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LABORATORY DATA PACKAGE, 320-10459-1, NAS BRUNSWICK ME
12/12/2014
TEST AMERICA

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 320-10459-1

Job Description: NAS Brunswick Maine 13-CTO WE09

For:
Tetra Tech, Inc.
Foster Plaza VII
661 Anderson Drive
Pittsburgh, PA 15220

Attention: Jeff Orient

Approved for release.
Karen M Sellers
Project Manager II
12/12/2014 4:08 PM

Karen M Sellers, Project Manager II
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4442
karen.sellers@testamericainc.com
12/12/2014

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Qualifiers

LCMS

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation

Glossary

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

CASE NARRATIVE

Client: Tetra Tech, Inc.

Project: NAS Brunswick Maine 13-CTO WE09

Report Number: 320-10459-1

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.

TestAmerica West Sacramento attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the applicable methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

TestAmerica utilizes USEPA approved methods and DOD QSM, where applicable, in all analytical work. The samples presented in this report were analyzed for the parameter(s) listed on the analytical methods summary page in accordance with the method(s) indicated. A summary of QC data for these analyses is included at the back of the report.

All parameters for which TestAmerica West Sacramento has certification were evaluated to the QSM specified reporting convention or to the client specified format if different from QSM. Parameters not certified under QSM, if any, were evaluated to the detection limit (DL) and include qualified results where applicable.

The sample(s) that contain constituents flagged with U are undetected. The result associated with this flag is the limit of detection (LOD).

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.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 11/18/2014 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.5º C.

PFOA/PFOS

Method WS-LC-0025:

The following samples were re-extracted past the 7 day extraction hold time due to contamination in the method blank (MB) and laboratory control sample (LCS) for the original prep batch: B7/10-GW02 (320-10459-1), B7/10-GW03S (320-10459-2), B7/10-GW06S (320-10459-4), EFA-FD01-1014 (320-10459-6), H123-GW02 (320-10459-5), QR4-GW02 (320-10459-3). There is no prescribed regulatory holding time for PFOA and PFOS. The 7 day extraction holding time is based on general EPA convention for the holding time of extractable organic compounds in water.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 320-59712.

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

Detection Summary

Client: Tetra Tech, Inc.
Project/Site: NAS Brunswick Maine 13-CTO WE09

TestAmerica Job ID: 320-10459-1

Client Sample ID: B7/10-GW02 — Lab Sample ID: 320-10459-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	10	H	2.2	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	6.6	H	2.2	1.4	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: B7/10-GW03S — Lab Sample ID: 320-10459-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	2.0	J H	2.3	0.87	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: QR4-GW02 — Lab Sample ID: 320-10459-3

No Detections.

Client Sample ID: B7/10-GW06S — Lab Sample ID: 320-10459-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	20	H	2.2	0.84	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	2.2	H	2.2	1.4	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: H123-GW02 — Lab Sample ID: 320-10459-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	17	H	2.2	0.82	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: EFA-FD01-1014 — Lab Sample ID: 320-10459-6

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	16	H	2.2	0.84	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: B7/10-GW02 — Lab Sample ID: 320-10459-1

Date Collected: 11/15/14 12:05 — **Matrix: Water**
Date Received: 11/18/14 09:50

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	10	H	2.2	0.83	ng/L		12/03/14 13:38	12/04/14 20:45	1
Perfluorooctane Sulfonate (PFOS)	6.6	H	2.2	1.4	ng/L		12/03/14 13:38	12/04/14 20:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*116*		*25 - 150*	*12/03/14 13:38*	*12/04/14 20:45*	*1*
13C4 PFOA	*85*		*25 - 150*	*12/03/14 13:38*	*12/04/14 20:45*	*1*

Client Sample ID: B7/10-GW03S — Lab Sample ID: 320-10459-2

Date Collected: 11/15/14 15:20 — **Matrix: Water**
Date Received: 11/18/14 09:50

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	2.0	J H	2.3	0.87	ng/L		12/03/14 13:38	12/04/14 21:07	1
Perfluorooctane Sulfonate (PFOS)	1.8	U H	2.3	1.5	ng/L		12/03/14 13:38	12/04/14 21:07	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*108*		*25 - 150*	*12/03/14 13:38*	*12/04/14 21:07*	*1*
13C4 PFOA	*64*		*25 - 150*	*12/03/14 13:38*	*12/04/14 21:07*	*1*

Client Sample ID: QR4-GW02 — Lab Sample ID: 320-10459-3

Date Collected: 11/16/14 10:20 — **Matrix: Water**
Date Received: 11/18/14 09:50

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	1.8	U H	2.3	0.88	ng/L		12/03/14 13:38	12/04/14 21:28	1
Perfluorooctane Sulfonate (PFOS)	1.8	U H	2.3	1.5	ng/L		12/03/14 13:38	12/04/14 21:28	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*109*		*25 - 150*	*12/03/14 13:38*	*12/04/14 21:28*	*1*
13C4 PFOA	*90*		*25 - 150*	*12/03/14 13:38*	*12/04/14 21:28*	*1*

Client Sample ID: B7/10-GW06S — Lab Sample ID: 320-10459-4

Date Collected: 11/16/14 11:50 — **Matrix: Water**
Date Received: 11/18/14 09:50

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	20	H	2.2	0.84	ng/L		12/03/14 13:38	12/04/14 21:49	1
Perfluorooctane Sulfonate (PFOS)	2.2	H	2.2	1.4	ng/L		12/03/14 13:38	12/04/14 21:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*108*		*25 - 150*	*12/03/14 13:38*	*12/04/14 21:49*	*1*
13C4 PFOA	*67*		*25 - 150*	*12/03/14 13:38*	*12/04/14 21:49*	*1*

Client Sample ID: H123-GW02 — Lab Sample ID: 320-10459-5

Date Collected: 11/16/14 15:00 — **Matrix: Water**
Date Received: 11/18/14 09:50

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	17	H	2.2	0.82	ng/L		12/03/14 13:38	12/04/14 22:10	1

Client Sample ID: H123-GW02 — Lab Sample ID: 320-10459-5

Date Collected: 11/16/14 15:00 **Matrix: Water**
Date Received: 11/18/14 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonate (PFOS)	1.6	U H	2.2	1.4	ng/L		12/03/14 13:38	12/04/14 22:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*107*		*25 - 150*	*12/03/14 13:38*	*12/04/14 22:10*	*1*
13C4 PFOA	*89*		*25 - 150*	*12/03/14 13:38*	*12/04/14 22:10*	*1*

Client Sample ID: EFA-FD01-1014 — Lab Sample ID: 320-10459-6

Date Collected: 11/16/14 00:00 **Matrix: Water**
Date Received: 11/18/14 09:50

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**16**	**H**	2.2	0.84	ng/L		12/03/14 13:38	12/04/14 22:31	1
Perfluorooctane Sulfonate (PFOS)	1.7	U H	2.2	1.4	ng/L		12/03/14 13:38	12/04/14 22:31	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*109*		*25 - 150*	*12/03/14 13:38*	*12/04/14 22:31*	*1*
13C4 PFOA	*82*		*25 - 150*	*12/03/14 13:38*	*12/04/14 22:31*	*1*

Default Detection Limits

Client: Tetra Tech, Inc.
Project/Site: NAS Brunswick Maine 13-CTO WE09

TestAmerica Job ID: 320-10459-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	LOQ	DL	Units	Method
Perfluorooctane Sulfonate (PFOS)	2.0	1.3	ng/L	WS-LC-0025
Perfluorooctanoic acid (PFOA)	2.0	0.75	ng/L	WS-LC-0025

Isotope Dilution Summary

Client: Tetra Tech, Inc.
Project/Site: NAS Brunswick Maine 13-CTO WE09

TestAmerica Job ID: 320-10459-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

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

		Percent Isotope Dilution Recovery (Acceptance Limits)									
		13C4 PFOS	13C4 PFOA								
Lab Sample ID	Client Sample ID	(25-150)	(25-150)								
320-10459-1	B7/10-GW02	116	85								
320-10459-2	B7/10-GW03S	108	64								
320-10459-3	QR4-GW02	109	90								
320-10459-4	B7/10-GW06S	108	67								
320-10459-5	H123-GW02	107	89								
320-10459-6	EFA-FD01-1014	109	82								
LCS 320-59712/2-A	Lab Control Sample	101	98								
MB 320-59712/1-A	Method Blank	111	109								

Surrogate Legend

13C4 PFOS = 13C4 PFOS

13C4 PFOA = 13C4 PFOA

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-59712/1-A
Matrix: Water
Analysis Batch: 59779

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 59712

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.809	J	2.0	0.75	ng/L		12/03/14 13:38	12/04/14 20:03	1
Perfluorooctane Sulfonate (PFOS)	1.5	U	2.0	1.3	ng/L		12/03/14 13:38	12/04/14 20:03	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*111*		*25 - 150*	*12/03/14 13:38*	*12/04/14 20:03*	*1*
13C4 PFOA	*109*		*25 - 150*	*12/03/14 13:38*	*12/04/14 20:03*	*1*

Lab Sample ID: LCS 320-59712/2-A
Matrix: Water
Analysis Batch: 59779

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 59712

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA)	40.0	50.4		ng/L		126	60 - 140
Perfluorooctane Sulfonate (PFOS)	38.2	39.7		ng/L		104	60 - 140

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFOS	*101*		*25 - 150*
13C4 PFOA	*98*		*25 - 150*

LCMS

Prep Batch: 59712

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-10459-1	B7/10-GW02	Total/NA	Water	3535	
320-10459-2	B7/10-GW03S	Total/NA	Water	3535	
320-10459-3	QR4-GW02	Total/NA	Water	3535	
320-10459-4	B7/10-GW06S	Total/NA	Water	3535	
320-10459-5	H123-GW02	Total/NA	Water	3535	
320-10459-6	EFA-FD01-1014	Total/NA	Water	3535	
LCS 320-59712/2-A	Lab Control Sample	Total/NA	Water	3535	
MB 320-59712/1-A	Method Blank	Total/NA	Water	3535	

Analysis Batch: 59779

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-10459-1	B7/10-GW02	Total/NA	Water	WS-LC-0025	59712
320-10459-2	B7/10-GW03S	Total/NA	Water	WS-LC-0025	59712
320-10459-3	QR4-GW02	Total/NA	Water	WS-LC-0025	59712
320-10459-4	B7/10-GW06S	Total/NA	Water	WS-LC-0025	59712
320-10459-5	H123-GW02	Total/NA	Water	WS-LC-0025	59712
320-10459-6	EFA-FD01-1014	Total/NA	Water	WS-LC-0025	59712
LCS 320-59712/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	59712
MB 320-59712/1-A	Method Blank	Total/NA	Water	WS-LC-0025	59712

Client Sample ID: B7/10-GW02
Lab Sample ID: 320-10459-1

Date Collected: 11/15/14 12:05
Matrix: Water
Date Received: 11/18/14 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			59712	12/03/14 13:38	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	59779	12/04/14 20:45	JRB	TAL SAC

Client Sample ID: B7/10-GW03S
Lab Sample ID: 320-10459-2

Date Collected: 11/15/14 15:20
Matrix: Water
Date Received: 11/18/14 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			59712	12/03/14 13:38	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	59779	12/04/14 21:07	JRB	TAL SAC

Client Sample ID: QR4-GW02
Lab Sample ID: 320-10459-3

Date Collected: 11/16/14 10:20
Matrix: Water
Date Received: 11/18/14 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			59712	12/03/14 13:38	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	59779	12/04/14 21:28	JRB	TAL SAC

Client Sample ID: B7/10-GW06S
Lab Sample ID: 320-10459-4

Date Collected: 11/16/14 11:50
Matrix: Water
Date Received: 11/18/14 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			59712	12/03/14 13:38	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	59779	12/04/14 21:49	JRB	TAL SAC

Client Sample ID: H123-GW02
Lab Sample ID: 320-10459-5

Date Collected: 11/16/14 15:00
Matrix: Water
Date Received: 11/18/14 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			59712	12/03/14 13:38	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	59779	12/04/14 22:10	JRB	TAL SAC

Client Sample ID: EFA-FD01-1014
Lab Sample ID: 320-10459-6

Date Collected: 11/16/14 00:00
Matrix: Water
Date Received: 11/18/14 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			59712	12/03/14 13:38	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	59779	12/04/14 22:31	JRB	TAL SAC

Laboratory References:

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

Certification Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-10459-1
Project/Site: NAS Brunswick Maine 13-CTO WE09

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

Method Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-10459-1
Project/Site: NAS Brunswick Maine 13-CTO WE09

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: Tetra Tech, Inc.
TestAmerica Job ID: 320-10459-1
Project/Site: NAS Brunswick Maine 13-CTO WE09

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-10459-1	B7/10-GW02	Water	11/15/14 12:05	11/18/14 09:50
320-10459-2	B7/10-GW03S	Water	11/15/14 15:20	11/18/14 09:50
320-10459-3	QR4-GW02	Water	11/16/14 10:20	11/18/14 09:50
320-10459-4	B7/10-GW06S	Water	11/16/14 11:50	11/18/14 09:50
320-10459-5	H123-GW02	Water	11/16/14 15:00	11/18/14 09:50
320-10459-6	EFA-FD01-1014	Water	11/16/14 00:00	11/18/14 09:50

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFCSU_00010	01/20/15	09/09/14	Methanol, Lot 067374	25 mL	LCM2PFHxDA_00001	0.2 mL	13C2-PFHxDA	0.4 ug/mL
					LCM2PFTeDA_00001	0.2 mL	13C2-PFTeDA	0.4 ug/mL
					LCM4PFHPA_00001	0.2 mL	13C4-PFHpA	0.4 ug/mL
					LCM5PFPEA_00002	0.2 mL	13C5-PFPeA	0.4 ug/mL
					LCM8FOSA_00004	0.5 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00002	0.2 mL	13C4 PFBA	0.4 ug/mL
					LCMPFDA_00003	0.2 mL	13C2 PFDA	0.4 ug/mL
					LCMPFDoA_00002	0.2 mL	13C2 PFDoA	0.4 ug/mL
					LCMPFHxA_00004	0.2 mL	13C2 PFHxA	0.4 ug/mL
					LCMPFHxS_00002	0.2 mL	18O2 PFHxS	0.3784 ug/mL
					LCMPFNA_00002	0.2 mL	13C5 PFNA	0.4 ug/mL
					LCMPFOA_00005	0.5 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00006	0.5 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00003	0.2 mL	13C2 PFUnA	0.4 ug/mL
.LCM2PFHxDA_00001	11/29/15	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00001	11/29/15	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM4PFHPA_00001	01/20/15	Wellington Laboratories, Lot M4PFHpA0112			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00002	03/07/15	Wellington Laboratories, Lot M5PFPeA0312			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
.LCM8FOSA_00004	10/11/18	Wellington Laboratories, Lot M8FOSA1013M			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00002	08/13/15	Wellington Laboratories, Lot MPFBA0812			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFDA_00003	09/13/17	Wellington Laboratories, Lot MPFDA0912			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00002	03/26/15	Wellington Laboratories, Lot MPFDoA0312			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00004	02/14/18	Wellington Laboratories, Lot MPFHxA0213			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00002	03/08/15	Wellington Laboratories, Lot MPFHxS0312			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00002	09/13/15	Wellington Laboratories, Lot MPFNA0912			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00005	07/04/19	Wellington Laboratories, Lot MPFOA0614			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00006	03/10/19	Wellington Laboratories, Lot MPFOS0314			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00003	09/29/16	Wellington Laboratories, Lot MPFUdA0911			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC-L1_00005	01/15/15	11/06/14	MeOH/H2O, Lot 042259	5 mL	LCMPFCSU_00010	250 uL	13C2-PFHxDA	20 ng/mL
							13C2-PFTeDA	20 ng/mL
							13C4-PFHpA	20 ng/mL
							13C5-PFPeA	20 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	20 ng/mL
							13C2 PFDA	20 ng/mL
							13C2 PFDoA	20 ng/mL
							13C2 PFHxA	20 ng/mL
							18O2 PFHxS	18.92 ng/mL
							13C5 PFNA	20 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	20 ng/mL
					LCPFCSP_00014	2.5 uL	Perfluorobutyric acid	0.5 ng/mL
							Perfluorobutane Sulfonate	0.442 ng/mL
							Perfluorodecanoic acid	0.5 ng/mL
							Perfluorododecanoic acid	0.5 ng/mL

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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		
							PFDoS (Perflouro-1-dodecanesulfonate)	0.484 ng/mL
							Perfluorodecane Sulfonate	0.482 ng/mL
							Perfluoroheptanoic acid	0.5 ng/mL
							Perfluoroheptane Sulfonate	0.476 ng/mL
							Perfluorohexanoic acid	0.5 ng/mL
							Perfluorohexadecanoic acid	0.5 ng/mL
							Perfluorohexane Sulfonate	0.473 ng/mL
							Perfluorononanoic acid	0.5 ng/mL
							PFNS (Perflouro-1-nonanesulfonate)	0.48 ng/mL
							Perfluorooctanoic acid (PFOA)	0.5 ng/mL
							Perfluorooctandecanoic acid	0.5 ng/mL
							Perfluorooctane Sulfonate (PFOS)	0.478 ng/mL
							Perfluorooctane Sulfonamide	0.5 ng/mL
							Perfluoropentanoic acid	0.5 ng/mL
							PFPeS (Perflouro-1-pentanesulfonate)	0.469 ng/mL
							Perfluorotetradecanoic acid	0.5 ng/mL
							Perfluorotridecanoic acid	0.5 ng/mL
							Perfluoroundecanoic acid	0.5 ng/mL
.LCMPFCSU_00010	01/20/15	09/09/14	Methanol, Lot 067374	25 mL	LCM2PFHxDA_00001	0.2 mL	13C2-PFHxDA	0.4 ug/mL
					LCM2PFTeDA_00001	0.2 mL	13C2-PFTeDA	0.4 ug/mL
					LCM4PFHPA_00001	0.2 mL	13C4-PFHpA	0.4 ug/mL
					LCM5PFPEA_00002	0.2 mL	13C5-PFPeA	0.4 ug/mL
					LCM8FOSA_00004	0.5 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00002	0.2 mL	13C4 PFBA	0.4 ug/mL
					LCMPFDA_00003	0.2 mL	13C2 PFDA	0.4 ug/mL
					LCMPFDoA_00002	0.2 mL	13C2 PFDoA	0.4 ug/mL
					LCMPFHxA_00004	0.2 mL	13C2 PFHxA	0.4 ug/mL
					LCMPFHxS_00002	0.2 mL	18O2 PFHxS	0.3784 ug/mL
					LCMPFNA_00002	0.2 mL	13C5 PFNA	0.4 ug/mL
					LCMPFOA_00005	0.5 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00006	0.5 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00003	0.2 mL	13C2 PFUnA	0.4 ug/mL
..LCM2PFHxDA_00001	11/29/15	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00001	11/29/15	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00001	01/20/15	Wellington Laboratories, Lot M4PFHpA0112			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00002	03/07/15	Wellington Laboratories, Lot M5PFPeA0312			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00004	10/11/18	Wellington Laboratories, Lot M8FOSA1013M			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00002	08/13/15	Wellington Laboratories, Lot MPFBA0812			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00003	09/13/17	Wellington Laboratories, Lot MPFDA0912			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00002	03/26/15	Wellington Laboratories, Lot MPFDoA0312			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00004	02/14/18	Wellington Laboratories, Lot MPFHxA0213			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00002	03/08/15	Wellington Laboratories, Lot MPFHxS0312			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00002	09/13/15	Wellington Laboratories, Lot MPFNA0912			(Purchased Reagent)		13C5 PFNA	50 ug/mL

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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		
..LCMPFOA_00005	07/04/19	Wellington Laboratories, Lot MPFOA0614			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00006	03/10/19	Wellington Laboratories, Lot MPFOS0314			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00003	09/29/16	Wellington Laboratories, Lot MPFUdA0911			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00014	01/15/15	07/15/14	Methanol, Lot 042259	10 mL	LCPFBA_00002	0.2 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00002	0.2 mL	Perfluorobutane Sulfonate	0.884 ug/mL
					LCPFDA_00003	0.2 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.2 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDoS_00002	0.2 mL	PFDoS (Perflouro-1-dodecanesulfonate)	0.968 ug/mL
					LCPFDS_00002	0.2 mL	Perfluorodecane Sulfonate	0.964 ug/mL
					LCPFHpA_00002	0.2 mL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00004	0.2 mL	Perfluoroheptane Sulfonate	0.952 ug/mL
					LCPFHxA_00002	0.2 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00003	0.2 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS_00002	0.2 mL	Perfluorohexane Sulfonate	0.946 ug/mL
					LCPFNA_00002	0.2 mL	Perfluorononanoic acid	1 ug/mL
					LCPFNS_00001	0.2 mL	PFNS (Perflouro-1-nonanesulfonate)	0.96 ug/mL
					LCPFOA_00004	0.2 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00003	0.2 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00002	0.2 mL	Perfluorooctane Sulfonate (PFOS)	0.956 ug/mL
					LCPFOSA_00004	0.2 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.2 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFPeS_00001	0.2 mL	PFPeS (Perflouro-1-pentanesulfonate)	0.938 ug/mL
					LCPFTeDA_00002	0.2 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00002	0.2 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00002	0.2 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00002	02/22/15	Wellington Laboratories, Lot PFBA0212			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00002	06/21/15	Wellington Laboratories, Lot LPFBS0612			(Purchased Reagent)		Perfluorobutane Sulfonate	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_00002	10/06/16	Wellington Laboratories, Lot LPFDoS1011			(Purchased Reagent)		PFDoS (Perflouro-1-dodecanesulfonate)	48.4 ug/mL
..LCPFDS_00002	06/21/15	Wellington Laboratories, Lot LPFDS0612			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
..LCPFHpA_00002	04/18/15	Wellington Laboratories, Lot PFHpA0412			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
..LCPFHpS_00004	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
..LCPFHxA_00002	10/29/15	Wellington Laboratories, Lot PFHxA1012			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00003	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS_00002	03/27/15	Wellington Laboratories, Lot LPFHxS0312			(Purchased Reagent)		Perfluorohexane Sulfonate	47.3 ug/mL
..LCPFNA_00002	06/14/15	Wellington Laboratories, Lot PFNA0612			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
..LCPFNS_00001	07/04/15	Wellington Laboratories, Lot LPFNS0712			(Purchased Reagent)		PFNS (Perflouro-1-nonanesulfonate)	48 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00003	07/13/15	Wellington Laboratories, Lot PFHODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL

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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		
..LCPFOS_00002	03/26/15	Wellington Laboratories, Lot LPFOS0312			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	47.8 ug/mL
..LCPFOSA_00004	09/13/15	Wellington Laboratories, Lot FOSA0912M			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00001	06/21/15	Wellington Laboratories, Lot LPFPeS0712			(Purchased Reagent)		PFPeS (Perflouro-1-pentanesulfonate)	46.9 ug/mL
..LCPFTeDA_00002	03/07/15	Wellington Laboratories, Lot PFTeDA0312			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00002	03/26/15	Wellington Laboratories, Lot PFTrDA0312			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00002	03/19/15	Wellington Laboratories, Lot PFUdA0312			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L2_00005	01/15/15	11/06/14	MeOH/H2O, Lot 042259	5 mL	LCMPFCSU_00010	250 uL	13C2-PFHxDA	20 ng/mL
							13C2-PFTeDA	20 ng/mL
							13C4-PFHpA	20 ng/mL
							13C5-PFPeA	20 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	20 ng/mL
							13C2 PFDA	20 ng/mL
							13C2 PFDoA	20 ng/mL
							13C2 PFHxA	20 ng/mL
							18O2 PFHxS	18.92 ng/mL
							13C5 PFNA	20 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	20 ng/mL
					LCPFCSP_00014	5 uL	Perfluorobutyric acid	1 ng/mL
							Perfluorobutane Sulfonate	0.884 ng/mL
							Perfluorodecanoic acid	1 ng/mL
							Perfluorododecanoic acid	1 ng/mL
							PFDoS (Perflouro-1-dodecanesulfonate)	0.968 ng/mL
							Perfluorodecane Sulfonate	0.964 ng/mL
							Perfluoroheptanoic acid	1 ng/mL
							Perfluoroheptane Sulfonate	0.952 ng/mL
							Perfluorohexanoic acid	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
							Perfluorohexane Sulfonate	0.946 ng/mL
							Perfluorononanoic acid	1 ng/mL
							PFNS (Perflouro-1-nonanesulfonate)	0.96 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctandecanoic acid	1 ng/mL
							Perfluorooctane Sulfonate (PFOS)	0.956 ng/mL
							Perfluorooctane Sulfonamide	1 ng/mL
							Perfluoropentanoic acid	1 ng/mL
							PFPeS (Perflouro-1-pentanesulfonate)	0.938 ng/mL
							Perfluorotetradecanoic acid	1 ng/mL

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Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorotridecanoic acid	1 ng/mL
							Perfluoroundecanoic acid	1 ng/mL
.LCMPFCSU_00010	01/20/15	09/09/14	Methanol, Lot 067374	25 mL	LCM2PFHxDA_00001	0.2 mL	13C2-PFHxDA	0.4 ug/mL
					LCM2PFTeDA_00001	0.2 mL	13C2-PFTeDA	0.4 ug/mL
					LCM4PFHPA_00001	0.2 mL	13C4-PFHpA	0.4 ug/mL
					LCM5PFPEA_00002	0.2 mL	13C5-PFPeA	0.4 ug/mL
					LCM8FOSA_00004	0.5 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00002	0.2 mL	13C4 PFBA	0.4 ug/mL
					LCMPFDA_00003	0.2 mL	13C2 PFDA	0.4 ug/mL
					LCMPFDoA_00002	0.2 mL	13C2 PFDoA	0.4 ug/mL
					LCMPFHxA_00004	0.2 mL	13C2 PFHxA	0.4 ug/mL
					LCMPFHxS_00002	0.2 mL	18O2 PFHxS	0.3784 ug/mL
					LCMPFNA_00002	0.2 mL	13C5 PFNA	0.4 ug/mL
					LCMPFOA_00005	0.5 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00006	0.5 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00003	0.2 mL	13C2 PFUnA	0.4 ug/mL
..LCM2PFHxDA_00001	11/29/15	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00001	11/29/15	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00001	01/20/15	Wellington Laboratories, Lot M4PFHpA0112			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00002	03/07/15	Wellington Laboratories, Lot M5PFPeA0312			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00004	10/11/18	Wellington Laboratories, Lot M8FOSA1013M			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00002	08/13/15	Wellington Laboratories, Lot MPFBA0812			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00003	09/13/17	Wellington Laboratories, Lot MPFDA0912			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00002	03/26/15	Wellington Laboratories, Lot MPFDoA0312			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00004	02/14/18	Wellington Laboratories, Lot MPFHxA0213			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00002	03/08/15	Wellington Laboratories, Lot MPFHxS0312			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00002	09/13/15	Wellington Laboratories, Lot MPFNA0912			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00005	07/04/19	Wellington Laboratories, Lot MPFOA0614			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00006	03/10/19	Wellington Laboratories, Lot MPFOS0314			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00003	09/29/16	Wellington Laboratories, Lot MPFUdA0911			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00014	01/15/15	07/15/14	Methanol, Lot 042259	10 mL	LCPFBA_00002	0.2 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00002	0.2 mL	Perfluorobutane Sulfonate	0.884 ug/mL
					LCPFDA_00003	0.2 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.2 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDoS_00002	0.2 mL	PFDoS (Perflouro-1-dodecanesulfonate)	0.968 ug/mL
					LCPFDS_00002	0.2 mL	Perfluorodecane Sulfonate	0.964 ug/mL
					LCPFHpA_00002	0.2 mL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00004	0.2 mL	Perfluoroheptane Sulfonate	0.952 ug/mL
					LCPFHxA_00002	0.2 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00003	0.2 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS_00002	0.2 mL	Perfluorohexane Sulfonate	0.946 ug/mL
					LCPFNA_00002	0.2 mL	Perfluorononanoic acid	1 ug/mL
					LCPFNS_00001	0.2 mL	PFNS (Perflouro-1-nonanesulfonate)	0.96 ug/mL
					LCPFOA_00004	0.2 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00003	0.2 mL	Perfluorooctandecanoic acid	1 ug/mL

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Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFOS_00002	0.2 mL	Perfluorooctane Sulfonate (PFOS)	0.956 ug/mL
					LCPFOSA_00004	0.2 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.2 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFPeS_00001	0.2 mL	PFPeS (Perflouro-1-pentanesulfonate)	0.938 ug/mL
					LCPFTeDA_00002	0.2 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00002	0.2 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00002	0.2 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00002	02/22/15	Wellington Laboratories, Lot PFBA0212			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00002	06/21/15	Wellington Laboratories, Lot LPFBS0612			(Purchased Reagent)		Perfluorobutane Sulfonate	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_00002	10/06/16	Wellington Laboratories, Lot LPFDoS1011			(Purchased Reagent)		PFDoS (Perflouro-1-dodecanesulfonate)	48.4 ug/mL
..LCPFDS_00002	06/21/15	Wellington Laboratories, Lot LPFDS0612			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
..LCPFHpA_00002	04/18/15	Wellington Laboratories, Lot PFHpA0412			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
..LCPFHpS_00004	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
..LCPFHxA_00002	10/29/15	Wellington Laboratories, Lot PFHxA1012			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00003	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS_00002	03/27/15	Wellington Laboratories, Lot LPFHxS0312			(Purchased Reagent)		Perfluorohexane Sulfonate	47.3 ug/mL
..LCPFNA_00002	06/14/15	Wellington Laboratories, Lot PFNA0612			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
..LCPFNS_00001	07/04/15	Wellington Laboratories, Lot LPFNS0712			(Purchased Reagent)		PFNS (Perflouro-1-nonanesulfonate)	48 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00003	07/13/15	Wellington Laboratories, Lot PFHODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS_00002	03/26/15	Wellington Laboratories, Lot LPFOS0312			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	47.8 ug/mL
..LCPFOSA_00004	09/13/15	Wellington Laboratories, Lot FOSA0912M			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00001	06/21/15	Wellington Laboratories, Lot LPFPeS0712			(Purchased Reagent)		PFPeS (Perflouro-1-pentanesulfonate)	46.9 ug/mL
..LCPFTeDA_00002	03/07/15	Wellington Laboratories, Lot PFTeDA0312			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00002	03/26/15	Wellington Laboratories, Lot PFTrDA0312			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00002	03/19/15	Wellington Laboratories, Lot PFUdA0312			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L3_00005	01/15/15	11/06/14	MeOH/H2O, Lot 042259	5 mL	LCMPFCSU_00010	250 uL	13C2-PFHxDA	20 ng/mL
							13C2-PFTeDA	20 ng/mL
							13C4-PFHpA	20 ng/mL
							13C5-PFPeA	20 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	20 ng/mL
							13C2 PFDA	20 ng/mL
							13C2 PFDoA	20 ng/mL
							13C2 PFHxA	20 ng/mL
							18O2 PFHxS	18.92 ng/mL
							13C5 PFNA	20 ng/mL
							13C4 PFOA	50 ng/mL

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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		
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	20 ng/mL
					LCPFCSP_00014	25 uL	Perfluorobutyric acid	5 ng/mL
							Perfluorobutane Sulfonate	4.42 ng/mL
							Perfluorodecanoic acid	5 ng/mL
							Perfluorododecanoic acid	5 ng/mL
							PFDoS (Perflouro-1-dodecanesulfonate)	4.84 ng/mL
							Perfluorodecane Sulfonate	4.82 ng/mL
							Perfluoroheptanoic acid	5 ng/mL
							Perfluoroheptane Sulfonate	4.76 ng/mL
							Perfluorohexanoic acid	5 ng/mL
							Perfluorohexadecanoic acid	5 ng/mL
							Perfluorohexane Sulfonate	4.73 ng/mL
							Perfluorononanoic acid	5 ng/mL
							PFNS (Perflouro-1-nonanesulfonate)	4.8 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctandecanoic acid	5 ng/mL
							Perfluorooctane Sulfonate (PFOS)	4.78 ng/mL
							Perfluorooctane Sulfonamide	5 ng/mL
							Perfluoropentanoic acid	5 ng/mL
							PFPeS (Perflouro-1-pentanesulfonate)	4.69 ng/mL
							Perfluorotetradecanoic acid	5 ng/mL
							Perfluorotridecanoic acid	5 ng/mL
							Perfluoroundecanoic acid	5 ng/mL
.LCMPFCSU_00010	01/20/15	09/09/14	Methanol, Lot 067374	25 mL	LCM2PFHxDA_00001	0.2 mL	13C2-PFHxDA	0.4 ug/mL
					LCM2PFTeDA_00001	0.2 mL	13C2-PFTeDA	0.4 ug/mL
					LCM4PFHPA_00001	0.2 mL	13C4-PFHpA	0.4 ug/mL
					LCM5PFPEA_00002	0.2 mL	13C5-PFPeA	0.4 ug/mL
					LCM8FOSA_00004	0.5 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00002	0.2 mL	13C4 PFBA	0.4 ug/mL
					LCMPFDA_00003	0.2 mL	13C2 PFDA	0.4 ug/mL
					LCMPFDoA_00002	0.2 mL	13C2 PFDoA	0.4 ug/mL
					LCMPFHxA_00004	0.2 mL	13C2 PFHxA	0.4 ug/mL
					LCMPFHxS_00002	0.2 mL	18O2 PFHxS	0.3784 ug/mL
					LCMPFNA_00002	0.2 mL	13C5 PFNA	0.4 ug/mL
					LCMPFOA_00005	0.5 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00006	0.5 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00003	0.2 mL	13C2 PFUnA	0.4 ug/mL
..LCM2PFHxDA_00001	11/29/15	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00001	11/29/15	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00001	01/20/15	Wellington Laboratories, Lot M4PFHpA0112			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00002	03/07/15	Wellington Laboratories, Lot M5PFPeA0312			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00004	10/11/18	Wellington Laboratories, Lot M8FOSA1013M			(Purchased Reagent)		13C8 FOSA	50 ug/mL

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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		
..LCMPFBA_00002	08/13/15	Wellington Laboratories, Lot MPFBA0812			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00003	09/13/17	Wellington Laboratories, Lot MPFDA0912			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00002	03/26/15	Wellington Laboratories, Lot MPFDoA0312			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00004	02/14/18	Wellington Laboratories, Lot MPFHxA0213			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00002	03/08/15	Wellington Laboratories, Lot MPFHxS0312			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00002	09/13/15	Wellington Laboratories, Lot MPFNA0912			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00005	07/04/19	Wellington Laboratories, Lot MPFOA0614			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00006	03/10/19	Wellington Laboratories, Lot MPFOS0314			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00003	09/29/16	Wellington Laboratories, Lot MPFUdA0911			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00014	01/15/15	07/15/14	Methanol, Lot 042259	10 mL	LCPFBA_00002	0.2 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00002	0.2 mL	Perfluorobutane Sulfonate	0.884 ug/mL
					LCPFDA_00003	0.2 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.2 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDoS_00002	0.2 mL	PFDoS (Perflouro-1-dodecanesulfonate)	0.968 ug/mL
					LCPFDS_00002	0.2 mL	Perfluorodecane Sulfonate	0.964 ug/mL
					LCPFHpA_00002	0.2 mL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00004	0.2 mL	Perfluoroheptane Sulfonate	0.952 ug/mL
					LCPFHxA_00002	0.2 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00003	0.2 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS_00002	0.2 mL	Perfluorohexane Sulfonate	0.946 ug/mL
					LCPFNA_00002	0.2 mL	Perfluorononanoic acid	1 ug/mL
					LCPFNS_00001	0.2 mL	PFNS (Perflouro-1-nonanesulfonate)	0.96 ug/mL
					LCPFOA_00004	0.2 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00003	0.2 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00002	0.2 mL	Perfluorooctane Sulfonate (PFOS)	0.956 ug/mL
					LCPFOSA_00004	0.2 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.2 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFPeS_00001	0.2 mL	PFPeS (Perflouro-1-pentanesulfonate)	0.938 ug/mL
					LCPFTeDA_00002	0.2 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00002	0.2 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00002	0.2 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00002	02/22/15	Wellington Laboratories, Lot PFBA0212			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00002	06/21/15	Wellington Laboratories, Lot LPFBS0612			(Purchased Reagent)		Perfluorobutane Sulfonate	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_00002	10/06/16	Wellington Laboratories, Lot LPFDoS1011			(Purchased Reagent)		PFDoS (Perflouro-1-dodecanesulfonate)	48.4 ug/mL
..LCPFDS_00002	06/21/15	Wellington Laboratories, Lot LPFDS0612			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
..LCPFHpA_00002	04/18/15	Wellington Laboratories, Lot PFHpA0412			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
..LCPFHpS_00004	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
..LCPFHxA_00002	10/29/15	Wellington Laboratories, Lot PFHxA1012			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00003	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS_00002	03/27/15	Wellington Laboratories, Lot LPFHxS0312			(Purchased Reagent)		Perfluorohexane Sulfonate	47.3 ug/mL

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Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFNA_00002	06/14/15	Wellington Laboratories, Lot PFNA0612			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
..LCPFNS_00001	07/04/15	Wellington Laboratories, Lot LPFNS0712			(Purchased Reagent)		PFNS (Perflouro-1-nonanesulfonate)	48 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00003	07/13/15	Wellington Laboratories, Lot PFHODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS_00002	03/26/15	Wellington Laboratories, Lot LPFOS0312			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	47.8 ug/mL
..LCPFOSA_00004	09/13/15	Wellington Laboratories, Lot FOSA0912M			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00001	06/21/15	Wellington Laboratories, Lot LPFPeS0712			(Purchased Reagent)		PFPeS (Perflouro-1-pentanesulfonate)	46.9 ug/mL
..LCPFTeDA_00002	03/07/15	Wellington Laboratories, Lot PFTeDA0312			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00002	03/26/15	Wellington Laboratories, Lot PFTrDA0312			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00002	03/19/15	Wellington Laboratories, Lot PFUdA0312			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L4_00005	01/05/15	11/06/14	MeOH/H2O, Lot 042259	5 mL	LCMPFCSU_00010	250 uL	13C2-PFHxDA	20 ng/mL
							13C2-PFTeDA	20 ng/mL
							13C4-PFHpA	20 ng/mL
							13C5-PFPeA	20 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	20 ng/mL
							13C2 PFDA	20 ng/mL
							13C2 PFDoA	20 ng/mL
							13C2 PFHxA	20 ng/mL
							18O2 PFHxS	18.92 ng/mL
							13C5 PFNA	20 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	20 ng/mL
					LCPFCSP_00014	100 uL	Perfluorobutyric acid	20 ng/mL
							Perfluorobutane Sulfonate	17.68 ng/mL
							Perfluorodecanoic acid	20 ng/mL
							Perfluorododecanoic acid	20 ng/mL
							PFDoS (Perflouro-1-dodecanesulfonate)	19.36 ng/mL
							Perfluorodecane Sulfonate	19.28 ng/mL
							Perfluoroheptanoic acid	20 ng/mL
							Perfluoroheptane Sulfonate	19.04 ng/mL
							Perfluorohexanoic acid	20 ng/mL
							Perfluorohexadecanoic acid	20 ng/mL
							Perfluorohexane Sulfonate	18.92 ng/mL
							Perfluorononanoic acid	20 ng/mL
							PFNS (Perflouro-1-nonanesulfonate)	19.2 ng/mL
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctandecanoic acid	20 ng/mL
							Perfluorooctane Sulfonate (PFOS)	19.12 ng/mL

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Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctane Sulfonamide	20 ng/mL
							Perfluoropentanoic acid	20 ng/mL
							PFPeS (Perflouro-1-pentanesulfonate)	18.76 ng/mL
							Perfluorotetradecanoic acid	20 ng/mL
							Perfluorotridecanoic acid	20 ng/mL
							Perfluoroundecanoic acid	20 ng/mL
.LCMPFCSU_00010	01/20/15	09/09/14	Methanol, Lot 067374	25 mL	LCM2PFHxDA_00001	0.2 mL	13C2-PFHxDA	0.4 ug/mL
					LCM2PFTeDA_00001	0.2 mL	13C2-PFTeDA	0.4 ug/mL
					LCM4PFHPA_00001	0.2 mL	13C4-PFHpA	0.4 ug/mL
					LCM5PFPEA_00002	0.2 mL	13C5-PFPeA	0.4 ug/mL
					LCM8FOSA_00004	0.5 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00002	0.2 mL	13C4 PFBA	0.4 ug/mL
					LCMPFDA_00003	0.2 mL	13C2 PFDA	0.4 ug/mL
					LCMPFDoA_00002	0.2 mL	13C2 PFDoA	0.4 ug/mL
					LCMPFHxA_00004	0.2 mL	13C2 PFHxA	0.4 ug/mL
					LCMPFHxS_00002	0.2 mL	18O2 PFHxS	0.3784 ug/mL
					LCMPFNA_00002	0.2 mL	13C5 PFNA	0.4 ug/mL
					LCMPFOA_00005	0.5 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00006	0.5 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00003	0.2 mL	13C2 PFUnA	0.4 ug/mL
..LCM2PFHxDA_00001	11/29/15	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00001	11/29/15	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00001	01/20/15	Wellington Laboratories, Lot M4PFHpA0112			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00002	03/07/15	Wellington Laboratories, Lot M5PFPeA0312			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00004	10/11/18	Wellington Laboratories, Lot M8FOSA1013M			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00002	08/13/15	Wellington Laboratories, Lot MPFBA0812			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00003	09/13/17	Wellington Laboratories, Lot MPFDA0912			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00002	03/26/15	Wellington Laboratories, Lot MPFDoA0312			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00004	02/14/18	Wellington Laboratories, Lot MPFHxA0213			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00002	03/08/15	Wellington Laboratories, Lot MPFHxS0312			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00002	09/13/15	Wellington Laboratories, Lot MPFNA0912			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00005	07/04/19	Wellington Laboratories, Lot MPFOA0614			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00006	03/10/19	Wellington Laboratories, Lot MPFOS0314			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00003	09/29/16	Wellington Laboratories, Lot MPFUdA0911			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00014	01/15/15	07/15/14	Methanol, Lot 042259	10 mL	LCPFBA_00002	0.2 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00002	0.2 mL	Perfluorobutane Sulfonate	0.884 ug/mL
					LCPFDA_00003	0.2 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.2 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDoS_00002	0.2 mL	PFDoS (Perflouro-1-dodecanesulfonate)	0.968 ug/mL
					LCPFDS_00002	0.2 mL	Perfluorodecane Sulfonate	0.964 ug/mL
					LCPFHpA_00002	0.2 mL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00004	0.2 mL	Perfluoroheptane Sulfonate	0.952 ug/mL
					LCPFHxA_00002	0.2 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00003	0.2 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS_00002	0.2 mL	Perfluorohexane Sulfonate	0.946 ug/mL

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Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFNA_00002	0.2 mL	Perfluorononanoic acid	1 ug/mL
					LCPFNS_00001	0.2 mL	PFNS (Perflouro-1-nonanesulfonate)	0.96 ug/mL
					LCPFOA_00004	0.2 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00003	0.2 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00002	0.2 mL	Perfluorooctane Sulfonate (PFOS)	0.956 ug/mL
					LCPFOSA_00004	0.2 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.2 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFPeS_00001	0.2 mL	PFPeS (Perflouro-1-pentanesulfonate)	0.938 ug/mL
					LCPFTeDA_00002	0.2 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00002	0.2 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00002	0.2 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00002	02/22/15	Wellington Laboratories, Lot PFBA0212			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00002	06/21/15	Wellington Laboratories, Lot LPFBS0612			(Purchased Reagent)		Perfluorobutane Sulfonate	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_00002	10/06/16	Wellington Laboratories, Lot LPFDoS1011			(Purchased Reagent)		PFDoS (Perflouro-1-dodecanesulfonate)	48.4 ug/mL
..LCPFDS_00002	06/21/15	Wellington Laboratories, Lot LPFDS0612			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
..LCPFHpA_00002	04/18/15	Wellington Laboratories, Lot PFHpA0412			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
..LCPFHpS_00004	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
..LCPFHxA_00002	10/29/15	Wellington Laboratories, Lot PFHxA1012			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00003	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS_00002	03/27/15	Wellington Laboratories, Lot LPFHxS0312			(Purchased Reagent)		Perfluorohexane Sulfonate	47.3 ug/mL
..LCPFNA_00002	06/14/15	Wellington Laboratories, Lot PFNA0612			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
..LCPFNS_00001	07/04/15	Wellington Laboratories, Lot LPFNS0712			(Purchased Reagent)		PFNS (Perflouro-1-nonanesulfonate)	48 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00003	07/13/15	Wellington Laboratories, Lot PFHODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS_00002	03/26/15	Wellington Laboratories, Lot LPFOS0312			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	47.8 ug/mL
..LCPFOSA_00004	09/13/15	Wellington Laboratories, Lot FOSA0912M			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00001	06/21/15	Wellington Laboratories, Lot LPFPeS0712			(Purchased Reagent)		PFPeS (Perflouro-1-pentanesulfonate)	46.9 ug/mL
..LCPFTeDA_00002	03/07/15	Wellington Laboratories, Lot PFTeDA0312			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00002	03/26/15	Wellington Laboratories, Lot PFTrDA0312			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00002	03/19/15	Wellington Laboratories, Lot PFUdA0312			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L5_00006	01/15/15	11/06/14	MeOH/H2O, Lot 042259	5 mL	LCMPFCSU_00010	250 uL	13C2-PFHxDA	20 ng/mL
							13C2-PFTeDA	20 ng/mL
							13C4-PFHpA	20 ng/mL
							13C5-PFPeA	20 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	20 ng/mL
							13C2 PFDA	20 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2 PFDoA	20 ng/mL
							13C2 PFHxA	20 ng/mL
							18O2 PFHxS	18.92 ng/mL
							13C5 PFNA	20 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	20 ng/mL
					LCPFCSP_00014	250 uL	Perfluorobutyric acid	50 ng/mL
							Perfluorobutane Sulfonate	44.2 ng/mL
							Perfluorodecanoic acid	50 ng/mL
							Perfluorododecanoic acid	50 ng/mL
							PFDoS (Perflouro-1-dodecanesulfonate)	48.4 ng/mL
							Perfluorodecane Sulfonate	48.2 ng/mL
							Perfluoroheptanoic acid	50 ng/mL
							Perfluoroheptane Sulfonate	47.6 ng/mL
							Perfluorohexanoic acid	50 ng/mL
							Perfluorohexadecanoic acid	50 ng/mL
							Perfluorohexane Sulfonate	47.3 ng/mL
							Perfluorononanoic acid	50 ng/mL
							PFNS (Perflouro-1-nonanesulfonate)	48 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
							Perfluorooctandecanoic acid	50 ng/mL
							Perfluorooctane Sulfonate (PFOS)	47.8 ng/mL
							Perfluorooctane Sulfonamide	50 ng/mL
							Perfluoropentanoic acid	50 ng/mL
							PFPeS (Perflouro-1-pentanesulfonate)	46.9 ng/mL
							Perfluorotetradecanoic acid	50 ng/mL
							Perfluorotridecanoic acid	50 ng/mL
							Perfluoroundecanoic acid	50 ng/mL
.LCMPFCSU_00010	01/20/15	09/09/14	Methanol, Lot 067374	25 mL	LCM2PFHxDA_00001	0.2 mL	13C2-PFHxDA	0.4 ug/mL
					LCM2PFTeDA_00001	0.2 mL	13C2-PFTeDA	0.4 ug/mL
					LCM4PFHPA_00001	0.2 mL	13C4-PFHpA	0.4 ug/mL
					LCM5PFPEA_00002	0.2 mL	13C5-PFPeA	0.4 ug/mL
					LCM8FOSA_00004	0.5 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00002	0.2 mL	13C4 PFBA	0.4 ug/mL
					LCMPFDA_00003	0.2 mL	13C2 PFDA	0.4 ug/mL
					LCMPFDoA_00002	0.2 mL	13C2 PFDoA	0.4 ug/mL
					LCMPFHxA_00004	0.2 mL	13C2 PFHxA	0.4 ug/mL
					LCMPFHxS_00002	0.2 mL	18O2 PFHxS	0.3784 ug/mL
					LCMPFNA_00002	0.2 mL	13C5 PFNA	0.4 ug/mL
					LCMPFOA_00005	0.5 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00006	0.5 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00003	0.2 mL	13C2 PFUnA	0.4 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM2PFHxDA_00001	11/29/15	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00001	11/29/15	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00001	01/20/15	Wellington Laboratories, Lot M4PFHpA0112			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00002	03/07/15	Wellington Laboratories, Lot M5PFPeA0312			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00004	10/11/18	Wellington Laboratories, Lot M8FOSA1013M			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00002	08/13/15	Wellington Laboratories, Lot MPFBA0812			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00003	09/13/17	Wellington Laboratories, Lot MPFDA0912			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00002	03/26/15	Wellington Laboratories, Lot MPFDoA0312			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00004	02/14/18	Wellington Laboratories, Lot MPFHxA0213			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00002	03/08/15	Wellington Laboratories, Lot MPFHxS0312			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00002	09/13/15	Wellington Laboratories, Lot MPFNA0912			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00005	07/04/19	Wellington Laboratories, Lot MPFOA0614			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00006	03/10/19	Wellington Laboratories, Lot MPFOS0314			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00003	09/29/16	Wellington Laboratories, Lot MPFUdA0911			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00014	01/15/15	07/15/14	Methanol, Lot 042259	10 mL	LCPFBA_00002	0.2 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00002	0.2 mL	Perfluorobutane Sulfonate	0.884 ug/mL
					LCPFDA_00003	0.2 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.2 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDoS_00002	0.2 mL	PFDoS (Perflouro-1-dodecanesulfonate)	0.968 ug/mL
					LCPFDS_00002	0.2 mL	Perfluorodecane Sulfonate	0.964 ug/mL
					LCPFHpA_00002	0.2 mL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00004	0.2 mL	Perfluoroheptane Sulfonate	0.952 ug/mL
					LCPFHxA_00002	0.2 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00003	0.2 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS_00002	0.2 mL	Perfluorohexane Sulfonate	0.946 ug/mL
					LCPFNA_00002	0.2 mL	Perfluorononanoic acid	1 ug/mL
					LCPFNS_00001	0.2 mL	PFNS (Perflouro-1-nonanesulfonate)	0.96 ug/mL
					LCPFOA_00004	0.2 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00003	0.2 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00002	0.2 mL	Perfluorooctane Sulfonate (PFOS)	0.956 ug/mL
					LCPFOSA_00004	0.2 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.2 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFPeS_00001	0.2 mL	PFPeS (Perflouro-1-pentanesulfonate)	0.938 ug/mL
					LCPFTeDA_00002	0.2 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00002	0.2 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00002	0.2 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00002	02/22/15	Wellington Laboratories, Lot PFBA0212			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00002	06/21/15	Wellington Laboratories, Lot LPFBS0612			(Purchased Reagent)		Perfluorobutane Sulfonate	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_00002	10/06/16	Wellington Laboratories, Lot LPFDoS1011			(Purchased Reagent)		PFDoS (Perflouro-1-dodecanesulfonate)	48.4 ug/mL
..LCPFDS_00002	06/21/15	Wellington Laboratories, Lot LPFDS0612			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL

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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_00002	04/18/15	Wellington Laboratories, Lot PFHpA0412			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
..LCPFHpS_00004	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
..LCPFHxA_00002	10/29/15	Wellington Laboratories, Lot PFHxA1012			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00003	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS_00002	03/27/15	Wellington Laboratories, Lot LPFHxS0312			(Purchased Reagent)		Perfluorohexane Sulfonate	47.3 ug/mL
..LCPFNA_00002	06/14/15	Wellington Laboratories, Lot PFNA0612			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
..LCPFNS_00001	07/04/15	Wellington Laboratories, Lot LPFNS0712			(Purchased Reagent)		PFNS (Perflouro-1-nonanesulfonate)	48 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00003	07/13/15	Wellington Laboratories, Lot PFHODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS_00002	03/26/15	Wellington Laboratories, Lot LPFOS0312			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	47.8 ug/mL
..LCPFOSA_00004	09/13/15	Wellington Laboratories, Lot FOSA0912M			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00001	06/21/15	Wellington Laboratories, Lot LPFPeS0712			(Purchased Reagent)		PFPeS (Perflouro-1-pentanesulfonate)	46.9 ug/mL
..LCPFTeDA_00002	03/07/15	Wellington Laboratories, Lot PFTeDA0312			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00002	03/26/15	Wellington Laboratories, Lot PFTrDA0312			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00002	03/19/15	Wellington Laboratories, Lot PFUdA0312			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L6_00005	01/15/15	11/06/14	MeOH/H2O, Lot 042259	5 mL	LCMPFCSU_00010	250 uL	13C2-PFHxDA	20 ng/mL
							13C2-PFTeDA	20 ng/mL
							13C4-PFHpA	20 ng/mL
							13C5-PFPeA	20 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	20 ng/mL
							13C2 PFDA	20 ng/mL
							13C2 PFDoA	20 ng/mL
							13C2 PFHxA	20 ng/mL
							18O2 PFHxS	18.92 ng/mL
							13C5 PFNA	20 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	20 ng/mL
					LCPFCSP_00014	1000 uL	Perfluorobutyric acid	200 ng/mL
							Perfluorobutane Sulfonate	176.8 ng/mL
							Perfluorodecanoic acid	200 ng/mL
							Perfluorododecanoic acid	200 ng/mL
							PFDoS (Perflouro-1-dodecanesulfonate)	193.6 ng/mL
							Perfluorodecane Sulfonate	192.8 ng/mL
							Perfluoroheptanoic acid	200 ng/mL
							Perfluoroheptane Sulfonate	190.4 ng/mL
							Perfluorohexanoic acid	200 ng/mL
							Perfluorohexadecanoic acid	200 ng/mL
							Perfluorohexane Sulfonate	189.2 ng/mL
							Perfluorononanoic acid	200 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							PFNS (Perflouro-1-nonanesulfonate)	192 ng/mL
							Perfluorooctanoic acid (PFOA)	200 ng/mL
							Perfluorooctandecanoic acid	200 ng/mL
							Perfluorooctane Sulfonate (PFOS)	191.2 ng/mL
							Perfluorooctane Sulfonamide	200 ng/mL
							Perfluoropentanoic acid	200 ng/mL
							PFPeS (Perflouro-1-pentanesulfonate)	187.6 ng/mL
							Perfluorotetradecanoic acid	200 ng/mL
							Perfluorotridecanoic acid	200 ng/mL
							Perfluoroundecanoic acid	200 ng/mL
.LCMPFCSU_00010	01/20/15	09/09/14	Methanol, Lot 067374	25 mL	LCM2PFHxDA_00001	0.2 mL	13C2-PFHxDA	0.4 ug/mL
					LCM2PFTeDA_00001	0.2 mL	13C2-PFTeDA	0.4 ug/mL
					LCM4PFHPA_00001	0.2 mL	13C4-PFHpA	0.4 ug/mL
					LCM5PFPEA_00002	0.2 mL	13C5-PFPeA	0.4 ug/mL
					LCM8FOSA_00004	0.5 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00002	0.2 mL	13C4 PFBA	0.4 ug/mL
					LCMPFDA_00003	0.2 mL	13C2 PFDA	0.4 ug/mL
					LCMPFDoA_00002	0.2 mL	13C2 PFDoA	0.4 ug/mL
					LCMPFHxA_00004	0.2 mL	13C2 PFHxA	0.4 ug/mL
					LCMPFHxS_00002	0.2 mL	18O2 PFHxS	0.3784 ug/mL
					LCMPFNA_00002	0.2 mL	13C5 PFNA	0.4 ug/mL
					LCMPFOA_00005	0.5 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00006	0.5 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00003	0.2 mL	13C2 PFUnA	0.4 ug/mL
..LCM2PFHxDA_00001	11/29/15	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00001	11/29/15	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00001	01/20/15	Wellington Laboratories, Lot M4PFHpA0112			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00002	03/07/15	Wellington Laboratories, Lot M5PFPeA0312			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00004	10/11/18	Wellington Laboratories, Lot M8FOSA1013M			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00002	08/13/15	Wellington Laboratories, Lot MPFBA0812			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00003	09/13/17	Wellington Laboratories, Lot MPFDA0912			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00002	03/26/15	Wellington Laboratories, Lot MPFDoA0312			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00004	02/14/18	Wellington Laboratories, Lot MPFHxA0213			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00002	03/08/15	Wellington Laboratories, Lot MPFHxS0312			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00002	09/13/15	Wellington Laboratories, Lot MPFNA0912			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00005	07/04/19	Wellington Laboratories, Lot MPFOA0614			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00006	03/10/19	Wellington Laboratories, Lot MPFOS0314			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00003	09/29/16	Wellington Laboratories, Lot MPFUdA0911			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00014	01/15/15	07/15/14	Methanol, Lot 042259	10 mL	LCPFBA_00002	0.2 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00002	0.2 mL	Perfluorobutane Sulfonate	0.884 ug/mL
					LCPFDA_00003	0.2 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.2 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDoS_00002	0.2 mL	PFDoS (Perflouro-1-dodecanesulfonate)	0.968 ug/mL

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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		
					LCPFDS_00002	0.2 mL	Perfluorodecane Sulfonate	0.964 ug/mL
					LCPFHpA_00002	0.2 mL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00004	0.2 mL	Perfluoroheptane Sulfonate	0.952 ug/mL
					LCPFHxA_00002	0.2 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00003	0.2 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS_00002	0.2 mL	Perfluorohexane Sulfonate	0.946 ug/mL
					LCPFNA_00002	0.2 mL	Perfluorononanoic acid	1 ug/mL
					LCPFNS_00001	0.2 mL	PFNS (Perflouro-1-nonanesulfonate)	0.96 ug/mL
					LCPFOA_00004	0.2 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00003	0.2 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00002	0.2 mL	Perfluorooctane Sulfonate (PFOS)	0.956 ug/mL
					LCPFOSA_00004	0.2 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.2 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFPeS_00001	0.2 mL	PFPeS (Perflouro-1-pentanesulfonate)	0.938 ug/mL
					LCPFTeDA_00002	0.2 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00002	0.2 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00002	0.2 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00002	02/22/15	Wellington Laboratories, Lot PFBA0212			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00002	06/21/15	Wellington Laboratories, Lot LPFBS0612			(Purchased Reagent)		Perfluorobutane Sulfonate	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_00002	10/06/16	Wellington Laboratories, Lot LPFDoS1011			(Purchased Reagent)		PFDoS (Perflouro-1-dodecanesulfonate)	48.4 ug/mL
..LCPFDS_00002	06/21/15	Wellington Laboratories, Lot LPFDS0612			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
..LCPFHpA_00002	04/18/15	Wellington Laboratories, Lot PFHpA0412			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
..LCPFHpS_00004	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
..LCPFHxA_00002	10/29/15	Wellington Laboratories, Lot PFHxA1012			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00003	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS_00002	03/27/15	Wellington Laboratories, Lot LPFHxS0312			(Purchased Reagent)		Perfluorohexane Sulfonate	47.3 ug/mL
..LCPFNA_00002	06/14/15	Wellington Laboratories, Lot PFNA0612			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
..LCPFNS_00001	07/04/15	Wellington Laboratories, Lot LPFNS0712			(Purchased Reagent)		PFNS (Perflouro-1-nonanesulfonate)	48 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00003	07/13/15	Wellington Laboratories, Lot PFHODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS_00002	03/26/15	Wellington Laboratories, Lot LPFOS0312			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	47.8 ug/mL
..LCPFOSA_00004	09/13/15	Wellington Laboratories, Lot FOSA0912M			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00001	06/21/15	Wellington Laboratories, Lot LPFPeS0712			(Purchased Reagent)		PFPeS (Perflouro-1-pentanesulfonate)	46.9 ug/mL
..LCPFTeDA_00002	03/07/15	Wellington Laboratories, Lot PFTeDA0312			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00002	03/26/15	Wellington Laboratories, Lot PFTrDA0312			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00002	03/19/15	Wellington Laboratories, Lot PFUdA0312			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L7_00005	01/15/15	11/06/14	MeOH/H2O, Lot 042259	5 mL	LCMPFCSU_00010	250 uL	13C2-PFHxDA	20 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2-PFTeDA	20 ng/mL
							13C4-PFHpA	20 ng/mL
							13C5-PFPeA	20 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	20 ng/mL
							13C2 PFDA	20 ng/mL
							13C2 PFDoA	20 ng/mL
							13C2 PFHxA	20 ng/mL
							18O2 PFHxS	18.92 ng/mL
							13C5 PFNA	20 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	20 ng/mL
					LCPFCSP_00014	2500 uL	Perfluorobutyric acid	500 ng/mL
							Perfluorobutane Sulfonate	442 ng/mL
							Perfluorodecanoic acid	500 ng/mL
							Perfluorododecanoic acid	500 ng/mL
							PFDoS (Perflouro-1-dodecanesulfonate)	484 ng/mL
							Perfluorodecane Sulfonate	482 ng/mL
							Perfluoroheptanoic acid	500 ng/mL
							Perfluoroheptane Sulfonate	476 ng/mL
							Perfluorohexanoic acid	500 ng/mL
							Perfluorohexadecanoic acid	500 ng/mL
							Perfluorohexane Sulfonate	473 ng/mL
							Perfluorononanoic acid	500 ng/mL
							PFNS (Perflouro-1-nonanesulfonate)	480 ng/mL
							Perfluorooctanoic acid (PFOA)	500 ng/mL
							Perfluorooctandecanoic acid	500 ng/mL
							Perfluorooctane Sulfonate (PFOS)	478 ng/mL
							Perfluorooctane Sulfonamide	500 ng/mL
							Perfluoropentanoic acid	500 ng/mL
							PFPeS (Perflouro-1-pentanesulfonate)	469 ng/mL
							Perfluorotetradecanoic acid	500 ng/mL
							Perfluorotridecanoic acid	500 ng/mL
							Perfluoroundecanoic acid	500 ng/mL
.LCMPFCSU_00010	01/20/15	09/09/14	Methanol, Lot 067374	25 mL	LCM2PFHxDA_00001	0.2 mL	13C2-PFHxDA	0.4 ug/mL
					LCM2PFTeDA_00001	0.2 mL	13C2-PFTeDA	0.4 ug/mL
					LCM4PFHPA_00001	0.2 mL	13C4-PFHpA	0.4 ug/mL
					LCM5PFPEA_00002	0.2 mL	13C5-PFPeA	0.4 ug/mL
					LCM8FOSA_00004	0.5 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00002	0.2 mL	13C4 PFBA	0.4 ug/mL
					LCMPFDA_00003	0.2 mL	13C2 PFDA	0.4 ug/mL
					LCMPFDoA_00002	0.2 mL	13C2 PFDoA	0.4 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxA_00004	0.2 mL	13C2 PFHxA	0.4 ug/mL
					LCMPFHxS_00002	0.2 mL	18O2 PFHxS	0.3784 ug/mL
					LCMPFNA_00002	0.2 mL	13C5 PFNA	0.4 ug/mL
					LCMPFOA_00005	0.5 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00006	0.5 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00003	0.2 mL	13C2 PFUnA	0.4 ug/mL
..LCM2PFHxDA_00001	11/29/15	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00001	11/29/15	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00001	01/20/15	Wellington Laboratories, Lot M4PFHpA0112			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00002	03/07/15	Wellington Laboratories, Lot M5PFPeA0312			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00004	10/11/18	Wellington Laboratories, Lot M8FOSA1013M			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00002	08/13/15	Wellington Laboratories, Lot MPFBA0812			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00003	09/13/17	Wellington Laboratories, Lot MPFDA0912			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00002	03/26/15	Wellington Laboratories, Lot MPFDoA0312			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00004	02/14/18	Wellington Laboratories, Lot MPFHxA0213			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00002	03/08/15	Wellington Laboratories, Lot MPFHxS0312			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00002	09/13/15	Wellington Laboratories, Lot MPFNA0912			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00005	07/04/19	Wellington Laboratories, Lot MPFOA0614			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00006	03/10/19	Wellington Laboratories, Lot MPFOS0314			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00003	09/29/16	Wellington Laboratories, Lot MPFUdA0911			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00014	01/15/15	07/15/14	Methanol, Lot 042259	10 mL	LCPFBA_00002	0.2 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00002	0.2 mL	Perfluorobutane Sulfonate	0.884 ug/mL
					LCPFDA_00003	0.2 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.2 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDoS_00002	0.2 mL	PFDoS (Perflouro-1-dodecanesulfonate)	0.968 ug/mL
					LCPFDS_00002	0.2 mL	Perfluorodecane Sulfonate	0.964 ug/mL
					LCPFHpA_00002	0.2 mL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00004	0.2 mL	Perfluoroheptane Sulfonate	0.952 ug/mL
					LCPFHxA_00002	0.2 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00003	0.2 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS_00002	0.2 mL	Perfluorohexane Sulfonate	0.946 ug/mL
					LCPFNA_00002	0.2 mL	Perfluorononanoic acid	1 ug/mL
					LCPFNS_00001	0.2 mL	PFNS (Perflouro-1-nonanesulfonate)	0.96 ug/mL
					LCPFOA_00004	0.2 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00003	0.2 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00002	0.2 mL	Perfluorooctane Sulfonate (PFOS)	0.956 ug/mL
					LCPFOSA_00004	0.2 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.2 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFPeS_00001	0.2 mL	PFPeS (Perflouro-1-pentanesulfonate)	0.938 ug/mL
					LCPFTeDA_00002	0.2 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00002	0.2 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00002	0.2 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00002	02/22/15	Wellington Laboratories, Lot PFBA0212			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFBS_00002	06/21/15	Wellington Laboratories, Lot LPFBS0612			(Purchased Reagent)		Perfluorobutane Sulfonate	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_00002	10/06/16	Wellington Laboratories, Lot LPFDoS1011			(Purchased Reagent)		PFDoS (Perflouro-1-dodecanesulfonate)	48.4 ug/mL
..LCPFDS_00002	06/21/15	Wellington Laboratories, Lot LPFDS0612			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
..LCPFHpA_00002	04/18/15	Wellington Laboratories, Lot PFHpA0412			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
..LCPFHpS_00004	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
..LCPFHxA_00002	10/29/15	Wellington Laboratories, Lot PFHxA1012			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00003	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS_00002	03/27/15	Wellington Laboratories, Lot LPFHxS0312			(Purchased Reagent)		Perfluorohexane Sulfonate	47.3 ug/mL
..LCPFNA_00002	06/14/15	Wellington Laboratories, Lot PFNA0612			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
..LCPFNS_00001	07/04/15	Wellington Laboratories, Lot LPFNS0712			(Purchased Reagent)		PFNS (Perflouro-1-nonanesulfonate)	48 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00003	07/13/15	Wellington Laboratories, Lot PFHODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS_00002	03/26/15	Wellington Laboratories, Lot LPFOS0312			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	47.8 ug/mL
..LCPFOSA_00004	09/13/15	Wellington Laboratories, Lot FOSA0912M			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFPeS_00001	06/21/15	Wellington Laboratories, Lot LPFPeS0712			(Purchased Reagent)		PFPeS (Perflouro-1-pentanesulfonate)	46.9 ug/mL
..LCPFTeDA_00002	03/07/15	Wellington Laboratories, Lot PFTeDA0312			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00002	03/26/15	Wellington Laboratories, Lot PFTrDA0312			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00002	03/19/15	Wellington Laboratories, Lot PFUdA0312			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFCIC_00005	01/20/15	11/06/14	MeOH/H2O, Lot 042259	5 mL	LCMPFCSU_00010	250 uL	13C2-PFHxDA	20 ng/mL
							13C2-PFTeDA	20 ng/mL
							13C4-PFHpA	20 ng/mL
							13C5-PFPeA	20 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	20 ng/mL
							13C2 PFDA	20 ng/mL
							13C2 PFDoA	20 ng/mL
							13C2 PFHxA	20 ng/mL
							18O2 PFHxS	18.92 ng/mL
							13C5 PFNA	20 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	20 ng/mL
					LCPFACMXB_00002	125 uL	Perfluorooctane Sulfonate (PFOS)	47.75 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
.LCMPFCSU_00010	01/20/15	09/09/14	Methanol, Lot 067374	25 mL	LCM2PFHxDA_00001	0.2 mL	13C2-PFHxDA	0.4 ug/mL
					LCM2PFTeDA_00001	0.2 mL	13C2-PFTeDA	0.4 ug/mL
					LCM4PFHPA_00001	0.2 mL	13C4-PFHpA	0.4 ug/mL
					LCM5PFPEA_00002	0.2 mL	13C5-PFPeA	0.4 ug/mL
					LCM8FOSA_00004	0.5 mL	13C8 FOSA	1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFBA_00002	0.2 mL	13C4 PFBA	0.4 ug/mL
					LCMPFDA_00003	0.2 mL	13C2 PFDA	0.4 ug/mL
					LCMPFDoA_00002	0.2 mL	13C2 PFDoA	0.4 ug/mL
					LCMPFHxA_00004	0.2 mL	13C2 PFHxA	0.4 ug/mL
					LCMPFHxS_00002	0.2 mL	18O2 PFHxS	0.3784 ug/mL
					LCMPFNA_00002	0.2 mL	13C5 PFNA	0.4 ug/mL
					LCMPFOA_00005	0.5 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00006	0.5 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00003	0.2 mL	13C2 PFUnA	0.4 ug/mL
..LCM2PFHxDA_00001	11/29/15	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00001	11/29/15	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00001	01/20/15	Wellington Laboratories, Lot M4PFHpA0112			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00002	03/07/15	Wellington Laboratories, Lot M5PFPeA0312			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00004	10/11/18	Wellington Laboratories, Lot M8FOSA1013M			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00002	08/13/15	Wellington Laboratories, Lot MPFBA0812			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00003	09/13/17	Wellington Laboratories, Lot MPFDA0912			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00002	03/26/15	Wellington Laboratories, Lot MPFDoA0312			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00004	02/14/18	Wellington Laboratories, Lot MPFHxA0213			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00002	03/08/15	Wellington Laboratories, Lot MPFHxS0312			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00002	09/13/15	Wellington Laboratories, Lot MPFNA0912			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00005	07/04/19	Wellington Laboratories, Lot MPFOA0614			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00006	03/10/19	Wellington Laboratories, Lot MPFOS0314			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00003	09/29/16	Wellington Laboratories, Lot MPFUdA0911			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFACMXB_00002	03/08/15	Wellington Laboratories, Lot PFACMXB0312			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	1.91 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
LCPFCSP_00014	01/15/15	07/15/14	Methanol, Lot 042259	10 mL	LCPFBA_00002	0.2 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00002	0.2 mL	Perfluorobutane Sulfonate	0.884 ug/mL
					LCPFDA_00003	0.2 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.2 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDoS_00002	0.2 mL	PFDoS (Perflouro-1-dodecanesulfonate)	0.968 ug/mL
					LCPFDS_00002	0.2 mL	Perfluorodecane Sulfonate	0.964 ug/mL
					LCPFHpA_00002	0.2 mL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00004	0.2 mL	Perfluoroheptane Sulfonate	0.952 ug/mL
					LCPFHxA_00002	0.2 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00003	0.2 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS_00002	0.2 mL	Perfluorohexane Sulfonate	0.946 ug/mL
					LCPFNA_00002	0.2 mL	Perfluorononanoic acid	1 ug/mL
					LCPFNS_00001	0.2 mL	PFNS (Perflouro-1-nonanesulfonate)	0.96 ug/mL
					LCPFOA_00004	0.2 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00003	0.2 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00002	0.2 mL	Perfluorooctane Sulfonate (PFOS)	0.956 ug/mL
					LCPFOSA_00004	0.2 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.2 mL	Perfluoropentanoic acid	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFPeS_00001	0.2 mL	PFPeS (Perflouro-1-pentanesulfonate)	0.938 ug/mL
					LCPFTeDA_00002	0.2 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00002	0.2 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00002	0.2 mL	Perfluoroundecanoic acid	1 ug/mL
.LCPFBA_00002	02/22/15	Wellington Laboratories, Lot PFBA0212			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
.LCPFBS_00002	06/21/15	Wellington Laboratories, Lot LPFBS0612			(Purchased Reagent)		Perfluorobutane Sulfonate	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_00002	10/06/16	Wellington Laboratories, Lot LPFDoS1011			(Purchased Reagent)		PFDoS (Perflouro-1-dodecanesulfonate)	48.4 ug/mL
.LCPFDS_00002	06/21/15	Wellington Laboratories, Lot LPFDS0612			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
.LCPFHpA_00002	04/18/15	Wellington Laboratories, Lot PFHpA0412			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
.LCPFHpS_00004	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
.LCPFHxA_00002	10/29/15	Wellington Laboratories, Lot PFHxA1012			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
.LCPFHxDA_00003	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS_00002	03/27/15	Wellington Laboratories, Lot LPFHxS0312			(Purchased Reagent)		Perfluorohexane Sulfonate	47.3 ug/mL
.LCPFNA_00002	06/14/15	Wellington Laboratories, Lot PFNA0612			(Purchased Reagent)		Perfluorononanoic acid	50 ug/mL
.LCPFNS_00001	07/04/15	Wellington Laboratories, Lot LPFNS0712			(Purchased Reagent)		PFNS (Perflouro-1-nonanesulfonate)	48 ug/mL
.LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00003	07/13/15	Wellington Laboratories, Lot PFHODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
.LCPFOS_00002	03/26/15	Wellington Laboratories, Lot LPFOS0312			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	47.8 ug/mL
.LCPFOSA_00004	09/13/15	Wellington Laboratories, Lot FOSA0912M			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
.LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
.LCPFPeS_00001	06/21/15	Wellington Laboratories, Lot LPFPeS0712			(Purchased Reagent)		PFPeS (Perflouro-1-pentanesulfonate)	46.9 ug/mL
.LCPFTeDA_00002	03/07/15	Wellington Laboratories, Lot PFTeDA0312			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
.LCPFTrDA_00002	03/26/15	Wellington Laboratories, Lot PFTrDA0312			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
.LCPFUdA_00002	03/19/15	Wellington Laboratories, Lot PFUdA0312			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL

Reagent

LCM2PFHxDA_00001

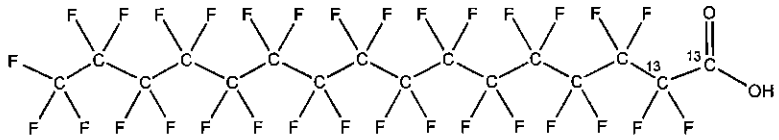
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

12-19-12 New pdf

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

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{14}HF_{31}O_2$	**MOLECULAR WEIGHT:**	816.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/29/2012		
EXPIRY DATE: (mm/dd/yyyy)	11/29/2015		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/05/2012 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

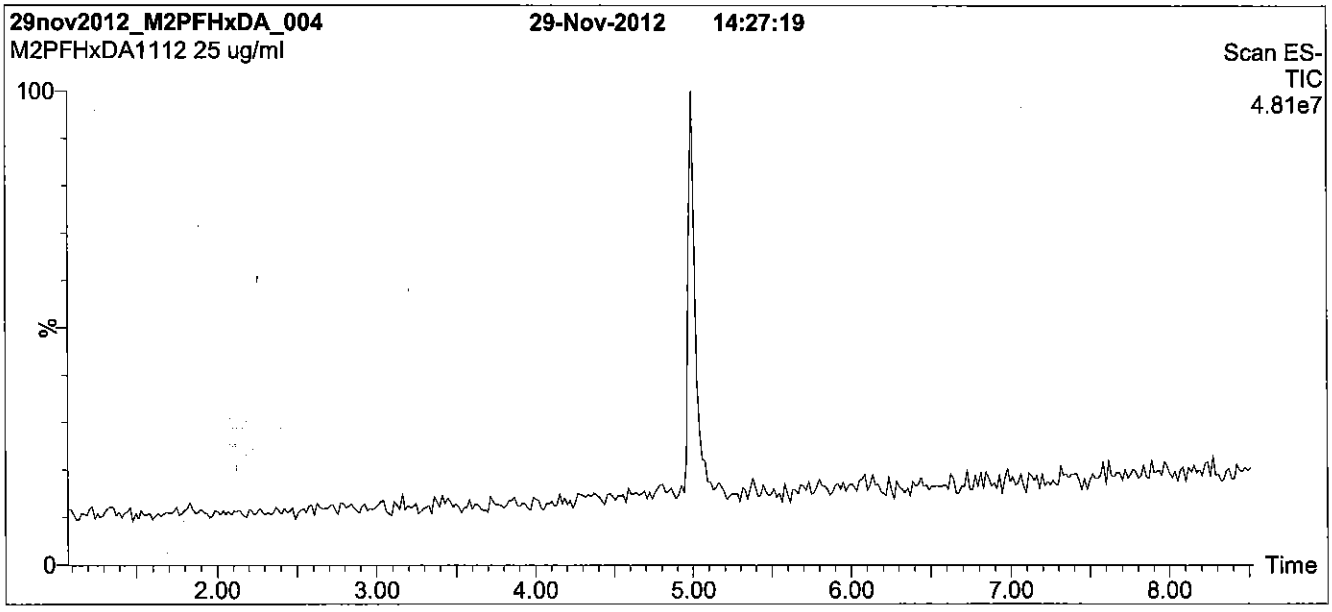
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

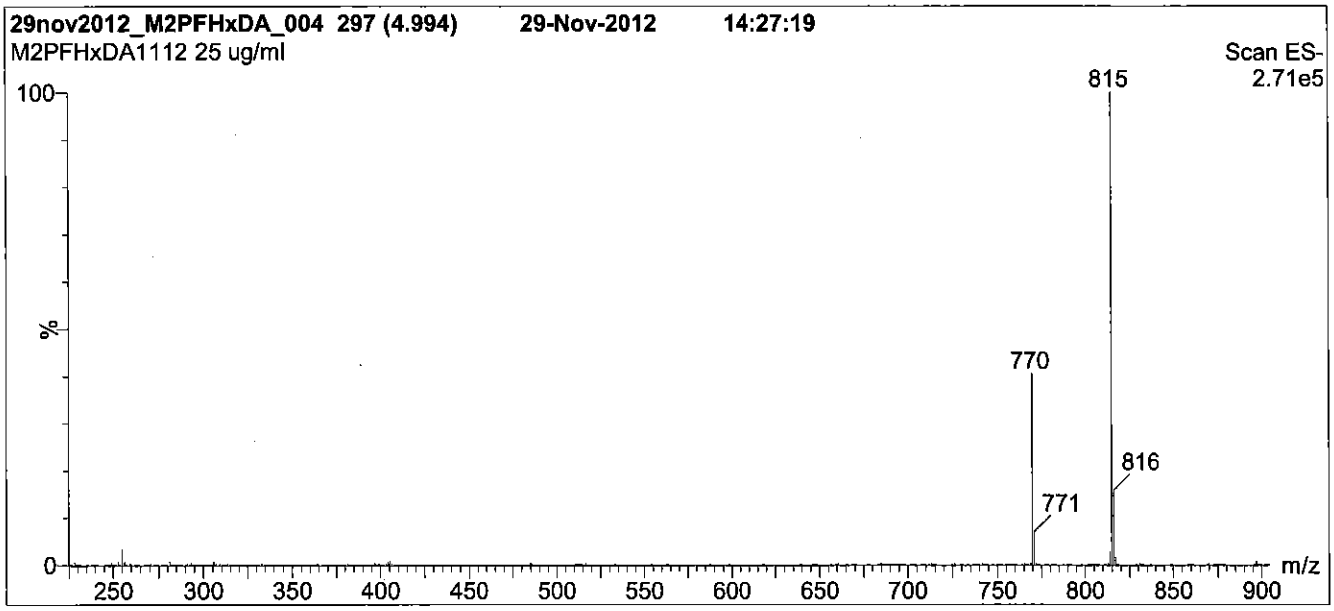
CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

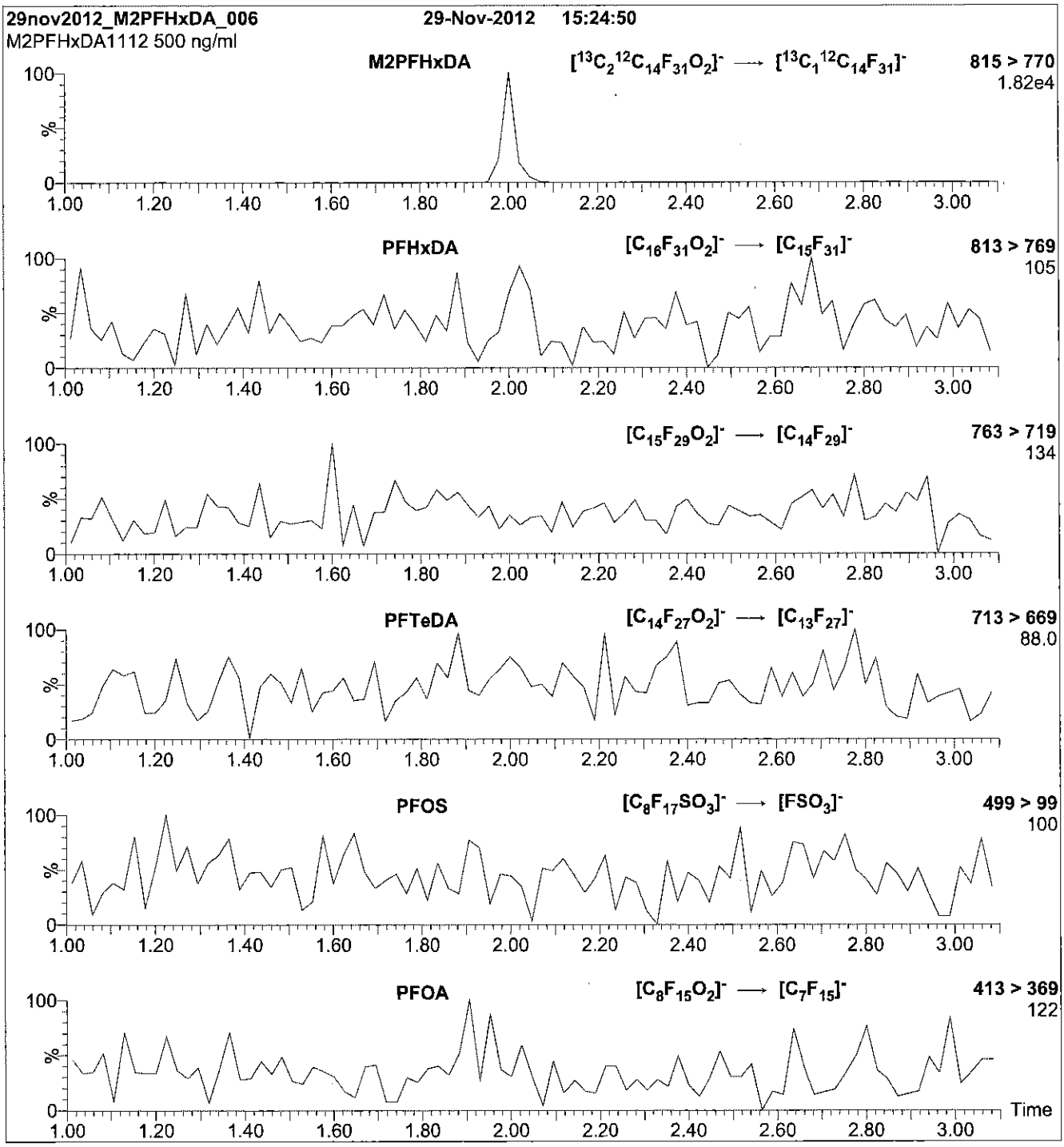
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCM2PFTeDA_00001

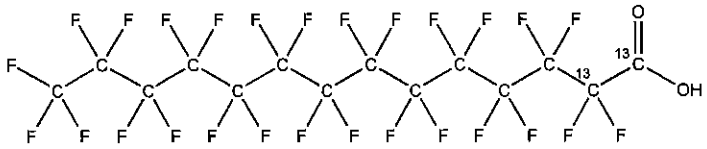
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

12-19-12 New pdt.

PRODUCT CODE: M2PFTeDA
LOT NUMBER: M2PFTeDA1112
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{12}HF_{27}O_2$	**MOLECULAR WEIGHT:**	716.10
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/29/2012		
EXPIRY DATE: (mm/dd/yyyy)	11/29/2015		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/04/2012 (mm/dd/yyyy)

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

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CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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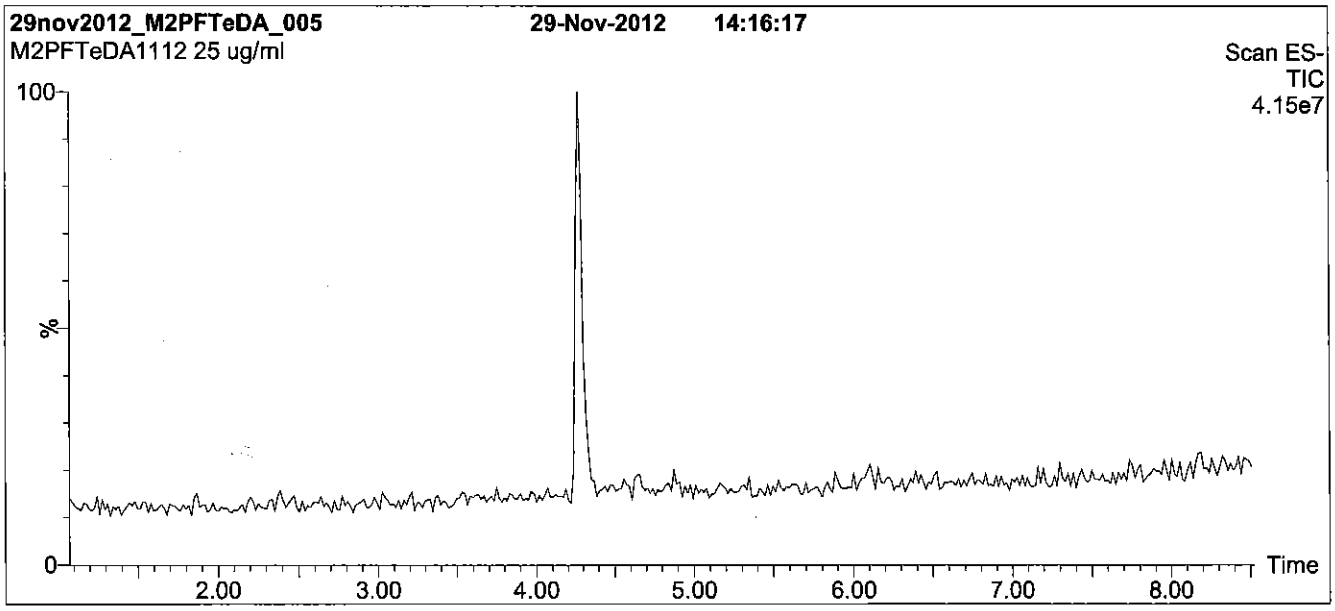
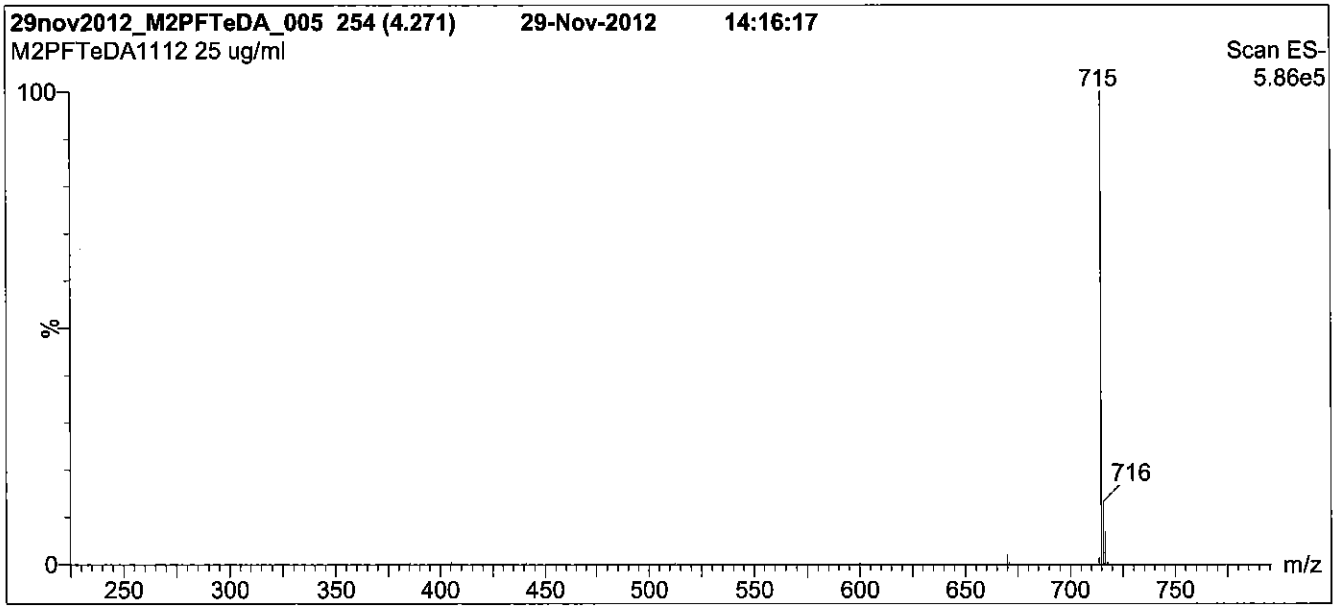
Figure 1: **M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

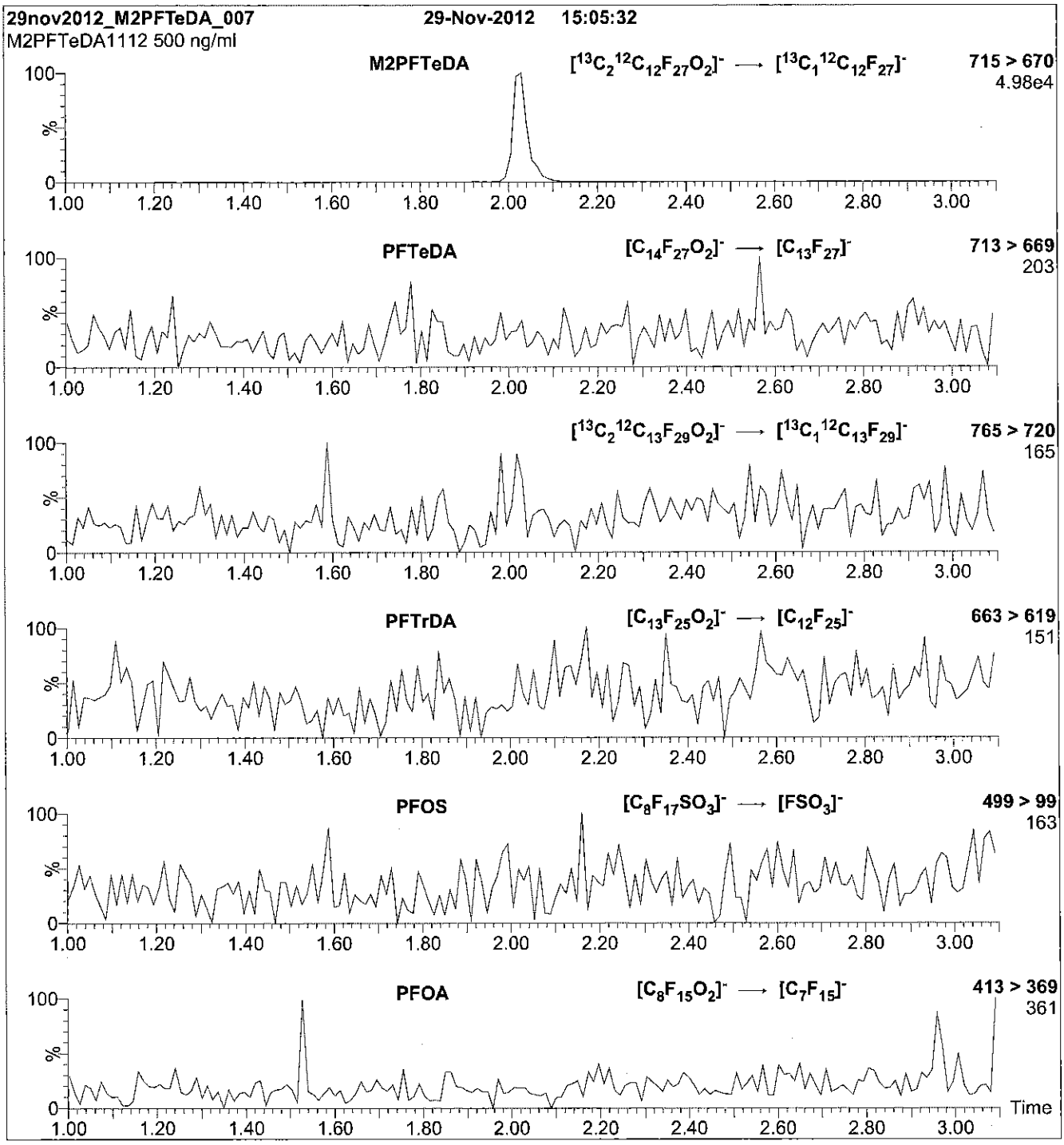
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 14

Reagent

LCM4PFHPA_00001

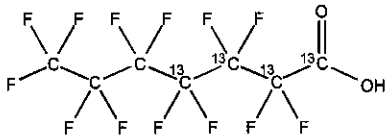
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

R: 12-14-12

LCM4PFHPA_00001

PRODUCT CODE:	M4PFHpA	**LOT NUMBER:**	M4PFHpA0112
COMPOUND:	Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid		
STRUCTURE:		**CAS #**	Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_3HF_{13}O_2$	**MOLECULAR WEIGHT:**	368.03
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	01/20/2012		
EXPIRY DATE: (mm/dd/yyyy)	01/20/2015		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 01/23/2012 (mm/dd/yyyy)
B.G. Chittim

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

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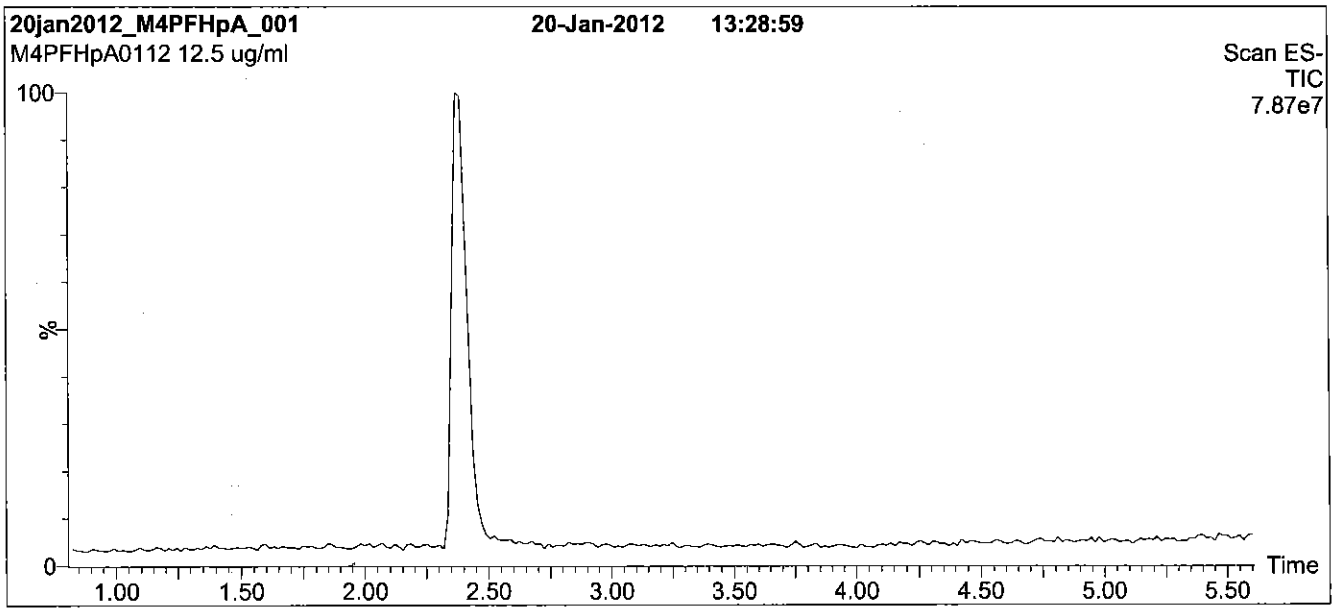
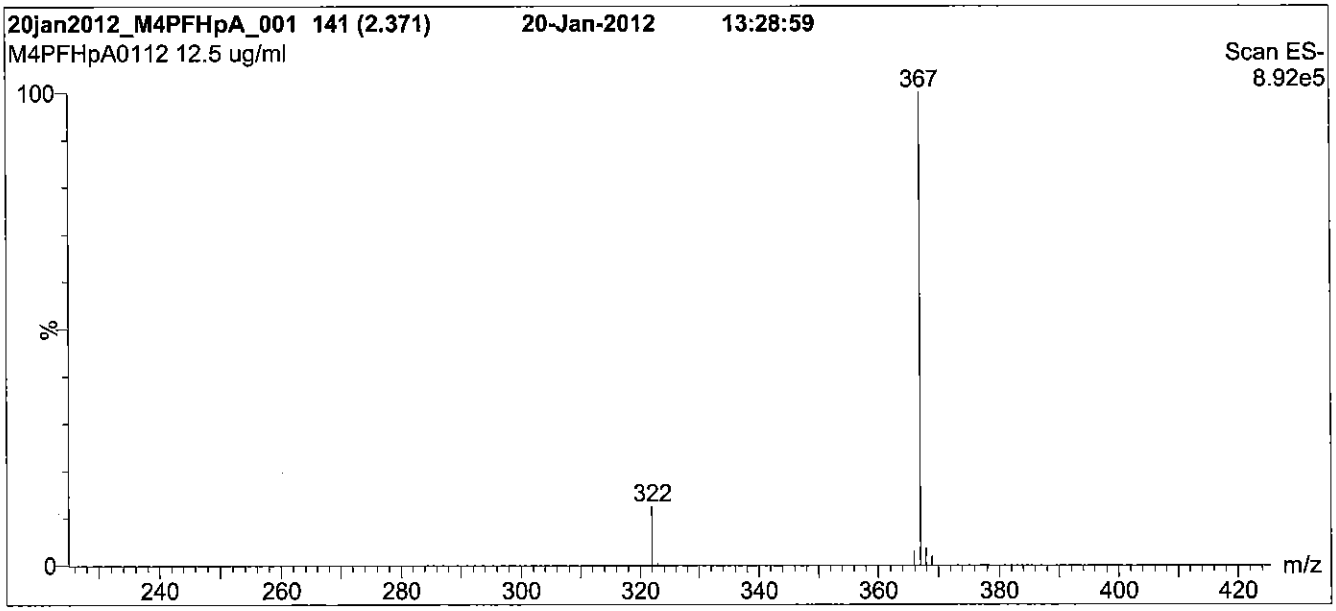
Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

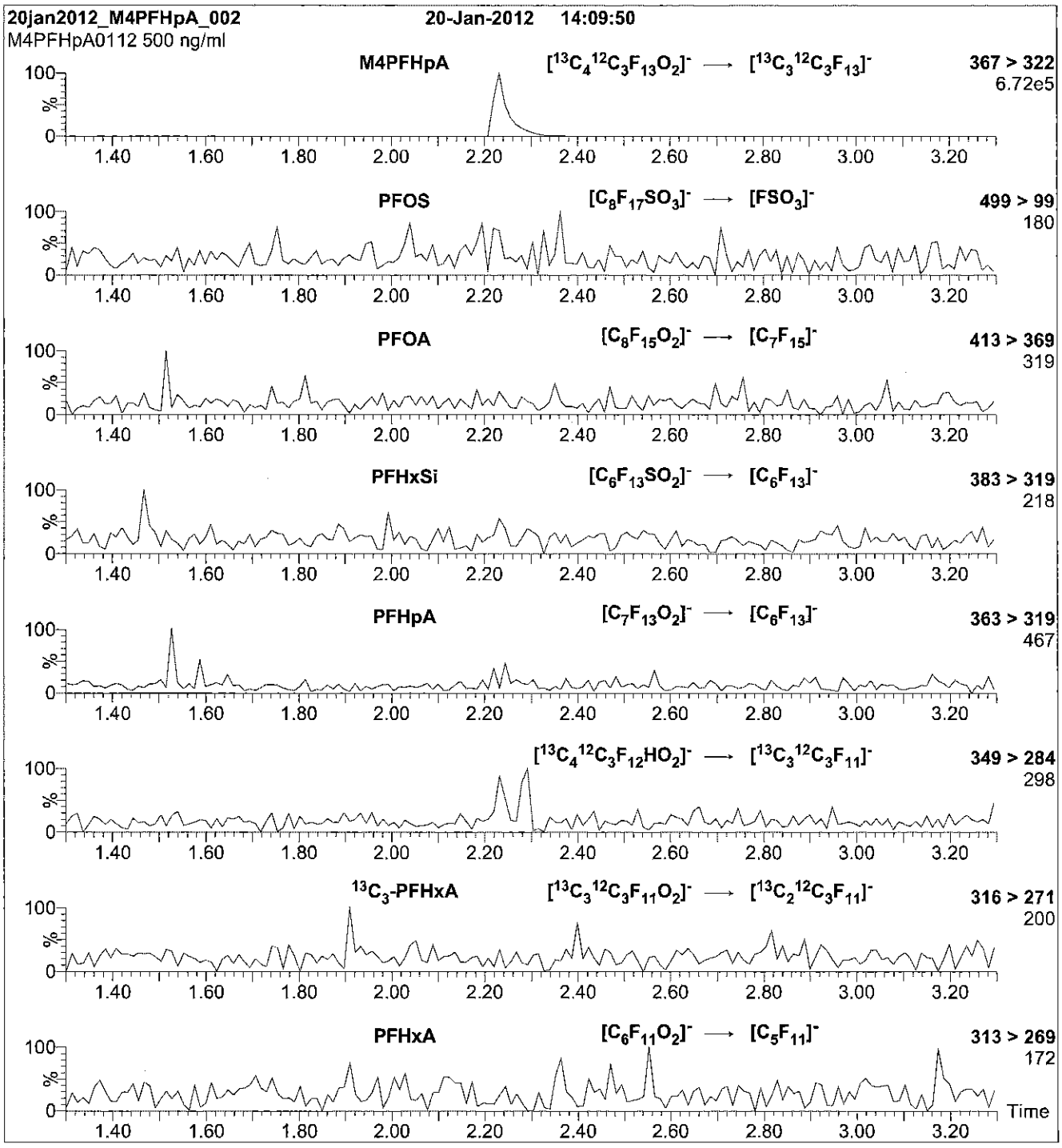
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: **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 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM5PFPEA_00002

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

R: 12-14-12

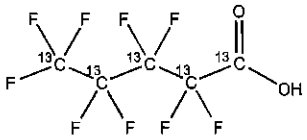
~~LCPF~~ LCM5PFPeA_00002
DEL 12-19-12

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

LOT NUMBER: M5PFPeA0312

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_5HF_9O_2$	**MOLECULAR WEIGHT:**	269.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	03/07/2012		
EXPIRY DATE: (mm/dd/yyyy)	03/07/2015		
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:** 03/19/2012 (mm/dd/yyyy)

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LIMITED WARRANTY:

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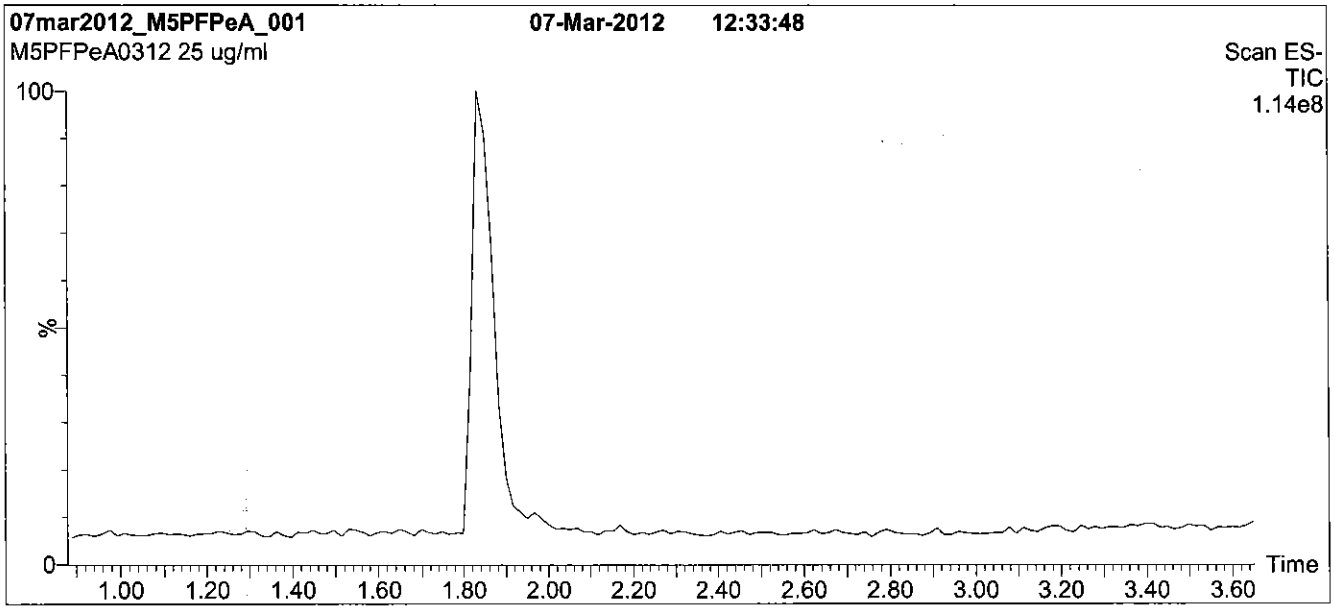
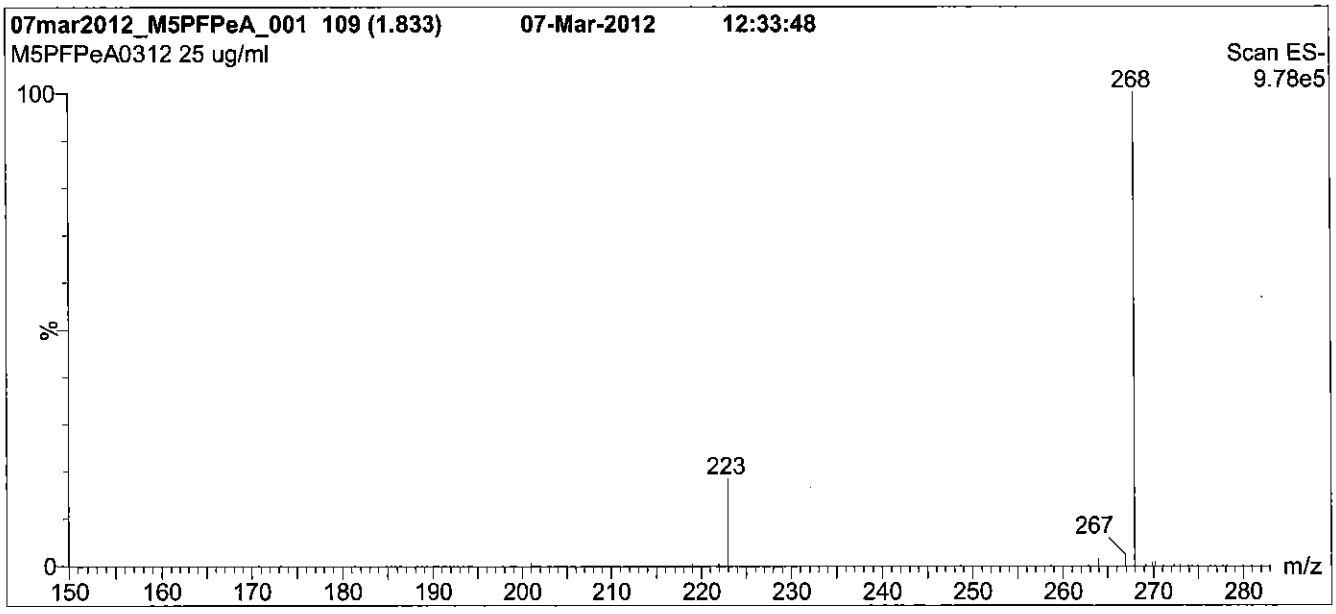
Figure 1: **M5PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 35% (80:20 MeOH:ACN) / 65% H_2O
(both with 10 mM NH_4OAc)
Ramp to 90% organic over 6.5 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

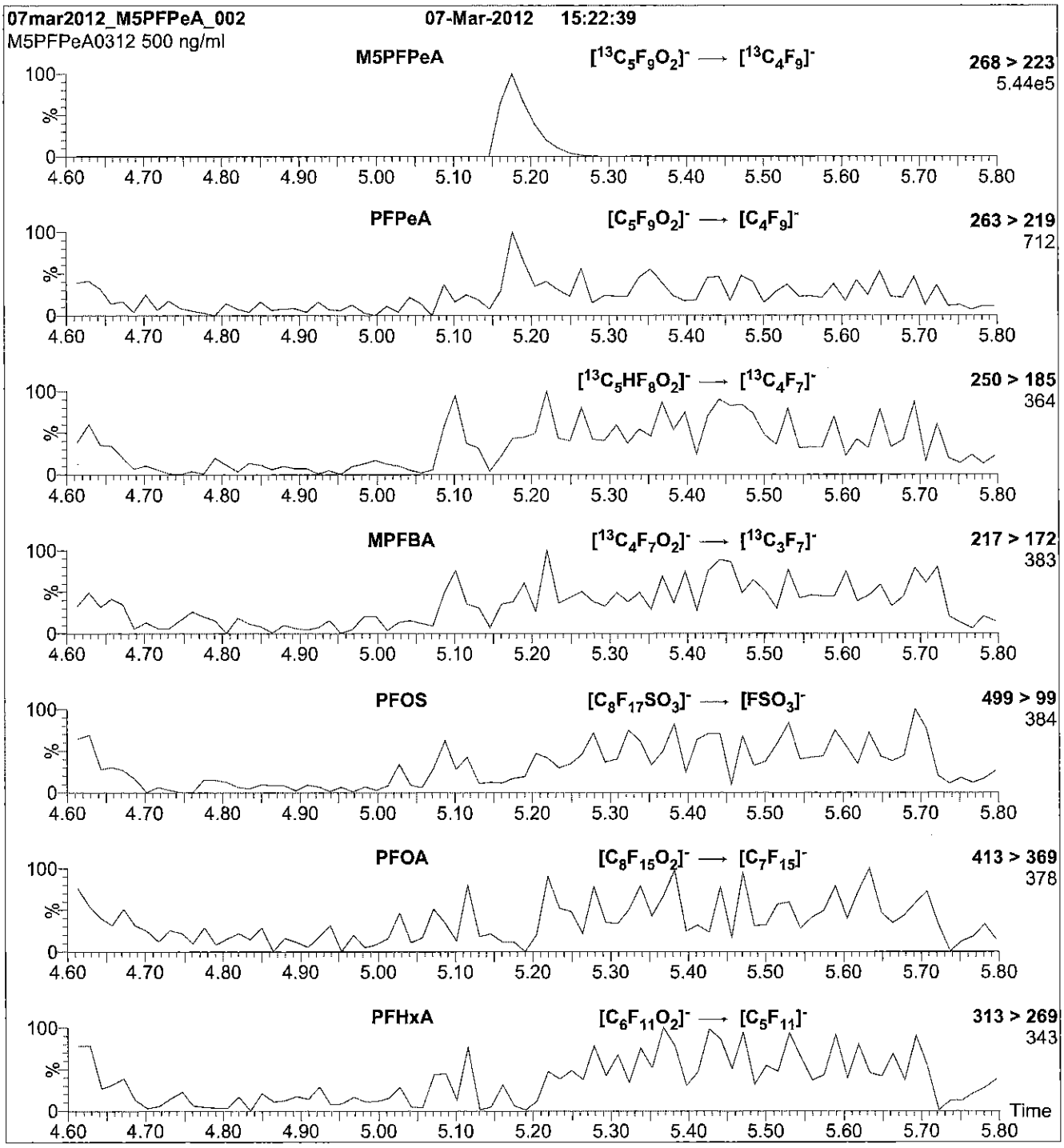
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCM8FOSA_00004

Rec 8/14/14 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

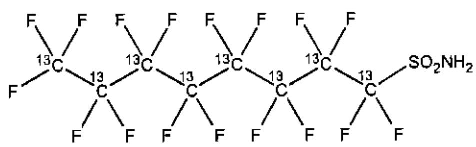
PRODUCT CODE: M8FOSA-M

LOT NUMBER: M8FOSA1013M

COMPOUND: Perfluoro-1-[$^{13}C_8$]octanesulfonamide

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	507.09
CONCENTRATION:	50 ± 2.5 μg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	10/11/2013		
EXPIRY DATE: (mm/dd/yyyy)	10/11/2018		
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:** 10/25/2013 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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

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

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

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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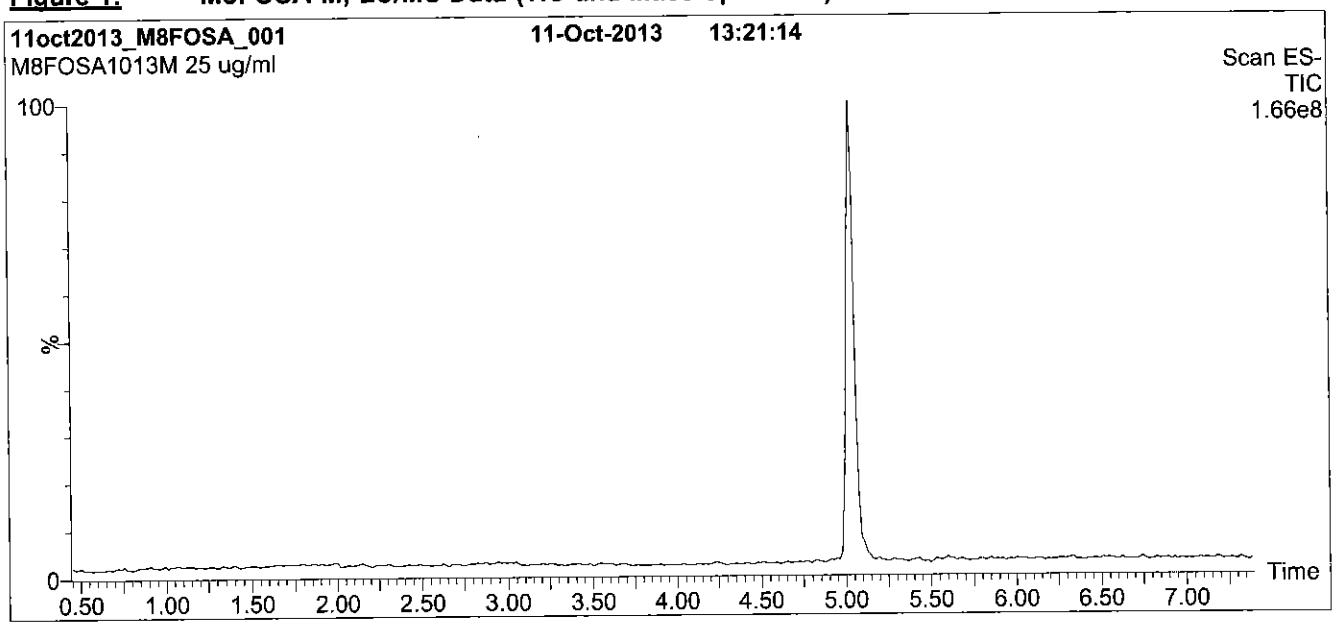
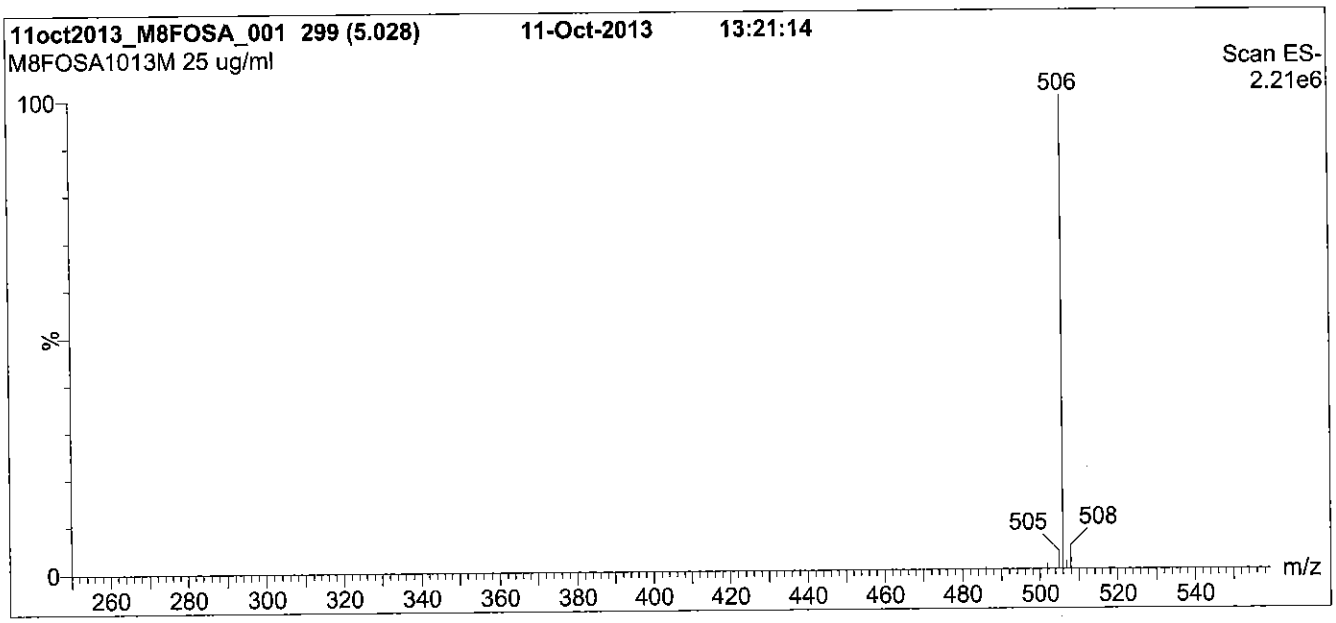
Figure 1: **M8FOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

