N60087_003919
BRUNSWICK_NAS
SSIC 5000-33c

LABORATORY DATA PACKAGE, 320-33221-1, NAS BRUNSWICK ME

11/28/2017

TESTAMERICA LABORATORIES INC

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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 320-33221-1

Job Description: TT: PFAS, Brunswick, Discharge

For:
Tetra Tech, Inc.
Foster Plaza VII
661 Anderson Drive
Foster Plaza 7
Pittsburgh, PA 15220

Attention: Jeff Orient



Approved for release.
David R Alltucker
Project Manager I
11/28/2017 3:26 PM

David R Alltucker, Project Manager I
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4383
david.alltucker@testamericainc.com
11/28/2017

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Qualifiers

LCMS

Qualifier	Qualifier Description
M	Manual integrated compound.
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
E	Result exceeded calibration range.
D	The reported value is from a dilution.

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	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
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 (Radiochemistry)
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)

Job Narrative
320-33221-1

Receipt
The samples were received on 11/10/2017 9:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.7º C.

LCMS
Method(s) 537 (modified): The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

Method(s) 537 (modified): The concentration of Perfluorooctanoic acid (PFOA) associated with the following sample exceeded the instrument calibration range: TP-PFC-023-TPI (320-33221-1). This analyte have been qualified; however, the peak did not saturate the instrument detector. The sample was analyzed at a dilution and both sets of results are reported.

Method(s) 537 (modified): The following sample was diluted to bring the concentration of Perfluorooctanoic acid (PFOA) within the calibration range: TP-PFC-023-TPI (320-33221-1). Elevated reporting limits (RLs) are provided.

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

Organic Prep
Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 320-195219.

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: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-33221-1

Client Sample ID: TP-PFC-023-TPI — Lab Sample ID: 320-33221-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	75	M	1.7	0.30	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	200		1.7	0.42	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	340		3.4	0.50	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	71		1.7	0.21	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1300	M E	3.4	0.73	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	2.3		1.7	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.72	J	1.7	0.27	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	52		1.7	0.26	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	350		1.7	0.26	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	6.8		1.7	0.26	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	340		3.4	0.46	ng/L	1		537 (modified)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	75	D	8.6	1.5	ng/L	5		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	200	D	8.6	2.1	ng/L	5		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	370	D	17	2.5	ng/L	5		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	70	D	8.6	1.1	ng/L	5		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1800	D M	17	3.6	ng/L	5		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA) - DL	2.7	J D	8.6	1.2	ng/L	5		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	93	D	8.6	1.3	ng/L	5		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	390	D	8.6	1.3	ng/L	5		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS) - DL	7.9	J D	8.6	1.3	ng/L	5		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	340	D	17	2.3	ng/L	5		537 (modified)	Total/NA

Client Sample ID: TP-PFC-023-MID-CARBON — Lab Sample ID: 320-33221-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	140	M	1.7	0.29	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	79		1.7	0.41	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	13		3.3	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.2	J M	3.3	0.70	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.26	J	1.7	0.25	ng/L	1		537 (modified)	Total/NA

Client Sample ID: TP-PFC-023-TPE — Lab Sample ID: 320-33221-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	140	M	1.7	0.30	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	49		1.7	0.42	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	8.6		3.4	0.49	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.34	J	1.7	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.59	J M	3.4	0.46	ng/L	1		537 (modified)	Total/NA

Client Sample ID: TP-PFC-023-TPE-D — Lab Sample ID: 320-33221-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	140	M	1.7	0.29	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	48		1.7	0.41	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	8.9		3.3	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.34	J	1.7	0.24	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: TP-PFC-023-TPE-D (Continued)

Lab Sample ID: 320-33221-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.29	J	1.7	0.25	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: TP-PFC-023-TPI

Lab Sample ID: 320-33221-1
Date Collected: 11/09/17 11:50
Matrix: Water
Date Received: 11/10/17 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**75**	**M**	1.7	0.30	ng/L		11/16/17 17:39	11/18/17 19:25	1
Perfluoropentanoic acid (PFPeA)	**200**		1.7	0.42	ng/L		11/16/17 17:39	11/18/17 19:25	1
Perfluorohexanoic acid (PFHxA)	**340**		3.4	0.50	ng/L		11/16/17 17:39	11/18/17 19:25	1
Perfluoroheptanoic acid (PFHpA)	**71**		1.7	0.21	ng/L		11/16/17 17:39	11/18/17 19:25	1
Perfluorooctanoic acid (PFOA)	**1300**	**M E**	3.4	0.73	ng/L		11/16/17 17:39	11/18/17 19:25	1
Perfluorononanoic acid (PFNA)	**2.3**		1.7	0.23	ng/L		11/16/17 17:39	11/18/17 19:25	1
Perfluorodecanoic acid (PFDA)	**0.72**	**J**	1.7	0.27	ng/L		11/16/17 17:39	11/18/17 19:25	1
Perfluoroundecanoic acid (PFUnA)	2.6	U	3.4	0.94	ng/L		11/16/17 17:39	11/18/17 19:25	1
Perfluorododecanoic acid (PFDoA)	1.7	U	3.4	0.47	ng/L		11/16/17 17:39	11/18/17 19:25	1
Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	1.1	ng/L		11/16/17 17:39	11/18/17 19:25	1
Perfluorotetradecanoic acid (PFTeA)	0.86	U	1.7	0.25	ng/L		11/16/17 17:39	11/18/17 19:25	1
Perfluorobutanesulfonic acid (PFBS)	**52**		1.7	0.26	ng/L		11/16/17 17:39	11/18/17 19:25	1
Perfluorohexanesulfonic acid (PFHxS)	**350**		1.7	0.26	ng/L		11/16/17 17:39	11/18/17 19:25	1
Perfluoroheptanesulfonic Acid (PFHpS)	**6.8**		1.7	0.26	ng/L		11/16/17 17:39	11/18/17 19:25	1
Perfluorooctanesulfonic acid (PFOS)	**340**		3.4	0.46	ng/L		11/16/17 17:39	11/18/17 19:25	1
Perfluorodecanesulfonic acid (PFDS)	0.86	U	1.7	0.27	ng/L		11/16/17 17:39	11/18/17 19:25	1
Perfluorooctane Sulfonamide (FOSA)	0.86	U	1.7	0.30	ng/L		11/16/17 17:39	11/18/17 19:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*126*		*25 - 150*	*11/16/17 17:39*	*11/18/17 19:25*	*1*
13C4 PFBA	*125*	*M*	*25 - 150*	*11/16/17 17:39*	*11/18/17 19:25*	*1*
13C2 PFHxA	*123*		*25 - 150*	*11/16/17 17:39*	*11/18/17 19:25*	*1*
13C4 PFOA	*94*		*25 - 150*	*11/16/17 17:39*	*11/18/17 19:25*	*1*
13C5 PFNA	*130*		*25 - 150*	*11/16/17 17:39*	*11/18/17 19:25*	*1*
13C2 PFDA	*139*		*25 - 150*	*11/16/17 17:39*	*11/18/17 19:25*	*1*
13C2 PFUnA	*130*		*25 - 150*	*11/16/17 17:39*	*11/18/17 19:25*	*1*
13C2 PFDoA	*125*		*25 - 150*	*11/16/17 17:39*	*11/18/17 19:25*	*1*
18O2 PFHxS	*129*		*25 - 150*	*11/16/17 17:39*	*11/18/17 19:25*	*1*
13C4 PFOS	*131*		*25 - 150*	*11/16/17 17:39*	*11/18/17 19:25*	*1*
13C2-PFTeDA	*124*		*25 - 150*	*11/16/17 17:39*	*11/18/17 19:25*	*1*
13C4-PFHpA	*124*		*25 - 150*	*11/16/17 17:39*	*11/18/17 19:25*	*1*
13C5 PFPeA	*131*		*25 - 150*	*11/16/17 17:39*	*11/18/17 19:25*	*1*
13C3-PFBS	*132*		*25 - 150*	*11/16/17 17:39*	*11/18/17 19:25*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**75**	**D**	8.6	1.5	ng/L		11/16/17 17:39	11/24/17 15:04	5
Perfluoropentanoic acid (PFPeA)	**200**	**D**	8.6	2.1	ng/L		11/16/17 17:39	11/24/17 15:04	5
Perfluorohexanoic acid (PFHxA)	**370**	**D**	17	2.5	ng/L		11/16/17 17:39	11/24/17 15:04	5
Perfluoroheptanoic acid (PFHpA)	**70**	**D**	8.6	1.1	ng/L		11/16/17 17:39	11/24/17 15:04	5
Perfluorooctanoic acid (PFOA)	**1800**	**D M**	17	3.6	ng/L		11/16/17 17:39	11/24/17 15:04	5
Perfluorononanoic acid (PFNA)	**2.7**	**J D**	8.6	1.2	ng/L		11/16/17 17:39	11/24/17 15:04	5
Perfluorodecanoic acid (PFDA)	4.3	U	8.6	1.3	ng/L		11/16/17 17:39	11/24/17 15:04	5
Perfluoroundecanoic acid (PFUnA)	13	U	17	4.7	ng/L		11/16/17 17:39	11/24/17 15:04	5
Perfluorododecanoic acid (PFDoA)	8.6	U	17	2.4	ng/L		11/16/17 17:39	11/24/17 15:04	5
Perfluorotridecanoic Acid (PFTriA)	13	U	17	5.6	ng/L		11/16/17 17:39	11/24/17 15:04	5
Perfluorotetradecanoic acid (PFTeA)	4.3	U	8.6	1.2	ng/L		11/16/17 17:39	11/24/17 15:04	5

Client Sample ID: TP-PFC-023-TPI — Lab Sample ID: 320-33221-1

Date Collected: 11/09/17 11:50 **Matrix: Water**
Date Received: 11/10/17 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances - DL (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**93**	**D**	8.6	1.3	ng/L		11/16/17 17:39	11/24/17 15:04	5
Perfluorohexanesulfonic acid (PFHxS)	**390**	**D**	8.6	1.3	ng/L		11/16/17 17:39	11/24/17 15:04	5
Perfluoroheptanesulfonic Acid (PFHpS)	**7.9**	**J D**	8.6	1.3	ng/L		11/16/17 17:39	11/24/17 15:04	5
Perfluorooctanesulfonic acid (PFOS)	**340**	**D**	17	2.3	ng/L		11/16/17 17:39	11/24/17 15:04	5
Perfluorodecanesulfonic acid (PFDS)	4.3	U	8.6	1.4	ng/L		11/16/17 17:39	11/24/17 15:04	5
Perfluorooctane Sulfonamide (FOSA)	4.3	U	8.6	1.5	ng/L		11/16/17 17:39	11/24/17 15:04	5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*101*		*25 - 150*	*11/16/17 17:39*	*11/24/17 15:04*	*5*
13C4 PFBA	*107*		*25 - 150*	*11/16/17 17:39*	*11/24/17 15:04*	*5*
13C2 PFHxA	*101*		*25 - 150*	*11/16/17 17:39*	*11/24/17 15:04*	*5*
13C4 PFOA	*89*		*25 - 150*	*11/16/17 17:39*	*11/24/17 15:04*	*5*
13C5 PFNA	*101*		*25 - 150*	*11/16/17 17:39*	*11/24/17 15:04*	*5*
13C2 PFDA	*102*		*25 - 150*	*11/16/17 17:39*	*11/24/17 15:04*	*5*
13C2 PFUnA	*100*		*25 - 150*	*11/16/17 17:39*	*11/24/17 15:04*	*5*
13C2 PFDoA	*95*		*25 - 150*	*11/16/17 17:39*	*11/24/17 15:04*	*5*
18O2 PFHxS	*109*		*25 - 150*	*11/16/17 17:39*	*11/24/17 15:04*	*5*
13C4 PFOS	*106*		*25 - 150*	*11/16/17 17:39*	*11/24/17 15:04*	*5*
13C2-PFTeDA	*93*		*25 - 150*	*11/16/17 17:39*	*11/24/17 15:04*	*5*
13C4-PFHpA	*103*		*25 - 150*	*11/16/17 17:39*	*11/24/17 15:04*	*5*
13C5 PFPeA	*105*		*25 - 150*	*11/16/17 17:39*	*11/24/17 15:04*	*5*
13C3-PFBS	*113*		*25 - 150*	*11/16/17 17:39*	*11/24/17 15:04*	*5*

Client Sample ID: TP-PFC-023-MID-CARBON — Lab Sample ID: 320-33221-2

Date Collected: 11/09/17 11:55 **Matrix: Water**
Date Received: 11/10/17 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**140**	**M**	1.7	0.29	ng/L		11/16/17 17:39	11/18/17 19:33	1
Perfluoropentanoic acid (PFPeA)	**79**		1.7	0.41	ng/L		11/16/17 17:39	11/18/17 19:33	1
Perfluorohexanoic acid (PFHxA)	**13**		3.3	0.48	ng/L		11/16/17 17:39	11/18/17 19:33	1
Perfluoroheptanoic acid (PFHpA)	0.83	U	1.7	0.21	ng/L		11/16/17 17:39	11/18/17 19:33	1
Perfluorooctanoic acid (PFOA)	**1.2**	**J M**	3.3	0.70	ng/L		11/16/17 17:39	11/18/17 19:33	1
Perfluorononanoic acid (PFNA)	0.83	U	1.7	0.22	ng/L		11/16/17 17:39	11/18/17 19:33	1
Perfluorodecanoic acid (PFDA)	0.83	U	1.7	0.26	ng/L		11/16/17 17:39	11/18/17 19:33	1
Perfluoroundecanoic acid (PFUnA)	2.5	U	3.3	0.91	ng/L		11/16/17 17:39	11/18/17 19:33	1
Perfluorododecanoic acid (PFDoA)	1.7	U	3.3	0.46	ng/L		11/16/17 17:39	11/18/17 19:33	1
Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.3	1.1	ng/L		11/16/17 17:39	11/18/17 19:33	1
Perfluorotetradecanoic acid (PFTeA)	0.83	U	1.7	0.24	ng/L		11/16/17 17:39	11/18/17 19:33	1
Perfluorobutanesulfonic acid (PFBS)	0.83	U	1.7	0.25	ng/L		11/16/17 17:39	11/18/17 19:33	1
Perfluorohexanesulfonic acid (PFHxS)	**0.26**	**J**	1.7	0.25	ng/L		11/16/17 17:39	11/18/17 19:33	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.83	U	1.7	0.25	ng/L		11/16/17 17:39	11/18/17 19:33	1
Perfluorooctanesulfonic acid (PFOS)	1.7	U	3.3	0.45	ng/L		11/16/17 17:39	11/18/17 19:33	1
Perfluorodecanesulfonic acid (PFDS)	0.83	U	1.7	0.26	ng/L		11/16/17 17:39	11/18/17 19:33	1
Perfluorooctane Sulfonamide (FOSA)	0.83	U	1.7	0.29	ng/L		11/16/17 17:39	11/18/17 19:33	1

Client Sample ID: TP-PFC-023-MID-CARBON — Lab Sample ID: 320-33221-2

Date Collected: 11/09/17 11:55 **Matrix: Water**
Date Received: 11/10/17 09:10

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	109		25 - 150	11/16/17 17:39	11/18/17 19:33	1
13C4 PFBA	109	M	25 - 150	11/16/17 17:39	11/18/17 19:33	1
13C2 PFHxA	111		25 - 150	11/16/17 17:39	11/18/17 19:33	1
13C4 PFOA	95		25 - 150	11/16/17 17:39	11/18/17 19:33	1
13C5 PFNA	111		25 - 150	11/16/17 17:39	11/18/17 19:33	1
13C2 PFDA	110		25 - 150	11/16/17 17:39	11/18/17 19:33	1
13C2 PFUnA	110		25 - 150	11/16/17 17:39	11/18/17 19:33	1
13C2 PFDoA	104		25 - 150	11/16/17 17:39	11/18/17 19:33	1
18O2 PFHxS	116		25 - 150	11/16/17 17:39	11/18/17 19:33	1
13C4 PFOS	111		25 - 150	11/16/17 17:39	11/18/17 19:33	1
13C2-PFTeDA	104		25 - 150	11/16/17 17:39	11/18/17 19:33	1
13C4-PFHpA	112		25 - 150	11/16/17 17:39	11/18/17 19:33	1
13C5 PFPeA	109		25 - 150	11/16/17 17:39	11/18/17 19:33	1
13C3-PFBS	114		25 - 150	11/16/17 17:39	11/18/17 19:33	1

Client Sample ID: TP-PFC-023-TPE — Lab Sample ID: 320-33221-3

Date Collected: 11/09/17 12:00 **Matrix: Water**
Date Received: 11/10/17 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**140**	**M**	1.7	0.30	ng/L		11/16/17 17:39	11/18/17 19:48	1
Perfluoropentanoic acid (PFPeA)	**49**		1.7	0.42	ng/L		11/16/17 17:39	11/18/17 19:48	1
Perfluorohexanoic acid (PFHxA)	**8.6**		3.4	0.49	ng/L		11/16/17 17:39	11/18/17 19:48	1
Perfluoroheptanoic acid (PFHpA)	0.85	U	1.7	0.21	ng/L		11/16/17 17:39	11/18/17 19:48	1
Perfluorooctanoic acid (PFOA)	1.7	U M	3.4	0.72	ng/L		11/16/17 17:39	11/18/17 19:48	1
Perfluorononanoic acid (PFNA)	0.85	U	1.7	0.23	ng/L		11/16/17 17:39	11/18/17 19:48	1
Perfluorodecanoic acid (PFDA)	0.85	U	1.7	0.26	ng/L		11/16/17 17:39	11/18/17 19:48	1
Perfluoroundecanoic acid (PFUnA)	2.5	U	3.4	0.93	ng/L		11/16/17 17:39	11/18/17 19:48	1
Perfluorododecanoic acid (PFDoA)	1.7	U	3.4	0.47	ng/L		11/16/17 17:39	11/18/17 19:48	1
Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.4	1.1	ng/L		11/16/17 17:39	11/18/17 19:48	1
Perfluorotetradecanoic acid (PFTeA)	0.85	U	1.7	0.25	ng/L		11/16/17 17:39	11/18/17 19:48	1
Perfluorobutanesulfonic acid (PFBS)	0.85	U	1.7	0.25	ng/L		11/16/17 17:39	11/18/17 19:48	1
Perfluorohexanesulfonic acid (PFHxS)	**0.34**	**J**	1.7	0.25	ng/L		11/16/17 17:39	11/18/17 19:48	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.85	U	1.7	0.25	ng/L		11/16/17 17:39	11/18/17 19:48	1
Perfluorooctanesulfonic acid (PFOS)	**0.59**	**J M**	3.4	0.46	ng/L		11/16/17 17:39	11/18/17 19:48	1
Perfluorodecanesulfonic acid (PFDS)	0.85	U	1.7	0.27	ng/L		11/16/17 17:39	11/18/17 19:48	1
Perfluorooctane Sulfonamide (FOSA)	0.85	U	1.7	0.30	ng/L		11/16/17 17:39	11/18/17 19:48	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	108		25 - 150	11/16/17 17:39	11/18/17 19:48	1
13C4 PFBA	109	M	25 - 150	11/16/17 17:39	11/18/17 19:48	1
13C2 PFHxA	113		25 - 150	11/16/17 17:39	11/18/17 19:48	1
13C4 PFOA	103		25 - 150	11/16/17 17:39	11/18/17 19:48	1
13C5 PFNA	113		25 - 150	11/16/17 17:39	11/18/17 19:48	1
13C2 PFDA	113		25 - 150	11/16/17 17:39	11/18/17 19:48	1
13C2 PFUnA	114		25 - 150	11/16/17 17:39	11/18/17 19:48	1
13C2 PFDoA	107		25 - 150	11/16/17 17:39	11/18/17 19:48	1
18O2 PFHxS	113		25 - 150	11/16/17 17:39	11/18/17 19:48	1

Client Sample ID: TP-PFC-023-TPE — Lab Sample ID: 320-33221-3

Date Collected: 11/09/17 12:00 **Matrix: Water**
Date Received: 11/10/17 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	111		25 - 150	11/16/17 17:39	11/18/17 19:48	1
13C2-PFTeDA	110		25 - 150	11/16/17 17:39	11/18/17 19:48	1
13C4-PFHpA	110		25 - 150	11/16/17 17:39	11/18/17 19:48	1
13C5 PFPeA	111		25 - 150	11/16/17 17:39	11/18/17 19:48	1
13C3-PFBS	115		25 - 150	11/16/17 17:39	11/18/17 19:48	1

Client Sample ID: TP-PFC-023-TPE-D — Lab Sample ID: 320-33221-4

Date Collected: 11/09/17 00:00 **Matrix: Water**
Date Received: 11/10/17 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**140**	**M**	1.7	0.29	ng/L		11/16/17 17:39	11/18/17 19:56	1
Perfluoropentanoic acid (PFPeA)	**48**		1.7	0.41	ng/L		11/16/17 17:39	11/18/17 19:56	1
Perfluorohexanoic acid (PFHxA)	**8.9**		3.3	0.48	ng/L		11/16/17 17:39	11/18/17 19:56	1
Perfluoroheptanoic acid (PFHpA)	0.83	U	1.7	0.21	ng/L		11/16/17 17:39	11/18/17 19:56	1
Perfluorooctanoic acid (PFOA)	1.7	U M	3.3	0.71	ng/L		11/16/17 17:39	11/18/17 19:56	1
Perfluorononanoic acid (PFNA)	0.83	U	1.7	0.22	ng/L		11/16/17 17:39	11/18/17 19:56	1
Perfluorodecanoic acid (PFDA)	0.83	U	1.7	0.26	ng/L		11/16/17 17:39	11/18/17 19:56	1
Perfluoroundecanoic acid (PFUnA)	2.5	U	3.3	0.91	ng/L		11/16/17 17:39	11/18/17 19:56	1
Perfluorododecanoic acid (PFDoA)	1.7	U	3.3	0.46	ng/L		11/16/17 17:39	11/18/17 19:56	1
Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.3	1.1	ng/L		11/16/17 17:39	11/18/17 19:56	1
Perfluorotetradecanoic acid (PFTeA)	**0.34**	**J**	1.7	0.24	ng/L		11/16/17 17:39	11/18/17 19:56	1
Perfluorobutanesulfonic acid (PFBS)	0.83	U	1.7	0.25	ng/L		11/16/17 17:39	11/18/17 19:56	1
Perfluorohexanesulfonic acid (PFHxS)	**0.29**	**J**	1.7	0.25	ng/L		11/16/17 17:39	11/18/17 19:56	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.83	U	1.7	0.25	ng/L		11/16/17 17:39	11/18/17 19:56	1
Perfluorooctanesulfonic acid (PFOS)	1.7	U	3.3	0.45	ng/L		11/16/17 17:39	11/18/17 19:56	1
Perfluorodecanesulfonic acid (PFDS)	0.83	U	1.7	0.27	ng/L		11/16/17 17:39	11/18/17 19:56	1
Perfluorooctane Sulfonamide (FOSA)	0.83	U	1.7	0.29	ng/L		11/16/17 17:39	11/18/17 19:56	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	108		25 - 150	11/16/17 17:39	11/18/17 19:56	1
13C4 PFBA	108	M	25 - 150	11/16/17 17:39	11/18/17 19:56	1
13C2 PFHxA	108		25 - 150	11/16/17 17:39	11/18/17 19:56	1
13C4 PFOA	98		25 - 150	11/16/17 17:39	11/18/17 19:56	1
13C5 PFNA	113		25 - 150	11/16/17 17:39	11/18/17 19:56	1
13C2 PFDA	113		25 - 150	11/16/17 17:39	11/18/17 19:56	1
13C2 PFUnA	109		25 - 150	11/16/17 17:39	11/18/17 19:56	1
13C2 PFDoA	99		25 - 150	11/16/17 17:39	11/18/17 19:56	1
18O2 PFHxS	112		25 - 150	11/16/17 17:39	11/18/17 19:56	1
13C4 PFOS	113		25 - 150	11/16/17 17:39	11/18/17 19:56	1
13C2-PFTeDA	108		25 - 150	11/16/17 17:39	11/18/17 19:56	1
13C4-PFHpA	112		25 - 150	11/16/17 17:39	11/18/17 19:56	1
13C5 PFPeA	110		25 - 150	11/16/17 17:39	11/18/17 19:56	1
13C3-PFBS	114		25 - 150	11/16/17 17:39	11/18/17 19:56	1

Default Detection Limits

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-33221-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	2.0	0.30	ng/L	537 (modified)
Perfluorobutanoic acid (PFBA)	2.0	0.35	ng/L	537 (modified)
Perfluorodecanesulfonic acid (PFDS)	2.0	0.32	ng/L	537 (modified)
Perfluorodecanoic acid (PFDA)	2.0	0.31	ng/L	537 (modified)
Perfluorododecanoic acid (PFDoA)	4.0	0.55	ng/L	537 (modified)
Perfluoroheptanesulfonic Acid (PFHpS)	2.0	0.30	ng/L	537 (modified)
Perfluoroheptanoic acid (PFHpA)	2.0	0.25	ng/L	537 (modified)
Perfluorohexanesulfonic acid (PFHxS)	2.0	0.30	ng/L	537 (modified)
Perfluorohexanoic acid (PFHxA)	4.0	0.58	ng/L	537 (modified)
Perfluorononanoic acid (PFNA)	2.0	0.27	ng/L	537 (modified)
Perfluorooctane Sulfonamide (FOSA)	2.0	0.35	ng/L	537 (modified)
Perfluorooctanesulfonic acid (PFOS)	4.0	0.54	ng/L	537 (modified)
Perfluorooctanoic acid (PFOA)	4.0	0.85	ng/L	537 (modified)
Perfluoropentanoic acid (PFPeA)	2.0	0.49	ng/L	537 (modified)
Perfluorotetradecanoic acid (PFTeA)	2.0	0.29	ng/L	537 (modified)
Perfluorotridecanoic Acid (PFTriA)	4.0	1.3	ng/L	537 (modified)
Perfluoroundecanoic acid (PFUnA)	4.0	1.1	ng/L	537 (modified)

Isotope Dilution Summary

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-33221-1

Method: 537 (modified) - Fluorinated Alkyl Substances

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	13C8 FOSA (25-150)	13C4 PFBA (25-150)	13C2 PFHxA (25-150)	13C4 PFOA (25-150)	13C5 PFNA (25-150)	13C2 PFDA (25-150)	13C2 PFUnA (25-150)	13C2 PFDoA (25-150)
320-33221-1	TP-PFC-023-TPI	126	125 M	123	94	130	139	130	125
320-33221-1 - DL	TP-PFC-023-TPI	101	107	101	89	101	102	100	95
320-33221-2	TP-PFC-023-MID-CARBON	109	109 M	111	95	111	110	110	104
320-33221-3	TP-PFC-023-TPE	108	109 M	113	103	113	113	114	107
320-33221-4	TP-PFC-023-TPE-D	108	108 M	108	98	113	113	109	99
LCS 320-195219/2-A	Lab Control Sample	106	112 M	108	100	113	117	121	102
LCSD 320-195219/3-A	Lab Control Sample Dup	102	114 M	116	101	117	116	124	105
MB 320-195219/1-A	Method Blank	105	111 M	107	104	112	115	119	108

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	18O2 PFHxS (25-150)	13C4 PFOS (25-150)	13C2-PFTeDA (25-150)	13C4-PFHpA (25-150)	13C5 PFPeA (25-150)	13C3-PFBS (25-150)		
320-33221-1	TP-PFC-023-TPI	129	131	124	124	131	132		
320-33221-1 - DL	TP-PFC-023-TPI	109	106	93	103	105	113		
320-33221-2	TP-PFC-023-MID-CARBON	116	111	104	112	109	114		
320-33221-3	TP-PFC-023-TPE	113	111	110	110	111	115		
320-33221-4	TP-PFC-023-TPE-D	112	113	108	112	110	114		
LCS 320-195219/2-A	Lab Control Sample	113	113	102	112	112	118		
LCSD 320-195219/3-A	Lab Control Sample Dup	120	118	103	113	115	125		
MB 320-195219/1-A	Method Blank	114	109	107	113	111	119		

Surrogate Legend

13C8 FOSA = 13C8 FOSA
13C4 PFBA = 13C4 PFBA
13C2 PFHxA = 13C2 PFHxA
13C4 PFOA = 13C4 PFOA
13C5 PFNA = 13C5 PFNA
13C2 PFDA = 13C2 PFDA
13C2 PFUnA = 13C2 PFUnA
13C2 PFDoA = 13C2 PFDoA
18O2 PFHxS = 18O2 PFHxS
13C4 PFOS = 13C4 PFOS
13C2-PFTeDA = 13C2-PFTeDA
13C4-PFHpA = 13C4-PFHpA
13C5 PFPeA = 13C5 PFPeA
13C3-PFBS = 13C3-PFBS

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-195219/1-A
Matrix: Water
Analysis Batch: 195562

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 195219

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.0	U	2.0	0.35	ng/L		11/16/17 17:39	11/18/17 16:55	1
Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	0.49	ng/L		11/16/17 17:39	11/18/17 16:55	1
Perfluorohexanoic acid (PFHxA)	2.0	U	4.0	0.58	ng/L		11/16/17 17:39	11/18/17 16:55	1
Perfluoroheptanoic acid (PFHpA)	1.0	U	2.0	0.25	ng/L		11/16/17 17:39	11/18/17 16:55	1
Perfluorooctanoic acid (PFOA)	2.0	U	4.0	0.85	ng/L		11/16/17 17:39	11/18/17 16:55	1
Perfluorononanoic acid (PFNA)	1.0	U	2.0	0.27	ng/L		11/16/17 17:39	11/18/17 16:55	1
Perfluorodecanoic acid (PFDA)	1.0	U	2.0	0.31	ng/L		11/16/17 17:39	11/18/17 16:55	1
Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	1.1	ng/L		11/16/17 17:39	11/18/17 16:55	1
Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	0.55	ng/L		11/16/17 17:39	11/18/17 16:55	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	1.3	ng/L		11/16/17 17:39	11/18/17 16:55	1
Perfluorotetradecanoic acid (PFTeA)	1.0	U	2.0	0.29	ng/L		11/16/17 17:39	11/18/17 16:55	1
Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	0.30	ng/L		11/16/17 17:39	11/18/17 16:55	1
Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	0.30	ng/L		11/16/17 17:39	11/18/17 16:55	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	0.30	ng/L		11/16/17 17:39	11/18/17 16:55	1
Perfluorooctanesulfonic acid (PFOS)	0.647	J M	4.0	0.54	ng/L		11/16/17 17:39	11/18/17 16:55	1
Perfluorodecanesulfonic acid (PFDS)	1.0	U	2.0	0.32	ng/L		11/16/17 17:39	11/18/17 16:55	1
Perfluorooctane Sulfonamide (FOSA)	1.0	U	2.0	0.35	ng/L		11/16/17 17:39	11/18/17 16:55	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*105*		*25 - 150*	*11/16/17 17:39*	*11/18/17 16:55*	*1*
13C4 PFBA	*111*	*M*	*25 - 150*	*11/16/17 17:39*	*11/18/17 16:55*	*1*
13C2 PFHxA	*107*		*25 - 150*	*11/16/17 17:39*	*11/18/17 16:55*	*1*
13C4 PFOA	*104*		*25 - 150*	*11/16/17 17:39*	*11/18/17 16:55*	*1*
13C5 PFNA	*112*		*25 - 150*	*11/16/17 17:39*	*11/18/17 16:55*	*1*
13C2 PFDA	*115*		*25 - 150*	*11/16/17 17:39*	*11/18/17 16:55*	*1*
13C2 PFUnA	*119*		*25 - 150*	*11/16/17 17:39*	*11/18/17 16:55*	*1*
13C2 PFDoA	*108*		*25 - 150*	*11/16/17 17:39*	*11/18/17 16:55*	*1*
18O2 PFHxS	*114*		*25 - 150*	*11/16/17 17:39*	*11/18/17 16:55*	*1*
13C4 PFOS	*109*		*25 - 150*	*11/16/17 17:39*	*11/18/17 16:55*	*1*
13C2-PFTeDA	*107*		*25 - 150*	*11/16/17 17:39*	*11/18/17 16:55*	*1*
13C4-PFHpA	*113*		*25 - 150*	*11/16/17 17:39*	*11/18/17 16:55*	*1*
13C5 PFPeA	*111*		*25 - 150*	*11/16/17 17:39*	*11/18/17 16:55*	*1*
13C3-PFBS	*119*		*25 - 150*	*11/16/17 17:39*	*11/18/17 16:55*	*1*

Lab Sample ID: LCS 320-195219/2-A
Matrix: Water
Analysis Batch: 195562

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 195219

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	40.0	41.4	M	ng/L		104	89 - 128
Perfluoropentanoic acid (PFPeA)	40.0	40.8		ng/L		102	66 - 136
Perfluorohexanoic acid (PFHxA)	40.0	42.1		ng/L		105	86 - 126
Perfluoroheptanoic acid (PFHpA)	40.0	40.0		ng/L		100	89 - 127
Perfluorooctanoic acid (PFOA)	40.0	41.5		ng/L		104	80 - 120
Perfluorononanoic acid (PFNA)	40.0	41.6		ng/L		104	77 - 137
Perfluorodecanoic acid (PFDA)	40.0	41.3		ng/L		103	84 - 123
Perfluoroundecanoic acid (PFUnA)	40.0	36.0		ng/L		90	73 - 122

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-195219/2-A
Matrix: Water
Analysis Batch: 195562

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 195219

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorododecanoic acid (PFDoA)	40.0	44.5		ng/L		111	82 - 122
Perfluorotridecanoic Acid (PFTriA)	40.0	37.9		ng/L		95	56 - 163
Perfluorotetradecanoic acid (PFTeA)	40.0	39.4		ng/L		99	66 - 120
Perfluorobutanesulfonic acid (PFBS)	35.4	36.5		ng/L		103	88 - 130
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.4		ng/L		97	87 - 126
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	39.5		ng/L		104	92 - 135
Perfluorooctanesulfonic acid (PFOS)	37.1	39.2		ng/L		105	83 - 126
Perfluorodecanesulfonic acid (PFDS)	38.6	39.0		ng/L		101	80 - 129
Perfluorooctane Sulfonamide (FOSA)	40.0	41.7		ng/L		104	91 - 133

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*106*		*25 - 150*
13C4 PFBA	*112*	*M*	*25 - 150*
13C2 PFHxA	*108*		*25 - 150*
13C4 PFOA	*100*		*25 - 150*
13C5 PFNA	*113*		*25 - 150*
13C2 PFDA	*117*		*25 - 150*
13C2 PFUnA	*121*		*25 - 150*
13C2 PFDoA	*102*		*25 - 150*
18O2 PFHxS	*113*		*25 - 150*
13C4 PFOS	*113*		*25 - 150*
13C2-PFTeDA	*102*		*25 - 150*
13C4-PFHpA	*112*		*25 - 150*
13C5 PFPeA	*112*		*25 - 150*
13C3-PFBS	*118*		*25 - 150*

Lab Sample ID: LCSD 320-195219/3-A
Matrix: Water
Analysis Batch: 195562

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 195219

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	40.0	40.3	M	ng/L		101	89 - 128	3	30
Perfluoropentanoic acid (PFPeA)	40.0	40.3		ng/L		101	66 - 136	1	30
Perfluorohexanoic acid (PFHxA)	40.0	39.7		ng/L		99	86 - 126	6	30
Perfluoroheptanoic acid (PFHpA)	40.0	40.6		ng/L		101	89 - 127	2	30
Perfluorooctanoic acid (PFOA)	40.0	39.6		ng/L		99	80 - 120	5	30
Perfluorononanoic acid (PFNA)	40.0	38.4		ng/L		96	77 - 137	8	30
Perfluorodecanoic acid (PFDA)	40.0	40.0		ng/L		100	84 - 123	3	30
Perfluoroundecanoic acid (PFUnA)	40.0	35.1		ng/L		88	73 - 122	3	30
Perfluorododecanoic acid (PFDoA)	40.0	43.0		ng/L		108	82 - 122	3	30

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-195219/3-A
Matrix: Water
Analysis Batch: 195562

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 195219

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorotridecanoic Acid (PFTriA)			40.0	38.8		ng/L		97	56 - 163	2	30
Perfluorotetradecanoic acid (PFTeA)			40.0	40.4		ng/L		101	66 - 120	3	30
Perfluorobutanesulfonic acid (PFBS)			35.4	34.2		ng/L		97	88 - 130	6	30
Perfluorohexanesulfonic acid (PFHxS)			36.4	33.9		ng/L		93	87 - 126	5	30
Perfluoroheptanesulfonic Acid (PFHpS)			38.1	38.8		ng/L		102	92 - 135	2	30
Perfluorooctanesulfonic acid (PFOS)			37.1	37.1		ng/L		100	83 - 126	5	30
Perfluorodecanesulfonic acid (PFDS)			38.6	39.0		ng/L		101	80 - 129	0	30
Perfluorooctane Sulfonamide (FOSA)			40.0	40.7		ng/L		102	91 - 133	2	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C8 FOSA	*102*		*25 - 150*
13C4 PFBA	*114*	*M*	*25 - 150*
13C2 PFHxA	*116*		*25 - 150*
13C4 PFOA	*101*		*25 - 150*
13C5 PFNA	*117*		*25 - 150*
13C2 PFDA	*116*		*25 - 150*
13C2 PFUnA	*124*		*25 - 150*
13C2 PFDoA	*105*		*25 - 150*
18O2 PFHxS	*120*		*25 - 150*
13C4 PFOS	*118*		*25 - 150*
13C2-PFTeDA	*103*		*25 - 150*
13C4-PFHpA	*113*		*25 - 150*
13C5 PFPeA	*115*		*25 - 150*
13C3-PFBS	*125*		*25 - 150*

LCMS

Prep Batch: 195219

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-33221-1	TP-PFC-023-TPI	Total/NA	Water	3535	
320-33221-1 - DL	TP-PFC-023-TPI	Total/NA	Water	3535	
320-33221-2	TP-PFC-023-MID-CARBON	Total/NA	Water	3535	
320-33221-3	TP-PFC-023-TPE	Total/NA	Water	3535	
320-33221-4	TP-PFC-023-TPE-D	Total/NA	Water	3535	
MB 320-195219/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-195219/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-195219/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 195562

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-33221-1	TP-PFC-023-TPI	Total/NA	Water	537 (modified)	195219
320-33221-2	TP-PFC-023-MID-CARBON	Total/NA	Water	537 (modified)	195219
320-33221-3	TP-PFC-023-TPE	Total/NA	Water	537 (modified)	195219
320-33221-4	TP-PFC-023-TPE-D	Total/NA	Water	537 (modified)	195219
MB 320-195219/1-A	Method Blank	Total/NA	Water	537 (modified)	195219
LCS 320-195219/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	195219
LCSD 320-195219/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	195219

Analysis Batch: 196712

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-33221-1 - DL	TP-PFC-023-TPI	Total/NA	Water	537 (modified)	195219

Lab Chronicle

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-33221-1

Client Sample ID: TP-PFC-023-TPI
Lab Sample ID: 320-33221-1
Date Collected: 11/09/17 11:50
Matrix: Water
Date Received: 11/10/17 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			195219	11/16/17 17:39	JER	TAL SAC
Total/NA	Analysis	537 (modified)		1	195562	11/18/17 19:25	ABH	TAL SAC
Total/NA	Prep	3535	DL		195219	11/16/17 17:39	JER	TAL SAC
Total/NA	Analysis	537 (modified)	DL	5	196712	11/24/17 15:04	ABH	TAL SAC

Client Sample ID: TP-PFC-023-MID-CARBON
Lab Sample ID: 320-33221-2
Date Collected: 11/09/17 11:55
Matrix: Water
Date Received: 11/10/17 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			195219	11/16/17 17:39	JER	TAL SAC
Total/NA	Analysis	537 (modified)		1	195562	11/18/17 19:33	ABH	TAL SAC

Client Sample ID: TP-PFC-023-TPE
Lab Sample ID: 320-33221-3
Date Collected: 11/09/17 12:00
Matrix: Water
Date Received: 11/10/17 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			195219	11/16/17 17:39	JER	TAL SAC
Total/NA	Analysis	537 (modified)		1	195562	11/18/17 19:48	ABH	TAL SAC

Client Sample ID: TP-PFC-023-TPE-D
Lab Sample ID: 320-33221-4
Date Collected: 11/09/17 00:00
Matrix: Water
Date Received: 11/10/17 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			195219	11/16/17 17:39	JER	TAL SAC
Total/NA	Analysis	537 (modified)		1	195562	11/18/17 19:56	ABH	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-33221-1
Project/Site: TT: PFAS, Brunswick, Discharge

Laboratory: TestAmerica Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4040	01-28-18

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
537 (modified)	3535	Water	Perfluorobutanesulfonic acid (PFBS)
537 (modified)	3535	Water	Perfluorobutanoic acid (PFBA)
537 (modified)	3535	Water	Perfluorodecanesulfonic acid (PFDS)
537 (modified)	3535	Water	Perfluorodecanoic acid (PFDA)
537 (modified)	3535	Water	Perfluorododecanoic acid (PFDoA)
537 (modified)	3535	Water	Perfluoroheptanesulfonic Acid (PFHpS)
537 (modified)	3535	Water	Perfluoroheptanoic acid (PFHpA)
537 (modified)	3535	Water	Perfluorohexanesulfonic acid (PFHxS)
537 (modified)	3535	Water	Perfluorohexanoic acid (PFHxA)
537 (modified)	3535	Water	Perfluorononanoic acid (PFNA)
537 (modified)	3535	Water	Perfluorooctane Sulfonamide (FOSA)
537 (modified)	3535	Water	Perfluorooctanesulfonic acid (PFOS)
537 (modified)	3535	Water	Perfluorooctanoic acid (PFOA)
537 (modified)	3535	Water	Perfluoropentanoic acid (PFPeA)
537 (modified)	3535	Water	Perfluorotetradecanoic acid (PFTeA)
537 (modified)	3535	Water	Perfluorotridecanoic Acid (PFTriA)
537 (modified)	3535	Water	Perfluoroundecanoic acid (PFUnA)

Method Summary

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-33221-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

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: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-33221-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-33221-1	TP-PFC-023-TPI	Water	11/09/17 11:50	11/10/17 09:10
320-33221-2	TP-PFC-023-MID-CARBON	Water	11/09/17 11:55	11/10/17 09:10
320-33221-3	TP-PFC-023-TPE	Water	11/09/17 12:00	11/10/17 09:10
320-33221-4	TP-PFC-023-TPE-D	Water	11/09/17 00:00	11/10/17 09:10

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 195190

Lab Sample ID: IC 320-195190/2 Client Sample ID:

Date Analyzed: 11/16/17 13:20 Lab File ID: 2017.11.16LLICAL_002.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.04	Baseline	phomsopha t	11/17/17 10:06

537 (modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 195558

Lab Sample ID: CCVL 320-195558/1 Client Sample ID:

Date Analyzed: 11/18/17 14:13 Lab File ID: 2017.11.18LLAXE_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.48	Incomplete Integration	hannigana	11/18/17 18:04

537 (modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 195562

Lab Sample ID: MB 320-195219/1-A Client Sample ID:

Date Analyzed: 11/18/17 16:55 Lab File ID: 2017.11.18LLAXEA_002.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C4 PFBA	1.48	Incomplete Integration	hannigana	11/24/17 11:28
Perfluorooctanesulfonic acid (PFOS)	3.04	Baseline	hannigana	11/24/17 11:27

Lab Sample ID: LCS 320-195219/2-A Client Sample ID:

Date Analyzed: 11/18/17 17:03 Lab File ID: 2017.11.18LLAXEA_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C4 PFBA	1.47	Incomplete Integration	hannigana	11/24/17 11:29
Perfluorobutanoic acid (PFBA)	1.47	Incomplete Integration	hannigana	11/24/17 11:29

Lab Sample ID: LCSD 320-195219/3-A Client Sample ID:

Date Analyzed: 11/18/17 17:11 Lab File ID: 2017.11.18LLAXEA_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C4 PFBA	1.47	Incomplete Integration	hannigana	11/24/17 11:30
Perfluorobutanoic acid (PFBA)	1.47	Incomplete Integration	hannigana	11/24/17 11:31

Lab Sample ID: 320-33221-1 Client Sample ID: TP-PFC-023-TPI

Date Analyzed: 11/18/17 19:25 Lab File ID: 2017.11.18LLAXEA_021.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C4 PFBA	1.48	Incomplete Integration	hannigana	11/24/17 13:12
Perfluorobutanoic acid (PFBA)	1.48	Incomplete Integration	hannigana	11/24/17 13:12
Perfluorooctanoic acid (PFOA)	2.68	Isomers	hannigana	11/24/17 13:10

537 (modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 195562

Lab Sample ID: 320-33221-2 Client Sample ID: TP-PFC-023-MID-CARBON

Date Analyzed: 11/18/17 19:33 Lab File ID: 2017.11.18LLAXEA_022.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C4 PFBA	1.48	Incomplete Integration	hannigana	11/24/17 13:15
Perfluorobutanoic acid (PFBA)	1.48	Incomplete Integration	hannigana	11/24/17 13:16
Perfluorooctanoic acid (PFOA)	2.68	Isomers	hannigana	11/24/17 13:15

Lab Sample ID: 320-33221-3 Client Sample ID: TP-PFC-023-TPE

Date Analyzed: 11/18/17 19:48 Lab File ID: 2017.11.18LLAXEA_024.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C4 PFBA	1.48	Incomplete Integration	hannigana	11/24/17 13:18
Perfluorobutanoic acid (PFBA)	1.48	Incomplete Integration	hannigana	11/24/17 13:19
Perfluorooctanoic acid (PFOA)	2.68	Isomers	hannigana	11/24/17 13:18
Perfluorooctanesulfonic acid (PFOS)	3.04	Baseline	hannigana	11/24/17 13:18

Lab Sample ID: 320-33221-4 Client Sample ID: TP-PFC-023-TPE-D

Date Analyzed: 11/18/17 19:56 Lab File ID: 2017.11.18LLAXEA_025.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C4 PFBA	1.48	Incomplete Integration	hannigana	11/24/17 13:20
Perfluorobutanoic acid (PFBA)	1.48	Incomplete Integration	hannigana	11/24/17 13:20
Perfluorooctanoic acid (PFOA)	2.68	Isomers	hannigana	11/24/17 13:20

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 196712

Lab Sample ID: 320-33221-1 DL Client Sample ID: TP-PFC-023-TPI DL

Date Analyzed: 11/24/17 15:04 Lab File ID: 2017.11.24LLA_011.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.71	Isomers	hannigana	11/27/17 15:11

Lab Sample ID: CCV 320-196712/3 Client Sample ID:

Date Analyzed: 11/24/17 15:12 Lab File ID: 2017.11.24LLA_012.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.07	Peak Tail	hannigana	11/27/17 15:12

537 (modified)

