.33		107	640	
D 19 13C2 PFDA										
515.0 > 470.0	12.259	12.262	-0.003		1632183	52.9		106	2348	
D 23 13C8 FOSA										
506.0 > 78.0	12.808	12.805	0.003		2130331	49.9		99.8	1827	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.798	12.805	-0.007	1.000	212187	5.07		101	507	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.934	12.929	0.005	1.000	50751	NC			145	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.934	12.929	0.005	1.000	50751	5.65		117		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.975	12.978	-0.003	1.000	198113	5.09		102	221	
D 26 13C2 PFUnA										
565.0 > 520.0	12.985	12.979	0.006		1936537	51.4		103	2158	
D 28 13C2 PFDaA										
615.0 > 570.0	13.602	13.597	0.005		2189120	51.7		103	2966	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.602	13.597	0.005	1.000	177540	5.17		103	126	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.113	14.114	-0.001	1.000	258508	5.81		116	179	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.550	14.548	0.002		1893525	49.0		98.0	3987	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.550	14.549	0.001	1.000	131273	4.25		85.1	45.1	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.179	15.177	0.002	1.000	493314	4.69		93.8	488	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.179	15.177	0.002		2415341	49.2		98.4	3444	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
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36 Perfluorooctadecanoic acid
 913.0 > 869.0 15.521 15.517 0.004 1.000 209271 4.76 95.1 207

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L3_00016

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_005.d

Injection Date: 06-Jan-2016 12:02:41

Instrument ID: A6

Lims ID: Std L3

Client ID:

Operator ID: JRB

ALS Bottle#: 19

Worklist Smp#: 6

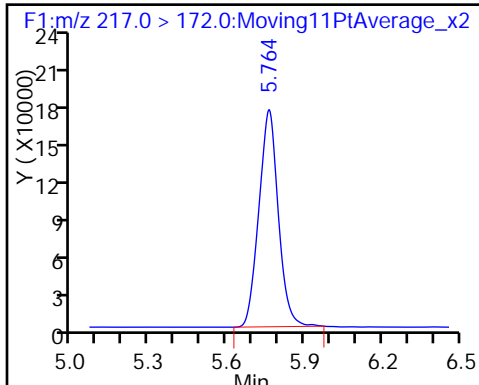
Injection Vol: 15.0 ul

Dil. Factor: 1.0000

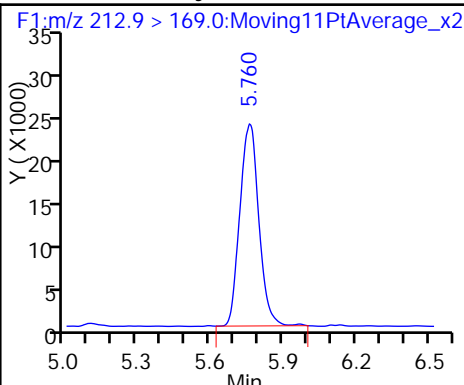
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

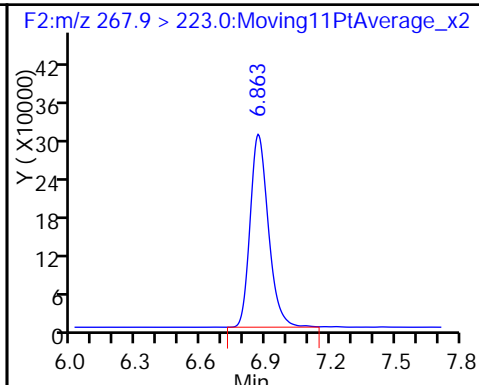
D 1 13C4 PFBA



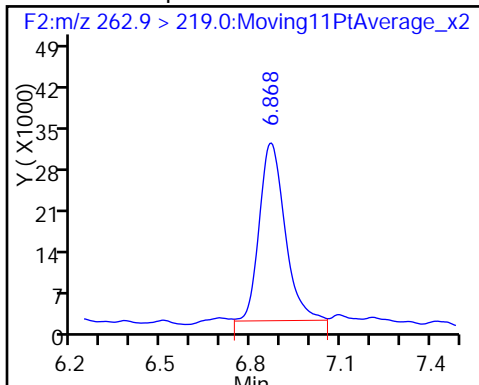
2 Perfluorobutyric acid



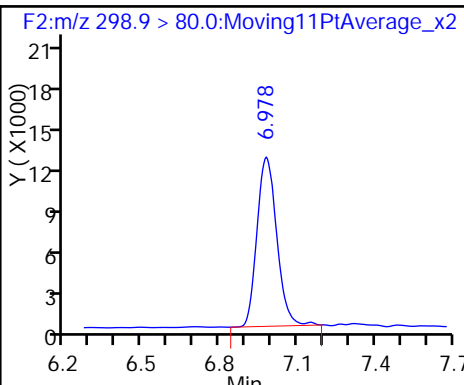
D 3 13C5-PFPeA



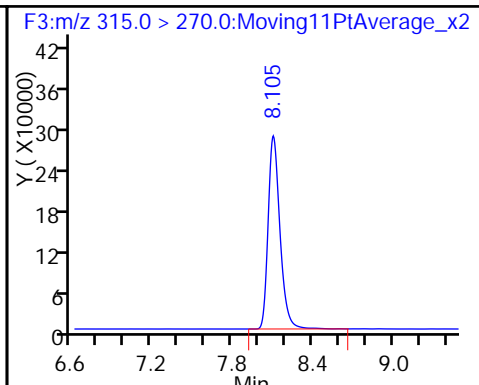
4 Perfluoropentanoic acid



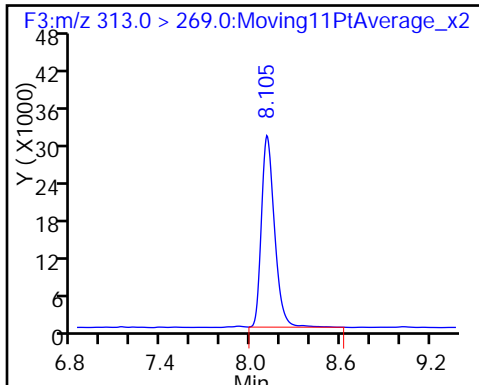
40 Perfluorobutanesulfonic acid



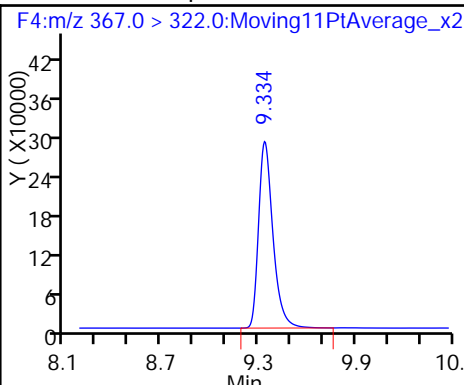
D 6 13C2 PFHxA



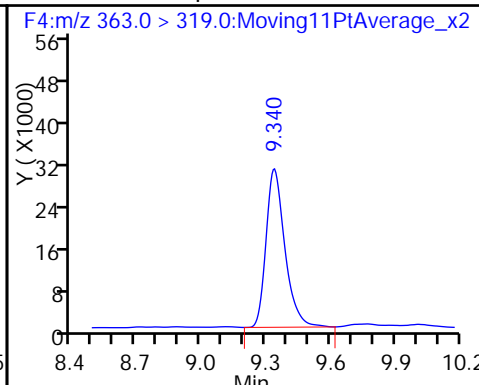
7 Perfluorohexanoic acid



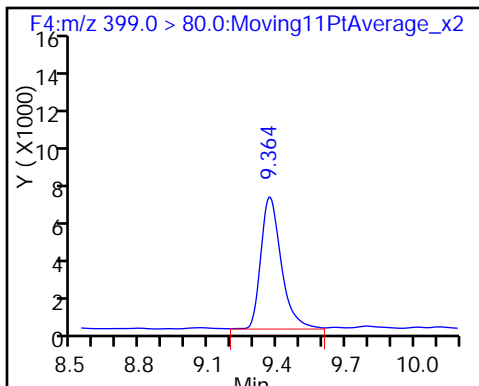
D 8 13C4-PFHpA



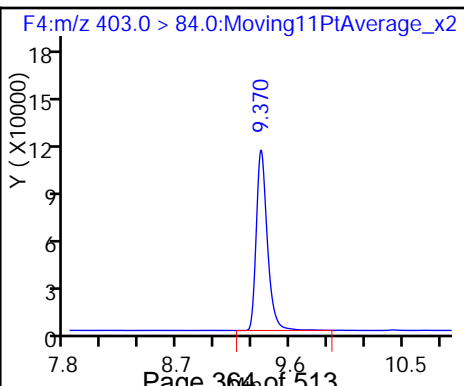
9 Perfluoroheptanoic acid



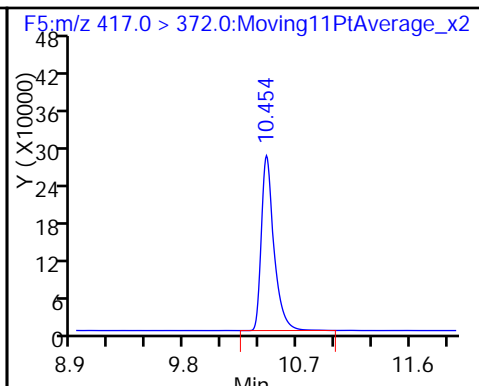
41 Perfluorohexanesulfonic acid

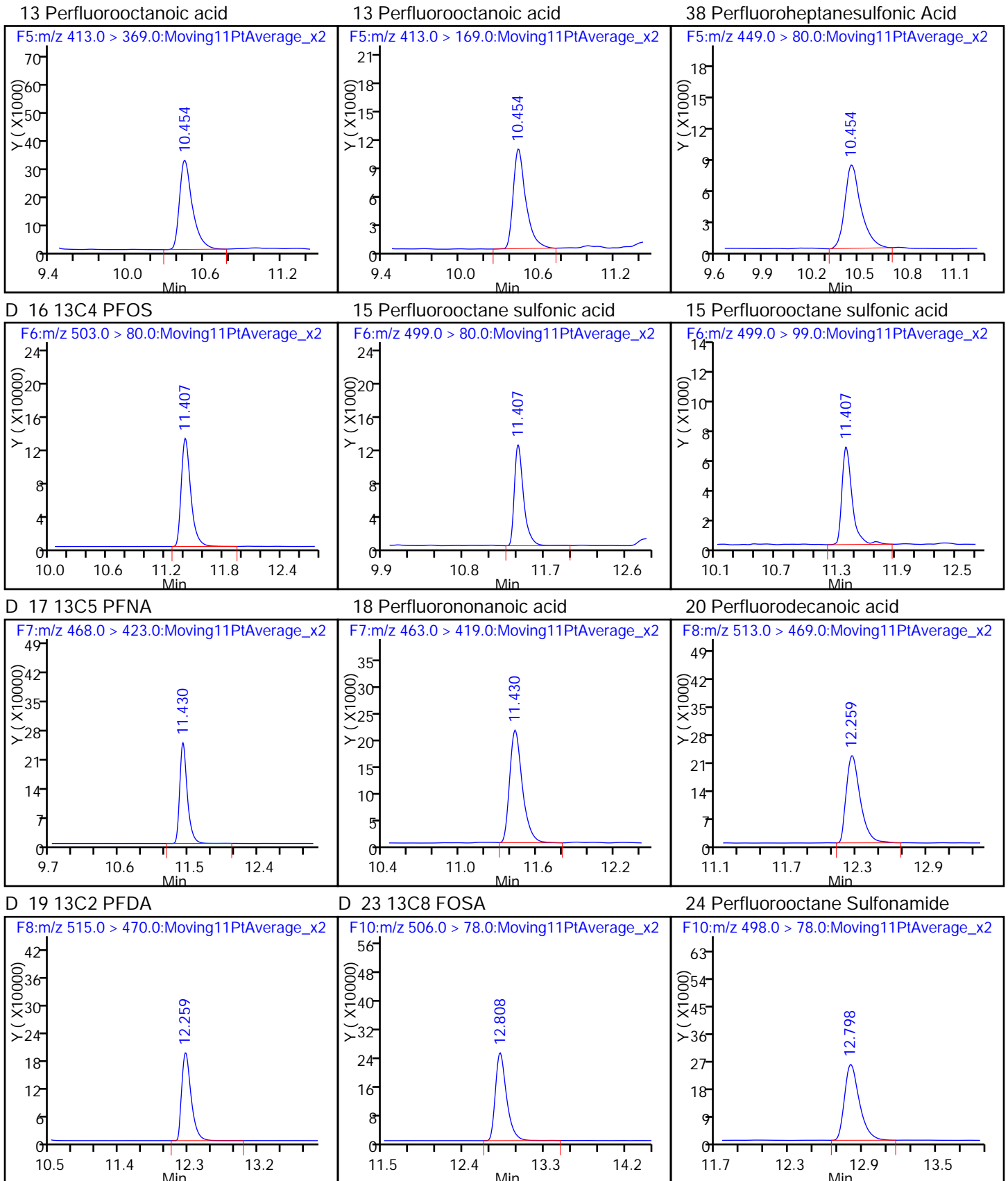


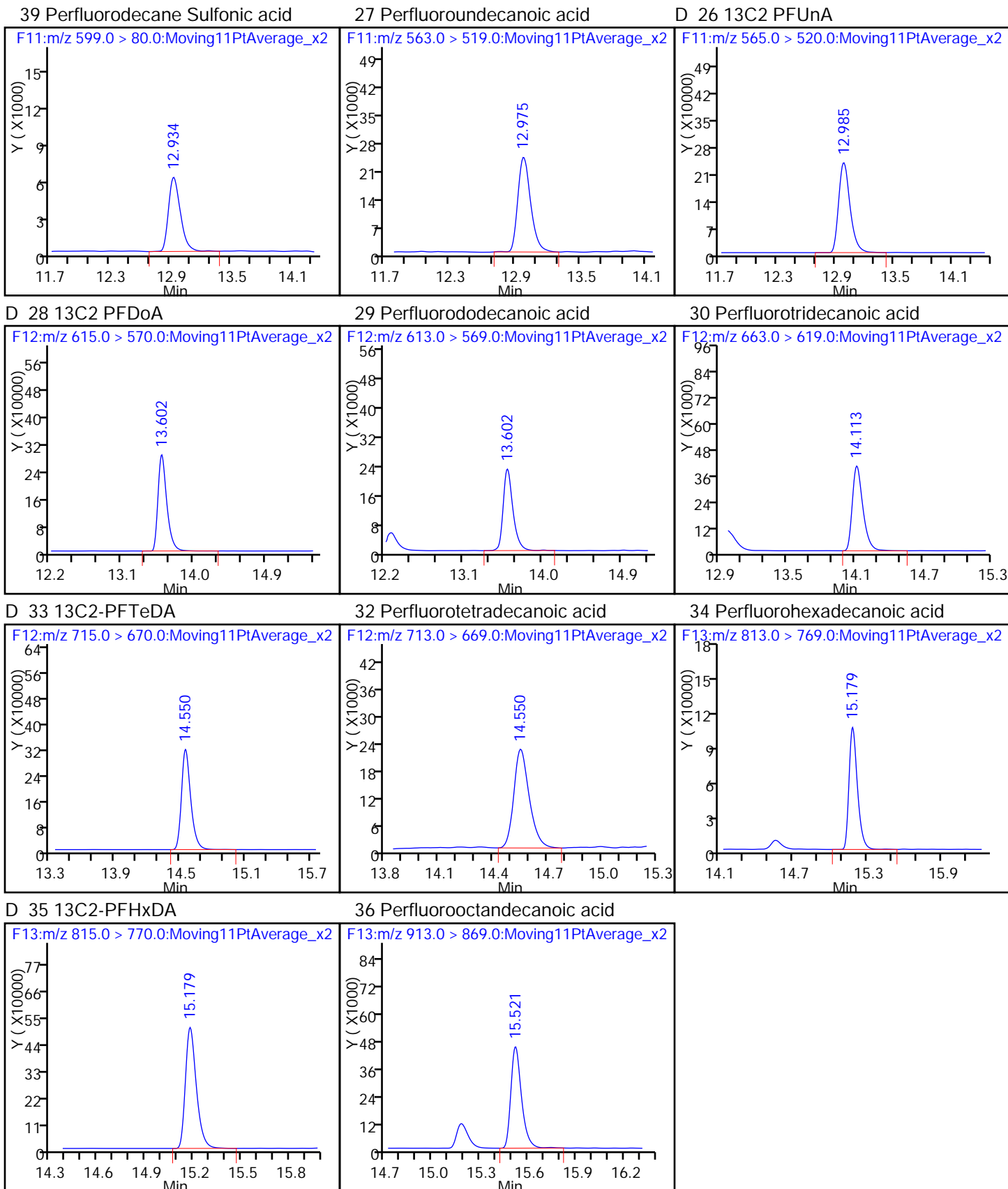
D 11 18O2 PFHxS



D 12 13C4 PFOA







TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_006.d
 Lims ID: Std L4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 06-Jan-2016 12:33:54 ALS Bottle#: 20 Worklist Smp#: 7
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L4
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub5
 Method: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 09:42:24 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 06-Jan-2016 13:15:26

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	5.760	5.763	-0.003	966659	52.5		105	4055	
2 Perfluorobutyric acid	212.9 > 169.0	5.763	5.763	0.0	523714	19.6		98.2	1756	
D 3 13C5-PFPeA	267.9 > 223.0	6.868	6.863	0.005	1804891	51.9		104	3157	
4 Perfluoropentanoic acid	262.9 > 219.0	6.868	6.864	0.004	711397	19.5		97.6	170	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.983	6.976	0.007	285156	NC			937	
	298.9 > 99.0	6.978	6.976	0.002	154188		1.85(0.00-0.00)		329	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.983	6.976	0.007	285156	17.7		100		
D 6 13C2 PFHxA	315.0 > 270.0	8.105	8.100	0.005	1754050	53.6		107	4316	
7 Perfluorohexanoic acid	313.0 > 269.0	8.111	8.102	0.009	727190	19.2		96.2	1554	
D 8 13C4-PFHpA	367.0 > 322.0	9.334	9.331	0.003	1823374	53.2		106	4307	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.340	9.335	0.005	753725	20.6		103	721	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.370	9.363	0.007	171711	NC			468	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.370	9.363	0.007	171711	19.5		103		
D 11 18O2 PFHxS	403.0 > 84.0	9.364	9.363	0.001	715340	49.2		104	2555	

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	10.454	10.452	0.002		1925127	49.8		99.5	4647	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.454	10.453	0.001	1.000	784363	19.0		95.0	598	
413.0 > 169.0	10.454	10.453	0.001	1.000	284871		2.75(0.00-0.00)	95.0	410	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.454	10.456	-0.002	1.000	189461	19.2		101		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.454	10.456	-0.002	1.000	189461	NC			781	
D 16 13C4 PFOS										
503.0 > 80.0	11.407	11.405	0.002		955663	51.1		107	2442	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.407	11.408	-0.001	1.000	384036	19.8		104	252	
499.0 > 99.0	11.407	11.408	-0.001	1.000	198698		1.93(0.00-0.00)	104	647	
D 17 13C5 PFNA										
468.0 > 423.0	11.430	11.427	0.003		1709507	53.3		107	5719	
18 Perfluorononanoic acid										
463.0 > 419.0	11.430	11.431	-0.001	1.000	576424	19.8		98.8	2319	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.259	12.260	-0.001	1.000	697392	21.1		105	1575	
D 19 13C2 PFDA										
515.0 > 470.0	12.259	12.262	-0.003		1573185	51.0		102	3360	
D 23 13C8 FOSA										
506.0 > 78.0	12.798	12.805	-0.007		2283786	53.5		107	1787	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.808	12.805	0.003	1.000	905836	20.2		101	1826	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.923	12.929	-0.006	1.000	182511	NC			674	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.923	12.929	-0.006	1.000	182511	19.5		101		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.975	12.978	-0.003	1.000	741290	20.2		101	1208	
D 26 13C2 PFUnA										
565.0 > 520.0	12.975	12.979	-0.004		2041366	54.1		108	1678	
D 28 13C2 PFDoA										
615.0 > 570.0	13.592	13.597	-0.005		2279400	53.8		108	2995	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.592	13.597	-0.005	1.000	714262	20.0		99.8	583	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.113	14.114	-0.001	1.000	941479	20.3		102	563	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.550	14.548	0.002		1902026	49.2		98.5	3497	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.543	14.549	-0.006	1.000	556971	19.0		95.2	197	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.174	15.177	-0.003	1.000	1172831	18.0		89.9	860	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.174	15.177	-0.003		2349134	47.9		95.7	2939	

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	15.516	15.517	-0.001	1.000	828096	18.1	90.4	753	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00017

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_006.d

Injection Date: 06-Jan-2016 12:33:54

Instrument ID: A6

Lims ID: Std L4

Client ID:

Operator ID: JRB

ALS Bottle#: 20

Worklist Smp#: 7

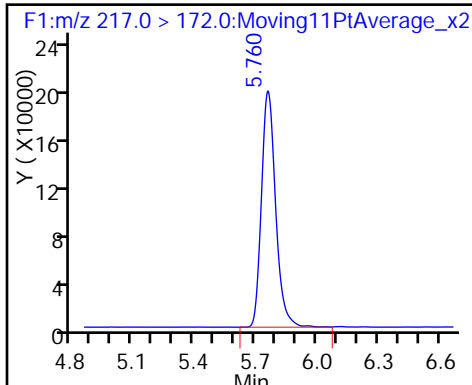
Injection Vol: 15.0 ul

Dil. Factor: 1.0000

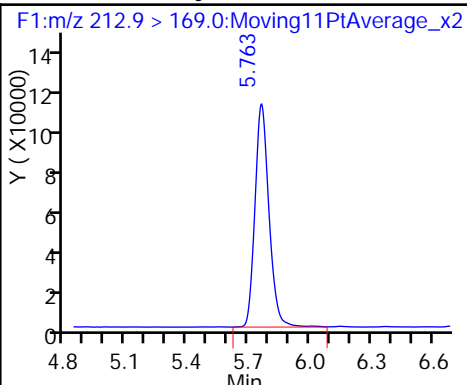
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

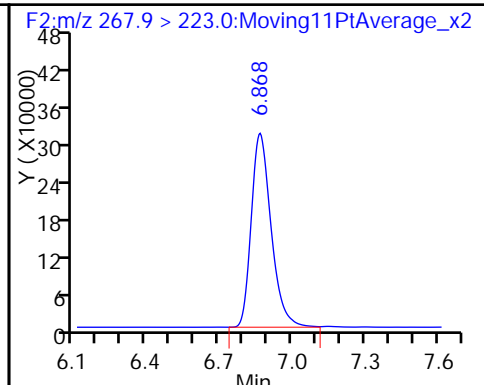
D 1 13C4 PFBA



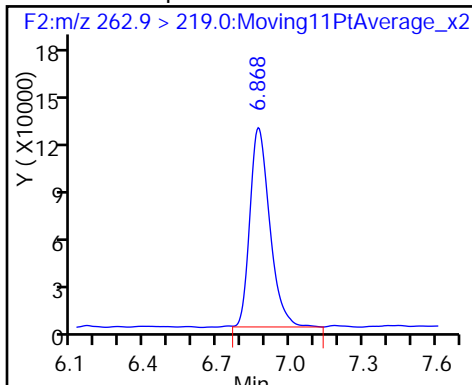
2 Perfluorobutyric acid



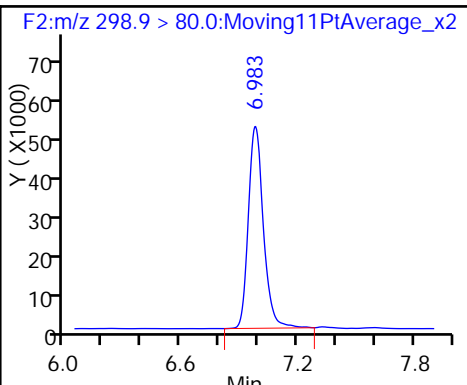
D 3 13C5-PFPeA



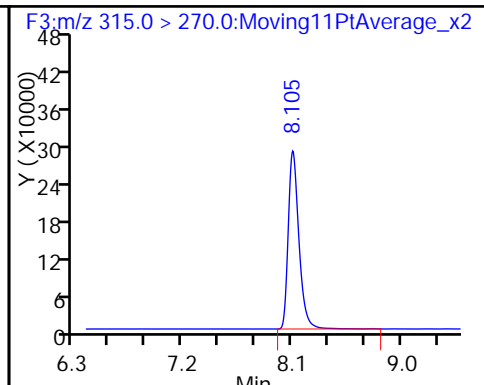
4 Perfluoropentanoic acid



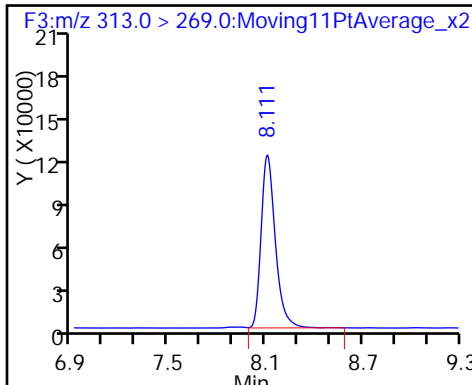
40 Perfluorobutanesulfonic acid



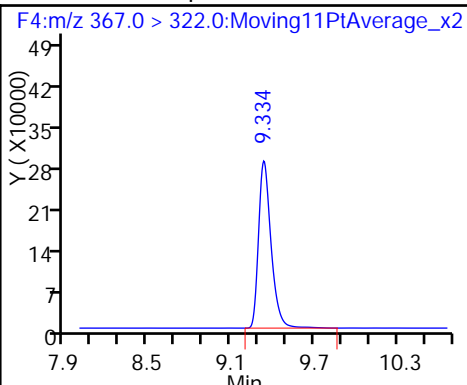
D 6 13C2 PFHxA



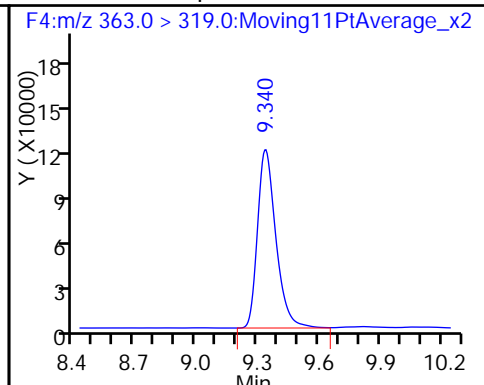
7 Perfluorohexanoic acid



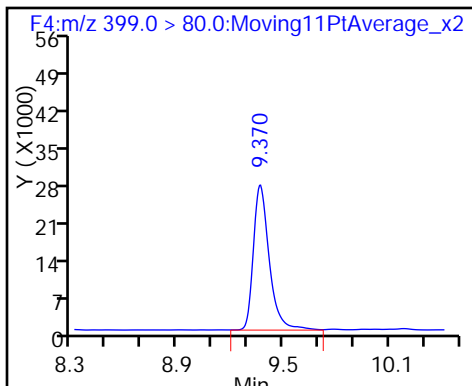
D 8 13C4-PFHpA



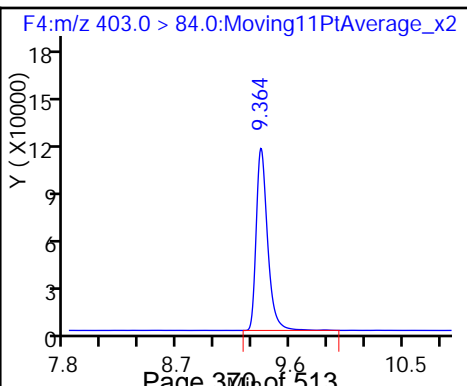
9 Perfluoroheptanoic acid



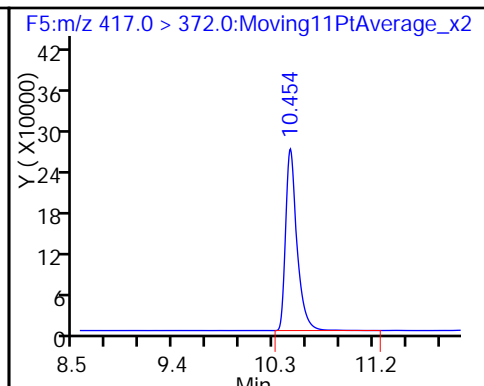
41 Perfluorohexanesulfonic acid

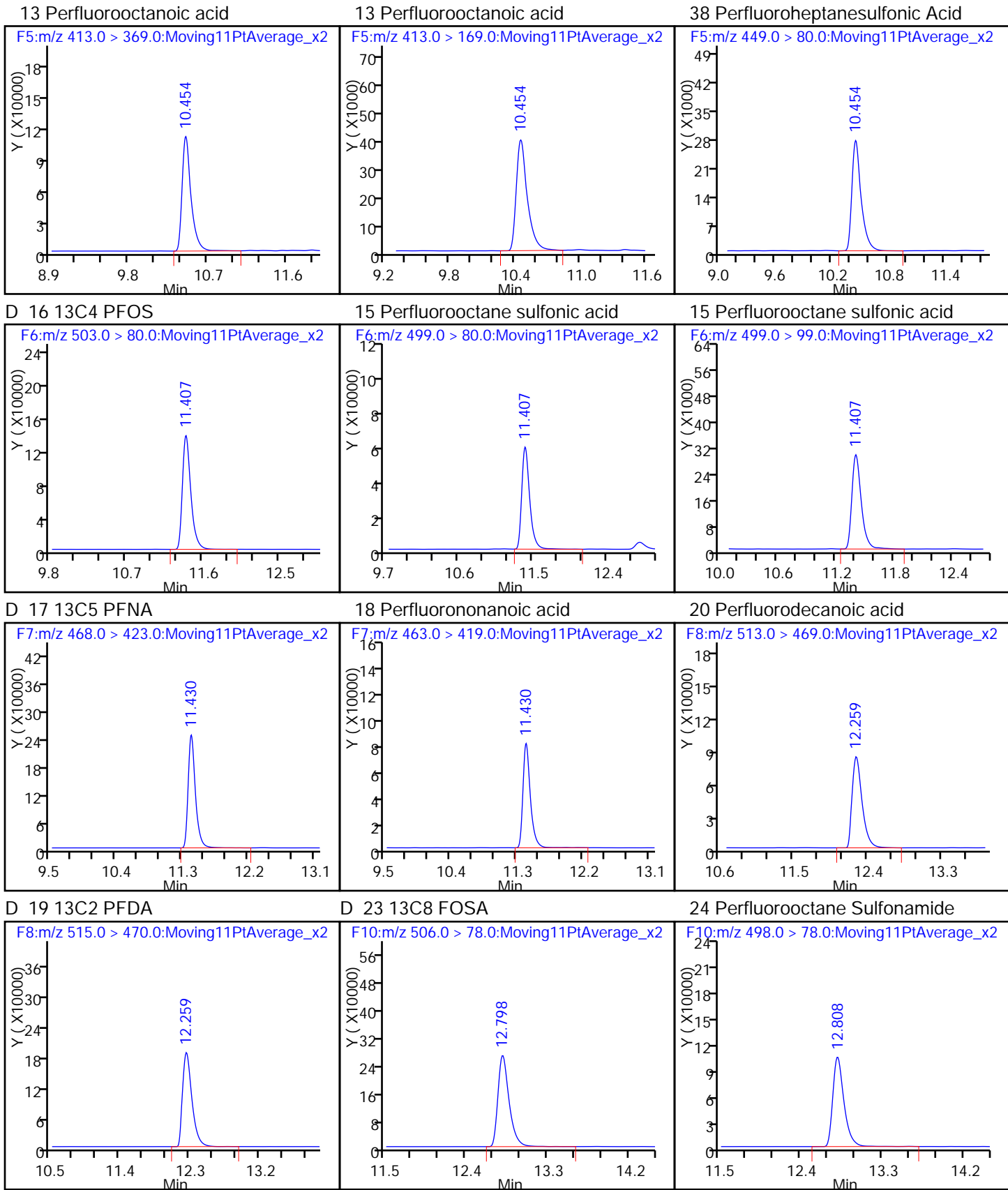


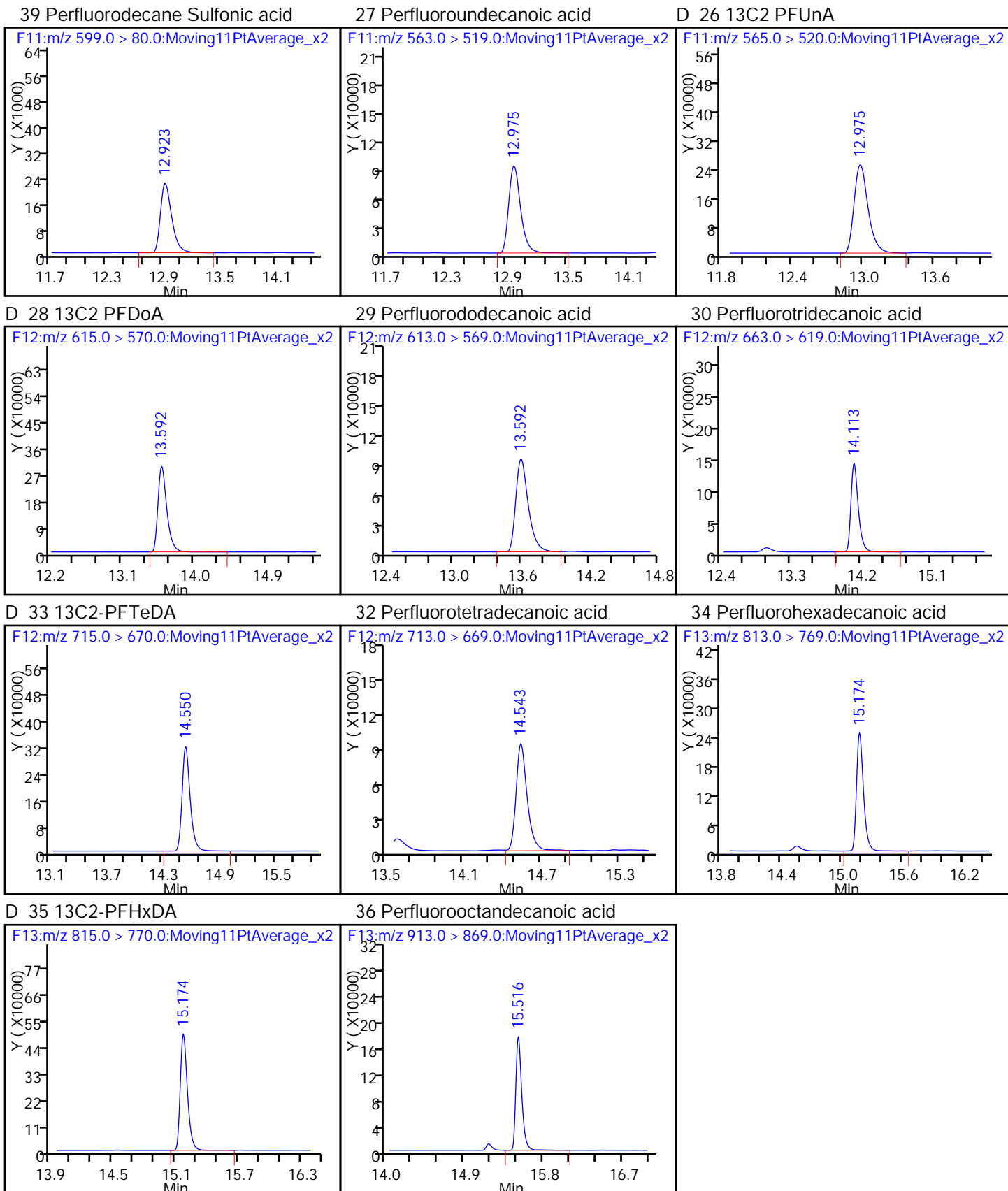
D 11 18O2 PFHxS



D 12 13C4 PFOA







TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_007.d
 Lims ID: Std L5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 06-Jan-2016 13:05:08 ALS Bottle#: 21 Worklist Smp#: 8
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L5
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub5
 Method: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 09:42:08 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 08-Jan-2016 09:29:59

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	5.760	5.763	-0.003	974114	52.9		106	3246	
2 Perfluorobutyric acid	212.9 > 169.0	5.760	5.763	-0.003	1381546	51.4		103	3503	
D 3 13C5-PFPeA	267.9 > 223.0	6.863	6.863	0.0	1810982	52.1		104	4023	
4 Perfluoropentanoic acid	262.9 > 219.0	6.868	6.864	0.004	1752091	47.9		95.8	345	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.978	6.976	0.002	729585	NC			1544	
	298.9 > 99.0	6.978	6.976	0.002	421493		1.73(0.00-0.00)		862	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.978	6.976	0.002	729585	44.1		99.9		
D 6 13C2 PFHxA	315.0 > 270.0	8.100	8.100	0.0	1751141	53.5		107	4946	
7 Perfluorohexanoic acid	313.0 > 269.0	8.105	8.102	0.003	1810095	47.9		95.9	1889	
D 8 13C4-PFHpA	367.0 > 322.0	9.329	9.331	-0.002	1798054	52.4		105	6242	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.335	9.335	0.0	1793000	50.1		100	1429	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.364	9.363	0.001	415372	NC			1120	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.364	9.363	0.001	415372	46.1		97.5		
D 11 18O2 PFHxS	403.0 > 84.0	9.364	9.363	0.001	733182	50.5		107	2067	

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	10.448	10.452	-0.004		1860618	48.1		96.2	5092	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.448	10.453	-0.005	1.000	1877840	47.1		94.1	1807	
413.0 > 169.0	10.455	10.453	0.002	1.001	696089		2.70(0.00-0.00)	94.1	746	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.448	10.456	-0.008	1.000	452423	44.5		93.5		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.448	10.456	-0.008	1.000	452423	NC			2217	
D 16 13C4 PFOS										
503.0 > 80.0	11.400	11.405	-0.005		986945	52.8		110	2497	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.407	11.408	-0.001	1.000	932484	46.6		97.5	307	
499.0 > 99.0	11.400	11.408	-0.008	0.999	513363		1.82(0.00-0.00)	97.5	928	
D 17 13C5 PFNA										
468.0 > 423.0	11.423	11.427	-0.004		1618271	50.4		101	3599	
18 Perfluorononanoic acid										
463.0 > 419.0	11.430	11.431	-0.001	1.000	1411768	51.1		102	2070	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.259	12.260	-0.001	1.000	1561638	46.6		93.1	2966	
D 19 13C2 PFDA										
515.0 > 470.0	12.259	12.262	-0.003		1594217	51.7		103	2725	
D 23 13C8 FOSA										
506.0 > 78.0	12.798	12.805	-0.007		2169673	50.8		102	2852	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.798	12.805	-0.007	1.000	2189426	51.4		103	2144	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.923	12.929	-0.006	1.000	481016	NC			1461	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.923	12.929	-0.006	1.000	481016	49.6		103		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.975	12.978	-0.003	1.000	1581984	46.8		93.7	1808	
D 26 13C2 PFUnA										
565.0 > 520.0	12.975	12.979	-0.004		1917383	50.8		102	3819	
D 28 13C2 PFDaA										
615.0 > 570.0	13.593	13.597	-0.004		2164474	51.1		102	2899	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.593	13.597	-0.004	1.000	1712069	50.4		101	1226	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.113	14.114	-0.001	1.000	2138582	48.6		97.2	1619	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.543	14.548	-0.005		1993331	51.6		103	3588	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.543	14.549	-0.006	1.000	1283969	47.0		94.0	491	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.175	15.177	-0.002	1.000	2722865	52.1		104	1876	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.175	15.177	-0.002		2586833	52.7		105	2994	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
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36 Perfluorooctadecanoic acid
913.0 > 869.0 15.511 15.517 -0.006 1.000 2271591 52.2 104 1559

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00016

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_007.d

Injection Date: 06-Jan-2016 13:05:08

Instrument ID: A6

Lims ID: Std L5

Client ID:

Operator ID: JRB

ALS Bottle#: 21

Worklist Smp#: 8

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

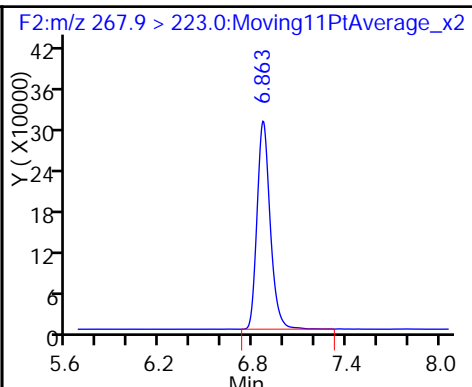
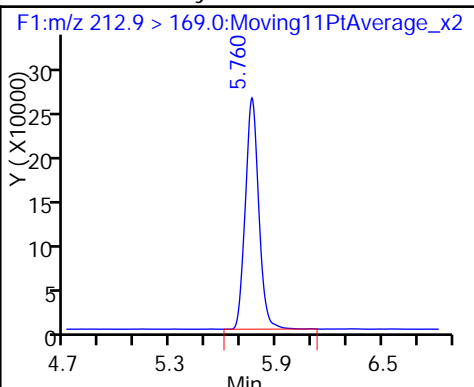
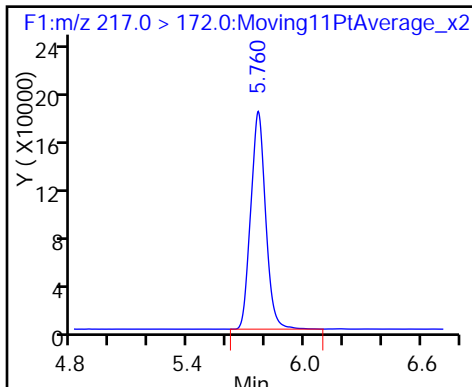
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

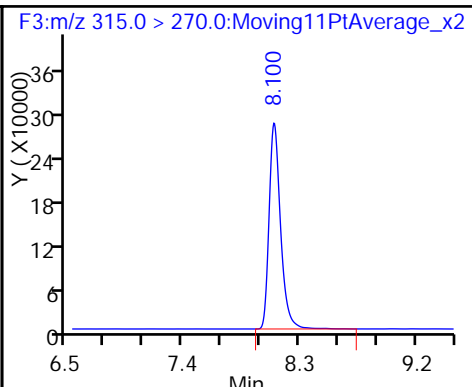
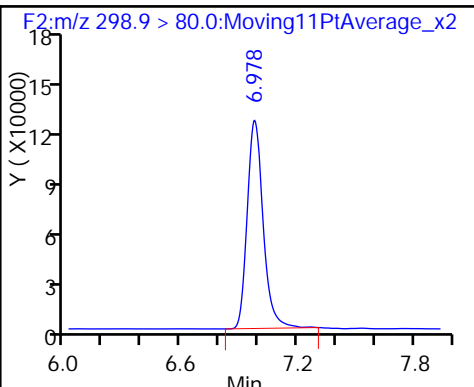
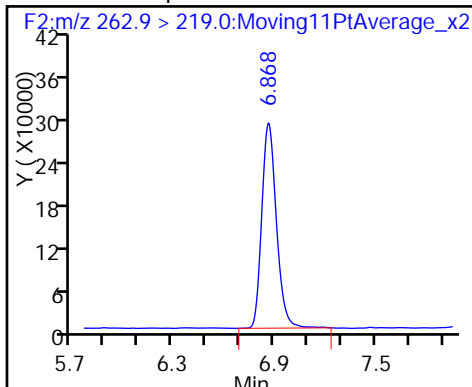
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

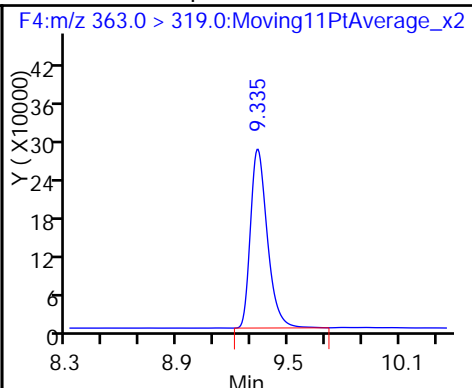
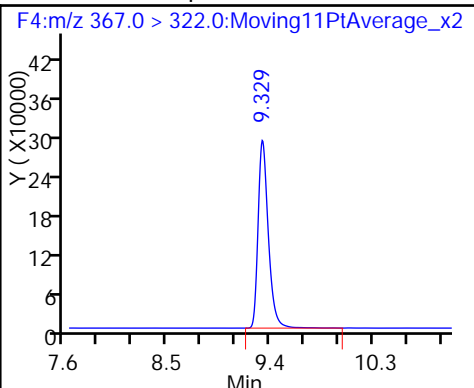
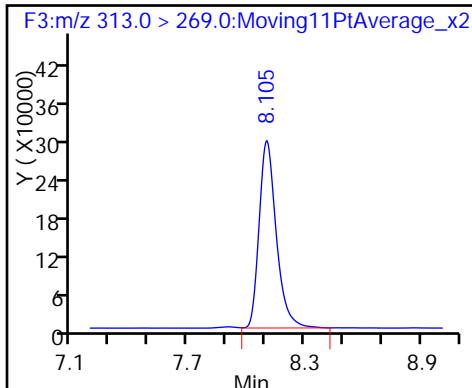
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

D 8 13C4-PFHpA

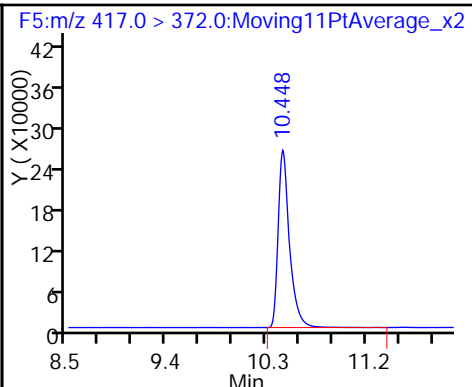
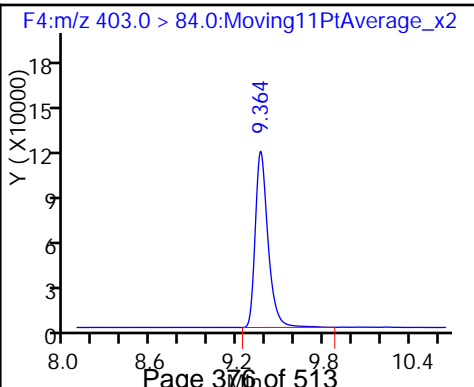
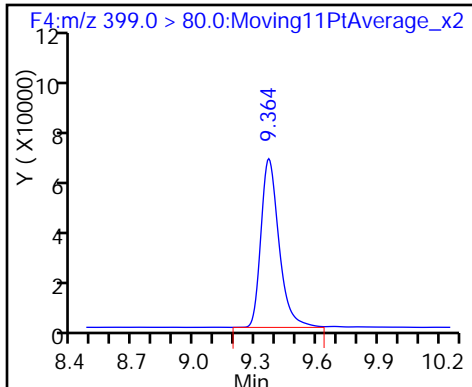
9 Perfluoroheptanoic acid

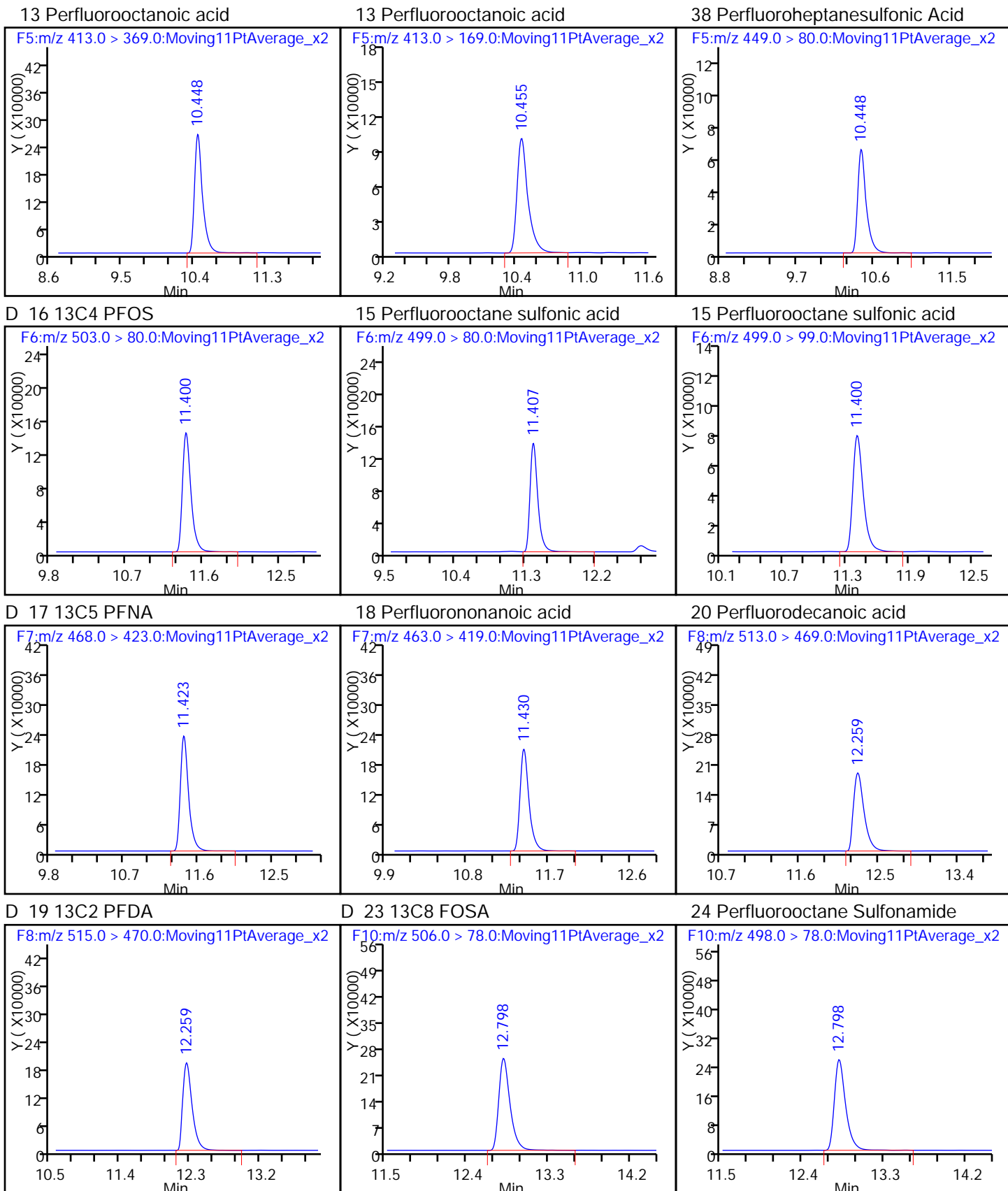


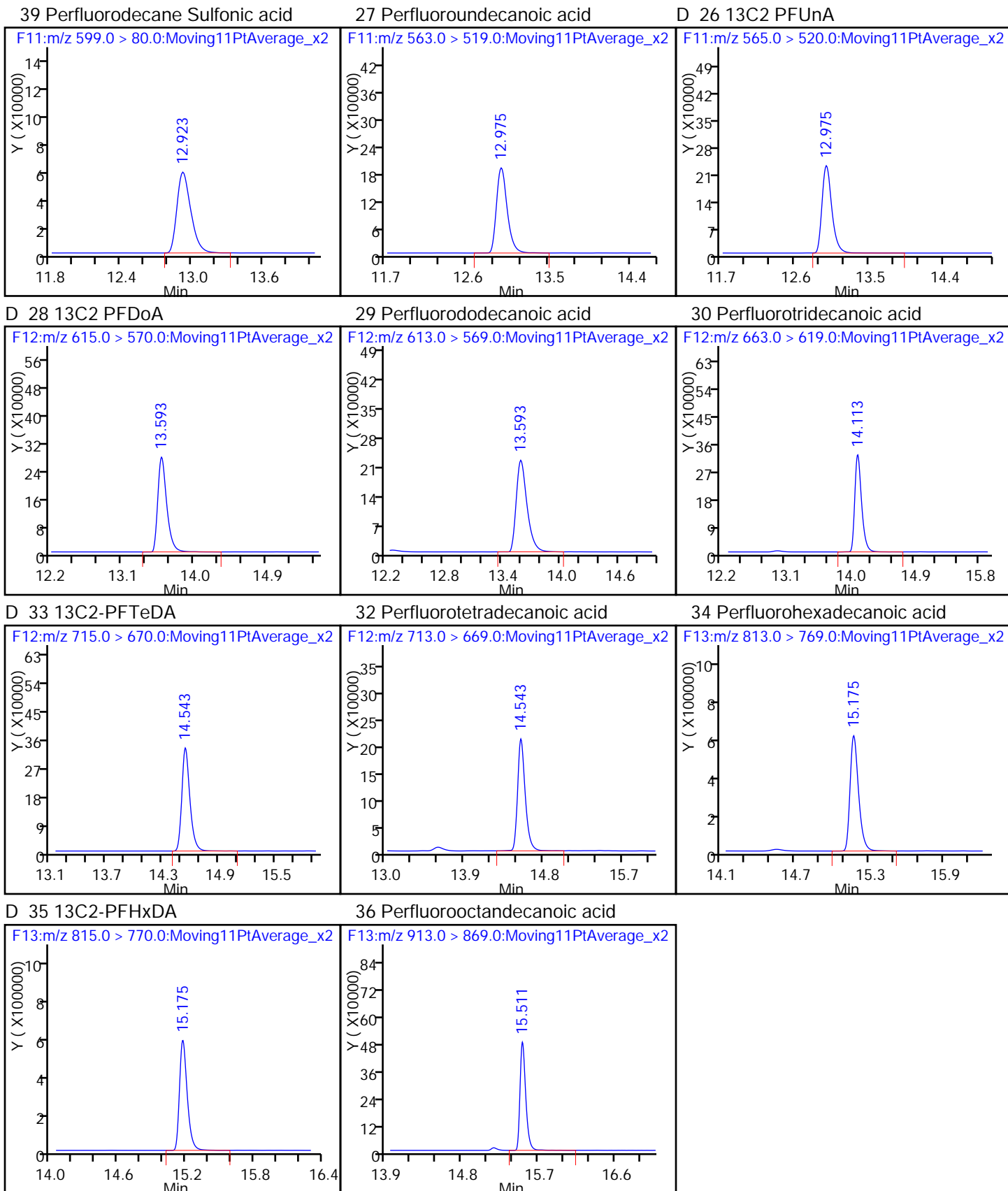
41 Perfluorohexanesulfonic acid

D 11 18O2 PFHxS

D 12 13C4 PFOA







TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_008.d
 Lims ID: Std L6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 06-Jan-2016 13:36:20 ALS Bottle#: 22 Worklist Smp#: 9
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L6
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub5
 Method: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 09:42:28 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 06-Jan-2016 14:45:32

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	5.763	5.763	0.0	838778	45.6		91.1	2135	
2 Perfluorobutyric acid	212.9 > 169.0	5.763	5.763	0.0	4633772	200.2		100	10202	
D 3 13C5-PFPeA	267.9 > 223.0	6.868	6.863	0.005	1569088	45.1		90.2	4125	
4 Perfluoropentanoic acid	262.9 > 219.0	6.868	6.864	0.004	6010884	189.7		94.9	1494	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.978	6.976	0.002	2445937	NC			4737	
	298.9 > 99.0	6.978	6.976	0.002	1398904		1.75(0.00-0.00)		2259	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.978	6.976	0.002	2445937	180.9		102		
D 6 13C2 PFHxA	315.0 > 270.0	8.105	8.100	0.005	1436454	43.9		87.8	3764	
7 Perfluorohexanoic acid	313.0 > 269.0	8.105	8.102	0.003	6266689	202.4		101	2633	
D 8 13C4-PFHpA	367.0 > 322.0	9.335	9.331	0.004	1442468	42.1		84.1	2677	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.335	9.335	0.0	5839203	204.1		102	2485	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.364	9.363	0.001	1407431	NC			2994	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.364	9.363	0.001	1407431	191.1		101		
D 11 18O2 PFHxS	403.0 > 84.0	9.364	9.363	0.001	599642	41.3		87.2	1539	

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	10.448	10.452	-0.004		1490496	38.5		77.1	5463	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.455	10.453	0.002	1.000	6076103	190.1		95.1	3493	
413.0 > 169.0	10.455	10.453	0.002	1.000	2199718		2.76(0.00-0.00)	95.1	2125	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.455	10.456	-0.001	1.000	1467858	192.4		101		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.455	10.456	-0.001	1.000	1467858	NC			2115	
D 16 13C4 PFOS										
503.0 > 80.0	11.400	11.405	-0.005		740605	39.6		82.9	1912	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.407	11.408	-0.001	1.000	2916813	194.2		102	352	
499.0 > 99.0	11.400	11.408	-0.008	0.999	1586237		1.84(0.00-0.00)	102	2049	
D 17 13C5 PFNA										
468.0 > 423.0	11.423	11.427	-0.004		1354219	42.2		84.4	2031	
18 Perfluorononanoic acid										
463.0 > 419.0	11.430	11.431	-0.001	1.000	4674483	202.4		101	6025	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.259	12.260	-0.001	1.000	4976064	180.3		90.2	5224	
D 19 13C2 PFDA										
515.0 > 470.0	12.259	12.262	-0.003		1311848	42.5		85.0	1567	
D 23 13C8 FOSA										
506.0 > 78.0	12.808	12.805	0.003		1989023	46.6		93.2	1771	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.808	12.805	0.003	1.000	7837373	200.7		100	2094	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.923	12.929	-0.006	1.000	1305054	NC			3269	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.923	12.929	-0.006	1.000	1305054	179.5		93.1		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.975	12.978	-0.003	1.000	5476584	195.6		97.8	3709	
D 26 13C2 PFUnA										
565.0 > 520.0	12.975	12.979	-0.004		1610211	42.7		85.4	2155	
D 28 13C2 PFDaA										
615.0 > 570.0	13.593	13.597	-0.004		1882387	44.4		88.9	2196	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.593	13.597	-0.004	1.000	5980430	202.3		101	3080	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.113	14.114	-0.001	1.000	6719579	175.6		87.8	2747	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.543	14.548	-0.005		1817616	47.0		94.1	3132	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.543	14.549	-0.006	1.000	4449710	188.9		94.5	1430	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.174	15.177	-0.003	1.000	8444706	200.4		100	3335	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.174	15.177	-0.003		2264391	46.1		92.3	3227	

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	15.511	15.517	-0.006	1.000	7400052	195.6	97.8	3153	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L6_00015

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_008.d

Injection Date: 06-Jan-2016 13:36:20

Instrument ID: A6

Lims ID: Std L6

Client ID:

Operator ID: JRB

ALS Bottle#: 22

Worklist Smp#: 9

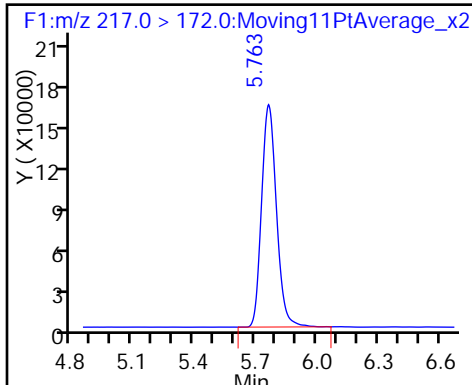
Injection Vol: 15.0 ul

Dil. Factor: 1.0000

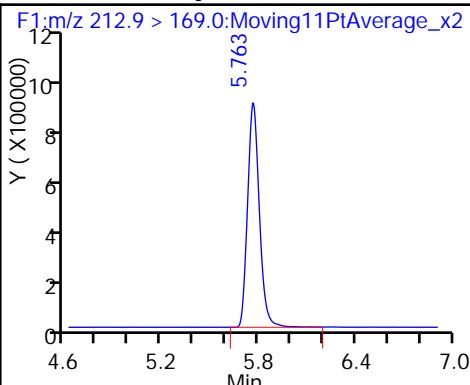
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