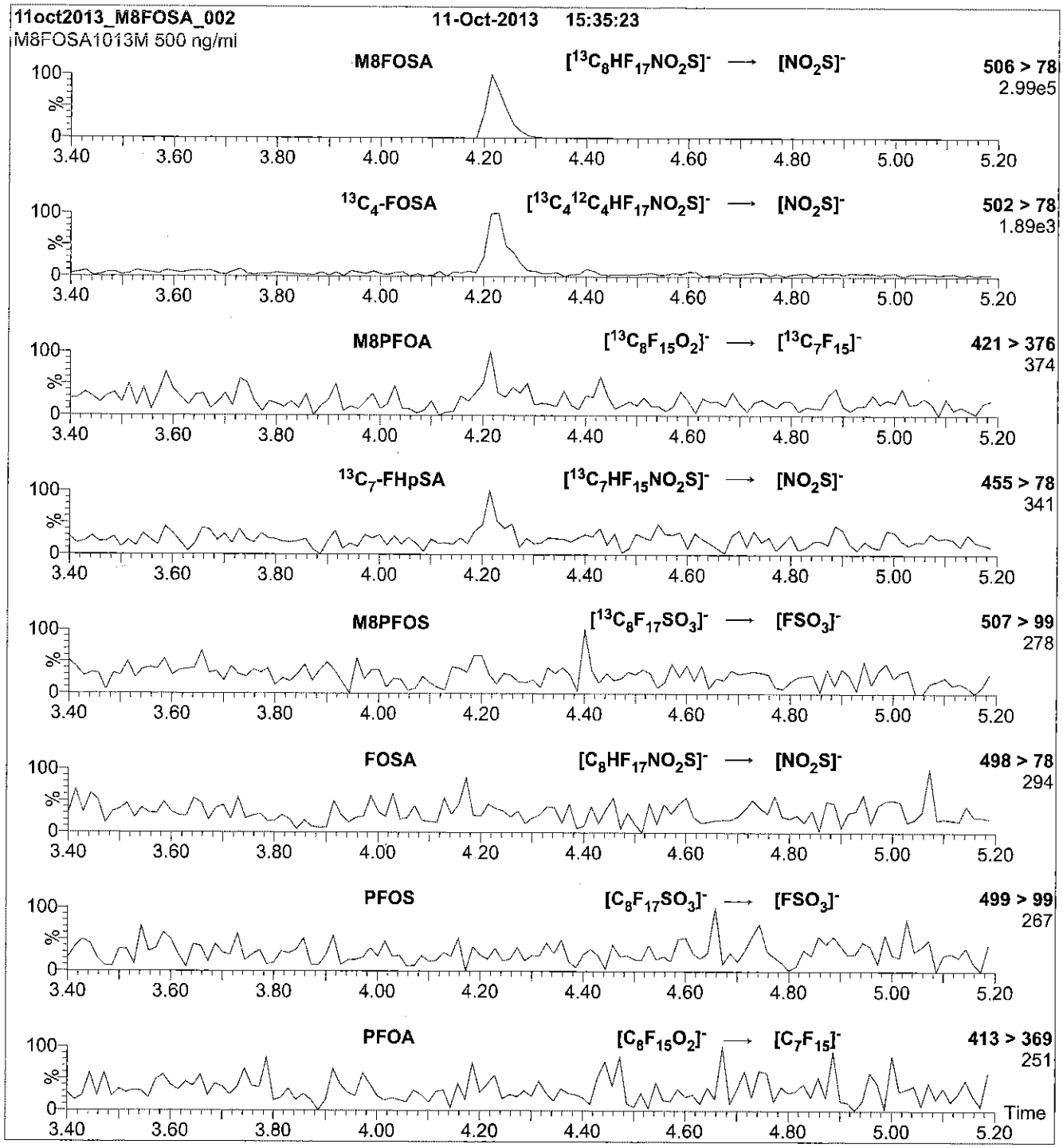
MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFBA_00002

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

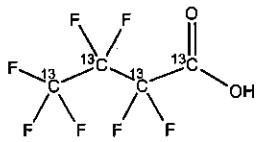
R 12-14-12
LCMPFBA_00002

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

LOT NUMBER: MPFBA0812

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_4HF_7O_2$	**MOLECULAR WEIGHT:**	218.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	08/13/2012		
EXPIRY DATE: (mm/dd/yyyy)	08/13/2015		
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 ~ 0.7% of native PFBA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/23/2012 (mm/dd/yyyy)
B.G. Chittim

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

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CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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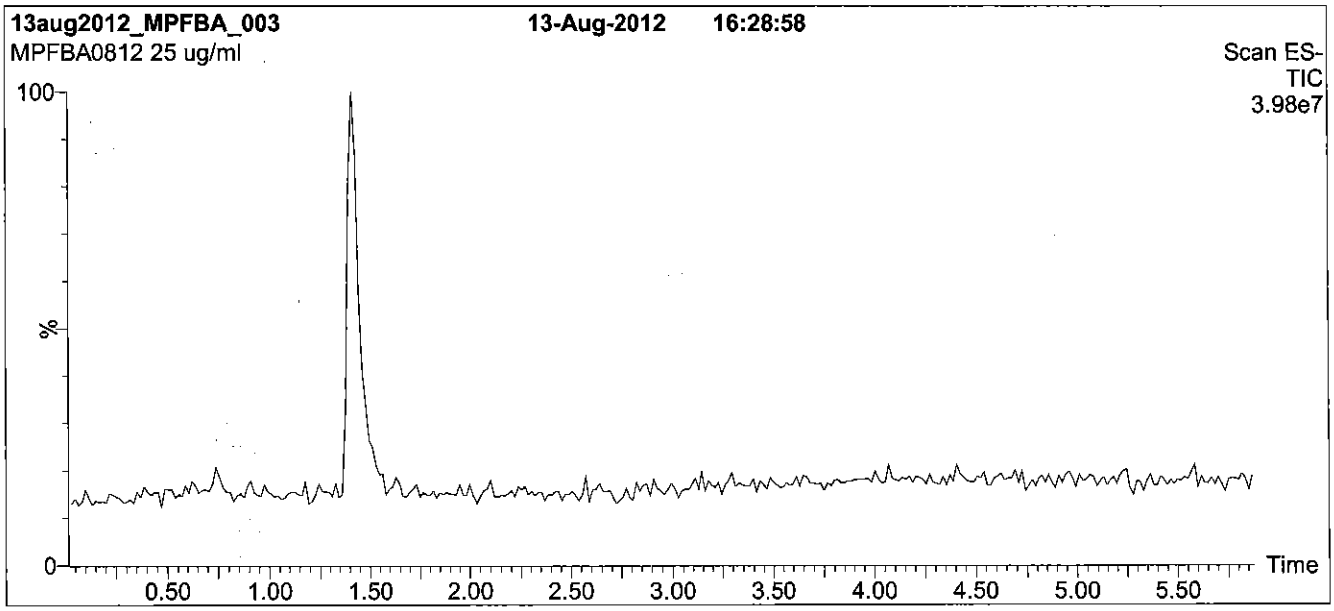
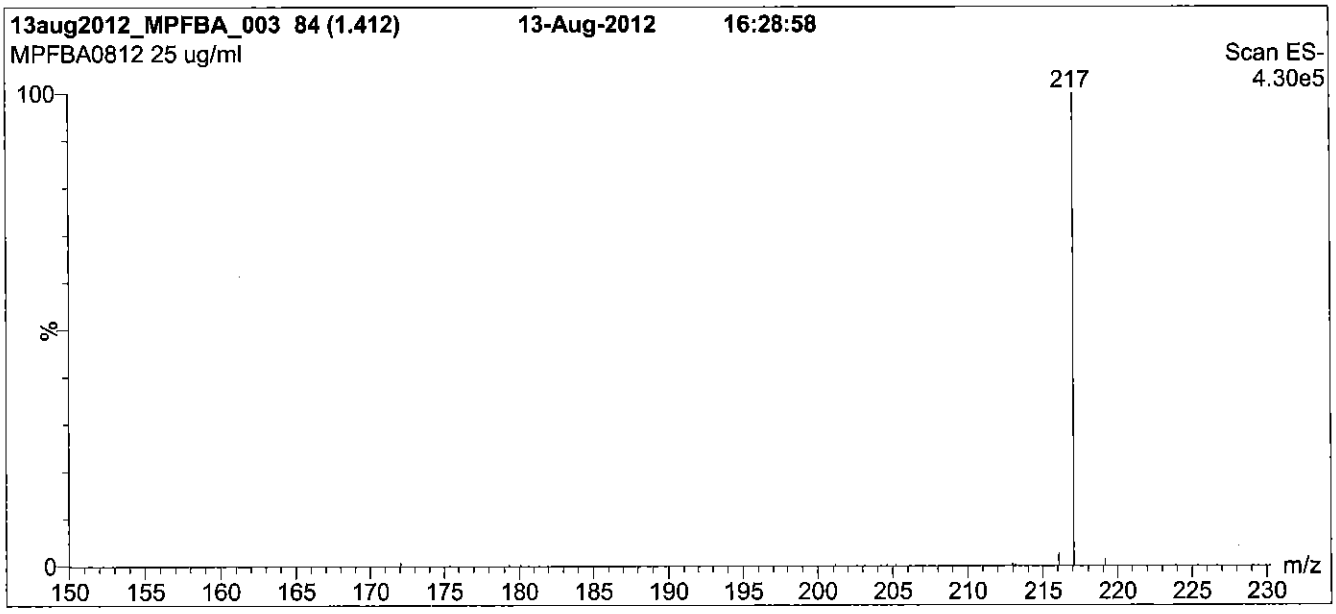
Figure 1: **MPFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

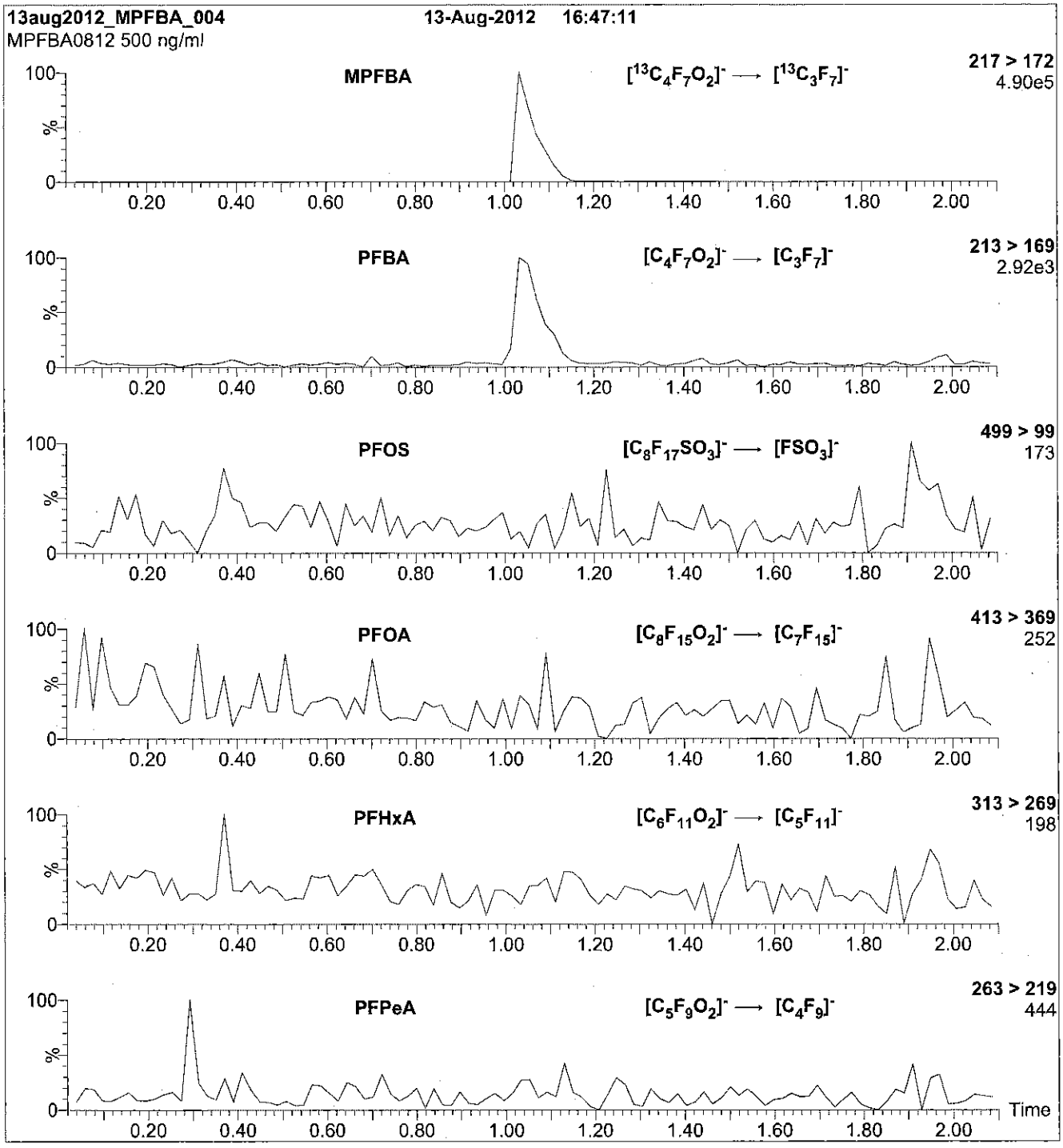
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 60
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 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.62e-3
Collision Energy (eV) = 10

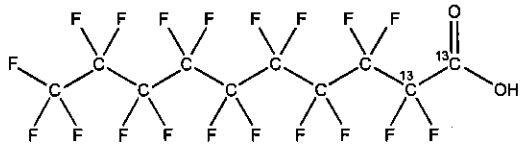
Reagent

LCMPFDA_00003

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA0912
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	09/13/2012		
EXPIRY DATE: (mm/dd/yyyy)	09/13/2017		
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 ~ 0.1% of $^{13}C_1$-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 01/09/2013 (mm/dd/yyyy)
B.G. Chittim

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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CALA Testing Accreditation No. A 1226

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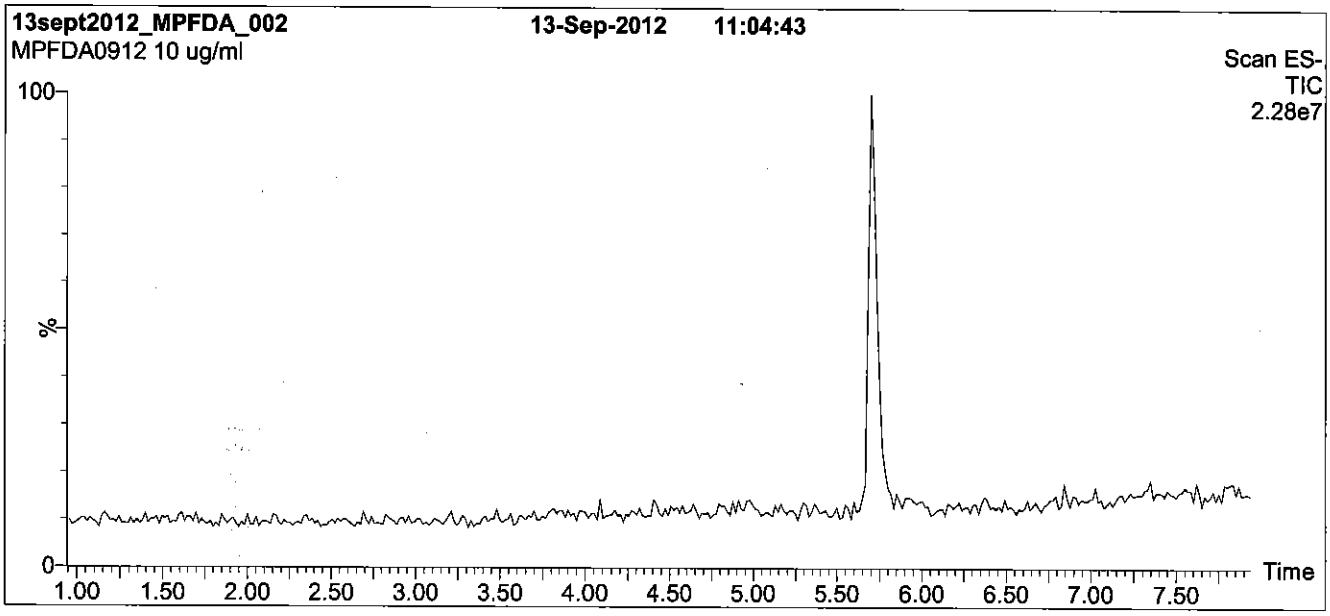
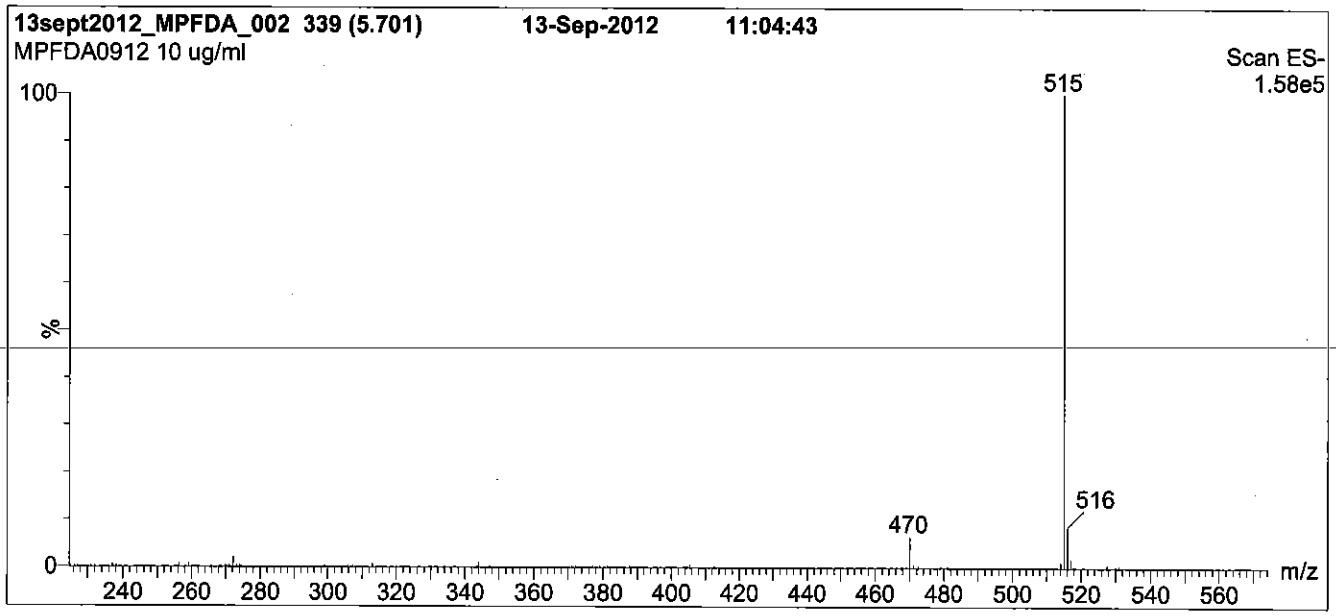




Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

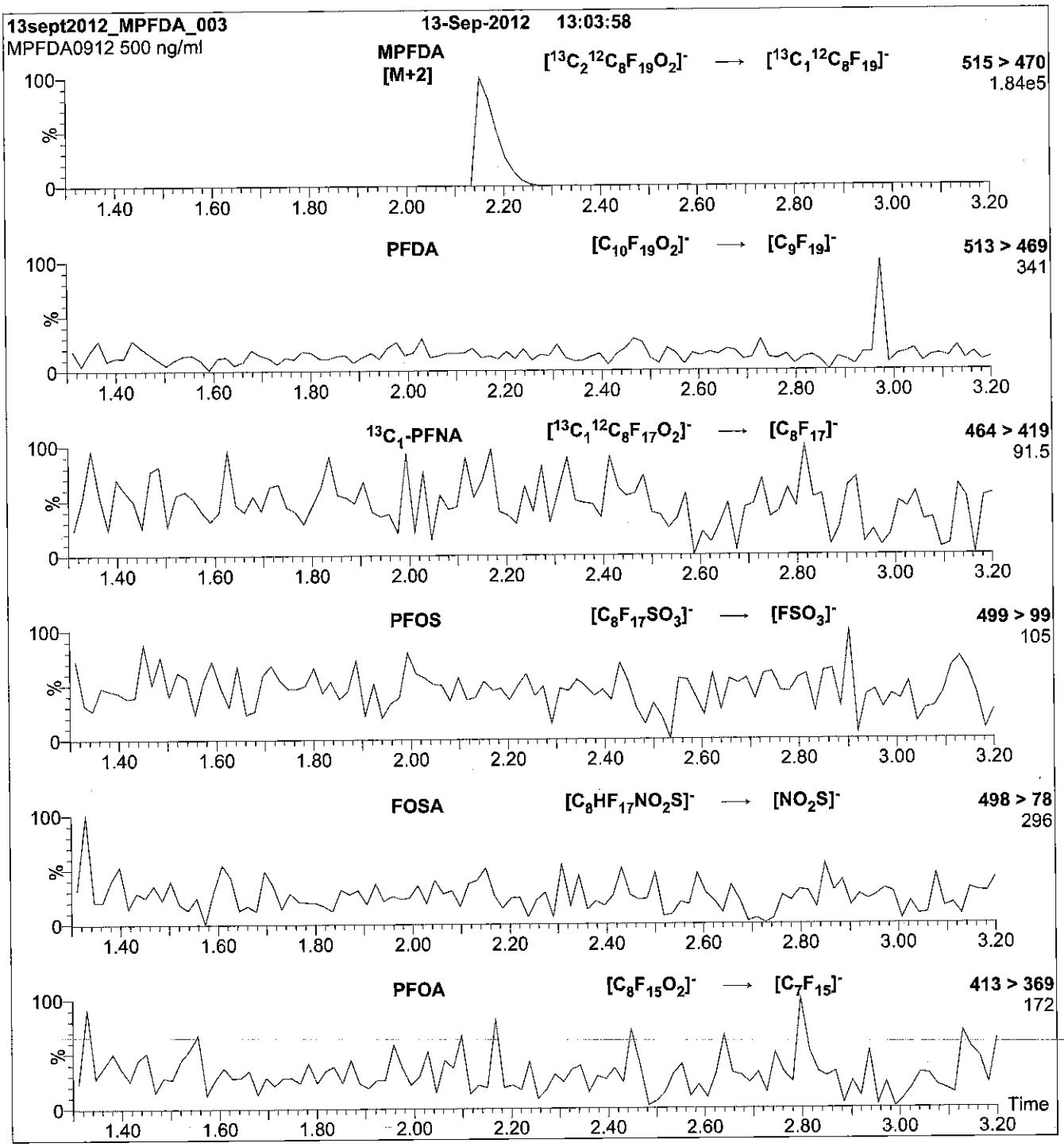
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFDoA_00002

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

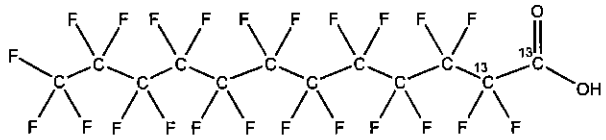
R: 12-14-12
LCMPFDoA_00002

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

LOT NUMBER: MPFDoA0312

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_{10}HF_{23}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 03/26/2012
EXPIRY DATE: (mm/dd/yyyy) 03/26/2015
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 616.08
SOLVENT(S): Methanol
Water (<1%)

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/04/2012
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,...x_n on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

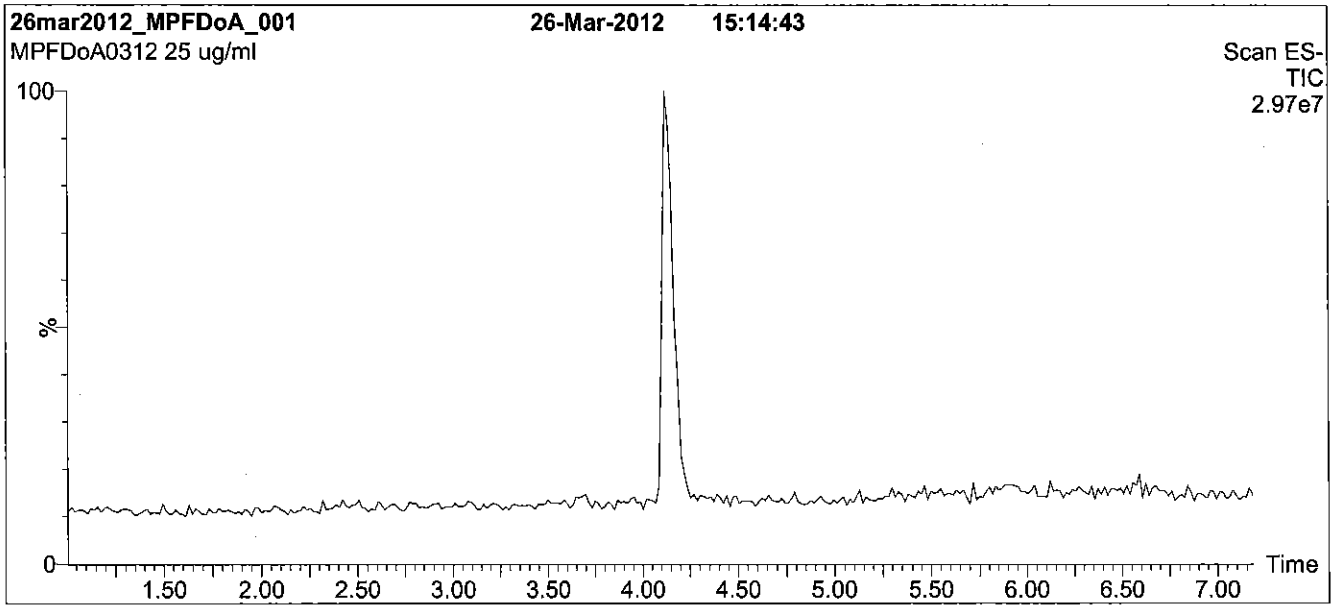
Ongoing stability studies of this product have demonstrated stability in its composition and concentration for the period of time specified by the expiry date in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

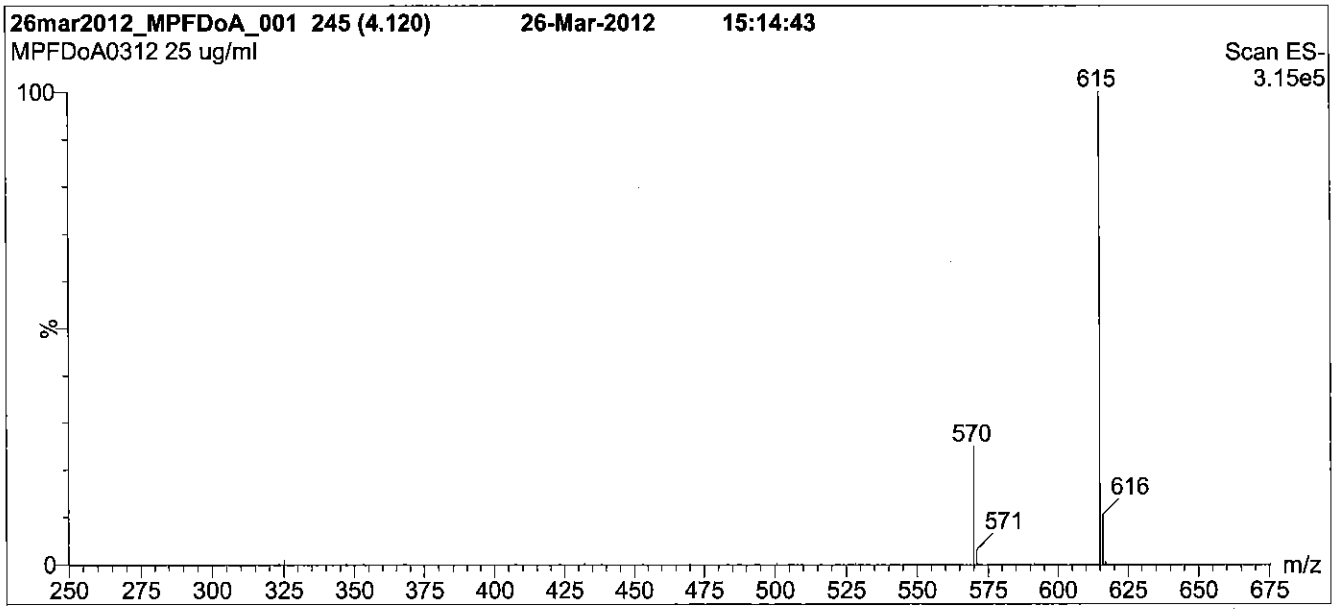
LIMITED WARRANTY:

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

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

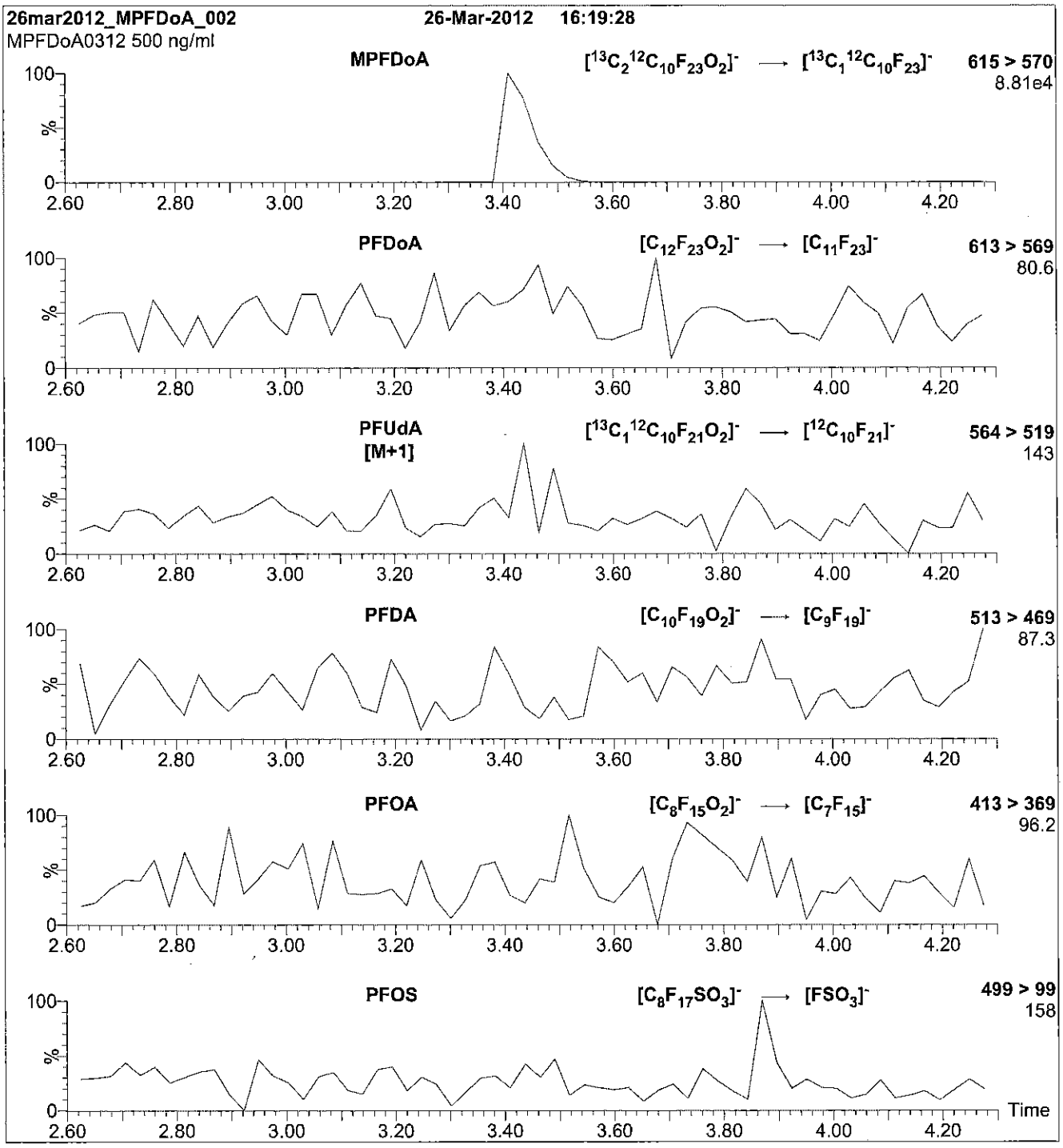
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 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

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 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

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

Reagent

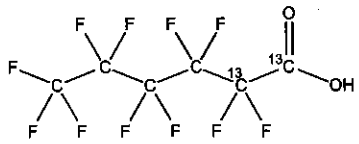
LCMPFHxA_00004

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxA
LOT NUMBER: MPFHxA0213
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_4HF_{11}O_2$	**MOLECULAR WEIGHT:**	316.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/14/2013		
EXPIRY DATE: (mm/dd/yyyy)	02/14/2018		
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 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:** 02/20/2013 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

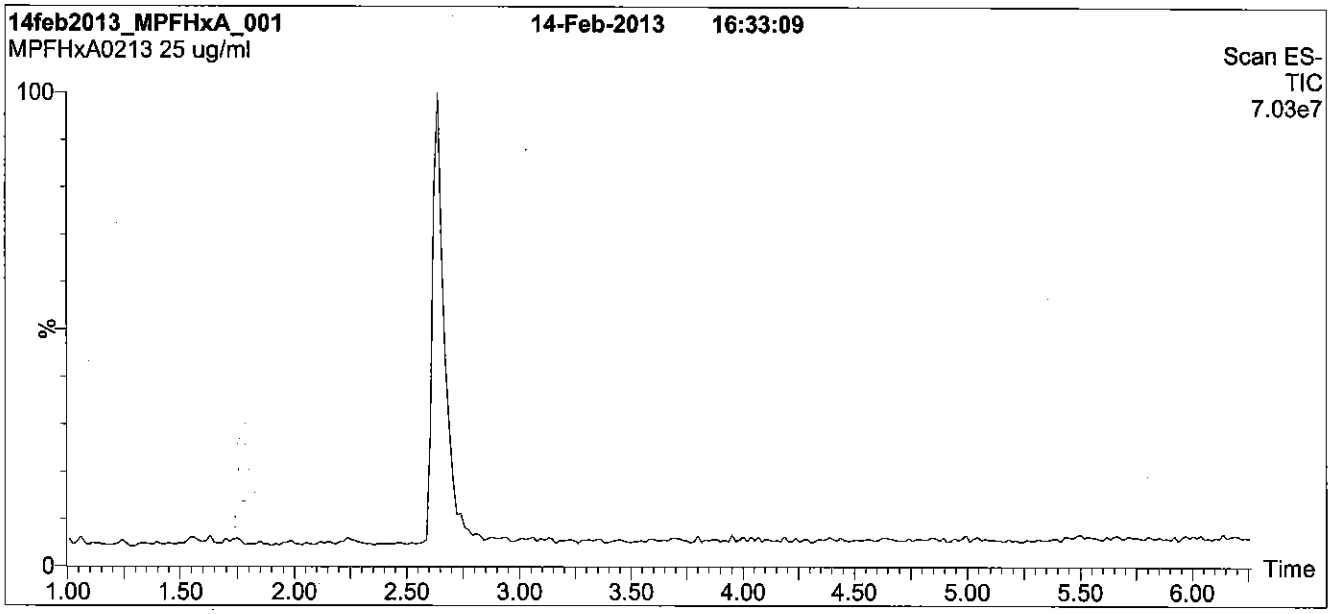
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

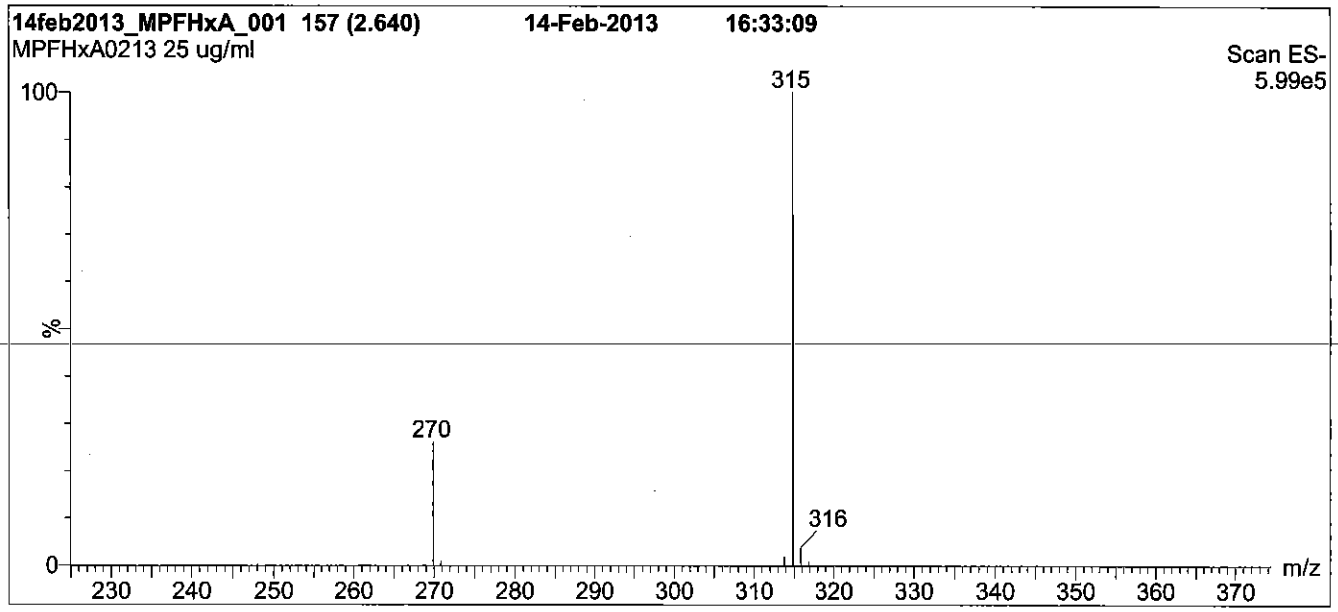
CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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

Figure 1: **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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions over 0.5 min.
Time: 10 min

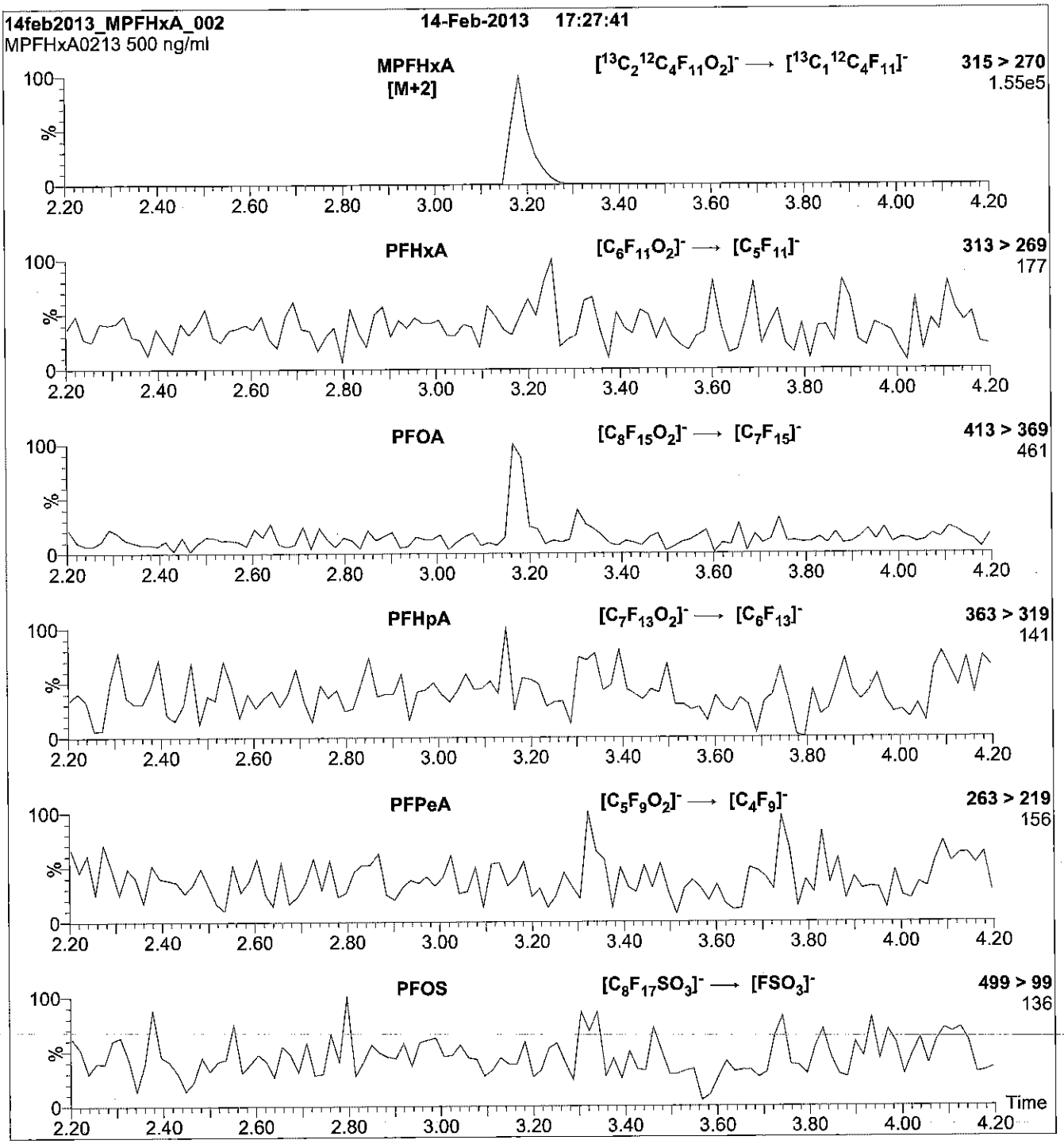
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCMPFHxS_00002

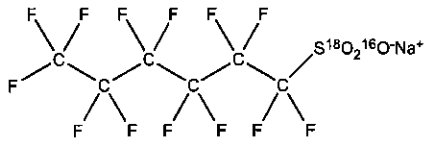
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

R: 12-14-12

LCMPFHxS-00002

PRODUCT CODE:	MPFHxS	**LOT NUMBER:**	MPFHxS0312
COMPOUND:	Sodium perfluoro-1-hexane[$^{18}O_2$]sulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_6F_{13}S^{18}O_2{}^{16}ONa$	**MOLECULAR WEIGHT:**	426.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.3 ± 2.4 µg/ml (MPFHxS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	>94% ($^{18}O_2$)
LAST TESTED: (mm/dd/yyyy)	03/08/2012		
EXPIRY DATE: (mm/dd/yyyy)	03/08/2015		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS ($C_6F_{13}S^{18}O_2{}^{16}O^-$) has been observed to be up to 10% lower than for PFHxS ($C_6F_{13}S^{16}O_3^-$) when both compounds are injected together. This difference may vary between instruments.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/19/2012 (mm/dd/yyyy)
B.G. Chittim

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. 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:

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HOMOGENEITY:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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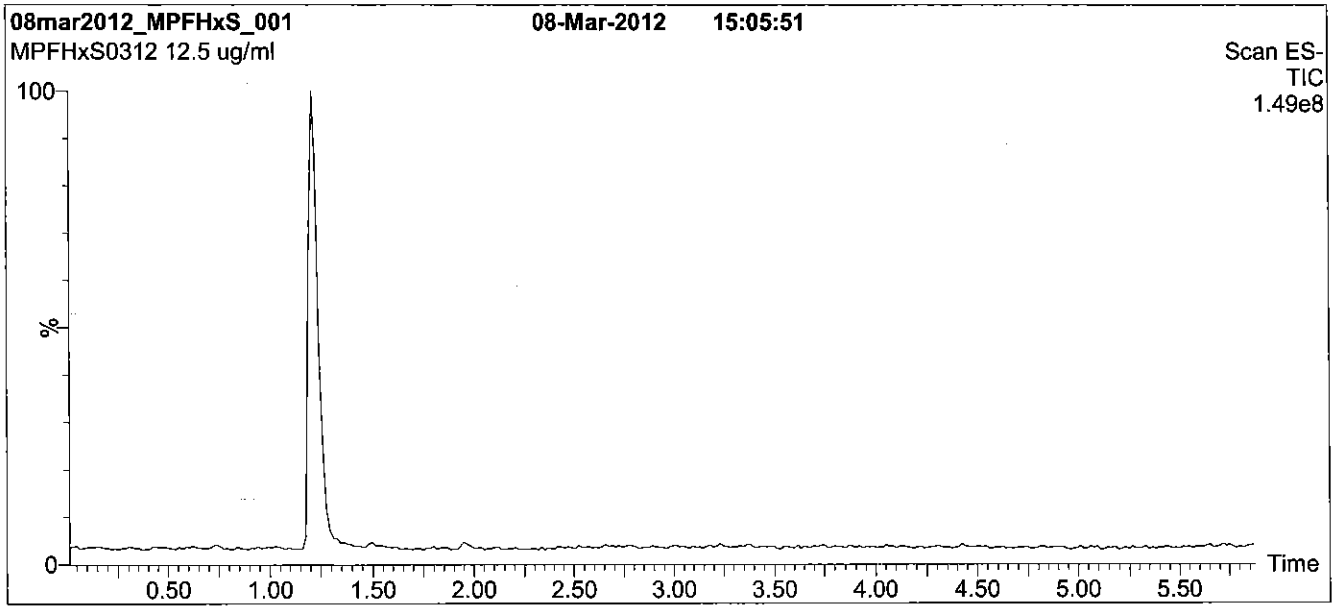
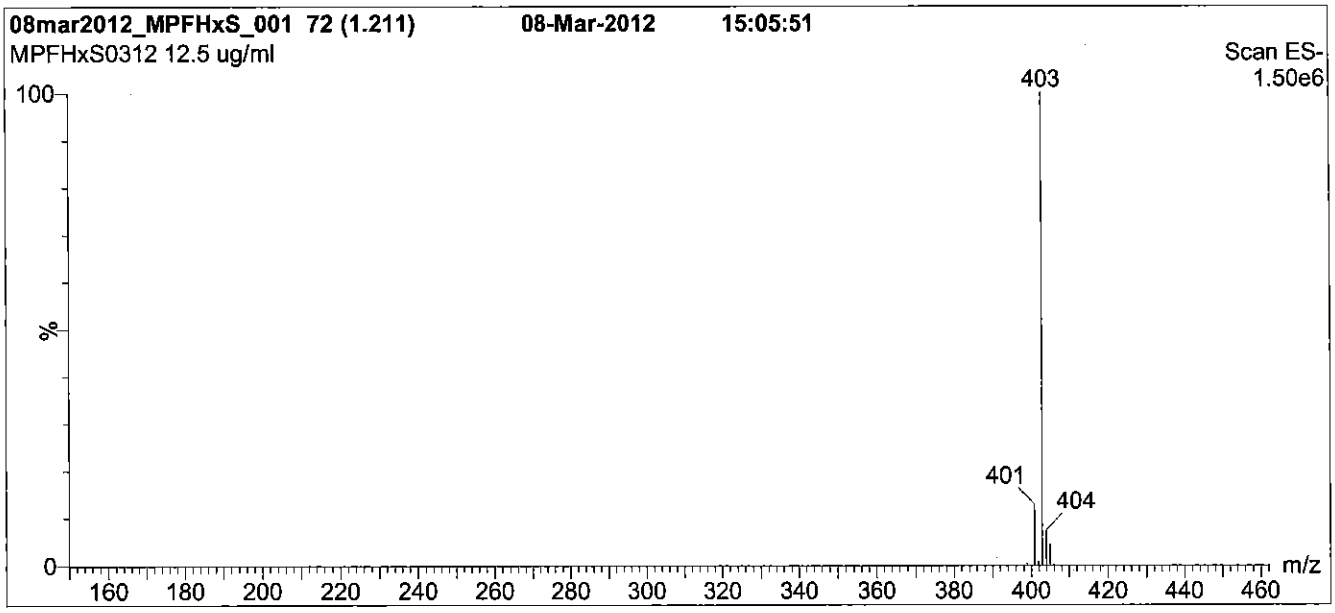
Figure 1: **MPFHxS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Isocratic with flush
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Hold for 6.5 min. Ramp to 90% organic over 0.5 min. Hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

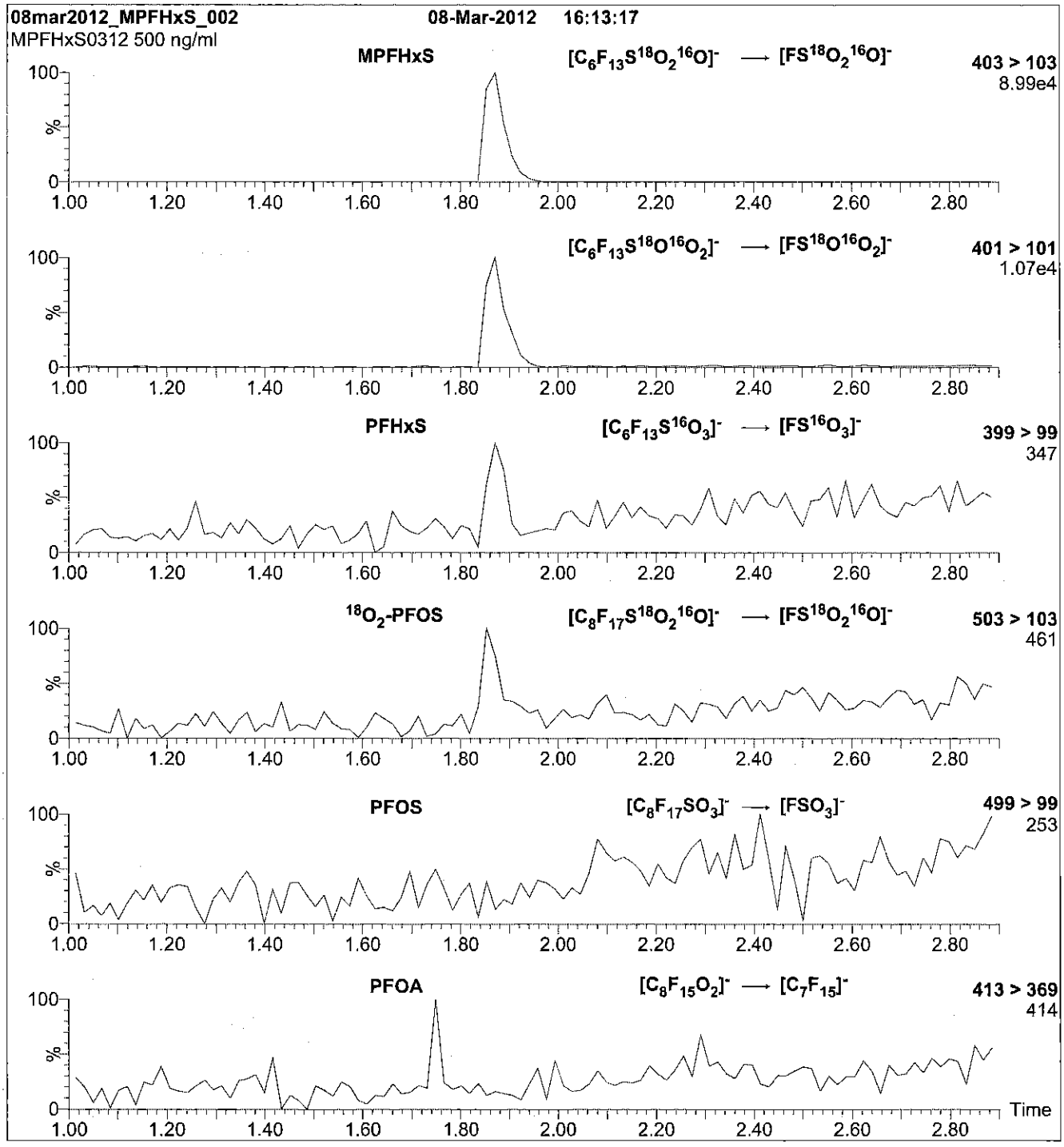
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 30

Reagent

LCMPFNA_00002

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

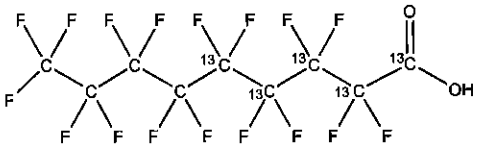
12-14-12
LCMPFNA_00002

PRODUCT CODE: MPFNA
COMPOUND: Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid

LOT NUMBER: MPFNA0912

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_5{}^{12}C_4HF_{17}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/13/2012
EXPIRY DATE: (mm/dd/yyyy) 09/13/2015
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 469.04
SOLVENT(S): Methanol
Water (<1%)

ISOTOPIC PURITY: ≥99% ^{13}C ($1,2,3,4,5\text{-}^{13}C_5$)

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 09/26/2012 (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 $x_1, x_2,...x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

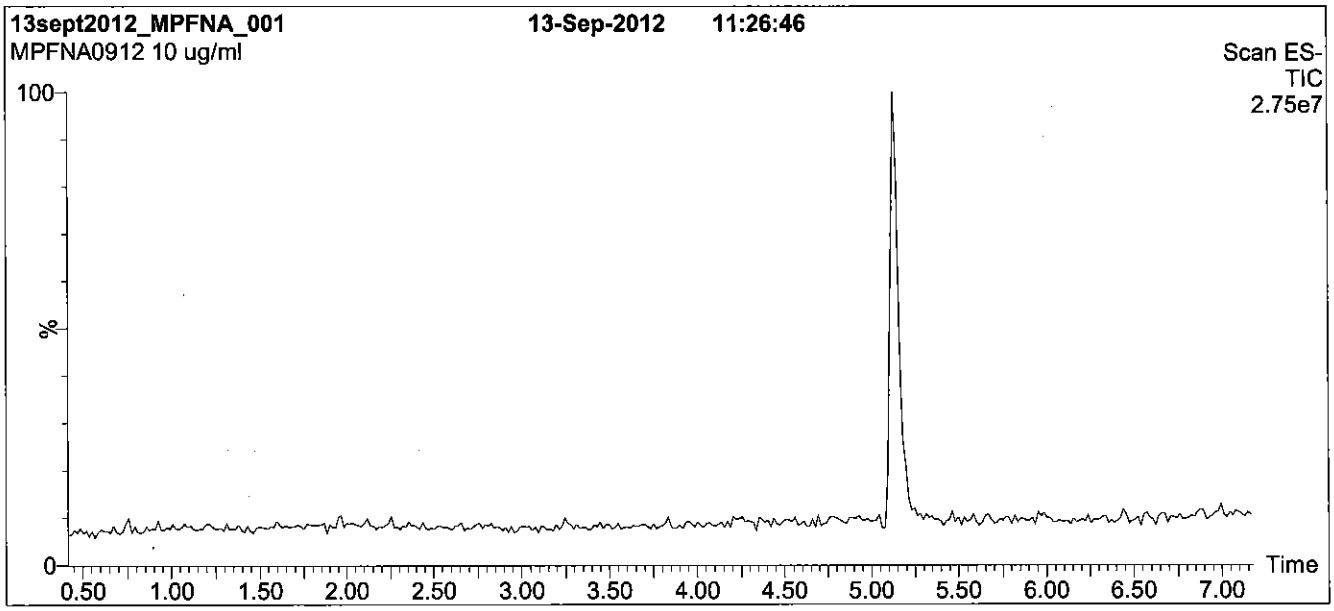
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

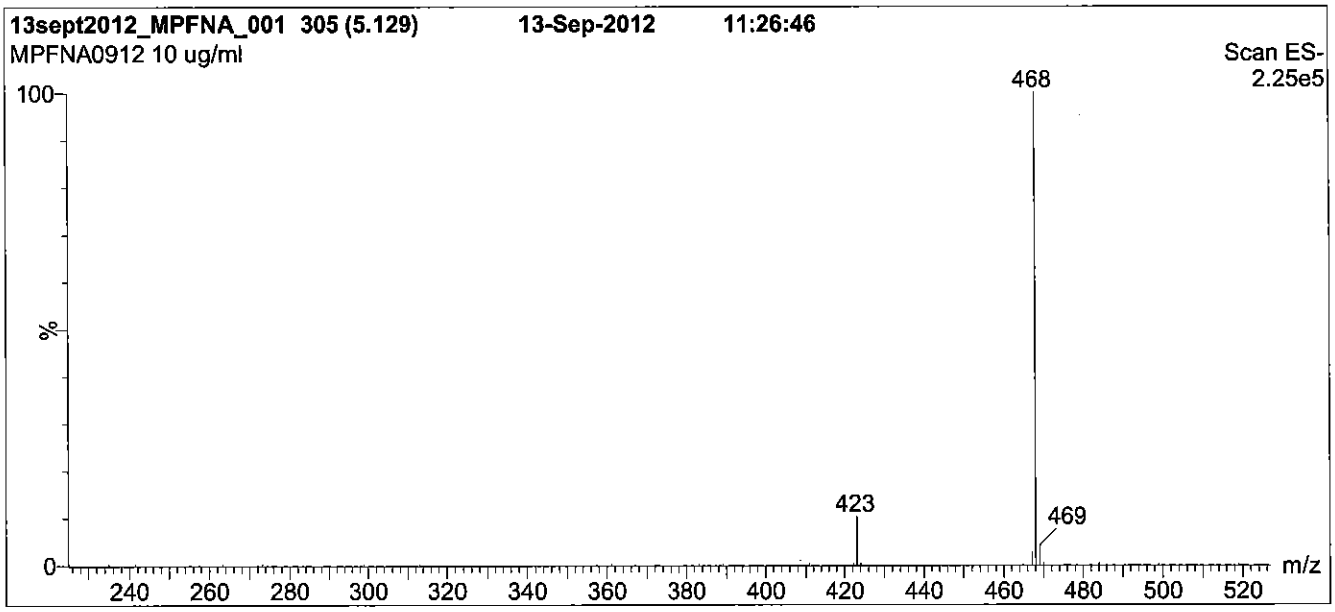
CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

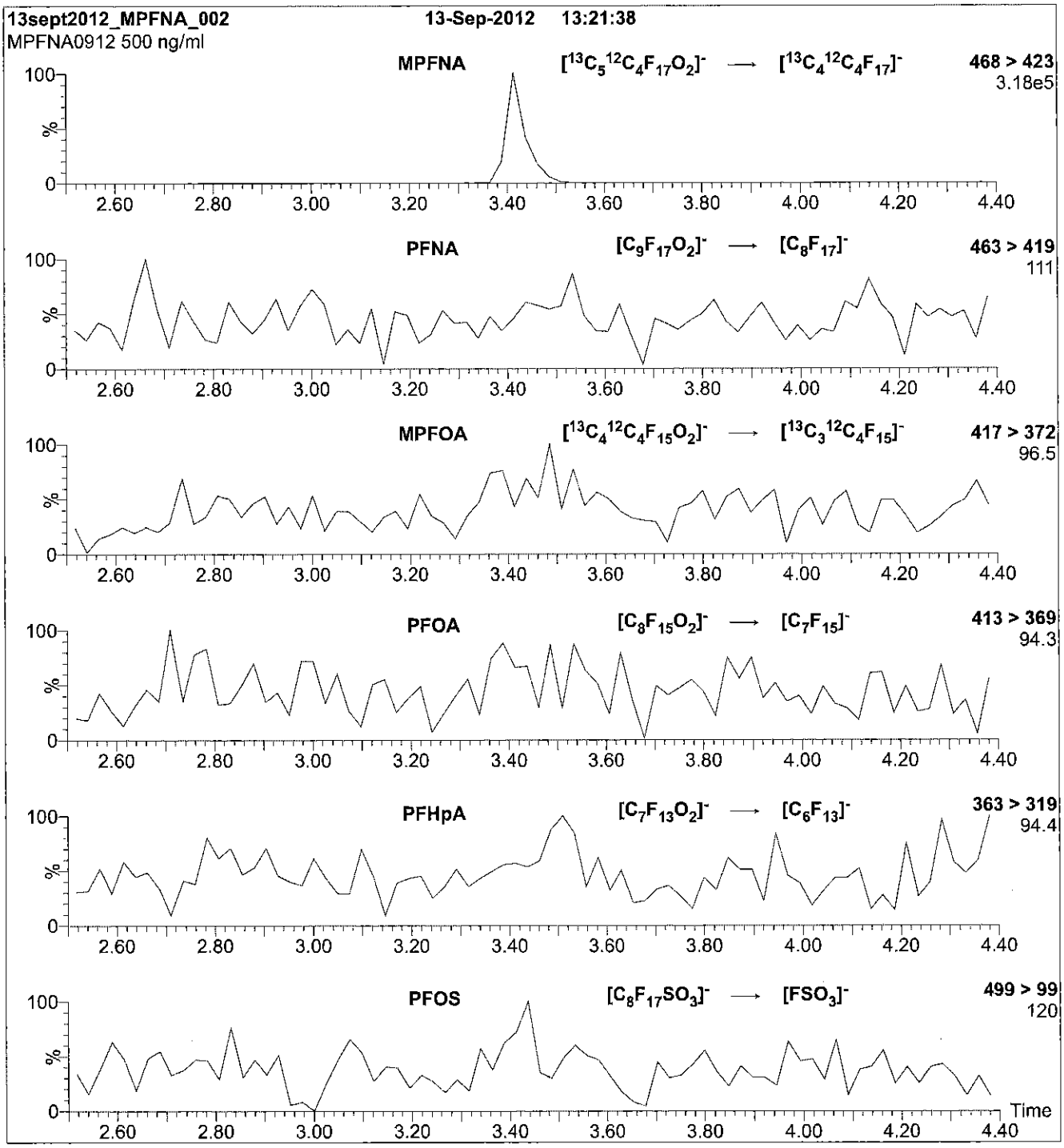
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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: **MPFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCMPFOA_00005

Rec 8/14/14 SK

WELLINGTON LABORATORIES

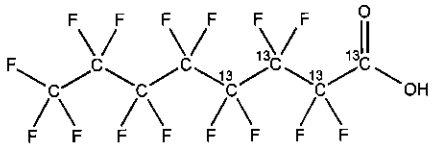
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFOA0614

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4HF_{15}O_2$	**MOLECULAR WEIGHT:**	418.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	07/04/2014		
EXPIRY DATE: (mm/dd/yyyy)	07/04/2019		
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 native perfluoro-n-octanoic acid (PFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/08/2014 (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).

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CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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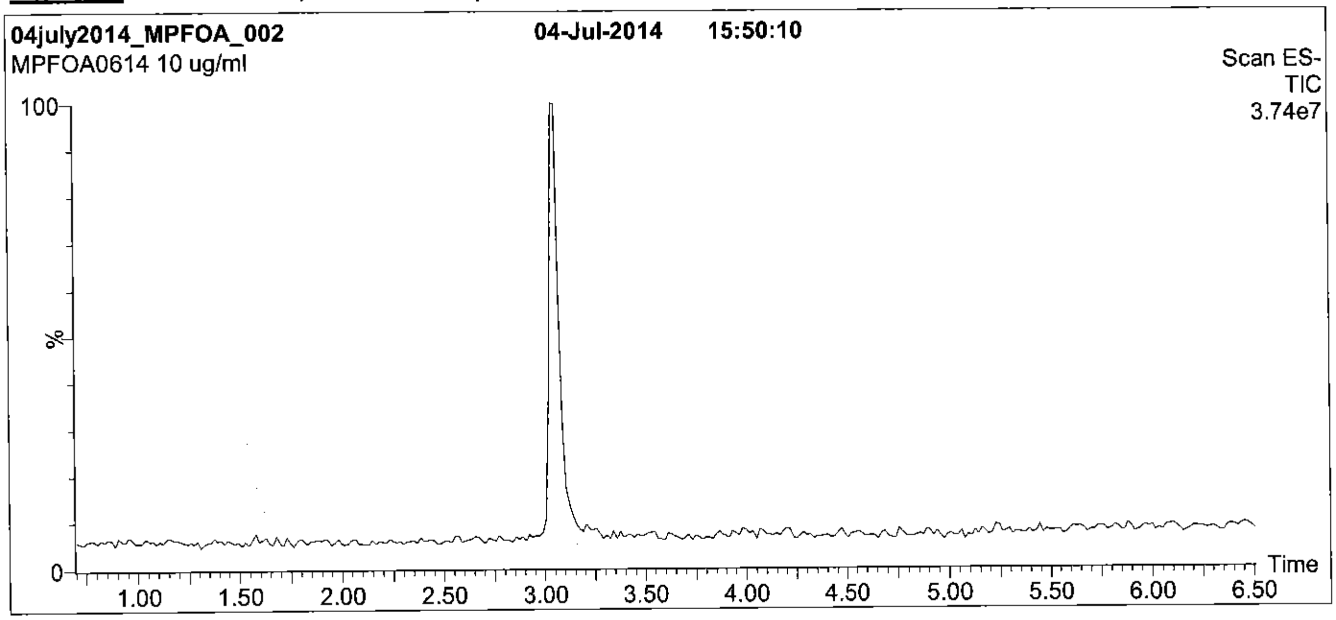
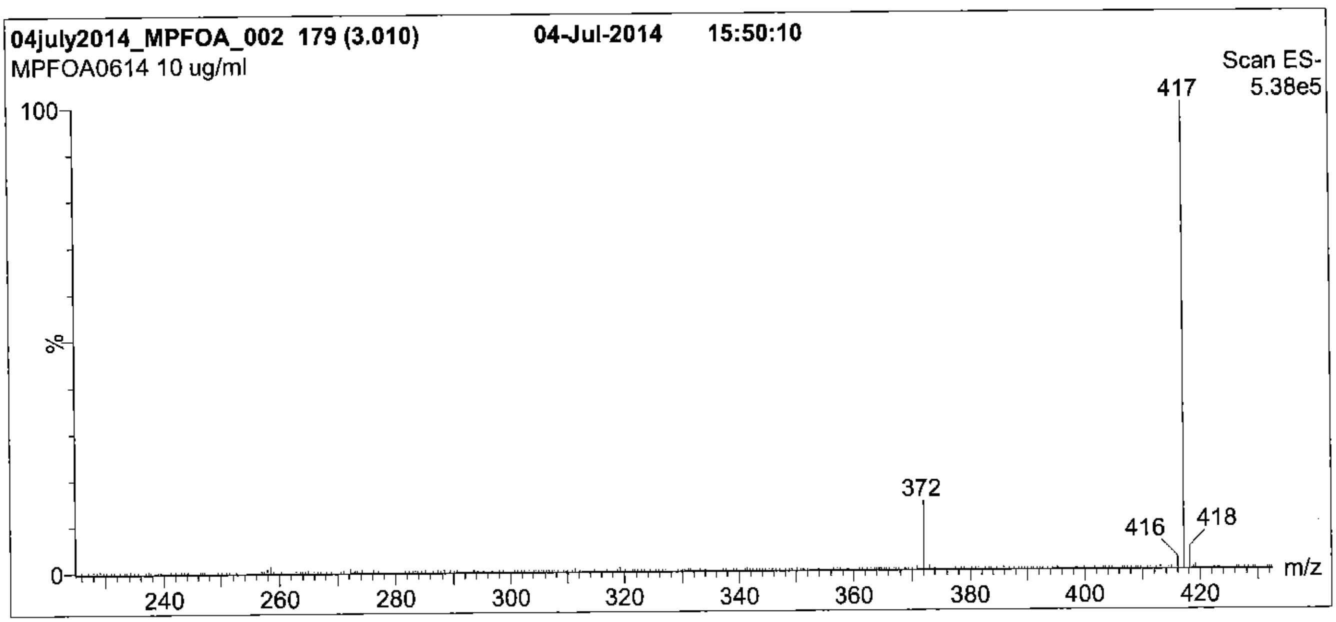
Figure 1: **MPFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

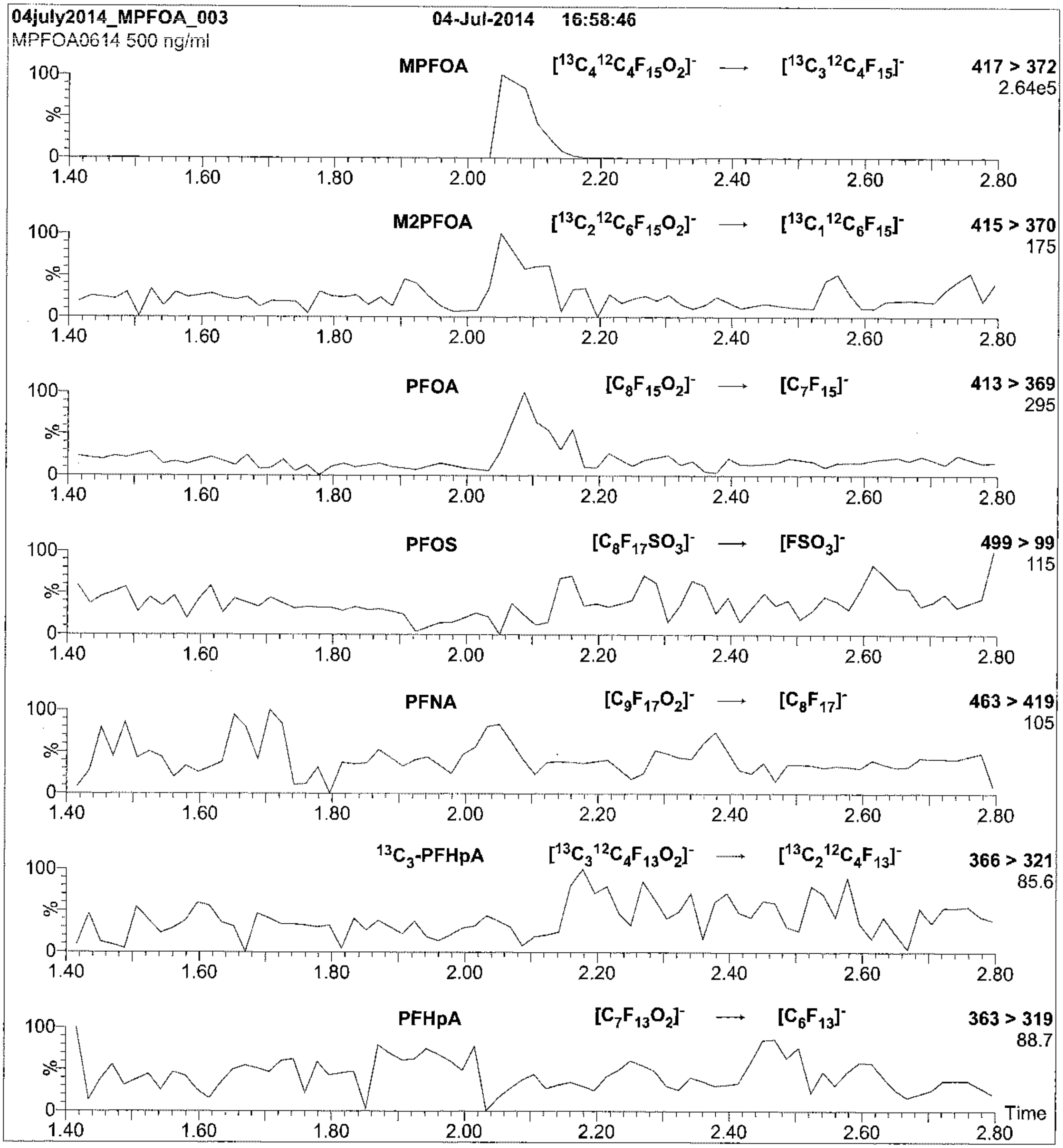
Flow: 300 µl/min

MS Parameters

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.62e-3
Collision Energy (eV) = 11

Reagent

LCMPFOS_00006

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

318140
ID: LCMPFOS_00006
Exp: 03/10/19 Prpd: SKV
13C4-Perfluorooctanesulfo

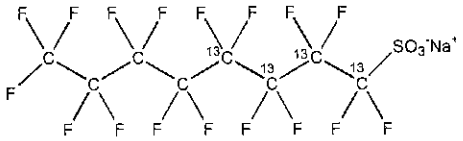
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0314

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	03/10/2014		
EXPIRY DATE: (mm/dd/yyyy)	03/10/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/19/2014 (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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CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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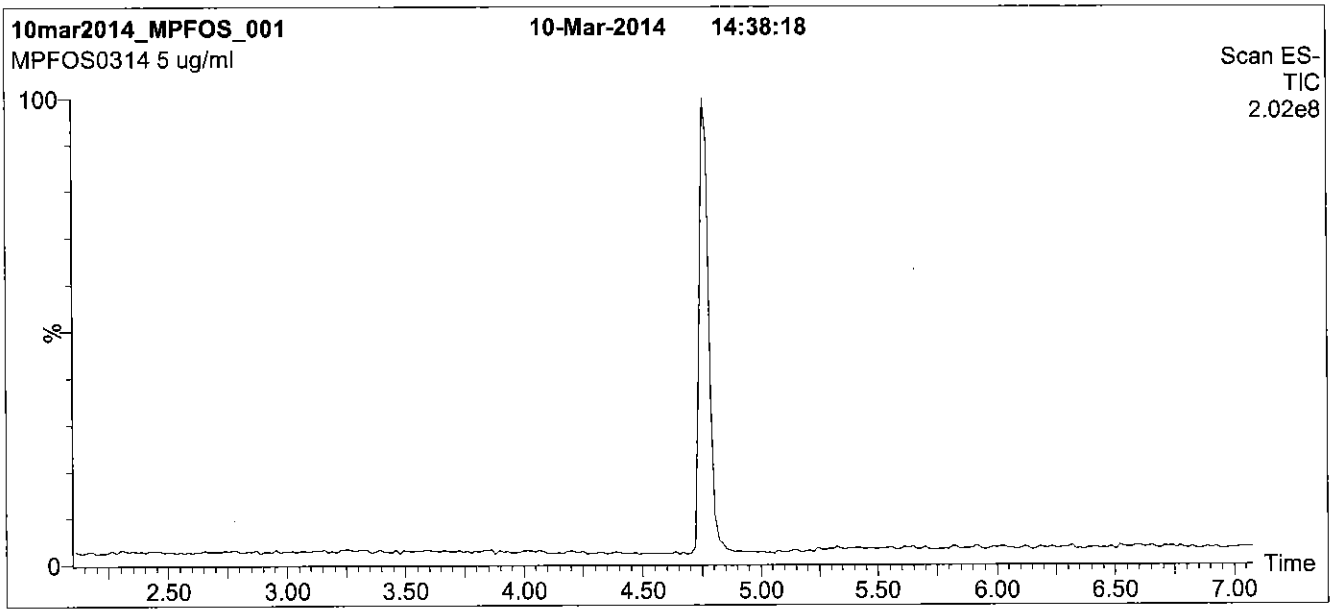
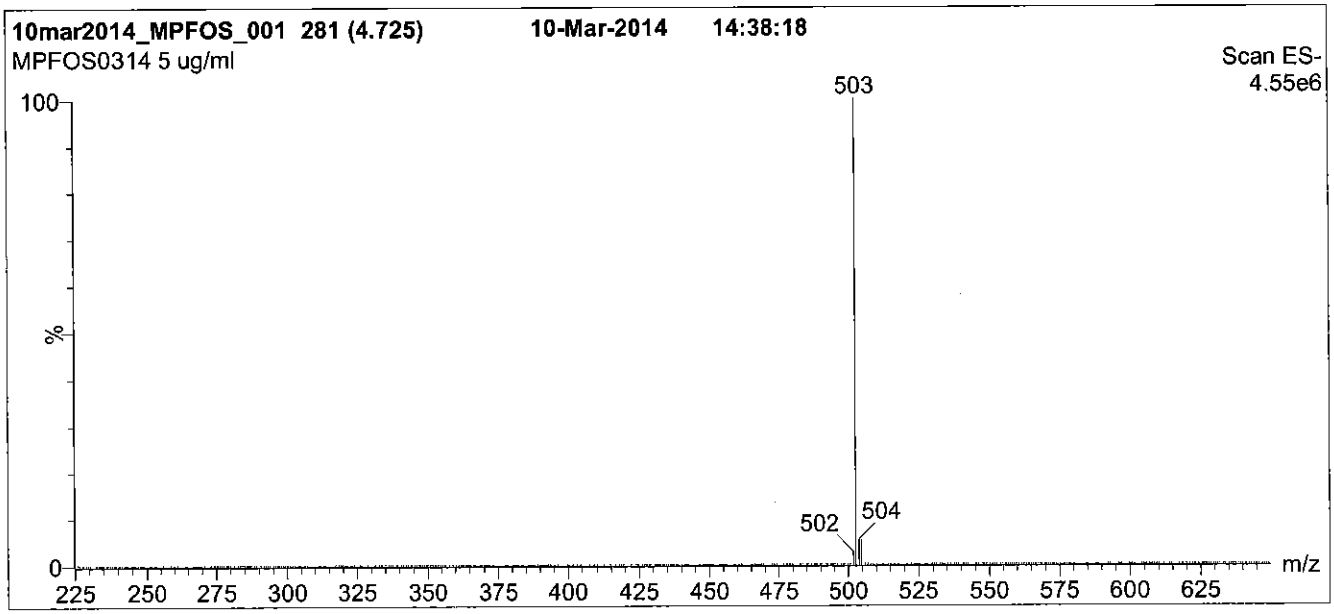




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

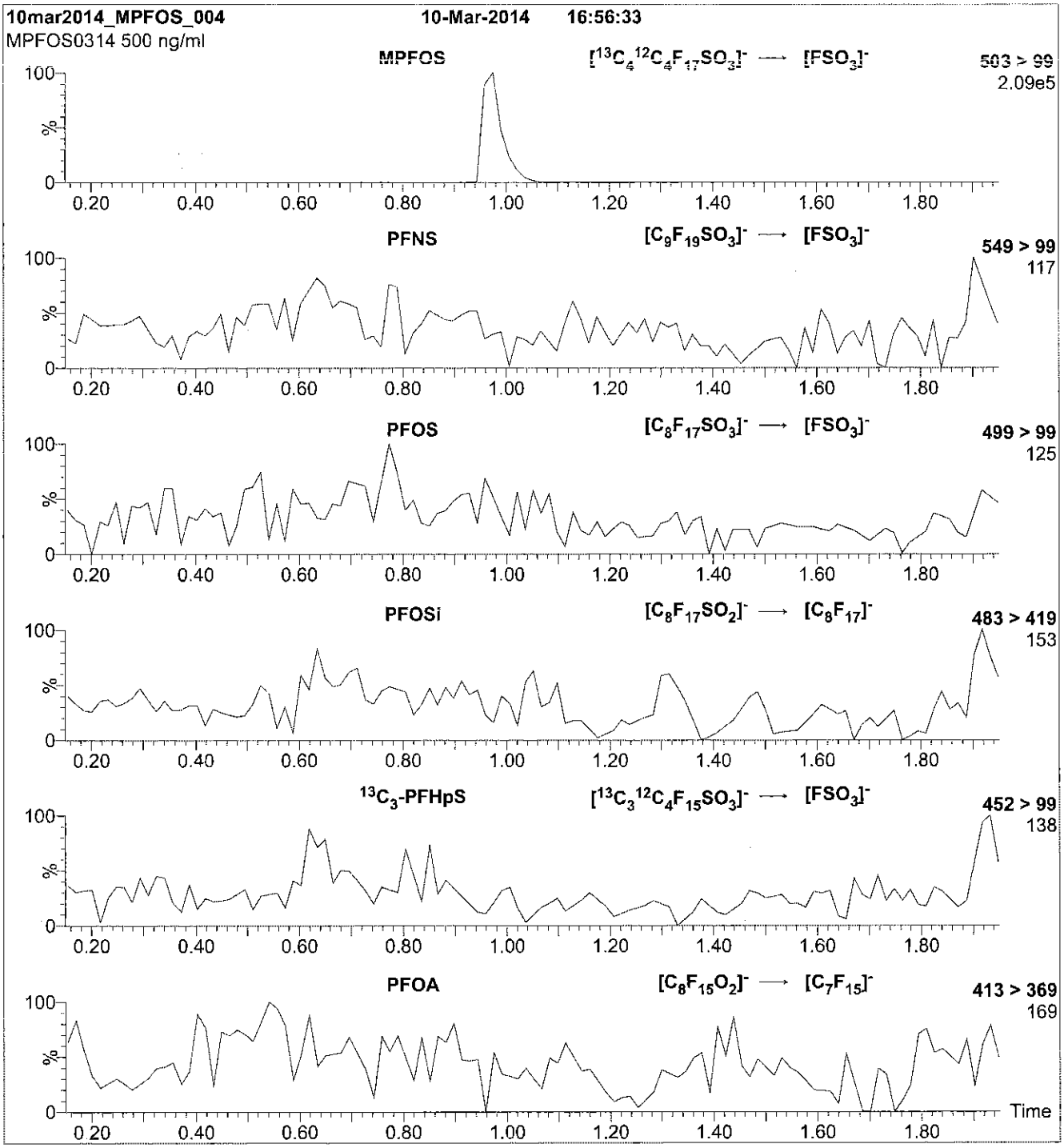
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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: **MPFOS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 40

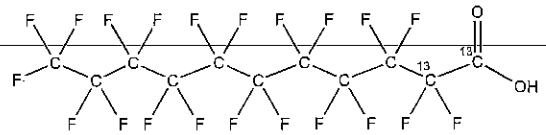
Reagent

LCMPFUdA_00003

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFUdA	**LOT NUMBER:**	MPFUdA0911
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_9HF_{21}O_2$	**MOLECULAR WEIGHT:**	566.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	09/29/2011		
EXPIRY DATE: (mm/dd/yyyy)	09/29/2016		
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 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Presence of 1-$^{13}C_1$-PFUdA (~1%; see Figure 2), 2-$^{13}C_1$-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ^{13}C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/09/2013 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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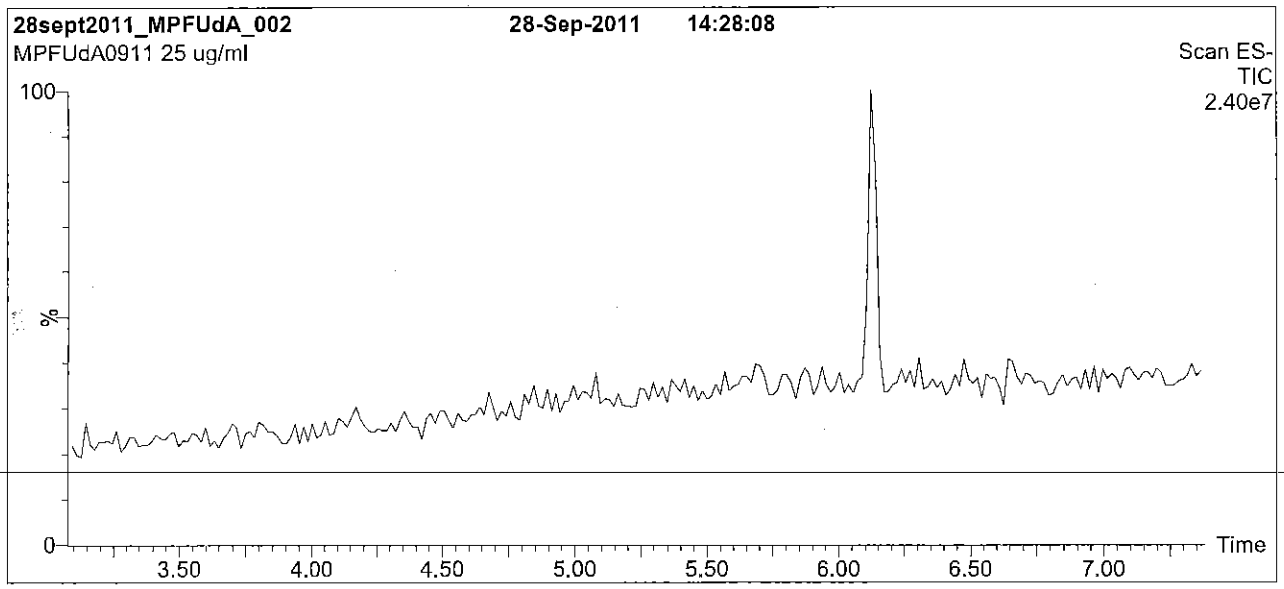
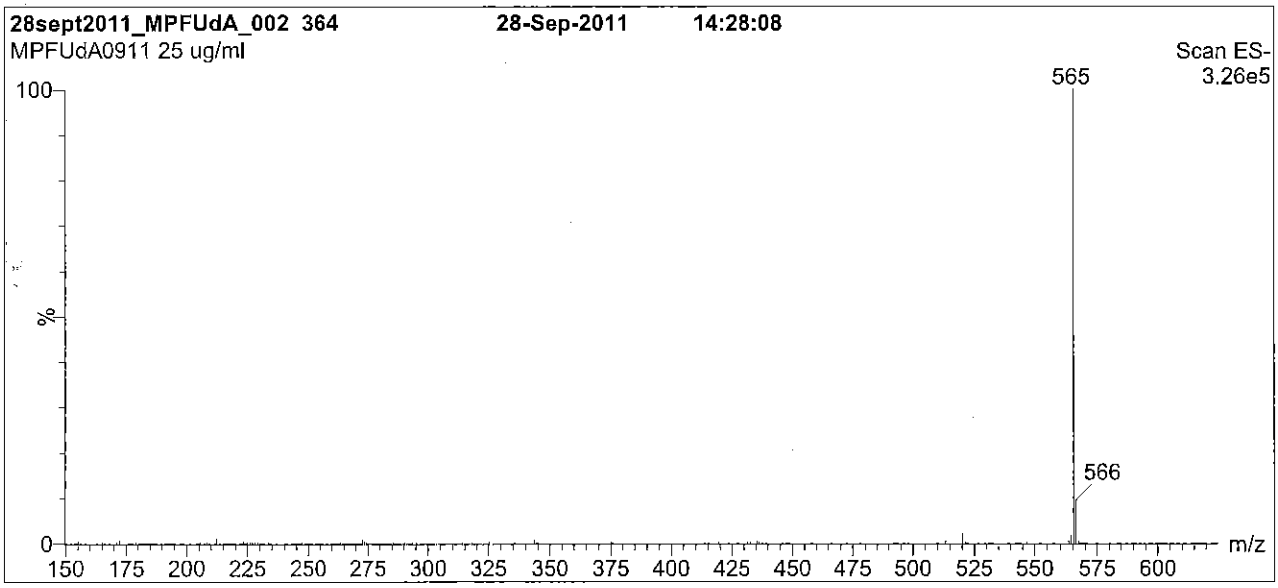
Figure 1: **MPFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Kinetex PFP
2.6 µm, 4.6 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Hold for 2 min. 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

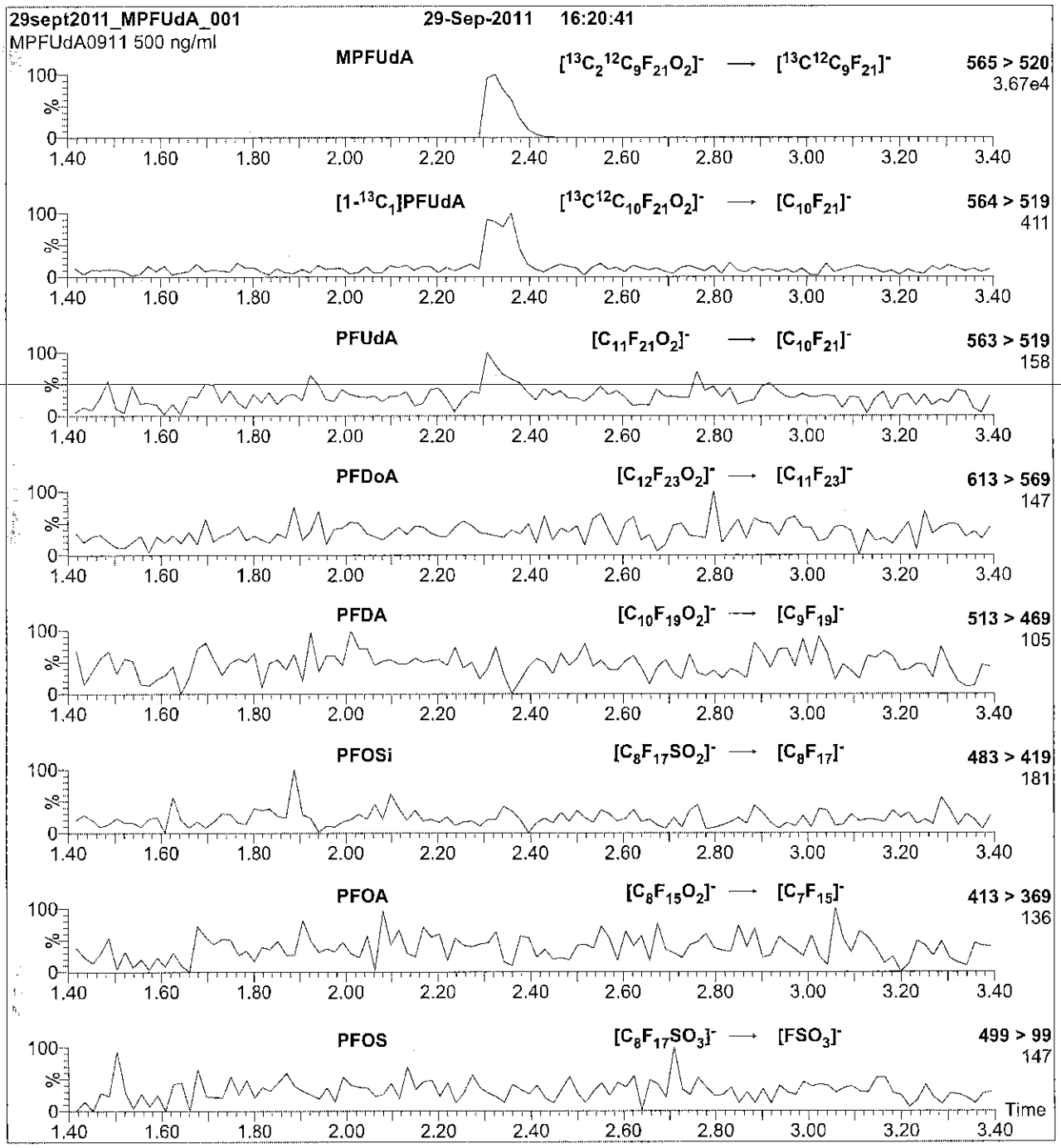
Flow: 1.0 ml/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFACMXB_00002

PFAC-MXB

Solution/Mixture of Native Perfluoroalkylcarboxylic Acids and Native Perfluoroalkylsulfonates

PRODUCT CODE:	PFAC-MXB
LOT NUMBER:	PFACMXB0312
SOLVENT(S):	Methanol / Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	03/07/2012
LAST TESTED: (mm/dd/yyyy)	03/08/2012
EXPIRY DATE: (mm/dd/yyyy)	03/08/2015
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

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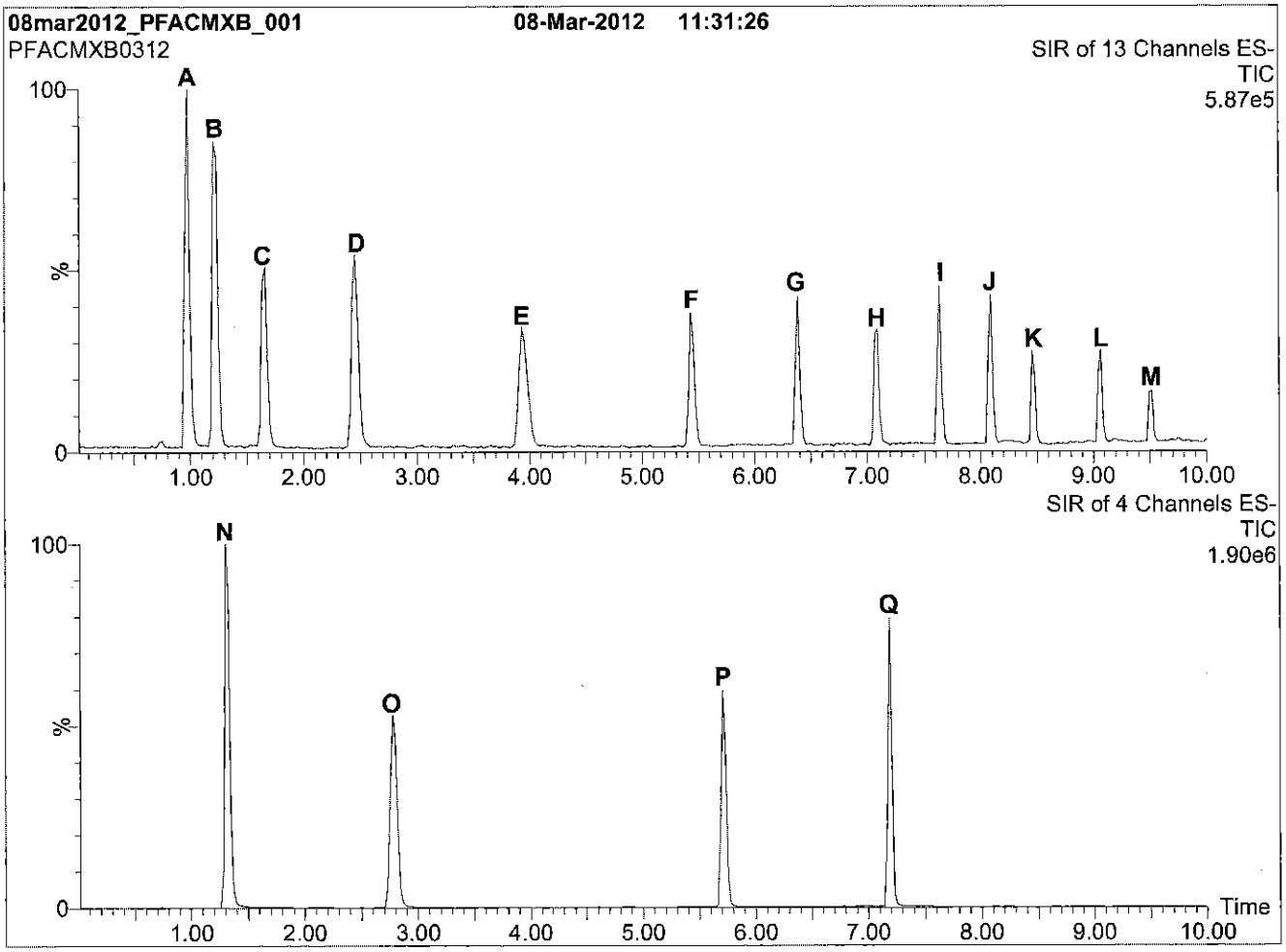
Table A: **PFAC-MXB; Components and Concentrations (ng/ml, ± 5% in Methanol / Water (<1%))**

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

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

Certified By: B.G. Chittim **Date:** 03/19/2012 (mm/dd/yyyy)

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% H_2O / 50% (80:20 MeOH:ACN)
(both with 10 mM NH_4OAc buffer)
Hold for 3 min; ramp to 100% organic over 7 min,
hold for 2 min, then return to initial conditions in 0.5 min.

Time: 15 min

Flow: 300 µl/min

MS Parameters

Experiment:
Function 1: SIR of 13 Channels
Function 2: SIR of 4 Channels

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
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)**

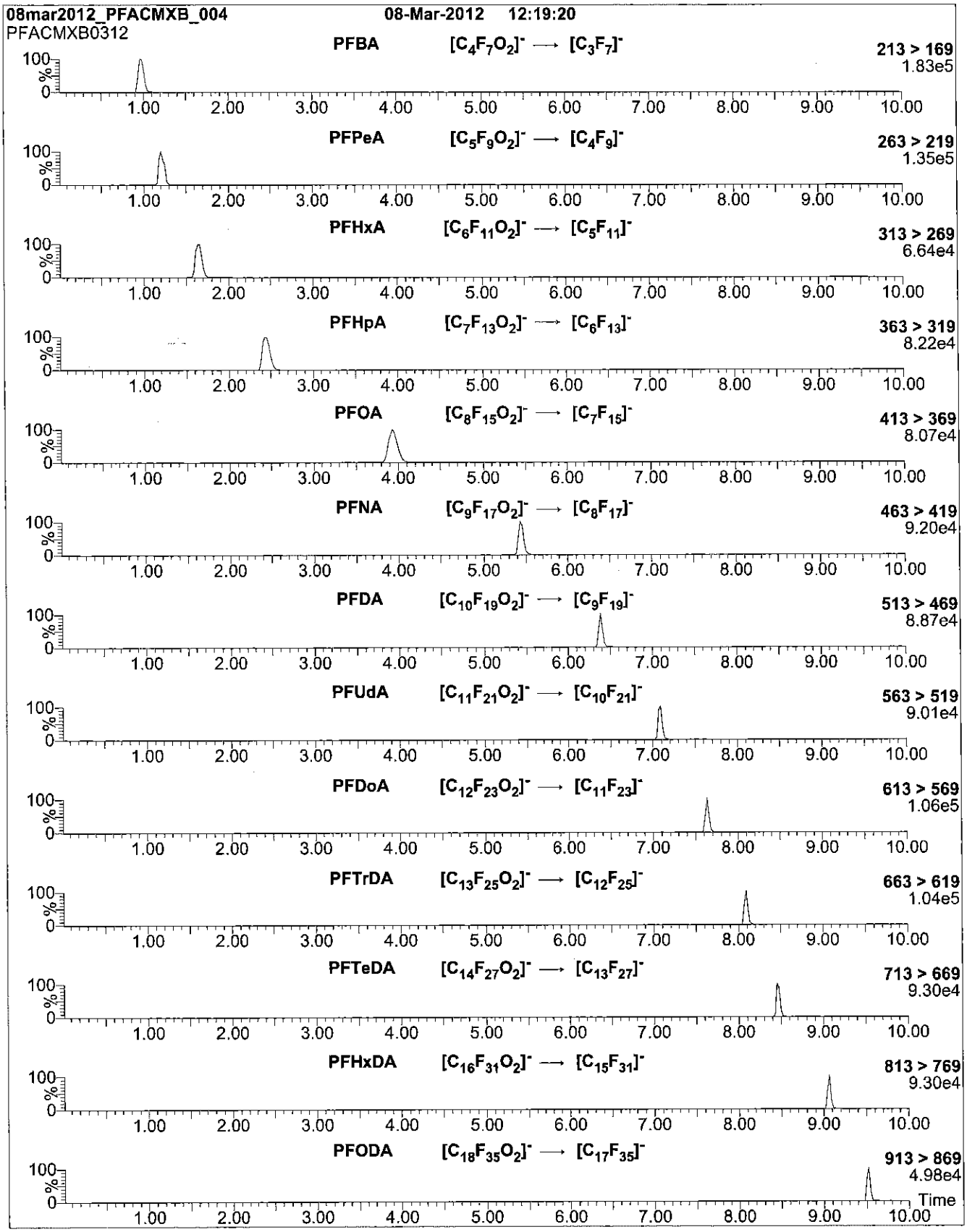
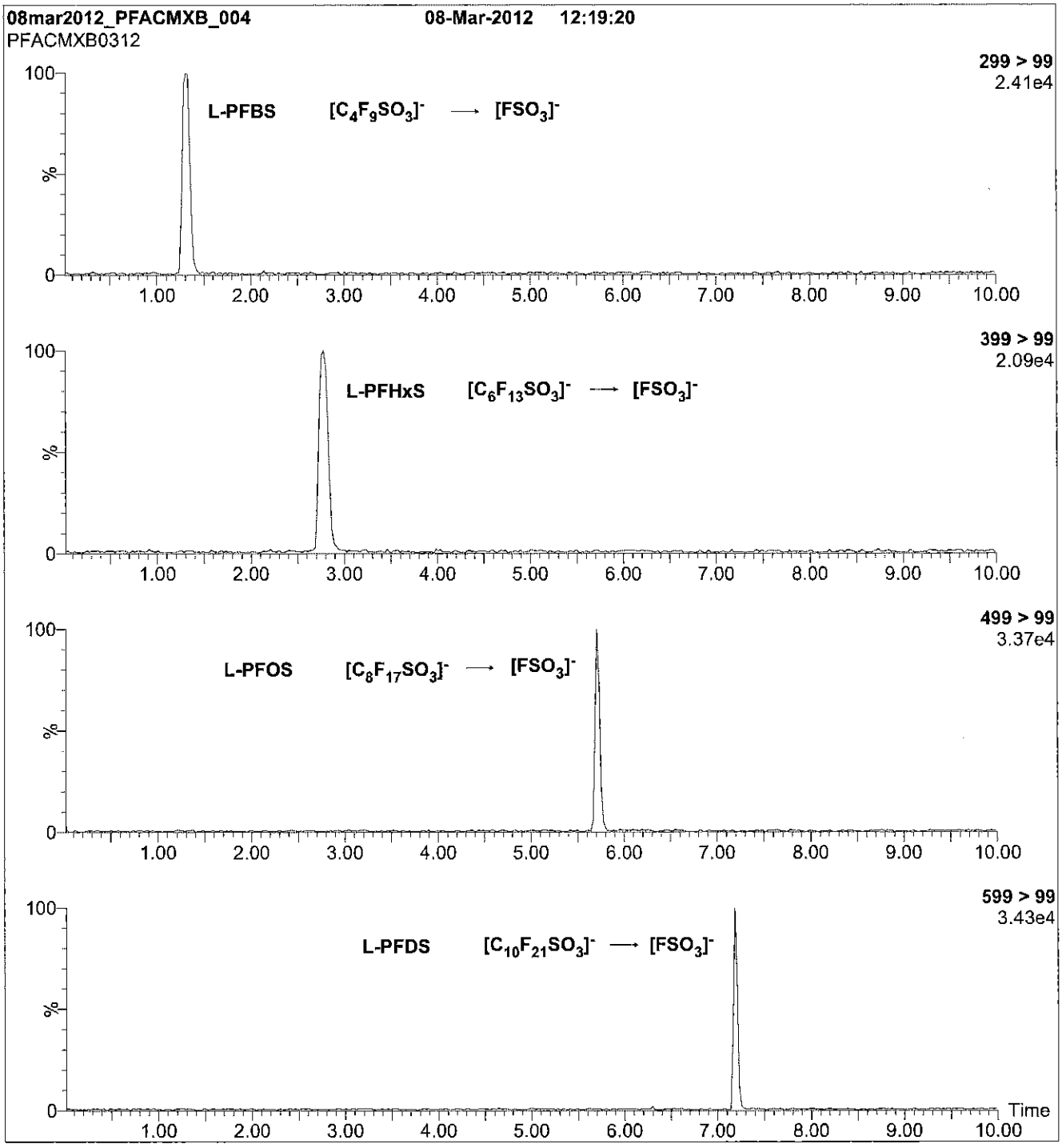


Figure 3: **PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figures 2 and 3:

Injection: on-column (PFAC-MXB)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3

Collision Energy (eV) = 9-50 (variable)

Reagent

LCPFBA_00002

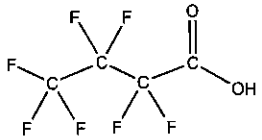
R: 3-15-12 DEL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFBA
COMPOUND: Perfluoro-n-butanoic acid
LOT NUMBER: PFBA0212

STRUCTURE:
CAS #: 375-22-4



MOLECULAR FORMULA: $C_4HF_7O_2$
MOLECULAR WEIGHT: 214.04
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/22/2012
EXPIRY DATE: (mm/dd/yyyy) 02/22/2015
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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Certified By: B.G. Chittim **Date:** 02/23/2012 (mm/dd/yyyy)

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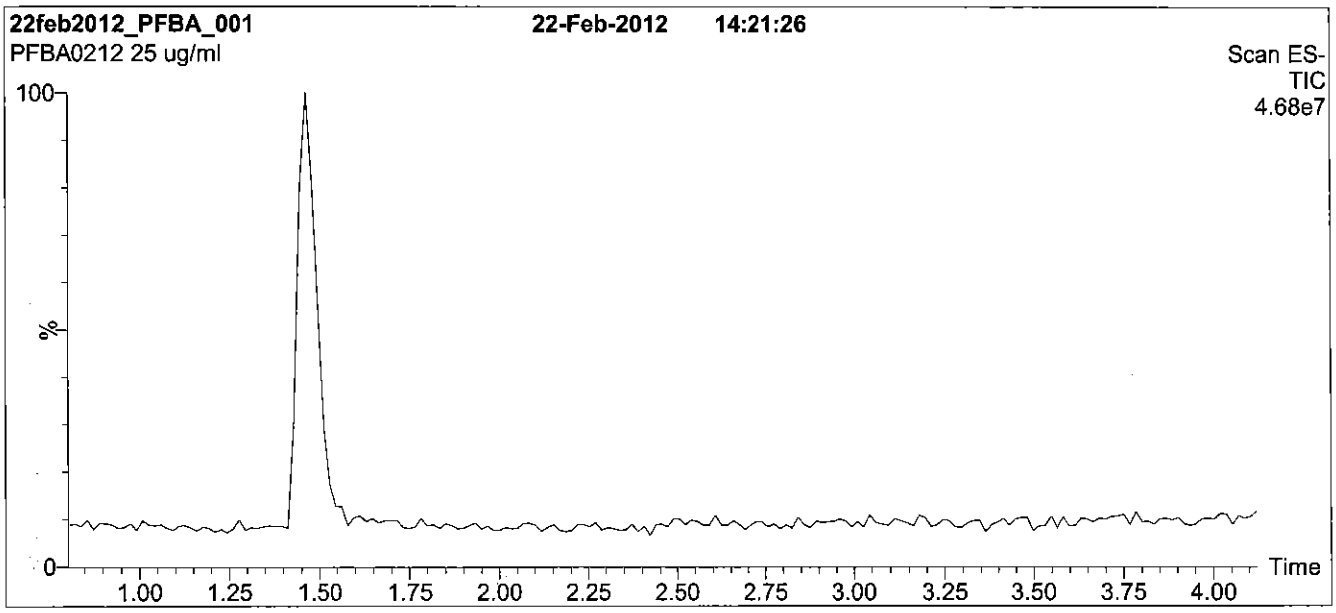
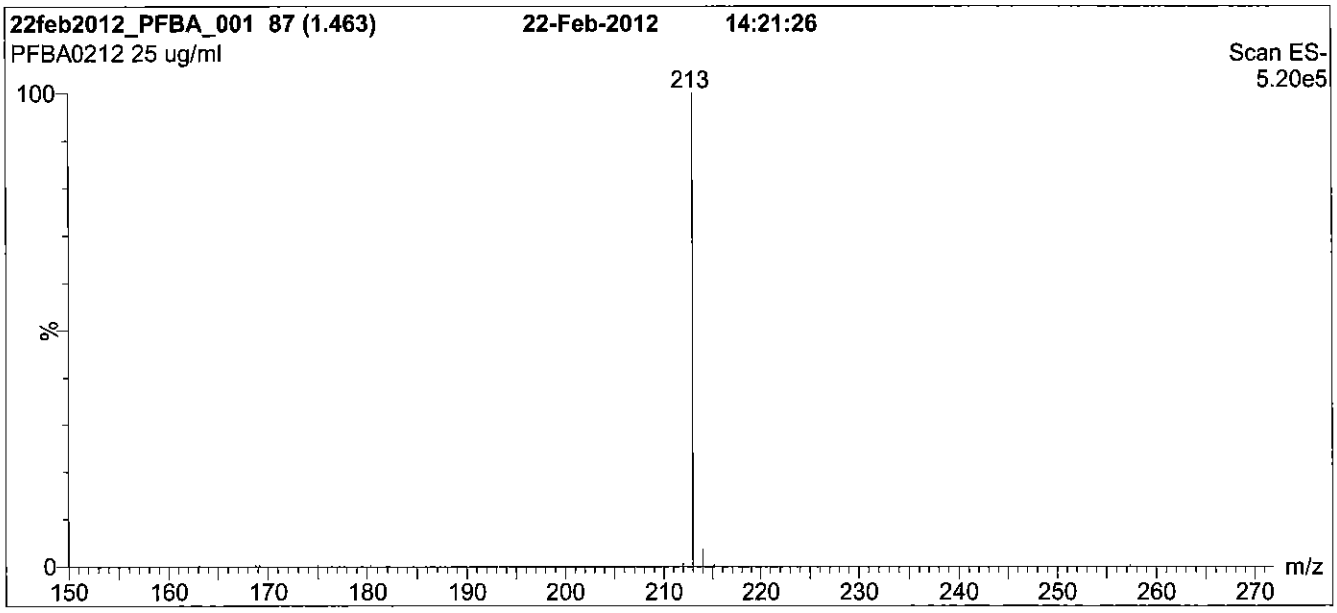
Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

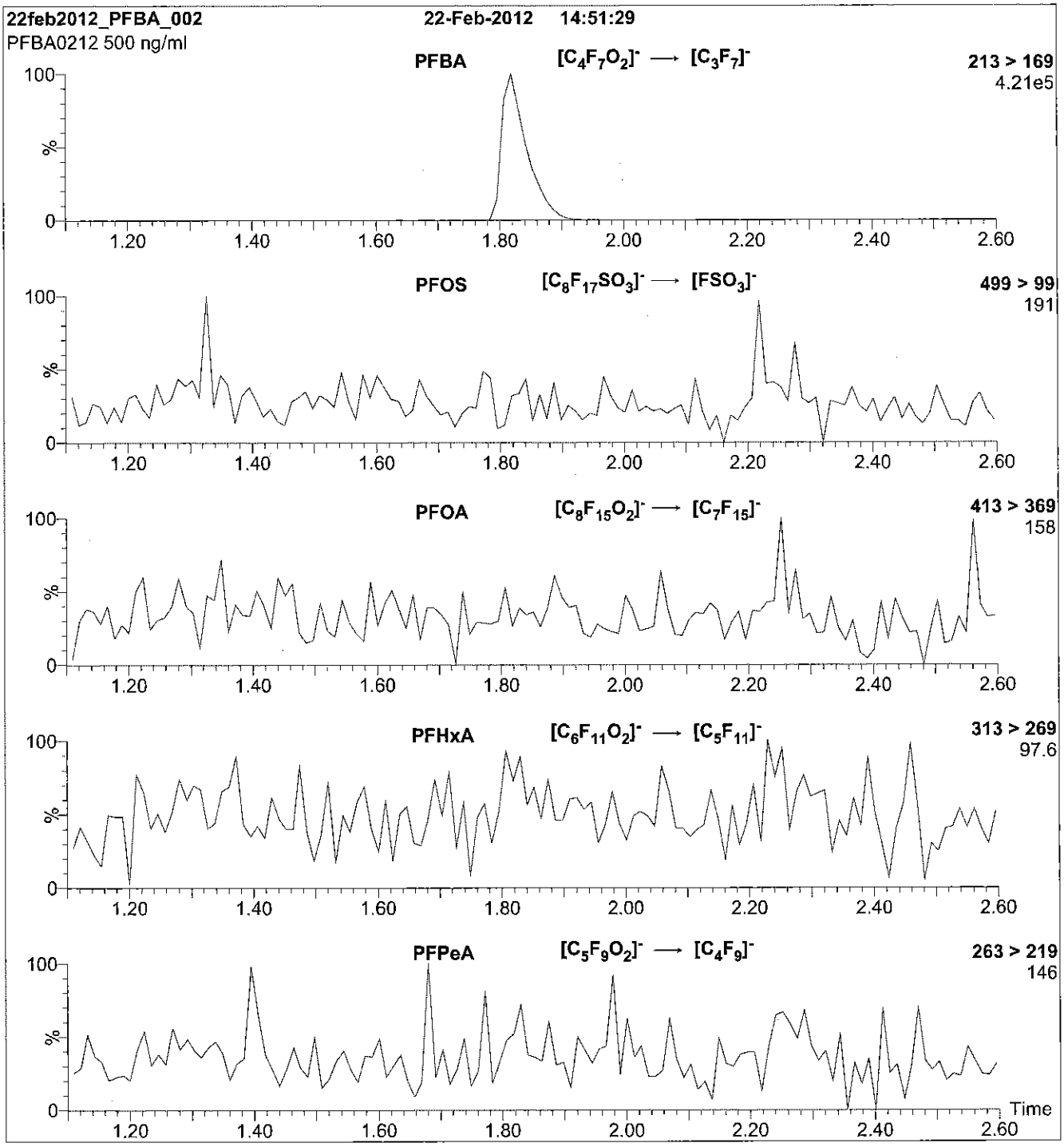
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 10

Reagent

LCPFBS_00002

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

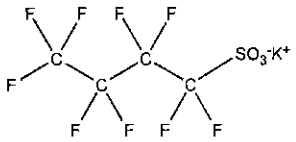
R: 12-14-12
LCPFBS_00002

PRODUCT CODE: L-PFBS
COMPOUND: Potassium perfluoro-1-butanesulfonate

LOT NUMBER: LPFBS0612

STRUCTURE:

CAS #: 29420-49-3



MOLECULAR FORMULA:	$C_4F_9SO_3K$	**MOLECULAR WEIGHT:**	338.19
CONCENTRATION:	50.0 ± 2.5 µg/ml (K salt) 44.2 ± 2.2 µg/ml (PFBS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	06/21/2012		
EXPIRY DATE: (mm/dd/yyyy)	06/21/2015		
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:** 07/09/2012 (mm/dd/yyyy)