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCM2-4:2LLIC_00002	12/30/17	08/19/17	MeOH/H2O, Lot 09285	5000 uL	LCM2-4:2FTSIC_00003	250 uL	13C2-PFOA	2.5 ng/mL
.LCM2-4:2FTSIC_00003	12/30/17	08/07/17	MeOH/H2O, Lot 09285	5000 uL	LCPFCIS_00003	50 uL	13C2-PFOA	50 ng/mL
..LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
...LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCMPFC_ALL_SU_00018	05/07/18	11/07/17	Methanol, Lot Baker 141039	200 mL	LCd-NEtFOSA-M_00006	200 uL	d-N-EtFOSA-M	0.05 ug/mL
					LCd-NMeFOSA-M_00005	200 uL	d-N-MeFOSA-M	0.05 ug/mL
					LCd3-NMeFOSAA_00005	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00005	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00005	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00007	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00011	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00010	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00010	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00011	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00014	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00011	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00004	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00016	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00011	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00017	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00011	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00011	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00015	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00023	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00012	200 uL	13C2 PFUnA	0.05 ug/mL
.LCd-NEtFOSA-M_00006	04/20/22	WELLINGTON, Lot dNEtFOSA0417M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
.LCd-NMeFOSA-M_00005	04/20/22	WELLINGTON, Lot dNMeFOSA0417M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
.LCd3-NMeFOSAA_00005	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
.LCd5-NEtFOSAA_00005	11/22/21	WELLINGTON, Lot d5NEtFOSAA1116			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
.LCM2-6:FTS_00005	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
.LCM2-8:2FTS_00007	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCM2PFHxDA_00011	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00010	12/07/20	Wellington Laboratories, Lot M2PFTeDA0217			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM4PFHPA_00010	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00011	11/22/21	Wellington Laboratories, Lot M5PFPeA1116			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
.LCM8FOSA_00014	04/20/22	Wellington Laboratories, Lot M8FOSA0417I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00011	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFBS_00004	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
.LCMPFDA_00016	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00011	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00017	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00011	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00011	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00015	04/12/22	Wellington Laboratories, Lot MPFOA0417			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00023	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00012	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCPFC-IS_00012	05/11/18	11/13/17	Methanol, Lot 090285	200 mL	LCM2PFOA_00006	200 uL	13C2-PFOA	0.05 ug/mL
.LCM2PFOA_00006	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC_CCVL_00001	12/30/17	07/13/17	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00002	500 uL	d-N-EtFOSA-M	2.5 ng/mL
							d-N-MeFOSA-M	2.5 ng/mL
							d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00108	100 uL	Perfluorobutanoic acid (PFBA)	0.05 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0442 ng/mL
							Perfluorodecanoic acid (PFDA)	0.05 ng/mL
							Perfluorododecanoic acid (PFDoA)	0.05 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.05 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0476 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.05 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0455 ng/mL
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorooctanoic acid (PFOA)	0.05 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0464 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.05 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.05 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.05 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorotridecanoic Acid (PFTriA)	0.05 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.05 ng/mL
.LCMPFC_ALL_SU_00002	01/11/18	07/11/17	Methanol, Lot Baker 141039	5000 uL	LCd-NEtFOSA-M_00005	100 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00004	100 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	100 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00004	100 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00004	100 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	100 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00010	100 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00009	100 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00009	100 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00010	100 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00013	100 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00010	100 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00003	100 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00015	100 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00010	100 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00016	100 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00010	100 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00010	100 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00014	100 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00022	100 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00011	100 uL	13C2 PFUnA	1 ug/mL
..LCd-NEtFOSA-M_00005	06/10/21	WELLINGTON, Lot dNEtFOSA0616M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00004	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00004	11/22/21	WELLINGTON, Lot d3NMeFOSAA1116			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00004	11/22/21	WELLINGTON, Lot d5NEtFOSAA1116			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00004	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00004	08/22/21	WELLINGTON, Lot M282FTS0816			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00010	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00009	12/07/20	Wellington Laboratories, Lot M2PFTeDA0217			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00009	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00010	11/22/21	Wellington Laboratories, Lot M5PFPeA1116			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00013	12/22/20	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00010	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00003	08/02/21	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00015	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00010	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00016	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00010	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00010	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00014	04/12/22	Wellington Laboratories, Lot MPFOA0417			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00022	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00011	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00108	01/12/18	07/12/17	Methanol, Lot 090285	10000 uL	LCPFCSP_00107	1 mL	Perfluorobutanoic acid (PFBA)	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00107	01/12/18	07/12/17	Methanol, Lot 090285	10000 uL	LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00007	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00007	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00007	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00007	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00006	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00007	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00007	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
...LCPFBA_00006	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00006	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00007	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00007	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDS_00007	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00007	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
...LCPFHxA_00006	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxS-br_00003	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00007	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00007	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFOS-br_00003	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
...LCPFPeA_00006	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFTeDA_00007	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00007	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFUdA_00006	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL1_00002	12/30/17	07/13/17	MeOH/H2O, Lot 90285	200 mL	LCMPFC_ALL_SU_00002	500 uL	d-N-EtFOSA-M	2.5 ng/mL
							d-N-MeFOSA-M	2.5 ng/mL
							d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCIS_00003	100 uL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00108	50 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.02335 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0237 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.02395 ng/mL
							N-ethylperfluoro-1-octanesulfonamide	0.025 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
							MeFOSA	0.025 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
							Perfluorobutanoic acid (PFBA)	0.025 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0221 ng/mL
							Perfluorodecanoic acid (PFDA)	0.025 ng/mL
							Perfluorododecanoic acid (PFDoA)	0.025 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.025 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0238 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.025 ng/mL
							Perfluorohexadecanoic acid	0.025 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.02275 ng/mL
							Perfluorononanoic acid (PFNA)	0.025 ng/mL
							Perfluorooctanoic acid (PFOA)	0.025 ng/mL
							Perfluorooctadecanoic acid	0.025 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0232 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.025 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoropentanoic acid (PFPeA)	0.025 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.025 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.025 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.025 ng/mL
.LCMPFC_ALL_SU_00002	01/11/18	07/11/17	Methanol, Lot Baker 141039	5000 uL	LCd-NEtFOSA-M_00005	100 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00004	100 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	100 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00004	100 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00004	100 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	100 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00010	100 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00009	100 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00009	100 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00010	100 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00013	100 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00010	100 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00003	100 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00015	100 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00010	100 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00016	100 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00010	100 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00010	100 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00014	100 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00022	100 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00011	100 uL	13C2 PFUnA	1 ug/mL
..LCd-NEtFOSA-M_00005	06/10/21	WELLINGTON, Lot dNEtFOSA0616M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00004	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00004	11/22/21	WELLINGTON, Lot d3NMeFOSAA1116			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00004	11/22/21	WELLINGTON, Lot d5NEtFOSAA1116			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00004	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00004	08/22/21	WELLINGTON, Lot M282FTS0816			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00010	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00009	12/07/20	Wellington Laboratories, Lot M2PFTeDA0217			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00009	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00010	11/22/21	Wellington Laboratories, Lot M5PFPeA1116			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00013	12/22/20	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00010	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00003	08/02/21	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00015	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00010	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00016	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00010	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00010	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFOA_00014	04/12/22	Wellington Laboratories, Lot MPFOA0417			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00022	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00011	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
..LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCPFCSP_00108	01/12/18	07/12/17	Methanol, Lot 090285	10000 uL	LCPFCSP_00107	1 mL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.0934 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0958 ug/mL
							N-ethylperfluoro-1-octanesulfonamide	0.1 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00107	01/12/18	07/12/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00002	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00004	200 uL	N-ethylperfluoro-1-octanesulfonamide	1 ug/mL
					LCN-EtFOSAA_00003	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00003	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00004	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00007	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00007	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00007	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00007	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00006	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00007	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00007	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00007	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00007	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC4:2FTS_00002	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
...LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
...LCN-EtFOSA-M_00004	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
...LCN-EtFOSAA_00003	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSA-M_00003	05/24/21	WELLINGTON, Lot NMeFOSA0516M			(Purchased Reagent)		MeFOSA	50 ug/mL
...LCN-MeFOSAA_00004	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCPFBA_00006	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00006	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00007	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00007	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDS_00007	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00007	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
...LCPFHxA_00006	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxDA_00007	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00003	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00007	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00007	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00007	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS-br_00003	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
...LCPFPeA_00006	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFTeDA_00007	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00007	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFUdA_00006	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL2_00002	12/30/17	07/13/17	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00002	500 uL	d-N-EtFOSA-M	2.5 ng/mL
							d-N-MeFOSA-M	2.5 ng/mL
							d3-NMeFOSAA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCIS_00003	100 uL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00108	100 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.0467 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0474 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0479 ng/mL
							N-ethylperfluoro-1-octanesulfonamide	0.05 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							MeFOSA	0.05 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							Perfluorobutanoic acid (PFBA)	0.05 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0442 ng/mL
							Perfluorodecanoic acid (PFDA)	0.05 ng/mL
							Perfluorododecanoic acid (PFDoA)	0.05 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.05 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0476 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.05 ng/mL
							Perfluorohexadecanoic acid	0.05 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	0.0455 ng/mL
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorooctanoic acid (PFOA)	0.05 ng/mL
							Perfluorooctadecanoic acid	0.05 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0464 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.05 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.05 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.05 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.05 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.05 ng/mL
.LCMPFC_ALL_SU_00002	01/11/18	07/11/17	Methanol, Lot Baker 141039	5000 uL	LCd-NEtFOSA-M_00005	100 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00004	100 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	100 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00004	100 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00004	100 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	100 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00010	100 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00009	100 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00009	100 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00010	100 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00013	100 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00010	100 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00003	100 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00015	100 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00010	100 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00016	100 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00010	100 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00010	100 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00014	100 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00022	100 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00011	100 uL	13C2 PFUnA	1 ug/mL
..LCd-NEtFOSA-M_00005	06/10/21	WELLINGTON, Lot dNEtFOSA0616M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00004	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00004	11/22/21	WELLINGTON, Lot d3NMeFOSAA1116			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00004	11/22/21	WELLINGTON, Lot d5NEtFOSAA1116			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00004	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00004	08/22/21	WELLINGTON, Lot M282FTS0816			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00010	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00009	12/07/20	Wellington Laboratories, Lot M2PFTeDA0217			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00009	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00010	11/22/21	Wellington Laboratories, Lot M5PFPeA1116			(Purchased Reagent)		13C5 PFPeA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM8FOSA_00013	12/22/20	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00010	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00003	08/02/21	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00015	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00010	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00016	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00010	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00010	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00014	04/12/22	Wellington Laboratories, Lot MPFOA0417			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00022	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00011	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
..LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCPFCSP_00108	01/12/18	07/12/17	Methanol, Lot 090285	10000 uL	LCPFCSP_00107	1 mL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.0934 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0958 ug/mL
							N-ethylperfluoro-1-octanesulfonamide	0.1 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00107	01/12/18	07/12/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00002	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00004	200 uL	N-ethylperfluoro-1-octanesulfonamide	1 ug/mL
					LCN-EtFOSAA_00003	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00003	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00004	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00007	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00007	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00007	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00007	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00006	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00007	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00007	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00007	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00007	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
...LC4:2FTS_00002	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
...LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
...LCN-EtFOSA-M_00004	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
...LCN-EtFOSAA_00003	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSA-M_00003	05/24/21	WELLINGTON, Lot NMeFOSA0516M			(Purchased Reagent)		MeFOSA	50 ug/mL
...LCN-MeFOSAA_00004	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCPFBA_00006	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00006	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00007	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00007	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDS_00007	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00007	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
...LCPFHxA_00006	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxDA_00007	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00003	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00007	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00007	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00007	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS-br_00003	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFPeA_00006	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFTeDA_00007	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00007	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFUdA_00006	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL3_00002	12/30/17	07/13/17	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00002	500 uL	d-N-EtFOSA-M	2.5 ng/mL
							d-N-MeFOSA-M	2.5 ng/mL
							d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCIS_00003	100 uL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00108	500 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.2335 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.237 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.2395 ng/mL
							N-ethylperfluoro-1-octanesulfonamide	0.25 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.25 ng/mL
							MeFOSA	0.25 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.25 ng/mL
							Perfluorobutanoic acid (PFBA)	0.25 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.221 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorodecanoic acid (PFDA)	0.25 ng/mL
							Perfluorododecanoic acid (PFDoA)	0.25 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.25 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.238 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.25 ng/mL
							Perfluorohexadecanoic acid	0.25 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2275 ng/mL
							Perfluorononanoic acid (PFNA)	0.25 ng/mL
							Perfluorooctanoic acid (PFOA)	0.25 ng/mL
							Perfluorooctadecanoic acid	0.25 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.232 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.25 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.25 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.25 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.25 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.25 ng/mL
.LCMPFC_ALL_SU_00002	01/11/18	07/11/17	Methanol, Lot Baker 141039	5000 uL	LCd-NEtFOSA-M_00005	100 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00004	100 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	100 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00004	100 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00004	100 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	100 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00010	100 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00009	100 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00009	100 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00010	100 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00013	100 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00010	100 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00003	100 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00015	100 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00010	100 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00016	100 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00010	100 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00010	100 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00014	100 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00022	100 uL	13C4 PFOS	0.956 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFUdA_00011	100 uL	13C2 PFUnA	1 ug/mL
..LCd-NEtFOSA-M_00005	06/10/21	WELLINGTON, Lot dNEtFOSA0616M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00004	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00004	11/22/21	WELLINGTON, Lot d3NMeFOSAA1116			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00004	11/22/21	WELLINGTON, Lot d5NEtFOSAA1116			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00004	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00004	08/22/21	WELLINGTON, Lot M282FTS0816			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00010	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00009	12/07/20	Wellington Laboratories, Lot M2PFTeDA0217			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00009	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00010	11/22/21	Wellington Laboratories, Lot M5PFPeA1116			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00013	12/22/20	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00010	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00003	08/02/21	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00015	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00010	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00016	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00010	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00010	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00014	04/12/22	Wellington Laboratories, Lot MPFOA0417			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00022	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00011	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
..LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCPFCSP_00108	01/12/18	07/12/17	Methanol, Lot 090285	10000 uL	LCPFCSP_00107	1 mL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.0934 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0958 ug/mL
							N-ethylperfluoro-1-octanesulfonamide	0.1 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00107	01/12/18	07/12/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00002	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00004	200 uL	N-ethylperfluoro-1-octanesulfonamide	1 ug/mL
					LCN-EtFOSAA_00003	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00003	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00004	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00007	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00007	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00007	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00007	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00006	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00007	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00007	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00007	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00007	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
...LC4:2FTS_00002	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
...LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
...LCN-EtFOSA-M_00004	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
...LCN-EtFOSAA_00003	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSA-M_00003	05/24/21	WELLINGTON, Lot NMeFOSA0516M			(Purchased Reagent)		MeFOSA	50 ug/mL
...LCN-MeFOSAA_00004	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCPFBA_00006	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00006	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00007	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00007	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDS_00007	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00007	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
...LCPFHxA_00006	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFHxDA_00007	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00003	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00007	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00007	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00007	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS-br_00003	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
...LCPFPeA_00006	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFTeDA_00007	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00007	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFUdA_00006	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL4_00002	12/30/17	07/13/17	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00002	500 uL	d-N-EtFOSA-M	2.5 ng/mL
							d-N-MeFOSA-M	2.5 ng/mL
							d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCIS_00003	100 uL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00107	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							N-ethylperfluoro-1-octanesulfonamide	1 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							MeFOSA	1 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							Perfluorobutanoic acid (PFBA)	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							Perfluorodecanoic acid (PFDA)	1 ng/mL
							Perfluorododecanoic acid (PFDoA)	1 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ng/mL
							Perfluorohexanoic acid (PFHxA)	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctadecanoic acid	1 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	1 ng/mL
							Perfluoropentanoic acid (PFPeA)	1 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	1 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	1 ng/mL
							Perfluoroundecanoic acid (PFUnA)	1 ng/mL
.LCMPFC_ALL_SU_00002	01/11/18	07/11/17	Methanol, Lot Baker 141039	5000 uL	LCd-NEtFOSA-M_00005	100 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00004	100 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	100 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00004	100 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00004	100 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	100 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00010	100 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00009	100 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00009	100 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00010	100 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00013	100 uL	13C8 FOSA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFBA_00010	100 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00003	100 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00015	100 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00010	100 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00016	100 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00010	100 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00010	100 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00014	100 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00022	100 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00011	100 uL	13C2 PFUnA	1 ug/mL
..LCd-NEtFOSA-M_00005	06/10/21	WELLINGTON, Lot dNEtFOSA0616M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00004	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00004	11/22/21	WELLINGTON, Lot d3NMeFOSAA1116			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00004	11/22/21	WELLINGTON, Lot d5NEtFOSAA1116			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00004	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00004	08/22/21	WELLINGTON, Lot M282FTS0816			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00010	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00009	12/07/20	Wellington Laboratories, Lot M2PFTeDA0217			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00009	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00010	11/22/21	Wellington Laboratories, Lot M5PFPeA1116			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00013	12/22/20	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00010	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00003	08/02/21	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00015	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00010	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00016	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00010	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00010	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00014	04/12/22	Wellington Laboratories, Lot MPFOA0417			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00022	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00011	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
..LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCPFCSP_00107	01/12/18	07/12/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00002	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00004	200 uL	N-ethylperfluoro-1-octanesulfonamide	1 ug/mL
					LCN-EtFOSAA_00003	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00003	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00004	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00007	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00007	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00007	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00007	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00006	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00007	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00007	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00007	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00007	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LC4:2FTS_00002	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
..LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSA-M_00004	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
..LCN-EtFOSAA_00003	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSA-M_00003	05/24/21	WELLINGTON, Lot NMeFOSA0516M			(Purchased Reagent)		MeFOSA	50 ug/mL
..LCN-MeFOSAA_00004	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00006	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00006	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFDA_00007	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00007	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00007	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00007	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00006	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxDA_00007	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00003	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00007	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00007	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00007	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00003	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00006	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00007	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00007	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00006	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL5_00002	12/30/17	07/13/17	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00002	500 uL	d-N-EtFOSA-M	2.5 ng/mL
							d-N-MeFOSA-M	2.5 ng/mL
							d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFCIS_00003	100 uL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00107	500 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	2.335 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	2.37 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	2.395 ng/mL
							N-ethylperfluoro-1-octanesulfonamide	2.5 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	2.5 ng/mL
							MeFOSA	2.5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	2.5 ng/mL
							Perfluorobutanoic acid (PFBA)	2.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	2.21 ng/mL
							Perfluorodecanoic acid (PFDA)	2.5 ng/mL
							Perfluorododecanoic acid (PFDoA)	2.5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	2.41 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	2.38 ng/mL
							Perfluorohexanoic acid (PFHxA)	2.5 ng/mL
							Perfluorohexadecanoic acid	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.275 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorooctanoic acid (PFOA)	2.5 ng/mL
							Perfluorooctadecanoic acid	2.5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	2.32 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	2.5 ng/mL
							Perfluoropentanoic acid (PFPeA)	2.5 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	2.5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	2.5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	2.5 ng/mL
.LCMPFC_ALL_SU_00002	01/11/18	07/11/17	Methanol, Lot Baker 141039	5000 uL	LCd-NEtFOSA-M_00005	100 uL	d-N-EtFOSA-M	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCd-NMeFOSA-M_00004	100 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	100 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00004	100 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00004	100 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	100 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00010	100 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00009	100 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00009	100 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00010	100 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00013	100 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00010	100 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00003	100 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00015	100 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00010	100 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00016	100 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00010	100 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00010	100 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00014	100 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00022	100 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00011	100 uL	13C2 PFUnA	1 ug/mL
..LCd-NEtFOSA-M_00005	06/10/21	WELLINGTON, Lot dNEtFOSA0616M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00004	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00004	11/22/21	WELLINGTON, Lot d3NMeFOSAA1116			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00004	11/22/21	WELLINGTON, Lot d5NEtFOSAA1116			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00004	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00004	08/22/21	WELLINGTON, Lot M282FTS0816			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00010	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00009	12/07/20	Wellington Laboratories, Lot M2PFTeDA0217			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00009	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00010	11/22/21	Wellington Laboratories, Lot M5PFPeA1116			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00013	12/22/20	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00010	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00003	08/02/21	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00015	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00010	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00016	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00010	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00010	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00014	04/12/22	Wellington Laboratories, Lot MPFOA0417			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00022	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00011	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
..LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCPFCSP_00107	01/12/18	07/12/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00002	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00004	200 uL	N-ethylperfluoro-1-octanesulfonamide	1 ug/mL
					LCN-EtFOSAA_00003	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00003	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00004	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00007	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00007	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00007	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00007	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00006	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00007	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00007	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00007	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00007	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LC4:2FTS_00002	12/12/21		WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
..LC6:2FTS_00003	06/25/21		WELLINGTON, Lot 62FTS0616		(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSA-M_00004	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
..LCN-EtFOSAA_00003	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSA-M_00003	05/24/21	WELLINGTON, Lot NMeFOSA0516M			(Purchased Reagent)		MeFOSA	50 ug/mL
..LCN-MeFOSAA_00004	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00006	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00006	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00007	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00007	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00007	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00007	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00006	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxDA_00007	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00003	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00007	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00007	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00007	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00003	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00006	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00007	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00007	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00006	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL6_00002	12/30/17	07/13/17	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00002	500 uL	d-N-EtFOSA-M	2.5 ng/mL
							d-N-MeFOSA-M	2.5 ng/mL
							d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCIS_00003	100 uL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00107	1000 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	4.67 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	4.74 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	4.79 ng/mL
							N-ethylperfluoro-1-octanesulfonamide	5 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							MeFOSA	5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							Perfluorobutanoic acid (PFBA)	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid (PFDA)	5 ng/mL
							Perfluorododecanoic acid (PFDoA)	5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	4.82 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	4.76 ng/mL
							Perfluorohexanoic acid (PFHxA)	5 ng/mL
							Perfluorohexadecanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctadecanoic acid	5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	4.64 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	5 ng/mL
							Perfluoropentanoic acid (PFPeA)	5 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	5 ng/mL
.LCMPFC_ALL_SU_00002	01/11/18	07/11/17	Methanol, Lot Baker 141039	5000 uL	LCd-NEtFOSA-M_00005	100 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00004	100 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	100 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00004	100 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00004	100 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	100 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00010	100 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00009	100 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00009	100 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00010	100 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00013	100 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00010	100 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00003	100 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00015	100 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00010	100 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00016	100 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00010	100 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00010	100 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00014	100 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00022	100 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00011	100 uL	13C2 PFUnA	1 ug/mL
..LCd-NEtFOSA-M_00005	06/10/21	WELLINGTON, Lot dNEtFOSA0616M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00004	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00004	11/22/21	WELLINGTON, Lot d3NMeFOSAA1116			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00004	11/22/21	WELLINGTON, Lot d5NEtFOSAA1116			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00004	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00004	08/22/21	WELLINGTON, Lot M282FTS0816			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00010	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00009	12/07/20	Wellington Laboratories, Lot M2PFTeDA0217			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00009	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00010	11/22/21	Wellington Laboratories, Lot M5PFPeA1116			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00013	12/22/20	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00010	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00003	08/02/21	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00015	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00010	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFHxA_00016	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00010	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00010	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00014	04/12/22	Wellington Laboratories, Lot MPFOA0417			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00022	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00011	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
..LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCPFCSP_00107	01/12/18	07/12/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00002	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00004	200 uL	N-ethylperfluoro-1-octanesulfonamide	1 ug/mL
					LCN-EtFOSAA_00003	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00003	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00004	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00007	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00007	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00007	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00007	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00006	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00007	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00007	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFTeDA_00007	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00007	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LC4:2FTS_00002	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
..LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSA-M_00004	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
..LCN-EtFOSAA_00003	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSA-M_00003	05/24/21	WELLINGTON, Lot NMeFOSA0516M			(Purchased Reagent)		MeFOSA	50 ug/mL
..LCN-MeFOSAA_00004	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00006	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00006	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00007	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00007	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00007	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00007	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00006	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxDA_00007	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00003	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00007	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00007	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00007	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00003	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00006	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00007	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFTrDA_00007	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00006	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL7_00002	12/30/17	07/13/17	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00002	500 uL	d-N-EtFOSA-M	2.5 ng/mL
							d-N-MeFOSA-M	2.5 ng/mL
							d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCIS_00003	100 uL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00107	2000 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	9.34 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	9.48 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	9.58 ng/mL
							N-ethylperfluoro-1-octanesulfonamide	10 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							MeFOSA	10 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							Perfluorobutanoic acid (PFBA)	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	8.84 ng/mL
							Perfluorodecanoic acid (PFDA)	10 ng/mL
							Perfluorododecanoic acid (PFDoA)	10 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorodecanesulfonic acid (PFDS)	9.64 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	9.52 ng/mL
							Perfluorohexanoic acid (PFHxA)	10 ng/mL
							Perfluorohexadecanoic acid	10 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	9.1 ng/mL
							Perfluorononanoic acid (PFNA)	10 ng/mL
							Perfluorooctanoic acid (PFOA)	10 ng/mL
							Perfluorooctadecanoic acid	10 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	9.28 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	10 ng/mL
							Perfluoropentanoic acid (PFPeA)	10 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	10 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	10 ng/mL
							Perfluoroundecanoic acid (PFUnA)	10 ng/mL
.LCMPFC_ALL_SU_00002	01/11/18	07/11/17	Methanol, Lot Baker 141039	5000 uL	LCd-NEtFOSA-M_00005	100 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00004	100 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	100 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00004	100 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00004	100 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	100 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00010	100 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00009	100 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00009	100 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00010	100 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00013	100 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00010	100 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00003	100 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00015	100 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00010	100 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00016	100 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00010	100 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00010	100 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00014	100 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00022	100 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00011	100 uL	13C2 PFUnA	1 ug/mL
..LCd-NEtFOSA-M_00005	06/10/21	WELLINGTON, Lot dNEtFOSA0616M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00004	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCd3-NMeFOSAA_00004	11/22/21	WELLINGTON, Lot d3NMeFOSAA1116			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00004	11/22/21	WELLINGTON, Lot d5NEtFOSAA1116			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00004	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00004	08/22/21	WELLINGTON, Lot M282FTS0816			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00010	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00009	12/07/20	Wellington Laboratories, Lot M2PFTeDA0217			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00009	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00010	11/22/21	Wellington Laboratories, Lot M5PFPeA1116			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00013	12/22/20	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00010	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00003	08/02/21	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00015	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00010	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00016	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00010	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00010	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00014	04/12/22	Wellington Laboratories, Lot MPFOA0417			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00022	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00011	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
..LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCPFCSP_00107	01/12/18	07/12/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00002	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00004	200 uL	N-ethylperfluoro-1-octanesulfonamide	1 ug/mL
					LCN-EtFOSAA_00003	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00003	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00004	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00007	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00007	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00007	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00007	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxA_00006	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00007	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00007	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00007	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00007	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LC4:2FTS_00002	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
..LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSA-M_00004	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
..LCN-EtFOSAA_00003	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSA-M_00003	05/24/21	WELLINGTON, Lot NMeFOSA0516M			(Purchased Reagent)		MeFOSA	50 ug/mL
..LCN-MeFOSAA_00004	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00006	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00006	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00007	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00007	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00007	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00007	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00006	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxDA_00007	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHxS-br_00003	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00007	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00007	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00007	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00003	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00006	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00007	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00007	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00006	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL8_00001	12/30/17	07/13/17	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00002	500 uL	d-N-EtFOSA-M	2.5 ng/mL
							d-N-MeFOSA-M	2.5 ng/mL
							d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCIS_00003	100 uL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00107	4000 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	18.68 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	18.96 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	19.16 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							N-ethylperfluoro-1-octanesulfonamide	20 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	20 ng/mL
							MeFOSA	20 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	20 ng/mL
							Perfluorobutanoic acid (PFBA)	20 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	17.68 ng/mL
							Perfluorodecanoic acid (PFDA)	20 ng/mL
							Perfluorododecanoic acid (PFDoA)	20 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	19.28 ng/mL
							Perfluoroheptanoic acid (PFHpA)	20 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	19.04 ng/mL
							Perfluorohexanoic acid (PFHxA)	20 ng/mL
							Perfluorohexadecanoic acid	20 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	18.2 ng/mL
							Perfluorononanoic acid (PFNA)	20 ng/mL
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctadecanoic acid	20 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	18.56 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	20 ng/mL
							Perfluoropentanoic acid (PFPeA)	20 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	20 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	20 ng/mL
							Perfluoroundecanoic acid (PFUnA)	20 ng/mL
.LCMPFC_ALL_SU_00002	01/11/18	07/11/17	Methanol, Lot Baker 141039	5000 uL	LCd-NEtFOSA-M_00005	100 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00004	100 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	100 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00004	100 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00004	100 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	100 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00010	100 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00009	100 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00009	100 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00010	100 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00013	100 uL	13C8 FOSA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFBA_00010	100 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00003	100 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00015	100 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00010	100 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00016	100 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00010	100 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00010	100 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00014	100 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00022	100 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00011	100 uL	13C2 PFUnA	1 ug/mL
..LCd-NEtFOSA-M_00005	06/10/21	WELLINGTON, Lot dNEtFOSA0616M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00004	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00004	11/22/21	WELLINGTON, Lot d3NMeFOSAA1116			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00004	11/22/21	WELLINGTON, Lot d5NEtFOSAA1116			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00004	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00004	08/22/21	WELLINGTON, Lot M282FTS0816			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00010	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00009	12/07/20	Wellington Laboratories, Lot M2PFTeDA0217			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00009	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00010	11/22/21	Wellington Laboratories, Lot M5PFPeA1116			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00013	12/22/20	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00010	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00003	08/02/21	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00015	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00010	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00016	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00010	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00010	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00014	04/12/22	Wellington Laboratories, Lot MPFOA0417			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00022	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00011	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
..LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCPFCSP_00107	01/12/18	07/12/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00002	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00004	200 uL	N-ethylperfluoro-1-octanesulfonamide	1 ug/mL
					LCN-EtFOSAA_00003	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00003	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00004	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00007	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00007	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00007	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00007	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00006	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00007	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00007	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00007	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00007	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LC4:2FTS_00002	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
..LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSA-M_00004	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
..LCN-EtFOSAA_00003	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSA-M_00003	05/24/21	WELLINGTON, Lot NMeFOSA0516M			(Purchased Reagent)		MeFOSA	50 ug/mL
..LCN-MeFOSAA_00004	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00006	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00006	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFDA_00007	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00007	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00007	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00007	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00006	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxDA_00007	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00003	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00007	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00007	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00007	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00003	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00006	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00007	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00007	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00006	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFCIC_FULL_00007	12/30/17	10/20/17	MeOH/H2O, Lot 09285	5000 uL	LCMPFC_ALL_SU_00011	250 uL	d-N-EtFOSA-M	50 ng/mL
							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
							13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5 PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C3-PFBS	46.5 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFACMXB_00010	125 uL	Perfluorobutanesulfonic acid (PFBS)	44.25 ng/mL
							Perfluorobutanoic acid (PFBA)	50 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	48.25 ng/mL
							Perfluorodecanoic acid (PFDA)	50 ng/mL
							Perfluorododecanoic acid (PFDoA)	50 ng/mL
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	47.25 ng/mL
							Perfluorohexanoic acid (PFHxA)	50 ng/mL
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	47.75 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
							Perfluoropentanoic acid (PFPeA)	50 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	50 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	50 ng/mL
							Perfluoroundecanoic acid (PFUnA)	50 ng/mL
					LCPFC3IM_00008	250 uL	Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	50 ng/mL
.LCMPFC_ALL_SU_00011	02/22/18	08/23/17	Methanol, Lot Baker 141039	5 mL	LCd-NEtFOSA-M_00005	100 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00004	100 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	100 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00004	100 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00004	100 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	100 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00011	100 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00010	100 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00010	100 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00011	100 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00014	100 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00011	100 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00004	100 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00016	100 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00011	100 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00017	100 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00011	100 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00011	100 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00015	100 uL	13C4 PFOA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFOS_00023	100 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00012	100 uL	13C2 PFUnA	1 ug/mL
..LCd-NEtFOSA-M_00005	06/10/21	WELLINGTON, Lot dNEtFOSA0616M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00004	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00004	11/22/21	WELLINGTON, Lot d3NMeFOSAA1116			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00004	11/22/21	WELLINGTON, Lot d5NEtFOSAA1116			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00004	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00004	08/22/21	WELLINGTON, Lot M282FTS0816			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00011	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00010	12/07/20	Wellington Laboratories, Lot M2PFTeDA0217			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00010	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00011	11/22/21	Wellington Laboratories, Lot M5PFPeA1116			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00014	04/20/22	Wellington Laboratories, Lot M8FOSA0417I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00011	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00004	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00016	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00011	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00017	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00011	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00011	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00015	04/12/22	Wellington Laboratories, Lot MPFOA0417			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00023	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00012	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFACMXB_00010	06/20/19	Wellington Laboratories, Lot PFACMXB0614			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluorobutanoic acid (PFBA)	2 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	1.93 ug/mL
							Perfluorodecanoic acid (PFDA)	2 ug/mL
							Perfluorododecanoic acid (PFDoA)	2 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.89 ug/mL
							Perfluorohexanoic acid (PFHxA)	2 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.91 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
							Perfluoropentanoic acid (PFPeA)	2 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	2 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	2 ug/mL
							Perfluoroundecanoic acid (PFUnA)	2 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFC3IM_00008	03/06/18	09/06/17	Methanol, Lot 090285	5 mL	LCPFHpSA_00002	0.1 mL	Perfluoroheptanesulfonic Acid (PFHpS)	952 ng/mL
					LCPFOSA_00010	0.1 mL	Perfluorooctane Sulfonamide (FOSA)	1000 ng/mL
..LCPFHpSA_00002	10/18/21	Wellington Laboratories, Lot LPFHpS1016			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFCSP_00120	03/29/18	10/02/17	Methanol, Lot 090285	250 mL	LC4:2FTS_00003	100 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.01868 ug/mL
					LC6:2FTS_00003	100 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.01896 ug/mL
					LC8:2FTS_00003	100 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.01916 ug/mL
					LCN-EtFOSA-M_00005	100 uL	N-ethylperfluoro-1-octanesulfonamide	0.02 ug/mL
					LCN-EtFOSAA_00004	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCN-MeFOSA-M_00004	100 uL	MeFOSA	0.02 ug/mL
					LCN-MeFOSAA_00004	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA_00007	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00008	100 uL	Perfluorobutane Sulfonate	0.01768 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00007	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00007	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDSA_00002	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00008	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00007	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxDA_00008	100 uL	Perfluorohexadecanoic acid	0.02 ug/mL
					LCPFHxS-br_00004	100 uL	Perfluorohexane Sulfonate	0.0182 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00009	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
					LCPFOA_00008	100 uL	Perfluorooctanoic acid (PFOA)	0.02 ug/mL
					LCPFODA_00008	100 uL	Perfluorooctadecanoic acid	0.02 ug/mL
					LCPFOS-br_00004	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00010	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFPeA_00007	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFTeDA_00007	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTrDA_00007	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUdA_00007	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
.LC4:2FTS_00003	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
.LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
.LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
.LCN-EtFOSA-M_00005	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
.LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCN-MeFOSA-M_00004	05/24/21	WELLINGTON, Lot NMeFOSA0516M			(Purchased Reagent)		MeFOSA	50 ug/mL
.LCN-MeFOSAA_00004	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
.LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00007	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
.LCPFDoA_00007	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
.LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
.LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
.LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
.LCPFHxDA_00008	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFOA_00008	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00008	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
.LCPFTeDA_00007	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
.LCPFTrDA_00007	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
.LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL

Reagent

LC4:2FTS_00002

R: SBC 3/31/17

896827
ID: LC4:2FTS_00002
Exp: 12/12/21 Prpd:
4:2FTS

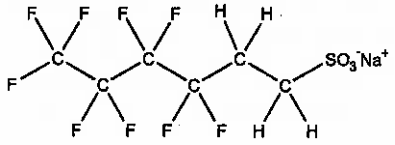
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: 4:2FTS **LOT NUMBER:** 42FTS1216

COMPOUND: Sodium 1H,1H,2H,2H-perfluorohexane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_6H_4F_9SO_3Na$		**MOLECULAR WEIGHT:**	350.13
CONCENTRATION:	50.0 ± 2.5 µg/ml	(Na salt)	**SOLVENT(S):**	Methanol
	46.7 ± 2.3 µg/ml	(4:2FTS anion)		
CHEMICAL PURITY:	>98%			
LAST TESTED: (mm/dd/yyyy)	12/12/2016			
EXPIRY DATE: (mm/dd/yyyy)	12/12/2021			
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:** 12/21/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

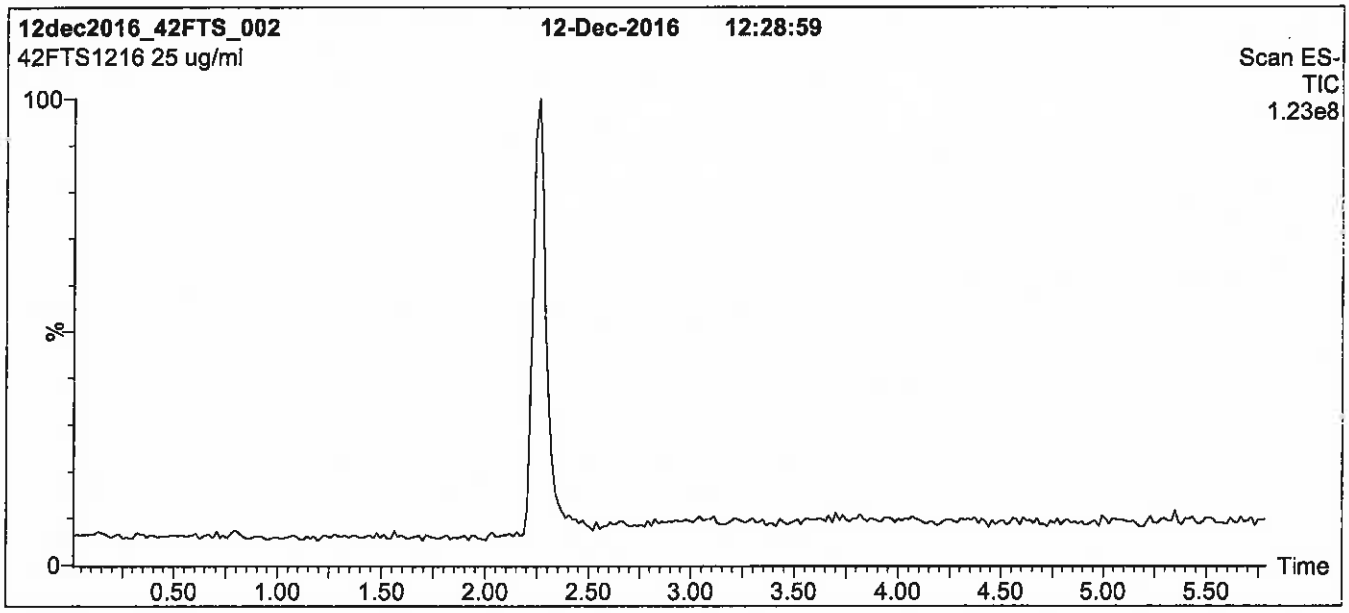
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

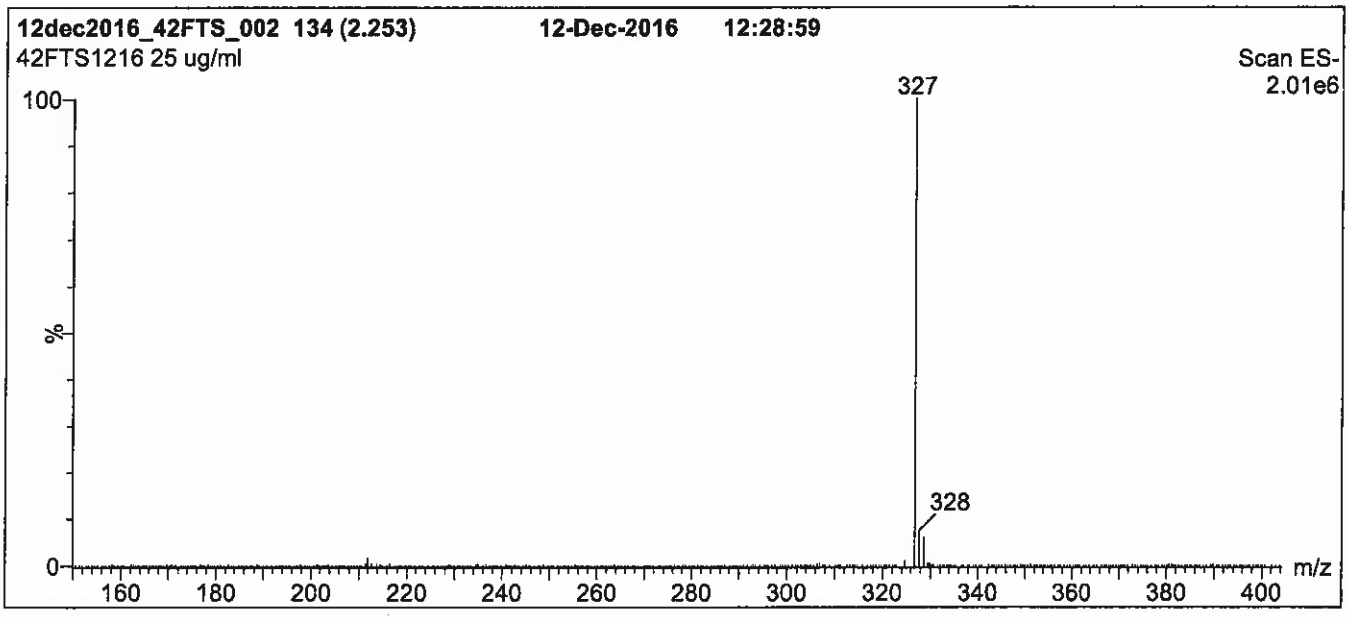
CALA Testing

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

Figure 1: **4:2FTS; 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 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

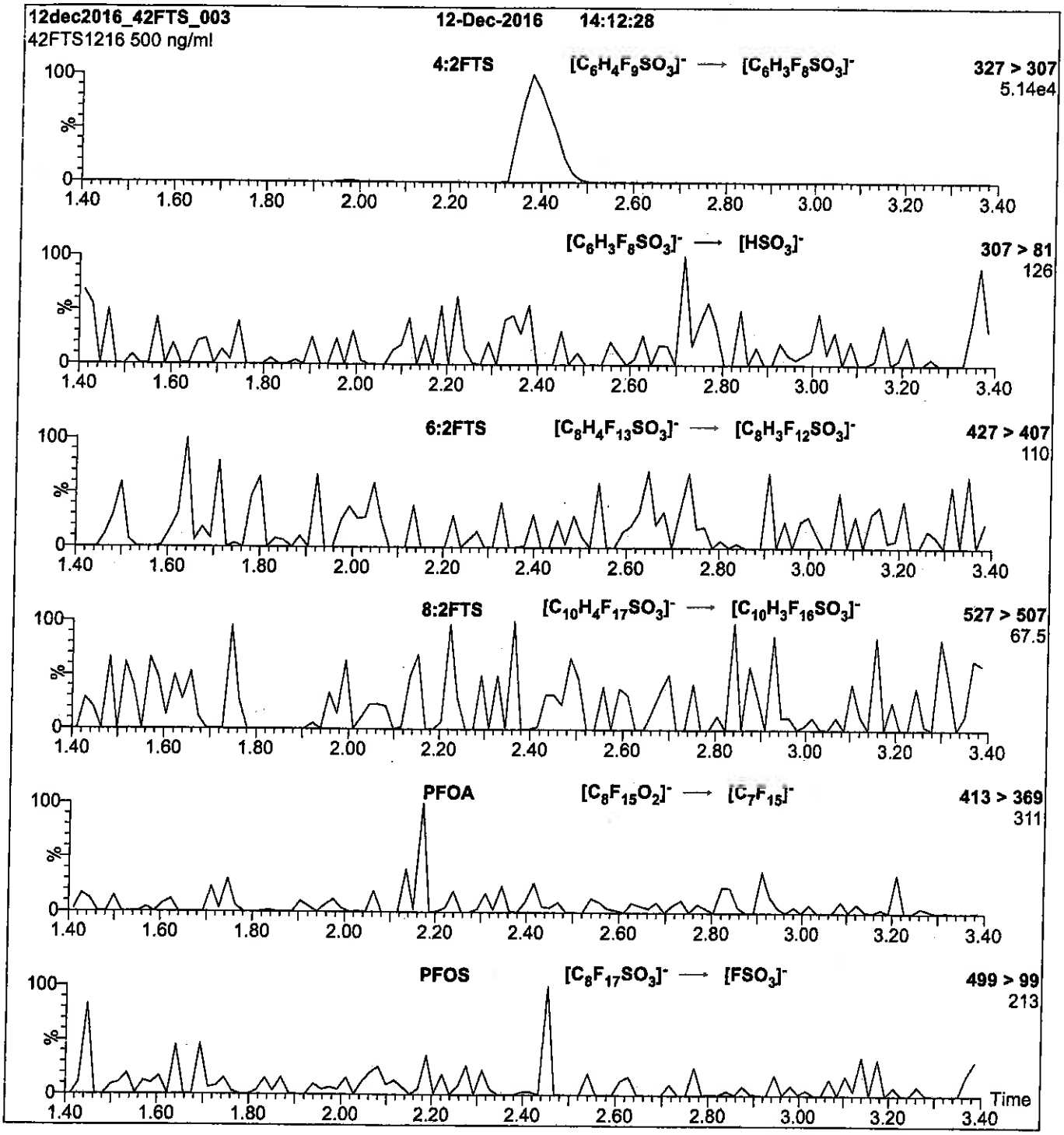
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **4:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 4:2FTS)

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) = 25

Reagent

LC4:2FTS_00003

n: 7/12/17 SK

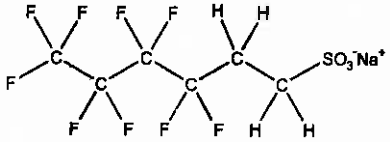
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 4:2FTS **LOT NUMBER:** 42FTS1216

COMPOUND: Sodium 1H,1H,2H,2H-perfluorohexane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_8H_4F_8SO_3Na$	**MOLECULAR WEIGHT:**	350.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	46.7 ± 2.3 µg/ml (4:2FTS anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	12/12/2021		
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:** 12/21/2016 (mm/dd/yyyy)

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

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

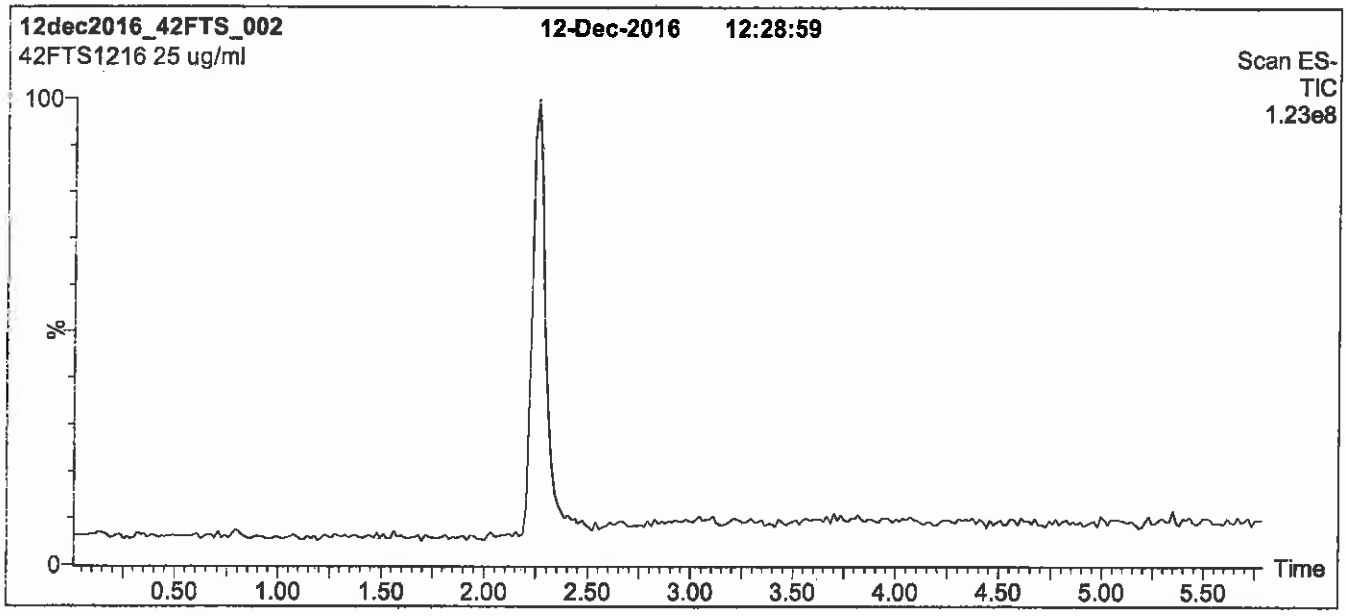
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