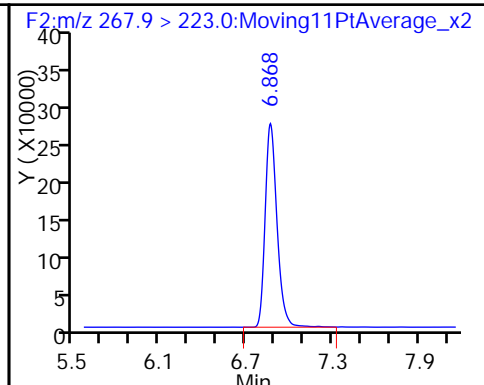
D 1 13C4 PFBA



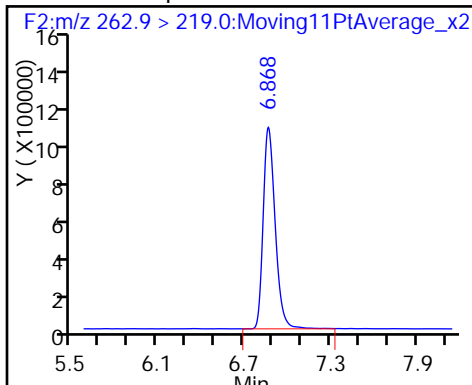
2 Perfluorobutyric acid



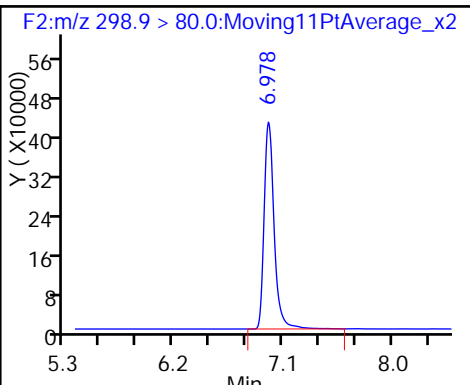
D 3 13C5-PFPeA



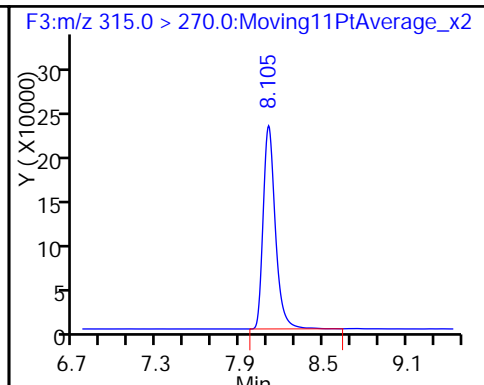
4 Perfluoropentanoic acid



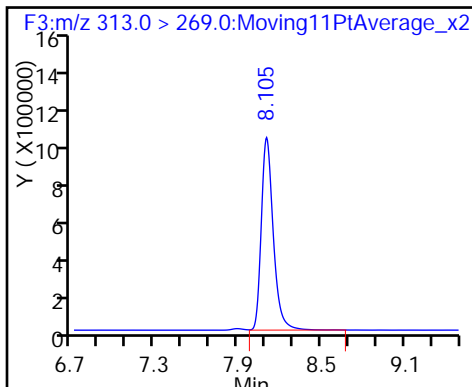
40 Perfluorobutanesulfonic acid



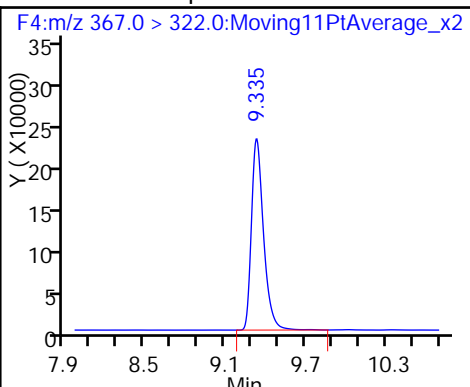
D 6 13C2 PFHxA



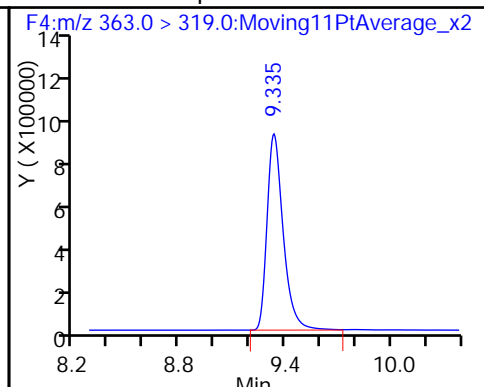
7 Perfluorohexanoic acid



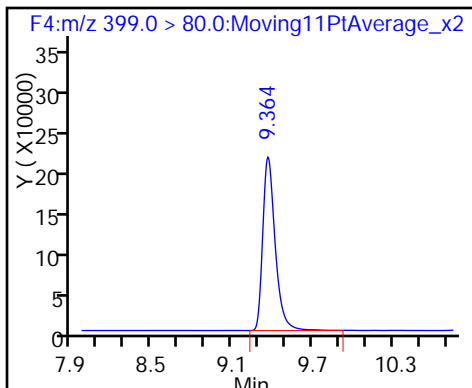
D 8 13C4-PFHpA



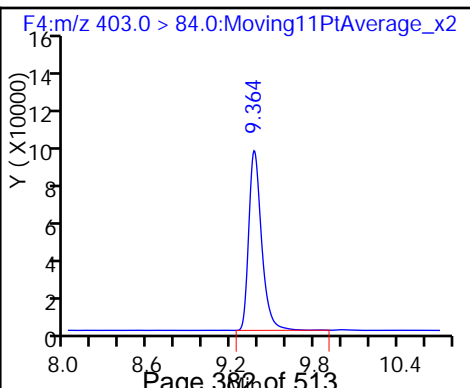
9 Perfluoroheptanoic acid



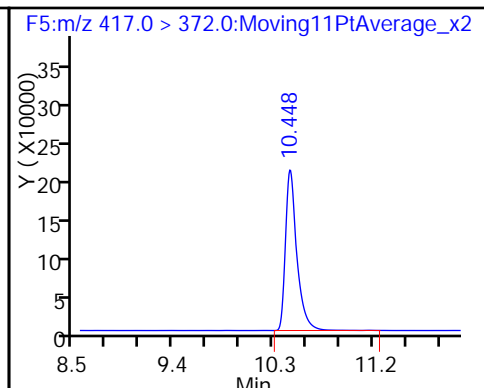
41 Perfluorohexanesulfonic acid

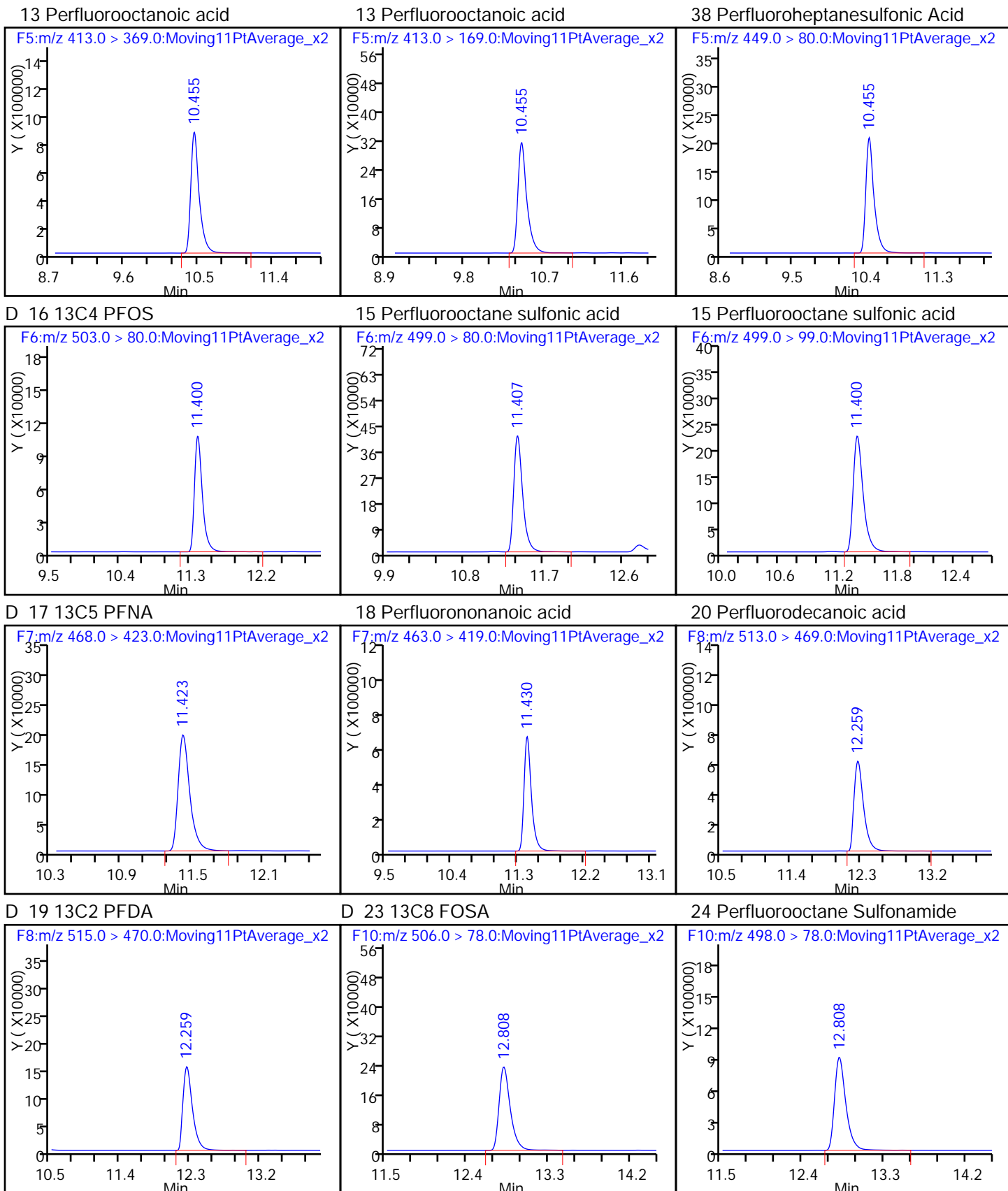


D 11 18O2 PFHxS

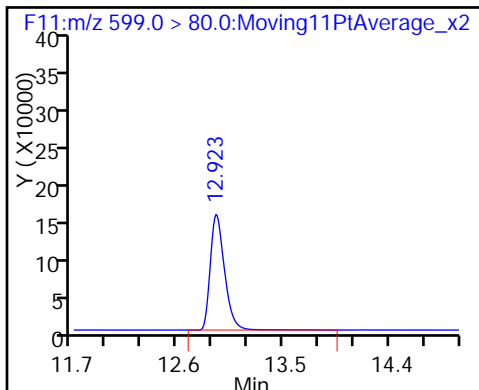


D 12 13C4 PFOA

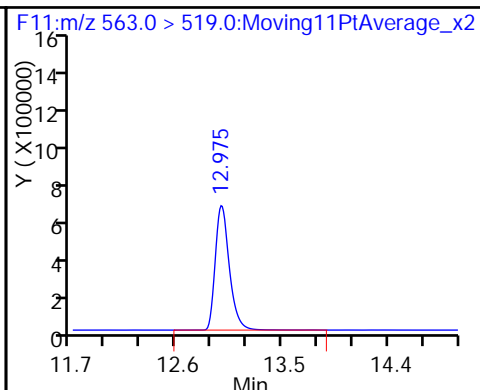




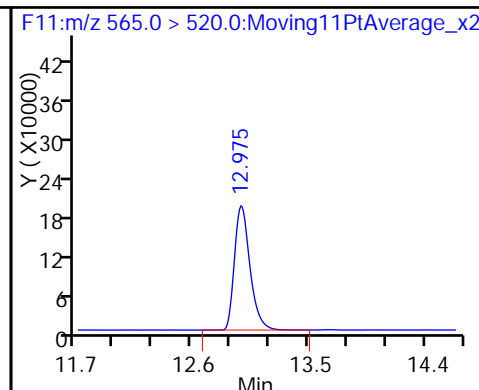
39 Perfluorodecane Sulfonic acid



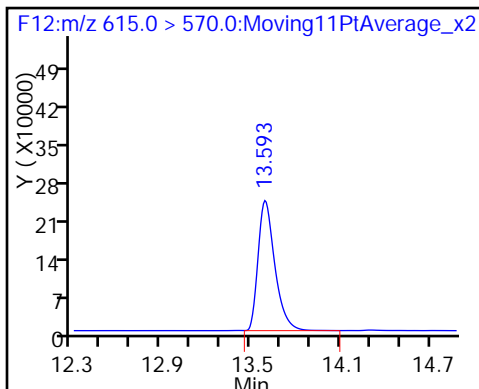
27 Perfluoroundecanoic acid



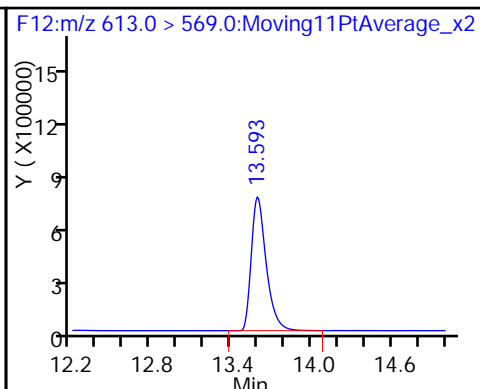
D 26 13C2 PFUnA



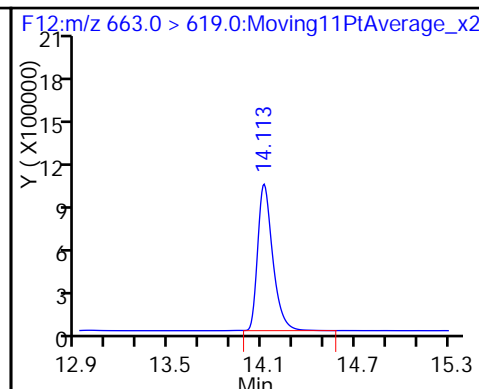
D 28 13C2 PFDaA



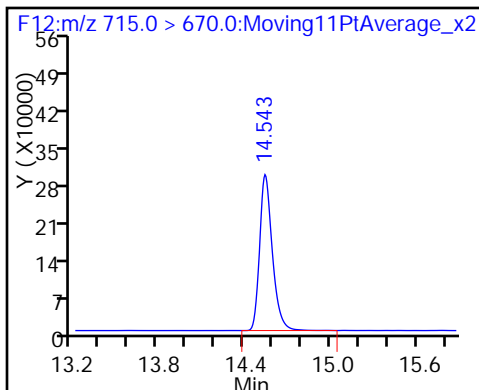
29 Perfluorododecanoic acid



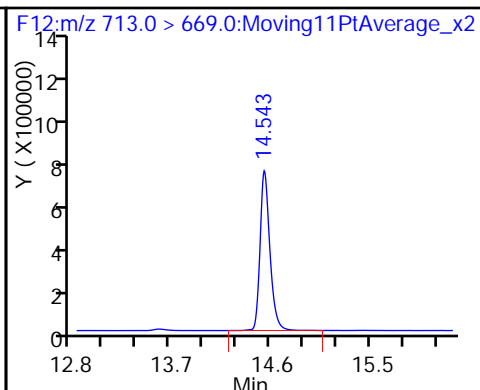
30 Perfluorotridecanoic acid



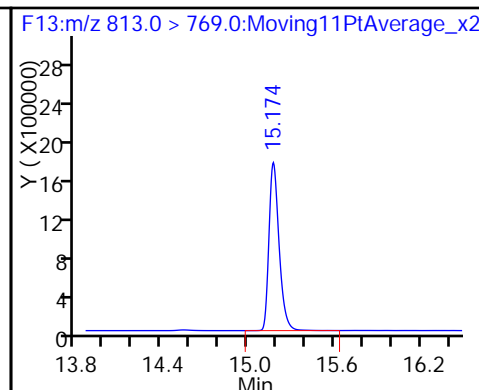
D 33 13C2-PFTeDA



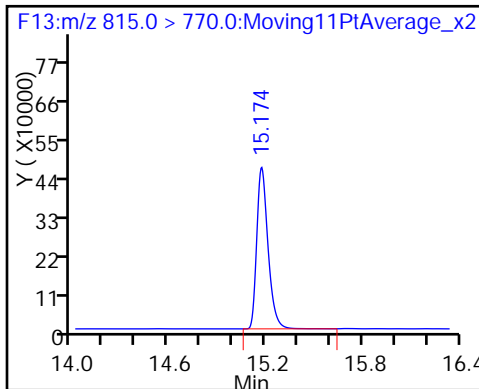
32 Perfluorotetradecanoic acid



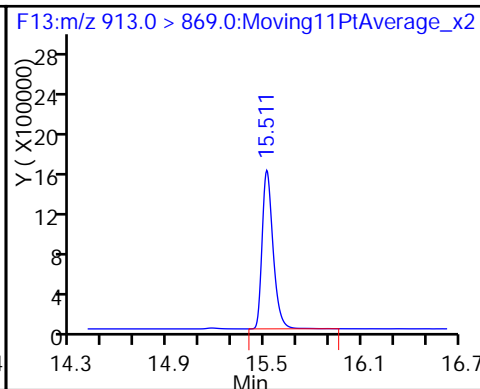
34 Perfluorohexadecanoic acid



D 35 13C2-PFHxDA



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Lims ID: Std L7
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 06-Jan-2016 14:07:35 ALS Bottle#: 23 Worklist Smp#: 10
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: STD L7
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Sublist: chrom-PFAC_A6*sub5
 Method: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 09:42:32 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 06-Jan-2016 14:53:59

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	5.763	5.763	0.0	719839	39.1		78.2	2139	
2 Perfluorobutyric acid	212.9 > 169.0	5.763	5.763	0.0	8139792	409.8		102	10442	
D 3 13C5-PFPeA	267.9 > 223.0	6.868	6.863	0.005	1307833	37.6		75.2	3640	
4 Perfluoropentanoic acid	262.9 > 219.0	6.868	6.864	0.004	9945285	376.6		94.1	1779	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.983	6.976	0.007	4136098	NC			8449	
	298.9 > 99.0	6.983	6.976	0.007	2272698		1.82(0.00-0.00)		1854	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.983	6.976	0.007	4136098	346.1		97.9		
D 6 13C2 PFHxA	315.0 > 270.0	8.105	8.100	0.005	1223768	37.4		74.8	3204	
7 Perfluorohexanoic acid	313.0 > 269.0	8.105	8.102	0.003	9993754	378.8		94.7	2049	
D 8 13C4-PFHpA	367.0 > 322.0	9.335	9.331	0.004	1283868	37.4		74.9	3001	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.335	9.335	0.0	10058302	395.3		98.8	6202	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.370	9.363	0.007	2507742	NC			2952	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.370	9.363	0.007	2507742	385.2		102		
D 11 18O2 PFHxS	403.0 > 84.0	9.364	9.363	0.001	530090	36.5		77.1	1417	

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	10.455	10.452	0.003		1218290	31.5		63.0	1919	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.455	10.453	0.002	1.000	9780690	374.4		93.6	3216	
413.0 > 169.0	10.455	10.453	0.002	1.000	3770949		2.59(0.00-0.00)	93.6	3606	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.455	10.456	-0.001	1.000	2500568	377.0		99.0		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.455	10.456	-0.001	1.000	2500568	NC			4018	
D 16 13C4 PFOS										
503.0 > 80.0	11.408	11.405	0.003		643966	34.4		72.1	1472	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.408	11.408	0.0	1.000	4917016	376.5		98.5	284	
499.0 > 99.0	11.408	11.408	0.0	1.000	2655413		1.85(0.00-0.00)	98.5	3707	
D 17 13C5 PFNA										
468.0 > 423.0	11.423	11.427	-0.004		1206211	37.6		75.2	2293	
18 Perfluorononanoic acid										
463.0 > 419.0	11.430	11.431	-0.001	1.000	8142347	395.8		98.9	6745	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.259	12.260	-0.001	1.000	8497438	364.3		91.1	4587	
D 19 13C2 PFDA										
515.0 > 470.0	12.259	12.262	-0.003		1109038	35.9		71.9	2348	
D 23 13C8 FOSA										
506.0 > 78.0	12.808	12.805	0.003		1773048	41.5		83.1	2483	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.808	12.805	0.003	1.000	13475405	387.0		96.8	3077	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.923	12.929	-0.006	1.000	2364097	NC			3617	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.923	12.929	-0.006	1.000	2364097	373.9		97.0		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.975	12.978	-0.003	1.000	9385325	407.2		102	4321	
D 26 13C2 PFUnA										
565.0 > 520.0	12.975	12.979	-0.004		1328469	35.2		70.5	1113	
D 28 13C2 PFDaA										
615.0 > 570.0	13.593	13.597	-0.004		1599382	37.7		75.5	2006	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.593	13.597	-0.004	1.000	10030582	399.4		99.9	3267	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.113	14.114	-0.001	1.000	11443058	352.0		88.0	3192	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.543	14.548	-0.005		1697645	43.9		87.9	2413	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.543	14.549	-0.006	1.000	8300566	415.5		104	2313	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.175	15.177	-0.002	1.000	15550097	440.9		110	3561	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.175	15.177	-0.002		2256284	46.0		91.9	3222	

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	15.511	15.517	-0.006	1.000	14207142	442.0	111	3756	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L7_00015

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d

Injection Date: 06-Jan-2016 14:07:35

Instrument ID: A6

Lims ID: Std L7

Client ID:

Operator ID: JRB

ALS Bottle#: 23

Worklist Smp#: 10

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

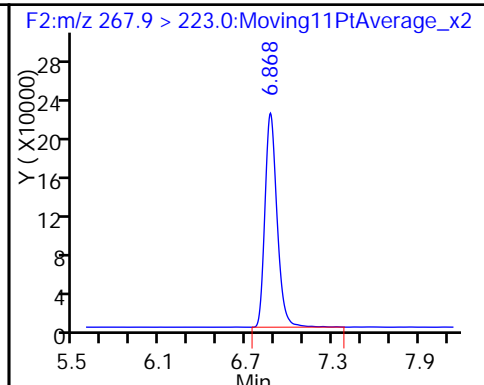
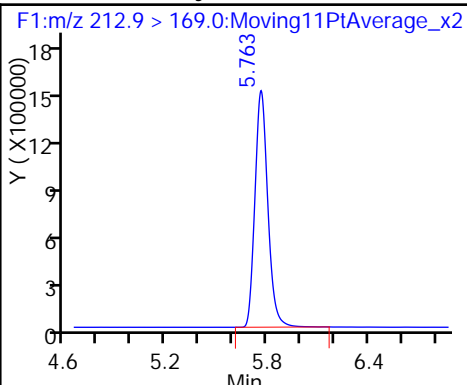
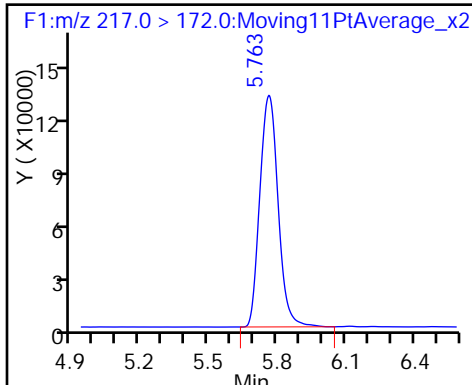
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

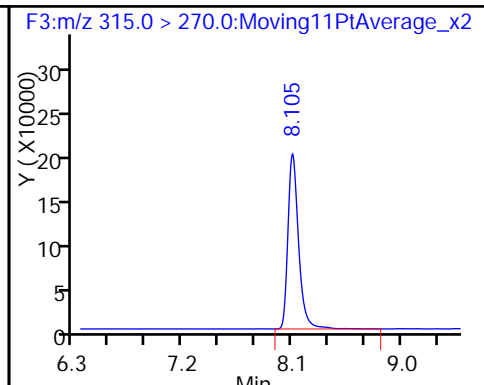
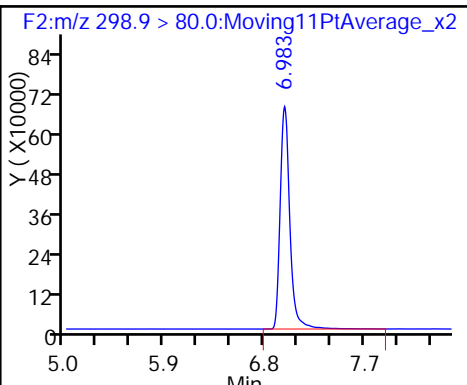
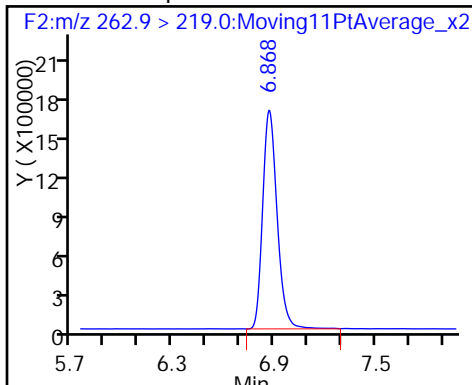
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

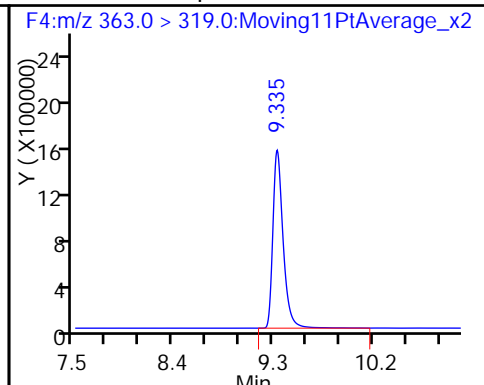
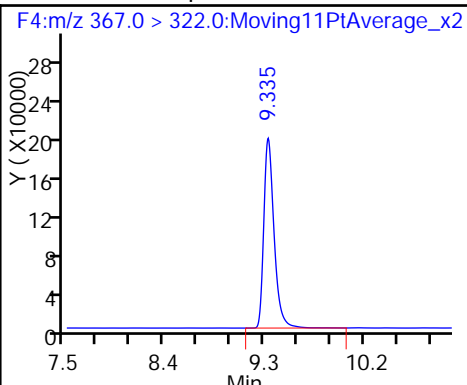
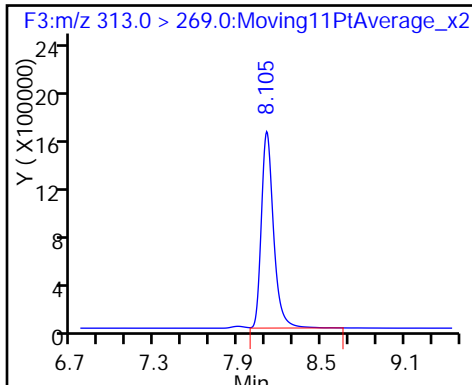
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

D 8 13C4-PFHpA

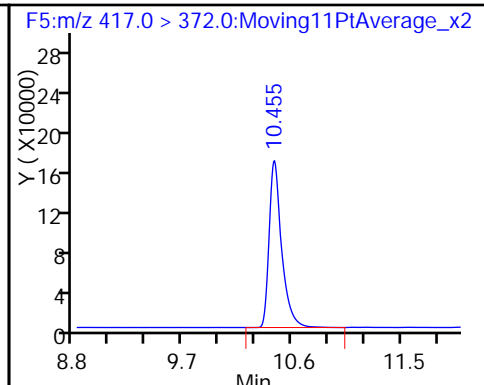
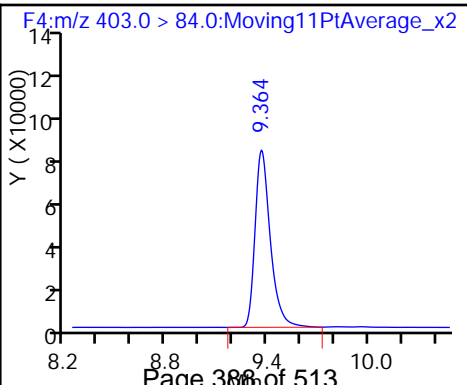
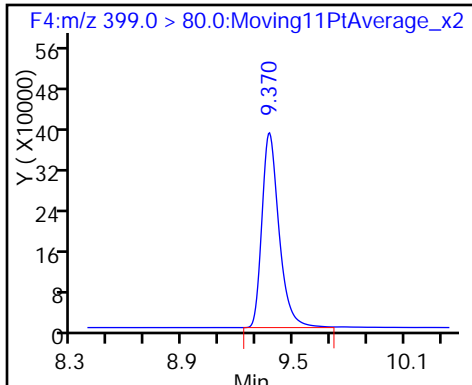
9 Perfluoroheptanoic acid

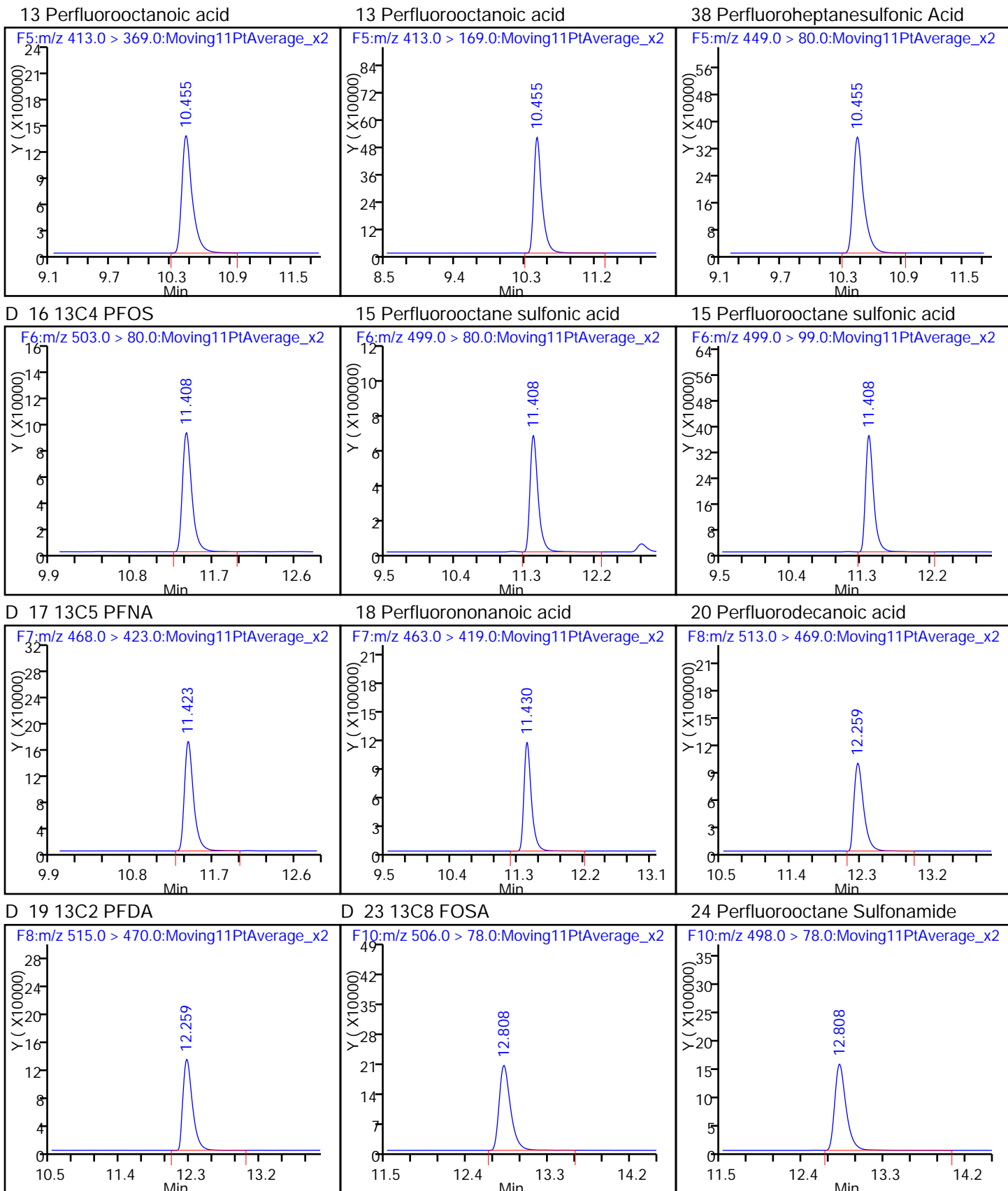


41 Perfluorohexanesulfonic acid

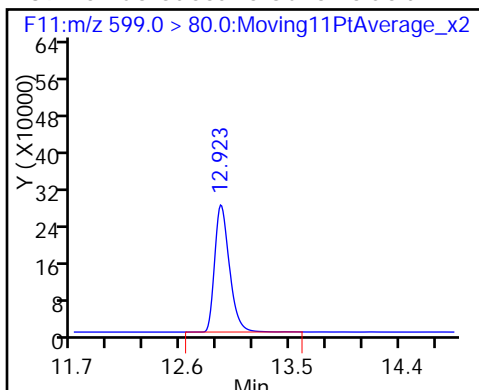
D 11 18O2 PFHxS

D 12 13C4 PFOA

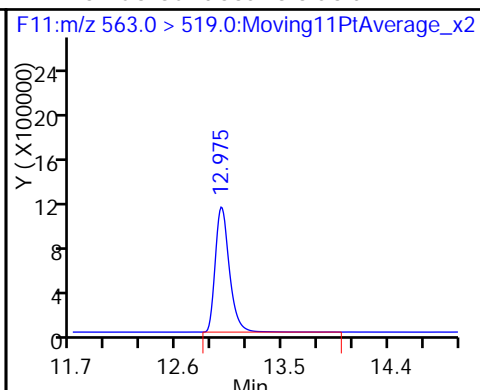




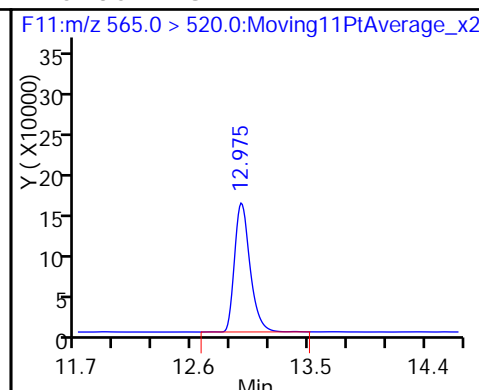
39 Perfluorodecane Sulfonic acid



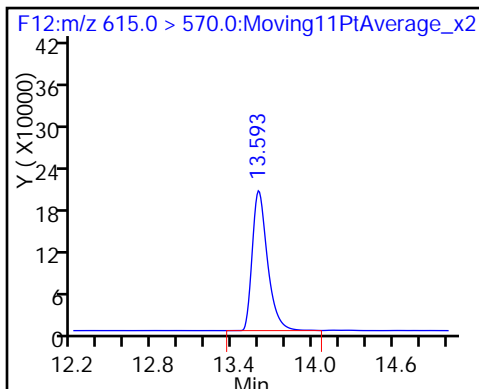
27 Perfluoroundecanoic acid



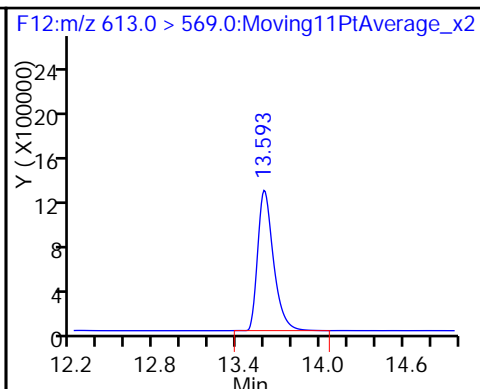
D 26 13C2 PFUnA



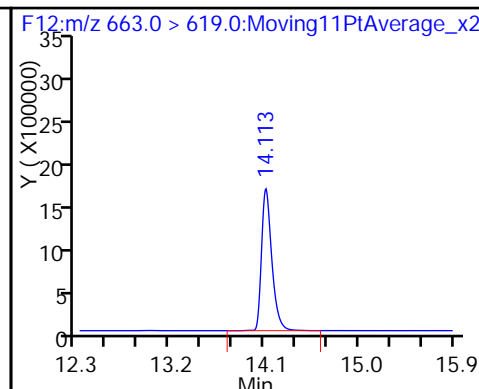
D 28 13C2 PFDaA



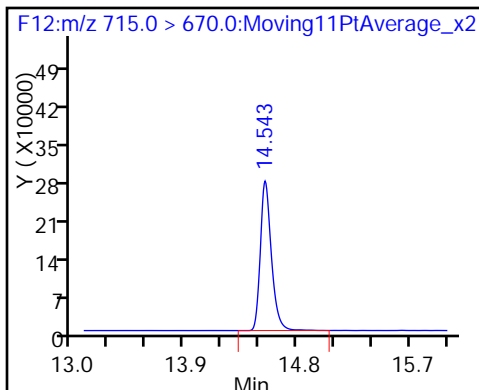
29 Perfluorododecanoic acid



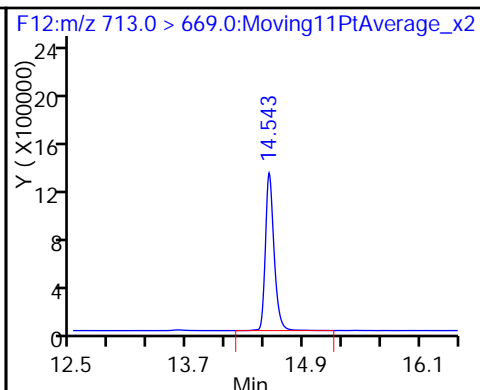
30 Perfluorotridecanoic acid



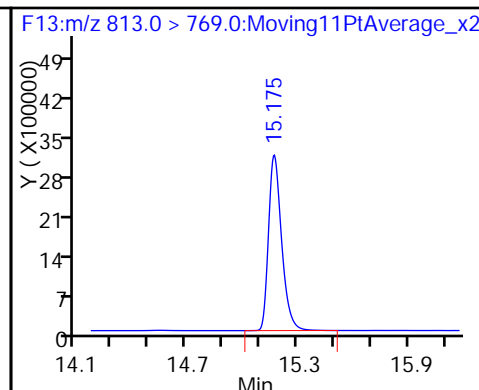
D 33 13C2-PFTeDA



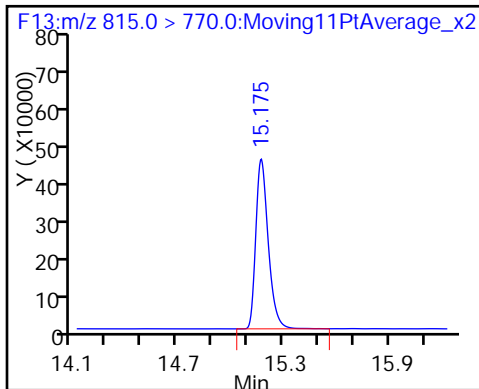
32 Perfluorotetradecanoic acid



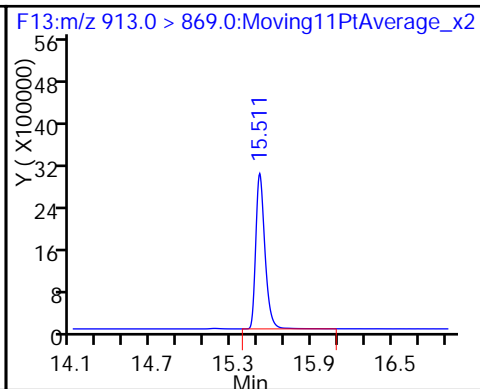
34 Perfluorohexadecanoic acid



D 35 13C2-PFHxDA



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Lab Sample ID: ICV 320-97425/12 Calibration Date: 01/06/2016 15:10
 Instrument ID: A6 Calib Start Date: 01/06/2016 11:00
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 01/06/2016 14:07
 Lab File ID: 06JAN2016A6A_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.380	1.535		55.6	50.0	11.2	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.010	1.034		51.2	50.0	2.4	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.078	1.040		48.2	50.0	-3.5	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.072		53.9	50.0	7.7	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	1.086		50.7	50.0	1.3	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9693	1.101		54.2	47.8	13.6	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8528	0.8938		52.4	50.0	4.8	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.052	1.037		49.3	50.0	-1.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9819	1.071		54.5	50.0	9.0	25.0
Perfluoroundecanoic acid (PFUnA)	L1ID		0.9454		53.8	50.0	7.6	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.7850	0.8474		54.0	50.0	7.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.016	1.037		51.0	50.0	2.1	25.0
Perfluorotetradecanoic acid (PFTeA)	L1ID		0.6595		52.3	50.0	4.6	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.433		60.2	50.0	20.3	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.005	1.196		59.5	50.0	19.0	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_011.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 06-Jan-2016 15:10:03 ALS Bottle#: 24 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\20160106-27625.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 07-Jan-2016 15:58:12 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK014

First Level Reviewer: westendorfc Date: 07-Jan-2016 08:39:13

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	5.763	5.763	0.0	963805	52.4		105	3158	
2 Perfluorobutyric acid	212.9 > 169.0	5.763	5.763	0.0	1479028	55.6			3513	
D 3 13C5-PFPeA	267.9 > 223.0	6.868	6.863	0.005	1831385	52.7		105	3238	
4 Perfluoropentanoic acid	262.9 > 219.0	6.872	6.864	0.008	1893220	51.2			371	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.978	6.976	0.002	790444	NC			1442	
	298.9 > 99.0	6.983	6.976	0.007	484020		1.63(0.00-0.00)		1141	
D 6 13C2 PFHxA	315.0 > 270.0	8.105	8.100	0.005	1900587	58.1		116	4021	
7 Perfluorohexanoic acid	313.0 > 269.0	8.105	8.102	0.003	1975911	48.2			2102	
D 8 13C4-PFHpA	367.0 > 322.0	9.335	9.331	0.004	1764489	51.5		103	3508	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.335	9.335	0.0	1891719	53.9			1237	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.370	9.363	0.007	461623	NC			1346	
D 11 18O2 PFHxS	403.0 > 84.0	9.364	9.363	0.001	751938	51.7		109	2073	
D 12 13C4 PFOA	417.0 > 372.0	10.455	10.452	0.003	1881136	48.6		97.3	4172	

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	10.455	10.453	0.002	1.000	2043807	50.7			1125	
413.0 > 169.0	10.455	10.453	0.002	1.000	723854		2.82(0.00-0.00)		1077	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.455	10.456	-0.001	1.000	467858	NC			1362	
D 16 13C4 PFOS										
503.0 > 80.0	11.408	11.405	0.003		912616	48.8		102	2666	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.408	11.408	0.0	1.000	1003627	54.2			374	
499.0 > 99.0	11.408	11.408	0.0	1.000	536003		1.87(0.00-0.00)		1120	
D 17 13C5 PFNA										
468.0 > 423.0	11.430	11.427	0.003		1695160	52.8		106	5498	
18 Perfluorononanoic acid										
463.0 > 419.0	11.430	11.431	-0.001	1.000	1515199	52.4			2173	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.259	12.260	-0.001	1.000	1668187	49.3			2483	
D 19 13C2 PFDA										
515.0 > 470.0	12.259	12.262	-0.003		1608228	52.1		104	2733	
D 23 13C8 FOSA										
506.0 > 78.0	12.808	12.805	0.003		2248048	52.7		105	3138	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.808	12.805	0.003	1.000	2406818	54.5			1416	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.923	12.929	-0.006	1.000	461427	NC			1365	
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.975	12.978	-0.003	1.000	1867649	53.8			1909	
D 26 13C2 PFUnA										
565.0 > 520.0	12.975	12.979	-0.004		1975614	52.4		105	2185	
D 28 13C2 PFDoA										
615.0 > 570.0	13.593	13.597	-0.004		2132598	50.3		101	2947	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.593	13.597	-0.004	1.000	1807175	54.0			1323	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.113	14.114	-0.001	1.000	2211993	51.0			1365	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.543	14.548	-0.005		2153360	55.7		111	3433	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.543	14.549	-0.006	1.000	1406506	52.3			451	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.169	15.177	-0.008	1.000	3055714	60.2			2206	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.169	15.177	-0.008		2896657	59.0		118	3518	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.506	15.517	-0.011	1.000	2549821	59.5			1464	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFCIC_00015

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_011.d

Injection Date: 06-Jan-2016 15:10:03

Instrument ID: A6

Lims ID: ICV

Client ID:

Operator ID: JRB

ALS Bottle#: 24

Worklist Smp#: 12

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

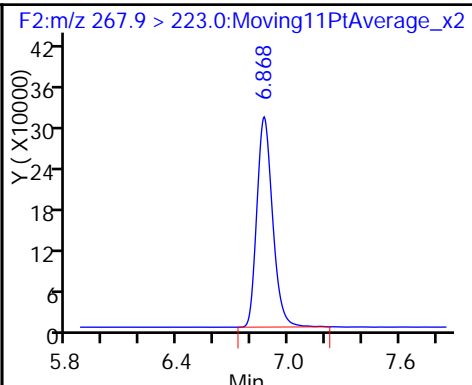
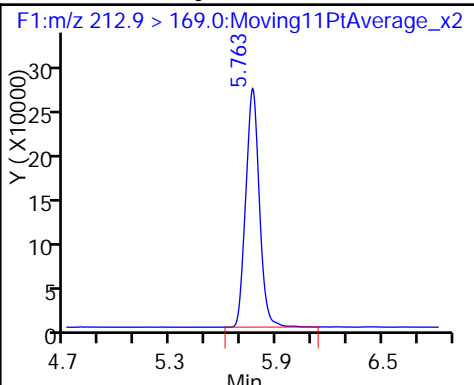
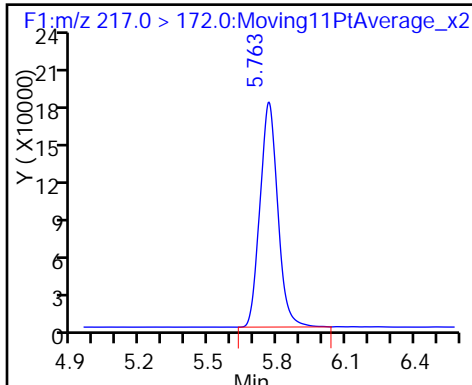
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

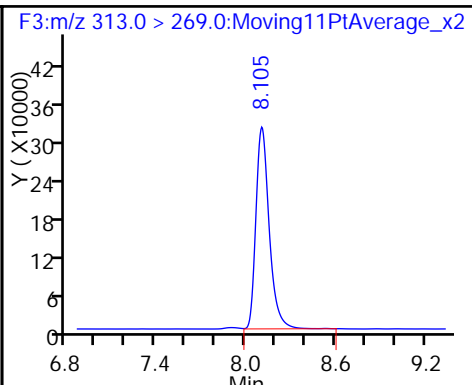
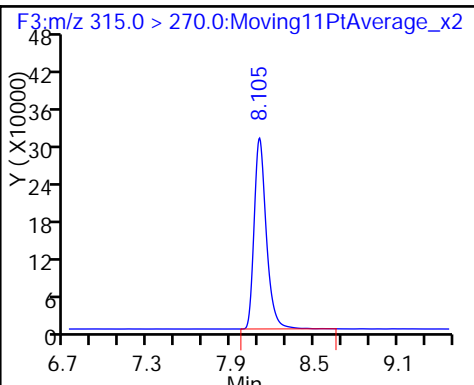
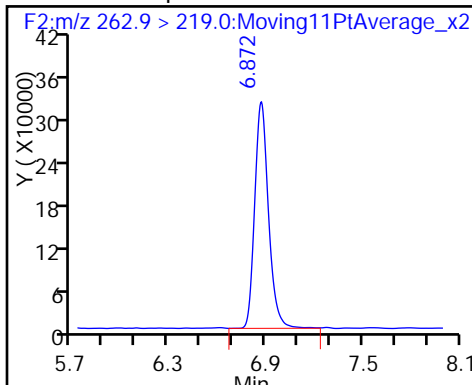
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 6 13C2 PFHxA

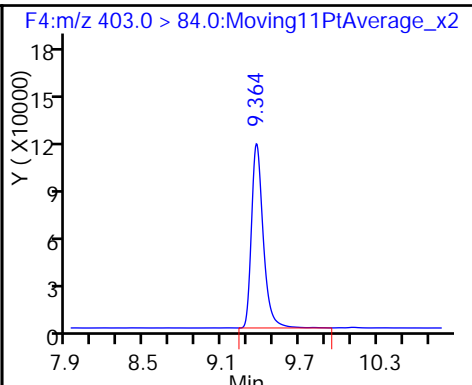
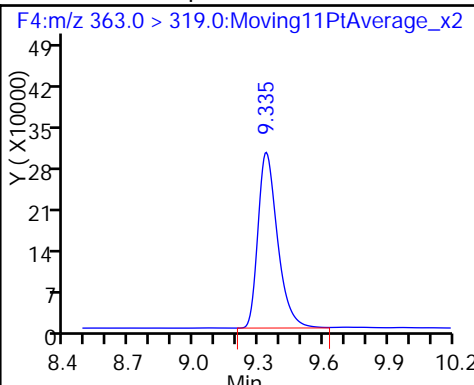
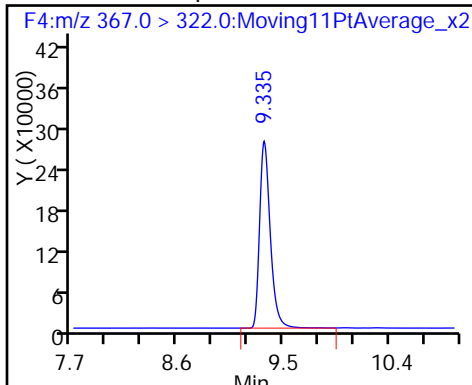
7 Perfluorohexanoic acid



D 8 13C4-PFHpA

9 Perfluoroheptanoic acid

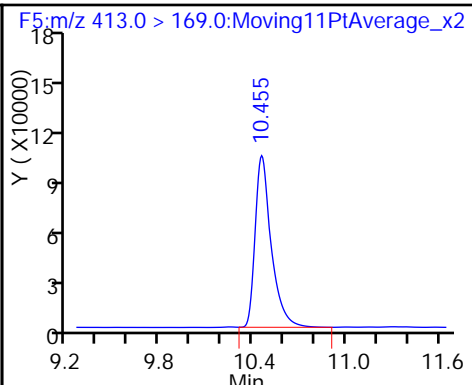
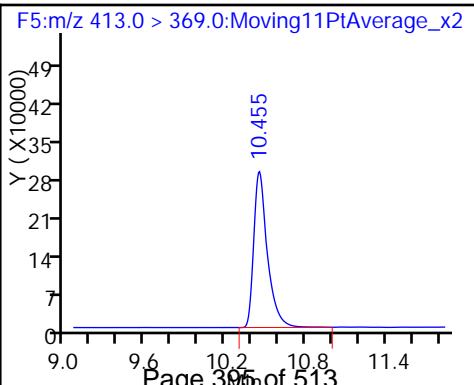
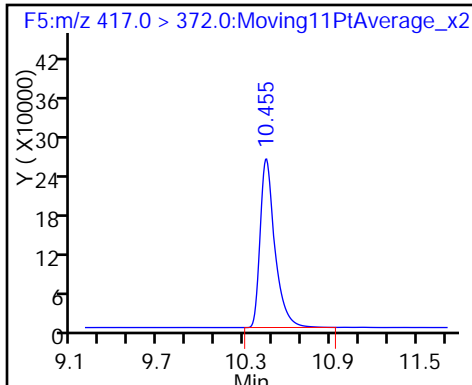
D 11 18O2 PFHxS



D 12 13C4 PFOA

13 Perfluorooctanoic acid

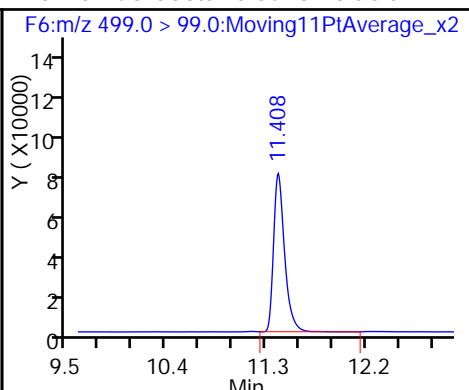
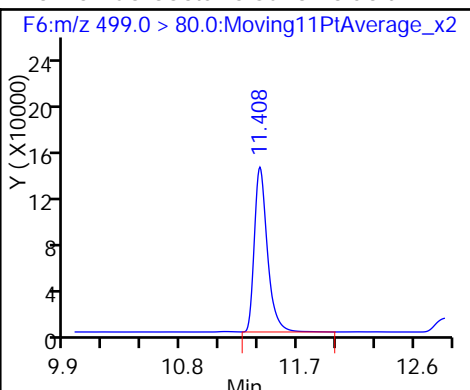
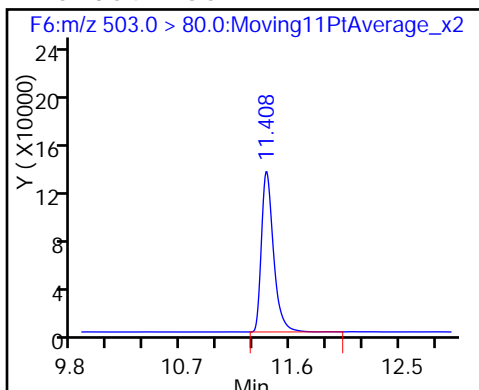
13 Perfluorooctanoic acid



D 16 13C4 PFOS

15 Perfluorooctane sulfonic acid

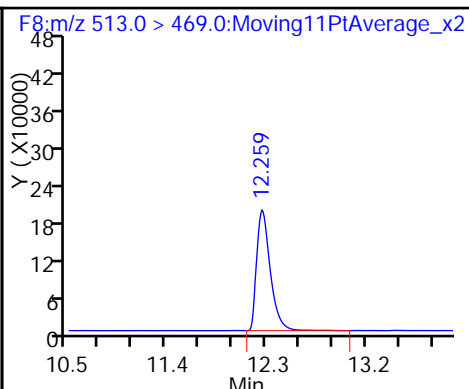
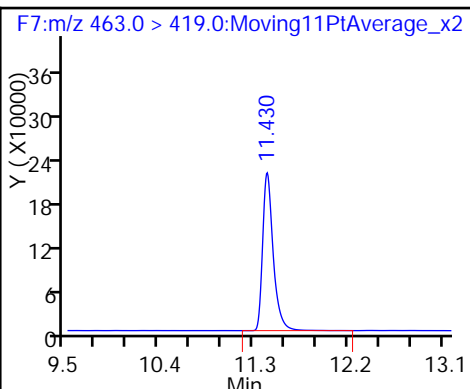
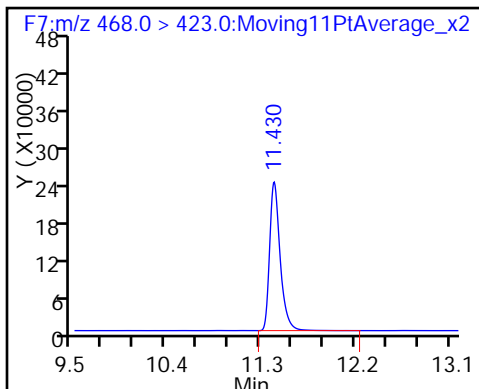
15 Perfluorooctane sulfonic acid



D 17 13C5 PFNA

18 Perfluorononanoic acid

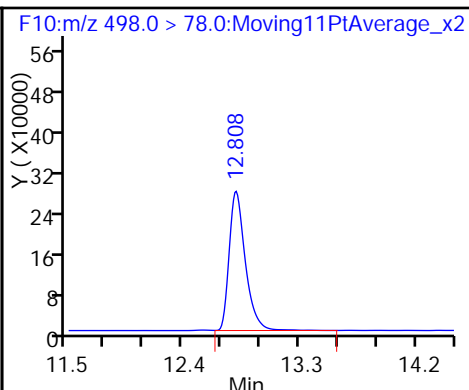
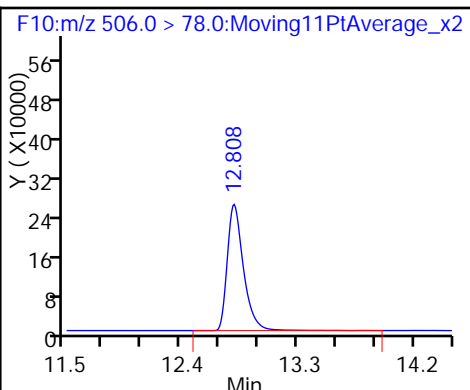
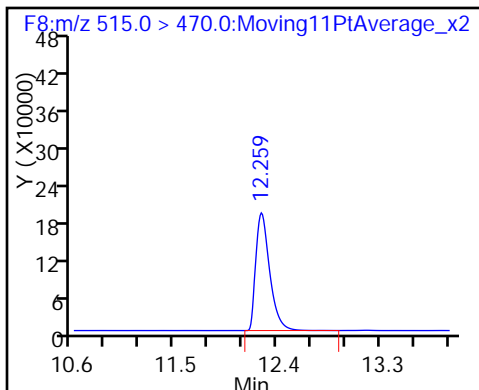
20 Perfluorodecanoic acid



D 19 13C2 PFDA

D 23 13C8 FOSA

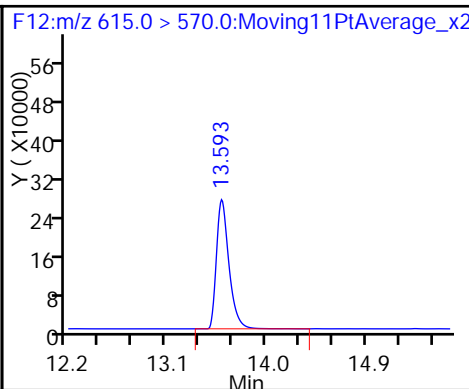
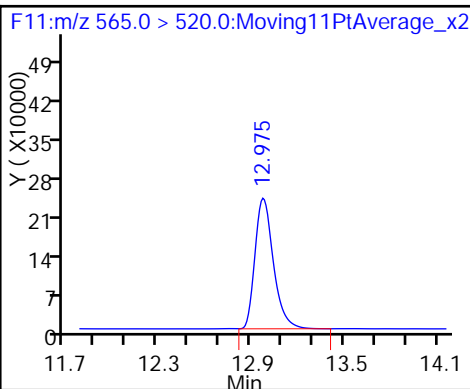
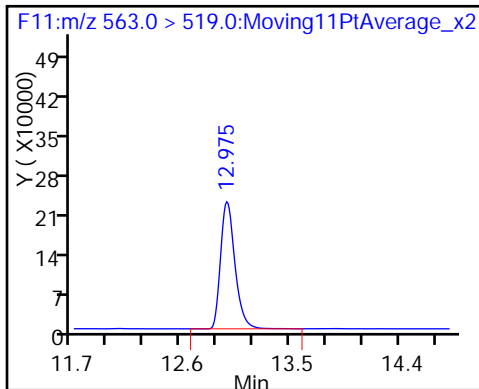
24 Perfluorooctane Sulfonamide