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

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CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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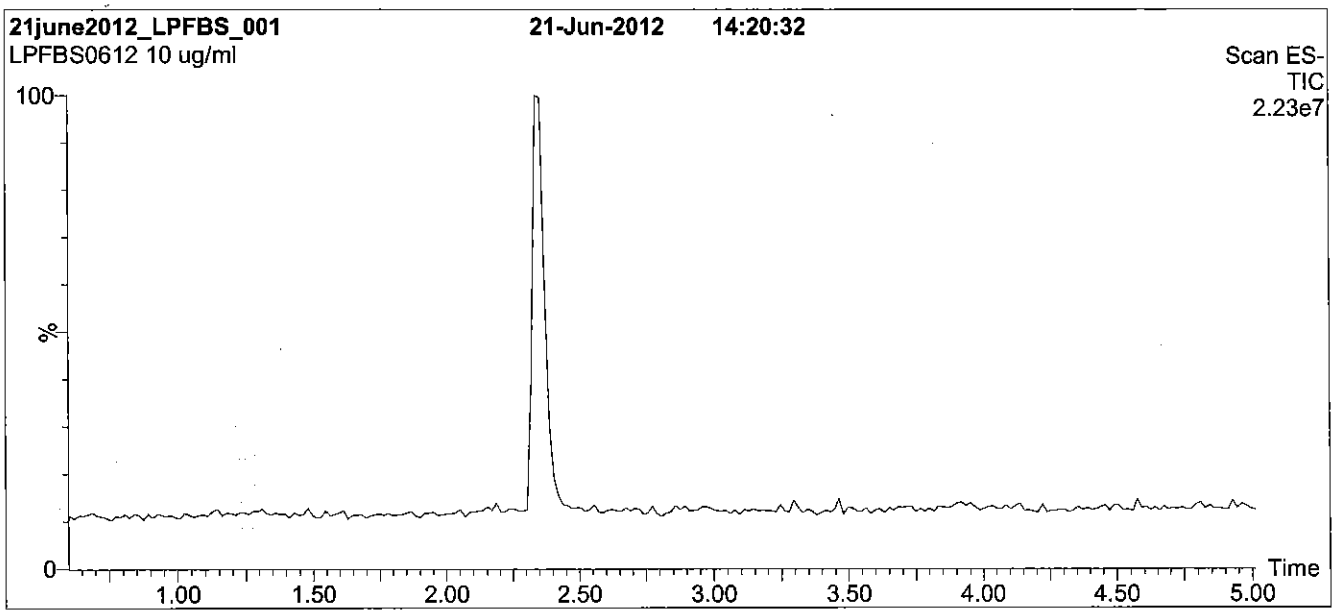
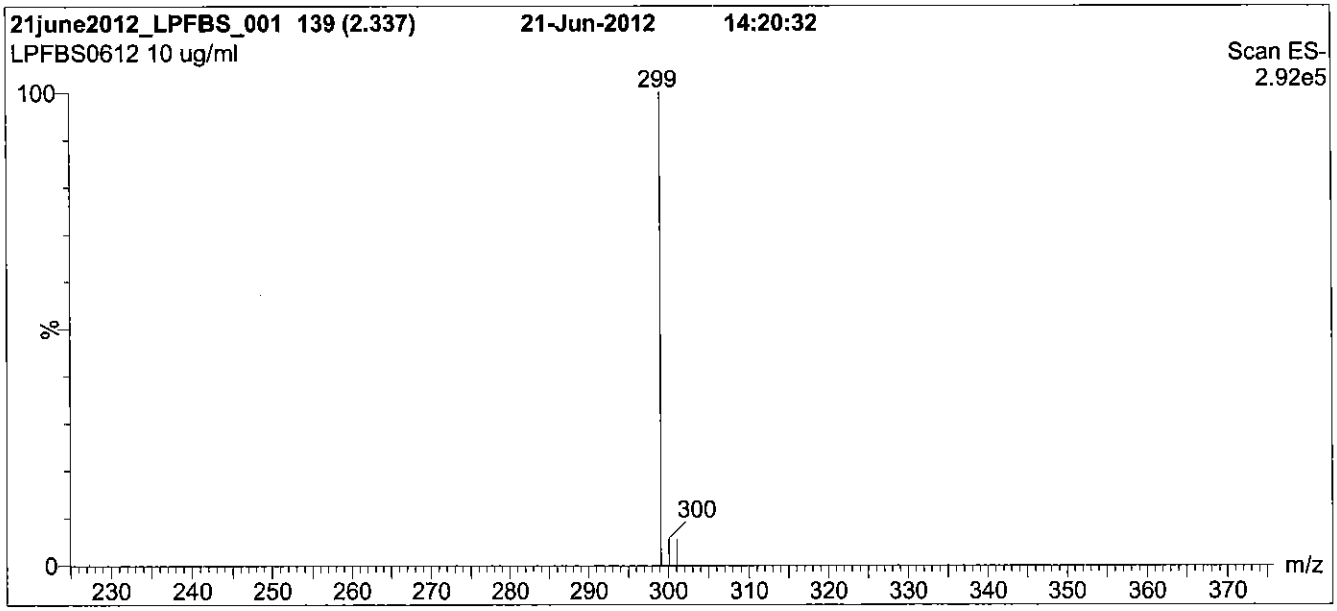
Figure 1: **L-PFBS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min
and hold for 2 min before returning
to initial conditions in 0.5 min.
Time: 10 min

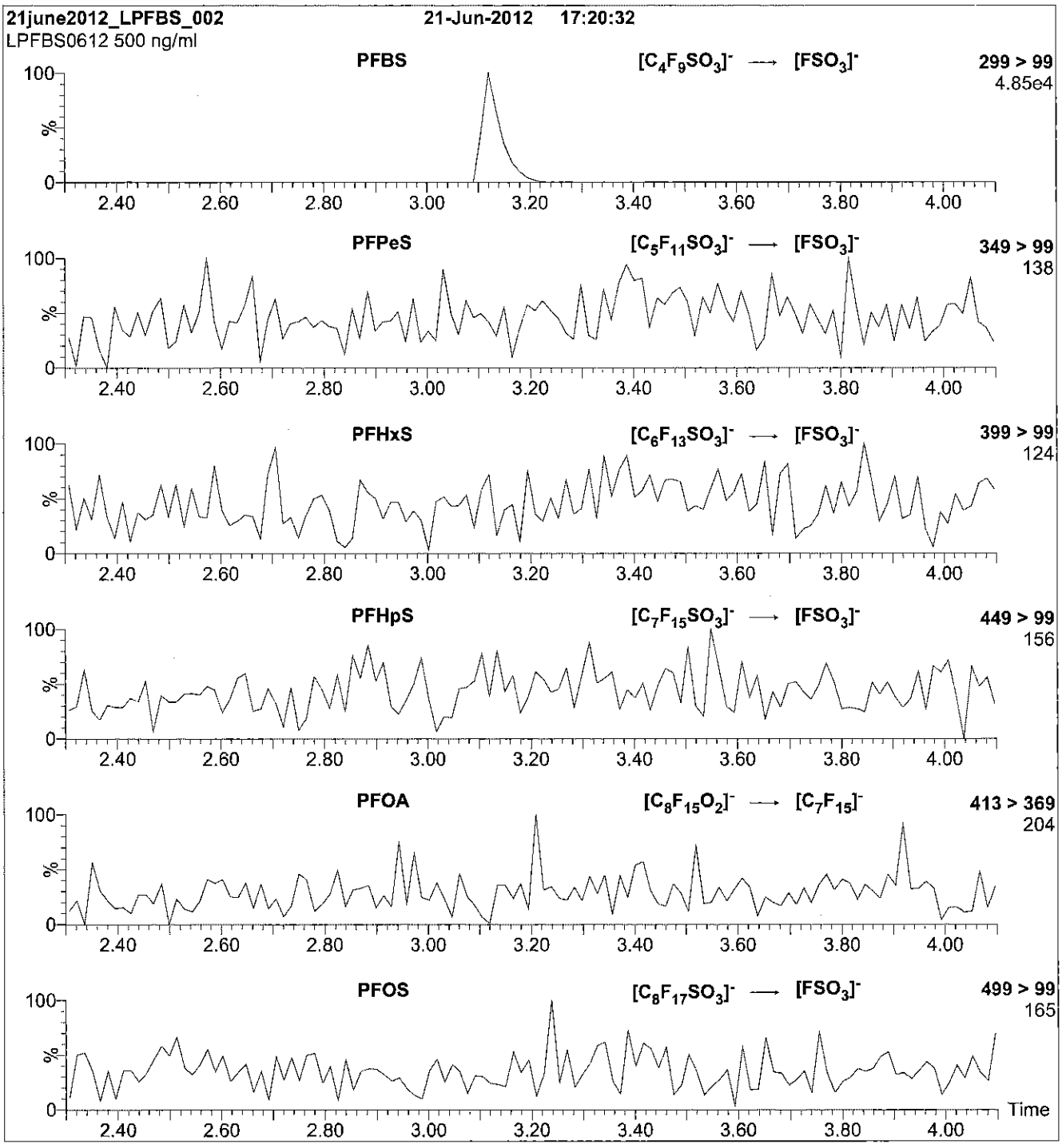
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 25

Reagent

LCPFDA_00003

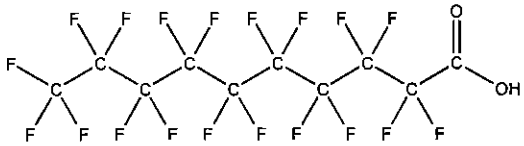
rec 7/16/14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

STRUCTURE:
CAS #: 335-76-2



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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 06/19/2013
EXPIRY DATE: (mm/dd/yyyy) 06/19/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/03/2013 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

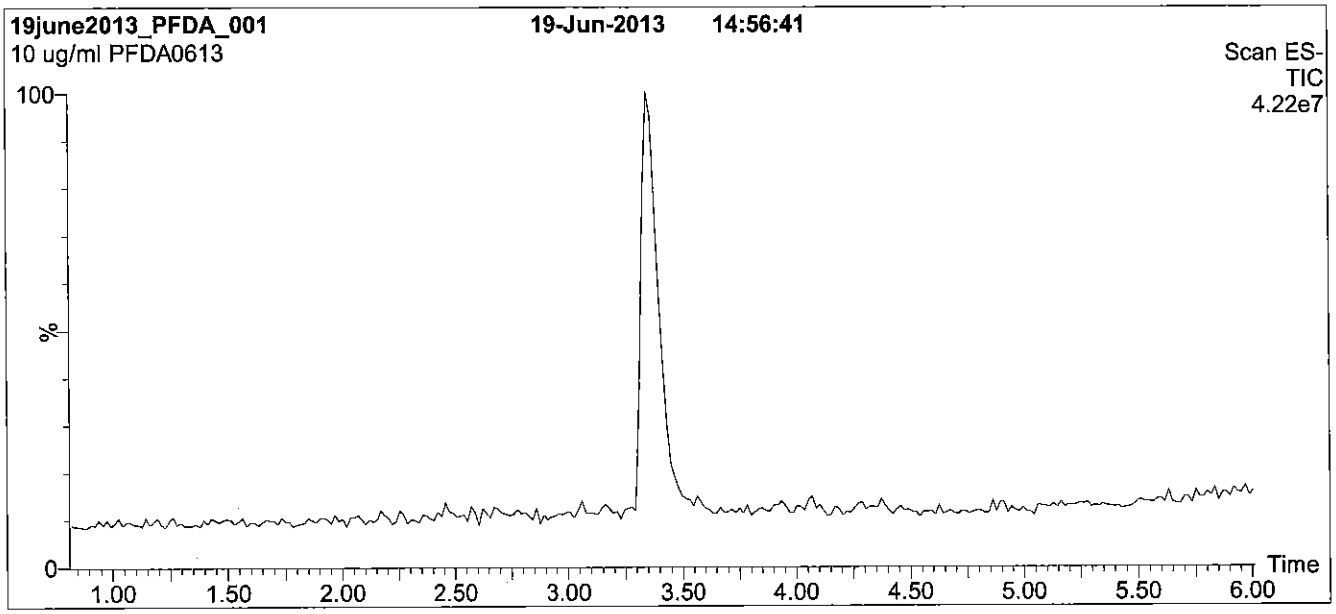
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

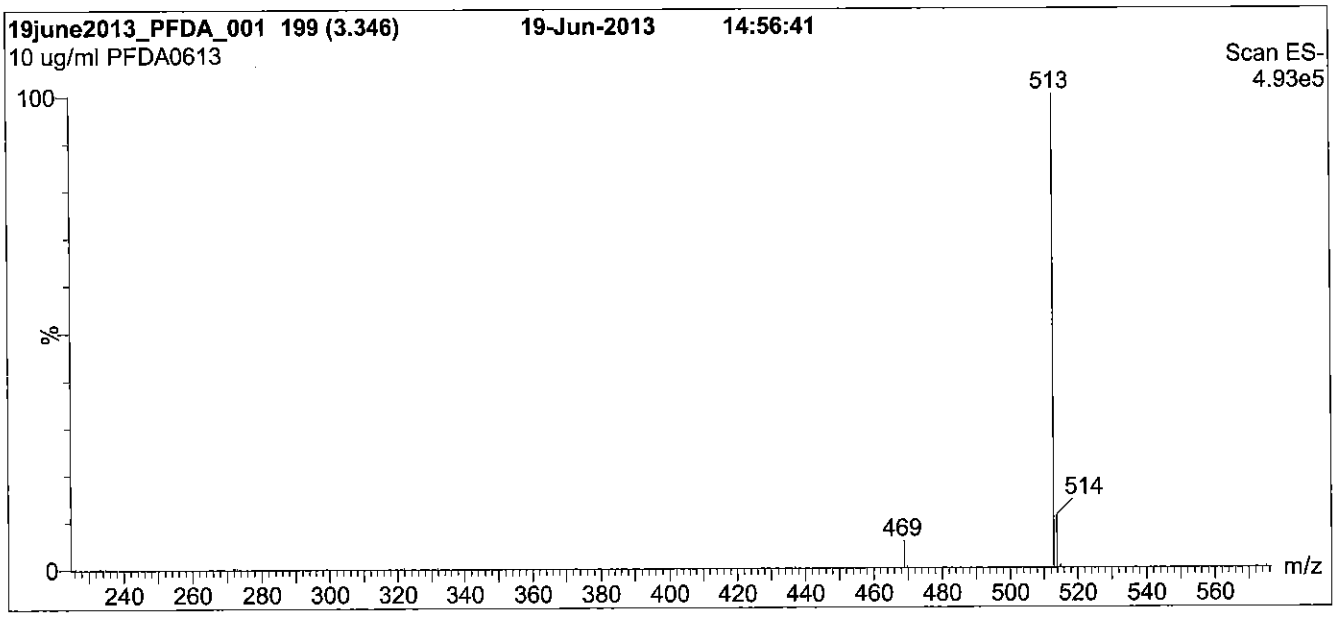
CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

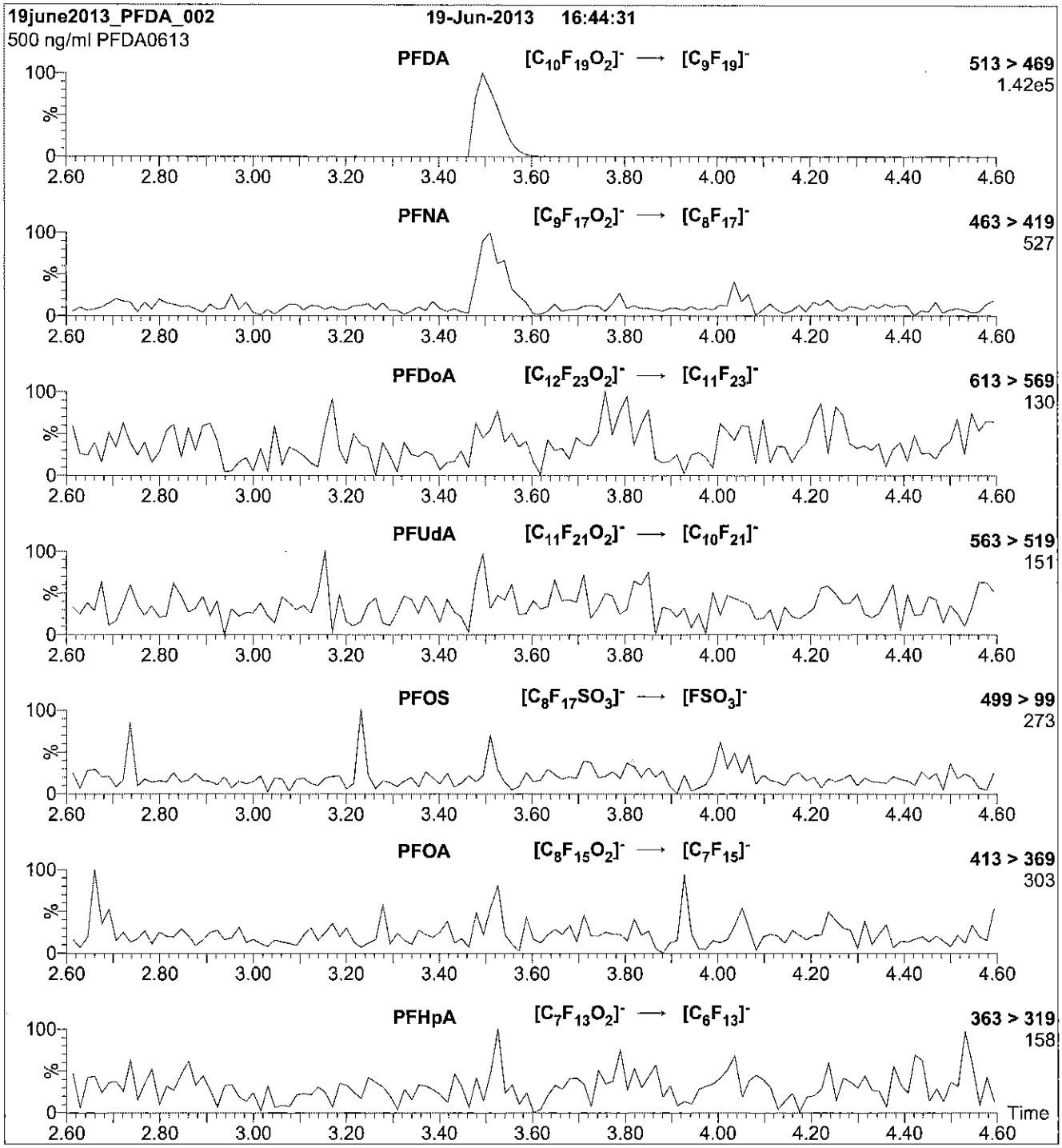
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.58e-3
Collision Energy (eV) = 13

Reagent

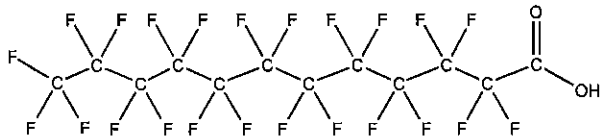
LCPFDoA_00003

Rec 7/14/15

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

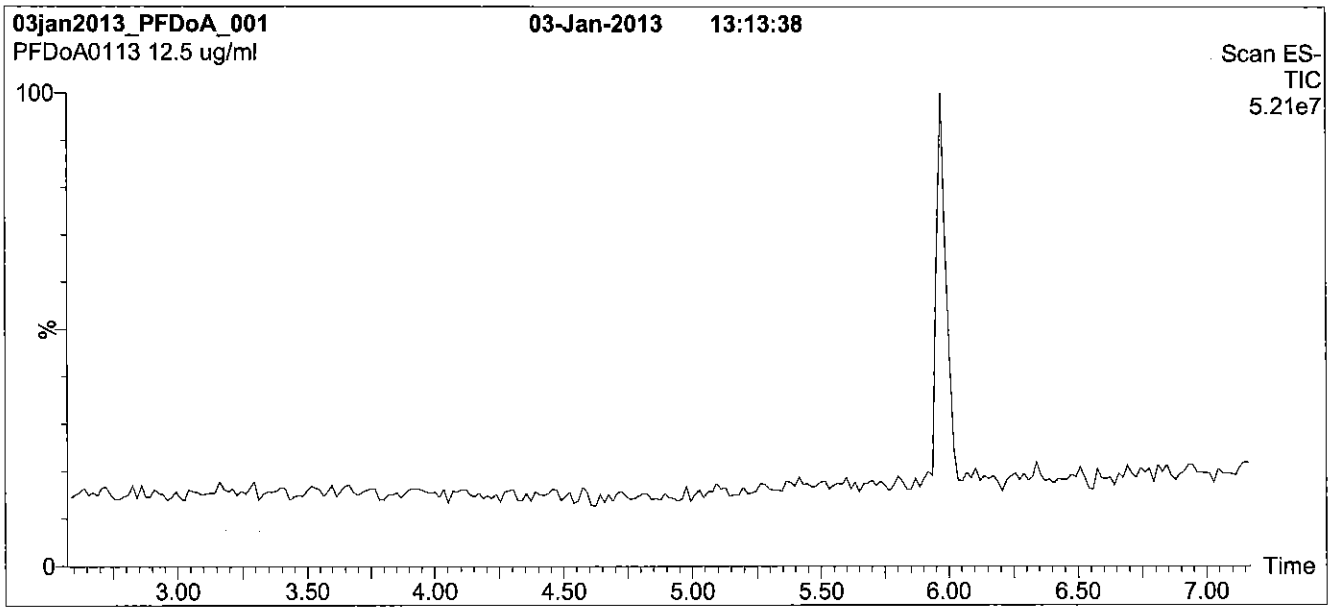
- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

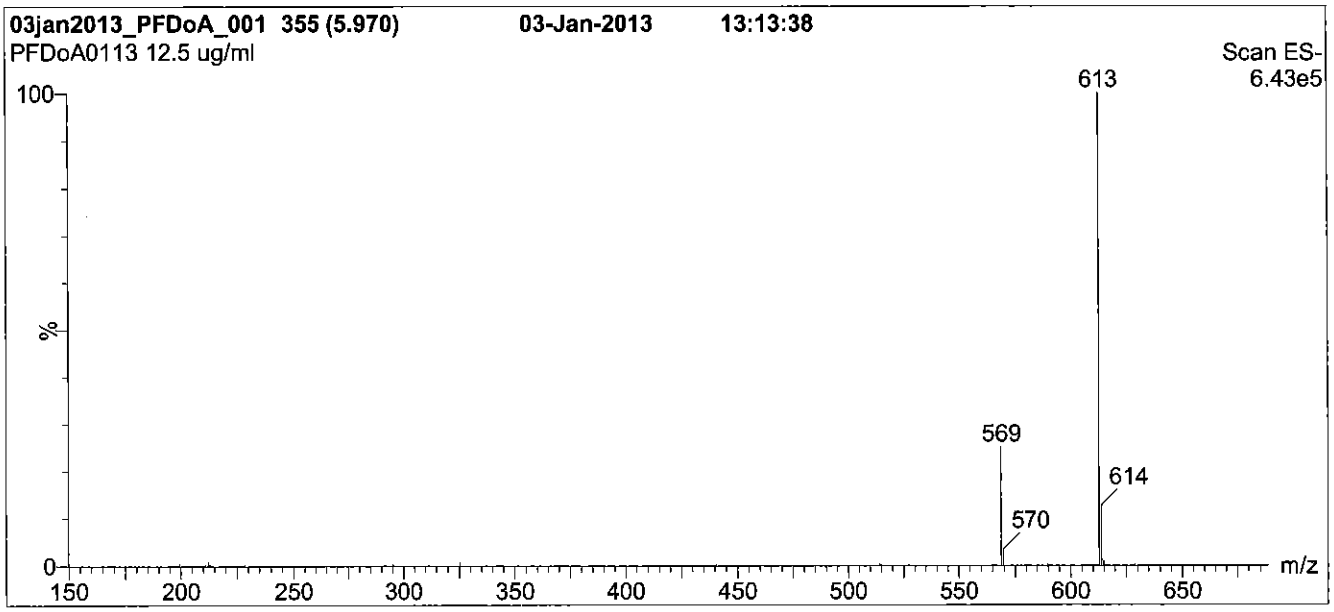
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/01/2013 (mm/dd/yyyy)

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc 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 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Reagent

LCPFDoS_00002

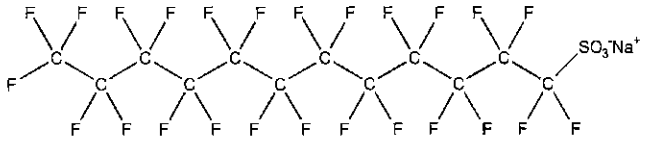
Rec 7/15/14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$C_{12}F_{25}SO_3Na$	**MOLECULAR WEIGHT:**	722.14
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.4 ± 2.4 µg/ml (PFDoS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	10/06/2011		
EXPIRY DATE: (mm/dd/yyyy)	10/06/2016		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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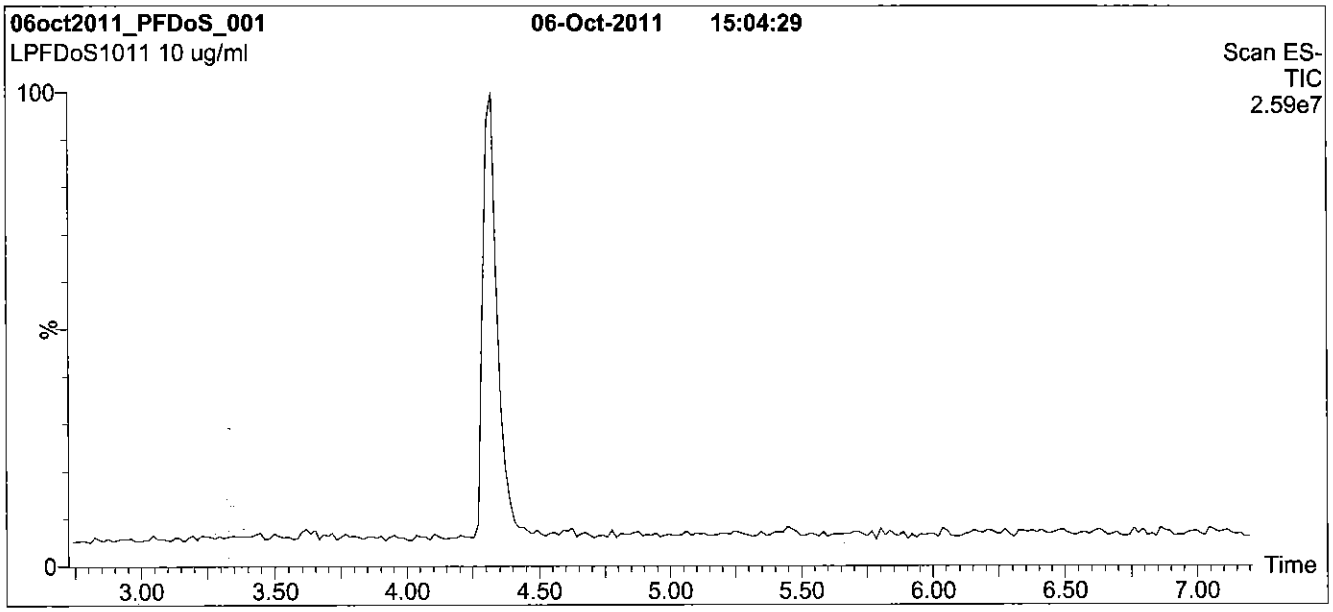
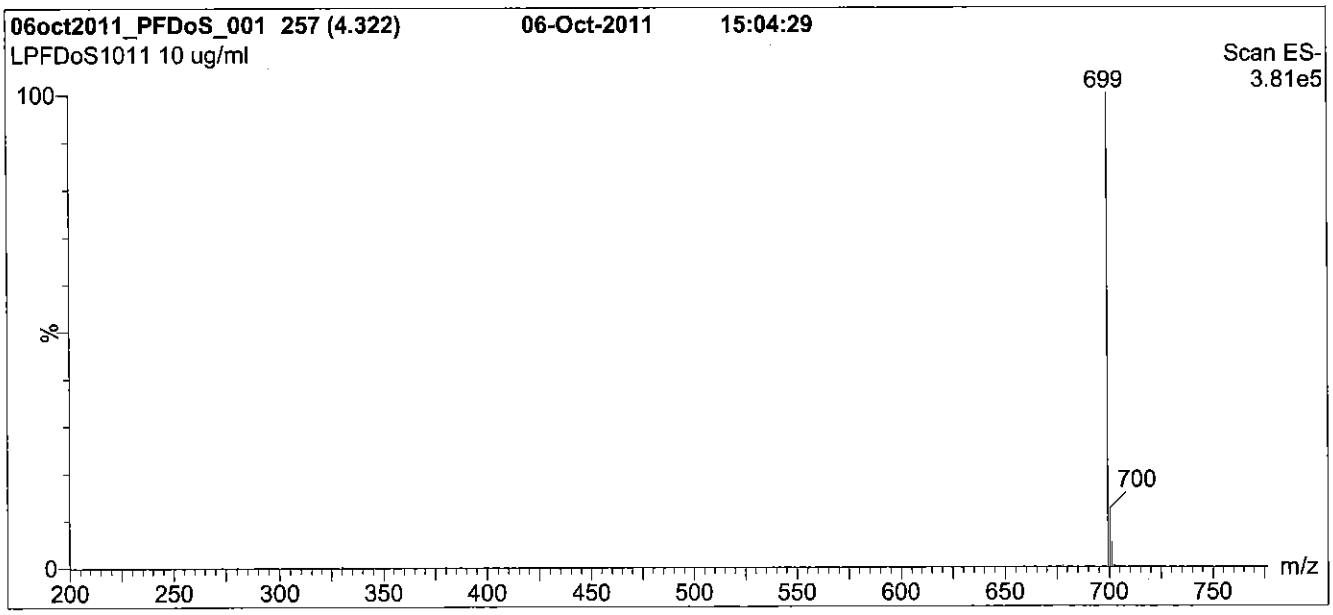
Figure 1: **L-PFDoS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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

Reagent

LCPFDS_00002

WELLINGTON LABORATORIES

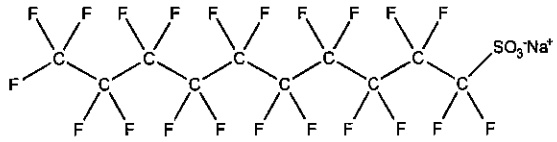
CERTIFICATE OF ANALYSIS DOCUMENTATION

R-12-14-12
LCPFDS_00002

PRODUCT CODE: L-PFDS
COMPOUND: Sodium perfluoro-1-decanesulfonate
LOT NUMBER: LPFDS0612

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$C_{10}F_{21}SO_3Na$	**MOLECULAR WEIGHT:**	622.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.2 ± 2.4 µg/ml (PFDS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	06/21/2012		
EXPIRY DATE: (mm/dd/yyyy)	06/21/2015		
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:** 07/12/2012 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

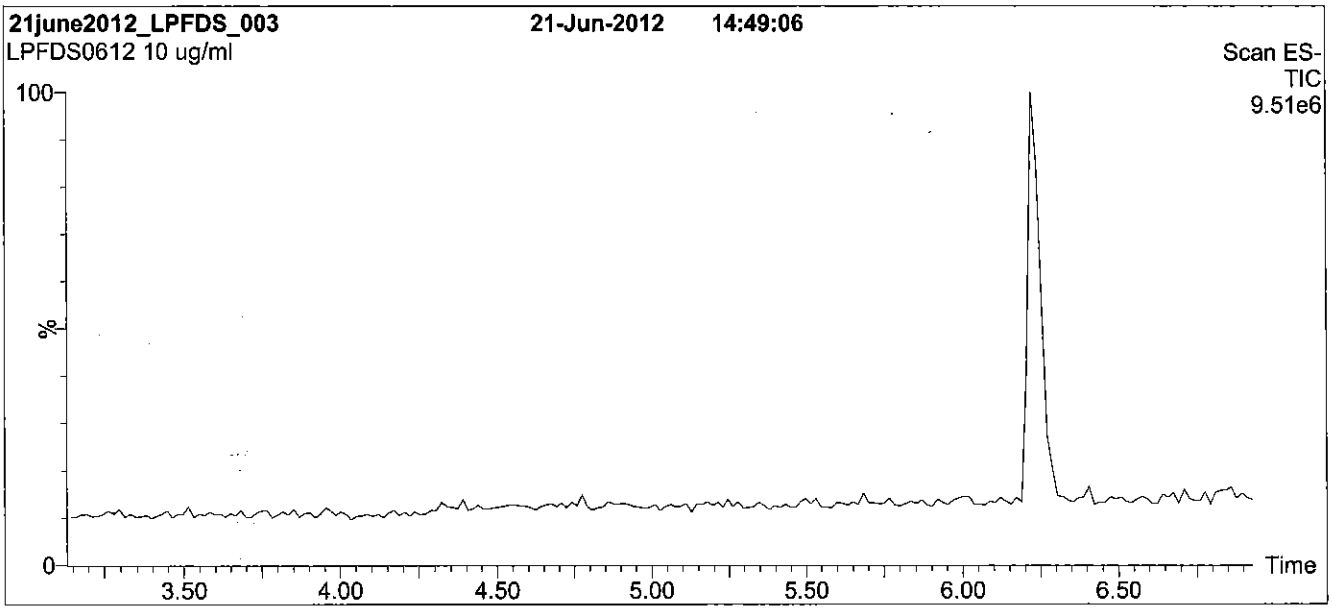
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

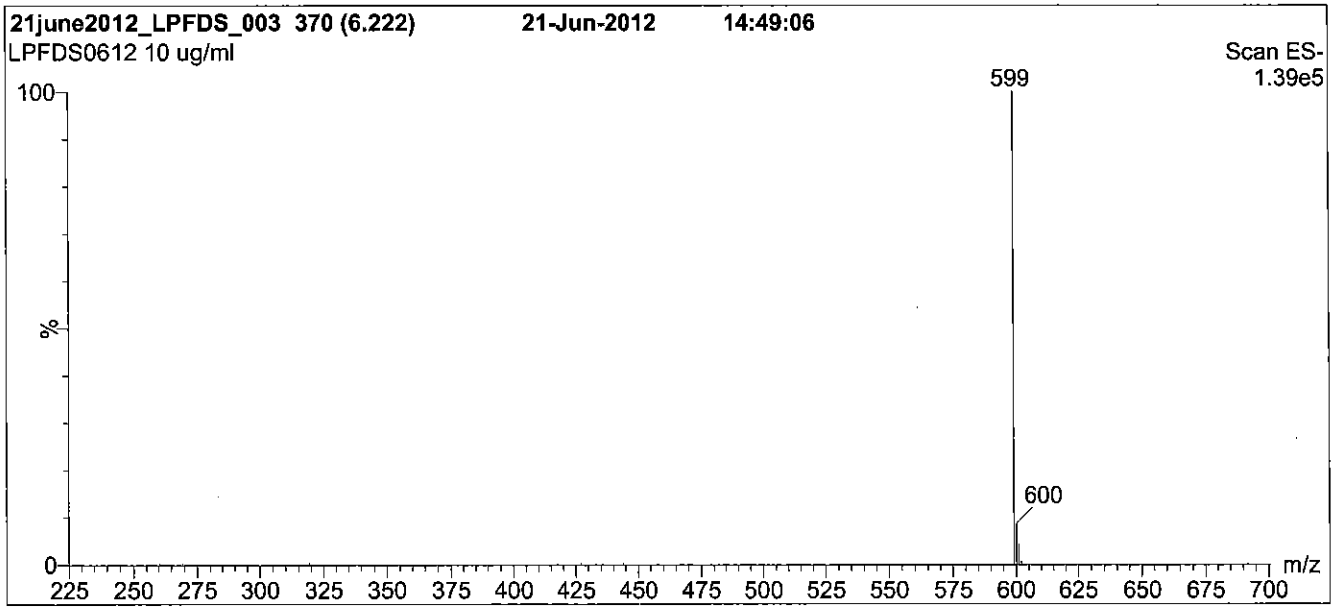
CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

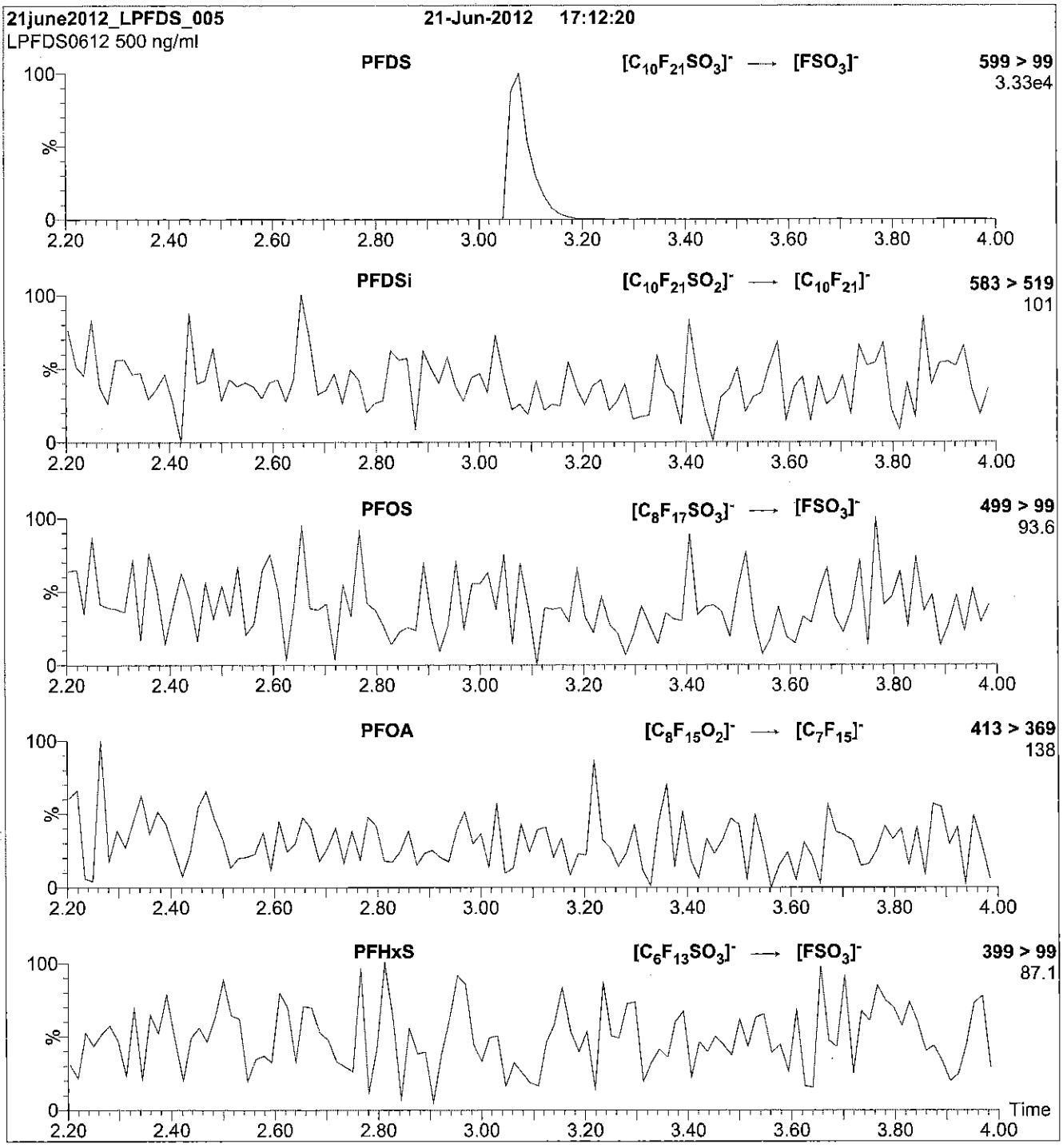
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 50

Reagent

LCPFHpA_00002

R 9-17-12 DEL

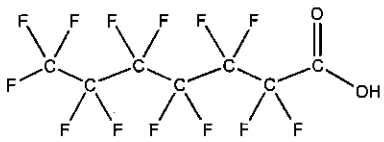
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

Dup LCPFHpA-00001
new lot LCPFHpA-000002

PRODUCT CODE: PFHpA
LOT NUMBER: PFHpA0412
COMPOUND: Perfluoro-n-heptanoic acid

STRUCTURE:
CAS #: 375-85-9



MOLECULAR FORMULA: $C_7HF_{13}O_2$
MOLECULAR WEIGHT: 364.06
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/18/2012
EXPIRY DATE: (mm/dd/yyyy) 04/18/2015
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:** 05/03/2012 (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:

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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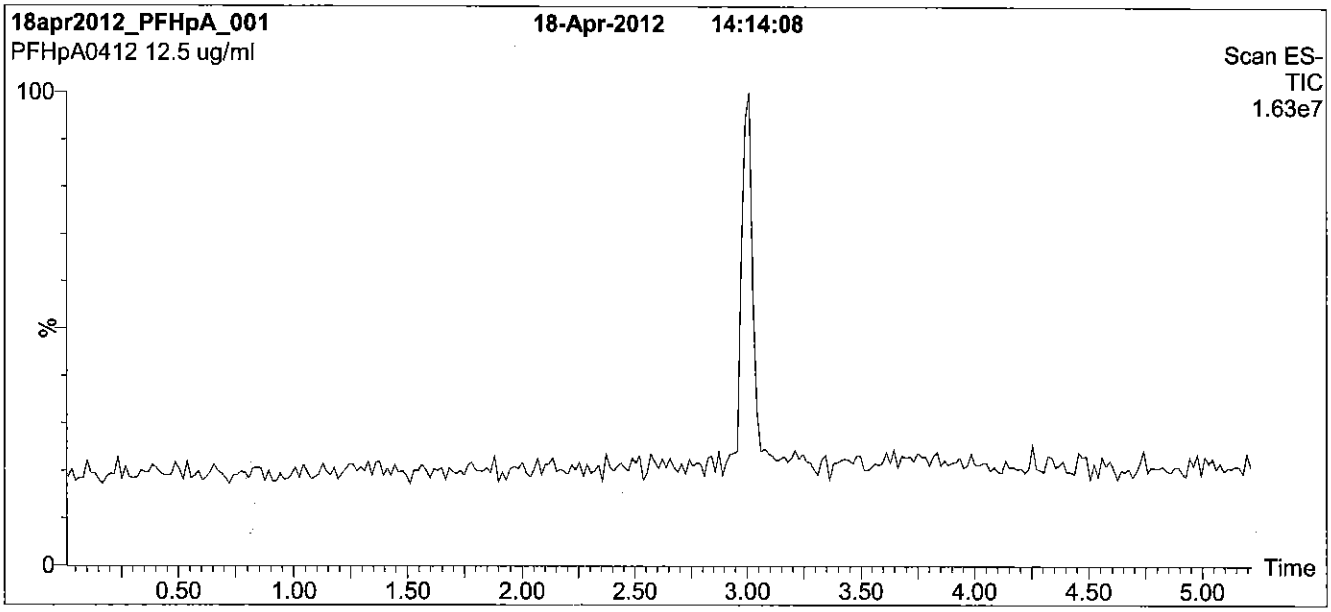
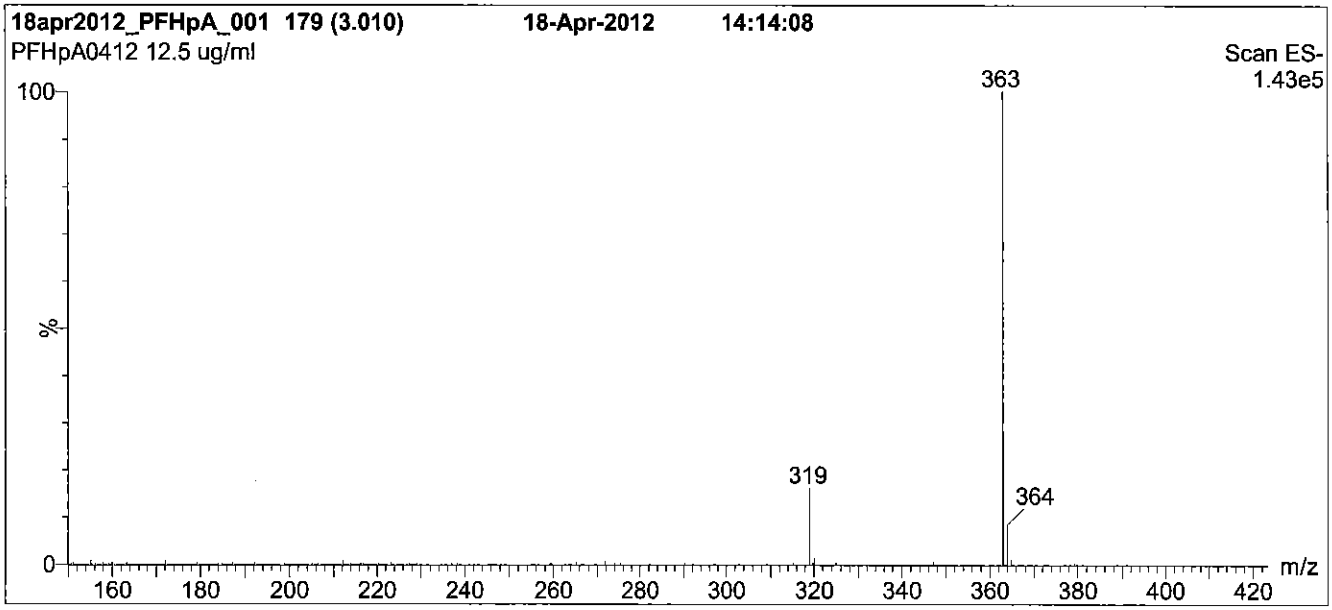
LIMITED WARRANTY:

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

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

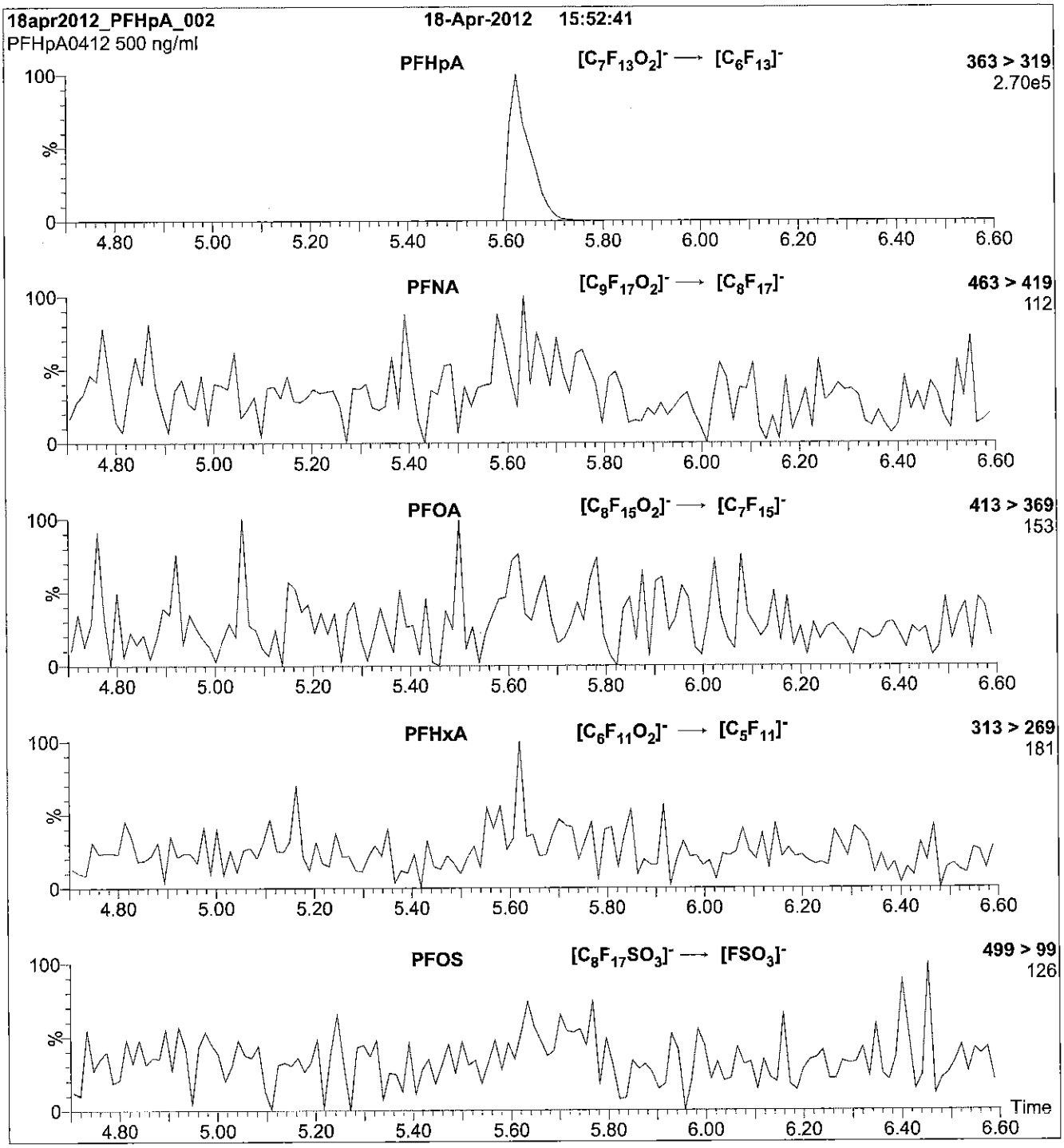
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 11

Reagent

LCPFHxA_00002

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

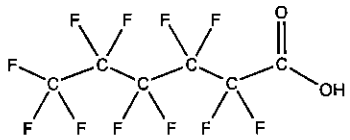
R: 12-14-12
LCPFHxA-00002

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

LOT NUMBER: PFHxA1012

STRUCTURE:

CAS #: 307-24-4



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

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/29/2012
EXPIRY DATE: (mm/dd/yyyy) 10/29/2015
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 11/01/2012 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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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:

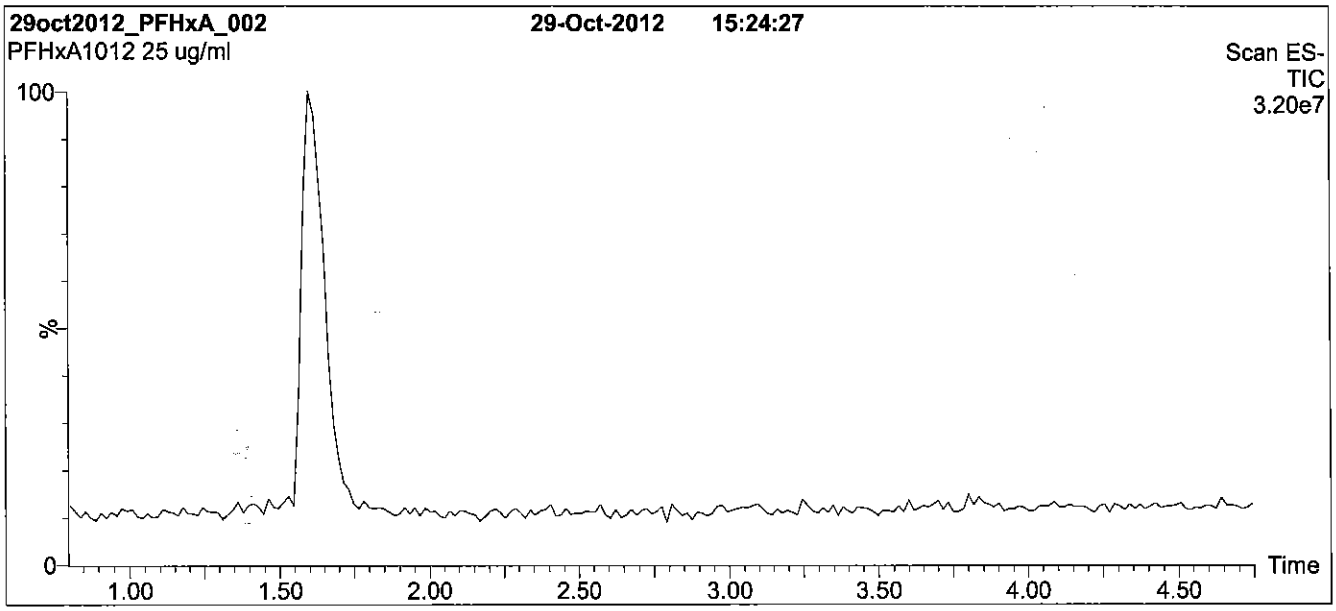
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

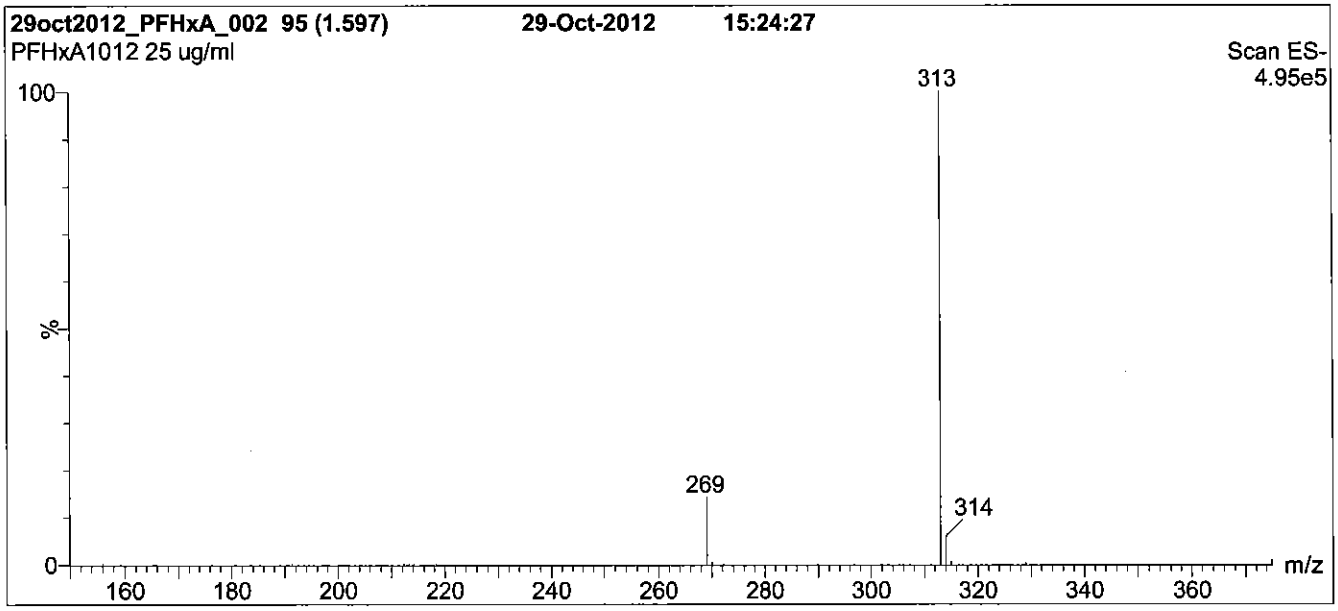
CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

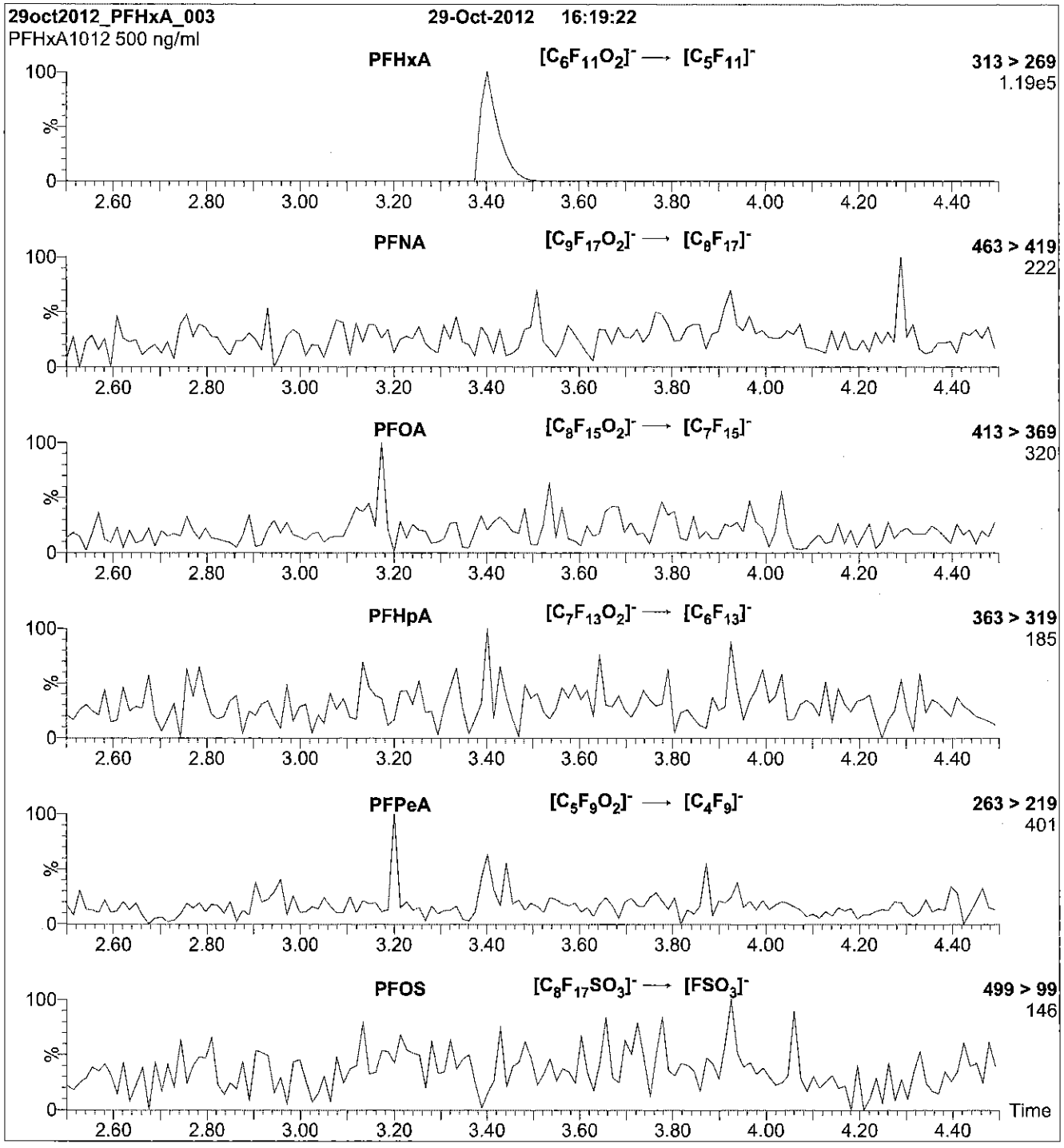
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.13e-3
Collision Energy (eV) = 10

Reagent

LCPFHxS_00002

R 9-17-12 DEL

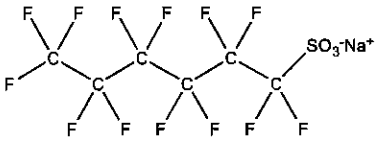
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

Dup LCPFHxS-00001
new lot LCPFHxS-00002

PRODUCT CODE: L-PFHxS
LOT NUMBER: LPFHxS0312
COMPOUND: Sodium perfluoro-1-hexanesulfonate

STRUCTURE:
CAS #: 82382-12-5



MOLECULAR FORMULA: $C_8F_{13}SO_3Na$
MOLECULAR WEIGHT: 422.10
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
47.3 ± 2.4 µg/ml (PFHxS anion) ✓
SOLVENT(S): Methanol

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 03/27/2012
EXPIRY DATE: (mm/dd/yyyy) 03/27/2015
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:** 04/18/2012 (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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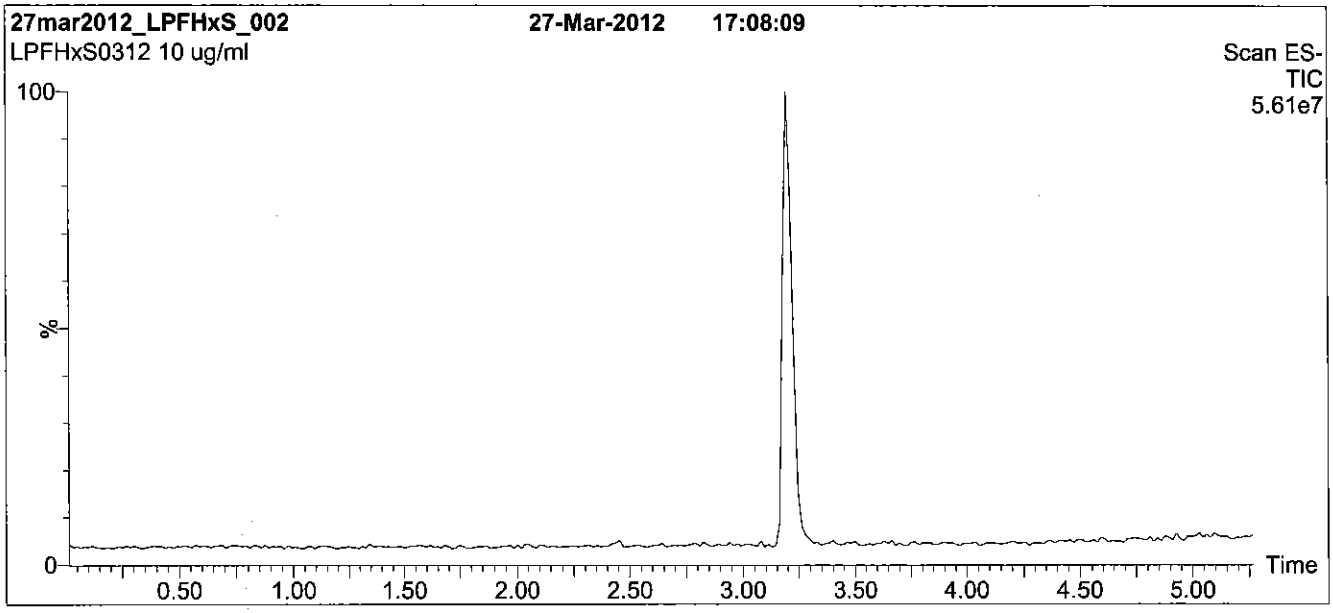
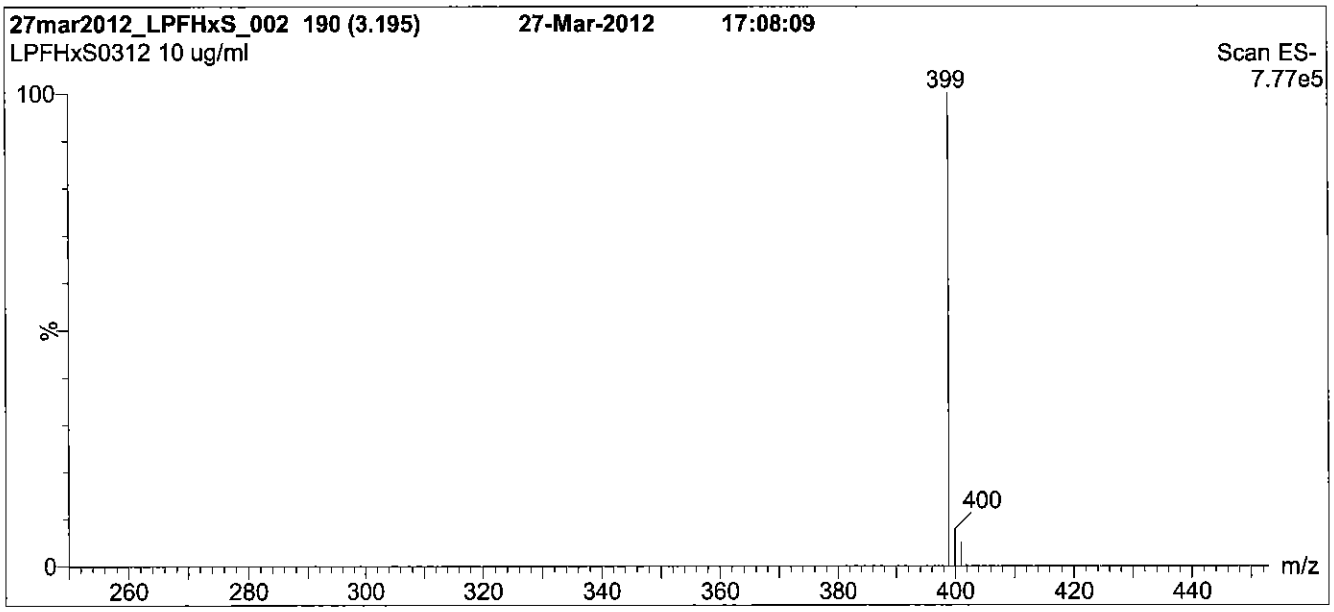
Figure 1: **L-PFHxS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

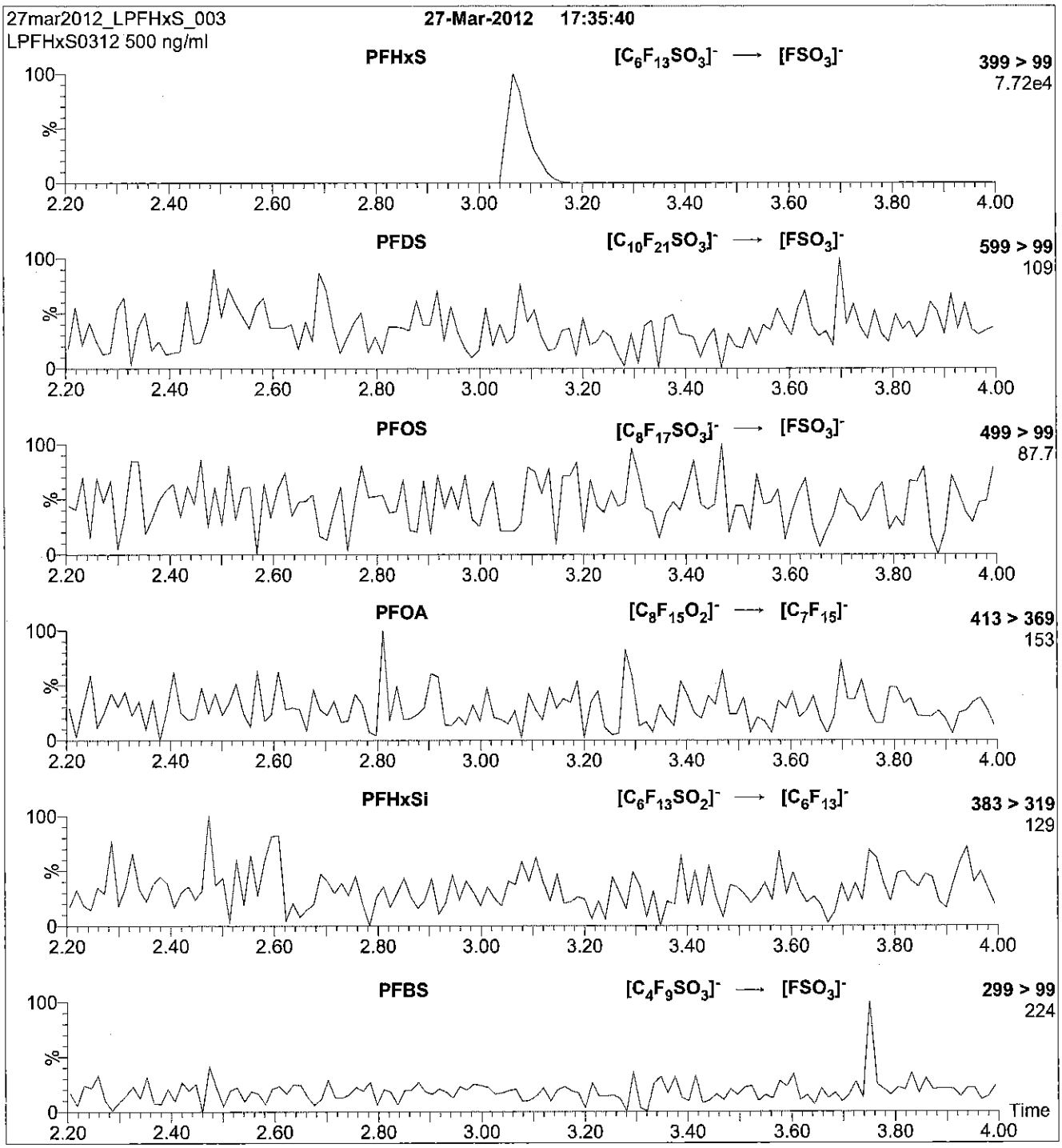
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 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: **L-PFHxS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFNA_00002

R 9-17-12 DEL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

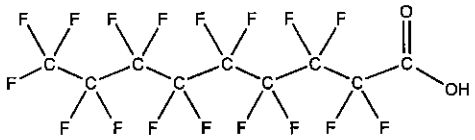
Dup LCPFDA_00001
new lot LCPFOA_00002

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

LOT NUMBER: PFNA0612

STRUCTURE:

CAS #: 375-95-1



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

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 06/14/2012
EXPIRY DATE: (mm/dd/yyyy) 06/14/2015
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 06/15/2012 (mm/dd/yyyy)

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

INTENDED USE:

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

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LIMITED WARRANTY:

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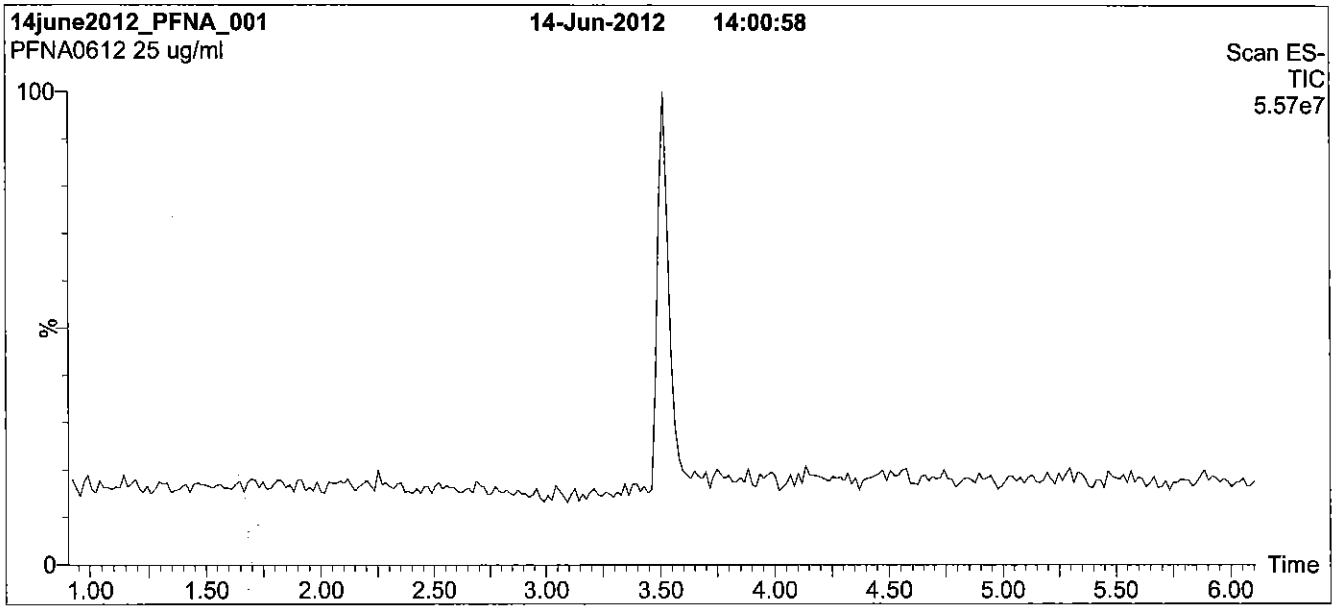
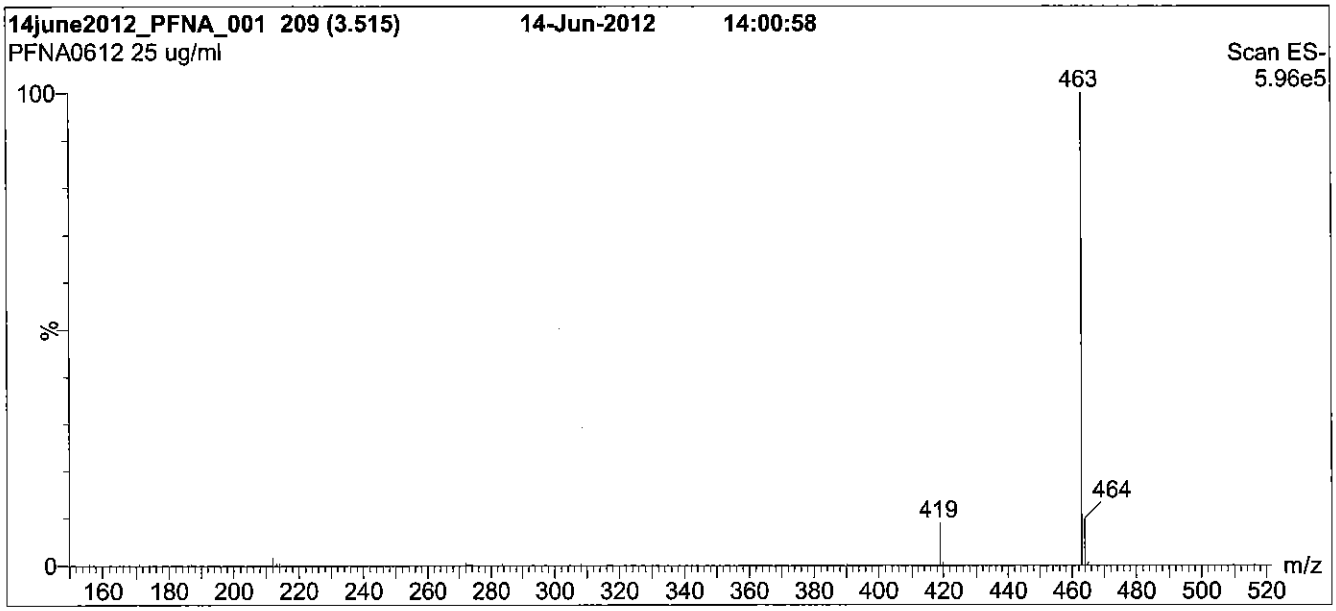
Figure 1: **PFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

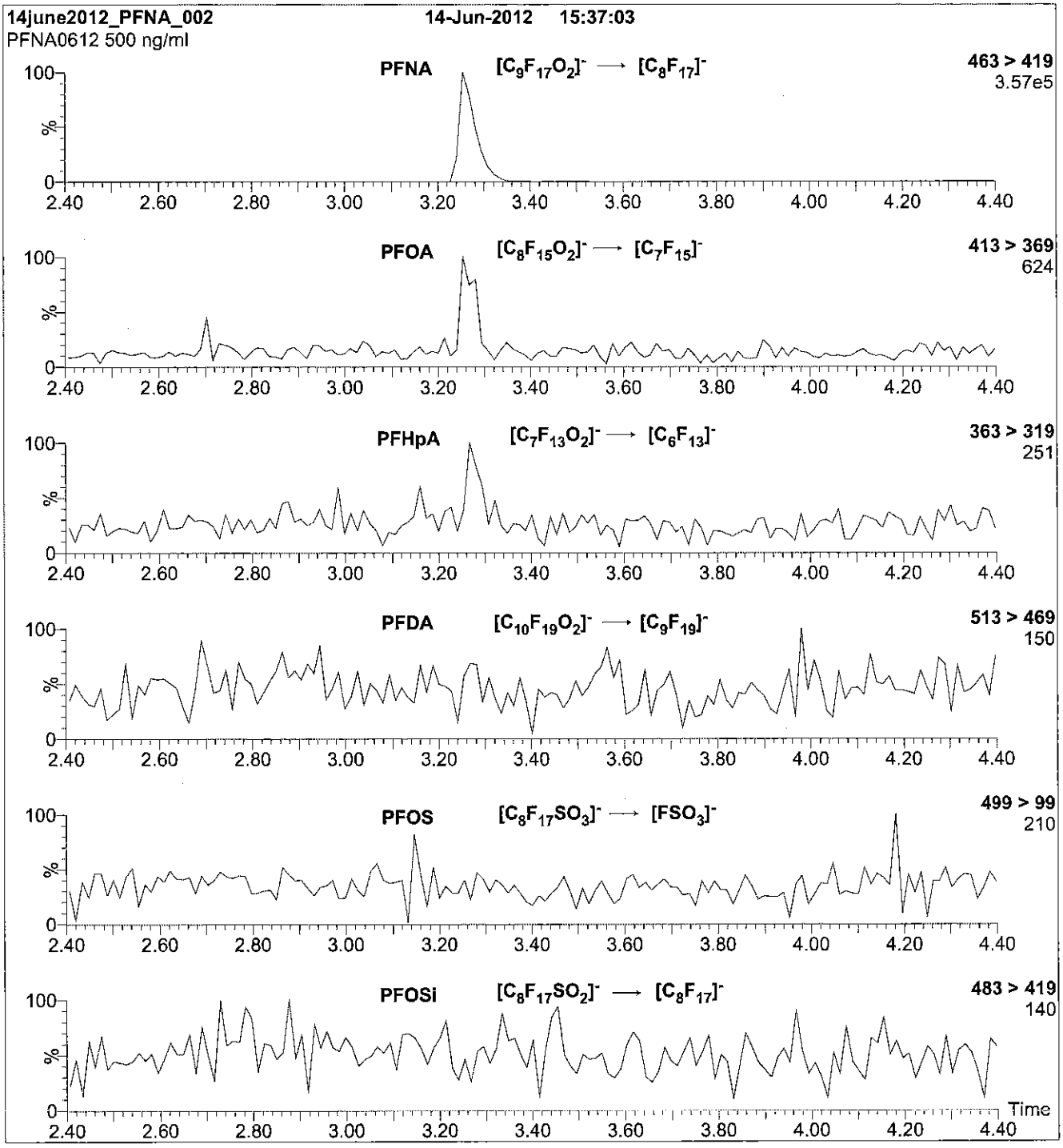
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFNS_00001

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

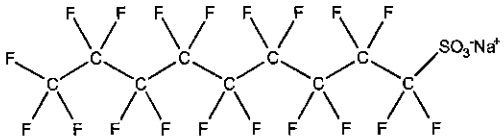
R= 12-14-12

PRODUCT CODE: L-PFNS
COMPOUND: Sodium perfluoro-1-nonanesulfonate

LOT NUMBER: LPFNS0712

STRUCTURE:

CAS #: 98789-57-2



MOLECULAR FORMULA:	$C_9F_{19}SO_3Na$	**MOLECULAR WEIGHT:**	572.12
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.0 ± 2.4 µg/ml (PFNS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/04/2012		
EXPIRY DATE: (mm/dd/yyyy)	07/04/2015		
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:** 07/12/2012 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

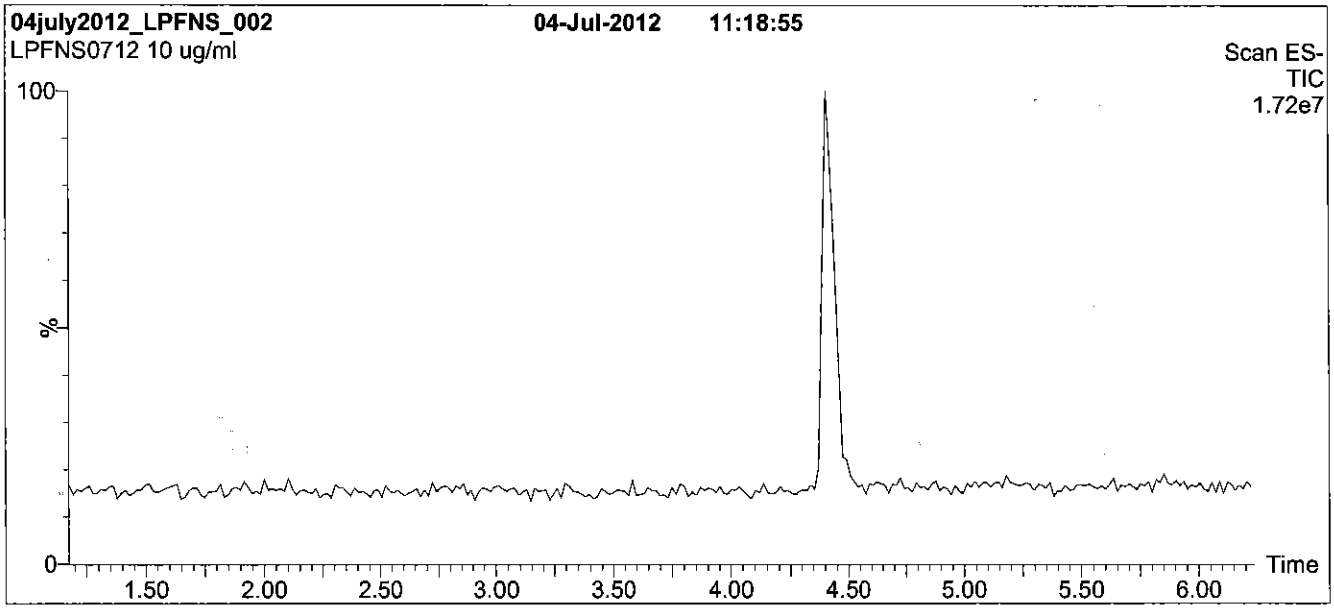
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

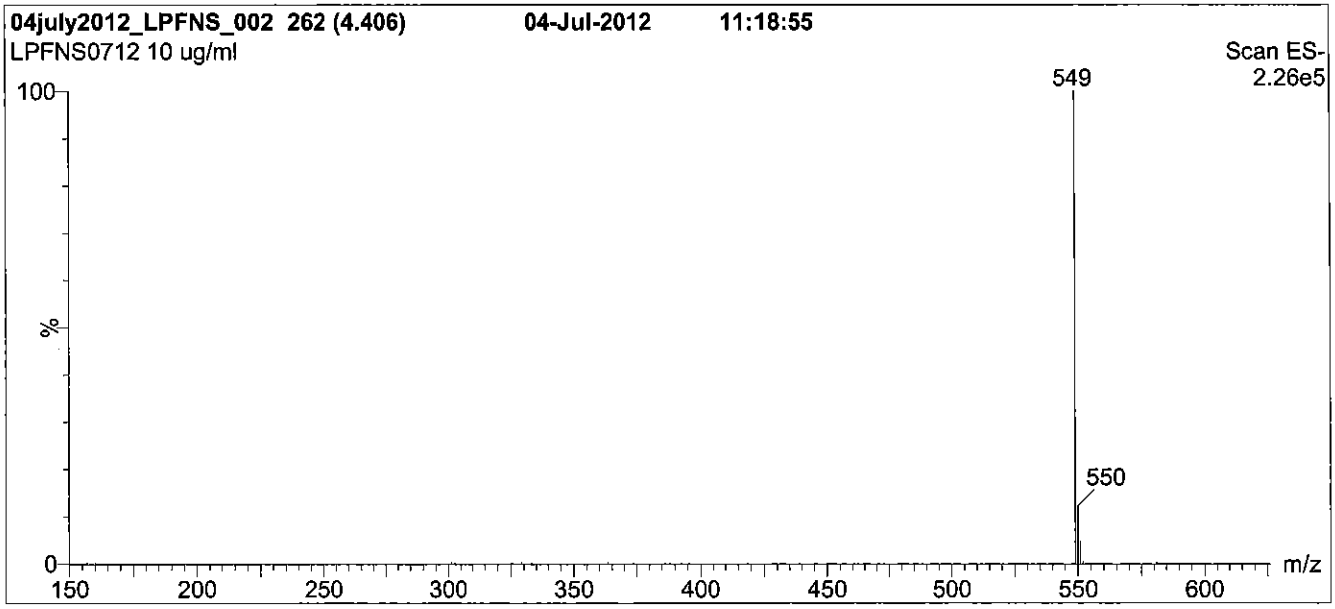
CALA Testing Accredited Labs No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

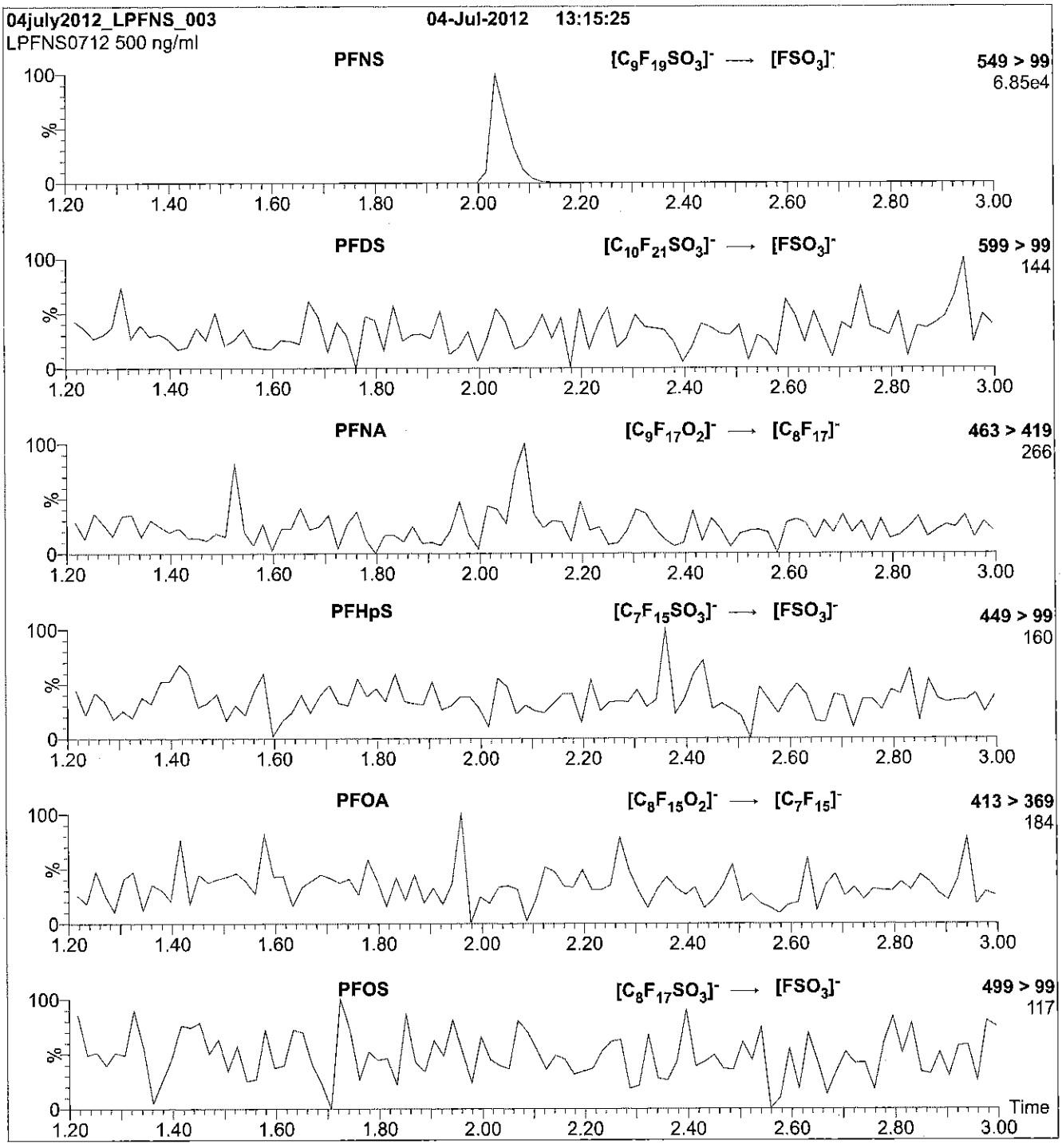
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFOA_00004

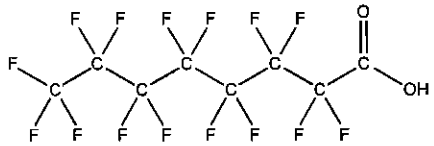
Rec 7/15/14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

STRUCTURE:
CAS #: 335-67-1



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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/11/2013
EXPIRY DATE: (mm/dd/yyyy) 10/11/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/18/2013 (mm/dd/yyyy)

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

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CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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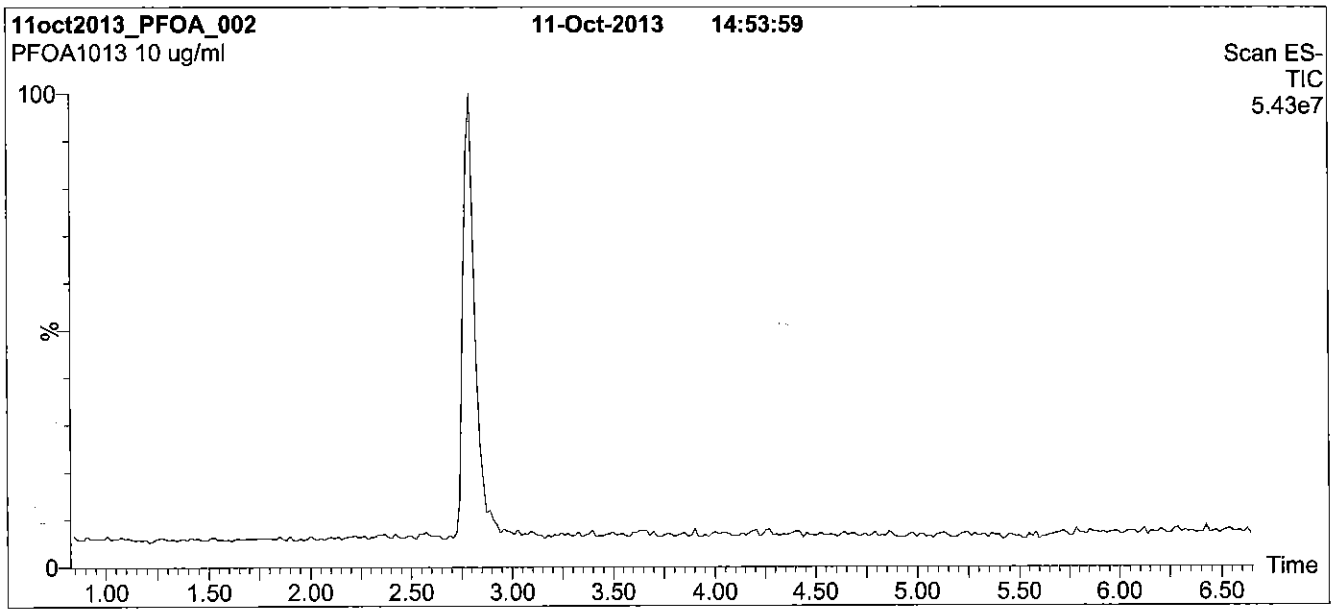
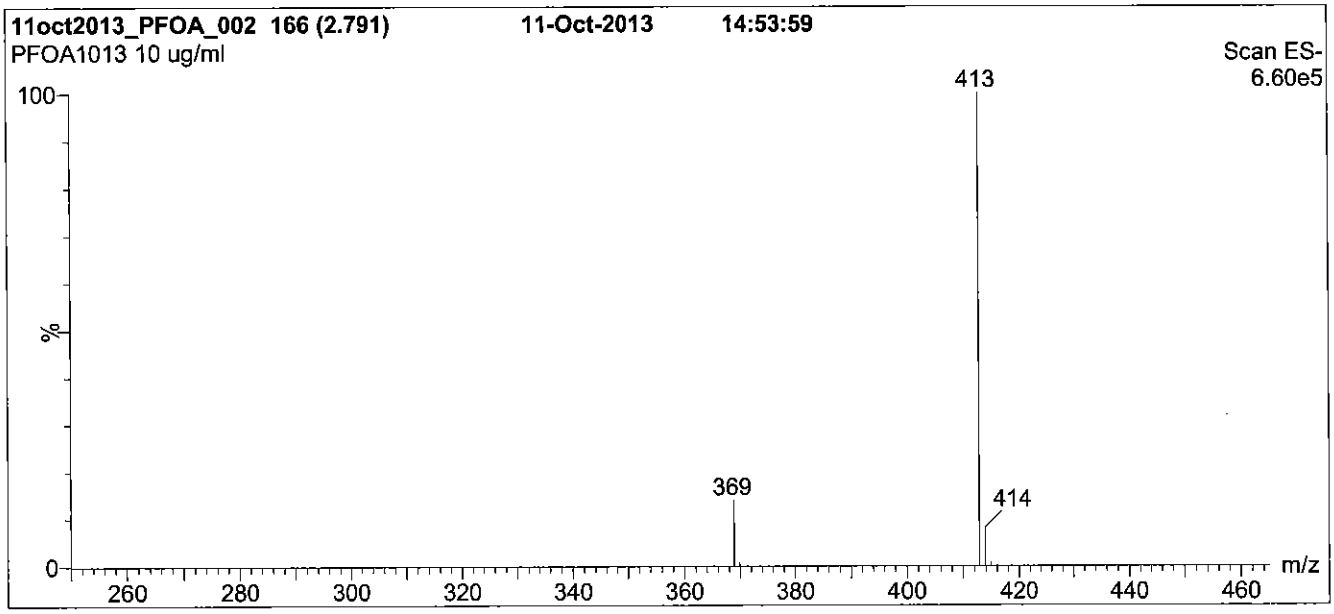
Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for
1 min before returning to initial conditions in 0.5 min.
Time: 10 min

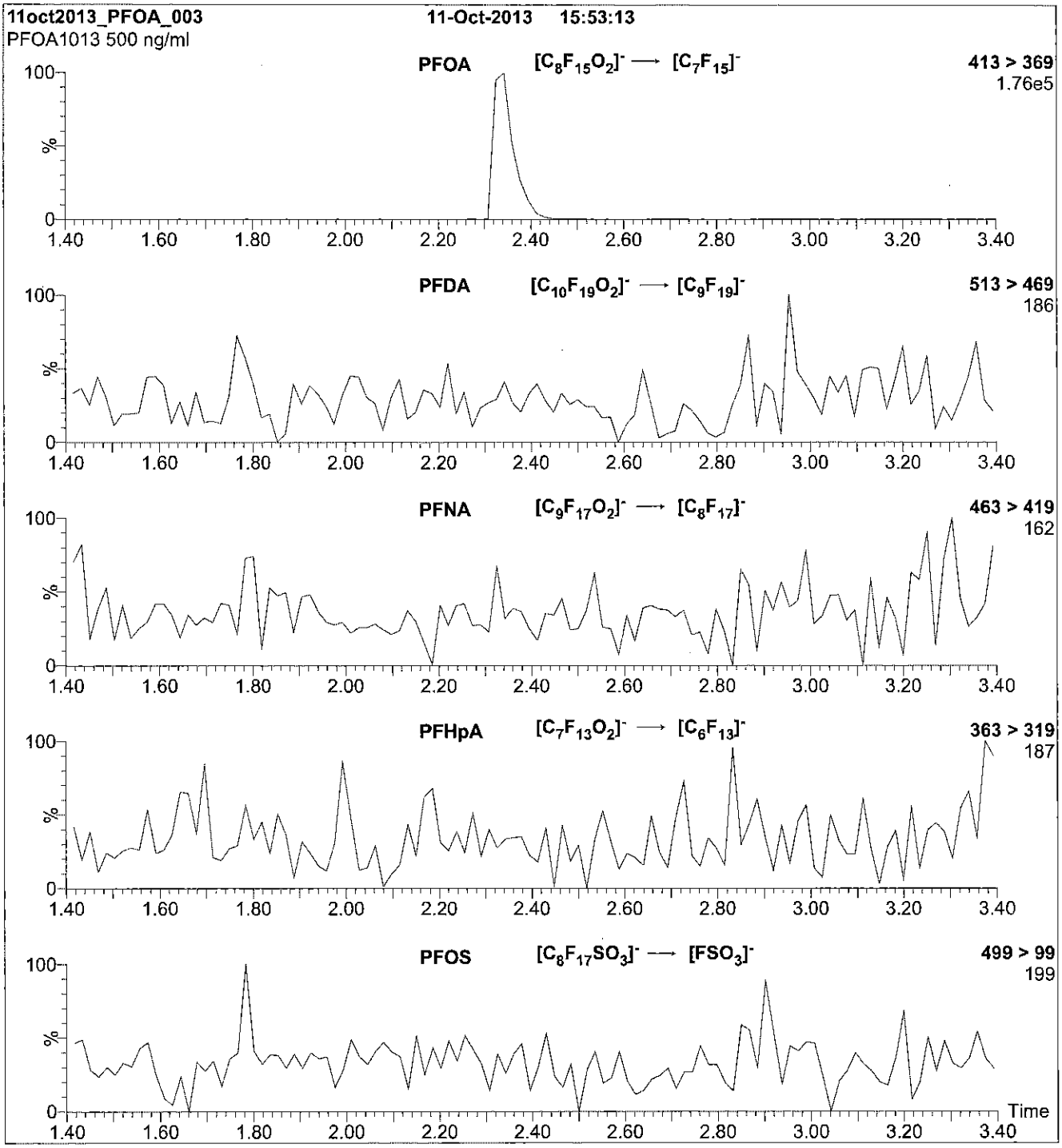
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCPFOS_00002

R- 9-17-12 DEL

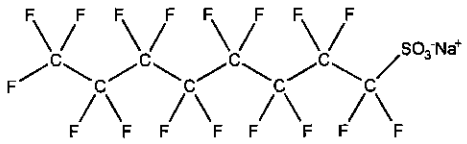
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

Dup LCPFOS_00001
new lot LCPFOS_00002

PRODUCT CODE: L-PFOS
COMPOUND: Sodium perfluoro-1-octanesulfonate
LOT NUMBER: LPFOS0312

STRUCTURE:



CAS #: 4021-47-0

MOLECULAR FORMULA:	$C_8F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	522.11
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (PFOS anion) ✓	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	03/26/2012		
EXPIRY DATE: (mm/dd/yyyy)	03/26/2015		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/04/2012
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

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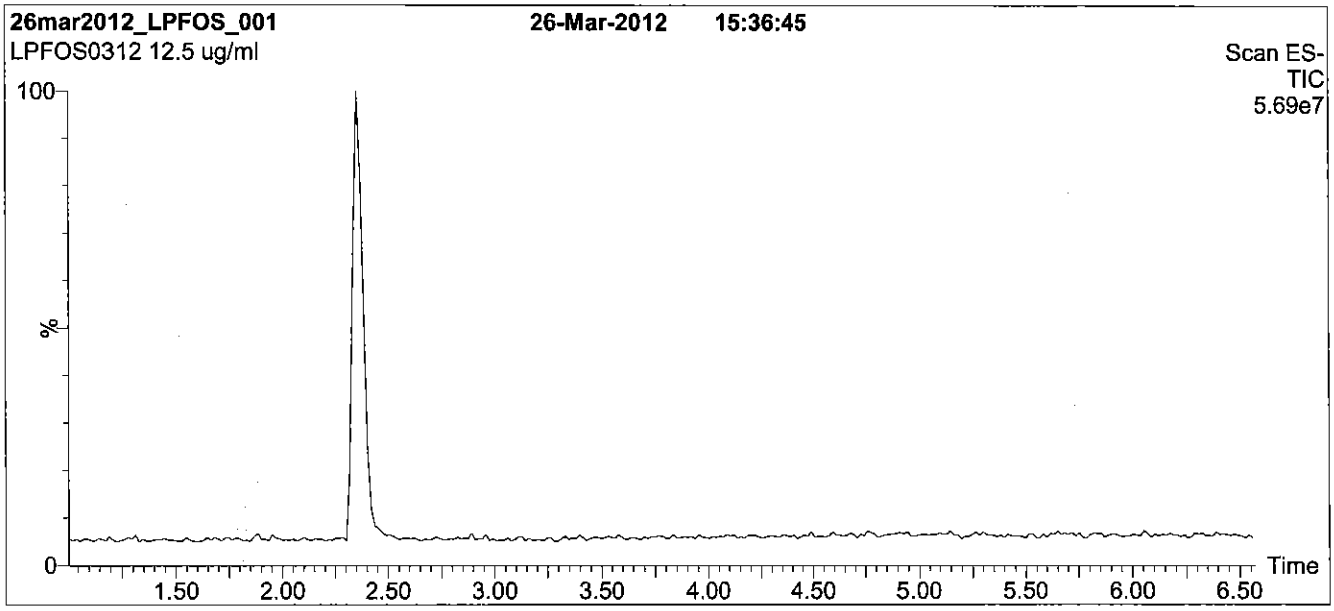
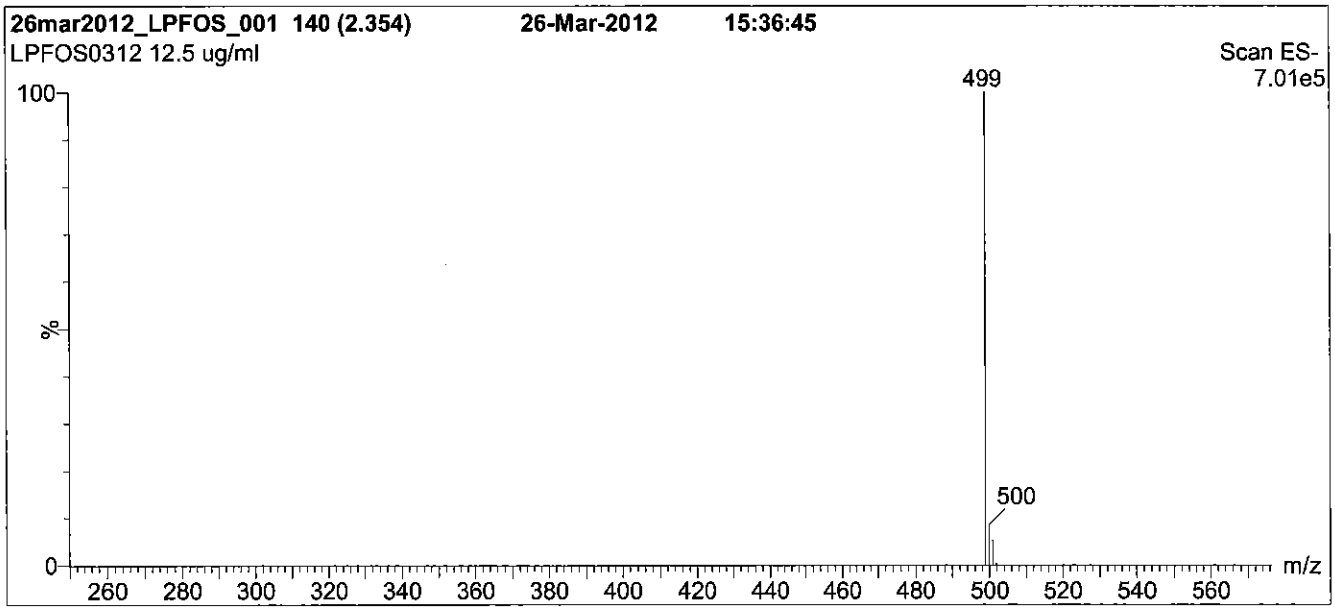
Figure 1: **L-PFOS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

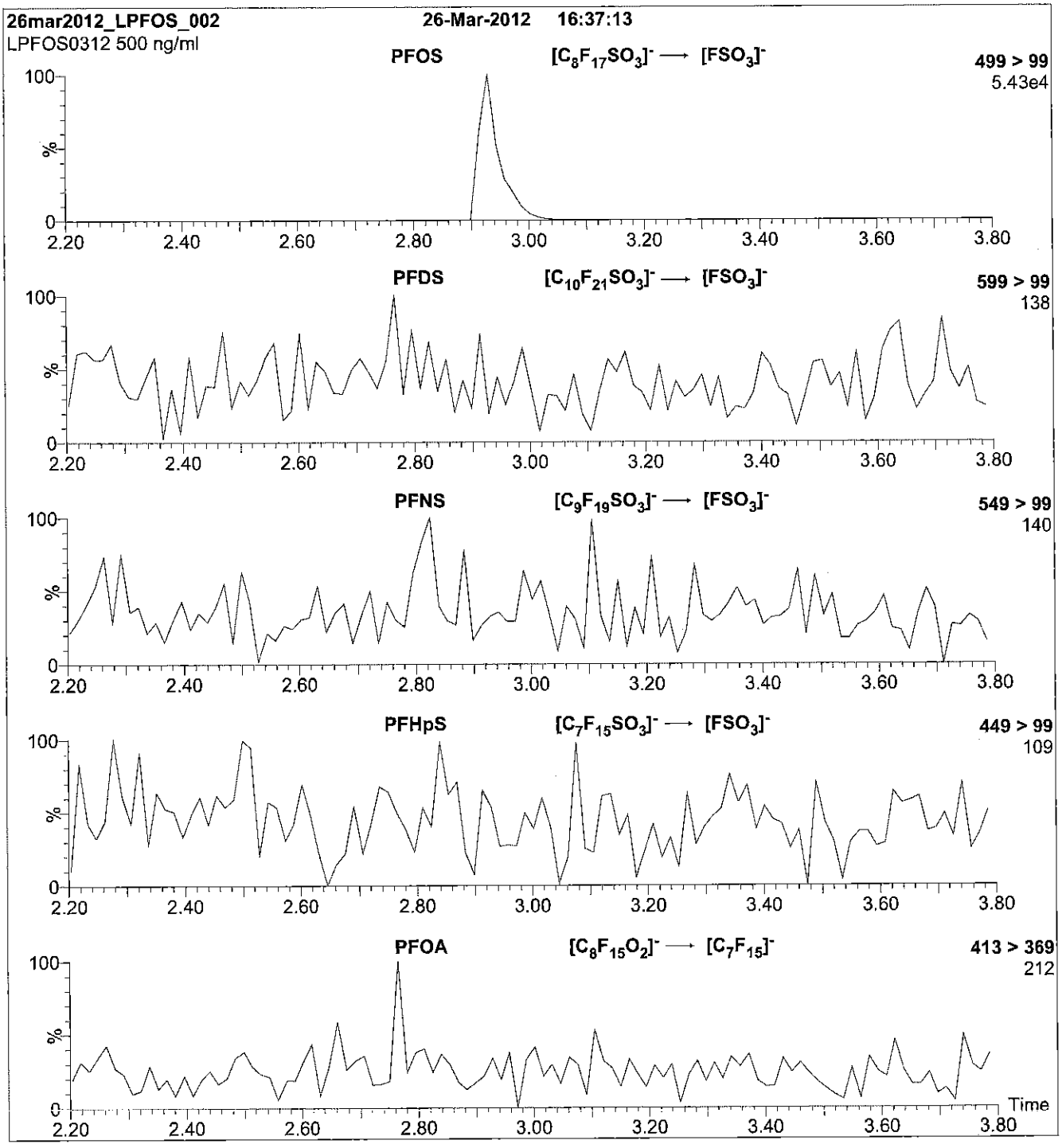
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 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) = 700

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 40

Reagent

LCPFOSA_00004

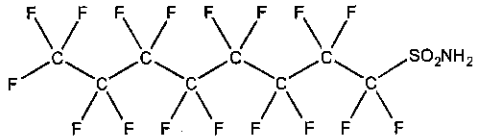
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

R12-14-12
LCPFOSA-00004

PRODUCT CODE: FOSA-M
COMPOUND: Perfluoro-1-octanesulfonamide
LOT NUMBER: FOSA0912M

STRUCTURE:
CAS #: 754-91-6



MOLECULAR FORMULA:	$C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	499.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/13/2012		
EXPIRY DATE: (mm/dd/yyyy)	09/13/2015		
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:** 10/03/2012 (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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LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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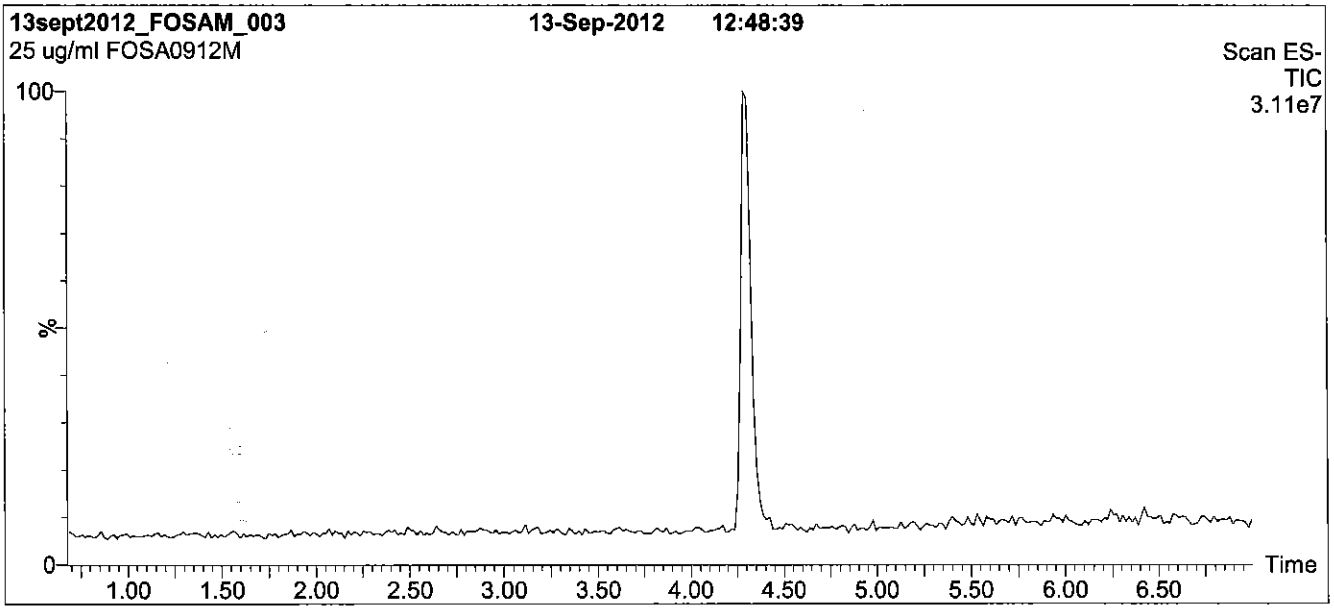
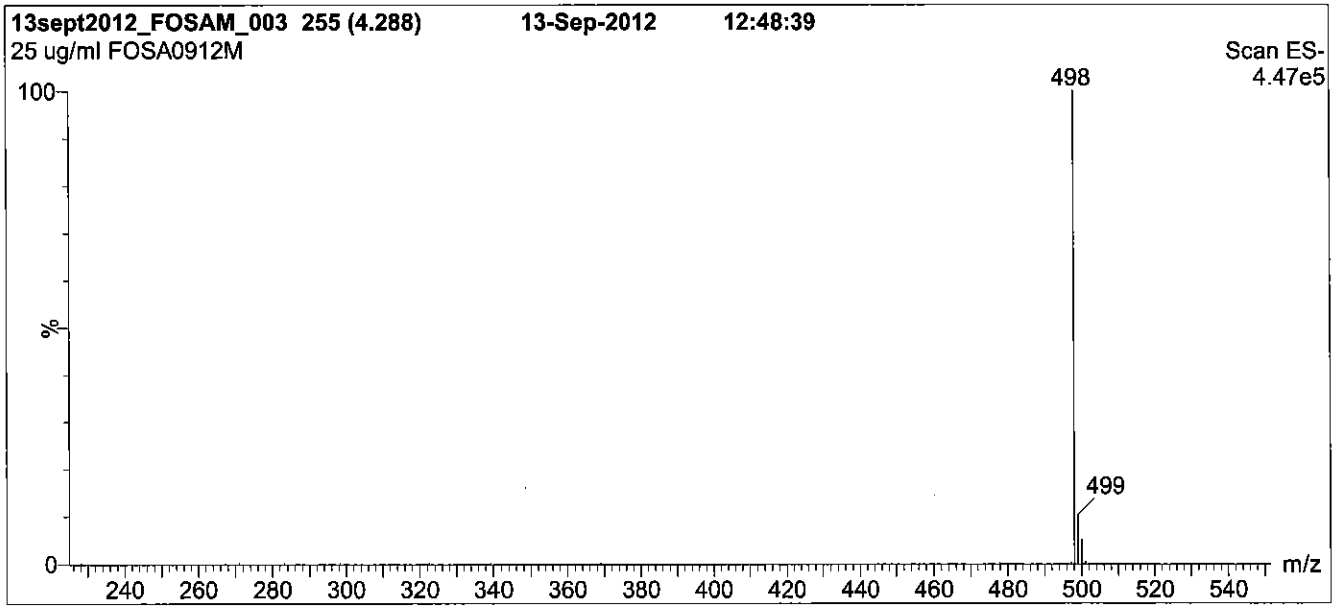
Figure 1: **FOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

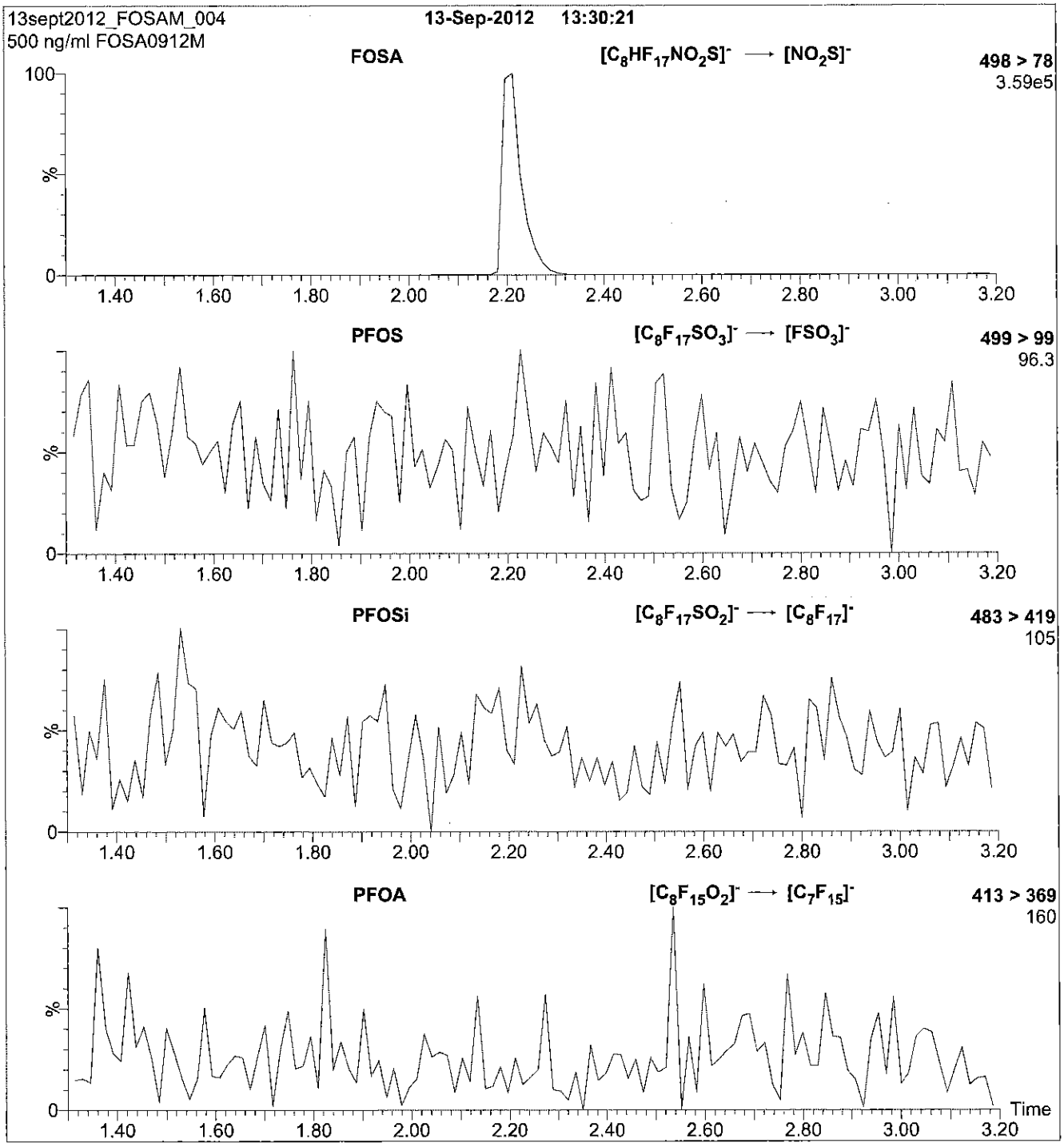
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml FOSA-M)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 30

Reagent

LCPFPeA_00003

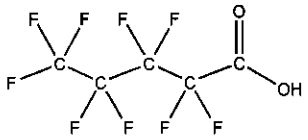
Rec 7/15/14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFPeA
COMPOUND: Perfluoro-n-pentanoic acid
LOT NUMBER: PFPeA0113

STRUCTURE:
CAS #: 2706-90-3



MOLECULAR FORMULA: $C_5HF_9O_2$
MOLECULAR WEIGHT: 264.05
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of $C_5H_2F_8O_2$ (hydrido - derivative) as measured by ^{19}F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