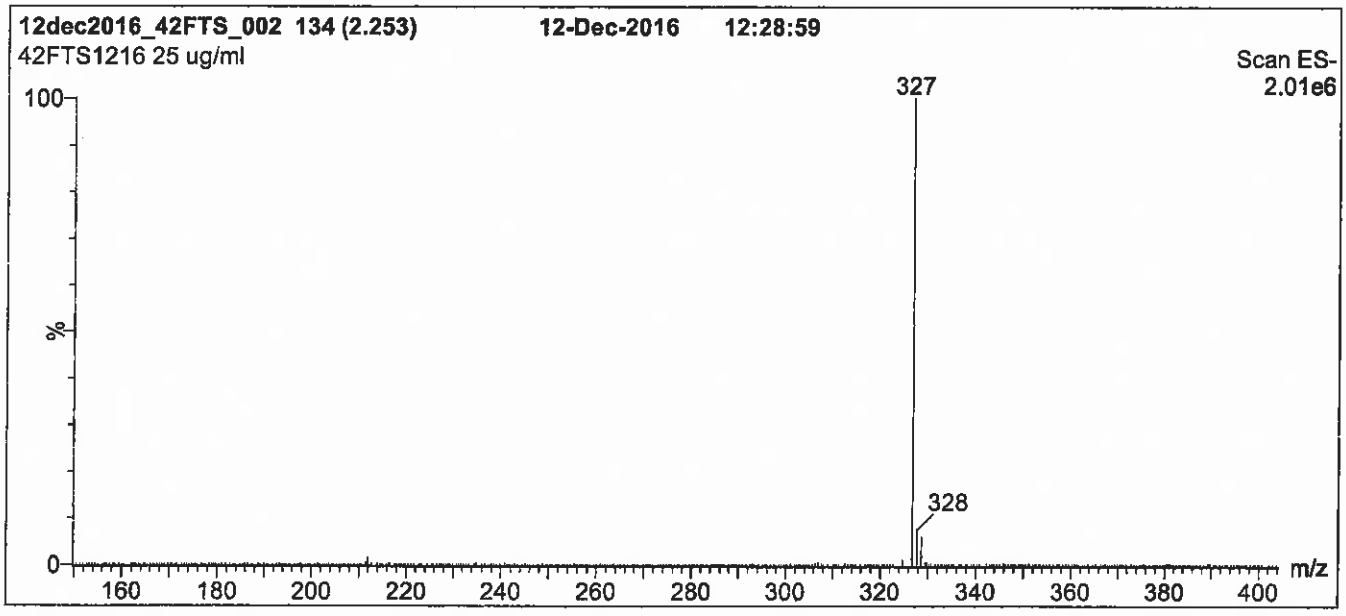
CALA

ANAB ACCREDITED

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: **4:2FTS; 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 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

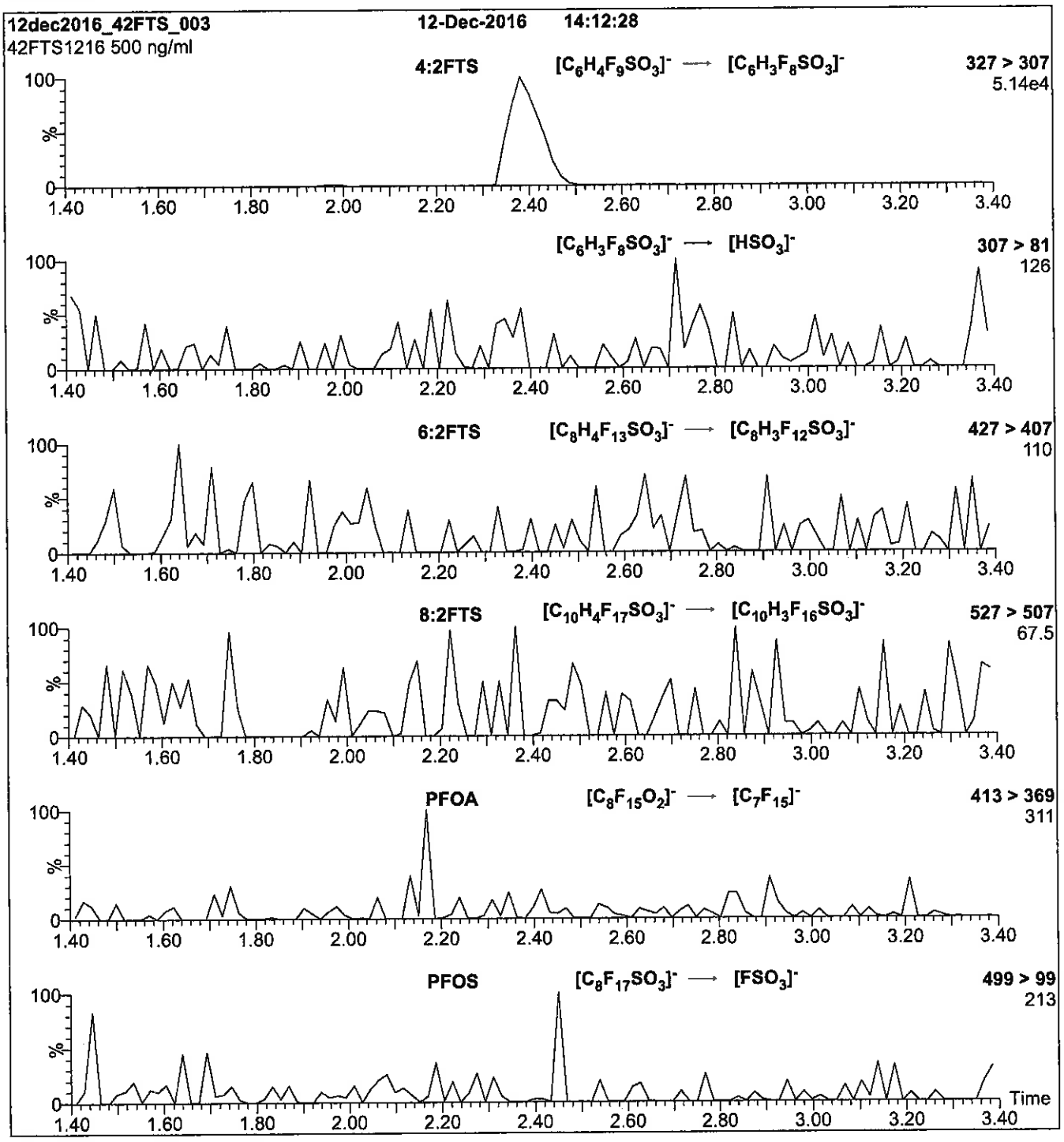
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **4:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml 4:2FTS)
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) = 25

Reagent

LC6:2FTS_00003

P: 12/29/16 SRV

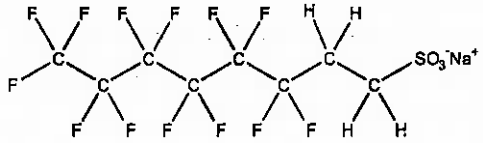
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: 6:2FTS **LOT NUMBER:** 62FTS0616

COMPOUND: Sodium 1H,1H,2H,2H-perfluorooctane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_8H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	450.15
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.4 ± 2.4 µg/ml (6:2FTS anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	06/25/2016		
EXPIRY DATE: (mm/dd/yyyy)	06/25/2021		
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:** 06/29/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

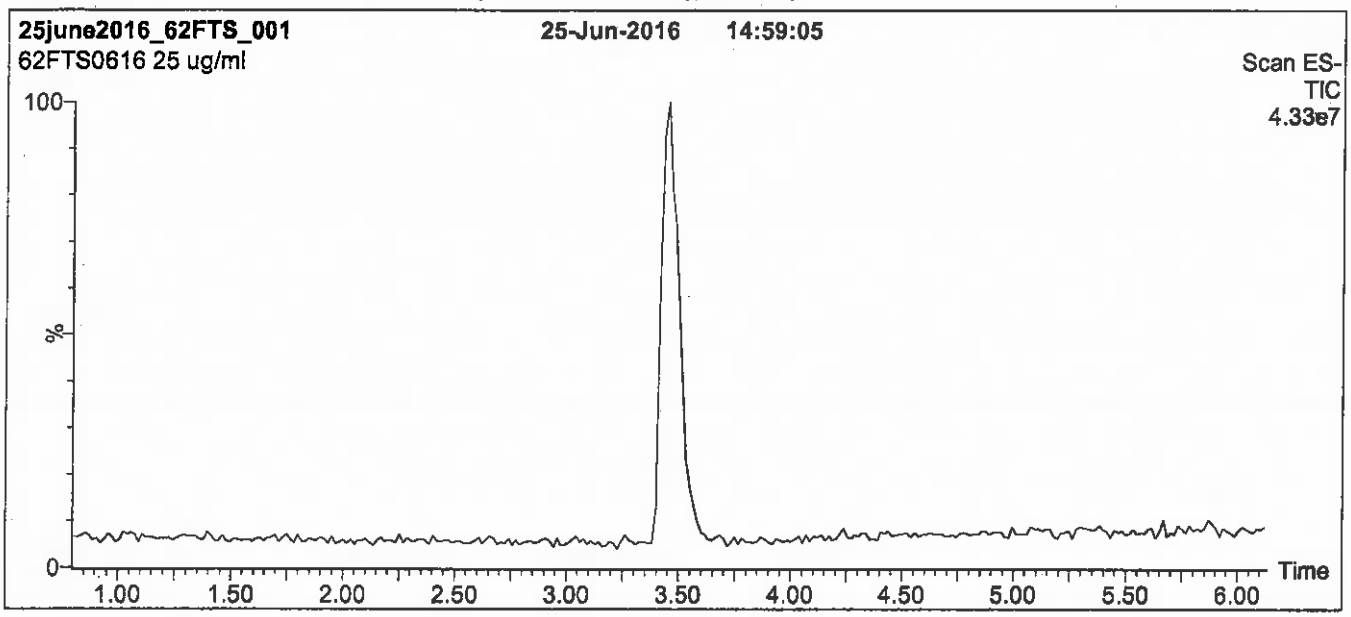
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

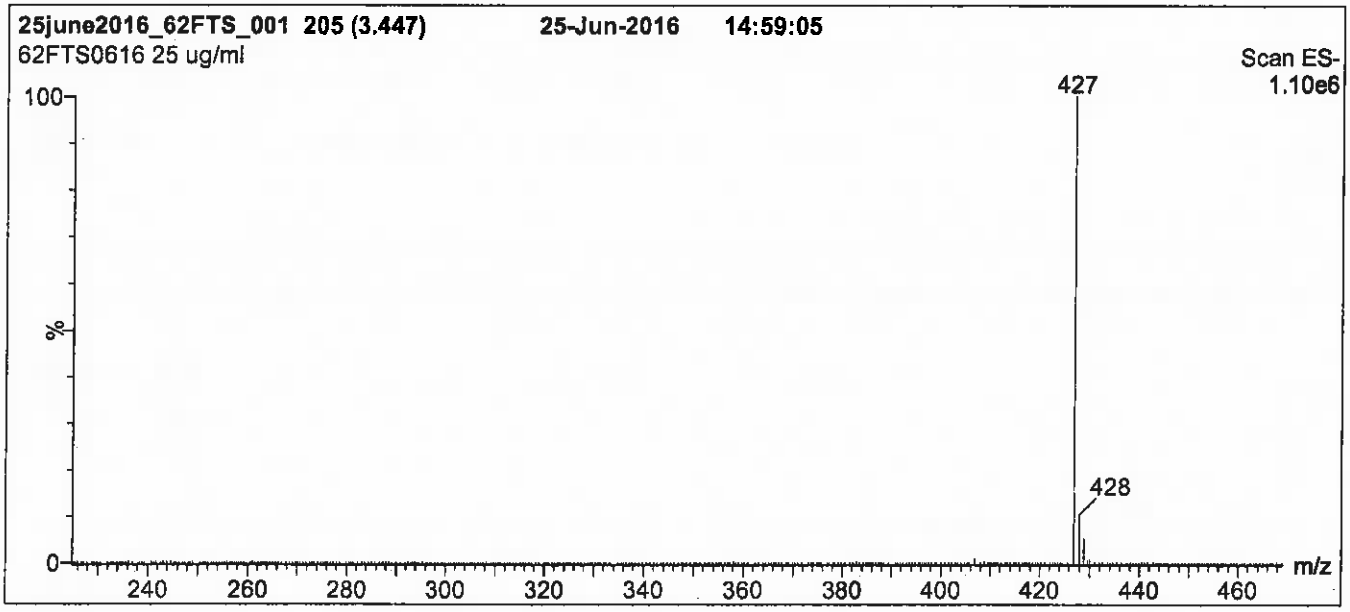
CALA

ANAB ACCREDITED 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: **6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

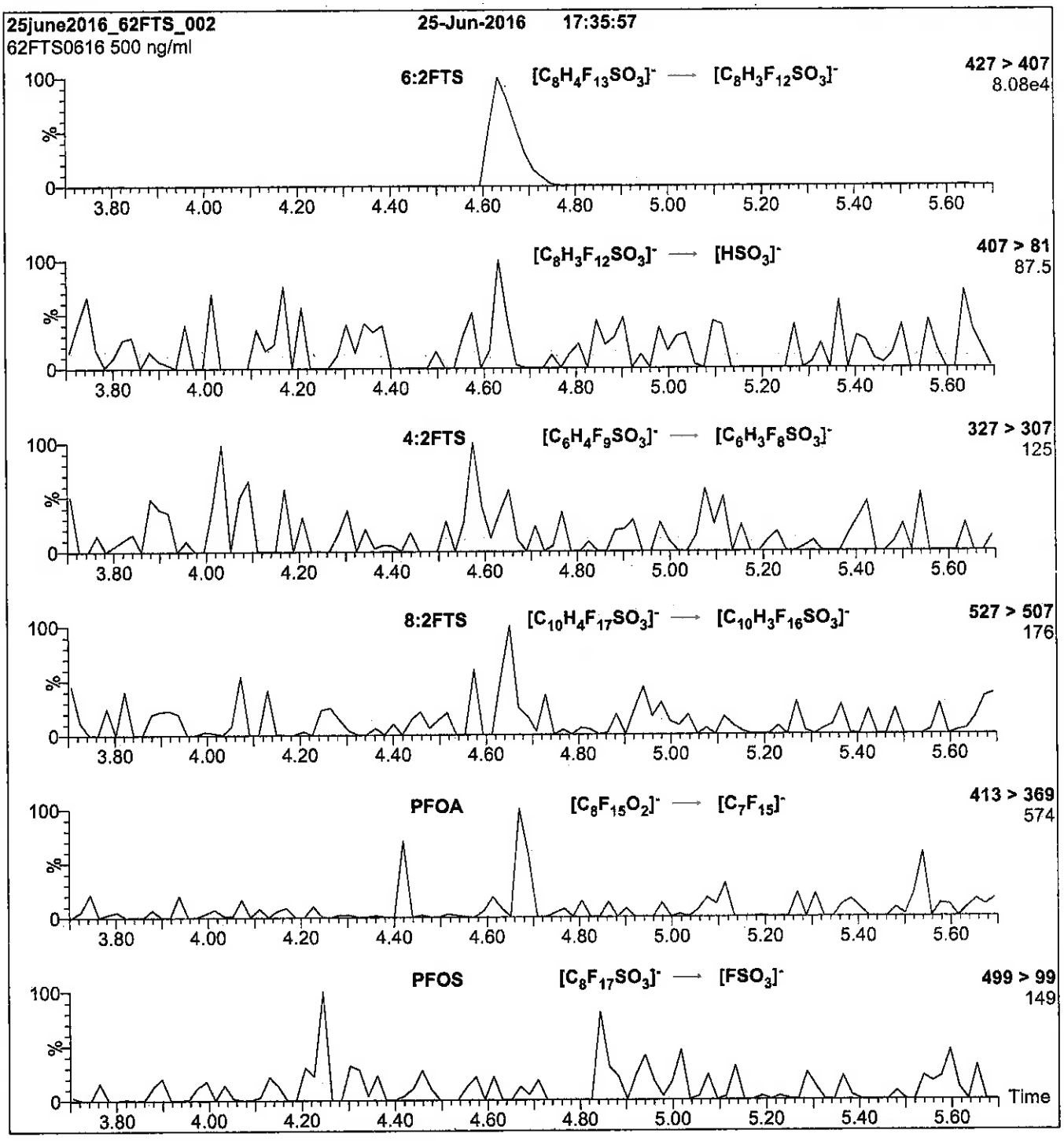
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **6:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 6:2FTS)

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) = 25

Reagent

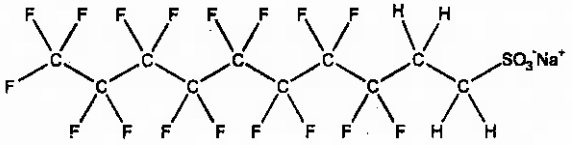
LC8:2FTS_00003

P: 12/29/16

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	8:2FTS	**LOT NUMBER:**	82FTS0816
COMPOUND:	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_{10}H_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	550.16
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/ml (8:2FTS anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	08/22/2016		
EXPIRY DATE: (mm/dd/yyyy)	08/22/2021		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 08/25/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

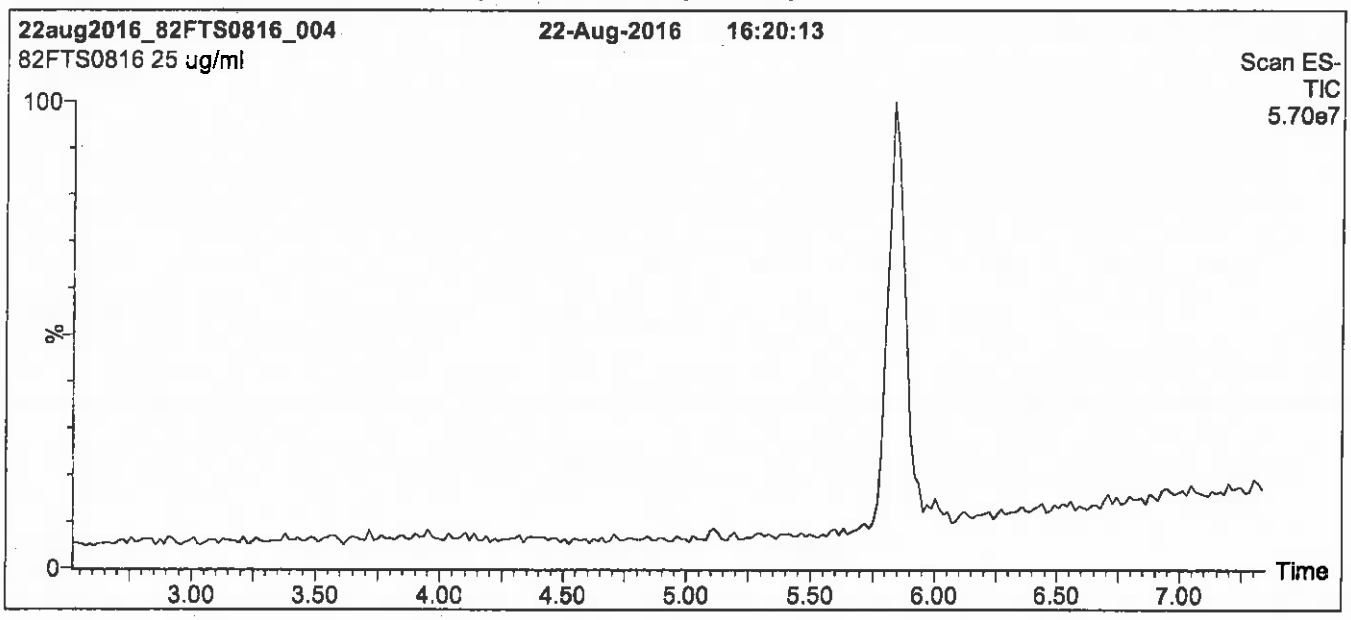
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

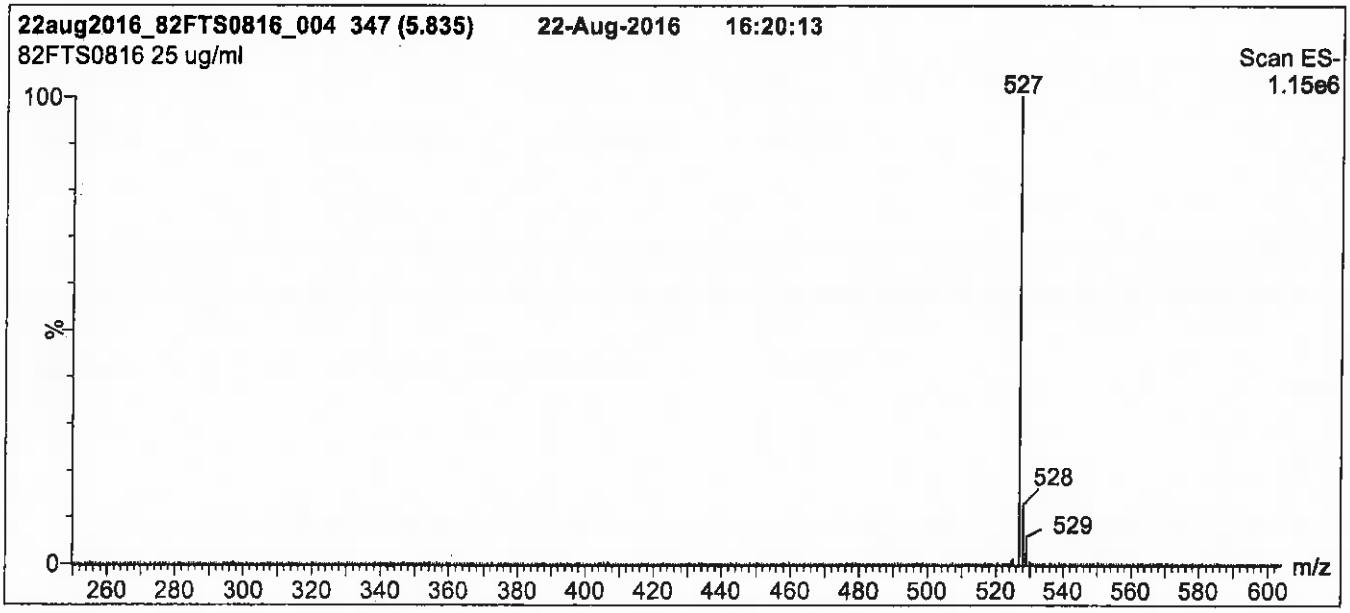
CALA

ANAB ACCREDITED

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: **8:2FTS; 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: Agilent Zorbax Bonus-RP
1.8 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 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

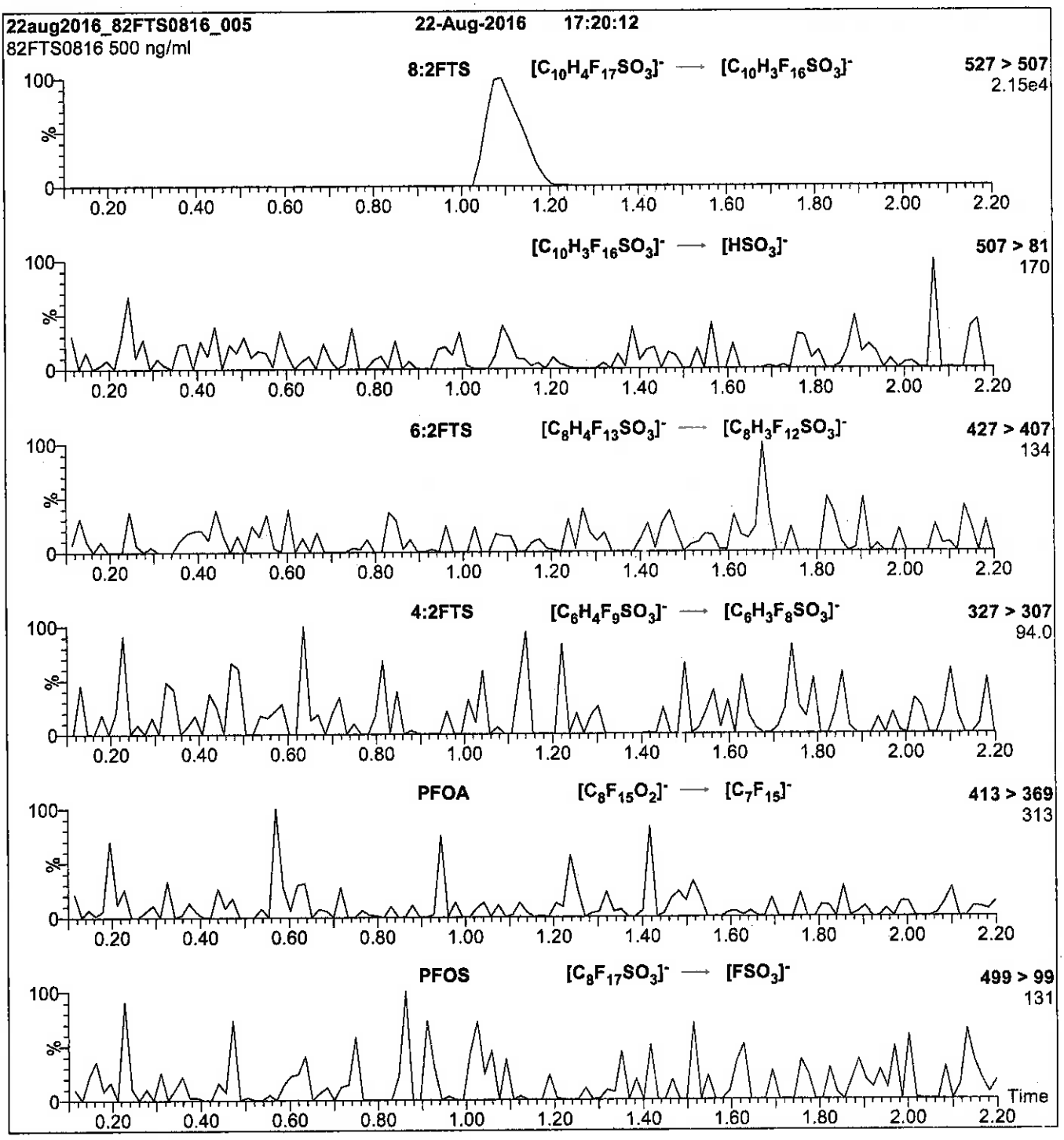
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250- 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 8:2FTS)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 30

Reagent

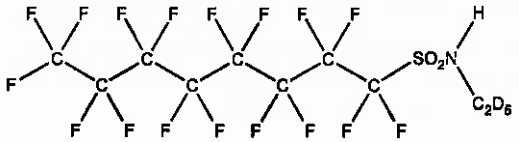
LCd-NEtFOSA-M_00005

D: 3/20/17

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	d-N-EtFOSA-M	**LOT NUMBER:**	dNEtFOSA0616M
COMPOUND:	N-ethyl-d_5-perfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_{10}D_5HF_{17}NO_2S$	**MOLECULAR WEIGHT:**	532.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy)	06/10/2016		
EXPIRY DATE: (mm/dd/yyyy)	06/10/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of N-methyl-d_3-perfluoro-1-octanesulfonamide (d-N-MeFOSA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/14/2016 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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EXPIRY DATE / PERIOD OF VALIDITY:

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QUALITY MANAGEMENT:

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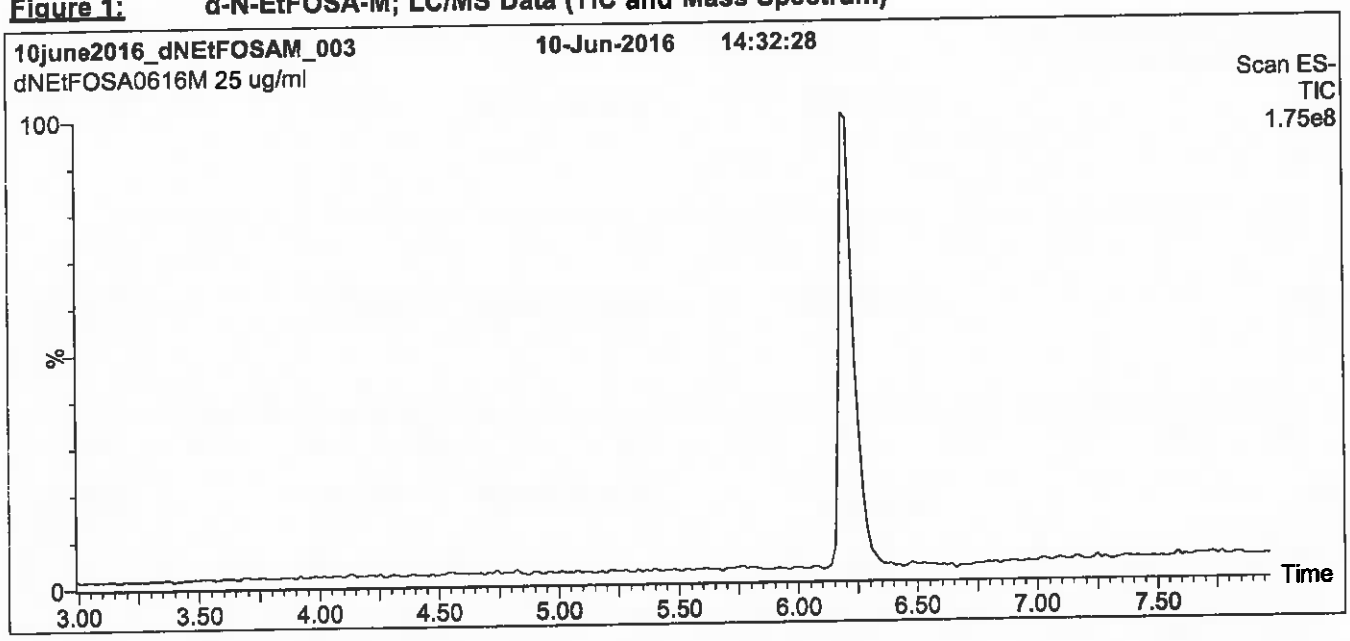
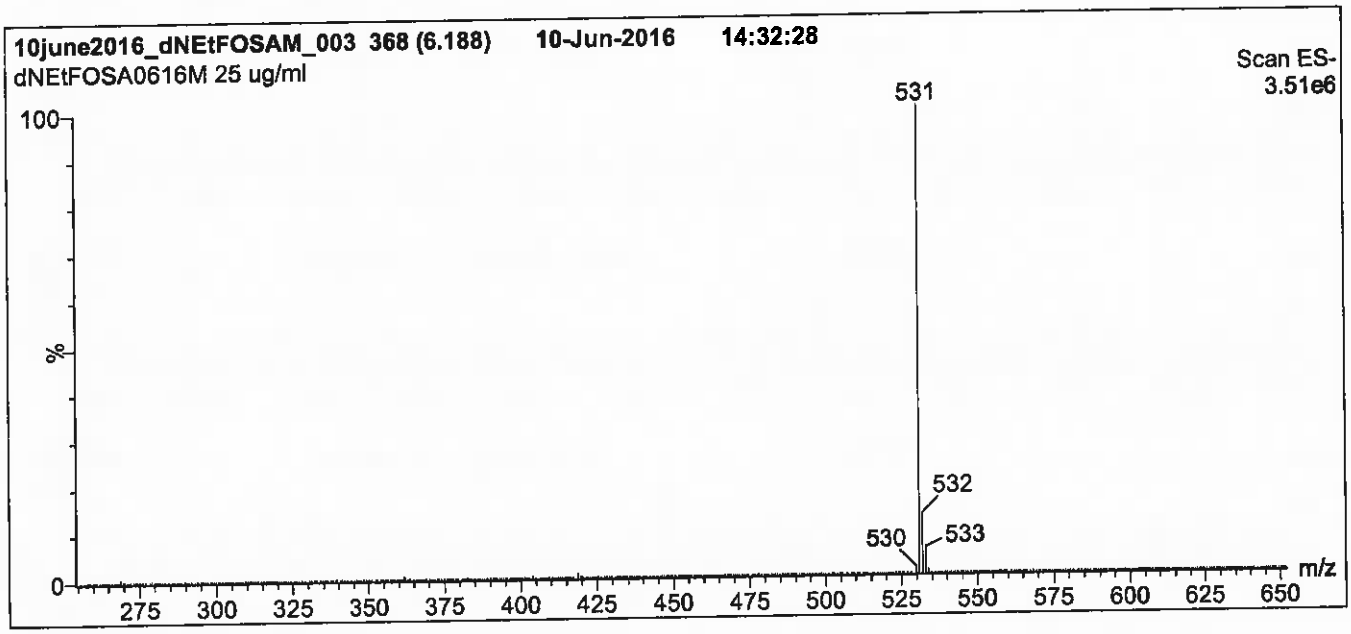
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

Figure 1: **d-N-EtFOSA-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: 40% H_2O / 60% (80:20 MeOH:ACN)
(both with 10mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

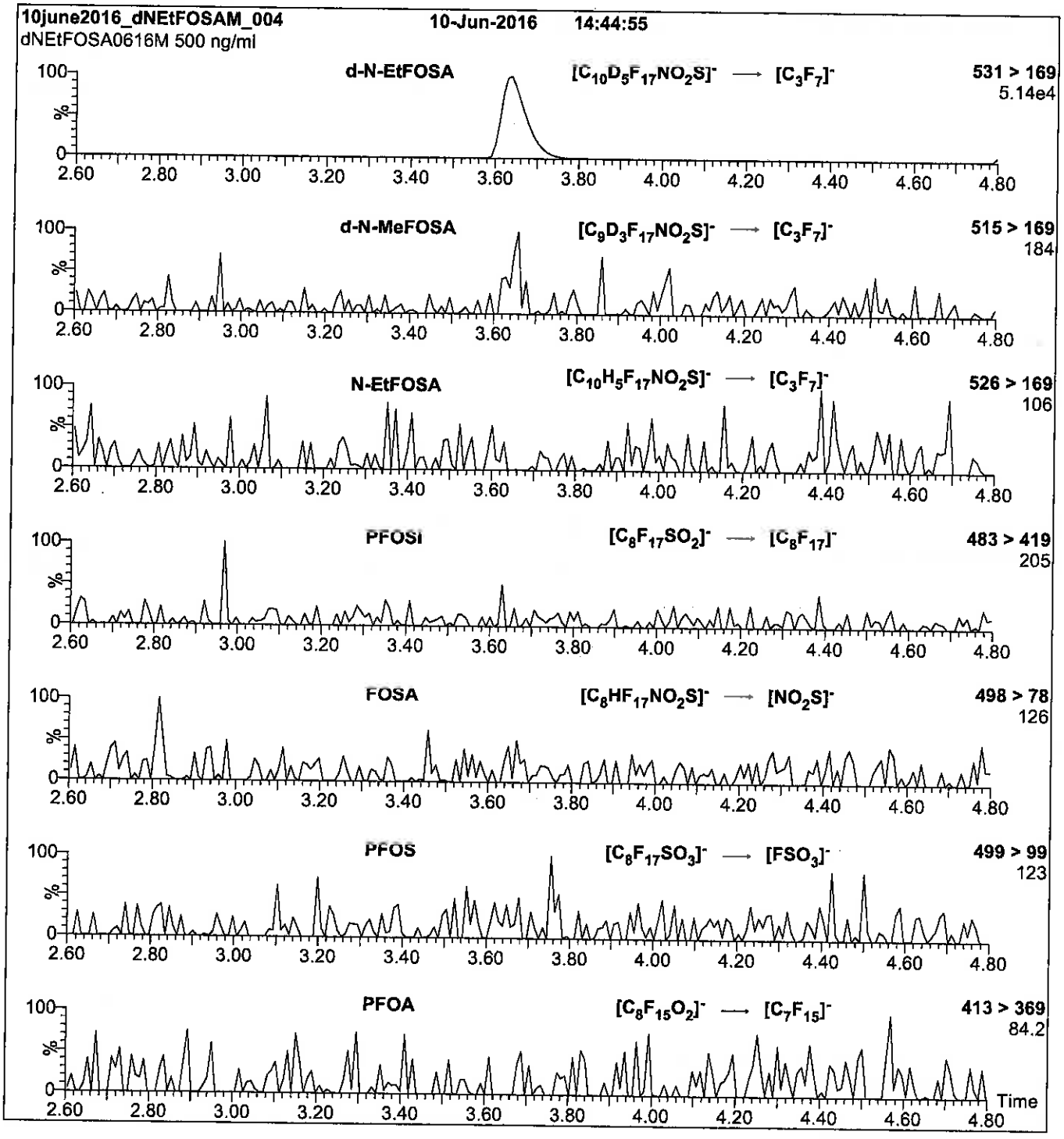
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml d-N-EtFOSA-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) = 3.39e-3
Collision Energy (eV) = 25

Reagent

LCd-NEtFOSA-M_00006

Ps 8/30/17 SW

WELLINGTON LABORATORIES

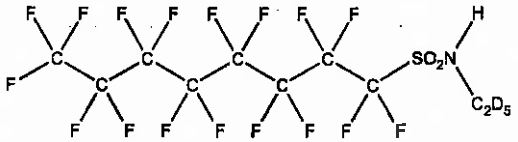
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d-N-EtFOSA-M
COMPOUND: N-ethyl-d_5-perfluoro-1-octanesulfonamide

LOT NUMBER: dNEtFOSA0417M

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$C_{10}D_5HF_{17}NO_2S$	**MOLECULAR WEIGHT:**	532.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy)	04/20/2017		
EXPIRY DATE: (mm/dd/yyyy)	04/20/2022		
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% of N-methyl-d_3-perfluoro-1-octanesulfonamide (d-N-MeFOSA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/24/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

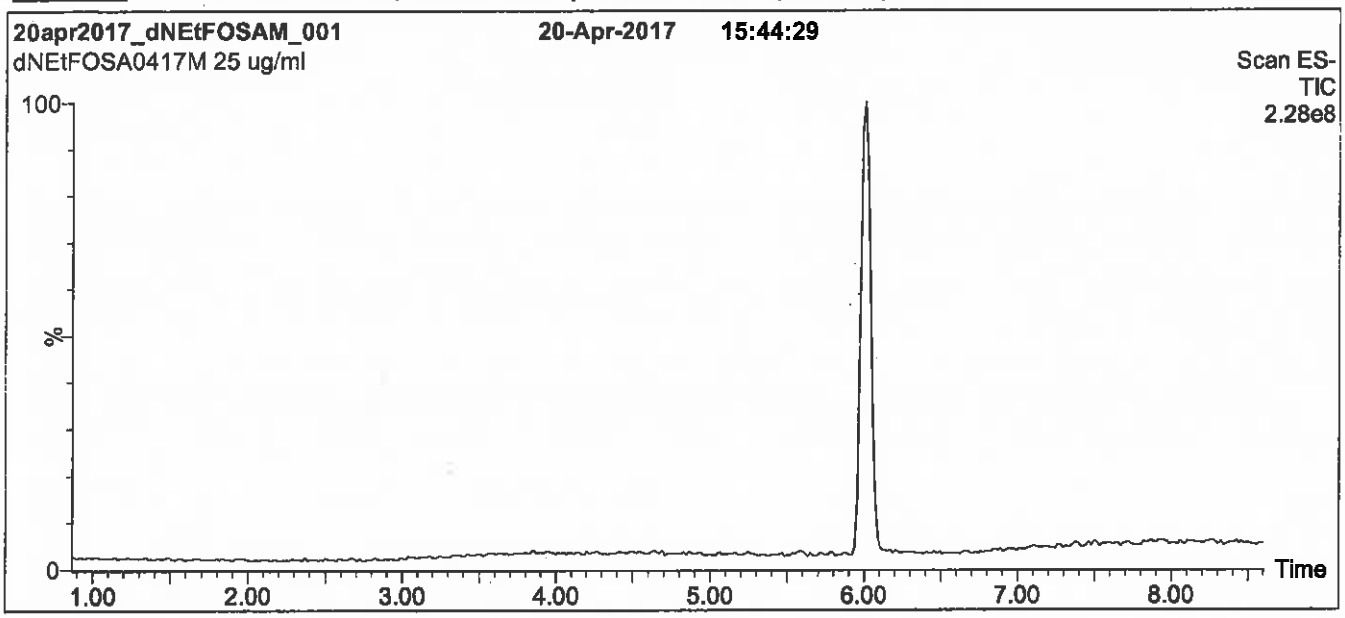
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

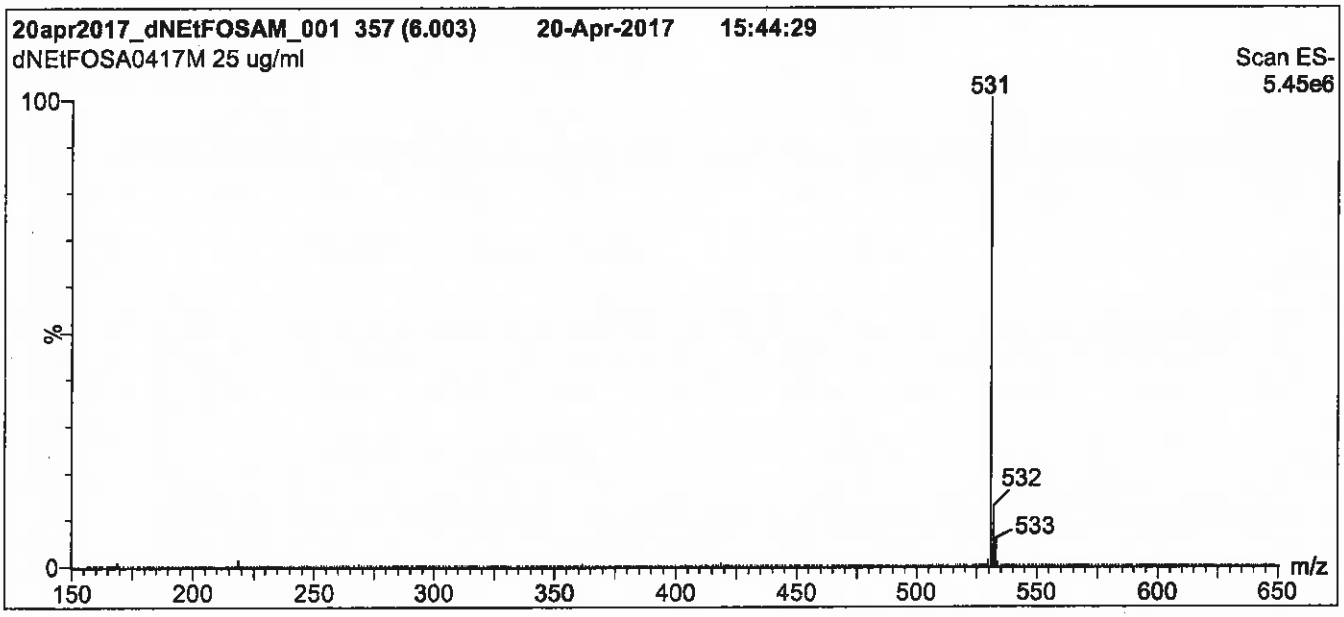
CALA

ANAB ACCREDITED

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: **d-N-EtFOSA-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: 40% H_2O / 60% (80:20 MeOH:ACN)
(both with 10mM 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

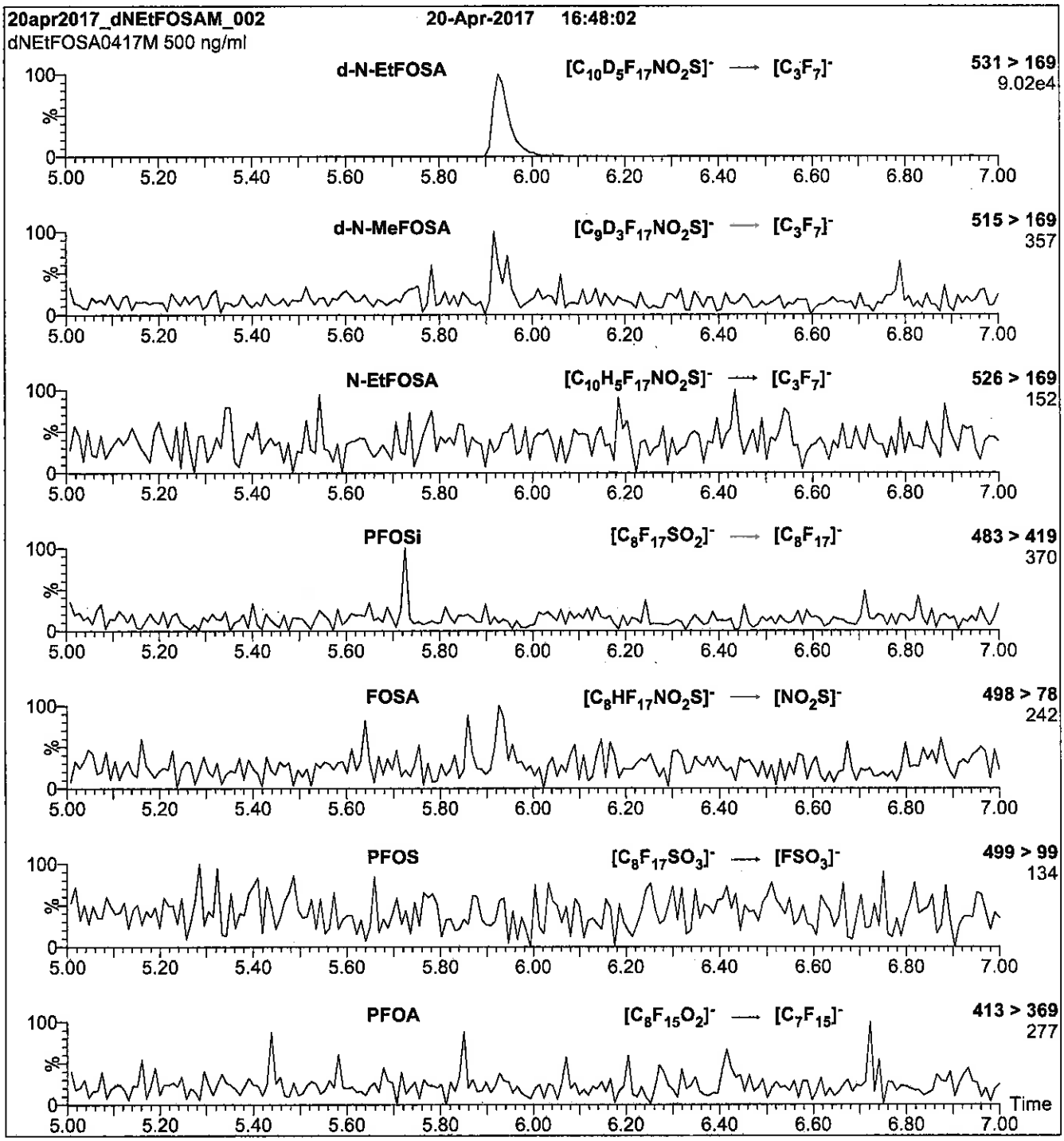
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d-N-EtFOSA-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) = 25