27 Perfluoroundecanoic acid

D 26 13C2 PFUnA

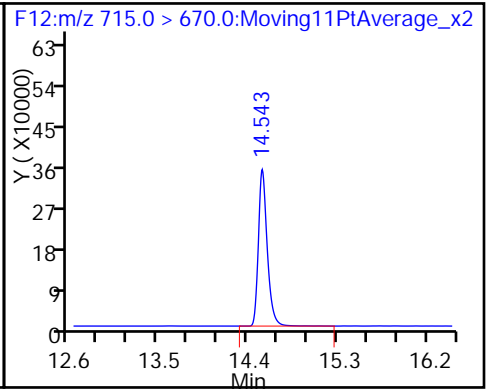
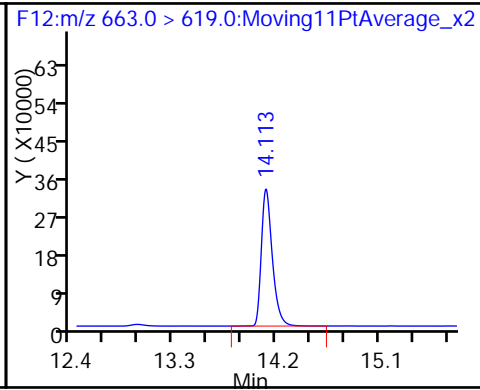
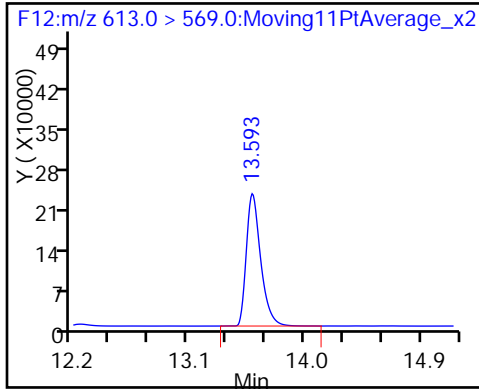
D 28 13C2 PFDoA



29 Perfluorododecanoic acid

30 Perfluorotridecanoic acid

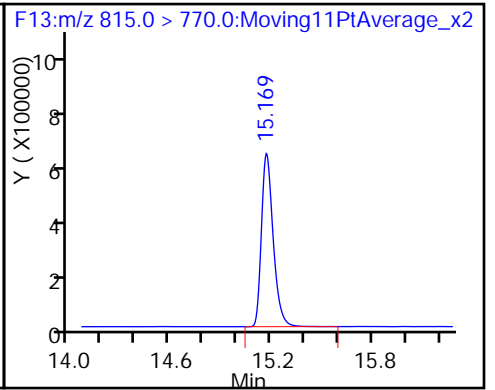
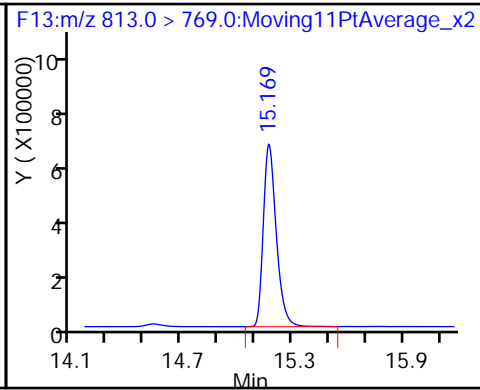
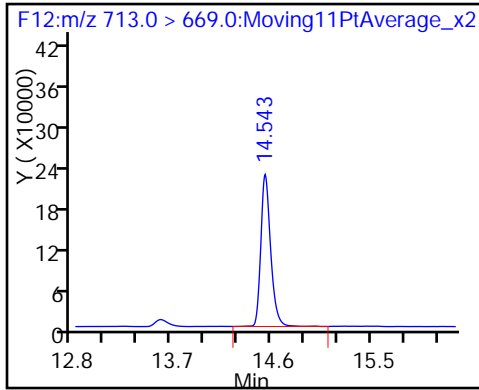
D 33 13C2-PFTeDA



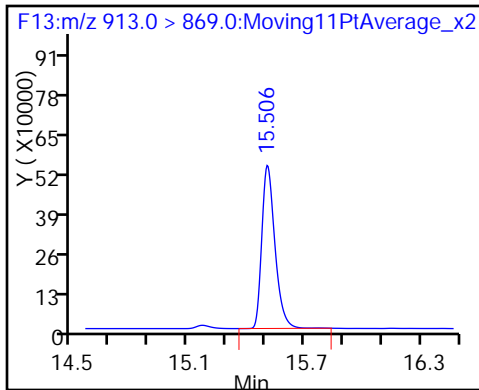
32 Perfluorotetradecanoic acid

34 Perfluorohexadecanoic acid

D 35 13C2-PFHxDA



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Lab Sample ID: CCV 320-97577/2 Calibration Date: 01/07/2016 14:51
 Instrument ID: A6 Calib Start Date: 01/06/2016 11:00
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 01/06/2016 14:07
 Lab File ID: 06JAN2016A6A_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	1.380	1.429		20.7	20.0	3.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.010	0.9716		19.2	20.0	-3.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.066	1.151		19.1	17.7	7.9	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.078	1.095		20.3	20.0	1.6	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.028		20.5	20.0	2.5	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.5809	0.5105		16.6	18.9	-12.1	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.4923	0.3243		12.5	19.0	-34.1*	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	1.011		18.9	20.0	-5.7	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9693	0.8891		17.5	19.1	-8.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8528	0.9283		21.8	20.0	8.8	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.052	0.9949		18.9	20.0	-5.4	25.0
Perfluorodecane Sulfonamide (FOSA)	AveID	0.9819	0.9346		19.0	20.0	-4.8	25.0
Perfluorodecane Sulfonic acid	AveID	0.4693	0.2587		10.6	19.3	-44.9*	25.0
Perfluoroundecanoic acid (PFUnA)	L1ID		0.8458		18.7	20.0	-6.4	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.7850	0.8359		21.3	20.0	6.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.016	1.102		21.7	20.0	8.4	25.0
Perfluorotetradecanoic acid (PFTeA)	L1ID		0.6230		19.4	20.0	-3.1	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.330		18.8	20.0	-6.1	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.005	0.8994		17.9	20.0	-10.5	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_065.d
 Lims ID: CCV L4
 Client ID:
 Sample Type: CCV
 Inject. Date: 07-Jan-2016 14:51:52 ALS Bottle#: 20 Worklist Smp#: 2
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L4
 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\20160107-27671.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 14:53:08 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 07-Jan-2016 16:02:12

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	5.766	5.763	0.003	859772	46.7		93.4	2855	
2 Perfluorobutyric acid	212.9 > 169.0	5.766	5.763	0.003	491459	20.7		104	1369	
D 3 13C5-PFPeA	267.9 > 223.0	6.886	6.863	0.023	1776761	51.1		102	4644	
4 Perfluoropentanoic acid	262.9 > 219.0	6.886	6.864	0.022	690540	19.2		96.2	203	
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.001	6.976	0.025	294997	NC			471	
	298.9 > 99.0	7.001	6.976	0.025	178647		1.65(0.00-0.00)		451	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.001	6.976	0.025	294997	19.1		108		
D 6 13C2 PFHxA	315.0 > 270.0	8.132	8.100	0.032	1470360	45.0		89.9	3427	
7 Perfluorohexanoic acid	313.0 > 269.0	8.132	8.102	0.030	644099	20.3		102	1494	
D 8 13C4-PFHpA	367.0 > 322.0	9.364	9.331	0.033	1725780	50.3		101	4773	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.364	9.335	0.029	709404	20.5		102	463	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.399	9.363	0.036	140069	NC			479	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.399	9.363	0.036	140069	16.6		87.9		
D 11 18O2 PFHxS	403.0 > 84.0	9.399	9.363	0.036	685953	47.2		99.8	1603	

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	10.475	10.452	0.023		1740504	45.0		90.0	4618	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.482	10.453	0.029	1.000	703557	18.9		94.3	301	
413.0 > 169.0	10.482	10.453	0.029	1.000	231724		3.04(0.00-0.00)		233	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.482	10.456	0.026	1.000	140140	12.5		65.9		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.482	10.456	0.026	1.000	140140	NC			513	
D 16 13C4 PFOS										
503.0 > 80.0	11.429	11.405	0.024		1085039	58.0		121	2247	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.429	11.408	0.021	1.000	385872	17.5		91.7	395	
499.0 > 99.0	11.429	11.408	0.021	1.000	209074		1.85(0.00-0.00)		650	
D 17 13C5 PFNA										
468.0 > 423.0	11.452	11.427	0.025		1390153	43.3		86.7	3598	
18 Perfluorononanoic acid										
463.0 > 419.0	11.452	11.431	0.021	1.000	516188	21.8		109	1793	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.279	12.260	0.019	1.000	567438	18.9		94.6	1651	
D 19 13C2 PFDA										
515.0 > 470.0	12.279	12.262	0.017		1425916	46.2		92.4	2214	
D 23 13C8 FOSA										
506.0 > 78.0	12.839	12.805	0.034		2086096	48.9		97.8	2610	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.839	12.805	0.034	1.000	779871	19.0		95.2	1230	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.933	12.929	0.004	1.000	113198	NC			334	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.933	12.929	0.004	1.000	113198	10.6		55.1		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.995	12.978	0.017	1.000	611588	18.7		93.6	1308	
D 26 13C2 PFUnA										
565.0 > 520.0	12.985	12.979	0.006		1807642	47.9		95.9	2319	
D 28 13C2 PFDaA										
615.0 > 570.0	13.602	13.597	0.005		1783155	42.1		84.2	3760	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.602	13.597	0.005	1.000	596226	21.3		106	355	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.113	14.114	-0.001	1.000	785686	21.7		108	660	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.543	14.548	-0.005		1594539	41.3		82.5	2943	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.543	14.549	-0.006	1.000	444391	19.4		96.9	128	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.164	15.177	-0.013	1.000	948443	18.8		93.9	1023	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.164	15.177	-0.013		1959618	39.9		79.8	3104	

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	15.486	15.517	-0.031	1.000	641497	17.9	89.5	675	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00017

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_065.d

Injection Date: 07-Jan-2016 14:51:52

Instrument ID: A6

Lims ID: CCV L4

Client ID:

Operator ID: JRB

ALS Bottle#: 20

Worklist Smp#: 2

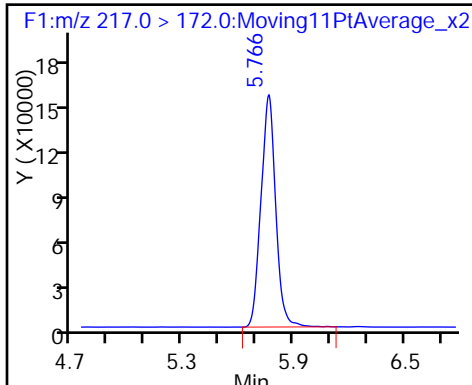
Injection Vol: 15.0 ul

Dil. Factor: 1.0000

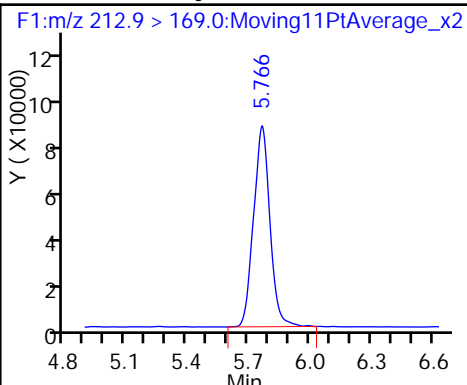
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

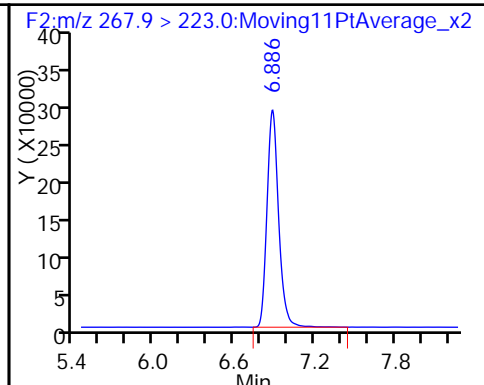
D 1 13C4 PFBA



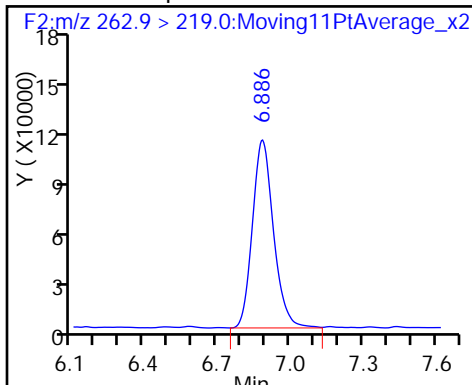
2 Perfluorobutyric acid



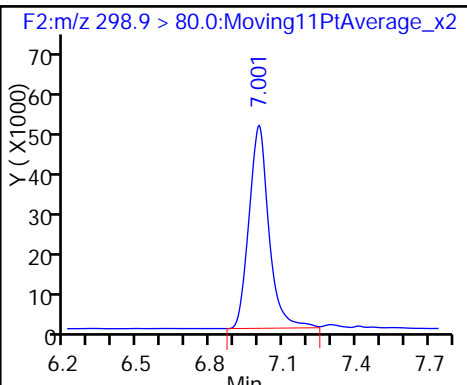
D 3 13C5-PFPeA



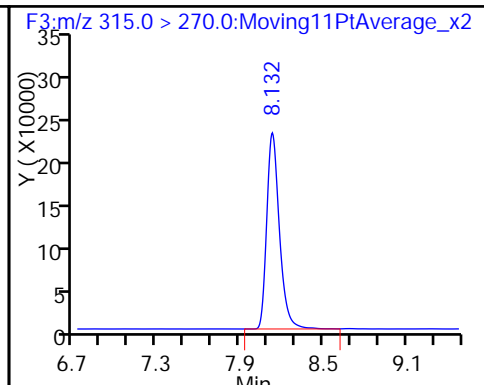
4 Perfluoropentanoic acid



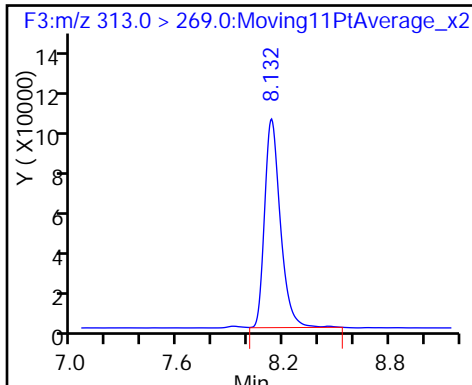
40 Perfluorobutanesulfonic acid



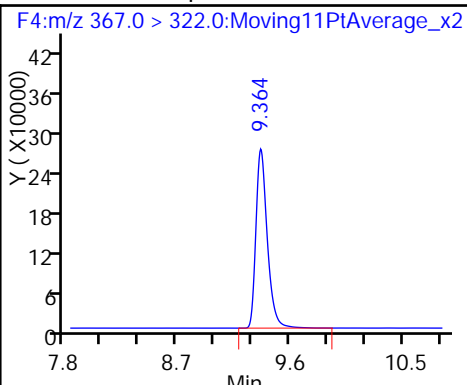
D 6 13C2 PFHxA



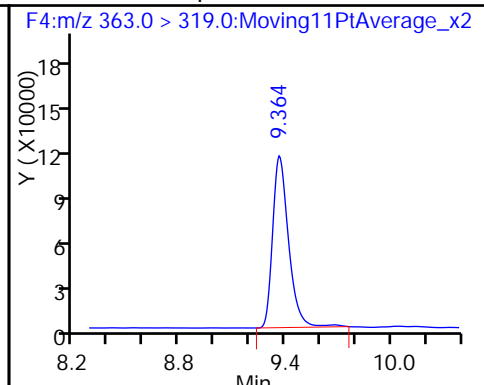
7 Perfluorohexanoic acid



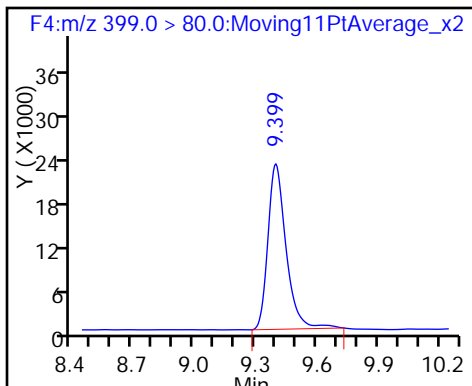
D 8 13C4-PFHpA



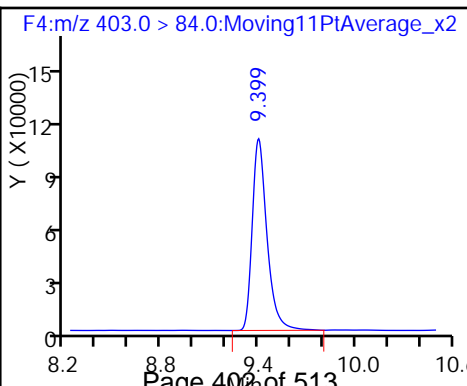
9 Perfluoroheptanoic acid



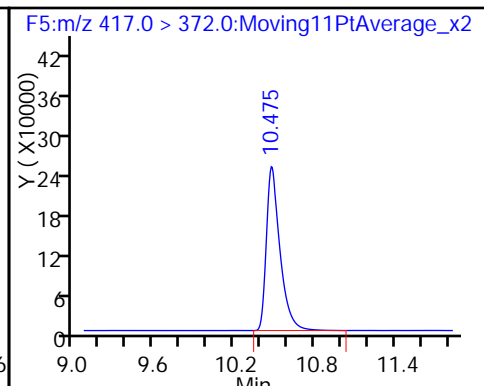
41 Perfluorohexanesulfonic acid

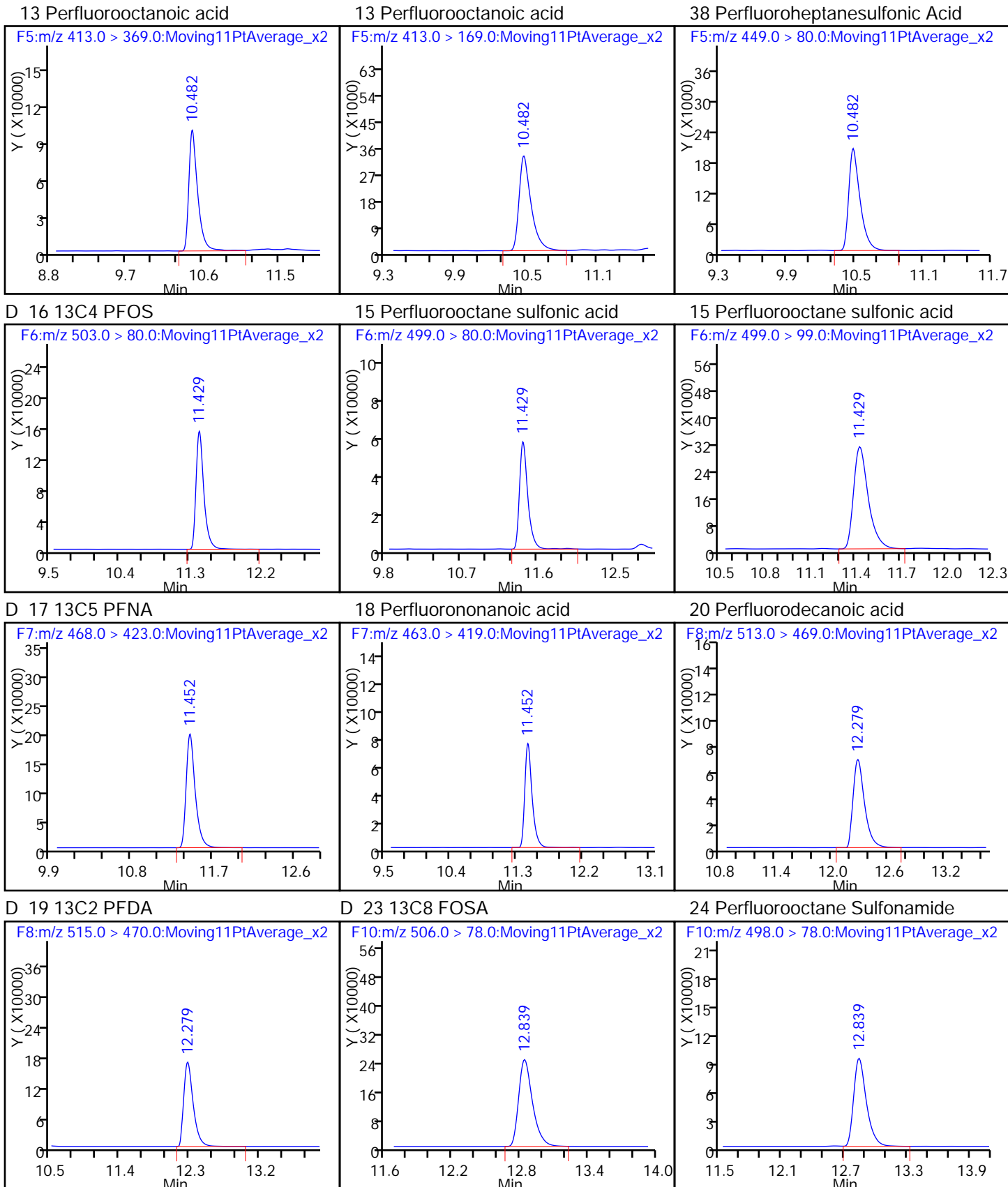


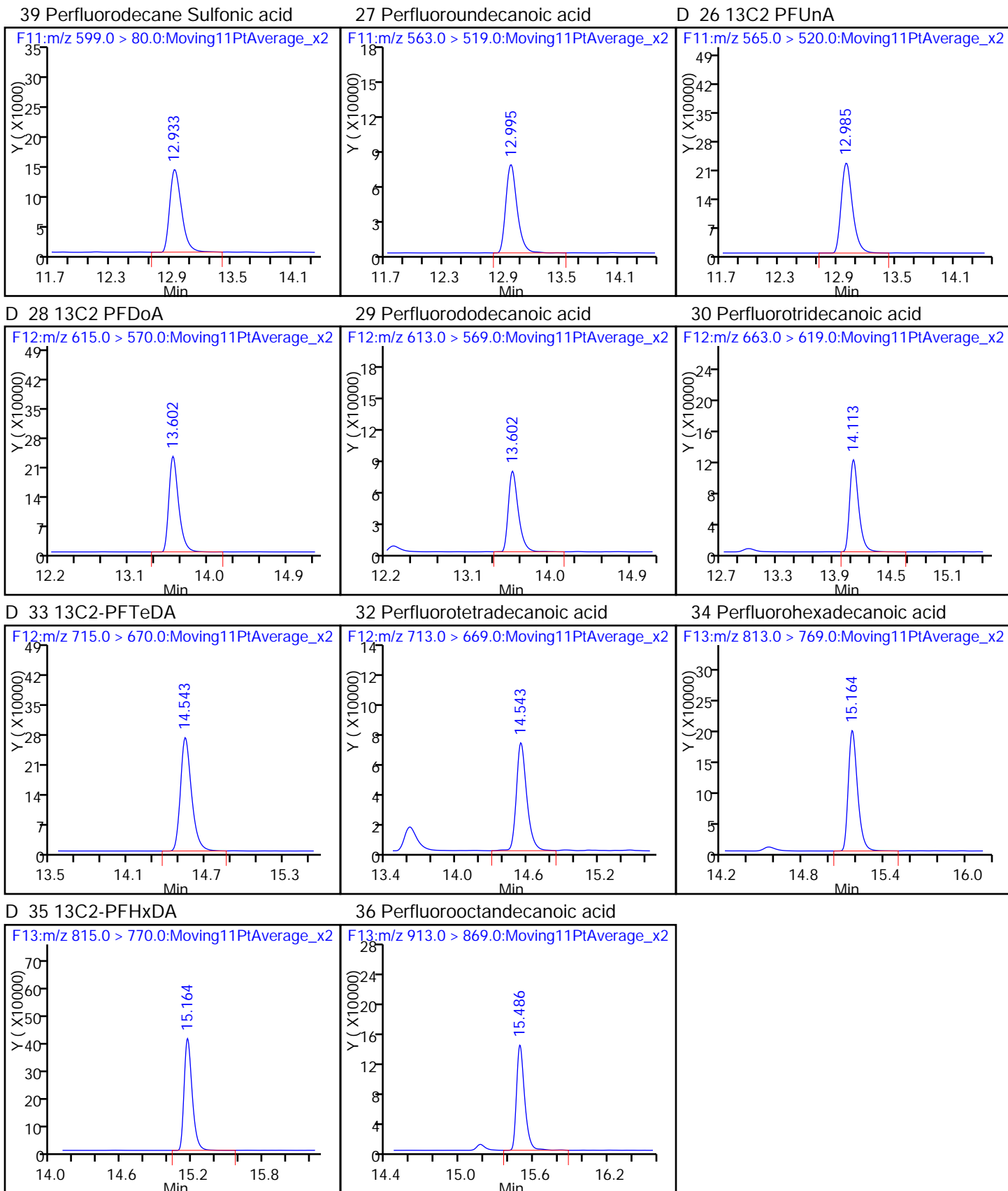
D 11 18O2 PFHxS



D 12 13C4 PFOA







FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Lab Sample ID: CCV 320-97577/3 Calibration Date: 01/07/2016 15:24
 Instrument ID: A6 Calib Start Date: 01/06/2016 11:00
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 01/06/2016 14:07
 Lab File ID: 06JAN2016A6A_066.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.380	1.514		1.10	1.00	9.7	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.010	1.089		1.08	1.00	7.8	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.066	0.9511		0.788	0.884	-10.8	50.0
Perfluorohexanoic acid (PFHxA)	AveID	1.078	1.285		1.19	1.00	19.2	50.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.037		0.787	1.00	-21.3	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.5809	0.7687		1.25	0.946	32.3	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	0.8094		0.755	1.00	-24.5	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.4923	0.4384		0.848	0.952	-11.0	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9693	0.8466		0.835	0.956	-12.7	50.0
Perfluorononanoic acid (PFNA)	AveID	0.8528	1.114		1.31	1.00	30.6	50.0
Perfluorodecanoic acid (PFDA)	AveID	1.052	1.249		1.19	1.00	18.8	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9819	1.063		1.08	1.00	8.2	50.0
Perfluorodecane Sulfonic acid	AveID	0.4693	0.4757		0.977	0.964	1.4	50.0
Perfluoroundecanoic acid (PFUnA)	L1ID		1.142		0.492	1.00	-50.8*	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.7850	0.8047		1.03	1.00	2.5	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.016	1.010		0.994	1.00	-0.6	50.0
Perfluorotetradecanoic acid (PFTeA)	L1ID		1.075		1.11	1.00	11.4	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		5.762		0.200	1.00	-136.7*	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.005	0.9710		0.966	1.00	-3.4	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_066.d
 Lims ID: CCV L2
 Client ID:
 Sample Type: CCVL
 Inject. Date: 07-Jan-2016 15:24:58 ALS Bottle#: 18 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*sub5
 Method: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 14:53:12 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 07-Jan-2016 16:03:41

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.760	5.763	-0.003	867303	47.1		94.2	3139	
2 Perfluorobutyric acid	212.9 > 169.0	5.760	5.763	-0.003	26263	1.10		110	70.0	
D 3 13C5-PFPeA	267.9 > 223.0	6.882	6.863	0.019	1841881	53.0		106	4790	
4 Perfluoropentanoic acid	262.9 > 219.0	6.882	6.864	0.018	40102	1.08		108	12.7	
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.001	6.976	0.025	15440	NC			25.2	
	298.9 > 99.0	7.008	6.976	0.032	11684		1.32(0.00-0.00)		15.2	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.001	6.976	0.025	15440	0.7885		89.2		
D 6 13C2 PFHxA	315.0 > 270.0	8.127	8.100	0.027	1610671	49.2		98.5	2991	
7 Perfluorohexanoic acid	313.0 > 269.0	8.132	8.102	0.030	41401	1.19		119	119	
D 8 13C4-PFHpA	367.0 > 322.0	9.364	9.331	0.033	1777435	51.8		104	4135	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.364	9.335	0.029	36851	0.7866		78.7	28.4	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.393	9.363	0.030	13355	NC			40.2	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.393	9.363	0.030	13355	1.25		132		
D 11 18O2 PFHxS	403.0 > 84.0	9.393	9.363	0.030	868627	59.8		126	2134	

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	10.475	10.452	0.023		1917867	49.6		99.2	3988	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.468	10.453	0.015	1.000	31047	0.7550		75.5	14.3	
413.0 > 169.0	10.489	10.453	0.036	1.002	16195		1.92(0.00-0.00)		18.1	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.482	10.456	0.026	1.000	10326	0.8477		89.0		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.482	10.456	0.026	1.000	10326	NC			44.3	
D 16 13C4 PFOS										
503.0 > 80.0	11.422	11.405	0.017		1182722	63.3		132	2317	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.429	11.408	0.021	1.000	20025	0.8350		87.3	48.7	
499.0 > 99.0	11.436	11.408	0.028	1.001	11169		1.79(0.00-0.00)		29.7	
D 17 13C5 PFNA										
468.0 > 423.0	11.445	11.427	0.018		1598786	49.8		99.7	4261	
18 Perfluorononanoic acid										
463.0 > 419.0	11.445	11.431	0.014	1.000	35620	1.31		131	83.7	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.269	12.260	0.009	1.000	40369	1.19		119	81.5	
D 19 13C2 PFDA										
515.0 > 470.0	12.269	12.262	0.007		1615576	52.4		105	2479	
D 23 13C8 FOSA										
506.0 > 78.0	12.829	12.805	0.024		2465992	57.8		116	3454	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.839	12.805	0.034	1.000	52409	1.08		108	185	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.944	12.929	0.015	1.000	11347	NC			44.6	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.944	12.929	0.015	1.000	11347	0.9771		101		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.985	12.978	0.007	1.000	44468	0.4918		49.2	73.2	
D 26 13C2 PFUnA										
565.0 > 520.0	12.985	12.979	0.006		1947566	51.6		103	3919	
D 28 13C2 PFDaA										
615.0 > 570.0	13.602	13.597	0.005		2097916	49.5		99.0	3504	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.602	13.597	0.005	1.000	33764	1.03		103	23.2	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.113	14.114	-0.001	1.000	42370	0.99		99.4	39.1	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.543	14.548	-0.005		1658357	42.9		85.8	2354	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.543	14.549	-0.006	1.000	45112	1.11		111	13.1	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.164	15.177	-0.013	1.000	241751	-0.3671		-36.7	293	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.164	15.177	-0.013		2073723	42.2		84.5	3161	

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 15.491 15.517 -0.026 1.000 40741 0.9664 96.6 42.9

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L2_00018

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_066.d

Injection Date: 07-Jan-2016 15:24:58

Instrument ID: A6

Lims ID: CCV L2

Client ID:

Operator ID: JRB

ALS Bottle#: 18

Worklist Smp#: 3

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

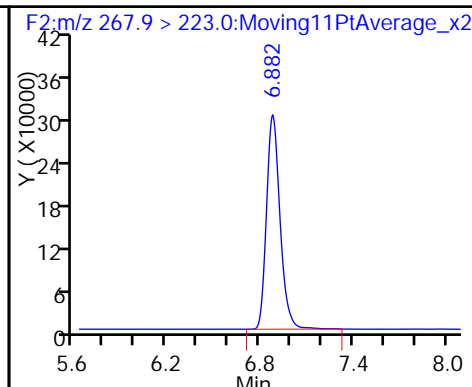
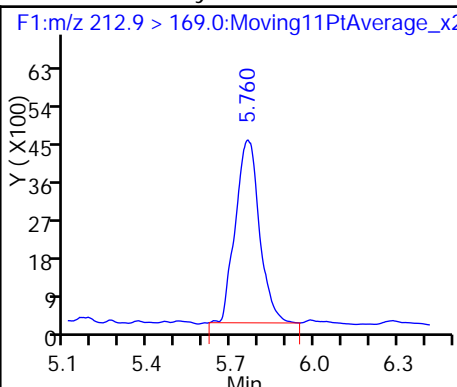
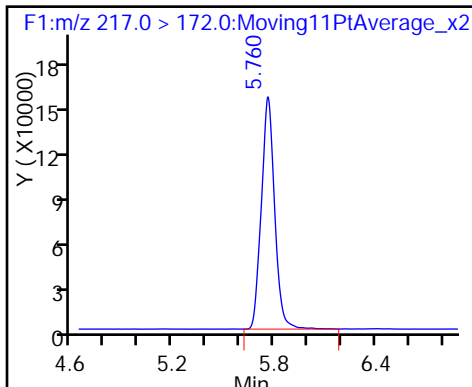
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

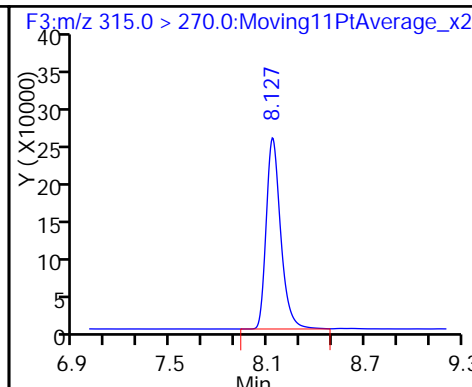
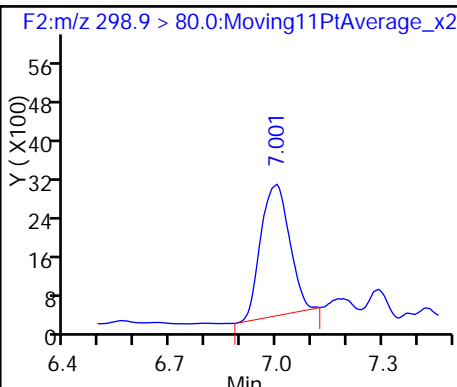
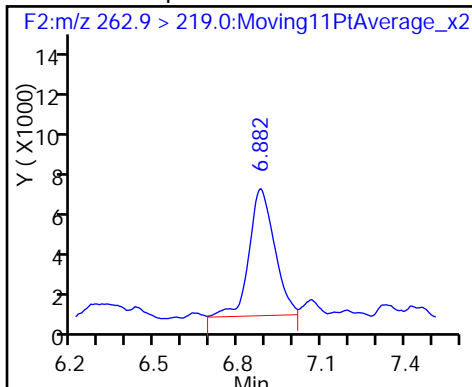
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

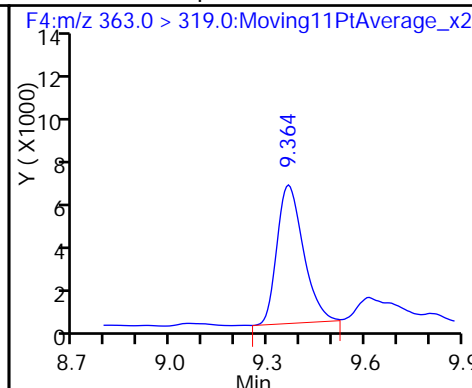
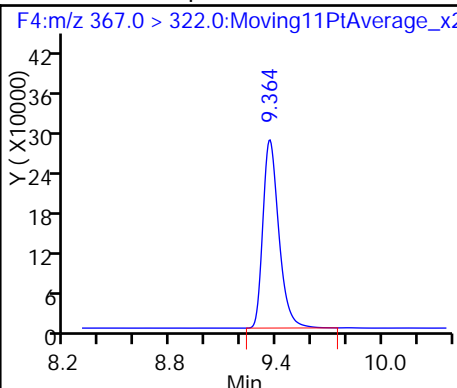
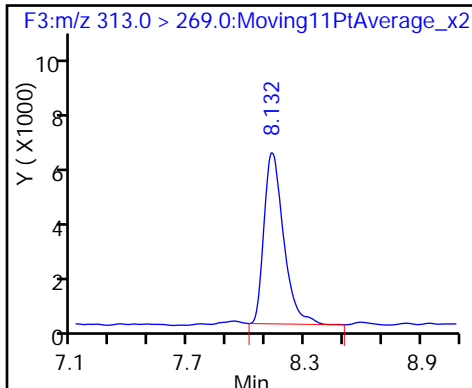
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

D 8 13C4-PFHpA

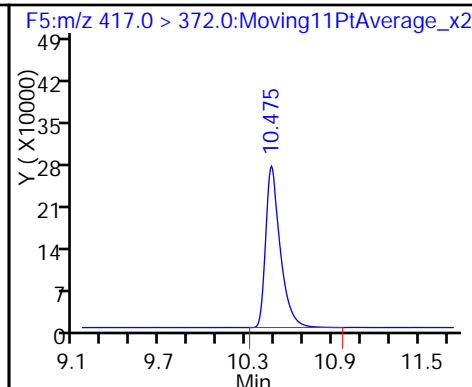
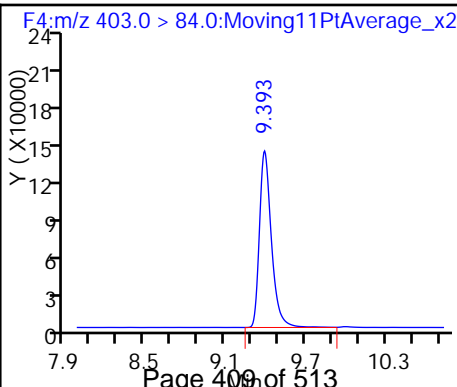
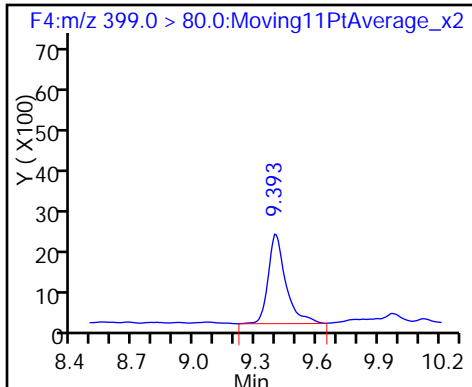
9 Perfluoroheptanoic acid

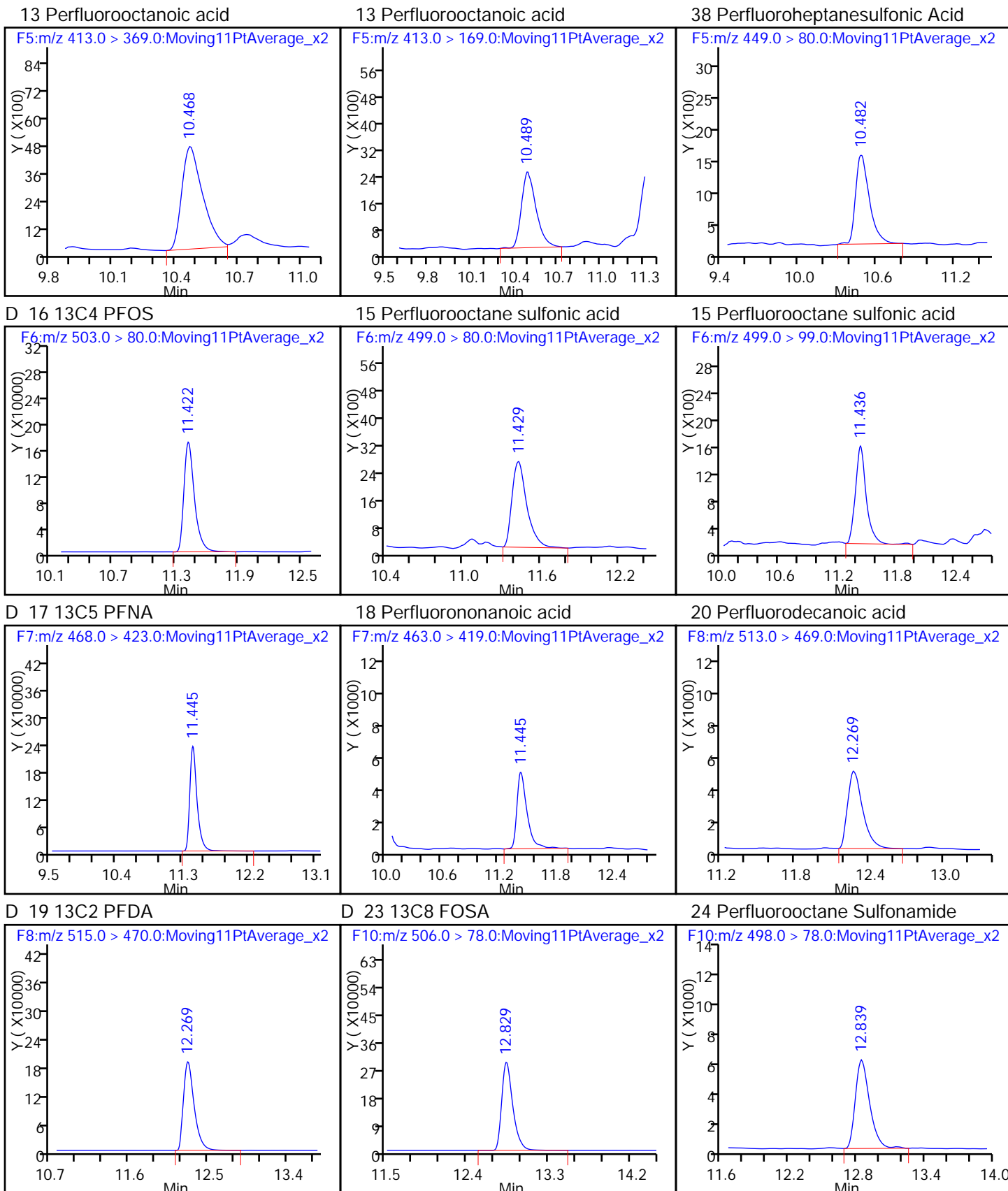


41 Perfluorohexanesulfonic acid

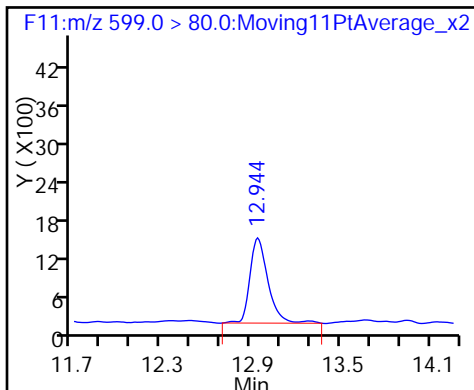
D 11 18O2 PFHxS

D 12 13C4 PFOA

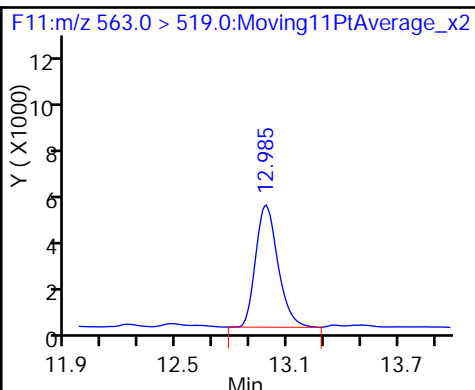




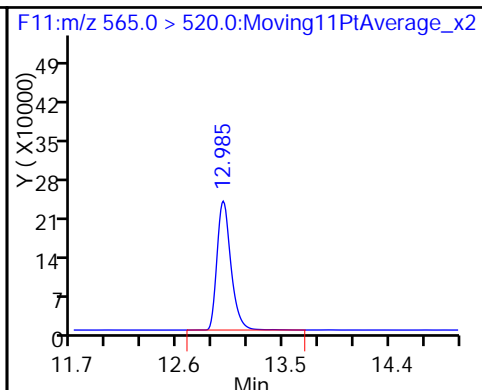
39 Perfluorodecane Sulfonic acid



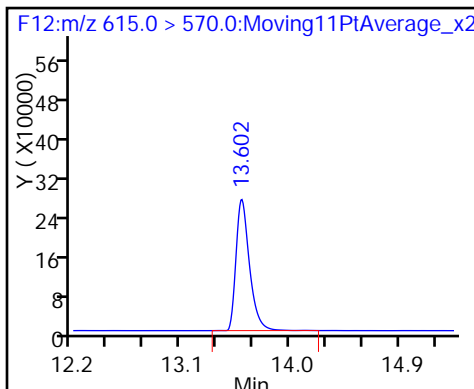
27 Perfluoroundecanoic acid



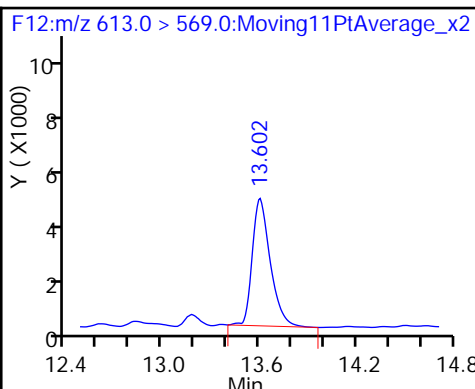
D 26 13C2 PFUnA



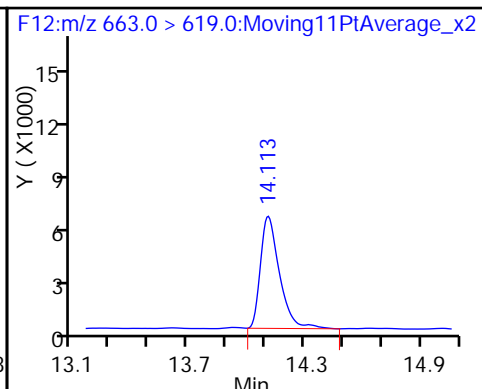
D 28 13C2 PFDaA



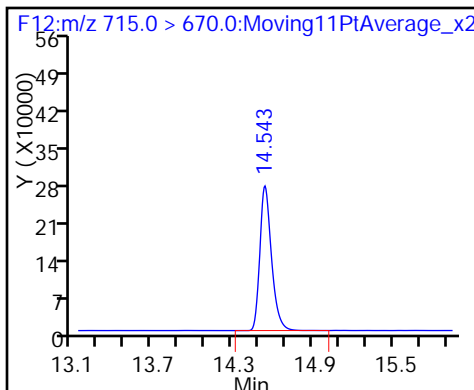
29 Perfluorododecanoic acid



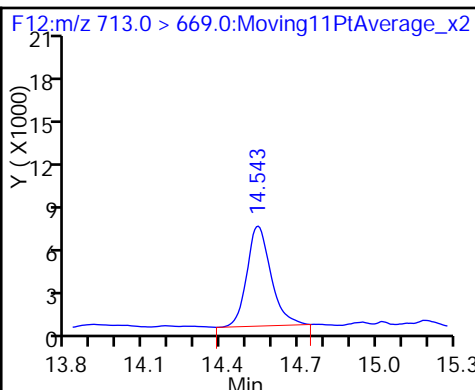
30 Perfluorotridecanoic acid



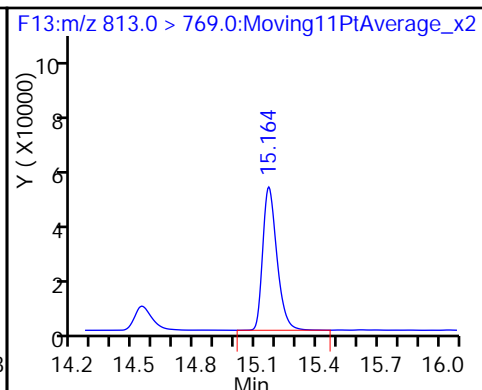
D 33 13C2-PFTeDA



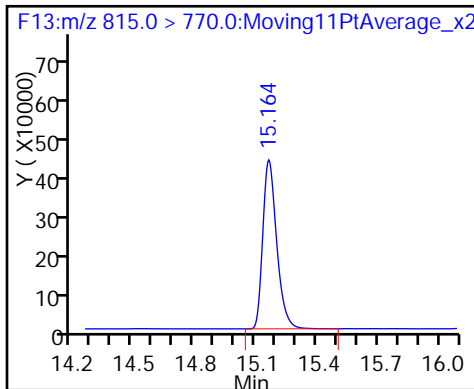
32 Perfluorotetradecanoic acid



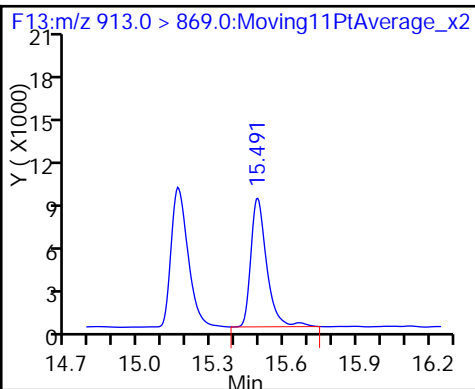
34 Perfluorohexadecanoic acid



D 35 13C2-PFHxDA



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Lab Sample ID: CCV 320-97577/23 Calibration Date: 01/07/2016 19:07
 Instrument ID: A6 Calib Start Date: 01/06/2016 11:00
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 01/06/2016 14:07
 Lab File ID: 06JAN2016A6A_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	1.380	1.428		20.7	20.0	3.5	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.010	0.9455		18.7	20.0	-6.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.066	0.9654		16.0	17.7	-9.5	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.078	1.110		20.6	20.0	2.9	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.029		20.5	20.0	2.6	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.5809	0.4803		15.6	18.9	-17.3	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.4923	0.3500		13.5	19.0	-28.9*	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	0.9515		17.7	20.0	-11.3	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9693	0.9653		19.0	19.1	-0.4	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8528	0.8054		18.9	20.0	-5.6	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.052	0.9741		18.5	20.0	-7.4	25.0
Perfluorodecane Sulfonamide (FOSA)	AveID	0.9819	0.9391		19.1	20.0	-4.4	25.0
Perfluorodecane Sulfonic acid	AveID	0.4693	0.3425		14.1	19.3	-27.0*	25.0
Perfluoroundecanoic acid (PFUnA)	L1ID		0.9006		20.0	20.0	-0.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.7850	0.7389		18.8	20.0	-5.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.016	1.032		20.3	20.0	1.6	25.0
Perfluorotetradecanoic acid (PFTeA)	L1ID		0.6000		18.6	20.0	-6.8	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.308		18.4	20.0	-8.1	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.005	0.9127		18.2	20.0	-9.2	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_076.d
 Lims ID: CCV L4
 Client ID:
 Sample Type: CCV
 Inject. Date: 07-Jan-2016 19:07:19 ALS Bottle#: 20 Worklist Smp#: 23
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L4
 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\20160107-27671.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 14:53:40 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 08-Jan-2016 08:59:15

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	5.748	5.763	-0.015	867080	47.1		94.2	2784	
2 Perfluorobutyric acid	212.9 > 169.0	5.748	5.763	-0.015	495258	20.7		104	1007	
D 3 13C5-PFPeA	267.9 > 223.0	6.854	6.863	-0.009	1767411	50.8		102	4341	
4 Perfluoropentanoic acid	262.9 > 219.0	6.850	6.864	-0.014	668418	18.7		93.6	201	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.964	6.976	-0.012	286543	NC			652	
	298.9 > 99.0	6.969	6.976	-0.007	167101		1.71(0.00-0.00)		482	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.964	6.976	-0.012	286543	16.0		90.5		
D 6 13C2 PFHxA	315.0 > 270.0	8.094	8.100	-0.006	1464872	44.8		89.6	4539	
7 Perfluorohexanoic acid	313.0 > 269.0	8.094	8.102	-0.008	650171	20.6		103	1354	
D 8 13C4-PFHpA	367.0 > 322.0	9.323	9.331	-0.008	1674374	48.8		97.7	3566	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.329	9.335	-0.006	689250	20.5		103	823	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.358	9.363	-0.005	152541	NC			375	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.358	9.363	-0.005	152541	15.6		82.7		
D 11 18O2 PFHxS	403.0 > 84.0	9.358	9.363	-0.005	794043	54.6		116	2099	

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	10.441	10.452	-0.011		1728974	44.7		89.4	3936	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.448	10.453	-0.005	1.000	658019	17.7		88.7	502	
413.0 > 169.0	10.448	10.453	-0.005	1.000	229515		2.87(0.00-0.00)		525	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.448	10.456	-0.008	1.000	143641	13.5		71.1		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.448	10.456	-0.008	1.000	143641	NC			594	
D 16 13C4 PFOS										
503.0 > 80.0	11.400	11.405	-0.005		1030353	55.1		115	1674	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.400	11.408	-0.008	1.000	397830	19.0		99.6	300	
499.0 > 99.0	11.400	11.408	-0.008	1.000	208583		1.91(0.00-0.00)		525	
D 17 13C5 PFNA										
468.0 > 423.0	11.423	11.427	-0.004		1481891	46.2		92.4	2992	
18 Perfluorononanoic acid										
463.0 > 419.0	11.423	11.431	-0.008	1.000	477399	18.9		94.4	1579	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.249	12.260	-0.011	1.000	534274	18.5		92.6	791	
D 19 13C2 PFDA										
515.0 > 470.0	12.249	12.262	-0.013		1371221	44.4		88.9	2888	
D 23 13C8 FOSA										
506.0 > 78.0	12.819	12.805	0.014		2075506	48.6		97.3	4009	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.819	12.805	0.014	1.000	779663	19.1		95.6	1563	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.913	12.929	-0.016	1.000	142353	NC			281	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.913	12.929	-0.016	1.000	142353	14.1		73.0		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.965	12.978	-0.013	1.000	622738	20.0		99.9	1087	
D 26 13C2 PFUnA										
565.0 > 520.0	12.965	12.979	-0.014		1728681	45.8		91.7	2264	
D 28 13C2 PFDaA										
615.0 > 570.0	13.574	13.597	-0.023		1986775	46.9		93.8	2670	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.574	13.597	-0.023	1.000	587201	18.8		94.1	368	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.090	14.114	-0.024	1.000	820488	20.3		102	669	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.524	14.548	-0.024		1671505	43.3		86.5	3316	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.524	14.549	-0.025	1.000	476860	18.6		93.2	123	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.149	15.177	-0.028	1.000	1039472	18.4		91.9	1219	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.149	15.177	-0.028		2090640	42.6		85.2	2937	

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	15.517	-0.041	1.000	725302	18.2	90.8	763	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00017

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_076.d

Injection Date: 07-Jan-2016 19:07:19

Instrument ID: A6

Lims ID: CCV L4

Client ID:

Operator ID: JRB

ALS Bottle#: 20

Worklist Smp#: 23

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

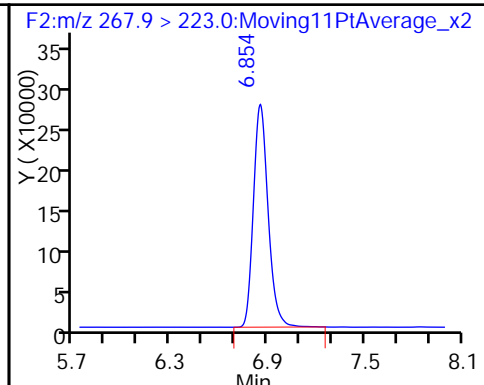
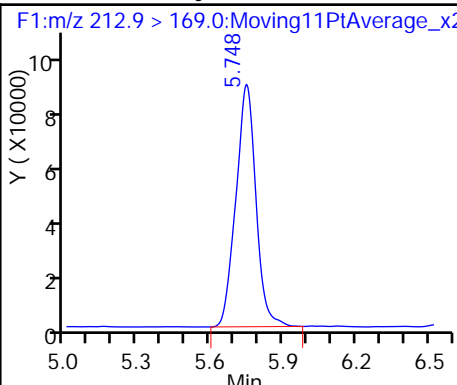
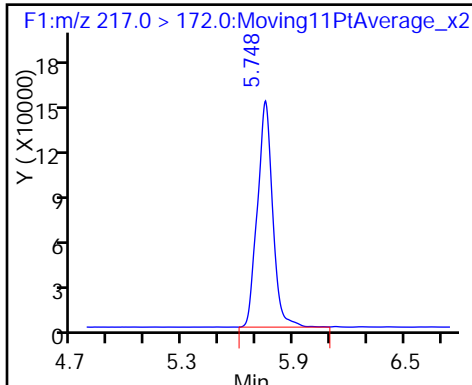
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

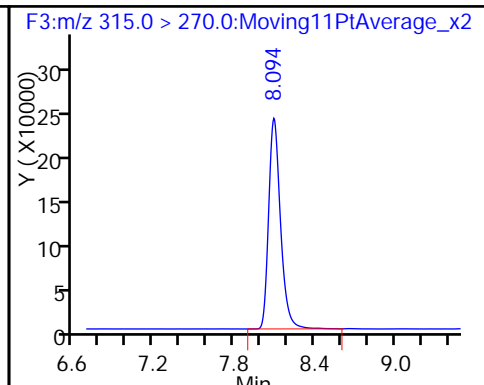
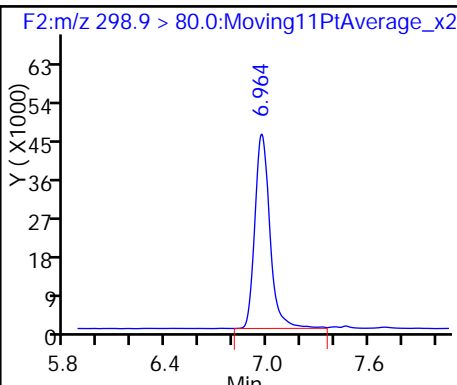
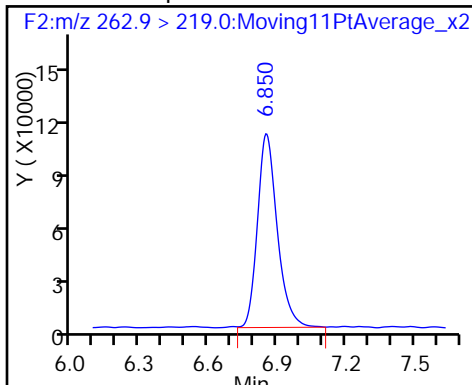
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

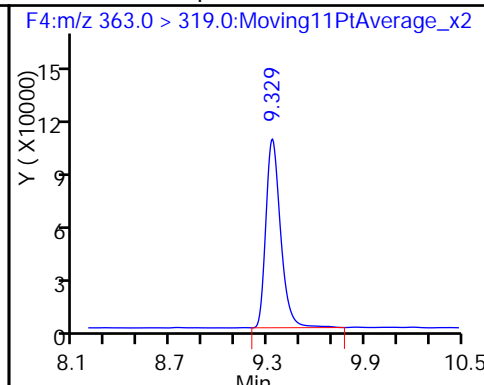
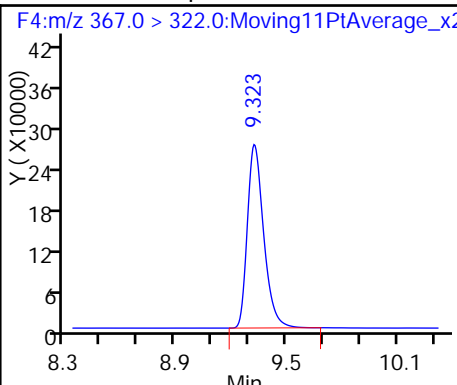
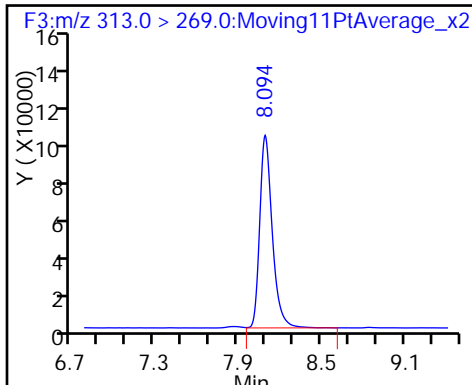
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