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CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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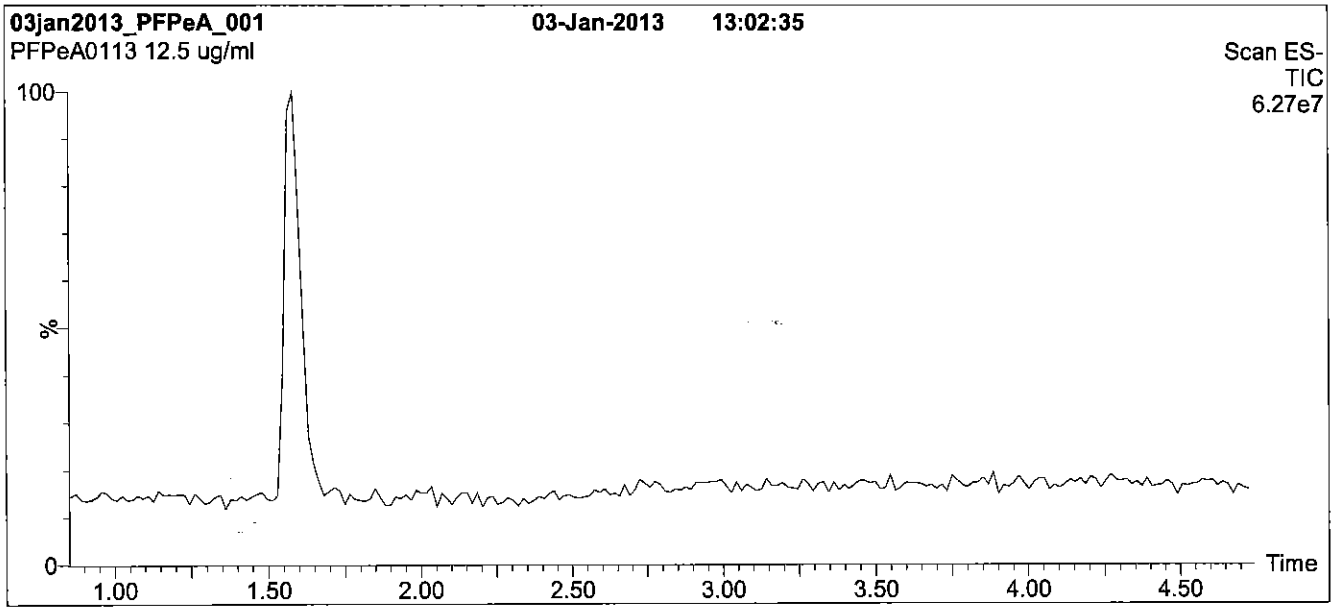
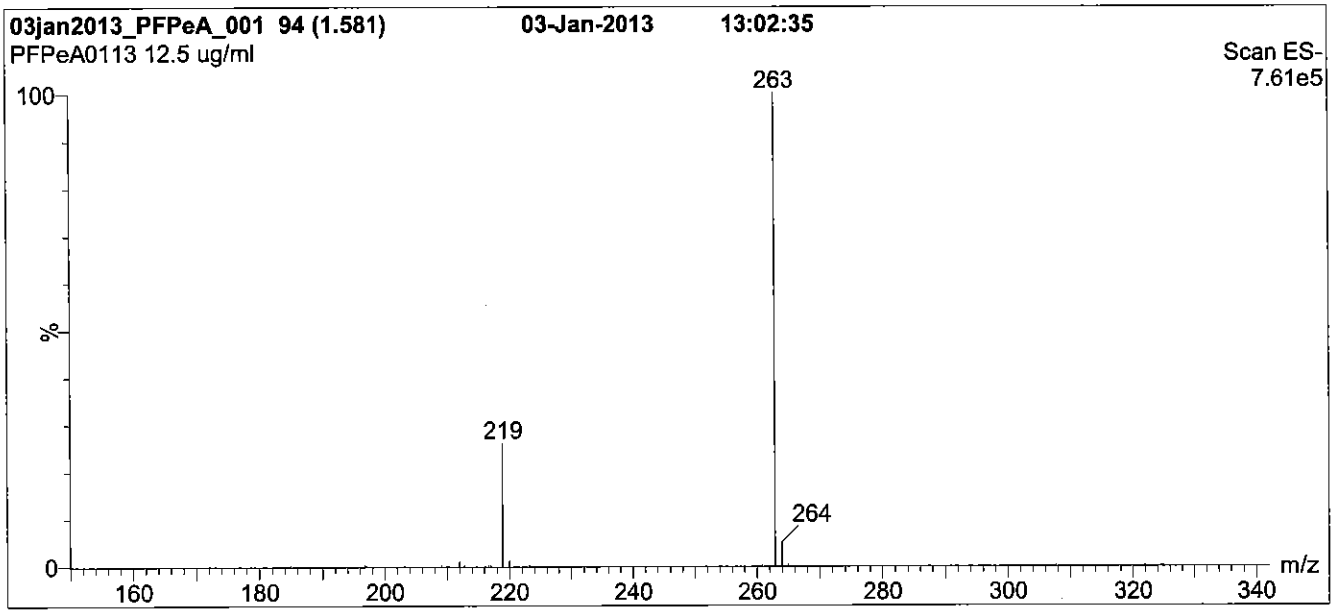
Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

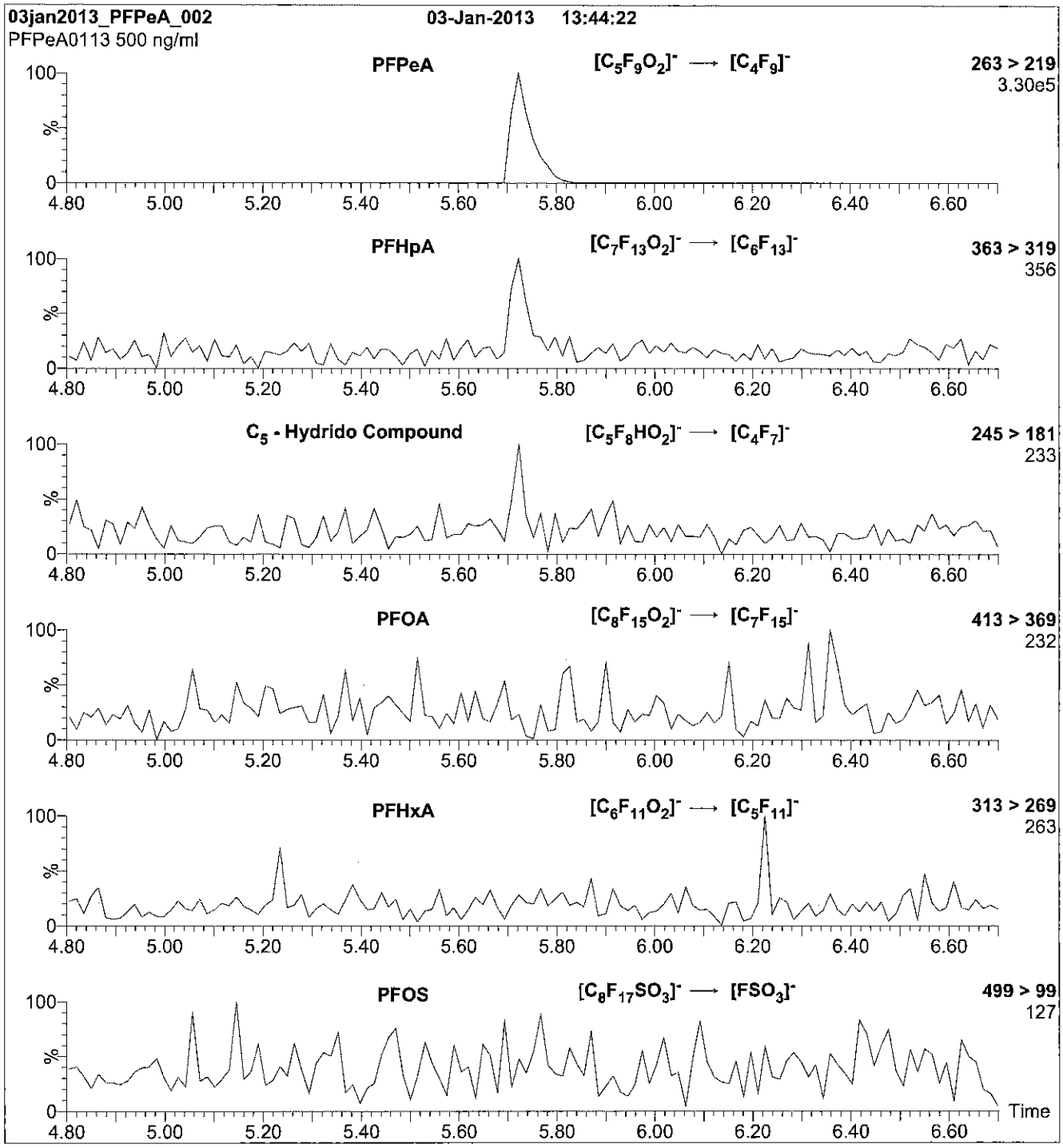
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFPeS_00001

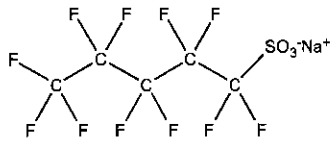
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

R: 12-14-12 New pdt-
LCPFPeS_00001

PRODUCT CODE: L-PFPeS
COMPOUND: Sodium perfluoro-1-pentanesulfonate
LOT NUMBER: LPFPeS0712
CAS #: Not available

STRUCTURE:



MOLECULAR FORMULA:	$C_5F_{11}SO_3Na$	**MOLECULAR WEIGHT:**	372.09
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 46.9 ± 2.3 µg/ml (PFPeS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/04/2012		
EXPIRY DATE: (mm/dd/yyyy)	07/04/2015		
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:** 07/09/2012 (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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$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

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

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

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CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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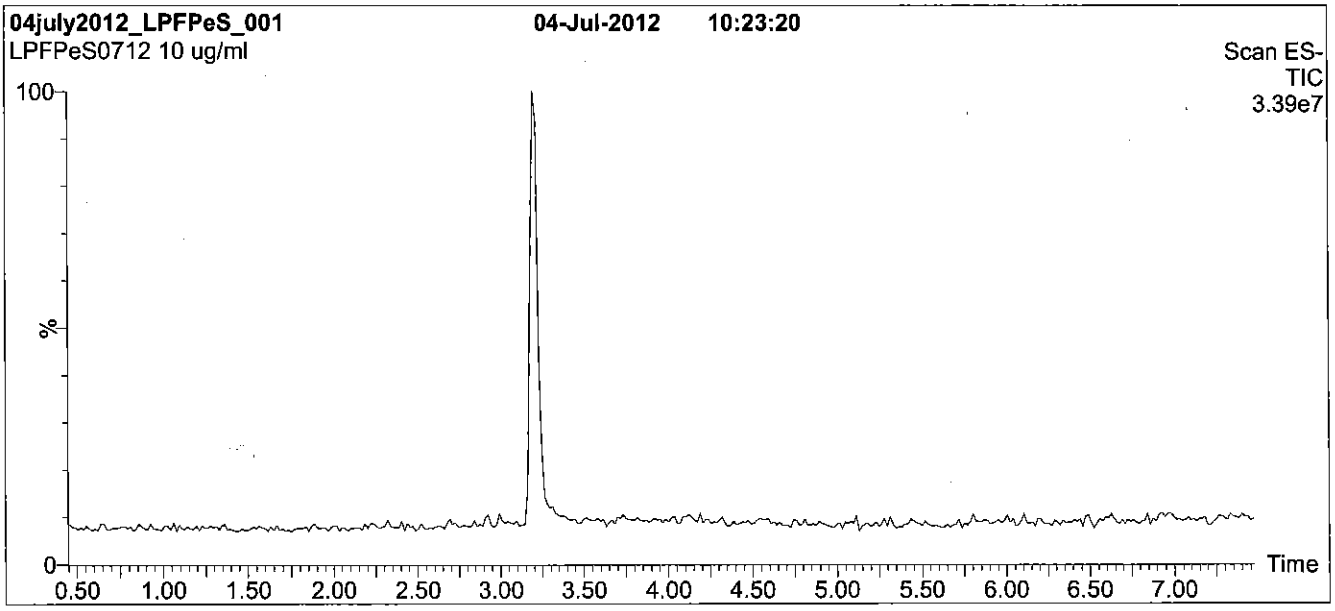
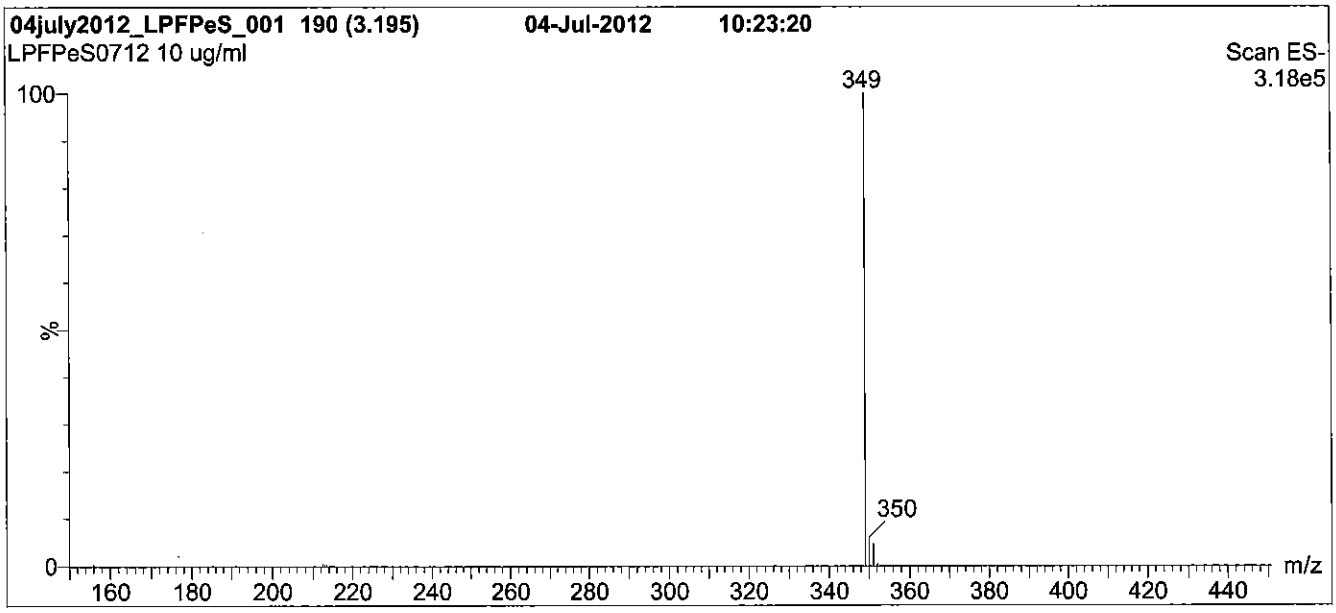
Figure 1: **L-PFPeS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

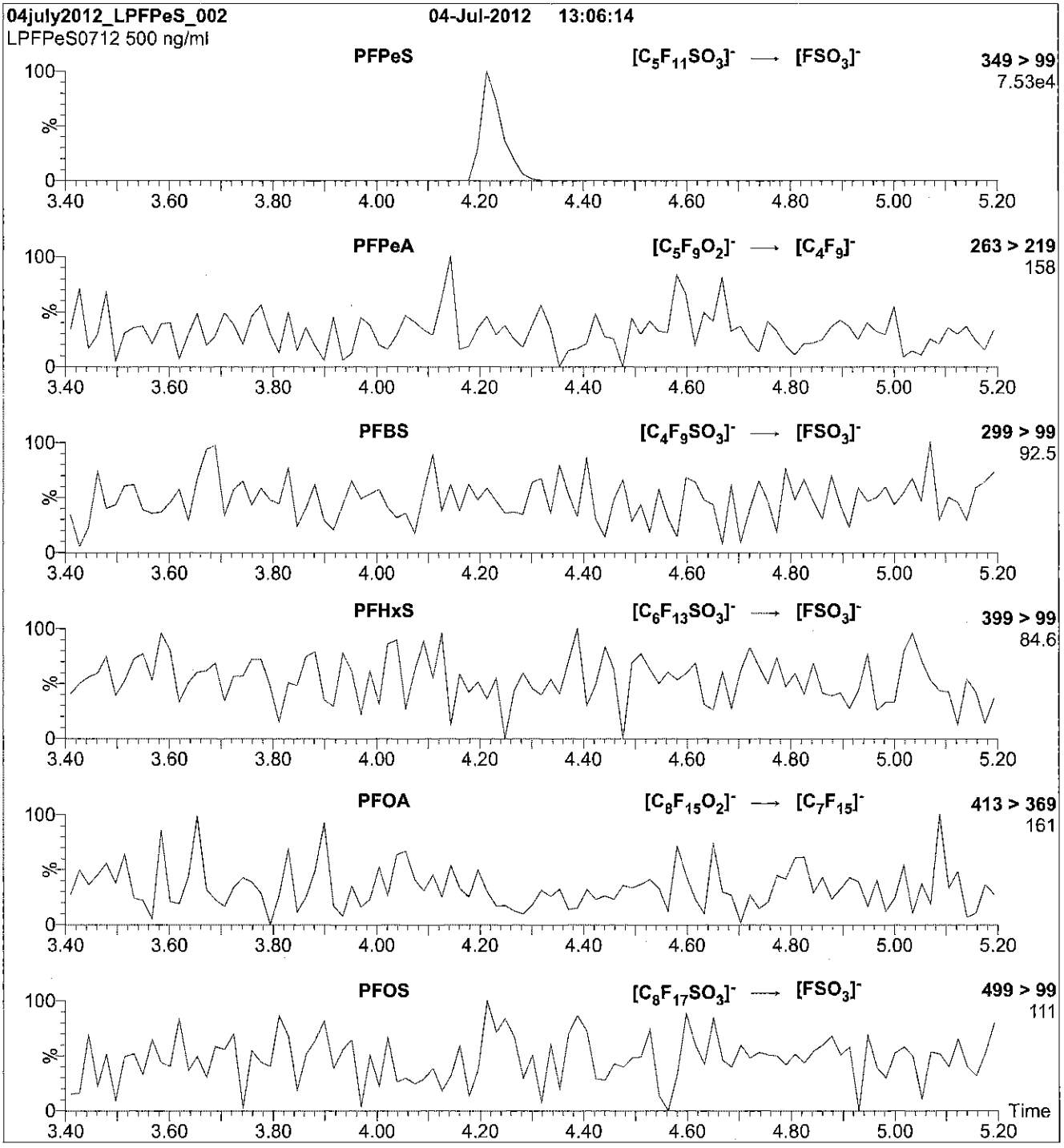
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 30

Reagent

LCPFTeDA_00002

WELLINGTON LABORATORIES

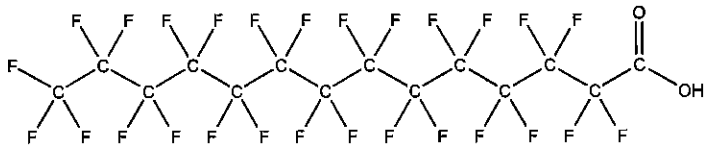
CERTIFICATE OF ANALYSIS
DOCUMENTATION

R: 12-14-12

LC PFTeDA - 00002

PRODUCT CODE: PFTeDA
COMPOUND: Perfluoro-n-tetradecanoic acid
LOT NUMBER: PFTeDA0312

STRUCTURE:
CAS #: 376-06-7



MOLECULAR FORMULA: $C_{14}HF_{27}O_2$
MOLECULAR WEIGHT: 714.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 03/07/2012
EXPIRY DATE: (mm/dd/yyyy) 03/07/2015
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:** 03/09/2012 (mm/dd/yyyy)

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

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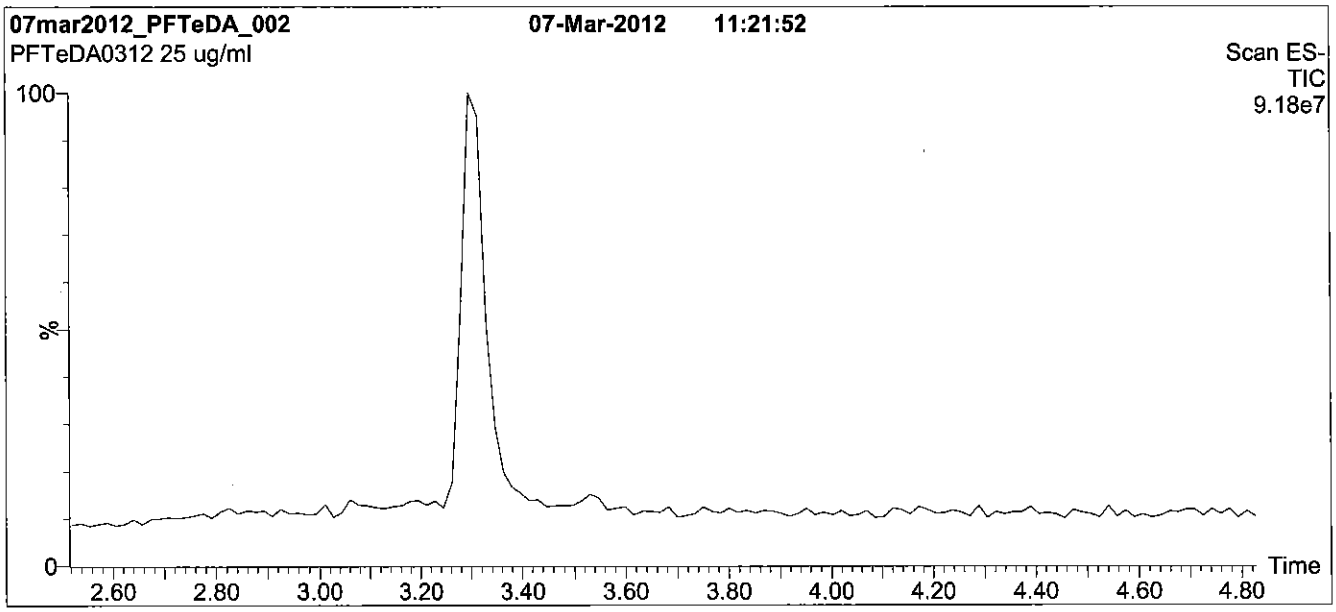
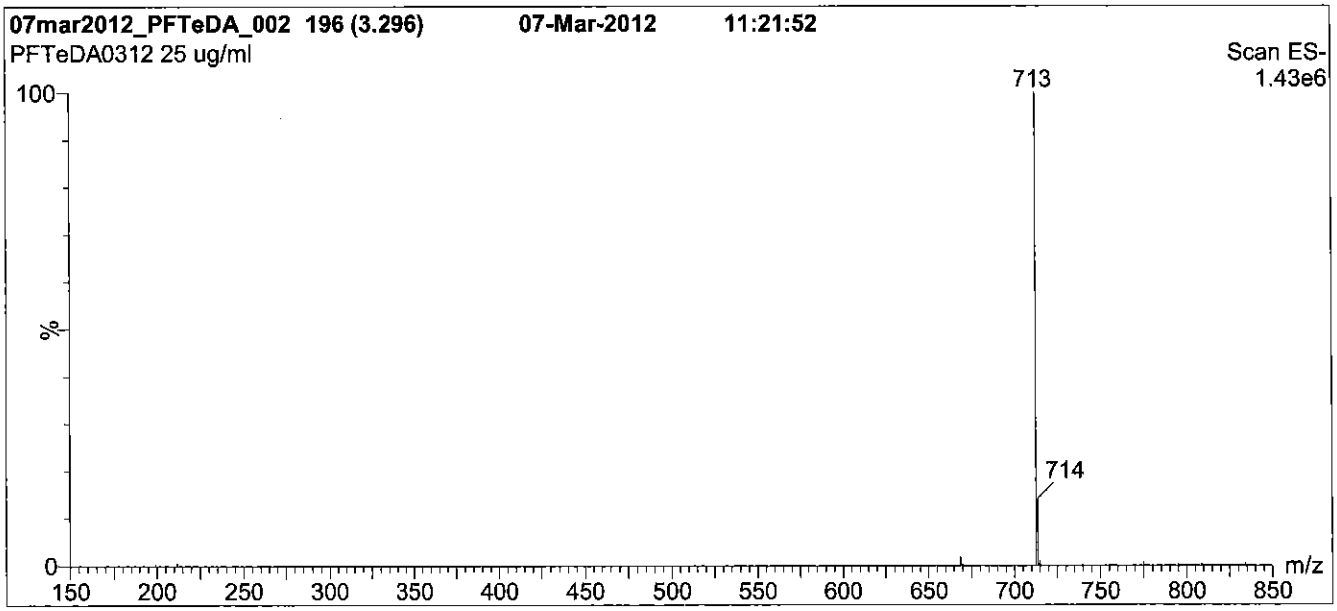
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 70% (80:20 MeOH:ACN) / 30% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 100% organic over 7 min and hold 1.5 min
before returning to initial conditions in 0.50 min.
Time: 10 min

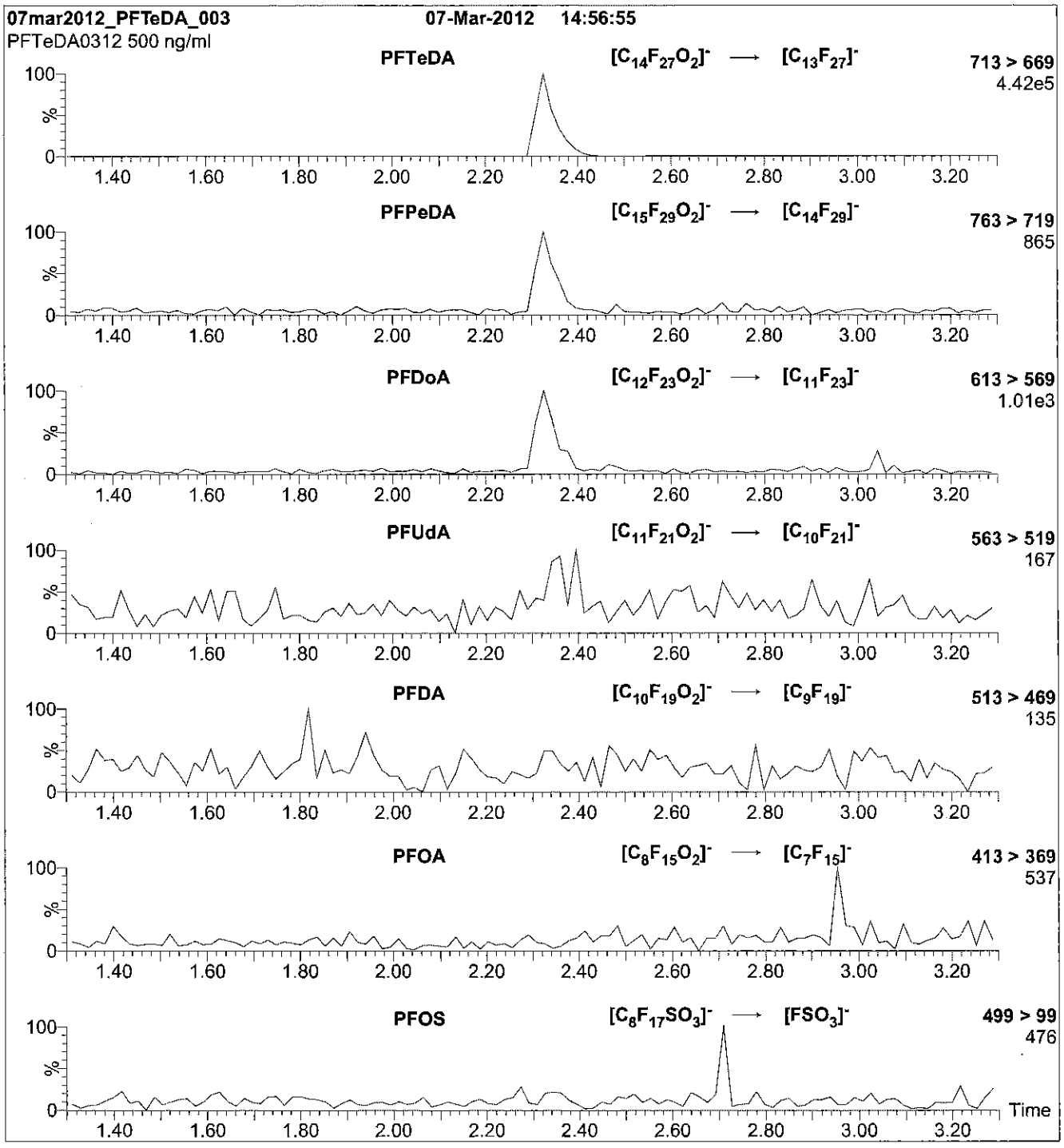
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 14

Reagent

LCPFTrDA_00002

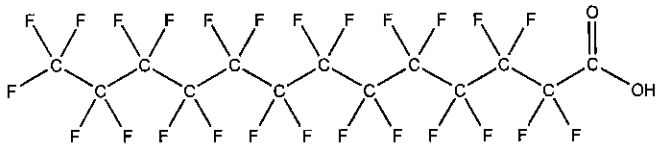
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

R: 12-14-12

LCPFTrDA-00002

PRODUCT CODE:	PFTrDA	**LOT NUMBER:**	PFTrDA0312
COMPOUND:	Perfluoro-n-tridecanoic acid		
STRUCTURE:		**CAS #:**	72629-94-8



MOLECULAR FORMULA:	$C_{13}HF_{25}O_2$	**MOLECULAR WEIGHT:**	664.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	03/26/2012		
EXPIRY DATE: (mm/dd/yyyy)	03/26/2015		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/04/2012 (mm/dd/yyyy)
B.G. Chittim

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

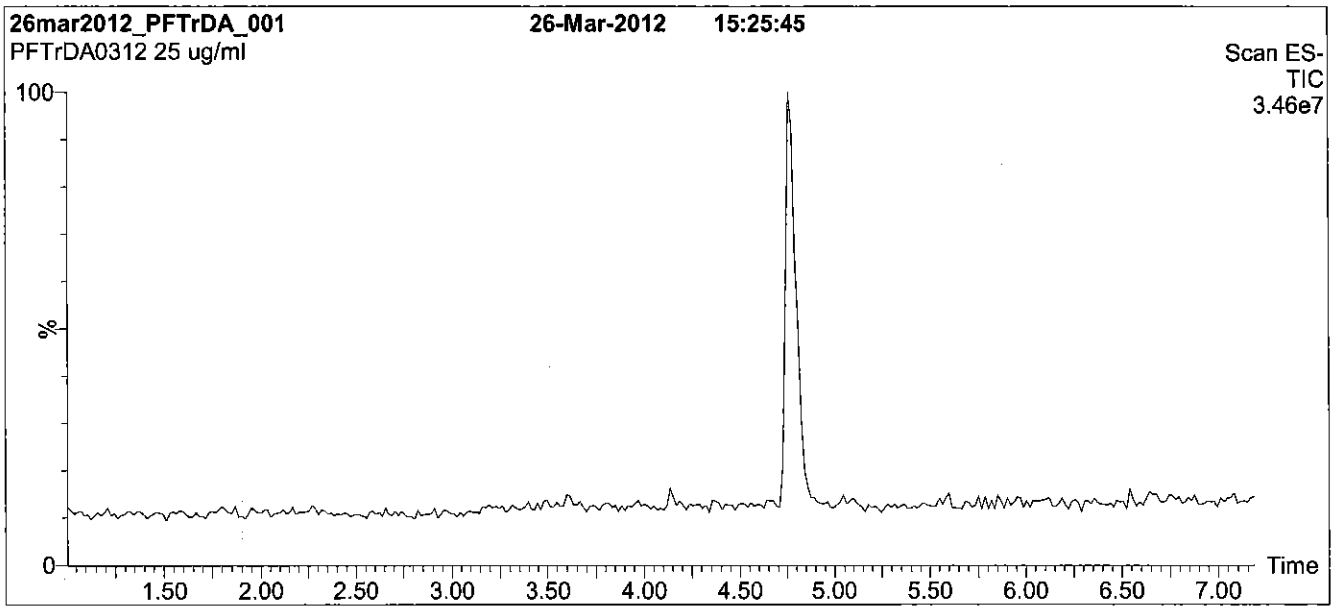
Ongoing stability studies of this product have demonstrated stability in its composition and concentration for the period of time specified by the expiry date in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

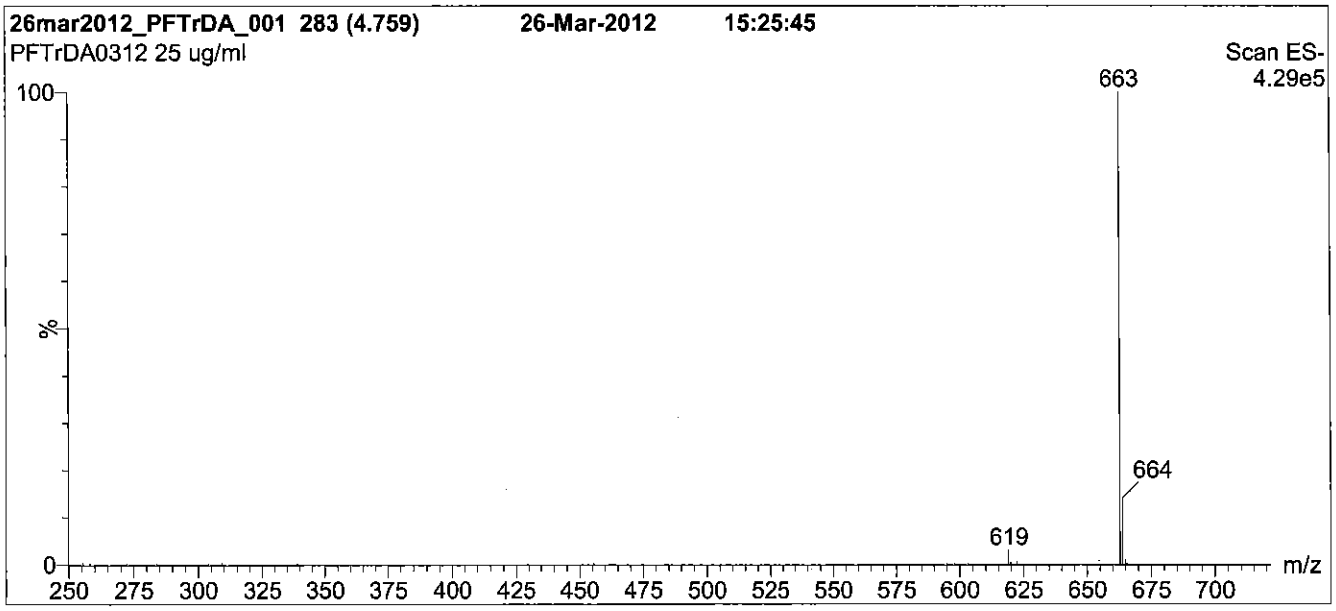
LIMITED WARRANTY:

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

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

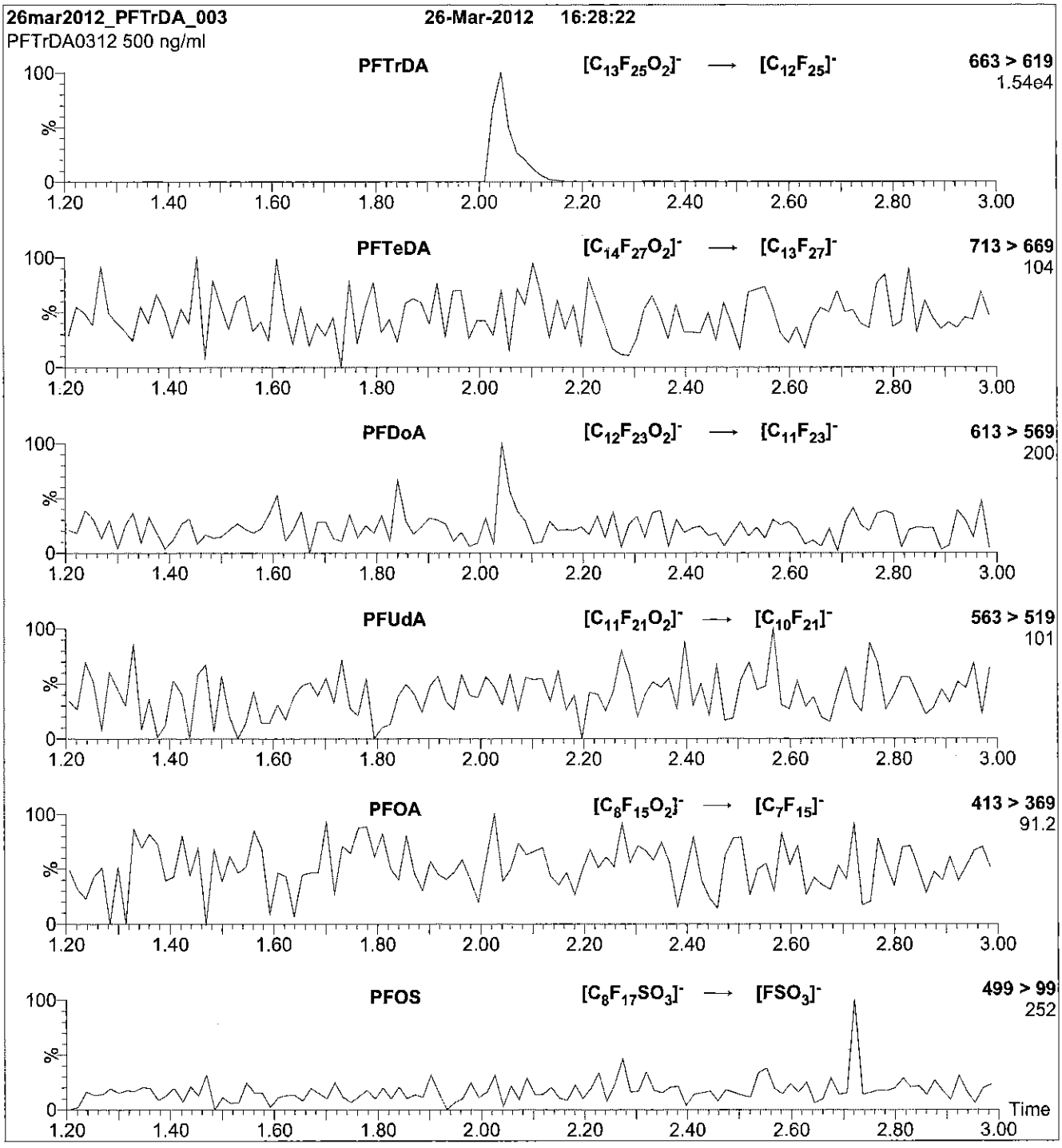
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 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) = 650

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 15

Reagent

LCPFUdA_00002

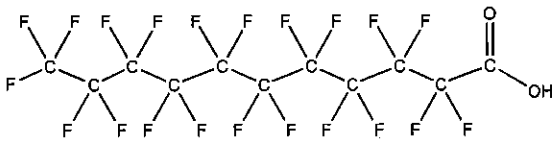
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

R: 12-14-12
LC PFUdA-00002

PRODUCT CODE: PFUdA
COMPOUND: Perfluoro-n-undecanoic acid
LOT NUMBER: PFUdA0312

STRUCTURE:
CAS #: 2058-94-8



MOLECULAR FORMULA: $C_{11}HF_{21}O_2$
MOLECULAR WEIGHT: 564.09
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 03/19/2012
EXPIRY DATE: (mm/dd/yyyy) 03/19/2015
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:** 03/27/2012 (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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The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

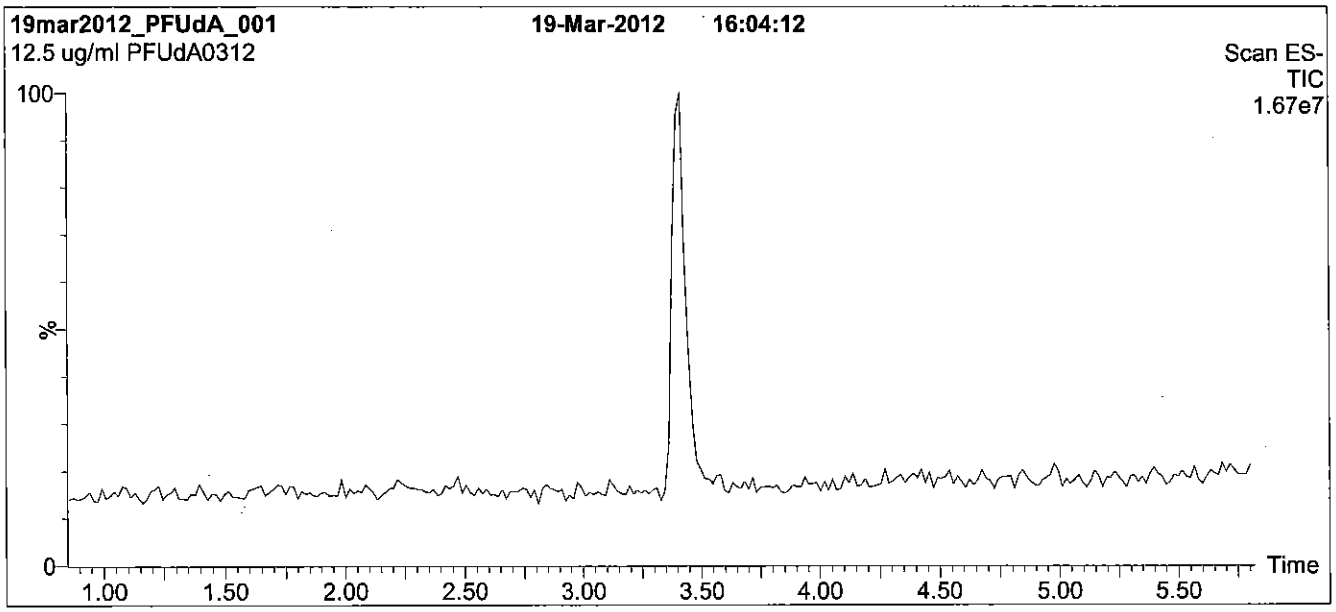
Ongoing stability studies of this product have demonstrated stability in its composition and concentration for the period of time specified by the expiry date in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

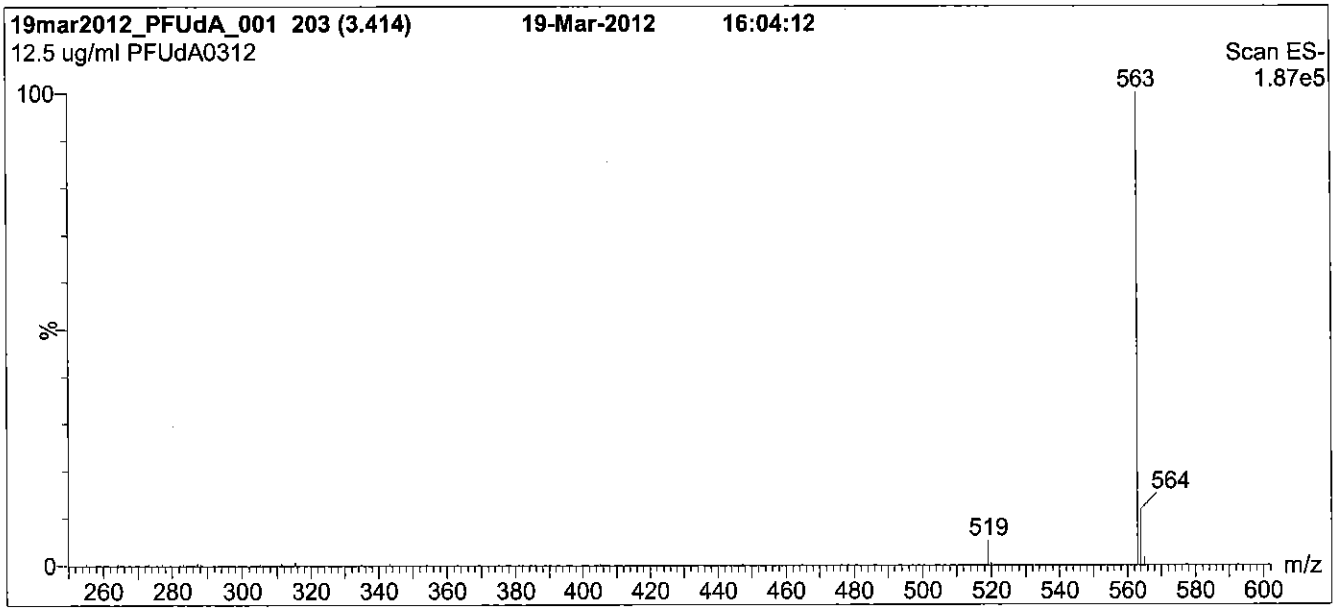
LIMITED WARRANTY:

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.

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 6.5 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

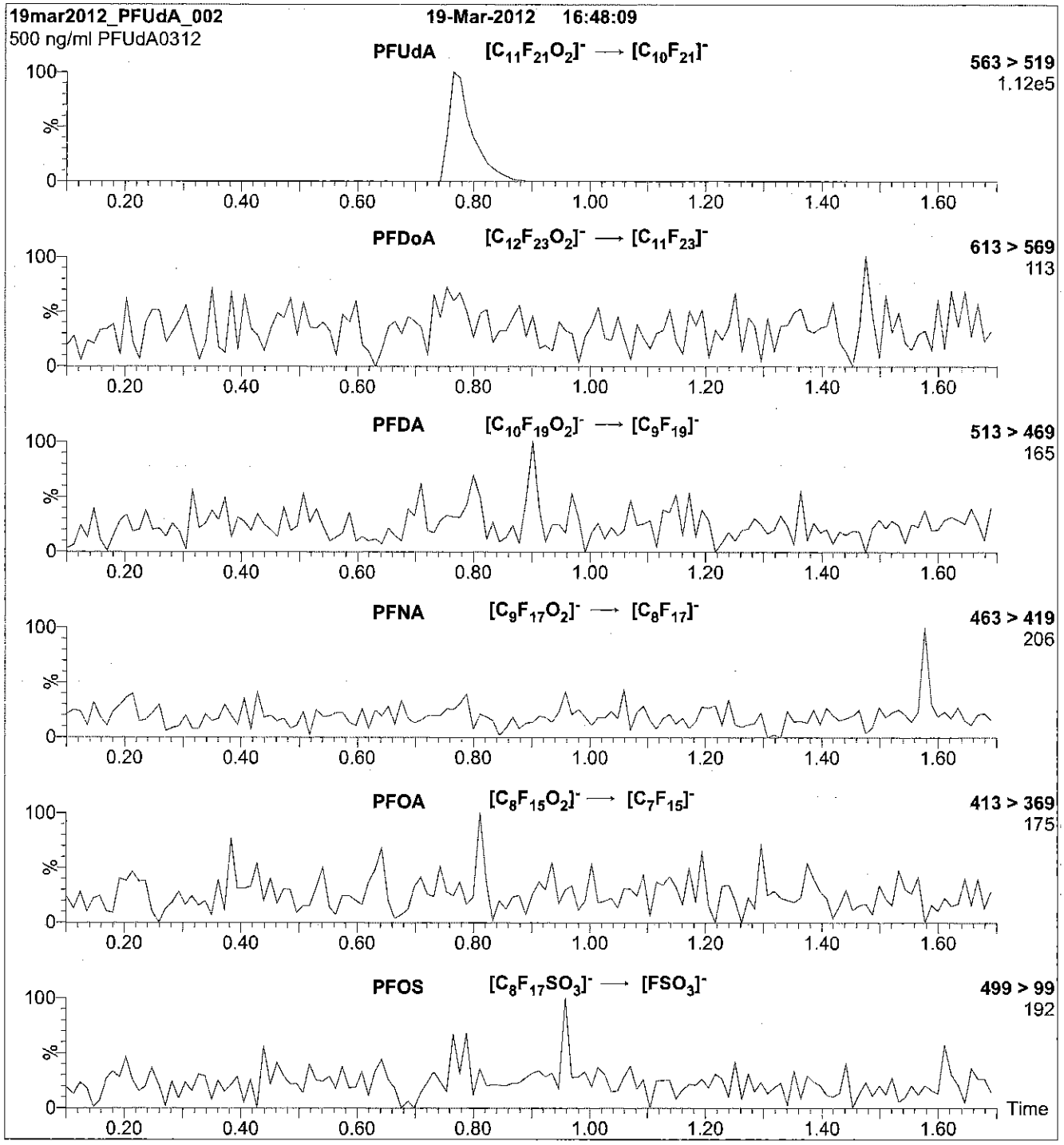
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

PFC_IDA

Perfluorinated Hydrocarbons

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFOA #	PFOS #
B7/10-GW02	320-10459-1	85	116
B7/10-GW03S	320-10459-2	64	108
QR4-GW02	320-10459-3	90	109
B7/10-GW06S	320-10459-4	67	108
H123-GW02	320-10459-5	89	107
EFA-FD01-1014	320-10459-6	82	109
	MB 320-59712/1-A	109	111
	LCS 320-59712/2-A	98	101

	QC LIMITS
PFOA = 13C4 PFOA	25-150
PFOS = 13C4 PFOS	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.: 320-10459-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 03DEC14A4A_083.d

Lab ID: LCS 320-59712/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	40.0	50.4	126	60-140	
Perfluorooctane Sulfonate (PFOS)	38.2	39.7	104	60-140	
13C4 PFOS	95.6	96.3	101	25-150	
13C4 PFOA	100	98.0	98	25-150	

Column to be used to flag recovery and RPD values

FORM III WS-LC-0025

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Lab File ID: 03DEC14A4A_082.d Lab Sample ID: MB 320-59712/1-A

Matrix: Water Date Extracted: 12/03/2014 13:38

Instrument ID: A4 Date Analyzed: 12/04/2014 20:03

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-59712/2-A	03DEC14A4A_083.d	12/04/2014 20:24
B7/10-GW02	320-10459-1	03DEC14A4A_084.d	12/04/2014 20:45
B7/10-GW03S	320-10459-2	03DEC14A4A_085.d	12/04/2014 21:07
QR4-GW02	320-10459-3	03DEC14A4A_086.d	12/04/2014 21:28
B7/10-GW06S	320-10459-4	03DEC14A4A_087.d	12/04/2014 21:49
H123-GW02	320-10459-5	03DEC14A4A_088.d	12/04/2014 22:10
EFA-FD01-1014	320-10459-6	03DEC14A4A_089.d	12/04/2014 22:31

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Client Sample ID: B7/10-GW02 Lab Sample ID: 320-10459-1

Matrix: Water Lab File ID: 03DEC14A4A_084.d

Analysis Method: WS-LC-0025 Date Collected: 11/15/2014 12:05

Extraction Method: 3535 Date Extracted: 12/03/2014 13:38

Sample wt/vol: 448.35(mL) Date Analyzed: 12/04/2014 20:45

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 59779 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	10	H	2.2	1.7	0.83
1763-23-1	Perfluorooctane Sulfonate (PFOS)	6.6	H	2.2	1.7	1.4

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	116		25-150
STL00990	13C4 PFOA	85		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_084.d
Lims ID: 320-10459-A-1-B Lab Sample ID: 320-10459-1
Client ID: B7/10-GW02
Sample Type: Client
Inject. Date: 04-Dec-2014 20:45:53 ALS Bottle#: 24 Worklist Smp#: 48
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-10459-a-1-b 59712
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:03:21 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
416.5 > 371.6	10.635	10.628	0.007		1440812	42.6		85.2	1974	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.635	10.628	0.007	1.000	226107	4.70			101	
412.8 > 168.7	10.635	10.628	0.007	1.000	70963		3.19(0.00-0.00)		69.2	
D 16 13C4 PFOS										
502.4 > 79.7	11.602	11.595	0.007		2500324	55.4		116	4350	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.602	11.595	0.007	1.000	279742	2.96			25.9	
498.9 > 98.7	11.602	11.595	0.007	1.000	170535		1.64(0.00-0.00)		56.4	

Report Date: 05-Dec-2014 10:03:24 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_084.d

Injection Date: 04-Dec-2014 20:45:53 Instrument ID: A4

Lims ID: 320-10459-A-1-B Lab Sample ID: 320-10459-1

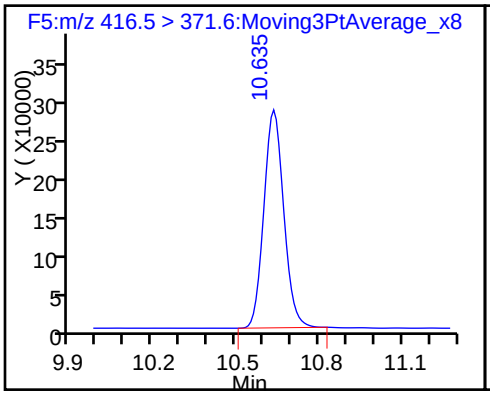
Client ID: B7/10-GW02

Operator ID: JRB ALS Bottle#: 24 Worklist Smp#: 48

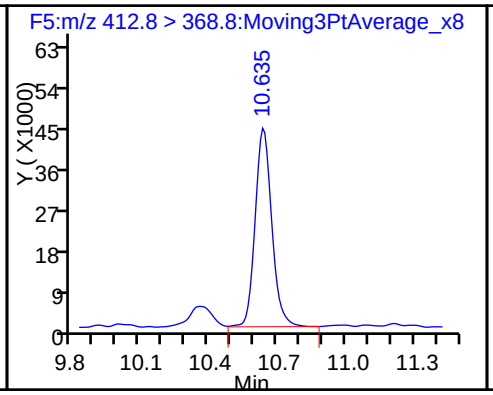
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC ICAL

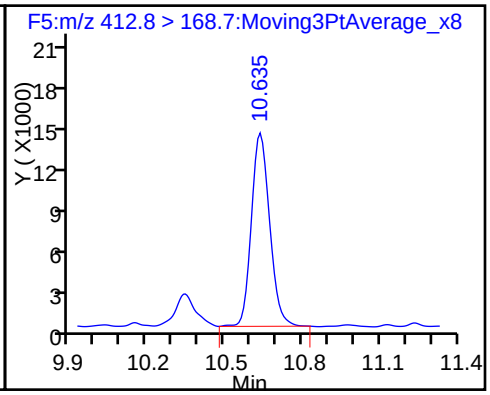
D 12 13C4 PFOA



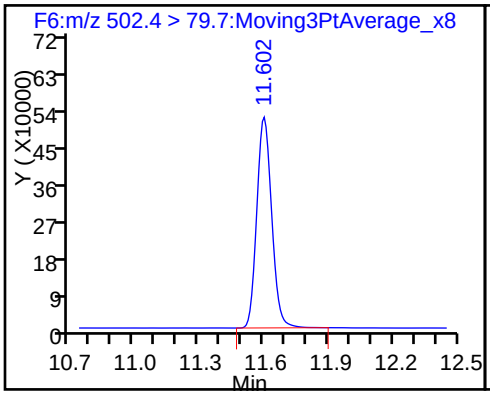
13 Perfluorooctanoic acid



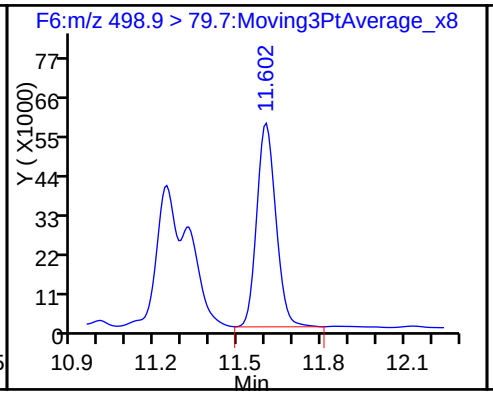
13 Perfluorooctanoic acid



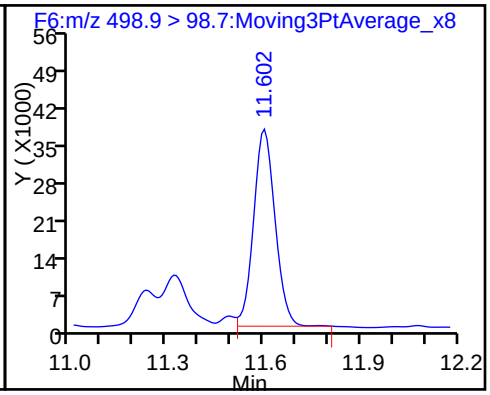
D 16 13C4 PFOS



15 Perfluorooctanoic Sulfonate



15 Perfluorooctanoic Sulfonate



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Client Sample ID: B7/10-GW03S Lab Sample ID: 320-10459-2

Matrix: Water Lab File ID: 03DEC14A4A_085.d

Analysis Method: WS-LC-0025 Date Collected: 11/15/2014 15:20

Extraction Method: 3535 Date Extracted: 12/03/2014 13:38

Sample wt/vol: 427.75(mL) Date Analyzed: 12/04/2014 21:07

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 59779 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	J H	2.3	1.8	0.87
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.8	U H	2.3	1.8	1.5

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	108		25-150
STL00990	13C4 PFOA	64		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_085.d
Lims ID: 320-10459-A-2-B Lab Sample ID: 320-10459-2
Client ID: B7/10-GW03S
Sample Type: Client
Inject. Date: 04-Dec-2014 21:07:07 ALS Bottle#: 25 Worklist Smp#: 49
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-10459-a-2-b 59712
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:03:21 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
416.5 > 371.6	10.632	10.628	0.004		1083559	32.0		64.1	2381	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.641	10.628	0.013	1.000	30849	0.8525			19.0	
412.8 > 168.7	10.641	10.628	0.013	1.000	10104		3.05(0.00-0.00)		10.9	
D 16 13C4 PFOS										
502.4 > 79.7	11.602	11.595	0.007		2323120	51.5		108	3478	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.602	11.595	0.007	1.000	35729	0.4074			23.1	
498.9 > 98.7	11.602	11.595	0.007	1.000	15556		2.30(0.00-0.00)		18.4	

Report Date: 05-Dec-2014 10:03:25 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_085.d

Injection Date: 04-Dec-2014 21:07:07 Instrument ID: A4

Lims ID: 320-10459-A-2-B Lab Sample ID: 320-10459-2

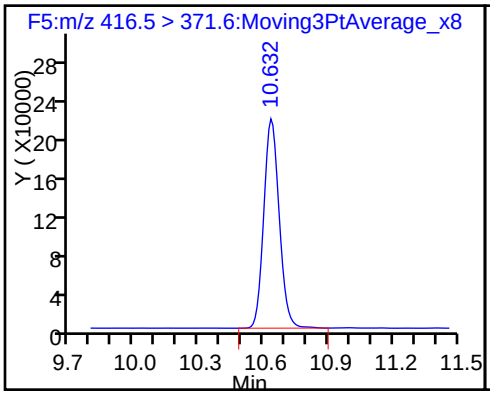
Client ID: B7/10-GW03S

Operator ID: JRB ALS Bottle#: 25 Worklist Smp#: 49

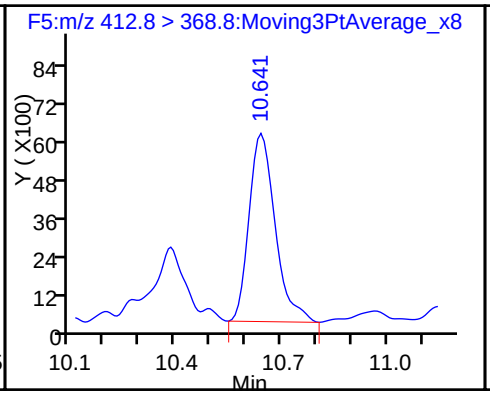
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC ICAL

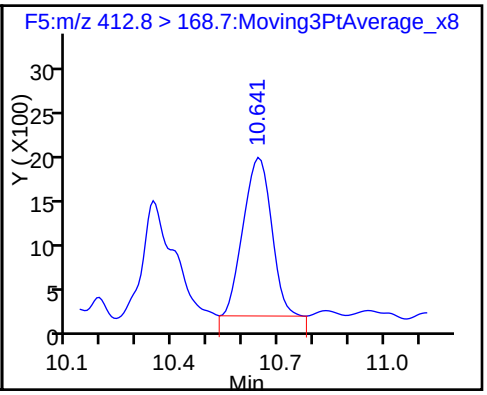
D 12 13C4 PFOA



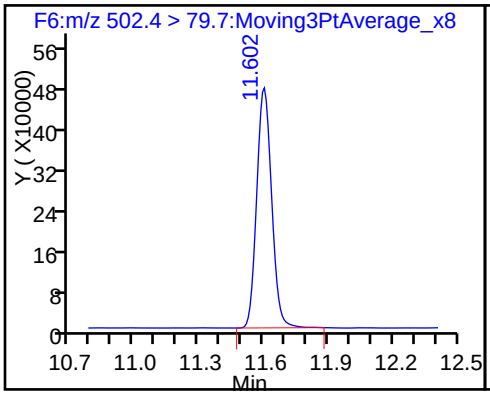
13 Perfluorooctanoic acid



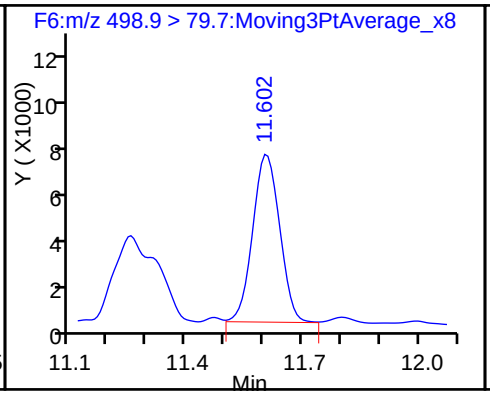
13 Perfluorooctanoic acid



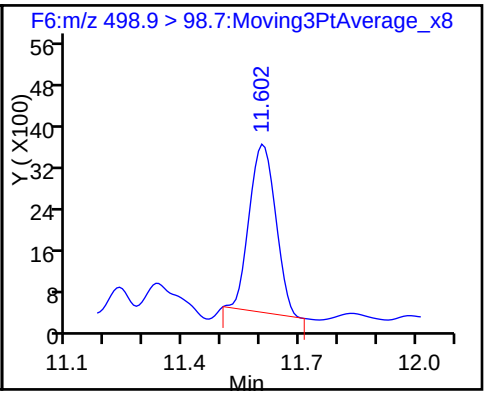
D 16 13C4 PFOS



15 Perfluorooctanoic Sulfonate



15 Perfluorooctanoic Sulfonate



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-10459-1

SDG No.:

Client Sample ID: QR4-GW02 | Lab Sample ID: 320-10459-3

Matrix: Water | Lab File ID: 03DEC14A4A_086.d

Analysis Method: WS-LC-0025 | Date Collected: 11/16/2014 10:20

Extraction Method: 3535 | Date Extracted: 12/03/2014 13:38

Sample wt/vol: 427.31(mL) | Date Analyzed: 12/04/2014 21:28

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.: 59779 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	1.8	U H	2.3	1.8	0.88
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.8	U H	2.3	1.8	1.5

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	109		25-150
STL00990	13C4 PFOA	90		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_086.d
Lims ID: 320-10459-A-3-B Lab Sample ID: 320-10459-3
Client ID: QR4-GW02
Sample Type: Client
Inject. Date: 04-Dec-2014 21:28:19 ALS Bottle#: 26 Worklist Smp#: 50
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-10459-a-3-b 59712
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:03:21 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
416.5 > 371.6	10.633	10.628	0.005		1518512	44.9		89.8	2377	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.633	10.628	0.005	1.000	17704	0.3491			9.9	
412.8 > 168.7	10.642	10.628	0.014	1.001	7303		2.42(0.00-0.00)		14.9	
D 16 13C4 PFOS										
502.4 > 79.7	11.602	11.595	0.007		2356329	52.2		109	4306	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.602	11.595	0.007	1.000	22351	0.2512			29.9	
498.9 > 98.7	11.602	11.595	0.007	1.000	11635		1.92(0.00-0.00)		10.4	

Report Date: 05-Dec-2014 10:03:25 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_086.d

Injection Date: 04-Dec-2014 21:28:19 Instrument ID: A4

Lims ID: 320-10459-A-3-B Lab Sample ID: 320-10459-3

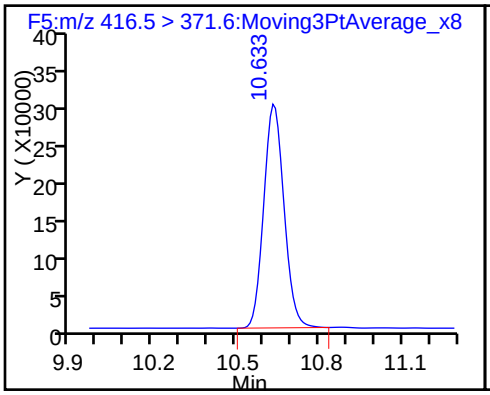
Client ID: QR4-GW02

Operator ID: JRB ALS Bottle#: 26 Worklist Smp#: 50

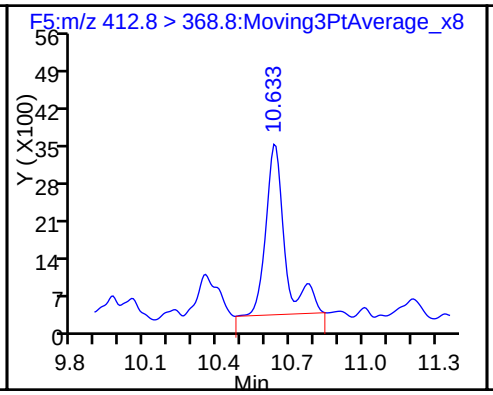
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC ICAL

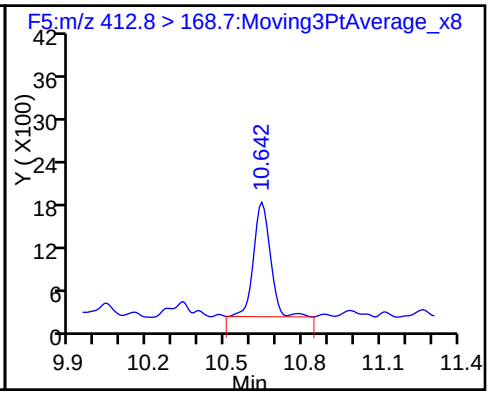
D 12 13C4 PFOA



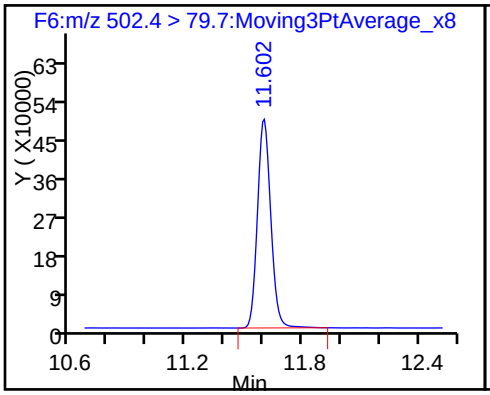
13 Perfluorooctanoic acid



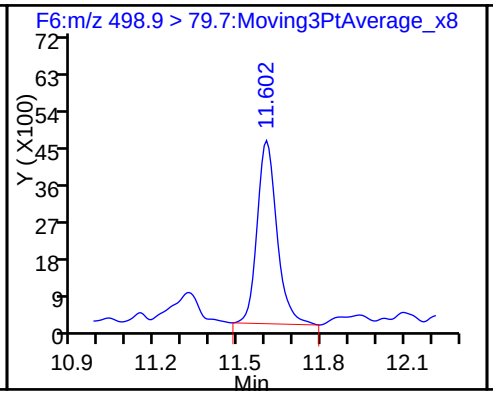
13 Perfluorooctanoic acid



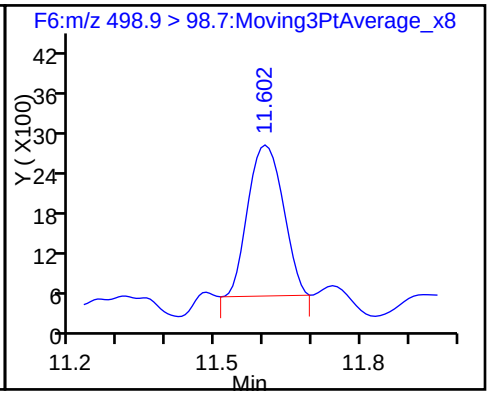
D 16 13C4 PFOS



15 Perfluorooctanoic Sulfonate



15 Perfluorooctanoic Sulfonate



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Client Sample ID: B7/10-GW06S Lab Sample ID: 320-10459-4

Matrix: Water Lab File ID: 03DEC14A4A_087.d

Analysis Method: WS-LC-0025 Date Collected: 11/16/2014 11:50

Extraction Method: 3535 Date Extracted: 12/03/2014 13:38

Sample wt/vol: 446.26(mL) Date Analyzed: 12/04/2014 21:49

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.: 59779 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	20	H	2.2	1.7	0.84
1763-23-1	Perfluorooctane Sulfonate (PFOS)	2.2	H	2.2	1.7	1.4

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	108		25-150
STL00990	13C4 PFOA	67		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_087.d
Lims ID: 320-10459-A-4-B Lab Sample ID: 320-10459-4
Client ID: B7/10-GW06S
Sample Type: Client
Inject. Date: 04-Dec-2014 21:49:30 ALS Bottle#: 27 Worklist Smp#: 51
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-10459-a-4-b 59712
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:03:21 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
416.5 > 371.6	10.642	10.628	0.014		1138168	33.6		67.3	1719	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.642	10.628	0.014	1.000	340395	8.96			107	
412.8 > 168.7	10.642	10.628	0.014	1.000	89169		3.82(0.00-0.00)		61.5	
D 16 13C4 PFOS										
502.4 > 79.7	11.602	11.595	0.007		2338394	51.9		108	3471	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.602	11.595	0.007	1.000	87815	0.99			17.4	
498.9 > 98.7	11.602	11.595	0.007	1.000	51215		1.71(0.00-0.00)		31.1	

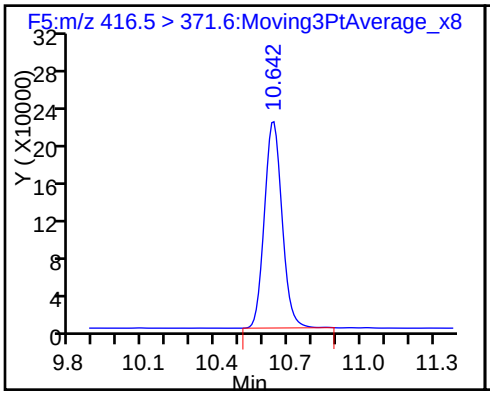
Report Date: 05-Dec-2014 10:03:26 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

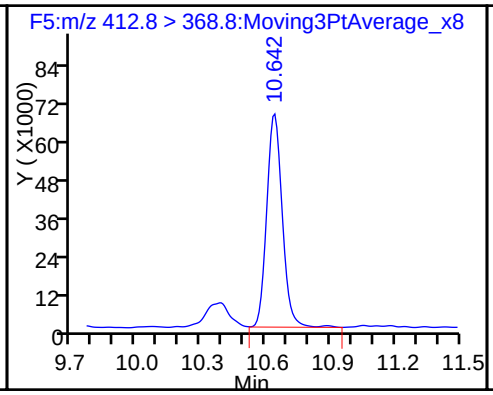
Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_087.d

Injection Date:	04-Dec-2014 21:49:30	Instrument ID:	A4		
Lims ID:	320-10459-A-4-B	Lab Sample ID:	320-10459-4		
Client ID:	B7/10-GW06S				
Operator ID:	JRB	ALS Bottle#:	27	Worklist Smp#:	51
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A4	Limit Group:	LC PFC ICAL		

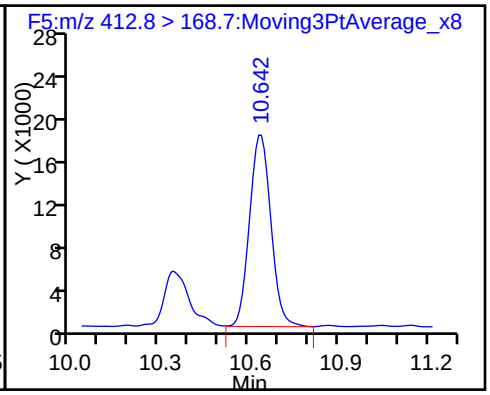
D 12 13C4 PFOA



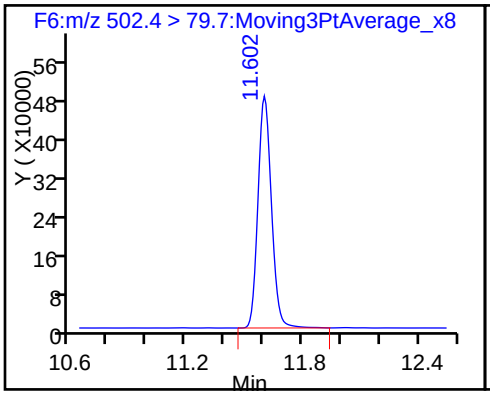
13 Perfluorooctanoic acid



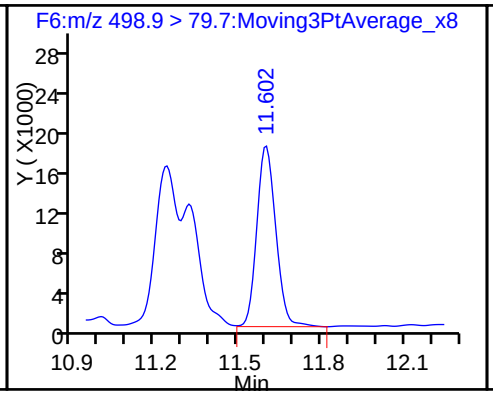
13 Perfluorooctanoic acid



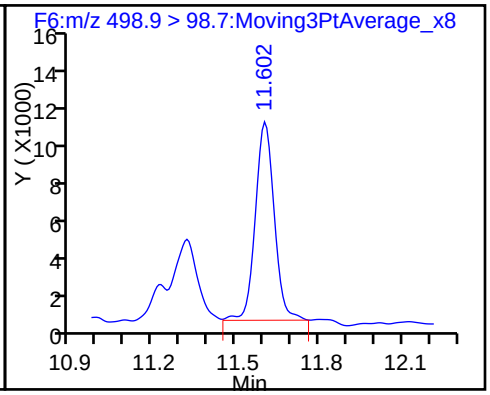
D 16 13C4 PFOS



15 Perfluorooctanoic Sulfonate



15 Perfluorooctanoic Sulfonate



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Client Sample ID: H123-GW02 Lab Sample ID: 320-10459-5

Matrix: Water Lab File ID: 03DEC14A4A_088.d

Analysis Method: WS-LC-0025 Date Collected: 11/16/2014 15:00

Extraction Method: 3535 Date Extracted: 12/03/2014 13:38

Sample wt/vol: 455.47(mL) Date Analyzed: 12/04/2014 22:10

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 59779 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	17	H	2.2	1.6	0.82
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.6	U H	2.2	1.6	1.4

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	107		25-150
STL00990	13C4 PFOA	89		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_088.d
Lims ID: 320-10459-A-5-B Lab Sample ID: 320-10459-5
Client ID: H123-GW02
Sample Type: Client
Inject. Date: 04-Dec-2014 22:10:42 ALS Bottle#: 28 Worklist Smp#: 52
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-10459-a-5-b 59712
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:03:21 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
416.5 > 371.6	10.632	10.628	0.004		1513765	44.7		89.5	2011	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.632	10.628	0.004	1.000	391049	7.74			109	
412.8 > 168.7	10.632	10.628	0.004	1.000	117288		3.33(0.00-0.00)		61.6	
D 16 13C4 PFOS										
502.4 > 79.7	11.594	11.595	-0.001		2301909	51.0		107	5627	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.602	11.595	0.007	1.000	46613	0.5364			15.9	
498.9 > 98.7	11.594	11.595	-0.001	0.999	22984		2.03(0.00-0.00)		22.7	

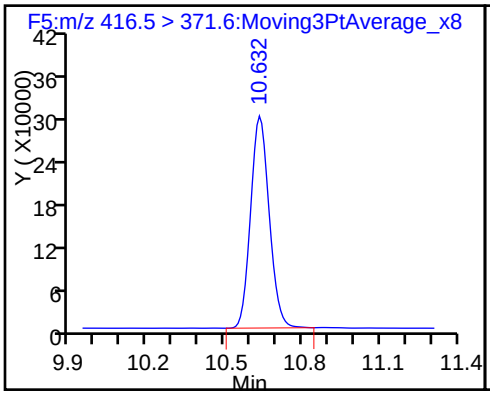
Report Date: 05-Dec-2014 10:03:27 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

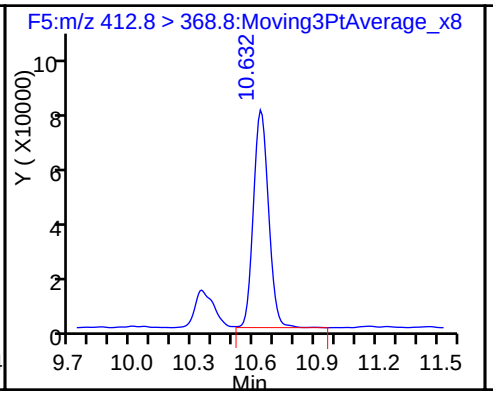
Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_088.d

Injection Date:	04-Dec-2014 22:10:42	Instrument ID:	A4		
Lims ID:	320-10459-A-5-B	Lab Sample ID:	320-10459-5		
Client ID:	H123-GW02				
Operator ID:	JRB	ALS Bottle#:	28	Worklist Smp#:	52
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A4	Limit Group:	LC PFC ICAL		

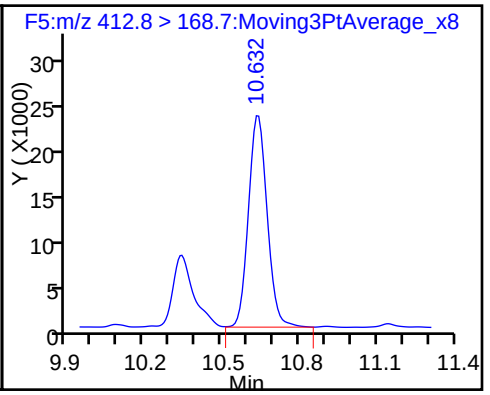
D 12 13C4 PFOA



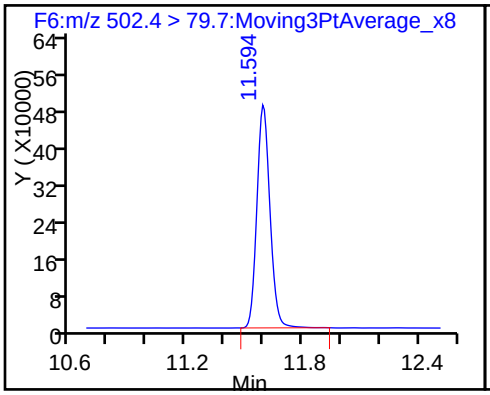
13 Perfluorooctanoic acid



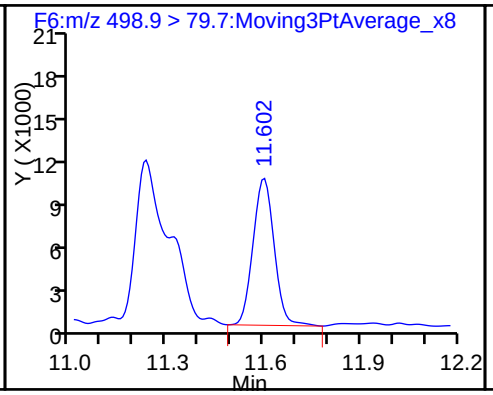
13 Perfluorooctanoic acid



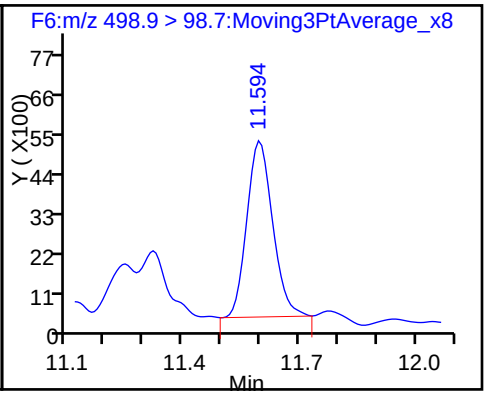
D 16 13C4 PFOS



15 Perfluorooctanoic Sulfonate



15 Perfluorooctanoic Sulfonate



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Client Sample ID: EFA-FD01-1014 Lab Sample ID: 320-10459-6

Matrix: Water Lab File ID: 03DEC14A4A_089.d

Analysis Method: WS-LC-0025 Date Collected: 11/16/2014 00:00

Extraction Method: 3535 Date Extracted: 12/03/2014 13:38

Sample wt/vol: 447.90(mL) Date Analyzed: 12/04/2014 22:31

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 59779 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	16	H	2.2	1.7	0.84
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.7	U H	2.2	1.7	1.4

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	109		25-150
STL00990	13C4 PFOA	82		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_089.d
Lims ID: 320-10459-A-6-B Lab Sample ID: 320-10459-6
Client ID: EFA-FD01-1014
Sample Type: Client
Inject. Date: 04-Dec-2014 22:31:53 ALS Bottle#: 29 Worklist Smp#: 53
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-10459-a-6-b 59712
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:03:21 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
416.5 > 371.6	10.632	10.628	0.004		1381817	40.8		81.7	1956	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.632	10.628	0.004	1.000	332759	7.21			105	
412.8 > 168.7	10.642	10.628	0.014	1.001	99306		3.35(0.00-0.00)		57.8	
D 16 13C4 PFOS										
502.4 > 79.7	11.602	11.595	0.007		2348037	52.1		109	4014	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.602	11.595	0.007	1.000	48141	0.5431			14.7	
498.9 > 98.7	11.610	11.595	0.015	1.001	30527		1.58(0.00-0.00)		28.2	

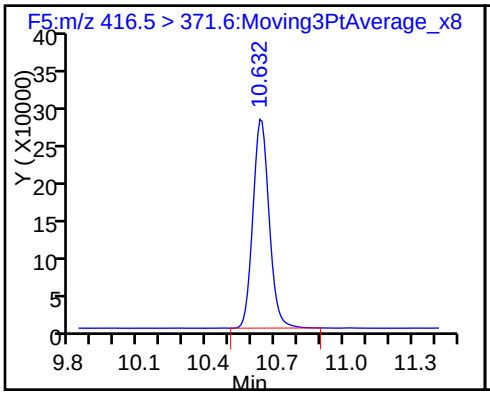
Report Date: 05-Dec-2014 10:03:28 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

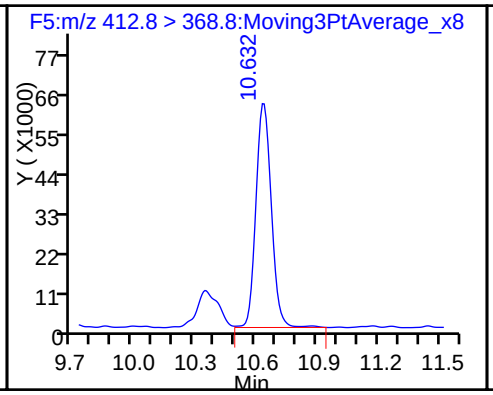
Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_089.d

Injection Date:	04-Dec-2014 22:31:53	Instrument ID:	A4		
Lims ID:	320-10459-A-6-B	Lab Sample ID:	320-10459-6		
Client ID:	EFA-FD01-1014				
Operator ID:	JRB	ALS Bottle#:	29	Worklist Smp#:	53
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A4	Limit Group:	LC PFC ICAL		

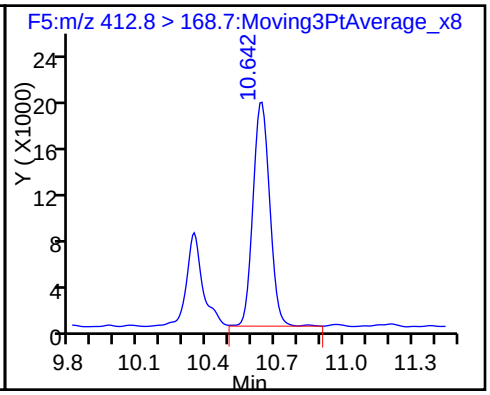
D 12 13C4 PFOA



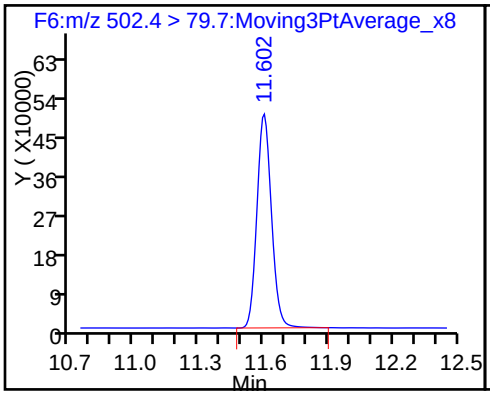
13 Perfluorooctanoic acid



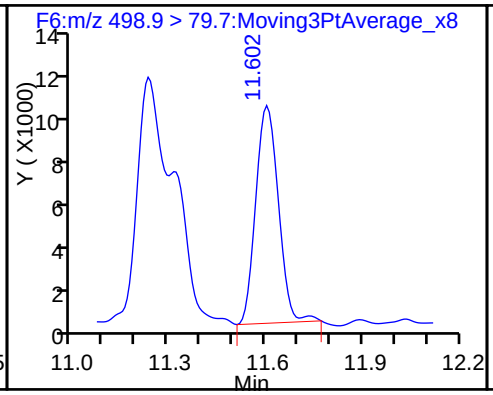
13 Perfluorooctanoic acid



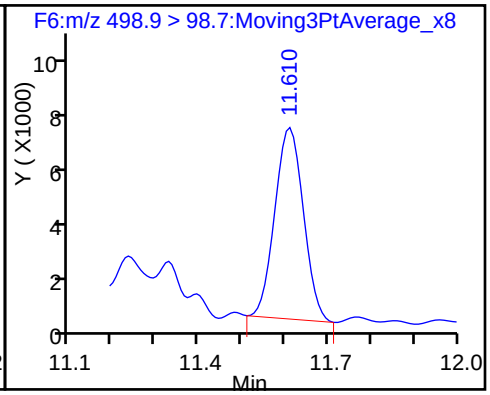
D 16 13C4 PFOS



15 Perfluorooctanoic Sulfonate



15 Perfluorooctanoic Sulfonate



FORM VI
LCMS INITIAL CALIBRATION DATA
EXTERNAL STANDARD RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1 Analy Batch No.: 59779

SDG No.:

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

Calibration Start Date: 12/04/2014 03:44 Calibration End Date: 12/04/2014 05:51 Calibration ID: 10479

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-59779/4	03DEC14A4A_040.d
Level 2	STD 320-59779/5	03DEC14A4A_041.d
Level 3	STD 320-59779/6	03DEC14A4A_042.d
Level 4	STD 320-59779/7	03DEC14A4A_043.d
Level 5	STD 320-59779/8	03DEC14A4A_044.d
Level 6	STD 320-59779/9	03DEC14A4A_045.d
Level 7	STD 320-59779/10	03DEC14A4A_046.d

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7				RT WINDOW	AVG RT
13C4 PFBA	5.934	5.937	5.928	5.934	5.934	5.934	5.934				5.684 - 6.184	5.934
13C5 PFPeA	7.035	7.035	7.029	7.043	7.046	7.036	7.040				6.788 - 7.288	7.038
13C2 PFHxA	8.273	8.284	8.273	8.290	8.284	8.284	8.286				8.032 - 8.532	8.282
13C4-PFHpA	9.505	9.510	9.499	9.505	9.510	9.505	9.510				9.256 - 9.756	9.506
18O2 PFHxS	9.538	9.545	9.538	9.545	9.545	9.545	9.552				9.294 - 9.794	9.544
13C4 PFOA	10.623	10.632	10.623	10.632	10.633	10.632	10.623				10.378 - 10.878	10.628
13C4 PFOS	11.585	11.602	11.594	11.594	11.594	11.602	11.594				11.345 - 11.845	11.595
13C5 PFNA	11.603	11.620	11.611	11.612	11.620	11.620	11.612				11.364 - 11.864	11.614
13C2 PFDA	12.455	12.466	12.455	12.466	12.466	12.466	12.466				12.213 - 12.713	12.463
13C8 FOSA	12.994	13.003	12.994	12.994	12.995	13.003	13.004				12.748 - 13.248	12.998
13C2 PFUnA	13.189	13.198	13.189	13.198	13.198	13.206	13.206				12.948 - 13.448	13.198
13C2 PFDoA	13.802	13.811	13.802	13.811	13.811	13.811	13.813				13.559 - 14.059	13.809
13C2-PFTeDA	14.765	14.765	14.765	14.765	14.765	14.772	14.766				14.516 - 15.016	14.766
13C2-PFHxDA	15.414	15.414	15.415	15.415	15.415	15.415	15.415				15.165 - 15.665	15.415

FORM VI
LCMS INITIAL CALIBRATION DATA
EXTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1 Analy Batch No.: 59779

SDG No.:

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

Calibration Start Date: 12/04/2014 03:44 Calibration End Date: 12/04/2014 05:51 Calibration ID: 10479

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-59779/4	03DEC14A4A_040.d
Level 2	STD 320-59779/5	03DEC14A4A_041.d
Level 3	STD 320-59779/6	03DEC14A4A_042.d
Level 4	STD 320-59779/7	03DEC14A4A_043.d
Level 5	STD 320-59779/8	03DEC14A4A_044.d
Level 6	STD 320-59779/9	03DEC14A4A_045.d
Level 7	STD 320-59779/10	03DEC14A4A_046.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	5268.6 3806.7	5812.9 3203.9	5254.9 2254.3	4338.2	Ave		4277.06429				30.0		50.0			
13C5 PFPeA	9419.7 7332.0	9580.9 5721.7	8177.5 4869.4	8903.4	Ave		7714.90000				24.0		50.0			
13C2 PFHxA	21470 18141	22784 16317	24835 11422	18449	Ave		19059.8143				23.0		50.0			
13C4-PFHpA	21643 17882	21390 11698	21748 10393	19442	Ave		17742.3500				27.0		50.0			
18O2 PFHxS	53128 47816	52233 33678	50966 25618	51213	Ave		44950.3322				24.0		50.0			
13C4 PFOA	41322 31379	41400 24644	40475 19047	38546	Ave		33830.5286				27.0		50.0			
13C4 PFOS	54398 44130	54385 33330	56166 23197	50088	Ave		45099.0735				28.0		50.0			
13C5 PFNA	44879 37219	45410 30155	48879 22012	41831	Ave		38626.2857				25.0		50.0			
13C2 PFDA	63235 48806	61430 37175	59297 32265	58211	Ave		51488.2929				24.0		50.0			
13C8 FOSA	150505 147550	155647 126255	158874 106829	155831	Ave		143069.894				14.0		50.0			
13C2 PFUnA	66511 59868	66532 58833	66894 69853	64772	Ave		64751.6643				6.2		50.0			
13C2 PFDoA	76991 59932	66196 56050	76655 52807	68862	Ave		65356.2357				15.0		50.0			
13C2-PFTeDA	77915 69707	76286 61208	80240 58365	76834	Ave		71507.9143				12.0		50.0			
13C2-PFHxDA	96546 111182	105842 105984	112387 93820	103841	Ave		104228.936				6.6		50.0			

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

FORM VI
LCMS INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1 Analy Batch No.: 59779

SDG No.:

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

Calibration Start Date: 12/04/2014 03:44 Calibration End Date: 12/04/2014 05:51 Calibration ID: 10479

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	10678 16623	22829 12169	21990	19527	19477	AveID		2.3514				25.0		35.0			
Perfluoropentanoic acid (PFPeA)	8732.0 11185	14944 9458.0	14198	14832	13130	AveID		1.6538				21.0		35.0			
Perfluorobutane Sulfonate (PFBS)	14683 39320	46758 32165	49055	48250	67174	AveID		0.9863				37.0		50.0			
Perfluorohexanoic acid (PFHxA)	9952.0 16870	21004 12521	26818	19955	20968	AveID		0.9761				24.0		35.0			
PFPeS (Perflouro-1-pentanesulfonate)	12755 32980	40229 24854	44086	42428	40598	AveID		0.7860				32.0		50.0			
Perfluoroheptanoic acid (PFHpA)	14724 21344	28535 18892	35883	33256	29606	AveID		1.5247				27.0		35.0			
Perfluorohexane Sulfonate (PFHxS)	24632 33051	52072 26648	53418	49529	45799	AveID		0.9222				22.0		35.0			
Perfluorooctanoic acid (PFOA)	54920 43078	74889 33366	68131	62497	54775	AveID		1.6697				9.7		35.0			
Perfluoro-1-heptanesulfonate (PFHpS)	12752 33076	45349 24051	51122	49900	46278	AveID		0.8647				33.0		50.0			
Perfluorooctane Sulfonate (PFOS)	143245 49883	124703 36721	92010	73648	66987	AveID		1.8046				26.0		35.0			
Perfluorononanoic acid (PFNA)	22096 39342	60944 27244	61254	52411	44283	AveID		1.1532				26.0		35.0			
PFNS (Perflouro-1-nonanesulfonate)	16554 25936	40576 18531	47018	41535	37537	AveID		0.7349				26.0		50.0			
Perfluorodecanoic acid (PFDA)	16398 41090	58072 33184	67070	63478	54711	AveID		0.9544				33.0		35.0			
Perfluorooctane Sulfonamide (FOSA)	60576 132015	157092 116050	155459	165246	157618	AveID		0.9501				26.0		35.0			
Perfluorodecane sulfonate (PFDS)	10237 23088	37158 16598	42628	36833	33233	AveID		0.6467				32.0		50.0			
Perfluoroundecanoic acid (PFUnA)	25356 49828	75233 40491	72252	72984	62389	AveID		0.8839				34.0		35.0			
Perfluorododecanoic acid (PFDoA)	25100 62748	61887 50239	92219	78804	73401	AveID		0.9863				32.0		35.0			
PFDoS (Perflouro-1-dodecanesulfonate)	7778.9 23770	32535 17735	43717	40638	35319	AveID		0.6584				36.0		50.0			
Perfluorotridecanoic Acid (PFTriA)	20248 45661	65903 40208	67545	66220	62650	AveID		0.8175				32.0		50.0			

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

FORM VI
LCMS INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1 Analy Batch No.: 59779

SDG No.:

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

Calibration Start Date: 12/04/2014 03:44 Calibration End Date: 12/04/2014 05:51 Calibration ID: 10479

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorotetradecanoic acid (PFTeA)	15018 30898	36572 27633	43161	42497	38214	AveID		0.5200				29.0		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	44032 92953	98406 78170	100981	86858	96066	AveID		1.3398				27.0		50.0			
Perfluoro-n-octandecanoic acid (PFODA)	22762 104163	94742 95748	99443	104957	102973	AveID		1.4197				38.0		50.0			

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

FORM VI
LCMS INITIAL CALIBRATION DATA
EXTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1 Analy Batch No.: 59779

SDG No.:

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

Calibration Start Date: 12/04/2014 03:44 Calibration End Date: 12/04/2014 05:51 Calibration ID: 10479

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-59779/4	03DEC14A4A_040.d
Level 2	STD 320-59779/5	03DEC14A4A_041.d
Level 3	STD 320-59779/6	03DEC14A4A_042.d
Level 4	STD 320-59779/7	03DEC14A4A_043.d
Level 5	STD 320-59779/8	03DEC14A4A_044.d
Level 6	STD 320-59779/9	03DEC14A4A_045.d
Level 7	STD 320-59779/10	03DEC14A4A_046.d

ANALYTE	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
		LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
13C4 PFBA	Ave	105372 64078	116258 45086	105097	86764	76134	20.0 20.0	20.0 20.0	20.0	20.0	20.0
13C5 PFPeA	Ave	188393 114434	191617 97387	163549	178067	146639	20.0 20.0	20.0 20.0	20.0	20.0	20.0
13C2 PFHxA	Ave	429395 326332	455689 228440	496708	368981	362829	20.0 20.0	20.0 20.0	20.0	20.0	20.0
13C4-PFHpA	Ave	432854 233963	427809 207868	434956	388840	357639	20.0 20.0	20.0 20.0	20.0	20.0	20.0
18O2 PFHxS	Ave	1005188 637190	988251 484686	964272	968949	904686	18.9 18.9	18.9 18.9	18.9	18.9	18.9
13C4 PFOA	Ave	2066105 1232205	2070020 952358	2023751	1927321	1568925	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C4 PFOS	Ave	2600203 1593174	2599599 1108797	2684739	2394219	2109419	47.8 47.8	47.8 47.8	47.8	47.8	47.8
13C5 PFNA	Ave	897580 603092	908195 440238	977581	836616	744378	20.0 20.0	20.0 20.0	20.0	20.0	20.0
13C2 PFDA	Ave	1264690 743492	1228601 645298	1185934	1164228	976118	20.0 20.0	20.0 20.0	20.0	20.0	20.0
13C8 FOSA	Ave	7525230 6312732	7782345 5341425	7943692	7791526	7377513	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFUnA	Ave	1330212 1176651	1330638 1397054	1337877	1295448	1197353	20.0 20.0	20.0 20.0	20.0	20.0	20.0
13C2 PFDoA	Ave	1539828 1120992	1323923 1056139	1533105	1377246	1198640	20.0 20.0	20.0 20.0	20.0	20.0	20.0
13C2-PFTeDA	Ave	1558303 1224157	1525719 1167304	1604800	1536682	1394143	20.0 20.0	20.0 20.0	20.0	20.0	20.0
13C2-PFHxDA	Ave	1930922 2119674	2116849 1876393	2247748	2076818	2223647	20.0 20.0	20.0 20.0	20.0	20.0	20.0

Curve Type Legend:
Ave = Average

FORM VI
LCMS INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1 Analy Batch No.: 59779

SDG No.:

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

Calibration Start Date: 12/04/2014 03:44 Calibration End Date: 12/04/2014 05:51 Calibration ID: 10479

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-59779/4	03DEC14A4A_040.d
Level 2	STD 320-59779/5	03DEC14A4A_041.d
Level 3	STD 320-59779/6	03DEC14A4A_042.d
Level 4	STD 320-59779/7	03DEC14A4A_043.d
Level 5	STD 320-59779/8	03DEC14A4A_044.d
Level 6	STD 320-59779/9	03DEC14A4A_045.d
Level 7	STD 320-59779/10	03DEC14A4A_046.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	5339 3324570	22829 6084630	109952	390544	973858	0.500 200	1.00 500	5.00	20.0	50.0
Perfluoropentanoic acid (PFPeA)		AveID	4366 2237092	14944 4729024	70990	296633	656489	0.500 200	1.00 500	5.00	20.0	50.0
Perfluorobutane Sulfonate (PFBS)		AveID	6490 6951713	41334 14216894	216823	853055	2969104	0.442 177	0.884 442	4.42	17.7	44.2
Perfluorohexanoic acid (PFHxA)		AveID	4976 3374043	21004 6260320	134092	399091	1048415	0.500 200	1.00 500	5.00	20.0	50.0
PFPeS (Perflouro-1-pentanesulfonate)		AveID	5982 6187089	37735 11656614	206763	795956	1904029	0.469 188	0.938 469	4.69	18.8	46.9
Perfluoroheptanoic acid (PFHpA)		AveID	7362 4268821	28535 9446001	179416	665119	1480278	0.500 200	1.00 500	5.00	20.0	50.0
Perfluorohexane Sulfonate (PFHxS)		AveID	11651 6253308	49260 12604320	252665	937096	2166299	0.473 189	0.946 473	4.73	18.9	47.3
Perfluorooctanoic acid (PFOA)		AveID	27460 8615547	74889 16683058	340656	1249944	2738772	0.500 200	1.00 500	5.00	20.0	50.0
Perfluoro-1-heptanesulfonate (PFHpS)		AveID	6070 6297711	43172 11448389	243339	950094	2202840	0.476 190	0.952 476	4.76	19.0	47.6
Perfluorooctane Sulfonate (PFOS)		AveID	68471 9537705	119216 17552751	439807	1408150	3201983	0.478 191	0.956 478	4.78	19.1	47.8
Perfluorononanoic acid (PFNA)		AveID	11048 7868399	60944 13621836	306271	1048226	2214146	0.500 200	1.00 500	5.00	20.0	50.0
PFNS (Perflouro-1-nonanesulfonate)		AveID	7946 4979770	38953 8895061	225687	797477	1801756	0.480 192	0.960 480	4.80	19.2	48.0
Perfluorodecanoic acid (PFDA)		AveID	8199 8217900	58072 16591989	335348	1269551	2735529	0.500 200	1.00 500	5.00	20.0	50.0
Perfluorooctane Sulfonamide (FOSA)		AveID	30288 26403028	157092 58025028	777293	3304921	7880884	0.500 200	1.00 500	5.00	20.0	50.0
Perfluorodecane sulfonate (PFDS)		AveID	4934 4451333	35820 8000344	205469	710141	1601818	0.482 193	0.964 482	4.82	19.3	48.2

FORM VI
LCMS INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1 Analy Batch No.: 59779

SDG No.:

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

Calibration Start Date: 12/04/2014 03:44 Calibration End Date: 12/04/2014 05:51 Calibration ID: 10479

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluoroundecanoic acid (PFUnA)		AveID	12678 9965686	75233 20245258	361261	1459686	3119455	0.500 200	1.00 500	5.00	20.0	50.0
Perfluorododecanoic acid (PFDoA)		AveID	12550 12549584	61887 25119659	461093	1576082	3670027	0.500 200	1.00 500	5.00	20.0	50.0
PFDoS (Perflouro-1-dodecanesulfonate)		AveID	3765 4601893	31494 8583795	211588	786746	1709417	0.484 194	0.968 484	4.84	19.4	48.4
Perfluorotridecanoic Acid (PFTriA)		AveID	10124 9132281	65903 20104094	337727	1324401	3132510	0.500 200	1.00 500	5.00	20.0	50.0
Perfluorotetradecanoic acid (PFTeA)		AveID	7509 6179569	36572 13816653	215805	849938	1910691	0.500 200	1.00 500	5.00	20.0	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)		AveID	22016 18590504	98406 39084771	504906	1737164	4803324	0.500 200	1.00 500	5.00	20.0	50.0
Perfluoro-n-octandecanoic acid (PFODA)		AveID	11381 20832627	94742 47874246	497216	2099144	5148634	0.500 200	1.00 500	5.00	20.0	50.0

Curve Type Legend:
AveID = Average isotope dilution

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_040.d
Lims ID: Std L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 04-Dec-2014 03:44:16 ALS Bottle#: 4 Worklist Smp#: 4
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: LCPFC-L1 PFC 0.50/50ng/mL
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub5

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:01:51 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.934	5.934	0.0		105372	24.6		123	409	
2 Perfluorobutyric acid										
212.7 > 168.6	5.934	5.935	-0.001	1.000	5339	0.2410		48.2	19.7	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.039	7.037	0.002	1.000	4366	0.2803		56.1	7.2	
D 3 13C5-PFPeA										
267.6 > 222.7	7.035	7.038	-0.003		188393	24.4		122	572	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.154	7.157	-0.003	1.000	6490	0.1239		28.0	28.9	
298.8 > 98.6	7.147	7.157	-0.010	0.999	5511		1.18(0.00-0.00)	28.0	19.8	
D 6 13C2 PFHxA										
314.6 > 269.7	8.273	8.282	-0.009		429395	22.5		113	1739	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.279	8.284	-0.005	1.000	4976	0.2374		47.5	15.1	
22 PFPeS (Perflouro-1-pentanesulfonat										
348.7 > 79.5	8.360	8.360	0.0	0.877	5982	0.1432		30.5	22.5	
D 8 13C4-PFHpA										
366.6 > 321.6	9.505	9.506	-0.001		432854	24.4		122	1684	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.510	9.508	0.002	1.000	7362	0.2231		44.6	21.3	
10 Perfluorohexane Sulfonate										
398.8 > 79.7	9.531	9.543	-0.012	1.000	11651	0.2378		50.3	36.2	
D 11 18O2 PFHxS										
402.5 > 83.6	9.538	9.544	-0.006		1005188	22.4		118	2708	
D 12 13C4 PFOA										
416.5 > 371.6	10.623	10.628	-0.005		2066105	61.1		122	3807	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
412.8 > 368.8	10.623	10.628	-0.005	1.000	27460	0.3980		79.6	41.1	
412.8 > 168.7	10.632	10.628	0.004	1.001	11257		2.44(0.00-0.00)	79.6	18.2	
14 Perfluoroheptane Sulfonate										
448.8 > 79.7	10.641	10.635	0.006	1.000	6070	0.1291		27.1	12.0	
D 16 13C4 PFOS										
502.4 > 79.7	11.585	11.595	-0.010		2600203	57.7		121	6261	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.585	11.595	-0.010	1.000	68471	0.6975		146	82.9	
498.9 > 98.7	11.585	11.595	-0.010	1.000	37166		1.84(0.00-0.00)	146	84.2	
D 17 13C5 PFNA										
467.5 > 422.6	11.603	11.614	-0.011		897580	23.2		116	2143	
18 Perfluorononanoic acid										
462.5 > 418.6	11.611	11.616	-0.005	1.000	11048	0.2135		42.7	21.7	
21 PFNS (Perflouro-1-nonanesulfonate)										
548.6 > 79.6	12.414	12.429	-0.015	1.000	7946	0.1988		41.4	18.1	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.445	12.461	-0.016	1.000	8199	0.1359		27.2	21.7	
D 19 13C2 PFDA										
514.4 > 469.5	12.455	12.463	-0.008		1264690	24.6		123	1953	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.984	12.998	-0.014	1.000	30288	0.2118		42.4	45.9	
D 23 13C8 FOSA										
505.4 > 77.6	12.994	12.998	-0.004		7525230	52.6		105	4617	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.154	13.152	0.002	1.000	4934	0.1402		29.1	8.8	
D 26 13C2 PFUnA										
564.3 > 519.5	13.189	13.198	-0.009		1330212	20.5		103	2524	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.189	13.198	-0.009	1.000	12678	0.2156		43.1	25.7	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.793	13.808	-0.015	1.000	12550	0.1653		33.1	7.8	
D 28 13C2 PFDoA										
614.4 > 569.4	13.802	13.809	-0.007		1539828	23.6		118	2135	
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.265	14.272	-0.007	1.000	3765	0.1051		21.7	6.9	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.319	14.327	-0.008	1.000	10124	0.1608		32.2	7.6	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.765	14.766	-0.001	1.000	7509	0.1876		37.5	7.0	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.765	14.766	-0.001		1558303	21.8		109	2502	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.414	15.415	-0.001		1930922	18.5		92.6	2349	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.414	15.415	-0.001	1.000	22016	0.2134		42.7	26.9	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.756	15.752	0.004	1.000	11381	0.1041		20.8	15.1	

Reagents:

LCPFC-L1_00005 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2014 10:01:51 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_040.d

Injection Date: 04-Dec-2014 03:44:16 Instrument ID: A4

Lims ID: Std L1

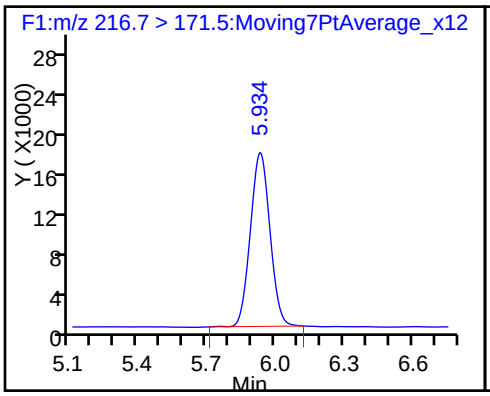
Client ID:

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

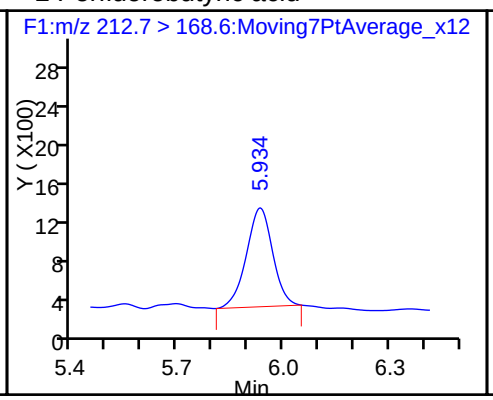
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC ICAL