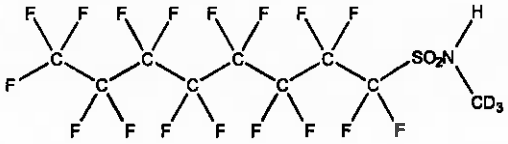
Reagent

LCd-NMeFOSA-M_00004

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	d-N-MeFOSA-M	**LOT NUMBER:**	dNMeFOSA0616M
COMPOUND:	N-methyl-d_3-perfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_8D_3HF_{17}NO_2S$	**MOLECULAR WEIGHT:**	516.19
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	06/10/2016		
EXPIRY DATE: (mm/dd/yyyy)	06/10/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 06/16/2016 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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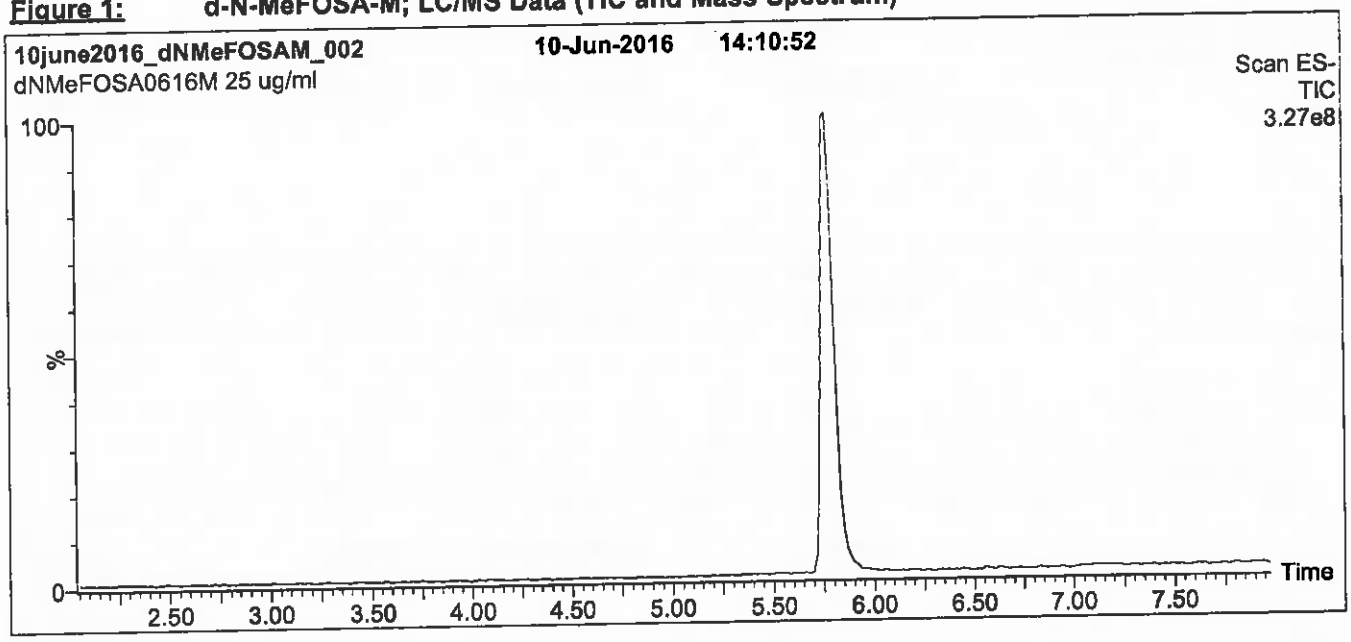
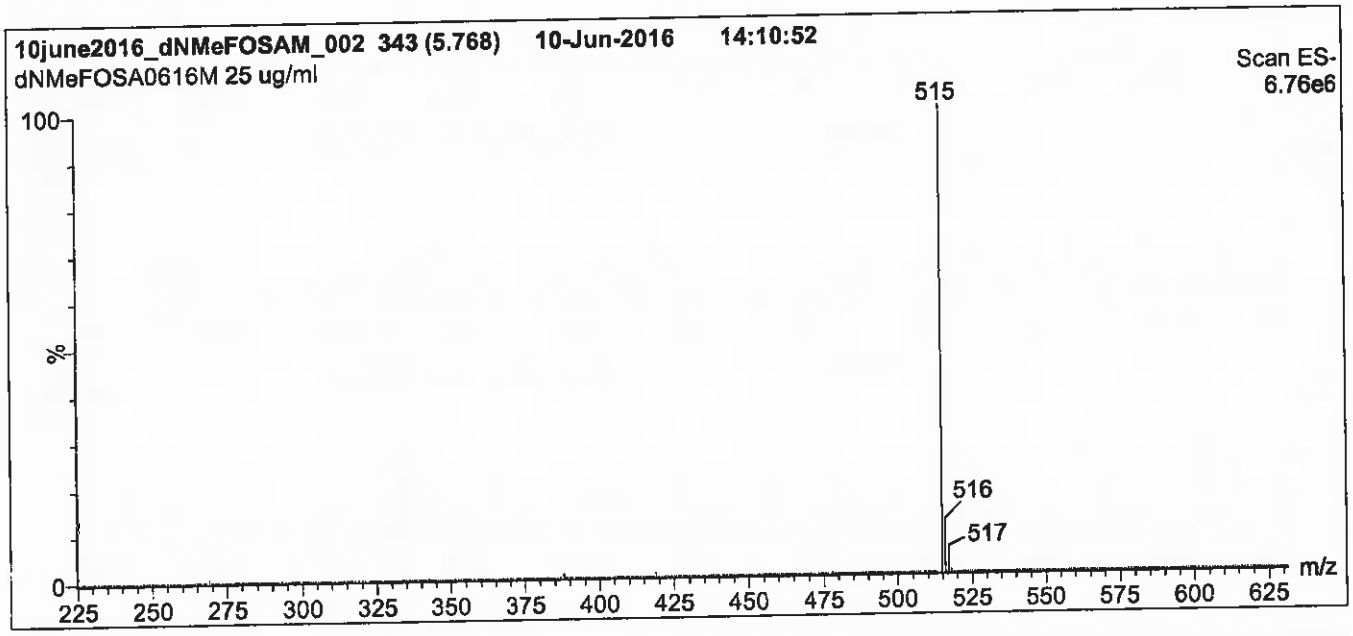
Figure 1: **d-N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





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

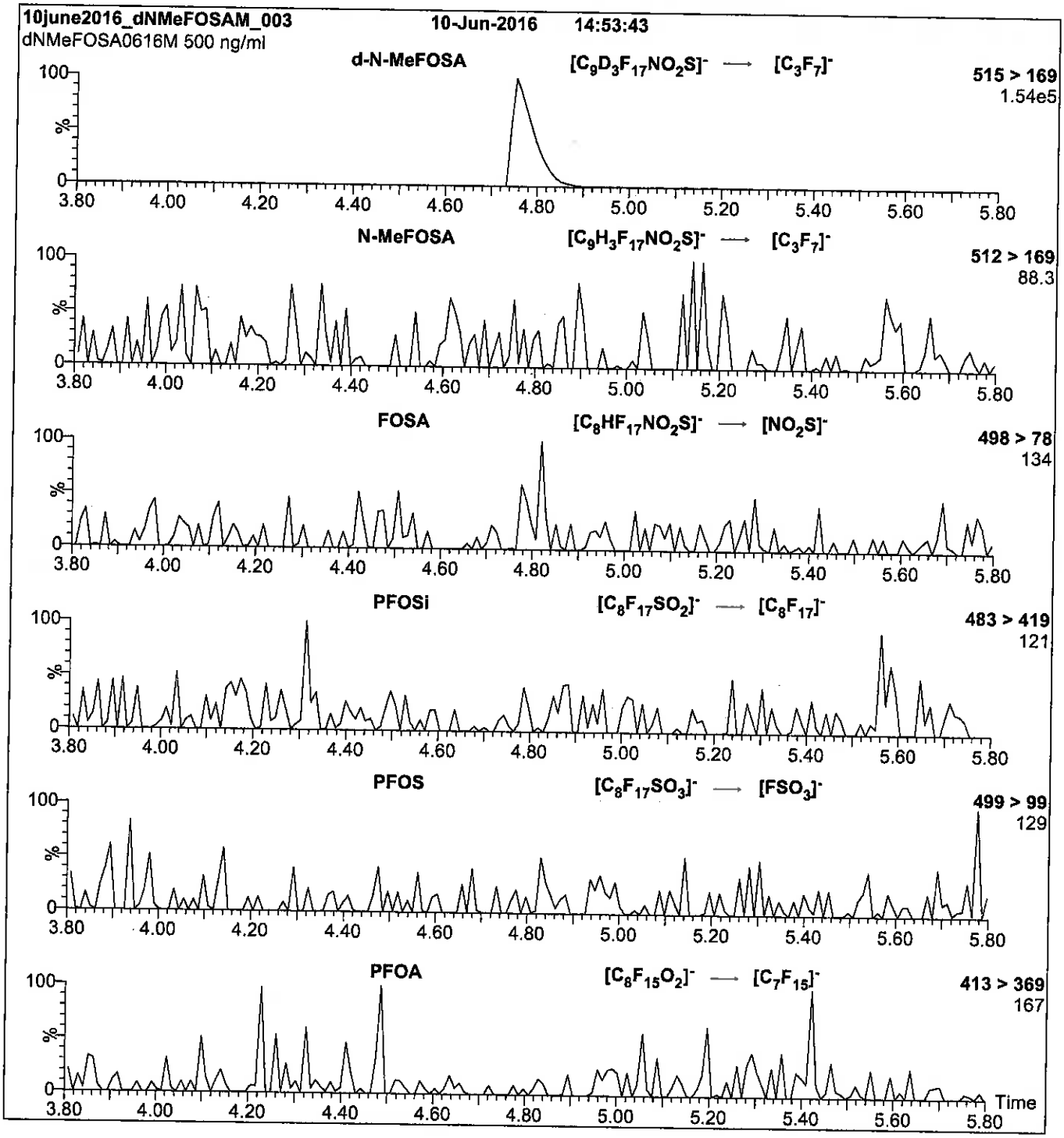
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml d-N-MeFOSA-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) = 3.39e-3
Collision Energy (eV) = 25

Reagent

LCd-NMeFOSA-M_00005

r: 8/31/17 SV

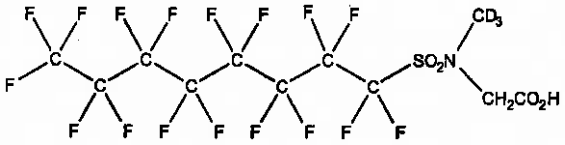
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA0517

COMPOUND: N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{11}D_3H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	574.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	05/19/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/19/2022		
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.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/31/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

INTENDED USE:

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HAZARDS:

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HOMOGENEITY:

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UNCERTAINTY:

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

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CALA

ANAB ACCREDITED

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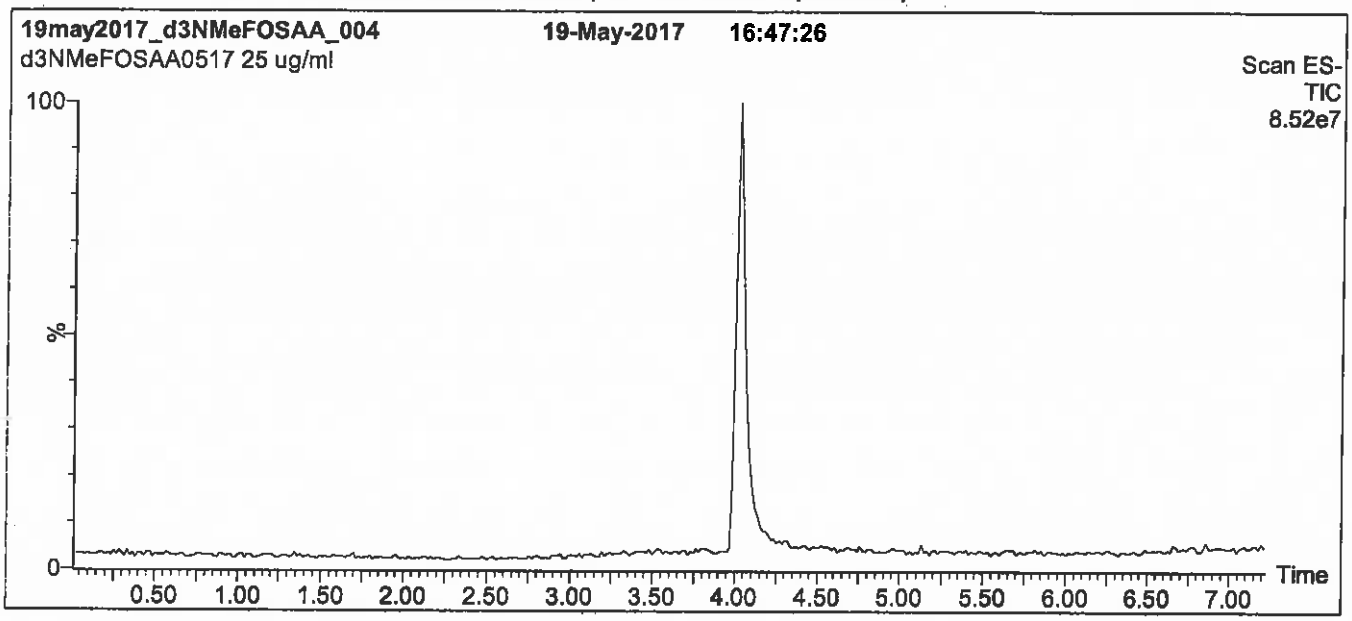
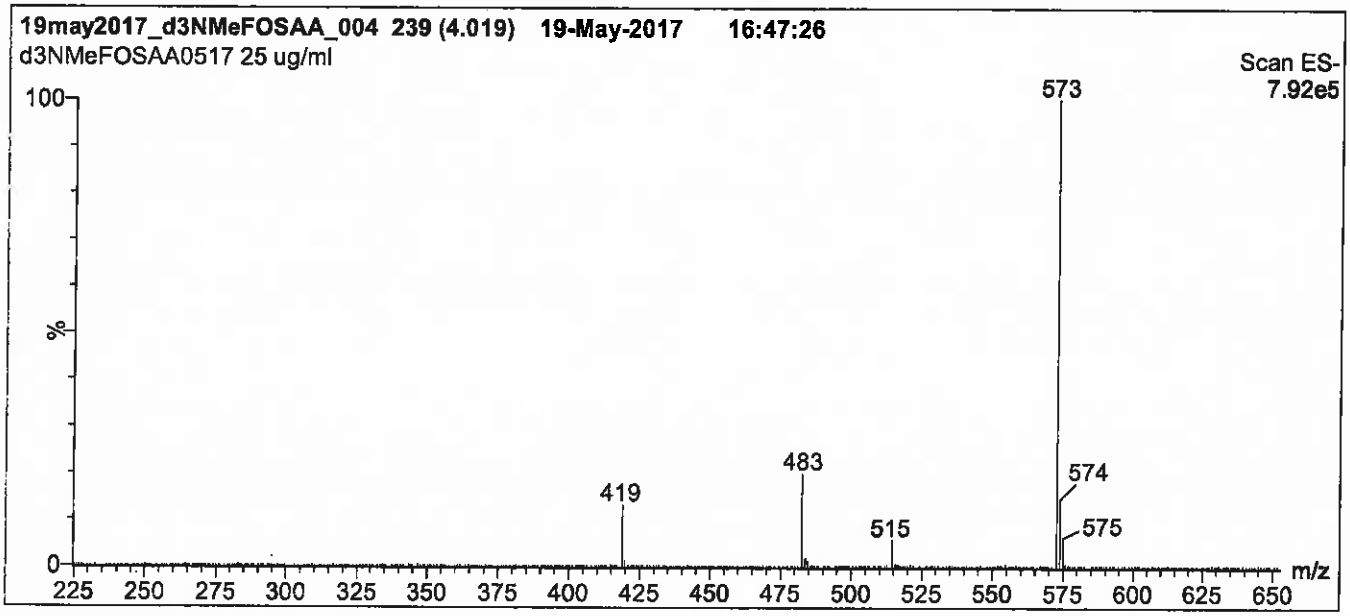
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

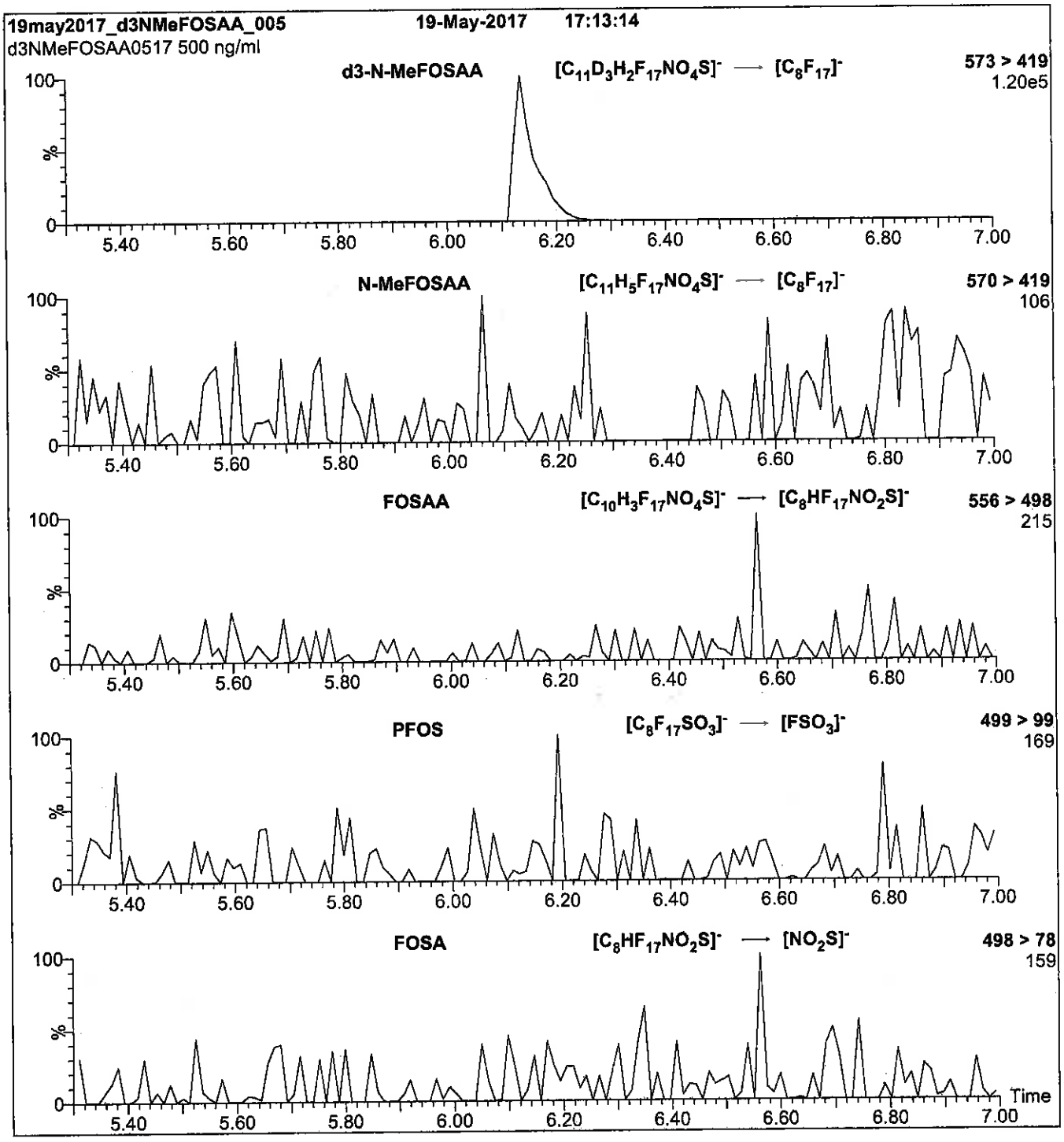
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **d3-N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml d3-N-MeFOSAA)
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) = 20

Reagent

LCd3-NMeFOSAA_00004

S: 3/20/17 SRV

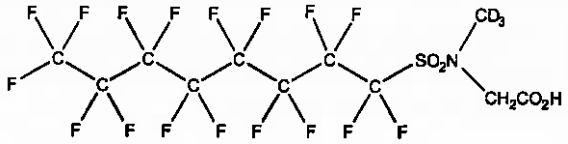
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA1116

COMPOUND: N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_{11}D_3H_3F_{17}NO_4S$ **MOLECULAR WEIGHT:** 574.23

CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol, Water (<1%)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% $^2H_3$

LAST TESTED: (mm/dd/yyyy) 11/22/2016

EXPIRY DATE: (mm/dd/yyyy) 11/22/2021

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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Certified By: B.G. Chittim **Date:** 12/07/2016 (mm/dd/yyyy)

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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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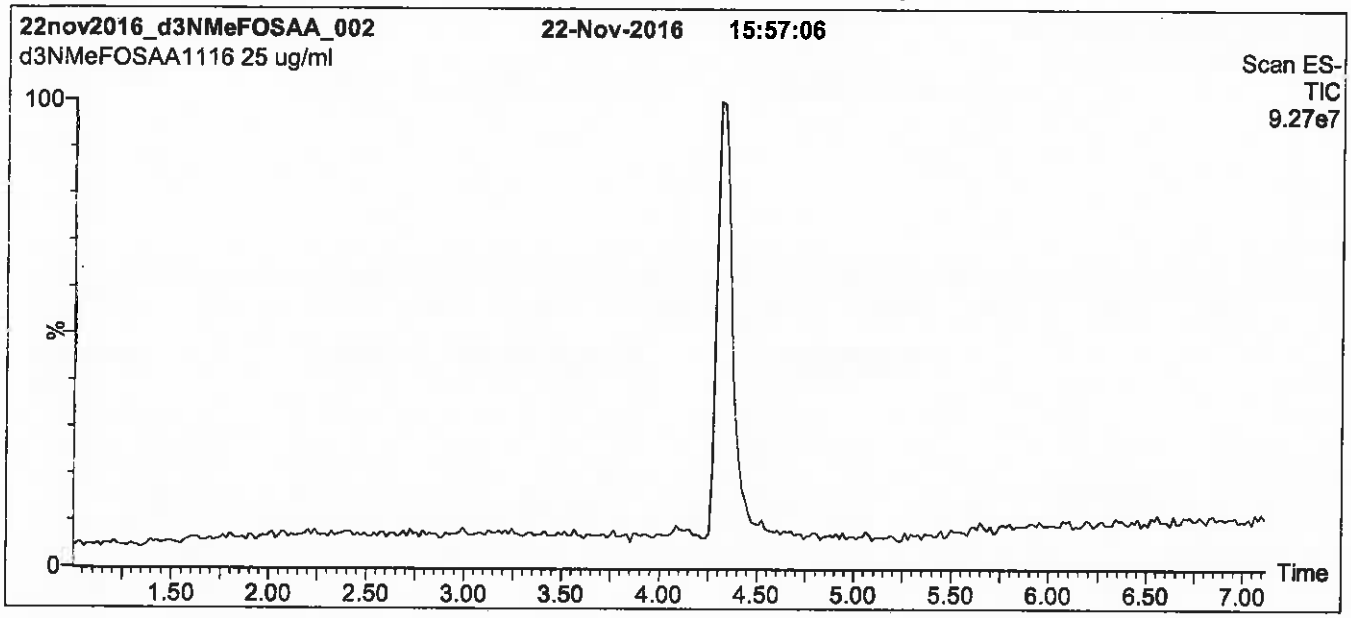
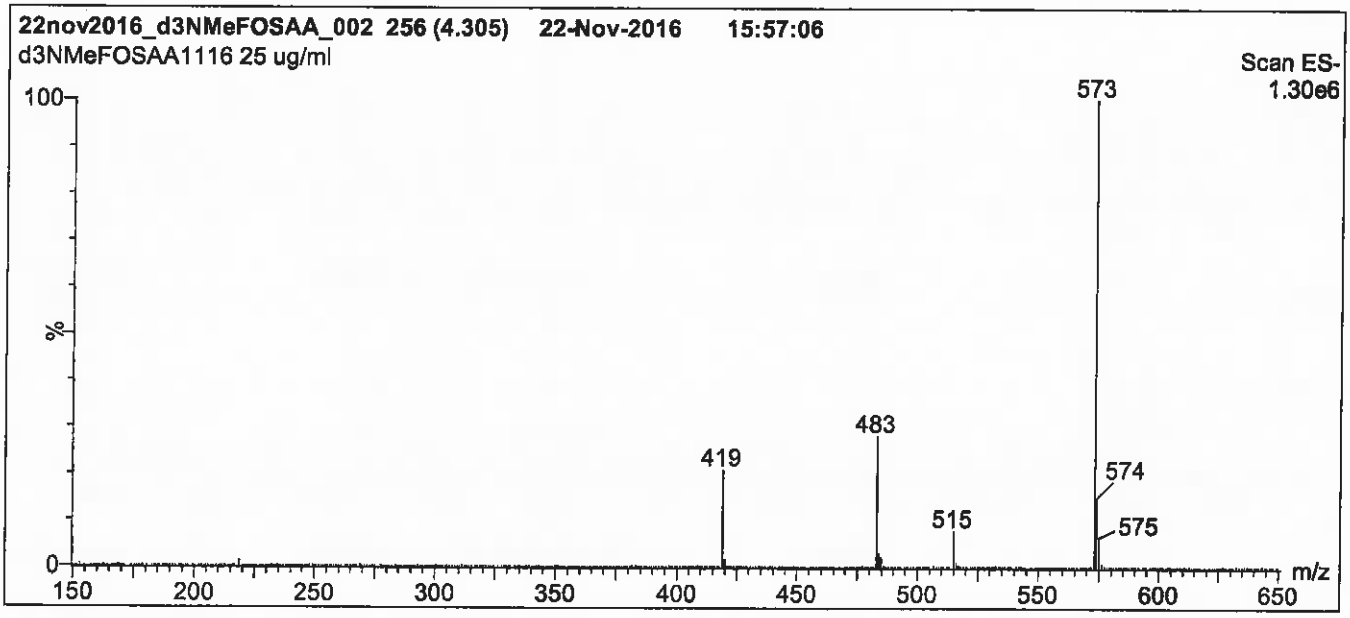
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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

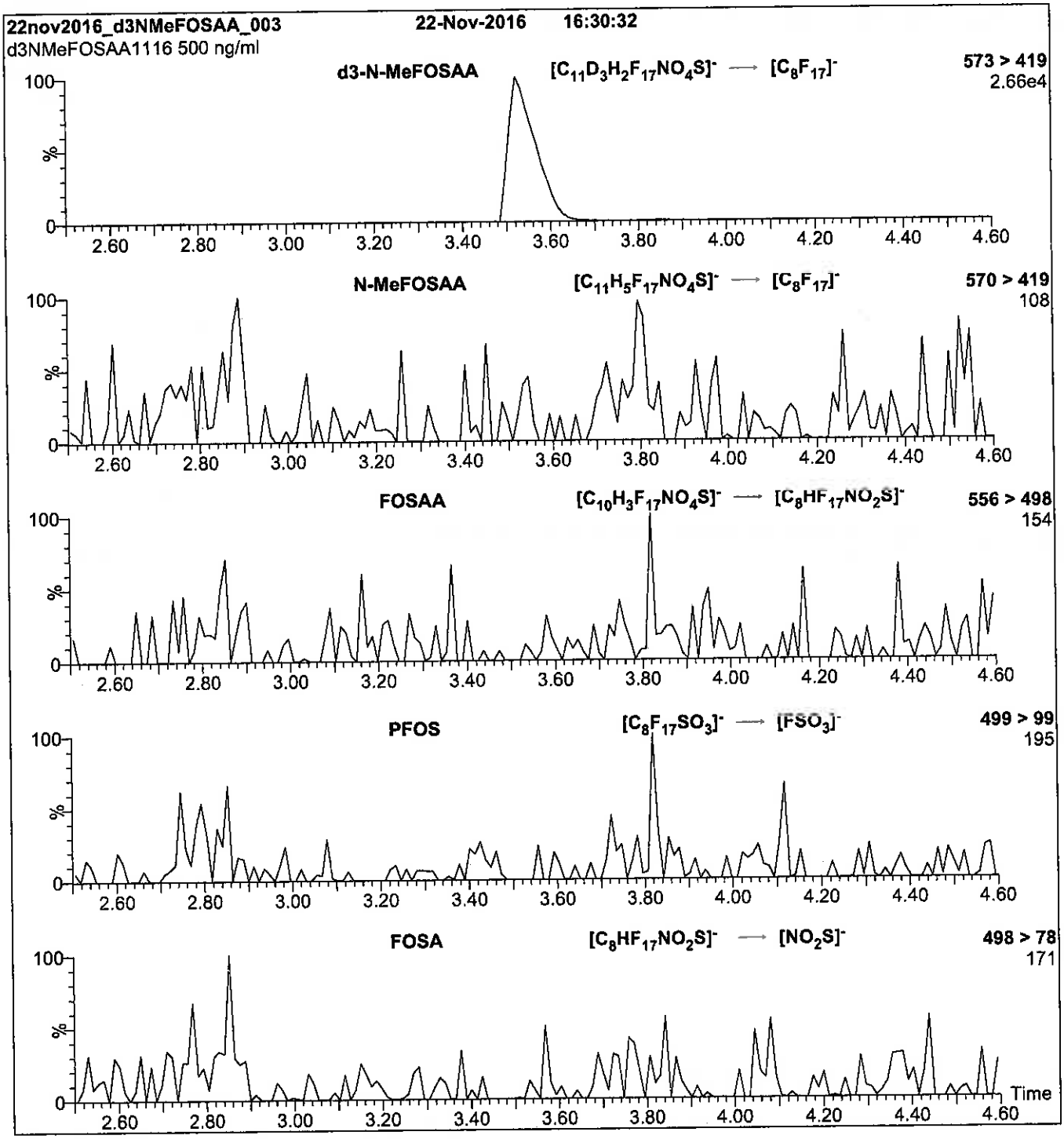
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **d3-N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d3-N-MeFOSAA)

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) = 20

Reagent

LCd3-NMeFOSAA_00005

r: 8/31/17 SV

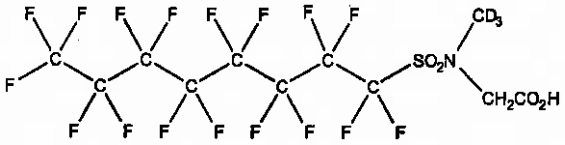
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA0517

COMPOUND: N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{11}D_3H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	574.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	05/19/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/19/2022		
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.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/31/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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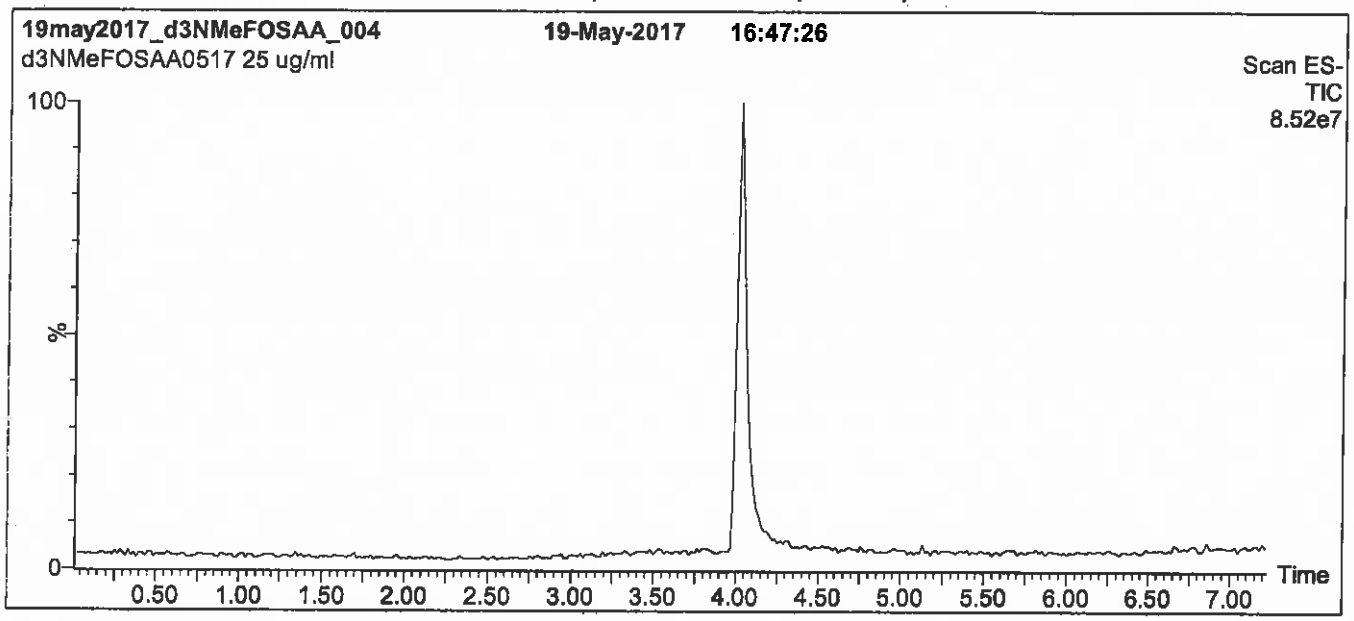

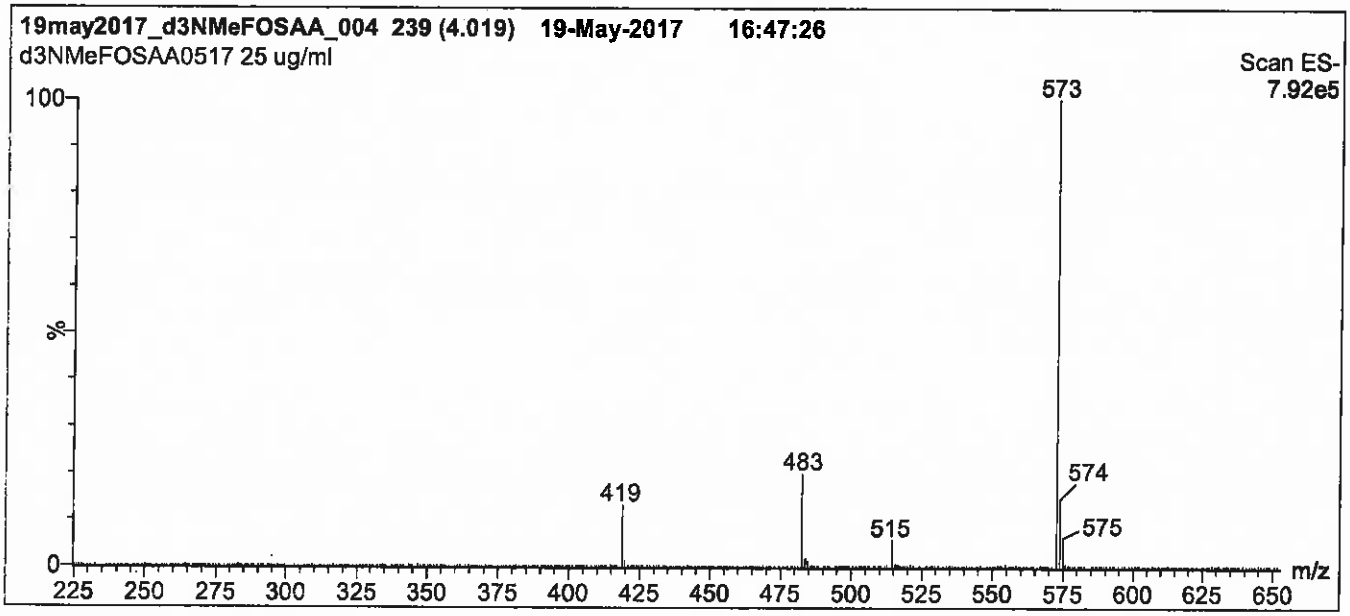

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Chromatographic Conditions

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

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

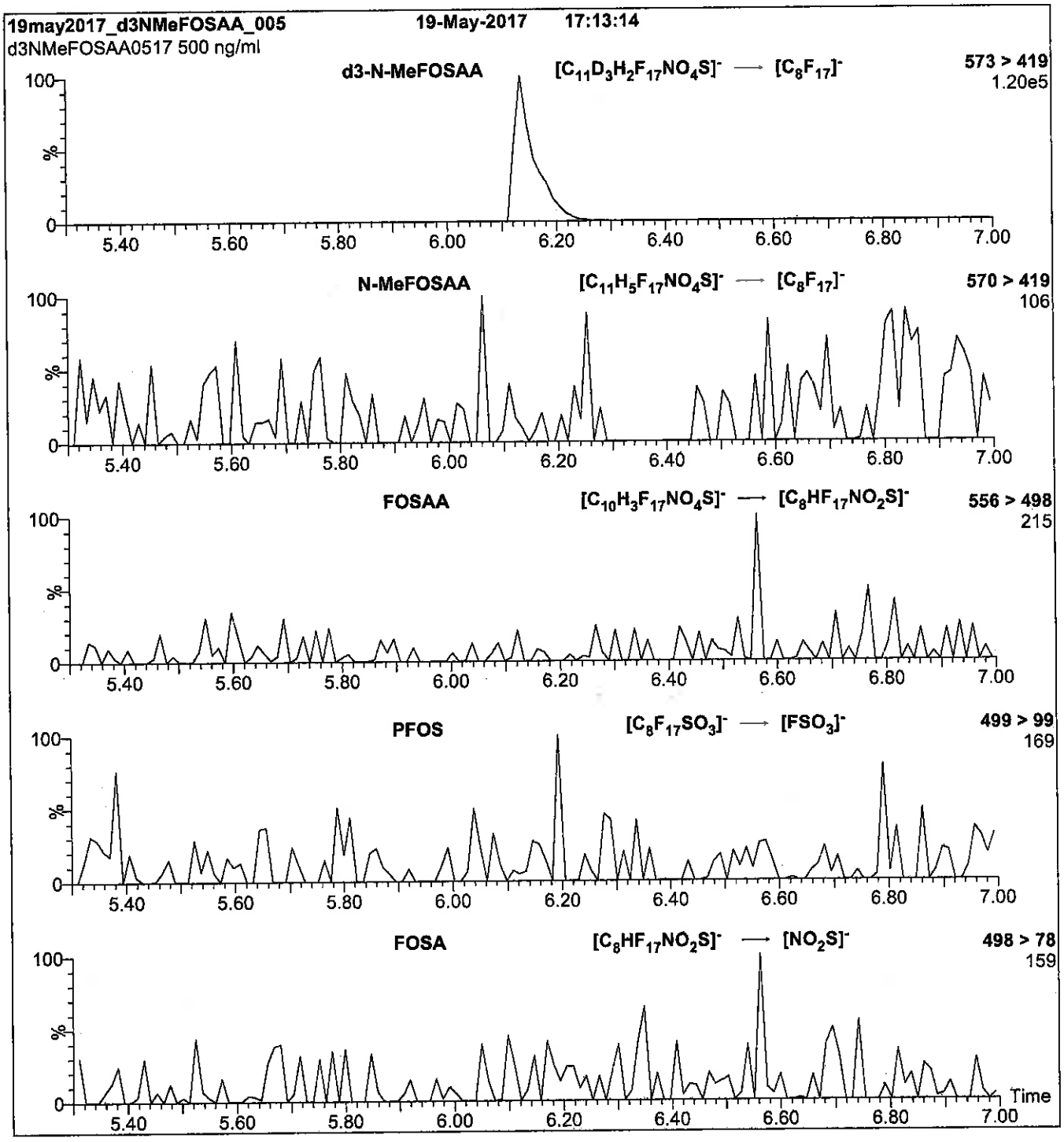
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **d3-N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml d3-N-MeFOSAA)
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) = 20

Reagent

LCd5-NEtFOSAA_00004

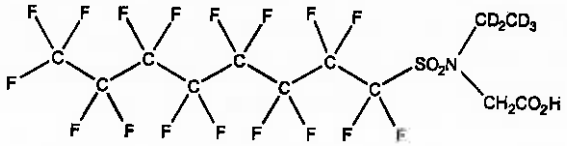
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA
LOT NUMBER: d5NEtFOSAA1116
COMPOUND: N-ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$C_{12}D_5H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	590.26
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy)	11/22/2016		
EXPIRY DATE: (mm/dd/yyyy)	11/22/2021		
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.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/01/2016 (mm/dd/yyyy)

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

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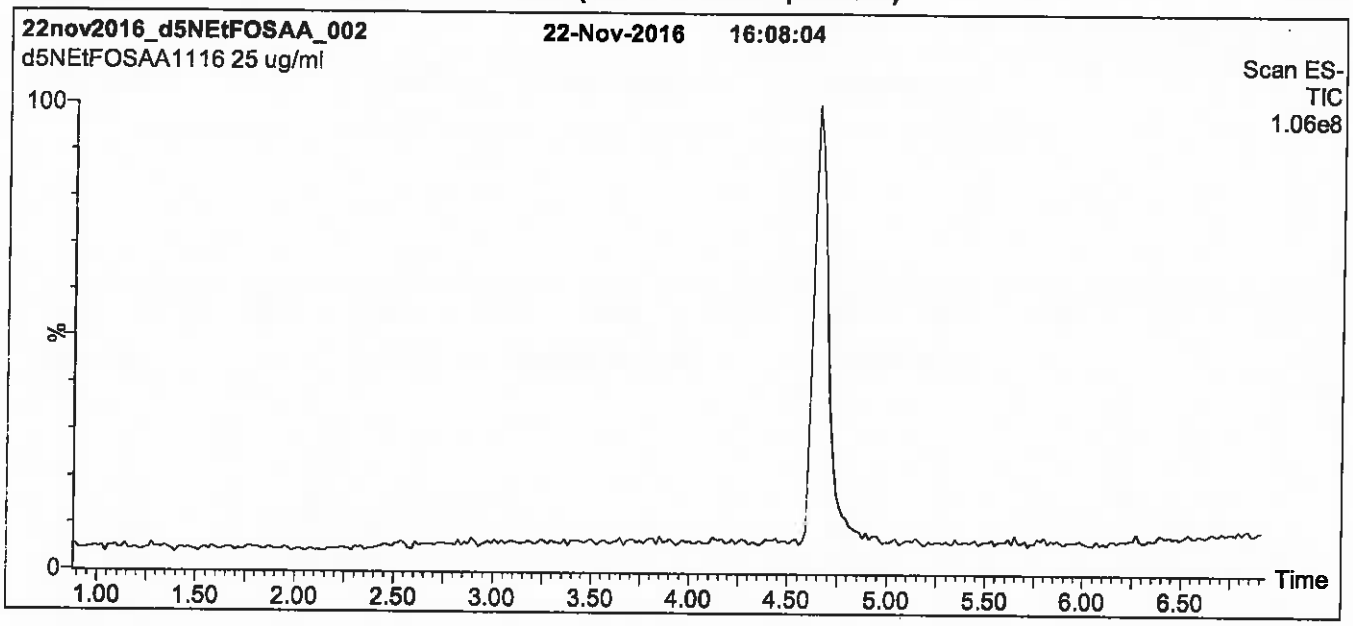
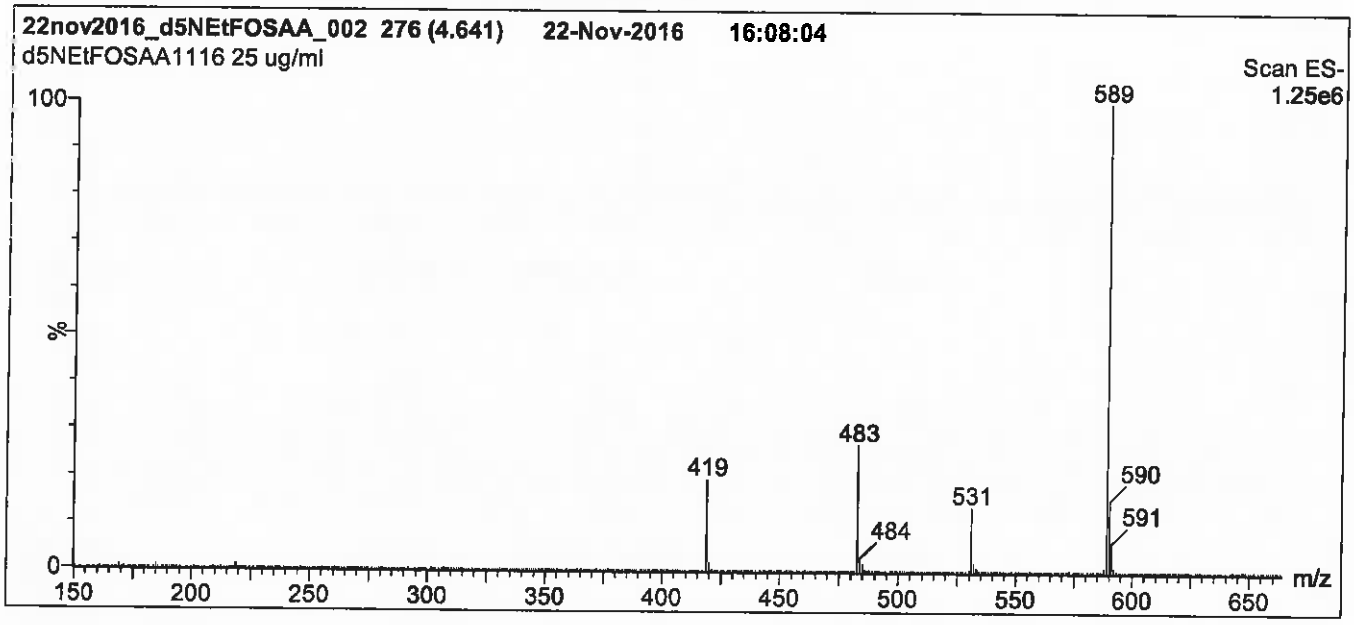
Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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