D 8 13C4-PFHpA

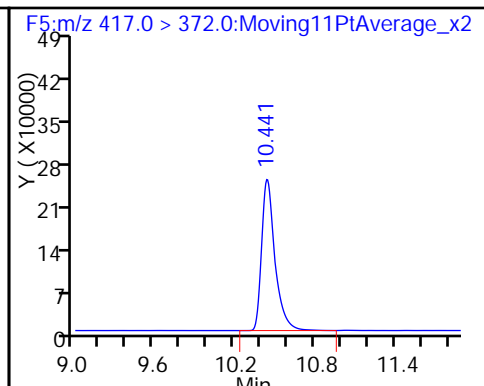
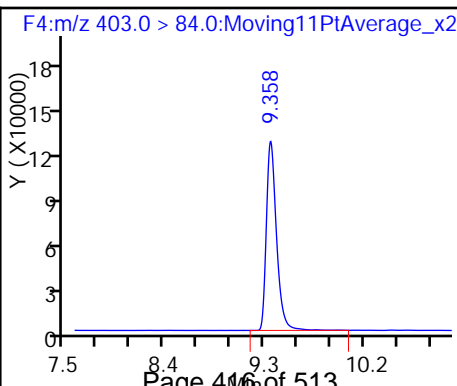
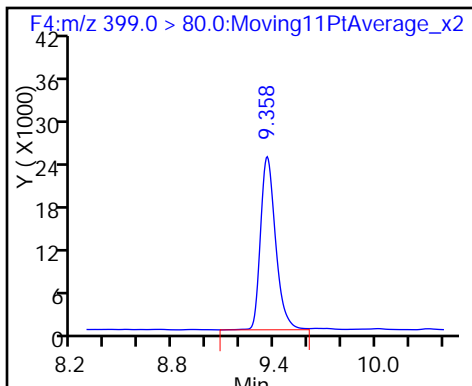
9 Perfluoroheptanoic acid

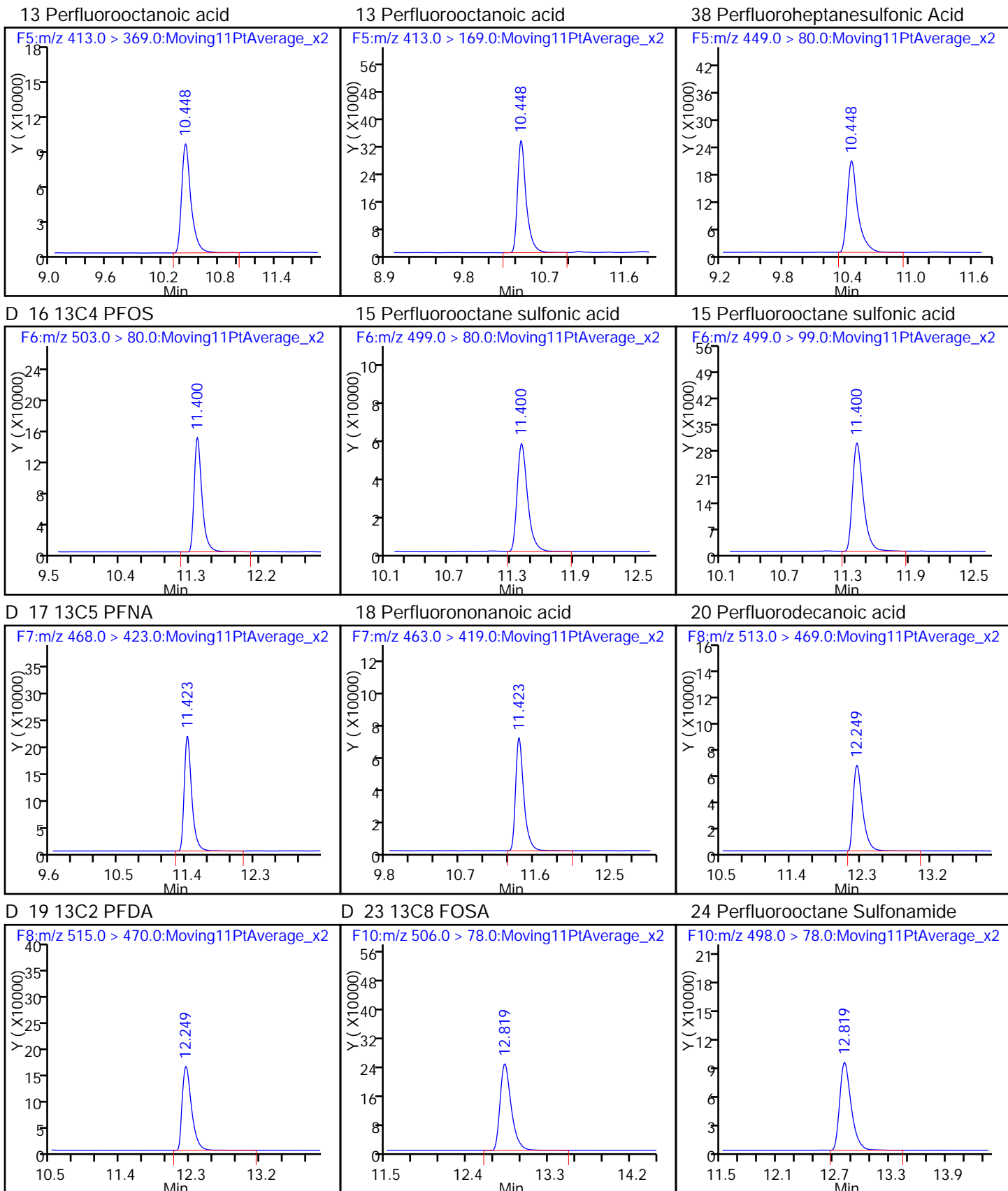


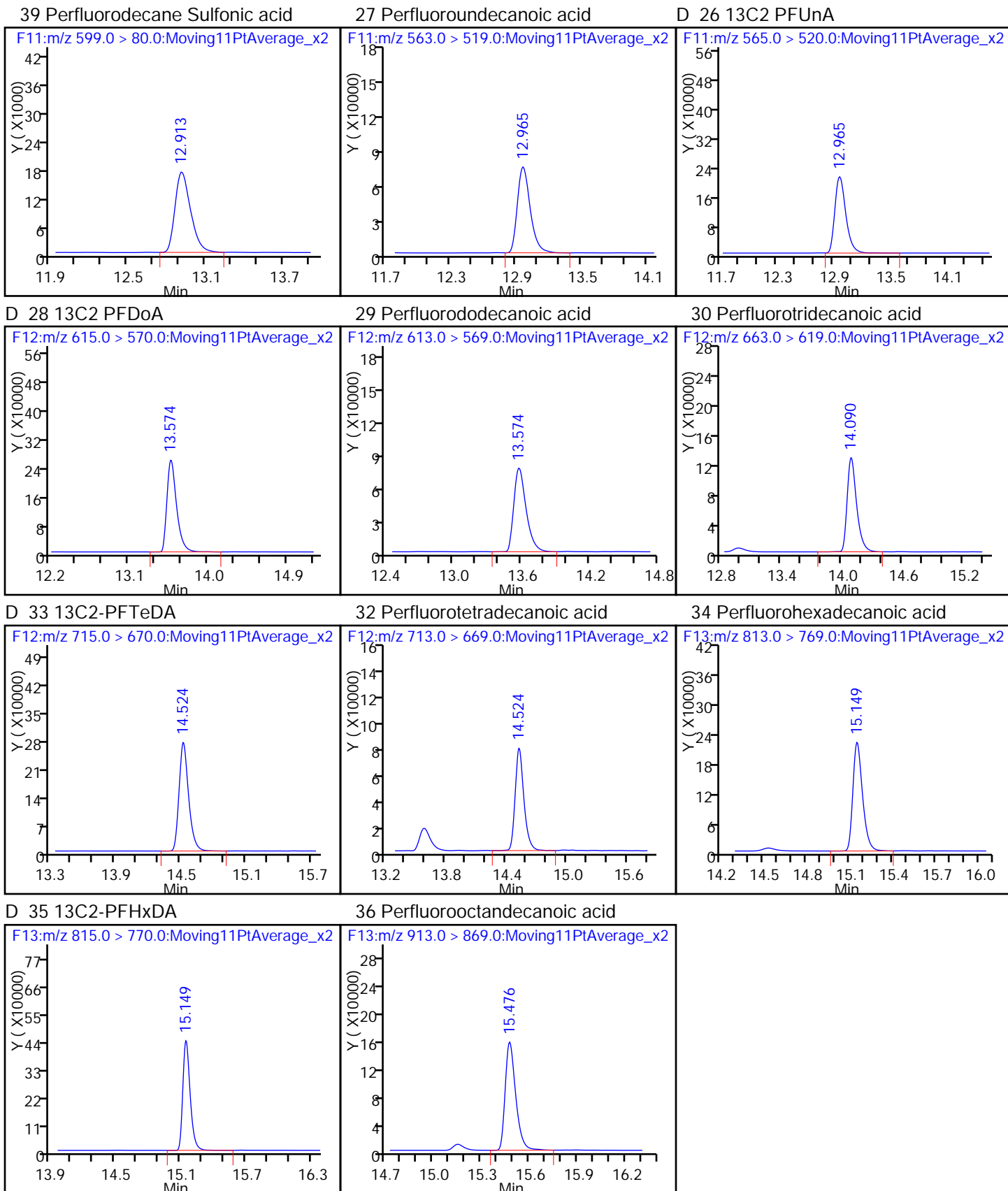
41 Perfluorohexanesulfonic acid

D 11 18O2 PFHxS

D 12 13C4 PFOA







FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Lab Sample ID: CCV 320-97577/12 Calibration Date: 01/07/2016 23:00
 Instrument ID: A6 Calib Start Date: 01/06/2016 11:00
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 01/06/2016 14:07
 Lab File ID: 06JAN2016A6A_087.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.380	1.473		53.4	50.0	6.7	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.010	0.9310		46.1	50.0	-7.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.066	1.002		41.5	44.2	-6.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.078	1.107		51.4	50.0	2.7	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.071		53.8	50.0	7.6	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.5809	0.4743		38.6	47.3	-18.4	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.4923	0.3258		31.5	47.6	-33.8*	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	0.9428		44.0	50.0	-12.1	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9693	0.9275		45.7	47.8	-4.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8528	0.7979		46.8	50.0	-6.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.052	0.9900		47.1	50.0	-5.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9819	0.8924		45.4	50.0	-9.1	25.0
Perfluorodecane Sulfonic acid	AveID	0.4693	0.3169		32.5	48.2	-32.5*	25.0
Perfluoroundecanoic acid (PFUnA)	L1ID		0.8904		50.6	50.0	1.2	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.7850	0.7614		48.5	50.0	-3.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.016	1.033		50.8	50.0	1.6	25.0
Perfluorotetradecanoic acid (PFTeA)	L1ID		0.6237		49.4	50.0	-1.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.267		52.6	50.0	5.1	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.005	0.8944		44.5	50.0	-11.0	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_087.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 07-Jan-2016 23:00:50 ALS Bottle#: 21 Worklist Smp#: 12
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 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\20160107-27671.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 14:54:08 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 08-Jan-2016 11:56:38

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	5.760	5.763	-0.003	710149	38.6		77.2	1396	
2 Perfluorobutyric acid	212.9 > 169.0	5.757	5.763	-0.006	1045747	53.4		107	2047	
D 3 13C5-PFPeA	267.9 > 223.0	6.854	6.863	-0.009	1576863	45.3		90.7	2600	
4 Perfluoropentanoic acid	262.9 > 219.0	6.854	6.864	-0.010	1468090	46.1		92.2	343	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.964	6.976	-0.012	598997	NC			703	
	298.9 > 99.0	6.969	6.976	-0.007	354687		1.69(0.00-0.00)		595	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.964	6.976	-0.012	598997	41.5		93.9		
D 6 13C2 PFHxA	315.0 > 270.0	8.083	8.100	-0.017	1280060	39.1		78.3	3112	
7 Perfluorohexanoic acid	313.0 > 269.0	8.083	8.102	-0.019	1417223	51.4		103	1843	
D 8 13C4-PFHpA	367.0 > 322.0	9.305	9.331	-0.026	1391309	40.6		81.1	3398	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.305	9.335	-0.030	1490481	53.8		108	1477	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.335	9.363	-0.028	303488	NC			738	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.335	9.363	-0.028	303488	38.6		81.6		
D 11 18O2 PFHxS	403.0 > 84.0	9.335	9.363	-0.028	639886	44.0		93.1	2119	

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	10.420	10.452	-0.032		1444248	37.3		74.7	3653	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.420	10.453	-0.033	1.000	1361628	44.0		87.9	950	
413.0 > 169.0	10.420	10.453	-0.033	1.000	494227		2.76(0.00-0.00)		672	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.420	10.456	-0.036	1.000	290310	31.5		66.2		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.420	10.456	-0.036	1.000	290310	NC			1295	
D 16 13C4 PFOS										
503.0 > 80.0	11.371	11.405	-0.034		894756	47.9		100	1818	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.371	11.408	-0.037	1.000	829874	45.7		95.7	285	
499.0 > 99.0	11.371	11.408	-0.037	1.000	436843		1.90(0.00-0.00)		1050	
D 17 13C5 PFNA										
468.0 > 423.0	11.394	11.427	-0.033		1290447	40.2		80.5	3751	
18 Perfluorononanoic acid										
463.0 > 419.0	11.394	11.431	-0.037	1.000	1029581	46.8		93.6	1597	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.228	12.260	-0.032	1.000	1197168	47.1		94.1	1780	
D 19 13C2 PFDA										
515.0 > 470.0	12.228	12.262	-0.034		1209295	39.2		78.4	3023	
D 23 13C8 FOSA										
506.0 > 78.0	12.798	12.805	-0.007		1940740	45.5		91.0	2732	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.798	12.805	-0.007	1.000	1731822	45.4		90.9	2951	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.892	12.929	-0.037	1.000	285937	NC			756	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.892	12.929	-0.037	1.000	285937	32.5		67.5		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.944	12.978	-0.034	1.000	1284280	50.6		101	1449	
D 26 13C2 PFUnA										
565.0 > 520.0	12.934	12.979	-0.045		1442366	38.3		76.5	1787	
D 28 13C2 PFDaA										
615.0 > 570.0	13.547	13.597	-0.050		1617259	38.2		76.3	2303	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.556	13.597	-0.041	1.000	1231421	48.5		97.0	889	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.067	14.114	-0.047	1.000	1670048	50.8		102	1658	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.504	14.548	-0.044		1478907	38.3		76.6	2937	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.504	14.549	-0.045	1.000	1008686	49.4		98.8	247	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.129	15.177	-0.048	1.000	2049730	52.6		105	1839	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.129	15.177	-0.048		1872366	38.1		76.3	2952	

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	15.517	-0.061	1.000	1446460	44.5	89.0	1168	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00016

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_087.d

Injection Date: 07-Jan-2016 23:00:50

Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: JRB

ALS Bottle#: 21

Worklist Smp#: 12

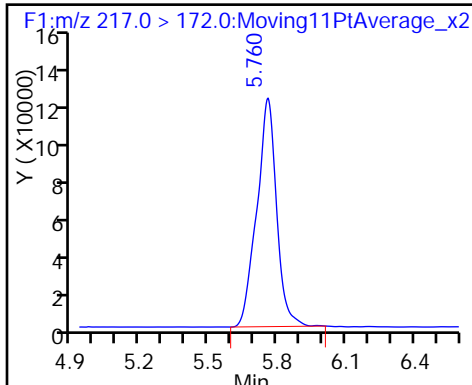
Injection Vol: 15.0 ul

Dil. Factor: 1.0000

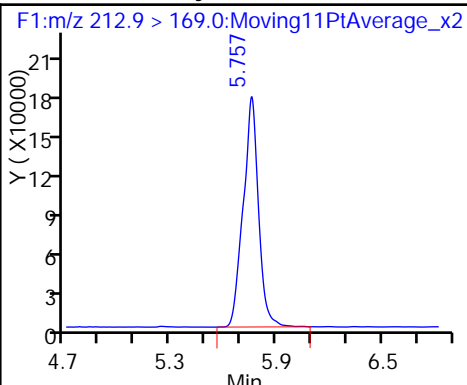
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

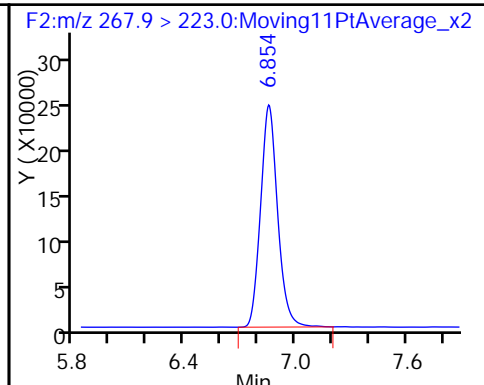
D 1 13C4 PFBA



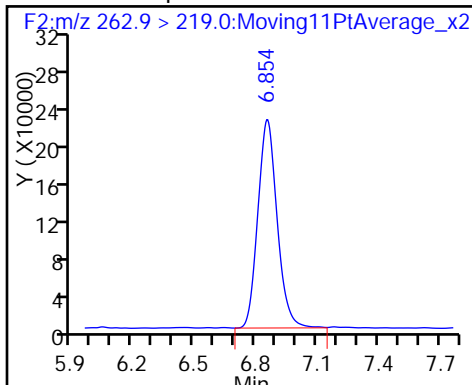
2 Perfluorobutyric acid



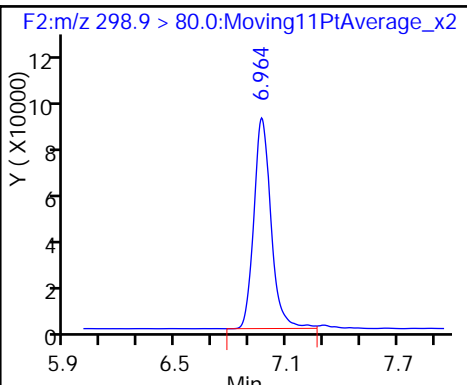
D 3 13C5-PFPeA



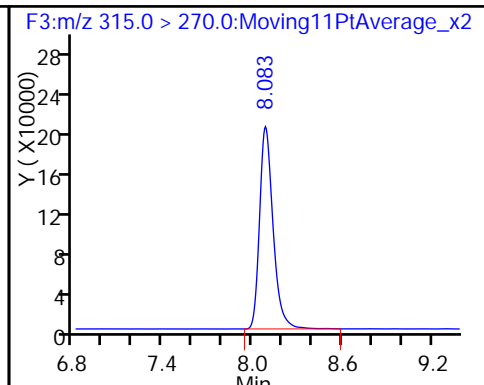
4 Perfluoropentanoic acid



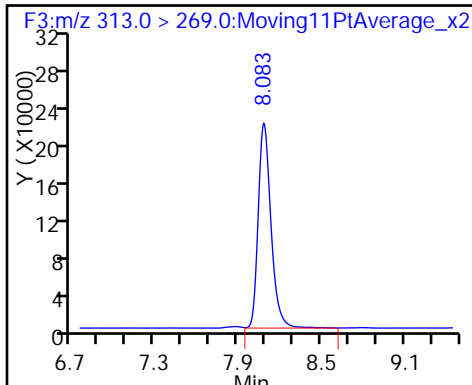
40 Perfluorobutanesulfonic acid



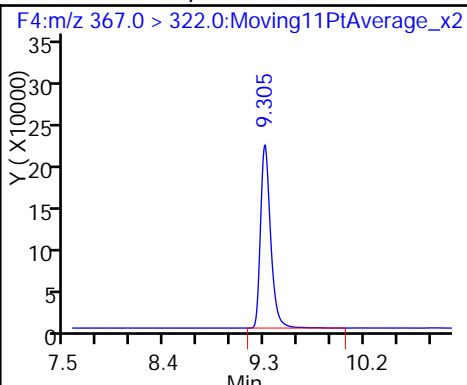
D 6 13C2 PFHxA



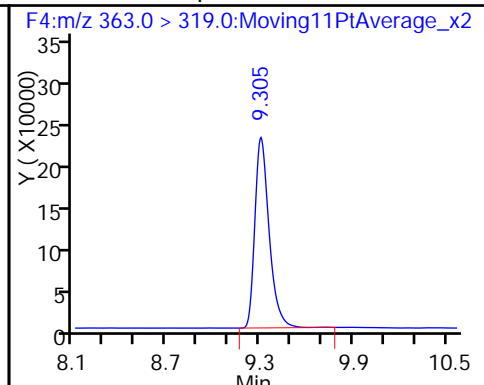
7 Perfluorohexanoic acid



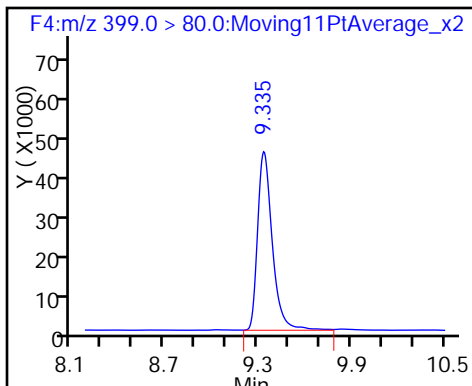
D 8 13C4-PFHpA



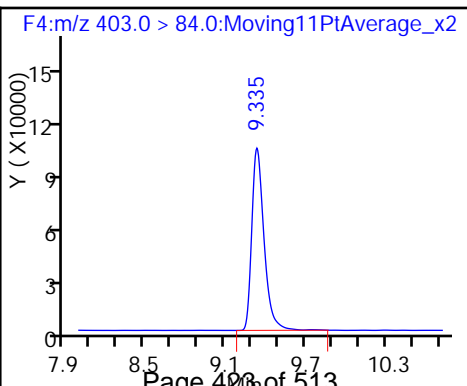
9 Perfluoroheptanoic acid



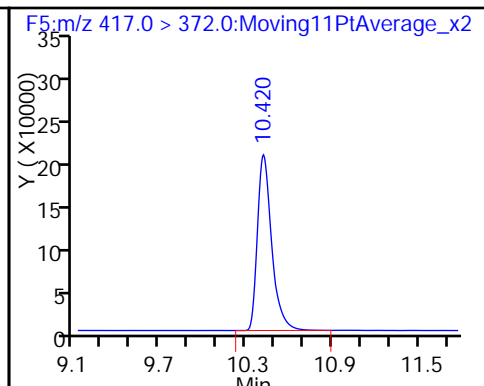
41 Perfluorohexanesulfonic acid

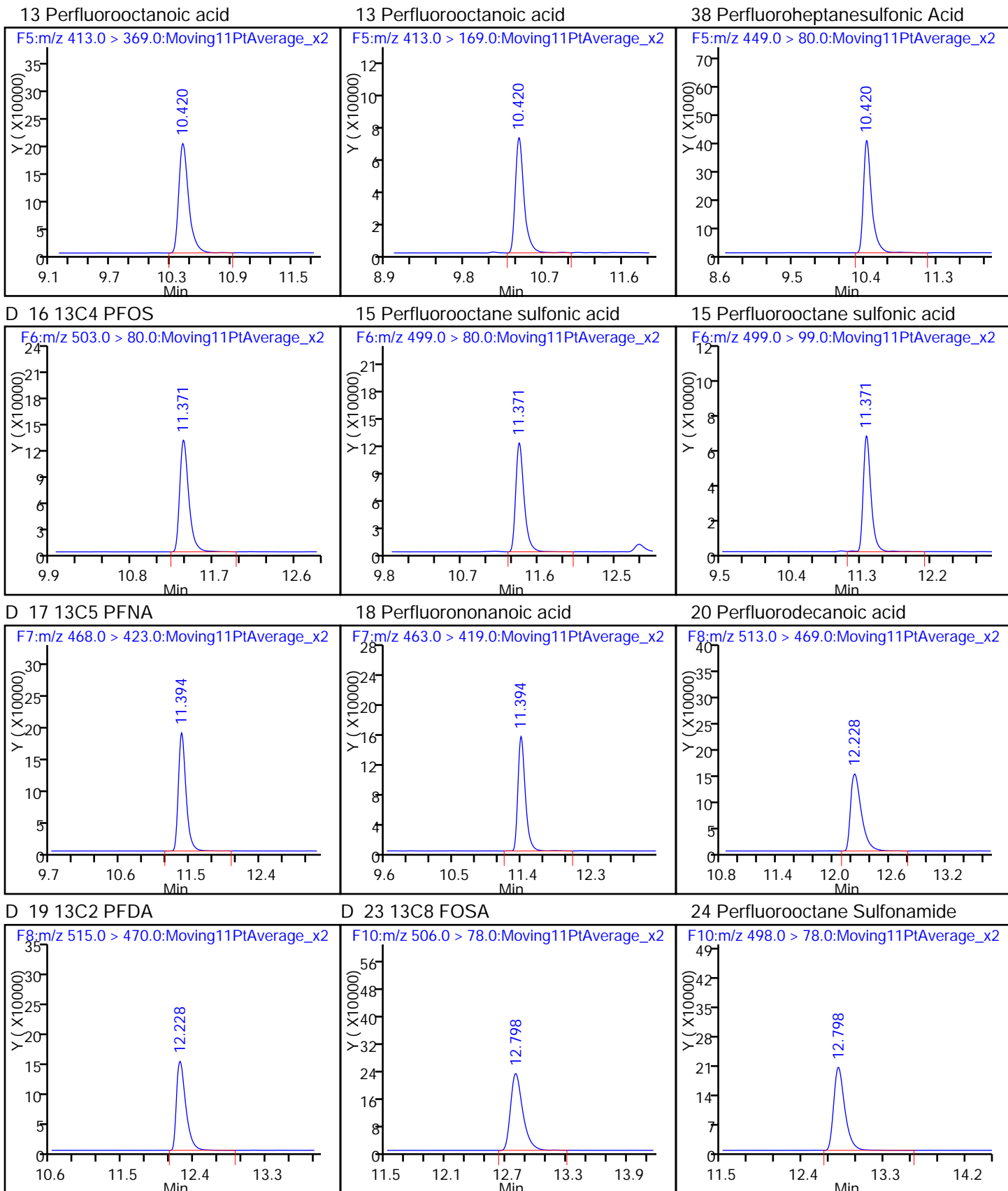


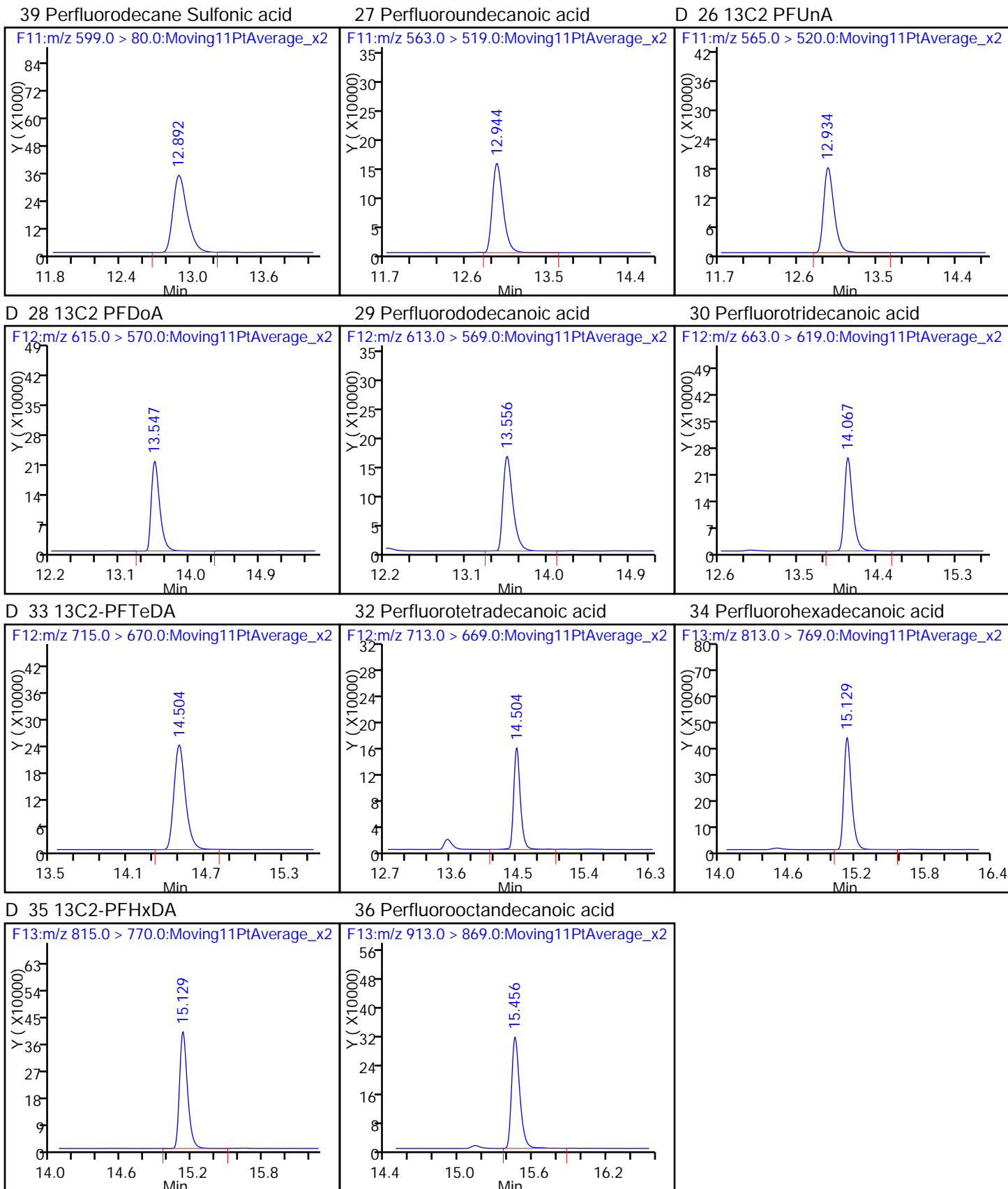
D 11 18O2 PFHxS



D 12 13C4 PFOA







FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Lab Sample ID: CCV 320-97663/16 Calibration Date: 01/08/2016 13:09
 Instrument ID: A6 Calib Start Date: 01/06/2016 11:00
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 01/06/2016 14:07
 Lab File ID: 08JAN2016A6A_008.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.380	1.342		0.973	1.00	-2.7	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.010	0.9611		0.952	1.00	-4.8	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.066	0.7164		0.594	0.884	-32.8	50.0
Perfluorohexanoic acid (PFHxA)	AveID	1.078	1.312		1.22	1.00	21.7	50.0
Perfluoroheptanoic acid (PFHpA)	L1ID		0.8935		0.642	1.00	-35.8	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.5809	0.5031		0.819	0.946	-13.4	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.4923	0.3454		0.668	0.952	-29.8	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	0.8811		0.822	1.00	-17.8	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9693	0.8308		0.819	0.956	-14.3	50.0
Perfluorononanoic acid (PFNA)	AveID	0.8528	0.7551		0.885	1.00	-11.5	50.0
Perfluorodecanoic acid (PFDA)	AveID	1.052	1.139		1.08	1.00	8.3	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9819	0.7352		0.749	1.00	-25.1	50.0
Perfluorodecane Sulfonic acid	AveID	0.4693	0.3088		0.634	0.964	-34.2	50.0
Perfluoroundecanoic acid (PFUnA)	L1ID		1.446		0.843	1.00	-15.7	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.7850	0.6297		0.802	1.00	-19.8	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.016	0.8076		0.795	1.00	-20.5	50.0
Perfluorotetradecanoic acid (PFTeA)	L1ID		0.8045		0.680	1.00	-32.0	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		6.395		0.215	1.00	-78.5*	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.005	0.6400		0.637	1.00	-36.3	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_008.d
 Lims ID: CCV L2
 Client ID:
 Sample Type: CCVL
 Inject. Date: 08-Jan-2016 13:09:49 ALS Bottle#: 18 Worklist Smp#: 16
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L2
 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\20160108-27690.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 11-Jan-2016 09:49:38 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 08-Jan-2016 13:55:37

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	5.766	5.763	0.003	977185	53.1		106	2636	
2 Perfluorobutyric acid	212.9 > 169.0	5.776	5.763	0.013	1.000	26231	0.9728	97.3	54.3	
D 3 13C5-PFPeA	267.9 > 223.0	6.868	6.863	0.005	2128978	61.2		122	3633	
4 Perfluoropentanoic acid	262.9 > 219.0	6.863	6.864	-0.001	1.000	40923	0.9519	95.2	7.5	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.987	6.976	0.011	1.000	12999	NC		31.9	
	298.9 > 99.0	6.978	6.976	0.002	0.999	8223	1.58(0.00-0.00)		23.3	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.987	6.976	0.011	1.000	12999	0.5939	67.2		
D 6 13C2 PFHxA	315.0 > 270.0	8.105	8.100	0.005	1654731	50.6		101	3124	
7 Perfluorohexanoic acid	313.0 > 269.0	8.122	8.102	0.020	1.000	43408	1.22	122	127	
D 8 13C4-PFHpA	367.0 > 322.0	9.329	9.331	-0.002	2052000	59.8		120	5144	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.335	9.335	0.0	1.000	36667	0.6420	64.2	35.9	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.364	9.363	0.001	1.000	9768	NC		24.6	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.364	9.363	0.001	1.000	9768	0.8192	86.6		
D 11 18O2 PFHxS	403.0 > 84.0	9.358	9.363	-0.005	970864	66.8		141	3497	

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	10.448	10.452	-0.004		2185375	56.5		113	6588	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.448	10.453	-0.005	1.000	38510	0.8218		82.2	25.3	
413.0 > 169.0	10.455	10.453	0.002	1.001	14731		2.61(0.00-0.00)		21.9	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.448	10.456	-0.008	1.000	8906	0.6679		70.2		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.448	10.456	-0.008	1.000	8906	NC			40.7	
D 16 13C4 PFOS										
503.0 > 80.0	11.400	11.405	-0.005		1294598	69.2		145	2956	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.400	11.408	-0.008	1.000	21511	0.8194		85.7	56.8	
499.0 > 99.0	11.386	11.408	-0.022	0.999	8904		2.42(0.00-0.00)		35.0	
D 17 13C5 PFNA										
468.0 > 423.0	11.423	11.427	-0.004		1735692	54.1		108	4991	
18 Perfluorononanoic acid										
463.0 > 419.0	11.423	11.431	-0.008	1.000	26211	0.8854		88.5	72.3	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.249	12.260	-0.011	1.000	40361	1.08		108	100.0	
D 19 13C2 PFDA										
515.0 > 470.0	12.249	12.262	-0.013		1771420	57.4		115	3603	
D 23 13C8 FOSA										
506.0 > 78.0	12.808	12.805	0.003		2561086	60.0		120	2348	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.819	12.805	0.014	1.000	37659	0.7488		74.9	119	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.923	12.929	-0.006	1.000	8061	NC			28.9	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.923	12.929	-0.006	1.000	8061	0.6342		65.8		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.964	12.978	-0.014	1.000	61469	0.8431		84.3	138	
D 26 13C2 PFUnA										
565.0 > 520.0	12.964	12.979	-0.015		2125945	56.4		113	4692	
D 28 13C2 PFDaA										
615.0 > 570.0	13.583	13.597	-0.014		2350977	55.5		111	3372	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.583	13.597	-0.014	1.000	29606	0.8021		80.2	16.3	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.090	14.114	-0.024	1.000	37973	0.7946		79.5	30.0	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.530	14.548	-0.018		1904189	49.3		98.6	3014	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.537	14.549	-0.012	1.000	37826	0.6801		68.0	8.1	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.154	15.177	-0.023	1.000	300706	0.2150		21.5	314	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.154	15.177	-0.023		2316041	47.2		94.4	2953	

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 15.486 15.517 -0.031 1.000 30091 0.6369 63.7 31.6

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L2_00018

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_008.d

Injection Date: 08-Jan-2016 13:09:49

Instrument ID: A6

Lims ID: CCV L2

Client ID:

Operator ID: JRB

ALS Bottle#: 18

Worklist Smp#: 16

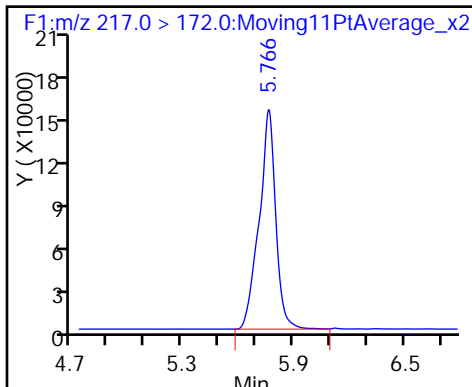
Injection Vol: 15.0 ul

Dil. Factor: 1.0000

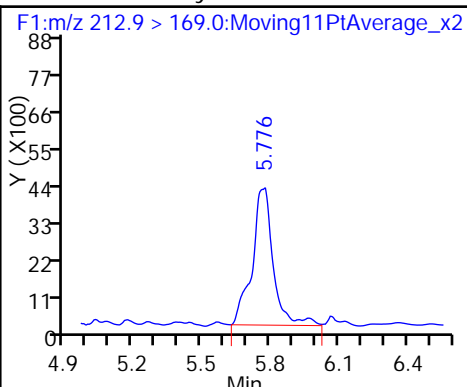
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

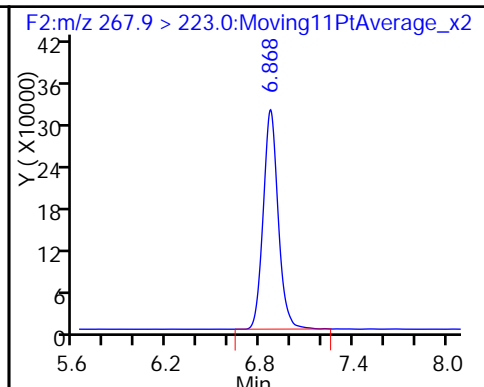
D 1 13C4 PFBA



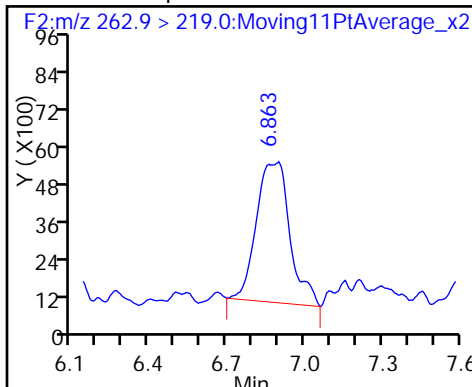
2 Perfluorobutyric acid



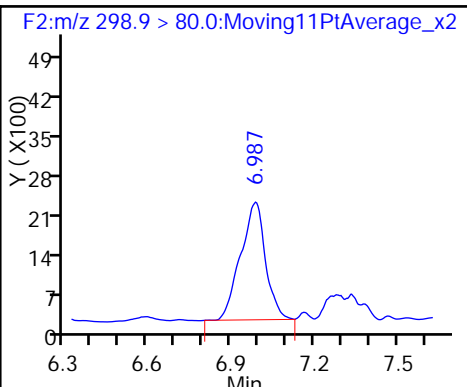
D 3 13C5-PFPeA



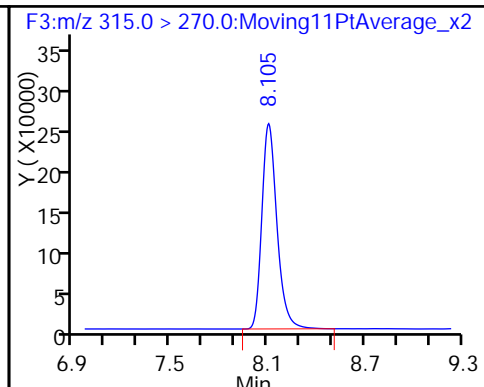
4 Perfluoropentanoic acid



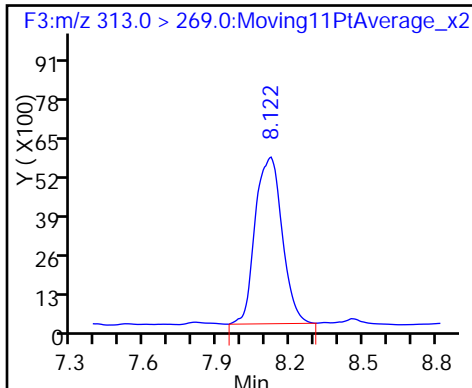
40 Perfluorobutanesulfonic acid



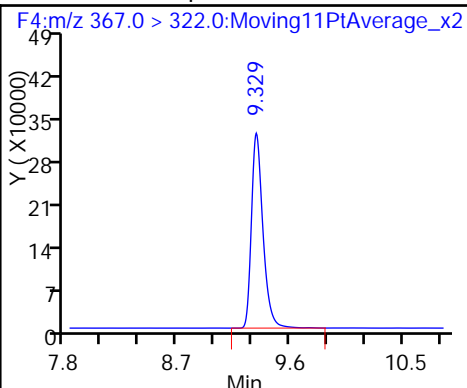
D 6 13C2 PFHxA



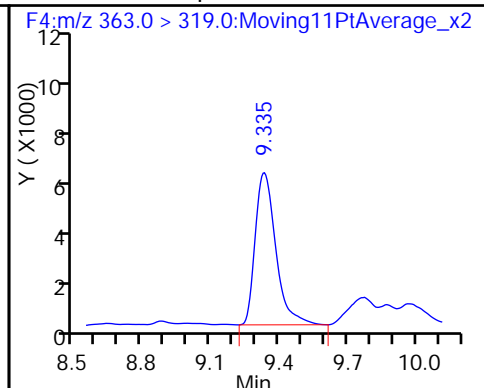
7 Perfluorohexanoic acid



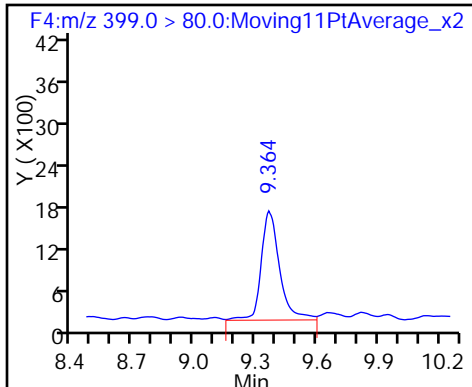
D 8 13C4-PFHpA



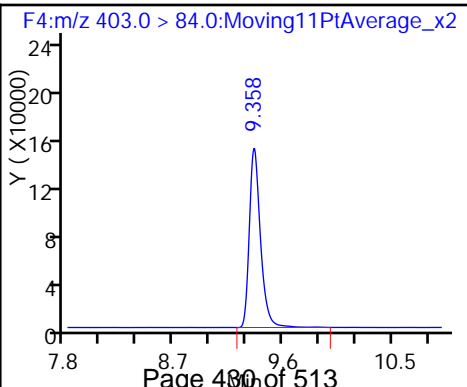
9 Perfluoroheptanoic acid



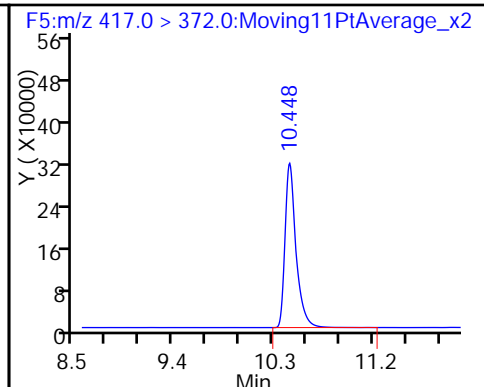
41 Perfluorohexanesulfonic acid

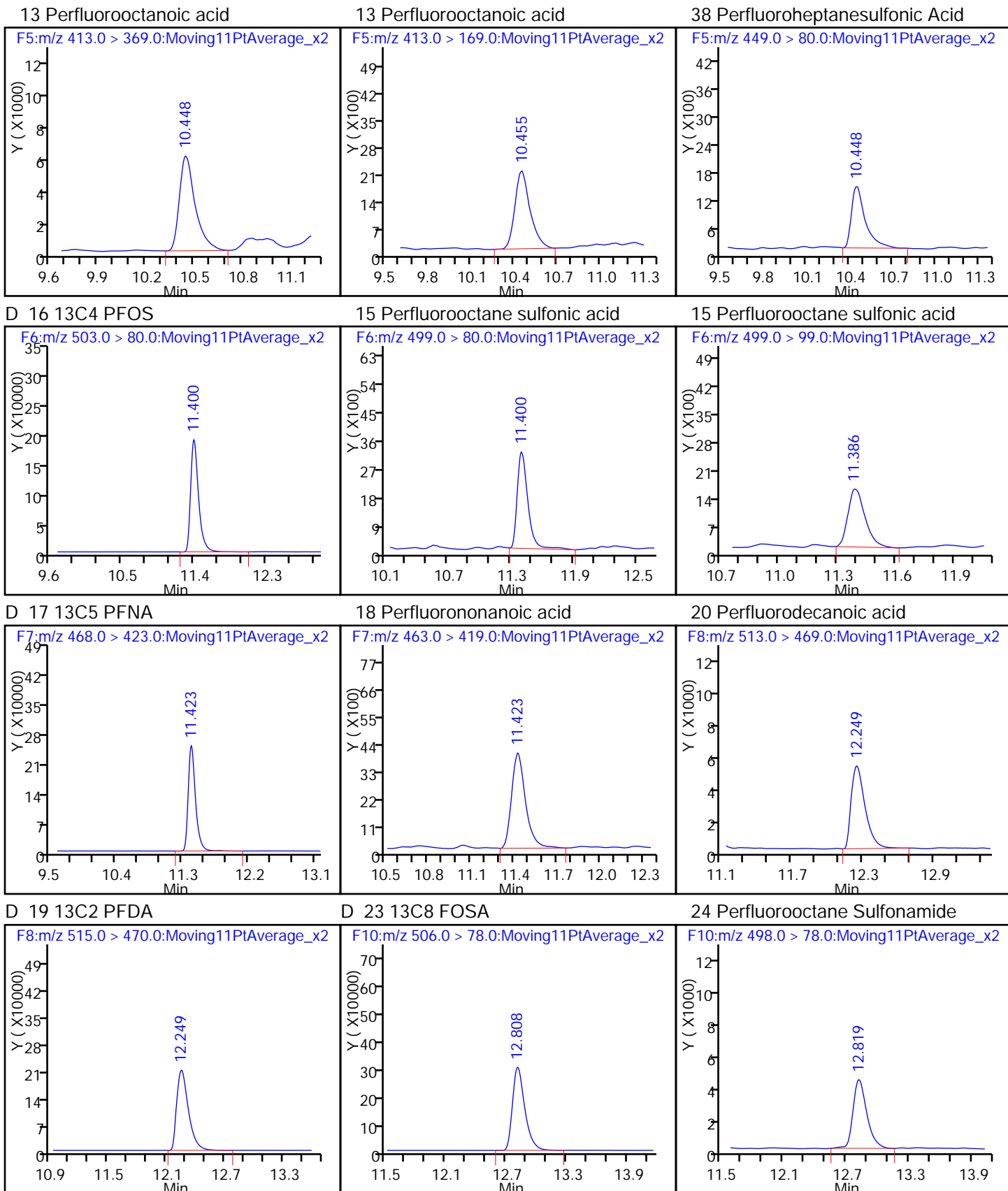


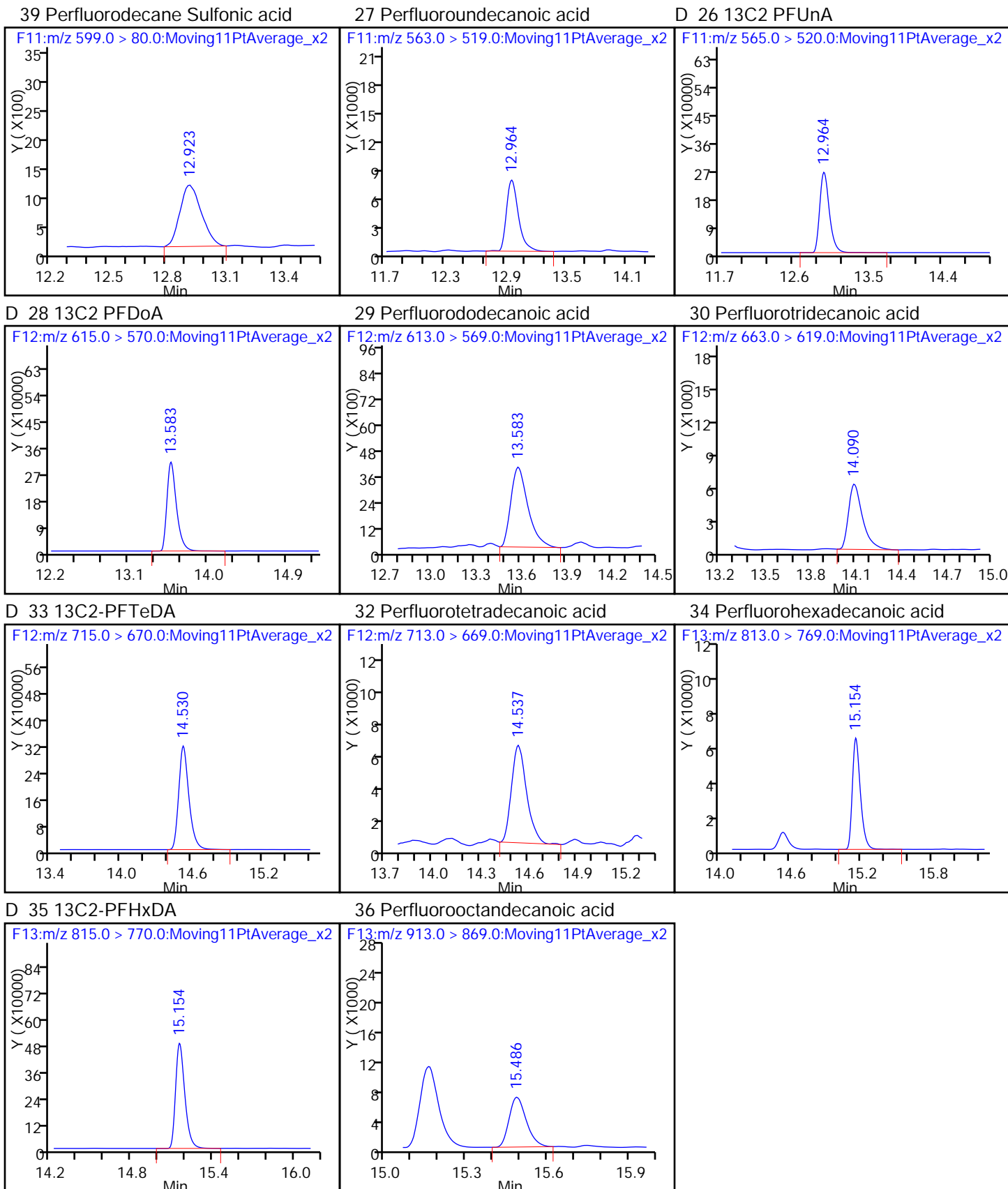
D 11 18O2 PFHxS



D 12 13C4 PFOA







FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Lab Sample ID: CCV 320-97663/17 Calibration Date: 01/08/2016 13:40
 Instrument ID: A6 Calib Start Date: 01/06/2016 11:00
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 01/06/2016 14:07
 Lab File ID: 08JAN2016A6A_009.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.380	1.448		52.5	50.0	5.0	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.010	0.9628		47.7	50.0	-4.6	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.066	1.030		42.7	44.2	-3.4	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.078	1.025		47.5	50.0	-4.9	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		0.9865		49.5	50.0	-0.9	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.5809	0.4920		40.1	47.3	-15.3	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	0.9357		43.6	50.0	-12.7	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.4923	0.3514		34.0	47.6	-28.6*	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9693	0.9790		48.3	47.8	1.0	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8528	0.8226		48.2	50.0	-3.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.052	0.9564		45.5	50.0	-9.1	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9819	0.8847		45.1	50.0	-9.9	25.0
Perfluorodecane Sulfonic acid	AveID	0.4693	0.3305		33.9	48.2	-29.6*	25.0
Perfluoroundecanoic acid (PFUnA)	L1ID		0.8921		50.7	50.0	1.4	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.7850	0.7625		48.6	50.0	-2.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.016	0.9882		48.6	50.0	-2.8	25.0
Perfluorotetradecanoic acid (PFTeA)	L1ID		0.5649		44.7	50.0	-10.6	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.079		43.9	50.0	-12.2	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.005	0.7974		39.7	50.0	-20.6	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_009.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 08-Jan-2016 13:40:49 ALS Bottle#: 21 Worklist Smp#: 17
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 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\20160108-27690.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 11-Jan-2016 09:49:51 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 08-Jan-2016 15:13:30

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	5.776	5.763	0.013	830636	45.1		90.3	2308	
2 Perfluorobutyric acid	212.9 > 169.0	5.779	5.763	0.016	1202949	52.5		105	3048	
D 3 13C5-PFPeA	267.9 > 223.0	6.886	6.863	0.023	1732419	49.8		99.6	2324	
4 Perfluoropentanoic acid	262.9 > 219.0	6.886	6.864	0.022	1667883	47.7		95.4	436	
5 Perfluorobutane Sulfonate	298.9 > 80.0	7.005	6.976	0.029	737854	NC			1805	
	298.9 > 99.0	7.005	6.976	0.029	434443		1.70(0.00-0.00)		906	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	7.005	6.976	0.029	737854	42.7		96.6		
D 6 13C2 PFHxA	315.0 > 270.0	8.127	8.100	0.027	1492876	45.6		91.3	3067	
7 Perfluorohexanoic acid	313.0 > 269.0	8.127	8.102	0.025	1530184	47.5		95.1	1397	
D 8 13C4-PFHpA	367.0 > 322.0	9.352	9.331	0.021	1637978	47.8		95.5	3286	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.352	9.335	0.017	1615828	49.5		99.1	931	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.382	9.363	0.019	376999	NC			982	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.382	9.363	0.019	376999	40.1		84.7		
D 11 18O2 PFHxS	403.0 > 84.0	9.382	9.363	0.019	766277	52.7		111	2826	

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	10.462	10.452	0.010		1640900	42.4		84.8	3954	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.462	10.453	0.009	1.000	1535385	43.6		87.3	638	
413.0 > 169.0	10.469	10.453	0.016	1.001	557057		2.76(0.00-0.00)		456	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.469	10.456	0.013	1.000	354383	34.0		71.4		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.469	10.456	0.013	1.000	354383	NC			916	
D 16 13C4 PFOS										
503.0 > 80.0	11.415	11.405	0.010		1012642	54.2		113	3297	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.415	11.408	0.007	1.000	991396	48.3		101	281	
499.0 > 99.0	11.415	11.408	0.007	1.000	497935		1.99(0.00-0.00)		1352	
D 17 13C5 PFNA										
468.0 > 423.0	11.438	11.427	0.011		1384161	43.1		86.3	3538	
18 Perfluorononanoic acid										
463.0 > 419.0	11.438	11.431	0.007	1.000	1138574	48.2		96.5	2644	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.269	12.260	0.009	1.000	1317476	45.5		90.9	2477	
D 19 13C2 PFDA										
515.0 > 470.0	12.269	12.262	0.007		1377543	44.6		89.3	2870	
D 23 13C8 FOSA										
506.0 > 78.0	12.818	12.805	0.013		2054593	48.1		96.3	2305	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.818	12.805	0.013	1.000	1817639	45.1		90.1	2787	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.933	12.929	0.004	1.000	337447	NC			1231	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.933	12.929	0.004	1.000	337447	33.9		70.4		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.975	12.978	-0.003	1.000	1386892	50.7		101	1946	
D 26 13C2 PFUnA										
565.0 > 520.0	12.975	12.979	-0.004		1554720	41.2		82.5	3427	
D 28 13C2 PFDaA										
615.0 > 570.0	13.593	13.597	-0.004		1870006	44.1		88.3	3101	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.593	13.597	-0.004	1.000	1425795	48.6		97.1	1106	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.105	14.114	-0.009	1.000	1847865	48.6		97.2	1232	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.537	14.548	-0.011		1490956	38.6		77.2	2719	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.537	14.549	-0.012	1.000	1056307	44.7		89.4	292	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.159	15.177	-0.018	1.000	2017173	43.9		87.8	2218	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.159	15.177	-0.018		1874014	38.2		76.3	2610	

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	15.491	15.517	-0.026	1.000	1491074	39.7	79.4	1358	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00016

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_009.d

Injection Date: 08-Jan-2016 13:40:49

Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: JRB

ALS Bottle#: 21

Worklist Smp#: 17

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

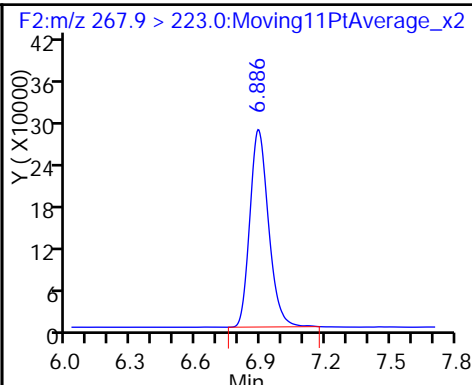
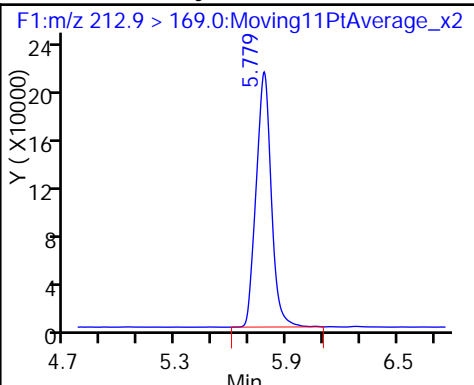
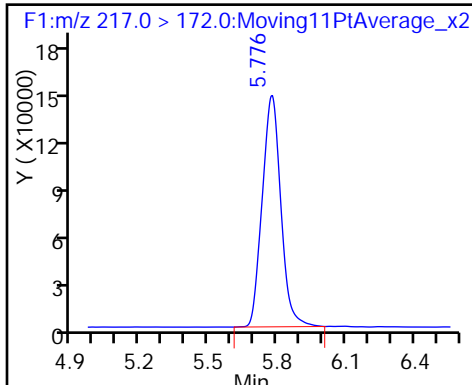
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