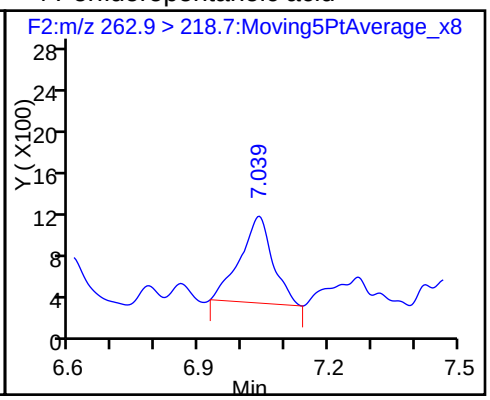
D 1 13C4 PFBA



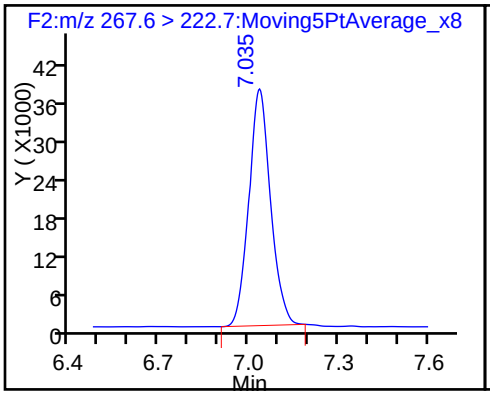
2 Perfluorobutyric acid



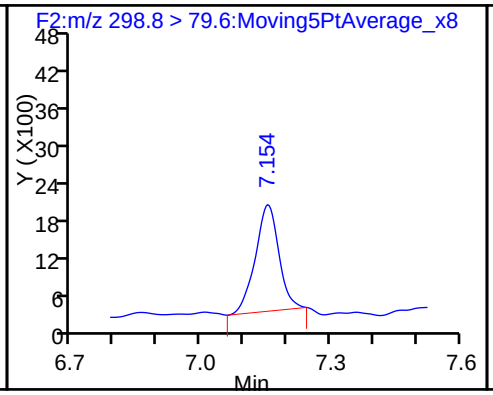
4 Perfluoropentanoic acid



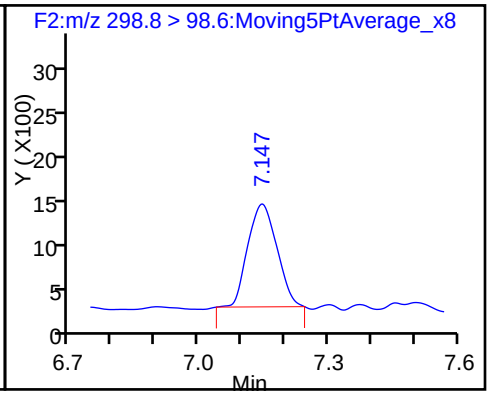
D 3 13C5-PFPeA



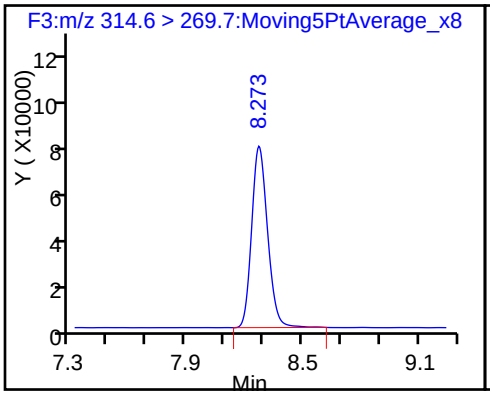
5 Perfluorobutane Sulfonate



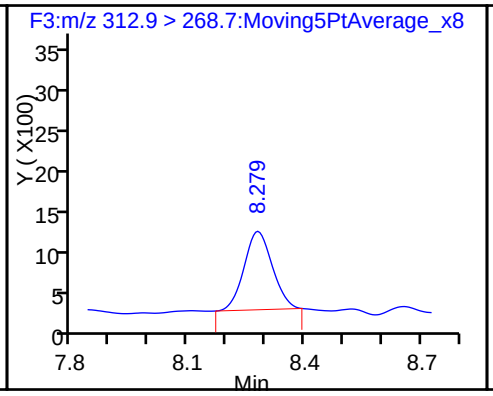
5 Perfluorobutane Sulfonate



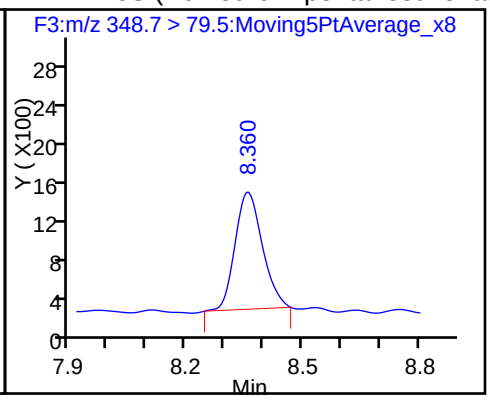
D 6 13C2 PFHxA



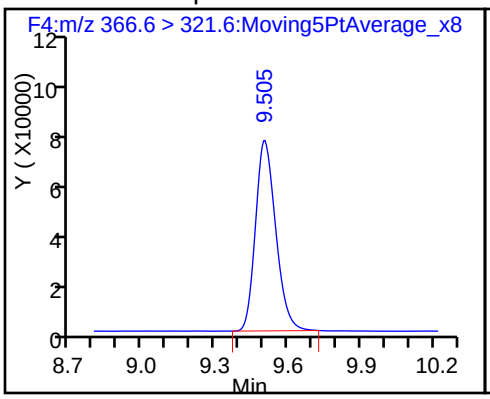
7 Perfluorohexanoic acid



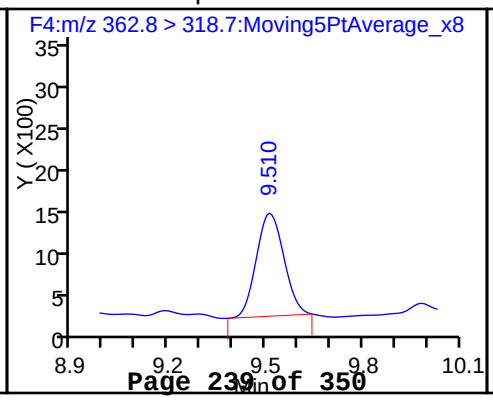
22 PFPeS (Perflouro-1-pentanesulfonat



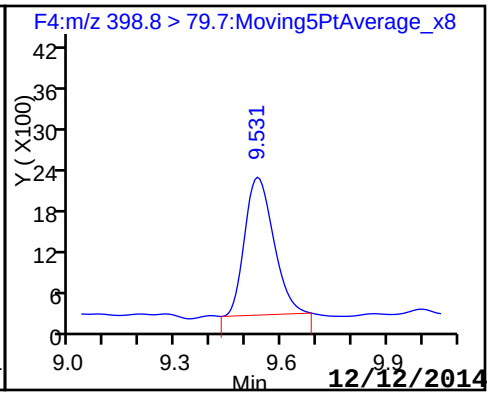
D 8 13C4-PFHpA



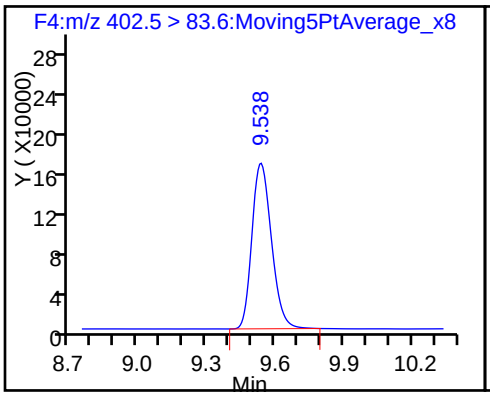
9 Perfluoroheptanoic acid



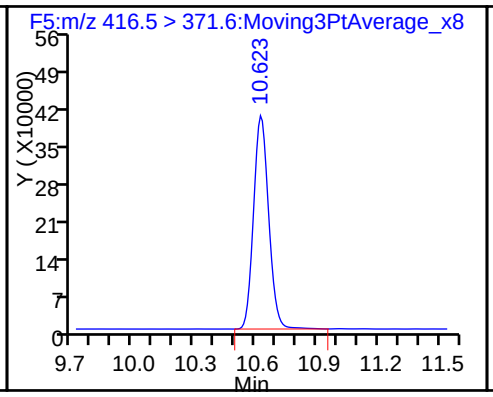
10 Perfluorohexane Sulfonate



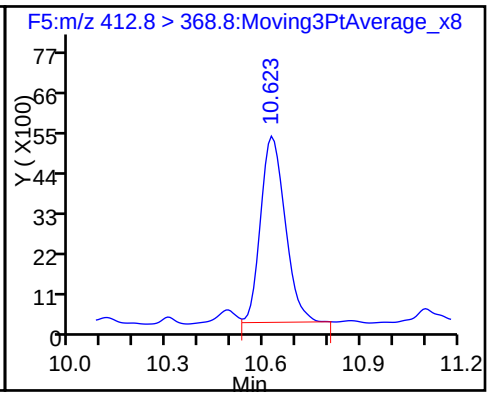
D 11 18O2 PFHxS



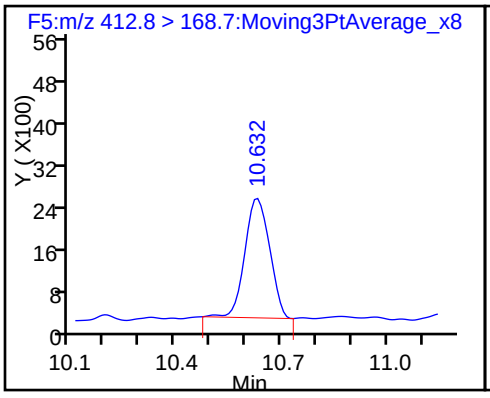
D 12 13C4 PFOA



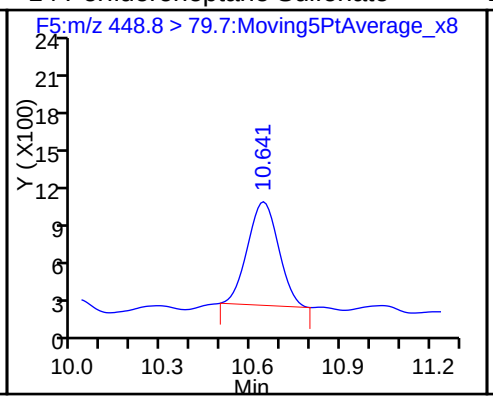
13 Perfluorooctanoic acid



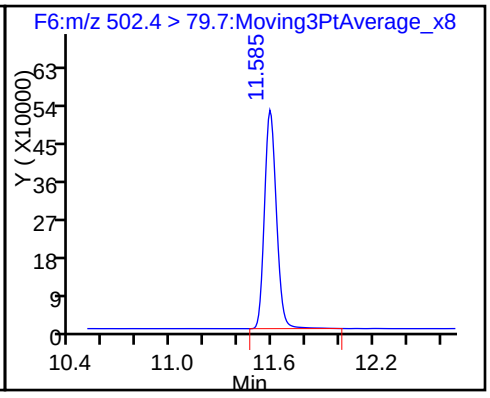
13 Perfluorooctanoic acid



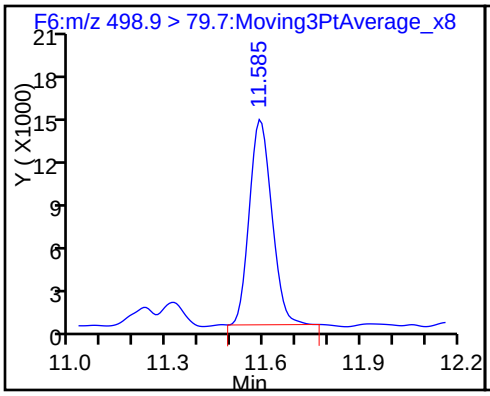
14 Perfluoroheptane Sulfonate



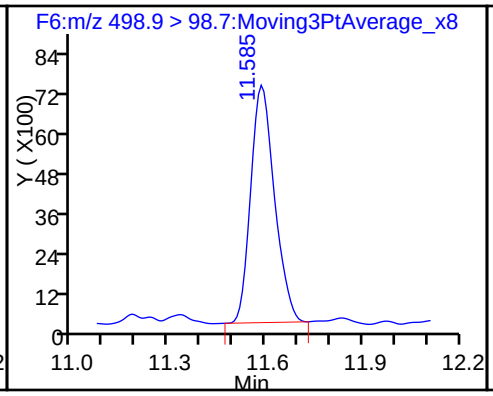
D 16 13C4 PFOS



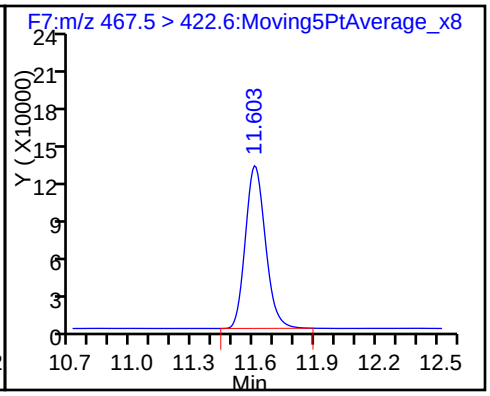
15 Perfluorooctanoic Sulfonate



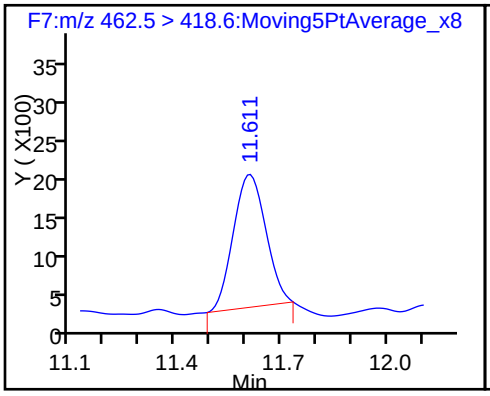
15 Perfluorooctanoic Sulfonate



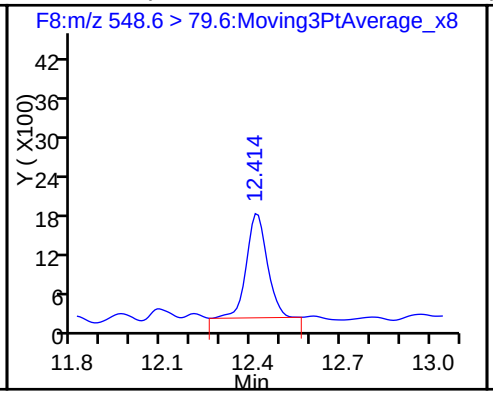
D 17 13C5 PFNA



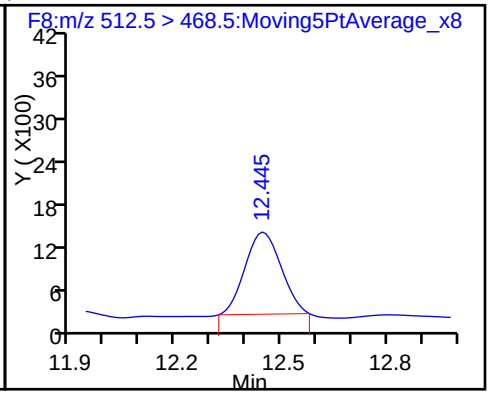
18 Perfluorononanoic acid



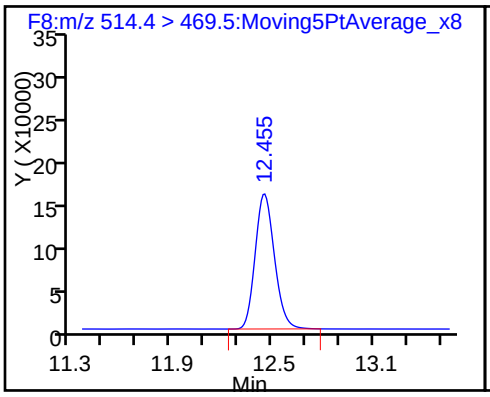
21 PFNS (Perflouro-1-nonanesulfonate)



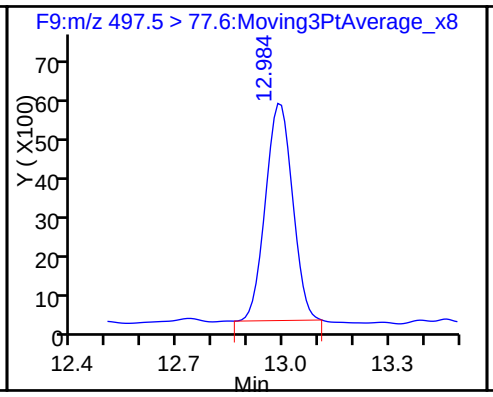
20 Perfluorodecanoic acid



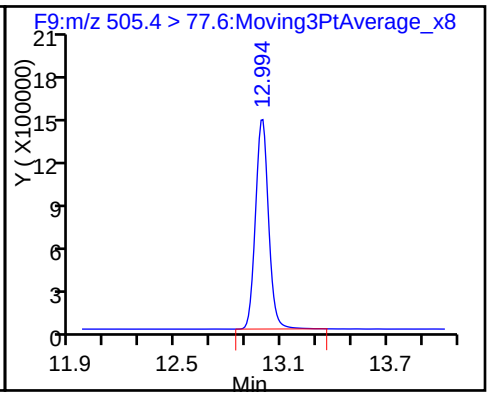
D 19 13C2 PFDA



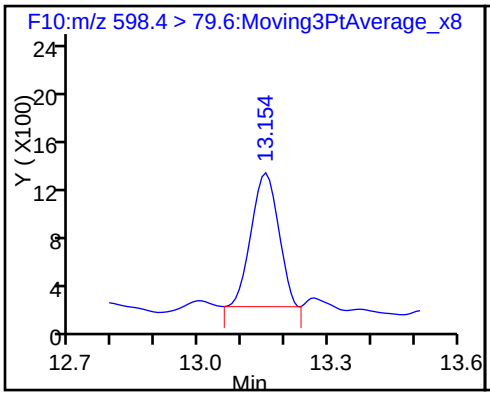
24 Perfluorooctane Sulfonamide



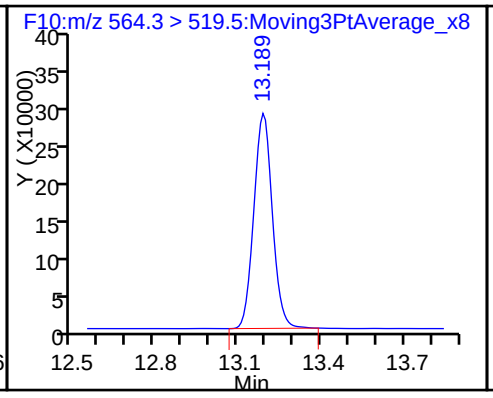
D 23 13C8 FOSA



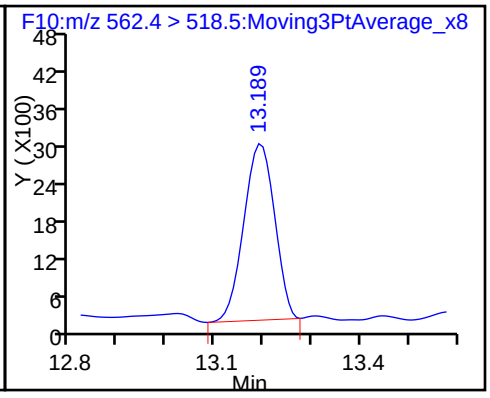
25 Perfluorodecane Sulfonate



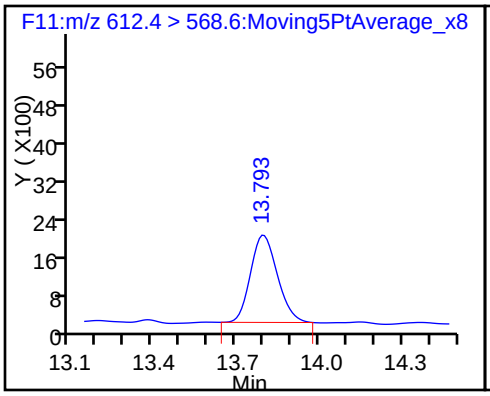
D 26 13C2 PFUnA



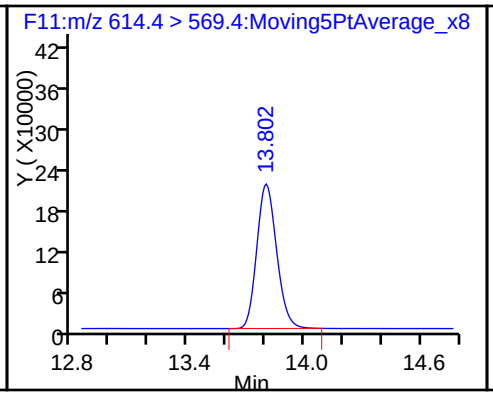
27 Perfluoroundecanoic acid



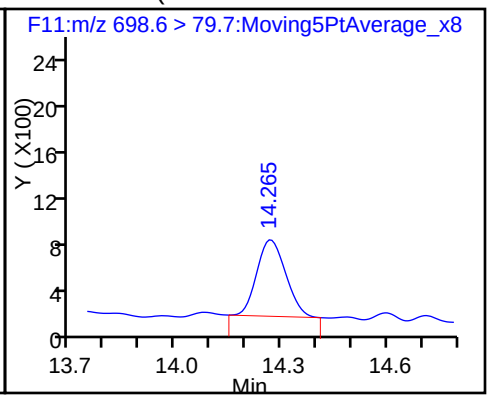
29 Perfluorododecanoic acid



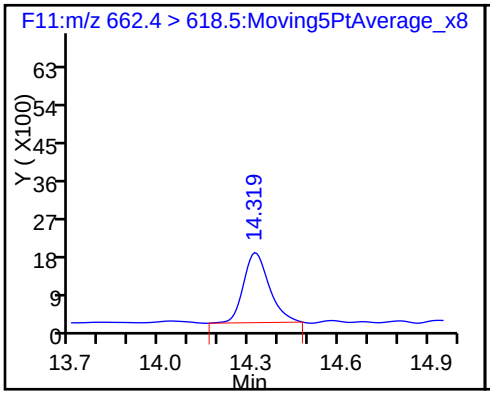
D 28 13C2 PFDoA



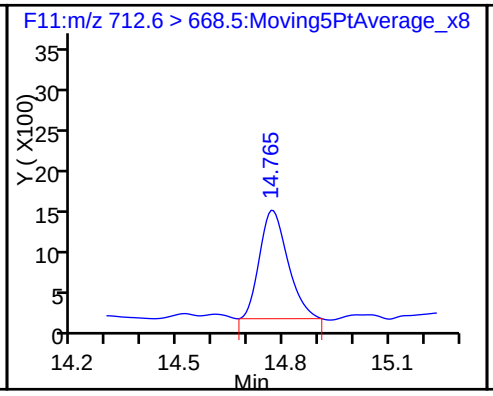
31 PFDoS (Perflouro-1-dodecanesulfona



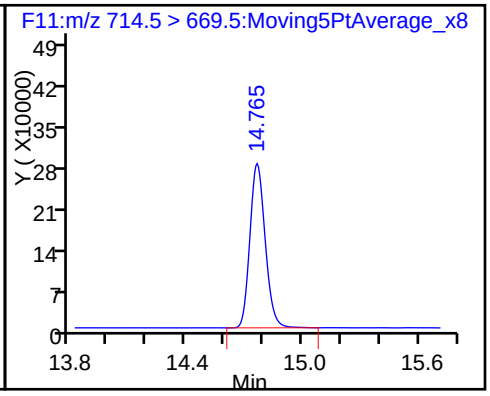
30 Perfluorotridecanoic acid



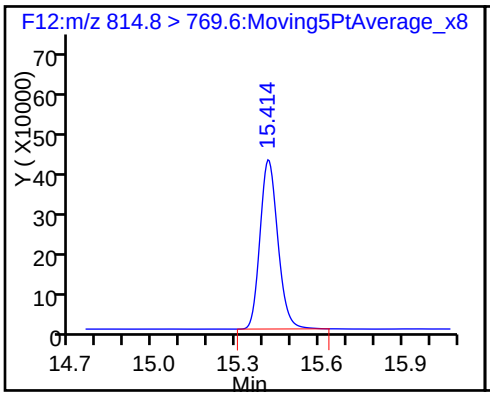
32 Perfluorotetradecanoic acid



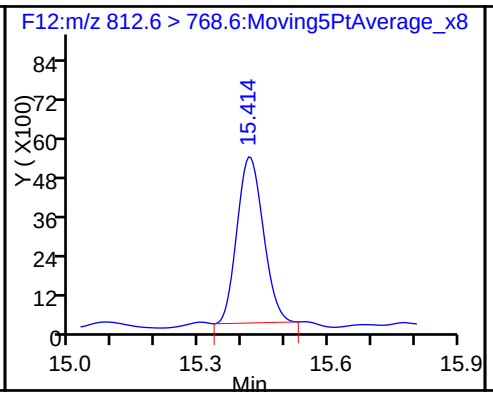
D 33 13C2-PFTeDA



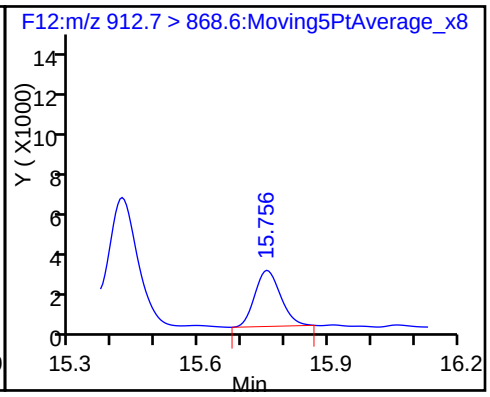
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_041.d
Lims ID: Std L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 04-Dec-2014 04:05:29 ALS Bottle#: 5 Worklist Smp#: 5
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: LCPFC-L2 PFC 1.00/50ng/mL
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub5

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:01:52 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.937	5.934	0.003		116258	27.2		136	401	
2 Perfluorobutyric acid										
212.7 > 168.6	5.937	5.935	0.002	1.000	22829	1.01		101	80.4	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.035	7.037	-0.002	1.000	14944	0.9431		94.3	25.5	
D 3 13C5-PFPeA										
267.6 > 222.7	7.035	7.038	-0.003		191617	24.8		124	619	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.157	7.157	0.0	1.000	41334	0.8023		90.8	163	
298.8 > 98.6	7.161	7.157	0.004	1.001	23851		1.73(0.00-0.00)	90.8	77.3	
D 6 13C2 PFHxA										
314.6 > 269.7	8.284	8.282	0.002		455689	23.9		120	1334	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.284	8.284	0.0	1.000	21004	0.9444		94.4	87.1	
22 PFPeS (Perflouro-1-pentanesulfonat										
348.7 > 79.5	8.366	8.360	0.006	0.876	37735	0.9191		98.0	147	
D 8 13C4-PFHpA										
366.6 > 321.6	9.510	9.506	0.004		427809	24.1		121	930	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.517	9.508	0.009	1.000	28535	0.8749		87.5	83.2	
10 Perfluorohexane Sulfonate										
398.8 > 79.7	9.545	9.543	0.002	1.000	49260	1.02		108	173	
D 11 18O2 PFHxS										
402.5 > 83.6	9.545	9.544	0.001		988251	22.0		116	3013	
D 12 13C4 PFOA										
416.5 > 371.6	10.632	10.628	0.004		2070020	61.2		122	3758	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
412.8 > 368.8	10.632	10.628	0.004	1.000	74889	1.08		108	111	
412.8 > 168.7	10.632	10.628	0.004	1.000	23992		3.12(0.00-0.00)	108	29.9	
14 Perfluoroheptane Sulfonate										
448.8 > 79.7	10.632	10.635	-0.003	1.000	43172	0.9181		96.4	74.5	
D 16 13C4 PFOS										
502.4 > 79.7	11.602	11.595	0.007		2599599	57.6		121	4817	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.602	11.595	0.007	1.000	119216	1.21		127	146	
498.9 > 98.7	11.602	11.595	0.007	1.000	73803		1.62(0.00-0.00)	127	131	
D 17 13C5 PFNA										
467.5 > 422.6	11.620	11.614	0.006		908195	23.5		118	2426	
18 Perfluorononanoic acid										
462.5 > 418.6	11.620	11.616	0.004	1.000	60944	1.16		116	96.0	
21 PFNS (Perflouro-1-nonanesulfonate)										
548.6 > 79.6	12.435	12.429	0.006	1.000	38953	0.9746		102	90.8	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.466	12.461	0.005	1.000	58072	0.99		99.0	88.3	
D 19 13C2 PFDA										
514.4 > 469.5	12.466	12.463	0.003		1228601	23.9		119	1888	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.003	12.998	0.005	1.000	157092	1.06		106	308	
D 23 13C8 FOSA										
505.4 > 77.6	13.003	12.998	0.005		7782345	54.4		109	4481	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.154	13.152	0.002	1.000	35820	1.02		106	83.6	
D 26 13C2 PFUnA										
564.3 > 519.5	13.198	13.198	0.0		1330638	20.5		103	3038	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.206	13.198	0.008	1.000	75233	1.28		128	150	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.811	13.808	0.003	1.000	61887	0.9479		94.8	41.7	
D 28 13C2 PFDoA										
614.4 > 569.4	13.811	13.809	0.002		1323923	20.3		101	1630	
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.273	14.272	0.001	1.000	31494	0.8795		90.9	68.8	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.326	14.327	-0.001	1.000	65903	1.22		122	56.4	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.765	14.766	-0.001	1.000	36572	1.06		106	47.2	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.765	14.766	-0.001		1525719	21.3		107	2687	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.414	15.415	-0.001		2116849	20.3		102	2541	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.414	15.415	-0.001	1.000	98406	1.11		111	135	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.751	15.752	-0.001	1.000	94742	1.01		101	110	

Reagents:

LCPFC-L2_00005 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2014 10:01:53 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_041.d

Injection Date: 04-Dec-2014 04:05:29 Instrument ID: A4

Lims ID: Std L2

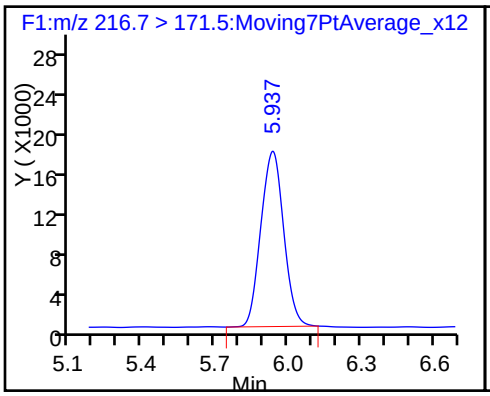
Client ID:

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

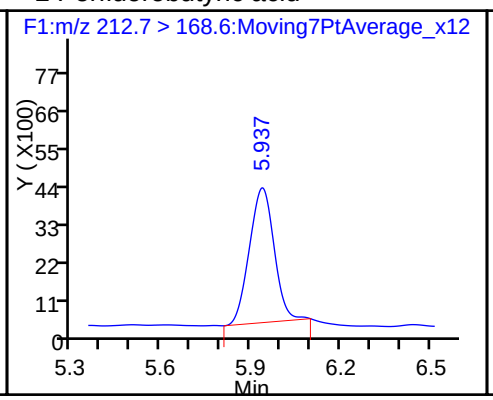
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC ICAL

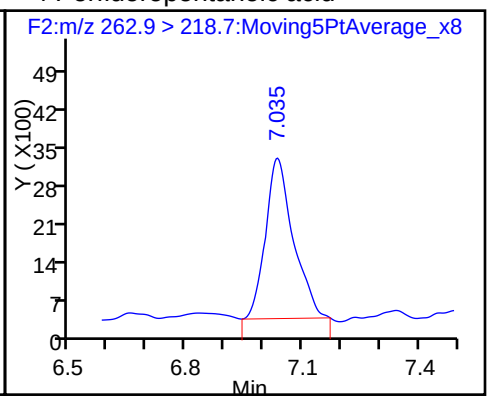
D 1 13C4 PFBA



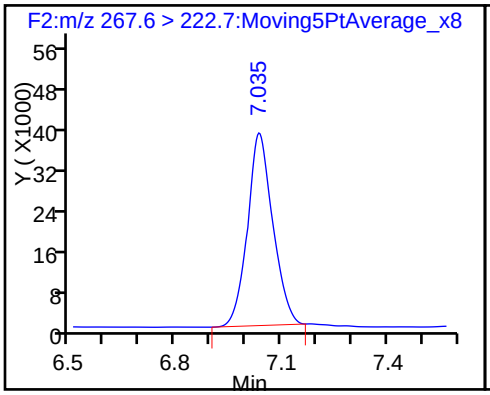
2 Perfluorobutyric acid



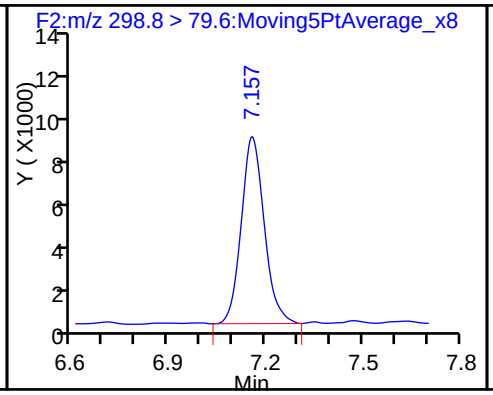
4 Perfluoropentanoic acid



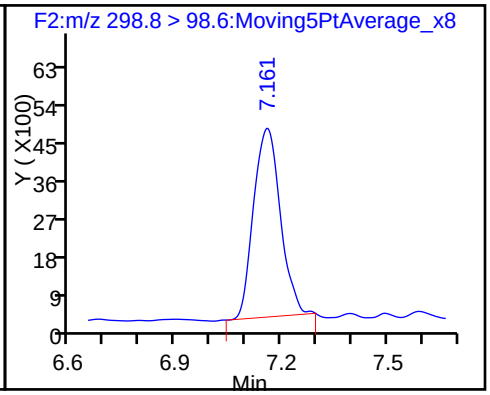
D 3 13C5-PFPeA



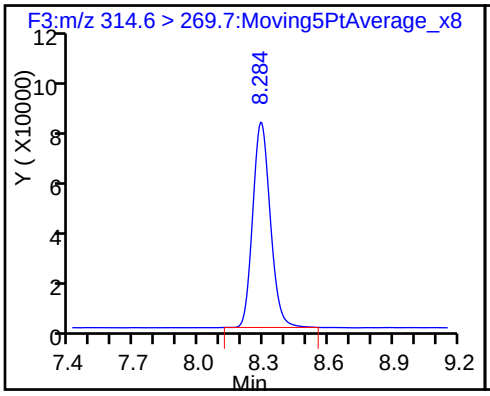
5 Perfluorobutane Sulfonate



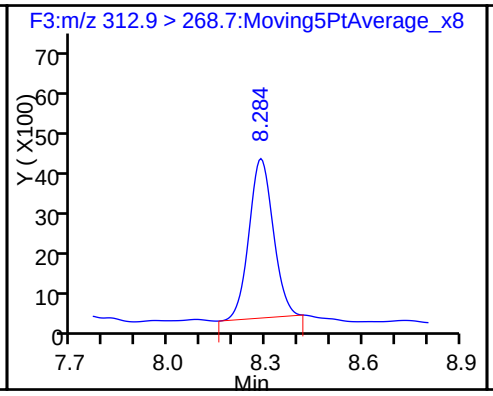
5 Perfluorobutane Sulfonate



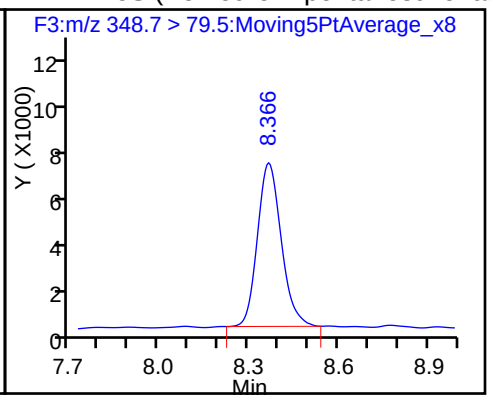
D 6 13C2 PFHxA



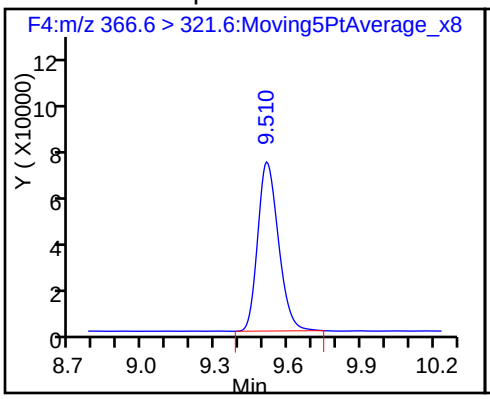
7 Perfluorohexanoic acid



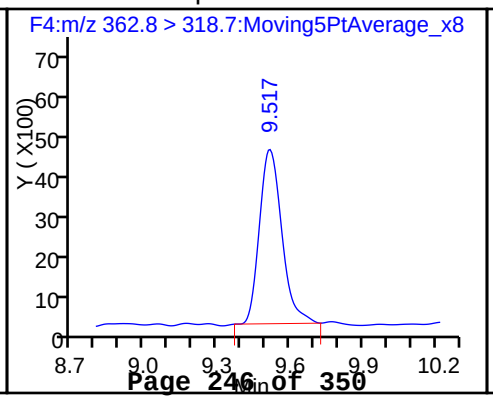
22 PFPeS (Perflouro-1-pentanesulfonat



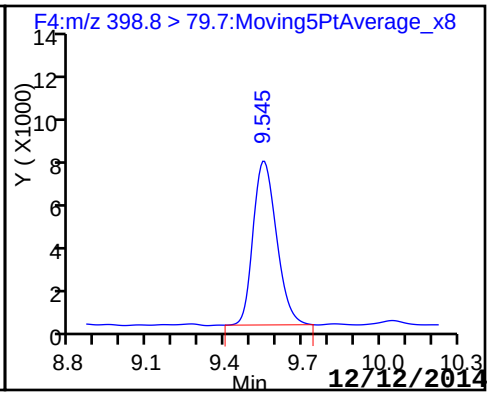
D 8 13C4-PFHpA



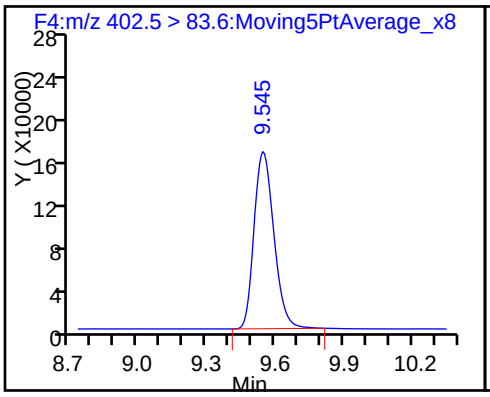
9 Perfluoroheptanoic acid



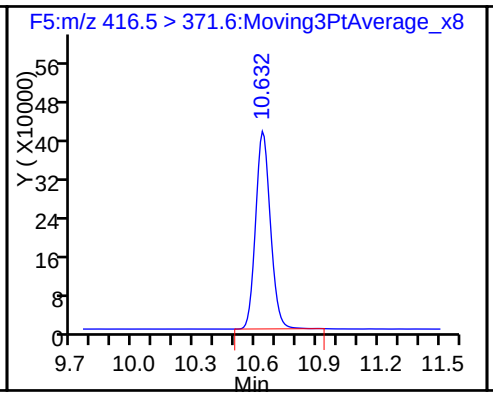
10 Perfluorohexane Sulfonate



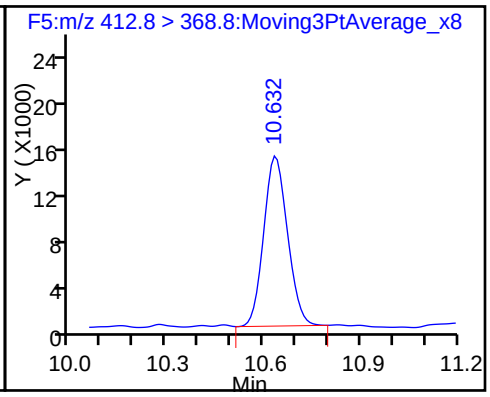
D 11 18O2 PFHxS



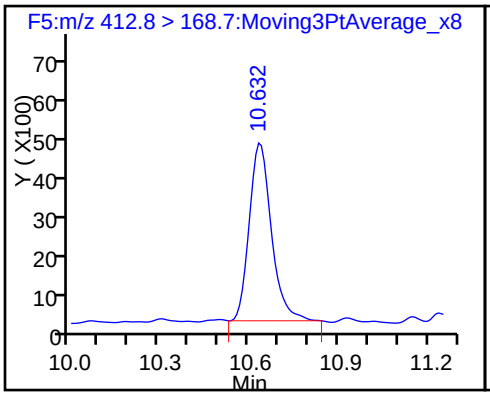
D 12 13C4 PFOA



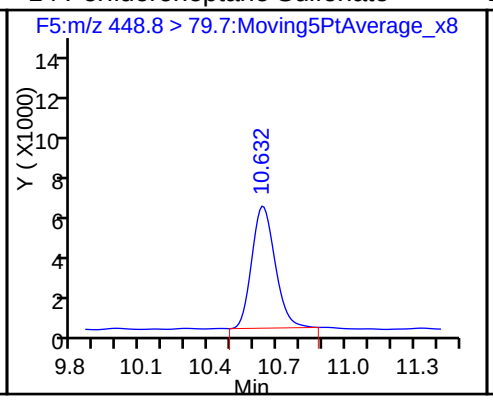
13 Perfluorooctanoic acid



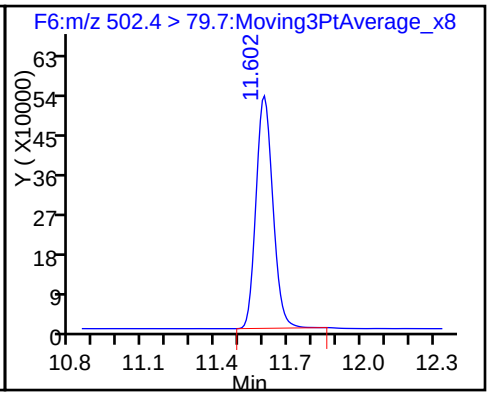
13 Perfluorooctanoic acid



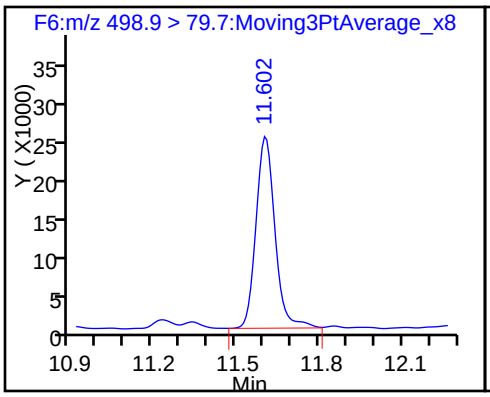
14 Perfluoroheptane Sulfonate



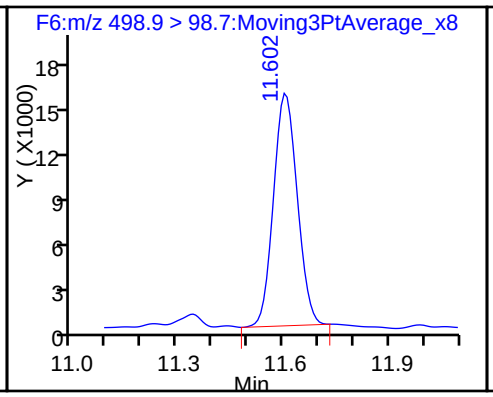
D 16 13C4 PFOS



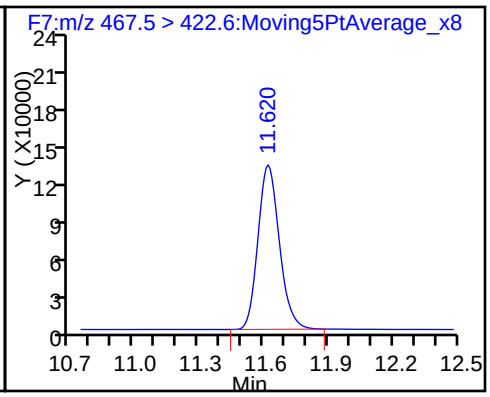
15 Perfluorooctanoic Sulfonate



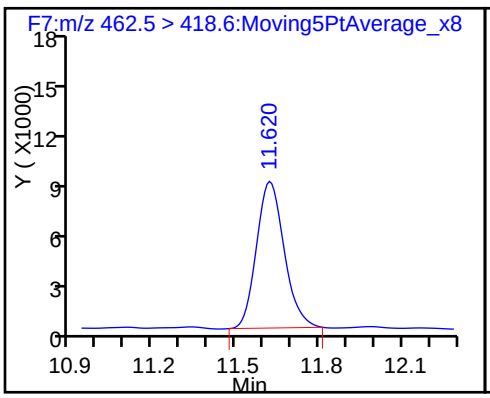
15 Perfluorooctanoic Sulfonate



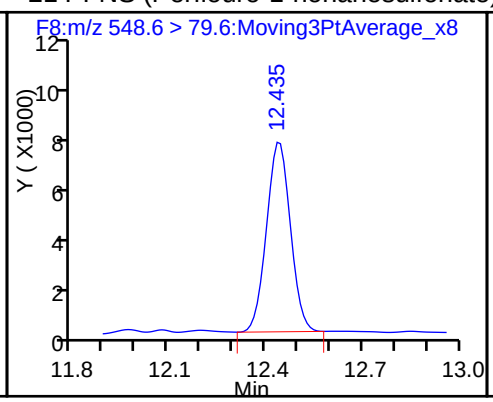
D 17 13C5 PFNA



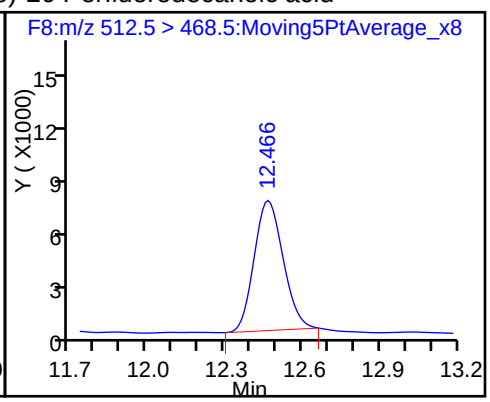
18 Perfluorononanoic acid



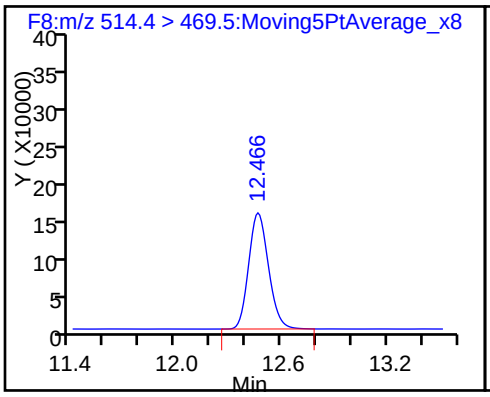
21 PFNS (Perflouro-1-nonanesulfonate)



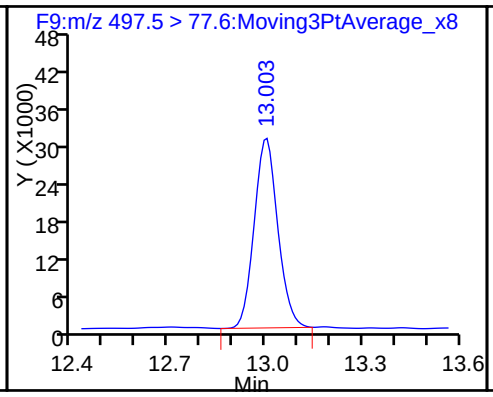
20 Perfluorodecanoic acid



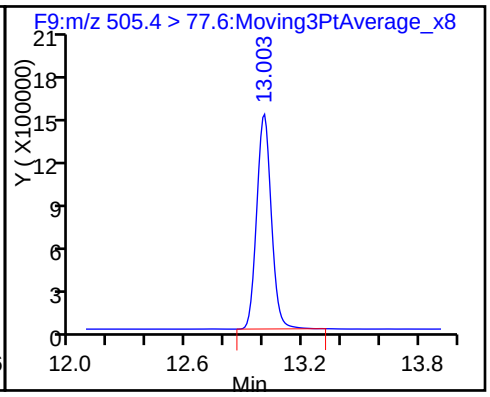
D 19 13C2 PFDA



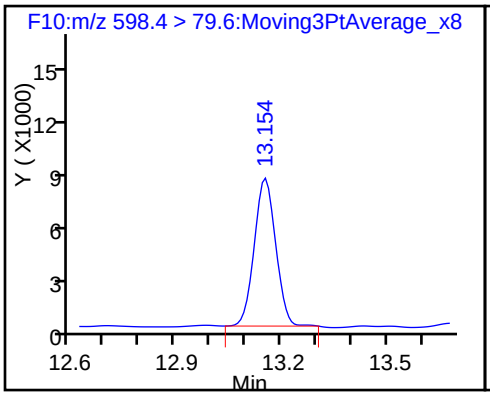
24 Perfluorooctane Sulfonamide



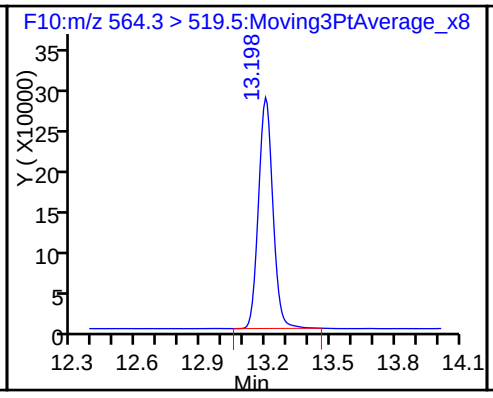
D 23 13C8 FOSA



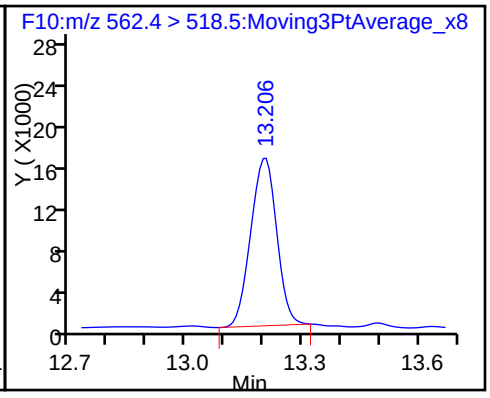
25 Perfluorodecane Sulfonate



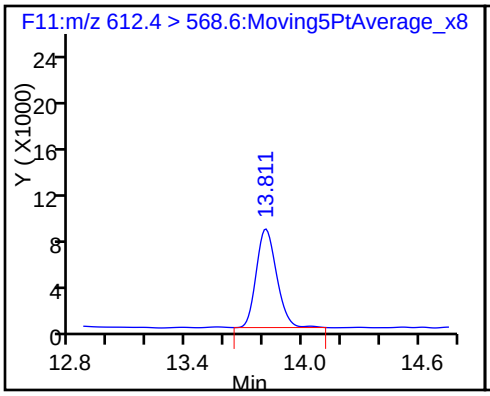
D 26 13C2 PFUnA



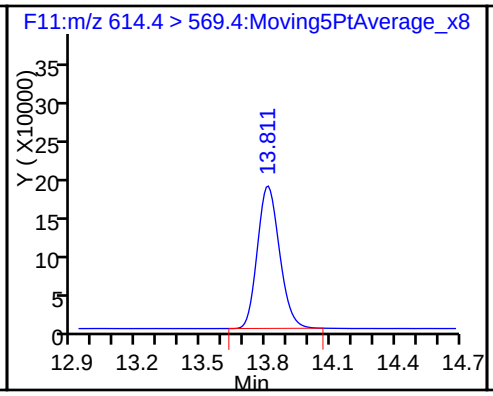
27 Perfluoroundecanoic acid



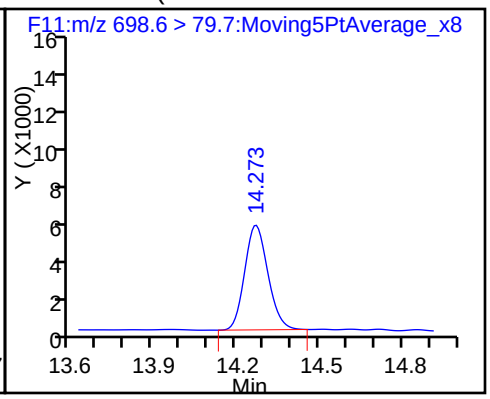
29 Perfluorododecanoic acid



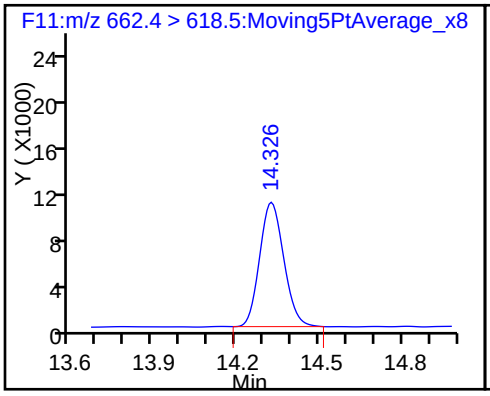
D 28 13C2 PFDoA



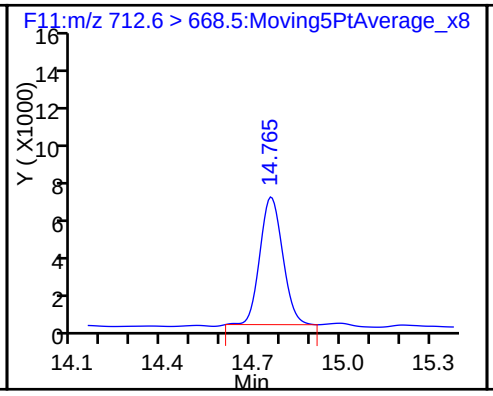
31 PFDoS (Perflouro-1-dodecanesulfona



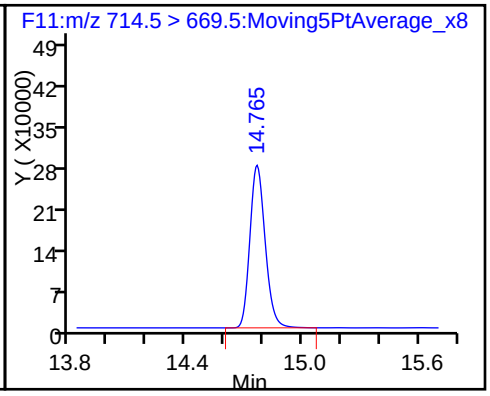
30 Perfluorotridecanoic acid



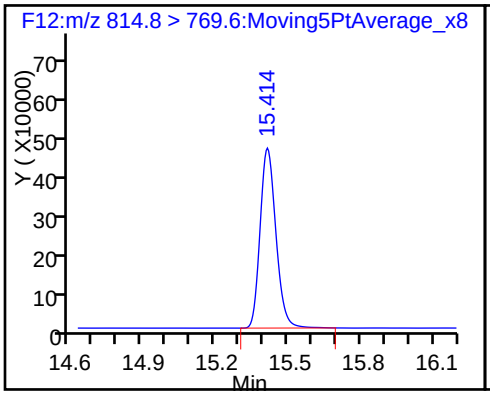
32 Perfluorotetradecanoic acid



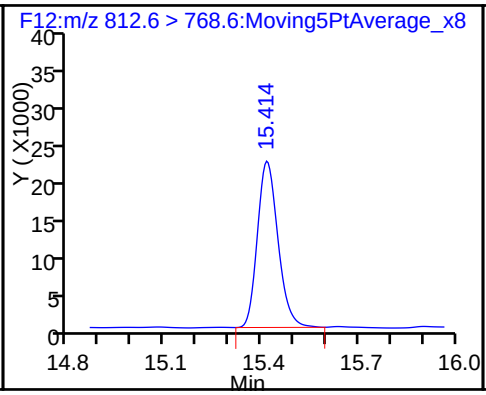
D 33 13C2-PFTeDA



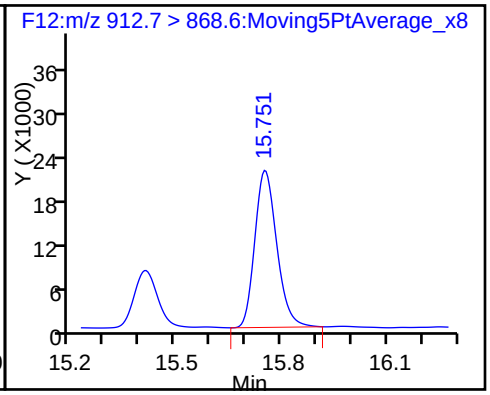
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_042.d
Lims ID: Std L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 04-Dec-2014 04:26:41 ALS Bottle#: 6 Worklist Smp#: 6
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: LCPFC-L3 PFC 5.0/50ng/mL
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub5

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:01:53 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.928	5.934	-0.006		105097	24.6		123	350	
2 Perfluorobutyric acid										
212.7 > 168.6	5.928	5.935	-0.007	1.000	109952	5.72		114	320	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.029	7.037	-0.008	1.000	70990	5.25		105	61.6	
D 3 13C5-PFPeA										
267.6 > 222.7	7.029	7.038	-0.009		163549	21.2		106	563	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.144	7.157	-0.013	1.000	216823	4.31		97.6	758	
298.8 > 98.6	7.147	7.157	-0.010	1.000	138038		1.57(0.00-0.00)	97.6	610	
D 6 13C2 PFHxA										
314.6 > 269.7	8.273	8.282	-0.009		496708	26.1		130	1850	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.273	8.284	-0.011	1.000	134092	5.53		111	318	
22 PFPeS (Perflouro-1-pentanesulfonat										
348.7 > 79.5	8.349	8.360	-0.011	0.875	206763	5.16		110	739	
D 8 13C4-PFHpA										
366.6 > 321.6	9.499	9.506	-0.007		434956	24.5		123	1400	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.499	9.508	-0.009	1.000	179416	5.41		108	509	
10 Perfluorohexane Sulfonate										
398.8 > 79.7	9.538	9.543	-0.005	1.000	252665	5.38		114	1071	
D 11 18O2 PFHxS										
402.5 > 83.6	9.538	9.544	-0.006		964272	21.5		113	2820	
D 12 13C4 PFOA										
416.5 > 371.6	10.623	10.628	-0.005		2023751	59.8		120	2824	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
412.8 > 368.8	10.623	10.628	-0.005	1.000	340656	5.04		101	470	
412.8 > 168.7	10.632	10.628	0.004	1.001	113441		3.00(0.00-0.00)	101	146	
14 Perfluoroheptane Sulfonate										
448.8 > 79.7	10.632	10.635	-0.003	1.000	243339	5.01		105	509	
D 16 13C4 PFOS										
502.4 > 79.7	11.594	11.595	-0.001		2684739	59.5		125	5305	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.594	11.595	-0.001	1.000	439807	4.34		90.8	593	
498.9 > 98.7	11.594	11.595	-0.001	1.000	243413		1.81(0.00-0.00)	90.8	455	
D 17 13C5 PFNA										
467.5 > 422.6	11.611	11.614	-0.003		977581	25.3		127	2917	
18 Perfluorononanoic acid										
462.5 > 418.6	11.611	11.616	-0.005	1.000	306271	5.43		109	581	
21 PFNS (Perflouro-1-nonanesulfonate)										
548.6 > 79.6	12.425	12.429	-0.004	1.000	225687	5.47		114	394	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.455	12.461	-0.006	1.000	335348	5.93		119	613	
D 19 13C2 PFDA										
514.4 > 469.5	12.455	12.463	-0.008		1185934	23.0		115	2273	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.994	12.998	-0.004	1.000	777293	5.15		103	922	
D 23 13C8 FOSA										
505.4 > 77.6	12.994	12.998	-0.004		7943692	55.5		111	5034	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.146	13.152	-0.006	1.000	205469	5.66		117	431	
D 26 13C2 PFUnA										
564.3 > 519.5	13.189	13.198	-0.009		1337877	20.7		103	2258	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.189	13.198	-0.009	1.000	361261	6.11		122	720	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.802	13.808	-0.006	1.000	461093	6.10		122	358	
D 28 13C2 PFDoA										
614.4 > 569.4	13.802	13.809	-0.007		1533105	23.5		117	2111	
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.273	14.272	0.001	1.000	211588	5.72		118	424	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.326	14.327	-0.001	1.000	337727	5.39		108	250	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.765	14.766	-0.001	1.000	215805	5.41		108	218	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.765	14.766	-0.001		1604800	22.4		112	2550	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.415	15.415	0.0		2247748	21.6		108	2844	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.415	15.415	0.0	1.000	504906	4.92		98.3	523	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.751	15.752	-0.001	1.000	497216	4.57		91.4	462	

Reagents:

LCPFC-L3_00005 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2014 10:01:54 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_042.d

Injection Date: 04-Dec-2014 04:26:41 Instrument ID: A4

Lims ID: Std L3

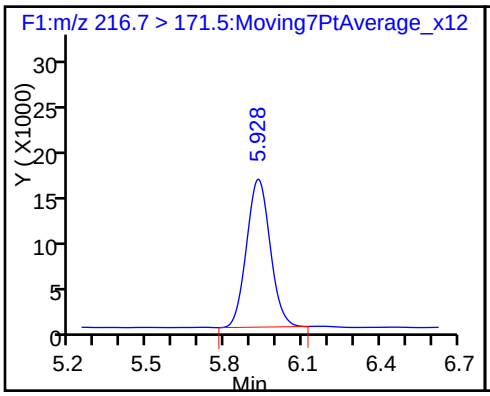
Client ID:

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

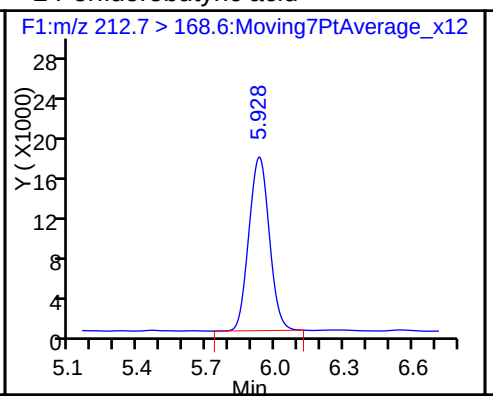
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC ICAL

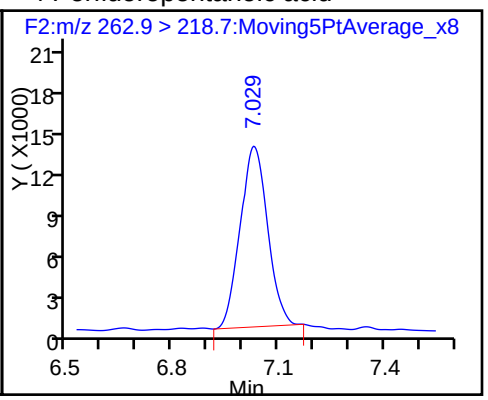
D 1 13C4 PFBA



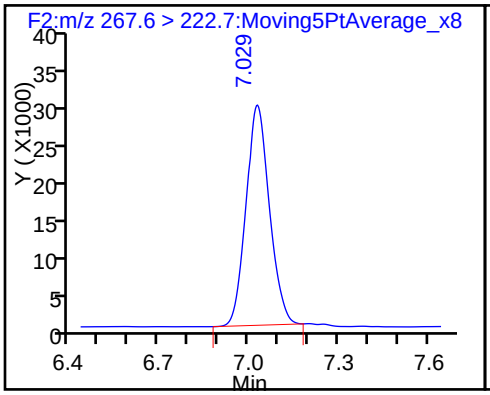
2 Perfluorobutyric acid



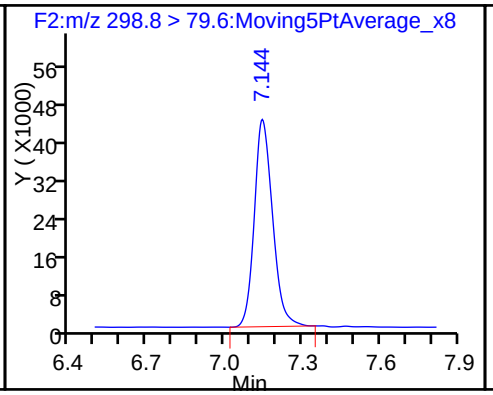
4 Perfluoropentanoic acid



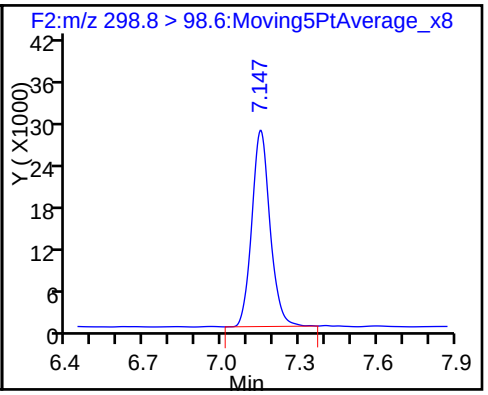
D 3 13C5-PFPeA



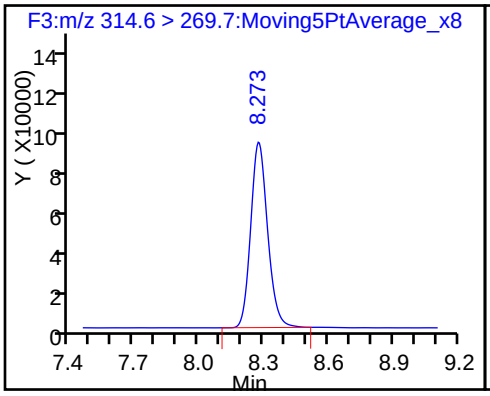
5 Perfluorobutane Sulfonate



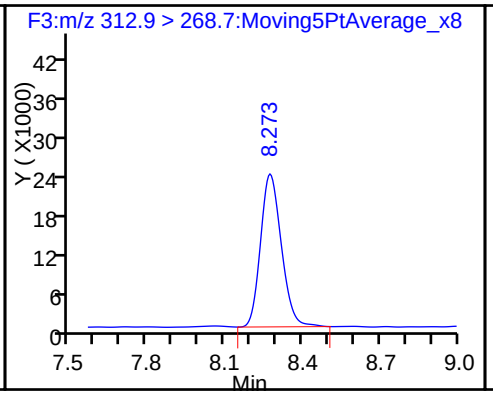
5 Perfluorobutane Sulfonate



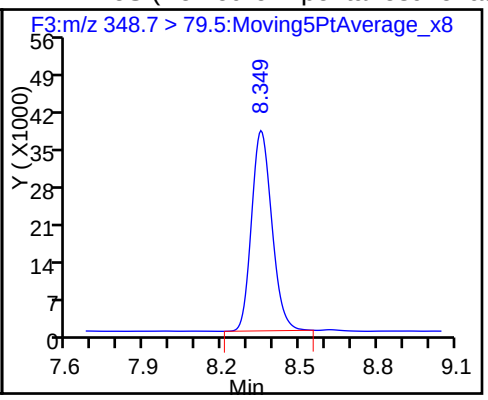
D 6 13C2 PFHxA



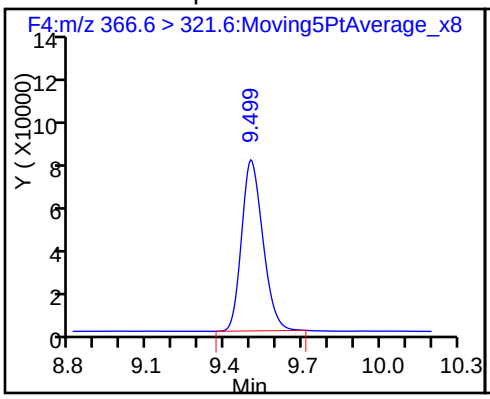
7 Perfluorohexanoic acid



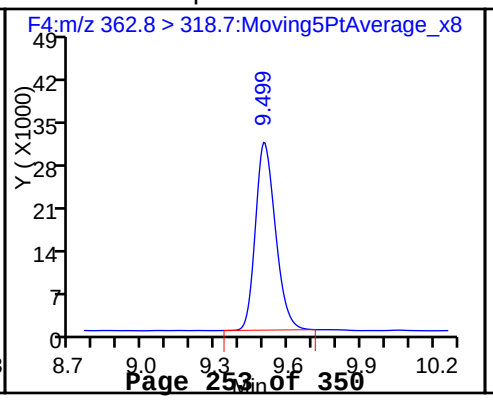
22 PFPeS (Perflouro-1-pentanesulfonat



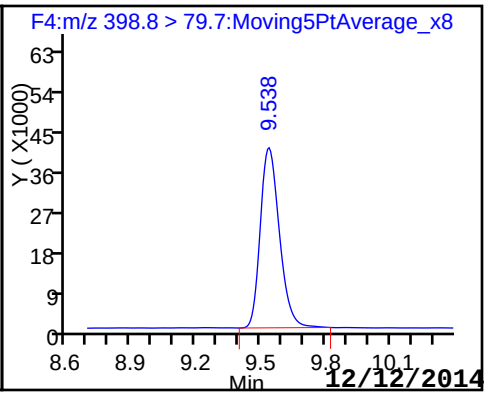
D 8 13C4-PFHpA



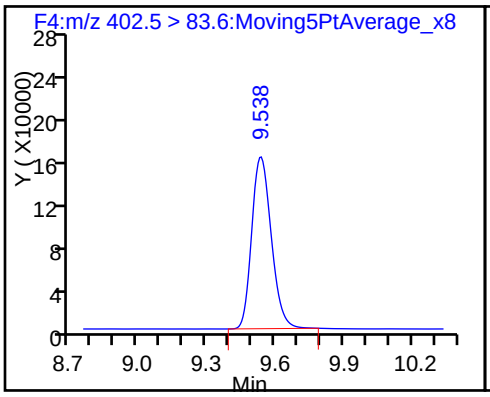
9 Perfluoroheptanoic acid



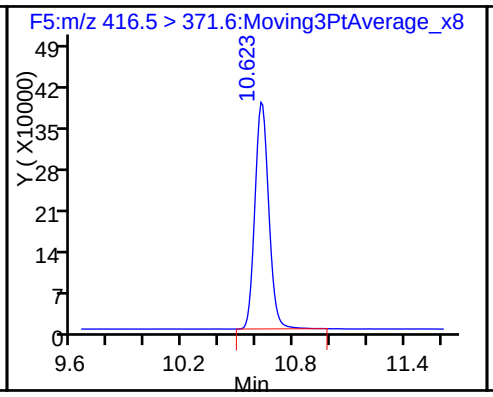
10 Perfluorohexane Sulfonate



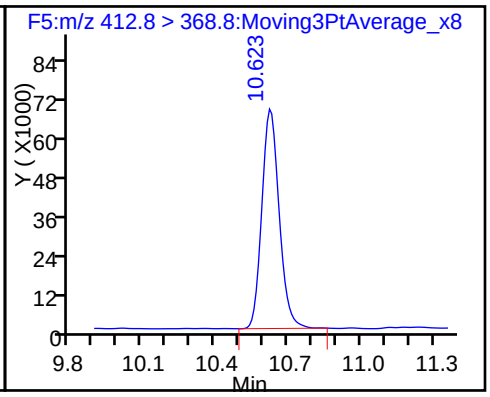
D 11 18O2 PFHxS



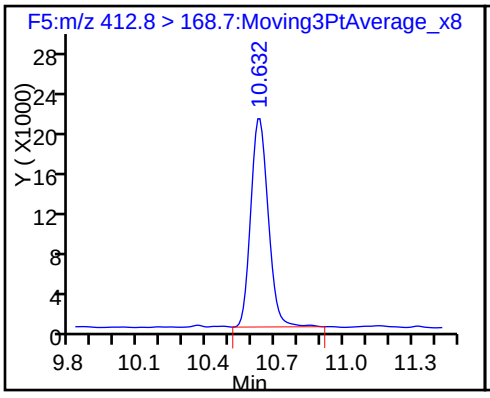
D 12 13C4 PFOA



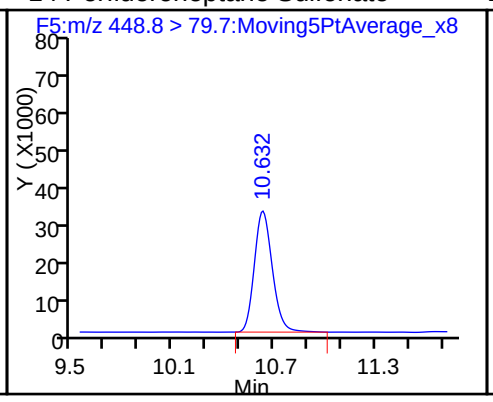
13 Perfluorooctanoic acid



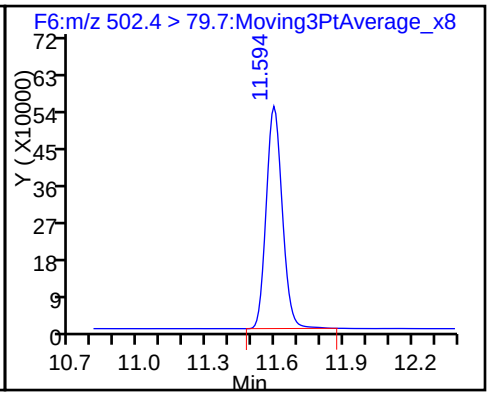
13 Perfluorooctanoic acid



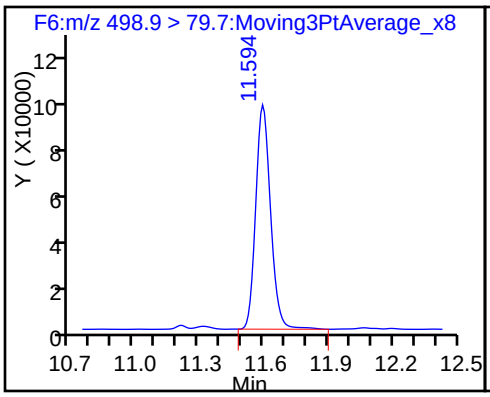
14 Perfluoroheptane Sulfonate



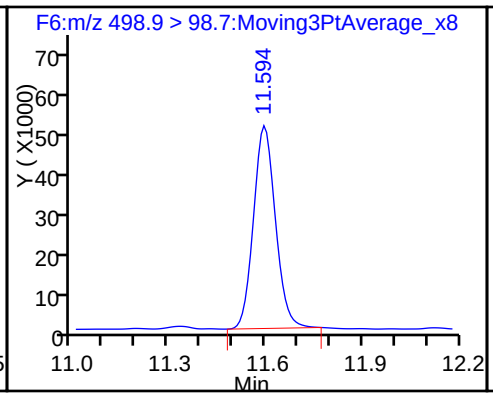
D 16 13C4 PFOS



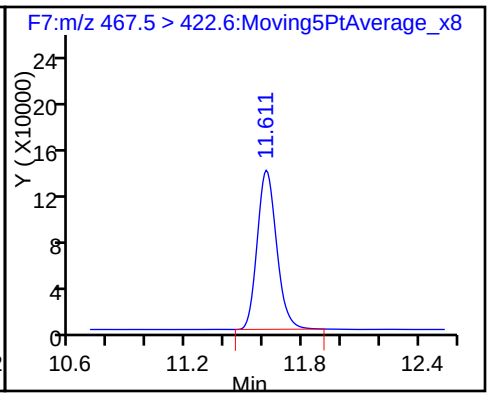
15 Perfluorooctanoic Sulfonate



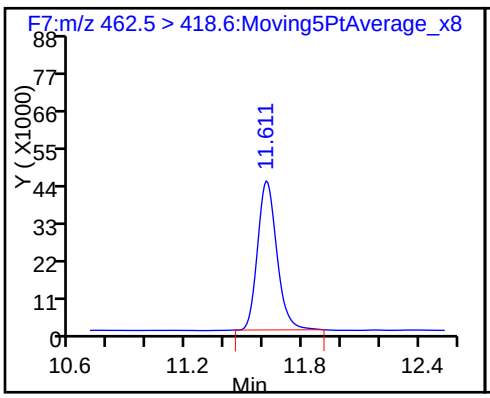
15 Perfluorooctanoic Sulfonate



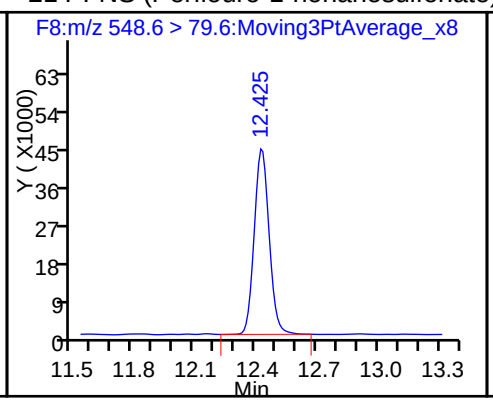
D 17 13C5 PFNA



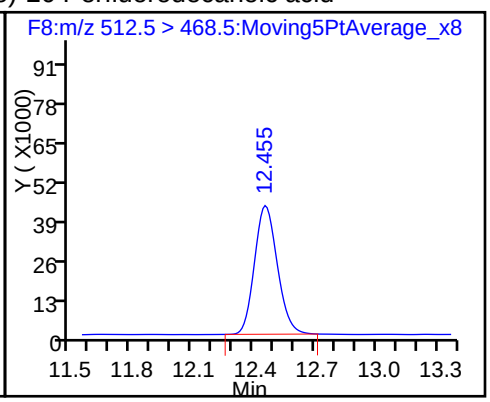
18 Perfluorononanoic acid



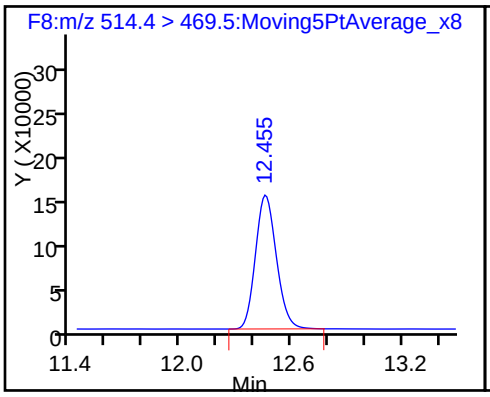
21 PFNS (Perflouro-1-nonanesulfonate)



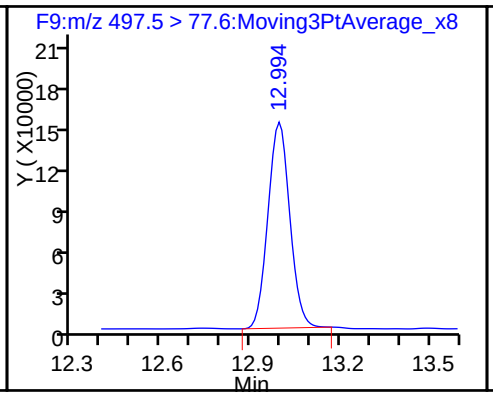
20 Perfluorodecanoic acid



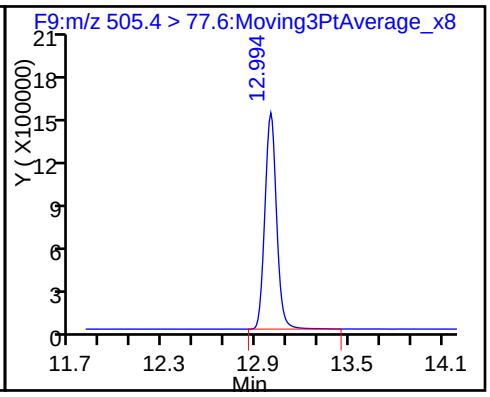
D 19 13C2 PFDA



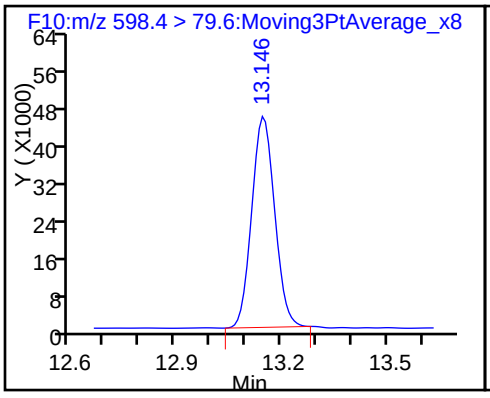
24 Perfluorooctane Sulfonamide



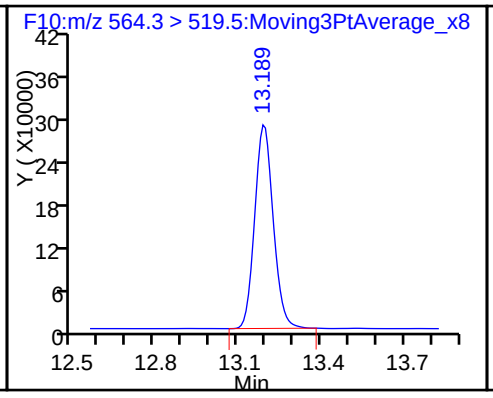
D 23 13C8 FOSA



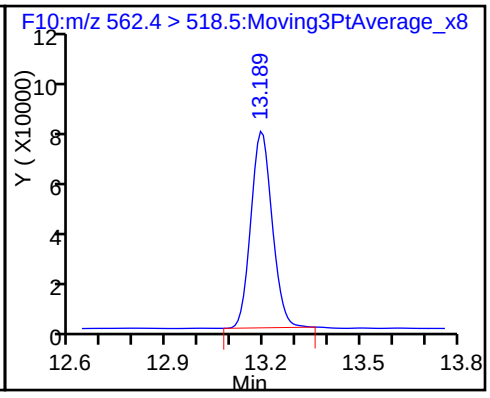
25 Perfluorodecane Sulfonate



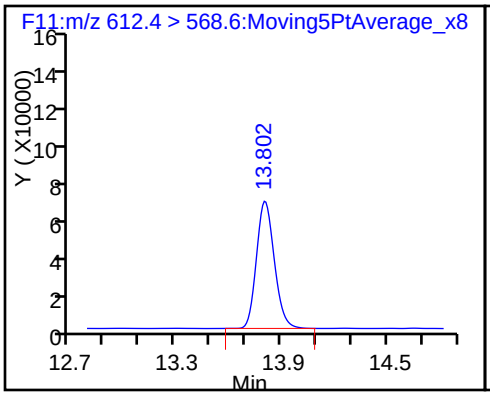
D 26 13C2 PFUnA



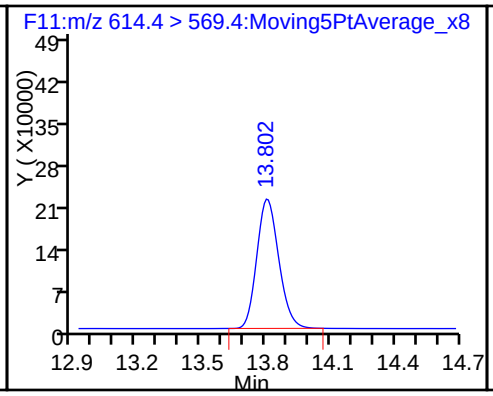
27 Perfluoroundecanoic acid



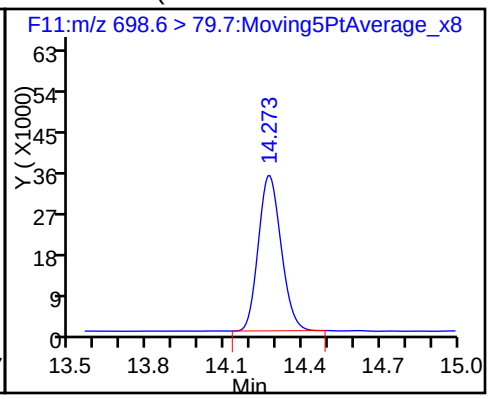
29 Perfluorododecanoic acid



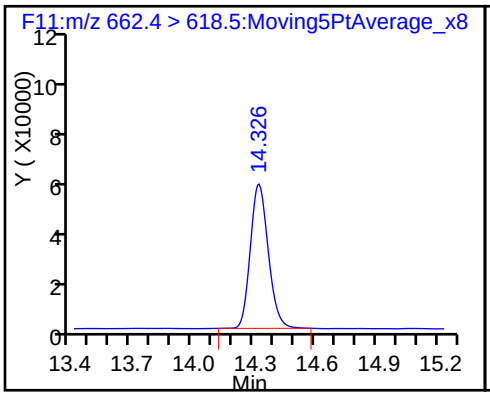
D 28 13C2 PFDoA



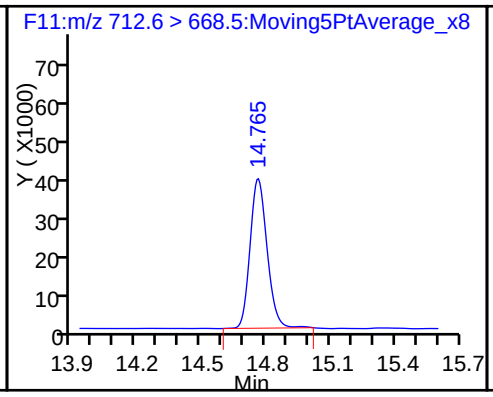
31 PFDoS (Perflouro-1-dodecanesulfona



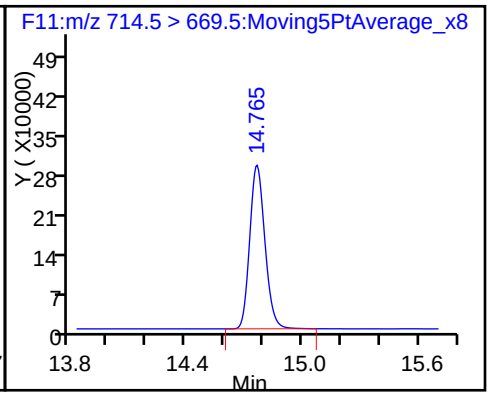
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



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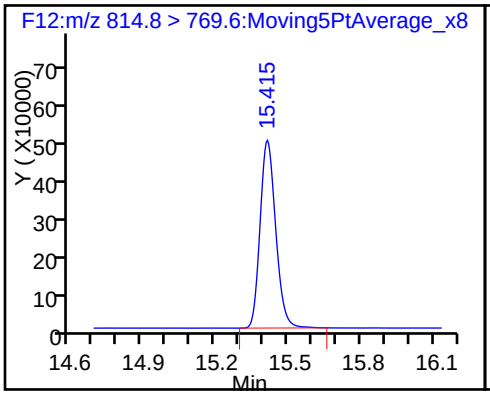
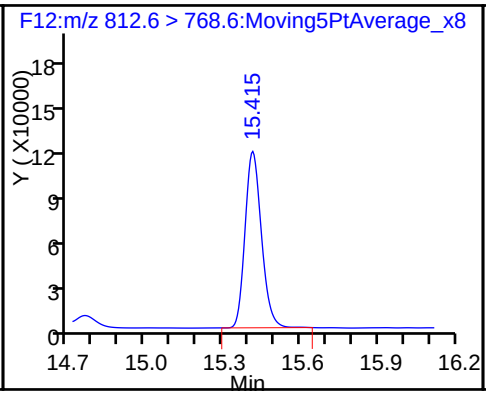
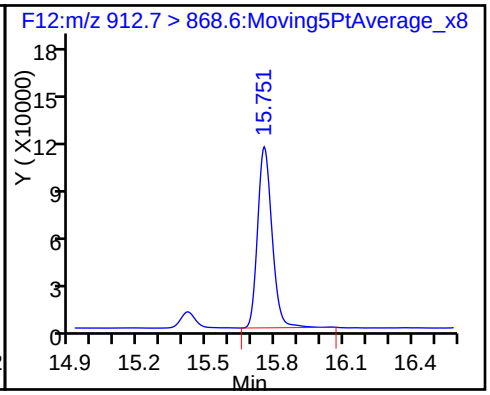


34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_043.d
Lims ID: Std L4
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 04-Dec-2014 04:47:55 ALS Bottle#: 7 Worklist Smp#: 7
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: LCPFC-L4 PFC 20/50ng/mL
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub5

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:01:54 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

First Level Reviewer: barnettj Date: 04-Dec-2014 09:44:55

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.934	5.934	0.0		86764	20.3		101	423	
2 Perfluorobutyric acid										
212.7 > 168.6	5.934	5.935	-0.001	1.000	390544	18.7		93.3	1329	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.039	7.037	0.002	1.000	296633	20.1		101	416	
D 3 13C5-PFPeA										
267.6 > 222.7	7.043	7.038	0.005		178067	23.1		115	848	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.161	7.157	0.004	1.000	853055	16.9		95.5	1804	
298.8 > 98.6	7.161	7.157	0.004	1.000	535360		1.59(0.00-0.00)	95.5	1767	
D 6 13C2 PFHxA										
314.6 > 269.7	8.290	8.282	0.008		368981	19.4		96.8	1065	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.290	8.284	0.006	1.000	399091	22.2		111	811	
22 PFPeS (Perflouro-1-pentanesulfonat										
348.7 > 79.5	8.360	8.360	0.0	0.876	795956	19.8		105	3427	
D 8 13C4-PFHpA										
366.6 > 321.6	9.505	9.506	-0.001		388840	21.9		110	934	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.511	9.508	0.003	1.000	665119	22.4		112	1608	
10 Perfluorohexane Sulfonate										
398.8 > 79.7	9.545	9.543	0.002	1.000	937096	19.8		105	2463	
D 11 18O2 PFHxS										
402.5 > 83.6	9.545	9.544	0.001		968949	21.6		114	3044	
D 12 13C4 PFOA										
416.5 > 371.6	10.632	10.628	0.004		1927321	57.0		114	3772	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
412.8 > 368.8	10.632	10.628	0.004	1.000	1249944	19.4		97.1	1444	
412.8 > 168.7	10.632	10.628	0.004	1.000	400743		3.12(0.00-0.00)	97.1	637	
14 Perfluoroheptane Sulfonate										
448.8 > 79.7	10.632	10.635	-0.003	1.000	950094	21.9		115	1551	
D 16 13C4 PFOS										
502.4 > 79.7	11.594	11.595	-0.001		2394219	53.1		111	3990	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.594	11.595	-0.001	1.000	1408150	15.6		81.5	1300	
498.9 > 98.7	11.594	11.595	-0.001	1.000	854068		1.65(0.00-0.00)	81.5	1324	
D 17 13C5 PFNA										
467.5 > 422.6	11.612	11.614	-0.002		836616	21.7		108	2209	
18 Perfluorononanoic acid										
462.5 > 418.6	11.612	11.616	-0.004	1.000	1048226	21.7		109	1672	
21 PFNS (Perflouro-1-nonanesulfonate)										
548.6 > 79.6	12.435	12.429	0.006	1.000	797477	21.7		113	1391	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.466	12.461	0.005	1.000	1269551	22.9		114	2193	
D 19 13C2 PFDA										
514.4 > 469.5	12.466	12.463	0.003		1164228	22.6		113	1500	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.994	12.998	-0.004	1.000	3304921	22.3		112	2521	
D 23 13C8 FOSA										
505.4 > 77.6	12.994	12.998	-0.004		7791526	54.5		109	3157	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.154	13.152	0.002	1.000	710141	21.9		114	1659	
D 26 13C2 PFUnA										
564.3 > 519.5	13.198	13.198	0.0		1295448	20.0		100	2289	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.198	13.198	0.0	1.000	1459686	25.5		127	1907	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.811	13.808	0.003	1.000	1576082	23.2		116	912	
D 28 13C2 PFDoA										
614.4 > 569.4	13.811	13.809	0.002		1377246	21.1		105	1763	
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.273	14.272	0.001	1.000	786746	23.9		123	1478	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.327	14.327	0.0	1.000	1324401	23.5		118	1066	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.765	14.766	-0.001	1.000	849938	23.7		119	889	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.765	14.766	-0.001		1536682	21.5		107	3721	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.415	15.415	0.0		2076818	19.9		99.6	2593	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.415	15.415	0.0	1.000	1737164	18.8		94.1	1317	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.751	15.752	-0.001	1.000	2099144	21.5		107	1834	

Reagents:

LCPFC-L4_00005 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2014 10:01:55 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_043.d

Injection Date: 04-Dec-2014 04:47:55 Instrument ID: A4

Lims ID: Std L4

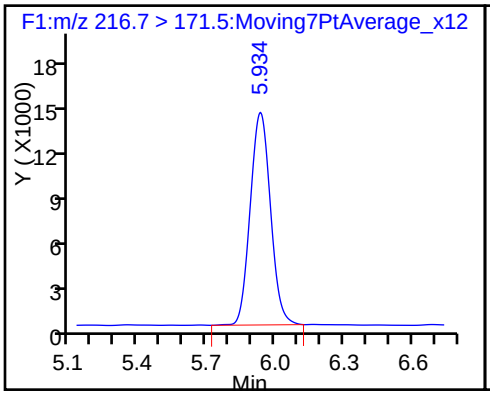
Client ID:

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

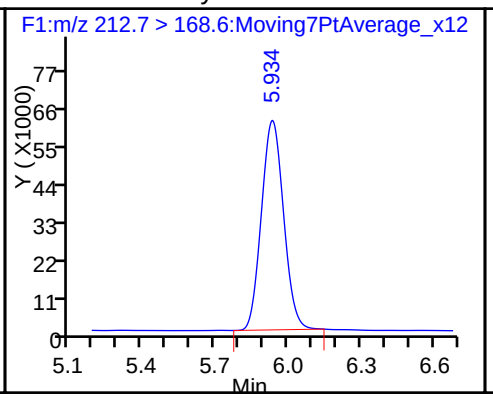
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC ICAL

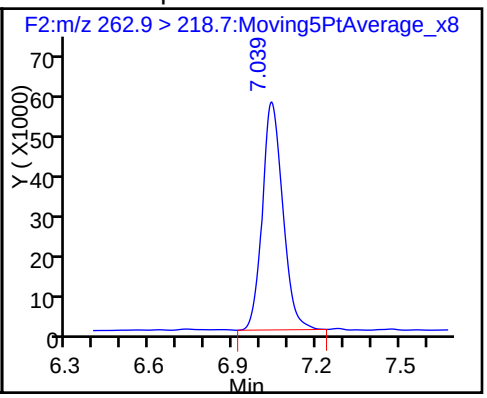
D 1 13C4 PFBA



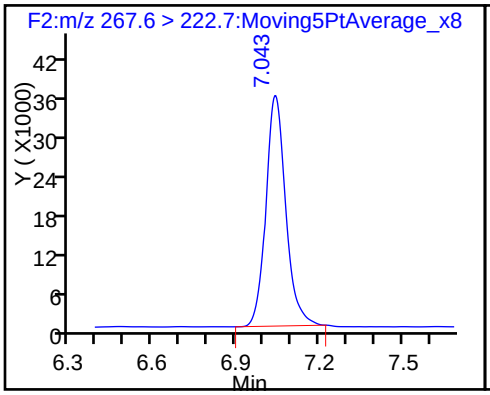
2 Perfluorobutyric acid



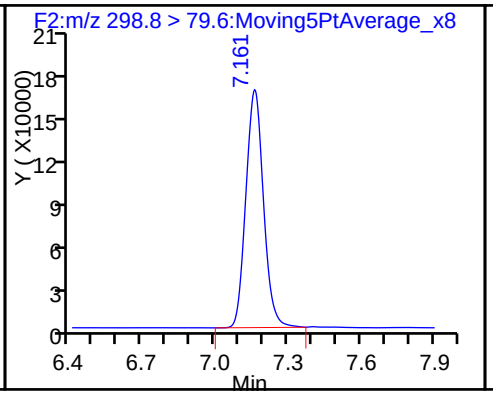
4 Perfluoropentanoic acid



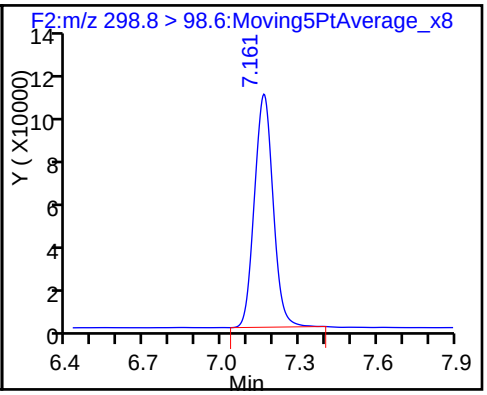
D 3 13C5-PFPeA



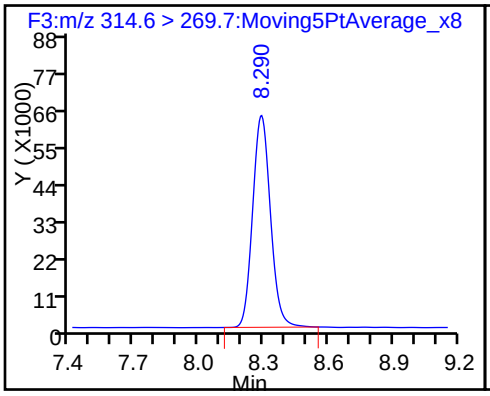
5 Perfluorobutane Sulfonate



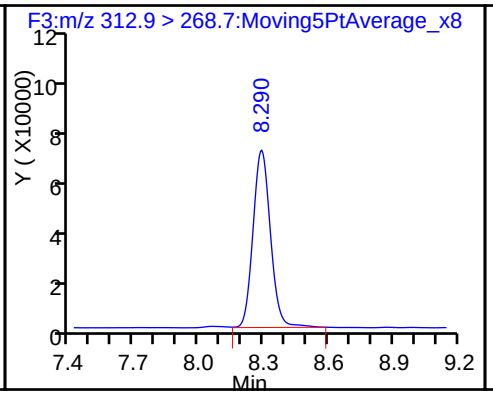
5 Perfluorobutane Sulfonate



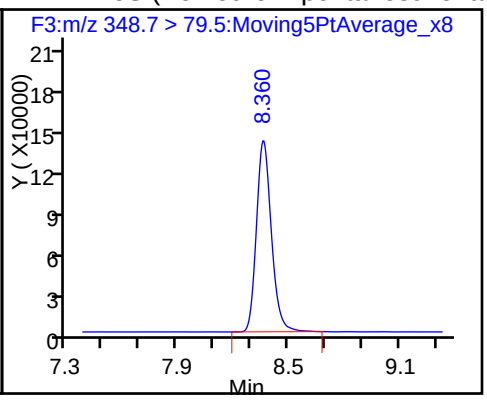
D 6 13C2 PFHxA



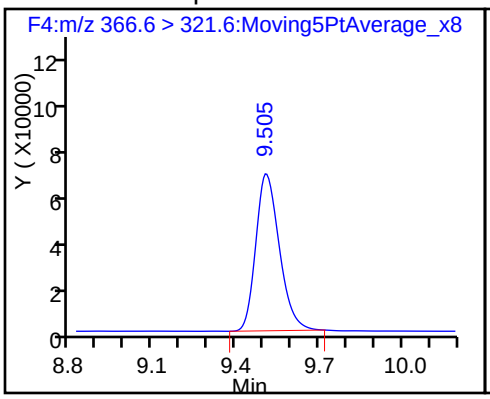
7 Perfluorohexanoic acid



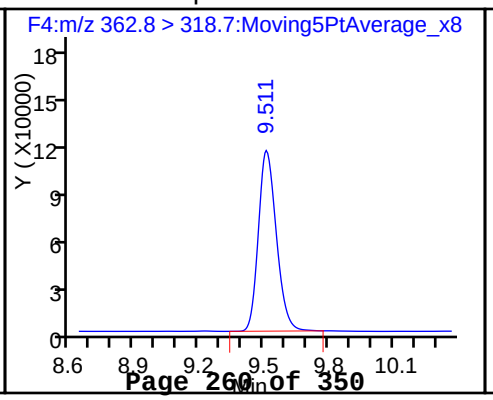
22 PFPeS (Perflouro-1-pentanesulfonat



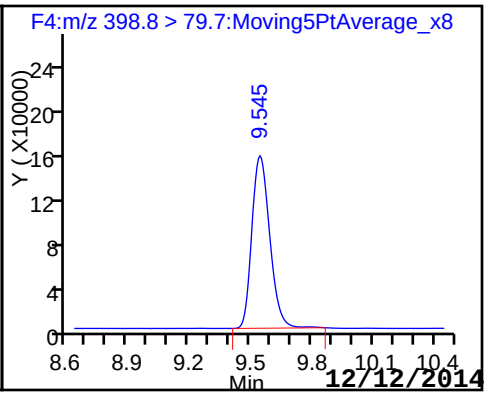
D 8 13C4-PFHpA



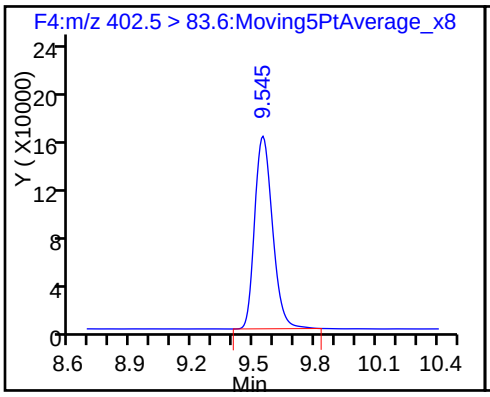
9 Perfluoroheptanoic acid



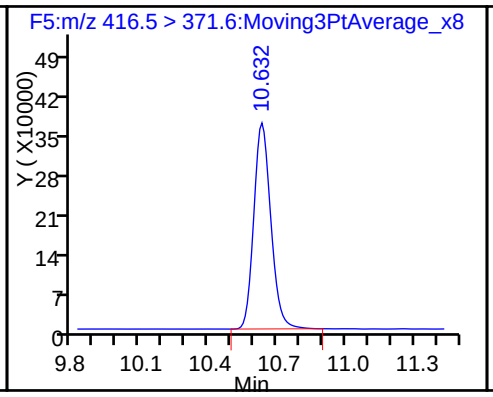
10 Perfluorohexane Sulfonate



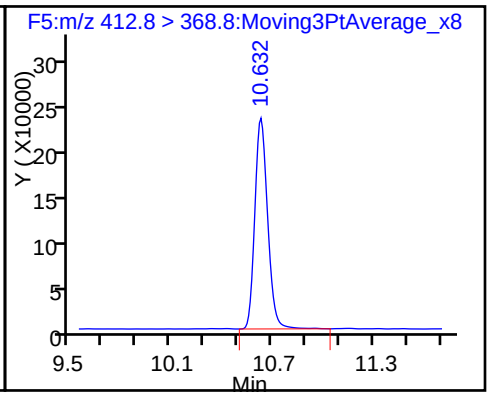
D 11 18O2 PFHxS



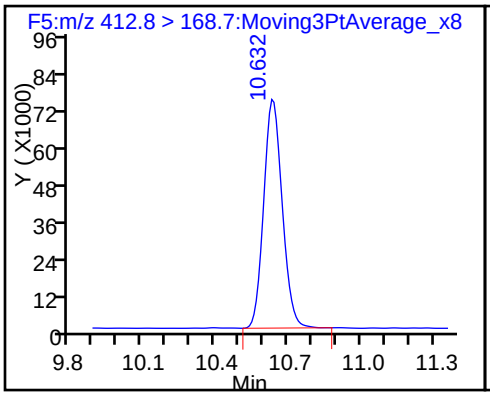
D 12 13C4 PFOA



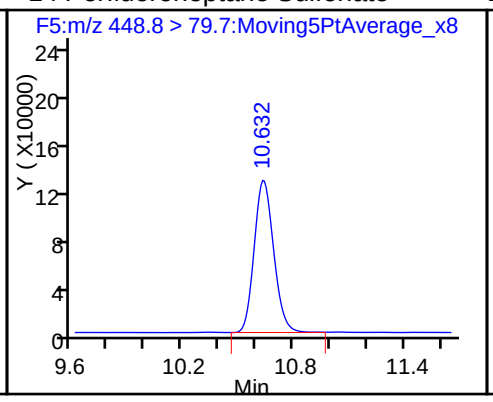
13 Perfluorooctanoic acid



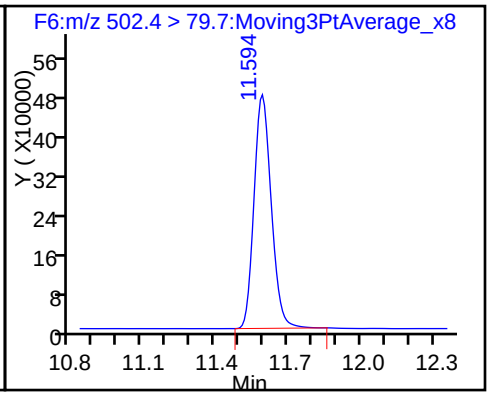
13 Perfluorooctanoic acid



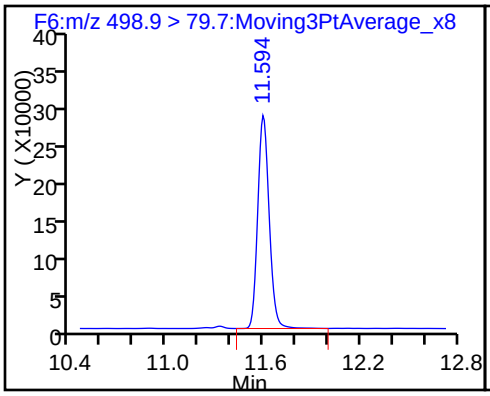
14 Perfluoroheptane Sulfonate



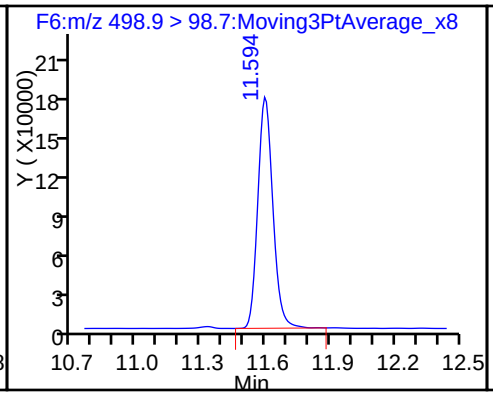
D 16 13C4 PFOS



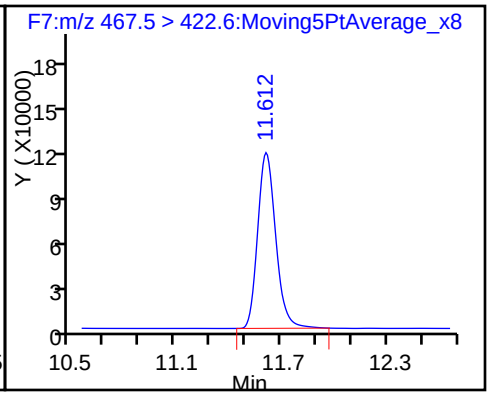
15 Perfluorooctanoic Sulfonate



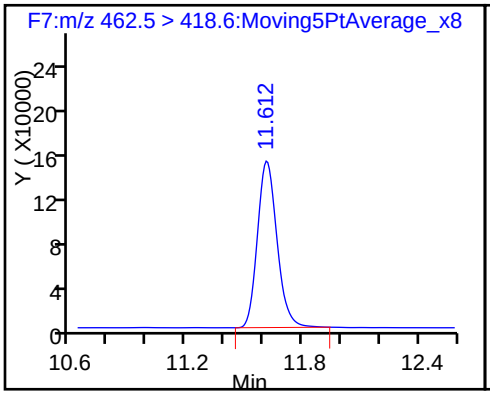
15 Perfluorooctanoic Sulfonate



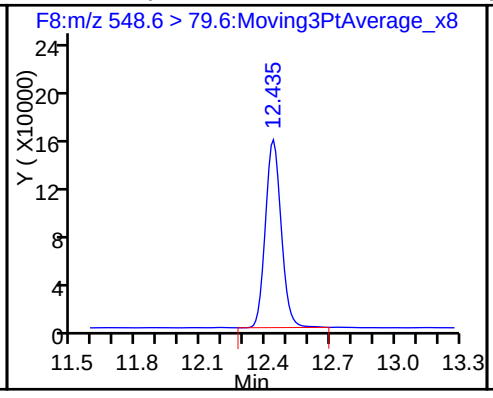
D 17 13C5 PFNA



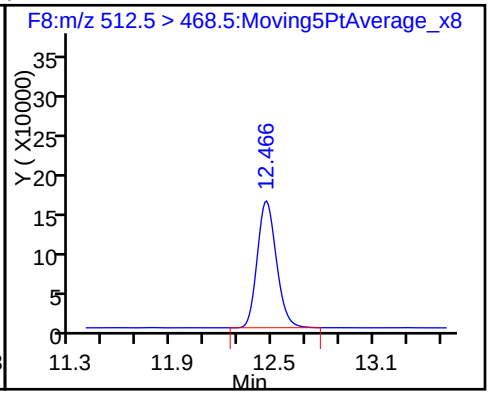
18 Perfluorononanoic acid



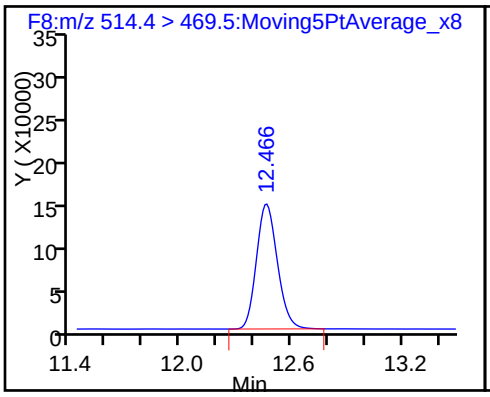
21 PFNS (Perflouro-1-nonanesulfonate)



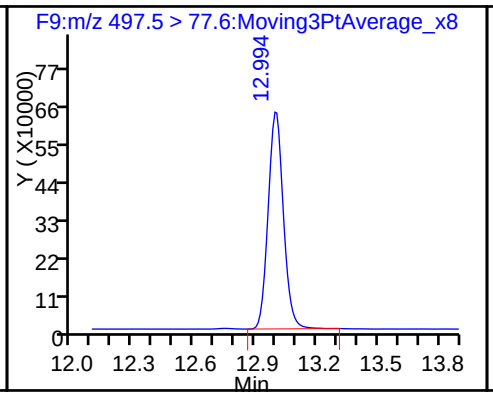
20 Perfluorodecanoic acid



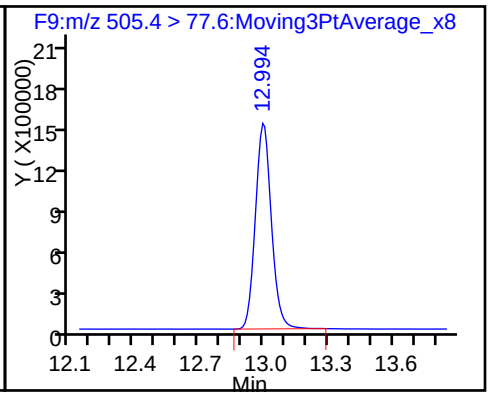
D 19 13C2 PFDA



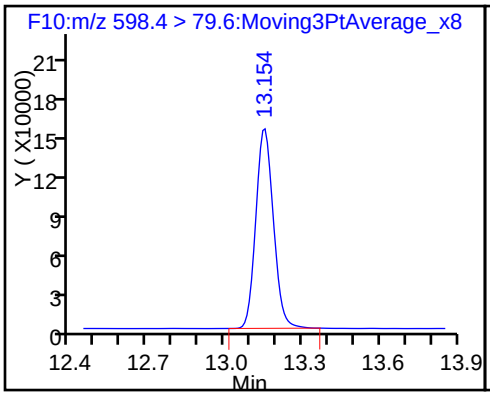
24 Perfluorooctane Sulfonamide



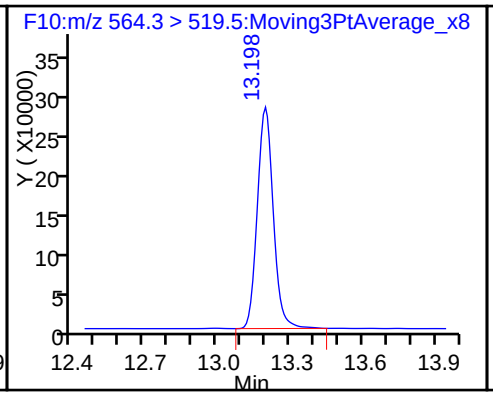
D 23 13C8 FOSA



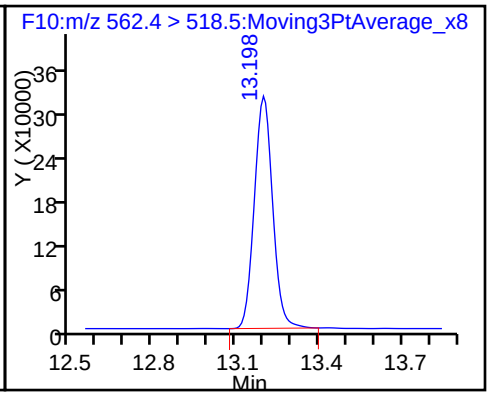
25 Perfluorodecane Sulfonate



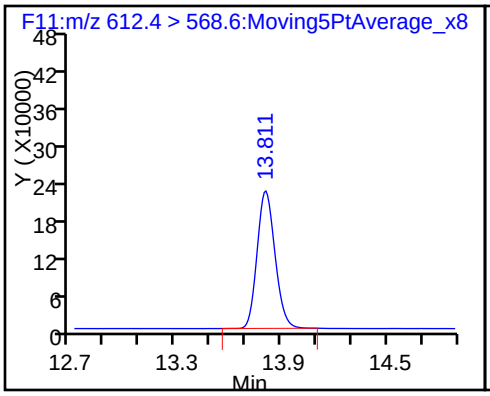
D 26 13C2 PFUnA



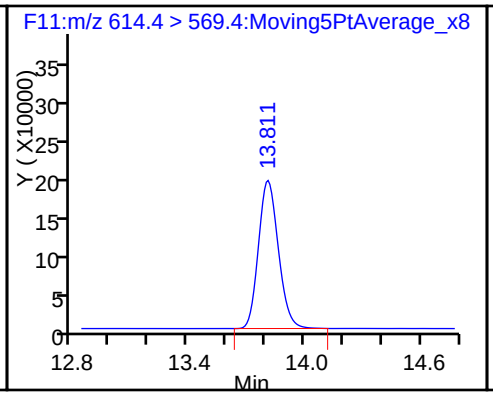
27 Perfluoroundecanoic acid



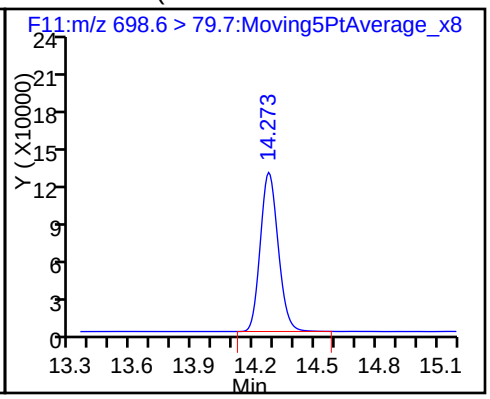
29 Perfluorododecanoic acid



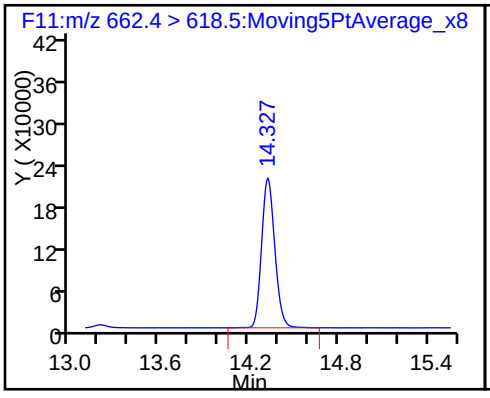
D 28 13C2 PFDoA



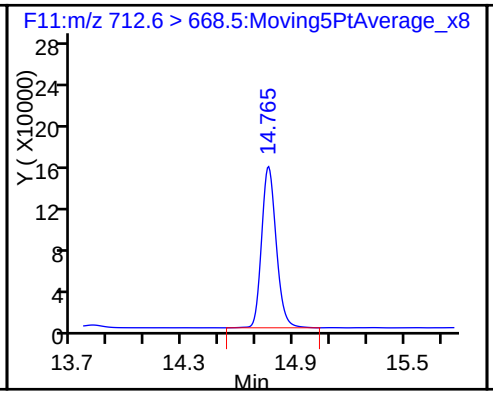
31 PFDoS (Perflouro-1-dodecanesulfona



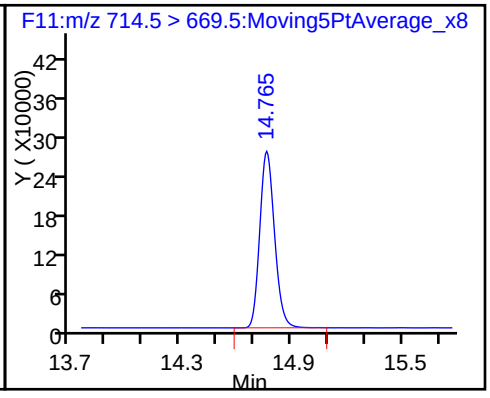
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



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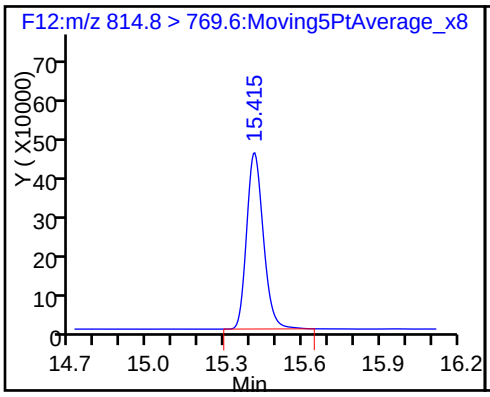
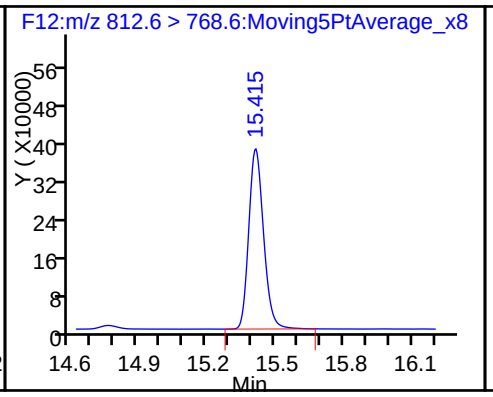
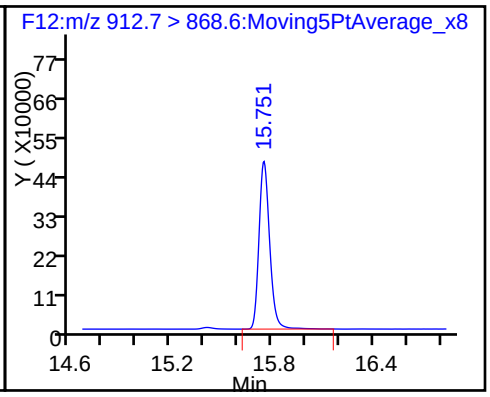


34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_044.d
Lims ID: Std L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 04-Dec-2014 05:09:08 ALS Bottle#: 8 Worklist Smp#: 8
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: LCPFC-L5 PFC 50/50ng/mL
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub5

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:01:55 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

First Level Reviewer: barnettj Date: 04-Dec-2014 14:16:16

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.934	5.934	0.0		76134	17.8		89.0	270	
2 Perfluorobutyric acid										
212.7 > 168.6	5.934	5.935	-0.001	1.000	973858	56.5		113	2549	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.039	7.037	0.002	1.000	656489	54.1		108	922	
D 3 13C5-PFPeA										
267.6 > 222.7	7.046	7.038	0.008		146639	19.0		95.0	503	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.161	7.157	0.004	1.000	2969104	63.0		142	6743	
298.8 > 98.6	7.158	7.157	0.001	0.999	1828732		1.62(0.00-0.00)	142	4401	
D 6 13C2 PFHxA										
314.6 > 269.7	8.284	8.282	0.002		362829	19.0		95.2	950	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.284	8.284	0.0	1.000	1048415	59.2		118	1383	
22 PFPeS (Perflouro-1-pentanesulfonat										
348.7 > 79.5	8.360	8.360	0.0	0.876	1904029	50.7		108	3852	
D 8 13C4-PFHpA										
366.6 > 321.6	9.510	9.506	0.004		357639	20.2		101	1026	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.510	9.508	0.002	1.000	1480278	54.3		109	2660	
10 Perfluorohexane Sulfonate										
398.8 > 79.7	9.545	9.543	0.002	1.000	2166299	49.1		104	3954	
D 11 18O2 PFHxS										
402.5 > 83.6	9.545	9.544	0.001		904686	20.1		106	2013	
D 12 13C4 PFOA										
416.5 > 371.6	10.633	10.628	0.005		1568925	46.4		92.8	2473	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
412.8 > 368.8	10.633	10.628	0.005	1.000	2738772	52.3		105	2366	
412.8 > 168.7	10.633	10.628	0.005	1.000	911992		3.00(0.00-0.00)	105	1636	
14 Perfluoroheptane Sulfonate										
448.8 > 79.7	10.633	10.635	-0.002	1.000	2202840	57.7		121	3728	
D 16 13C4 PFOS										
502.4 > 79.7	11.594	11.595	-0.001		2109419	46.8		97.9	3107	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.594	11.595	-0.001	1.000	3201983	40.2		84.1	2416	
498.9 > 98.7	11.602	11.595	0.007	1.001	1798361		1.78(0.00-0.00)	84.1	1906	
D 17 13C5 PFNA										
467.5 > 422.6	11.620	11.614	0.006		744378	19.3		96.4	2568	
18 Perfluorononanoic acid										
462.5 > 418.6	11.620	11.616	0.004	1.000	2214146	51.6		103	3103	
21 PFNS (Perflouro-1-nonanesulfonate)										
548.6 > 79.6	12.435	12.429	0.006	1.000	1801756	55.6		116	2778	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.466	12.461	0.005	1.000	2735529	58.7		117	2845	
D 19 13C2 PFDA										
514.4 > 469.5	12.466	12.463	0.003		976118	19.0		94.8	1886	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.004	12.998	0.006	1.000	7880884	56.2		112	3240	
D 23 13C8 FOSA										
505.4 > 77.6	12.995	12.998	-0.003		7377513	51.6		103	3100	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.154	13.152	0.002	1.000	1601818	56.1		116	2268	
D 26 13C2 PFUnA										
564.3 > 519.5	13.198	13.198	0.0		1197353	18.5		92.5	2787	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.198	13.198	0.0	1.000	3119455	58.9		118	3940	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.811	13.808	0.003	1.000	3670027	62.1		124	2134	
D 28 13C2 PFDoA										
614.4 > 569.4	13.811	13.809	0.002		1198640	18.3		91.7	1577	
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.273	14.272	0.001	1.000	1709417	58.8		122	2751	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.327	14.327	0.0	1.000	3132510	63.9		128	2299	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.765	14.766	-0.001	1.000	1910691	61.3		123	1772	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.765	14.766	-0.001		1394143	19.5		97.5	2441	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.415	15.415	0.0		2223647	21.3		107	2662	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.415	15.415	0.0	1.000	4803324	59.8		120	2343	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.751	15.752	-0.001	1.000	5148634	60.5		121	1859	

Reagents:

LCPFC-L5_00006 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2014 10:01:56 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_044.d