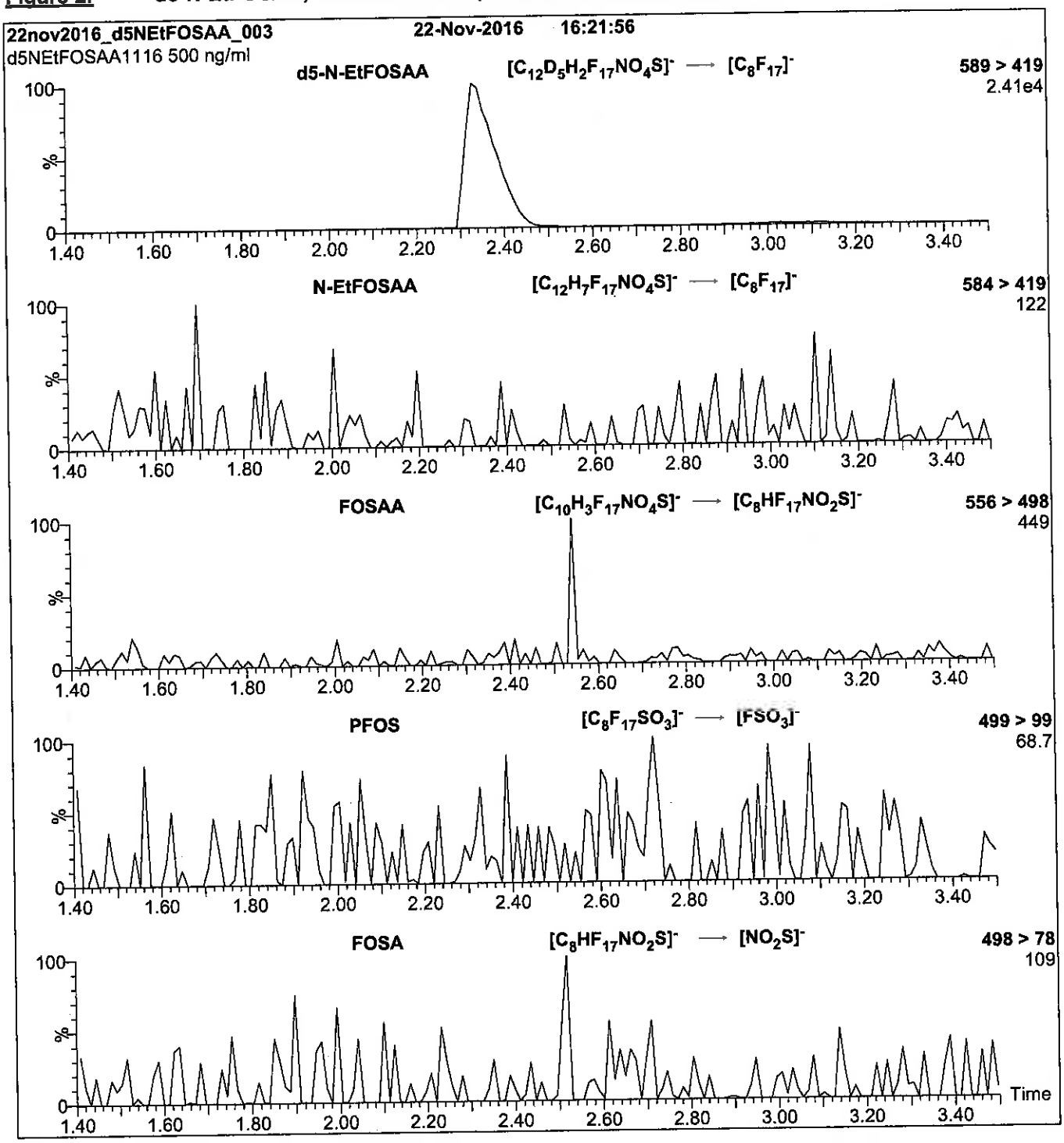
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d5-N-EtFOSAA)

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) = 20

Reagent

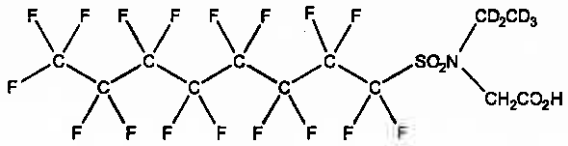
LCd5-NEtFOSAA_00005

R: 8/30/17 SKN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	d5-N-EtFOSAA	**LOT NUMBER:**	d5NEtFOSAA1116
COMPOUND:	N-ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid		
STRUCTURE:		**CAS #:**	Not available



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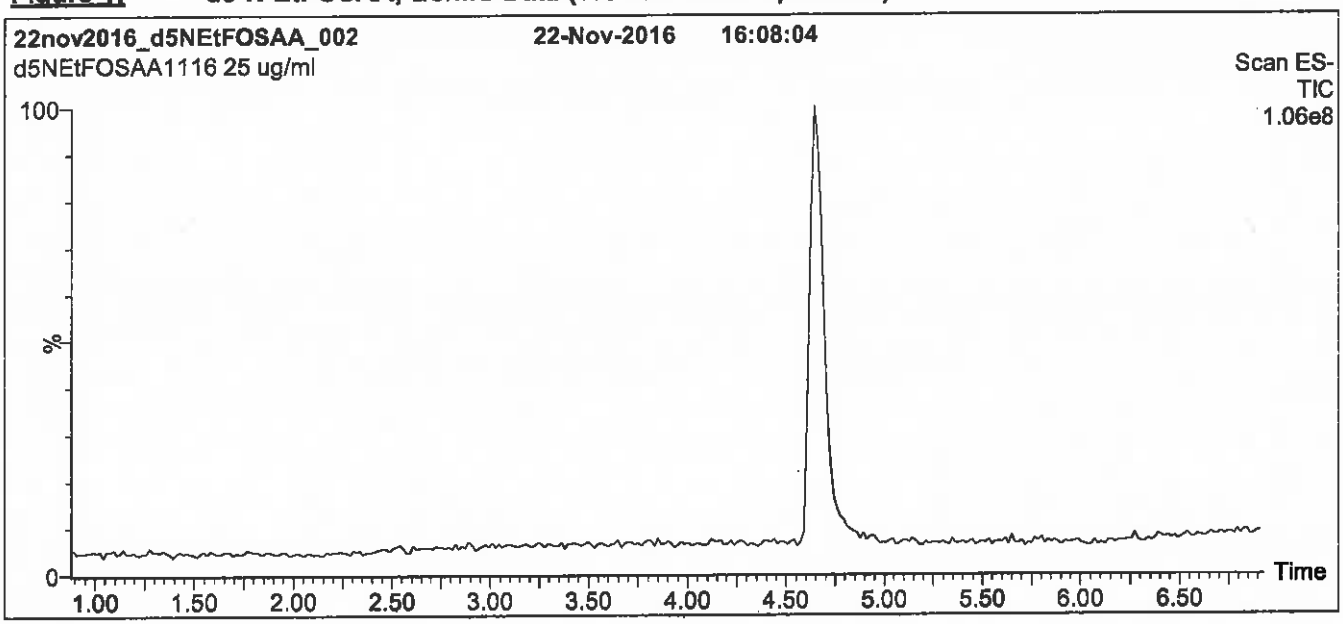

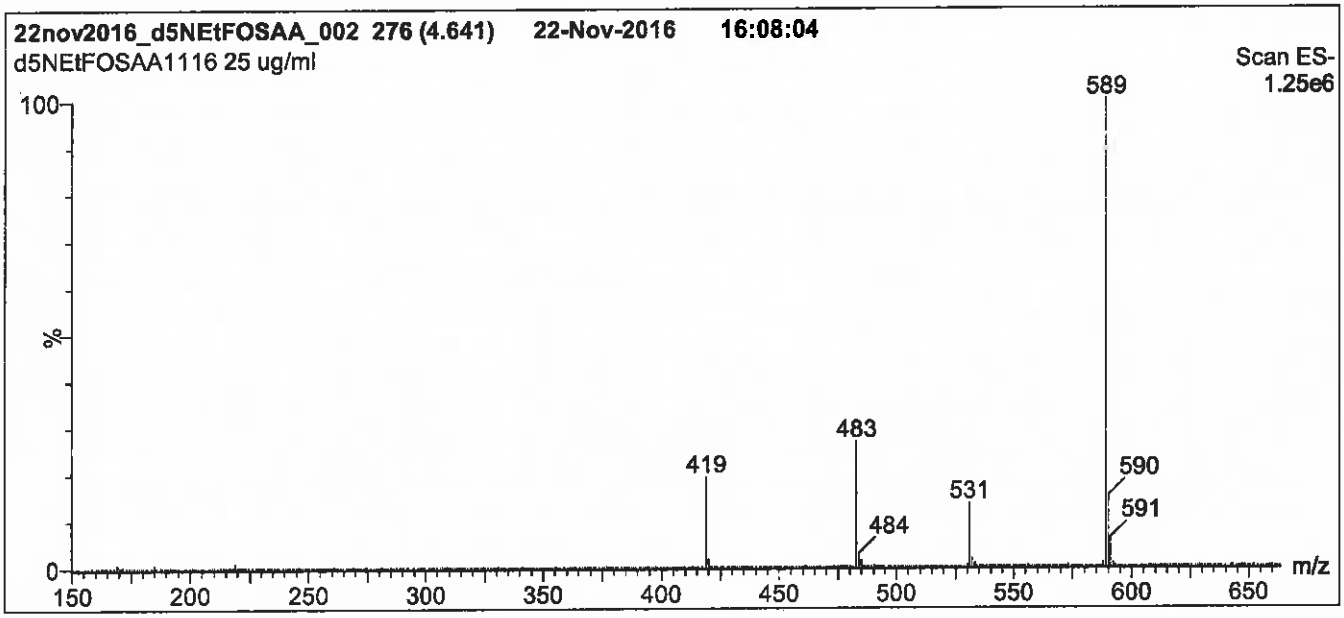

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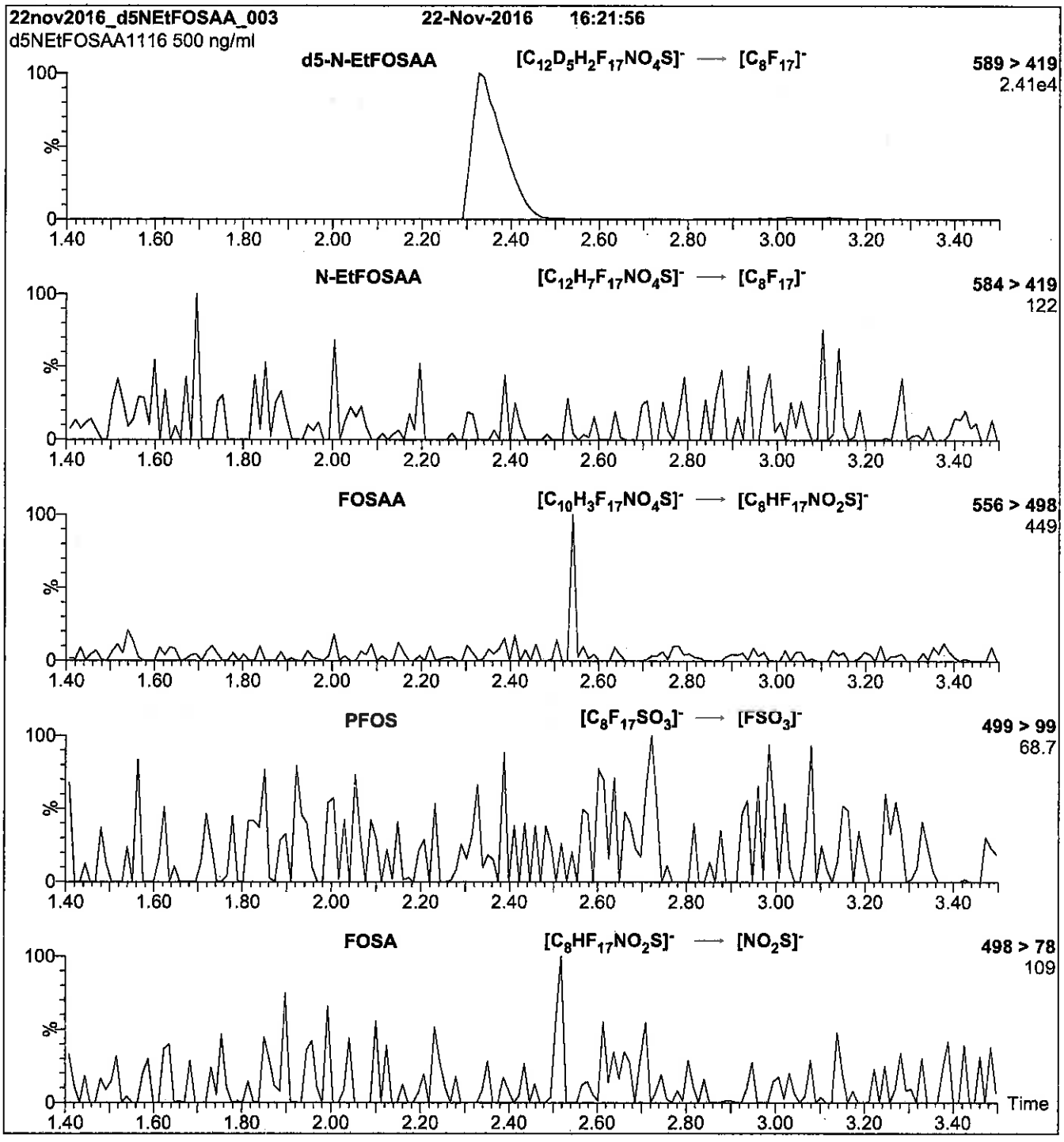


Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml d5-N-EtFOSAA)
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) = 20

Reagent

LCM2-6:FTS_00004

P: 3/20/17 SRV

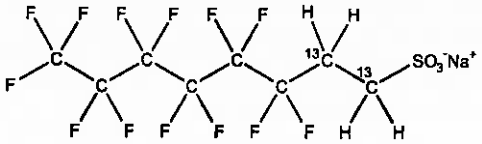
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-6:2FTS **LOT NUMBER:** M262FTS0217

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]octane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	452.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.5 ± 2.4 µg/ml (M2-6:2FTS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	02/17/2022		
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.
- The native 6:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/24/2017 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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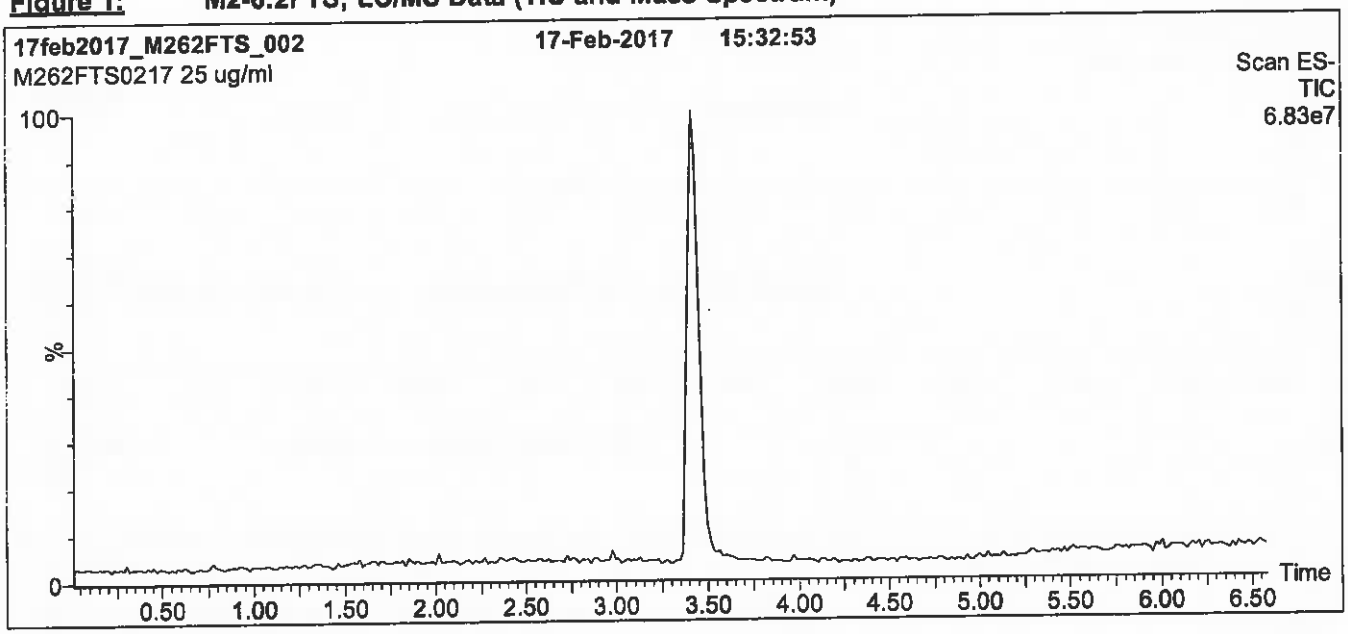
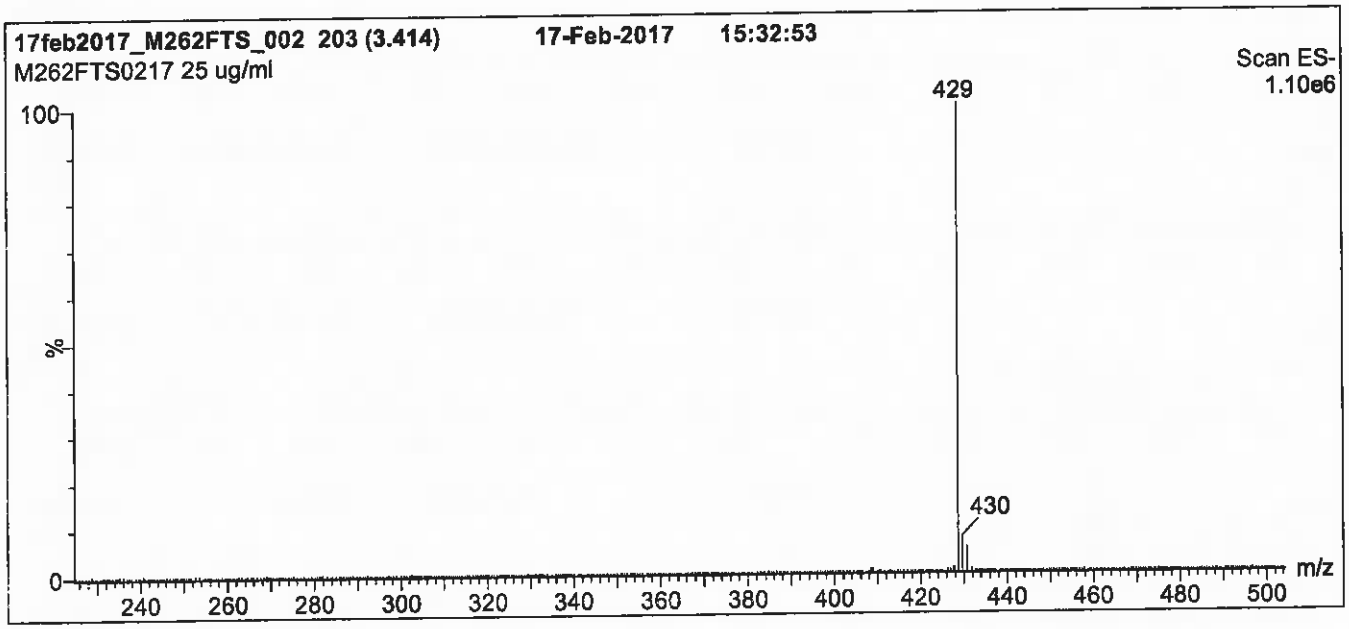
Figure 1: **M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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

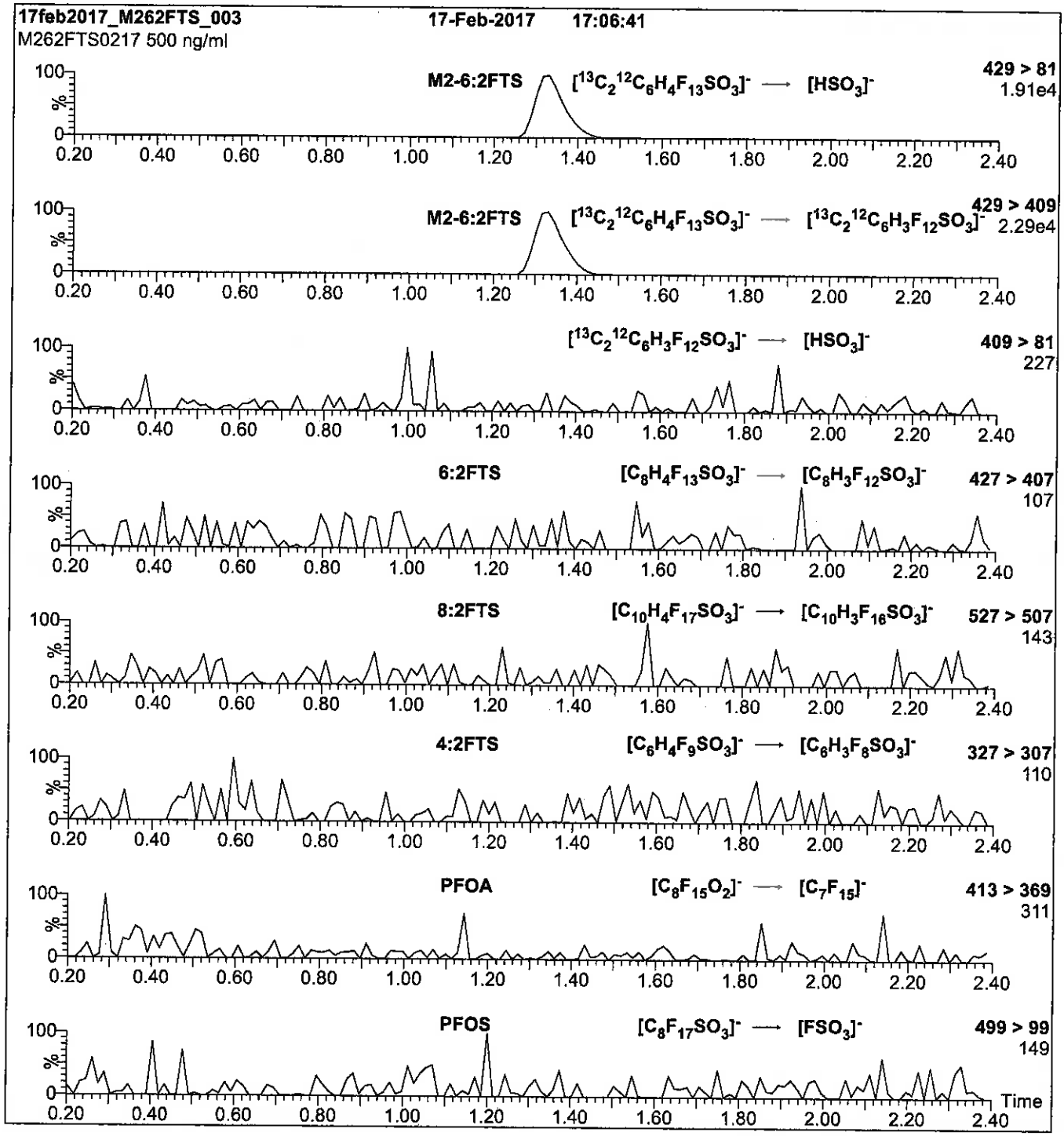
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2-6:2FTS)

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) = 25

Reagent

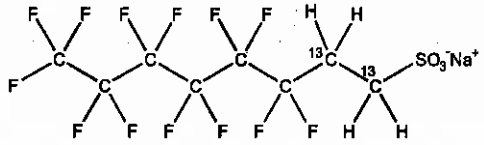
LCM2-6:FTS_00005

rf 8/30/17 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	M2-6:2FTS	**LOT NUMBER:**	M262FTS0217
COMPOUND:	Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]octane sulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	452.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.5 ± 2.4 µg/ml (M2-6:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	02/17/2022		
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.
- The native 6:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/24/2017 (mm/dd/yyyy)

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

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CALA

ANAB ACCREDITED

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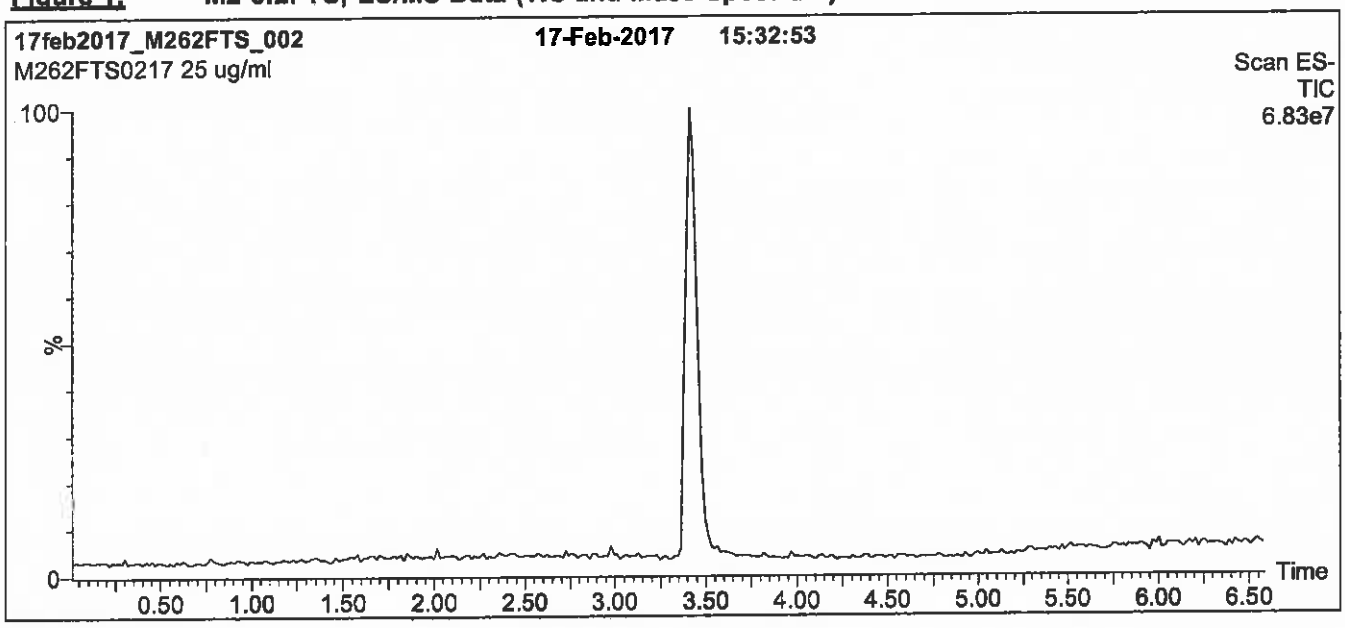
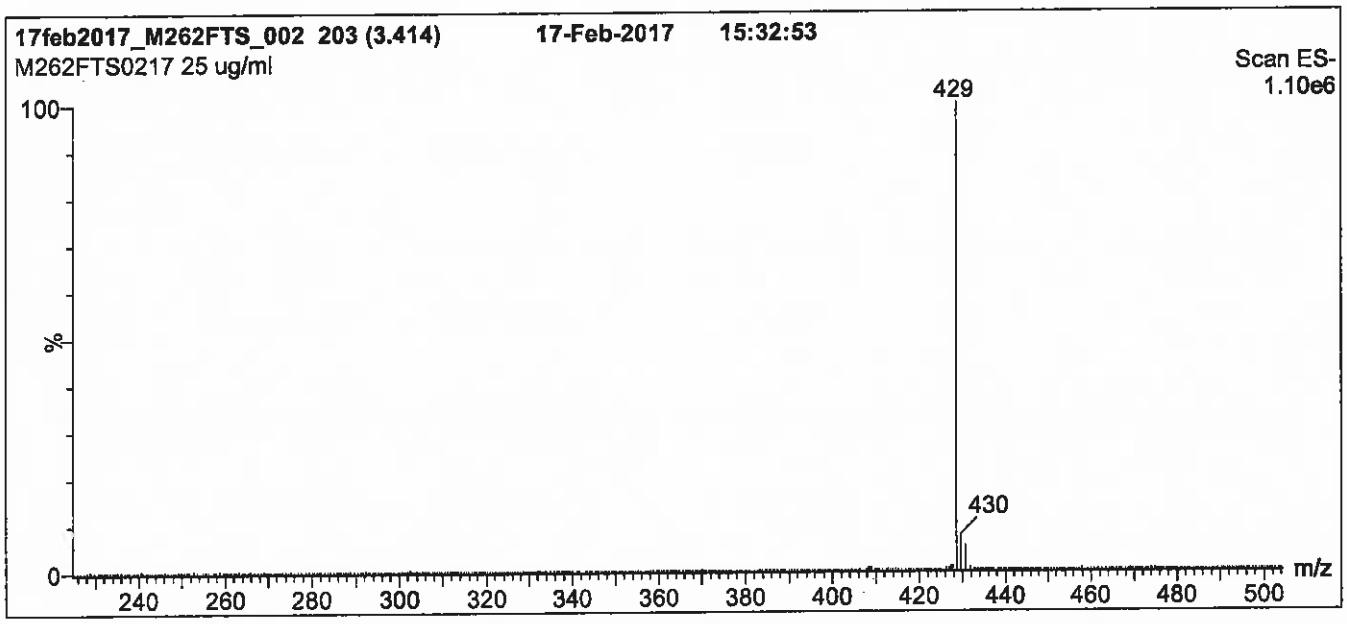
Figure 1: **M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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

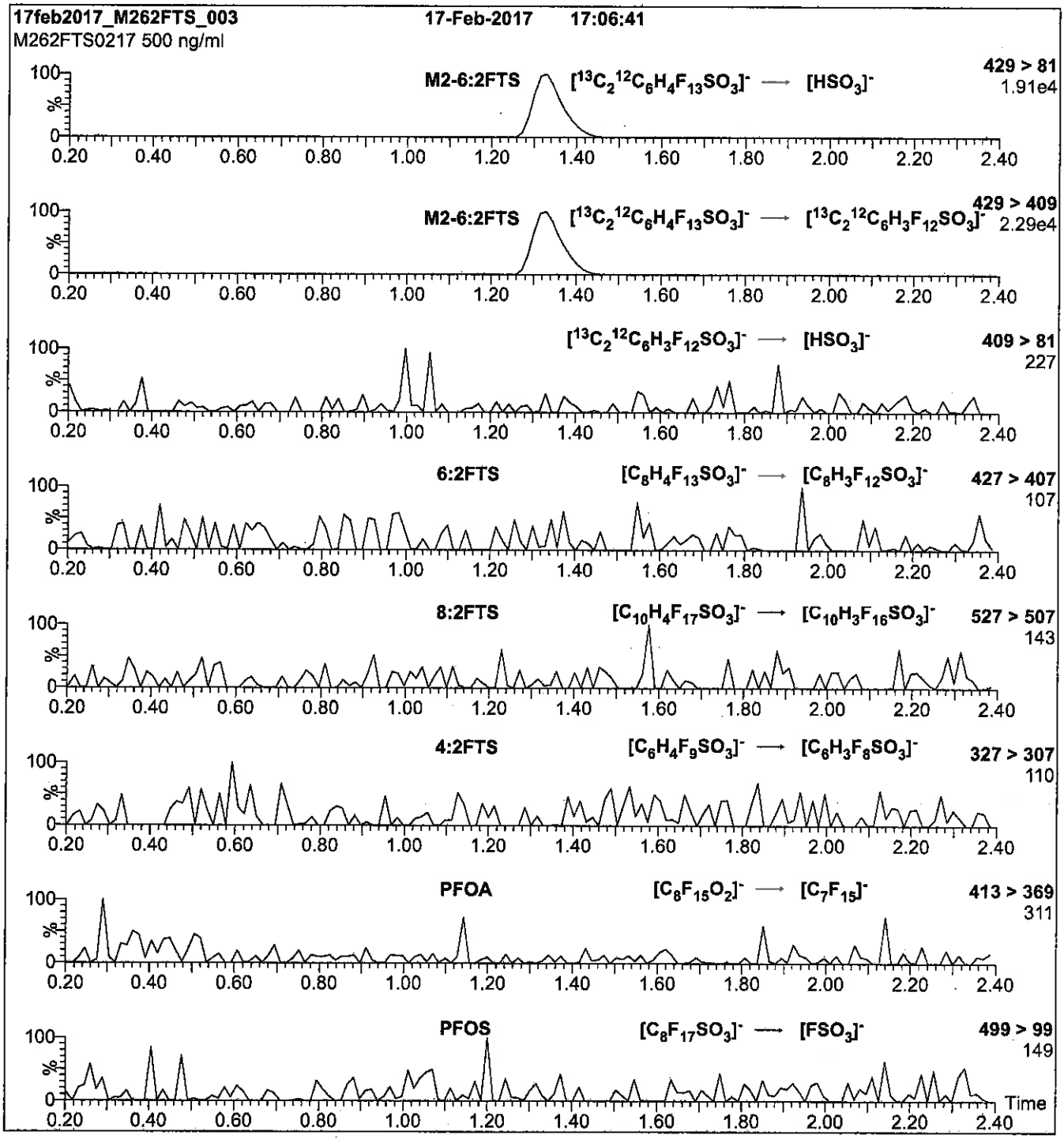
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2-6:2FTS)

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) = 25

Reagent

LCM2-8:2FTS_00004

r: 3/20/17 SEV

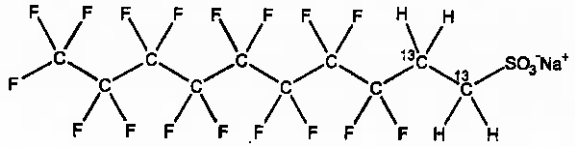
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-8:2FTS
LOT NUMBER: M282FTS0816
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]decane sulfonate

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	552.15
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/ml (M2-8:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	08/22/2016		
EXPIRY DATE: (mm/dd/yyyy)	08/22/2021		
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:

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- The native 8:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 09/02/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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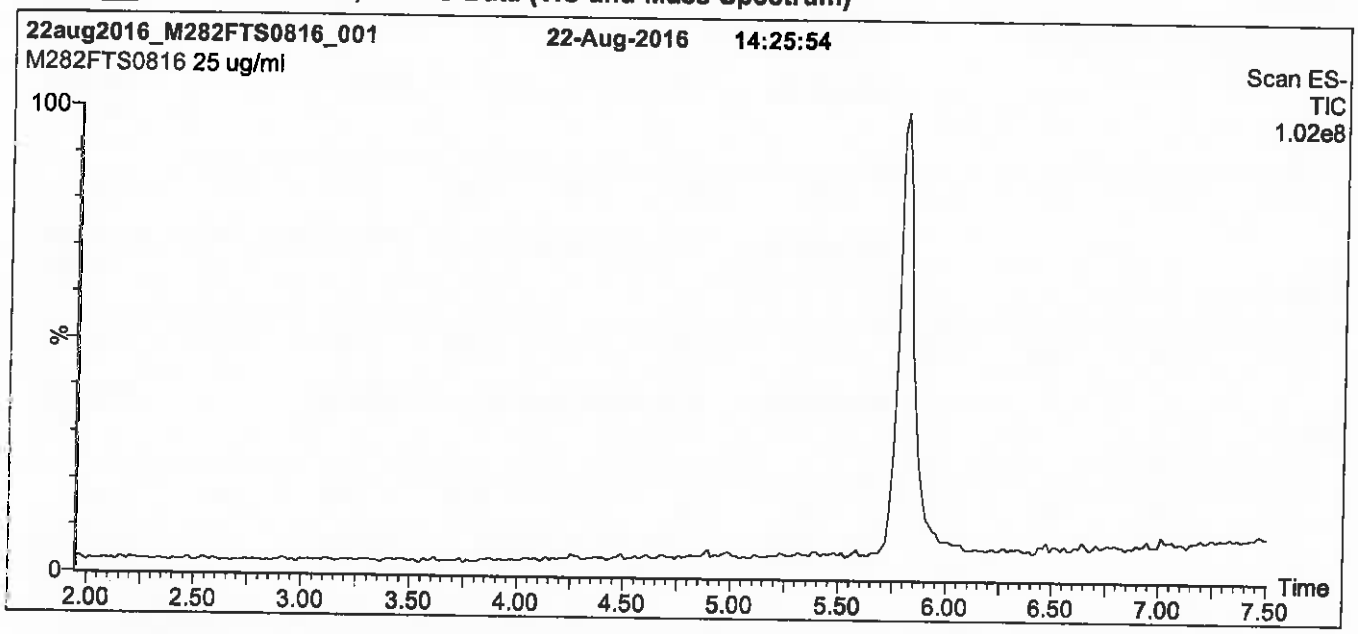
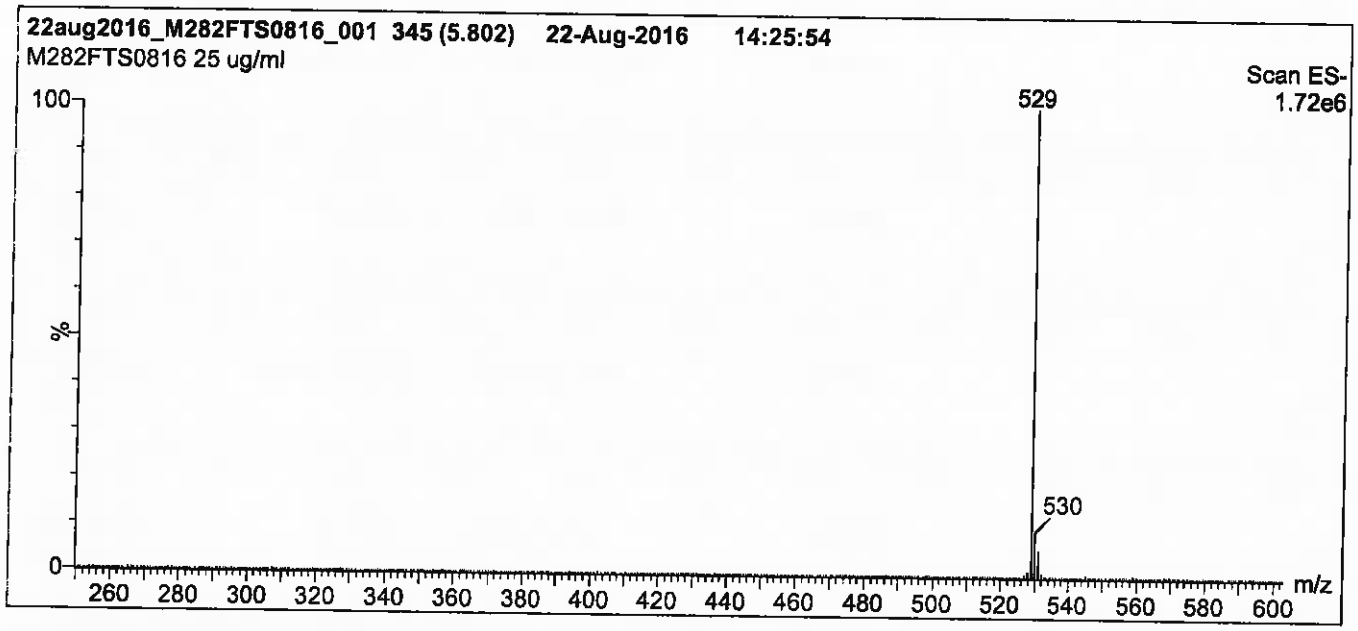
Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Agilent Zorbax Bonus-RP
1.8 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 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

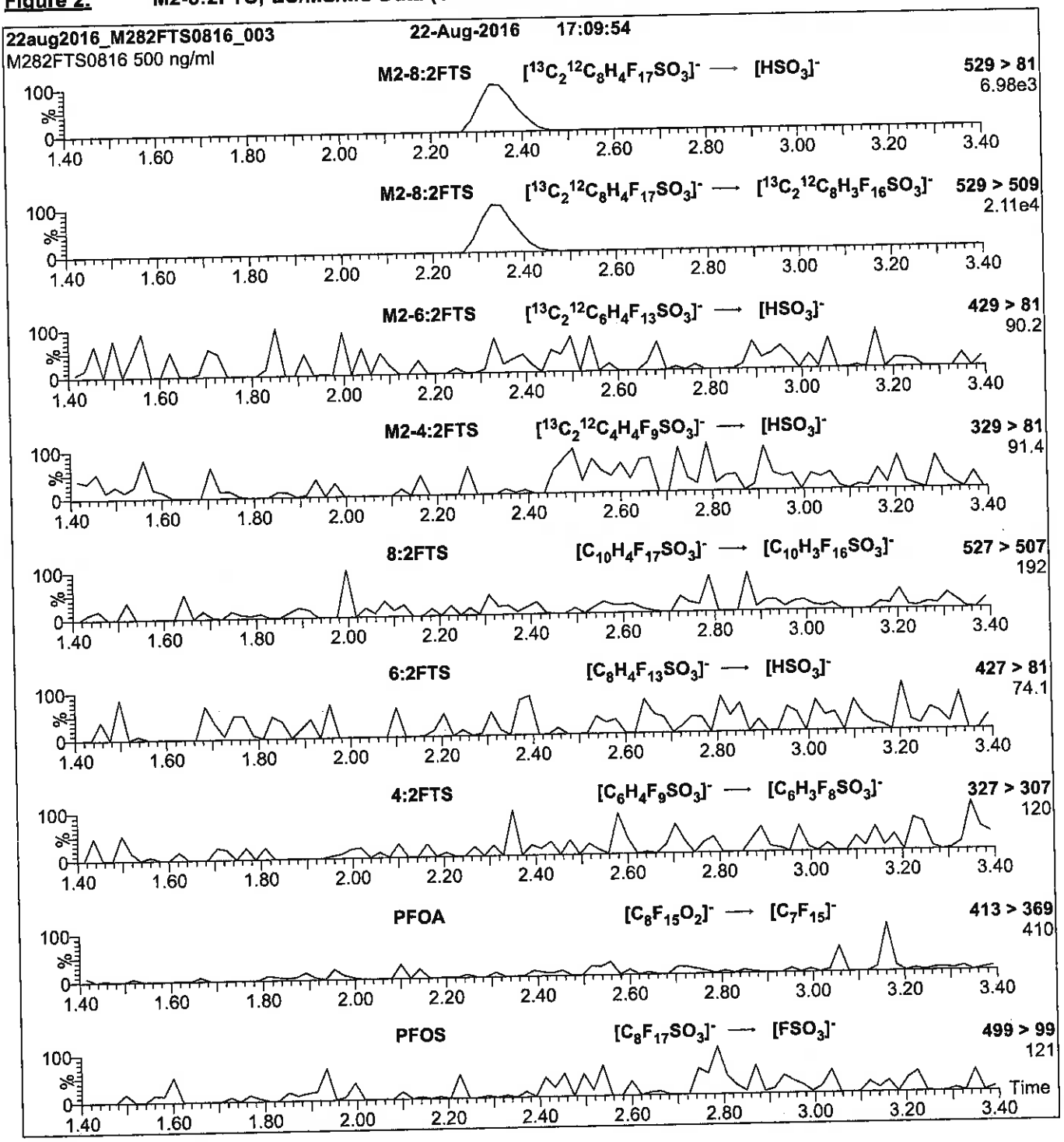
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2-8:2FTS)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 30

Reagent

LCM2-8:2FTS_00007

R\ 8/20/17-SFU

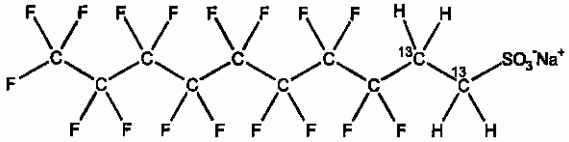
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0717

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	552.15
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/ml (M2-8:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	07/05/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/05/2022		
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.
- The native 8:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/07/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

INTENDED USE:

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

HAZARDS:

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

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

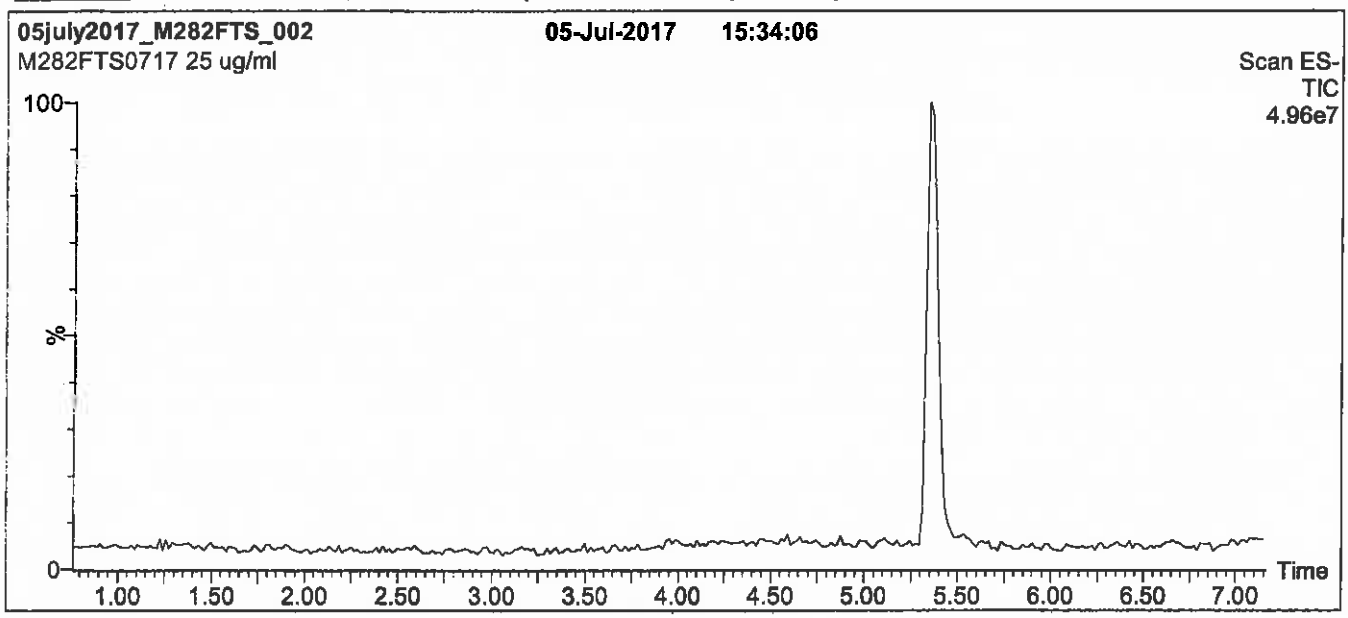
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

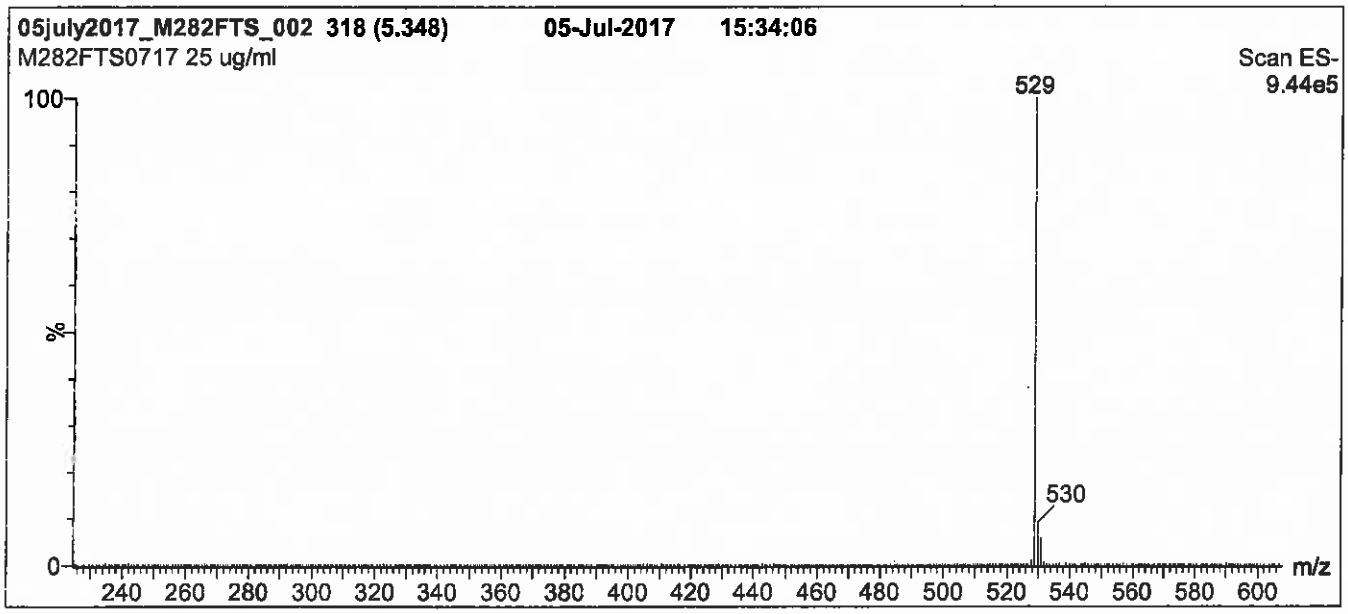
CALA

ANAB ACCREDITED

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: **M2-8:2FTS; 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 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