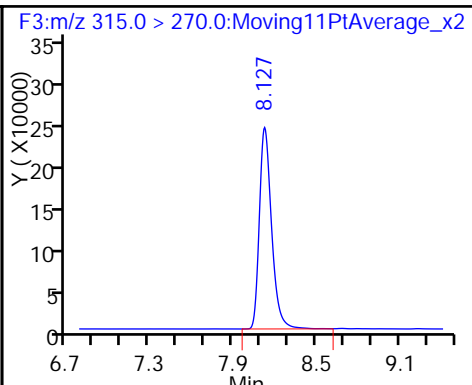
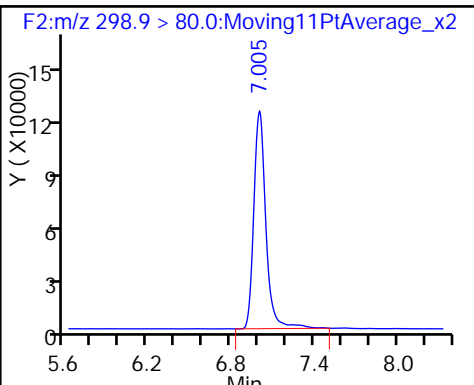
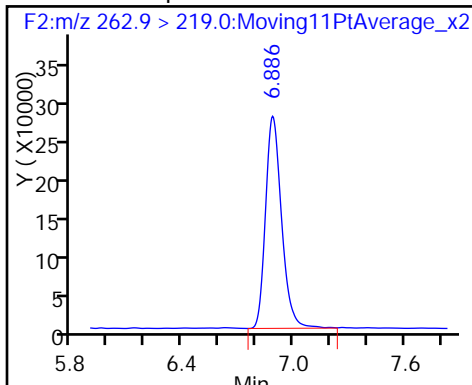
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

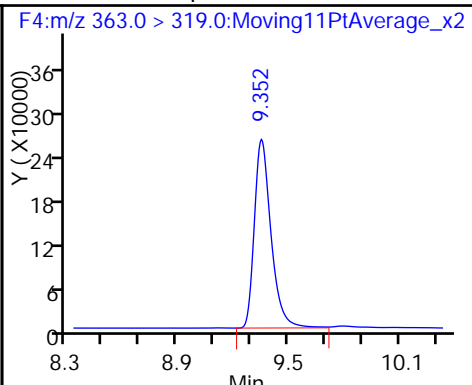
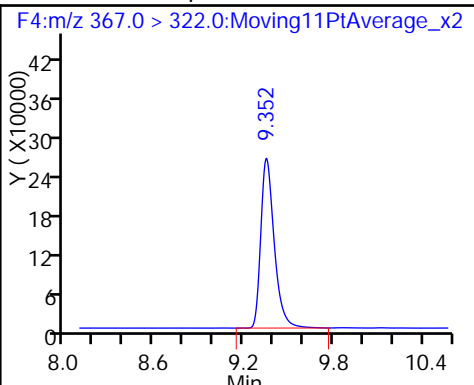
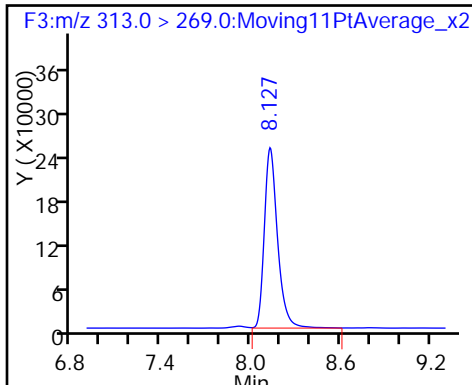
D 6 13C2 PFXxA



7 Perfluorohexanoic acid

D 8 13C4-PFHpA

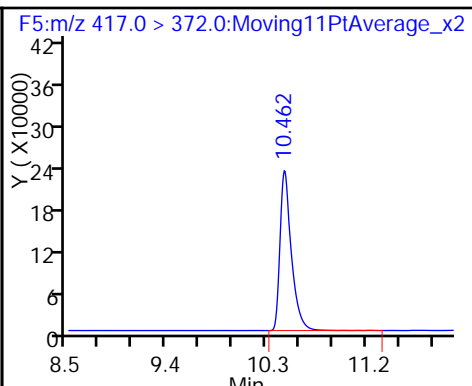
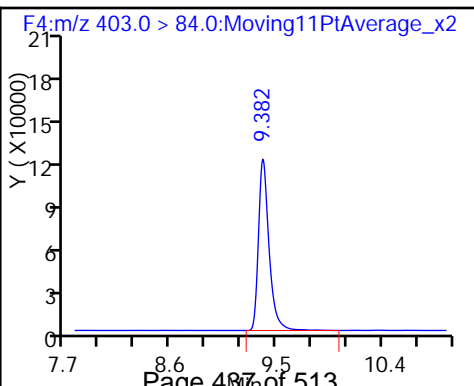
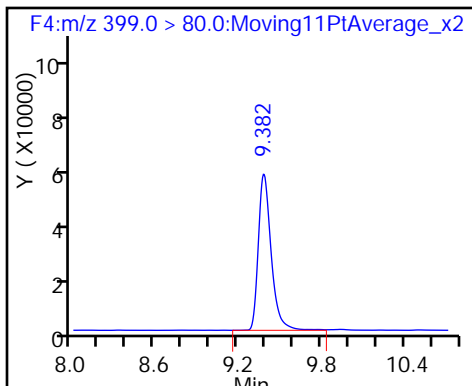
9 Perfluoroheptanoic acid

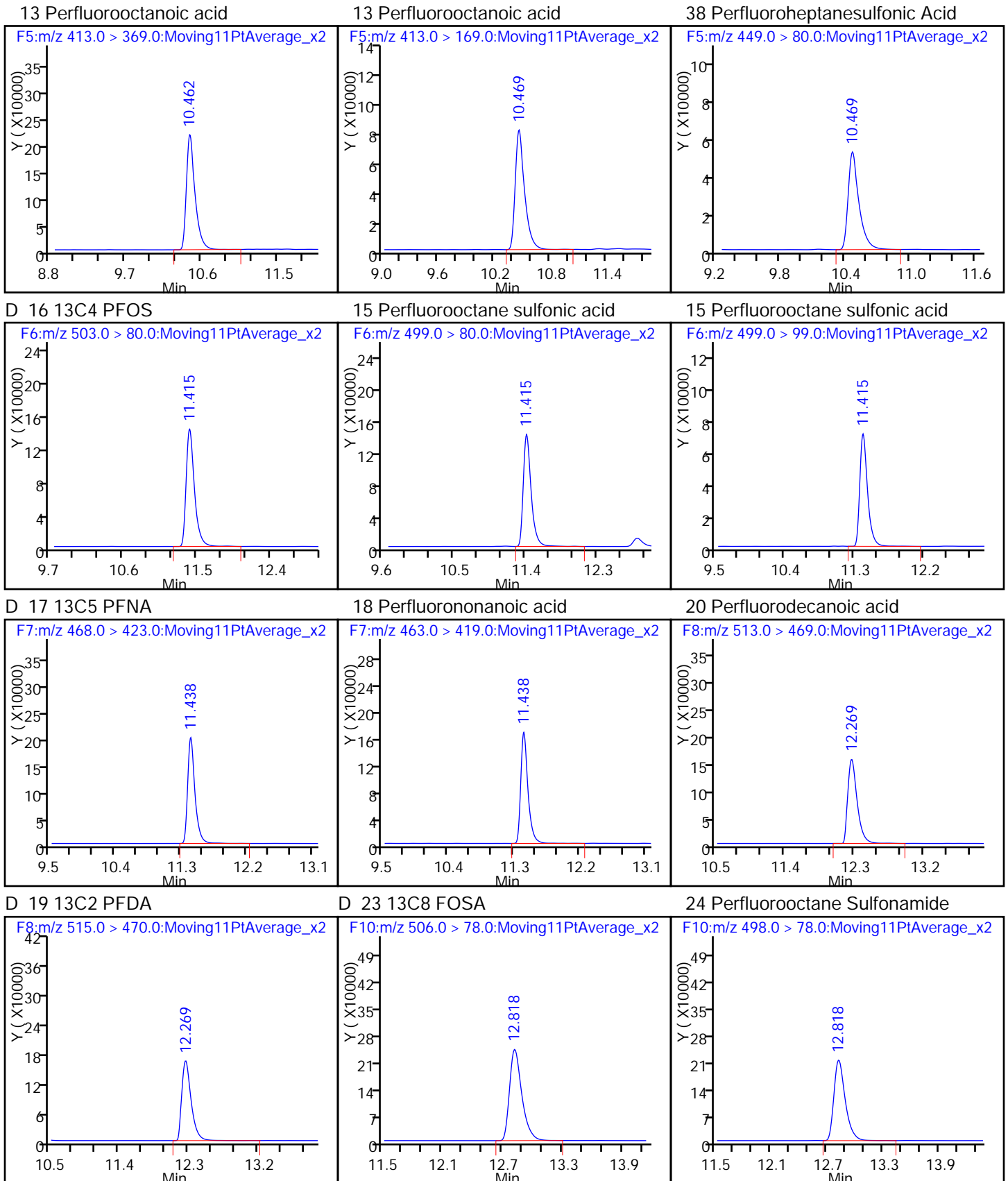


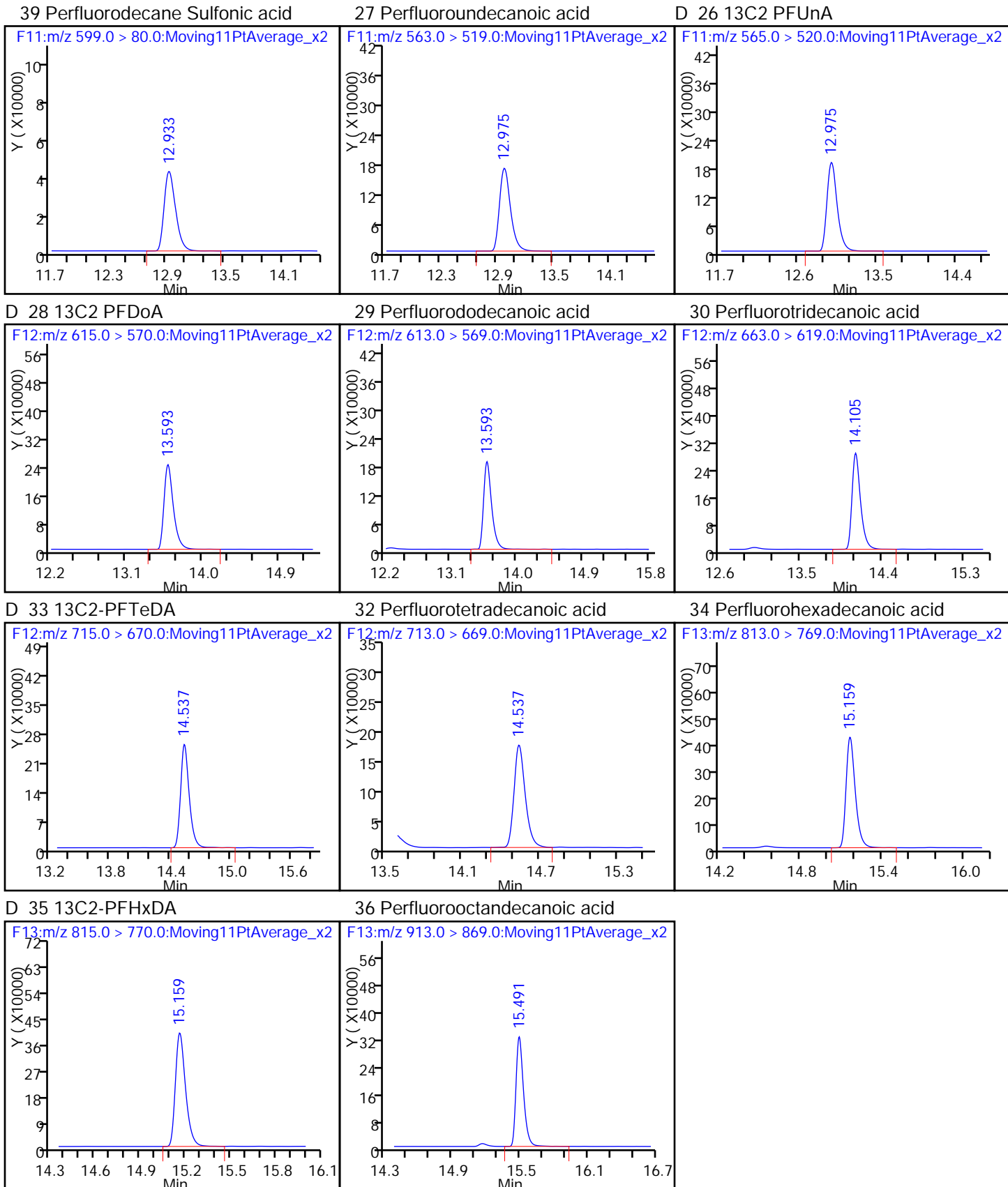
41 Perfluorohexanesulfonic acid

D 11 18O2 PFXsS

D 12 13C4 PFOA







FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Lab Sample ID: CCV 320-97663/18 Calibration Date: 01/08/2016 17:41
 Instrument ID: A6 Calib Start Date: 01/06/2016 11:00
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 01/06/2016 14:07
 Lab File ID: 08JAN2016A6A_020.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.380	1.364		19.8	20.0	-1.2	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.010	0.9425		18.7	20.0	-6.6	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.066	0.9593		15.9	17.7	-10.0	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.078	1.107		20.5	20.0	2.7	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.066		21.3	20.0	6.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.5809	0.4794		15.6	18.9	-17.5	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.4923	0.3289		12.7	19.0	-33.2*	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	0.9021		16.8	20.0	-15.9	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9693	0.9720		19.2	19.1	0.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8528	0.8446		19.8	20.0	-1.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.052	0.9807		18.7	20.0	-6.7	25.0
Perfluorodecane Sulfonamide (FOSA)	AveID	0.9819	0.8763		17.8	20.0	-10.8	25.0
Perfluorodecane Sulfonic acid	AveID	0.4693	0.3104		12.8	19.3	-33.9*	25.0
Perfluoroundecanoic acid (PFUnA)	L1ID		0.8307		18.4	20.0	-8.2	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.7850	0.7673		19.5	20.0	-2.3	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.016	1.013		19.9	20.0	-0.3	25.0
Perfluorotetradecanoic acid (PFTeA)	L1ID		0.6229		19.4	20.0	-3.1	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.258		17.5	20.0	-12.7	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.005	0.8101		16.1	20.0	-19.4	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_020.d
 Lims ID: CCV L4
 Client ID:
 Sample Type: CCV
 Inject. Date: 08-Jan-2016 17:41:12 ALS Bottle#: 20 Worklist Smp#: 18
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L4
 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\20160108-27690.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 11-Jan-2016 09:51:33 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 11-Jan-2016 08:36:46

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	5.766	5.763	0.003	822984	44.7		89.4	3702	
2 Perfluorobutyric acid	212.9 > 169.0	5.766	5.763	0.003	448899	19.8		98.8	794	
D 3 13C5-PFPeA	267.9 > 223.0	6.872	6.863	0.009	1735842	49.9		99.8	3281	
4 Perfluoropentanoic acid	262.9 > 219.0	6.872	6.864	0.008	654428	18.7		93.4	253	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.987	6.976	0.011	270085	NC			397	
	298.9 > 99.0	6.987	6.976	0.011	177347		1.52(0.00-0.00)		375	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.987	6.976	0.011	270085	15.9		90.0		
D 6 13C2 PFHxA	315.0 > 270.0	8.105	8.100	0.005	1425759	43.6		87.2	3950	
7 Perfluorohexanoic acid	313.0 > 269.0	8.111	8.102	0.009	631550	20.5		103	1274	
D 8 13C4-PFHpA	367.0 > 322.0	9.329	9.331	-0.002	1598082	46.6		93.2	3756	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.329	9.335	-0.006	681170	21.3		106	717	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.358	9.363	-0.005	144440	NC			374	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.358	9.363	-0.005	144440	15.6		82.5		
D 11 18O2 PFHxS	403.0 > 84.0	9.364	9.363	0.001	753226	51.8		110	2279	

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	10.441	10.452	-0.011		1683305	43.5		87.0	4611	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.448	10.453	-0.005	1.000	607426	16.8		84.1	511	
413.0 > 169.0	10.448	10.453	-0.005	1.000	232358		2.61(0.00-0.00)		389	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.448	10.456	-0.008	1.000	134577	12.7		66.8		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.448	10.456	-0.008	1.000	134577	NC			621	
D 16 13C4 PFOS										
503.0 > 80.0	11.400	11.405	-0.005		1027141	54.9		115	3142	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.400	11.408	-0.008	1.000	399343	19.2		100	243	
499.0 > 99.0	11.400	11.408	-0.008	1.000	212846		1.88(0.00-0.00)		700	
D 17 13C5 PFNA										
468.0 > 423.0	11.416	11.427	-0.011		1412883	44.0		88.1	3378	
18 Perfluorononanoic acid										
463.0 > 419.0	11.416	11.431	-0.015	1.000	477337	19.8		99.0	1077	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.249	12.260	-0.011	1.000	517830	18.7		93.3	1086	
D 19 13C2 PFDA										
515.0 > 470.0	12.249	12.262	-0.013		1320007	42.8		85.6	2312	
D 23 13C8 FOSA										
506.0 > 78.0	12.808	12.805	0.003		2020615	47.3		94.7	2618	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.819	12.805	0.014	1.000	708242	17.8		89.2	1955	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.913	12.929	-0.016	1.000	128609	NC			368	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.913	12.929	-0.016	1.000	128609	12.8		66.1		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.965	12.978	-0.013	1.000	539858	18.4		91.8	799	
D 26 13C2 PFUnA										
565.0 > 520.0	12.965	12.979	-0.014		1624636	43.1		86.2	3158	
D 28 13C2 PFDoA										
615.0 > 570.0	13.574	13.597	-0.023		1832837	43.3		86.5	3029	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.574	13.597	-0.023	1.000	562565	19.5		97.7	392	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.090	14.114	-0.024	1.000	743008	19.9		99.7	637	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.524	14.548	-0.024		1604195	41.5		83.0	3009	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.524	14.549	-0.025	1.000	456643	19.4		96.9	128	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.149	15.177	-0.028	1.000	922486	17.5		87.3	932	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.149	15.177	-0.028		1919963	39.1		78.2	3052	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
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36 Perfluorooctadecanoic acid
 913.0 > 869.0 15.476 15.517 -0.041 1.000 593932 16.1 80.6 648

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00017

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_020.d

Injection Date: 08-Jan-2016 17:41:12

Instrument ID: A6

Lims ID: CCV L4

Client ID:

Operator ID: JRB

ALS Bottle#: 20

Worklist Smp#: 18

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

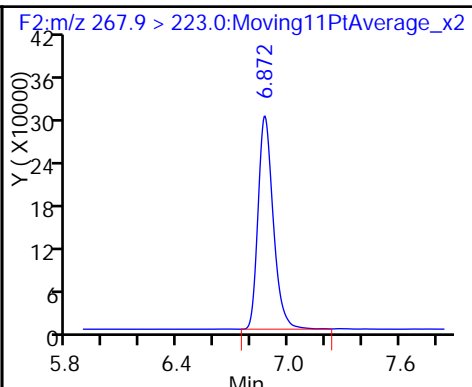
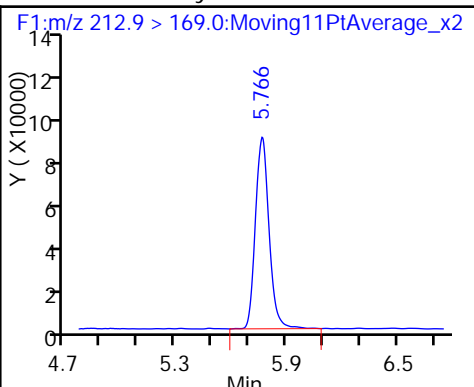
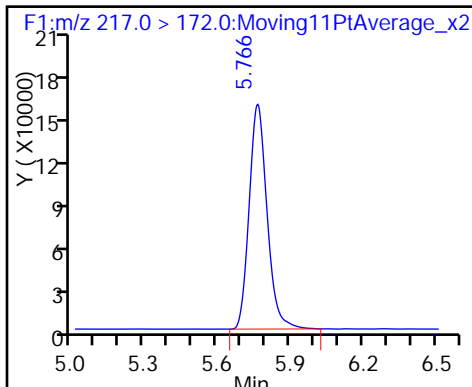
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

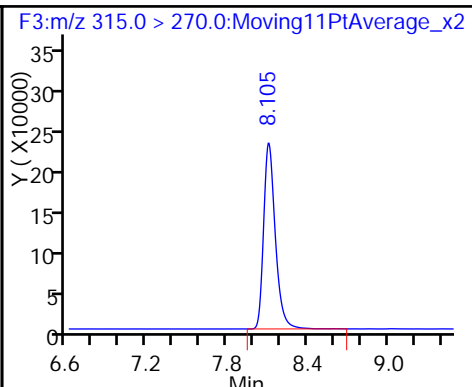
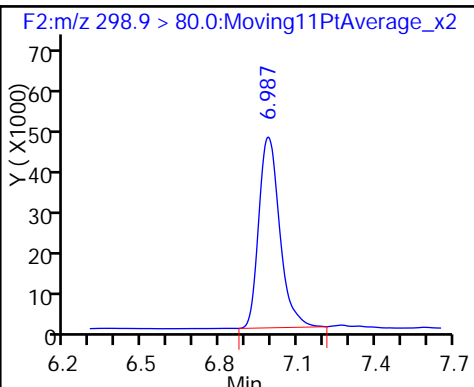
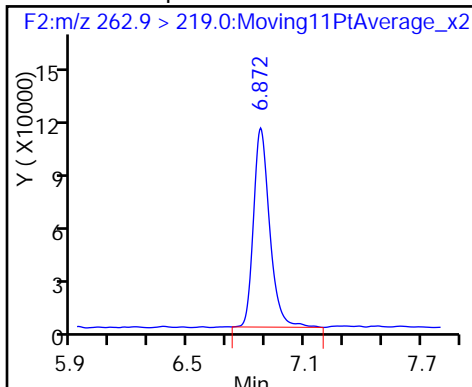
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

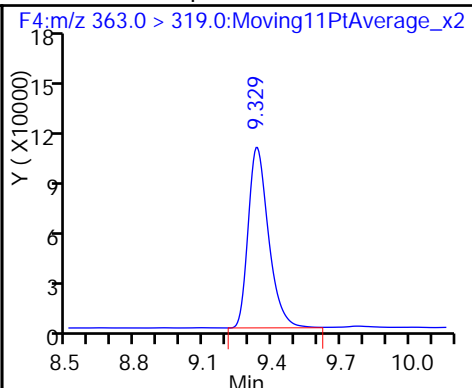
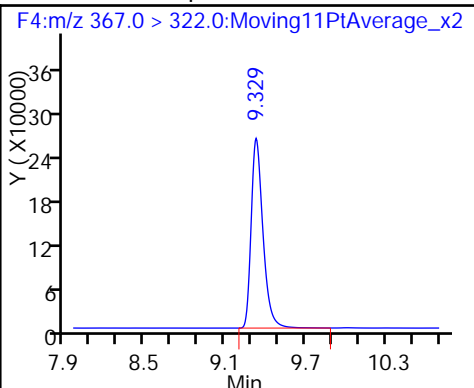
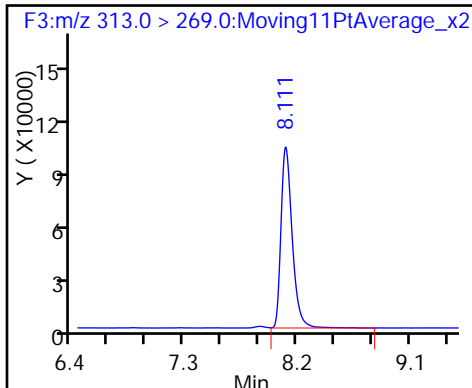
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

D 8 13C4-PFHpA

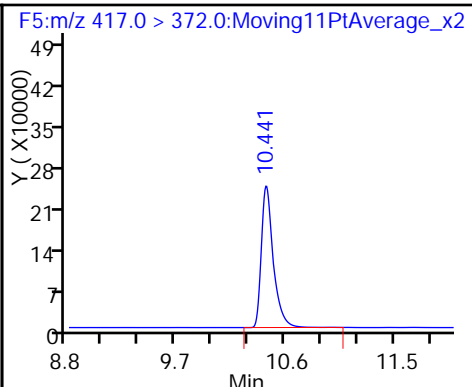
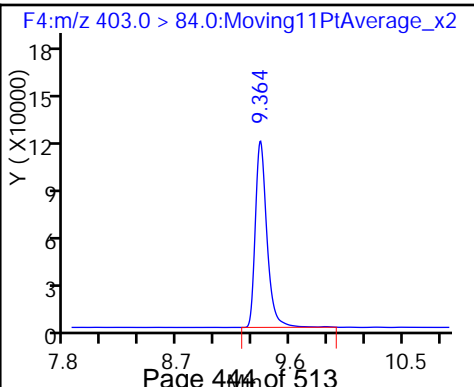
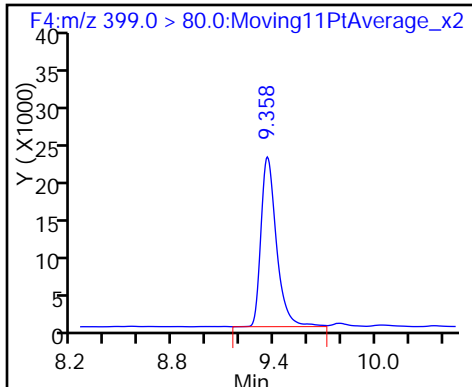
9 Perfluoroheptanoic acid

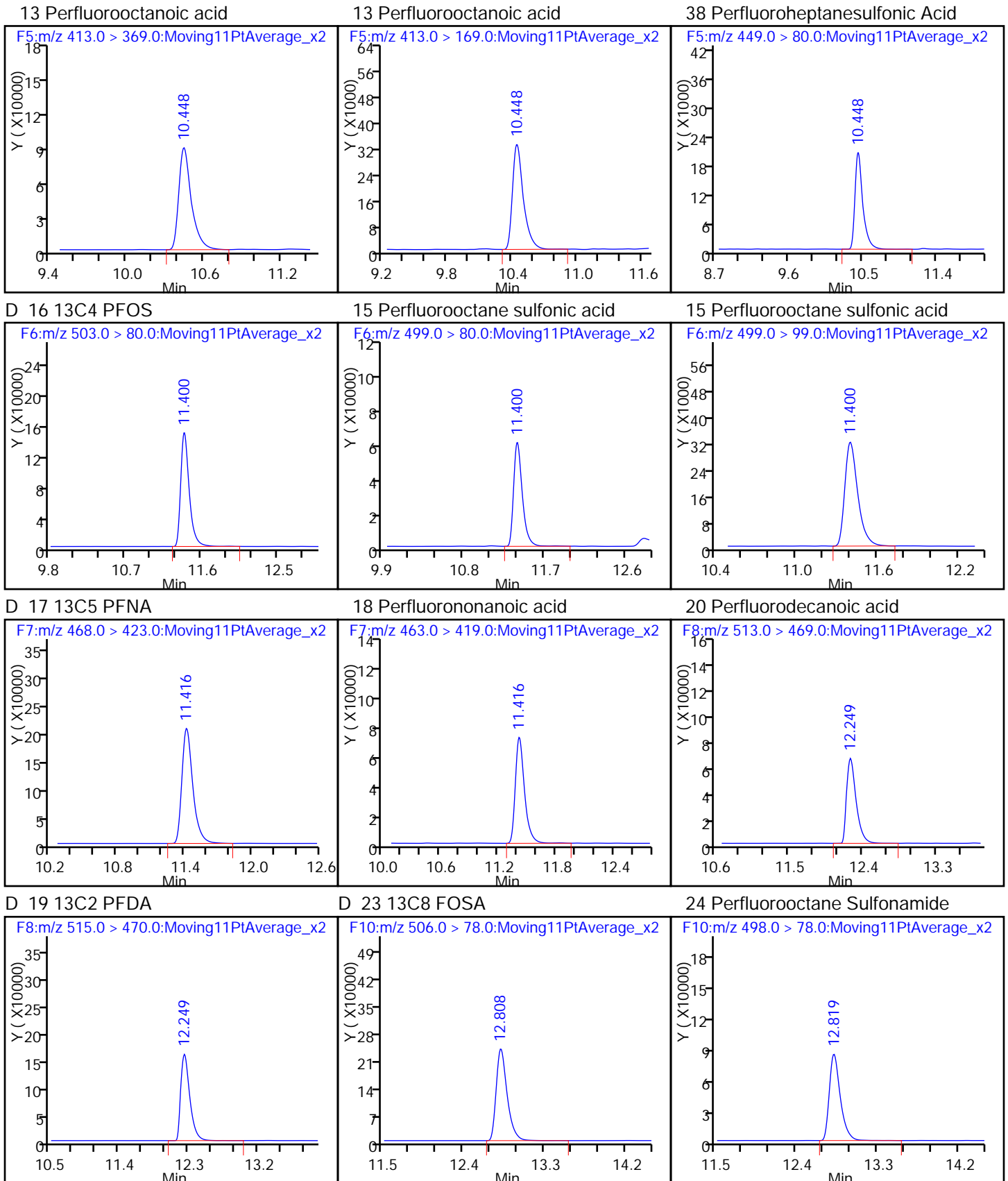


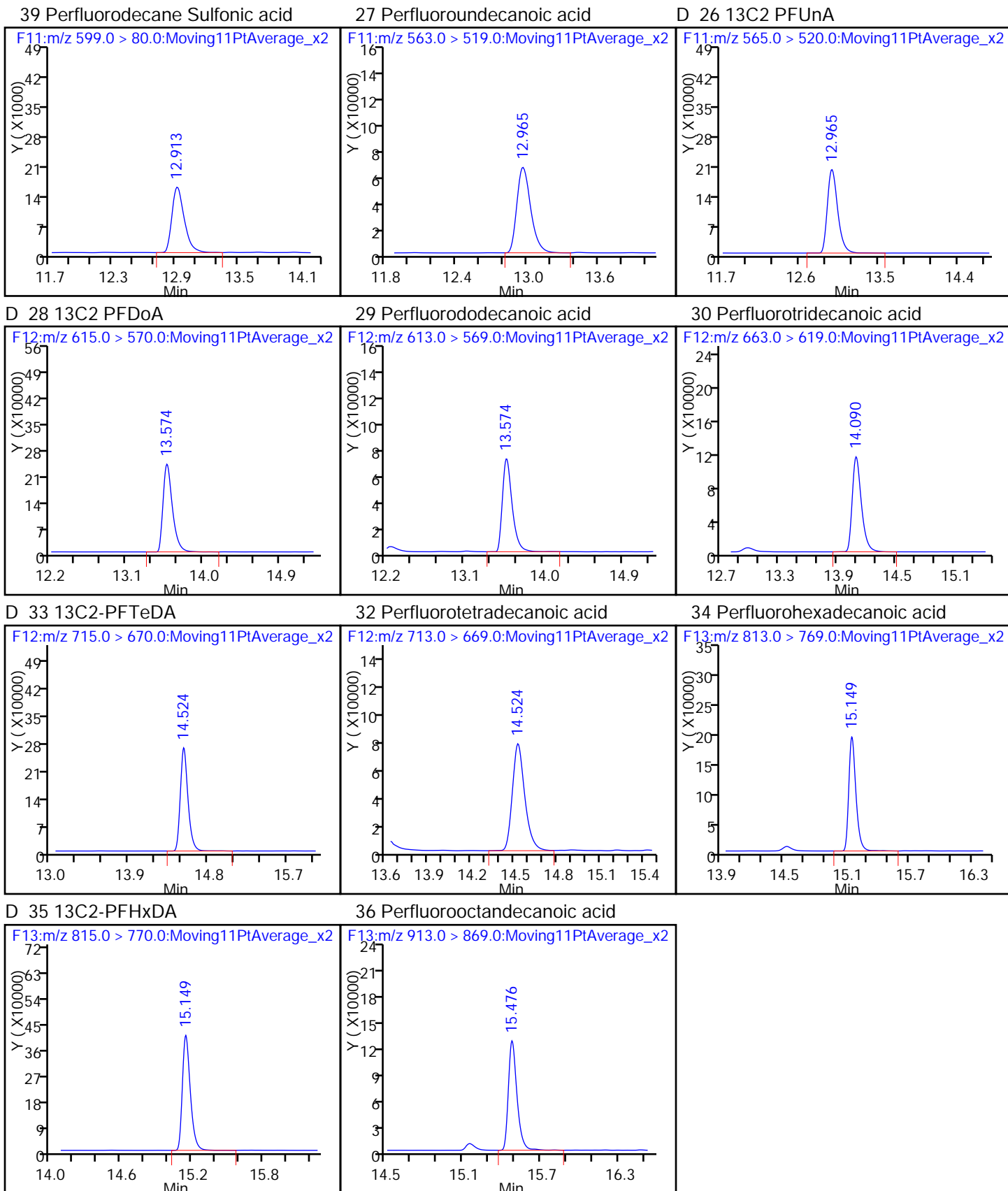
41 Perfluorohexanesulfonic acid

D 11 18O2 PFHxS

D 12 13C4 PFOA







FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-97259/1-A
 Matrix: Water Lab File ID: 06JAN2016A6A_068.d
 Analysis Method: WS-LC-0025 Date Collected: _____
 Extraction Method: 3535 Date Extracted: 01/05/2016 08:39
 Sample wt/vol: 500 (mL) Date Analyzed: 01/07/2016 16:17
 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.: 97577 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.01	J	2.5	2.0	0.92
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.0	U	2.5	2.0	0.80
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	2.5	2.0	0.87
375-95-1	Perfluorononanoic acid (PFNA)	2.0	U	2.5	2.0	0.65
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	U	2.5	2.0	0.75

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	91		25-150
STL00990	13C4 PFOA	96		25-150
STL00991	13C4 PFOS	127		25-150
STL01892	13C4-PFHpA	97		25-150
STL00994	18O2 PFHxS	119		25-150
STL00995	13C5 PFNA	93		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_068.d
 Lims ID: MB 320-97259/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 07-Jan-2016 16:17:29 ALS Bottle#: 26 Worklist Smp#: 41
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: MB 320-97259/1-A
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 14:53:12 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

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	5.751	5.763	-0.012		855062	46.5		92.9	2921	
2 Perfluorobutyric acid										
212.9 > 169.0	5.760	5.763	-0.003	1.000	33636	1.43			76.1	
D 3 13C5-PFPeA										
267.9 > 223.0	6.859	6.863	-0.004		1701032	48.9		97.8	3186	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.868	6.864	0.004	1.000	17477	0.5088			4.9	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.969	6.976	-0.007	1.000	9280	NC			24.9	
298.9 > 99.0	6.969	6.976	-0.007	1.000	5900		1.57(0.00-0.00)		13.4	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.969	6.976	-0.007	1.000	9280	0.5045				
D 6 13C2 PFHxA										
315.0 > 270.0	8.100	8.100	0.0		1485399	45.4		90.8	3849	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.100	8.102	-0.002	1.000	17016	0.5314			57.5	
D 8 13C4-PFHpA										
367.0 > 322.0	9.335	9.331	0.004		1671555	48.7		97.5	4706	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.329	9.335	-0.006	1.000	6714	-0.0573			8.5	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.364	9.363	0.001	1.000	2223	NC			7.3	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.364	9.363	0.001	1.000	2223	0.2218				
D 11 18O2 PFHxS										
403.0 > 84.0	9.364	9.363	0.001		815902	56.2		119	2450	
D 12 13C4 PFOA										
417.0 > 372.0	10.448	10.452	-0.004		1856616	48.0		96.0	7487	

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	10.448	10.453	-0.005	1.000	3504	0.0880		4.1	
D 16 13C4 PFOS	503.0 > 80.0	11.407	11.405	0.002		1131129	60.5	127	2178	
15 Perfluorooctane sulfonic acid	499.0 > 80.0	11.407	11.408	-0.001	1.000	1933	0.0843		7.9	
D 17 13C5 PFNA	468.0 > 423.0	11.423	11.427	-0.004		1489951	46.4	92.9	4066	
18 Perfluorononanoic acid	463.0 > 419.0	11.416	11.431	-0.015	1.000	2329	0.0916		7.3	
20 Perfluorodecanoic acid	513.0 > 469.0	12.259	12.260	-0.001	1.000	7573	0.2582		31.1	
D 19 13C2 PFDA	515.0 > 470.0	12.259	12.262	-0.003		1394193	45.2	90.4	2823	
D 23 13C8 FOSA	506.0 > 78.0	12.819	12.805	0.014		1028822	24.1	48.2	1827	
24 Perfluorooctane Sulfonamide	498.0 > 78.0	12.829	12.805	0.024	1.000	2563	0.1269		7.3	
27 Perfluoroundecanoic acid	563.0 > 519.0	12.965	12.978	-0.013	1.000	23471	0.0513		58.5	
D 26 13C2 PFUnA	565.0 > 520.0	12.975	12.979	-0.004		1543370	40.9	81.9	3906	
D 28 13C2 PFDoA	615.0 > 570.0	13.583	13.597	-0.014		1518186	35.8	71.7	2707	
30 Perfluorotridecanoic acid	663.0 > 619.0	14.105	14.114	-0.009	1.000	20343	0.6592		23.2	
D 33 13C2-PFTeDA	715.0 > 670.0	14.530	14.548	-0.018		1083801	28.1	56.1	2879	
32 Perfluorotetradecanoic acid	713.0 > 669.0	14.530	14.549	-0.019	1.000	18345	0.3588		5.6	
34 Perfluorohexadecanoic acid	813.0 > 769.0	15.159	15.177	-0.018	1.000	136016	-1.54		186	
D 35 13C2-PFHxDA	815.0 > 770.0	15.154	15.177	-0.023		1411478	28.8	57.5	2650	
36 Perfluorooctandecanoic acid	913.0 > 869.0	15.486	15.517	-0.031	1.000	3351	0.1098		4.3	

QC Flag Legend

Processing Flags

NC - Not Calibrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_068.d

Injection Date: 07-Jan-2016 16:17:29

Instrument ID: A6

Lims ID: MB 320-97259/1-A

Client ID:

Operator ID: JRB

ALS Bottle#: 26

Worklist Smp#: 41

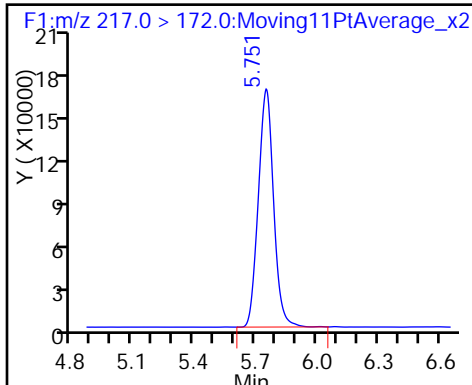
Injection Vol: 15.0 ul

Dil. Factor: 1.0000

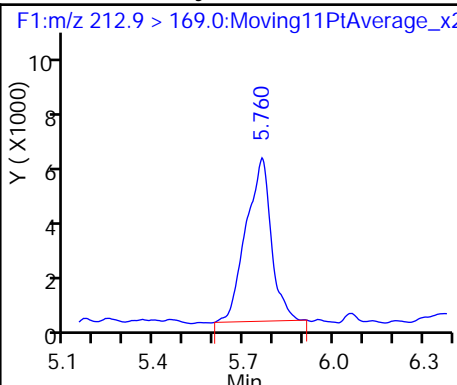
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

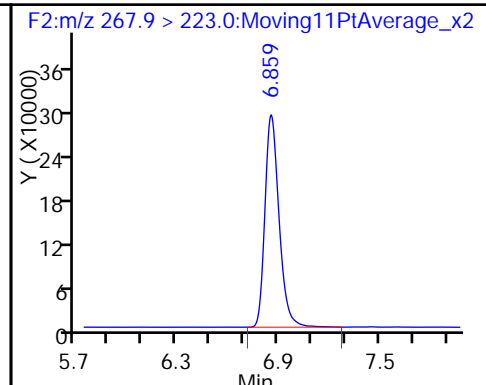
D 1 13C4 PFBA



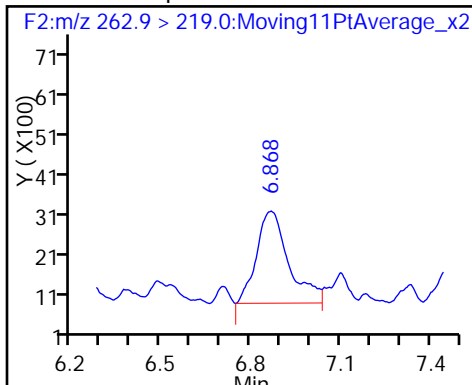
2 Perfluorobutyric acid



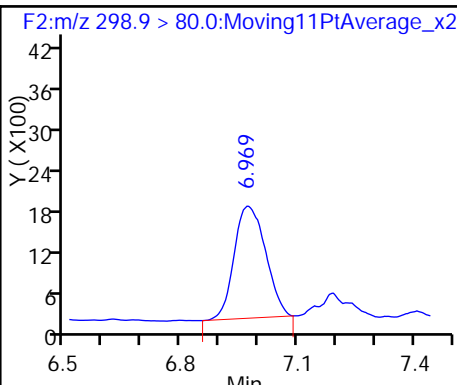
D 3 13C5-PFPeA



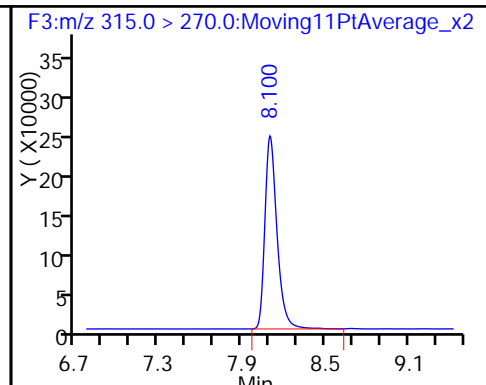
4 Perfluoropentanoic acid



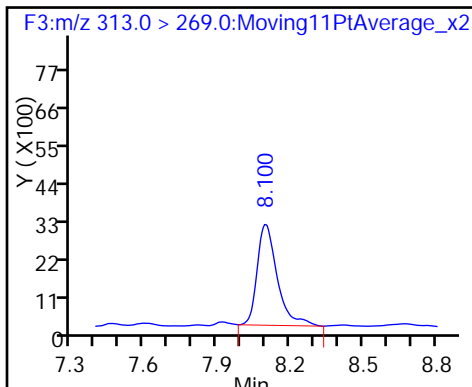
40 Perfluorobutanesulfonic acid



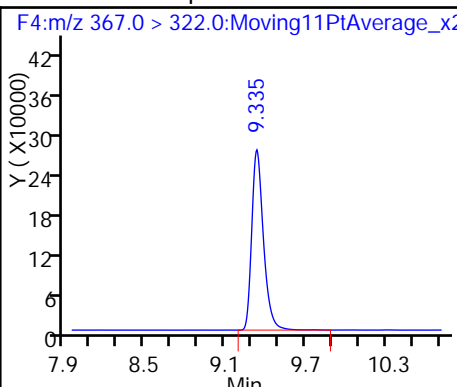
D 6 13C2 PFHxA



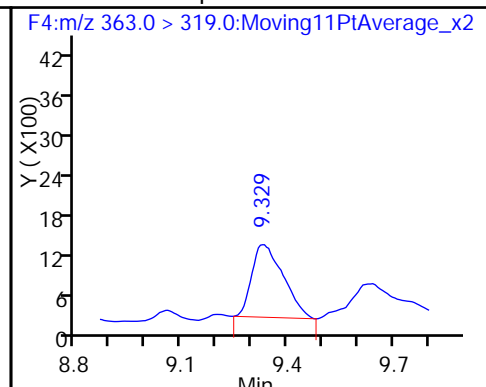
7 Perfluorohexanoic acid



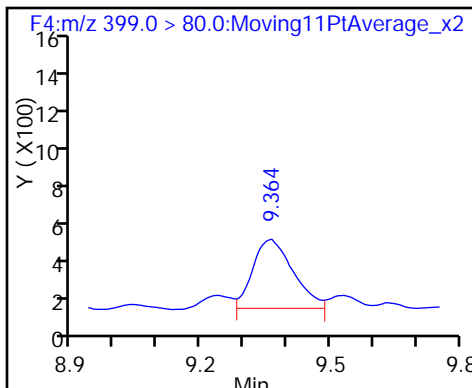
D 8 13C4-PFHpA



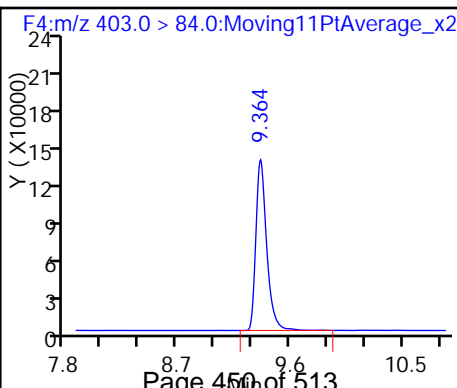
9 Perfluoroheptanoic acid



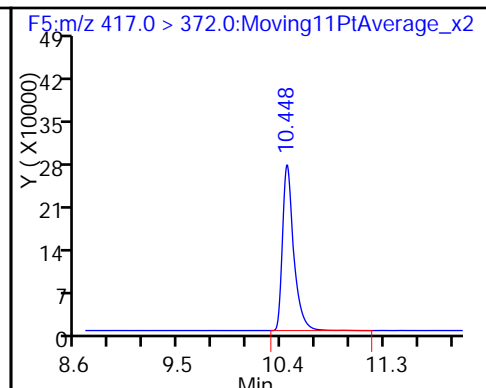
41 Perfluorohexanesulfonic acid

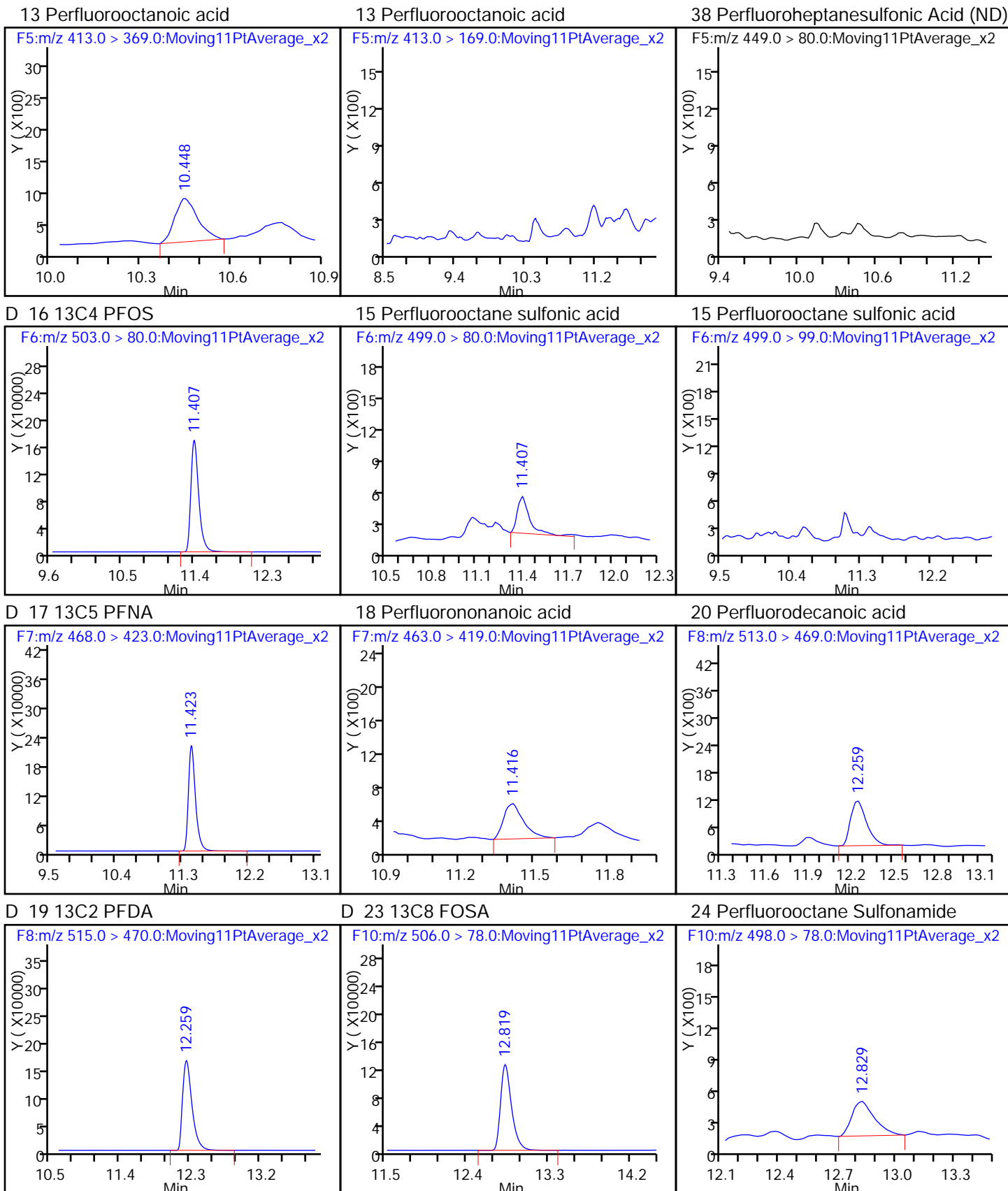


D 11 18O2 PFHxS



D 12 13C4 PFOA

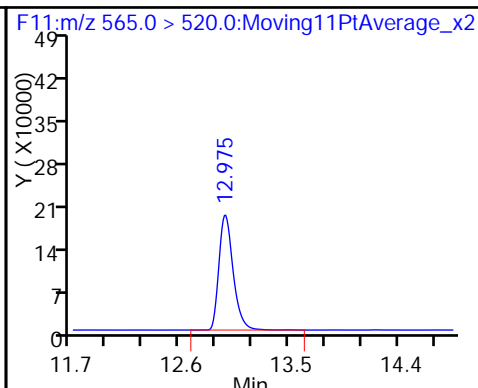
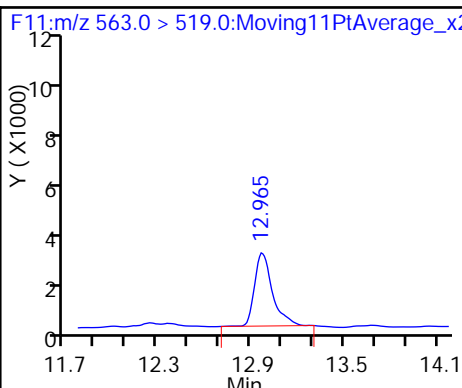
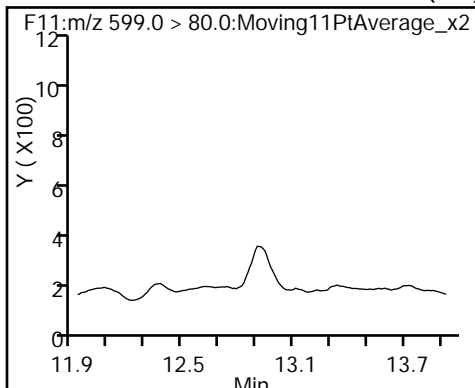




39 Perfluorodecane Sulfonic acid (ND)

27 Perfluoroundecanoic acid

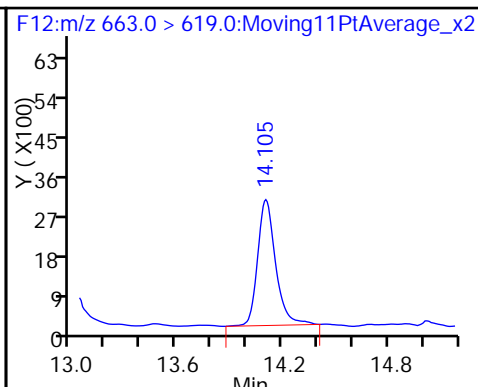
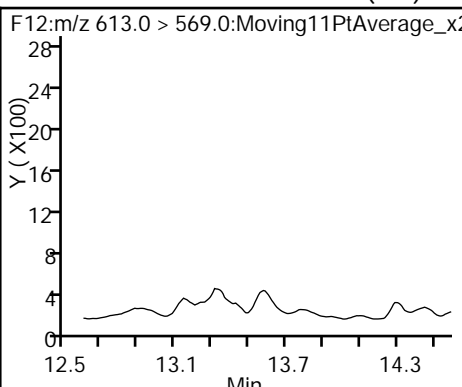
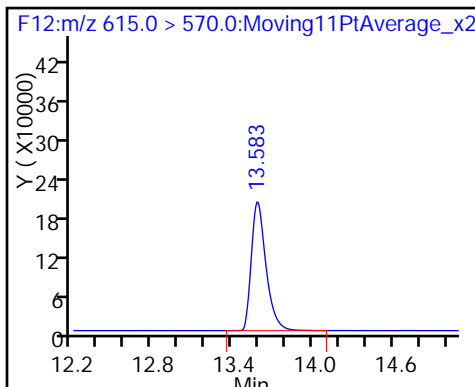
D 26 13C2 PFUnA



D 28 13C2 PFDaA

29 Perfluorododecanoic acid (ND)

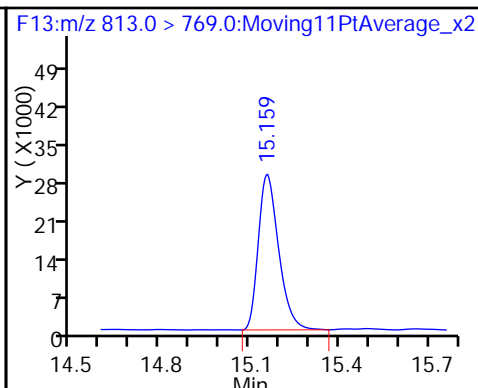
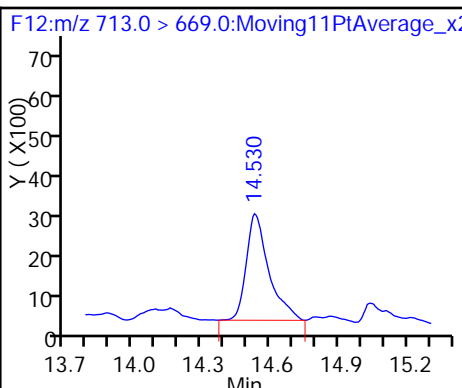
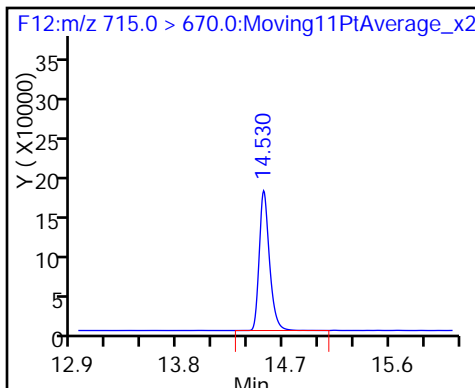
30 Perfluorotridecanoic acid



D 33 13C2-PFTeDA

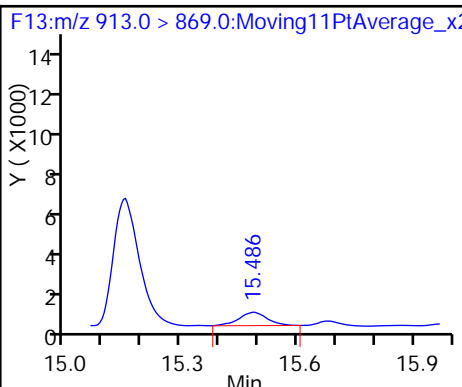
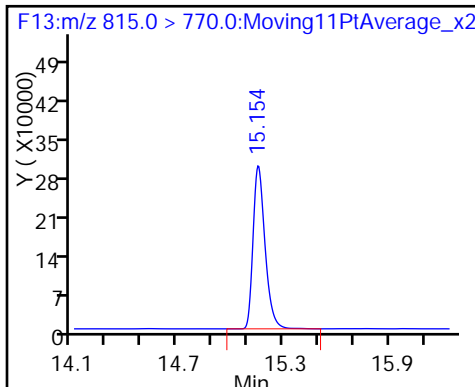
32 Perfluorotetradecanoic acid

34 Perfluorohexadecanoic acid



D 35 13C2-PFHxDA

36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 320-97259/2-A
 Matrix: Water Lab File ID: 06JAN2016A6A_069.d
 Analysis Method: WS-LC-0025 Date Collected: _____
 Extraction Method: 3535 Date Extracted: 01/05/2016 08:39
 Sample wt/vol: 500 (mL) Date Analyzed: 01/07/2016 16:38
 Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1
 Injection Volume: 15 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 97577 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32.2		2.5	2.0	0.92
375-85-9	Perfluoroheptanoic acid (PFHpA)	37.4		2.5	2.0	0.80
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	32.3		2.5	2.0	0.87
375-95-1	Perfluorononanoic acid (PFNA)	35.7		2.5	2.0	0.65
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	35.5		4.0	3.0	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	32.2		2.5	2.0	0.75

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		25-150
STL00990	13C4 PFOA	95		25-150
STL00991	13C4 PFOS	128		25-150
STL01892	13C4-PFHpA	102		25-150
STL00994	18O2 PFHxS	123		25-150
STL00995	13C5 PFNA	97		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_069.d
 Lims ID: LCS 320-97259/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 07-Jan-2016 16:38:43 ALS Bottle#: 27 Worklist Smp#: 42
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: LCS 320-97259/2-A
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 14:53:12 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

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	5.751	5.763	-0.012	882949	48.0		95.9	1908	
2 Perfluorobutyric acid	212.9 > 169.0	5.751	5.763	-0.012	499695	20.5		103	826	
D 3 13C5-PFPeA	267.9 > 223.0	6.859	6.863	-0.004	1785835	51.4		103	3361	
4 Perfluoropentanoic acid	262.9 > 219.0	6.863	6.864	-0.001	666428	18.5		92.4	197	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.969	6.976	-0.007	306880	NC			809	
	298.9 > 99.0	6.974	6.976	-0.002	181604		1.69(0.00-0.00)		328	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.969	6.976	-0.007	306880	16.1		91.0		
D 6 13C2 PFHxA	315.0 > 270.0	8.100	8.100	0.0	1515289	46.3		92.7	4053	
7 Perfluorohexanoic acid	313.0 > 269.0	8.105	8.102	0.003	633081	19.4		96.9	1173	
D 8 13C4-PFHpA	367.0 > 322.0	9.334	9.331	0.003	1747636	51.0		102	4120	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.334	9.335	-0.001	656880	18.7		93.6	835	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.370	9.363	0.007	167726	NC			443	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.370	9.363	0.007	167726	16.1		85.3		
D 11 18O2 PFHxS	403.0 > 84.0	9.364	9.363	0.001	845815	58.2		123	2662	
D 12 13C4 PFOA	417.0 > 372.0	10.454	10.452	0.002	1831365	47.3		94.7	4758	