Injection Date: 04-Dec-2014 05:09:08 Instrument ID: A4

Lims ID: Std L5

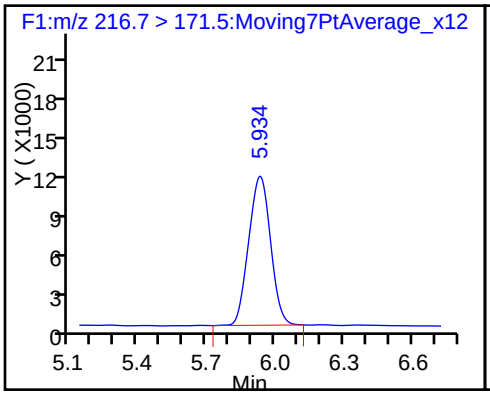
Client ID:

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

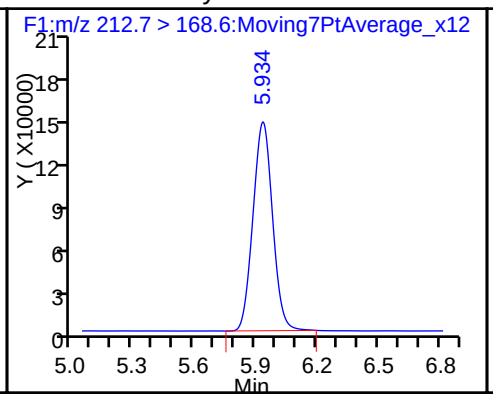
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC ICAL

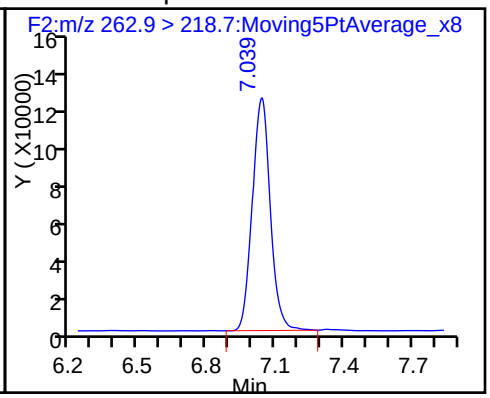
D 1 13C4 PFBA



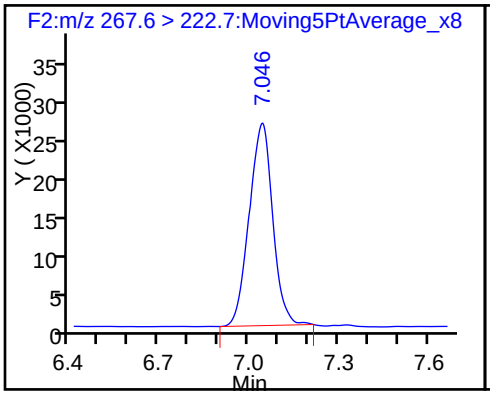
2 Perfluorobutyric acid



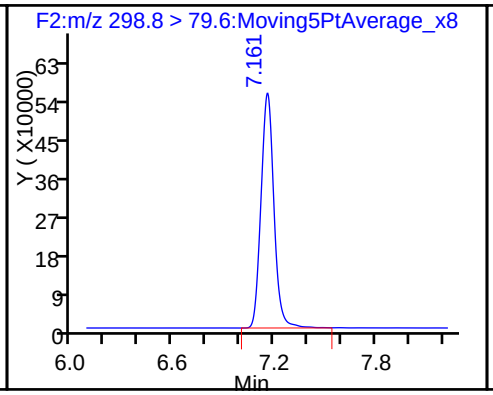
4 Perfluoropentanoic acid



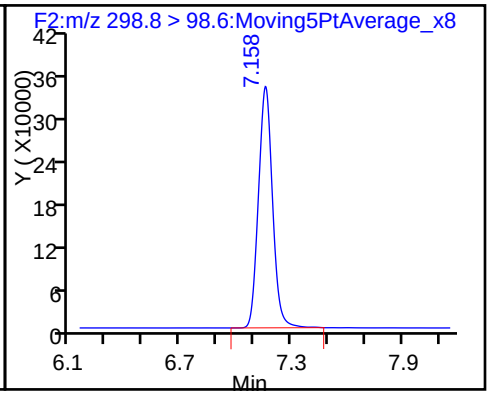
D 3 13C5-PFPeA



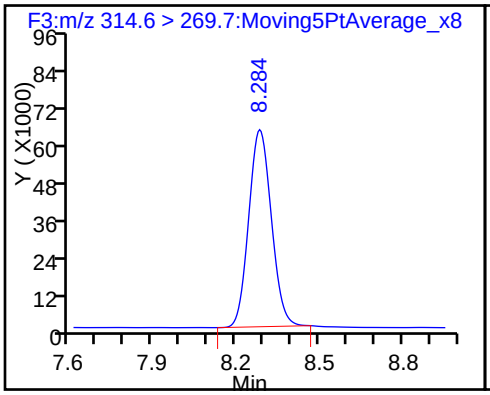
5 Perfluorobutane Sulfonate



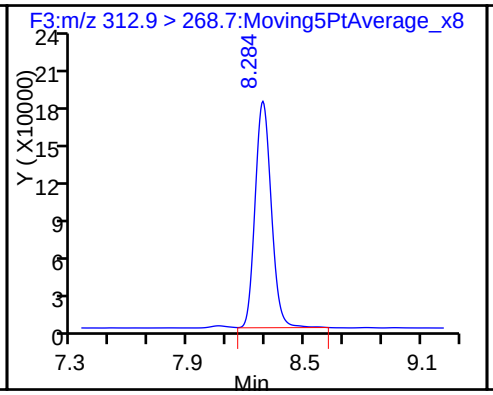
5 Perfluorobutane Sulfonate



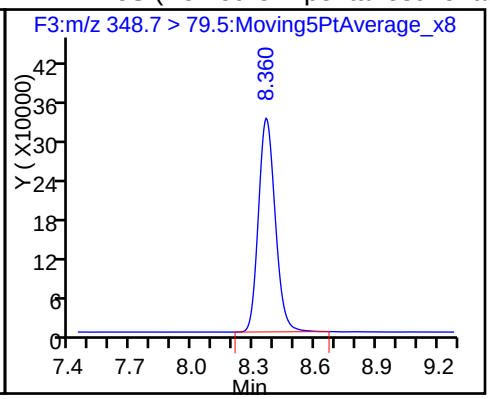
D 6 13C2 PFHxA



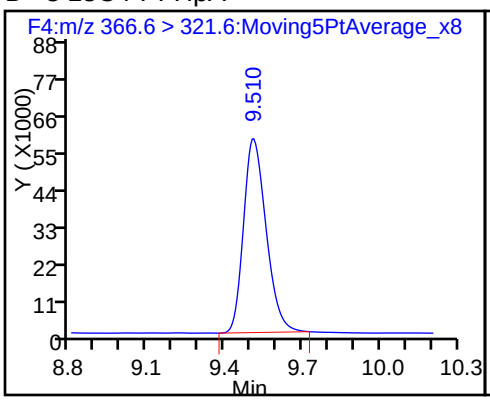
7 Perfluorohexanoic acid



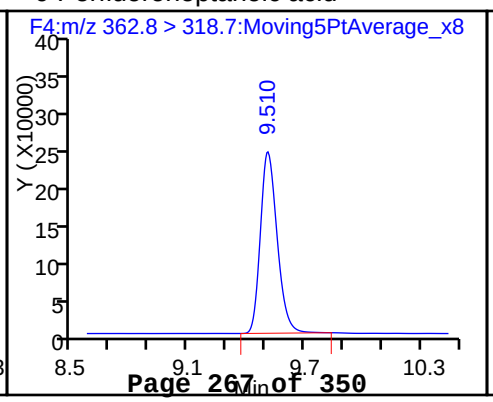
22 PFPeS (Perflouro-1-pentanesulfonat



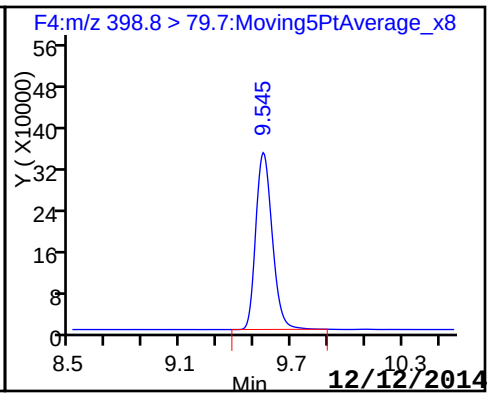
D 8 13C4-PFHpA



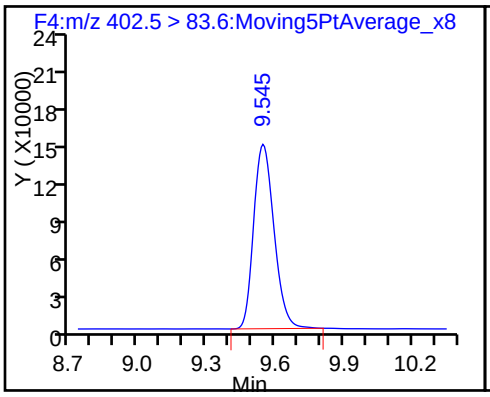
9 Perfluoroheptanoic acid



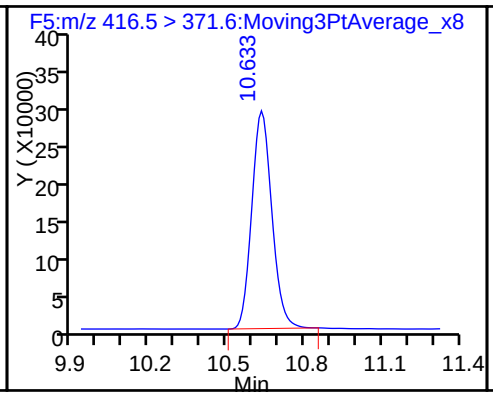
10 Perfluorohexane Sulfonate



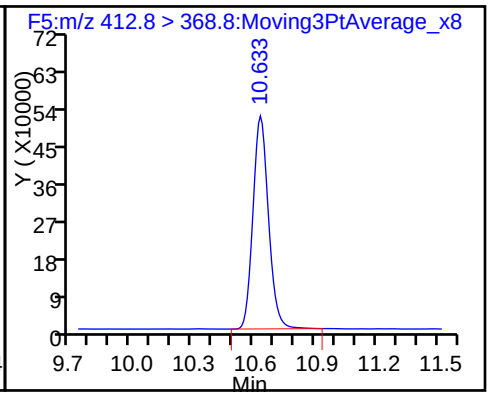
D 11 18O2 PFHxS



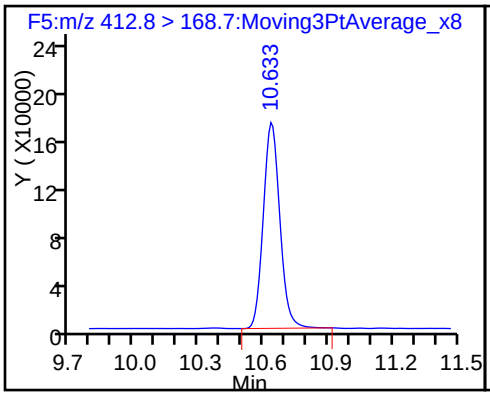
D 12 13C4 PFOA



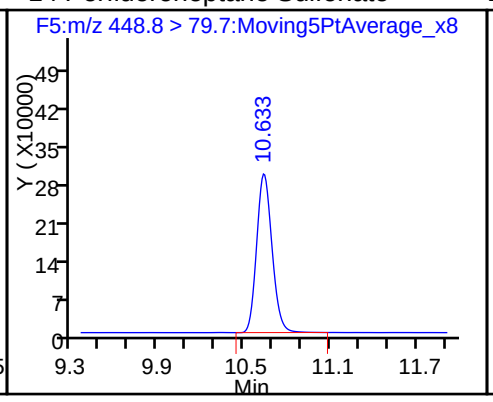
13 Perfluorooctanoic acid



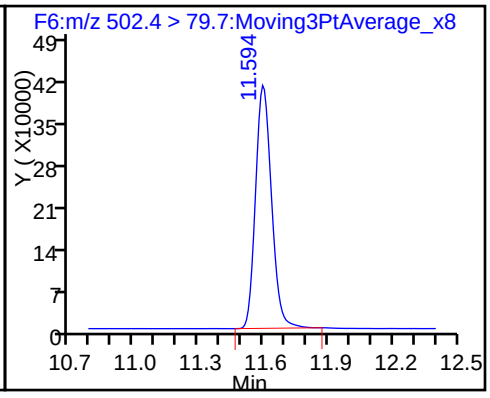
13 Perfluorooctanoic acid



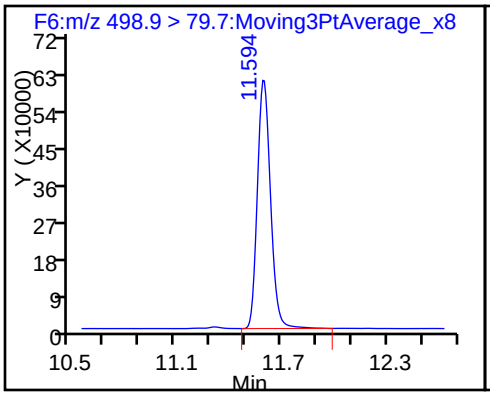
14 Perfluoroheptane Sulfonate



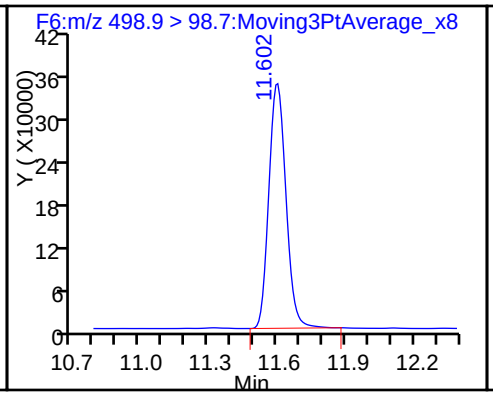
D 16 13C4 PFOS



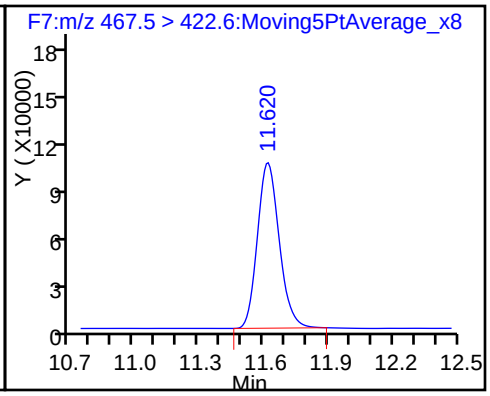
15 Perfluorooctanoic Sulfonate



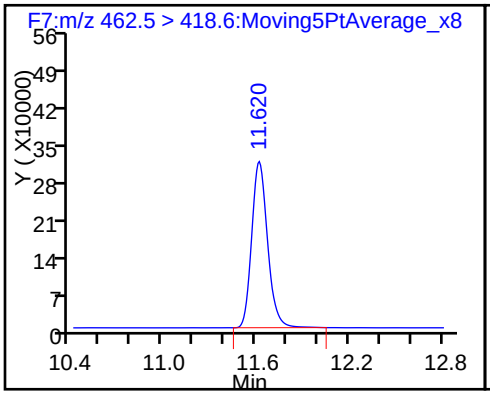
15 Perfluorooctanoic Sulfonate



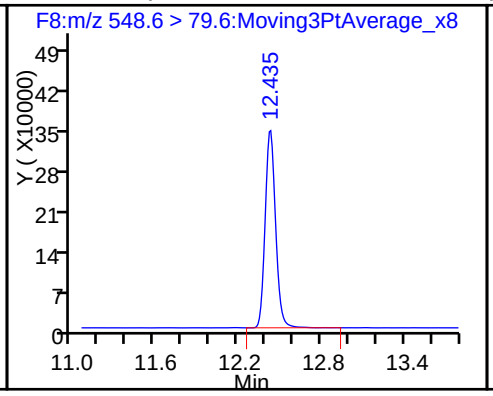
D 17 13C5 PFNA



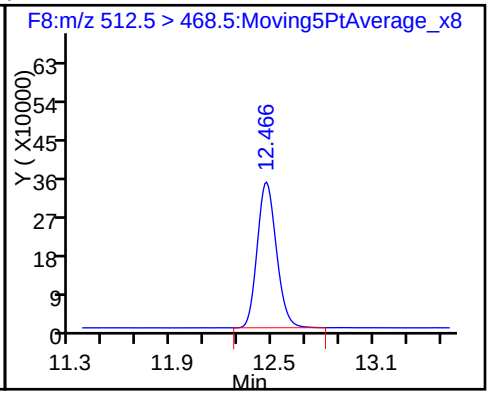
18 Perfluorononanoic acid



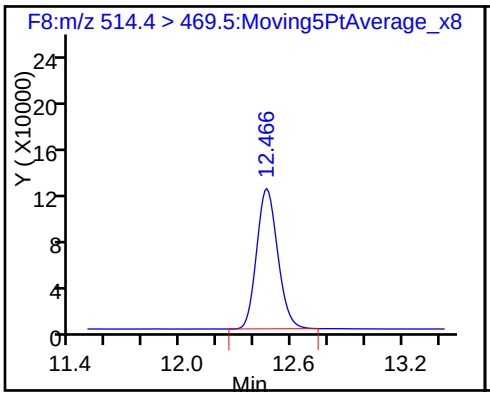
21 PFNS (Perflouro-1-nonanesulfonate)



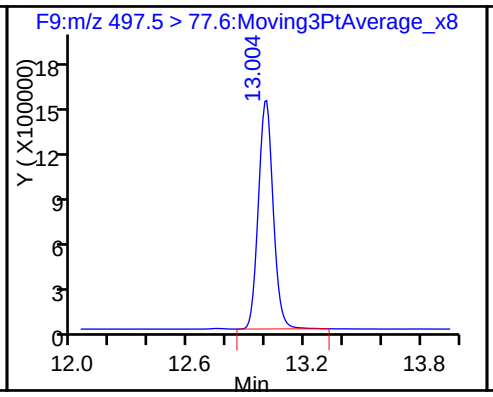
20 Perfluorodecanoic acid



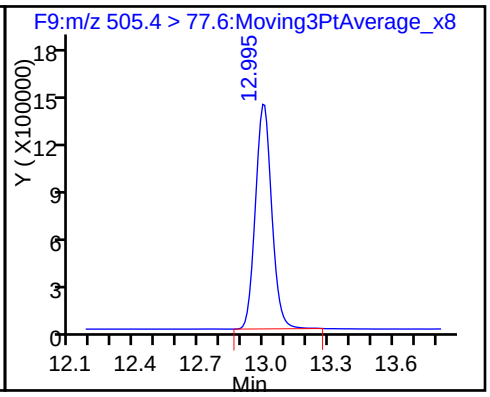
D 19 13C2 PFDA



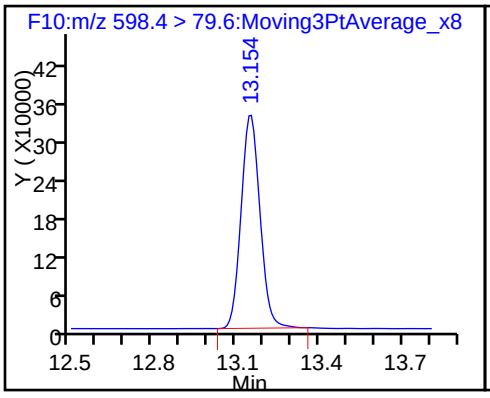
24 Perfluorooctane Sulfonamide



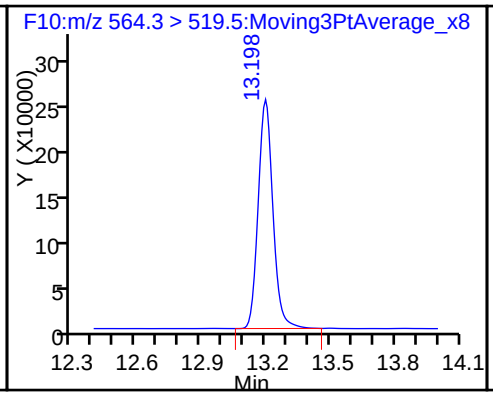
D 23 13C8 FOSA



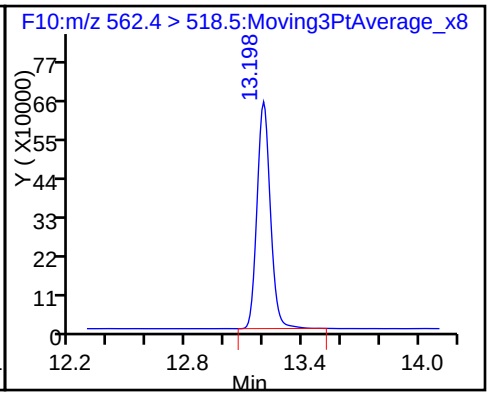
25 Perfluorodecane Sulfonate



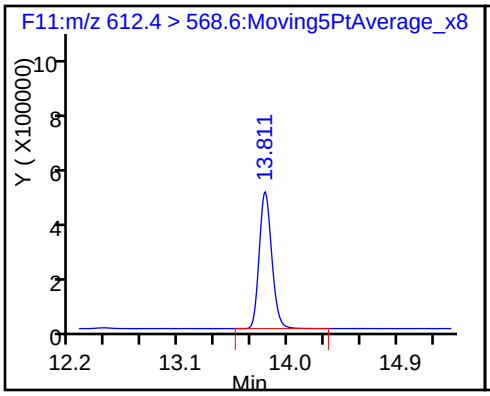
D 26 13C2 PFUnA



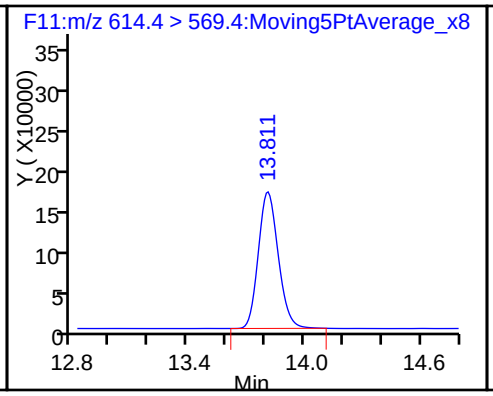
27 Perfluoroundecanoic acid



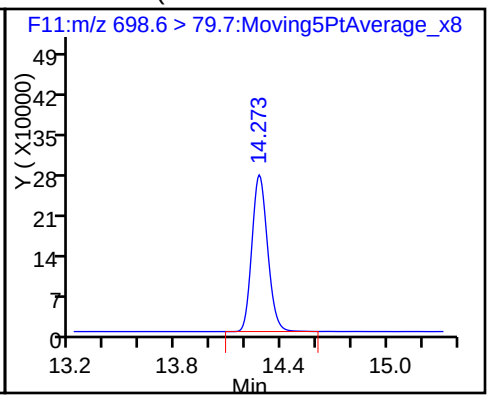
29 Perfluorododecanoic acid



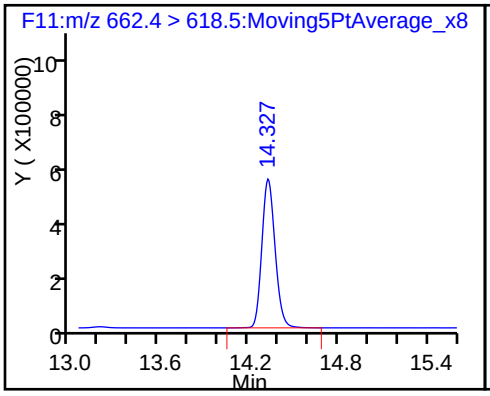
D 28 13C2 PFDoA



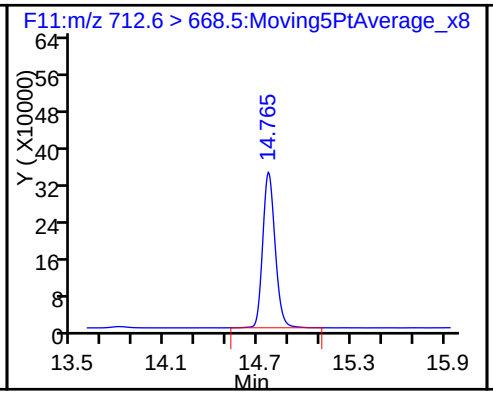
31 PFDoS (Perflouro-1-dodecanesulfona



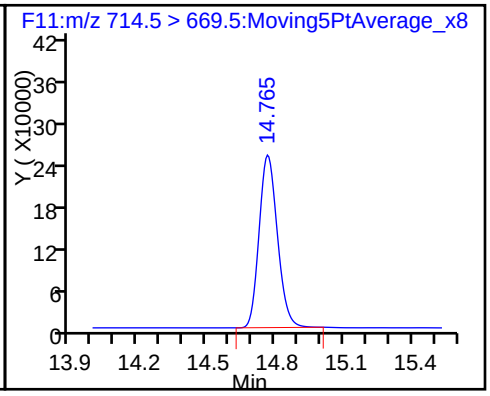
30 Perfluorotridecanoic acid



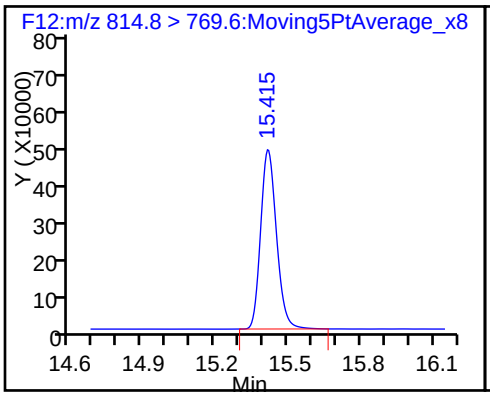
32 Perfluorotetradecanoic acid



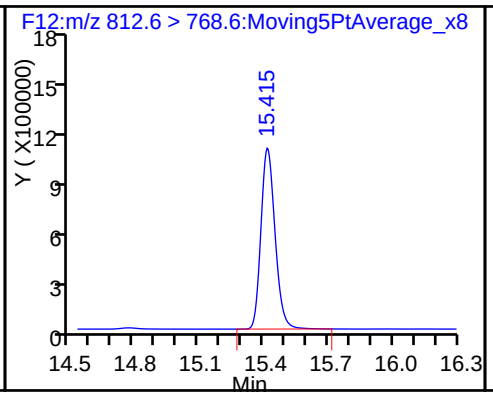
D 33 13C2-PFTeDA



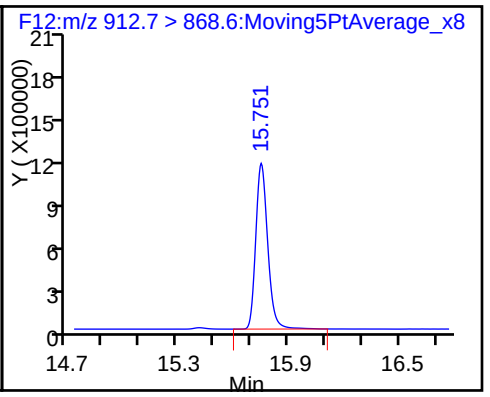
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_045.d
Lims ID: Std L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 04-Dec-2014 05:30:22 ALS Bottle#: 9 Worklist Smp#: 9
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: LCPFC-L6 PFC 200/50ng/mL
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub5

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:01:57 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

First Level Reviewer: barnettj Date: 04-Dec-2014 10:17:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.934	5.934	0.0		64078	15.0		74.9	172	
2 Perfluorobutyric acid										
212.7 > 168.6	5.934	5.935	-0.001	1.000	3324570	247.1		124	11134	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.036	7.037	-0.001	1.000	2237092	236.4		118	2477	
D 3 13C5-PFPeA										
267.6 > 222.7	7.036	7.038	-0.002		114434	14.8		74.2	390	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.158	7.157	0.001	1.000	6951713	209.3		118	10653	
298.8 > 98.6	7.158	7.157	0.001	1.000	4325906		1.61(0.00-0.00)	118	11278	
D 6 13C2 PFHxA										
314.6 > 269.7	8.284	8.282	0.002		326332	17.1		85.6	1067	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.284	8.284	0.0	1.000	3374043	211.8		106	2254	
22 PFPeS (Perflouro-1-pentanesulfonat										
348.7 > 79.5	8.360	8.360	0.0	0.876	6187089	233.7		125	7653	
D 8 13C4-PFHpA										
366.6 > 321.6	9.505	9.506	-0.001		233963	13.2		65.9	638	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.505	9.508	-0.003	1.000	4268821	239.3		120	5537	
10 Perfluorohexane Sulfonate										
398.8 > 79.7	9.545	9.543	0.002	1.000	6253308	201.3		106	10496	
D 11 18O2 PFHxS										
402.5 > 83.6	9.545	9.544	0.001		637190	14.2		74.9	1671	
D 12 13C4 PFOA										
416.5 > 371.6	10.632	10.628	0.004		1232205	36.4		72.8	1691	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
412.8 > 368.8	10.632	10.628	0.004	1.000	8615547	209.4		105	5932	
412.8 > 168.7	10.632	10.628	0.004	1.000	2789255		3.09(0.00-0.00)	105	3340	
14 Perfluoroheptane Sulfonate										
448.8 > 79.7	10.642	10.635	0.007	1.000	6297711	218.5		115	5936	
D 16 13C4 PFOS										
502.4 > 79.7	11.602	11.595	0.007		1593174	35.3		73.9	2573	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.602	11.595	0.007	1.000	9537705	158.6		82.9	3559	
498.9 > 98.7	11.602	11.595	0.007	1.000	5595082		1.70(0.00-0.00)	82.9	3373	
D 17 13C5 PFNA										
467.5 > 422.6	11.620	11.614	0.006		603092	15.6		78.1	1329	
18 Perfluorononanoic acid										
462.5 > 418.6	11.620	11.616	0.004	1.000	7868399	226.3		113	7645	
21 PFNS (Perflouro-1-nonanesulfonate)										
548.6 > 79.6	12.435	12.429	0.006	1.000	4979770	203.3		106	5351	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.466	12.461	0.005	1.000	8217900	231.6		116	8527	
D 19 13C2 PFDA										
514.4 > 469.5	12.466	12.463	0.003		743492	14.4		72.2	1688	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.003	12.998	0.005	1.000	26403028	220.1		110	3107	
D 23 13C8 FOSA										
505.4 > 77.6	13.003	12.998	0.005		6312732	44.1		88.2	3932	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.154	13.152	0.002	1.000	4451333	206.5		107	4554	
D 26 13C2 PFUnA										
564.3 > 519.5	13.206	13.198	0.008		1176651	18.2		90.9	1960	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.206	13.198	0.008	1.000	9965686	191.6		95.8	6752	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.811	13.808	0.003	1.000	12549584	227.0		114	3636	
D 28 13C2 PFDoA										
614.4 > 569.4	13.811	13.809	0.002		1120992	17.2		85.8	1041	
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.273	14.272	0.001	1.000	4601893	209.7		108	4870	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.334	14.327	0.007	1.000	9132281	199.3		99.6	3101	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.772	14.766	0.006	1.000	6179569	212.0		106	2829	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.772	14.766	0.006		1224157	17.1		85.6	2164	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.415	15.415	0.0		2119674	20.3		102	2572	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.415	15.415	0.0	1.000	18590504	247.6		124	2880	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.751	15.752	-0.001	1.000	20832627	261.8		131	2455	

Reagents:

LCPFC-L6_00005 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2014 10:01:57 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_045.d

Injection Date: 04-Dec-2014 05:30:22 Instrument ID: A4

Lims ID: Std L6

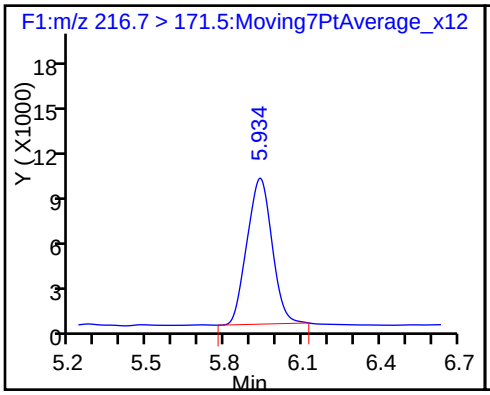
Client ID:

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

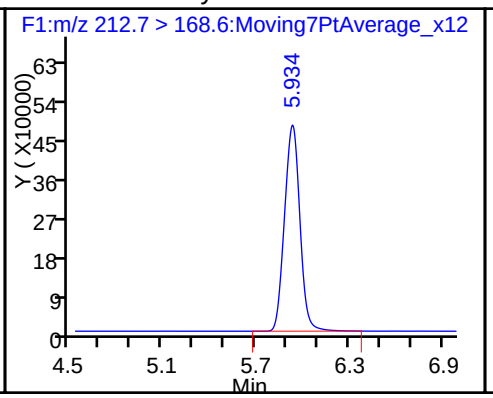
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC ICAL

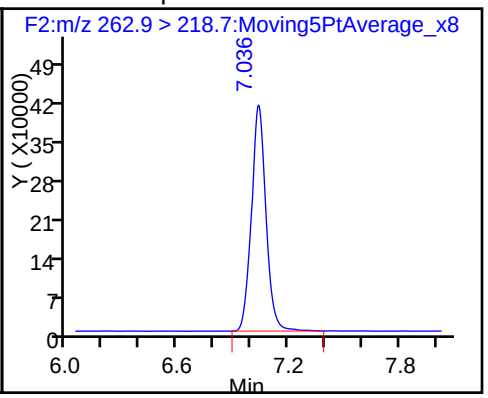
D 1 13C4 PFBA



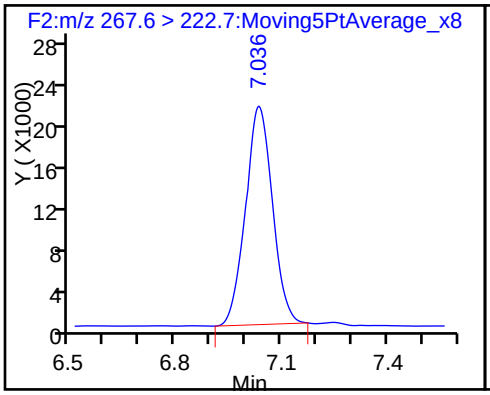
2 Perfluorobutyric acid



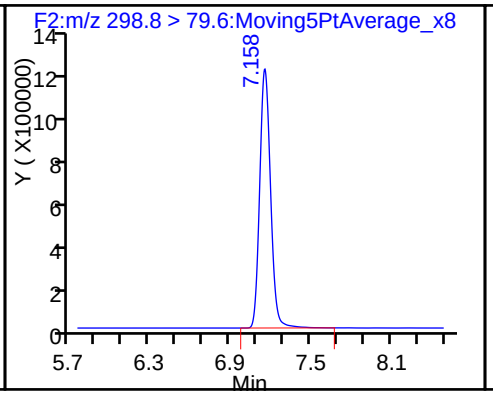
4 Perfluoropentanoic acid



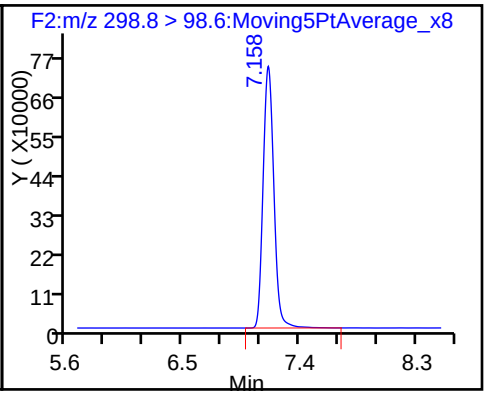
D 3 13C5-PFPeA



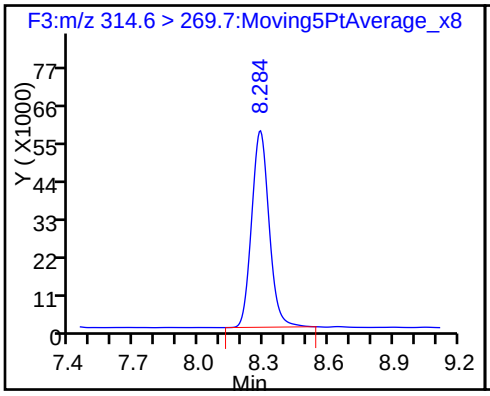
5 Perfluorobutane Sulfonate



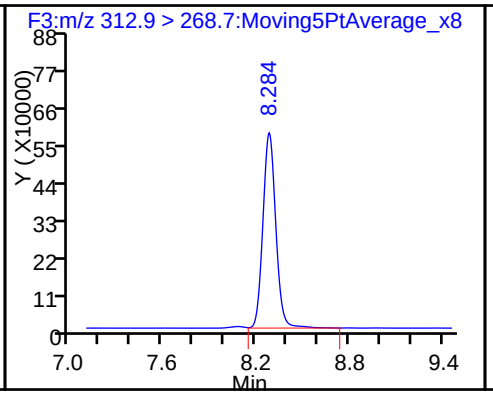
5 Perfluorobutane Sulfonate



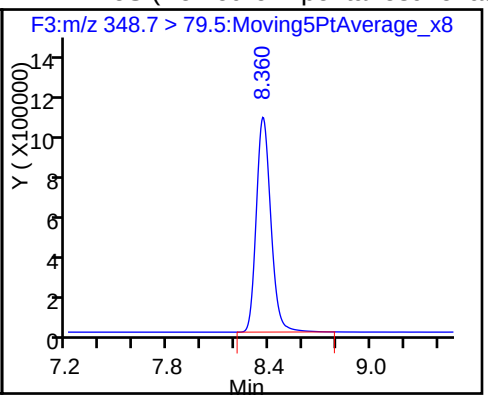
D 6 13C2 PFHxA



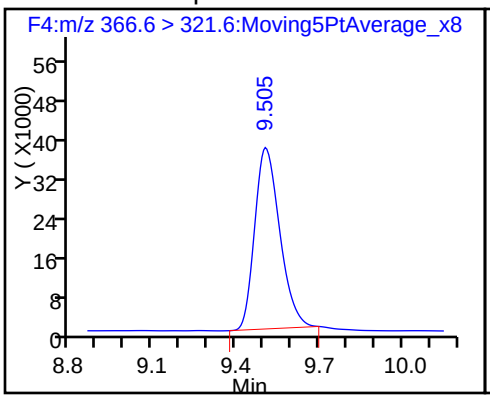
7 Perfluorohexanoic acid



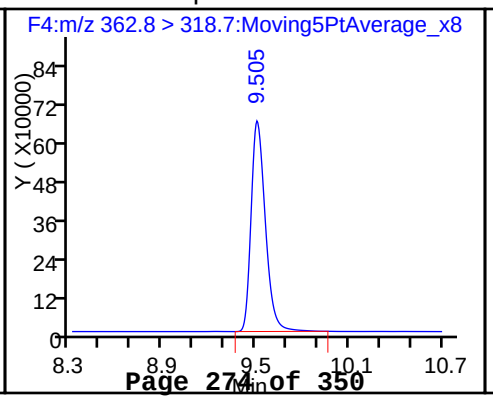
22 PFPeS (Perflouro-1-pentanesulfonat



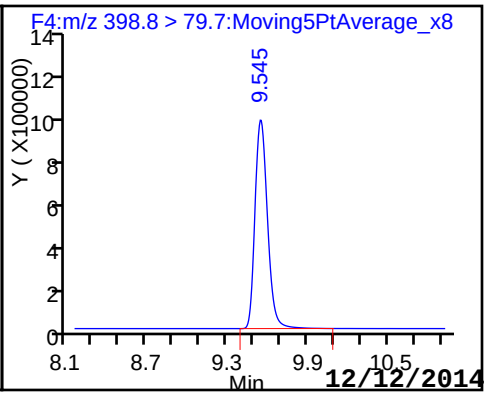
D 8 13C4-PFHpA



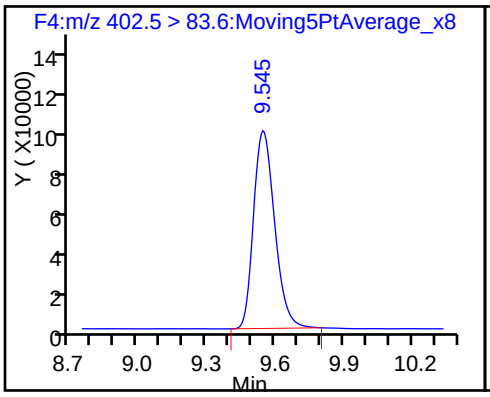
9 Perfluoroheptanoic acid



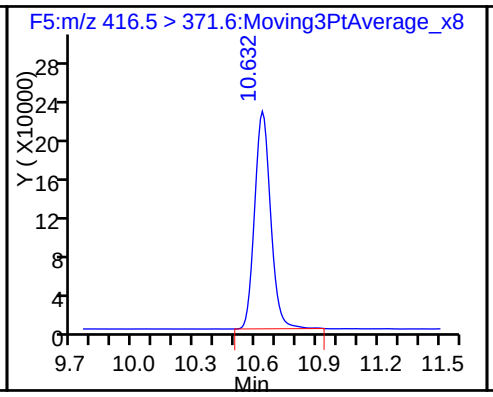
10 Perfluorohexane Sulfonate



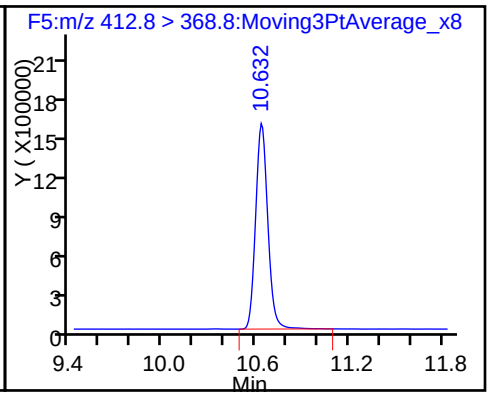
D 11 18O2 PFHxS



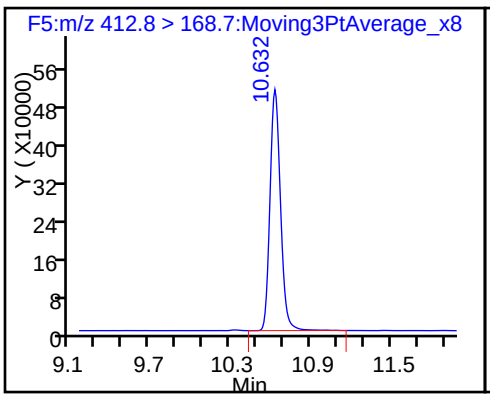
D 12 13C4 PFOA



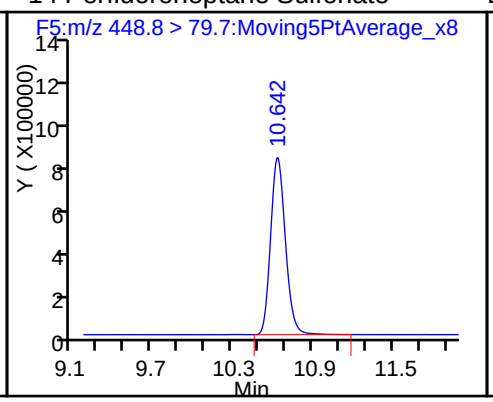
13 Perfluorooctanoic acid



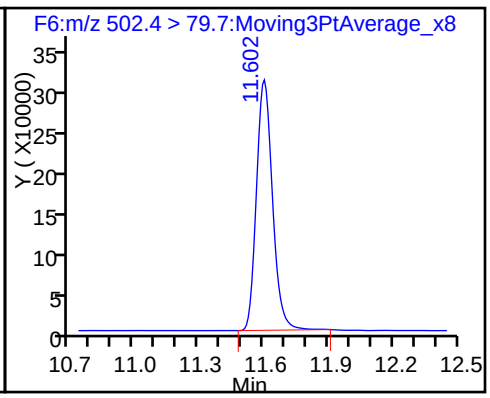
13 Perfluorooctanoic acid



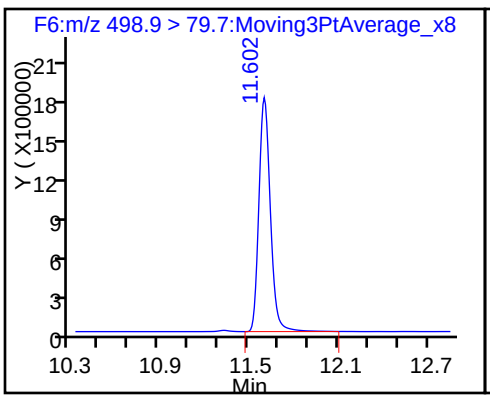
14 Perfluoroheptane Sulfonate



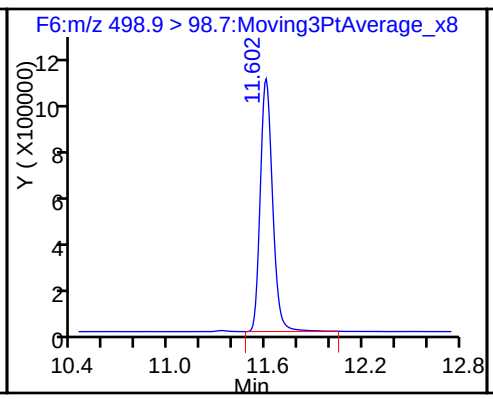
D 16 13C4 PFOS



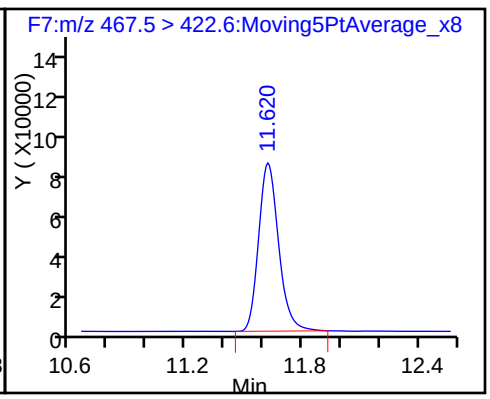
15 Perfluorooctanoic Sulfonate



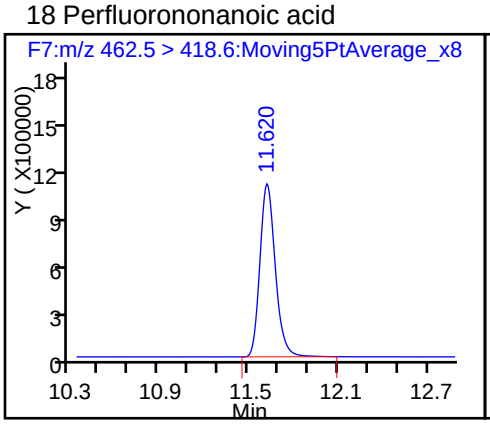
15 Perfluorooctanoic Sulfonate



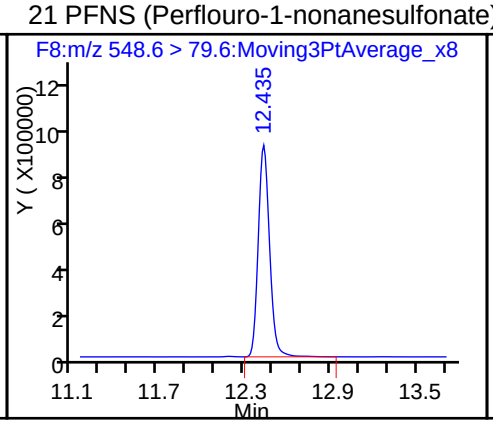
D 17 13C5 PFNA



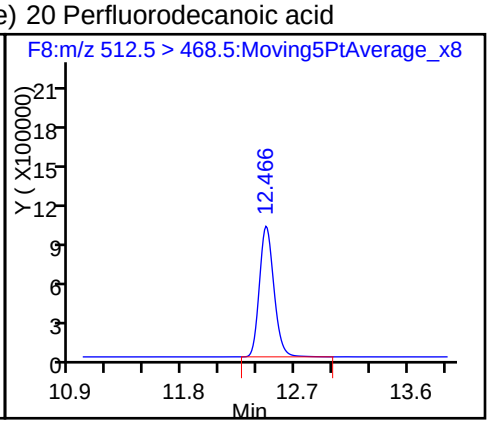
18 Perfluorononanoic acid



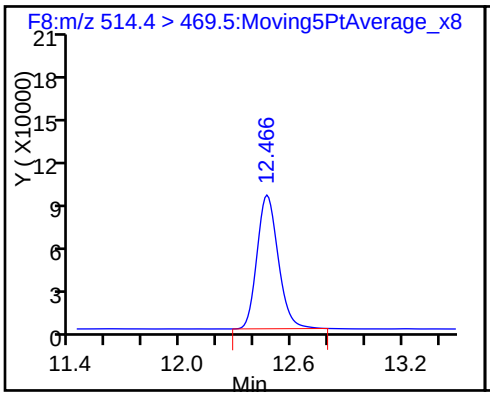
21 PFNS (Perflouro-1-nonanesulfonate)



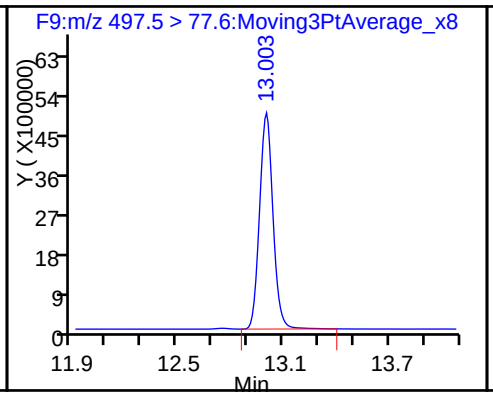
20 Perfluorodecanoic acid



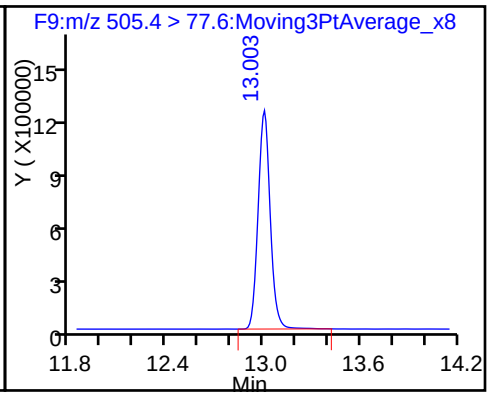
D 19 13C2 PFDA



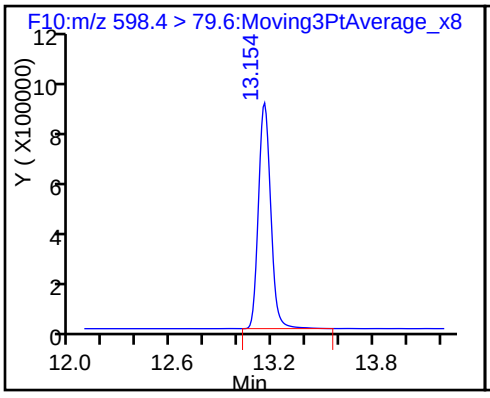
24 Perfluorooctane Sulfonamide



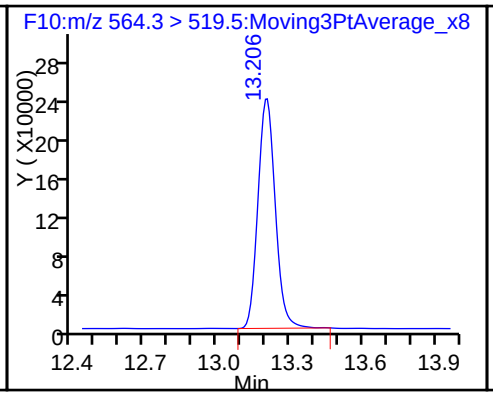
D 23 13C8 FOSA



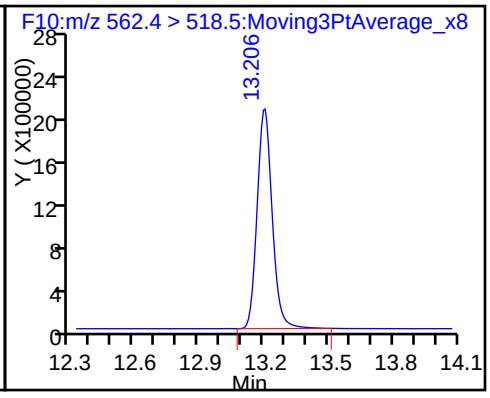
25 Perfluorodecane Sulfonate



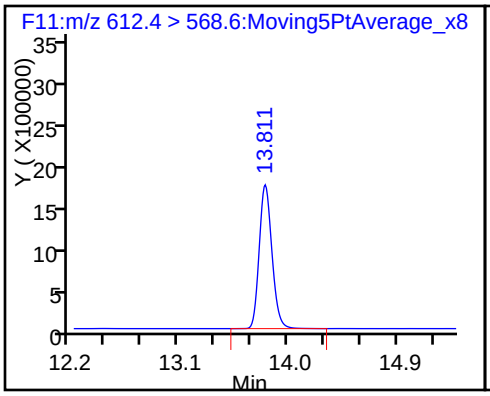
D 26 13C2 PFUnA



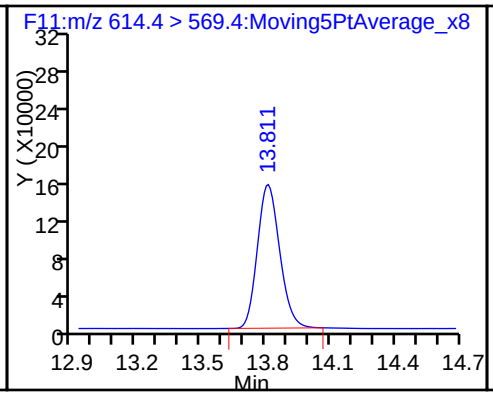
27 Perfluoroundecanoic acid



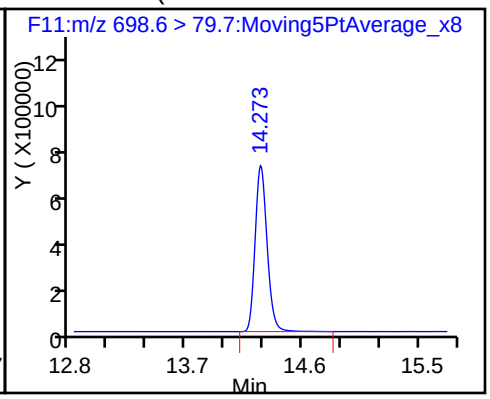
29 Perfluorododecanoic acid



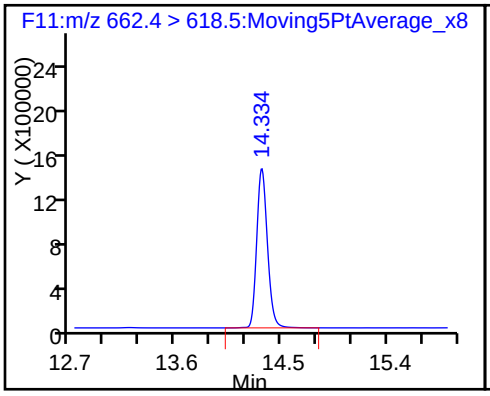
D 28 13C2 PFDoA



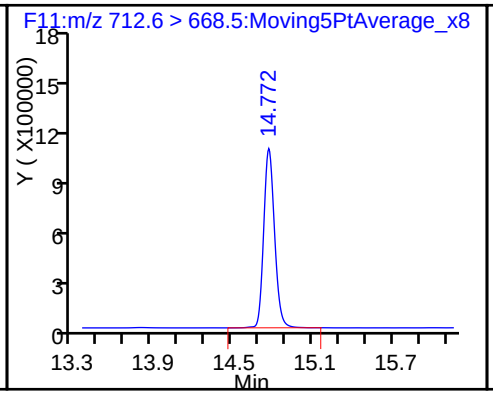
31 PFDoS (Perflouro-1-dodecanesulfona



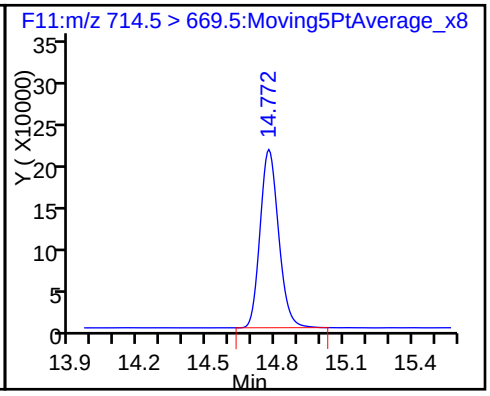
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



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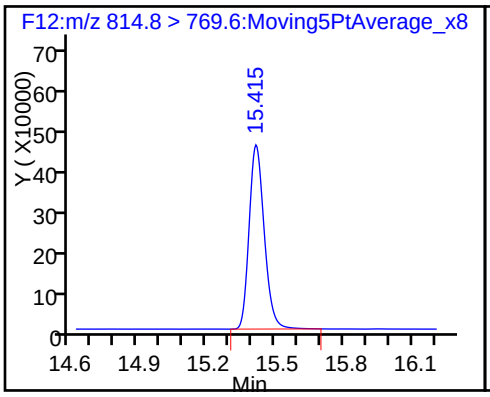
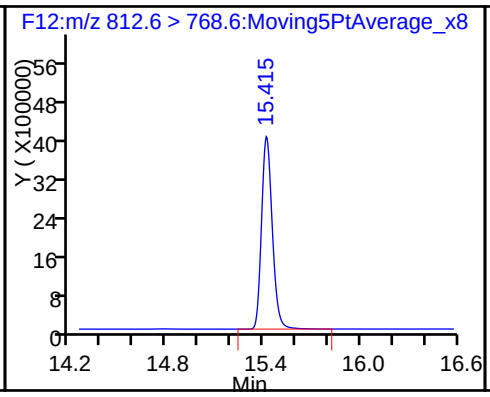
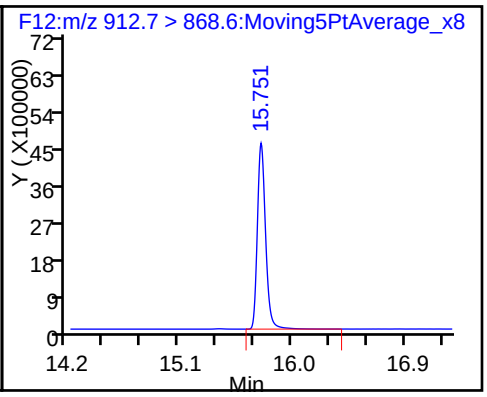


34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d
Lims ID: Std L7
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 04-Dec-2014 05:51:34 ALS Bottle#: 10 Worklist Smp#: 10
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: LCPFC-L7 PFC 500/50ng/mL
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub5

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:01:58 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.934	5.934	0.0		45086	10.5		52.7	168	
2 Perfluorobutyric acid										
212.7 > 168.6	5.941	5.935	0.006	1.000	6084630	531.4		106	12919	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.040	7.037	0.003	1.000	4729024	587.2		117	5934	
D 3 13C5-PFPeA										
267.6 > 222.7	7.040	7.038	0.002		97387	12.6		63.1	247	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.162	7.157	0.005	1.000	14216894	562.7		127	13614	
298.8 > 98.6	7.162	7.157	0.005	1.000	8687902		1.64(0.00-0.00)	127	15376	
D 6 13C2 PFHxA										
314.6 > 269.7	8.286	8.282	0.004		228440	12.0		59.9	527	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.291	8.284	0.007	1.000	6260320	561.5		112	1620	
22 PFPeS (Perflouro-1-pentanesulfonat										
348.7 > 79.5	8.362	8.360	0.002	0.875	11656614	578.9		123	13351	
D 8 13C4-PFHpA										
366.6 > 321.6	9.510	9.506	0.004		207868	11.7		58.6	427	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.505	9.508	-0.003	1.000	9446001	596.1		119	9459	
10 Perfluorohexane Sulfonate										
398.8 > 79.7	9.552	9.543	0.009	1.000	12604320	533.5		113	11248	
D 11 18O2 PFHxS										
402.5 > 83.6	9.552	9.544	0.008		484686	10.8		57.0	923	
D 12 13C4 PFOA										
416.5 > 371.6	10.623	10.628	-0.005		952358	28.2		56.3	1312	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
412.8 > 368.8	10.623	10.628	-0.005	1.000	16683058	524.6		105	6845	
412.8 > 168.7	10.632	10.628	0.004	1.001	5344475		3.12(0.00-0.00)	105	3569	
14 Perfluoroheptane Sulfonate										
448.8 > 79.7	10.632	10.635	-0.003	1.000	11448389	570.8		120	5166	
D 16 13C4 PFOS										
502.4 > 79.7	11.594	11.595	-0.001		1108797	24.6		51.4	1556	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.594	11.595	-0.001	1.000	17552751	419.3		87.7	2797	
498.9 > 98.7	11.594	11.595	-0.001	1.000	10235840		1.71(0.00-0.00)	87.7	3533	
D 17 13C5 PFNA										
467.5 > 422.6	11.612	11.614	-0.002		440238	11.4		57.0	1058	
18 Perfluorononanoic acid										
462.5 > 418.6	11.620	11.616	0.004	1.000	13621836	536.6		107	8608	
21 PFNS (Perflouro-1-nonanesulfonate)										
548.6 > 79.6	12.425	12.429	-0.004	1.000	8895061	521.8		109	5811	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.466	12.461	0.005	1.000	16591989	538.8		108	7125	
D 19 13C2 PFDA										
514.4 > 469.5	12.466	12.463	0.003		645298	12.5		62.7	912	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.004	12.998	0.006	1.000	58025028	571.7		114	3532	
D 23 13C8 FOSA										
505.4 > 77.6	13.004	12.998	0.006		5341425	37.3		74.7	2000	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.146	13.152	-0.006	1.000	8000344	533.3		111	5011	
D 26 13C2 PFUnA										
564.3 > 519.5	13.206	13.198	0.008		1397054	21.6		108	2197	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.198	13.198	0.0	1.000	20245258	327.9		65.6	9226	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.813	13.808	0.005	1.000	25119659	482.3		96.5	3670	
D 28 13C2 PFDoA										
614.4 > 569.4	13.813	13.809	0.004		1056139	16.2		80.8	956	
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.274	14.272	0.002	1.000	8583795	562.0		116	3466	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.328	14.327	0.001	1.000	20104094	465.7		93.1	3264	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.766	14.766	0.0	1.000	13816653	503.2		101	3017	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.766	14.766	0.0		1167304	16.3		81.6	1880	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.415	15.415	0.0		1876393	18.0		90.0	1772	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.415	15.415	0.0	1.000	39084771	552.4		110	2331	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.752	15.752	0.0	1.000	47874246	638.6		128	2236	

Reagents:

LCPFC-L7_00005 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2014 10:01:58 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Injection Date: 04-Dec-2014 05:51:34 Instrument ID: A4

Lims ID: Std L7

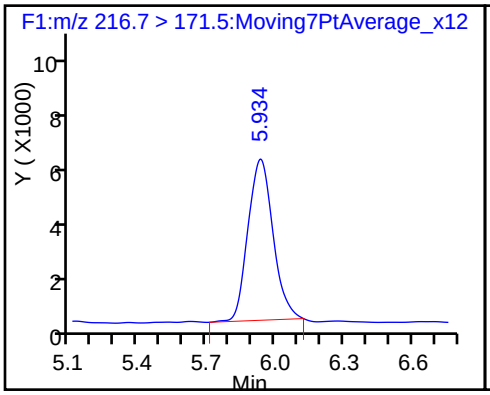
Client ID:

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

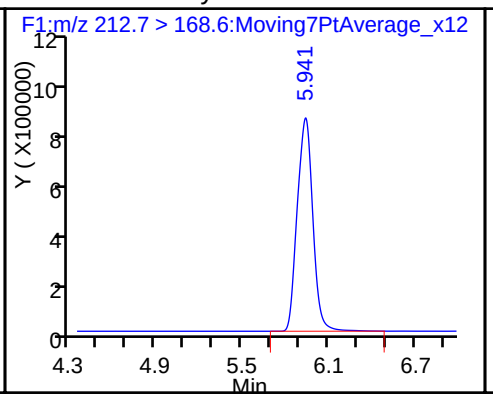
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC ICAL

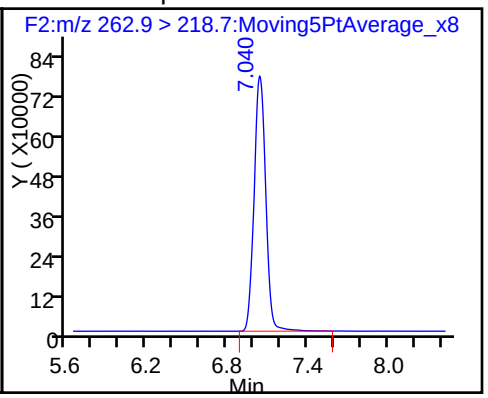
D 1 13C4 PFBA



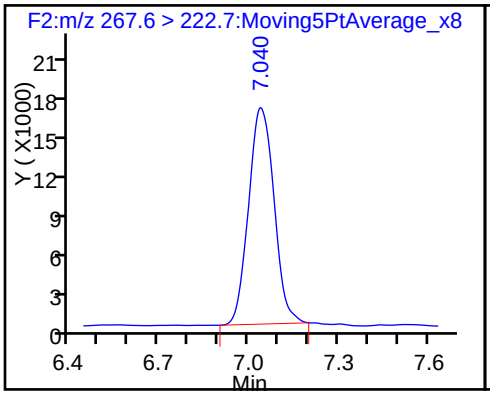
2 Perfluorobutyric acid



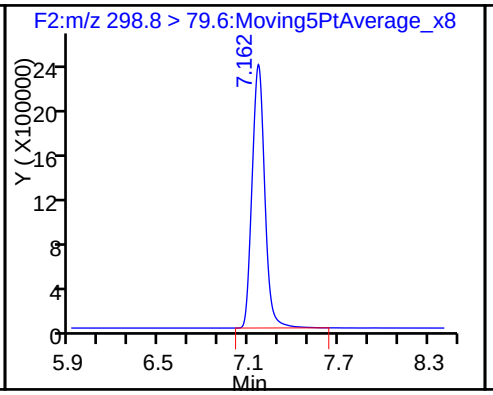
4 Perfluoropentanoic acid



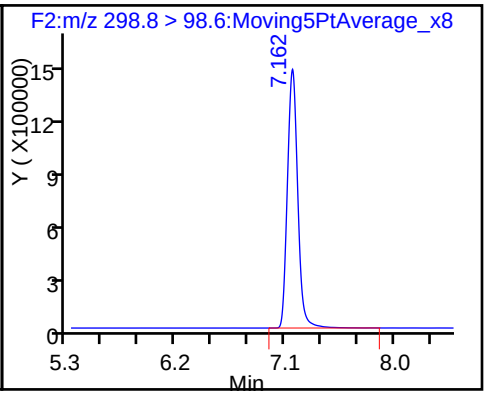
D 3 13C5-PFPeA



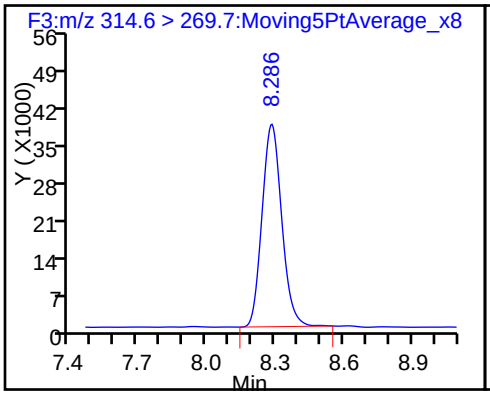
5 Perfluorobutane Sulfonate



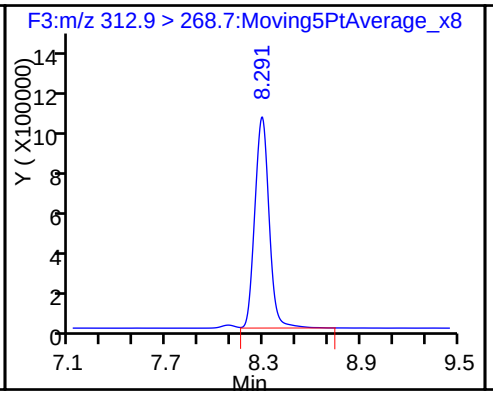
5 Perfluorobutane Sulfonate



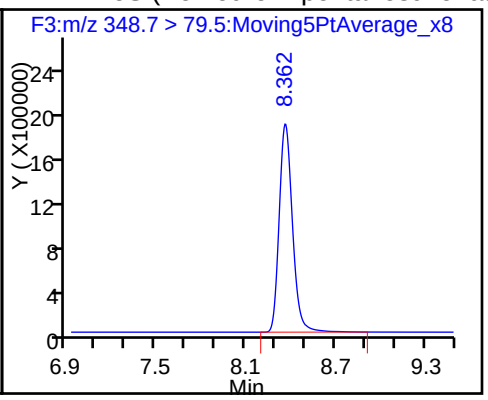
D 6 13C2 PFHxA



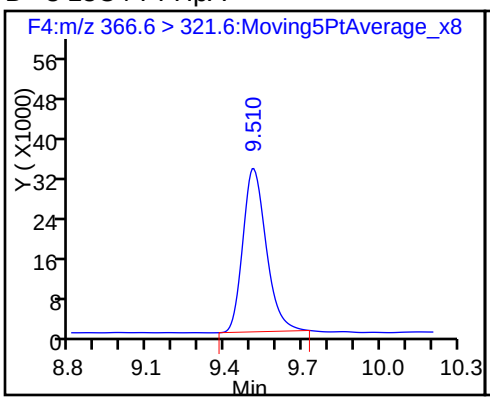
7 Perfluorohexanoic acid



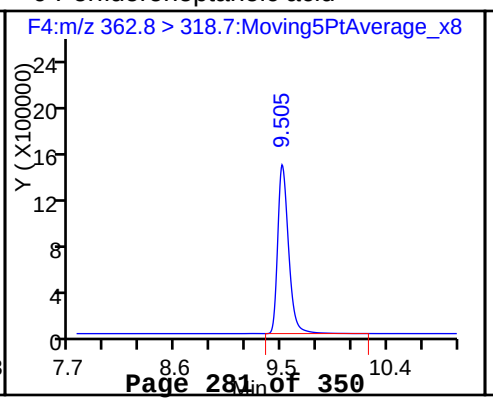
22 PFPeS (Perflouro-1-pentanesulfonat



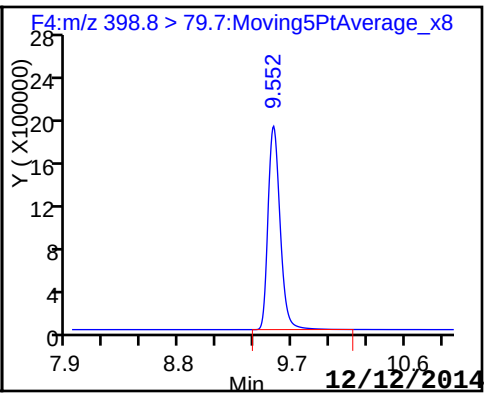
D 8 13C4-PFHpA



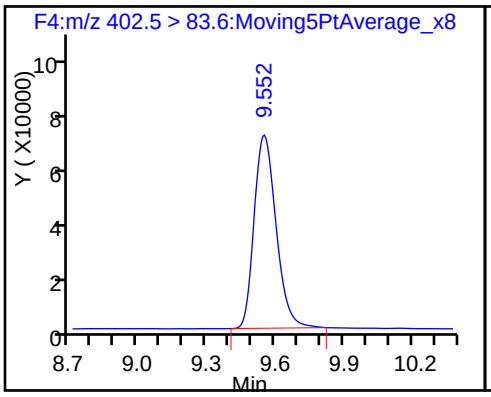
9 Perfluoroheptanoic acid



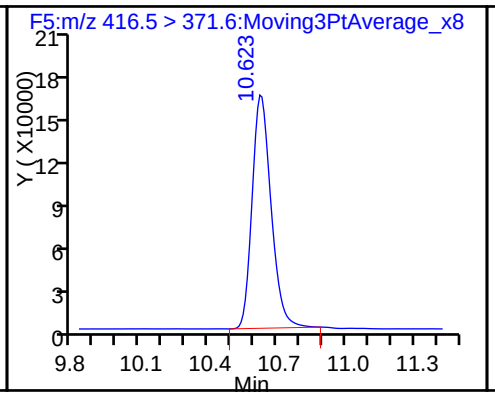
10 Perfluorohexane Sulfonate



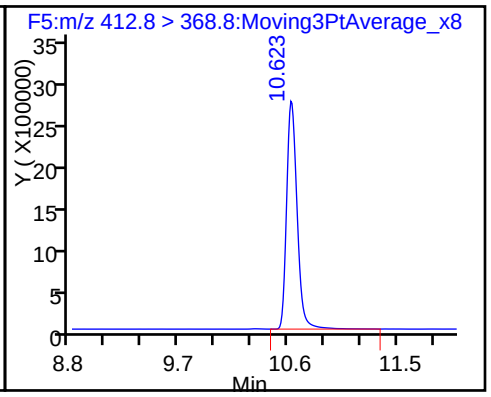
D 11 18O2 PFHxS



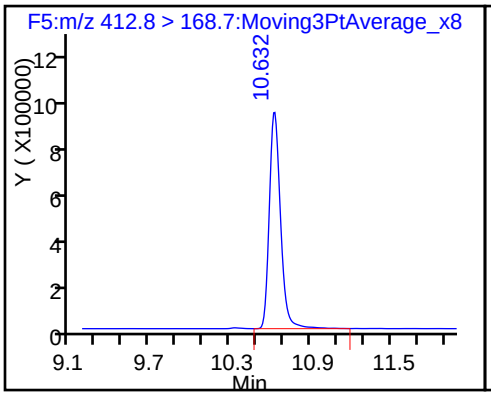
D 12 13C4 PFOA



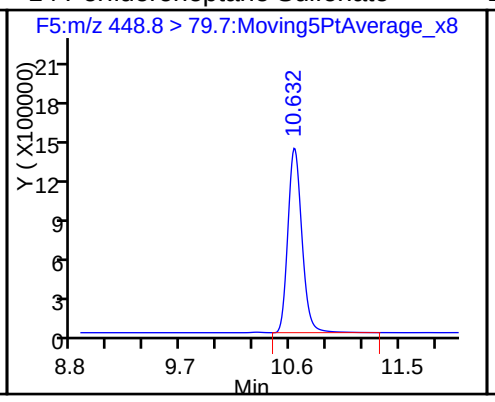
13 Perfluorooctanoic acid



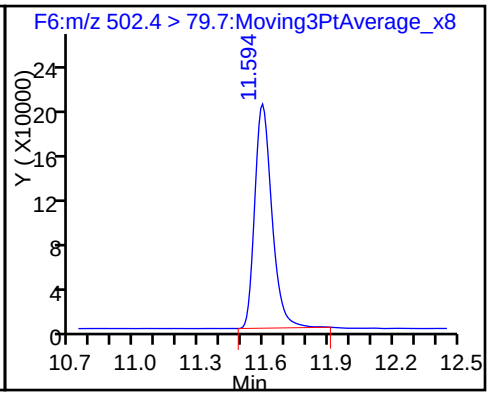
13 Perfluorooctanoic acid



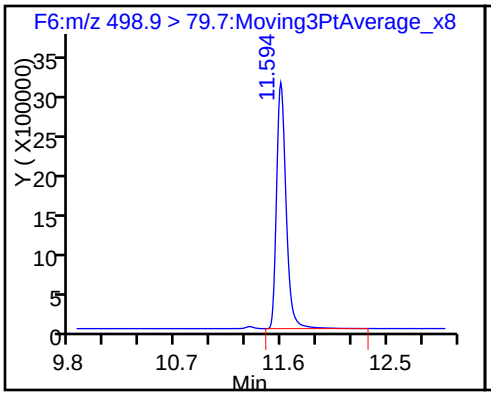
14 Perfluoroheptane Sulfonate



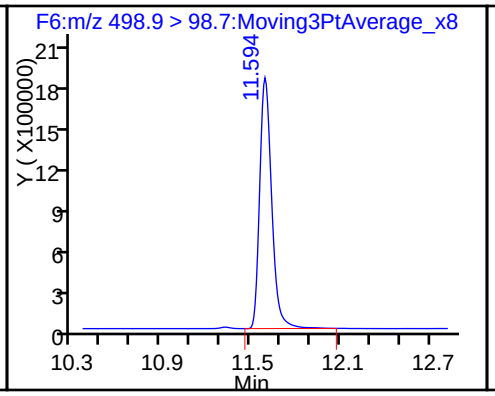
D 16 13C4 PFOS



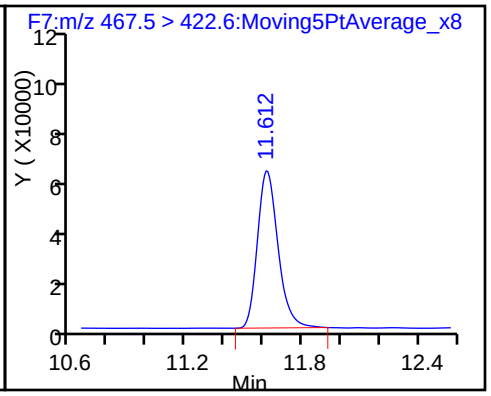
15 Perfluorooctanoic Sulfonate



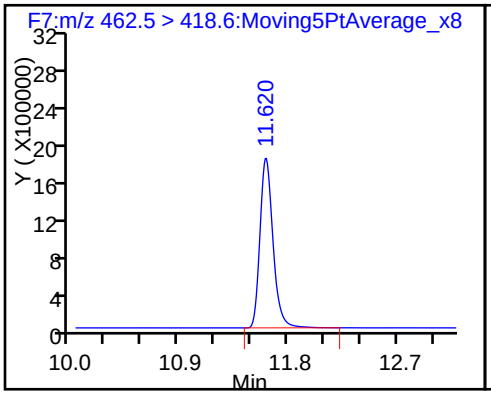
15 Perfluorooctanoic Sulfonate



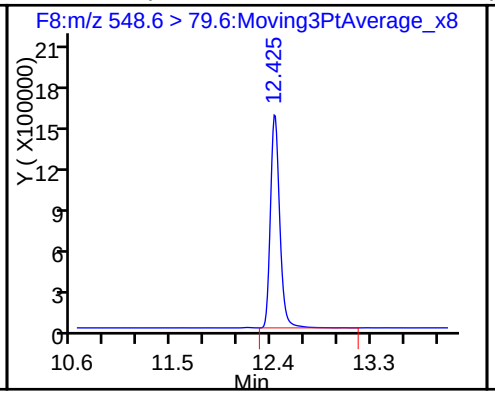
D 17 13C5 PFNA



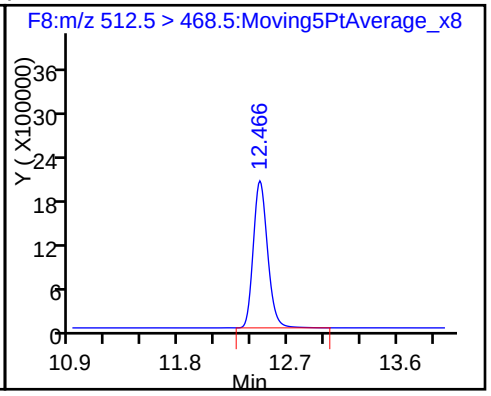
18 Perfluorononanoic acid



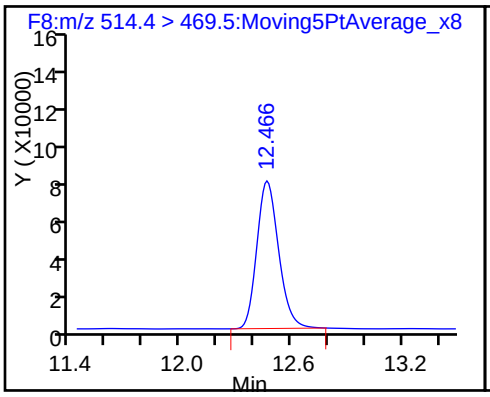
21 PFNS (Perflouro-1-nonanesulfonate)



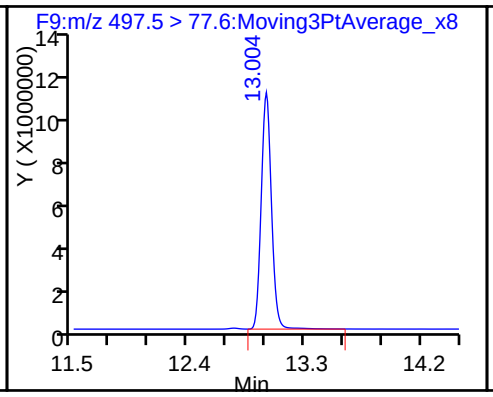
20 Perfluorodecanoic acid



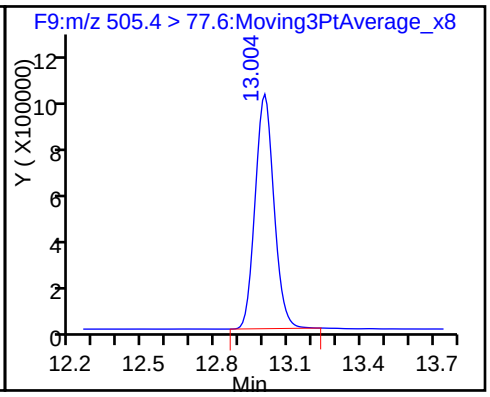
D 19 13C2 PFDA



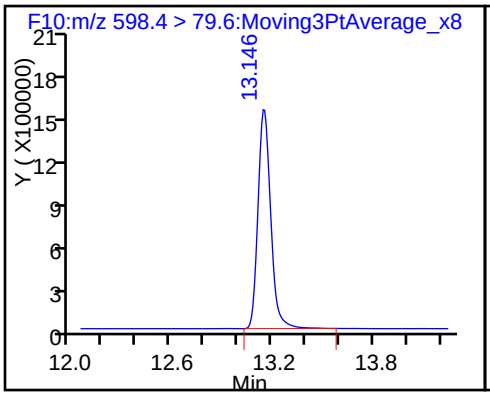
24 Perfluorooctane Sulfonamide



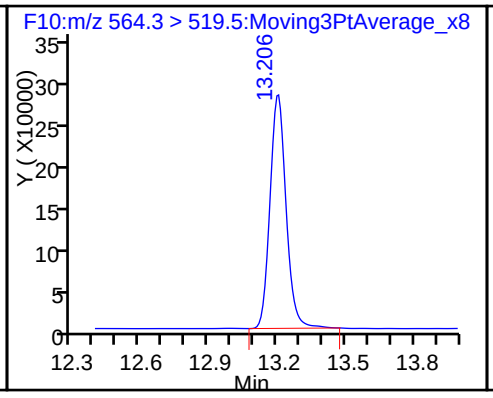
D 23 13C8 FOSA



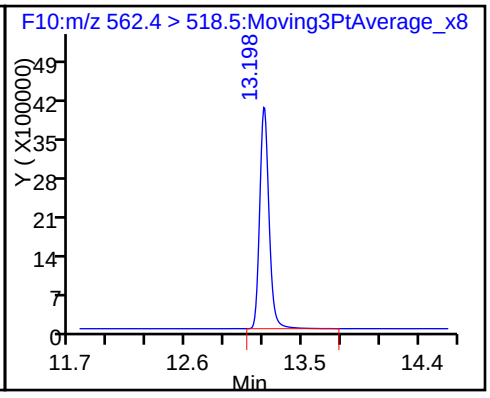
25 Perfluorodecane Sulfonate



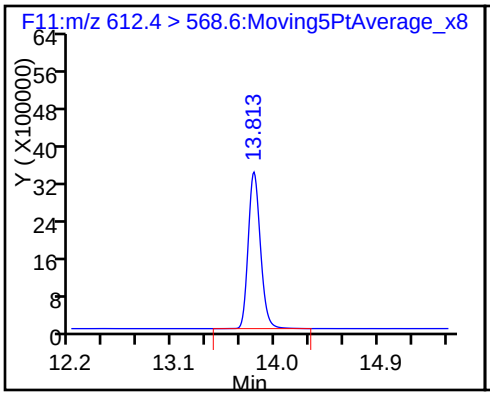
D 26 13C2 PFUnA



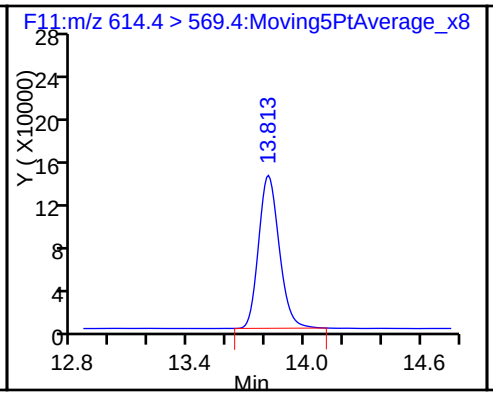
27 Perfluoroundecanoic acid



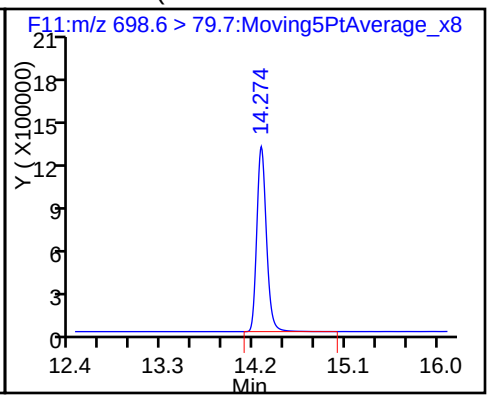
29 Perfluorododecanoic acid



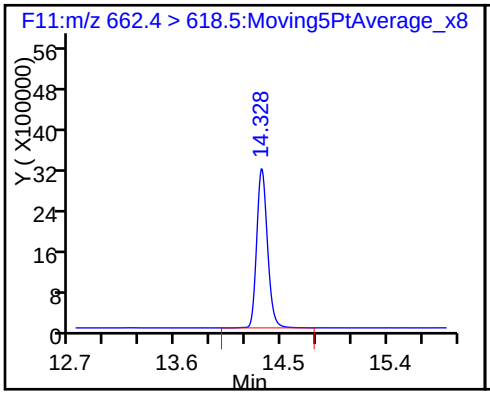
D 28 13C2 PFDoA



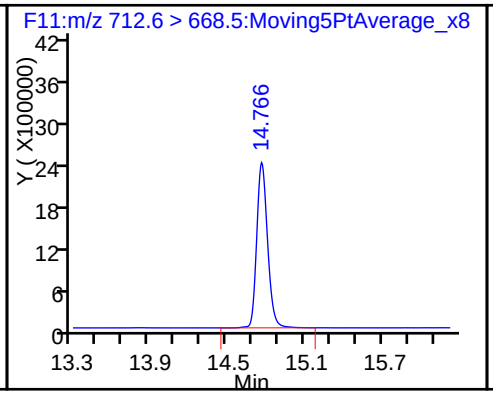
31 PFDoS (Perflouro-1-dodecanesulfona



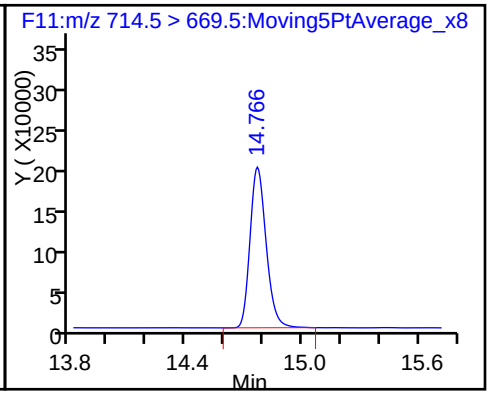
30 Perfluorotridecanoic acid



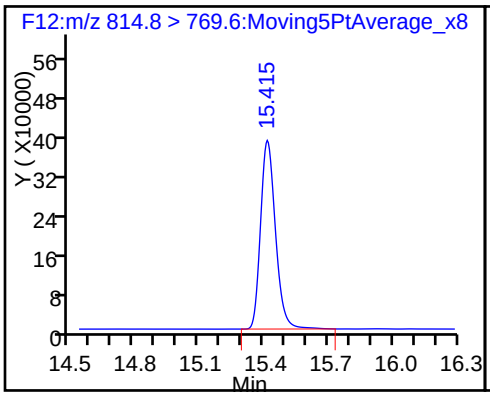
32 Perfluorotetradecanoic acid



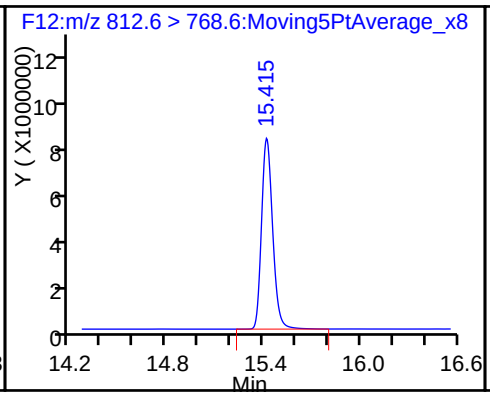
D 33 13C2-PFTeDA



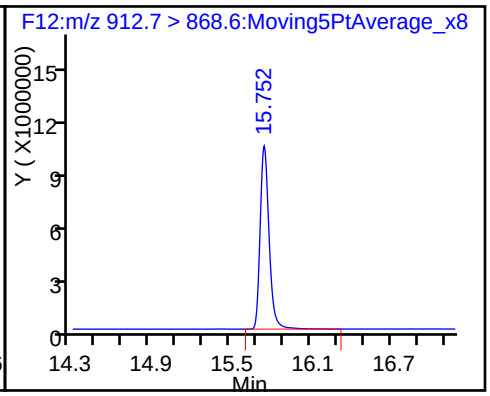
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Lab Sample ID: ICV 320-59779/22 Calibration Date: 12/04/2014 10:23

Instrument ID: A4 Calib Start Date: 12/04/2014 03:44

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/04/2014 05:51

Lab File ID: 03DEC14A4A_058.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	2.351	2.637		56.1	50.0	12.2	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.654	1.886		57.0	50.0	14.0	50.0
Perfluorobutane Sulfonate (PFBS)	AveID	0.9863	1.236		55.5	44.3	25.3	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9761	1.190		61.0	50.0	21.9	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.525	2.160		70.8	50.0	41.7	50.0
Perfluorohexane Sulfonate (PFHxS)	AveID	0.9222	1.119		57.4	47.3	21.4	50.0
Perfluoro-1-heptanesulfonate (PFHpS)	AveID	0.8647	0.9109		50.1	47.6	5.3	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.670	1.812		54.2	50.0	8.5	50.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.805	1.655		43.8	47.8	-8.3	50.0
Perfluorononanoic acid (PFNA)	AveID	1.153	1.206		52.3	50.0	4.6	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9544	1.211		63.4	50.0	26.8	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9501	0.9856		51.9	50.0	3.7	50.0
Perfluorodecane sulfonate (PFDS)	AveID	0.6467	0.7475		55.8	48.3	15.6	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8839	1.141		64.5	50.0	29.1	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9863	1.176		59.6	50.0	19.2	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8175	0.9516		58.2	50.0	16.4	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5200	0.6011		57.8	50.0	15.6	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	AveID	1.340	1.644		61.3	50.0	22.7	50.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.420	1.763		62.1	50.0	24.2	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_058.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 04-Dec-2014 10:23:34 ALS Bottle#: 11 Worklist Smp#: 22
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4
Sublist:

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:02:31 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.950	5.934	0.016		78611	18.4		91.9	276	
2 Perfluorobutyric acid										
212.7 > 168.6	5.950	5.935	0.015	1.000	998130	56.1			3772	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.070	7.037	0.033	1.000	713887	57.0			819	
D 3 13C5-PFPeA										
267.6 > 222.7	7.067	7.038	0.029		151391	19.6		98.1	382	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.186	7.157	0.029	1.000	2103191	55.5			4835	
298.8 > 98.6	7.186	7.157	0.029	1.000	1253987		1.68(0.00-0.00)		2670	
D 6 13C2 PFHxA										
314.6 > 269.7	8.317	8.282	0.035		380517	20.0		99.8	1366	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.317	8.284	0.033	1.000	1132047	61.0			1862	
D 8 13C4-PFHpA										
366.6 > 321.6	9.538	9.506	0.032		290495	16.4		81.9	1032	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.538	9.508	0.030	1.000	1568563	70.8			3709	
10 Perfluorohexane Sulfonate										
398.8 > 79.7	9.573	9.543	0.030	1.000	2033871	57.4			4859	
D 11 18O2 PFHxS										
402.5 > 83.6	9.573	9.544	0.029		727555	16.2		85.5	2121	
D 12 13C4 PFOA										
416.5 > 371.6	10.660	10.628	0.032		1537054	45.4		90.9	2980	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.660	10.628	0.032	1.000	2784461	54.2			2059	
412.8 > 168.7	10.660	10.628	0.032	1.000	901089		3.09(0.00-0.00)		1834	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
14 Perfluoroheptane Sulfonate										
448.8 > 79.7	10.660	10.635	0.025	1.000	1849156	50.1			2439	
D 16 13C4 PFOS										
502.4 > 79.7	11.610	11.595	0.015		2038537	45.2		94.6	3811	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.619	11.595	0.024	1.000	3369395	43.8			2694	
498.9 > 98.7	11.619	11.595	0.024	1.000	1930634		1.75(0.00-0.00)		2401	
D 17 13C5 PFNA										
467.5 > 422.6	11.637	11.614	0.023		804258	20.8		104	2517	
18 Perfluorononanoic acid										
462.5 > 418.6	11.637	11.616	0.021	1.000	2424305	52.3			2893	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.476	12.461	0.015	1.000	3129689	63.4			3766	
D 19 13C2 PFDA										
514.4 > 469.5	12.476	12.463	0.013		1034113	20.1		100	2116	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.012	12.998	0.014	1.000	7036514	51.9			2509	
D 23 13C8 FOSA										
505.4 > 77.6	13.012	12.998	0.014		7139099	49.9		99.8	5003	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.154	13.152	0.002	1.000	1538194	55.8			2286	
D 26 13C2 PFUnA										
564.3 > 519.5	13.198	13.198	0.0		1158043	17.9		89.4	2092	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.198	13.198	0.0	1.000	3303471	64.5			3542	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.811	13.808	0.003	1.000	3801675	59.6			2789	
D 28 13C2 PFDoA										
614.4 > 569.4	13.811	13.809	0.002		1293615	19.8		99.0	1668	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.327	14.327	0.0	1.000	3077366	58.2			1847	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.765	14.766	-0.001	1.000	1943943	57.8			1926	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.765	14.766	-0.001		1424288	19.9		99.6	2616	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.404	15.415	-0.011		2266653	21.7		109	2388	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.404	15.415	-0.011	1.000	5315127	61.3			2456	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.736	15.752	-0.016	1.000	5702352	62.1			2021	

Reagents:

LCPFCIC_00005 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2014 10:02:31 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_058.d

Injection Date: 04-Dec-2014 10:23:34 Instrument ID: A4

Lims ID: ICV

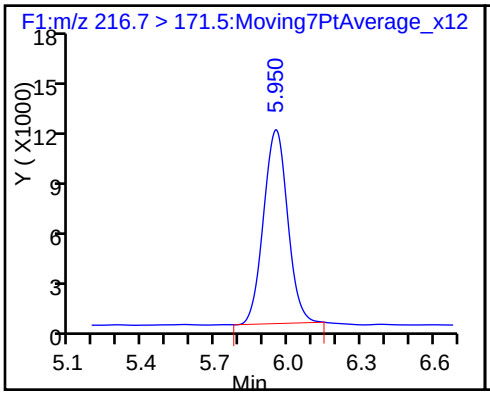
Client ID:

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

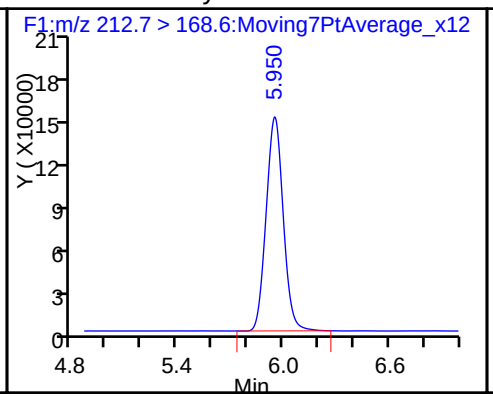
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC ICAL

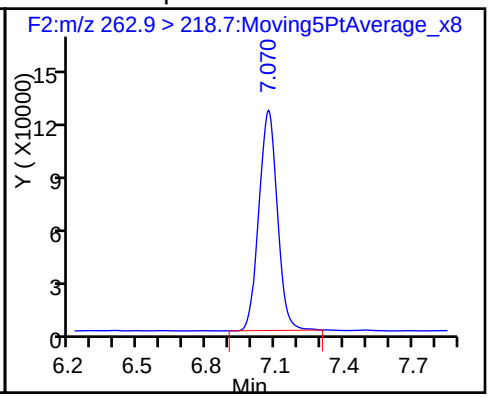
D 1 13C4 PFBA



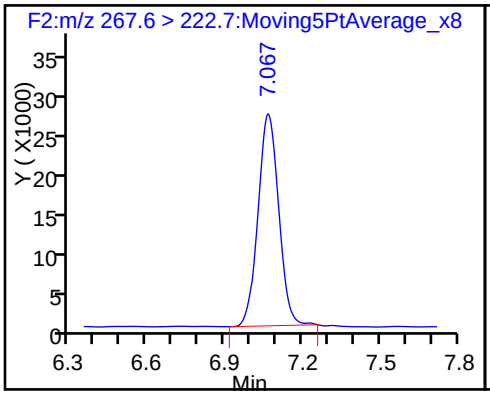
2 Perfluorobutyric acid



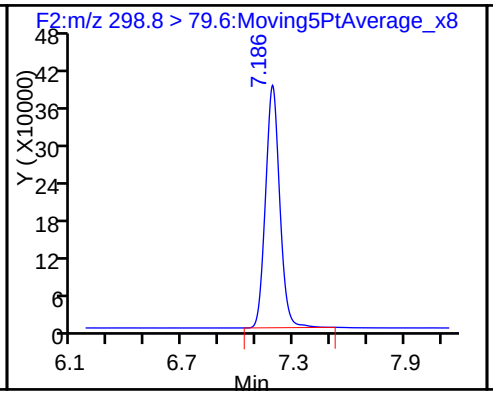
4 Perfluoropentanoic acid



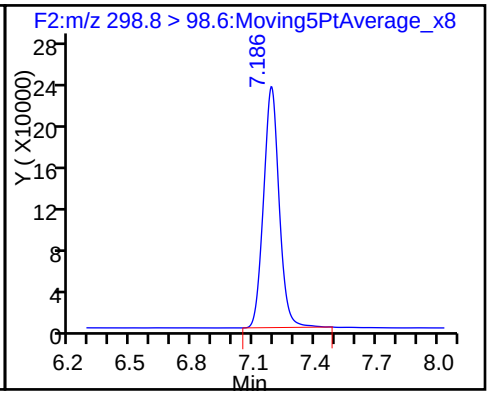
D 3 13C5-PFPeA



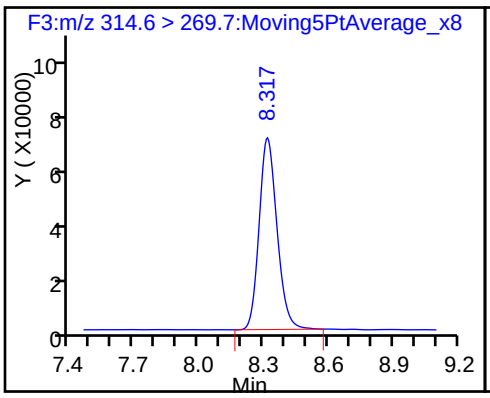
5 Perfluorobutane Sulfonate



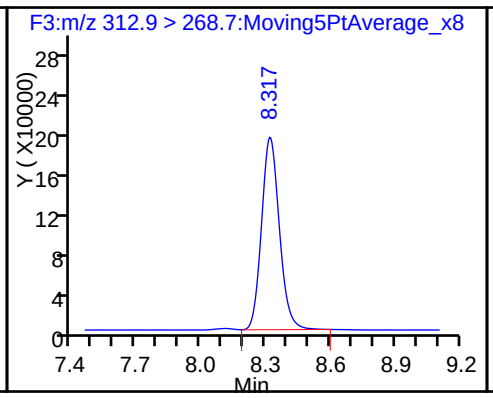
5 Perfluorobutane Sulfonate



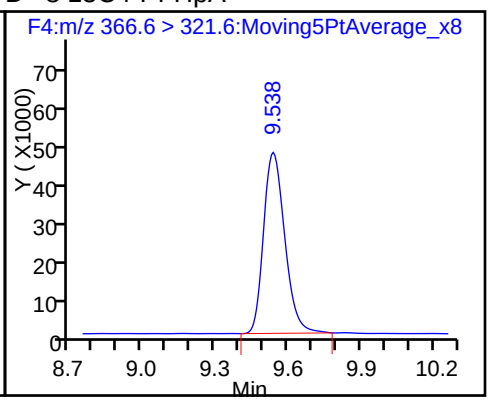
D 6 13C2 PFHxA



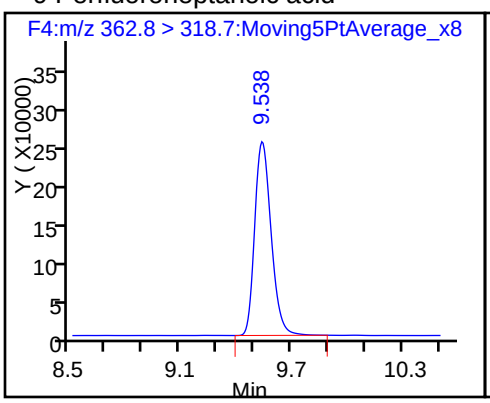
7 Perfluorohexanoic acid



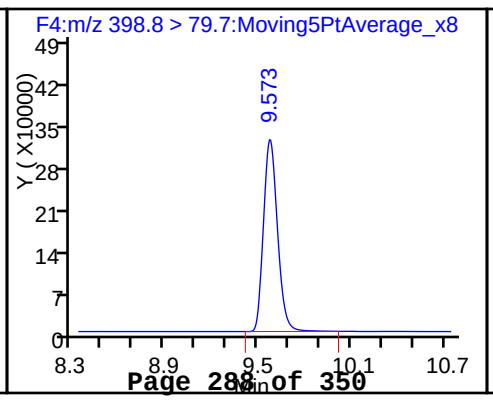
D 8 13C4-PFHpA



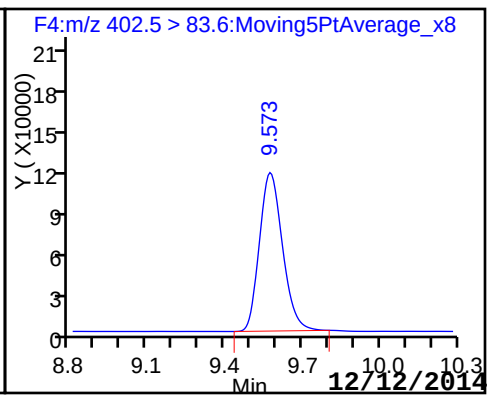
9 Perfluoroheptanoic acid



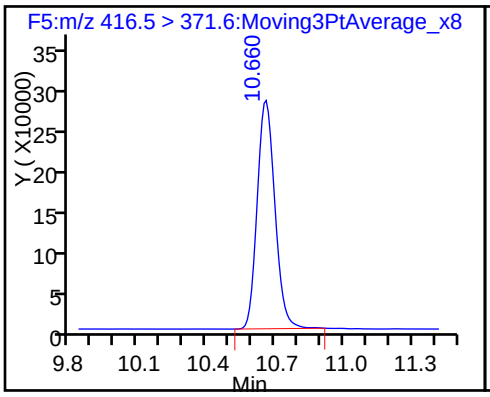
10 Perfluorohexane Sulfonate



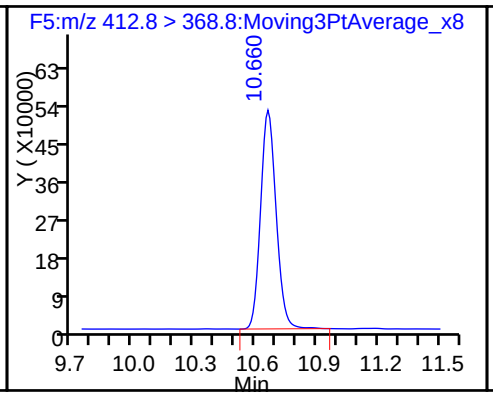
D 11 18O2 PFHxS



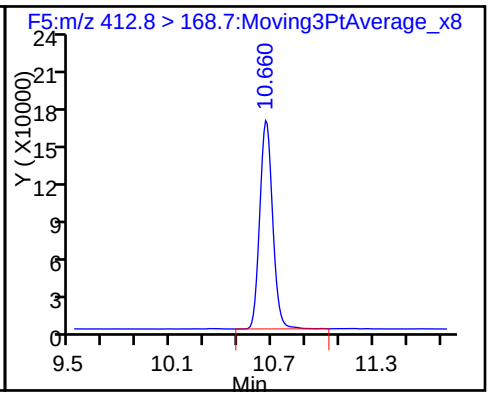
D 12 13C4 PFOA



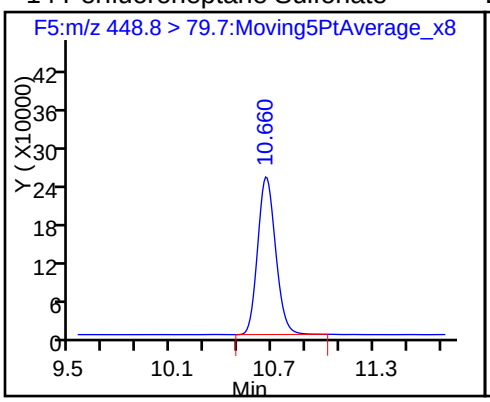
13 Perfluorooctanoic acid



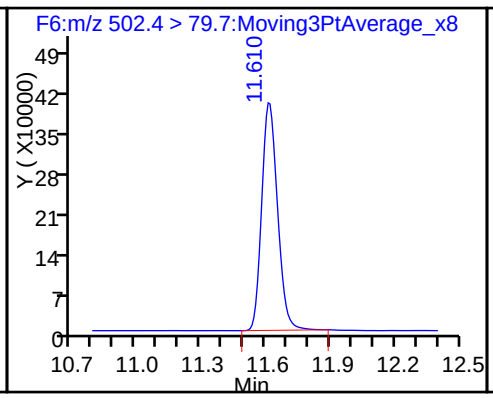
13 Perfluorooctanoic acid



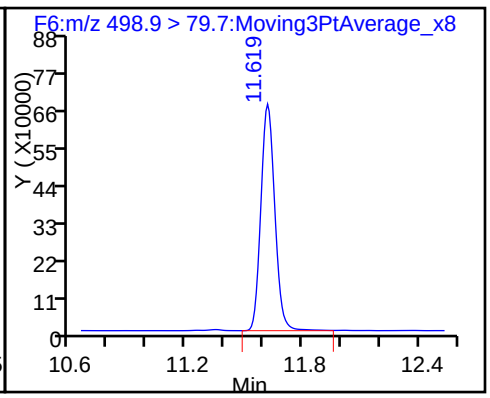
14 Perfluoroheptane Sulfonate



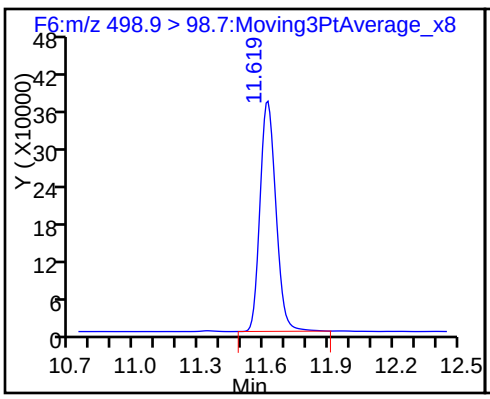
D 16 13C4 PFOS



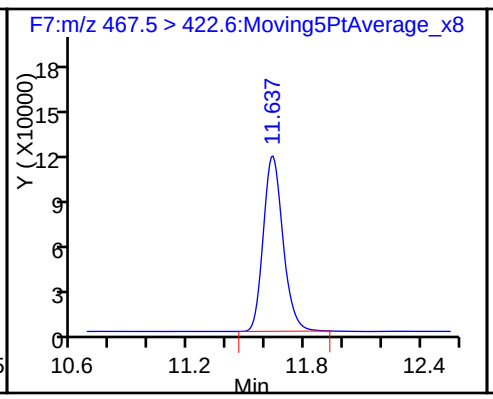
15 Perfluorooctanoic Sulfonate



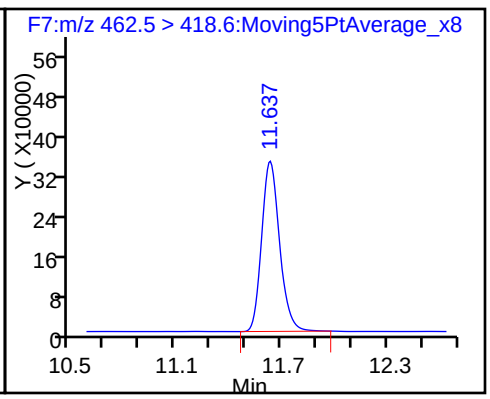
15 Perfluorooctanoic Sulfonate



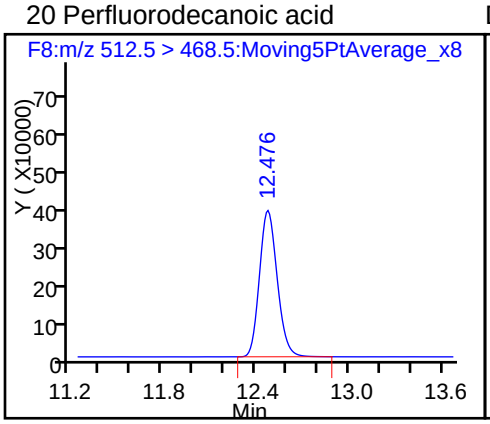
D 17 13C5 PFNA



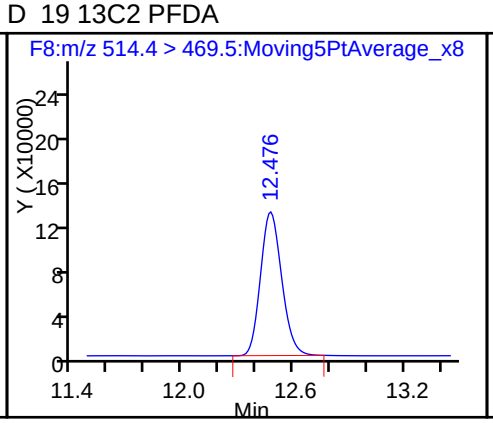
18 Perfluorononanoic acid



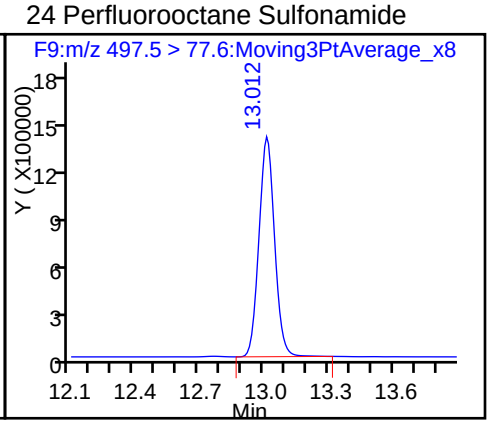
20 Perfluorodecanoic acid



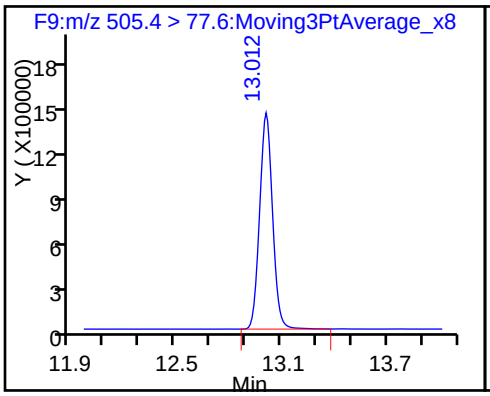
D 19 13C2 PFDA



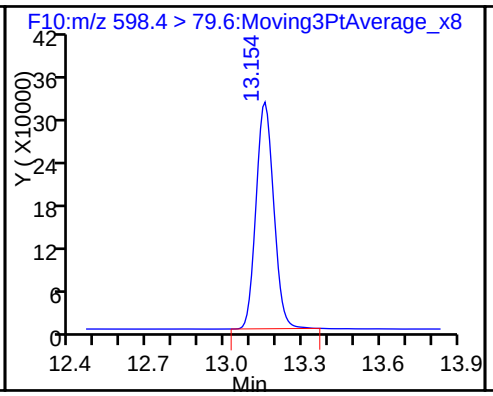
24 Perfluorooctane Sulfonamide



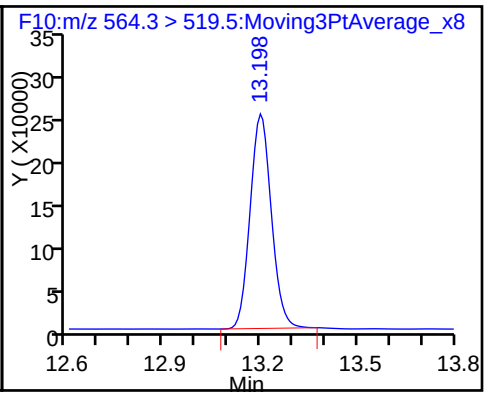
D 23 13C8 FOSA



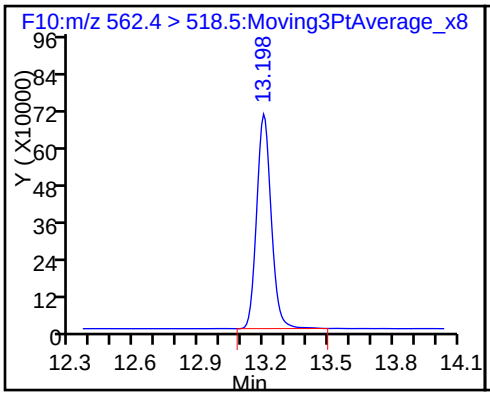
25 Perfluorodecane Sulfonate



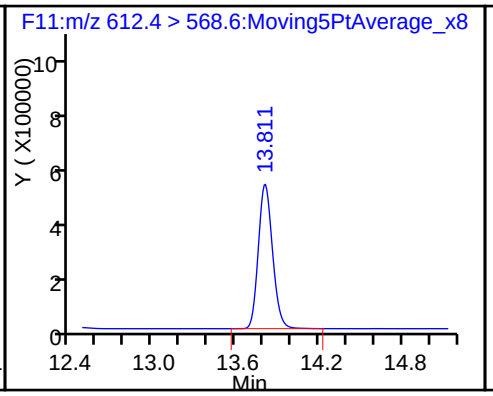
D 26 13C2 PFUnA



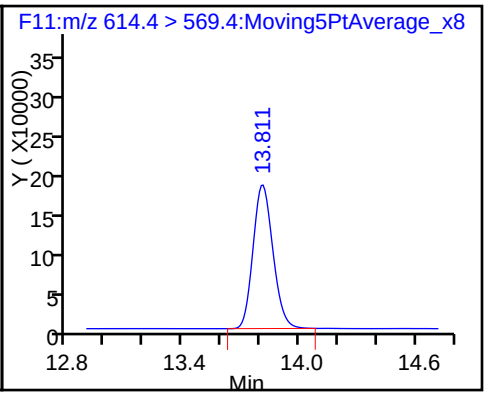
27 Perfluoroundecanoic acid



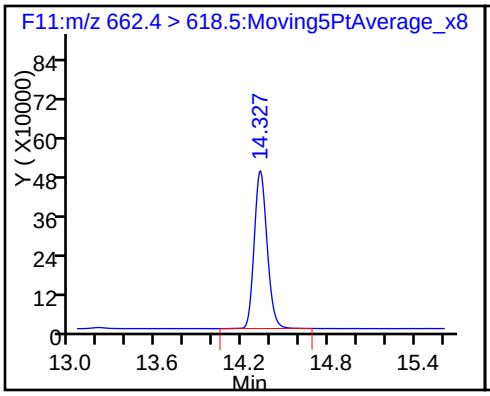
29 Perfluorododecanoic acid



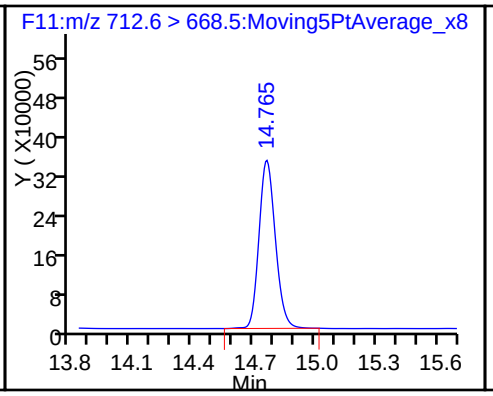
D 28 13C2 PFDoA



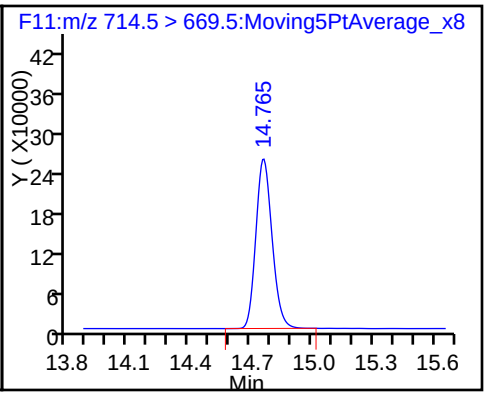
30 Perfluorotridecanoic acid



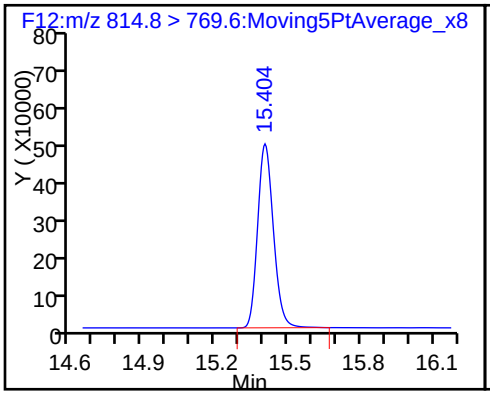
32 Perfluorotetradecanoic acid



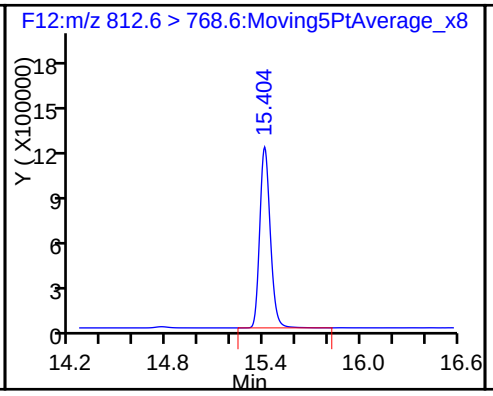
D 33 13C2-PFTeDA



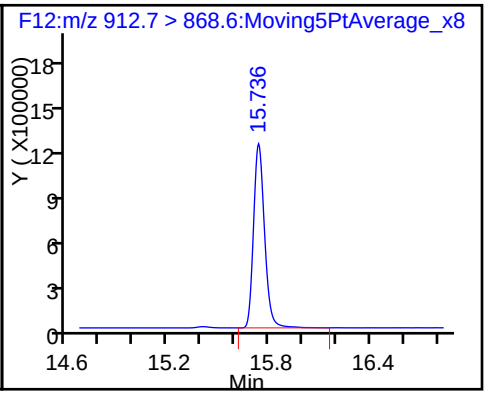
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Lab Sample ID: CCV 320-59779/45 Calibration Date: 12/04/2014 19:42