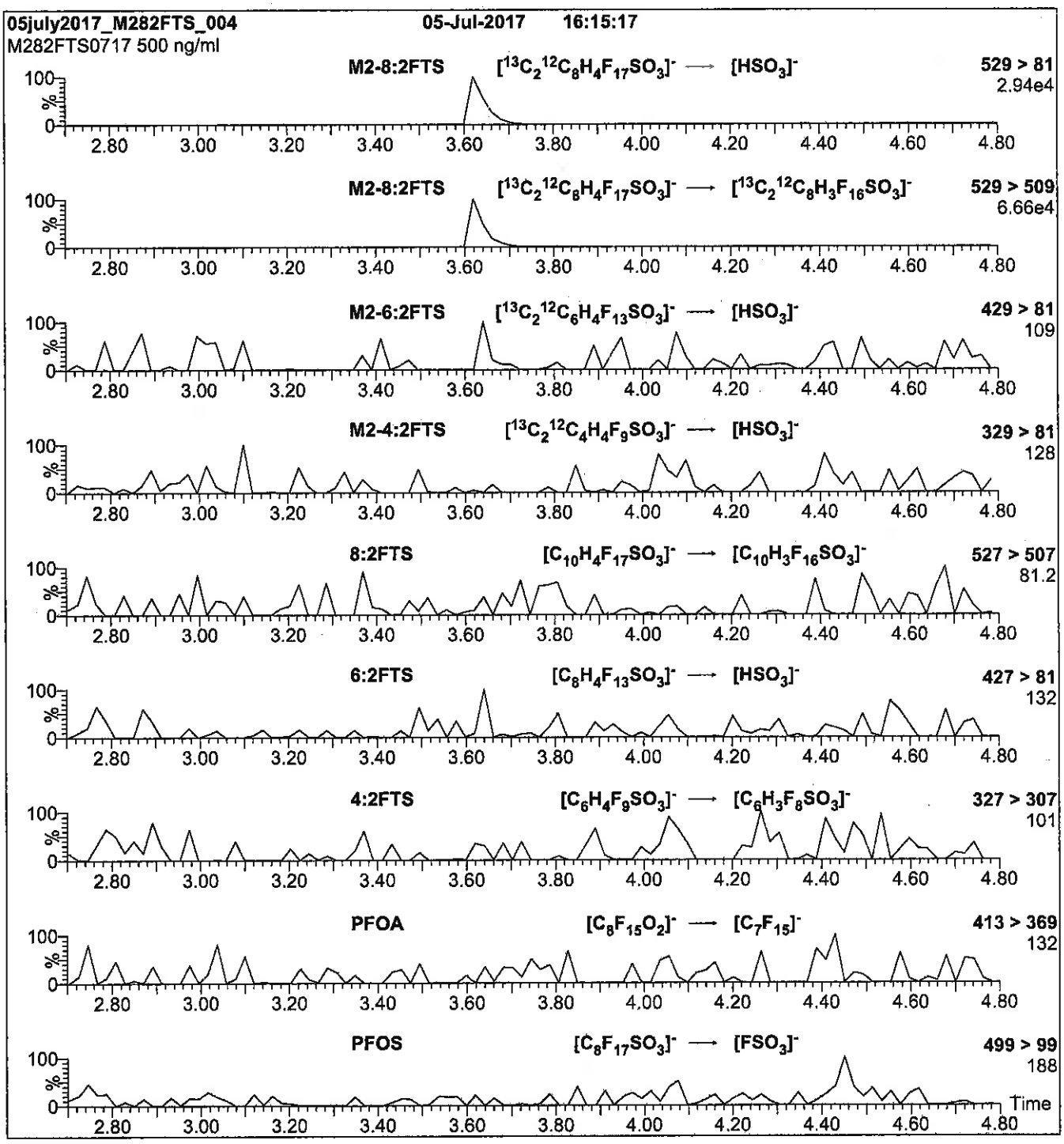
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2-8:2FTS)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 30

Reagent

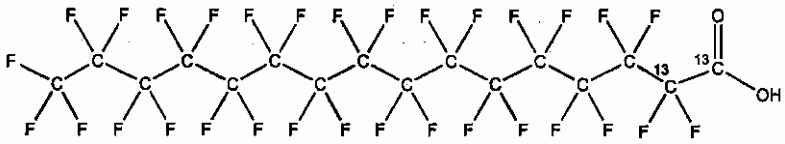
LCM2PFHxDA_00010

n: 5/3/17 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	M2PFHxDA	**LOT NUMBER:**	M2PFHxDA1112
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid		
STRUCTURE:		**CAS #:**	Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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HOMOGENEITY:

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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 of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

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CALA

ANAB ACCREDITED

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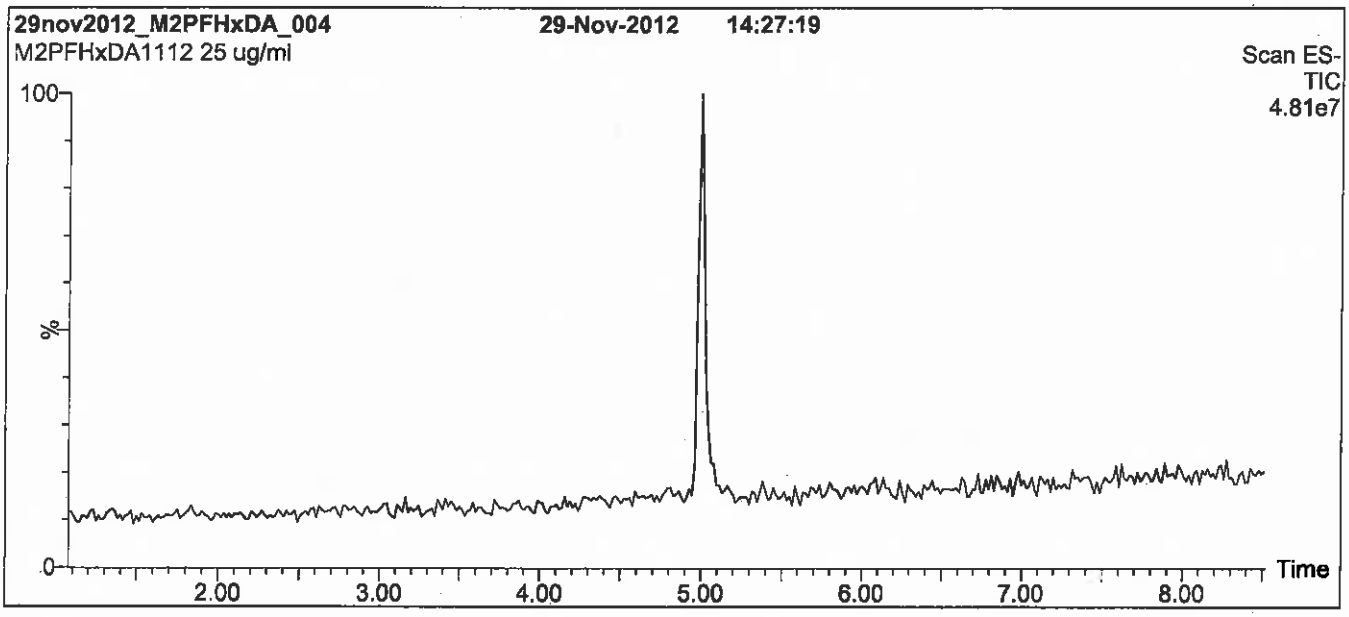
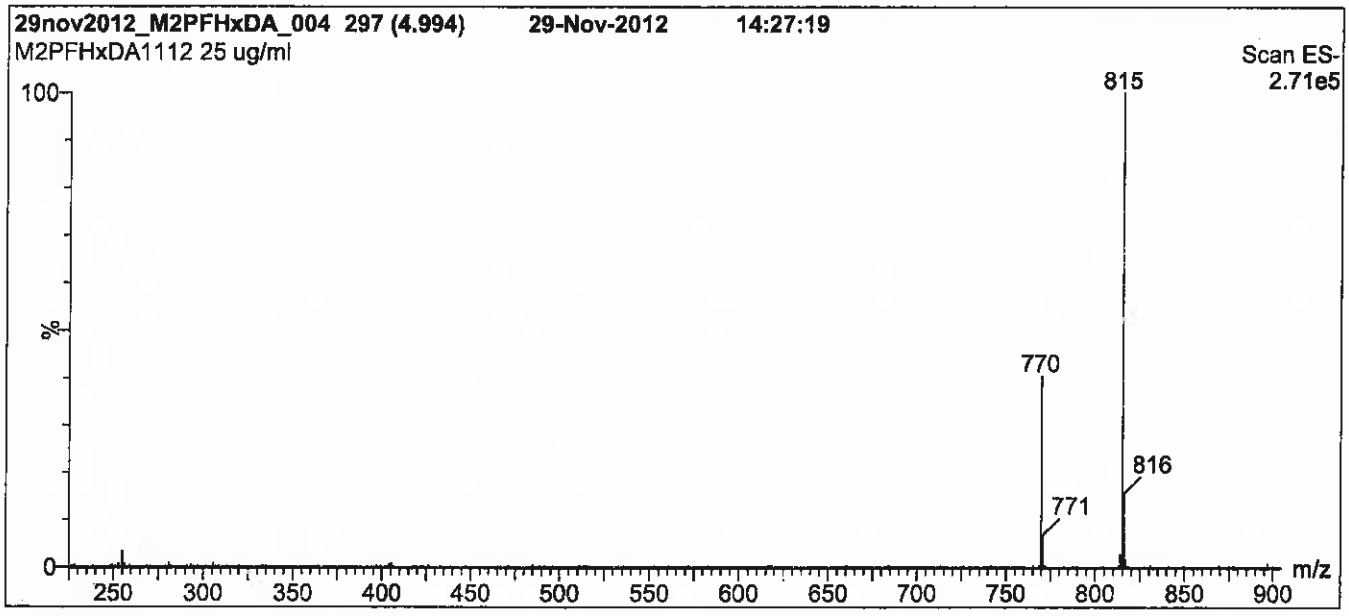
Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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

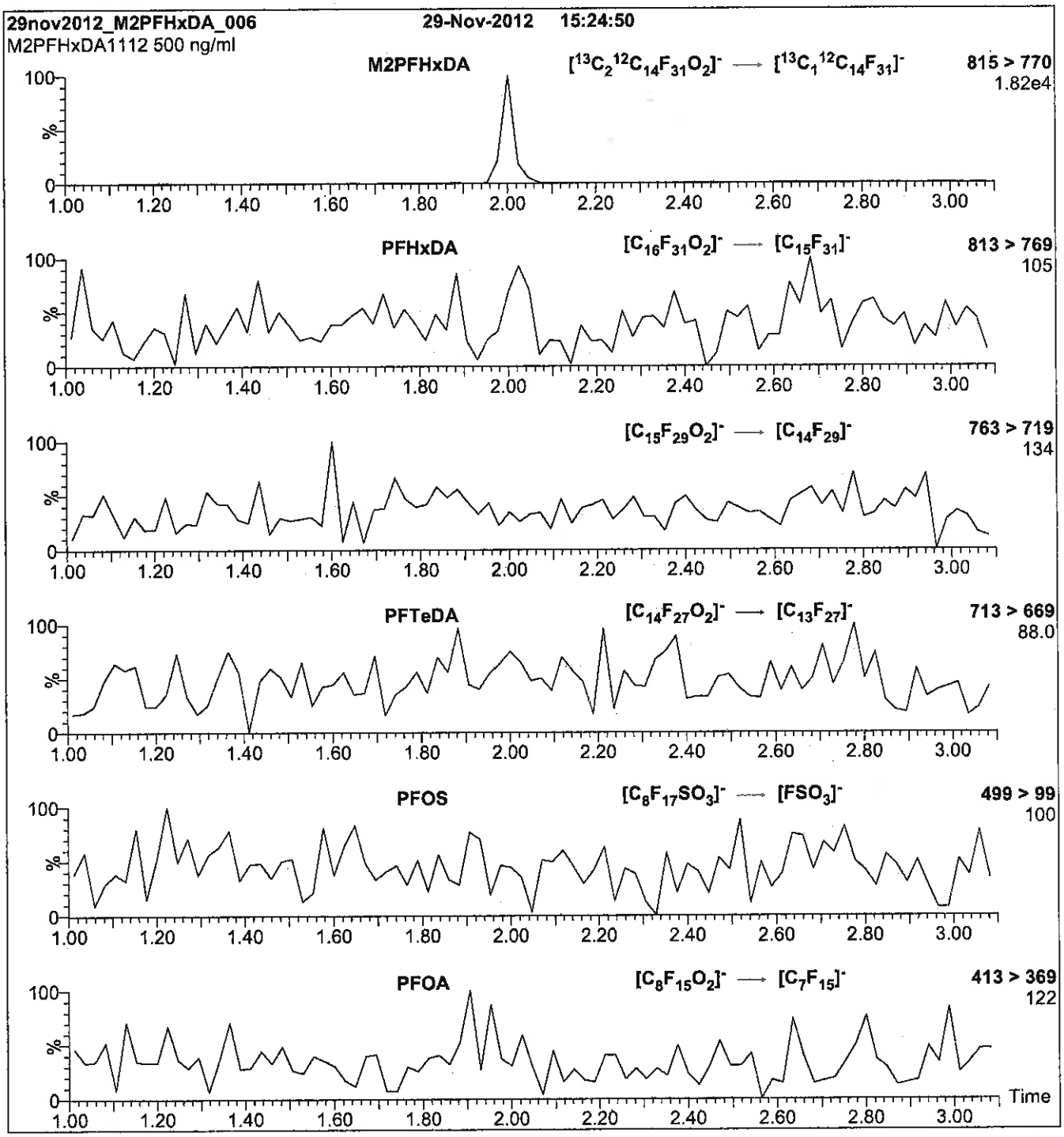
Flow: 300 µl/min

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

LCM2PFHxDA_00011

r: 7/5/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

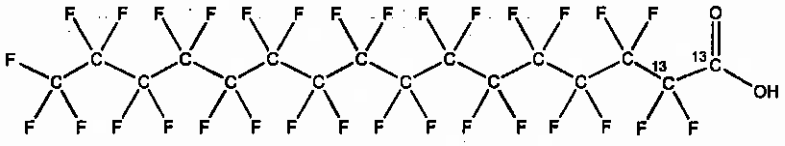
PRODUCT CODE: M2PFHxDA

LOT NUMBER: M2PFHxDA1112

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

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_{14}HF_{31}O_2$

MOLECULAR WEIGHT: 816.11

CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%

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

LAST TESTED: (mm/dd/yyyy) 01/07/2016

EXPIRY DATE: (mm/dd/yyyy) 01/07/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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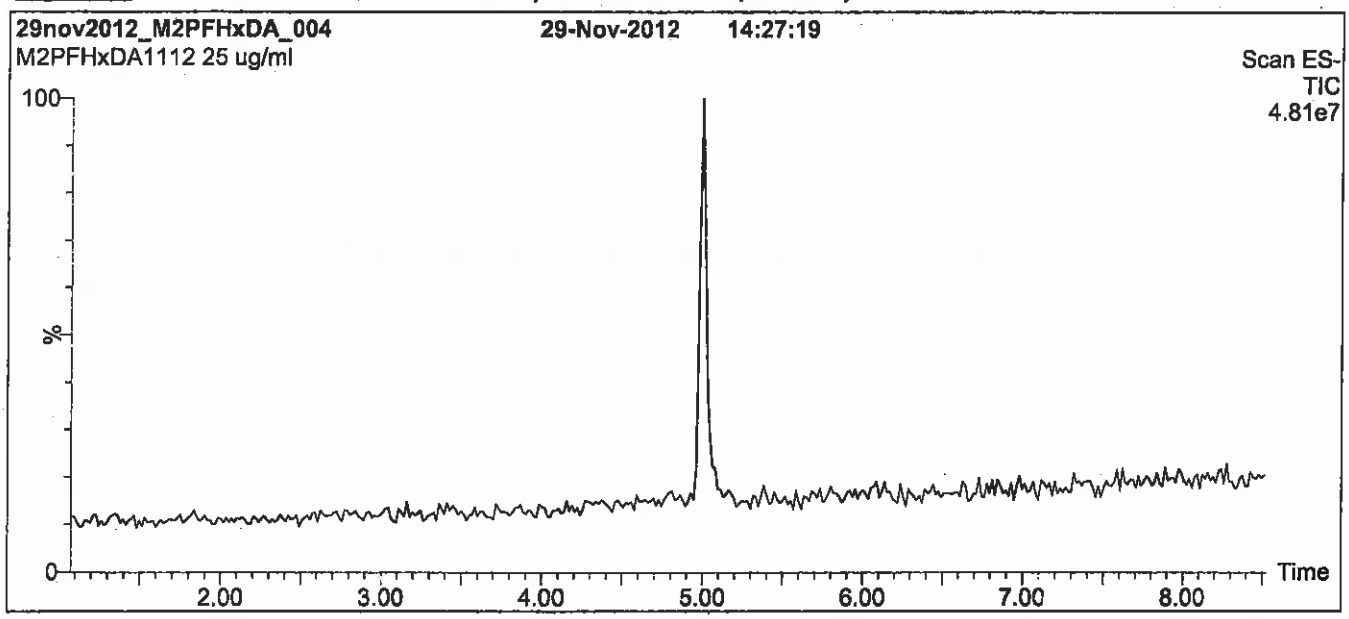
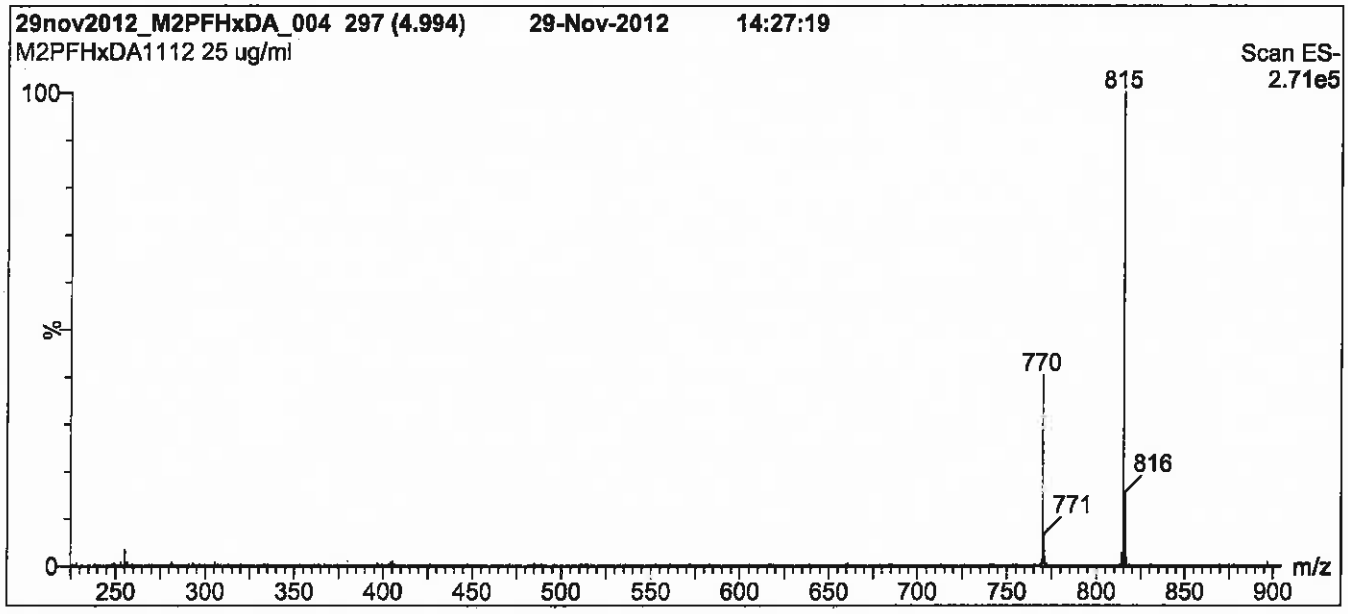
Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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

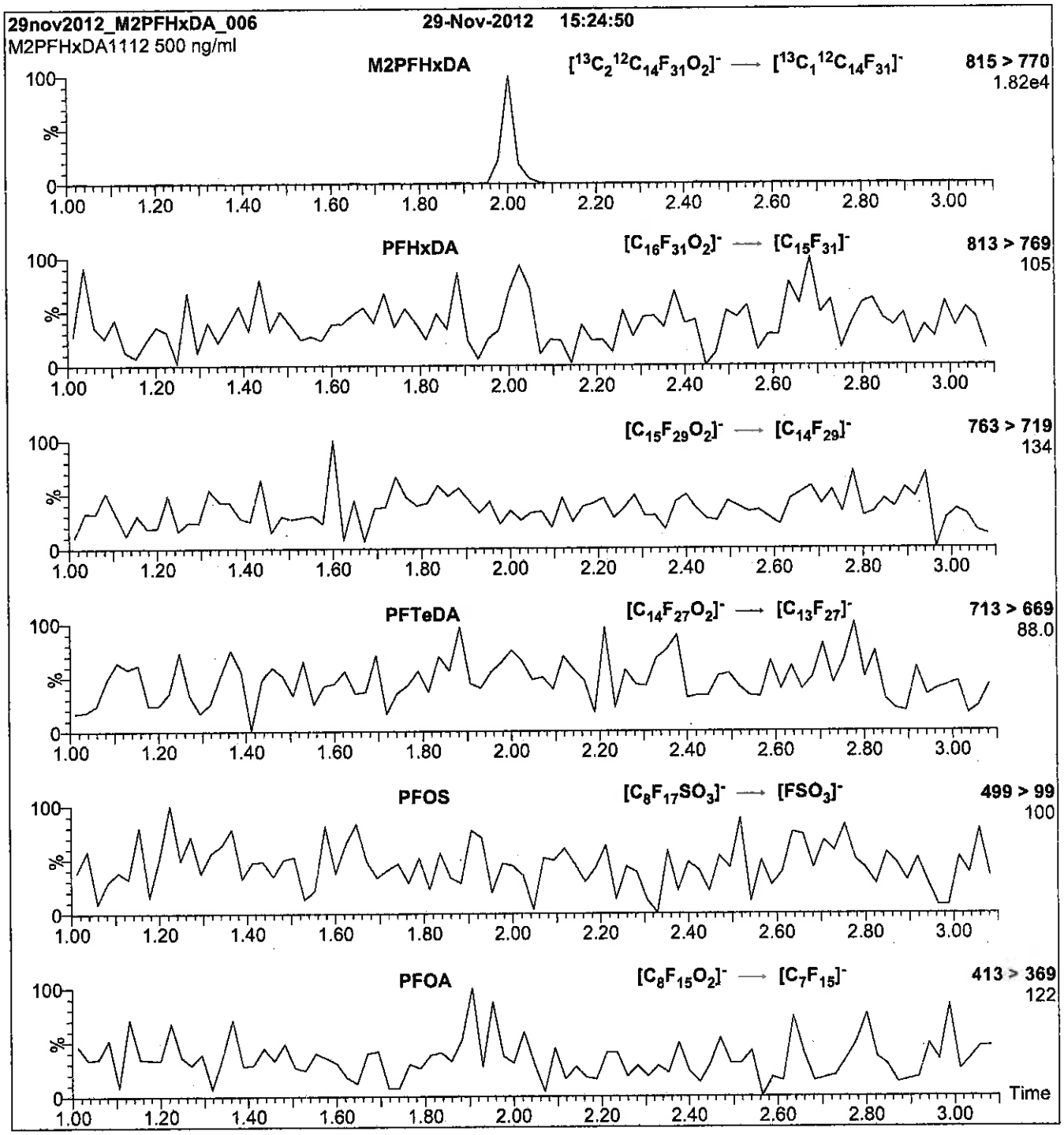
Flow: 300 µl/min

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

LCM2PFOA_00005

Rec'd. 2/10/15 SV

WELLINGTON LABORATORIES

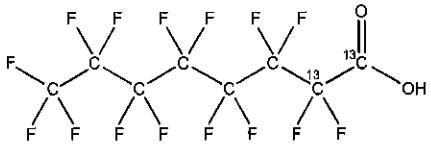
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFOA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]octanoic acid

LOT NUMBER: M2PFOA0613

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6HF_{15}O_2$	**MOLECULAR WEIGHT:**	416.05
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)	06/19/2013		
EXPIRY DATE: (mm/dd/yyyy)	06/19/2018		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/16/2013 (mm/dd/yyyy)

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

SYNTHESIS / CHARACTERIZATION:

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:

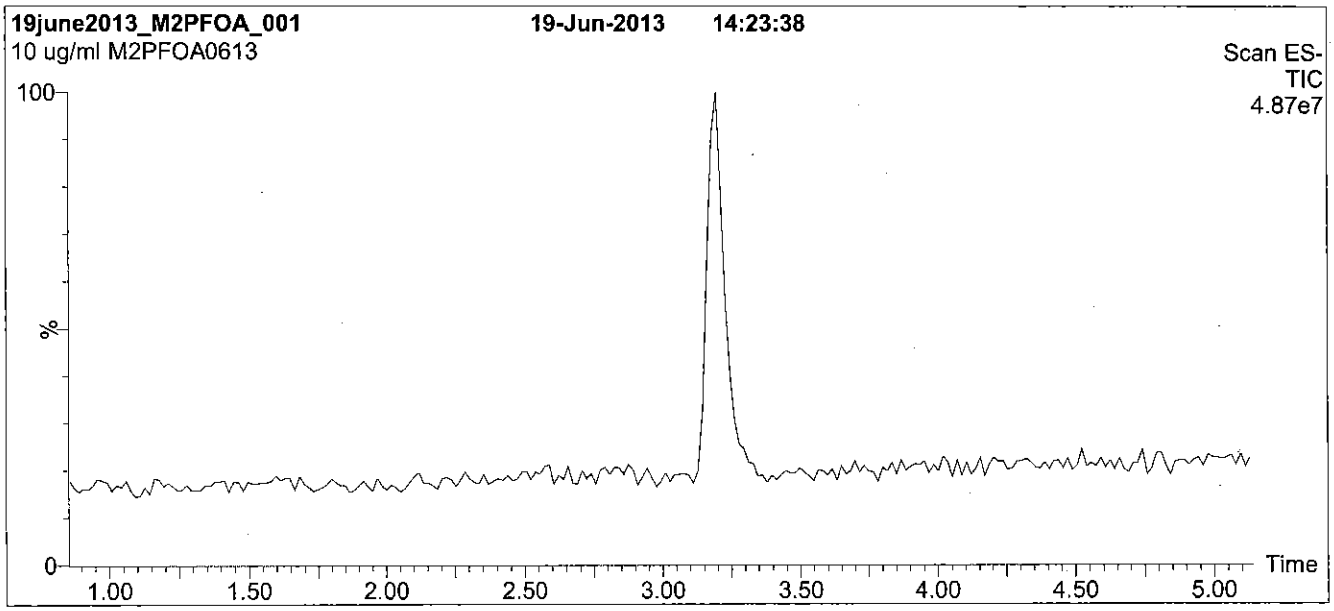
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

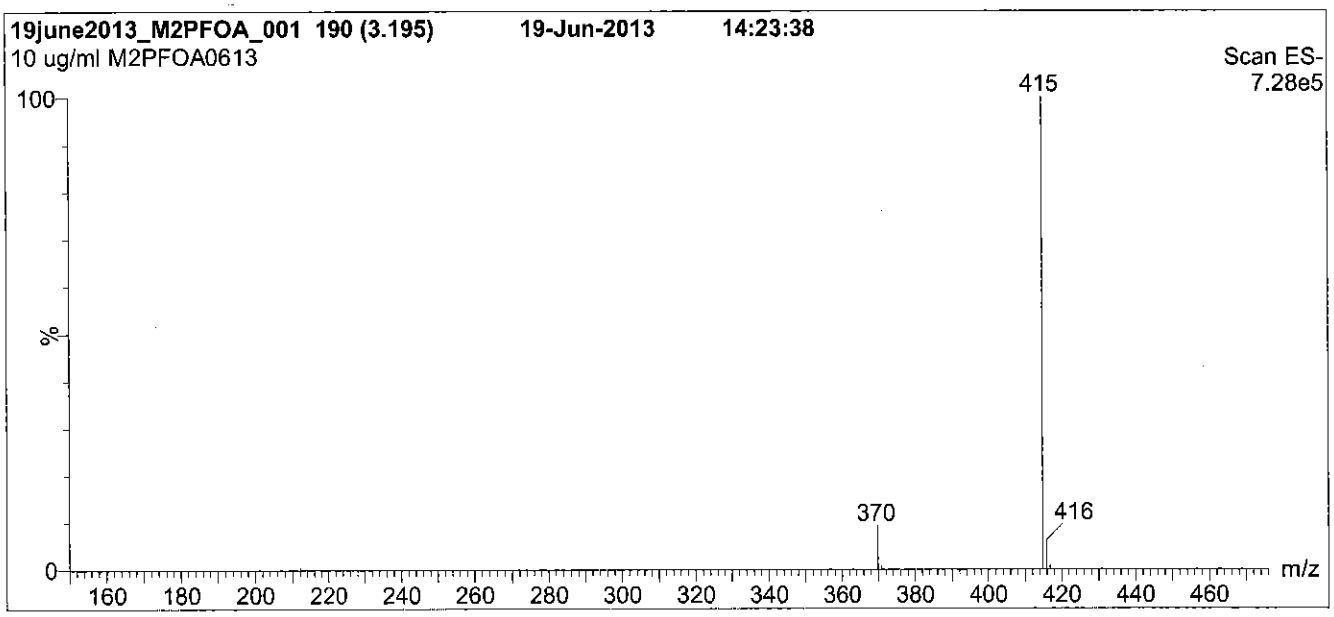
CALA Testing Accreditation No. A1226

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: **M2PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

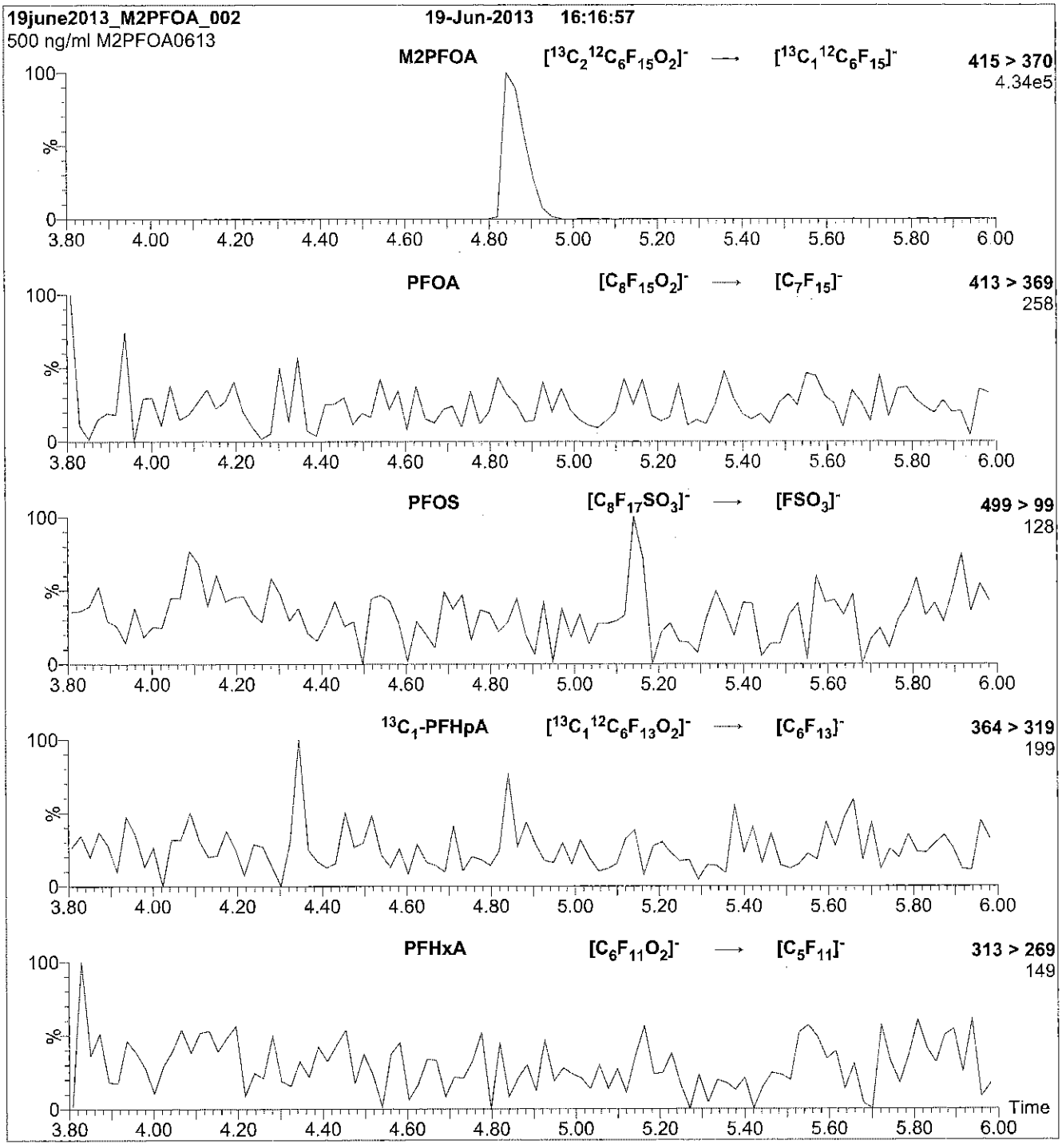
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Figure 2: **M2PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M2PFOA)
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) = 11

Reagent

LCM2PFOA_00006

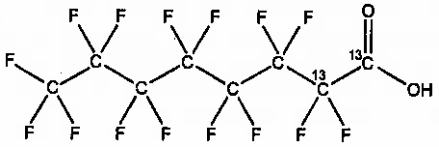
R: SBC 12/21/16

814260
ID: LCM2PFOA_00006
Exp: 02/12/21 Prpd: SBC
13C2-PFOA Stock 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	M2PFOA	**LOT NUMBER:**	M2PFOA0216
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]octanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6HF_{15}O_2$	**MOLECULAR WEIGHT:**	416.05
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)	02/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	02/12/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/24/2016 (mm/dd/yyyy)

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

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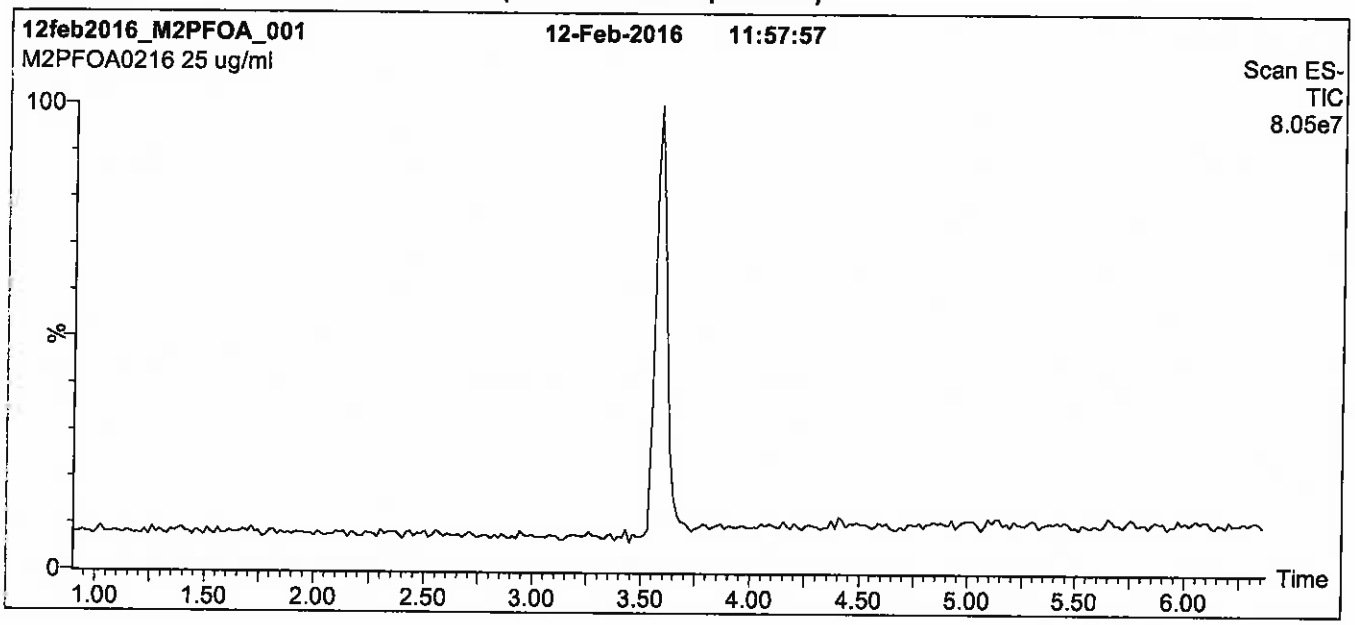

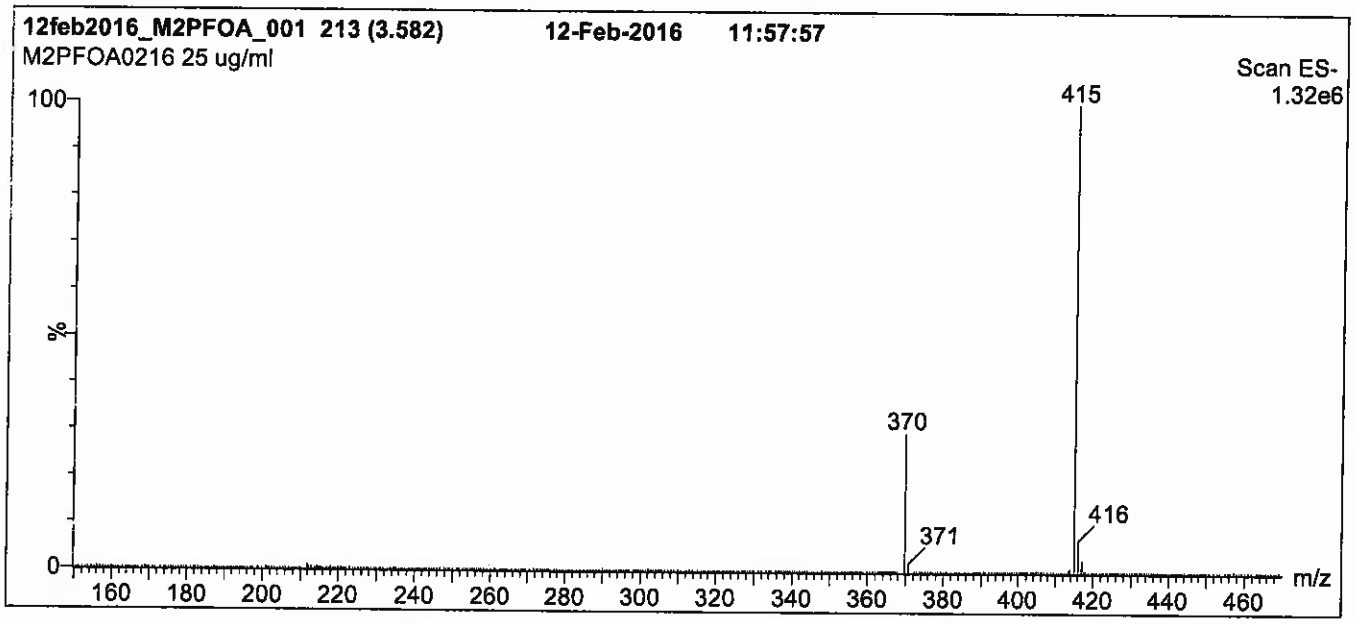

Conditions for Figure 1:

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 7.5 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) = 3.00
Cone Voltage (V) = 15.00
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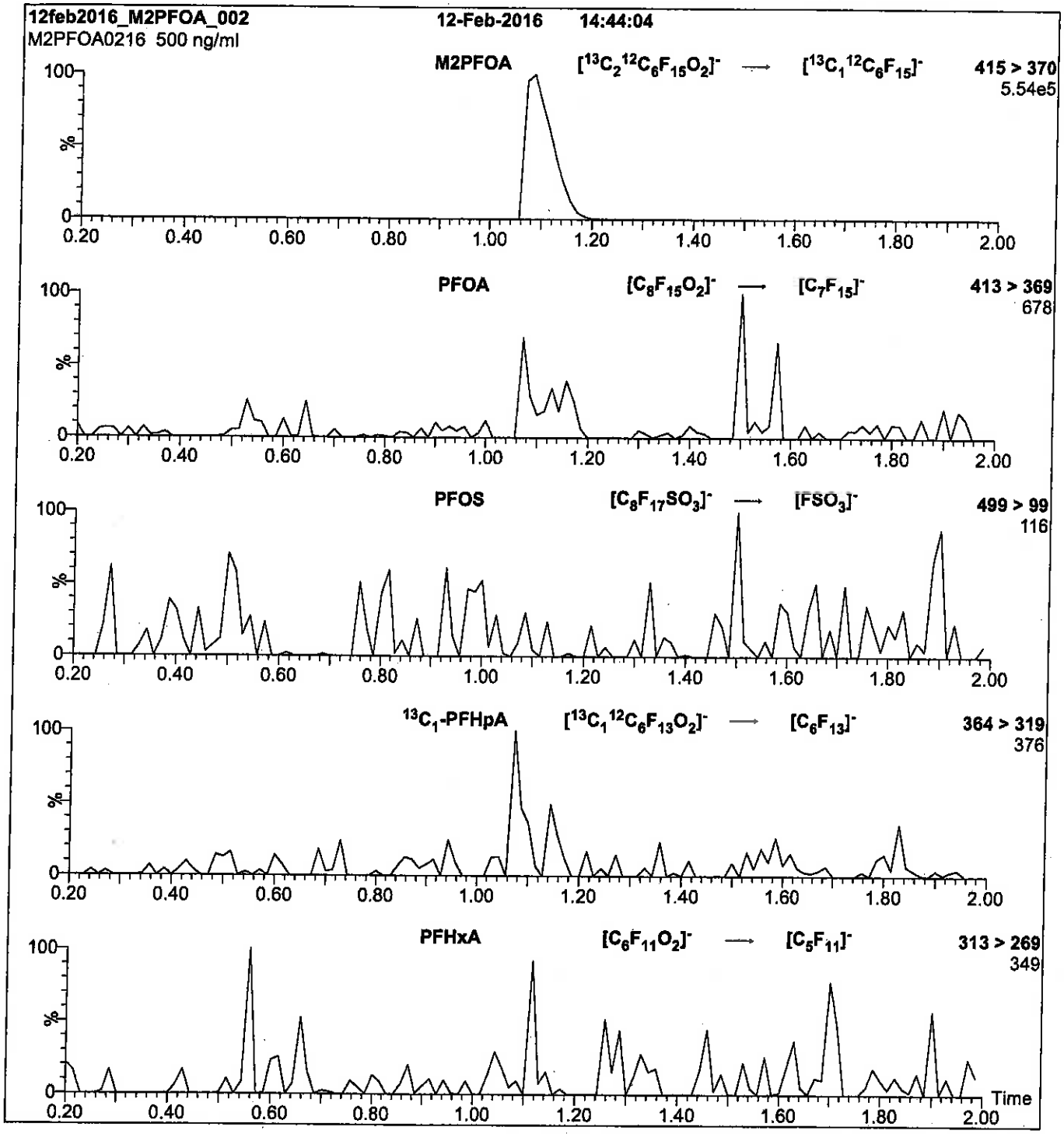


Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M2PFOA)
Mobile phase:	Isocratic 80% MeOH / 20% H_2O
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 10

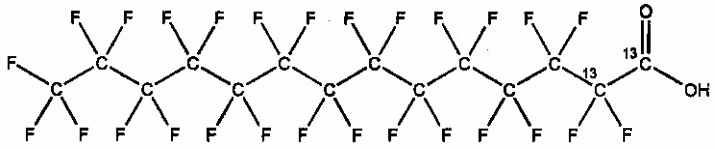
Reagent

LCM2PFTeDA_00009

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFTeDA	**LOT NUMBER:**	M2PFTeDA0217
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)	03/01/2017		
EXPIRY DATE: (mm/dd/yyyy)	03/01/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/07/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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CALA