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	10.454	10.453	0.001	1.000	632971	16.1		80.6	520	
413.0 > 169.0	10.454	10.453	0.001	1.000	268826		2.35(0.00-0.00)		444	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.454	10.456	-0.002	1.000	154481	13.1		68.7		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.454	10.456	-0.002	1.000	154481	NC			424	
D 16 13C4 PFOS										
503.0 > 80.0	11.407	11.405	0.002		1146630	61.3		128	2930	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.407	11.408	-0.001	1.000	413209	17.8		92.9	718	
499.0 > 99.0	11.407	11.408	-0.001	1.000	210091		1.97(0.00-0.00)		593	
D 17 13C5 PFNA										
468.0 > 423.0	11.430	11.427	0.003		1556398	48.5		97.0	3457	
18 Perfluorononanoic acid										
463.0 > 419.0	11.430	11.431	-0.001	1.000	474386	17.9		89.3	871	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.259	12.260	-0.001	1.000	558578	18.7		93.3	1545	
D 19 13C2 PFDA										
515.0 > 470.0	12.259	12.262	-0.003		1423592	46.1		92.3	3485	
D 23 13C8 FOSA										
506.0 > 78.0	12.818	12.805	0.013		411349	9.64		19.3	946	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.829	12.805	0.024	1.000	151889	18.8		94.0	323	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.923	12.929	-0.006	1.000	132038	NC			513	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.923	12.929	-0.006	1.000	132038	11.7		60.8		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.975	12.978	-0.003	1.000	573802	18.4		92.1	1098	
D 26 13C2 PFUnA										
565.0 > 520.0	12.975	12.979	-0.004		1721566	45.7		91.3	3088	
D 28 13C2 PFDoA										
615.0 > 570.0	13.592	13.597	-0.005		1634548	38.6		77.2	2855	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.592	13.597	-0.005	1.000	489858	19.1		95.4	383	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.105	14.114	-0.009	1.000	523036	15.7		78.7	440	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.530	14.548	-0.018		1122464	29.1		58.1	2531	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.530	14.549	-0.019	1.000	334525	15.8		79.0	104	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.159	15.177	-0.018	1.000	776073	16.1		80.7	946	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.159	15.177	-0.018		1664504	33.9		67.8	3304	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.481	15.517	-0.036	1.000	690414	21.0		105	808	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_069.d

Injection Date: 07-Jan-2016 16:38:43

Instrument ID: A6

Lims ID: LCS 320-97259/2-A

Client ID:

Operator ID: JRB

ALS Bottle#: 27

Worklist Smp#: 42

Injection Vol: 15.0 ul

Dil. Factor: 1.0000

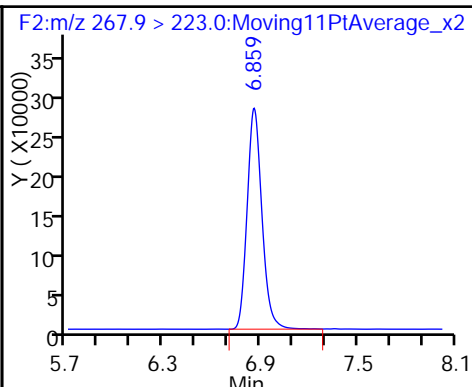
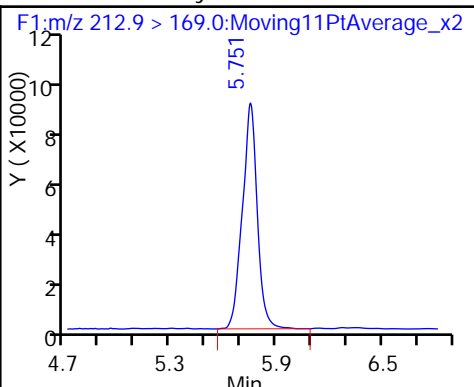
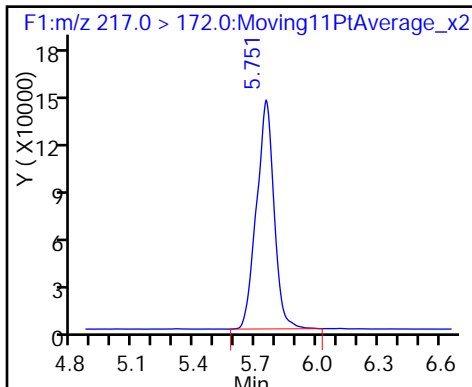
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

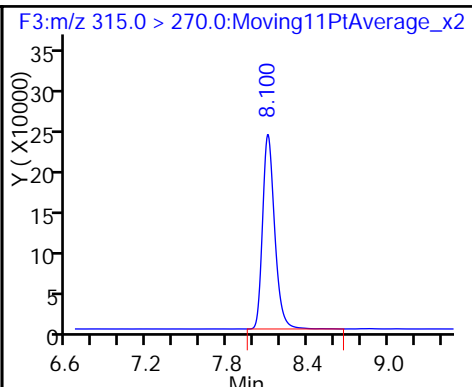
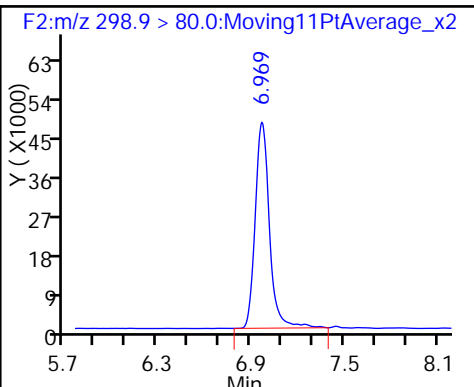
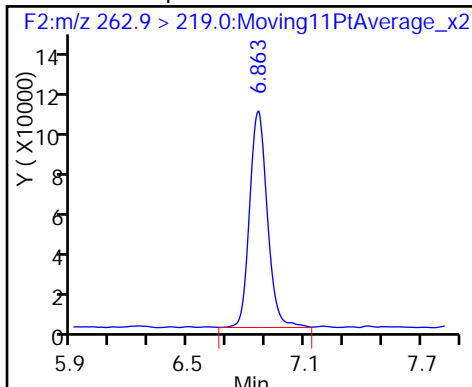
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

40 Perfluorobutanesulfonic acid

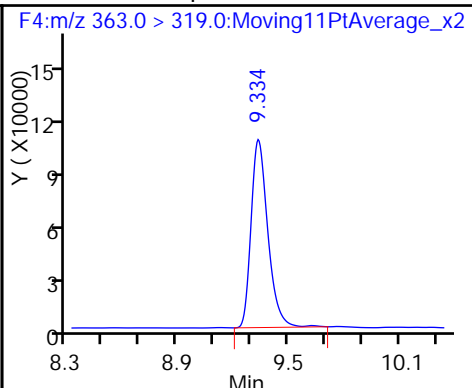
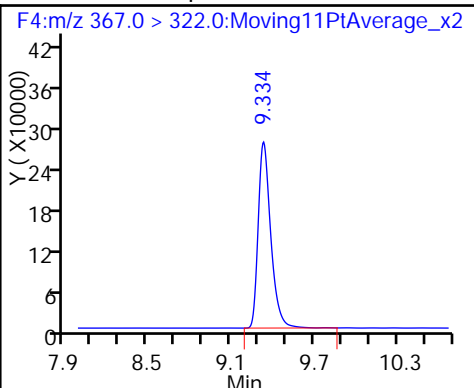
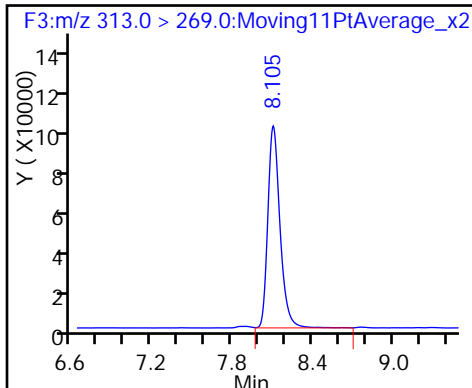
D 6 13C2 PFHxA



7 Perfluorohexanoic acid

D 8 13C4-PFHpA

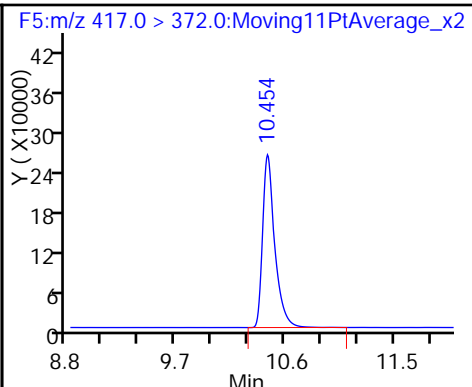
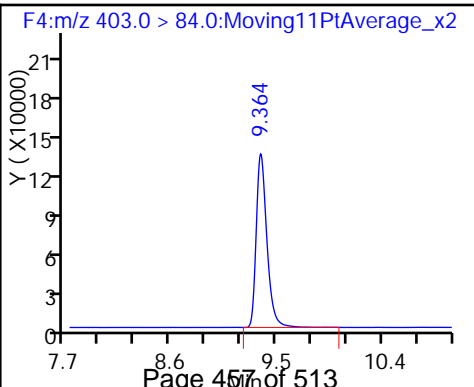
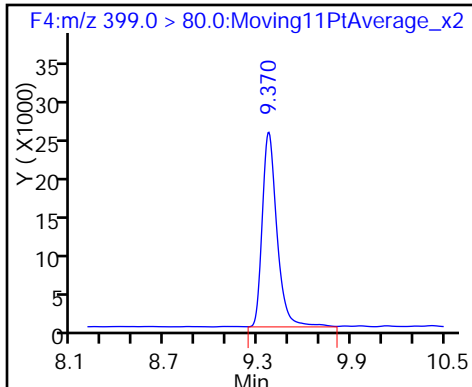
9 Perfluoroheptanoic acid

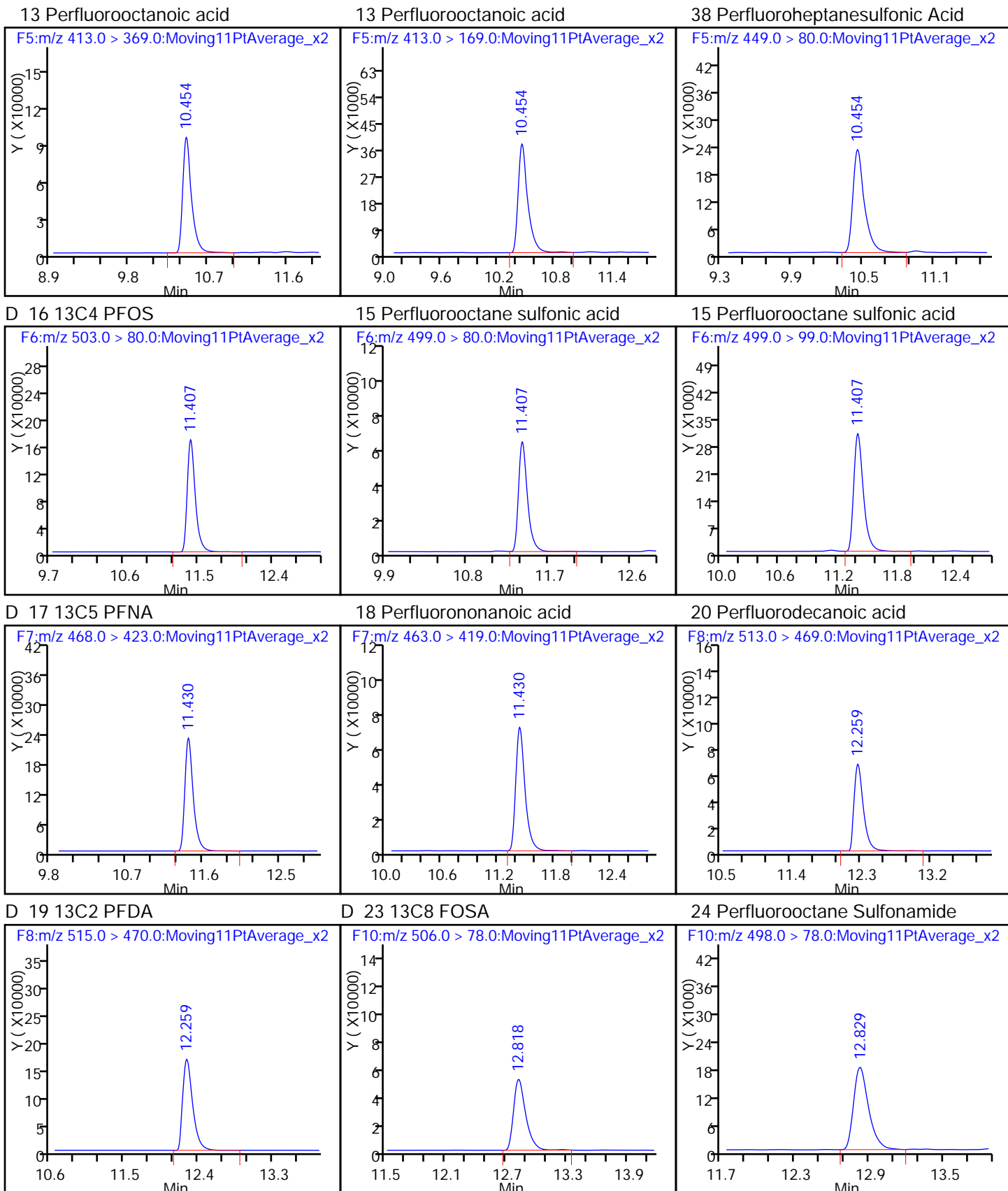


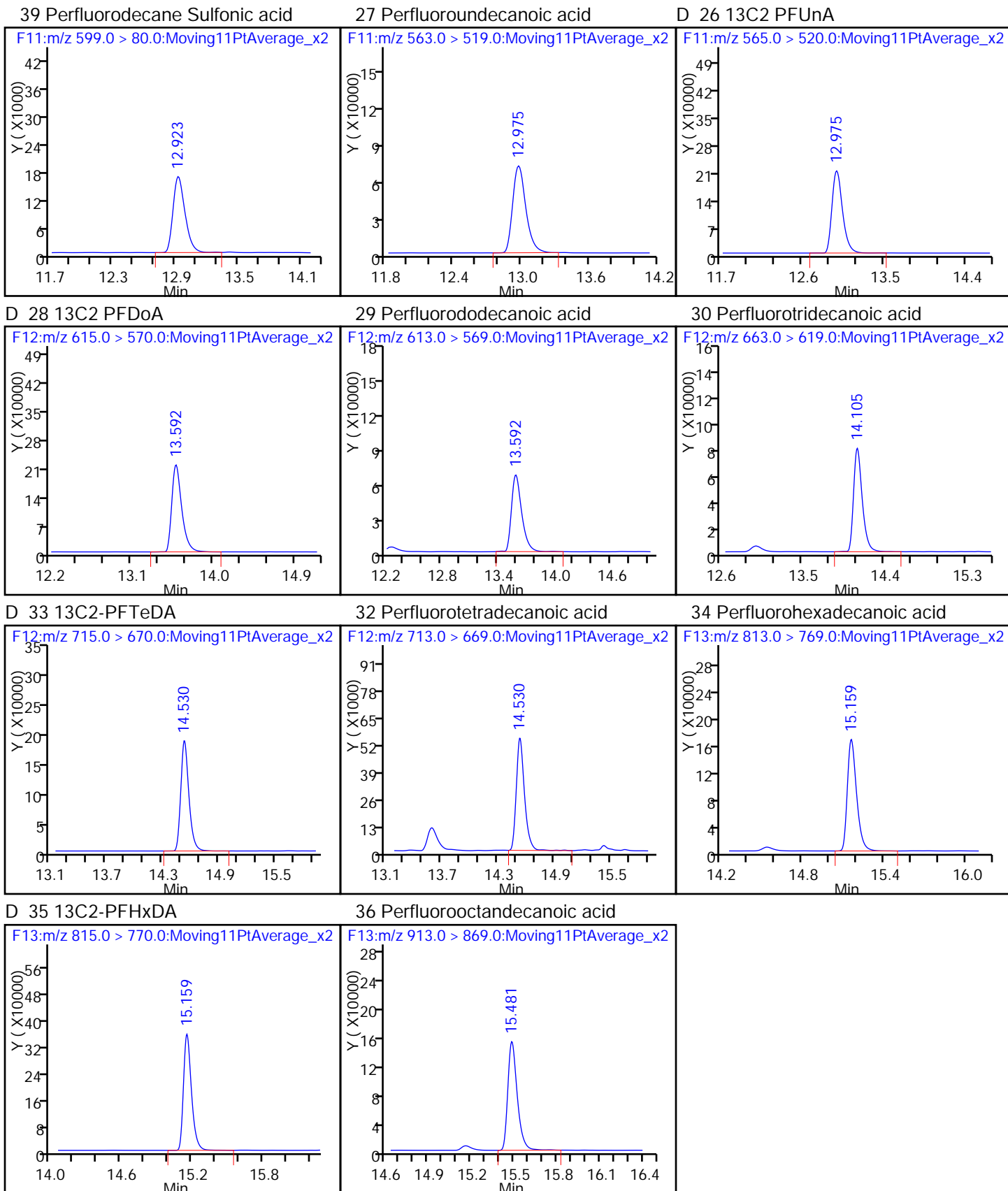
41 Perfluorohexanesulfonic acid

D 11 18O2 PFHxS

D 12 13C4 PFOA







FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Client Sample ID: 46MW04_1215 MS Lab Sample ID: 320-16660-5 MS
 Matrix: Water Lab File ID: 06JAN2016A6A_083.d
 Analysis Method: WS-LC-0025 Date Collected: 12/30/2015 14:15
 Extraction Method: 3535 Date Extracted: 01/05/2016 08:39
 Sample wt/vol: 560.8 (mL) Date Analyzed: 01/07/2016 21:35
 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.: 97577 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	60.6		2.2	1.8	0.82
375-85-9	Perfluoroheptanoic acid (PFHpA)	52.3		2.2	1.8	0.72
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	870	J M 4	2.2	1.8	0.78
375-95-1	Perfluorononanoic acid (PFNA)	47.9		2.2	1.8	0.58
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3390	J M 4	3.6	2.7	1.1
335-67-1	Perfluorooctanoic acid (PFOA)	64.0		2.2	1.8	0.67

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	73		25-150
STL00990	13C4 PFOA	79		25-150
STL00991	13C4 PFOS	58		25-150
STL01892	13C4-PFHpA	74		25-150
STL00994	18O2 PFHxS	98		25-150
STL00995	13C5 PFNA	51		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_083.d
 Lims ID: 320-16660-A-5-B MS
 Client ID: 46MW04_1215
 Sample Type: MS
 Inject. Date: 07-Jan-2016 21:35:58 ALS Bottle#: 40 Worklist Smp#: 55
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-16660-A-5-B MS
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 14:53:40 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 08-Jan-2016 09:16:53

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	5.745	5.763	-0.018	436417	23.7		47.4	1703	
2 Perfluorobutyric acid	212.9 > 169.0	5.748	5.763	-0.015	378125	31.4		157	110	
D 3 13C5-PFPeA	267.9 > 223.0	6.845	6.863	-0.018	1376356	39.6		79.2	2530	
4 Perfluoropentanoic acid	262.9 > 219.0	6.845	6.864	-0.019	1061936	38.2		191	204	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.960	6.976	-0.016	517123	NC			13.2	
	298.9 > 99.0	6.960	6.976	-0.016	303438		1.70(0.00-0.00)		230	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.960	6.976	-0.016	517123	34.0		192		
22 PFPeS (Perflouro-1-pentanesulfonat	349.0 > 80.0	7.888	7.799	0.089	17644	NC			1.5	
D 6 13C2 PFHxA	315.0 > 270.0	8.078	8.100	-0.022	1200008	36.7		73.4	3999	
7 Perfluorohexanoic acid	313.0 > 269.0	8.078	8.102	-0.024	1465813	56.7		283	263	
D 8 13C4-PFHpA	367.0 > 322.0	9.294	9.331	-0.037	1270011	37.0		74.1	3619	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.294	9.335	-0.041	744099	29.3		147	277	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.329	9.363	-0.034	3409998	NC			2616	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.329	9.363	-0.034	4047202	487.9		2579		EM
										EM
D 11 18O2 PFHxS	403.0 > 84.0	9.329	9.363	-0.034	475451	46.5		98.3	2181	

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	10.413	10.452	-0.039		1529066	39.5		79.1	4966	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.413	10.453	-0.040	1.000	1176050	35.9		179	182	
413.0 > 169.0	10.420	10.453	-0.033	1.001	455708		2.58(0.00-0.00)		132	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.413	10.456	-0.043	1.000	281197	52.3		274		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.413	10.456	-0.043	1.000	281197	NC			140	
D 16 13C4 PFOS										
503.0 > 80.0	11.364	11.405	-0.041		522473	27.9		58.5	848	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.364	11.408	-0.044	1.000	20151128	1902.0		9948	690	EM
499.0 > 99.0	11.364	11.408	-0.044	1.000	9676081		2.08(0.00-0.00)		2845	EM M
D 17 13C5 PFNA										
468.0 > 423.0	11.394	11.427	-0.033		816211	25.4		50.9	2089	
18 Perfluorononanoic acid										
463.0 > 419.0	11.394	11.431	-0.037	1.000	373919	26.9		134	328	
21 PFNS (Perflouro-1-nonanesulfonate)										
549.0 > 80.0	11.833	11.893	-0.060	1.000	76433	NC			6.3	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.218	12.260	-0.042	1.000	503595	21.9		109	828	
D 19 13C2 PFDA										
515.0 > 470.0	12.218	12.262	-0.044		1094872	35.5		71.0	2122	
D 23 13C8 FOSA										
506.0 > 78.0	12.788	12.805	-0.017		463499	10.9		21.7	1224	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.788	12.805	-0.017	1.000	156068	17.1		85.7	474	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.882	12.929	-0.047	1.000	167545	NC			259	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.882	12.929	-0.047	1.000	167545	32.7		169		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.923	12.978	-0.055	1.000	547301	20.1		101	878	
D 26 13C2 PFUnA										
565.0 > 520.0	12.923	12.979	-0.056		1510418	40.1		80.1	2377	
D 28 13C2 PFDaA										
615.0 > 570.0	13.538	13.597	-0.059		857855	20.2		40.5	1402	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.538	13.597	-0.059	1.000	245170	18.2		91.0	316	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.067	14.114	-0.047	1.000	426238	24.4		122	566	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.496	14.548	-0.052		911998	23.6		47.2	877	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.496	14.549	-0.053	1.000	245869	22.4		112	184	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.129	15.177	-0.048	1.000	730388	33.4		167	1002	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 35 13C2-PFHxDA	815.0 > 770.0	15.129	15.177	-0.048		1461012	29.8		59.5	2617
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.456	15.517	-0.061	1.000	541509	31.4		157	785

QC Flag Legend

Processing Flags

NC - Not Calibrated

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_083.d

Injection Date: 07-Jan-2016 21:35:58

Instrument ID: A6

Lims ID: 320-16660-A-5-B MS

Client ID: 46MW04_1215

Operator ID: JRB

ALS Bottle#: 40

Worklist Smp#: 55

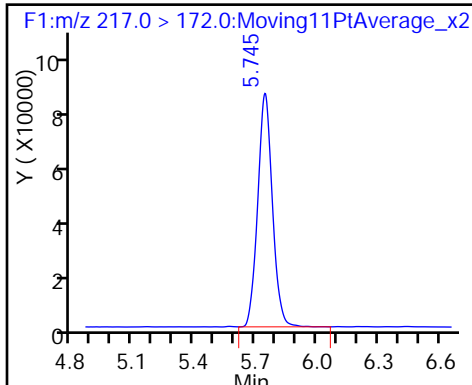
Injection Vol: 15.0 ul

Dil. Factor: 1.0000

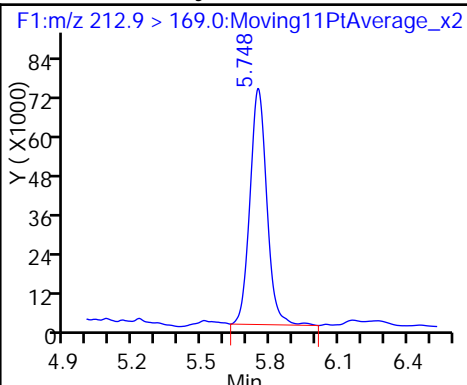
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

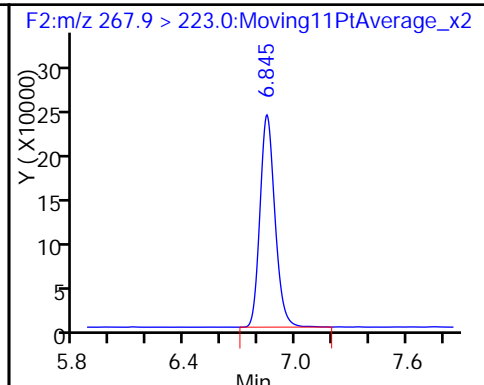
D 1 13C4 PFBA



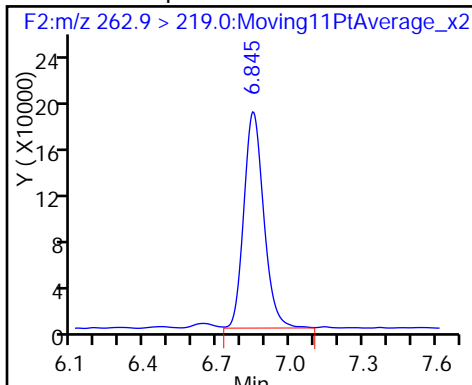
2 Perfluorobutyric acid



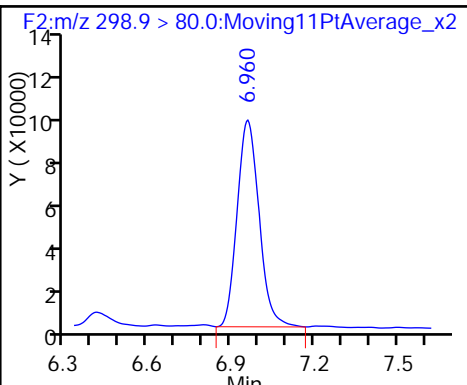
D 3 13C5-PFPeA



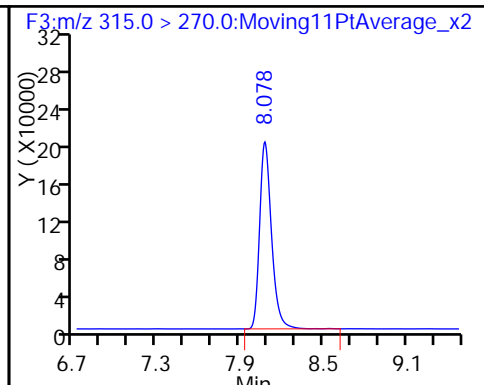
4 Perfluoropentanoic acid



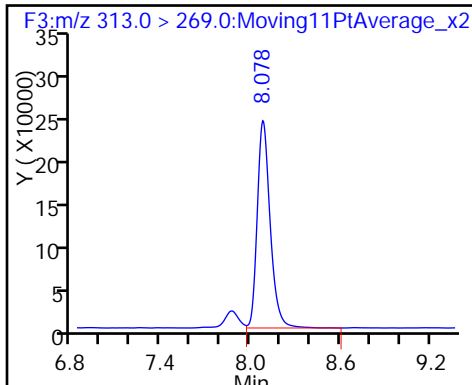
40 Perfluorobutanesulfonic acid



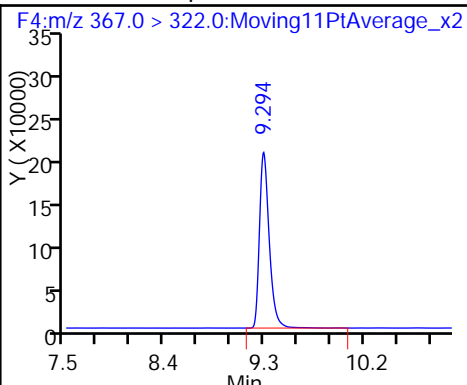
D 6 13C2 PFHxA



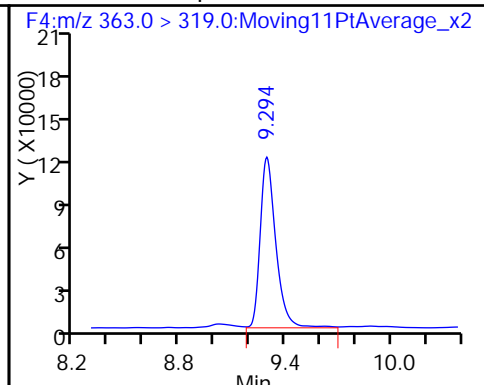
7 Perfluorohexanoic acid



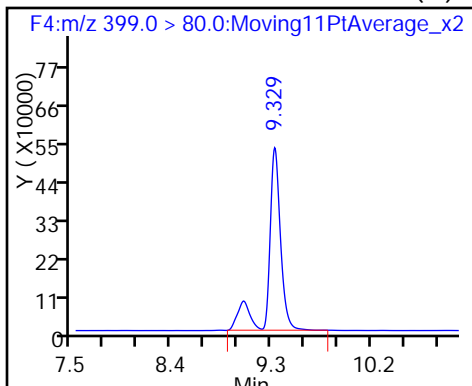
D 8 13C4-PFHpA



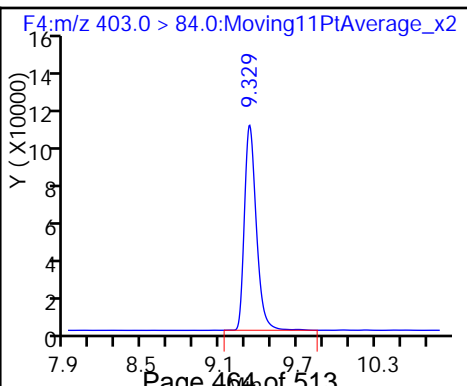
9 Perfluoroheptanoic acid



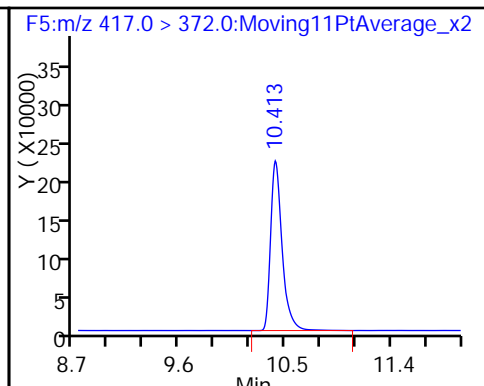
41 Perfluorohexanesulfonic acid (M)

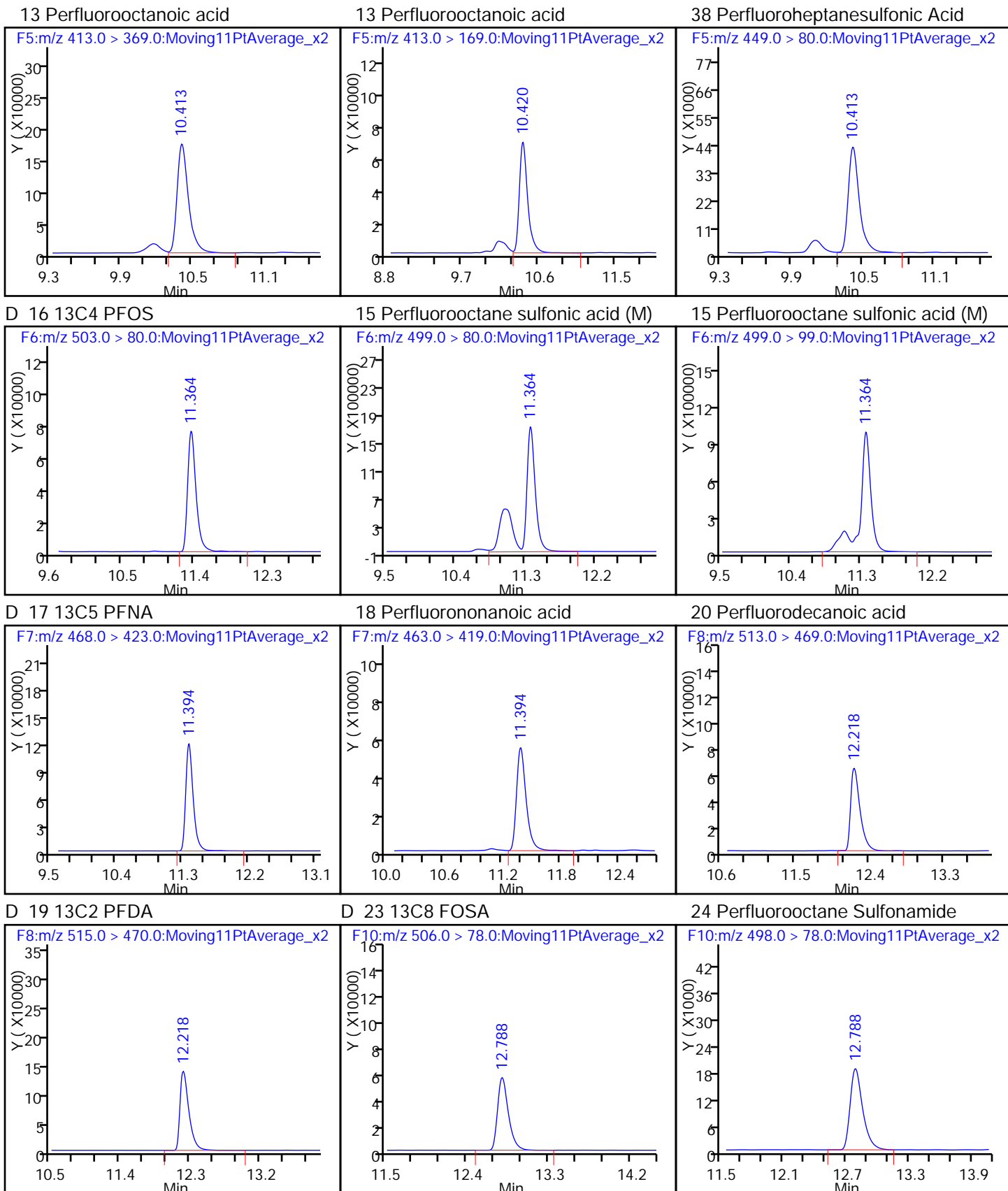


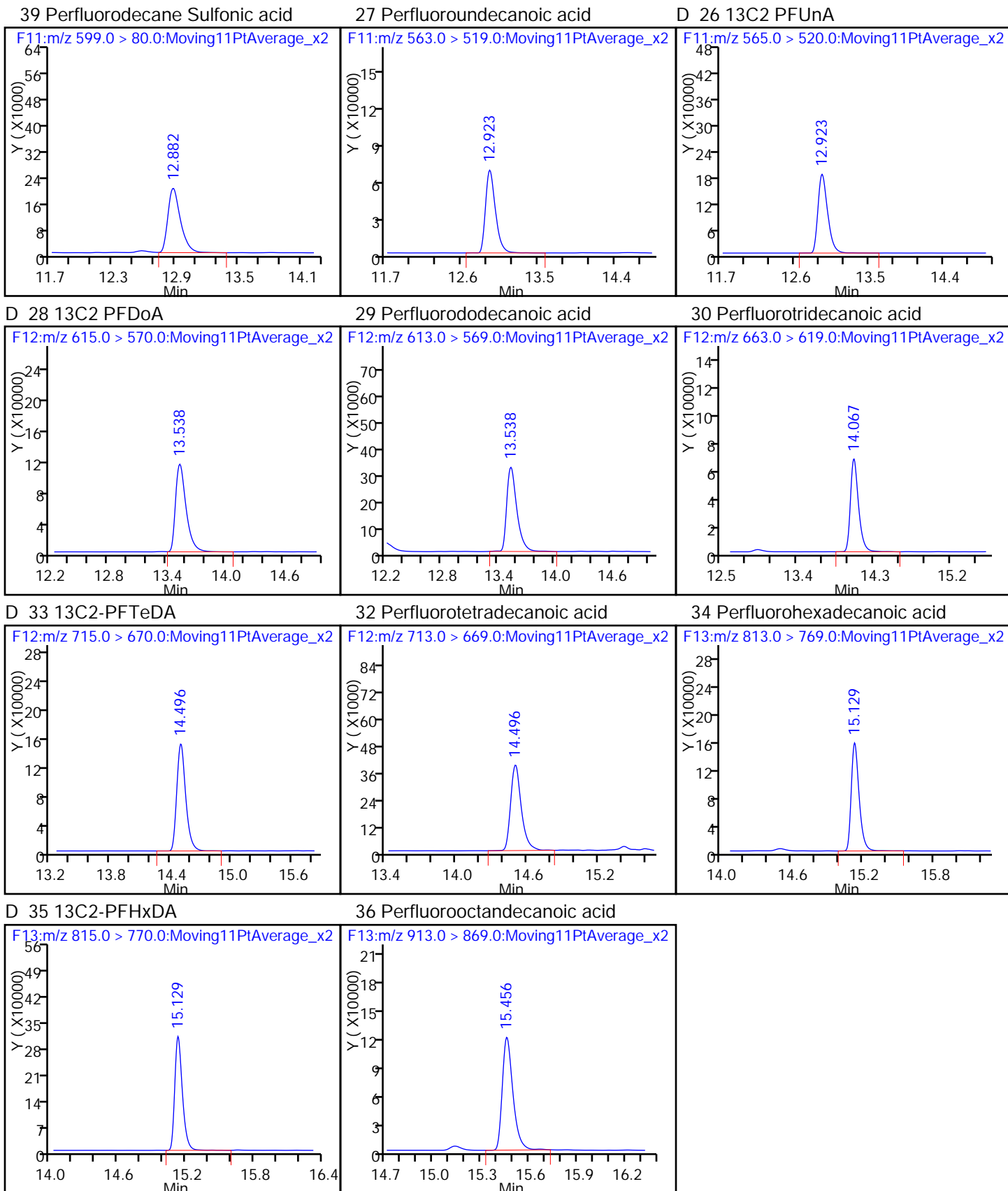
D 11 18O2 PFHxS



D 12 13C4 PFOA







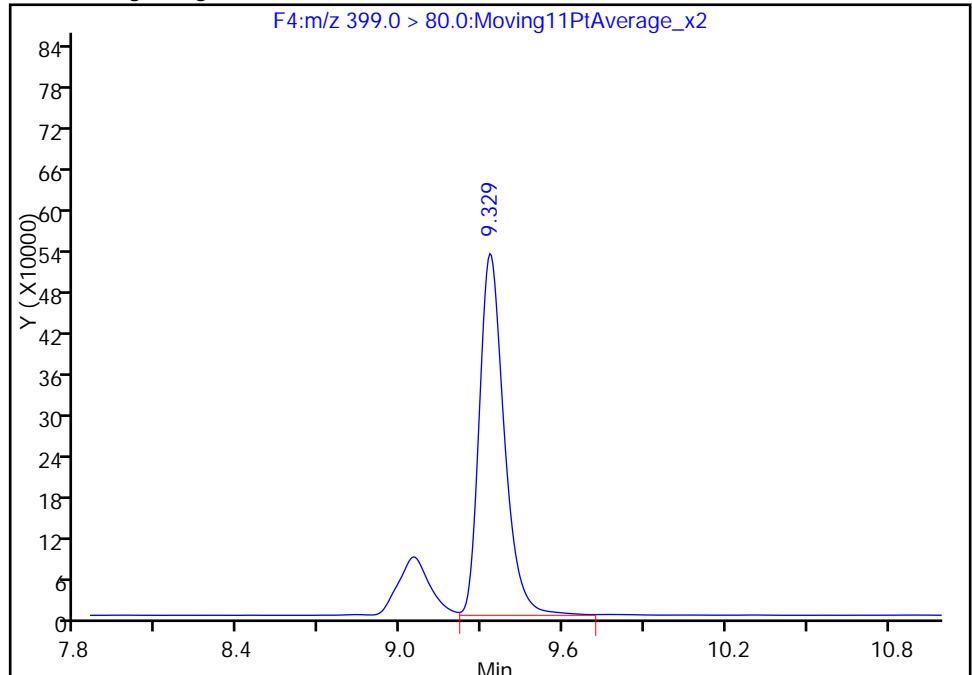
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_083.d
Injection Date: 07-Jan-2016 21:35:58 Instrument ID: A6
Lims ID: 320-16660-A-5-B MS
Client ID: 46MW04_1215
Operator ID: JRB ALS Bottle#: 40 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

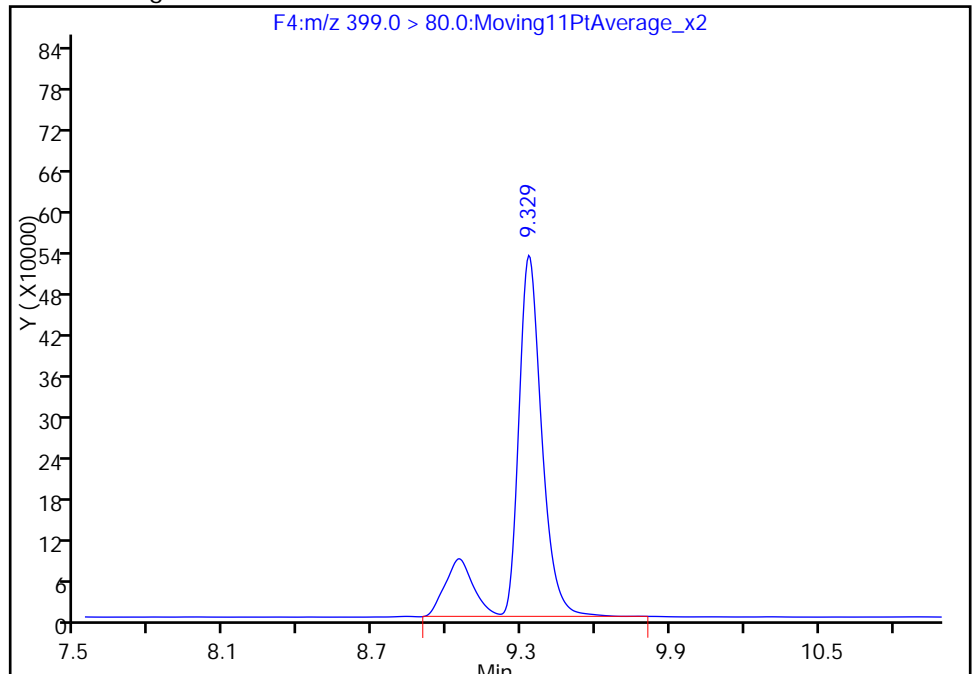
RT: 9.33
Area: 3409998
Amount: 411.0688
Amount Units: ng/ml

Processing Integration Results



RT: 9.33
Area: 4047202
Amount: 487.8826
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:16:53
Audit Action: Manually Integrated
Audit Reason: Isomers

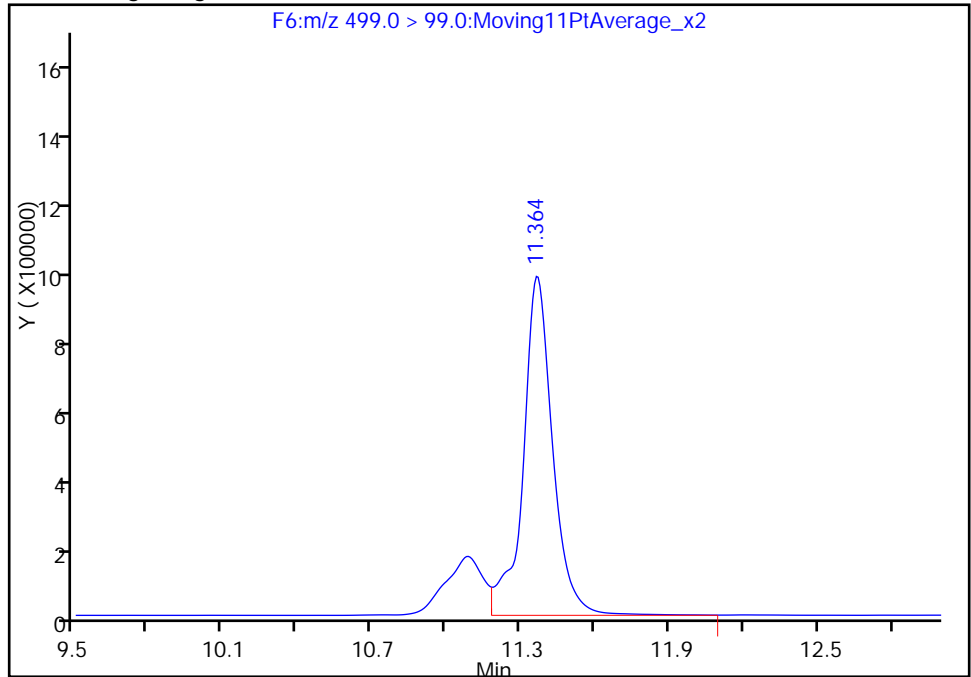
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_083.d
Injection Date: 07-Jan-2016 21:35:58 Instrument ID: A6
Lims ID: 320-16660-A-5-B MS
Client ID: 46MW04_1215
Operator ID: JRB ALS Bottle#: 40 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:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

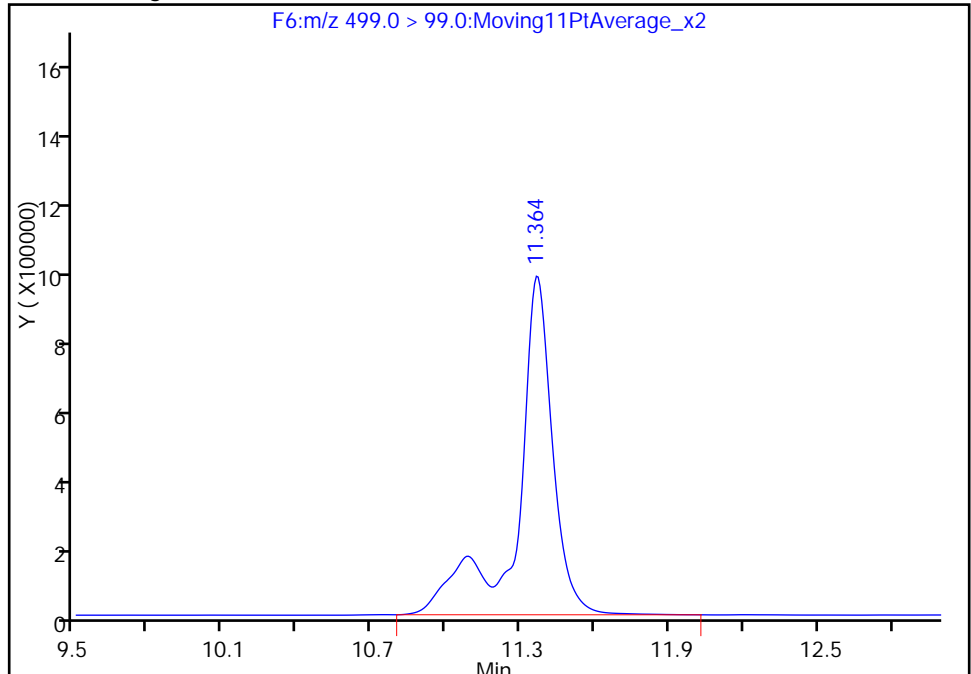
RT: 11.36
Area: 7987975
Amount: 1226.5934
Amount Units: ng/ml

Processing Integration Results



RT: 11.36
Area: 9676081
Amount: 1902.0200
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:16:53
Audit Action: Manually Integrated
Audit Reason: Isomers

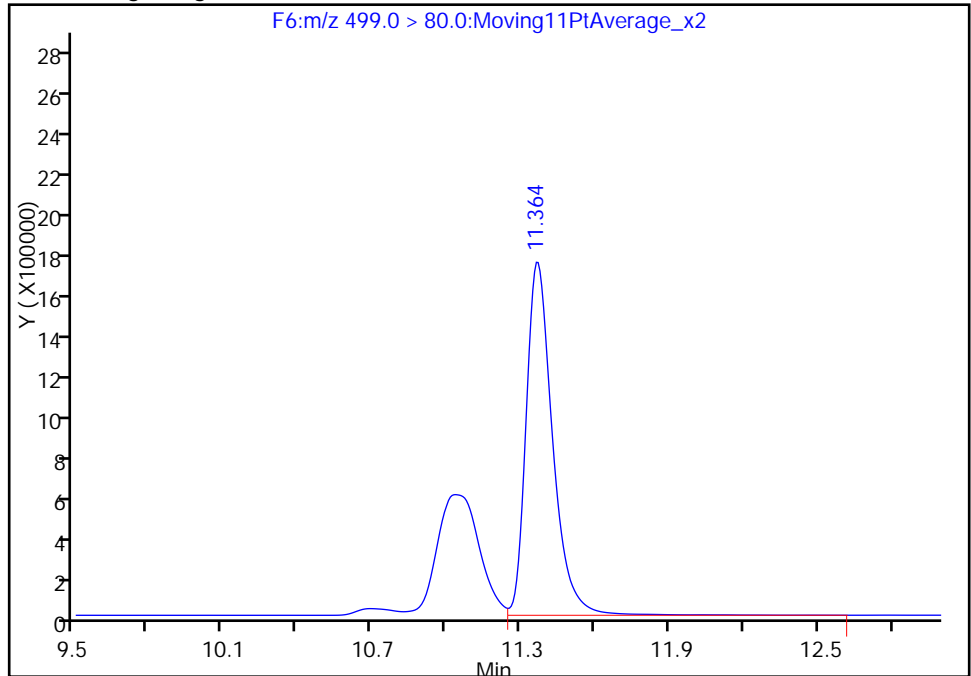
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_083.d
Injection Date: 07-Jan-2016 21:35:58 Instrument ID: A6
Lims ID: 320-16660-A-5-B MS
Client ID: 46MW04_1215
Operator ID: JRB ALS Bottle#: 40 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:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

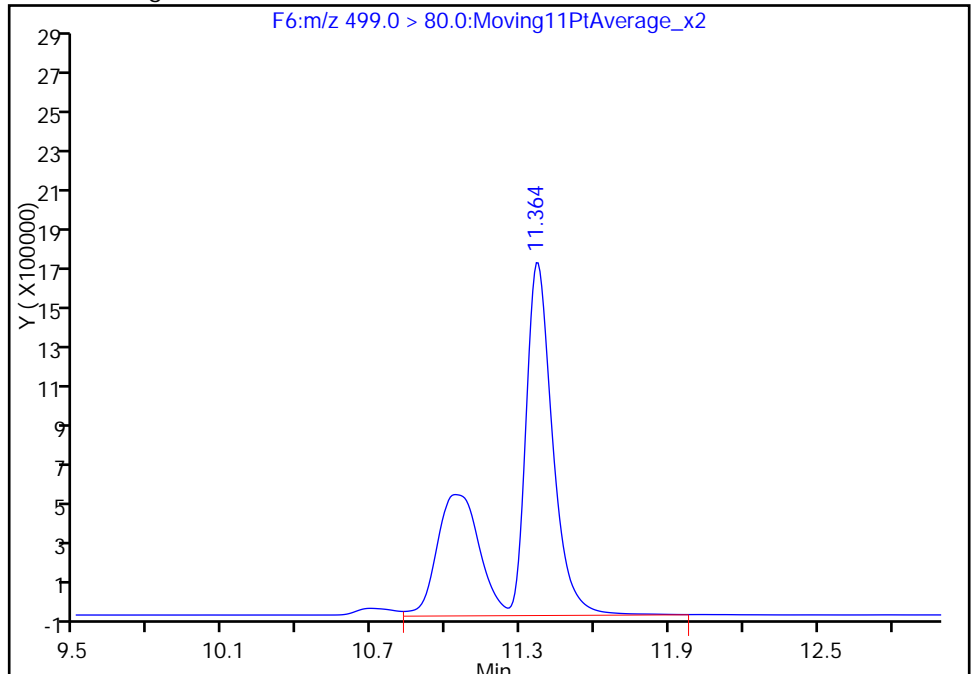
RT: 11.36
Area: 12995258
Amount: 1226.5934
Amount Units: ng/ml

Processing Integration Results



RT: 11.36
Area: 20151128
Amount: 1902.0200
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Client Sample ID: 46MW04_1215 MS DL Lab Sample ID: 320-16660-5 MS DL
 Matrix: Water Lab File ID: 08JAN2016A6A_012.d
 Analysis Method: WS-LC-0025 Date Collected: 12/30/2015 14:15
 Extraction Method: 3535 Date Extracted: 01/05/2016 08:39
 Sample wt/vol: 560.8 (mL) Date Analyzed: 01/08/2016 14:51
 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.: 97663 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	<i>Perfluorobutanesulfonic acid (PFBS)</i>	43.0	D J	22	18	8.2
375-85-9	<i>Perfluoroheptanoic acid (PFHpA)</i>	46.1	D	22	18	7.2
355-46-4	<i>Perfluorohexanesulfonic acid (PFHxS)</i>	976	D 4	22	18	7.8
375-95-1	<i>Perfluorononanoic acid (PFNA)</i>	48.6	D	22	18	5.8
1763-23-1	<i>Perfluorooctanesulfonic acid (PFOS)</i>	2790	D M 4	36	27	11
335-67-1	<i>Perfluorooctanoic acid (PFOA)</i>	60.6	D	22	18	6.7

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	130		25-150
STL00994	18O2 PFHxS	118		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_012.d
 Lims ID: 320-16660-A-5-B MS
 Client ID: 46MW04_1215
 Sample Type: MS
 Inject. Date: 08-Jan-2016 14:51:24 ALS Bottle#: 35 Worklist Smp#: 6
 Injection Vol: 15.0 ul Dil. Factor: 10.0000
 Sample Info: 320-16660-A-5-B MS 10x
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 11-Jan-2016 09:49:51 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 08-Jan-2016 15:49:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.766	5.763	0.003	41865	2.27		4.5	57.0	
2 Perfluorobutyric acid	212.9 > 169.0	5.773	5.763	0.010	35304	3.06		153	27.9	
D 3 13C5-PFPeA	267.9 > 223.0	6.872	6.863	0.009	122720	3.53		7.1	61.4	
4 Perfluoropentanoic acid	262.9 > 219.0	6.872	6.864	0.008	94360	3.81		190	17.0	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.987	6.976	0.011	43956	NC			7.4	
	298.9 > 99.0	6.992	6.976	0.016	24291		1.81(0.00-0.00)		25.5	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.987	6.976	0.011	43956	2.41		136		
22 PFPeS (Perflouro-1-pentanesulfonat	349.0 > 80.0	7.953	7.799	0.154	6285	NC			5.2	
D 6 13C2 PFHxA	315.0 > 270.0	8.105	8.100	0.005	120666	3.69		7.4	87.2	
7 Perfluorohexanoic acid	313.0 > 269.0	8.105	8.102	0.003	161256	6.20		310	56.6	
D 8 13C4-PFHpA	367.0 > 322.0	9.329	9.331	-0.002	192049	5.60		11.2	489	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.329	9.335	-0.006	108282	2.59		129	57.0	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.358	9.363	-0.005	543481	NC			589	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.358	9.363	-0.005	543481	54.7		2892		
D 11 18O2 PFHxS	403.0 > 84.0	9.358	9.363	-0.005	80872	5.57		11.8	58.3	

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	10.441	10.452	-0.011		197366	5.10		10.2	655	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.441	10.453	-0.012	1.000	143754	3.40		170	56.2	
413.0 > 169.0	10.427	10.453	-0.026	0.999	52910		2.72(0.00-0.00)		48.4	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.448	10.456	-0.008	1.000	22752	1.90		99.6		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.448	10.456	-0.008	1.000	22752	NC			38.0	
D 16 13C4 PFOS										
503.0 > 80.0	11.393	11.405	-0.012		116534	6.23		13.0	306	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.386	11.408	-0.022	1.000	3700721	156.6		8191	2743	M
499.0 > 99.0	11.386	11.408	-0.022	1.000	1896376		1.95(0.00-0.00)		2659	M
D 17 13C5 PFNA										
468.0 > 423.0	11.416	11.427	-0.011		120200	3.75		7.5	158	
18 Perfluorononanoic acid										
463.0 > 419.0	11.416	11.431	-0.015	1.000	55862	2.72		136	60.2	
21 PFNS (Perflouro-1-nonanesulfonate)										
549.0 > 80.0	11.873	11.893	-0.020	1.000	5319	NC			3.6	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.238	12.260	-0.022	1.000	60265	2.19		110	93.9	
D 19 13C2 PFDA										
515.0 > 470.0	12.238	12.262	-0.024		130754	4.24		8.5	450	
D 23 13C8 FOSA										
506.0 > 78.0	12.798	12.805	-0.007		54862	1.29		2.6	173	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.808	12.805	0.003	1.000	23284	2.16		108	72.0	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.913	12.929	-0.016	1.000	9329	NC			15.8	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.913	12.929	-0.016	1.000	9329	0.8153		42.3		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.944	12.978	-0.034	1.000	44309	0.9421		47.1	57.7	
D 26 13C2 PFUnA										
565.0 > 520.0	12.954	12.979	-0.025		144670	3.84		7.7	400	
D 28 13C2 PFDaA										
615.0 > 570.0	13.574	13.597	-0.023		141731	3.34		6.7	298	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.574	13.597	-0.023	1.000	41340	1.86		92.9	67.2	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.090	14.114	-0.024	1.000	32851	1.14		57.0	97.9	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.530	14.548	-0.018		96819	2.51		5.0	380	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.524	14.549	-0.025	1.000	30948	1.14		57.0	25.9	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.154	15.177	-0.023	1.000	85148	-2.90		-145.0	247	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 35 13C2-PFHxDA	815.0 > 770.0	15.154	15.177	-0.023	172128	3.51		7.0	496	
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.481	15.517	-0.036	53523	1.88	1.000	94.0	161	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_012.d

Injection Date: 08-Jan-2016 14:51:24

Instrument ID: A6

Lims ID: 320-16660-A-5-B MS

Client ID: 46MW04_1215

Operator ID: JRB

ALS Bottle#: 35

Worklist Smp#: 6

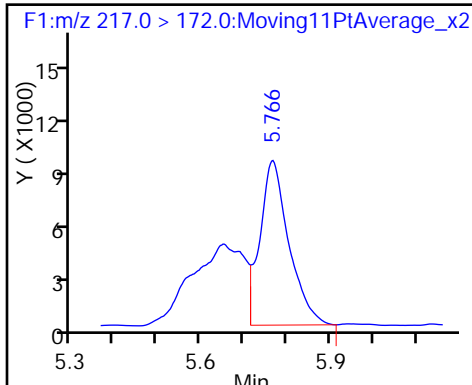
Injection Vol: 15.0 ul

Dil. Factor: 10.0000

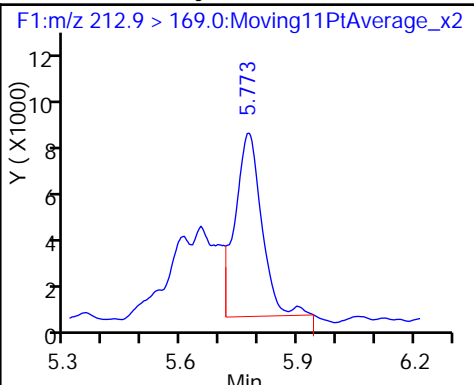
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