Instrument ID: A4 Calib Start Date: 12/04/2014 03:44

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/04/2014 05:51

Lab File ID: 03DEC14A4A_081.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	2.351	3.794		32.3	20.0	61.4*	40.0
Perfluoropentanoic acid (PFPeA)	AveID	1.654	2.282		27.6	20.0	38.0	40.0
Perfluorobutane Sulfonate (PFBS)	AveID	0.9863	1.023		18.3	17.7	3.7	40.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9761	1.252		25.6	20.0	28.2	40.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.525	2.068		27.1	20.0	35.7	40.0
Perfluorohexane Sulfonate (PFHxS)	AveID	0.9222	0.998		20.5	18.9	8.2	40.0
Perfluoro-1-heptanesulfonate (PFHpS)	AveID	0.8647	0.9528		21.0	19.0	10.2	40.0
Perfluorooctanoic acid (PFOA)	AveID	1.670	1.850		22.2	20.0	10.8	40.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.805	1.488		15.8	19.1	-17.6	40.0
Perfluorononanoic acid (PFNA)	AveID	1.153	1.142		19.8	20.0	-1.0	40.0
Perfluorodecanoic acid (PFDA)	AveID	0.9544	1.018		21.3	20.0	6.6	40.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9501	1.009		21.2	20.0	6.2	40.0
Perfluorodecane sulfonate (PFDS)	AveID	0.6467	0.7121		21.2	19.3	10.1	40.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8839	1.135		25.7	20.0	28.4	40.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9863	1.182		24.0	20.0	19.9	40.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8175	0.9328		22.8	20.0	14.1	40.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5200	0.5912		22.7	20.0	13.7	40.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	AveID	1.340	1.503		22.4	20.0	12.2	40.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.420	1.589		22.4	20.0	11.9	40.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_081.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 04-Dec-2014 19:42:11 ALS Bottle#: 13 Worklist Smp#: 45
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub5

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:03:21 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.928	5.934	-0.006		37702	8.81		44.1	164	
2 Perfluorobutyric acid										
212.7 > 168.6	5.928	5.935	-0.007	1.000	368051	32.3		161	1250	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.036	7.037	-0.001	1.000	221395	27.6		138	299	
D 3 13C5-PFPeA										
267.6 > 222.7	7.036	7.038	-0.002		97006	12.6		62.9	407	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.154	7.157	-0.003	1.000	809307	18.3		104	2339	
298.8 > 98.6	7.154	7.157	-0.003	1.000	515857		1.57(0.00-0.00)		1627	
D 6 13C2 PFHxA										
314.6 > 269.7	8.284	8.282	0.002		284568	14.9		74.7	990	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.284	8.284	0.0	1.000	356142	25.6		128	727	
22 PFPeS (Perflouro-1-pentanesulfonat										
348.7 > 79.5	8.360	8.360	0.0	0.876	678416	19.3		103	1522	
D 8 13C4-PFHpA										
366.6 > 321.6	9.510	9.506	0.004		292541	16.5		82.4	597	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.510	9.508	0.002	1.000	605064	27.1		136	1746	
10 Perfluorohexane Sulfonate										
398.8 > 79.7	9.545	9.543	0.002	1.000	844262	20.5		108	2060	
D 11 18O2 PFHxS										
402.5 > 83.6	9.545	9.544	0.001		846358	18.8		99.5	2006	
D 12 13C4 PFOA										
416.5 > 371.6	10.632	10.628	0.004		1785879	52.8		106	2174	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
412.8 > 368.8	10.642	10.628	0.014	1.000	1321432	22.2		111	1760	
412.8 > 168.7	10.642	10.628	0.014	1.000	399862		3.30(0.00-0.00)		592	
14 Perfluoroheptane Sulfonate										
448.8 > 79.7	10.642	10.635	0.007	1.000	862776	21.0		110	1352	
D 16 13C4 PFOS										
502.4 > 79.7	11.602	11.595	0.007		2273365	50.4		105	5010	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.602	11.595	0.007	1.000	1352981	15.8		82.4	1845	
498.9 > 98.7	11.602	11.595	0.007	1.000	777457		1.74(0.00-0.00)		1773	
D 17 13C5 PFNA										
467.5 > 422.6	11.620	11.614	0.006		882241	22.8		114	2428	
18 Perfluorononanoic acid										
462.5 > 418.6	11.620	11.616	0.004	1.000	1007484	19.8		99.0	1627	
21 PFNS (Perflouro-1-nonanesulfonate)										
548.6 > 79.6	12.435	12.429	0.006	1.000	709832	20.3		106	1096	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.466	12.461	0.005	1.000	1152984	21.3		107	1270	
D 19 13C2 PFDA										
514.4 > 469.5	12.466	12.463	0.003		1132812	22.0		110	2279	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.004	12.998	0.006	1.000	2996256	21.2		106	2169	
D 23 13C8 FOSA										
505.4 > 77.6	13.004	12.998	0.006		7425537	51.9		104	4287	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.154	13.152	0.002	1.000	652922	21.2		110	985	
D 26 13C2 PFUnA										
564.3 > 519.5	13.198	13.198	0.0		1234387	19.1		95.3	2050	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.198	13.198	0.0	1.000	1400526	25.7		128	1903	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.811	13.808	0.003	1.000	1627337	24.0		120	1143	
D 28 13C2 PFDoA										
614.4 > 569.4	13.811	13.809	0.002		1376207	21.1		105	1822	
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.273	14.272	0.001	1.000	732714	23.4		121	1367	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.327	14.327	0.0	1.000	1283705	22.8		114	847	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.765	14.766	-0.001	1.000	813561	22.7		114	728	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.765	14.766	-0.001		1526321	21.3		107	2478	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.404	15.415	-0.011		2277015	21.8		109	2792	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.404	15.415	-0.011	1.000	2068581	22.4		112	1315	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.736	15.752	-0.016	1.000	2186469	22.4		112	1210	

Reagents:

LCPFC-L4_00005 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2014 10:03:22 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_081.d

Injection Date: 04-Dec-2014 19:42:11 Instrument ID: A4

Lims ID: CCV L4

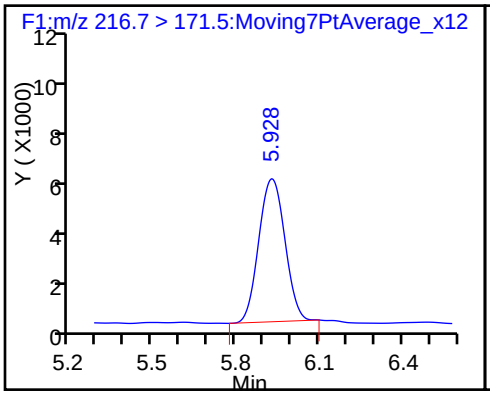
Client ID:

Operator ID: JRB ALS Bottle#: 13 Worklist Smp#: 45

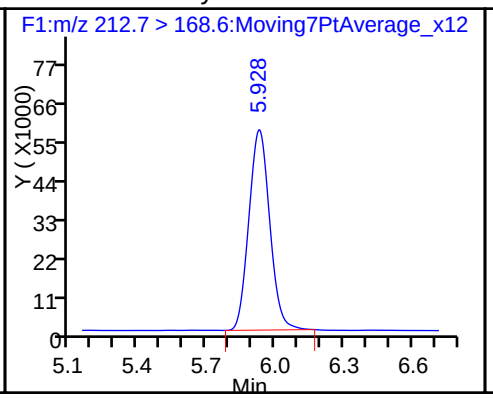
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC ICAL

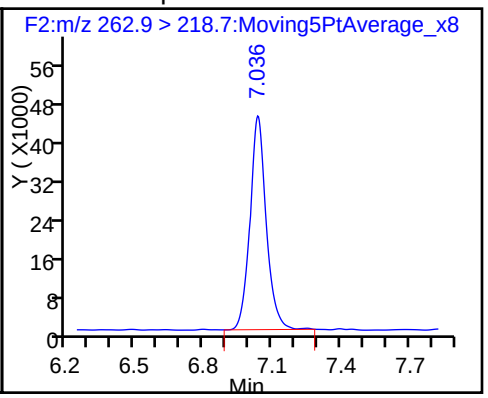
D 1 13C4 PFBA



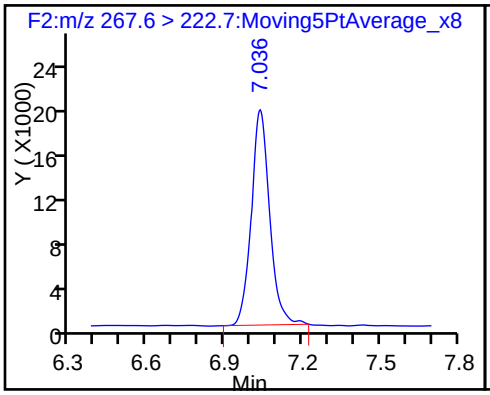
2 Perfluorobutyric acid



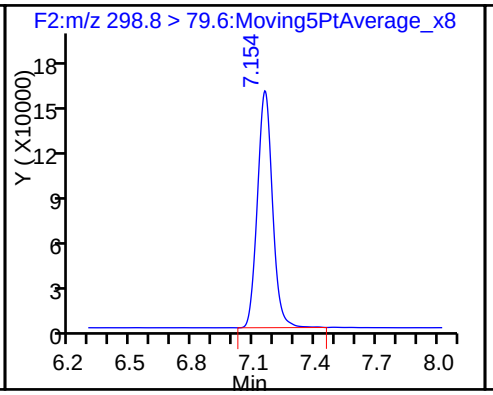
4 Perfluoropentanoic acid



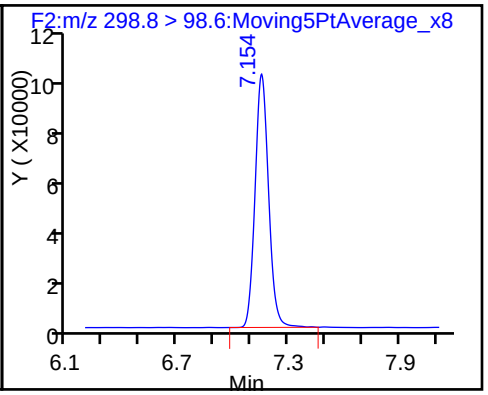
D 3 13C5-PFPeA



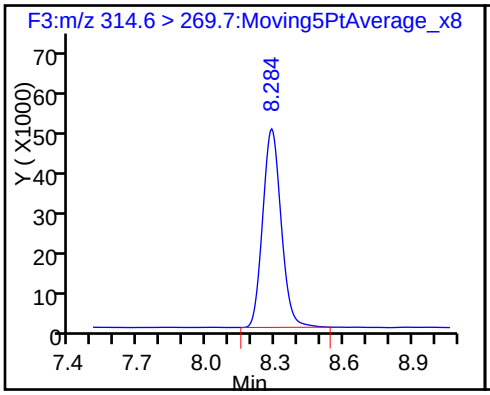
5 Perfluorobutane Sulfonate



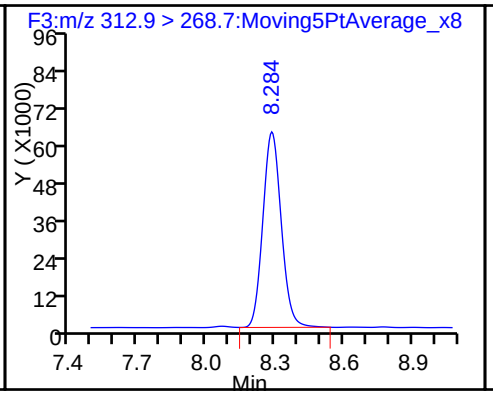
5 Perfluorobutane Sulfonate



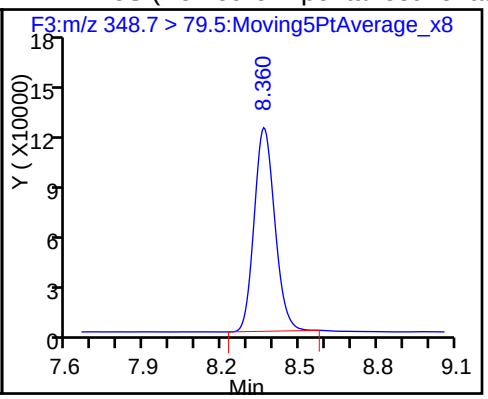
D 6 13C2 PFHxA



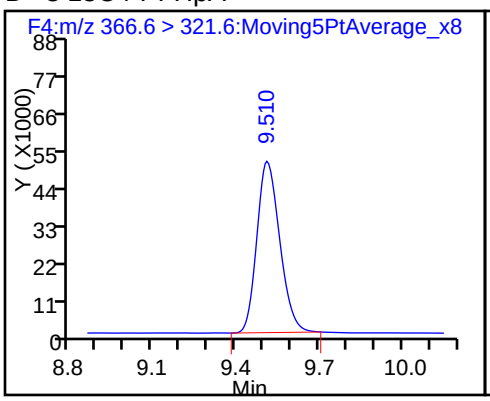
7 Perfluorohexanoic acid



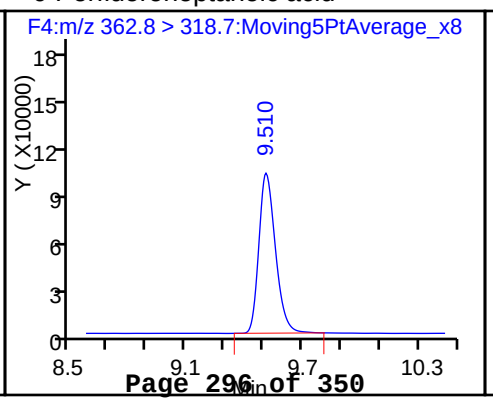
22 PFPeS (Perflouro-1-pentanesulfonat



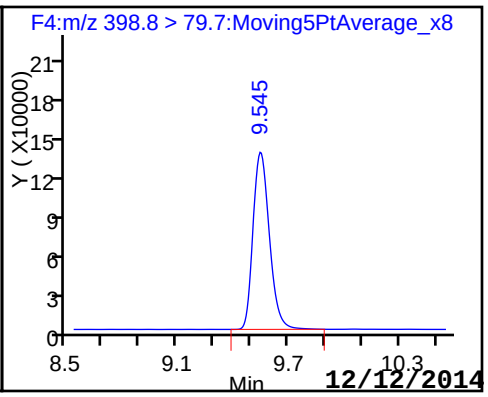
D 8 13C4-PFHpA



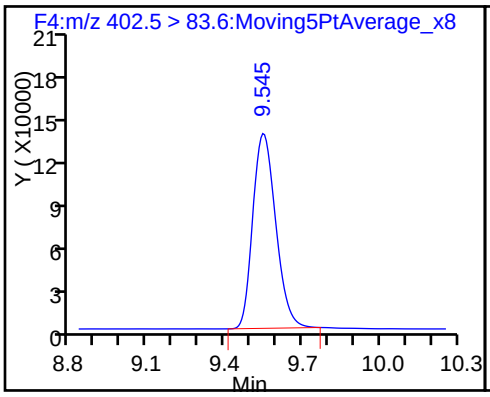
9 Perfluoroheptanoic acid



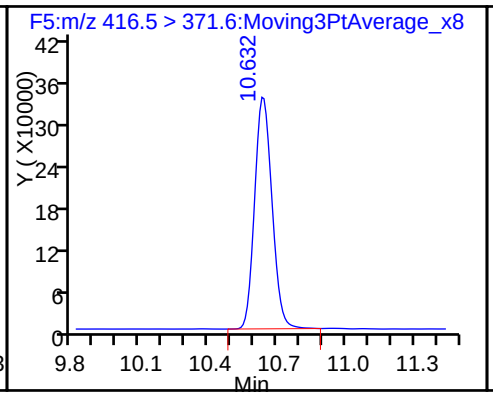
10 Perfluorohexane Sulfonate



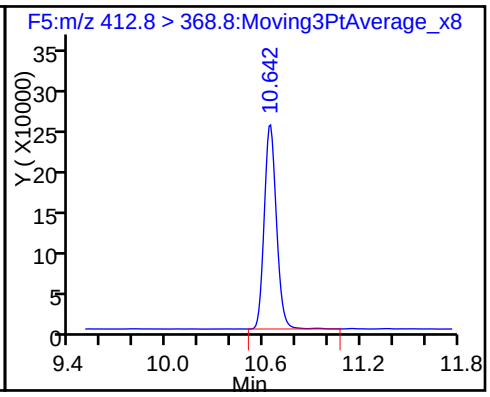
D 11 18O2 PFHxS



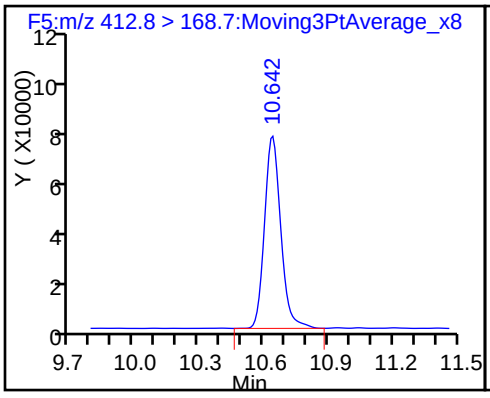
D 12 13C4 PFOA



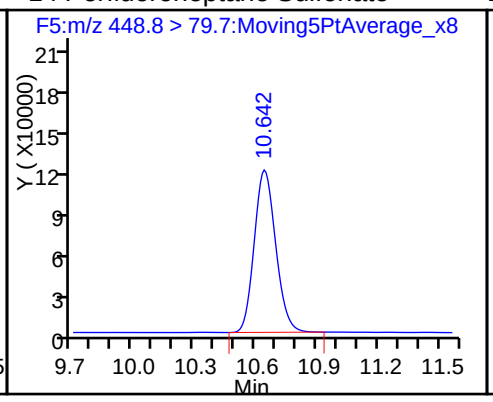
13 Perfluorooctanoic acid



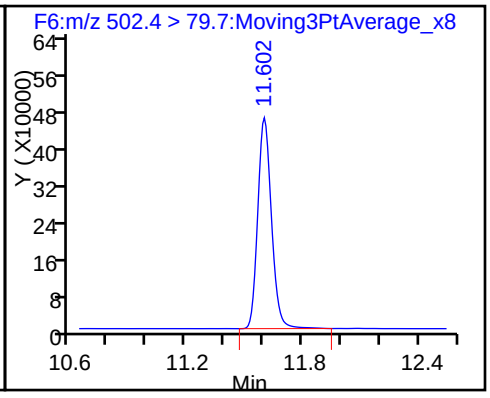
13 Perfluorooctanoic acid



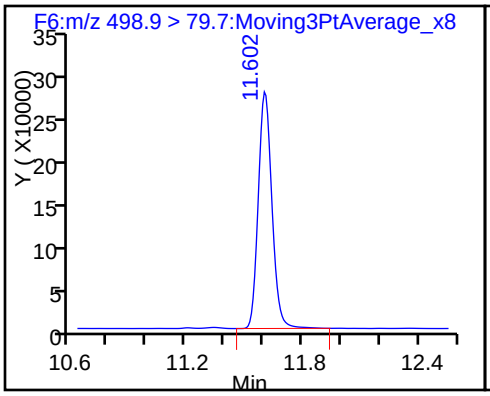
14 Perfluoroheptane Sulfonate



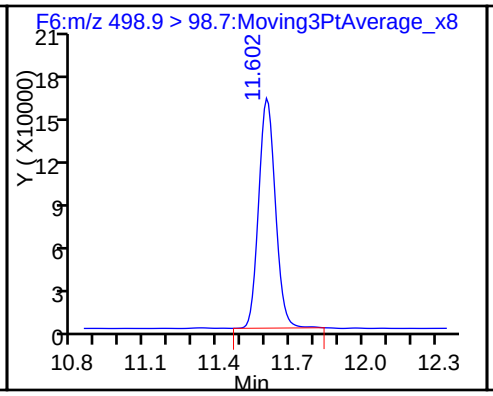
D 16 13C4 PFOS



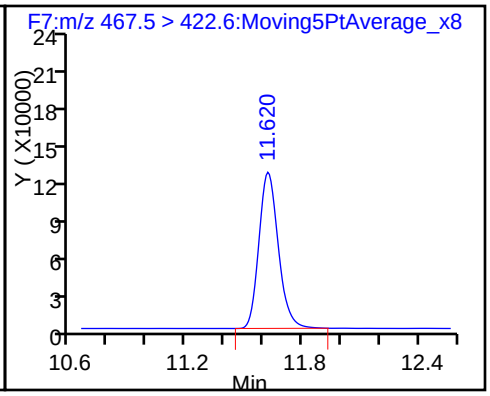
15 Perfluorooctanoic Sulfonate



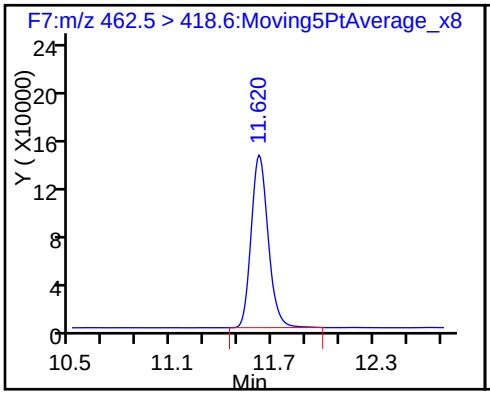
15 Perfluorooctanoic Sulfonate



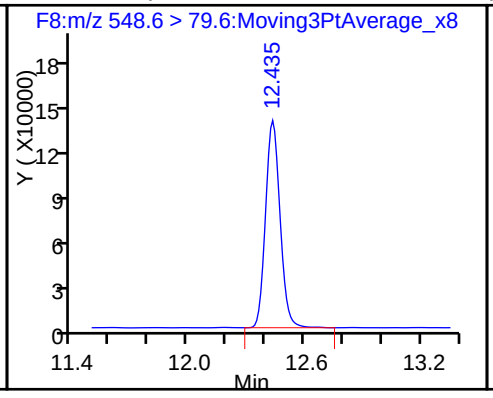
D 17 13C5 PFNA



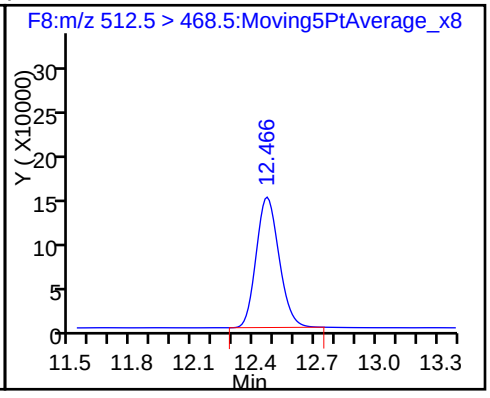
18 Perfluorononanoic acid



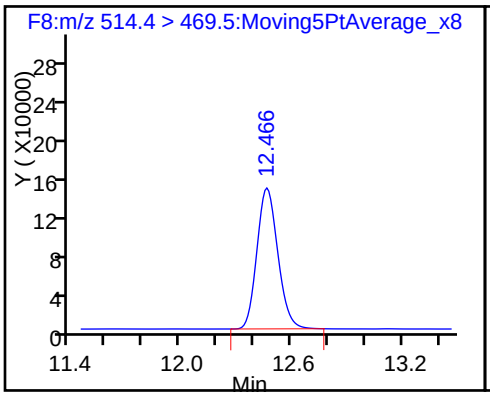
21 PFNS (Perflouro-1-nonanesulfonate)



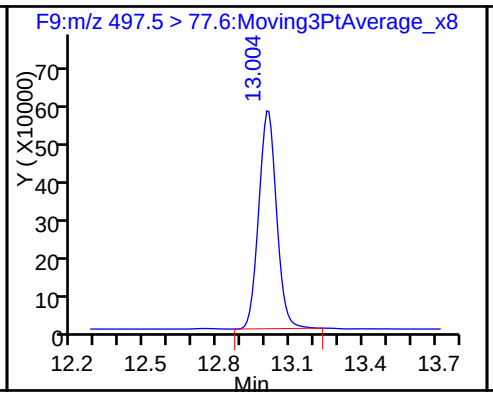
20 Perfluorodecanoic acid



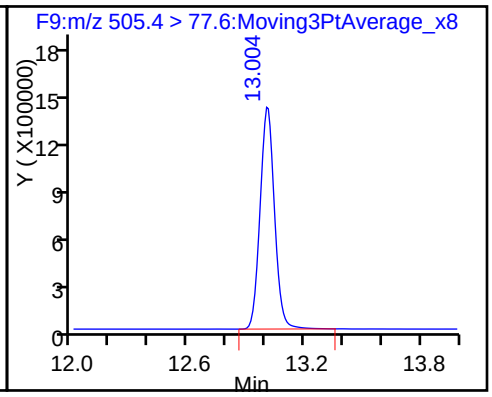
D 19 13C2 PFDA



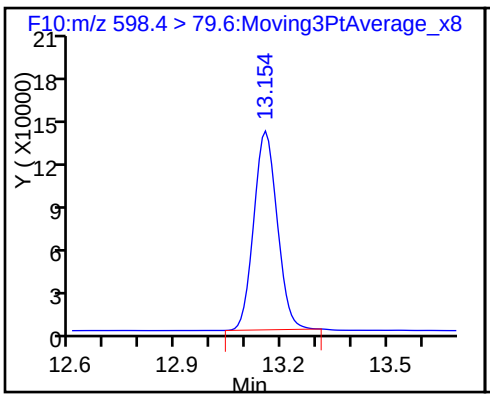
24 Perfluorooctane Sulfonamide



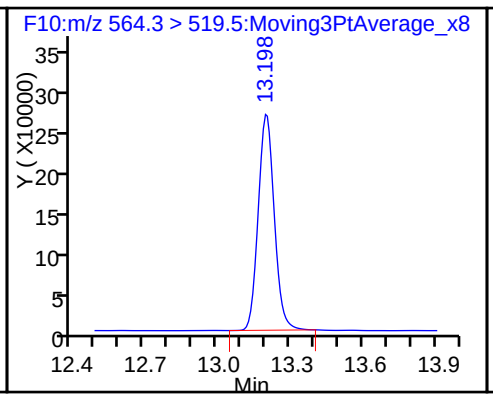
D 23 13C8 FOSA



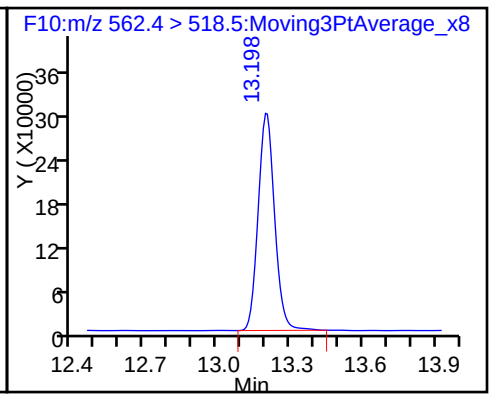
25 Perfluorodecane Sulfonate



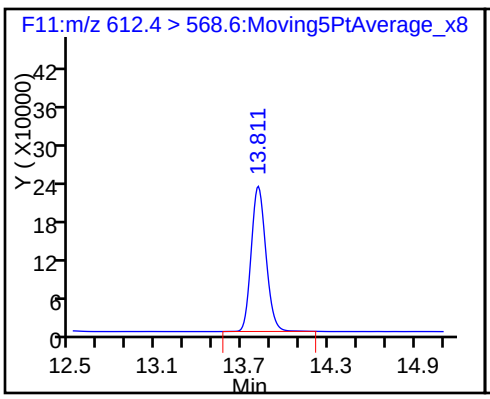
D 26 13C2 PFUnA



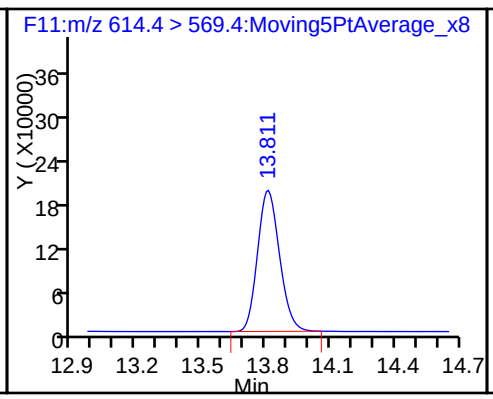
27 Perfluoroundecanoic acid



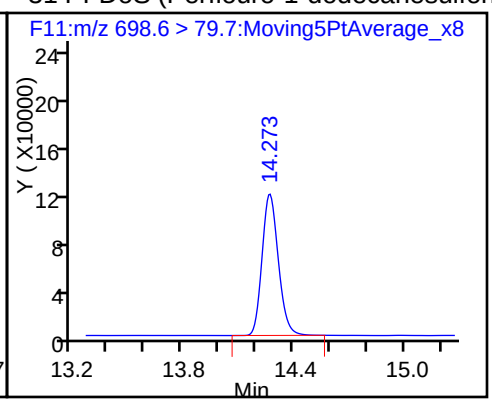
29 Perfluorododecanoic acid



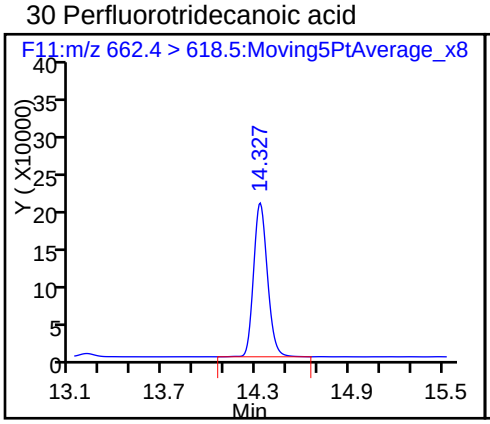
D 28 13C2 PFDoA



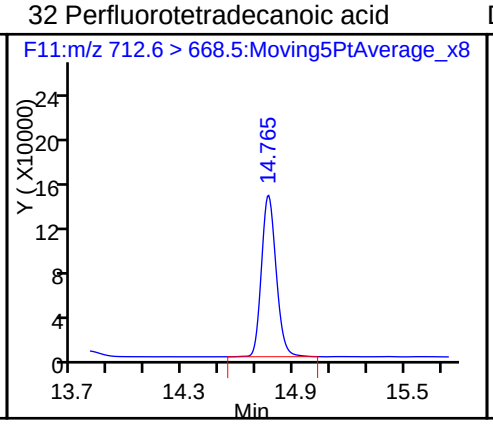
31 PFDoS (Perflouro-1-dodecanesulfona



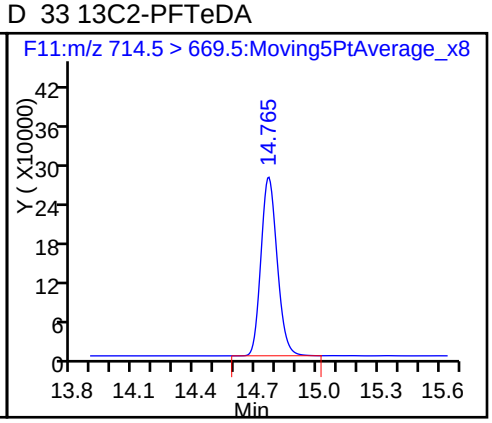
30 Perfluorotridecanoic acid



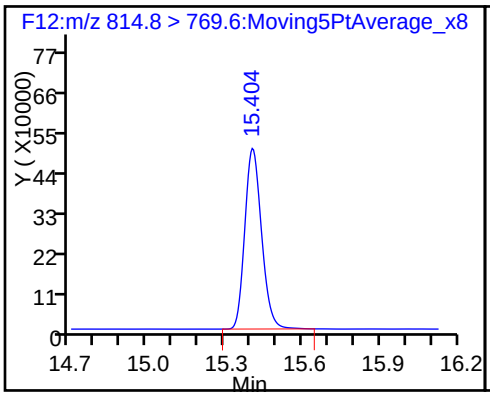
32 Perfluorotetradecanoic acid



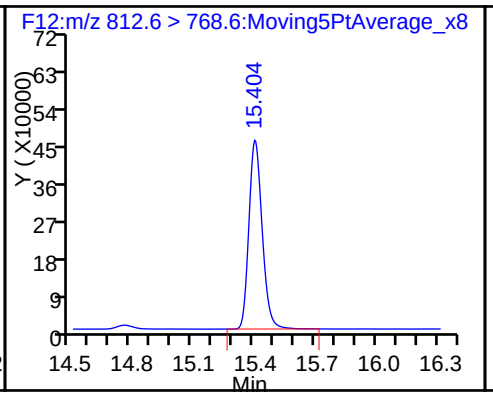
D 33 13C2-PFTeDA



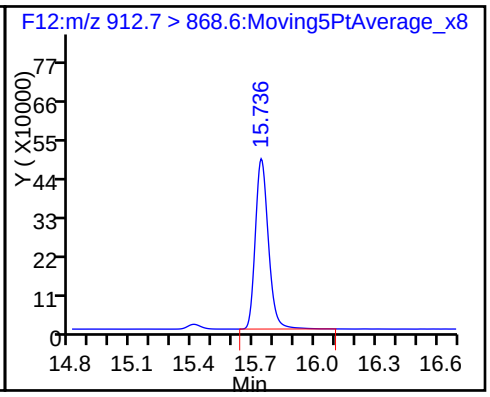
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Lab Sample ID: CCV 320-59779/57 Calibration Date: 12/04/2014 23:56

Instrument ID: A4 Calib Start Date: 12/04/2014 03:44

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/04/2014 05:51

Lab File ID: 03DEC14A4A_093.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	2.351	3.249		69.1	50.0	38.2	40.0
Perfluoropentanoic acid (PFPeA)	AveID	1.654	2.193		66.3	50.0	32.6	40.0
Perfluorobutane Sulfonate (PFBS)	AveID	0.9863	1.639		73.5	44.2	66.2*	40.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9761	1.185		60.7	50.0	21.4	40.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.525	1.987		65.1	50.0	30.3	40.0
Perfluorohexane Sulfonate (PFHxS)	AveID	0.9222	1.045		53.6	47.3	13.3	40.0
Perfluoro-1-heptanesulfonate (PFHpS)	AveID	0.8647	0.9556		52.6	47.6	10.5	40.0
Perfluorooctanoic acid (PFOA)	AveID	1.670	1.657		49.6	50.0	-0.7	40.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.805	1.512		40.0	47.8	-16.2	40.0
Perfluorononanoic acid (PFNA)	AveID	1.153	1.219		52.8	50.0	5.7	40.0
Perfluorodecanoic acid (PFDA)	AveID	0.9544	1.069		56.0	50.0	12.0	40.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9501	1.050		55.3	50.0	10.5	40.0
Perfluorodecane sulfonate (PFDS)	AveID	0.6467	0.6689		49.8	48.2	3.4	40.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8839	1.054		59.6	50.0	19.3	40.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9863	1.179		59.8	50.0	19.5	40.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8175	0.9404		57.5	50.0	15.0	40.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5200	0.5983		57.5	50.0	15.1	40.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	AveID	1.340	1.598		59.6	50.0	19.3	40.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.420	1.784		62.8	50.0	25.7	40.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_093.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 04-Dec-2014 23:56:45 ALS Bottle#: 14 Worklist Smp#: 57
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub5

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 11:43:09 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

First Level Reviewer: barnettj Date: 05-Dec-2014 11:43:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.934	5.934	0.0		43898	10.3		51.3	214	
2 Perfluorobutyric acid										
212.7 > 168.6	5.934	5.935	-0.001	1.000	918655	69.1		138	2962	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.040	7.037	0.003	1.000	619975	66.3		133	784	
D 3 13C5-PFPeA										
267.6 > 222.7	7.040	7.038	0.002		113092	14.7		73.3	417	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.155	7.157	-0.002	1.000	2883515	73.5		166	7024	
298.8 > 98.6	7.155	7.157	-0.002	1.000	1831083		1.57(0.00-0.00)		5544	
D 6 13C2 PFHxA										
314.6 > 269.7	8.286	8.283	0.003		308162	16.2		80.8	907	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.291	8.285	0.006	1.000	912713	60.7		121	1752	
22 PFPeS (Perflouro-1-pentanesulfonat										
348.7 > 79.5	8.367	8.361	0.006	0.876	1689870	54.0		115	4635	
D 8 13C4-PFHpA										
366.6 > 321.6	9.511	9.507	0.004		274996	15.5		77.5	698	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.518	9.509	0.009	1.000	1365733	65.1		130	3237	
10 Perfluorohexane Sulfonate										
398.8 > 79.7	9.552	9.544	0.008	1.000	1966484	53.6		113	3383	
D 11 18O2 PFHxS										
402.5 > 83.6	9.552	9.545	0.007		752958	16.8		88.5	2077	
D 12 13C4 PFOA										
416.5 > 371.6	10.642	10.630	0.012		1624638	48.0		96.0	2184	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
412.8 > 368.8	10.642	10.630	0.012	1.000	2692481	49.6		99.3	3143	
412.8 > 168.7	10.642	10.630	0.012	1.000	885834		3.04(0.00-0.00)		1573	
14 Perfluoroheptane Sulfonate										
448.8 > 79.7	10.642	10.636	0.006	1.000	1989674	52.6		111	4178	
D 16 13C4 PFOS										
502.4 > 79.7	11.602	11.596	0.006		2090959	46.4		97.0	3565	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.602	11.596	0.006	1.000	3160526	40.0		83.8	2974	
498.9 > 98.7	11.602	11.596	0.006	1.000	1809472		1.75(0.00-0.00)		2399	
D 17 13C5 PFNA										
467.5 > 422.6	11.620	11.615	0.005		760335	19.7		98.4	1997	
18 Perfluorononanoic acid										
462.5 > 418.6	11.620	11.617	0.003	1.000	2316836	52.8		106	3784	
21 PFNS (Perflouro-1-nonanesulfonate)										
548.6 > 79.6	12.435	12.430	0.005	1.000	1676333	52.1		109	3571	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.466	12.462	0.004	1.000	2455672	56.0		112	3689	
D 19 13C2 PFDA										
514.4 > 469.5	12.466	12.463	0.003		918867	17.8		89.2	1282	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.003	12.999	0.004	1.000	7228791	55.3		111	2906	
D 23 13C8 FOSA										
505.4 > 77.6	13.003	12.999	0.004		6884880	48.1		96.2	2814	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.145	13.151	-0.006	1.000	1410239	49.8		103	2332	
D 26 13C2 PFUnA										
564.3 > 519.5	13.198	13.198	0.0		1048630	16.2		81.0	1912	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.198	13.198	0.0	1.000	2764337	59.6		119	3977	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.802	13.807	-0.005	1.000	3664061	59.8		120	2495	
D 28 13C2 PFDoA										
614.4 > 569.4	13.802	13.808	-0.006		1243065	19.0		95.1	1371	
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.265	14.271	-0.006	1.000	1614752	56.1		116	2339	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.319	14.326	-0.007	1.000	2922334	57.5		115	2022	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.758	14.765	-0.007	1.000	1859210	57.5		115	1394	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.758	14.765	-0.007		1401500	19.6		98.0	2419	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.404	15.413	-0.009		2197476	21.1		105	2391	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.404	15.413	-0.009	1.000	4965341	59.6		119	2268	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.731	15.749	-0.018	1.000	5545303	62.8		126	1916	

Reagents:

LCPFC-L5_00006 Amount Added: 1.00 Units: mL

Report Date: 05-Dec-2014 11:43:09 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_093.d

Injection Date: 04-Dec-2014 23:56:45 Instrument ID: A4

Lims ID: CCV L5

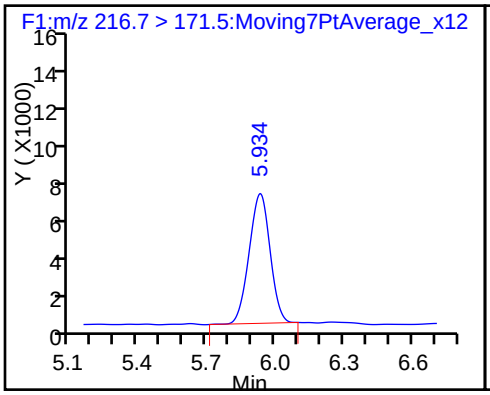
Client ID:

Operator ID: JRB ALS Bottle#: 14 Worklist Smp#: 57

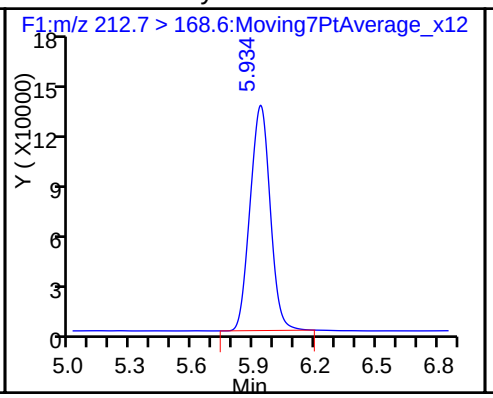
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC ICAL

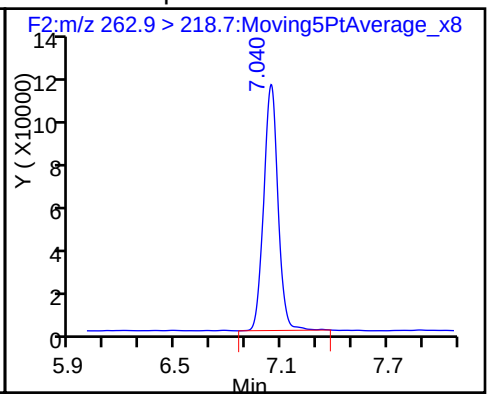
D 1 13C4 PFBA



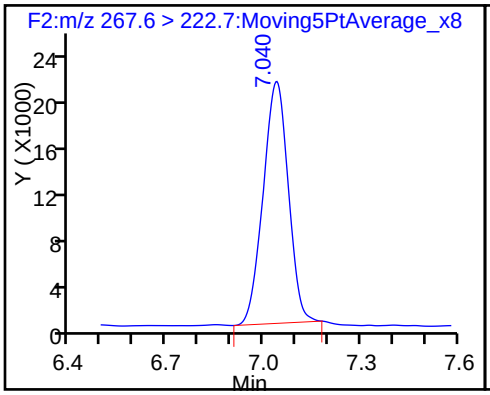
2 Perfluorobutyric acid



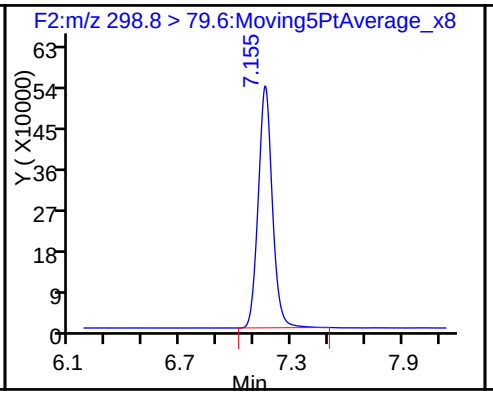
4 Perfluoropentanoic acid



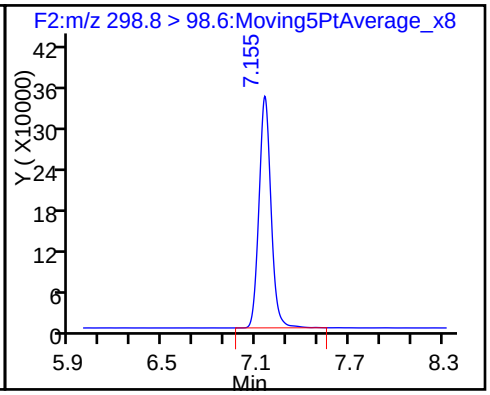
D 3 13C5-PFPeA



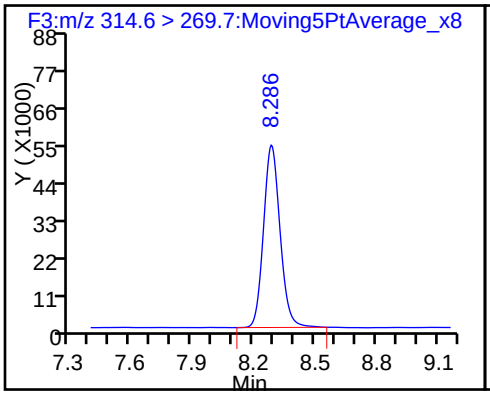
5 Perfluorobutane Sulfonate



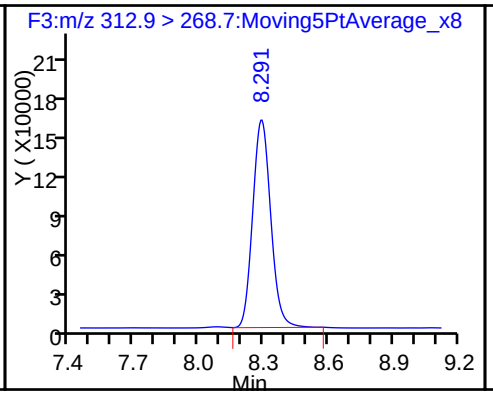
5 Perfluorobutane Sulfonate



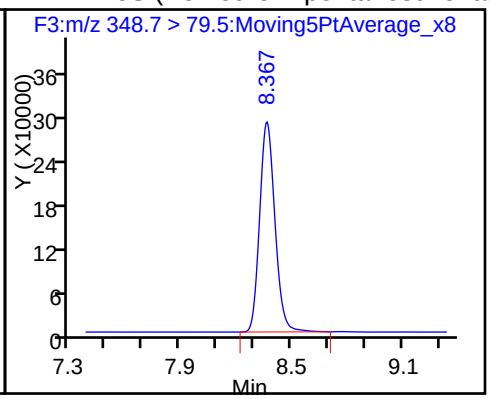
D 6 13C2 PFHxA



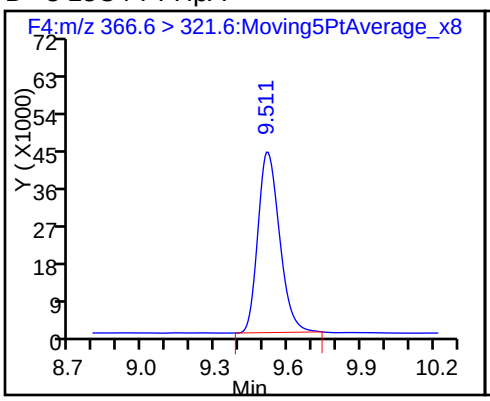
7 Perfluorohexanoic acid



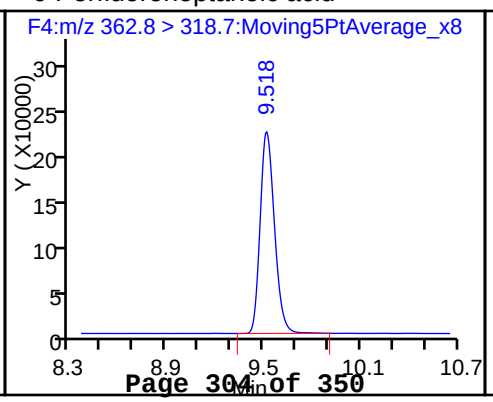
22 PFPeS (Perflouro-1-pentanesulfonat



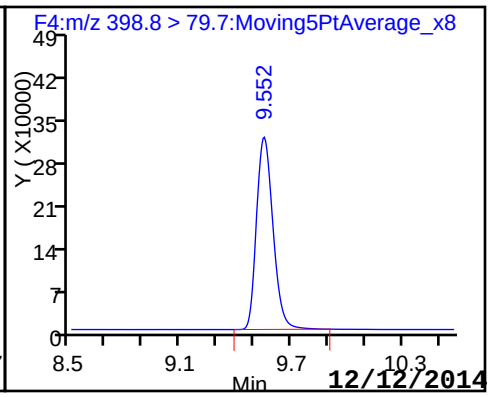
D 8 13C4-PFHpA



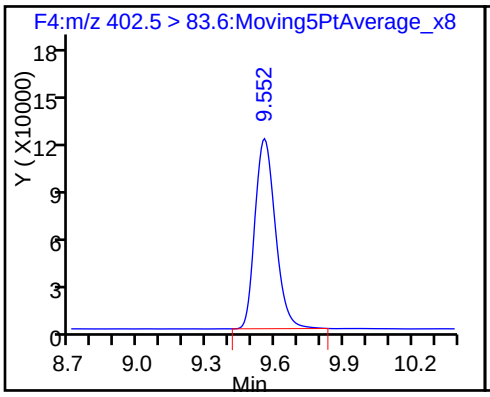
9 Perfluoroheptanoic acid



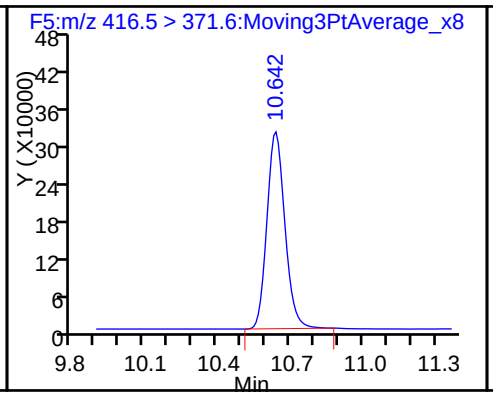
10 Perfluorohexane Sulfonate



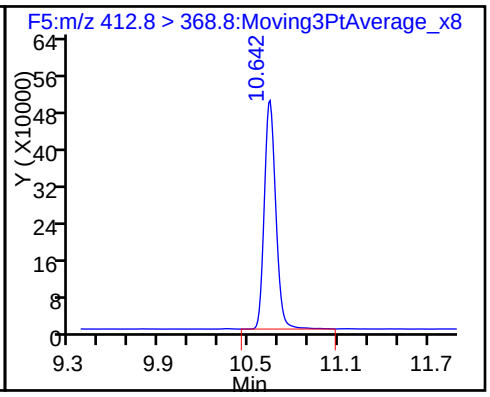
D 11 18O2 PFHxS



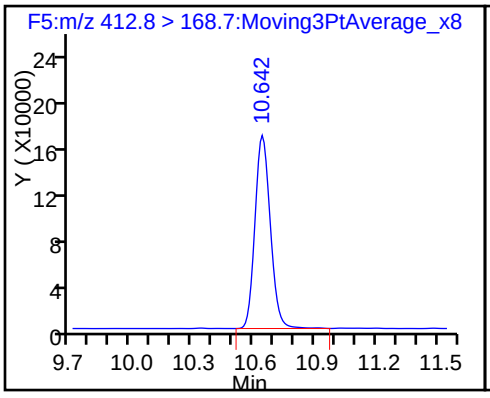
D 12 13C4 PFOA



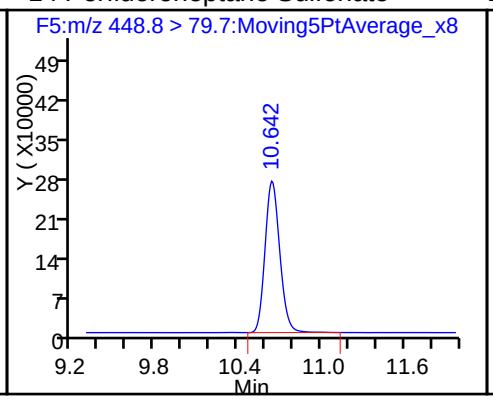
13 Perfluorooctanoic acid



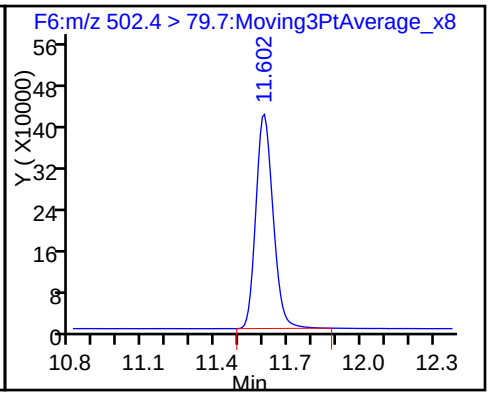
13 Perfluorooctanoic acid



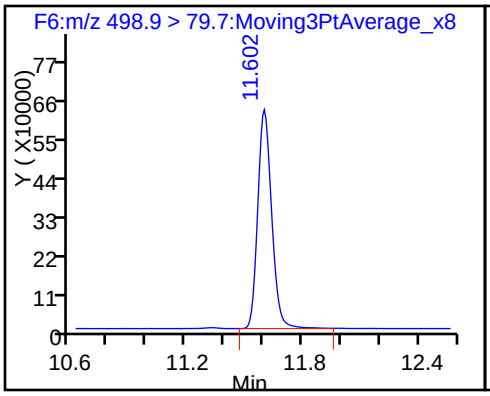
14 Perfluoroheptane Sulfonate



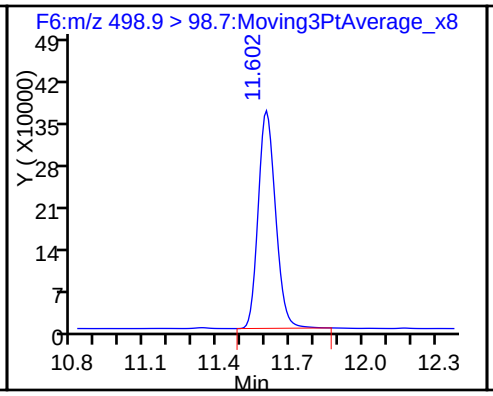
D 16 13C4 PFOS



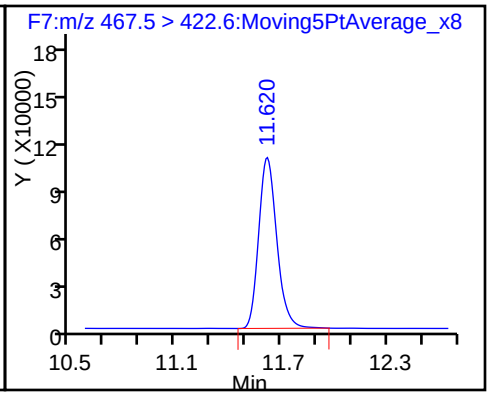
15 Perfluorooctanoic Sulfonate



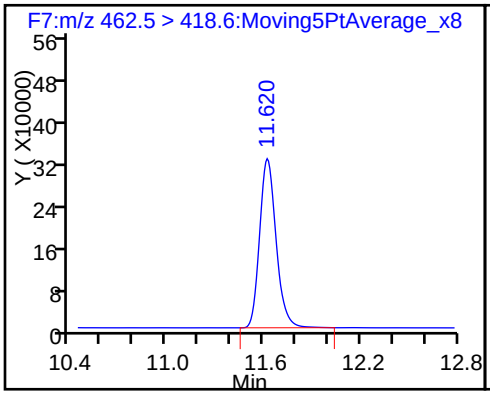
15 Perfluorooctanoic Sulfonate



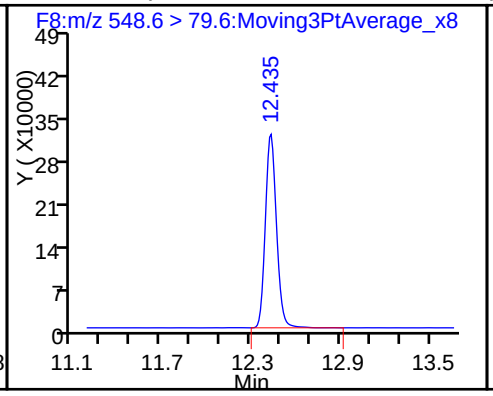
D 17 13C5 PFNA



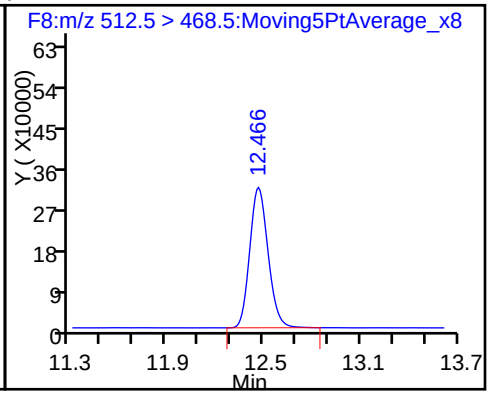
18 Perfluorononanoic acid



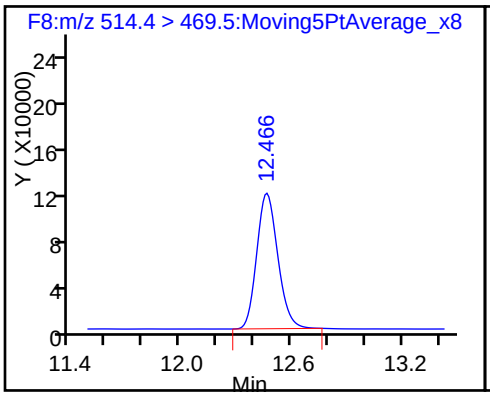
21 PFNS (Perflouro-1-nonanesulfonate)



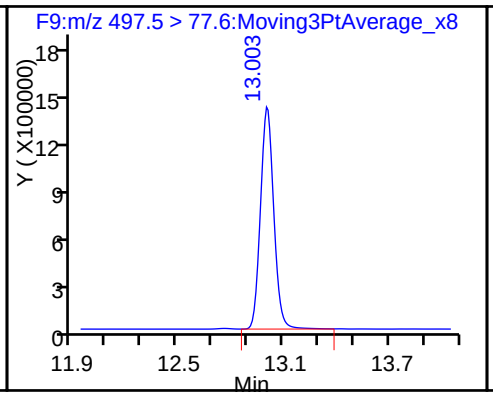
20 Perfluorodecanoic acid



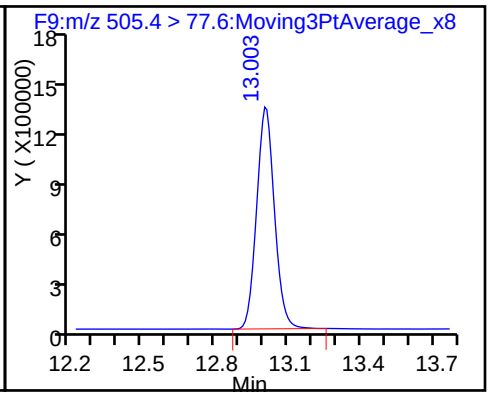
D 19 13C2 PFDA



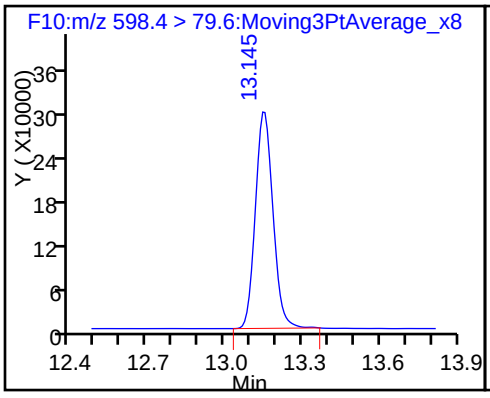
24 Perfluorooctane Sulfonamide



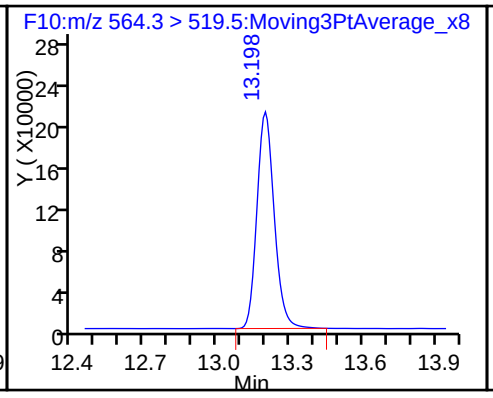
D 23 13C8 FOSA



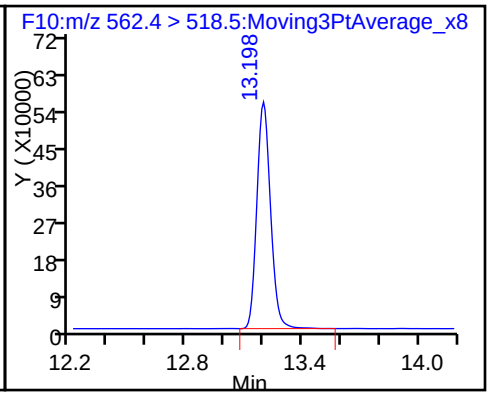
25 Perfluorodecane Sulfonate



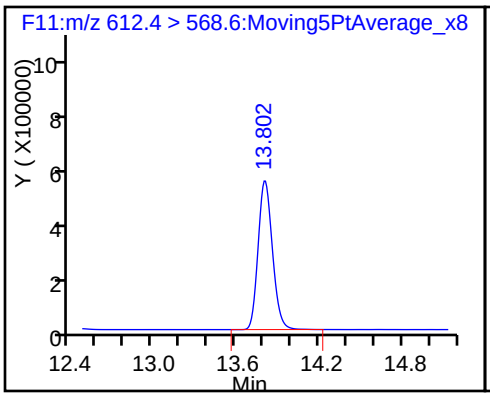
D 26 13C2 PFUnA



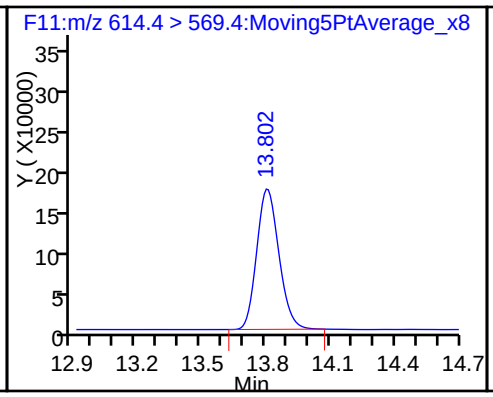
27 Perfluoroundecanoic acid



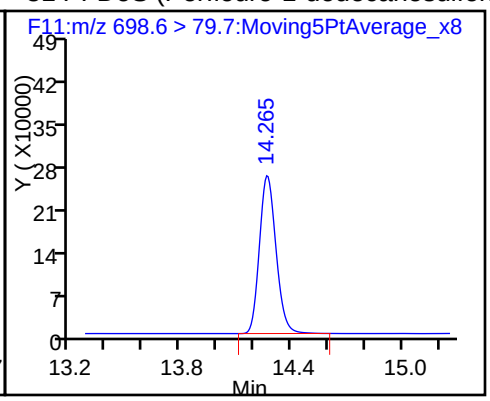
29 Perfluorododecanoic acid



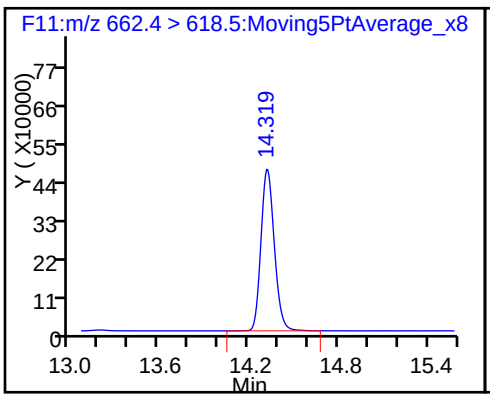
D 28 13C2 PFDoA



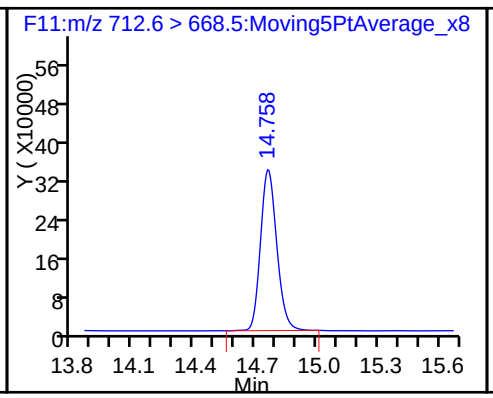
31 PFDoS (Perflouro-1-dodecanesulfona



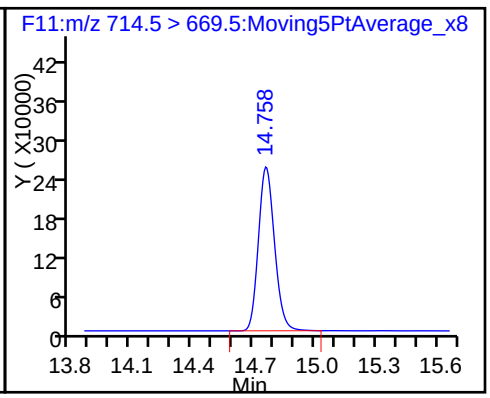
30 Perfluorotridecanoic acid



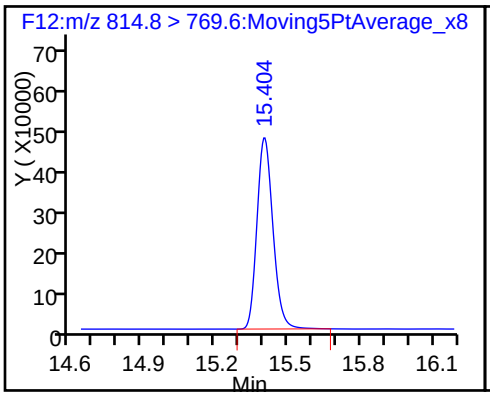
32 Perfluorotetradecanoic acid



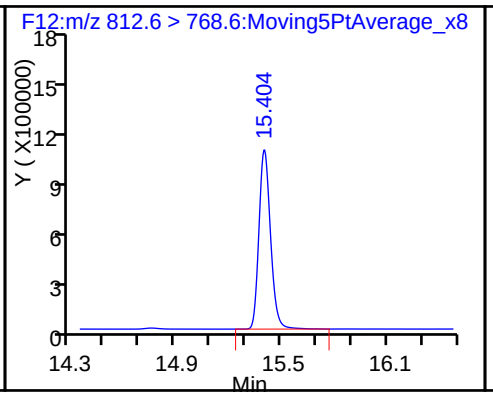
D 33 13C2-PFTeDA



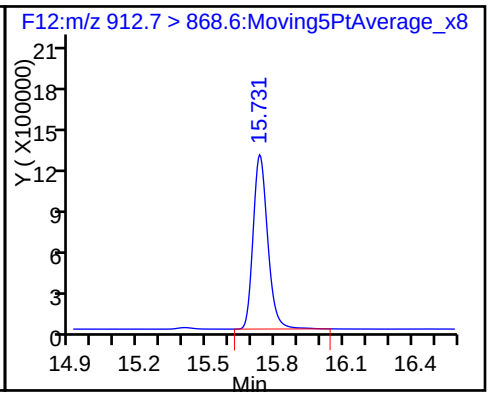
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-59712/1-A

Matrix: Water Lab File ID: 03DEC14A4A_082.d

Analysis Method: WS-LC-0025 Date Collected:

Extraction Method: 3535 Date Extracted: 12/03/2014 13:38

Sample wt/vol: 500.00(mL) Date Analyzed: 12/04/2014 20:03

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 59779 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.809	J	2.0	1.5	0.75
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.5	U	2.0	1.5	1.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	111		25-150
STL00990	13C4 PFOA	109		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_082.d
Lims ID: MB 320-59712/1-A
Client ID:
Sample Type: MB
Inject. Date: 04-Dec-2014 20:03:26 ALS Bottle#: 22 Worklist Smp#: 46
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-59712/1-a 59712
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:03:21 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.928	5.934	-0.006		27219	6.36		31.8	83.8	
D 3 13C5-PFPeA										
267.6 > 222.7	7.039	7.038	0.001		89401	11.6		57.9	377	
D 6 13C2 PFHxA										
314.6 > 269.7	8.284	8.282	0.002		261844	13.7		68.7	874	
D 8 13C4-PFHpA										
366.6 > 321.6	9.510	9.506	0.004		290618	16.4		81.9	882	
10 Perfluorohexane Sulfonate										
398.8 > 79.7	9.545	9.543	0.002	1.000	2915	0.0737			10.4	
D 11 18O2 PFHxS										
402.5 > 83.6	9.545	9.544	0.001		810985	18.0		95.4	2247	
D 12 13C4 PFOA										
416.5 > 371.6	10.642	10.628	0.014		1843821	54.5		109	3092	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.642	10.628	0.014	1.000	24900	0.4044			26.5	
412.8 > 168.7	10.632	10.628	0.004	0.999	3853		6.46(0.00-0.00)		6.6	
D 16 13C4 PFOS										
502.4 > 79.7	11.602	11.595	0.007		2393416	53.1		111	4947	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.610	11.595	0.015	1.000	20748	0.2296			39.7	
498.9 > 98.7	11.602	11.595	0.007	0.999	10394		2.00(0.00-0.00)		19.6	
D 17 13C5 PFNA										
467.5 > 422.6	11.620	11.614	0.006		905590	23.4		117	2613	
D 19 13C2 PFDA										
514.4 > 469.5	12.466	12.463	0.003		1121599	21.8		109	2647	
D 23 13C8 FOSA										
505.4 > 77.6	13.004	12.998	0.006		4931589	34.5		68.9	3402	
D 26 13C2 PFUnA										
564.3 > 519.5	13.198	13.198	0.0		1117477	17.3		86.3	2721	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.189	13.198	-0.009	1.000	2362	0.0478			6.5	
D 28 13C2 PFDoA										
614.4 > 569.4	13.811	13.809	0.002		1008439	15.4		77.1	1856	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.765	14.766	-0.001		749399	10.5		52.4	1763	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.404	15.415	-0.011		1255809	12.0		60.2	1924	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.410	15.415	-0.005	1.000	6386	0.0945			9.2	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.741	15.752	-0.011	1.000	6696	0.0935			9.5	

Report Date: 05-Dec-2014 10:03:23 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_082.d

Injection Date: 04-Dec-2014 20:03:26 Instrument ID: A4

Lims ID: MB 320-59712/1-A

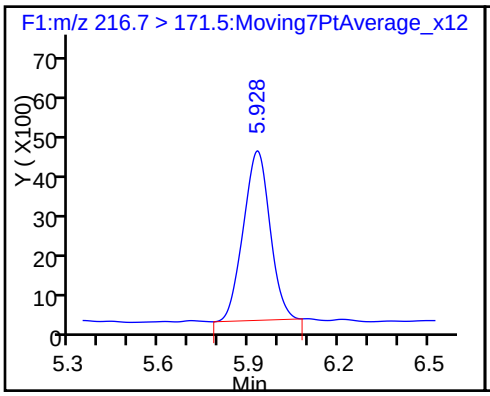
Client ID:

Operator ID: JRB ALS Bottle#: 22 Worklist Smp#: 46

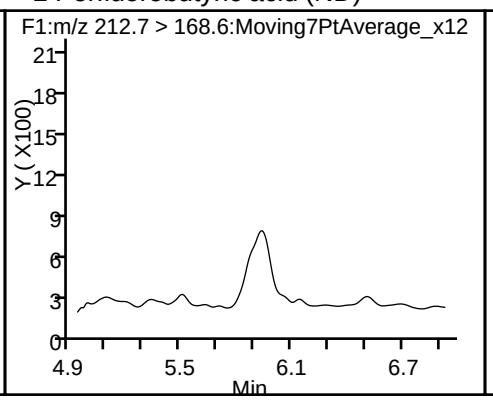
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC ICAL

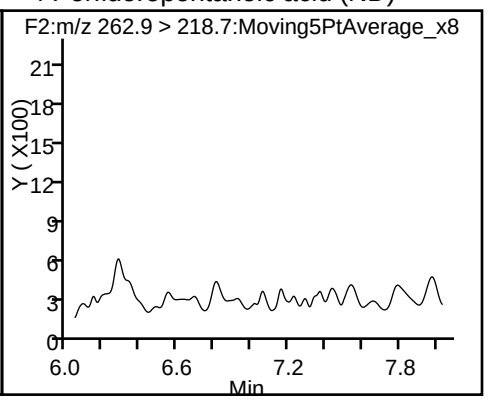
D 1 13C4 PFBA



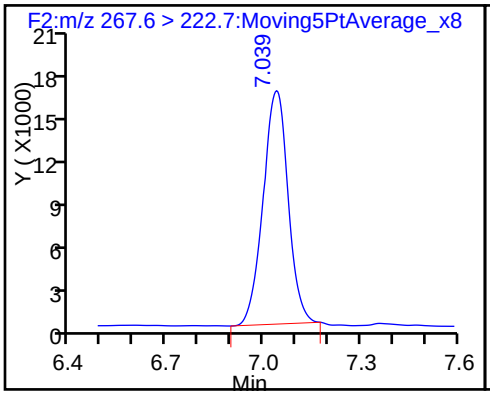
2 Perfluorobutyric acid (ND)



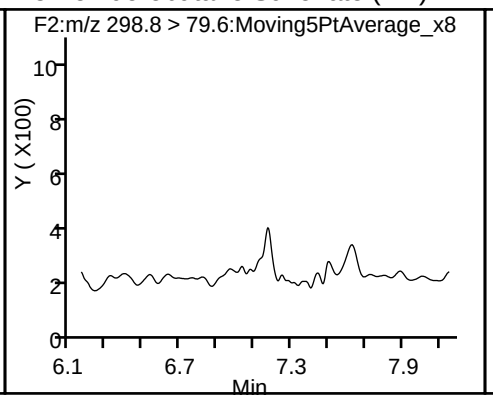
4 Perfluoropentanoic acid (ND)



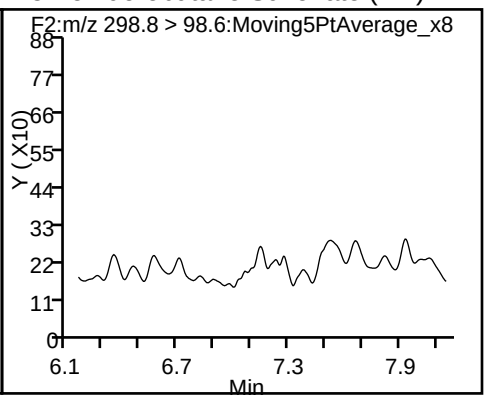
D 3 13C5-PFPeA



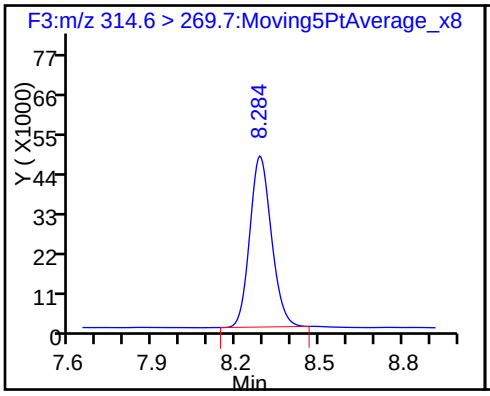
5 Perfluorobutane Sulfonate (ND)



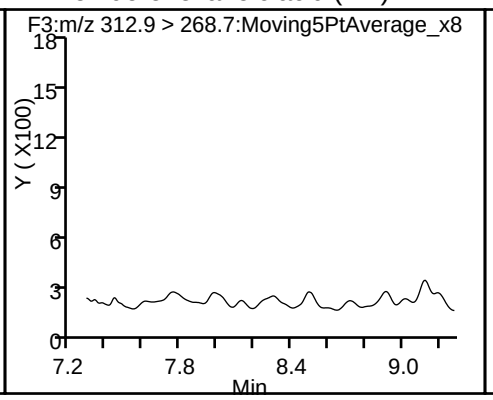
5 Perfluorobutane Sulfonate (ND)



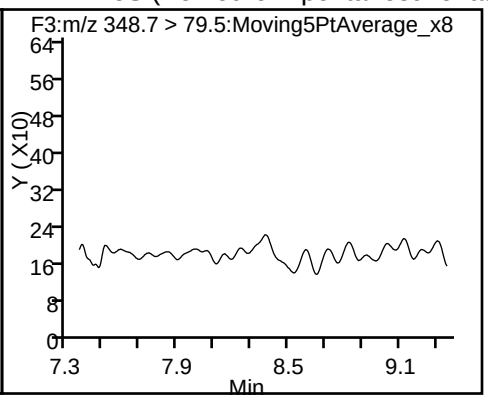
D 6 13C2 PFHxA



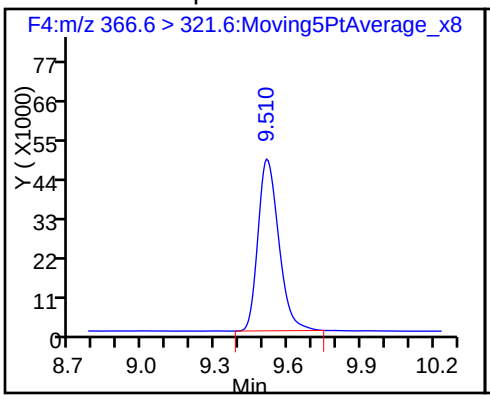
7 Perfluorohexanoic acid (ND)



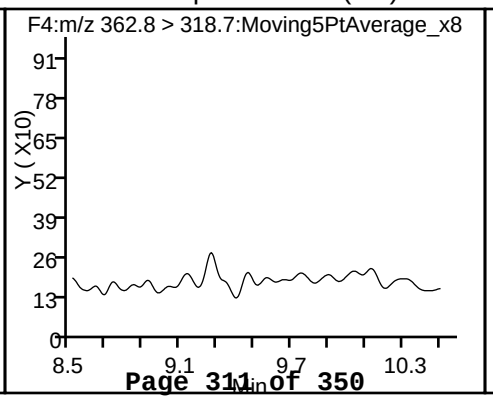
22 PFPeS (Perflouro-1-pentanesulfonat (ND)



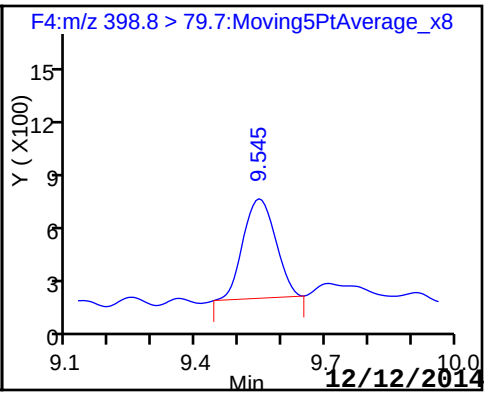
D 8 13C4-PFHpA



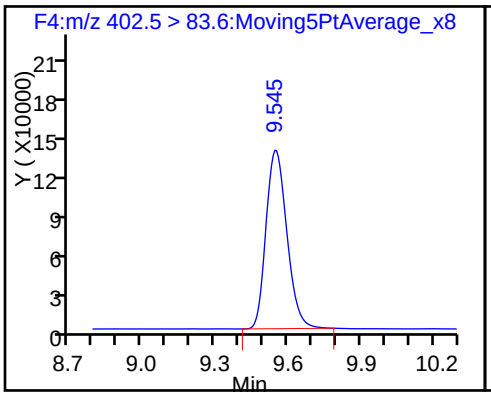
9 Perfluoroheptanoic acid (ND)



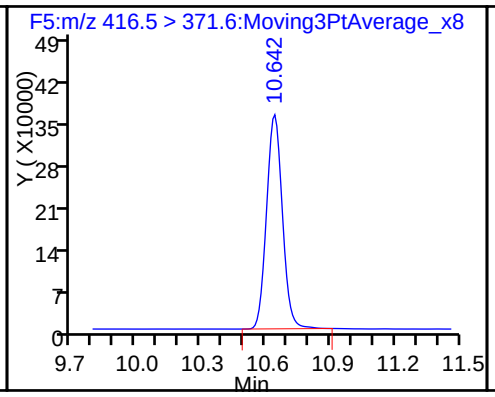
10 Perfluorohexane Sulfonate



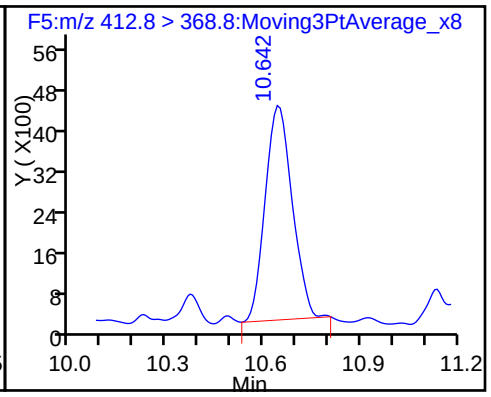
D 11 18O2 PFHxS



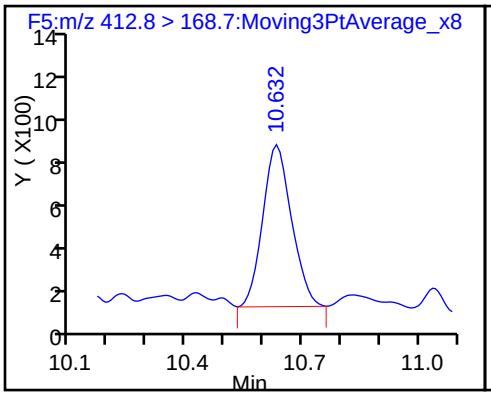
D 12 13C4 PFOA



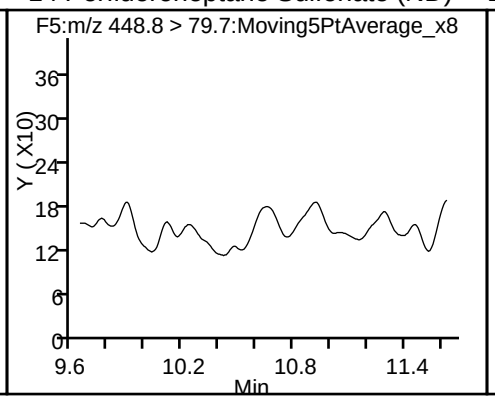
13 Perfluorooctanoic acid



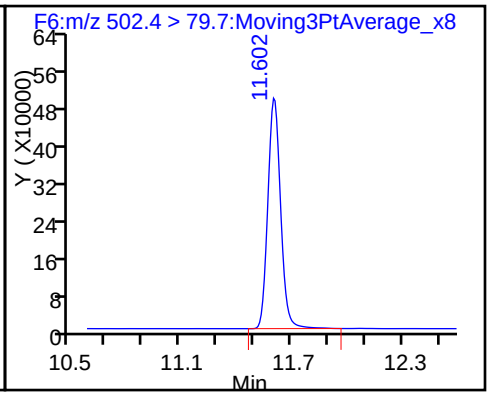
13 Perfluorooctanoic acid



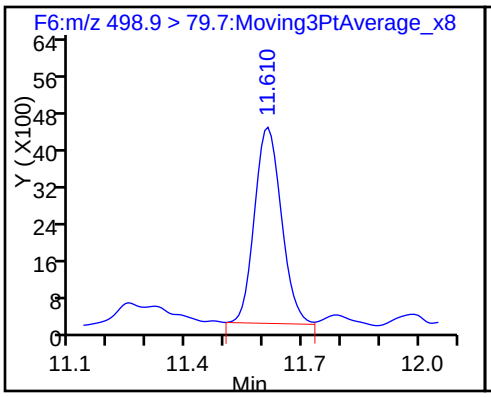
14 Perfluoroheptane Sulfonate (ND)



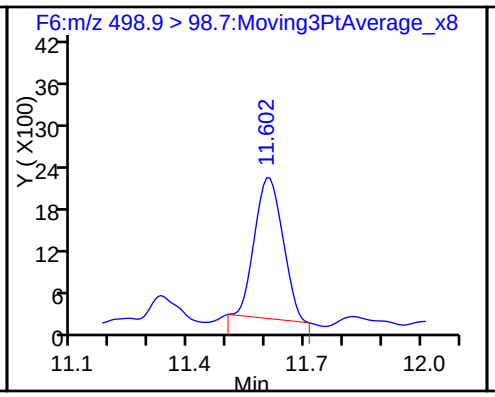
D 16 13C4 PFOS



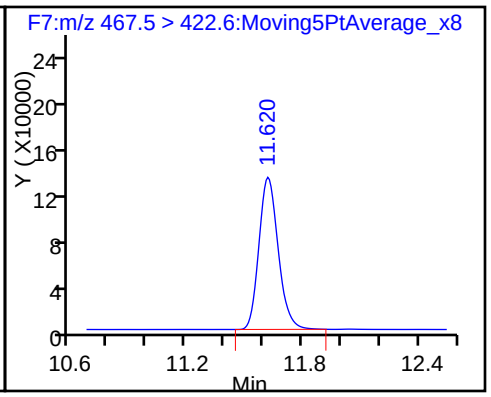
15 Perfluorooctanoic Sulfonate



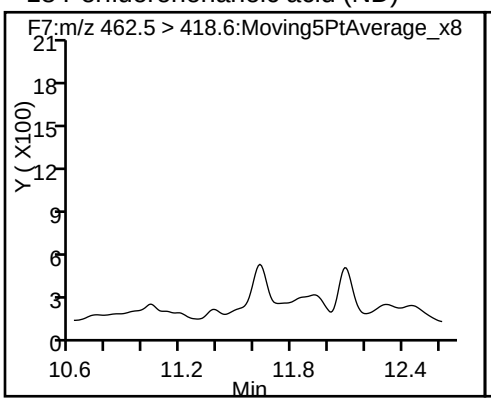
15 Perfluorooctanoic Sulfonate



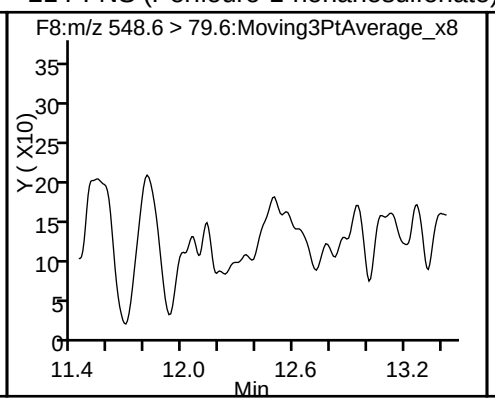
D 17 13C5 PFNA



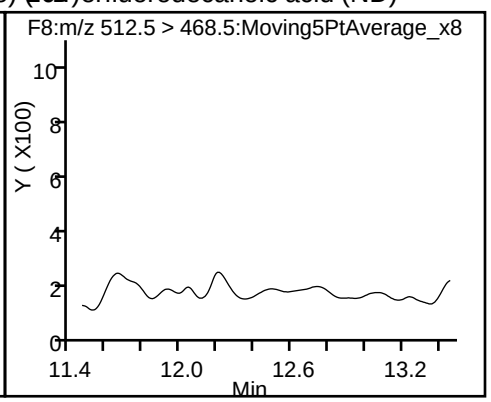
18 Perfluorononanoic acid (ND)



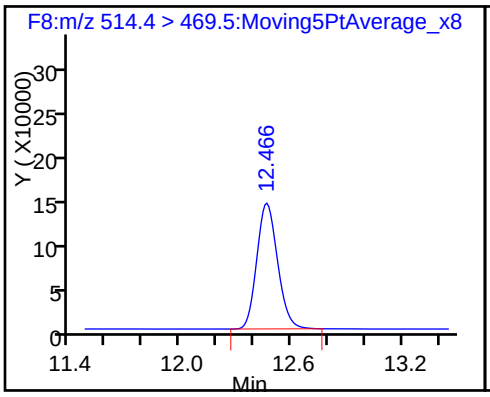
21 PFNS (Perflouro-1-nonanesulfonate) (ND)



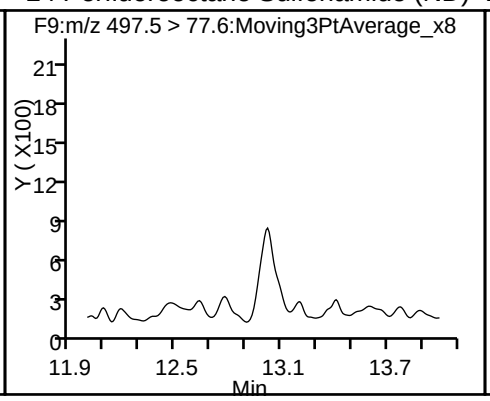
20 Perfluorodecanoic acid (ND)



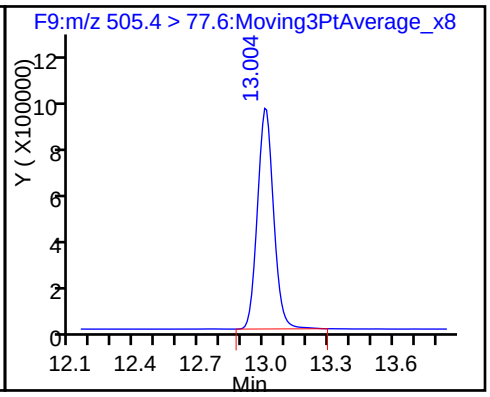
D 19 13C2 PFDA



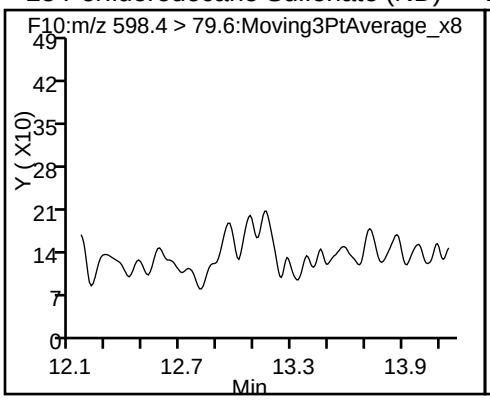
24 Perfluorooctane Sulfonamide (ND)



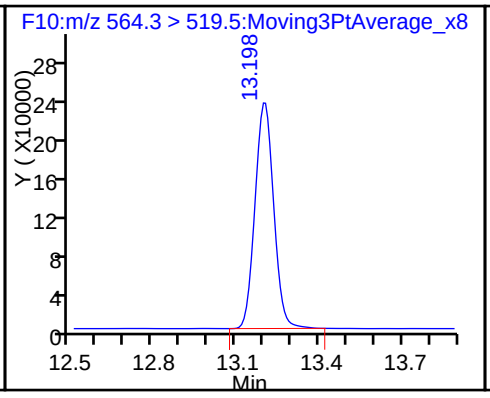
D 23 13C8 FOSA



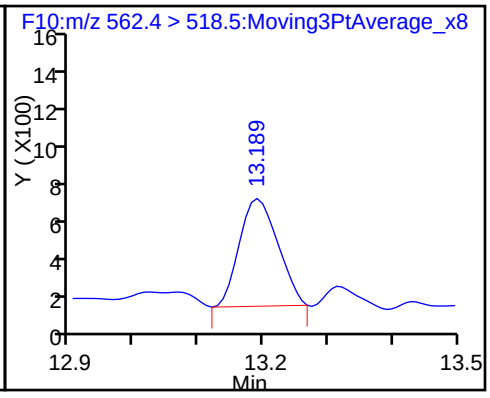
25 Perfluorodecane Sulfonate (ND)



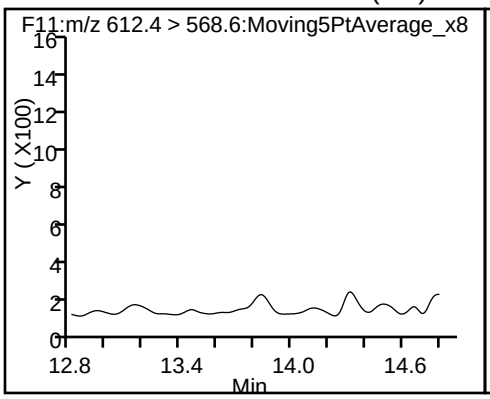
D 26 13C2 PFUnA



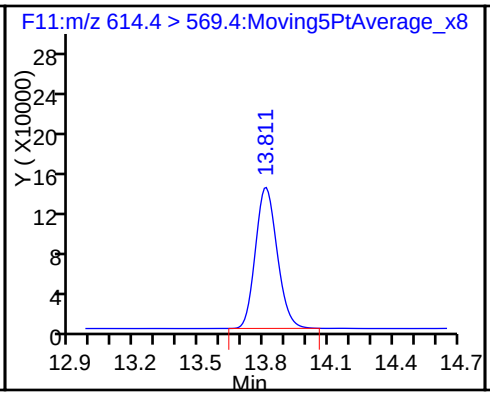
27 Perfluoroundecanoic acid



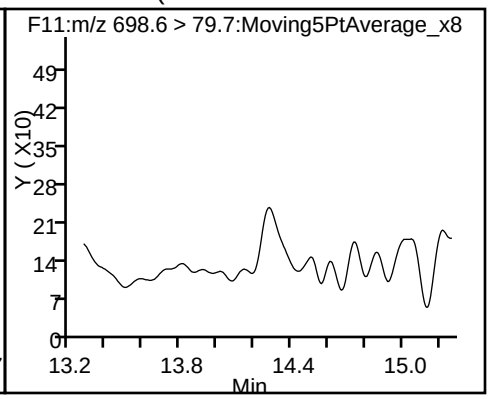
29 Perfluorododecanoic acid (ND)



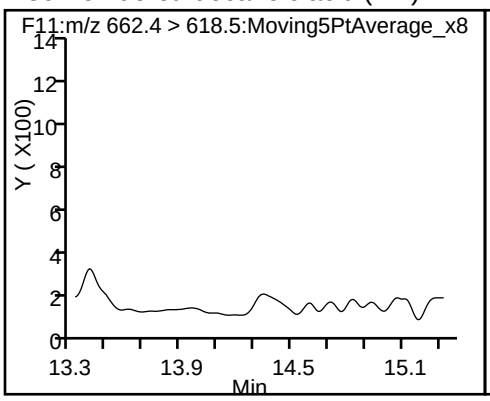
D 28 13C2 PFDoA



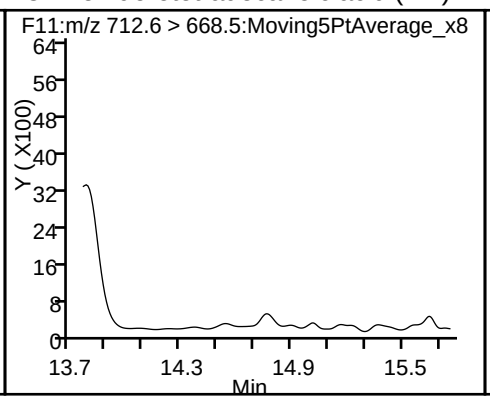
31 PFDoS (Perflouro-1-dodecanesulfona (ND)



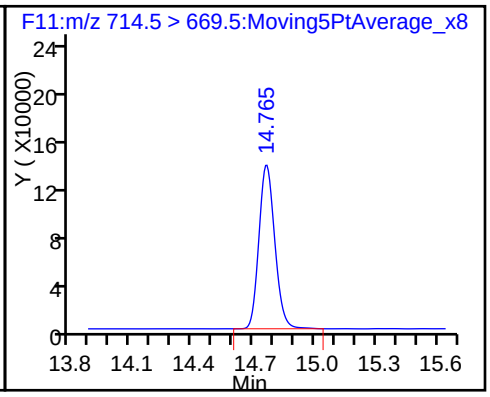
30 Perfluorotridecanoic acid (ND)



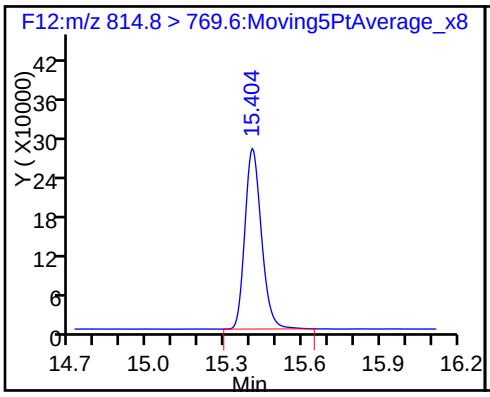
32 Perfluorotetradecanoic acid (ND)



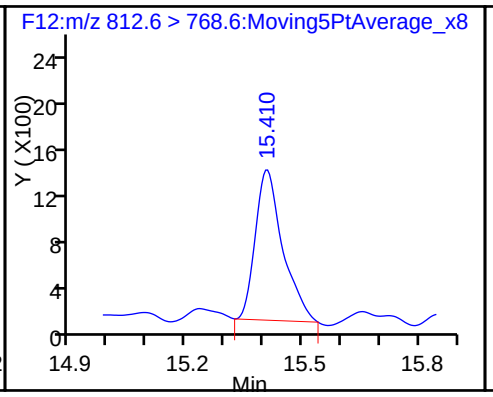
D 33 13C2-PFTeDA



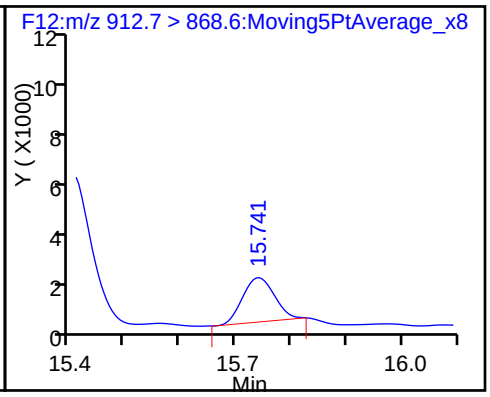
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Client Sample ID: Lab Sample ID: LCS 320-59712/2-A

Matrix: Water Lab File ID: 03DEC14A4A_083.d

Analysis Method: WS-LC-0025 Date Collected:

Extraction Method: 3535 Date Extracted: 12/03/2014 13:38

Sample wt/vol: 500.00(mL) Date Analyzed: 12/04/2014 20:24

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 59779 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	50.4		2.0	1.5	0.75
1763-23-1	Perfluorooctane Sulfonate (PFOS)	39.7		2.0	1.5	1.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	101		25-150
STL00990	13C4 PFOA	98		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_083.d
Lims ID: LCS 320-59712/2-A
Client ID:
Sample Type: LCS
Inject. Date: 04-Dec-2014 20:24:40 ALS Bottle#: 23 Worklist Smp#: 47
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-59712/2-a 59712
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:03:21 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.922	5.934	-0.012		25563	5.98		29.9	94.1	
2 Perfluorobutyric acid										
212.7 > 168.6	5.928	5.935	-0.007	1.000	404010	48.1		241	1217	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.037	7.037	0.0	1.000	220687	37.4		187	351	
D 3 13C5-PFPeA										
267.6 > 222.7	7.040	7.038	0.002		71436	9.26		46.3	285	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.152	7.157	-0.005	1.000	902925	21.2		120	1704	
298.8 > 98.6	7.152	7.157	-0.005	1.000	587476		1.54(0.00-0.00)		1433	
D 6 13C2 PFHxA										
314.6 > 269.7	8.286	8.282	0.004		240697	12.6		63.1	723	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.286	8.284	0.002	1.000	317763	27.0		135	699	
22 PFPeS (Perflouro-1-pentanesulfonat										
348.7 > 79.5	8.362	8.360	0.002	0.876	816453	24.0		128	2181	
D 8 13C4-PFHpA										
366.6 > 321.6	9.511	9.506	0.005		273562	15.4		77.1	1033	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.511	9.508	0.003	1.000	721283	34.6		173	1713	
10 Perfluorohexane Sulfonate										
398.8 > 79.7	9.545	9.543	0.002	1.000	939802	23.6		125	2436	
D 11 18O2 PFHxS										
402.5 > 83.6	9.545	9.544	0.001		817188	18.2		96.1	1996	
D 12 13C4 PFOA										
416.5 > 371.6	10.632	10.628	0.004		1657511	49.0		98.0	2628	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.632	10.628	0.004	1.000	1395384	25.2		126	1416	
412.8 > 168.7	10.632	10.628	0.004	1.000	432499		3.23(0.00-0.00)		806	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
14 Perfluoroheptane Sulfonate										
448.8 > 79.7	10.632	10.635	-0.003	1.000	1068143	27.2		143	1398	
D 16 13C4 PFOS										
502.4 > 79.7	11.602	11.595	0.007		2170616	48.1		101	4250	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.602	11.595	0.007	1.000	1628323	19.9		104	2281	
498.9 > 98.7	11.602	11.595	0.007	1.000	894977		1.82(0.00-0.00)		1434	
D 17 13C5 PFNA										
467.5 > 422.6	11.612	11.614	-0.002		828770	21.5		107	2153	
18 Perfluorononanoic acid										
462.5 > 418.6	11.620	11.616	0.004	1.000	1102178	23.1		115	1939	
21 PFNS (Perflouro-1-nonanesulfonate)										
548.6 > 79.6	12.435	12.429	0.006	1.000	792745	23.8		124	1225	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.466	12.461	0.005	1.000	1288911	26.2		131	1742	
D 19 13C2 PFDA										
514.4 > 469.5	12.466	12.463	0.003		1029276	20.0		100.0	1444	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.003	12.998	0.005	1.000	2119886	27.0		135	1726	
D 23 13C8 FOSA										
505.4 > 77.6	13.003	12.998	0.005		4137743	28.9		57.8	3273	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.154	13.152	0.002	1.000	712044	24.2		126	1243	
D 26 13C2 PFUnA										
564.3 > 519.5	13.198	13.198	0.0		1129572	17.4		87.2	2189	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.198	13.198	0.0	1.000	1575629	31.6		158	1970	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.811	13.808	0.003	1.000	1585953	29.6		148	1178	
D 28 13C2 PFDoA										
614.4 > 569.4	13.811	13.809	0.002		1087143	16.6		83.2	1451	
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.265	14.272	-0.007	1.000	474162	15.9		81.9	812	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.326	14.327	-0.001	1.000	887921	20.0		99.9	609	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.765	14.766	-0.001	1.000	470152	16.6		83.2	488	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.758	14.766	-0.008		730624	10.2		51.1	1256	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.404	15.415	-0.011		1315788	12.6		63.1	2100	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.404	15.415	-0.011	1.000	1400292	19.2		96.1	1675	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.736	15.752	-0.016	1.000	1742284	22.6		113	1367	

Report Date: 05-Dec-2014 10:03:23 Chrom Revision: 2.2 06-Nov-2014 14:50:32

TestAmerica Sacramento

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_083.d

Injection Date: 04-Dec-2014 20:24:40 Instrument ID: A4

Lims ID: LCS 320-59712/2-A

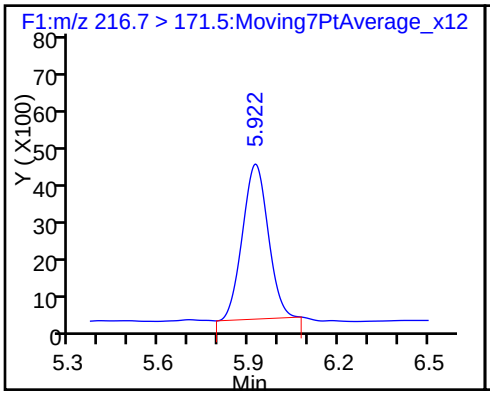
Client ID:

Operator ID: JRB ALS Bottle#: 23 Worklist Smp#: 47

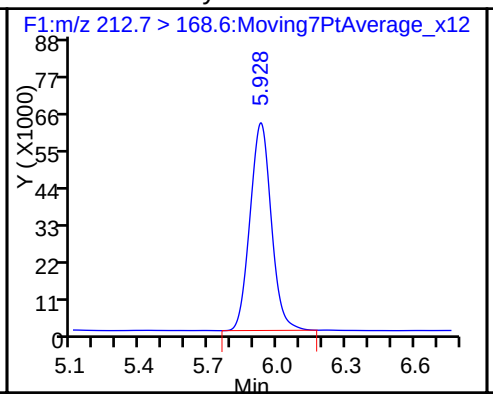
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC ICAL

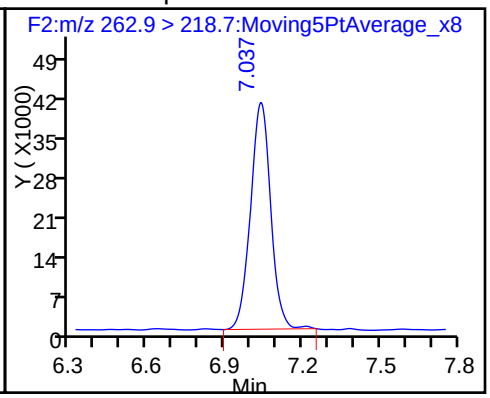
D 1 13C4 PFBA



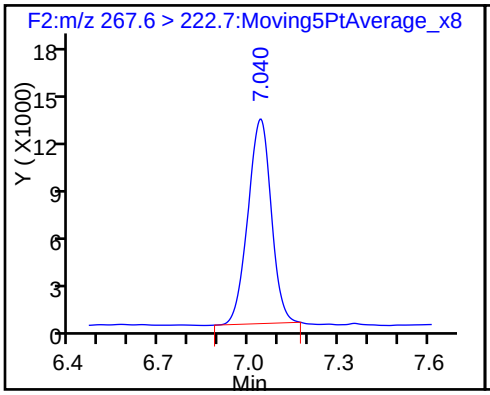
2 Perfluorobutyric acid



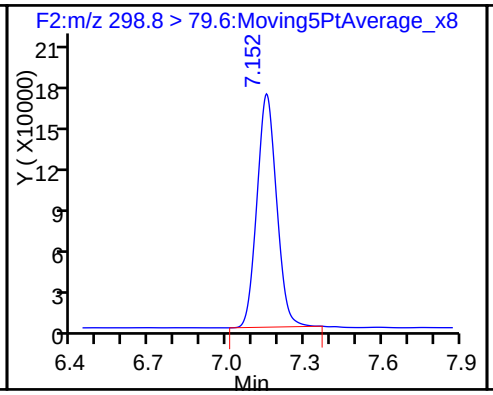
4 Perfluoropentanoic acid



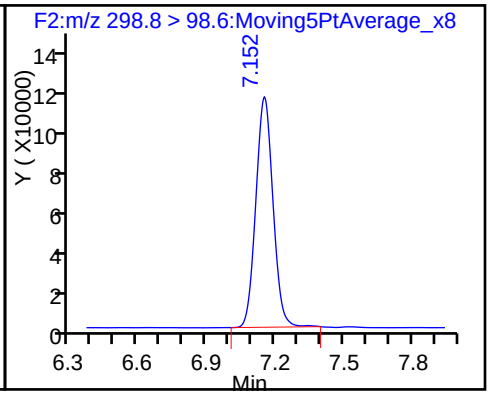
D 3 13C5-PFPeA



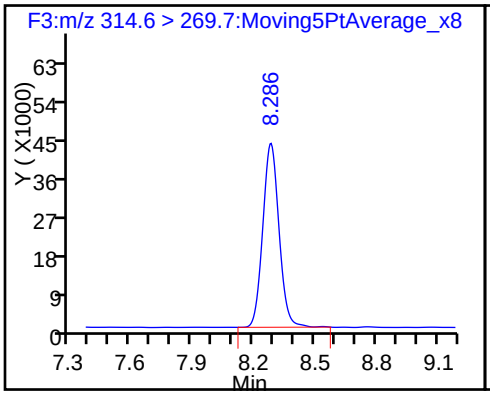
5 Perfluorobutane Sulfonate



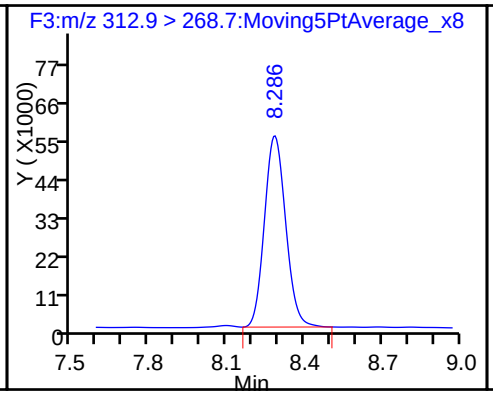
5 Perfluorobutane Sulfonate



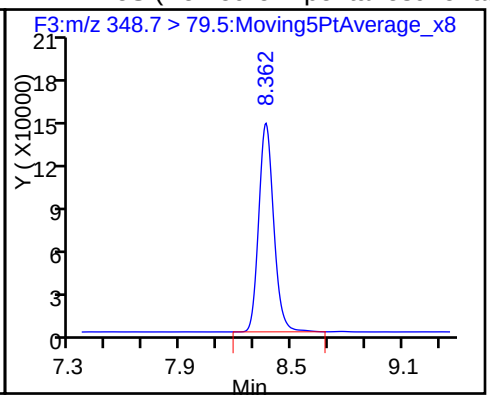
D 6 13C2 PFHxA



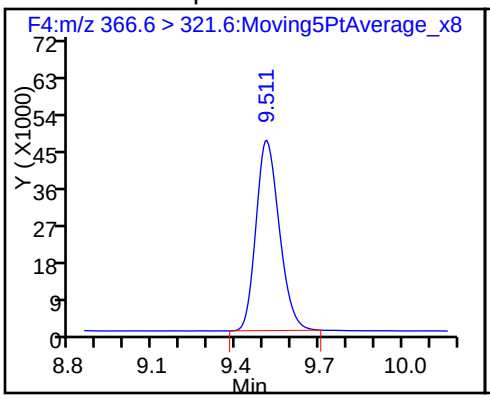
7 Perfluorohexanoic acid



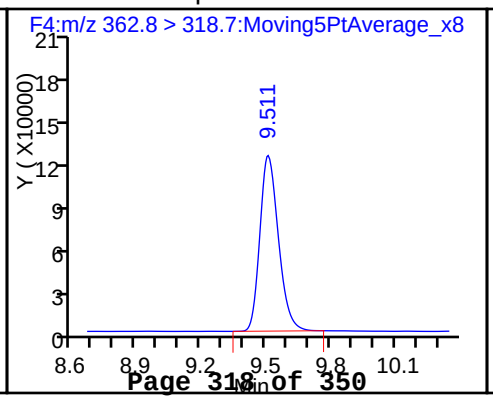
22 PFPeS (Perflouro-1-pentanesulfonat



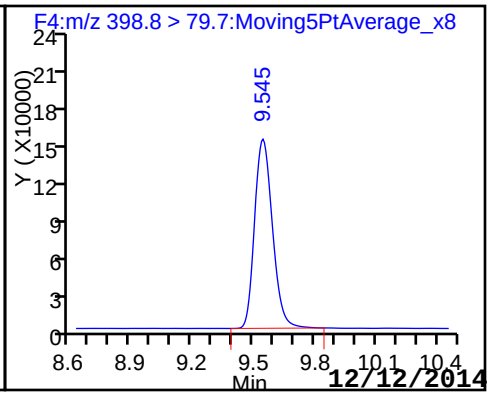
D 8 13C4-PFHpA



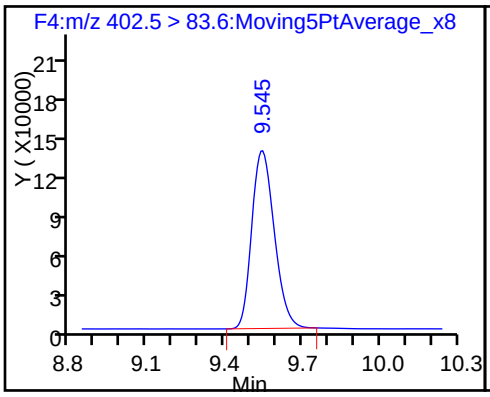
9 Perfluoroheptanoic acid



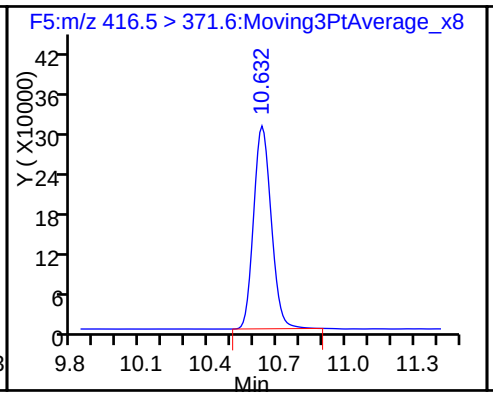
10 Perfluorohexane Sulfonate



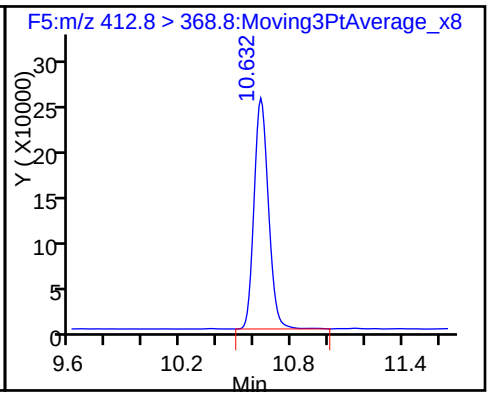
D 11 18O2 PFHxS



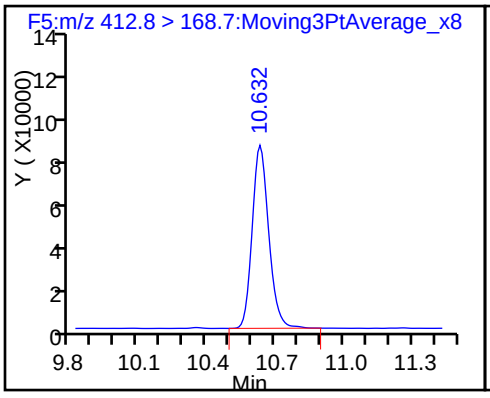
D 12 13C4 PFOA



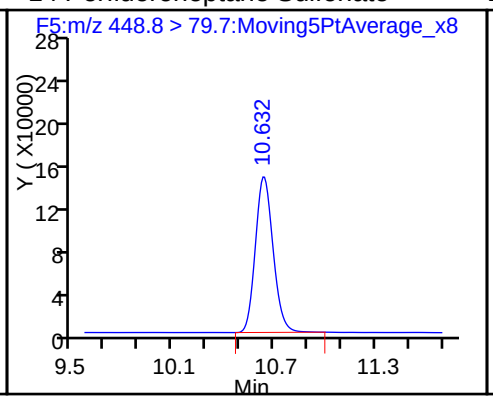
13 Perfluorooctanoic acid



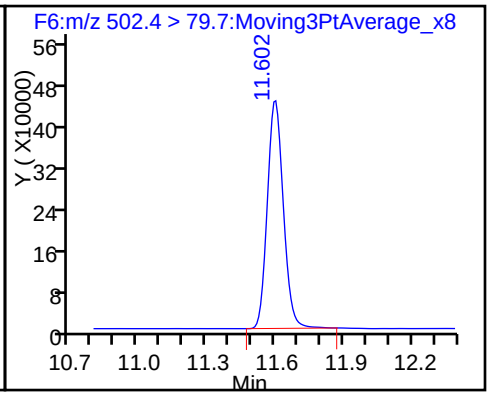
13 Perfluorooctanoic acid



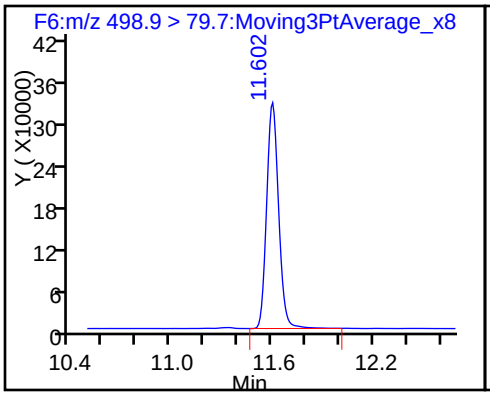
14 Perfluoroheptane Sulfonate



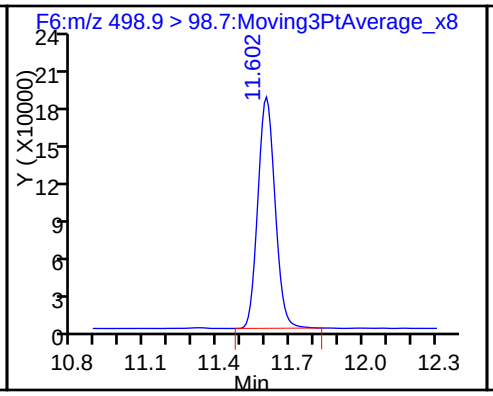
D 16 13C4 PFOS



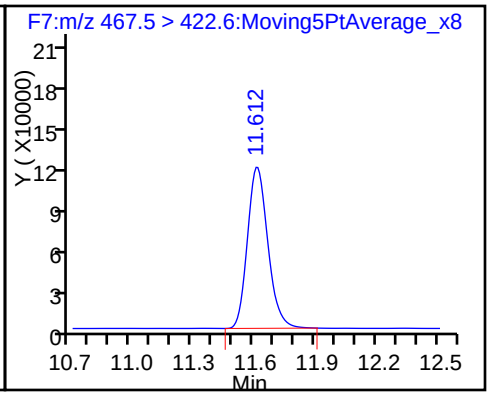
15 Perfluorooctanoic Sulfonate



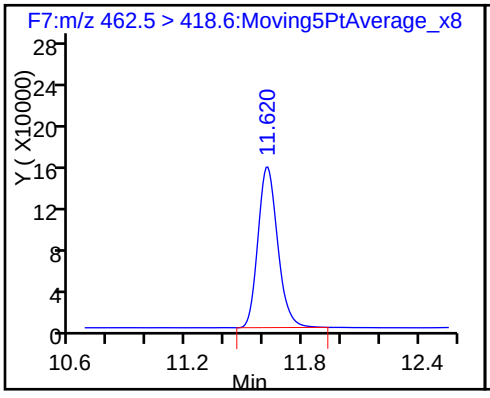
15 Perfluorooctanoic Sulfonate



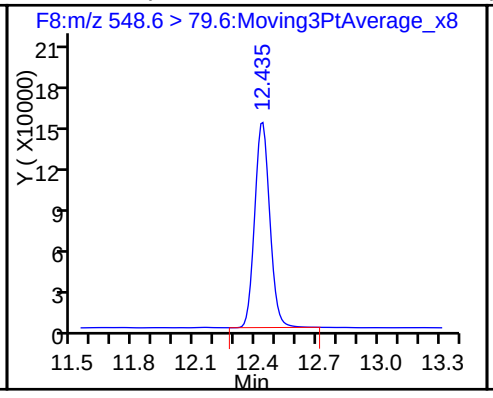
D 17 13C5 PFNA



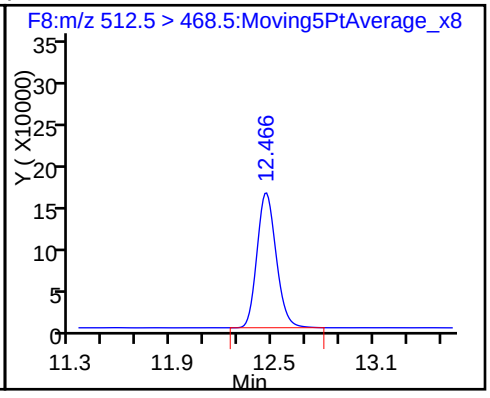
18 Perfluorononanoic acid



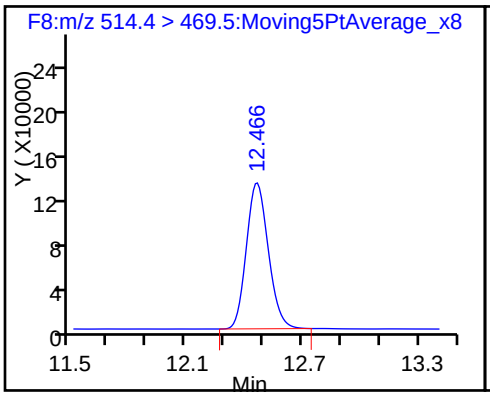
21 PFNS (Perflouro-1-nonanesulfonate)