ANAB ACCREDITED

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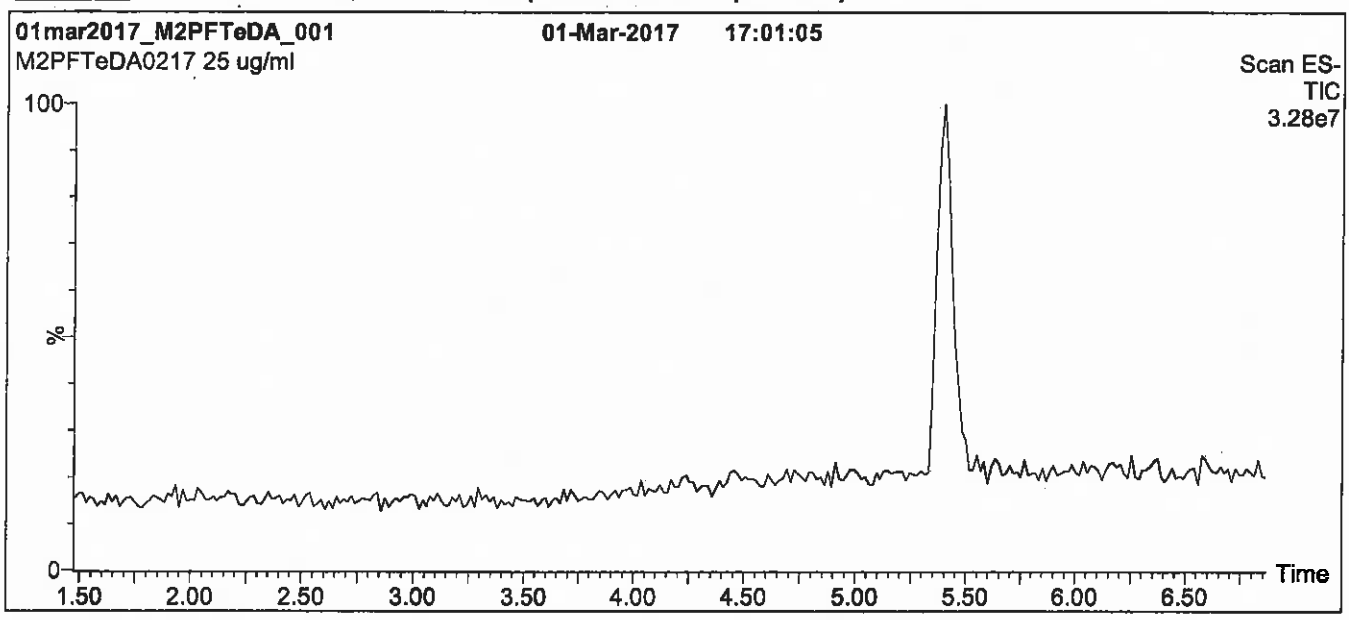
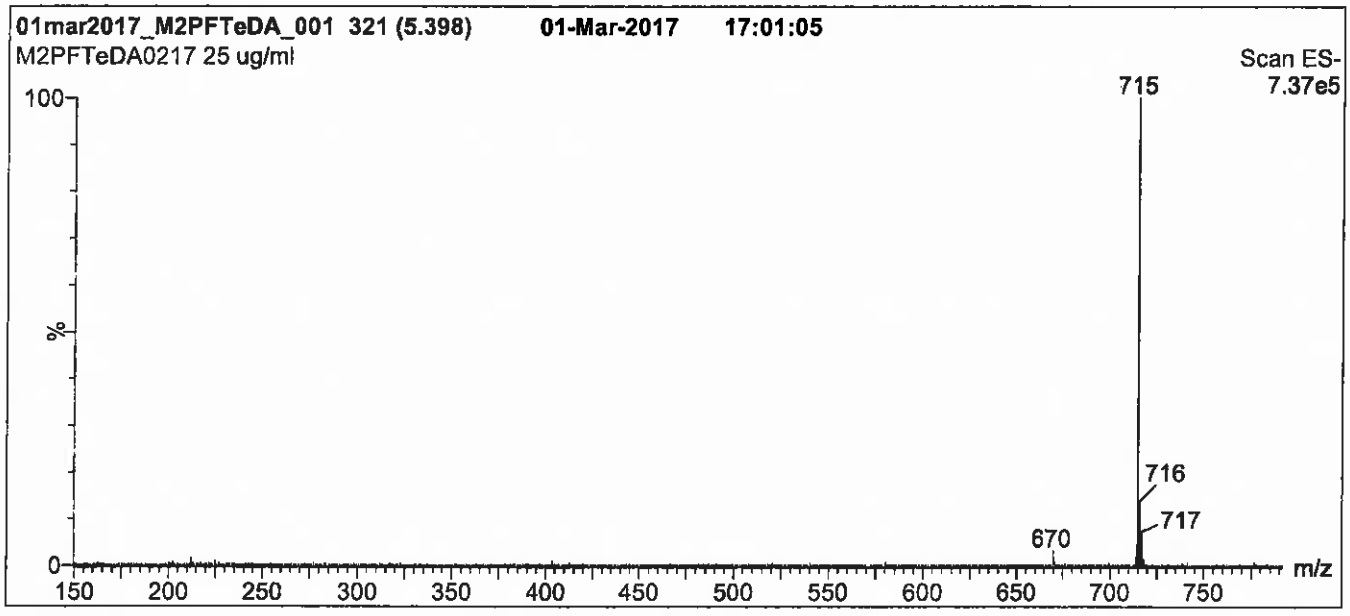
Figure 1: **M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

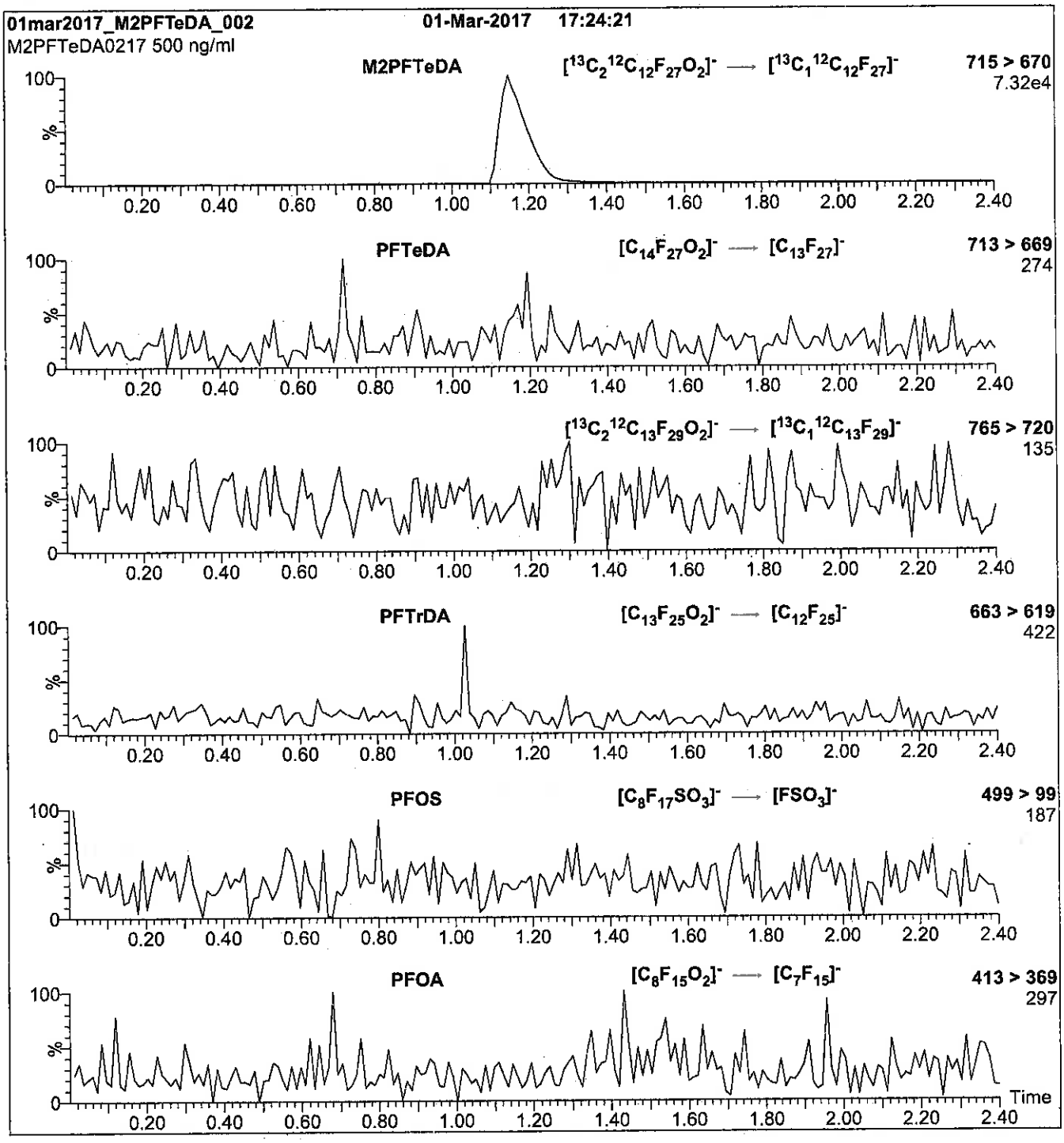
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 14

Reagent

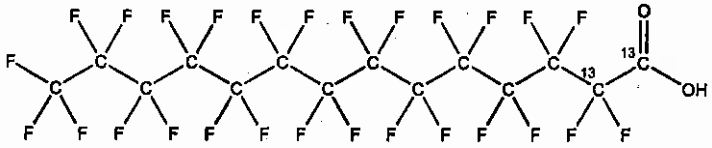
LCM2PFTeDA_00010

r: 7/5/17 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	M2PFTeDA	**LOT NUMBER:**	M2PFTeDA0217
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid		
STRUCTURE:		**CAS #:**	Not available



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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

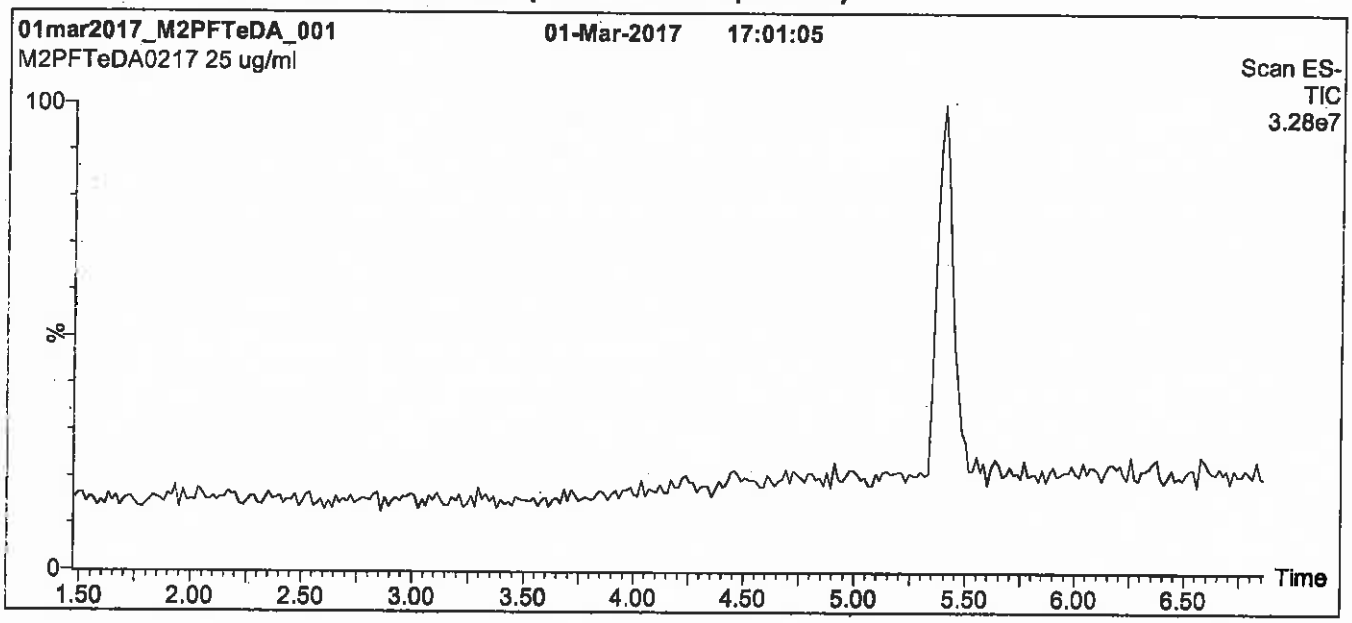
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

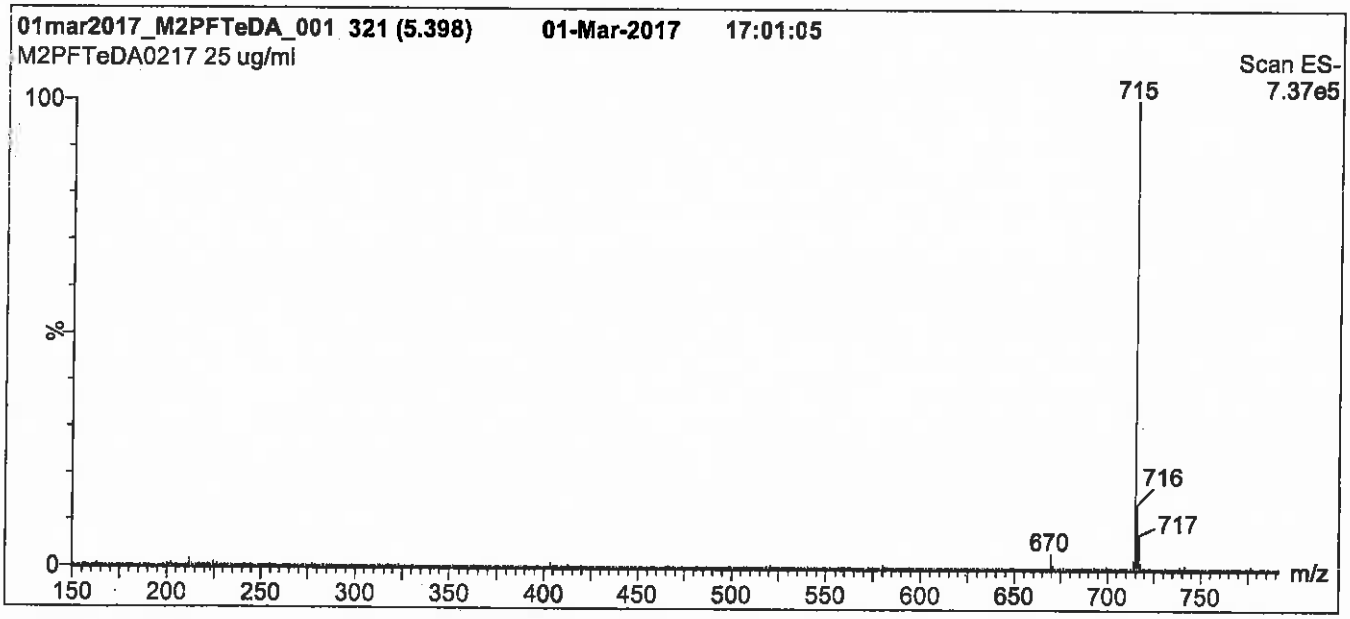
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

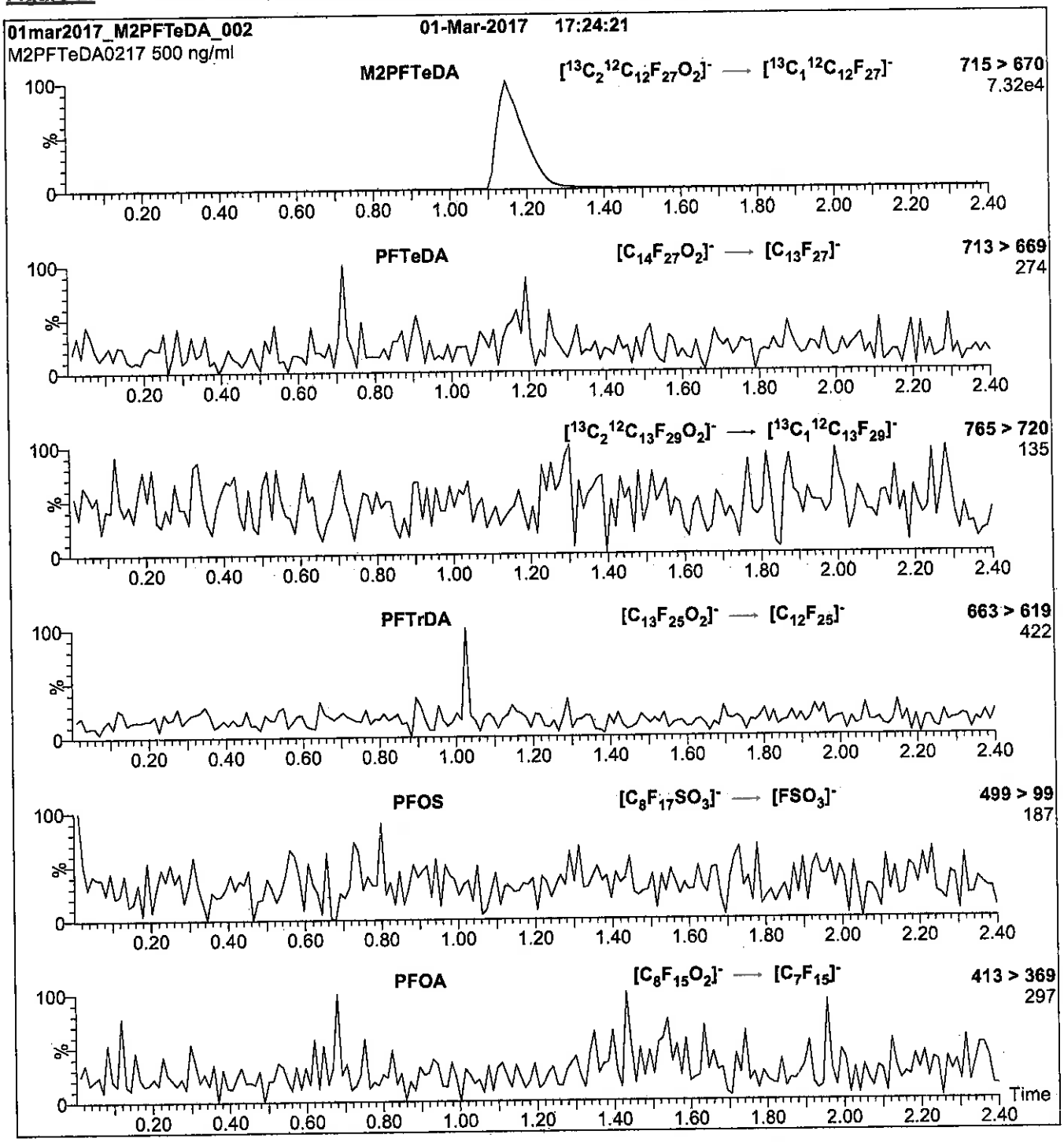
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 14

Reagent

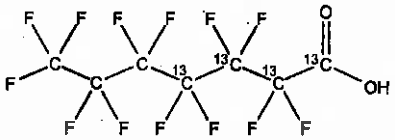
LCM4PFHPA_00009

r: 5/3/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M4PFHpA	**LOT NUMBER:**	M4PFHpA0516
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)	05/27/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/27/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/05/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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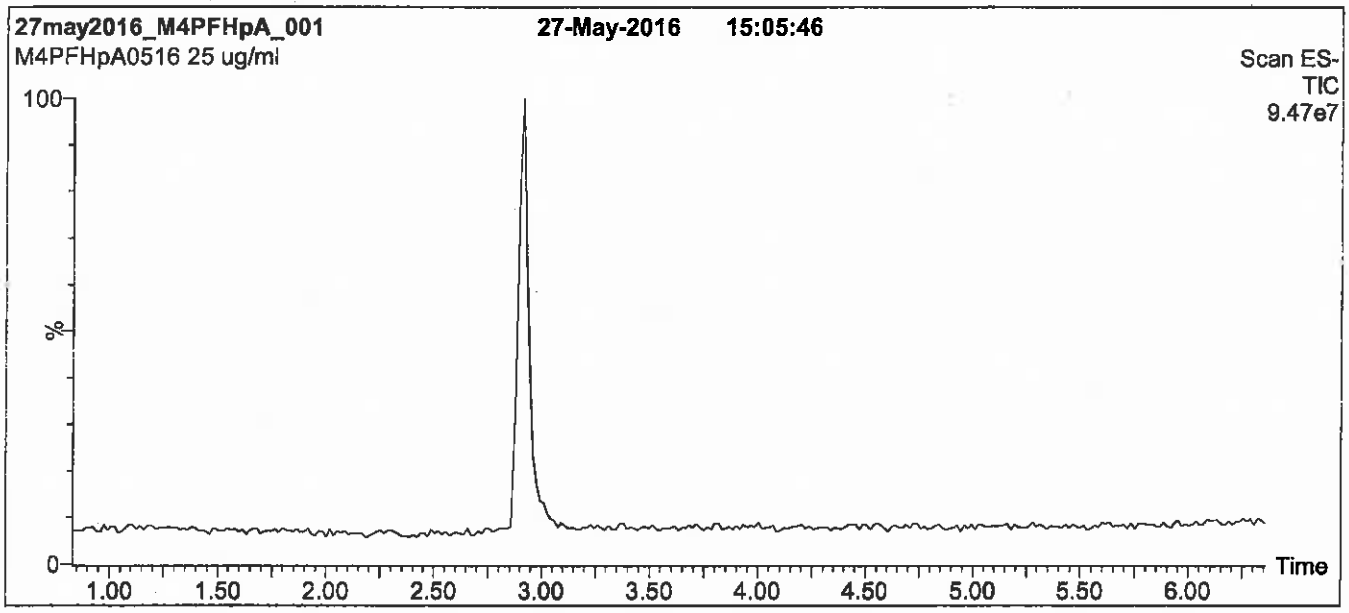
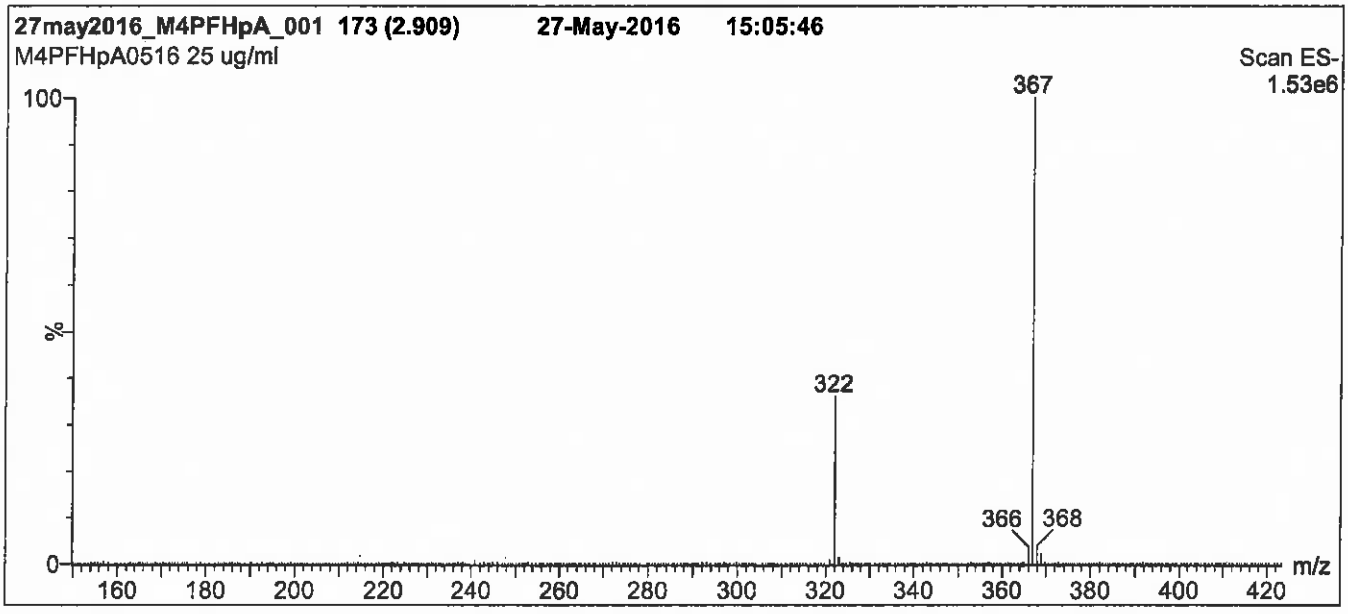
Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

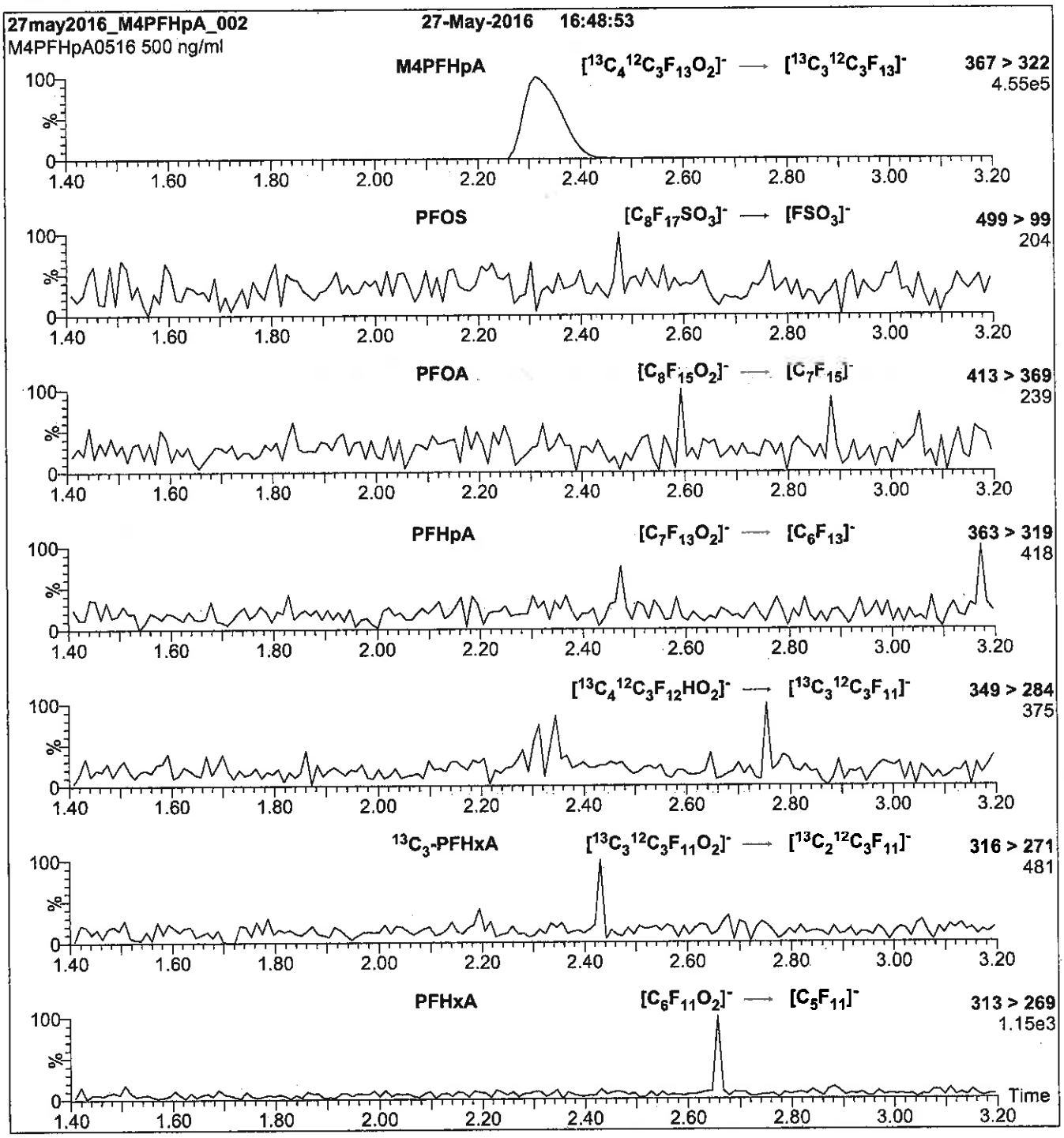
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM4PFHPA_00010

r: 71sh7 ﻟﻤﻮ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

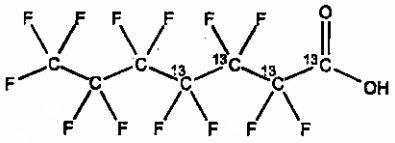
PRODUCT CODE: M4PFHpA

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

LOT NUMBER: M4PFHpA0517

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_3HF_{13}O_2$

CONCENTRATION: 50 ± 2.5 µg/ml

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 05/03/2017

EXPIRY DATE: (mm/dd/yyyy) 05/03/2022

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 368.03

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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim, General Manager

Date: 05/11/2017 (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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HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

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ANAB ACCREDITED

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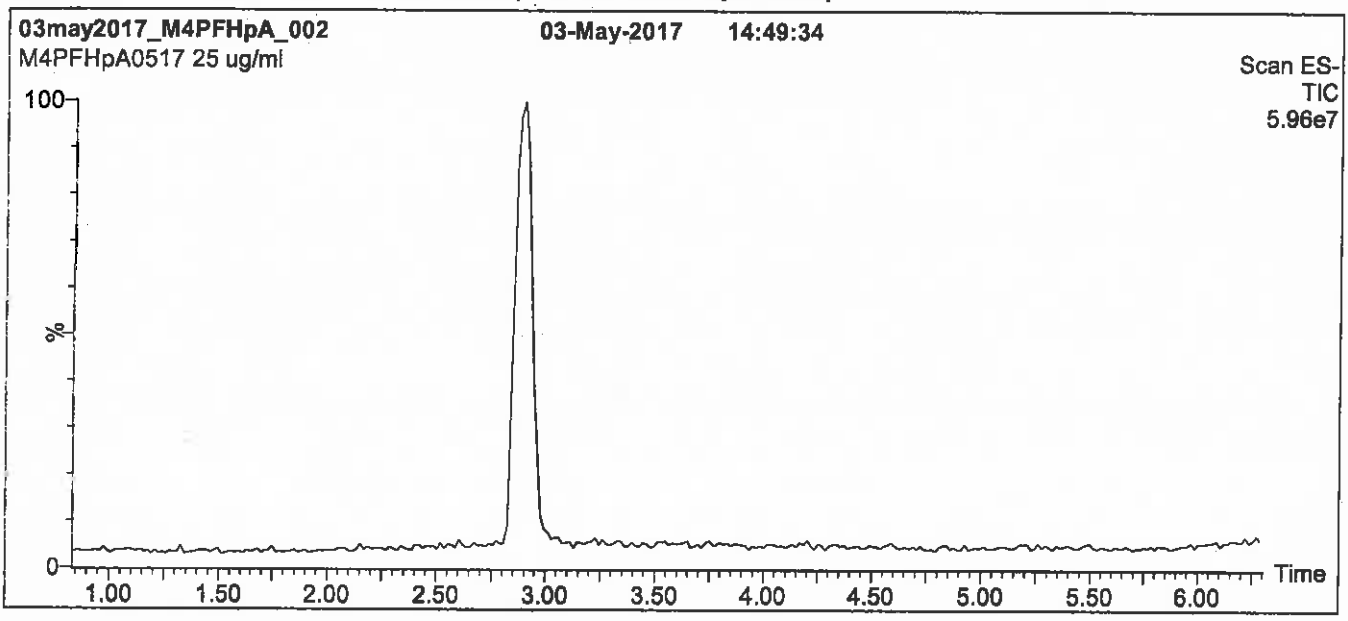
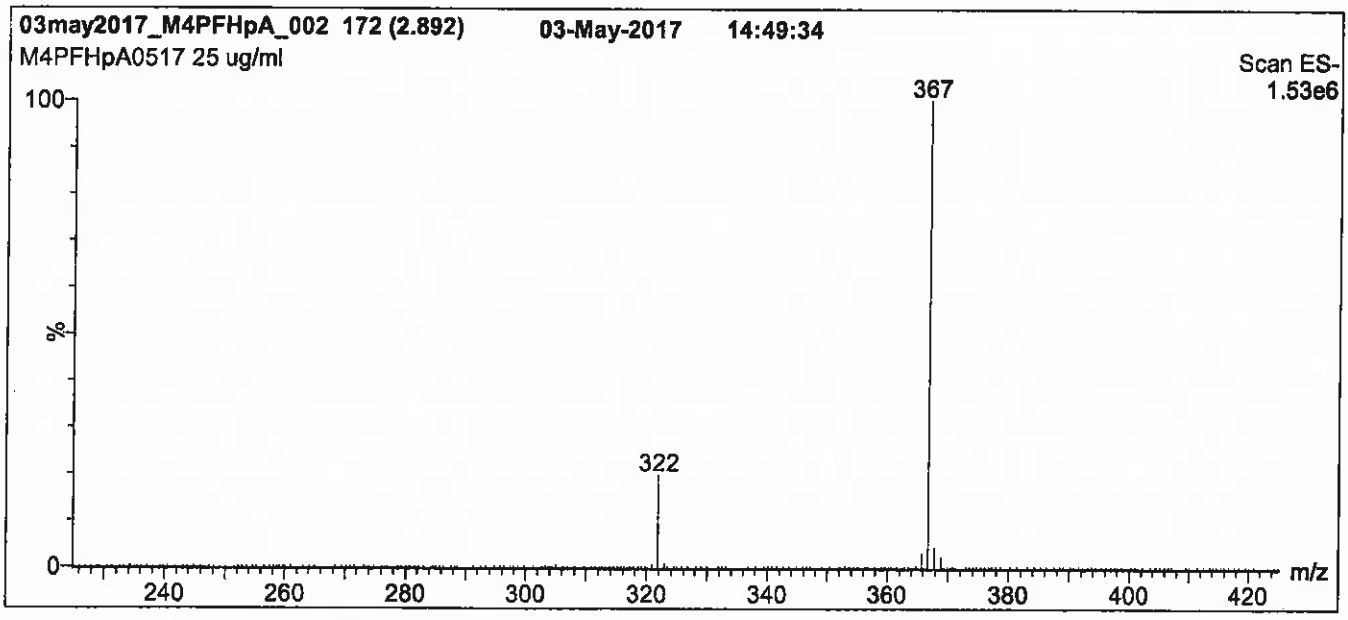
Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





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

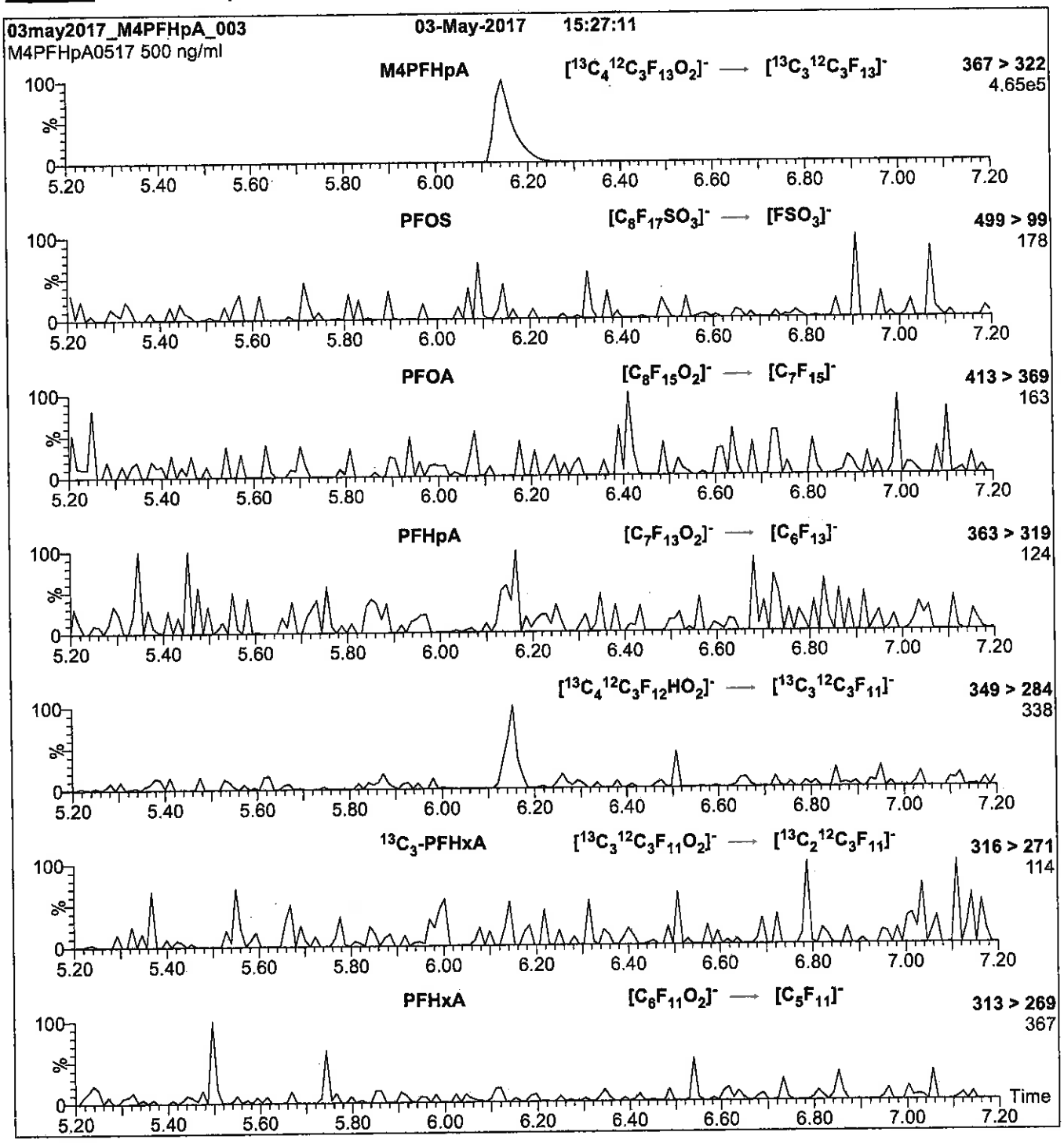
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 9

Reagent

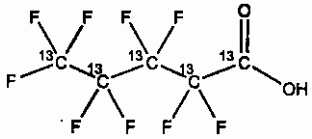
LCM5PFPEA_00010

r: 5/3/19 SV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	M5PFPeA	**LOT NUMBER:**	M5PFPeA1116
COMPOUND:	Perfluoro-n-[$^{13}C_5$]pentanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5HF_9O_2$	**MOLECULAR WEIGHT:**	269.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	11/22/2016		
EXPIRY DATE: (mm/dd/yyyy)	11/22/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/09/2016 (mm/dd/yyyy)

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

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ANAB ACCREDITED

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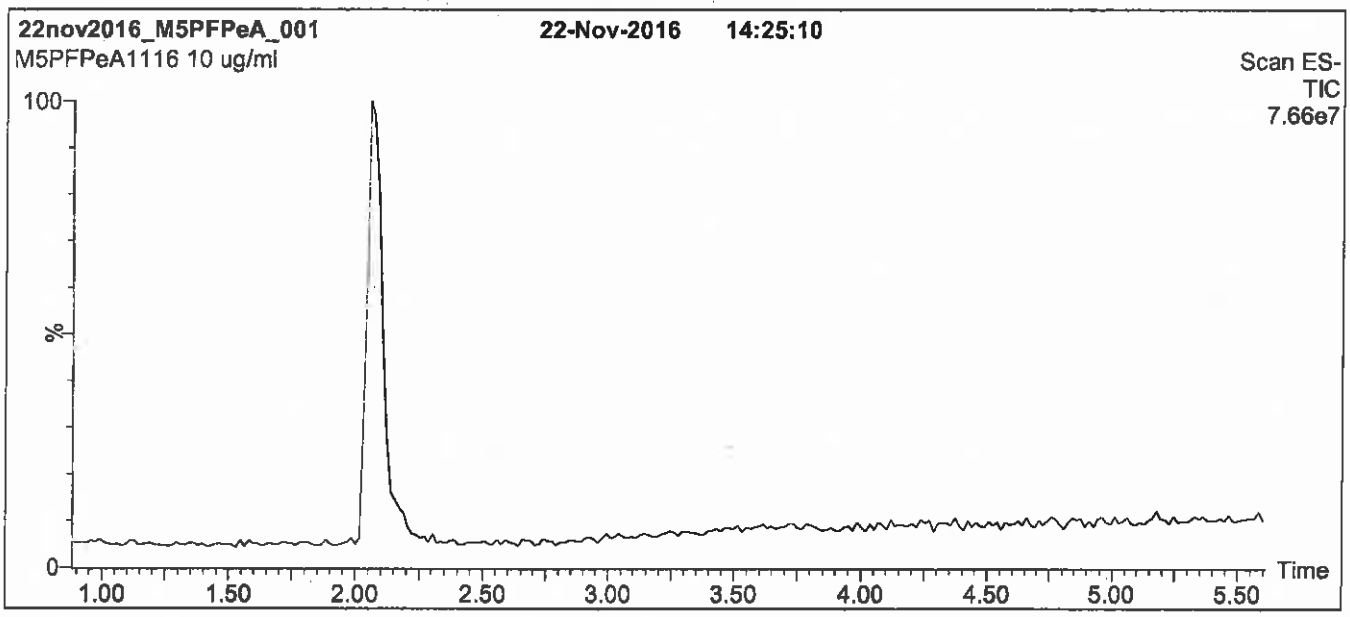
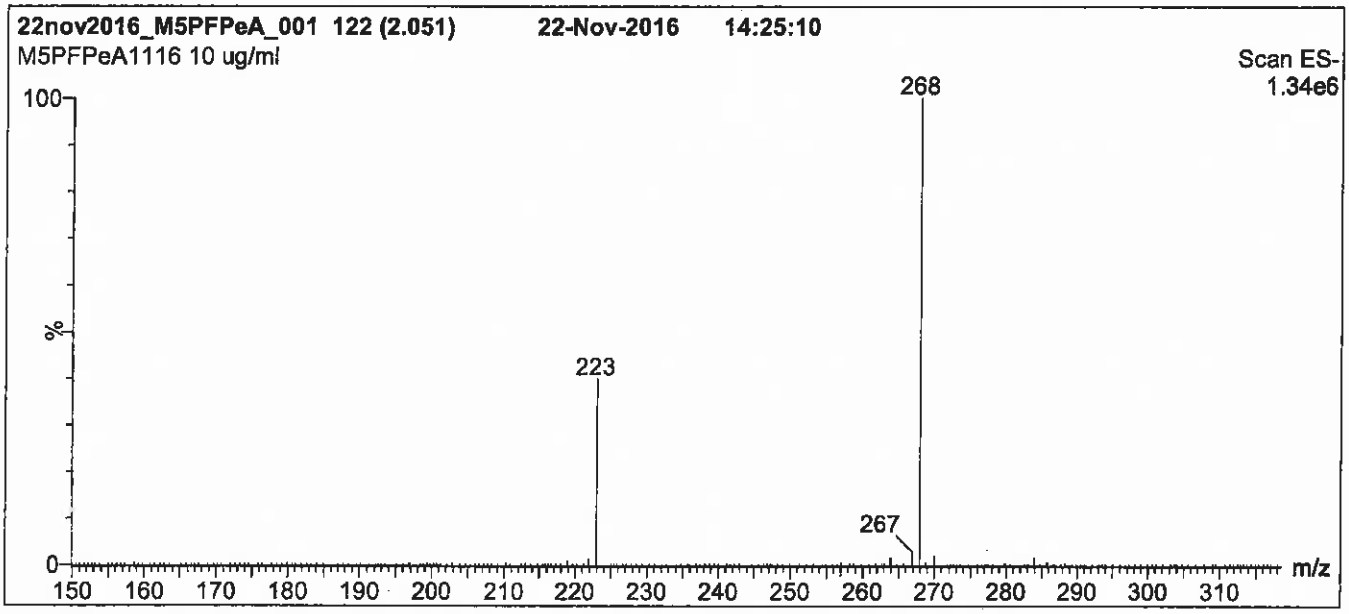
Figure 1: **M5PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

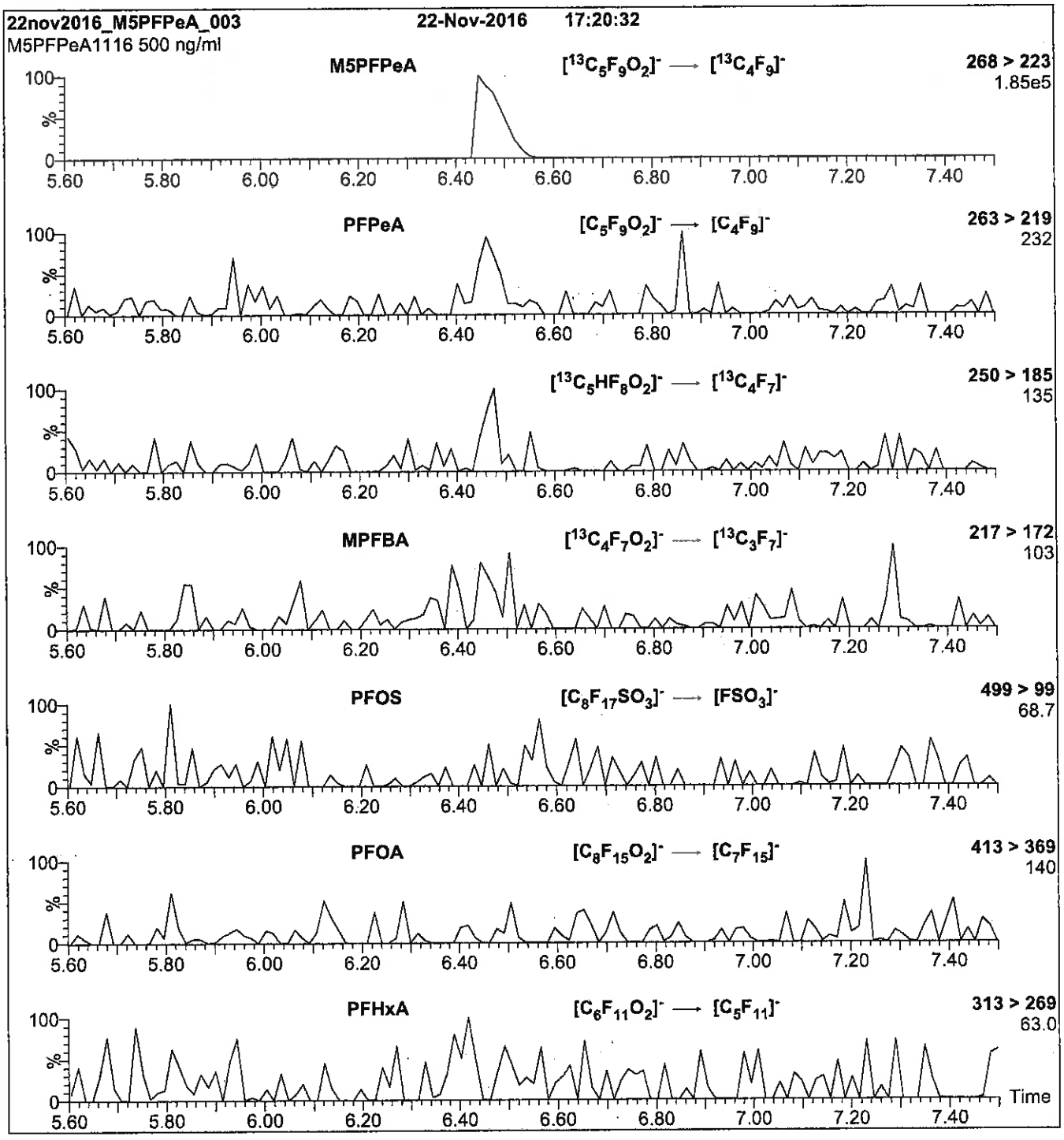
Flow: 300 µl/min

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) = 3.46e-3
Collision Energy (eV) = 9

Reagent

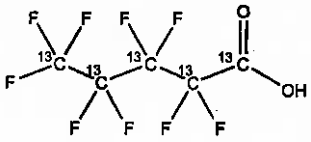
LCM5PFPEA_00011

P:7/5/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M5PFPeA	**LOT NUMBER:**	M5PFPeA1116
COMPOUND:	Perfluoro-n-[$^{13}C_5$]pentanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_6HF_9O_2$	**MOLECULAR WEIGHT:**	269.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_6$)
LAST TESTED: (mm/dd/yyyy)	11/22/2016		
EXPIRY DATE: (mm/dd/yyyy)	11/22/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/09/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