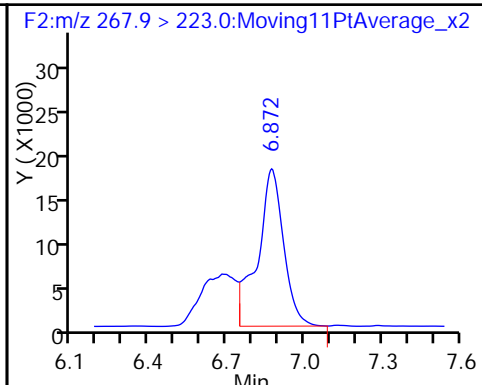
D 1 13C4 PFBA



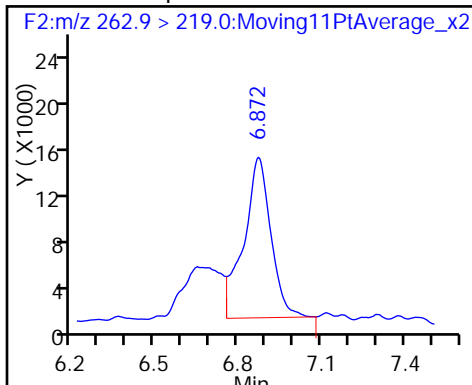
2 Perfluorobutyric acid



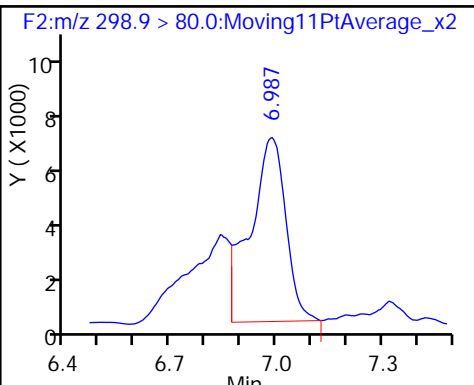
D 3 13C5-PFPeA



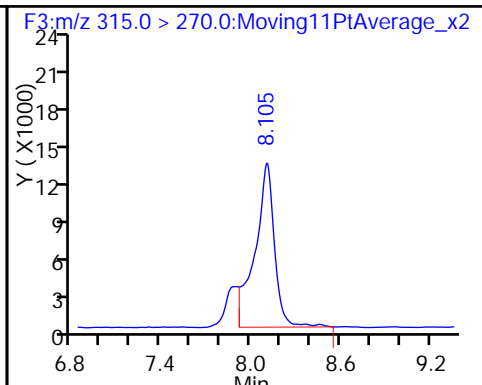
4 Perfluoropentanoic acid



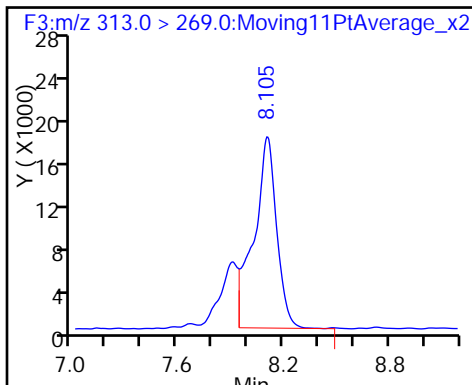
40 Perfluorobutanesulfonic acid



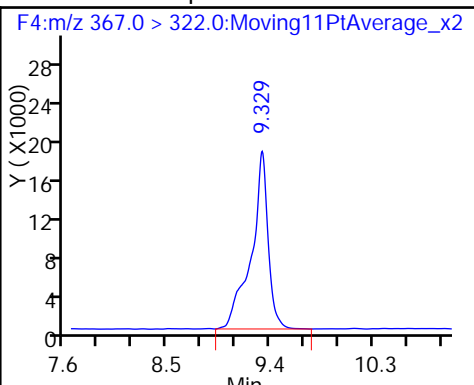
D 6 13C2 PFHxA



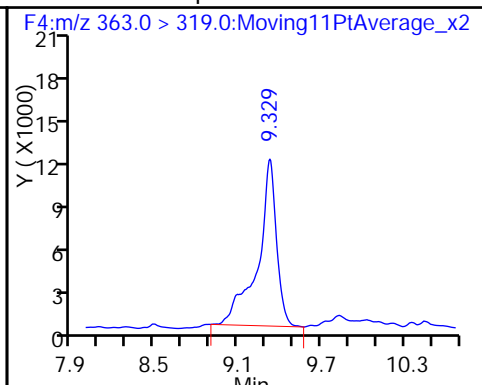
7 Perfluorohexanoic acid



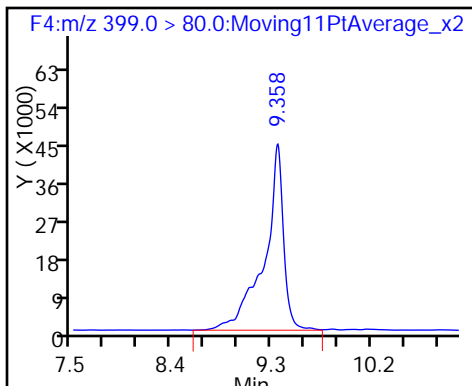
D 8 13C4-PFHpA



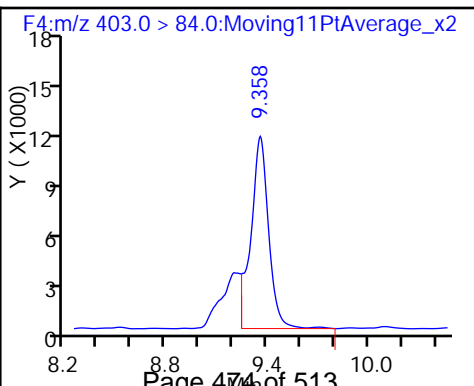
9 Perfluoroheptanoic acid



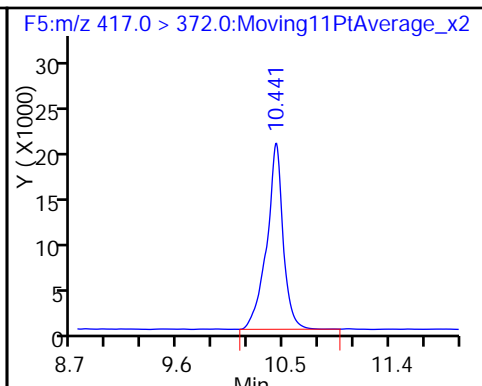
41 Perfluorohexanesulfonic acid

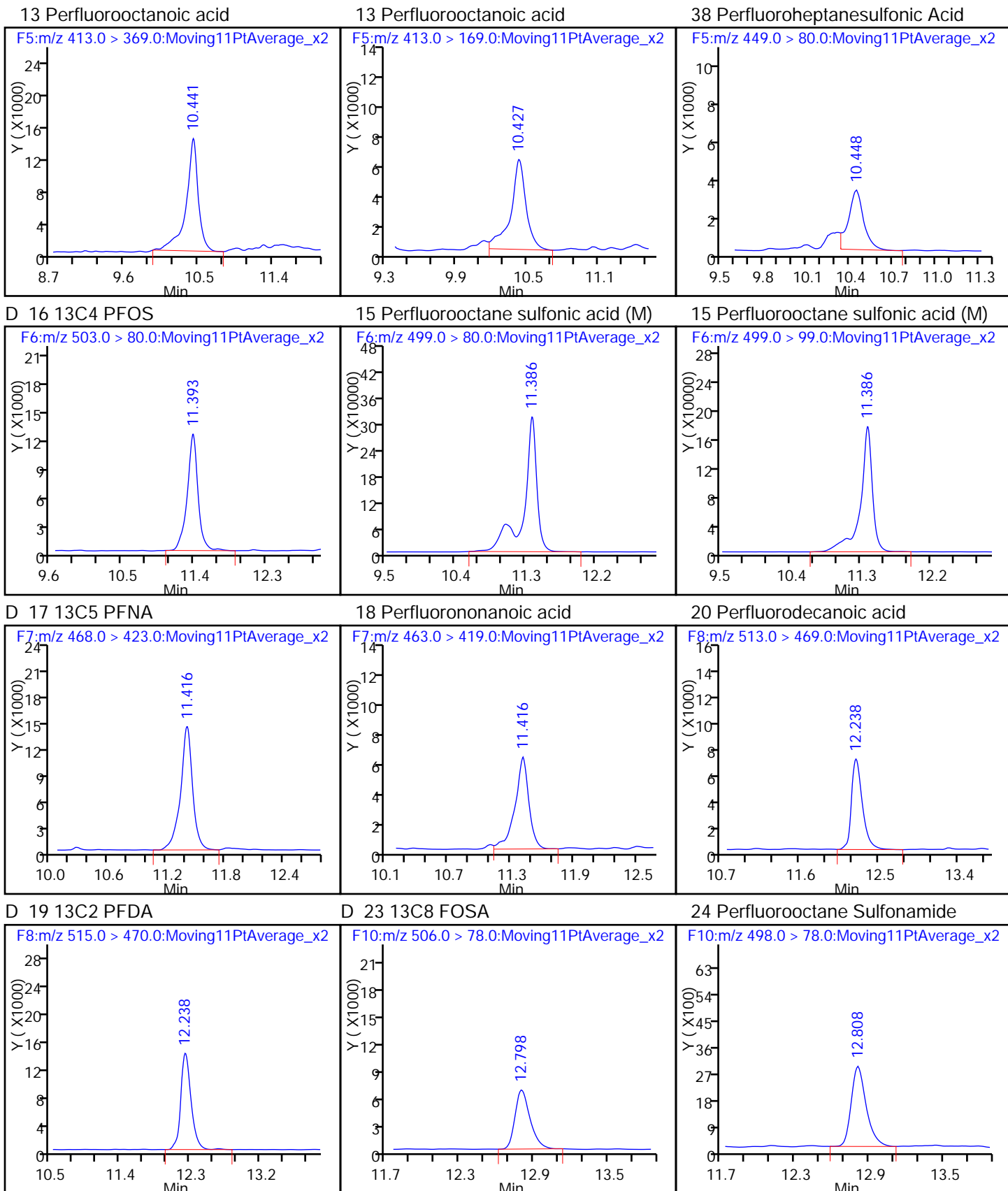


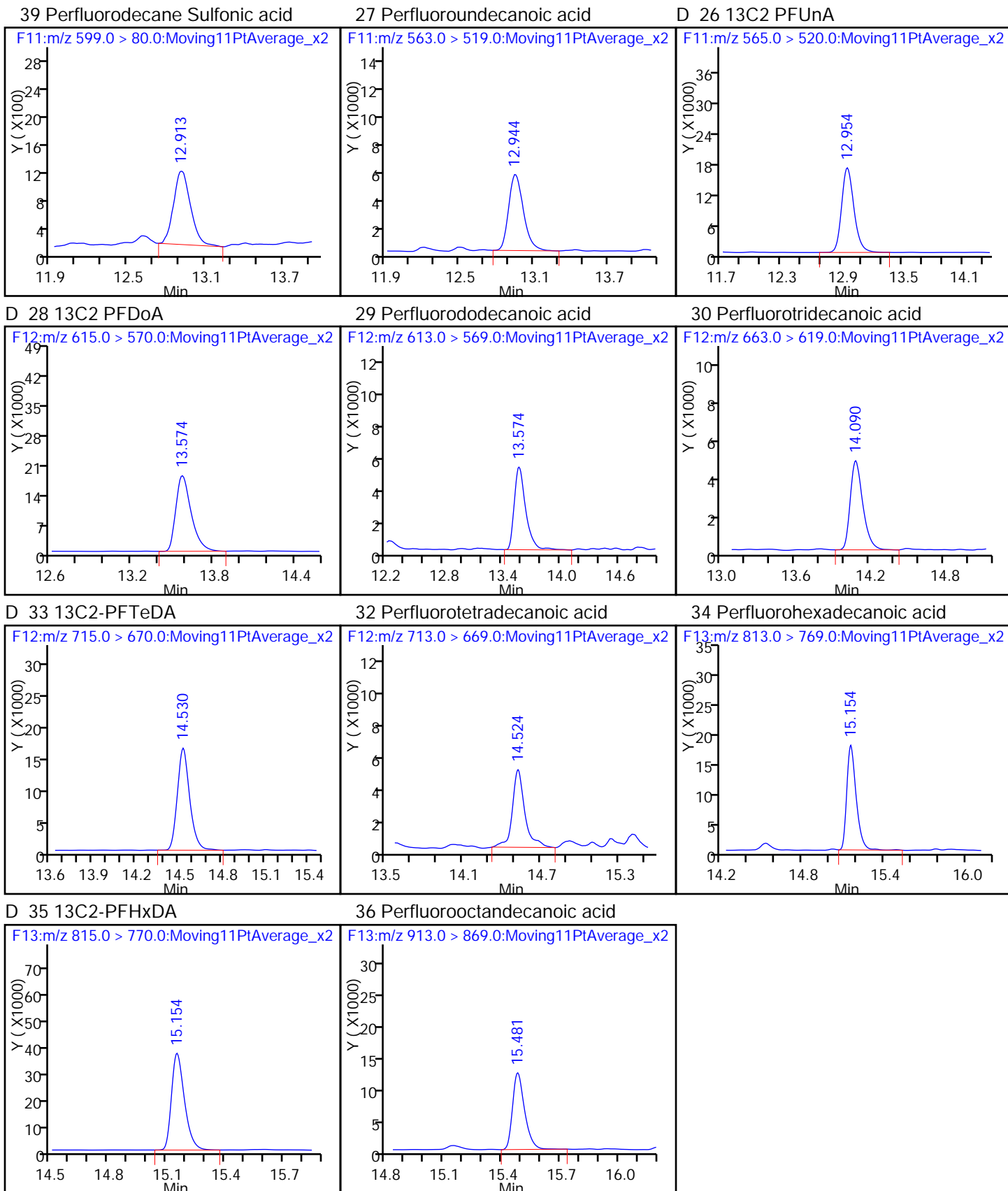
D 11 18O2 PFHxS



D 12 13C4 PFOA







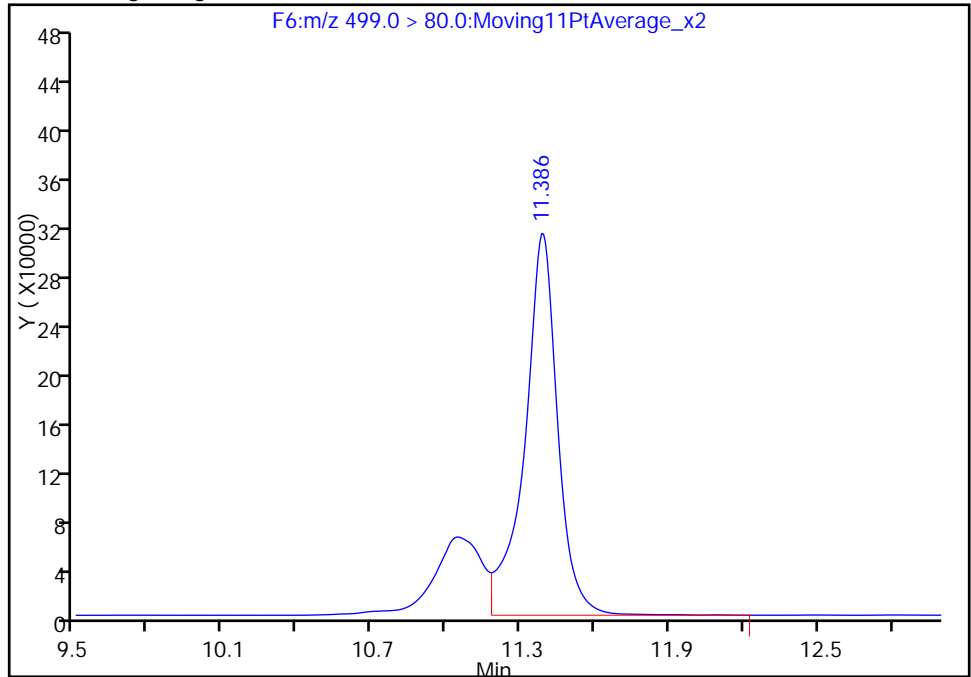
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_012.d
Injection Date: 08-Jan-2016 14:51:24 Instrument ID: A6
Lims ID: 320-16660-A-5-B MS
Client ID: 46MW04_1215
Operator ID: JRB ALS Bottle#: 35 Worklist Smp#: 6
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

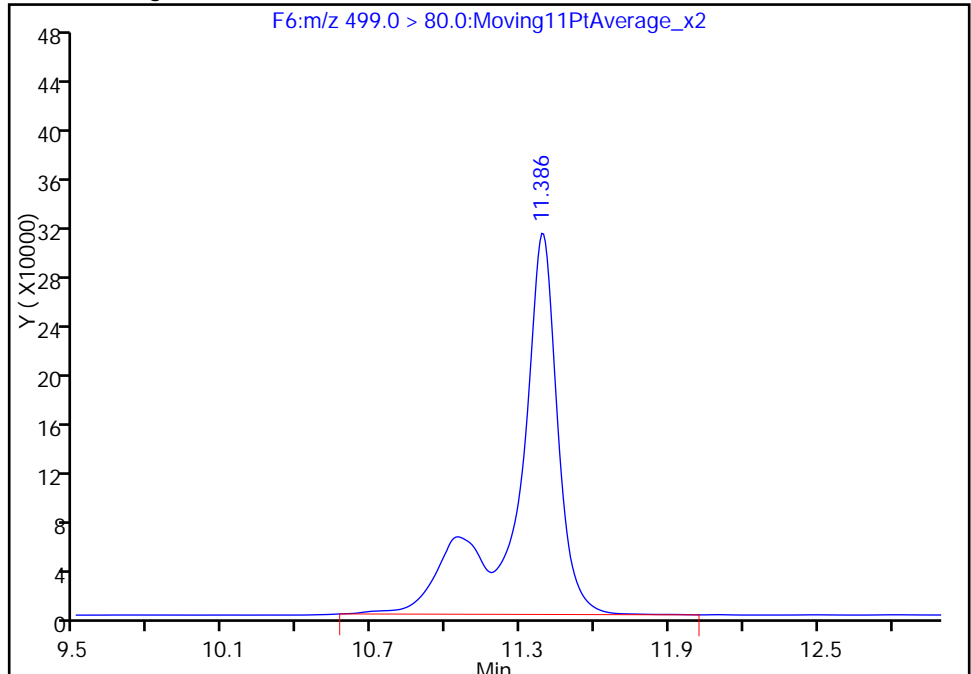
RT: 11.39
Area: 2886069
Amount: 122.1332
Amount Units: ng/ml

Processing Integration Results



RT: 11.39
Area: 3700721
Amount: 156.6078
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 15:49:18
Audit Action: Manually Integrated
Audit Reason: Isomers

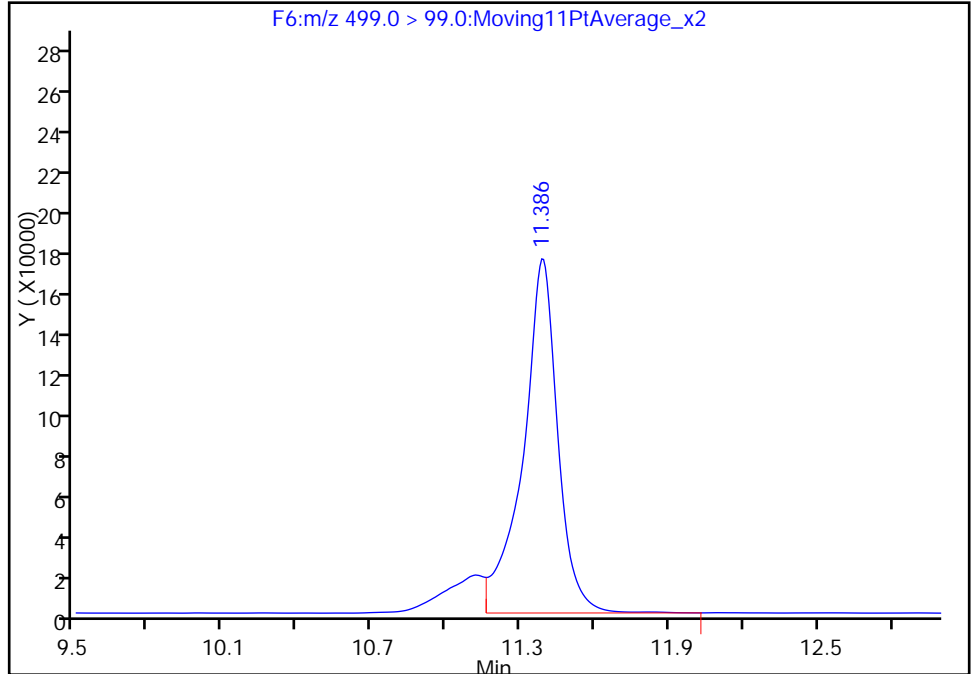
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_012.d
Injection Date: 08-Jan-2016 14:51:24 Instrument ID: A6
Lims ID: 320-16660-A-5-B MS
Client ID: 46MW04_1215
Operator ID: JRB ALS Bottle#: 35 Worklist Smp#: 6
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

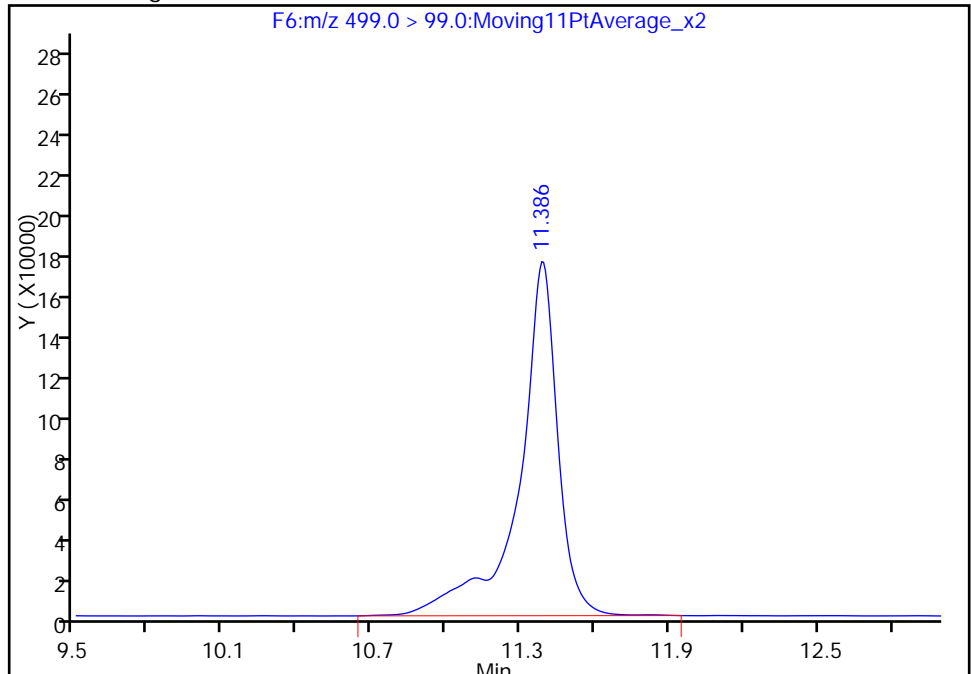
RT: 11.39
Area: 1688010
Amount: 122.1332
Amount Units: ng/ml

Processing Integration Results



RT: 11.39
Area: 1896376
Amount: 156.6078
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Client Sample ID: 46MW04_1215 MSD Lab Sample ID: 320-16660-5 MSD
 Matrix: Water Lab File ID: 06JAN2016A6A_084.d
 Analysis Method: WS-LC-0025 Date Collected: 12/30/2015 14:15
 Extraction Method: 3535 Date Extracted: 01/05/2016 08:39
 Sample wt/vol: 561.4 (mL) Date Analyzed: 01/07/2016 21:57
 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.: 97577 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	63.3		2.2	1.8	0.82
375-85-9	Perfluoroheptanoic acid (PFHpA)	53.4		2.2	1.8	0.71
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	851	J M 4	2.2	1.8	0.77
375-95-1	Perfluorononanoic acid (PFNA)	51.1		2.2	1.8	0.58
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3240	J M 4	3.6	2.7	1.1
335-67-1	Perfluorooctanoic acid (PFOA)	65.0		2.2	1.8	0.67

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	57		25-150
STL00990	13C4 PFOA	57		25-150
STL00991	13C4 PFOS	47		25-150
STL01892	13C4-PFHpA	54		25-150
STL00994	18O2 PFHxS	74		25-150
STL00995	13C5 PFNA	35		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_084.d
 Lims ID: 320-16660-B-5-A MSD
 Client ID: 46MW04_1215
 Sample Type: MSD
 Inject. Date: 07-Jan-2016 21:57:12 ALS Bottle#: 41 Worklist Smp#: 56
 Injection Vol: 15.0 ul Dil. Factor: 1.0000
 Sample Info: 320-16660-B-5-A MSD
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Jan-2016 14:53:40 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK033

First Level Reviewer: westendorfc Date: 08-Jan-2016 09:17:41

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.0 > 172.0	5.754	5.763	-0.009	366968	19.9		39.9	1753	
2 Perfluorobutyric acid	212.9 > 169.0	5.754	5.763	-0.009	346135	34.2		171	152	
D 3 13C5-PFPeA	267.9 > 223.0	6.859	6.863	-0.004	1066419	30.7		61.3	2871	
4 Perfluoropentanoic acid	262.9 > 219.0	6.859	6.864	-0.005	802634	37.3		186	233	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.969	6.976	-0.007	407797	NC			16.0	
	298.9 > 99.0	6.969	6.976	-0.007	243278		1.68(0.00-0.00)		245	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.969	6.976	-0.007	407797	35.5		201		
22 PFPeS (Perflouro-1-pentanesulfonat	349.0 > 80.0	7.898	7.799	0.099	14632	NC			1.4	
D 6 13C2 PFHxA	315.0 > 270.0	8.089	8.100	-0.011	926132	28.3		56.6	3611	
7 Perfluorohexanoic acid	313.0 > 269.0	8.089	8.102	-0.013	1138313	57.0		285	257	
D 8 13C4-PFHpA	367.0 > 322.0	9.300	9.331	-0.031	918741	26.8		53.6	2754	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.305	9.335	-0.030	550367	30.0		150	266	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.335	9.363	-0.028	2498267	NC			2509	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.335	9.363	-0.028	2985420	477.5		2524		EM EM
D 11 18O2 PFHxS	403.0 > 84.0	9.335	9.363	-0.028	509106	35.0		74.1	1080	

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	10.420	10.452	-0.032		1102779	28.5		57.0	2237	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.420	10.453	-0.033	1.000	862758	36.5		182	173	
413.0 > 169.0	10.420	10.453	-0.033	1.000	291633		2.96(0.00-0.00)		122	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.420	10.456	-0.036	1.000	211268	48.7		256		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.420	10.456	-0.036	1.000	211268	NC			146	
D 16 13C4 PFOS										
503.0 > 80.0	11.371	11.405	-0.034		420873	22.5		47.1	1881	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.371	11.408	-0.037	1.000	15518363	1818.3		9510	738	EM
499.0 > 99.0	11.371	11.408	-0.037	1.000	7296574		2.13(0.00-0.00)		1914	EM M
D 17 13C5 PFNA										
468.0 > 423.0	11.394	11.427	-0.033		556745	17.4		34.7	1424	
18 Perfluorononanoic acid										
463.0 > 419.0	11.394	11.431	-0.037	1.000	272357	28.7		143	254	
21 PFNS (Perfluoro-1-nonanesulfonate)										
549.0 > 80.0	11.823	11.893	-0.070	1.000	43647	NC			5.2	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.218	12.260	-0.042	1.000	331822	21.5		107	566	
D 19 13C2 PFDA										
515.0 > 470.0	12.218	12.262	-0.044		734532	23.8		47.6	1680	
D 23 13C8 FOSA										
506.0 > 78.0	12.788	12.805	-0.017		351728	8.24		16.5	1038	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.788	12.805	-0.017	1.000	133838	19.4		96.9	253	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.882	12.929	-0.047	1.000	82983	NC			281	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.882	12.929	-0.047	1.000	82983	20.1		104		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.934	12.978	-0.044	1.000	349065	19.2		95.8	416	
D 26 13C2 PFUnA										
565.0 > 520.0	12.923	12.979	-0.056		1008485	26.7		53.5	1928	
D 28 13C2 PFDaA										
615.0 > 570.0	13.538	13.597	-0.059		605872	14.3		28.6	1519	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.538	13.597	-0.059	1.000	172636	18.1		90.7	243	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.067	14.114	-0.047	1.000	264333	21.5		107	717	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.504	14.548	-0.044		538828	13.9		27.9	718	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.504	14.549	-0.045	1.000	151708	19.5		97.4	134	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.129	15.177	-0.048	1.000	503610	32.5		163	1030	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 35 13C2-PFHxDA	815.0 > 770.0	15.129	15.177	-0.048		965277	19.7		39.3	1808
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.461	15.517	-0.056	1.000	359278	29.5		148	538

QC Flag Legend

Processing Flags

NC - Not Calibrated

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_084.d

Injection Date: 07-Jan-2016 21:57:12 Instrument ID: A6

Lims ID: 320-16660-B-5-A MSD

Client ID: 46MW04_1215

Operator ID: JRB

ALS Bottle#: 41

Worklist Smp#: 56

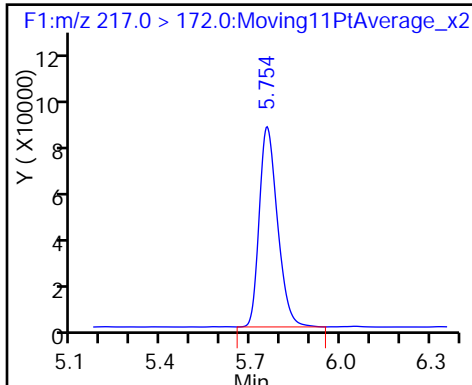
Injection Vol: 15.0 ul

Dil. Factor: 1.0000

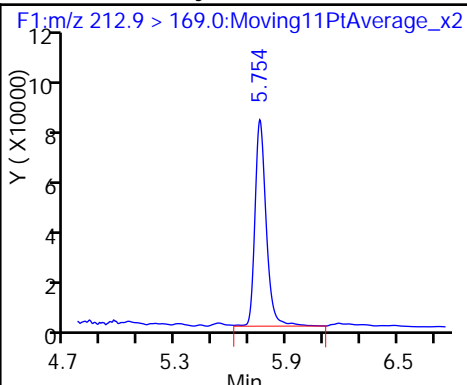
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

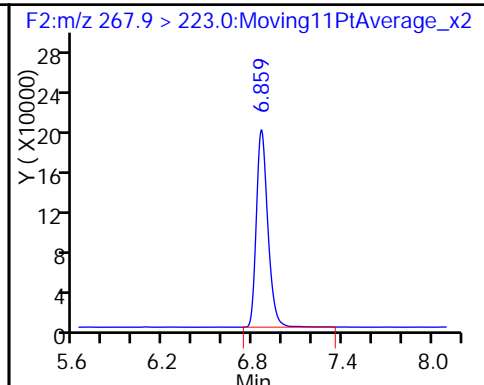
D 1 13C4 PFBA



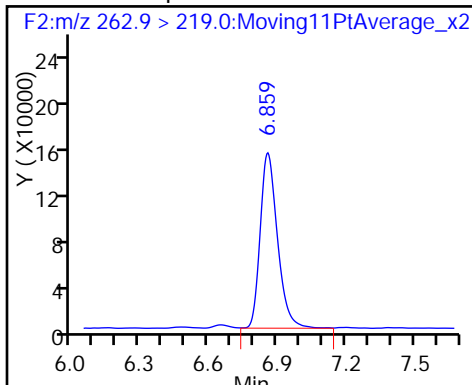
2 Perfluorobutyric acid



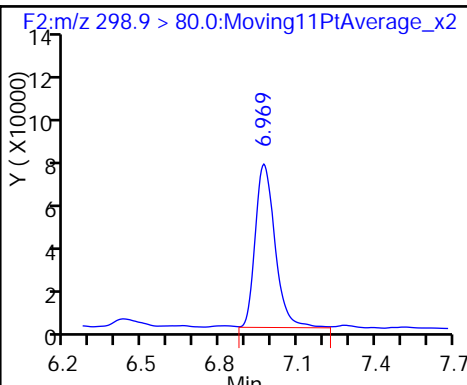
D 3 13C5-PFPeA



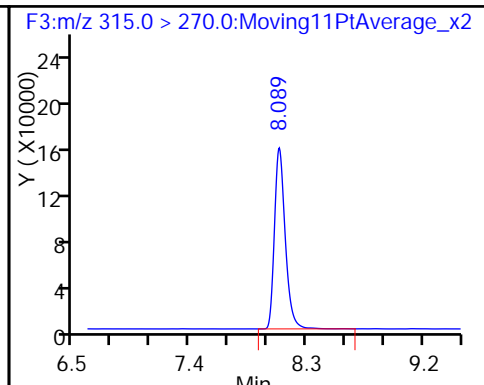
4 Perfluoropentanoic acid



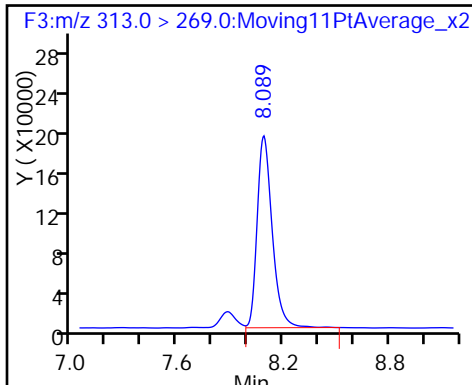
40 Perfluorobutanesulfonic acid



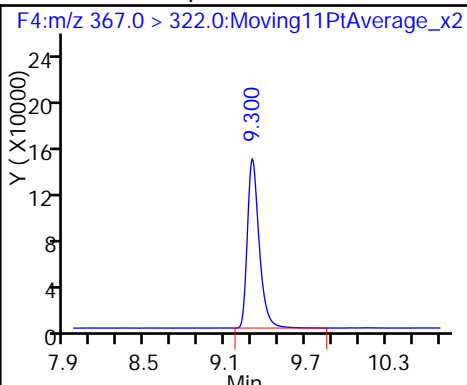
D 6 13C2 PFHxA



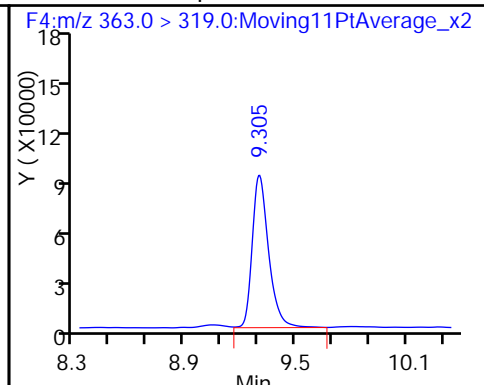
7 Perfluorohexanoic acid



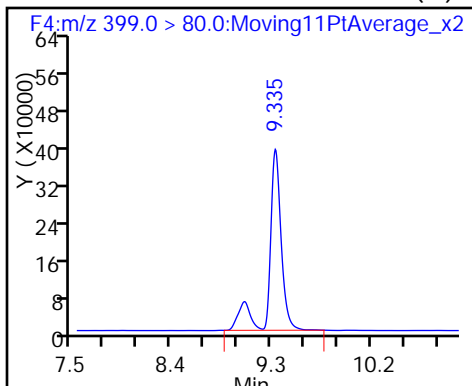
D 8 13C4-PFHpA



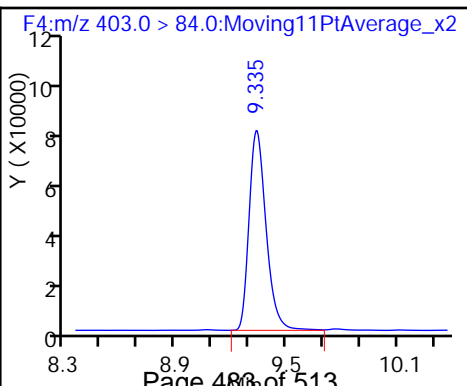
9 Perfluoroheptanoic acid



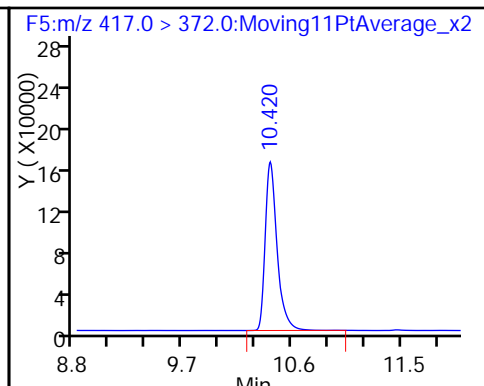
41 Perfluorohexanesulfonic acid (M)

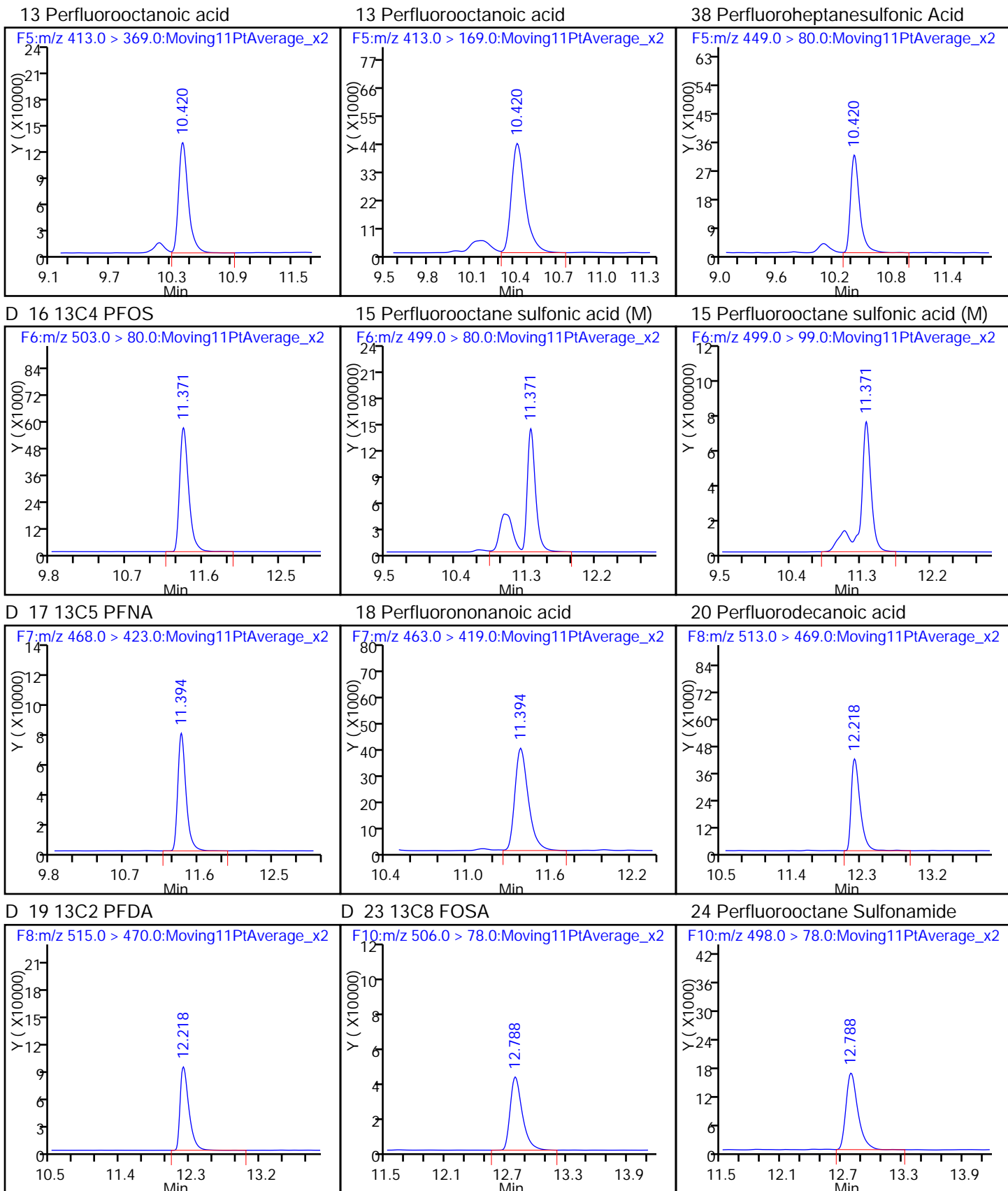


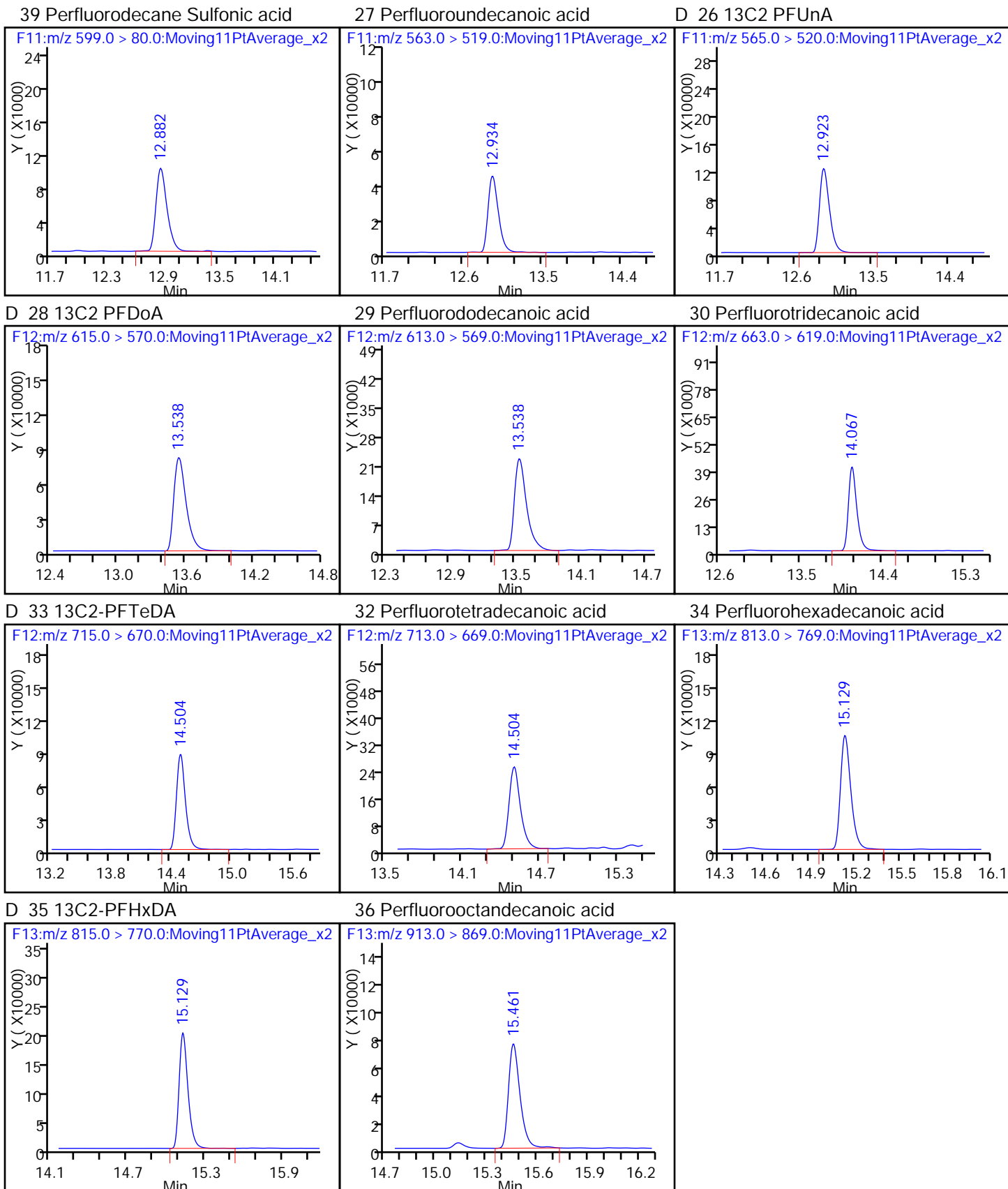
D 11 18O2 PFHxS



D 12 13C4 PFOA







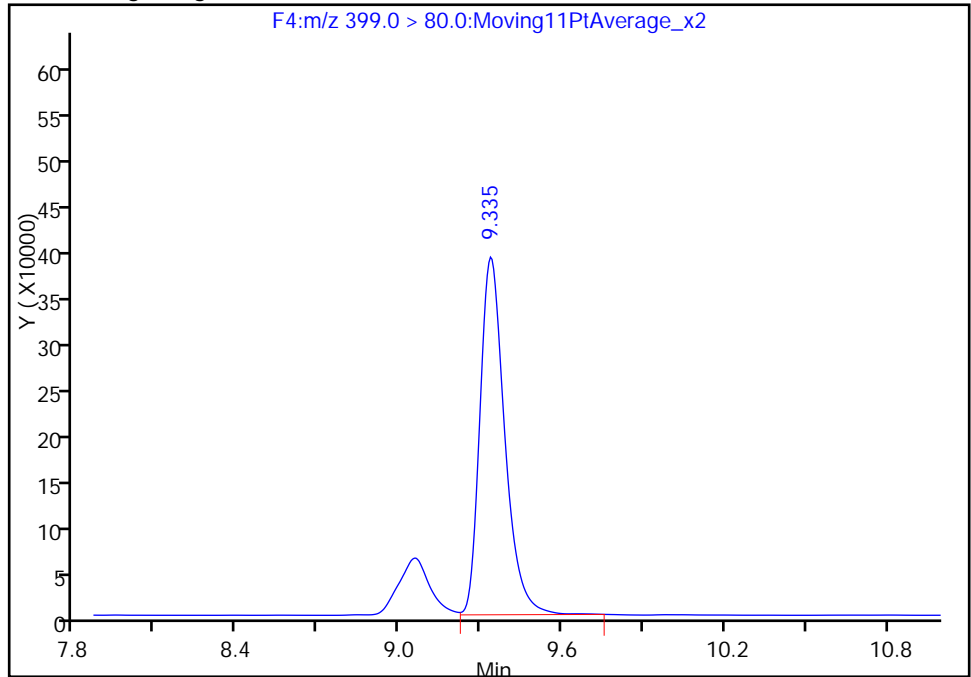
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_084.d
Injection Date: 07-Jan-2016 21:57:12 Instrument ID: A6
Lims ID: 320-16660-B-5-A MSD
Client ID: 46MW04_1215
Operator ID: JRB ALS Bottle#: 41 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 F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

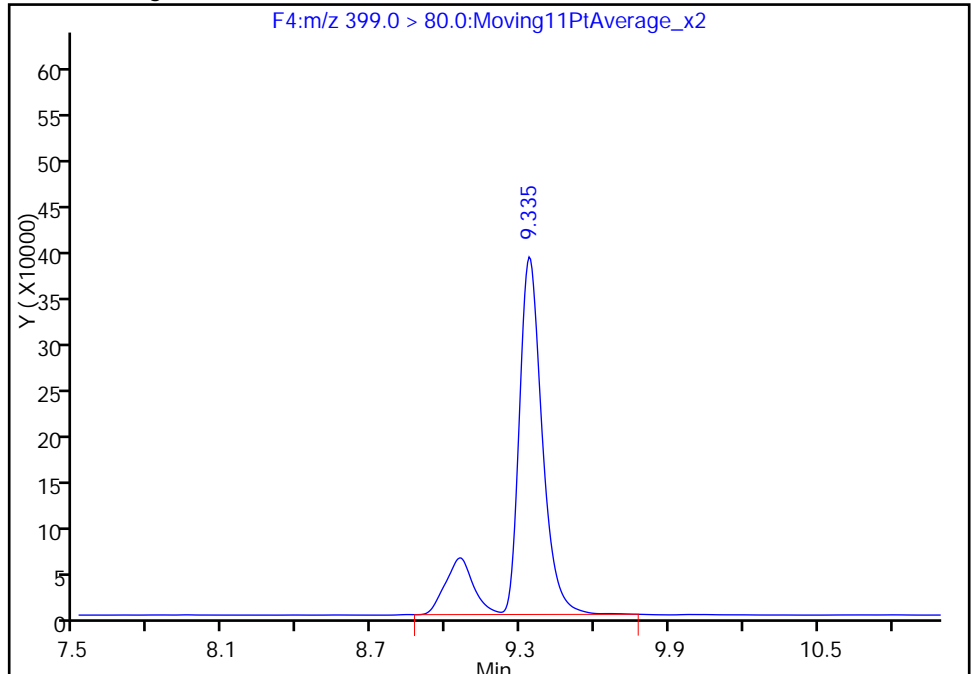
RT: 9.33
Area: 2498267
Amount: 399.5627
Amount Units: ng/ml

Processing Integration Results



RT: 9.33
Area: 2985420
Amount: 477.4759
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:17:41
Audit Action: Manually Integrated
Audit Reason: Isomers

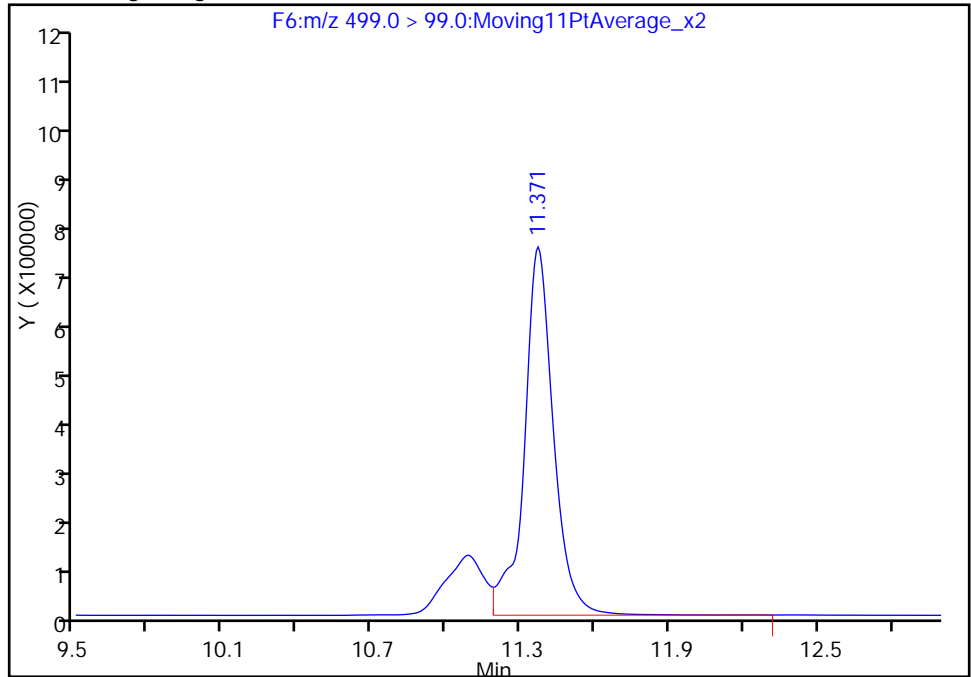
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_084.d
Injection Date: 07-Jan-2016 21:57:12 Instrument ID: A6
Lims ID: 320-16660-B-5-A MSD
Client ID: 46MW04_1215
Operator ID: JRB ALS Bottle#: 41 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

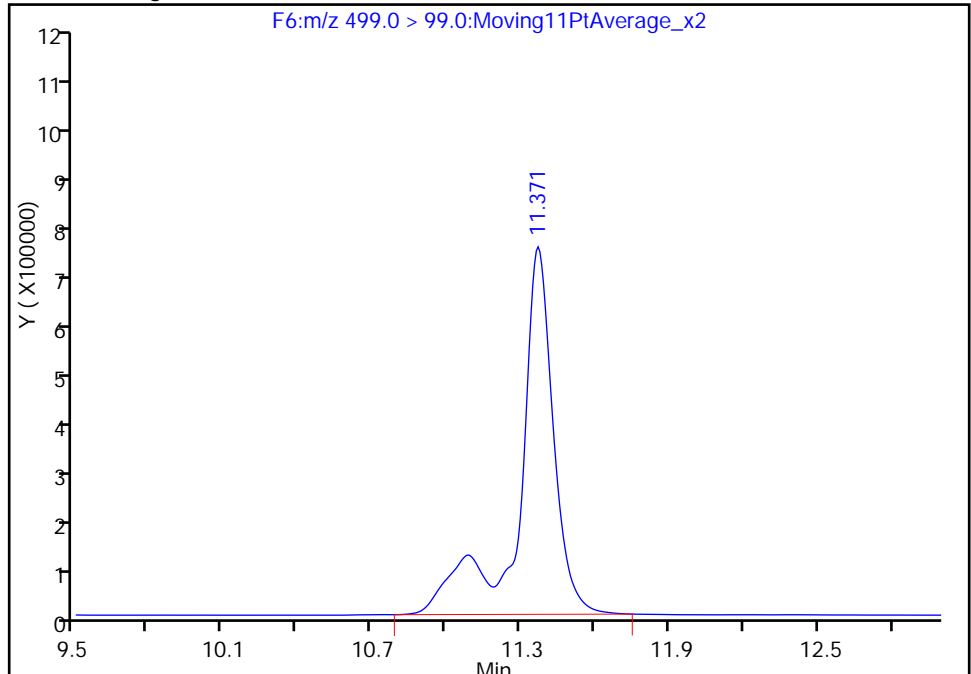
RT: 11.37
Area: 6081254
Amount: 1232.6458
Amount Units: ng/ml

Processing Integration Results



RT: 11.37
Area: 7296574
Amount: 1818.3371
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:17:41
Audit Action: Manually Integrated
Audit Reason: Isomers

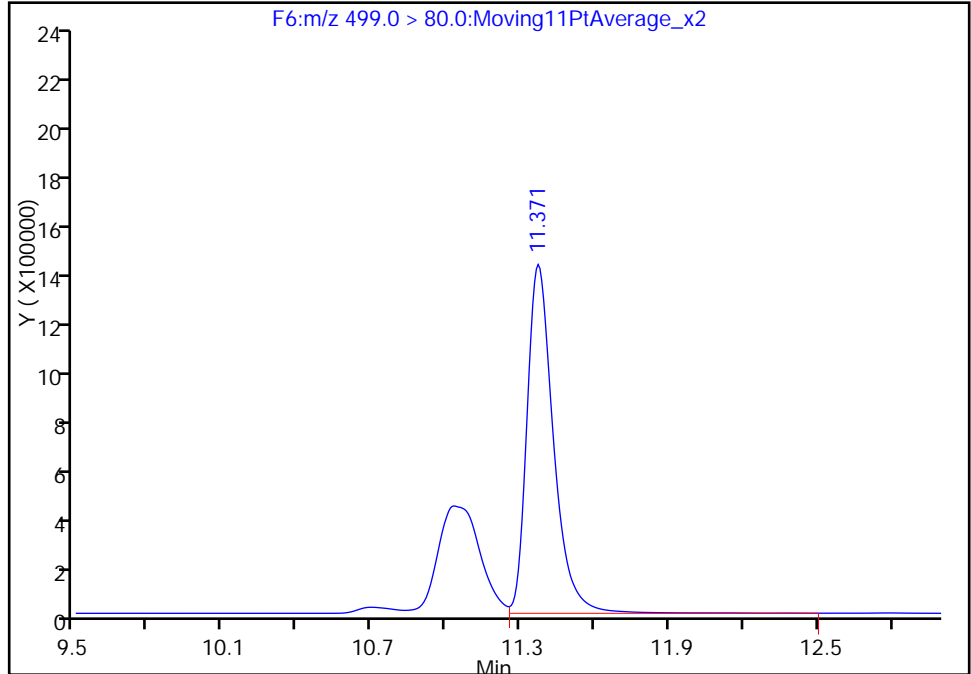
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160107-27671.b\06JAN2016A6A_084.d
Injection Date: 07-Jan-2016 21:57:12 Instrument ID: A6
Lims ID: 320-16660-B-5-A MSD
Client ID: 46MW04_1215
Operator ID: JRB ALS Bottle#: 41 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

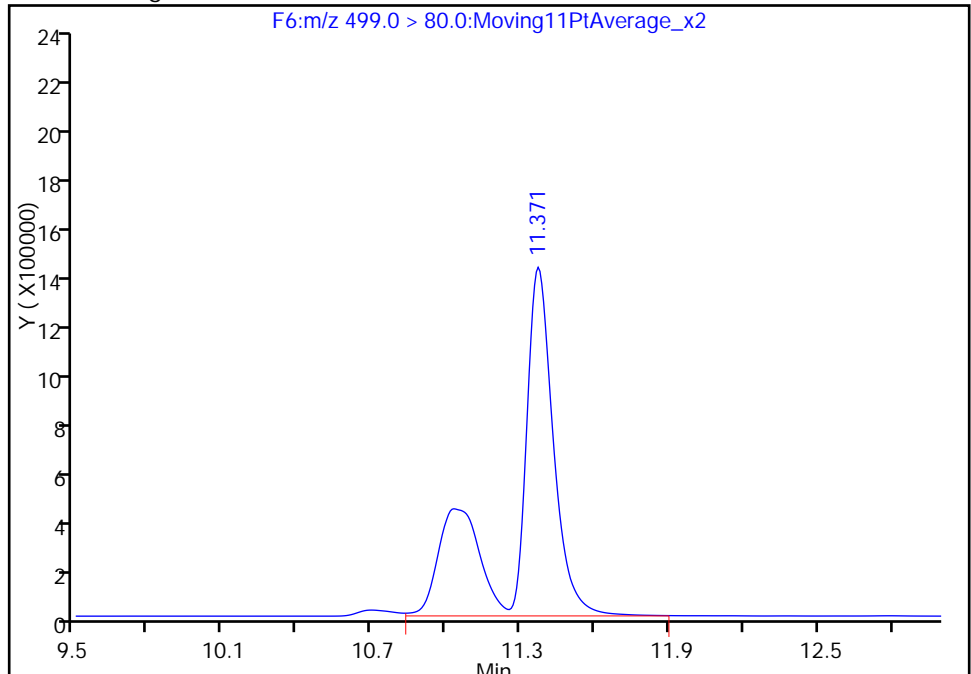
RT: 11.37
Area: 10519856
Amount: 1232.6458
Amount Units: ng/ml

Processing Integration Results



RT: 11.37
Area: 15518363
Amount: 1818.3371
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 09:17:41
Audit Action: Manually Integrated
Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1
 SDG No.: _____
 Client Sample ID: 46MW04_1215 MSD DL Lab Sample ID: 320-16660-5 MSD DL
 Matrix: Water Lab File ID: 08JAN2016A6A_013.d
 Analysis Method: WS-LC-0025 Date Collected: 12/30/2015 14:15
 Extraction Method: 3535 Date Extracted: 01/05/2016 08:39
 Sample wt/vol: 561.4 (mL) Date Analyzed: 01/08/2016 15:12
 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.: 97663 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	<i>Perfluorobutanesulfonic acid (PFBS)</i>	42.0	D J	22	18	8.2
375-85-9	<i>Perfluoroheptanoic acid (PFHpA)</i>	61.4	D	22	18	7.1
355-46-4	<i>Perfluorohexanesulfonic acid (PFHxS)</i>	850	D 4	22	18	7.7
375-95-1	<i>Perfluorononanoic acid (PFNA)</i>	39.6	D	22	18	5.8
1763-23-1	<i>Perfluorooctanesulfonic acid (PFOS)</i>	2710	D M 4	36	27	11
335-67-1	<i>Perfluorooctanoic acid (PFOA)</i>	72.7	D	22	18	6.7

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	123		25-150
STL00994	18O2 PFHxS	117		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_013.d
 Lims ID: 320-16660-B-5-A MSD
 Client ID: 46MW04_1215
 Sample Type: MSD
 Inject. Date: 08-Jan-2016 15:12:37 ALS Bottle#: 36 Worklist Smp#: 7
 Injection Vol: 15.0 ul Dil. Factor: 10.0000
 Sample Info: 320-16660-B-5-A MSD 10x
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
 Operator ID: JRB Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\PFAC_A6.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 11-Jan-2016 09:49:51 Calib Date: 06-Jan-2016 14:07:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160106-27625.b\06JAN2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 08-Jan-2016 15:50:07