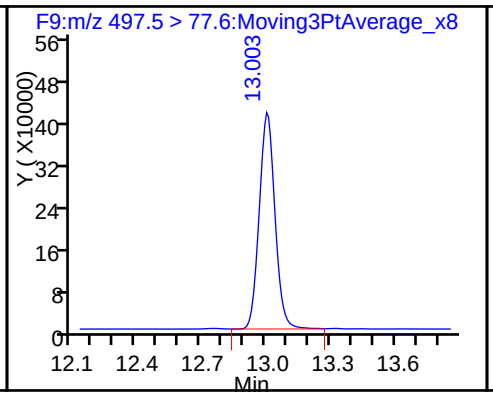
20 Perfluorodecanoic acid



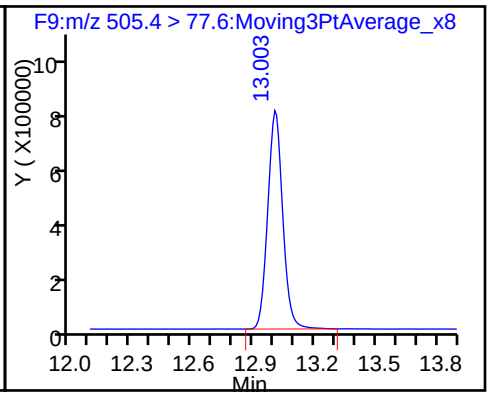
D 19 13C2 PFDA



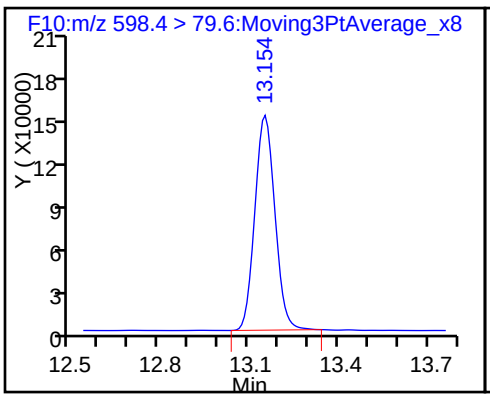
24 Perfluorooctane Sulfonamide



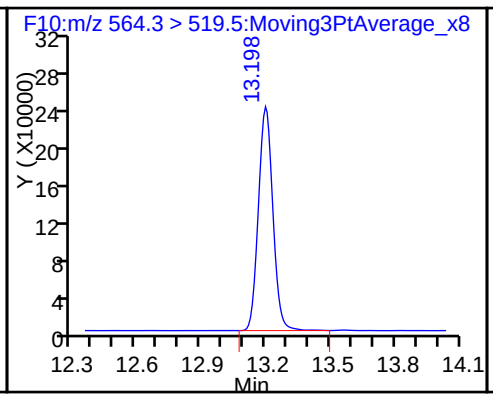
D 23 13C8 FOSA



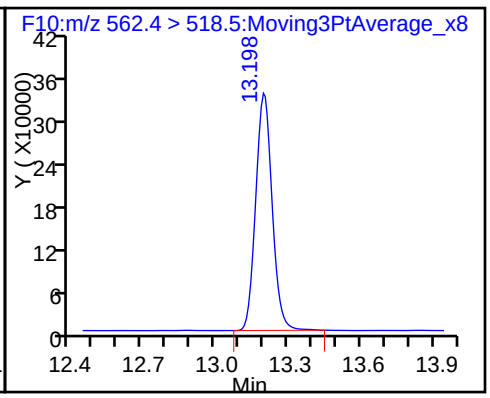
25 Perfluorodecane Sulfonate



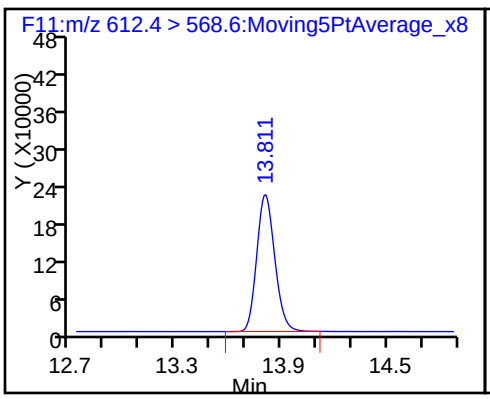
D 26 13C2 PFUnA



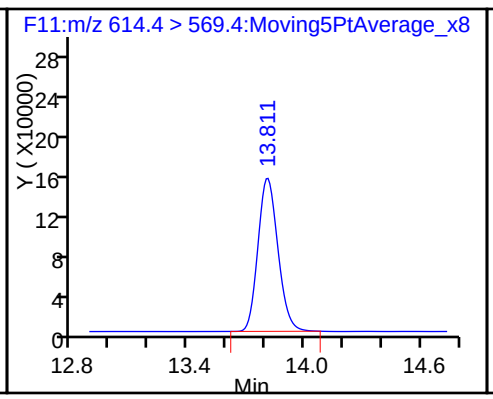
27 Perfluoroundecanoic acid



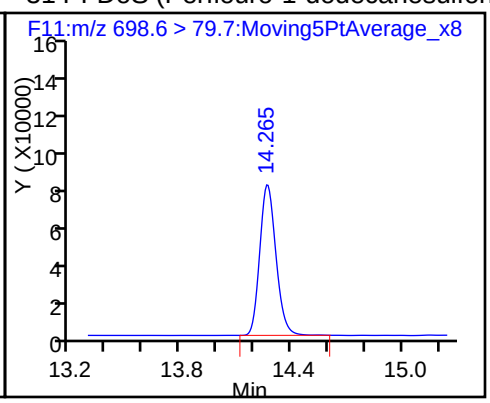
29 Perfluorododecanoic acid



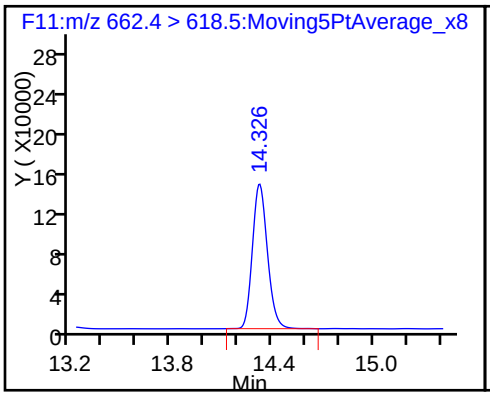
D 28 13C2 PFDoA



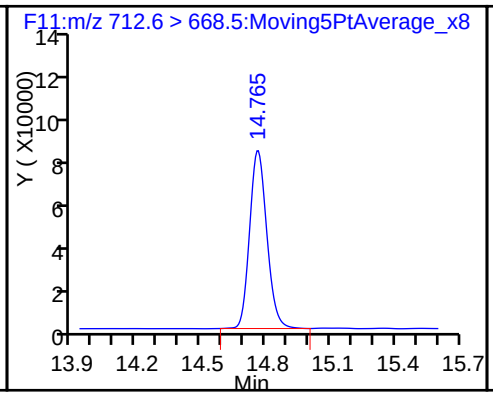
31 PFDoS (Perflouro-1-dodecanesulfona



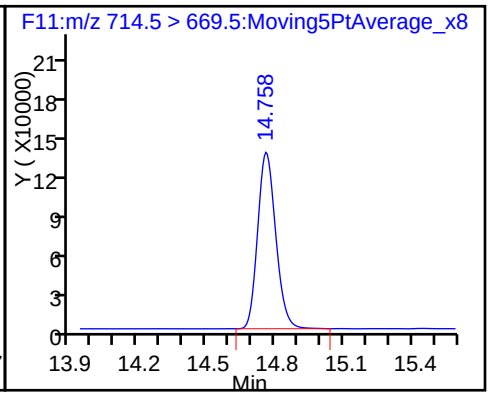
30 Perfluorotridecanoic acid



32 Perfluorotetradecanoic acid



D 33 13C2-PFTeDA



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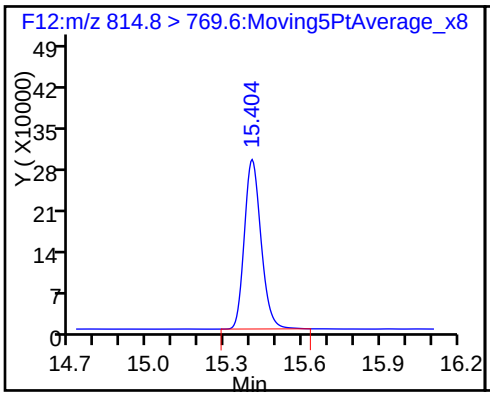
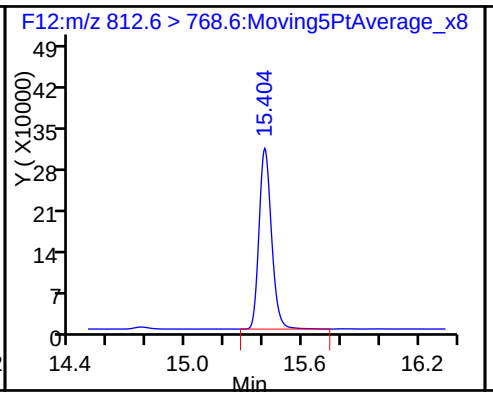
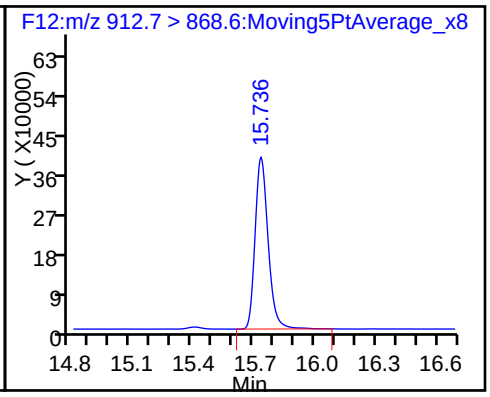


34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Instrument ID: A4 Start Date: 12/04/2014 03:44

Analysis Batch Number: 59779 End Date: 12/04/2014 23:56

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-59779/4 IC		12/04/2014 03:44	1	03DEC14A4A_040.d	Acquity 2.1(mm)
STD 320-59779/5 IC		12/04/2014 04:05	1	03DEC14A4A_041.d	Acquity 2.1(mm)
STD 320-59779/6 IC		12/04/2014 04:26	1	03DEC14A4A_042.d	Acquity 2.1(mm)
STD 320-59779/7 IC		12/04/2014 04:47	1	03DEC14A4A_043.d	Acquity 2.1(mm)
STD 320-59779/8 IC		12/04/2014 05:09	1	03DEC14A4A_044.d	Acquity 2.1(mm)
STD 320-59779/9 IC		12/04/2014 05:30	1	03DEC14A4A_045.d	Acquity 2.1(mm)
STD 320-59779/10 IC		12/04/2014 05:51	1	03DEC14A4A_046.d	Acquity 2.1(mm)
CCV 320-59779/20		12/04/2014 09:23	1		Acquity 2.1(mm)
ICV 320-59779/22		12/04/2014 10:23	1	03DEC14A4A_058.d	Acquity 2.1(mm)
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ZZZZZ		12/04/2014 12:11	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 12:37	100		Acquity 2.1(mm)
ZZZZZ		12/04/2014 12:59	100		Acquity 2.1(mm)
ZZZZZ		12/04/2014 13:20	100		Acquity 2.1(mm)
ZZZZZ		12/04/2014 13:41	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 14:02	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 14:24	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 14:44	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 15:06	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 15:27	1		Acquity 2.1(mm)
CCV 320-59779/34		12/04/2014 15:48	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 16:10	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 16:31	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 16:52	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 17:13	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 17:34	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 17:56	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 18:17	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 18:38	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 18:59	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 19:20	1		Acquity 2.1(mm)
CCV 320-59779/45		12/04/2014 19:42	1	03DEC14A4A_081.d	Acquity 2.1(mm)
MB 320-59712/1-A		12/04/2014 20:03	1	03DEC14A4A_082.d	Acquity 2.1(mm)
LCS 320-59712/2-A		12/04/2014 20:24	1	03DEC14A4A_083.d	Acquity 2.1(mm)
320-10459-1	B7/10-GW02	12/04/2014 20:45	1	03DEC14A4A_084.d	Acquity 2.1(mm)
320-10459-2	B7/10-GW03S	12/04/2014 21:07	1	03DEC14A4A_085.d	Acquity 2.1(mm)
320-10459-3	QR4-GW02	12/04/2014 21:28	1	03DEC14A4A_086.d	Acquity 2.1(mm)
320-10459-4	B7/10-GW06S	12/04/2014 21:49	1	03DEC14A4A_087.d	Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Instrument ID: A4 Start Date: 12/04/2014 03:44

Analysis Batch Number: 59779 End Date: 12/04/2014 23:56

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
320-10459-5	H123-GW02	12/04/2014 22:10	1	03DEC14A4A_088.d	Acquity 2.1(mm)
320-10459-6	EFA-FD01-1014	12/04/2014 22:31	1	03DEC14A4A_089.d	Acquity 2.1(mm)
ZZZZZ		12/04/2014 22:53	20		Acquity 2.1(mm)
ZZZZZ		12/04/2014 23:14	20		Acquity 2.1(mm)
ZZZZZ		12/04/2014 23:35	20		Acquity 2.1(mm)
CCV 320-59779/57		12/04/2014 23:56	1	03DEC14A4A_093.d	Acquity 2.1(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Batch Number: 59712 Batch Start Date: 12/03/14 13:38 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 12/03/14 19:10

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	LCMPFCSU 00010	LCPFCSP 00014		
MB 320-59712/1		3535, WS-LC-0025		500.00 mL	1.00 mL	50 uL			
LCS 320-59712/2		3535, WS-LC-0025		500.00 mL	1.00 mL	50 uL	20 uL		
320-10459-A-1	B7/10-GW02	3535, WS-LC-0025	T	448.35 mL	1.00 mL	50 uL			
320-10459-A-2	B7/10-GW03S	3535, WS-LC-0025	T	427.75 mL	1.00 mL	50 uL			
320-10459-A-3	QR4-GW02	3535, WS-LC-0025	T	427.31 mL	1.00 mL	50 uL			
320-10459-A-4	B7/10-GW06S	3535, WS-LC-0025	T	446.26 mL	1.00 mL	50 uL			
320-10459-A-5	H123-GW02	3535, WS-LC-0025	T	455.47 mL	1.00 mL	50 uL			
320-10459-A-6	EFA-FD01-1014	3535, WS-LC-0025	T	447.90 mL	1.00 mL	50 uL			

Batch Notes	
Balance ID	QA-070
H2O Lot used	11/24/14
Pipette ID	EC15219
Analyst who added reagent	JER
SU Reagent Drop	JER
SU Reagent Drop Witness	SNE
Solvent Lot #	0.3%NH4OH-Me_00006
Solvent Name	0.3%NH4OH/MeOH
SOP Number	WS-LC-0005
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk Lot Number	002334148A

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 8957, 9021, 10572, 10114, 10591, 10459 Work List ID(s): 17820

Extraction Batch: 51087, 58953, 59090, 59712 Analysis Batch(es): 59779

Delivery Rank 2, 4 Due Date: Varies

A. Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch#	✓	✓	
2. ICAL, CCV Frequency & Criteria met.	✓	✓	
• $RF_{average}$ criteria appropriate for the method.	✓	✓	
• Linear Regression criteria appropriate if required ($r \geq 0.995$).			✓
• Quadratic fit criteria appropriate if required ($r^2 \geq 0.990$).			✓
• For Linear Regression and Quadratic fit – Does the y-intercept support ½ the reporting limit as described in CA-Q-S-005?			✓
• All curve points show calculated concentrations.	✓	✓	
3. Peaks correctly ID'd by data system.	✓	✓	
5. Tune check frequency & criteria met and Tune check report attached.			✓
B. QA/QC			
1. Are all QC samples properly linked in TALS?	✓	✓	
2. Method blank, LCS/LCSD and MS/SD frequencies met.	✓	✓	
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.	✓	✓	
4. Are MS/MSD recoveries and RPD within control limits?			✓
5. Holding Times were met for prep and analytical. in House samples + NCM	✓	✓	
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#	✓	✓	
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: 12/5/14

2nd Level Reviewer: [signature] Date: 12/12/14

Box #12

Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-59087

Method Code: 320-Shake_Bath_14D-320

Analyst: Reed, Jonathan E

Batch Open: 11/25/2014 2:06:49PM

Batch End: 11/26/2014 8:40:00PM

Shake Extraction with Ultrasonic Bath Extraction

	Input Sample Lab ID (Analytical Method)	SDG	Initial Amount	Final Amount	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-59087/1 N/A	N/A	5.00 g	1.00 mL	N/A	N/A	N/A		MB 320-59087/1-A
2	LCS~320-59087/2 N/A	N/A	5.00 g	1.00 mL	N/A	N/A	N/A		LCS 320-59087/2-A
3	320-10515-B-1 (PFC_IDA)	10502757.55010801	5.09 g	1.00 mL	12/9/14	12_Days	4		320-10515-B-1-A
4	320-10515-B-1~MS (PFC_IDA)	10502757.55010801	5.13 g	1.00 mL	12/9/14	12_Days	4		320-10515-B-1-B MS
5	320-10515-B-1~MSD (PFC_IDA)	10502757.55010801	5.09 g	1.00 mL	12/9/14	12_Days	4		320-10515-B-1-C MSD
6	320-8957-G-1 (PFC_IDA)	N/A	5.00 g	1.00 mL	9/4/14	12_Days	2		320-8957-G-1-A
7	320-9021-W-1 (PFC_IDA)	N/A	5.00 g	1.00 mL	9/9/14	12_Days	2		320-9021-W-1-A

Batch Notes

Blank Sand Lot # 142675

Filter Lot # NA

Millipore Water Dispense Date 11/24/14

Person's name who witnessed reagent drop SNE

SPE Cartridge Lot # 014933351A

SPE Cartridge Type WAX 150mg

Batch Comment SOLVENT: 0.3%NH4OH-Me_00006

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12/12/2014

Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-59087

Method Code: 320-Shake_Bath_14D-320

Analyst: Reed, Jonathan E

Batch Open: 11/25/2014 2:06:49PM

Batch End: 11/26/2014 8:40:00PM

Comments

320-10515-B-1	
320-10515-B-1~MS	Method Comments: See QAS, decant excess water & take sample from solids if possible
320-10515-B-1~MSD	Method Comments: See QAS, decant excess water & take sample from solids if possible
320-8957-G-1	Method Comments: See QAS, decant excess water & take sample from solids if possible
320-9021-W-1	Method Comments: Please add surrogate to the container and then rinse with 50mL of solvent. See Jeremy with questions
	Method Comments: Please add surrogate to the container and then rinse with 50mL of solvent. See Jeremy with questions

Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-59087

Method Code: 320-Shake_Bath_14D-320

Analyst: Reed, Jonathan E

Batch Open: 11/25/2014 2:06:49PM

Batch End: 11/26/14 8:40PM

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-59087/1	LCMPFCSU_00010	50.00 uL	1.00 mL	11/25/14	SNE 11/25/14
LCS 320-59087/2	LCMPFCSU_00010	50.00 uL	1.00 mL		
LCS 320-59087/2	LCPFCSP_00014	20.00 uL	1.00 mL		
320-10515-B-1	LCMPFCSU_00010	50.00 uL	1.00 mL		
320-10515-B-1 MS	LCMPFCSU_00010	50.00 uL	1.00 mL		
320-10515-B-1 MS	LCPFCSP_00014	20.00 uL	1.00 mL		
320-10515-B-1 MSD	LCMPFCSU_00010	50.00 uL	1.00 mL		
320-10515-B-1 MSD	LCPFCSP_00014	20.00 uL	1.00 mL		
320-8957-G-1	LCMPFCSU_00010	50.00 uL	1.00 mL		
320-9021-W-1	LCMPFCSU_00010	50.00 uL	1.00 mL		

Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-59087

Analyst: Reed, Jonathan E

Batch Open: 11/25/2014 2:06:49PM

Method Code: 320-Shake_Bath_14D-320

Batch End: 11/26/2014 8:40:00PM

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 59087 Test: PFC-5

Earliest Holding Time: 12/02/14

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	NA	NA
Method/sample/login/QAS checked and correct	✓	
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and Cl Check)	✓	✓
The pH is transcribed correctly in TALS	NA	NA
All additional information transcribed into TALS is correct and raw data is attached	✓	✓
Comments are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Batch Information	**1st Level Reviewer**	**2nd Level Reviewer**
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: [signature] Date: 11/26/14

2nd Level Reviewer: HJA Date: 12-1-14

Comments:

Box #16

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-59712

Method Code: 320-3535_IVWT-320

Analyst: Reed, Jonathan E

Batch Open: 12/3/2014 1:38:55PM

Batch End: 12/3/2014 7:10:00PM

Solid-Phase Extraction (SPE)

	Input Sample Lab ID (Analytical Method)	SDG	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-59712/1 N/A	N/A		500.00 mL 1.00 mL				N/A	N/A	N/A		MB 320-59712/1-A
2	LCS~320-59712/2 N/A	N/A		500.00 mL 1.00 mL				N/A	N/A	N/A		LCS 320-59712/2-A
3	320-10459-A-1 (PFC_IDA)	N/A		448.35 mL 1.00 mL				12/6/14	18_Days	4		320-10459-A-1-B
4	320-10459-A-2 (PFC_IDA)	N/A		427.75 mL 1.00 mL				12/6/14	18_Days	4		320-10459-A-2-B
5	320-10459-A-3 (PFC_IDA)	N/A		427.31 mL 1.00 mL				12/6/14	18_Days	4		320-10459-A-3-B
6	320-10459-A-4 (PFC_IDA)	N/A		446.26 mL 1.00 mL				12/6/14	18_Days	4		320-10459-A-4-B
7	320-10459-A-5 (PFC_IDA)	N/A		455.47 mL 1.00 mL				12/6/14	18_Days	4		320-10459-A-5-B
8	320-10459-A-6 (PFC_IDA)	N/A		447.90 mL 1.00 mL				12/6/14	18_Days	4		320-10459-A-6-B

12/12/2014

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-59712

Analyst: Reed, Jonathan E

Batch Open: 12/3/2014 1:38:55PM

Method Code: 320-3535_IVWT-320

Batch End: 12/3/2014 7:10:00PM

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	002334148A
H2O Lot used	11/24/14
Pipette ID	EC15219
Solvent Name	0.3%NH4OH/MeOH
Solvent Lot #	0.3%NH4OH-Me_00006
Analyst who added reagent	JER
SU Reagent Drop	JER
SU Reagent Drop Witness	SNE
Acid Name	NA
Acid Lot	NA
Reagent ID	NA
Reagent Lot Number	NA
NaCl Lot #	NA
SOP Number	WS-LC-0005
Batch Comment	NA

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-59712
Method Code: 320-3535_IVWT-320

Analyst: Reed, Jonathan E

Batch Open: 12/3/2014 1:38:55PM
Batch End: 12/3/2014 7:10:00PM

Comments

320-10459-A-1		
	Method Comments:	Q5
	Rework Comments:	MB and LCS contaminated.
320-10459-A-2		
	Method Comments:	Q5
	Rework Comments:	MB and LCS contaminated.
320-10459-A-3		
	Method Comments:	Q5
	Rework Comments:	MB and LCS contaminated.
320-10459-A-4		
	Method Comments:	Q5
	Rework Comments:	MB and LCS contaminated.
320-10459-A-5		
	Method Comments:	Q5
	Rework Comments:	MB and LCS contaminated.
320-10459-A-6		
	Method Comments:	Q5
	Rework Comments:	MB and LCS contaminated.

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-59712

Method Code: 320-3535_IVWT-320

Analyst: Reed, Jonathan E

Batch Open: 12/3/2014 1:38:55PM

Batch End: 12/03/14 7:10 PM

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-59712/1	LCMPFCSU_00010	50.00 uL	1.00 mL	12/03/14	SNE 12/3/14
LCS 320-59712/2	LCMPFCSU_00010	50.00 uL	1.00 mL		
LCS 320-59712/2	LCPFCSP_00014	20.00 uL	1.00 mL		
320-10459-A-1	LCMPFCSU_00010	50.00 uL	1.00 mL		
320-10459-A-2	LCMPFCSU_00010	50.00 uL	1.00 mL		
320-10459-A-3	LCMPFCSU_00010	50.00 uL	1.00 mL		
320-10459-A-4	LCMPFCSU_00010	50.00 uL	1.00 mL		
320-10459-A-5	LCMPFCSU_00010	50.00 uL	1.00 mL		
320-10459-A-6	LCMPFCSU_00010	50.00 uL	1.00 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 57712 Test: PFC-L

Earliest Holding Time: 4/22/14

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and Cl Check)	✓	✓
The pH is transcribed correctly in TALS	NA	NA
All additional information transcribed into TALS is correct and raw data is attached	✓	✓
Comments are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Batch Information	**1st Level Reviewer**	**2nd Level Reviewer**
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: [signature] Date: 12/03/14

2nd Level Reviewer: HJA Date: 12-4-14

Comments:

Box #11

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-59090 Analyst: Reed, Jonathan E Batch Open: 11/25/2014 2:15:36PM

Method Code: 320-3535_IVWT-320 Batch End: 11/26/2014 2:38:00PM

Solid-Phase Extraction (SPE)

	Input Sample Lab ID (Analytical Method)	SDG	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-59090/1 N/A	N/A		500.00 mL				N/A	N/A	N/A		MB 320-59090/1-A
				1.00 mL								
2	LCS~320-59090/2 N/A	N/A		500.00 mL				N/A	N/A	N/A		LCS 320-59090/2-A
				1.00 mL								
3	320-10591-B-1 (PFC_IDA)	N/A	552.44 g	512.3 mL				12/5/14	8_Days	4		320-10591-B-1-A
			40.19 g	1.00 mL								

12/12/2014

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-59090 Analyst: Reed, Jonathan E Batch Open: 11/25/2014 2:15:36PM

Method Code: 320-3535_IVWT-320 Batch End: 11/26/2014 2:38:00PM

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	002334148A
H2O Lot used	11/24/14
Pipette ID	EC15219
Solvent Name	0.3%NH4OH/MeOH
Solvent Lot #	0.3%NH4OH-Me_00006
Analyst who added reagent	JER
SU Reagent Drop	JER
SU Reagent Drop Witness	SNE
Acid Name	NA
Acid Lot	NA
Reagent ID	NA
Reagent Lot Number	NA
NaCl Lot #	NA
SOP Number	WS-LC-0025
Batch Comment	NA

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-59090

Method Code: 320-3535_IVWT-320

Analyst: Reed, Jonathan E

Batch Open: 11/25/2014 2:15:36PM

Batch End: 11/26/2014 2:38:00PM

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-59090
Method Code: 320-3535_IVWT-320

Analyst: Reed, Jonathan E

Batch Open: 11/25/2014 2:15:36PM
Batch End: 11/26/14 2:38 PM

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-59090/1	LCMPFCSU_00010	50.00 uL	1.00 mL	11/25/14	SNE 11/25/14
LCS 320-59090/2	LCMPFCSU_00010	50.00 uL	1.00 mL		
LCS 320-59090/2	LCPFCSP_00014	20.00 uL	1.00 mL		
320-10591-B-1	LCMPFCSU_00010	50.00 uL	1.00 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 59090 Test: PFC-L

Earliest Holding Time: 11/21/14

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and Cl Check)	✓	✓
The pH is transcribed correctly in TALS	NA	NA
All additional information transcribed into TALS is correct and raw data is attached	✓	✓
Comments are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Batch Information	**1st Level Reviewer**	**2nd Level Reviewer**
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: [signature] Date: 11/26/14

2nd Level Reviewer: HJA Date: 11-26-14

Comments:

Box #10

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-58953

Method Code: 320-3535_IVWT-320

Analyst: Reed, Jonathan E

Batch Open: 11/24/2014 4:22:13PM

Batch End: 11/25/2014 5:08:00PM

Solid-Phase Extraction (SPE)

	Input Sample Lab ID (Analytical Method)	SDG	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-58953/1 N/A	N/A		500.00 mL 1.00 mL				N/A	N/A	N/A		MB 320-58953/1-A
2	LCS~320-58953/2 N/A	N/A		500.00 mL 1.00 mL				N/A	N/A	N/A		LCS 320-58953/2-A
3	320-10572-A-1 (PFC_IDA)	N/A		500.25 mL 1.00 mL				12/9/14	18_Days	4		320-10572-A-1-A
4	N/A	N/A		1.00 mL				N/A	N/A	N/A		
5	N/A	N/A		1.00 mL				N/A	N/A	N/A		
6	320-10572-A-2 (PFC_IDA)	N/A		499.85 mL 1.00 mL				12/9/14	18_Days	4		320-10572-A-2-A
7	320-10572-A-3 (PFC_IDA)	N/A		502.05 mL 1.00 mL				12/9/14	18_Days	4		320-10572-A-3-A
8	320-10572-A-4 (PFC_IDA)	N/A		501.98 mL 1.00 mL				12/9/14	18_Days	4		320-10572-A-4-A
9	320-10114-A-16 (PFC_IDA)	LCMS PFC Aq A4		500.00 mL 1.00 mL				1/7/15	47_Days	4	LOD-1	320-10114-A-16-A
10	320-10114-A-17 (PFC_IDA)	LCMS PFC Aq A4		500.00 mL 1.00 mL				1/7/15	47_Days	4	LOD-2	320-10114-A-17-A

12/12/2014

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-58953

Analyst: Reed, Jonathan E

Batch Open: 11/24/2014 4:22:13PM

Method Code: 320-3535_IVWT-320

Batch End: 11/25/2014 5:08:00PM

11	320-10114-A-18 (PFC_IDA)	LCMS PFC Aq A4		500.00 mL				1/7/15	47_Days	4	LOD-3	320-10114-A-18-A
				1.00 mL								
12	320-10114-A-19 (PFC_IDA)	LCMS PFC Aq A4		500.00 mL				1/7/15	47_Days	4	LOQ-1	320-10114-A-19-A
				1.00 mL								
13	320-10114-A-20 (PFC_IDA)	LCMS PFC Aq A4		500.00 mL				1/7/15	47_Days	4	LOQ-2	320-10114-A-20-A
				1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-58953

Method Code: 320-3535_IVWT-320

Analyst: Reed, Jonathan E

Batch Open: 11/24/2014 4:22:13PM

Batch End: 11/25/2014 5:08:00PM

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	0023341484
H2O Lot used	11/14/14
Pipette ID	EC15219
Solvent Name	0.3%NH4OH/MeOH
Solvent Lot #	0.3%NH4OH-Me_00006
Analyst who added reagent	JER
SU Reagent Drop	JER
SU Reagent Drop Witness	AVM
Acid Name	NA
Acid Lot	NA
Reagent ID	NA
Reagent Lot Number	NA
NaCl Lot #	NA
SOP Number	WS-LC-0025
Batch Comment	NA

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-58953
Analyst: Reed, Jonathan E
Batch Open: 11/24/2014 4:22:13PM

Method Code: 320-3535_IVWT-320
Batch End: 11/25/2014 5:08:00PM

Comments

320-10572-A-1	Method Comments:	Q5
320-10572-A-2	Method Comments:	Q5
320-10572-A-3	Method Comments:	Q5
320-10572-A-4	Method Comments:	Q5

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-58953

Method Code: 320-3535_IVWT-320

Analyst: Reed, Jonathan E

Batch Open: 11/24/2014 4:22:13PM

Batch End: 11/25/14 5:08PM

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-58953/1	LCMPFCSU_00010	50.00 uL	1.00 mL	11/24/14	AM 4/24/14
LCS 320-58953/2	LCMPFCSU_00010	50.00 uL	1.00 mL		
LCS 320-58953/2	LCPFCSP_00014	20.00 uL	1.00 mL		
320-10572-A-1	LCMPFCSU_00010	50.00 uL	1.00 mL		
	~~LCMPFCSU_00010~~	~~50.00 uL~~	~~1.00 mL~~		
	~~LCMPFCSU_00010~~	~~50.00 uL~~	~~1.00 mL~~ 11/24/14		
320-10572-A-2	LCMPFCSU_00010	50.00 uL	1.00 mL		
320-10572-A-3	LCMPFCSU_00010	50.00 uL	1.00 mL		
320-10572-A-4	LCMPFCSU_00010	50.00 uL	1.00 mL		
320-10114-A-16	LCMPFCSU_00010	50.00 uL	1.00 mL		
320-10114-A-16	LCPFCSP_00016	50.00 uL	1.00 mL		
320-10114-A-17	LCMPFCSU_00010	50.00 uL	1.00 mL		
320-10114-A-17	LCPFCSP_00016	100.00 uL	1.00 mL		
320-10114-A-18	LCMPFCSU_00010	50.00 uL	1.00 mL		
320-10114-A-18	LCPFCSP_00016	150.00 uL	1.00 mL		
320-10114-A-19	LCMPFCSU_00010	50.00 uL	1.00 mL		
320-10114-A-19	LCPFCSP_00016	125.00 uL	1.00 mL		
320-10114-A-20	LCMPFCSU_00010	50.00 uL	1.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-58953

Method Code: 320-3535_IVWT-320

Analyst: Reed, Jonathan E

Batch Open: 11/24/2014 4:22:13PM

Batch End: 11/25/14 5:08PM

320-10114-A-20	LCPFCSP_00016	200.00 uL	1.00 mL	11/24/14	A/M 11/24/14

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 58953 Test: PFC-L

Earliest Holding Time: 11/25/14

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	✓	✓
Method/sample/login/QAS checked and correct	✓	
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and Cl Check)	✓	✓
The pH is transcribed correctly in TALS	NA	NA
All additional information transcribed into TALS is correct and raw data is attached	✓	✓
Comments are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	
Batch Information	**1st Level Reviewer**	**2nd Level Reviewer**
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	

1st Level Reviewer: [signature] Date: 11/25/14

2nd Level Reviewer: [signature] Date: 11/25/14

Comments: _____

Shipping and Receiving Documents

Tetra Tech, Inc. CHAIN OF CUSTODY | NUMBER No. 0533 | PAGE 1 OF 1

PROJECT NO: 112G02063	FACILITY: NAS Brunswick	PROJECT MANAGER Jeff Orient	PHONE NUMBER 412 921 7090	LABORATORY NAME AND CONTACT: Test America
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER Tim Evans	PHONE NUMBER 412 921 7090	ADDRESS 880 Riverside Pkwy
		CARRIER/WAYBILL NUMBER 8066 1897 7115 FedEx		CITY, STATE West Sacramento CA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2014	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS PFOA/PFOS	COMMENTS
									P	1		
11/15	1205	B7/10-GW02	B7/10-MW02	-	-	GW	G	1	1			
↓	1520	B7/10-GW03S	B7/10-MW03S	-	-	GW	G	1	1			
11/16	1020	QRY-GW02	QRY-MW02	-	-	GW	G	1	1			
	1150	B7/10-GW06S	B7/10-MW06S	-	-	GW	G	1	1			
	1500	H123-GW02	H123-MW02	-	-	GW	G	1	1			
↓	0000	EFA-FD01-1014	Field Duplicate	-	-	GW	G	1	1			

320-10459 Chain of Custody

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	11/17/14	1730	1. RECEIVED BY FedEx		
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY 0.5°C	DATE 11/18/14	TIME 950
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

12/12/2014

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-10459-1

Login Number: 10459

List Source: TestAmerica Sacramento

List Number: 1

Creator: Sadler, Jeremy

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

"B7/10-GW02","WS-LC-0025","RES","320-10459-1","TALSAC","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","6.6","ng/L","H","1.4","DL","","TRG","","","2.2","LOQ","YES","-99","","448.35","1.00","1.7",""
"B7/10-GW02","WS-LC-0025","RES","320-10459-1","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","10","ng/L","H","0.83","DL","","TRG","","","2.2","LOQ","YES","-99","","448.35","1.00","1.7",""
"B7/10-GW02","WS-LC-0025","RES","320-10459-1","TALSAC","STL00990","13C4
PFOA","95","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","112","","448.35","1.00","0",""
"B7/10-GW02","WS-LC-0025","RES","320-10459-1","TALSAC","STL00991","13C4
PFOS","120","ng/L","","-99","DL","","TRG","116","","-99","LOQ","YES","107","","448.35","1.00","0",""
"B7/10-GW03S","WS-LC-0025","RES","320-10459-2","TALSAC","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","1.8","ng/L","U H","1.5","DL","","TRG","","","2.3","LOQ","YES","-99","","427.75","1.00","1.8",""
"B7/10-GW03S","WS-LC-0025","RES","320-10459-2","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","2.0","ng/L","J H","0.87","DL","","TRG","","","2.3","LOQ","YES","-99","","427.75","1.00","1.8",""
"B7/10-GW03S","WS-LC-0025","RES","320-10459-2","TALSAC","STL00990","13C4
PFOA","75","ng/L","","-99","DL","","TRG","64","","-99","LOQ","YES","117","","427.75","1.00","0",""
"B7/10-GW03S","WS-LC-0025","RES","320-10459-2","TALSAC","STL00991","13C4
PFOS","120","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","112","","427.75","1.00","0",""
"QR4-GW02","WS-LC-0025","RES","320-10459-3","TALSAC","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","1.8","ng/L","U H","1.5","DL","","TRG","","","2.3","LOQ","YES","-99","","427.31","1.00","1.8",""
"QR4-GW02","WS-LC-0025","RES","320-10459-3","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","1.8","ng/L","U H","0.88","DL","","TRG","","","2.3","LOQ","YES","-99","","427.31","1.00","1.8",""
"QR4-GW02","WS-LC-0025","RES","320-10459-3","TALSAC","STL00990","13C4
PFOA","110","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","117","","427.31","1.00","0",""
"QR4-GW02","WS-LC-0025","RES","320-10459-3","TALSAC","STL00991","13C4
PFOS","120","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","112","","427.31","1.00","0",""
"B7/10-GW06S","WS-LC-0025","RES","320-10459-4","TALSAC","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","2.2","ng/L","H","1.4","DL","","TRG","","","2.2","LOQ","YES","-99","","446.26","1.00","1.7",""
"B7/10-GW06S","WS-LC-0025","RES","320-10459-4","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","20","ng/L","H","0.84","DL","","TRG","","","2.2","LOQ","YES","-99","","446.26","1.00","1.7",""
"B7/10-GW06S","WS-LC-0025","RES","320-10459-4","TALSAC","STL00990","13C4
PFOA","75","ng/L","","-99","DL","","TRG","67","","-99","LOQ","YES","112","","446.26","1.00","0",""
"B7/10-GW06S","WS-LC-0025","RES","320-10459-4","TALSAC","STL00991","13C4
PFOS","120","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","107","","446.26","1.00","0",""
"H123-GW02","WS-LC-0025","RES","320-10459-5","TALSAC","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","1.6","ng/L","U H","1.4","DL","","TRG","","","2.2","LOQ","YES","-99","","455.47","1.00","1.6",""
"H123-GW02","WS-LC-0025","RES","320-10459-5","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","17","ng/L","H","0.82","DL","","TRG","","","2.2","LOQ","YES","-99","","455.47","1.00","1.6",""
"H123-GW02","WS-LC-0025","RES","320-10459-5","TALSAC","STL00990","13C4
PFOA","98","ng/L","","-99","DL","","TRG","89","","-99","LOQ","YES","110","","455.47","1.00","0",""
"H123-GW02","WS-LC-0025","RES","320-10459-5","TALSAC","STL00991","13C4
PFOS","110","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","105","","455.47","1.00","0",""
"EFA-FD01-1014","WS-LC-0025","RES","320-10459-6","TALSAC","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","1.7","ng/L","U H","1.4","DL","","TRG","","","2.2","LOQ","YES","-99","","447.90","1.00","1.7",""
"EFA-FD01-1014","WS-LC-0025","RES","320-10459-6","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","16","ng/L","H","0.84","DL","","TRG","","","2.2","LOQ","YES","-99","","447.90","1.00","1.7",""
"EFA-FD01-1014","WS-LC-0025","RES","320-10459-6","TALSAC","STL00990","13C4
PFOA","91","ng/L","","-99","DL","","TRG","82","","-99","LOQ","YES","112","","447.90","1.00","0",""
"EFA-FD01-1014","WS-LC-0025","RES","320-10459-6","TALSAC","STL00991","13C4
PFOS","120","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","107","","447.90","1.00","0",""
"LCS 320-59712/2-A","WS-LC-0025","RES","LCS 320-59712/2-A","TALSAC","1763-23-1","Perfluorooctane
Sulfonate
(PFOS)","39.7","ng/L","","1.3","DL","","SPK","104","","2.0","LOQ","YES","38.2","","500.00","1.00","1.5",""
"LCS 320-59712/2-A","WS-LC-0025","RES","LCS 320-59712/2-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","50.4","ng/L","","0.75","DL","","SPK","126","","2.0","LOQ","YES","40.0","","500.00","1.00","1.5",""

"LCS 320-59712/2-A","WS-LC-0025","RES","LCS 320-59712/2-A","TALSAC","STL00990","13C4 PFOA","98.0","ng/L","","-99","DL","","SPK","98","","-99","LOQ","YES","100","","500.00","1.00","0",""
"LCS 320-59712/2-A","WS-LC-0025","RES","LCS 320-59712/2-A","TALSAC","STL00991","13C4 PFOS","96.3","ng/L","","-99","DL","","SPK","101","","-99","LOQ","YES","95.6","","500.00","1.00","0",""
"MB 320-59712/1-A","WS-LC-0025","RES","MB 320-59712/1-A","TALSAC","1763-23-1","Perfluorooctane Sulfonate (PFOS)","1.5","ng/L","U","1.3","DL","","TRG","","","2.0","LOQ","YES","-99","","500.00","1.00","1.5",""
"MB 320-59712/1-A","WS-LC-0025","RES","MB 320-59712/1-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","0.809","ng/L","J","0.75","DL","","TRG","","","2.0","LOQ","YES","-99","","500.00","1.00","1.5",""
"MB 320-59712/1-A","WS-LC-0025","RES","MB 320-59712/1-A","TALSAC","STL00990","13C4 PFOA","109","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","100","","500.00","1.00","0",""
"MB 320-59712/1-A","WS-LC-0025","RES","MB 320-59712/1-A","TALSAC","STL00991","13C4 PFOS","106","ng/L","","-99","DL","","TRG","111","","-99","LOQ","YES","95.6","","500.00","1.00","0",""
"13-CTO WE09","NAS, Brunswick","B7/10-GW02","11/15/2014 12:05","AQ","320-10459-1","NM","","0.00","WS-LC-0025","3535","RES","12/03/2014 13:38","12/04/2014 20:45","TALSAC","COA","WET","NA","1","NA","NA","","100","320-59712","320-59712","NA","320-59779","320-10459-1","11/18/2014 09:50","11/18/2014 15:12",""
"13-CTO WE09","NAS, Brunswick","B7/10-GW03S","11/15/2014 15:20","AQ","320-10459-2","NM","","0.00","WS-LC-0025","3535","RES","12/03/2014 13:38","12/04/2014 21:07","TALSAC","COA","WET","NA","1","NA","NA","","100","320-59712","320-59712","NA","320-59779","320-10459-1","11/18/2014 09:50","11/18/2014 15:12",""
"13-CTO WE09","NAS, Brunswick","QR4-GW02","11/16/2014 10:20","AQ","320-10459-3","NM","","0.00","WS-LC-0025","3535","RES","12/03/2014 13:38","12/04/2014 21:28","TALSAC","COA","WET","NA","1","NA","NA","","100","320-59712","320-59712","NA","320-59779","320-10459-1","11/18/2014 09:50","11/18/2014 15:12",""
"13-CTO WE09","NAS, Brunswick","B7/10-GW06S","11/16/2014 11:50","AQ","320-10459-4","NM","","0.00","WS-LC-0025","3535","RES","12/03/2014 13:38","12/04/2014 21:49","TALSAC","COA","WET","NA","1","NA","NA","","100","320-59712","320-59712","NA","320-59779","320-10459-1","11/18/2014 09:50","11/18/2014 15:12",""
"13-CTO WE09","NAS, Brunswick","H123-GW02","11/16/2014 15:00","AQ","320-10459-5","NM","","0.00","WS-LC-0025","3535","RES","12/03/2014 13:38","12/04/2014 22:10","TALSAC","COA","WET","NA","1","NA","NA","","100","320-59712","320-59712","NA","320-59779","320-10459-1","11/18/2014 09:50","11/18/2014 15:12",""
"13-CTO WE09","NAS, Brunswick","EFA-FD01-1014","11/16/2014 00:00","AQ","320-10459-6","NM","","0.00","WS-LC-0025","3535","RES","12/03/2014 13:38","12/04/2014 22:31","TALSAC","COA","WET","NA","1","NA","NA","","100","320-59712","320-59712","NA","320-59779","320-10459-1","11/18/2014 09:50","11/18/2014 15:12",""
"13-CTO WE09","NAS, Brunswick","LCS 320-59712/2-A","","AQ","LCS 320-59712/2-A","LCS","","-99","WS-LC-0025","3535","RES","12/03/2014 13:38","12/04/2014 20:24","TALSAC","COA","WET","NA","1","NA","NA","","100","320-59712","320-59712","NA","320-59779","320-10459-1","12/03/2014 13:38","11/18/2014 15:12",""
"13-CTO WE09","NAS, Brunswick","MB 320-59712/1-A","","AQ","MB 320-59712/1-A","MB","","-99","WS-LC-0025","3535","RES","12/03/2014 13:38","12/04/2014 20:03","TALSAC","COA","WET","NA","1","NA","NA","","100","320-59712","320-59712","NA","320-59779","320-10459-1","12/03/2014 13:38","11/18/2014 15:12",""

TETRA TECH **INTERNAL CORRESPONDENCE**

TO: **J. ORIENT** **DATE:** **FEBRUARY 17, 2015**

FROM: **MICHELLE L. ALLEN** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – PFOA/PFOS**
FORMER NAVAL AIR STATION (NAS) BRUNSWICK, BRUNSWICK, ME
CTO WE09
SAMPLE DELIVERY GROUPS (SDGs) 320-10459-1 & 320-10572-1

SAMPLES: 10/Aqueous/PFOA/PFOS

SDG 320-10459-1

B7/10-GW02	B7/10-GW03S	B7/10-GW06S
EFA-FD01-1014	H123-GW02	QR4-GW02

SDG 320-10572-1

EFA-GW01	EFA-GW02	EFA-GW03
EFA-GW09		

Overview

The sample set for former NAS Brunswick, SDGs 320-10459-1 & 320-10572-1 consisted of ten (10) aqueous environmental samples. All ten (1) aqueous samples were analyzed for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). One field duplicate pair was included in these Sample Delivery Groups (SDGs): EFA-FD01-1014/H123-GW02.

The samples were collected by Tetra Tech, Inc. on November 15, 16, 18, 19, and 20, 2014 and analyzed by TestAmerica. The PFOA & PFOS analyses were conducted using Test America Laboratories (TAL) Standard Operating Procedure (SOP) WS-LC-0025 analytical and reporting protocols. The data was evaluated based on the following parameters:

* • Data Completeness
* • Holding Times/Sample Preservation
* • LC/MS Tuning
* • Initial and Continuing Calibration Results
• Laboratory Method Blank Results
* • Surrogate Spike Recoveries
* • Internal Standard Recoveries
* • Laboratory Control Sample Results
* • Field Duplicate Precision
* • Detection Limits
* • Compound Identification and Quantification

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B, and Appendix C contains the documentation to support the findings as discussed in this data validation report. An EPA Region 1 tier II validation was performed on the data in these SDGs. The text of this report has been formulated to address only those areas affecting data quality.

LABORATORY METHOD AND TRIP BLANK RESULTS

The following compound was detected in the laboratory method blank at the following maximum concentration:

Compound	Maximum Concentration (ng/L)	Action Level (ng/L)
PFOA (1)	0.809	4.05

(1) Maximum concentration detected in the laboratory method blank, MB 320-59712/1-A, from preparation batch # 320-59712 affecting the all samples from SDG 320-10459-1.

An action level of 5X the maximum contaminant concentration was established to evaluate blank contamination. Dilution factor and sample aliquot were taken into consideration during the application of the action level. The detected result reported for PFOA below the established action level in sample B7/10-GW03S was qualified as non-detected, (U).

NOTES

EPA Region 1 worksheets were not applicable to this methodology and were not included in this tier II validation.

Detected results reported below the Limit of Quantitation (LOQ) but above the Detection Limit (DL) were qualified as estimated, (J). Non-detected results are reported to the Limit of Detection (LOD).

EXECUTIVE SUMMARY

Laboratory Performance: PFOA was detected in the laboratory method blank.

Other Factors Affecting Data Quality: Detected results below the LOQ were estimated.

The data for these analyses were reviewed with reference to the EPA New England Environmental Data Review Supplement for Regional Data Review Elements Superfund Guidance/Procedures (April 2013), National Functional Guidelines for Organic Data Validation (January 2008), and the Department of Defense (DoD) document entitled, "Quality Systems Manual (QSM) for Environmental Laboratories" (July 2013). The text of this report has been formulated to address only those areas affecting data quality.

Tetra Tech, Inc.
Michelle L. Allen
Environmental Chemist

Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A

QUALIFIED LABORATORY RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate

PROJ_NO: 02063	NSAMPLE	B7/10-GW02			B7/10-GW03S			B7/10-GW06S			EFA-FD01-1014		
SDG: 320-10459-1	LAB_ID	320-10459-1			320-10459-2			320-10459-4			320-10459-6		
FRACTION: OS	SAMP_DATE	11/15/2014			11/15/2014			11/16/2014			11/16/2014		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF										H123-GW02		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		10			2	U	A	20			16		
PERFLUOROOCTANE SULFONIC ACID		6.6			1.8	U		2.2			1.7	U	

PROJ_NO: 02063	NSAMPLE	H123-GW02			QRY-GW02		
SDG: 320-10459-1	LAB_ID	320-10459-5			320-10459-3		
FRACTION: OS	SAMP_DATE	11/16/2014			11/16/2014		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		17			1.8	U	
PERFLUOROOCTANE SULFONIC ACID		1.6	U		1.8	U	

PROJ_NO: 02063	NSAMPLE	EFA-GW01			EFA-GW02			EFA-GW03			EFA-GW09		
SDG: 320-10572-1	LAB_ID	320-10572-1			320-10572-2			320-10572-3			320-10572-4		
FRACTION: OS	SAMP_DATE	11/18/2014			11/18/2014			11/19/2014			11/20/2014		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		1.8	J	P	1.5	U		11			31		
PERFLUOROOCTANE SULFONIC ACID		1.5	U		1.5	U		14			7.6		

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-10459-1

SDG No.:

Client Sample ID: B7/10-GW02 | Lab Sample ID: 320-10459-1

Matrix: Water | Lab File ID: 03DEC14A4A_084.d

Analysis Method: WS-LC-0025 | Date Collected: 11/15/2014 12:05

Extraction Method: 3535 | Date Extracted: 12/03/2014 13:38

Sample wt/vol: 448.35(mL) | Date Analyzed: 12/04/2014 20:45

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 59779 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	10	H	2.2	1.7	0.83
1763-23-1	Perfluorooctane Sulfonate (PFOS)	6.6	H	2.2	1.7	1.4

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	116		25-150
STL00990	13C4 PFOA	85		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Client Sample ID: B7/10-GW03S Lab Sample ID: 320-10459-2

Matrix: Water Lab File ID: 03DEC14A4A_085.d

Analysis Method: WS-LC-0025 Date Collected: 11/15/2014 15:20

Extraction Method: 3535 Date Extracted: 12/03/2014 13:38

Sample wt/vol: 427.75(mL) Date Analyzed: 12/04/2014 21:07

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 59779 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	J H	2.3	1.8	0.87
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.8	U H	2.3	1.8	1.5

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	108		25-150
STL00990	13C4 PFOA	64		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Client Sample ID: B7/10-GW06S Lab Sample ID: 320-10459-4

Matrix: Water Lab File ID: 03DEC14A4A_087.d

Analysis Method: WS-LC-0025 Date Collected: 11/16/2014 11:50

Extraction Method: 3535 Date Extracted: 12/03/2014 13:38

Sample wt/vol: 446.26(mL) Date Analyzed: 12/04/2014 21:49

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.: 59779 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	20	H	2.2	1.7	0.84
1763-23-1	Perfluorooctane Sulfonate (PFOS)	2.2	H	2.2	1.7	1.4

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	108		25-150
STL00990	13C4 PFOA	67		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Client Sample ID: EFA-FD01-1014 Lab Sample ID: 320-10459-6

Matrix: Water Lab File ID: 03DEC14A4A_089.d

Analysis Method: WS-LC-0025 Date Collected: 11/16/2014 00:00

Extraction Method: 3535 Date Extracted: 12/03/2014 13:38

Sample wt/vol: 447.90(mL) Date Analyzed: 12/04/2014 22:31

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 59779 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	16	H	2.2	1.7	0.84
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.7	U H	2.2	1.7	1.4

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	109		25-150
STL00990	13C4 PFOA	82		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Client Sample ID: H123-GW02 Lab Sample ID: 320-10459-5

Matrix: Water Lab File ID: 03DEC14A4A_088.d

Analysis Method: WS-LC-0025 Date Collected: 11/16/2014 15:00

Extraction Method: 3535 Date Extracted: 12/03/2014 13:38

Sample wt/vol: 455.47(mL) Date Analyzed: 12/04/2014 22:10

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 59779 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	17	H	2.2	1.6	0.82
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.6	U H	2.2	1.6	1.4

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	107		25-150
STL00990	13C4 PFOA	89		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-10459-1

SDG No.:

Client Sample ID: QR4-GW02 | Lab Sample ID: 320-10459-3

Matrix: Water | Lab File ID: 03DEC14A4A_086.d

Analysis Method: WS-LC-0025 | Date Collected: 11/16/2014 10:20

Extraction Method: 3535 | Date Extracted: 12/03/2014 13:38

Sample wt/vol: 427.31(mL) | Date Analyzed: 12/04/2014 21:28

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.: 59779 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	1.8	U H	2.3	1.8	0.88
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.8	U H	2.3	1.8	1.5

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	109		25-150
STL00990	13C4 PFOA	90		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-10572-1

SDG No.:

Client Sample ID: EFA-GW01 | Lab Sample ID: 320-10572-1

Matrix: Water | Lab File ID: 03DEC14A4A_074.d

Analysis Method: WS-LC-0025 | Date Collected: 11/18/2014 11:00

Extraction Method: 3535 | Date Extracted: 11/24/2014 16:22

Sample wt/vol: 500.25(mL) | Date Analyzed: 12/04/2014 17:13

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 59779 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	1.8	J	2.0	1.5	0.75
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.5	U	2.0	1.5	1.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	114		25-150
STL00990	13C4 PFOA	113		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10572-1

SDG No.:

Client Sample ID: EFA-GW02 Lab Sample ID: 320-10572-2

Matrix: Water Lab File ID: 03DEC14A4A_075.d

Analysis Method: WS-LC-0025 Date Collected: 11/18/2014 16:25

Extraction Method: 3535 Date Extracted: 11/24/2014 16:22

Sample wt/vol: 499.85(mL) Date Analyzed: 12/04/2014 17:34

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 59779 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	1.5	U	2.0	1.5	0.75
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.5	U	2.0	1.5	1.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	105		25-150
STL00990	13C4 PFOA	97		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10572-1

SDG No.:

Client Sample ID: EFA-GW03 Lab Sample ID: 320-10572-3

Matrix: Water Lab File ID: 03DEC14A4A_076.d

Analysis Method: WS-LC-0025 Date Collected: 11/19/2014 11:10

Extraction Method: 3535 Date Extracted: 11/24/2014 16:22

Sample wt/vol: 502.05(mL) Date Analyzed: 12/04/2014 17:56

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 59779 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	11		2.0	1.5	0.74
1763-23-1	Perfluorooctane Sulfonate (PFOS)	14		2.0	1.5	1.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	109		25-150
STL00990	13C4 PFOA	93		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10572-1

SDG No.:

Client Sample ID: EFA-GW09 Lab Sample ID: 320-10572-4

Matrix: Water Lab File ID: 03DEC14A4A_077.d

Analysis Method: WS-LC-0025 Date Collected: 11/20/2014 10:40

Extraction Method: 3535 Date Extracted: 11/24/2014 16:22

Sample wt/vol: 501.98(mL) Date Analyzed: 12/04/2014 18:17

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.: 59779 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	31		2.0	1.5	0.75
1763-23-1	Perfluorooctane Sulfonate (PFOS)	7.6		2.0	1.5	1.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	113		25-150
STL00990	13C4 PFOA	72		25-150

APPENDIX C

SUPPORT DOCUMENTATION

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_087.d
Lims ID: 320-10459-A-4-B Lab Sample ID: 320-10459-4
Client ID: B7/10-GW06S
Sample Type: Client
Inject. Date: 04-Dec-2014 21:49:30 ALS Bottle#: 27 Worklist Smp#: 51
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-10459-a-4-b 59712
Misc. Info.: AcquityBEH 1.7u C18, 150x3.0mm, T=50C,A(4967-113F)
Operator ID: JRB Instrument ID: A4

Method: \\Sacchrom\ChromData\A4\20141204-17820.b\PFAC_A4.m
Limit Group: LC PFC ICAL
Last Update: 05-Dec-2014 10:03:21 Calib Date: 04-Dec-2014 05:51:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\Sacchrom\ChromData\A4\20141204-17820.b\03DEC14A4A_046.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK022

$\overline{RRF} = 1.6697$

extraction: $\frac{446.26\text{ml}}{1\text{ml}}$

df = 1

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
416.5 > 371.6	10.642	10.628	0.014		1138168	33.6		67.3	1719	
13 Perfluorooctanoic acid										
→ 412.8 > 368.8	10.642	10.628	0.014	1.000	340395	8.96			107	
412.8 > 168.7	10.642	10.628	0.014	1.000	89169		3.82(0.00-0.00)		61.5	
D 16 13C4 PFOS										
502.4 > 79.7	11.602	11.595	0.007		2338394	51.9		108	3471	
15 Perfluorooctanoic Sulfonate										
498.9 > 79.7	11.602	11.595	0.007	1.000	87815	0.99			17.4	
498.9 > 98.7	11.602	11.595	0.007	1.000	51215		1.71(0.00-0.00)		31.1	

$$\frac{340395 \times 50\text{ng/ml}}{1138168 \times 1.6697} \times \frac{1\text{ml}}{446.26} \times \frac{1000\text{ml}}{1\text{L}}$$

$$= 20.07\ \text{ng/L}$$

NAS BRUNSWICK
WATER DATA
320-10459-1

FRACTION	CHEMICAL	H123-GW02	UNITS	EFA-FD01-1014	RPD	D
OS	PENTADECAFLUOROOCTANOIC ACID	17 J	NG/L	16 J	6.06	1.00

Current RPD Quality Control Limit: 30 %.
Shaded cells indicate RPDs that exceed the applicable quality control limit.

Tetra Tech, Inc. CHAIN OF CUSTODY | NUMBER No. 0533 | PAGE 1 OF 1

PROJECT NO: 112G02063	FACILITY: NAS Brunswick	PROJECT MANAGER Jeff Orient	PHONE NUMBER 412 921 7090	LABORATORY NAME AND CONTACT: Test America
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER Tim Evans	PHONE NUMBER 412 921 7090	ADDRESS 880 Riverside Pkwy
		CARRIER/WAYBILL NUMBER FedEx 8066 1897 7115		CITY, STATE West Sacramento CA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): P
PRESERVATIVE USED: 1
TYPE OF ANALYSIS: PFOA/PFOS

DATE YEAR 2014	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS		COMMENTS
11/15	1205	B7/10-GW02	B7/10-MW02	-	-	GW	G	1	1	
↓	1520	B7/10-GW03S	B7/10-MW03S	-	-	GW	G	1	1	
11/16	1020	QRY-GW02	QRY-MW02	-	-	GW	G	1	1	
	1150	B7/10-GW06S	B7/10-MW06S	-	-	GW	G	1	1	
	1500	H123-GW02	H123-MW02	-	-	GW	G	1	1	
↓	0000	EFA-FD01-1014	Field Duplicate	-	-	GW	G	1	1	

320-10459 Chain of Custody

1. RELINQUISHED BY	DATE 11/17/14	TIME 1730	1. RECEIVED BY FedEx	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY 0.5°C	DATE 11/18/14	TIME 950
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

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12/12/2014

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-10459-1

Login Number: 10459
List Number: 1
Creator: Sadler, Jeremy

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

CASE NARRATIVE

Client: Tetra Tech, Inc.

Project: NAS Brunswick Maine 13-CTO WE09

Report Number: 320-10459-1

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.

TestAmerica West Sacramento attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the applicable methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

TestAmerica utilizes USEPA approved methods and DOD QSM, where applicable, in all analytical work. The samples presented in this report were analyzed for the parameter(s) listed on the analytical methods summary page in accordance with the method(s) indicated. A summary of QC data for these analyses is included at the back of the report.

All parameters for which TestAmerica West Sacramento has certification were evaluated to the QSM specified reporting convention or to the client specified format if different from QSM. Parameters not certified under QSM, if any, were evaluated to the detection limit (DL) and include qualified results where applicable.

The sample(s) that contain constituents flagged with U are undetected. The result associated with this flag is the limit of detection (LOD).

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.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 11/18/2014 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.5° C.

PFOA/PFOS

Method WS-LC-0025:

The following samples were re-extracted past the 7 day extraction hold time due to contamination in the method blank (MB) and laboratory control sample (LCS) for the original prep batch: B7/10-GW02 (320-10459-1), B7/10-GW03S (320-10459-2), B7/10-GW06S (320-10459-4), EFA-FD01-1014 (320-10459-6), H123-GW02 (320-10459-5), QR4-GW02 (320-10459-3). There is no prescribed regulatory holding time for PFOA and PFOS. The 7 day extraction holding time is based on general EPA convention for the holding time of extractable organic compounds in water.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 320-59712.

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

Method Summary

Client: Tetra Tech, Inc.
Project/Site: NAS Brunswick Maine 13-CTO WE09

TestAmerica Job ID: 320-10459-1

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: Tetra Tech, Inc.
Project/Site: NAS Brunswick Maine 13-CTO WE09

TestAmerica Job ID: 320-10459-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-10459-1	B7/10-GW02	Water	11/15/14 12:05	11/18/14 09:50
320-10459-2	B7/10-GW03S	Water	11/15/14 15:20	11/18/14 09:50
320-10459-3	QR4-GW02	Water	11/16/14 10:20	11/18/14 09:50
320-10459-4	B7/10-GW06S	Water	11/16/14 11:50	11/18/14 09:50
320-10459-5	H123-GW02	Water	11/16/14 15:00	11/18/14 09:50
320-10459-6	EFA-FD01-1014	Water	11/16/14 00:00	11/18/14 09:50

Qualifiers

LCMS

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation

Glossary

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

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFOA #	PFOS #
B7/10-GW02	320-10459-1	85	116
B7/10-GW03S	320-10459-2	64	108
QR4-GW02	320-10459-3	90	109
B7/10-GW06S	320-10459-4	67	108
H123-GW02	320-10459-5	89	107
EFA-FD01-1014	320-10459-6	82	109
	MB 320-59712/1-A	109	111
	LCS 320-59712/2-A	98	101

	QC LIMITS
PFOA = 13C4 PFOA	25-150
PFOS = 13C4 PFOS	25-150

Column to be used to flag recovery values

FORM II WS-LC-0025

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Lab File ID: 03DEC14A4A_082.d Lab Sample ID: MB 320-59712/1-A

Matrix: Water Date Extracted: 12/03/2014 13:38

Instrument ID: A4 Date Analyzed: 12/04/2014 20:03

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-59712/2-A	03DEC14A4A_083.d	12/04/2014 20:24
B7/10-GW02	320-10459-1	03DEC14A4A_084.d	12/04/2014 20:45
B7/10-GW03S	320-10459-2	03DEC14A4A_085.d	12/04/2014 21:07
QR4-GW02	320-10459-3	03DEC14A4A_086.d	12/04/2014 21:28
B7/10-GW06S	320-10459-4	03DEC14A4A_087.d	12/04/2014 21:49
H123-GW02	320-10459-5	03DEC14A4A_088.d	12/04/2014 22:10
EFA-FD01-1014	320-10459-6	03DEC14A4A_089.d	12/04/2014 22:31

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-10459-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-59712/1-A

Matrix: Water | Lab File ID: 03DEC14A4A_082.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 12/03/2014 13:38

Sample wt/vol: 500.00(mL) | Date Analyzed: 12/04/2014 20:03

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 59779 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.809	J	2.0	1.5	0.75
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.5	U	2.0	1.5	1.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	111		25-150
STL00990	13C4 PFOA	109		25-150

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 03DEC14A4A_083.d

Lab ID: LCS 320-59712/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	40.0	50.4	126	60-140	
Perfluorooctane Sulfonate (PFOS)	38.2	39.7	104	60-140	
13C4 PFOS	95.6	96.3	101	25-150	
13C4 PFOA	100	98.0	98	25-150	

Column to be used to flag recovery and RPD values

FORM III WS-LC-0025

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Instrument ID: A4 Start Date: 12/04/2014 03:44

Analysis Batch Number: 59779 End Date: 12/04/2014 23:56

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-59779/4 IC		12/04/2014 03:44	1	03DEC14A4A_040.d	Acquity 2.1(mm)
STD 320-59779/5 IC		12/04/2014 04:05	1	03DEC14A4A_041.d	Acquity 2.1(mm)
STD 320-59779/6 IC		12/04/2014 04:26	1	03DEC14A4A_042.d	Acquity 2.1(mm)
STD 320-59779/7 IC		12/04/2014 04:47	1	03DEC14A4A_043.d	Acquity 2.1(mm)
STD 320-59779/8 IC		12/04/2014 05:09	1	03DEC14A4A_044.d	Acquity 2.1(mm)
STD 320-59779/9 IC		12/04/2014 05:30	1	03DEC14A4A_045.d	Acquity 2.1(mm)
STD 320-59779/10 IC		12/04/2014 05:51	1	03DEC14A4A_046.d	Acquity 2.1(mm)
CCV 320-59779/20		12/04/2014 09:23	1		Acquity 2.1(mm)
ICV 320-59779/22		12/04/2014 10:23	1	03DEC14A4A_058.d	Acquity 2.1(mm)
ZZZZZ		12/04/2014 11:50	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 12:11	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 12:37	100		Acquity 2.1(mm)
ZZZZZ		12/04/2014 12:59	100		Acquity 2.1(mm)
ZZZZZ		12/04/2014 13:20	100		Acquity 2.1(mm)
ZZZZZ		12/04/2014 13:41	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 14:02	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 14:24	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 14:44	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 15:06	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 15:27	1		Acquity 2.1(mm)
CCV 320-59779/34		12/04/2014 15:48	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 16:10	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 16:31	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 16:52	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 17:13	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 17:34	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 17:56	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 18:17	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 18:38	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 18:59	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 19:20	1		Acquity 2.1(mm)
CCV 320-59779/45		12/04/2014 19:42	1	03DEC14A4A_081.d	Acquity 2.1(mm)
MB 320-59712/1-A		12/04/2014 20:03	1	03DEC14A4A_082.d	Acquity 2.1(mm)
LCS 320-59712/2-A		12/04/2014 20:24	1	03DEC14A4A_083.d	Acquity 2.1(mm)
320-10459-1	B7/10-GW02	12/04/2014 20:45	1	03DEC14A4A_084.d	Acquity 2.1(mm)
320-10459-2	B7/10-GW03S	12/04/2014 21:07	1	03DEC14A4A_085.d	Acquity 2.1(mm)
320-10459-3	QR4-GW02	12/04/2014 21:28	1	03DEC14A4A_086.d	Acquity 2.1(mm)
320-10459-4	B7/10-GW06S	12/04/2014 21:49	1	03DEC14A4A_087.d	Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Instrument ID: A4 Start Date: 12/04/2014 03:44

Analysis Batch Number: 59779 End Date: 12/04/2014 23:56

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
320-10459-5	H123-GW02	12/04/2014 22:10	1	03DEC14A4A_088.d	Acquity 2.1(mm)
320-10459-6	EFA-FD01-1014	12/04/2014 22:31	1	03DEC14A4A_089.d	Acquity 2.1(mm)
ZZZZZ		12/04/2014 22:53	20		Acquity 2.1(mm)
ZZZZZ		12/04/2014 23:14	20		Acquity 2.1(mm)
ZZZZZ		12/04/2014 23:35	20		Acquity 2.1(mm)
CCV 320-59779/57		12/04/2014 23:56	1	03DEC14A4A_093.d	Acquity 2.1(mm)

FORM VI
LCMS INITIAL CALIBRATION DATA
EXTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1 Analy Batch No.: 59779

SDG No.:

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

Calibration Start Date: 12/04/2014 03:44 Calibration End Date: 12/04/2014 05:51 Calibration ID: 10479

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-59779/4	03DEC14A4A_040.d
Level 2	STD 320-59779/5	03DEC14A4A_041.d
Level 3	STD 320-59779/6	03DEC14A4A_042.d
Level 4	STD 320-59779/7	03DEC14A4A_043.d
Level 5	STD 320-59779/8	03DEC14A4A_044.d
Level 6	STD 320-59779/9	03DEC14A4A_045.d
Level 7	STD 320-59779/10	03DEC14A4A_046.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	5268.6 3806.7	5812.9 3203.9	5254.9 2254.3	4338.2	Ave		4277.06429				30.0		50.0			
13C5 PFPeA	9419.7 7332.0	9580.9 5721.7	8177.5 4869.4	8903.4	Ave		7714.90000				24.0		50.0			
13C2 PFHxA	21470 18141	22784 16317	24835 11422	18449	Ave		19059.8143				23.0		50.0			
13C4-PFHpA	21643 17882	21390 11698	21748 10393	19442	Ave		17742.3500				27.0		50.0			
18O2 PFHxS	53128 47816	52233 33678	50966 25618	51213	Ave		44950.3322				24.0		50.0			
13C4 PFOA	41322 31379	41400 24644	40475 19047	38546	Ave		33830.5286				27.0		50.0			
13C4 PFOS	54398 44130	54385 33330	56166 23197	50088	Ave		45099.0735				28.0		50.0			
13C5 PFNA	44879 37219	45410 30155	48879 22012	41831	Ave		38626.2857				25.0		50.0			
13C2 PFDA	63235 48806	61430 37175	59297 32265	58211	Ave		51488.2929				24.0		50.0			
13C8 FOSA	150505 147550	155647 126255	158874 106829	155831	Ave		143069.894				14.0		50.0			
13C2 PFUnA	66511 59868	66532 58833	66894 69853	64772	Ave		64751.6643				6.2		50.0			
13C2 PFDoA	76991 59932	66196 56050	76655 52807	68862	Ave		65356.2357				15.0		50.0			
13C2-PFTeDA	77915 69707	76286 61208	80240 58365	76834	Ave		71507.9143				12.0		50.0			
13C2-PFHxDA	96546 111182	105842 105984	112387 93820	103841	Ave		104228.936				6.6		50.0			

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

FORM VI
LCMS INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1 Analy Batch No.: 59779

SDG No.:

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

Calibration Start Date: 12/04/2014 03:44 Calibration End Date: 12/04/2014 05:51 Calibration ID: 10479

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	10678 16623	22829 12169	21990	19527	19477	AveID		2.3514				25.0		35.0			
Perfluoropentanoic acid (PFPeA)	8732.0 11185	14944 9458.0	14198	14832	13130	AveID		1.6538				21.0		35.0			
Perfluorobutane Sulfonate (PFBS)	14683 39320	46758 32165	49055	48250	67174	AveID		0.9863				37.0		50.0			
Perfluorohexanoic acid (PFHxA)	9952.0 16870	21004 12521	26818	19955	20968	AveID		0.9761				24.0		35.0			
PFPeS (Perflouro-1-pentanesulfonate)	12755 32980	40229 24854	44086	42428	40598	AveID		0.7860				32.0		50.0			
Perfluoroheptanoic acid (PFHpA)	14724 21344	28535 18892	35883	33256	29606	AveID		1.5247				27.0		35.0			
Perfluorohexane Sulfonate (PFHxS)	24632 33051	52072 26648	53418	49529	45799	AveID		0.9222				22.0		35.0			
Perfluorooctanoic acid (PFOA)	54920 43078	74889 33366	68131	62497	54775	AveID		1.6697				9.7		35.0			
Perfluoro-1-heptanesulfonate (PFHpS)	12752 33076	45349 24051	51122	49900	46278	AveID		0.8647				33.0		50.0			
Perfluorooctane Sulfonate (PFOS)	143245 49883	124703 36721	92010	73648	66987	AveID		1.8046				26.0		35.0			
Perfluorononanoic acid (PFNA)	22096 39342	60944 27244	61254	52411	44283	AveID		1.1532				26.0		35.0			
PFNS (Perflouro-1-nonanesulfonate)	16554 25936	40576 18531	47018	41535	37537	AveID		0.7349				26.0		50.0			
Perfluorodecanoic acid (PFDA)	16398 41090	58072 33184	67070	63478	54711	AveID		0.9544				33.0		35.0			
Perfluorooctane Sulfonamide (FOSA)	60576 132015	157092 116050	155459	165246	157618	AveID		0.9501				26.0		35.0			
Perfluorodecane sulfonate (PFDS)	10237 23088	37158 16598	42628	36833	33233	AveID		0.6467				32.0		50.0			
Perfluoroundecanoic acid (PFUnA)	25356 49828	75233 40491	72252	72984	62389	AveID		0.8839				34.0		35.0			
Perfluorododecanoic acid (PFDoA)	25100 62748	61887 50239	92219	78804	73401	AveID		0.9863				32.0		35.0			
PFDoS (Perflouro-1-dodecanesulfonate)	7778.9 23770	32535 17735	43717	40638	35319	AveID		0.6584				36.0		50.0			
Perfluorotridecanoic Acid (PFTriA)	20248 45661	65903 40208	67545	66220	62650	AveID		0.8175				32.0		50.0			

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

FORM VI
LCMS INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1 Analy Batch No.: 59779

SDG No.:

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

Calibration Start Date: 12/04/2014 03:44 Calibration End Date: 12/04/2014 05:51 Calibration ID: 10479

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorotetradecanoic acid (PFTeA)	15018 30898	36572 27633	43161	42497	38214	AveID		0.5200				29.0		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	44032 92953	98406 78170	100981	86858	96066	AveID		1.3398				27.0		50.0			
Perfluoro-n-octandecanoic acid (PFODA)	22762 104163	94742 95748	99443	104957	102973	AveID		1.4197				38.0		50.0			

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

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Lab Sample ID: ICV 320-59779/22 Calibration Date: 12/04/2014 10:23

Instrument ID: A4 Calib Start Date: 12/04/2014 03:44

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/04/2014 05:51

Lab File ID: 03DEC14A4A_058.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	2.351	2.637		56.1	50.0	12.2	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.654	1.886		57.0	50.0	14.0	50.0
Perfluorobutane Sulfonate (PFBS)	AveID	0.9863	1.236		55.5	44.3	25.3	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9761	1.190		61.0	50.0	21.9	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.525	2.160		70.8	50.0	41.7	50.0
Perfluorohexane Sulfonate (PFHxS)	AveID	0.9222	1.119		57.4	47.3	21.4	50.0
Perfluoro-1-heptanesulfonate (PFHpS)	AveID	0.8647	0.9109		50.1	47.6	5.3	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.670	1.812		54.2	50.0	8.5	50.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.805	1.655		43.8	47.8	-8.3	50.0
Perfluorononanoic acid (PFNA)	AveID	1.153	1.206		52.3	50.0	4.6	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9544	1.211		63.4	50.0	26.8	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9501	0.9856		51.9	50.0	3.7	50.0
Perfluorodecane sulfonate (PFDS)	AveID	0.6467	0.7475		55.8	48.3	15.6	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8839	1.141		64.5	50.0	29.1	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9863	1.176		59.6	50.0	19.2	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8175	0.9516		58.2	50.0	16.4	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5200	0.6011		57.8	50.0	15.6	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	AveID	1.340	1.644		61.3	50.0	22.7	50.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.420	1.763		62.1	50.0	24.2	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Lab Sample ID: CCV 320-59779/45 Calibration Date: 12/04/2014 19:42

Instrument ID: A4 Calib Start Date: 12/04/2014 03:44

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/04/2014 05:51

Lab File ID: 03DEC14A4A_081.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	2.351	3.794		32.3	20.0	61.4*	40.0
Perfluoropentanoic acid (PFPeA)	AveID	1.654	2.282		27.6	20.0	38.0	40.0
Perfluorobutane Sulfonate (PFBS)	AveID	0.9863	1.023		18.3	17.7	3.7	40.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9761	1.252		25.6	20.0	28.2	40.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.525	2.068		27.1	20.0	35.7	40.0
Perfluorohexane Sulfonate (PFHxS)	AveID	0.9222	0.998		20.5	18.9	8.2	40.0
Perfluoro-1-heptanesulfonate (PFHpS)	AveID	0.8647	0.9528		21.0	19.0	10.2	40.0
Perfluorooctanoic acid (PFOA)	AveID	1.670	1.850		22.2	20.0	10.8	40.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.805	1.488		15.8	19.1	-17.6	40.0
Perfluorononanoic acid (PFNA)	AveID	1.153	1.142		19.8	20.0	-1.0	40.0
Perfluorodecanoic acid (PFDA)	AveID	0.9544	1.018		21.3	20.0	6.6	40.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9501	1.009		21.2	20.0	6.2	40.0
Perfluorodecane sulfonate (PFDS)	AveID	0.6467	0.7121		21.2	19.3	10.1	40.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8839	1.135		25.7	20.0	28.4	40.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9863	1.182		24.0	20.0	19.9	40.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8175	0.9328		22.8	20.0	14.1	40.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5200	0.5912		22.7	20.0	13.7	40.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	AveID	1.340	1.503		22.4	20.0	12.2	40.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.420	1.589		22.4	20.0	11.9	40.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Lab Sample ID: CCV 320-59779/57 Calibration Date: 12/04/2014 23:56

Instrument ID: A4 Calib Start Date: 12/04/2014 03:44

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/04/2014 05:51

Lab File ID: 03DEC14A4A_093.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	2.351	3.249		69.1	50.0	38.2	40.0
Perfluoropentanoic acid (PFPeA)	AveID	1.654	2.193		66.3	50.0	32.6	40.0
Perfluorobutane Sulfonate (PFBS)	AveID	0.9863	1.639		73.5	44.2	66.2*	40.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9761	1.185		60.7	50.0	21.4	40.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.525	1.987		65.1	50.0	30.3	40.0
Perfluorohexane Sulfonate (PFHxS)	AveID	0.9222	1.045		53.6	47.3	13.3	40.0
Perfluoro-1-heptanesulfonate (PFHpS)	AveID	0.8647	0.9556		52.6	47.6	10.5	40.0
Perfluorooctanoic acid (PFOA)	AveID	1.670	1.657		49.6	50.0	-0.7	40.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.805	1.512		40.0	47.8	-16.2	40.0
Perfluorononanoic acid (PFNA)	AveID	1.153	1.219		52.8	50.0	5.7	40.0
Perfluorodecanoic acid (PFDA)	AveID	0.9544	1.069		56.0	50.0	12.0	40.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9501	1.050		55.3	50.0	10.5	40.0
Perfluorodecane sulfonate (PFDS)	AveID	0.6467	0.6689		49.8	48.2	3.4	40.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8839	1.054		59.6	50.0	19.3	40.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9863	1.179		59.8	50.0	19.5	40.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8175	0.9404		57.5	50.0	15.0	40.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5200	0.5983		57.5	50.0	15.1	40.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	AveID	1.340	1.598		59.6	50.0	19.3	40.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.420	1.784		62.8	50.0	25.7	40.0

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10459-1

SDG No.:

Batch Number: 59712 Batch Start Date: 12/03/14 13:38 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 12/03/14 19:10

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	LCMPFCSU 00010	LCPFCSP 00014		
MB 320-59712/1		3535, WS-LC-0025		500.00 mL	1.00 mL	50 uL			
LCS 320-59712/2		3535, WS-LC-0025		500.00 mL	1.00 mL	50 uL	20 uL		
320-10459-A-1	B7/10-GW02	3535, WS-LC-0025	T	448.35 mL	1.00 mL	50 uL			
320-10459-A-2	B7/10-GW03S	3535, WS-LC-0025	T	427.75 mL	1.00 mL	50 uL			
320-10459-A-3	QR4-GW02	3535, WS-LC-0025	T	427.31 mL	1.00 mL	50 uL			
320-10459-A-4	B7/10-GW06S	3535, WS-LC-0025	T	446.26 mL	1.00 mL	50 uL			
320-10459-A-5	H123-GW02	3535, WS-LC-0025	T	455.47 mL	1.00 mL	50 uL			
320-10459-A-6	EFA-FD01-1014	3535, WS-LC-0025	T	447.90 mL	1.00 mL	50 uL			

Batch Notes	
Balance ID	QA-070
H2O Lot used	11/24/14
Pipette ID	EC15219
Analyst who added reagent	JER
SU Reagent Drop	JER
SU Reagent Drop Witness	SNE
Solvent Lot #	0.3%NH4OH-Me_00006
Solvent Name	0.3%NH4OH/MeOH
SOP Number	WS-LC-0005
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk Lot Number	002334148A

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 8957, 9021, 10572, 10114, 10591, 10459 Work List ID(s): 17820

Extraction Batch: 58987, 58953, 58990, 59718 Analysis Batch(es): 59779

Delivery Rank 2, 4 Due Date: Varies

A. Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch#	✓	✓	
2. ICAL, CCV Frequency & Criteria met.	✓	✓	
• $RF_{average}$ criteria appropriate for the method.	✓	✓	
• Linear Regression criteria appropriate if required ($r \geq 0.995$).			✓
• Quadratic fit criteria appropriate if required ($r^2 \geq 0.990$).			✓
• For Linear Regression and Quadratic fit – Does the y-intercept support ½ the reporting limit as described in CA-Q-S-005?			✓
• All curve points show calculated concentrations.	✓	✓	
3. Peaks correctly ID'd by data system.	✓	✓	
5. Tune check frequency & criteria met and Tune check report attached.			✓
B. QA/QC			
1. Are all QC samples properly linked in TALS?	✓	✓	
2. Method blank, LCS/LCSD and MS/SD frequencies met.	✓	✓	
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.	✓	✓	
4. Are MS/MSD recoveries and RPD within control limits?			✓
5. Holding Times were met for prep and analytical. in House samples + NCM	✓	✓	
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#	✓	✓	
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: 12/5/14

2nd Level Reviewer: [signature] Date: 12/12/14

Box #12

Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-59087

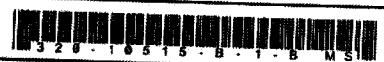
Method Code: 320-Shake_Bath_14D-320

Analyst: Reed, Jonathan E

Batch Open: 11/25/2014 2:06:49PM

Batch End: 11/26/2014 8:40:00PM

Shake Extraction with Ultrasonic Bath Extraction

	Input Sample Lab ID (Analytical Method)	SDG	Initial Amount	Final Amount	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-59087/1 N/A	N/A	5.00 g	1.00 mL	N/A	N/A	N/A		
2	LCS~320-59087/2 N/A	N/A	5.00 g	1.00 mL	N/A	N/A	N/A		
3	320-10515-B-1 (PFC_IDA)	10502757.5501080 1	5.09 g	1.00 mL	12/9/14	12_Days	4		
4	320-10515-B-1~MS (PFC_IDA)	10502757.5501080 1	5.13 g	1.00 mL	12/9/14	12_Days	4		
5	320-10515-B-1~MSD (PFC_IDA)	10502757.5501080 1	5.09 g	1.00 mL	12/9/14	12_Days	4		
6	320-8957-G-1 (PFC_IDA)	N/A	5.00 g	1.00 mL	9/4/14	12_Days	2		
7	320-9021-W-1 (PFC_IDA)	N/A	5.00 g	1.00 mL	9/9/14	12_Days	2		

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12/12/2014

Batch Notes

Blank Sand Lot # 142675

Filter Lot # NA

Millipore Water Dispense Date 11/24/14

Person's name who witnessed reagent drop SNE

SPE Cartridge Lot # 014933351A

SPE Cartridge Type WAX 150mg

Batch Comment SOLVENT: 0.3%NH4OH-Me_00006

Tetra Tech, Inc. CHAIN OF CUSTODY | NUMBER No. 0537 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G-02063	EFA / NAS Brunswick	Jeff Orient	412921-7090	Test America
SAMPLERS (SIGNATURE)		**FIELD OPERATIONS LEADER**	**PHONE NUMBER**	**ADDRESS**
		Tim Evans	4129217090	880 Riverside Pkwy
		CARRIER/WAYBILL NUMBER		**CITY, STATE**
		FedEx 8065 1897 7159		West Sacramento CA

STANDARD TAT (X)
RUSH TAT ( )
( ) 24 hr. ( ) 48 hr. ( ) 72 hr. ( ) 7 day ( ) 14 day

DATE YEAR 2014	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS PFOA/PFOS	COMMENTS
									P	—		
11/18	1100	EFA-GW01 (DUP)	EFA-GW01	—	—	GW	G	1	1			
11/18	1625	EFA-GW02	EFA-02	—	—	GW	G	1	1			
11/19	1110	EFA-GW03	EFA-03	—	—	GW	G	1	1			
11/20	1049	EFA-GW09	EFA-09	—	—	GW	G	1	1			

320-10572 Chain of Custody

		DATE	TIME		DATE	TIME
1. RELINQUISHED BY		11/20/14	1930	1. RECEIVED BY FedEx	11/20/14	1930
2. RELINQUISHED BY		DATE	TIME	2. RECEIVED BY Kim Nelson	11/21/14	745
3. RELINQUISHED BY		DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

12/12/2014

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-10572-1

Login Number: 10572
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

CASE NARRATIVE

Client: Tetra Tech, Inc.

Project: Naval Air Station Brunswick Maine

Report Number: 320-10572-1

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.

TestAmerica West Sacramento attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the applicable methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

TestAmerica utilizes USEPA approved methods and DOD QSM, where applicable, in all analytical work. The samples presented in this report were analyzed for the parameter(s) listed on the analytical methods summary page in accordance with the method(s) indicated. A summary of QC data for these analyses is included at the back of the report.

All parameters for which TestAmerica West Sacramento has certification were evaluated to the QSM specified reporting convention or to the client specified format if different from QSM. Parameters not certified under QSM, if any, were evaluated to the detection limit (DL) and include qualified results where applicable.

The sample(s) that contain constituents flagged with U are undetected. The result associated with this flag is the limit of detection (LOD).

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.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT
The samples were received on 11/21/2014 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.7° C.

PFOA/PFOS
Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 320-58953.

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

Method Summary

Client: Tetra Tech, Inc.
Project/Site: Naval Air Station Brunswick Maine

TestAmerica Job ID: 320-10572-1

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: Tetra Tech, Inc.
Project/Site: Naval Air Station Brunswick Maine

TestAmerica Job ID: 320-10572-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-10572-1	EFA-GW01	Water	11/18/14 11:00	11/21/14 09:15
320-10572-2	EFA-GW02	Water	11/18/14 16:25	11/21/14 09:15
320-10572-3	EFA-GW03	Water	11/19/14 11:10	11/21/14 09:15
320-10572-4	EFA-GW09	Water	11/20/14 10:40	11/21/14 09:15

Qualifiers

LCMS

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

Glossary

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

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-10572-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFOA #	PFOS #
EFA-GW01	320-10572-1	113	114
EFA-GW02	320-10572-2	97	105
EFA-GW03	320-10572-3	93	109
EFA-GW09	320-10572-4	72	113
	MB 320-58953/1-A	105	106
	LCS 320-58953/2-A	97	99

	QC LIMITS
PFOA = 13C4 PFOA	25-150
PFOS = 13C4 PFOS	25-150

Column to be used.to flag recovery values

FORM II WS-LC-0025

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-10572-1

SDG No.:

Lab File ID: 03DEC14A4A_066.d Lab Sample ID: MB 320-58953/1-A

Matrix: Water Date Extracted: 11/24/2014 16:22

Instrument ID: A4 Date Analyzed: 12/04/2014 14:24

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-58953/2-A	03DEC14A4A_067.d	12/04/2014 14:44
EFA-GW01	320-10572-1	03DEC14A4A_074.d	12/04/2014 17:13
EFA-GW02	320-10572-2	03DEC14A4A_075.d	12/04/2014 17:34
EFA-GW03	320-10572-3	03DEC14A4A_076.d	12/04/2014 17:56
EFA-GW09	320-10572-4	03DEC14A4A_077.d	12/04/2014 18:17

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-10572-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-58953/1-A

Matrix: Water | Lab File ID: 03DEC14A4A_066.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 11/24/2014 16:22

Sample wt/vol: 500.00(mL) | Date Analyzed: 12/04/2014 14:24

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 59779 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	1.5	U	2.0	1.5	0.75
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.5	U	2.0	1.5	1.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	106		25-150
STL00990	13C4 PFOA	105		25-150

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-10572-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 03DEC14A4A_067.d

Lab ID: LCS 320-58953/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	40.0	46.3	116	60-140	
Perfluorooctane Sulfonate (PFOS)	38.2	35.8	94	60-140	
13C4 PFOS	95.6	95.0	99	25-150	
13C4 PFOA	100	96.6	97	25-150	

Column to be used to flag recovery and RPD values

FORM III WS-LC-0025

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-10572-1

SDG No.:

Instrument ID: A4 Start Date: 12/04/2014 03:44

Analysis Batch Number: 59779 End Date: 12/04/2014 23:56

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-59779/4 IC		12/04/2014 03:44	1	03DEC14A4A_040.d	Acquity 2.1(mm)
STD 320-59779/5 IC		12/04/2014 04:05	1	03DEC14A4A_041.d	Acquity 2.1(mm)
STD 320-59779/6 IC		12/04/2014 04:26	1	03DEC14A4A_042.d	Acquity 2.1(mm)
STD 320-59779/7 IC		12/04/2014 04:47	1	03DEC14A4A_043.d	Acquity 2.1(mm)
STD 320-59779/8 IC		12/04/2014 05:09	1	03DEC14A4A_044.d	Acquity 2.1(mm)
STD 320-59779/9 IC		12/04/2014 05:30	1	03DEC14A4A_045.d	Acquity 2.1(mm)
STD 320-59779/10 IC		12/04/2014 05:51	1	03DEC14A4A_046.d	Acquity 2.1(mm)
CCV 320-59779/20		12/04/2014 09:23	1	03DEC14A4A_056.d	Acquity 2.1(mm)
ICV 320-59779/22		12/04/2014 10:23	1	03DEC14A4A_058.d	Acquity 2.1(mm)
ZZZZZ		12/04/2014 11:50	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 12:11	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 12:37	100		Acquity 2.1(mm)
ZZZZZ		12/04/2014 12:59	100		Acquity 2.1(mm)
ZZZZZ		12/04/2014 13:20	100		Acquity 2.1(mm)
ZZZZZ		12/04/2014 13:41	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 14:02	1		Acquity 2.1(mm)
MB 320-58953/1-A		12/04/2014 14:24	1	03DEC14A4A_066.d	Acquity 2.1(mm)
LCS 320-58953/2-A		12/04/2014 14:44	1	03DEC14A4A_067.d	Acquity 2.1(mm)
ZZZZZ		12/04/2014 15:06	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 15:27	1		Acquity 2.1(mm)
CCV 320-59779/34		12/04/2014 15:48	1	03DEC14A4A_070.d	Acquity 2.1(mm)
ZZZZZ		12/04/2014 16:10	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 16:31	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 16:52	1		Acquity 2.1(mm)
320-10572-1	EFA-GW01	12/04/2014 17:13	1	03DEC14A4A_074.d	Acquity 2.1(mm)
320-10572-2	EFA-GW02	12/04/2014 17:34	1	03DEC14A4A_075.d	Acquity 2.1(mm)
320-10572-3	EFA-GW03	12/04/2014 17:56	1	03DEC14A4A_076.d	Acquity 2.1(mm)
320-10572-4	EFA-GW09	12/04/2014 18:17	1	03DEC14A4A_077.d	Acquity 2.1(mm)
ZZZZZ		12/04/2014 18:38	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 18:59	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 19:20	1		Acquity 2.1(mm)
CCV 320-59779/45		12/04/2014 19:42	1	03DEC14A4A_081.d	Acquity 2.1(mm)
ZZZZZ		12/04/2014 20:03	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 20:24	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 20:45	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 21:07	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 21:28	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 21:49	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-10572-1

SDG No.:

Instrument ID: A4 Start Date: 12/04/2014 03:44

Analysis Batch Number: 59779 End Date: 12/04/2014 23:56

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		12/04/2014 22:10	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 22:31	1		Acquity 2.1(mm)
ZZZZZ		12/04/2014 22:53	20		Acquity 2.1(mm)
ZZZZZ		12/04/2014 23:14	20		Acquity 2.1(mm)
ZZZZZ		12/04/2014 23:35	20		Acquity 2.1(mm)
CCV 320-59779/57		12/04/2014 23:56	1		Acquity 2.1(mm)

FORM VI
LCMS INITIAL CALIBRATION DATA
EXTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-10572-1 Analy Batch No.: 59779

SDG No.:

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

Calibration Start Date: 12/04/2014 03:44 Calibration End Date: 12/04/2014 05:51 Calibration ID: 10479

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-59779/4	03DEC14A4A_040.d
Level 2	STD 320-59779/5	03DEC14A4A_041.d
Level 3	STD 320-59779/6	03DEC14A4A_042.d
Level 4	STD 320-59779/7	03DEC14A4A_043.d
Level 5	STD 320-59779/8	03DEC14A4A_044.d
Level 6	STD 320-59779/9	03DEC14A4A_045.d
Level 7	STD 320-59779/10	03DEC14A4A_046.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	5268.6 3806.7	5812.9 3203.9	5254.9 2254.3	4338.2	Ave		4277.06429				30.0		50.0			
13C5 PFPeA	9419.7 7332.0	9580.9 5721.7	8177.5 4869.4	8903.4	Ave		7714.90000				24.0		50.0			
13C2 PFHxA	21470 18141	22784 16317	24835 11422	18449	Ave		19059.8143				23.0		50.0			
13C4-PFHpA	21643 17882	21390 11698	21748 10393	19442	Ave		17742.3500				27.0		50.0			
18O2 PFHxS	53128 47816	52233 33678	50966 25618	51213	Ave		44950.3322				24.0		50.0			
13C4 PFOA	41322 31379	41400 24644	40475 19047	38546	Ave		33830.5286				27.0		50.0			
13C4 PFOS	54398 44130	54385 33330	56166 23197	50088	Ave		45099.0735				28.0		50.0			
13C5 PFNA	44879 37219	45410 30155	48879 22012	41831	Ave		38626.2857				25.0		50.0			
13C2 PFDA	63235 48806	61430 37175	59297 32265	58211	Ave		51488.2929				24.0		50.0			
13C8 FOSA	150505 147550	155647 126255	158874 106829	155831	Ave		143069.894				14.0		50.0			
13C2 PFUnA	66511 59868	66532 58833	66894 69853	64772	Ave		64751.6643				6.2		50.0			
13C2 PFDoA	76991 59932	66196 56050	76655 52807	68862	Ave		65356.2357				15.0		50.0			
13C2-PFTeDA	77915 69707	76286 61208	80240 58365	76834	Ave		71507.9143				12.0		50.0			
13C2-PFHxDA	96546 111182	105842 105984	112387 93820	103841	Ave		104228.936				6.6		50.0			

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

FORM VI
LCMS INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-10572-1 Analy Batch No.: 59779

SDG No.:

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

Calibration Start Date: 12/04/2014 03:44 Calibration End Date: 12/04/2014 05:51 Calibration ID: 10479

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	10678 16623	22829 12169	21990	19527	19477	AveID		2.3514				25.0		35.0			
Perfluoropentanoic acid (PFPeA)	8732.0 11185	14944 9458.0	14198	14832	13130	AveID		1.6538				21.0		35.0			
Perfluorobutane Sulfonate (PFBS)	14683 39320	46758 32165	49055	48250	67174	AveID		0.9863				37.0		50.0			
Perfluorohexanoic acid (PFHxA)	9952.0 16870	21004 12521	26818	19955	20968	AveID		0.9761				24.0		35.0			
PFPeS (Perflouro-1-pentanesulfonate)	12755 32980	40229 24854	44086	42428	40598	AveID		0.7860				32.0		50.0			
Perfluoroheptanoic acid (PFHpA)	14724 21344	28535 18892	35883	33256	29606	AveID		1.5247				27.0		35.0			
Perfluorohexane Sulfonate (PFHxS)	24632 33051	52072 26648	53418	49529	45799	AveID		0.9222				22.0		35.0			
Perfluorooctanoic acid (PFOA)	54920 43078	74889 33366	68131	62497	54775	AveID		1.6697				9.7		35.0			
Perfluoro-1-heptanesulfonate (PFHpS)	12752 33076	45349 24051	51122	49900	46278	AveID		0.8647				33.0		50.0			
Perfluorooctane Sulfonate (PFOS)	143245 49883	124703 36721	92010	73648	66987	AveID		1.8046				26.0		35.0			
Perfluorononanoic acid (PFNA)	22096 39342	60944 27244	61254	52411	44283	AveID		1.1532				26.0		35.0			
PFNS (Perflouro-1-nonanesulfonate)	16554 25936	40576 18531	47018	41535	37537	AveID		0.7349				26.0		50.0			
Perfluorodecanoic acid (PFDA)	16398 41090	58072 33184	67070	63478	54711	AveID		0.9544				33.0		35.0			
Perfluorooctane Sulfonamide (FOSA)	60576 132015	157092 116050	155459	165246	157618	AveID		0.9501				26.0		35.0			
Perfluorodecane sulfonate (PFDS)	10237 23088	37158 16598	42628	36833	33233	AveID		0.6467				32.0		50.0			
Perfluoroundecanoic acid (PFUnA)	25356 49828	75233 40491	72252	72984	62389	AveID		0.8839				34.0		35.0			
Perfluorododecanoic acid (PFDoA)	25100 62748	61887 50239	92219	78804	73401	AveID		0.9863				32.0		35.0			
PFDoS (Perflouro-1-dodecanesulfonate)	7778.9 23770	32535 17735	43717	40638	35319	AveID		0.6584				36.0		50.0			
Perfluorotridecanoic Acid (PFTriA)	20248 45661	65903 40208	67545	66220	62650	AveID		0.8175				32.0		50.0			

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

FORM VI
LCMS INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-10572-1 Analy Batch No.: 59779

SDG No.:

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

Calibration Start Date: 12/04/2014 03:44 Calibration End Date: 12/04/2014 05:51 Calibration ID: 10479

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorotetradecanoic acid (PFTeA)	15018 30898	36572 27633	43161	42497	38214	AveID		0.5200				29.0		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	44032 92953	98406 78170	100981	86858	96066	AveID		1.3398				27.0		50.0			
Perfluoro-n-octandecanoic acid (PFODA)	22762 104163	94742 95748	99443	104957	102973	AveID		1.4197				38.0		50.0			

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

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-10572-1

SDG No.:

Lab Sample ID: CCV 320-59779/20 Calibration Date: 12/04/2014 09:23

Instrument ID: A4 Calib Start Date: 12/04/2014 03:44

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/04/2014 05:51

Lab File ID: 03DEC14A4A_056.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	2.351	2.886		24.5	20.0	22.7	40.0
Perfluoropentanoic acid (PFPeA)	AveID	1.654	1.983		24.0	20.0	19.9	40.0
Perfluorobutane Sulfonate (PFBS)	AveID	0.9863	1.029		18.5	17.7	4.4	40.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9761	1.064		21.8	20.0	9.0	40.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.525	2.016		26.4	20.0	32.2	40.0
Perfluorohexane Sulfonate (PFHxS)	AveID	0.9222	0.9830		20.2	18.9	6.6	40.0
Perfluoro-1-heptanesulfonate (PFHpS)	AveID	0.8647	1.083		23.9	19.0	25.3	40.0
Perfluorooctanoic acid (PFOA)	AveID	1.670	1.896		22.7	20.0	13.5	40.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.805	1.558		16.5	19.1	-13.6	40.0
Perfluorononanoic acid (PFNA)	AveID	1.153	1.188		20.6	20.0	3.0	40.0
Perfluorodecanoic acid (PFDA)	AveID	0.9544	1.105		23.1	20.0	15.7	40.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9501	1.027		21.6	20.0	8.1	40.0
Perfluorodecane sulfonate (PFDS)	AveID	0.6467	0.7177		21.4	19.3	11.0	40.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8839	1.156		26.1	20.0	30.7	40.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9863	1.170		23.7	20.0	18.6	40.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8175	0.9363		22.9	20.0	14.5	40.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5200	0.5680		21.8	20.0	9.2	40.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	AveID	1.340	1.393		20.8	20.0	3.9	40.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.420	1.440		20.3	20.0	1.4	40.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-10572-1

SDG No.:

Lab Sample ID: ICV 320-59779/22 Calibration Date: 12/04/2014 10:23

Instrument ID: A4 Calib Start Date: 12/04/2014 03:44

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/04/2014 05:51

Lab File ID: 03DEC14A4A_058.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	2.351	2.637		56.1	50.0	12.2	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.654	1.886		57.0	50.0	14.0	50.0
Perfluorobutane Sulfonate (PFBS)	AveID	0.9863	1.236		55.5	44.3	25.3	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9761	1.190		61.0	50.0	21.9	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.525	2.160		70.8	50.0	41.7	50.0
Perfluorohexane Sulfonate (PFHxS)	AveID	0.9222	1.119		57.4	47.3	21.4	50.0
Perfluoro-1-heptanesulfonate (PFHpS)	AveID	0.8647	0.9109		50.1	47.6	5.3	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.670	1.812		54.2	50.0	8.5	50.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.805	1.655		43.8	47.8	-8.3	50.0
Perfluorononanoic acid (PFNA)	AveID	1.153	1.206		52.3	50.0	4.6	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9544	1.211		63.4	50.0	26.8	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9501	0.9856		51.9	50.0	3.7	50.0
Perfluorodecane sulfonate (PFDS)	AveID	0.6467	0.7475		55.8	48.3	15.6	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8839	1.141		64.5	50.0	29.1	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9863	1.176		59.6	50.0	19.2	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8175	0.9516		58.2	50.0	16.4	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5200	0.6011		57.8	50.0	15.6	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	AveID	1.340	1.644		61.3	50.0	22.7	50.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.420	1.763		62.1	50.0	24.2	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-10572-1

SDG No.:

Lab Sample ID: CCV 320-59779/34 Calibration Date: 12/04/2014 15:48

Instrument ID: A4 Calib Start Date: 12/04/2014 03:44

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/04/2014 05:51

Lab File ID: 03DEC14A4A_070.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	2.351	2.527		21.5	20.0	7.5	40.0
Perfluoropentanoic acid (PFPeA)	AveID	1.654	1.839		22.2	20.0	11.2	40.0
Perfluorobutane Sulfonate (PFBS)	AveID	0.9863	0.9250		16.6	17.7	-6.2	40.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9761	1.166		23.9	20.0	19.5	40.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.525	1.731		22.7	20.0	13.6	40.0
Perfluorohexane Sulfonate (PFHxS)	AveID	0.9222	0.8886		18.2	18.9	-3.6	40.0
Perfluoro-1-heptanesulfonate (PFHpS)	AveID	0.8647	0.9356		20.6	19.0	8.2	40.0
Perfluorooctanoic acid (PFOA)	AveID	1.670	1.742		20.9	20.0	4.3	40.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.805	1.442		15.3	19.1	-20.1	40.0
Perfluorononanoic acid (PFNA)	AveID	1.153	1.235		21.4	20.0	7.1	40.0
Perfluorodecanoic acid (PFDA)	AveID	0.9544	1.137		23.8	20.0	19.1	40.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9501	1.031		21.7	20.0	8.5	40.0
Perfluorodecane sulfonate (PFDS)	AveID	0.6467	0.6365		19.0	19.3	-1.6	40.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8839	1.159		26.2	20.0	31.1	40.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9863	1.149		23.3	20.0	16.5	40.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8175	0.9686		23.7	20.0	18.5	40.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5200	0.5747		22.1	20.0	10.5	40.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	AveID	1.340	1.470		21.9	20.0	9.7	40.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.420	1.601		22.5	20.0	12.7	40.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-10572-1

SDG No.:

Lab Sample ID: CCV 320-59779/45 Calibration Date: 12/04/2014 19:42

Instrument ID: A4 Calib Start Date: 12/04/2014 03:44

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/04/2014 05:51

Lab File ID: 03DEC14A4A_081.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	2.351	3.794		32.3	20.0	61.4*	40.0
Perfluoropentanoic acid (PFPeA)	AveID	1.654	2.282		27.6	20.0	38.0	40.0
Perfluorobutane Sulfonate (PFBS)	AveID	0.9863	1.023		18.3	17.7	3.7	40.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9761	1.252		25.6	20.0	28.2	40.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.525	2.068		27.1	20.0	35.7	40.0
Perfluorohexane Sulfonate (PFHxS)	AveID	0.9222	0.998		20.5	18.9	8.2	40.0
Perfluoro-1-heptanesulfonate (PFHpS)	AveID	0.8647	0.9528		21.0	19.0	10.2	40.0
Perfluorooctanoic acid (PFOA)	AveID	1.670	1.850		22.2	20.0	10.8	40.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.805	1.488		15.8	19.1	-17.6	40.0
Perfluorononanoic acid (PFNA)	AveID	1.153	1.142		19.8	20.0	-1.0	40.0
Perfluorodecanoic acid (PFDA)	AveID	0.9544	1.018		21.3	20.0	6.6	40.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9501	1.009		21.2	20.0	6.2	40.0
Perfluorodecane sulfonate (PFDS)	AveID	0.6467	0.7121		21.2	19.3	10.1	40.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8839	1.135		25.7	20.0	28.4	40.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9863	1.182		24.0	20.0	19.9	40.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8175	0.9328		22.8	20.0	14.1	40.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5200	0.5912		22.7	20.0	13.7	40.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	AveID	1.340	1.503		22.4	20.0	12.2	40.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.420	1.589		22.4	20.0	11.9	40.0

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-10572-1

SDG No.:

Batch Number: 58953 Batch Start Date: 11/24/14 16:22 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 11/25/14 17:08

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	LCMPFCSU 00010	LCPFCSP 00014		
MB 320-58953/1		3535, WS-LC-0025		500.00 mL	1.00 mL	50 uL			
LCS 320-58953/2		3535, WS-LC-0025		500.00 mL	1.00 mL	50 uL	20 uL		
320-10572-A-1	EFA-GW01	3535, WS-LC-0025	T	500.25 mL	1.00 mL	50 uL			
320-10572-A-2	EFA-GW02	3535, WS-LC-0025	T	499.85 mL	1.00 mL	50 uL			
320-10572-A-3	EFA-GW03	3535, WS-LC-0025	T	502.05 mL	1.00 mL	50 uL			
320-10572-A-4	EFA-GW09	3535, WS-LC-0025	T	501.98 mL	1.00 mL	50 uL			

Batch Notes	
Balance ID	QA-070
H2O Lot used	11/14/14
Pipette ID	EC15219
Analyst who added reagent	JER
SU Reagent Drop	JER
SU Reagent Drop Witness	AVM
Solvent Lot #	0.3%NH4OH-Me_00006
Solvent Name	0.3%NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk Lot Number	0023341484

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.

DODCMD_ID	INSTALLATION_ID	SDG	SITE_NAME	NORM_SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE	ANALYTICAL_METHOD	ANALYTICAL_METHOD_GRP_DESC
MID_ATLANTIC	BRUNSWICK_NAS	320-10459-1	RCRA CLOSURE	SITE 00011	NASB-H123-MW02	Monitoring well	3014401.09	387341.48	N6247008D1001	WE09	TETRA TECH NUS, INC.	H123-GW02-20141116-D	Ground water	Field duplicate	16-Nov-14	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-10459-1	RCRA CLOSURE	SITE 00011	NASB-H123-MW02	Monitoring well	3014401.09	387341.48	N6247008D1001	WE09	TETRA TECH NUS, INC.	H123-GW02-20141116	Ground water	Normal (Regular)	16-Nov-14	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-10459-1	BLDG 7/10		B7/10-MW06S	Monitoring well	3014954.96	387415.51	N6247008D1001	WE09	TETRA TECH NUS, INC.	B7/10-GW06S-20141116	Ground water	Normal (Regular)	16-Nov-14	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-10459-1	BLDG 7/10		B7/10-MW03S	Monitoring well	3014935.31	387512.11	N6247008D1001	WE09	TETRA TECH NUS, INC.	B7/10-GW03S-20141115	Ground water	Normal (Regular)	15-Nov-14	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-10459-1	BLDG 7/10		B7/10-MW02	Monitoring well	3014857.41	387526.42	N6247008D1001	WE09	TETRA TECH NUS, INC.	B7/10-GW02-20141115	Ground water	Normal (Regular)	15-Nov-14	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-10459-1	MRP QS		MW-QRY-02	Monitoring well	3010220.926	382943.47	N6247008D1001	WE09	TETRA TECH NUS, INC.	QRY-GW02-20141116	Ground water	Normal (Regular)	16-Nov-14	TA_WS-LC-0025	Perfluoroalkyl Compounds