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	5.763	5.763	0.0	51677	2.81		5.6	75.0	
2 Perfluorobutyric acid	212.9 > 169.0	5.766	5.763	0.003	45629	3.20		160	36.9	
D 3 13C5-PFPeA	267.9 > 223.0	6.872	6.863	0.009	113500	3.26		6.5	65.7	
4 Perfluoropentanoic acid	262.9 > 219.0	6.872	6.864	0.008	103789	4.53		226	16.7	
5 Perfluorobutane Sulfonate	298.9 > 80.0	6.987	6.976	0.011	42582	NC			9.1	
	298.9 > 99.0	6.974	6.976	-0.002	24878		1.71(0.00-0.00)		20.6	
40 Perfluorobutanesulfonic acid	298.9 > 80.0	6.987	6.976	0.011	42582	2.36		133		
22 PFPeS (Perflouro-1-pentanesulfonat	349.0 > 80.0	8.002	7.799	0.203	13111	NC			7.7	
D 6 13C2 PFHxA	315.0 > 270.0	8.105	8.100	0.005	134645	4.12		8.2	86.7	
7 Perfluorohexanoic acid	313.0 > 269.0	8.100	8.102	-0.002	137975	4.75		238	62.5	
D 8 13C4-PFHpA	367.0 > 322.0	9.317	9.331	-0.014	157905	4.60		9.2	510	
9 Perfluoroheptanoic acid	363.0 > 319.0	9.323	9.335	-0.012	115864	3.44		172	59.7	
10 Perfluorohexane Sulfonate	399.0 > 80.0	9.352	9.363	-0.011	469913	NC			461	
41 Perfluorohexanesulfonic acid	399.0 > 80.0	9.352	9.363	-0.011	469913	47.7		2522		
D 11 18O2 PFHxS	403.0 > 84.0	9.341	9.363	-0.022	80126	5.52		11.7	245	

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	10.434	10.452	-0.018		170590	4.41		8.8	379	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.434	10.453	-0.019	1.000	149278	4.08		204	81.6	
413.0 > 169.0	10.434	10.453	-0.019	1.000	45044		3.31(0.00-0.00)		33.8	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.427	10.456	-0.029	1.000	23462	2.07		109		
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.427	10.456	-0.029	1.000	23462	NC			45.6	
D 16 13C4 PFOS										
503.0 > 80.0	11.386	11.405	-0.019		110140	5.89		12.3	355	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.386	11.408	-0.022	1.000	3392573	151.9		7945	2664	M
499.0 > 99.0	11.386	11.408	-0.022	1.000	1688841		2.01(0.00-0.00)		1933	M
D 17 13C5 PFNA										
468.0 > 423.0	11.409	11.427	-0.018		129387	4.03		8.1	203	
18 Perfluorononanoic acid										
463.0 > 419.0	11.409	11.431	-0.022	1.000	49011	2.22		111	73.4	
21 PFNS (Perflouro-1-nonanesulfonate)										
549.0 > 80.0	11.843	11.893	-0.050	1.000	5170	NC			4.1	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.238	12.260	-0.022	1.000	59111	2.13		107	144	
D 19 13C2 PFDA										
515.0 > 470.0	12.238	12.262	-0.024		131801	4.27		8.5	296	
D 23 13C8 FOSA										
506.0 > 78.0	12.798	12.805	-0.007		70577	1.65		3.3	382	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.808	12.805	0.003	1.000	19929	1.44		71.9	80.3	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.913	12.929	-0.016	1.000	11476	NC			44.1	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.913	12.929	-0.016	1.000	11476	1.06		55.0		
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.954	12.978	-0.024	1.000	58915	1.68		84.1	95.1	
D 26 13C2 PFUnA										
565.0 > 520.0	12.954	12.979	-0.025		135581	3.60		7.2	372	
D 28 13C2 PFDaA										
615.0 > 570.0	13.574	13.597	-0.023		132849	3.14		6.3	270	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.584	13.597	-0.013	1.000	34231	1.64		82.1	62.2	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.090	14.114	-0.024	1.000	40991	1.52		75.9	89.8	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.524	14.548	-0.024		83210	2.15		4.3	300	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.524	14.549	-0.025	1.000	23525	0.8099		40.5	18.6	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.149	15.177	-0.028	1.000	63469	-3.47		-173.3	215	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 35 13C2-PFHxDA	815.0 > 770.0	15.154	15.177	-0.023	150246	3.06		6.1	549	
36 Perfluorooctadecanoic acid	913.0 > 869.0	15.486	15.517	-0.031	46097	1.73	1.000	86.3	166	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_013.d

Injection Date: 08-Jan-2016 15:12:37

Instrument ID: A6

Lims ID: 320-16660-B-5-A MSD

Client ID: 46MW04_1215

Operator ID: JRB

ALS Bottle#: 36

Worklist Smp#: 7

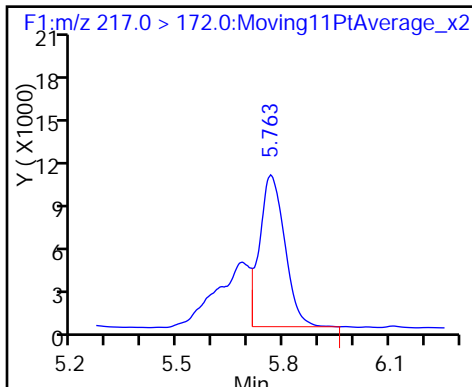
Injection Vol: 15.0 ul

Dil. Factor: 10.0000

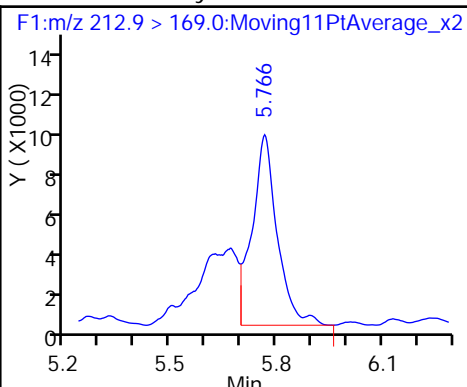
Method: PFAC_A6

Limit Group: LC PFC_DOD ICAL

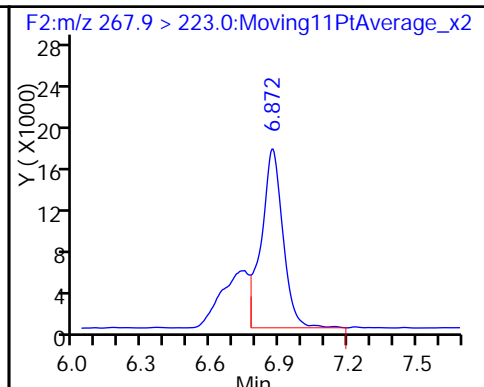
D 1 13C4 PFBA



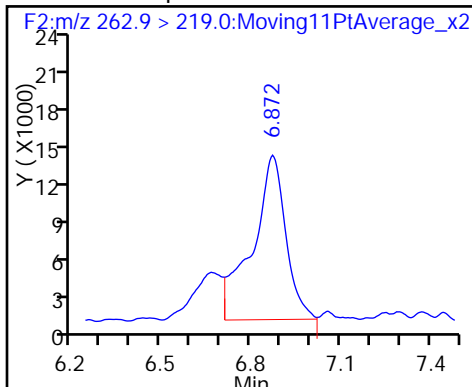
2 Perfluorobutyric acid



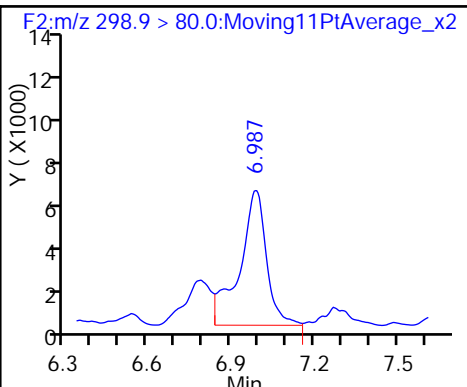
D 3 13C5-PFPeA



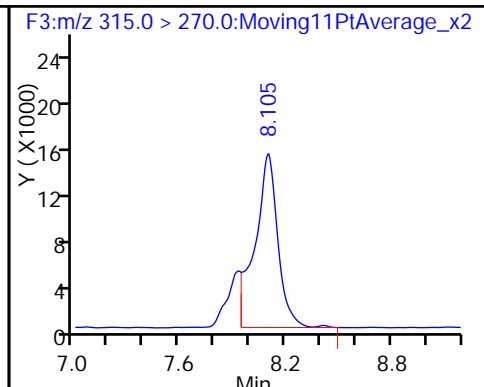
4 Perfluoropentanoic acid



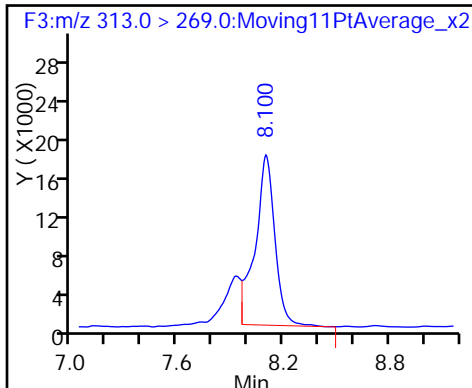
40 Perfluorobutanesulfonic acid



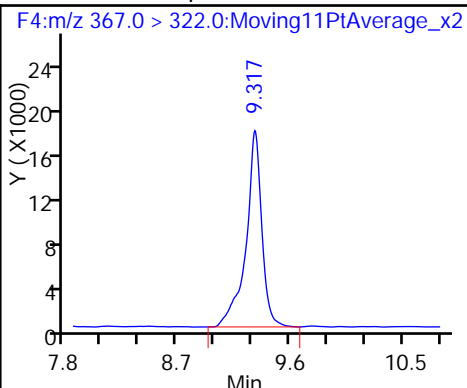
D 6 13C2 PFHxA



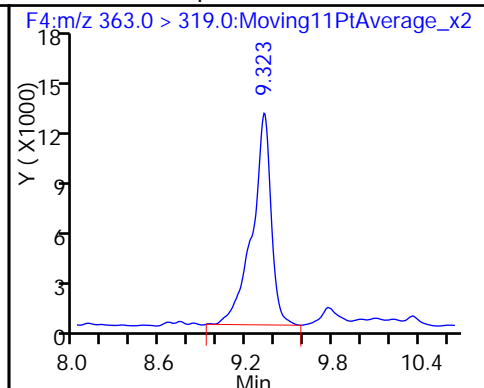
7 Perfluorohexanoic acid



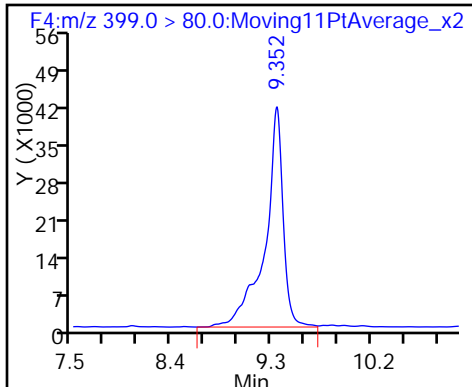
D 8 13C4-PFHpA



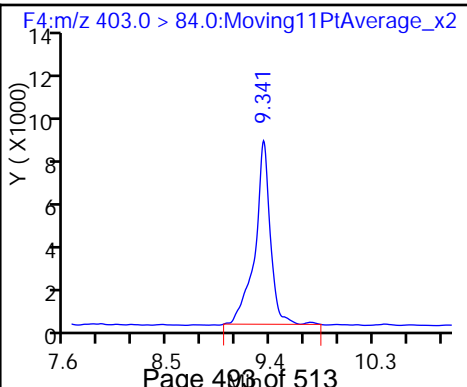
9 Perfluoroheptanoic acid



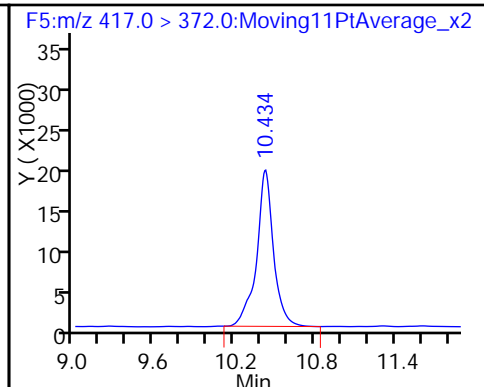
41 Perfluorohexanesulfonic acid

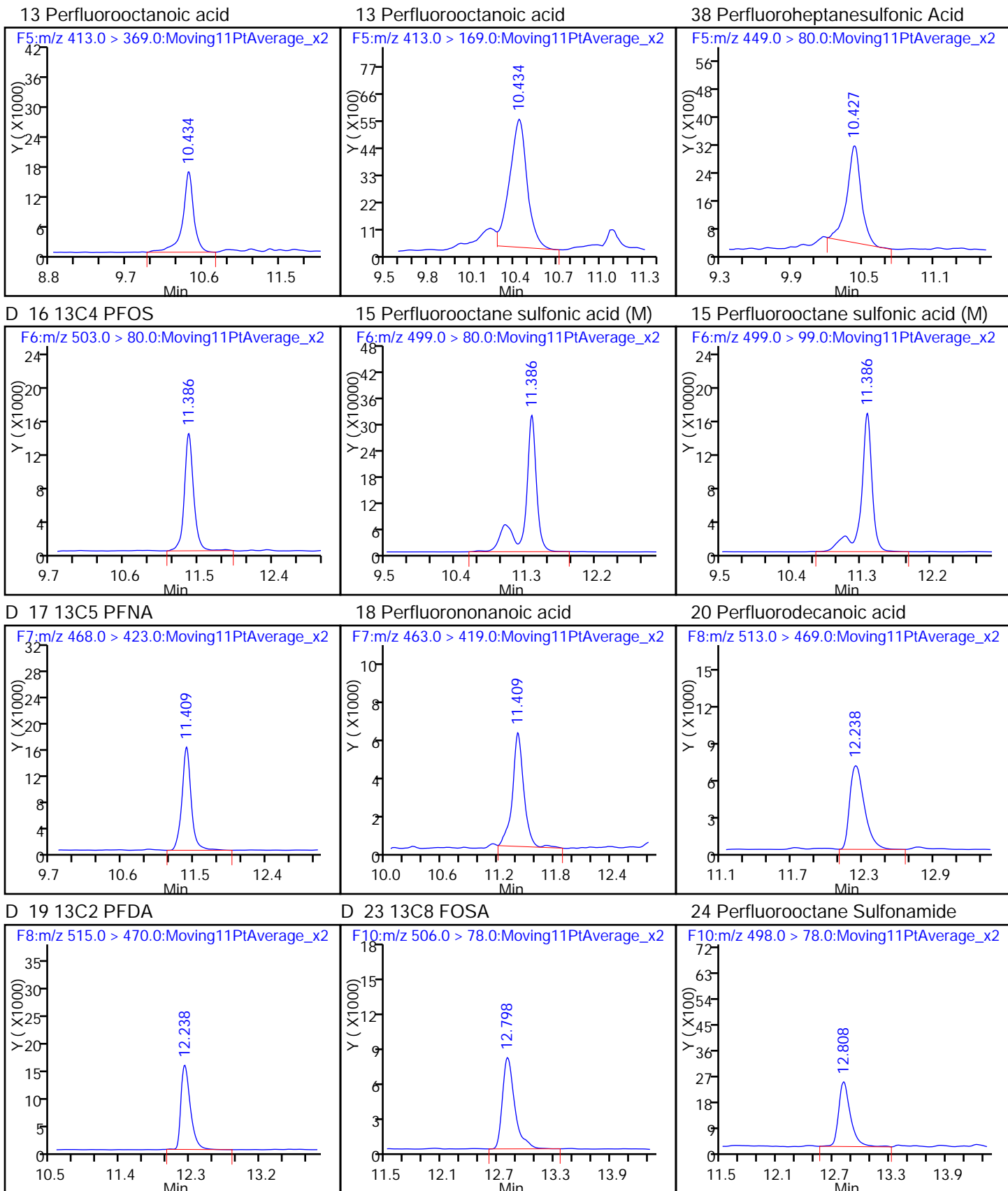


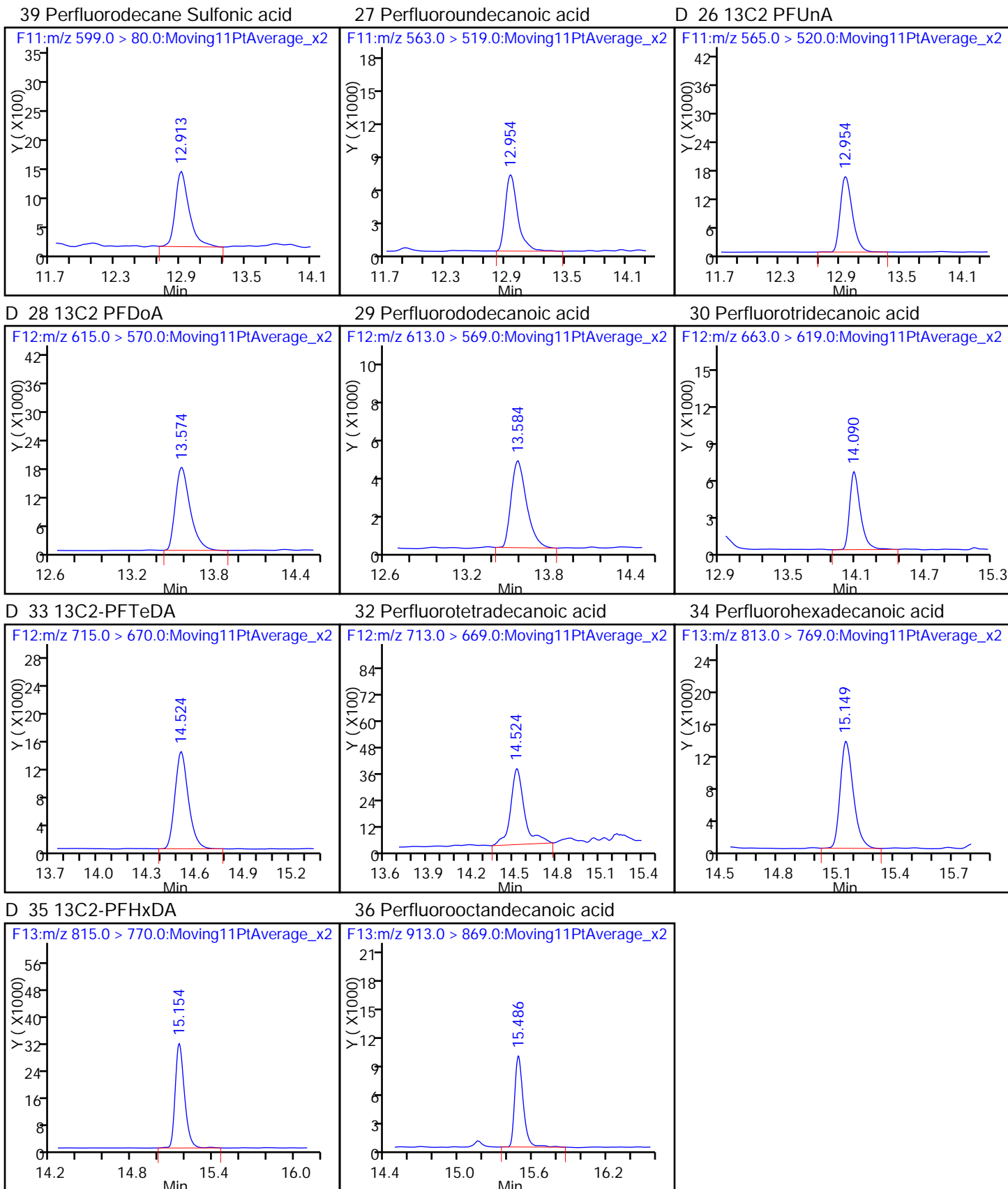
D 11 18O2 PFHxS



D 12 13C4 PFOA







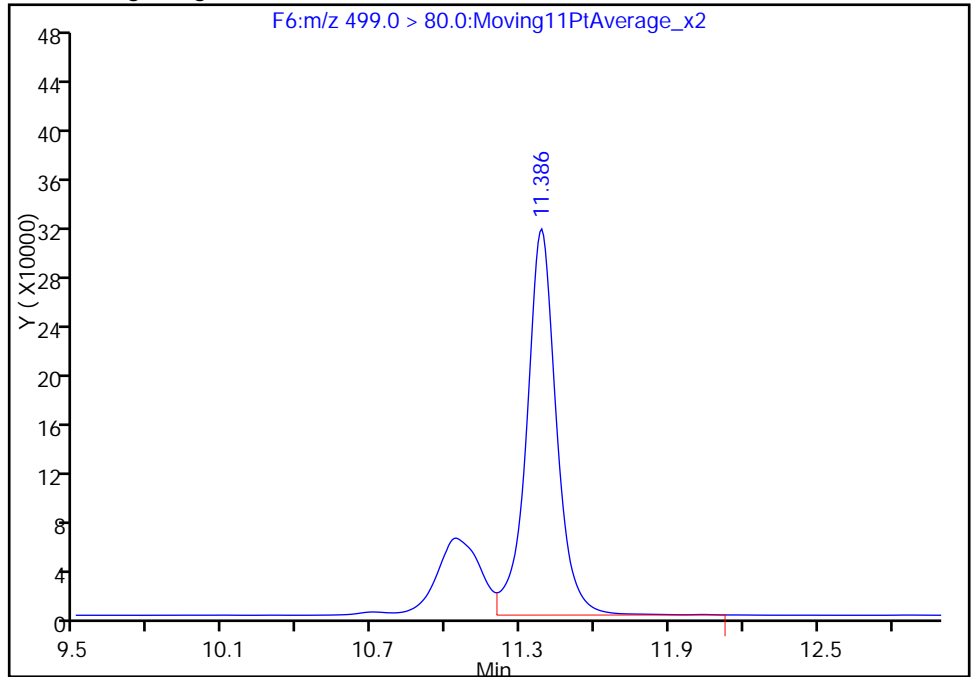
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_013.d
Injection Date: 08-Jan-2016 15:12:37 Instrument ID: A6
Lims ID: 320-16660-B-5-A MSD
Client ID: 46MW04_1215
Operator ID: JRB ALS Bottle#: 36 Worklist Smp#: 7
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

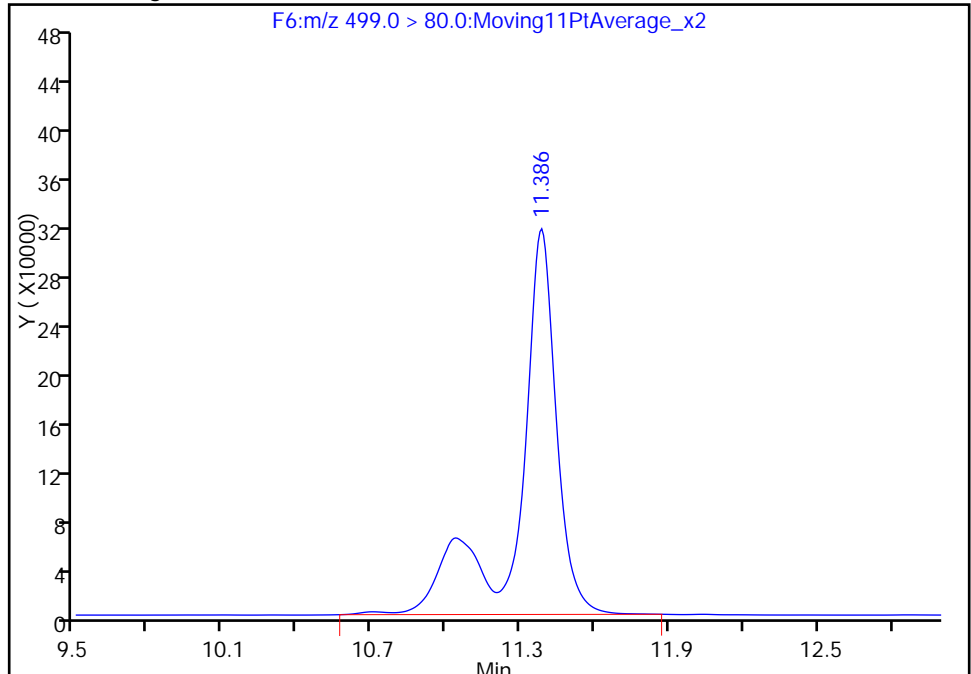
RT: 11.39
Area: 2637263
Amount: 118.0832
Amount Units: ng/ml

Processing Integration Results



RT: 11.39
Area: 3392573
Amount: 151.9021
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 08-Jan-2016 15:50:07
Audit Action: Manually Integrated
Audit Reason: Isomers

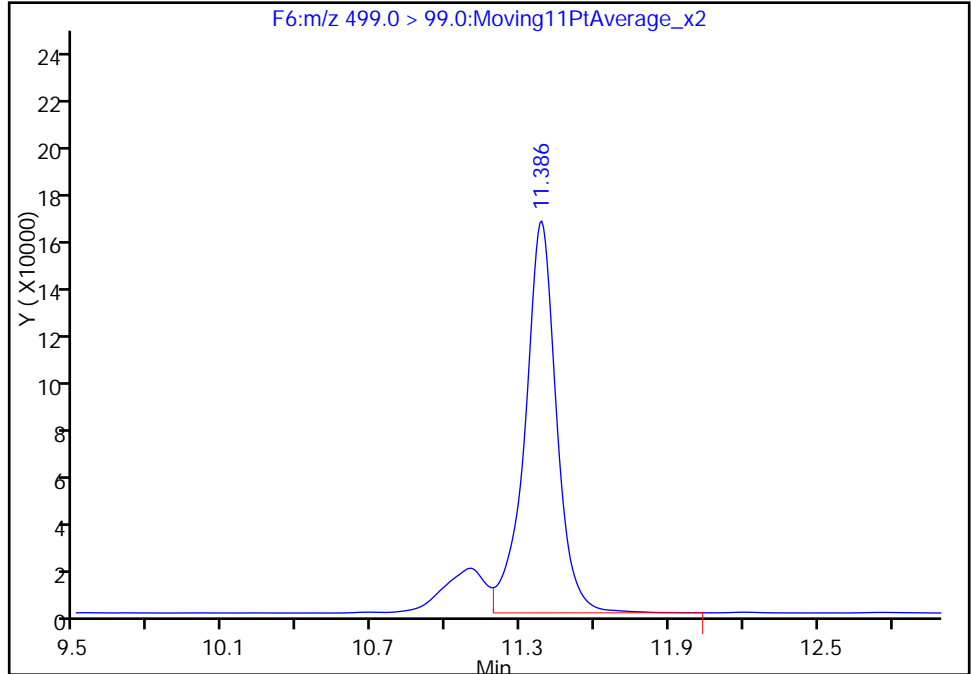
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160108-27690.b\08JAN2016A6A_013.d
Injection Date: 08-Jan-2016 15:12:37 Instrument ID: A6
Lims ID: 320-16660-B-5-A MSD
Client ID: 46MW04_1215
Operator ID: JRB ALS Bottle#: 36 Worklist Smp#: 7
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

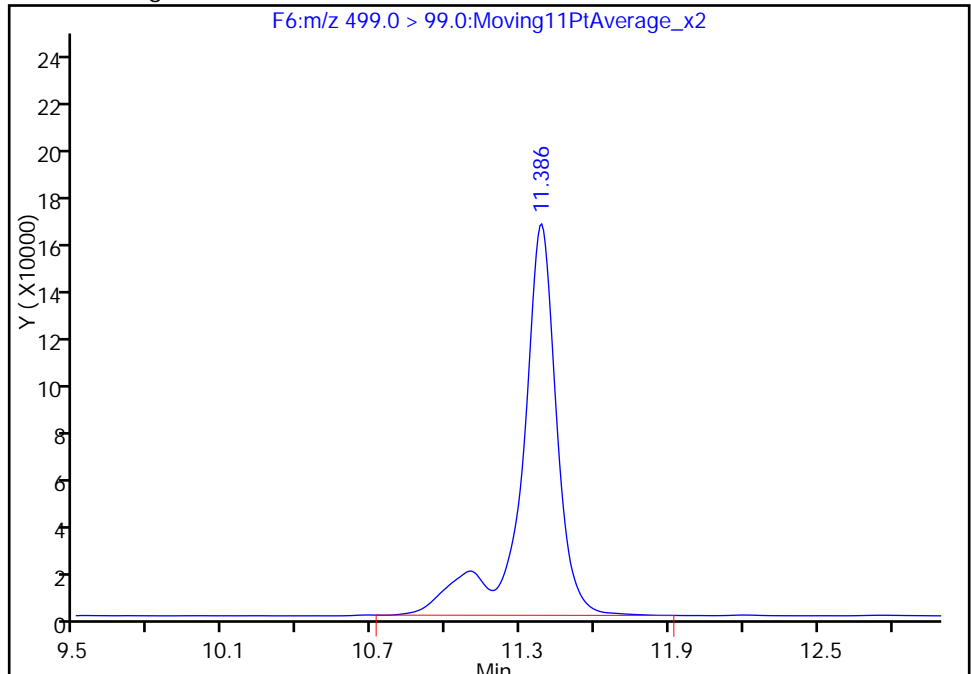
RT: 11.39
Area: 1475541
Amount: 118.0832
Amount Units: ng/ml

Processing Integration Results



RT: 11.39
Area: 1688841
Amount: 151.9021
Amount Units: ng/ml

Manual Integration Results



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1

SDG No.: _____

Instrument ID: A6 Start Date: 01/06/2016 11:00

Analysis Batch Number: 97425 End Date: 01/07/2016 14:16

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-97425/4 IC		01/06/2016 11:00	1	06JAN2016A6A_00 3.d	Acquity 2.1(mm)
STD 320-97425/5 IC		01/06/2016 11:31	1	06JAN2016A6A_00 4.d	Acquity 2.1(mm)
STD 320-97425/6 IC		01/06/2016 12:02	1	06JAN2016A6A_00 5.d	Acquity 2.1(mm)
STD 320-97425/7 IC		01/06/2016 12:33	1	06JAN2016A6A_00 6.d	Acquity 2.1(mm)
STD 320-97425/8 IC		01/06/2016 13:05	1	06JAN2016A6A_00 7.d	Acquity 2.1(mm)
STD 320-97425/9 IC		01/06/2016 13:36	1	06JAN2016A6A_00 8.d	Acquity 2.1(mm)
STD 320-97425/10 IC		01/06/2016 14:07	1	06JAN2016A6A_00 9.d	Acquity 2.1(mm)
ZZZZZ		01/06/2016 14:38	1		Acquity 2.1(mm)
ICV 320-97425/12		01/06/2016 15:10	1	06JAN2016A6A_01 1.d	Acquity 2.1(mm)
ZZZZZ		01/06/2016 15:41	10		Acquity 2.1(mm)
ZZZZZ		01/06/2016 16:12	10		Acquity 2.1(mm)
ZZZZZ		01/06/2016 16:43	20		Acquity 2.1(mm)
ZZZZZ		01/06/2016 17:15	20		Acquity 2.1(mm)
ZZZZZ		01/06/2016 17:46	10		Acquity 2.1(mm)
ZZZZZ		01/06/2016 18:17	10		Acquity 2.1(mm)
ZZZZZ		01/06/2016 18:48	10		Acquity 2.1(mm)
ZZZZZ		01/06/2016 19:19	10		Acquity 2.1(mm)
ZZZZZ		01/06/2016 19:51	10		Acquity 2.1(mm)
ZZZZZ		01/06/2016 20:22	1		Acquity 2.1(mm)
CCV 320-97425/15		01/06/2016 20:53	1		Acquity 2.1(mm)
CCV 320-97425/34		01/07/2016 00:32	1		Acquity 2.1(mm)
CCV 320-97425/35		01/07/2016 10:24	1		Acquity 2.1(mm)
ZZZZZ		01/07/2016 13:00	1		Acquity 2.1(mm)
ZZZZZ		01/07/2016 13:21	1		Acquity 2.1(mm)
CCV 320-97425/39		01/07/2016 14:16	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1

SDG No.: _____

Instrument ID: A6 Start Date: 01/07/2016 14:51

Analysis Batch Number: 97577 End Date: 01/07/2016 23:00

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-97577/2		01/07/2016 14:51	1	06JAN2016A6A_06 5.d	Acquity 2.1(mm)
CCV 320-97577/3 CCVL		01/07/2016 15:24	1	06JAN2016A6A_06 6.d	Acquity 2.1(mm)
MB 320-97259/1-A		01/07/2016 16:17	1	06JAN2016A6A_06 8.d	Acquity 2.1(mm)
LCS 320-97259/2-A		01/07/2016 16:38	1	06JAN2016A6A_06 9.d	Acquity 2.1(mm)
ZZZZZ		01/07/2016 16:59	1		Acquity 2.1(mm)
ZZZZZ		01/07/2016 17:21	1		Acquity 2.1(mm)
ZZZZZ		01/07/2016 17:42	1		Acquity 2.1(mm)
ZZZZZ		01/07/2016 18:03	1		Acquity 2.1(mm)
ZZZZZ		01/07/2016 18:24	1		Acquity 2.1(mm)
ZZZZZ		01/07/2016 18:46	1		Acquity 2.1(mm)
CCV 320-97577/23		01/07/2016 19:07	1	06JAN2016A6A_07 6.d	Acquity 2.1(mm)
ZZZZZ		01/07/2016 19:28	1		Acquity 2.1(mm)
320-16660-1		01/07/2016 19:49	1	06JAN2016A6A_07 8.d	Acquity 2.1(mm)
320-16660-2		01/07/2016 20:11	1	06JAN2016A6A_07 9.d	Acquity 2.1(mm)
320-16660-3		01/07/2016 20:32	1	06JAN2016A6A_08 0.d	Acquity 2.1(mm)
320-16660-4		01/07/2016 20:53	1	06JAN2016A6A_08 1.d	Acquity 2.1(mm)
320-16660-5		01/07/2016 21:14	1	06JAN2016A6A_08 2.d	Acquity 2.1(mm)
320-16660-5 MS		01/07/2016 21:35	1	06JAN2016A6A_08 3.d	Acquity 2.1(mm)
320-16660-5 MSD		01/07/2016 21:57	1	06JAN2016A6A_08 4.d	Acquity 2.1(mm)
320-16660-6		01/07/2016 22:18	1	06JAN2016A6A_08 5.d	Acquity 2.1(mm)
320-16660-7		01/07/2016 22:39	1	06JAN2016A6A_08 6.d	Acquity 2.1(mm)
CCV 320-97577/12		01/07/2016 23:00	1	06JAN2016A6A_08 7.d	Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1

SDG No.: _____

Instrument ID: A6 Start Date: 01/08/2016 13:09

Analysis Batch Number: 97663 End Date: 01/08/2016 22:17

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-97663/16 CCVL		01/08/2016 13:09	1	08JAN2016A6A_00 8.d	Acquity 2.1(mm)
CCV 320-97663/17		01/08/2016 13:40	1	08JAN2016A6A_00 9.d	Acquity 2.1(mm)
320-16660-2 DL		01/08/2016 14:08	5	08JAN2016A6A_01 0.d	Acquity 2.1(mm)
320-16660-5 DL		01/08/2016 14:30	10	08JAN2016A6A_01 1.d	Acquity 2.1(mm)
320-16660-5 MS DL		01/08/2016 14:51	10	08JAN2016A6A_01 2.d	Acquity 2.1(mm)
320-16660-5 MSD DL		01/08/2016 15:12	10	08JAN2016A6A_01 3.d	Acquity 2.1(mm)
320-16660-6 DL		01/08/2016 15:33	5	08JAN2016A6A_01 4.d	Acquity 2.1(mm)
CCV 320-97663/18		01/08/2016 17:41	1	08JAN2016A6A_02 0.d	Acquity 2.1(mm)
CCV 320-97663/29		01/08/2016 21:34	1		Acquity 2.1(mm)
CCV 320-97663/31		01/08/2016 22:17	1		Acquity 2.1(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-16660-1

SDG No.: _____

Batch Number: 97259 Batch Start Date: 01/05/16 08:39 Batch Analyst: Arauz, Horacio J

Batch Method: 3535 Batch End Date: 01/05/16 19:45

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00024	LCPCFCSP 00039
MB 320-97259/1		3535, WS-LC-0025				500 mL	1.00 mL	50 uL	
LCS 320-97259/2		3535, WS-LC-0025				500 mL	1.00 mL	50 uL	20 uL
320-16660-1	46MW01_1215	3535, WS-LC-0025	T	520.12 g	44.05 g	476.1 mL	1.00 mL	50 uL	
320-16660-2	46MW02_1215	3535, WS-LC-0025	T	528.78 g	44.61 g	484.2 mL	1.00 mL	50 uL	
320-16660-3	46MW03_1215	3535, WS-LC-0025	T	515.89 g	44.17 g	471.7 mL	1.00 mL	50 uL	
320-16660-4	46MW03_1215X	3535, WS-LC-0025	T	596.07 g	44.70 g	551.4 mL	1.00 mL	50 uL	
320-16660-5	46MW04_1215	3535, WS-LC-0025	T	606.2 g	46.12 g	560.1 mL	1.00 mL	50 uL	
320-16660-5 MS	46MW04_1215	3535, WS-LC-0025	T	606.9 g	46.12 g	560.8 mL	1.00 mL	50 uL	20 uL
320-16660-5 MSD	46MW04_1215	3535, WS-LC-0025	T	607.7 g	46.27 g	561.4 mL	1.00 mL	50 uL	20 uL
320-16660-6	46MW05_1215	3535, WS-LC-0025	T	517.86 g	43.91 g	474 mL	1.00 mL	50 uL	
320-16660-7	EB123015	3535, WS-LC-0025	T	601.0 g	44.08 g	556.9 mL	1.00 mL	50 uL	

Batch Notes	
Balance ID	QA-070
Batch Comment	MeOH 557955
H2O Lot used	01-04-2016
Pipette ID	EC15219
Analyst who added reagent	HJA
SU Reagent Drop	HJA
SU Reagent Drop Witness	NGK
Solvent Lot #	562564
Solvent Name	0.3% Ammonium hydroxide/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	Wax 500mg
Solid Phase Extraction Disk Lot Number	002535183A

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.: 320-16660-1

SDG No.: _____

Batch Number: 97259 Batch Start Date: 01/05/16 08:39 Batch Analyst: Arauz, Horacio J

Batch Method: 3535 Batch End Date: 01/05/16 19:45

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): 320-16637, 320-16660

Work List ID(s): 27671, 27690

Extraction Batch: 97259

Analysis Batch(es): 97577, 97663

Delivery Rank: 4

Due Date: 1/6/16

A: Calibration/Instrument Run QC	1 st Level	2 nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# <u>97425</u>	✓	✓	
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 ($r^2 > 0.990$).			✓
• 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? <u>4 flags</u>	✓	✓	
5. Holding Times were met for prep and analytical.	✓	✓	
6. IS/Surrogate recoveries meet criteria or properly noted.	✓	✓	
C. Sample Analysis			
1. Was correct analysis performed and were project instructions followed?	✓	✓	
2. If required, are compounds within RT windows?			✓
3. If required, are positive hits confirmed and >40% RPD flagged?			✓
4. Manual Integrations reviewed and appropriate.	✓	✓	
5. All analytes correctly reported. (Primary, secondary, acceptable status)	✓	✓	
6. Correct reporting limits used. (based on client request, prep factors, and dilutions)	✓	✓	
D. Documentation			
1. Are all non-conformances documented/attached? NCM# <u>46153</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: 1/14/16

2nd Level Reviewer: MWU

Date: 1/14/2016

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-97259

Analyst: Arauz, Horacio J

Batch Open: 1/5/2016 8:39:10AM

Method Code: 320-3535_VWWT-320

Batch End: 1/05/16 19:45

Solid-Phase Extraction (SPE)

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmt FinAmt	Rcvd	PHs		Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
					Adj1	Adj2					
1 MB-320-97259/1 N/A	N/A		500 mL 1.00 mL				N/A	N/A	N/A		MB-320-97259-1-A
2 LCS-320-97259/2 N/A	N/A		500 mL 1.00 mL				N/A	N/A	N/A		LCS-320-97259-2-A
3 320-16637-A-1 (PFC_IDA_DOD5)	N/A (320-16637-1)	514.35 g 43.96 g	470.4 mL 1.00 mL				1/6/16	5_Day_RUSH	4		320-16637-A-1-A
3 320-16637-A-1-MS (PFC_IDA_DOD5)	N/A (320-16637-1)	517.81 g 44.55 g	473.3 mL 1.00 mL				1/6/16	5_Day_RUSH	4		320-16637-A-1-B MS
6 320-16637-A-1-MSD (PFC_IDA_DOD5)	N/A (320-16637-1)	526.90 g 43.78 g	483.1 mL 1.00 mL				1/6/16	5_Day_RUSH	4		320-16637-A-1-C MS D
6 320-16637-A-2 (PFC_IDA_DOD5)	N/A (320-16637-1)	510.19 g 44.15 g	466 mL 1.00 mL				1/6/16	5_Day_RUSH	4		320-16637-A-2-A
7 320-16637-A-3 (PFC_IDA_DOD5)	N/A (320-16637-1)	500.22 g 44.09 g	556.1 mL 1.00 mL				1/6/16	5_Day_RUSH	4		320-16637-A-3-A
8 320-16637-A-4 (PFC_IDA_DOD5)	N/A (320-16637-1)	516.09 g 43.72 g	472.4 mL 1.00 mL				1/6/16	5_Day_RUSH	4		320-16637-A-4-A
9 320-16637-A-5 (PFC_IDA_DOD5)	N/A (320-16637-1)	512.7 g 44.01 g	568.7 mL 1.00 mL				1/6/16	5_Day_RUSH	4		320-16637-A-5-A
10 320-16660-D-1 (PFC_IDA_DOD5)	N/A (320-16660-1)	520.12 g 44.05 g	476.1 mL 1.00 mL				1/7/16	5_Day_RUSH	4		320-16660-D-1-A

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)









Batch Number: 320-97259

Analyst: Arauz, Horacio J

Batch Open: 1/5/2016 8:39:10AM

Method Code: 320-3535_IVWIT-320

Batch End:

11	320-16660-D-2 (PFC_IDA_DOD5)	N/A (320-16660-1)	528.78 g 44.61 g	484.2 mL 1.00 mL				1/7/16	5_Day_RUSH	4	
12	320-16660-B-3 (PFC_IDA_DOD5)	N/A (320-16660-1)	515.89 g 44.17 g	471.7 mL 1.00 mL				1/7/16	5_Day_RUSH	4	
13	320-16660-A-4 (PFC_IDA_DOD5)	N/A (320-16660-1)	596.07 g 44.70 g	551.4 mL 1.00 mL				1/7/16	5_Day_RUSH	4	
14	320-16660-A-5 (PFC_IDA_DOD5)	N/A (320-16660-1)	506.2 g 46.12 g	560.1 mL 1.00 mL				1/7/16	5_Day_RUSH	4	
15	320-16660-A-5-MS (PFC_IDA_DOD5)	N/A (320-16660-1)	506.9 g 46.12 g	560.8 mL 1.00 mL				1/7/16	5_Day_RUSH	4	
16	320-16660-B-5-MSD (PFC_IDA_DOD5)	N/A (320-16660-1)	507.7 g 46.27 g	561.4 mL 1.00 mL				1/7/16	5_Day_RUSH	4	
17	320-16660-A-6 (PFC_IDA_DOD5)	N/A (320-16660-1)	517.86 g 43.91 g	474 mL 1.00 mL				1/7/16	5_Day_RUSH	4	
18	320-16660-A-7 (PFC_IDA_DOD5)	N/A (320-16660-1)	501.0 g 44.08 g	556.9 mL 1.00 mL				1/7/16	5_Day_RUSH	4	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-97259

Batch Open: 1/5/2016 8:39:10AM

Method Code: 320-3535_I\WWT-320

Analyst: Arauz, Horacio J

Batch End:

Batch Notes	
First Start time	NA
First End time	NA
Balance ID	QA-070
SPE Cartridge Type	Wax 500mg
Solid Phase Extraction Disk Lot Number	002535183A
H2O Lot used	01-04-2016
Pipette ID	EC15219
Solvent Name	0.3% Ammonium hydroxide/MeOH
Solvent Lot #	562564
Analyst who added reagent	HJA
SU Reagent Drop	HJA
SU Reagent Drop Witness	MGK
Acid Name	NA
Acid Lot	NA
Reagent ID	NA
Reagent Lot Number	NA
NaCl Lot #	NA
SOP Number	WS-LC-0025
Batch Comment	MeOH 557955

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-97259

Batch Open: 1/5/2016 8:39:10AM

Analyst: Arauz, Horacio J

Method Code: 320-3535_I\WWT-320

Batch End:

	Comments
320-16637-A-1	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-16637-A-1~MS	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-16637-A-1~MSD	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-16637-A-2	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-16637-A-3	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-16637-A-4	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-16637-A-5	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-16660-D-1	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-16660-D-2	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-16660-B-3	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-16660-A-4	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-16660-A-5	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-16660-A-5~MS	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-16660-B-5~MSD	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-16660-A-6	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-16660-A-7	Method Comments: Q5Rev111213_StdVarApp_30day disposal

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-97259

Analyst: Arauz, Horacio J

Batch Open: 1/5/2016 8:39:10AM

Method Code: 320-3535_IVWT-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-97259/1	LCMPFCSU_00024	50 uL	1.00 mL	HJA 1-5-16	nan 1-5-16
LCS 320-97259/2	LCMPFCSU_00024	50 uL	1.00 mL		
LCS 320-97259/2	LCPFCSU_00039	20 uL	1.00 mL		
320-16637-A-1	LCMPFCSU_00024	50 uL	1.00 mL		
320-16637-A-1 MS	LCMPFCSU_00024	50 uL	1.00 mL		
320-16637-A-1 MS	LCPFCSU_00039	20 uL	1.00 mL		
320-16637-A-1 MSD	LCMPFCSU_00024	50 uL	1.00 mL		
320-16637-A-1 MSD	LCPFCSU_00039	20 uL	1.00 mL		
320-16637-A-2	LCMPFCSU_00024	50 uL	1.00 mL		
320-16637-A-3	LCMPFCSU_00024	50 uL	1.00 mL		
320-16637-A-4	LCMPFCSU_00024	50 uL	1.00 mL		
320-16637-A-5	LCMPFCSU_00024	50 uL	1.00 mL		
320-16660-D-1	LCMPFCSU_00024	50 uL	1.00 mL		
320-16660-D-2	LCMPFCSU_00024	50 uL	1.00 mL		
320-16660-B-3	LCMPFCSU_00024	50 uL	1.00 mL		
320-16660-A-4	LCMPFCSU_00024	50 uL	1.00 mL		
320-16660-A-5	LCMPFCSU_00024	50 uL	1.00 mL		
320-16660-A-5 MS	LCMPFCSU_00024	50 uL	1.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-97259

Analyst: Arauz, Horacio J

Batch Open: 1/5/2016 8:39:10AM

Method Code: 320-3535_VWVT-320

Batch End:

320-16660-A-5 MS	LCPFCSU_00039	20 uL	1.00 mL	HSA 1-5-16	NEW 1-5-16
320-16660-B-5 MSD	LCMPFCSU_00024	50 uL	1.00 mL	↓	
320-16660-B-5 MSD	LCPFCSU_00039	20 uL	1.00 mL		
320-16660-A-6	LCMPFCSU_00024	50 uL	1.00 mL	↓	
320-16660-A-7	LCMPFCSU_00024	50 uL	1.00 mL		

Reagent	Other Reagents:	Amount/Units	Lot#:

Preparation Batch Number(s): 320-97259 Test: PFC-L

Earliest Holding Time: 1-5-16 / 1-6-16

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: 

Date: 1/05/15

2nd Level Reviewer: SNE

Date: 1/6/15

Comments: _____

Shipping and Receiving Documents

Chain of Custody Record

Client Information Client Contact: Mike Dryden Earth Toxics, Inc. Address: P.O. BOX 3382 City: Logan State, Zip: UT, 84321 Phone: [blank] Email: mdryden@earthtoxics.com Project Name: Ensafe-NWS - Earle, NJ PFC's Groundwater Site: 46 NWS Earle		Lab PM: Johnston, Michelle A E-Mail: michelle.johnston@testamericainc.com Camer Tracking Note: [blank]	
Client Information Sample: J.C. Maggiali + Top Pick Phone: 801-694-3957		COC No.: 280-48902-18075.1 Page: Page 1 of 2 Job #: [blank]	
Due Date Requested: [blank] TAT Requested (days): 7 day total PO #: [blank] Purchase Order Requested: [blank] SOW #: [blank]		Analysis Requested Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - TSP Dye J - Hydrolyzate K - U-Acetate L - Water M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - H2SO4 S - H2SO4 T - TSP Dye U - Acetate V - MCAA W - on 4-5 X - EDTA Y - EDA Z - other (specify): [blank]	
Sample Identification 46 MW01-1215 46 MW02-1215 46 MW03-1215 46 MW03-1215 X 46 MW04-1215 46 MW05-1215 FBI 13015		Matrix (W=water, S=solid, C=water, A=air) Sample Type (C=comp, G=grab) Sample Time Sample Date Preservation Code Field Filtered Sample (Yes or No) Performance/MS/MSD (Yes or No) DV-LC-0012 (PFOS, PFOA, PFNA, PFHS, PFHA & PFBS)	
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological Other Hazardable Requested: I, II, III, IV, Other (specify): [blank]		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return to Client <input type="checkbox"/> Dispose By Lab <input type="checkbox"/> Archive For [blank] Months Special Instructions/OC Requirements: [blank]	
Relinquished by: THOMAS DECK Relinquished on: 12/30/15 Relinquished by: [Signature]		Relinquished by: Ken Linn Relinquished on: 12/30/15 Relinquished by: [Signature]	
Relinquished by: [Signature] Relinquished on: 12/30/15		Relinquished by: [Signature] Relinquished on: 12/30/15	
Custody Seals Intact: A Yes Δ No Custody Seal No: [blank]		Method of Shipment: [blank] Date: 12/30/15 Date: 12/30/15 Date: 12/30/15	

12/1

RS 3.6/5.6°C

Login Sample Receipt Checklist

Client: Earth Toxics, Inc

Job Number: 320-16660-1

Login Number: 16660
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	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 $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



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: 320-16637-1 and 320-16660-1
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 potable water samples collected in December 2015 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 | Isotope dilution recoveries |
| * Sample receipt and preservation | Laboratory method blanks |
| * Holding times | Equipment rinsate blanks |
| * Initial calibration | * Field duplicate precision |
| * Initial calibration verification | Matrix spike/matrix spike duplicates (MS/MSDs) |
| * Continuing calibration verification | * Sample result transcriptions/recalculations |
| * Laboratory control sample/laboratory control sample duplicate results | |

Acceptable data parameters for which all criteria were met, as indicated above with an asterisk (*), are not discussed further.

Isotope Dilution Recoveries

The isotope dilution analytes consist of carbon-13 labeled analogs, oxygen-18 labeled analogs, or deuterated analogs of the compounds of interest, and they are spiked into every standard and sample at the time of extraction. This provides a correction for recovery of each corresponding native compound because the native compound and its labeled compound exhibit similar effects upon extraction, concentration, and analysis. By determining the ratio of these amounts, both the quantity and mass of the compound can be ascertained.

Sample 46MW02_1215 had an isotope dilution percent recovery (%R) for $^{13}\text{C}_4$ -PFOS of 156%, which was above the 25-150% control limit. However, no qualification was performed because isotope dilution recovery outliers are not anticipated to have adverse effects to data quality.

Blanks

Blanks help determine how much, if any, contamination was introduced in the laboratory or the field. All results associated with a particular laboratory blank were evaluated to determine whether there was an inherent variability in the data, or if a problem was an isolated occurrence that did not affect the data.

Laboratory method blanks were analyzed with samples to assess contamination imparted by sample preparation and/or analysis. All results associated with a particular laboratory blank were evaluated to determine whether there was an inherent variability in the data, or if a problem was an isolated occurrence that did not affect the data.

For this project equipment blanks were collected by transferring laboratory-supplied water over a cleaned sampling device to assess potential cross-contamination that could potentially affect the quality of the associated samples.

Laboratory Method Blank Outliers

Laboratory method blank MB 320-97259/1-A contained perfluorobutanesulfonic acid (PFBS) at a concentration of 1.01 nanograms per liter (ng/L). PFBS was detected below the limit of quantitation and was qualified as undetected "U" in the following samples due to laboratory blank contamination: PWSB2D_1215, 46MW03_1215, and 46MW03_1215X.

Equipment Blanks

EB123015 contained perfluorohexanesulfonic acid (PFHxS) and perfluorooctanesulfonic acid (PFOS) at concentrations of 2.5 ng/L and 3.9 ng/L; respectively. PFHxS in 46MW01_1215, 46MW04_1215, and PWSB2D_1215 and PFOS in 46MW04_1215 and PWSB2D_1215 were qualified as estimated, instead of undetected based on reviewer judgment and these results represent worst-case.

Matrix Spike/Matrix Spike Duplicates

MS/MSDs are generated to provide information about the effect of each sample matrix on the sample preparation and the measurement methodology. MS/MSD %Rs assess the effect of the sample matrix on the accuracy of the analytical results. %Rs above the laboratory control limit could indicate a potential high result bias while %Rs below QC limits could indicate a potential low result bias. The relative percent difference (RPD) between the MS and MSD results is evaluated to assess sample precision.



46MW04_1215 was spiked by the laboratory to assess accuracy and precision. PFHxS and PFOS had %Rs outside the control limits; however, since the native sample results were greater than four times the added spike amount, no qualification was performed.

Overall Assessment

The data from SDGs 320-16637-1 and 320-16660-1 were reviewed independently from the laboratory to assess data quality. PFBS was qualified as undetected in three samples due to suspected cross-contamination from laboratory sources. PFHxS and PFOS were qualified as estimated in several samples due to equipment blank outliers. The remaining results were acceptable without qualification; therefore, the data are usable for their intended purpose, according to U.S. Environmental Protection Agency and Department of Defense guidelines. Attachment B provides final results after data review.

Attachment A
Sample and Analysis Summary

Table A-1 Sample Summary					
Sample Delivery Group	Lab ID	Sample ID	Location	Sample Date	Matrix
320166371	320-16637-1	PWSB2_1215	PWSB2	12/29/2015	Potable Water
320166371	320-16637-2	PWSB2D_1215	PWSB2	12/29/2015	Duplicate of PWSB2_1215
320166371	320-16637-3	POSTTB2_1215	POSTTB2	12/29/2015	Potable Water
320166371	320-16637-4	PWSF1_1215	PWSF1	12/29/2015	Potable Water
320166371	320-16637-5	POSTTF1_1215	POSTTF1	12/29/2015	Potable Water
320166601	320-16660-1	46MW01_1215	46MW01	12/30/2015	Groundwater
320166601	320-16660-2	46MW02_1215	46MW02	12/30/2015	Groundwater
320166601	320-16660-3	46MW03_1215	46MW03	12/30/2015	Groundwater
320166601	320-16660-4	46MW03_1215X	46MW03	12/30/2015	Duplicate of 46MW03_1215
320166601	320-16660-5	46MW04_1215	46MW04	12/30/2015	Groundwater
320166601	320-16660-6	46MW05_1215	46MW05	12/30/2015	Groundwater
320166601	320-16660-7	EB123015		12/30/2015	Equipment Blank

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 – December 2015**

Sample Delivery Group				320166371			320166371			320166371		
Lab ID				320-16637-1			320-16637-2			320-16637-3		
Sample ID				PWSB2_1215			PWSB2D_1215			POSTTB2_1215		
Sample Date				12/29/2015			12/29/2015			12/29/2015		
Sample Type				Potable Water			Duplicate			Potable Water		
Method	Analyte	CAS No	Units	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
TA_WS-LC-0025	PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	ng/L	2.1	U		2.1	U	bl	1.8	U	
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	ng/L	2.1	U		1.8	J		1.8	U	
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	ng/L	2.1	U		1.9	J	bf	1.8	U	
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	ng/L	2.1	U		2.4	J		1.8	U	
TA_WS-LC-0025	PERFLUOROOCTANE SULFONIC ACID (PFOS)	1763-23-1	ng/L	3.2	U		1.7	J	bf	2.7	U	
TA_WS-LC-0025	PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	ng/L	2.1	U		2.3	J		1.8	U	

Sample Delivery Group				320166371			320166371			320166601		
Lab ID				320-16637-4			320-16637-5			320-16660-1		
Sample ID				PWSF1_1215			POSTTF1_1215			46MW01_1215		
Sample Date				12/29/2015			12/29/2015			12/30/2015		
Sample Type				Potable Water			Potable Water			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	2.1	U		1.8	U		2.1	U	
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	ng/L	2.1	U		1.8	U		2.1	U	
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	ng/L	2.1	U		1.8	U		1.5	J	bf
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	ng/L	2.1	U		1.8	U		2.1	U	
TA_WS-LC-0025	PERFLUOROOCTANE SULFONIC ACID (PFOS)	1763-23-1	ng/L	3.2	U		2.6	U		50		
TA_WS-LC-0025	PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	ng/L	2.1	U		1.8	U		2.1	U	

Table B-1 (Continued)
Perfluorinated Compound Results – December 2015

Sample Delivery Group				320166601			320166601			320166601		
Lab ID				320-16660-2			320-16660-3			320-16660-4		
Sample ID				46MW02_1215			46MW03_1215			46MW03_1215X		
Sample Date				12/30/2015			12/30/2015			12/30/2015		
Sample Type				Groundwater			Groundwater			Duplicate		
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			2.1	U	bl	1.8	U	bl
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	ng/L	8.3			2.1	U		1.8	U	
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	ng/L	320			46			37		
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	ng/L	4.5			2.1	U		1.8	U	
TA_WS-LC-0025	PERFLUOROOCCTANE SULFONIC ACID (PFOS)	1763-23-1	ng/L	1500			21			18		
TA_WS-LC-0025	PERFLUOROOCCTANOIC ACID (PFOA)	335-67-1	ng/L	29			2.1	U		1.8	U	

Sample Delivery Group				320166601			320166601			320166601		
Lab ID				320-16660-5			320-16660-6			320-16660-7		
Sample ID				46MW04_1215			46MW05_1215			EB123015		
Sample Date				12/30/2015			12/30/2015			12/30/2015		
Sample Type				Groundwater			Groundwater			Equipment Blank		
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	33			70			1.8	U	
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	ng/L	17			39			1.8	U	
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	ng/L	830	J	bf	1500			2.5		
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	ng/L	15			1	J		1.8	U	
TA_WS-LC-0025	PERFLUOROOCCTANE SULFONIC ACID (PFOS)	1763-23-1	ng/L	2800	J	bf	1900			3.9		
TA_WS-LC-0025	PERFLUOROOCCTANOIC ACID (PFOA)	335-67-1	ng/L	33			94			1.8	U	

Notes:

ng/L = Nanograms per liter

Qual = Final qualifier

RC = Data qualification reason code

U = **Undetected** — The parameter was analyzed but undetected or was qualified as undetected during data review due to blank artifacts.

J = **Estimated Value** — One or more quality control parameters were outside control limits or the analyte concentration was less than the limit of quantitation.

Qualification Reason Codes

bf = Result qualified as undetected due to field-derived blank results

bl = Result qualified as undetected due to laboratory blank results