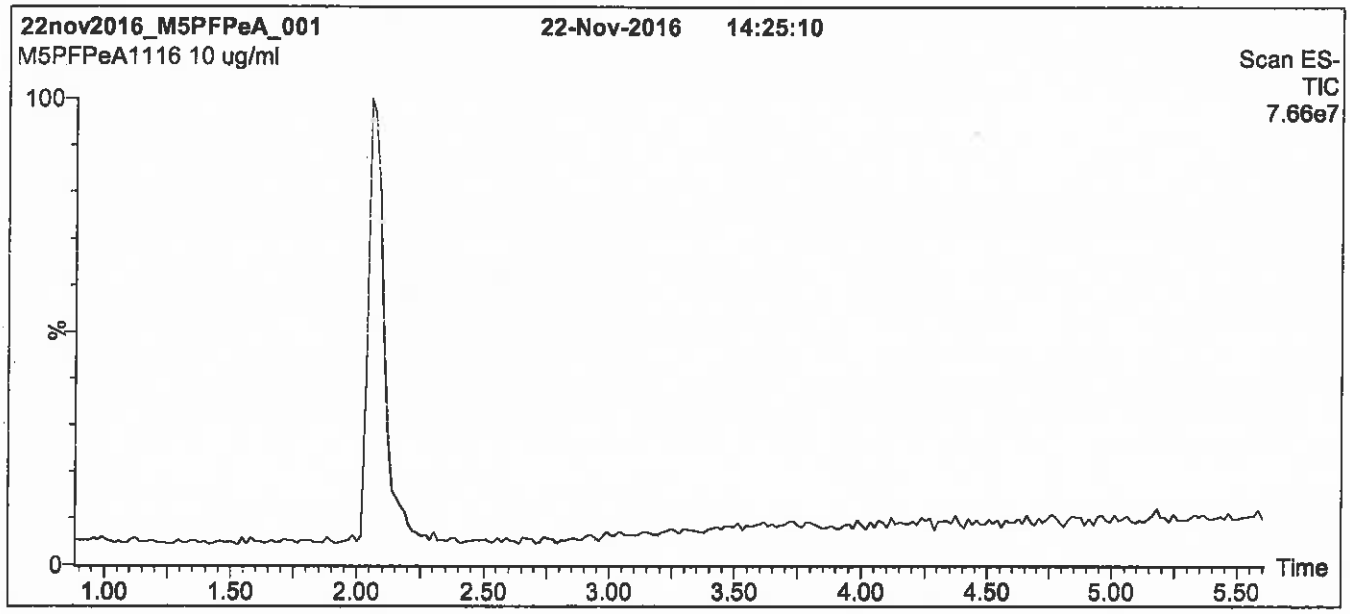
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

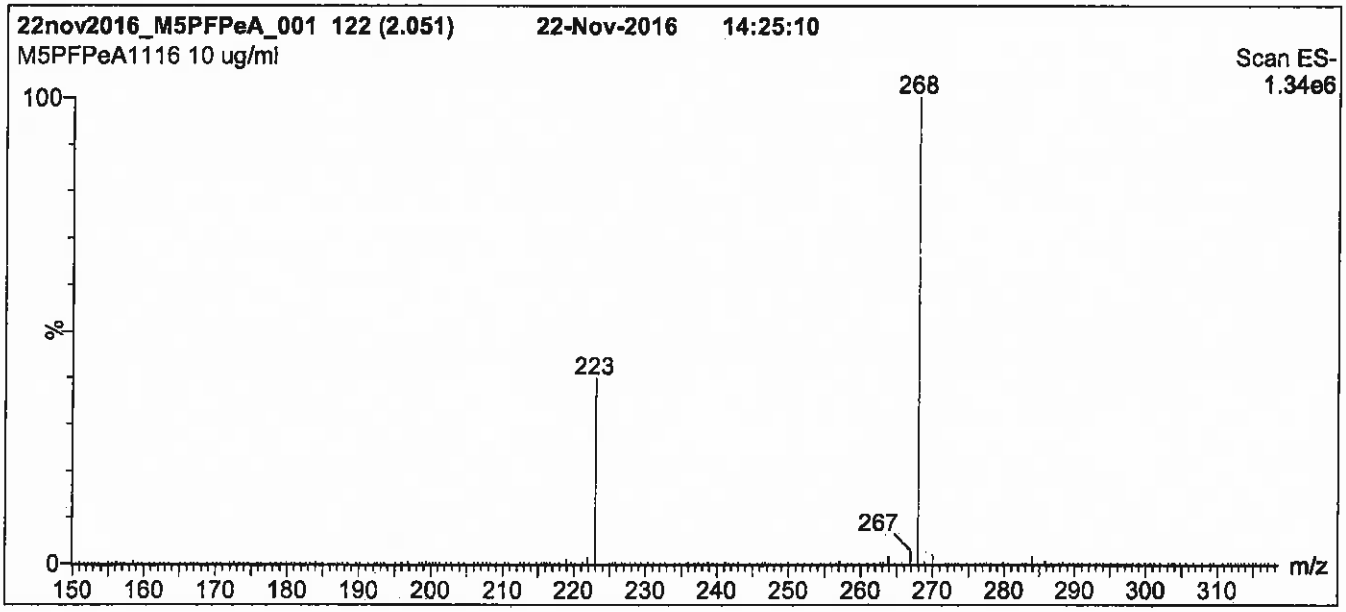
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

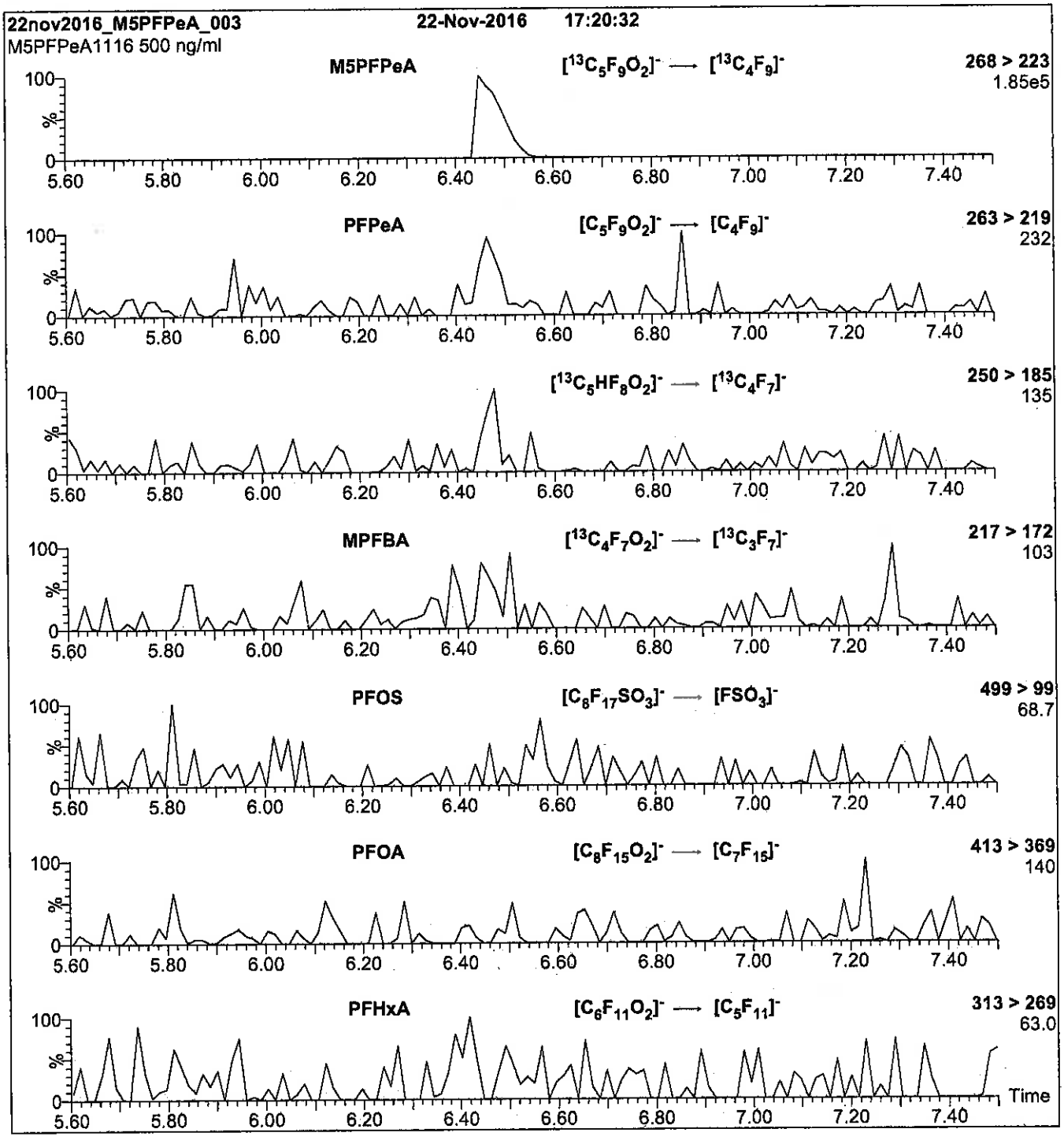
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M5PFPeA)

Mobile phase: Isocratic 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) = 9

Reagent

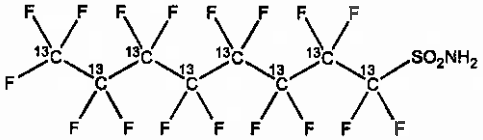
LCM8FOSA_00013

r: 5/3/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	M8FOSA-I	**LOT NUMBER:**	M8FOSA1215I
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):**	Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	12/22/2015		
EXPIRY DATE: (mm/dd/yyyy)	12/22/2020		
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:** 12/13/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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CALA

ANAB ACCREDITED

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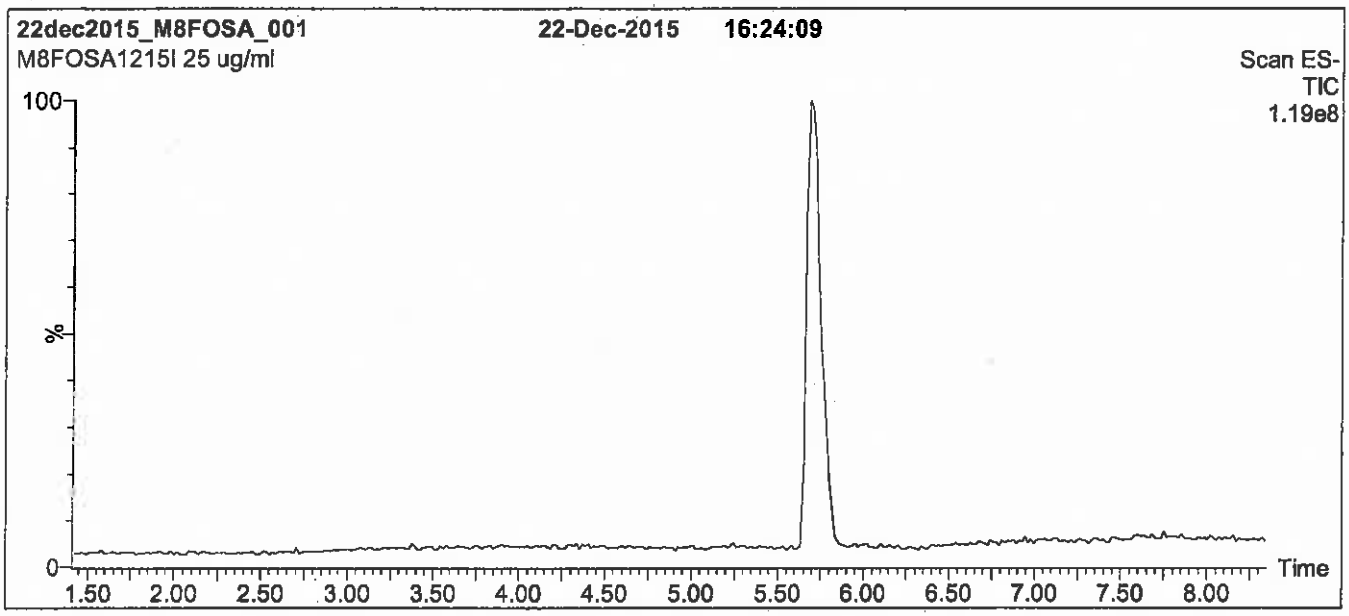
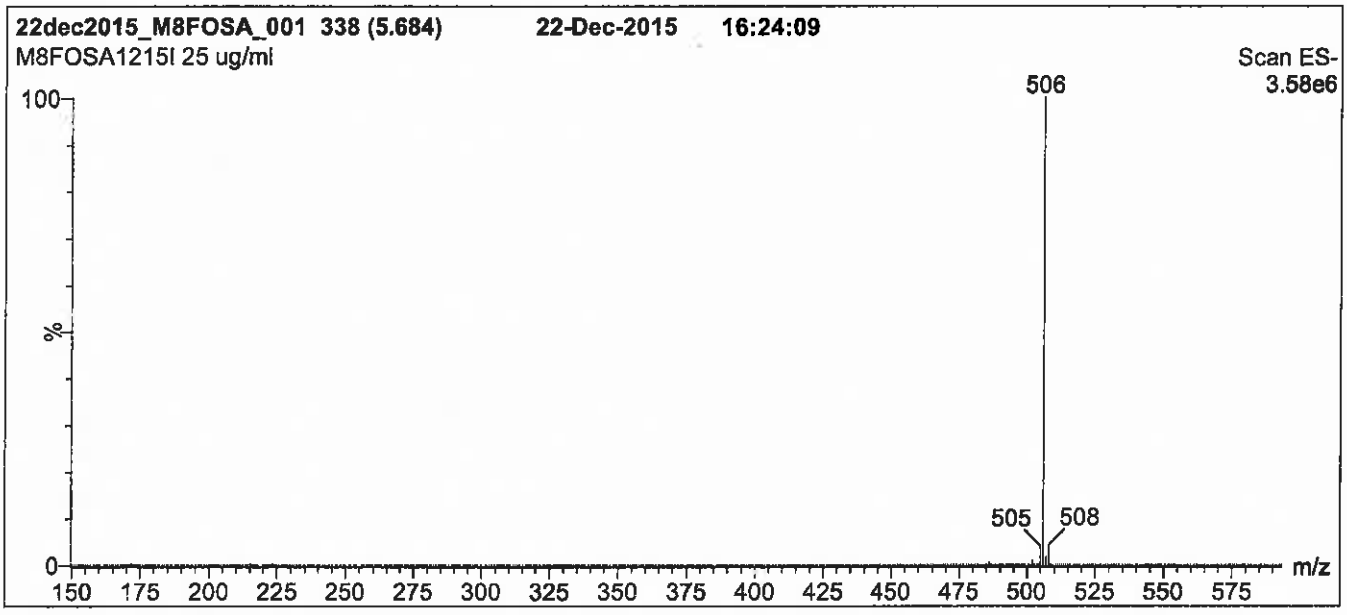
Figure 1: **M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

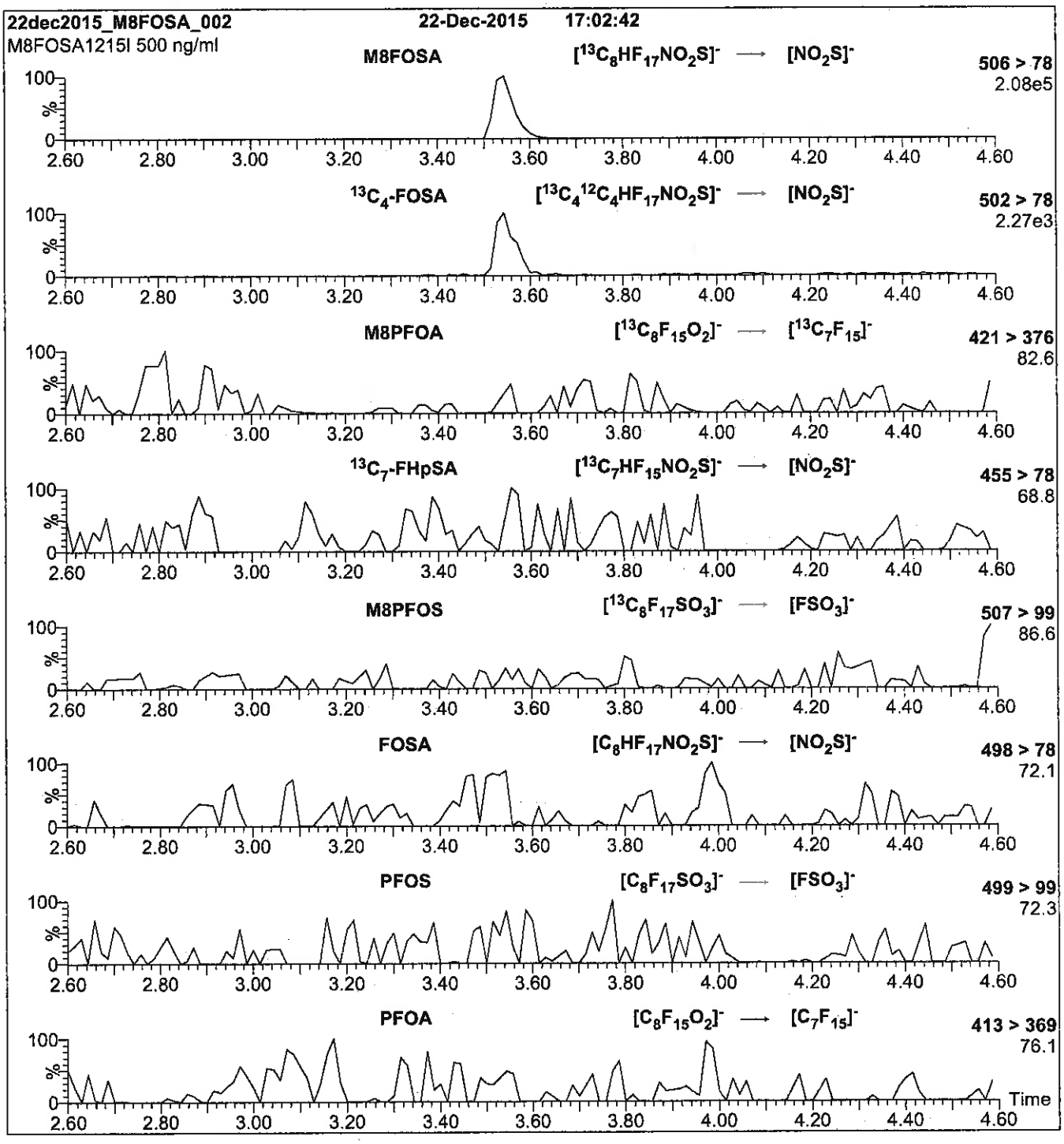
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

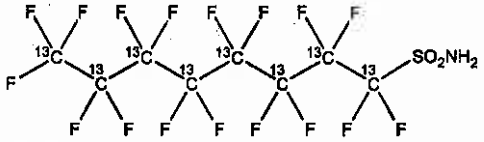
LCM8FOSA_00014

P: 7/5/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	M8FOSA-I	**LOT NUMBER:**	M8FOSA0417I
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):**	Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	04/20/2017		
EXPIRY DATE: (mm/dd/yyyy)	04/20/2022		
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.
- Contains ~ 1.1% of perfluoro-1-[$^{13}C_4$]octanesulfonamide and ~ 0.01% of perfluoro-1-[$^{13}C_7$]heptanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/04/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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UNCERTAINTY:

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

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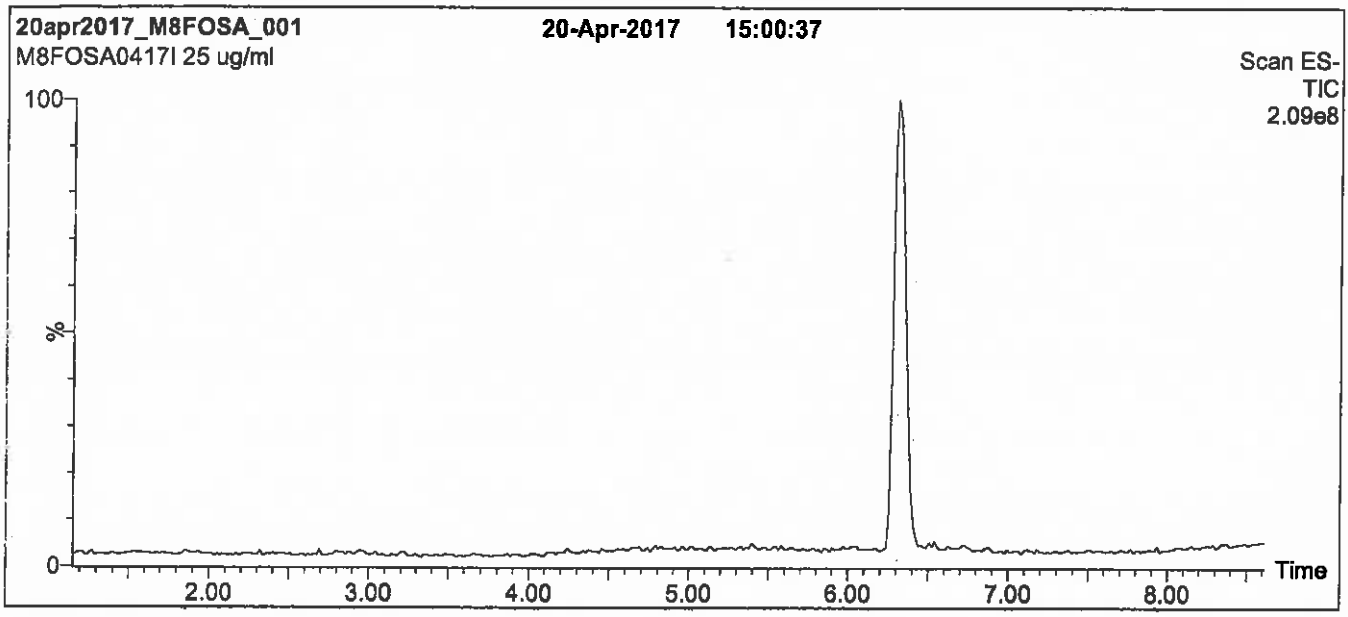
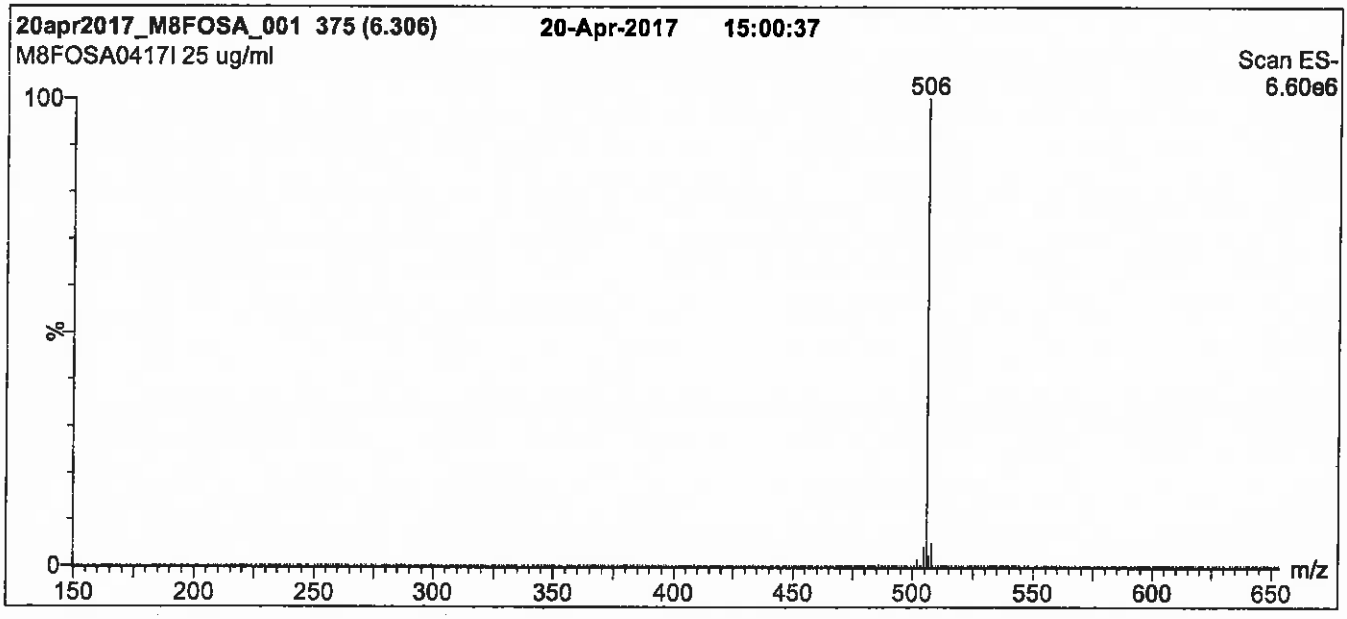
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

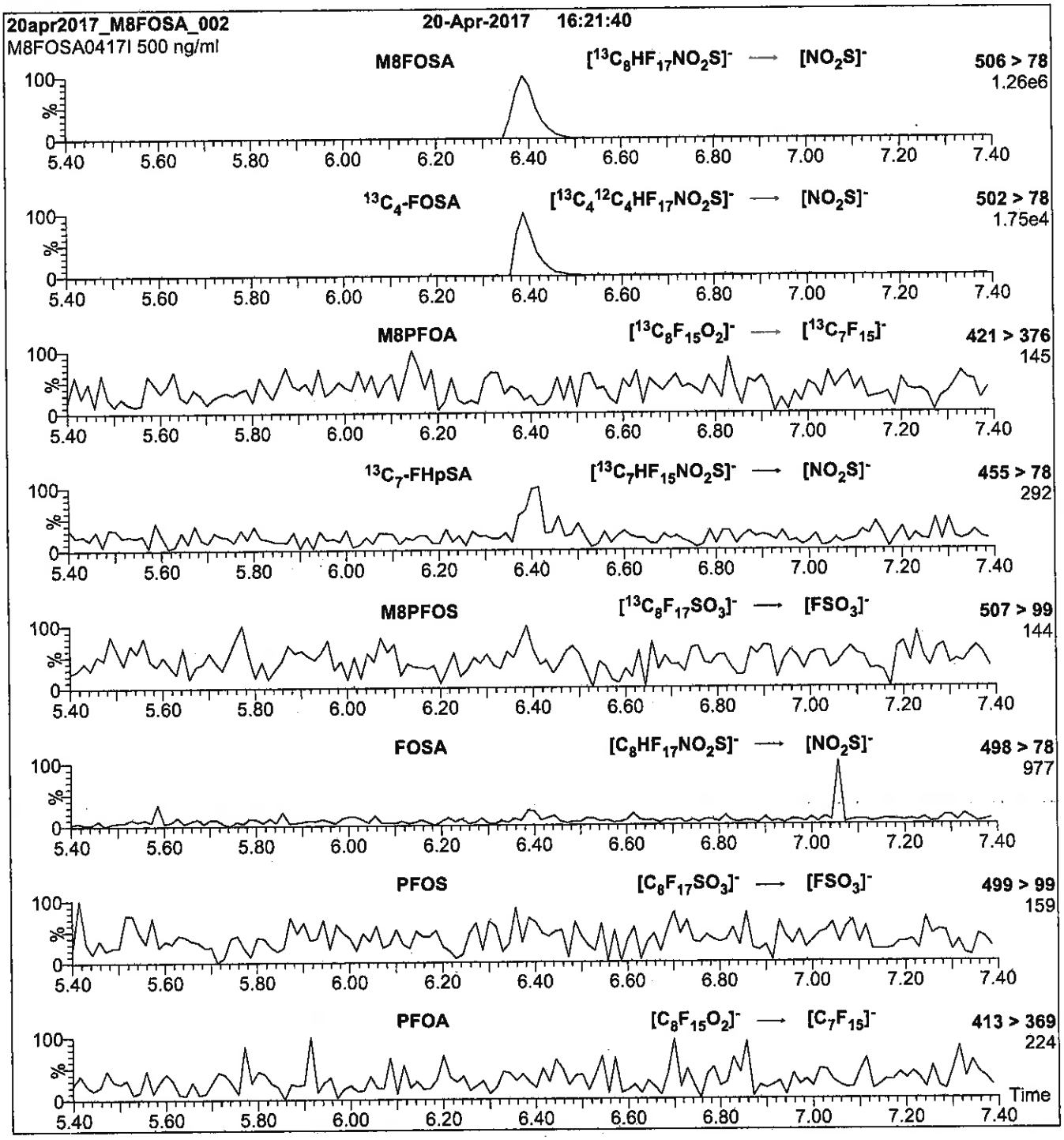
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 30

Reagent

LCMPFBA_00010

P: 5/3/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

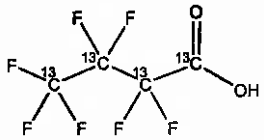
PRODUCT CODE: MPFBA

LOT NUMBER: MPFBA0516

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

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4HF_7O_2$

MOLECULAR WEIGHT: 218.01

CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%

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

LAST TESTED: (mm/dd/yyyy) 05/24/2016

EXPIRY DATE: (mm/dd/yyyy) 05/24/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/30/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED

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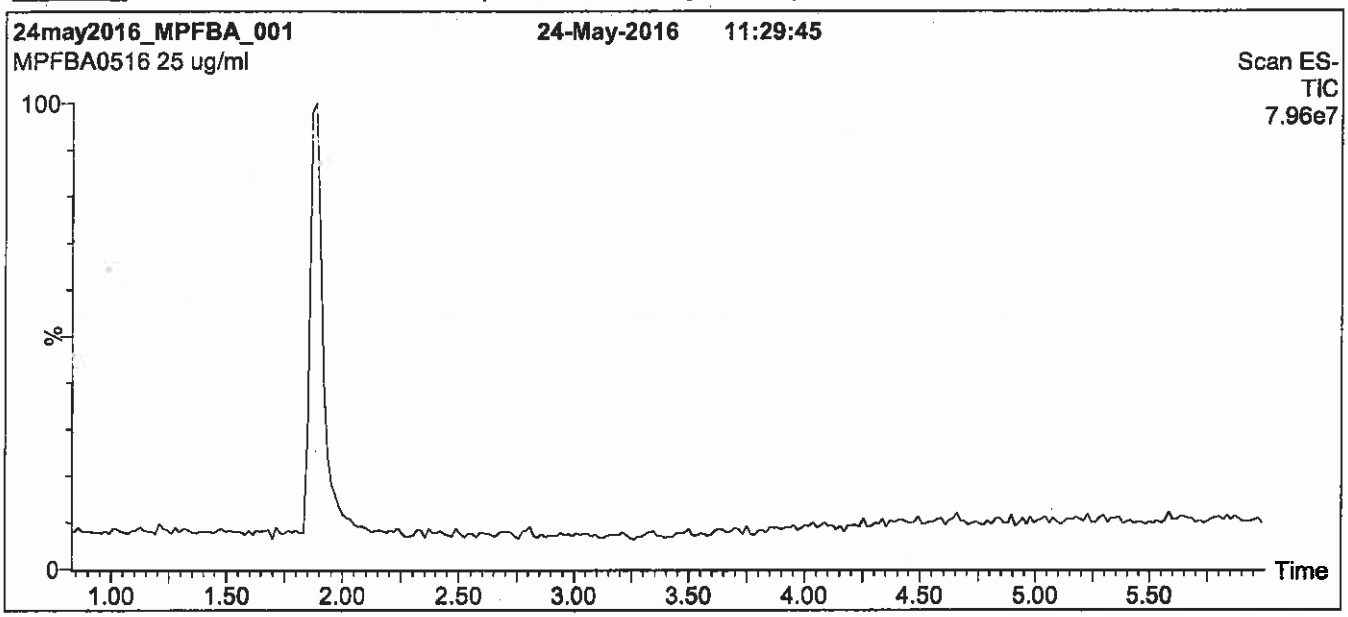
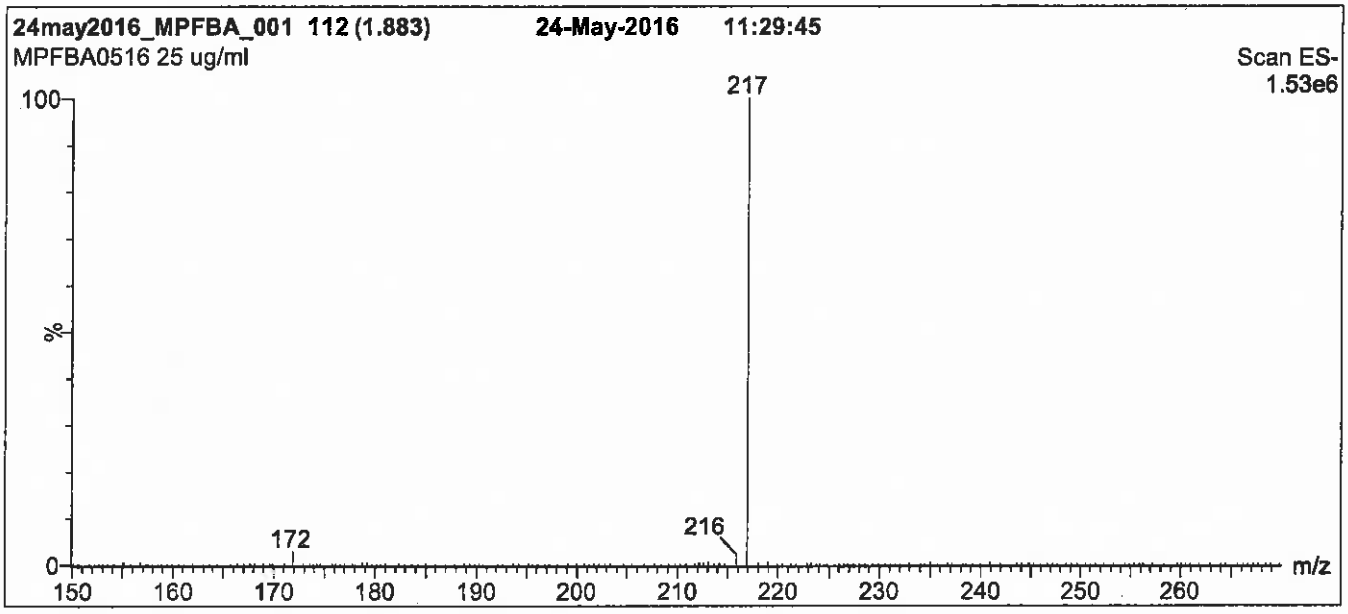
Figure 1: **MPFBA; LC/MS Data (TIC and Mass Spectrum)**





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

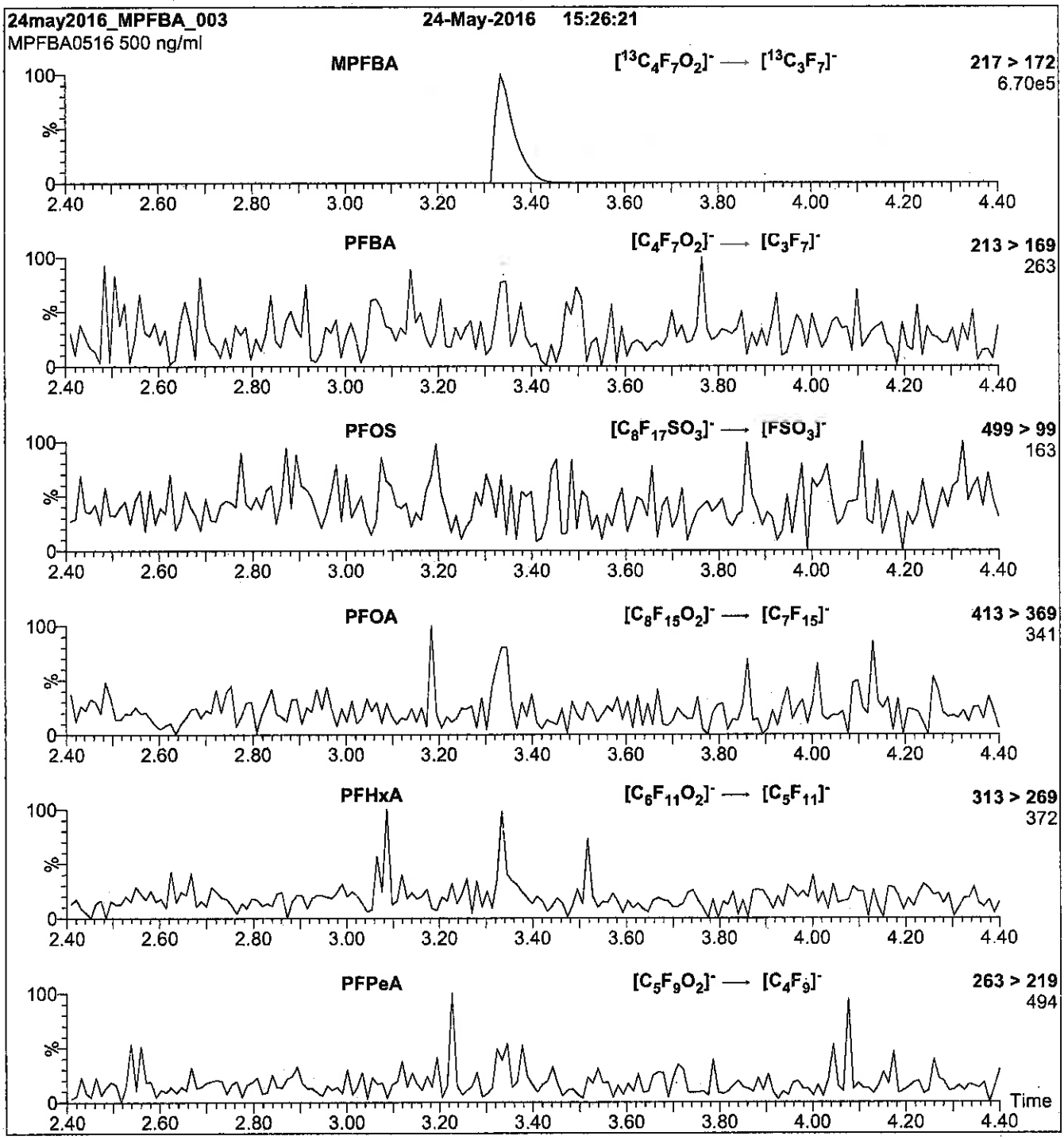
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 10

Reagent

LCMPFBA_00011

WELLINGTON LABORATORIES

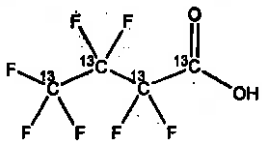
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFBA0417

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4HF_7O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/12/2017
EXPIRY DATE: (mm/dd/yyyy) 04/12/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/20/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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UNCERTAINTY:

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

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

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED Reference Material Producer

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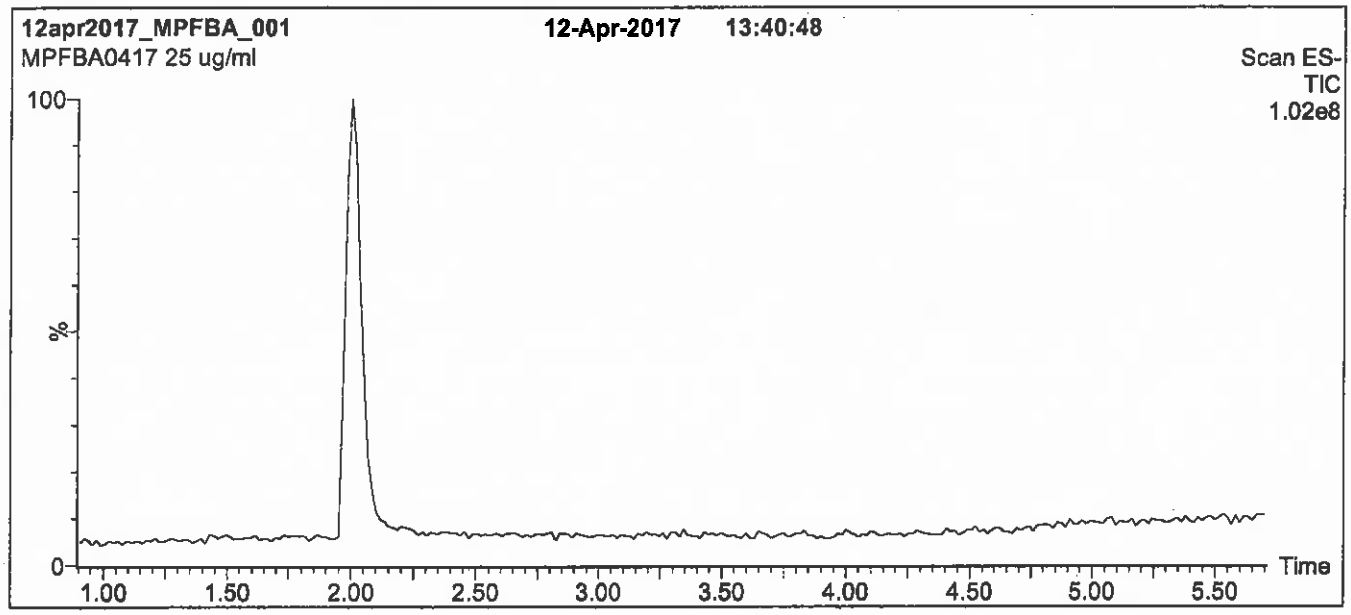
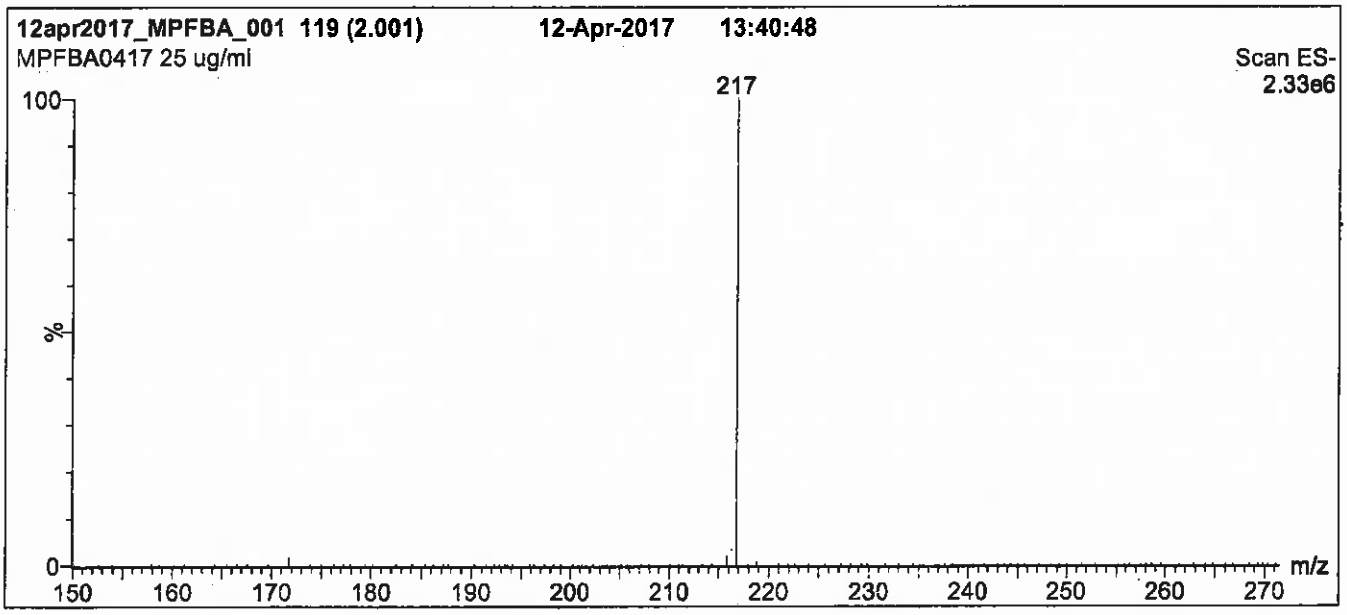




Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% 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

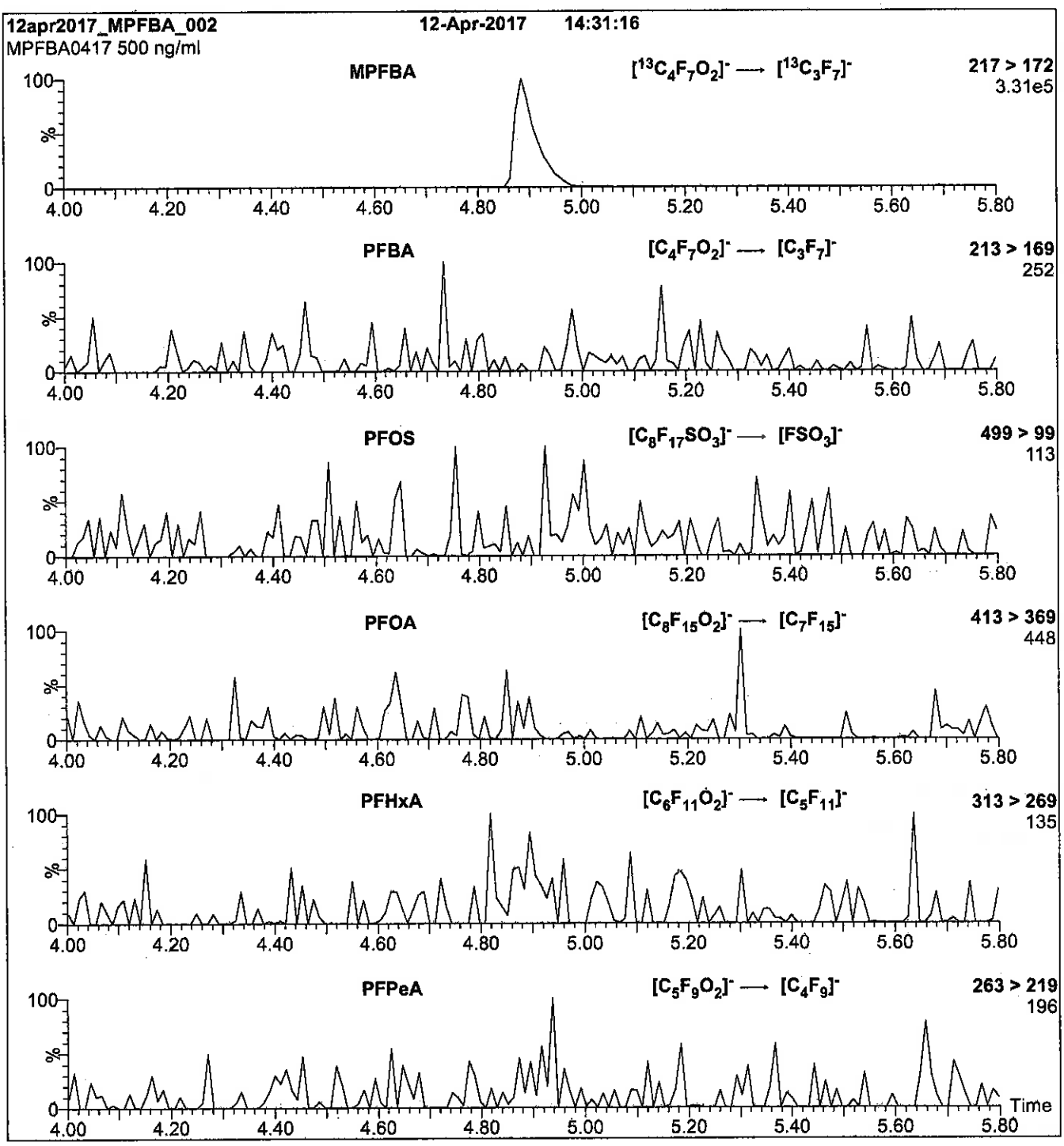
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

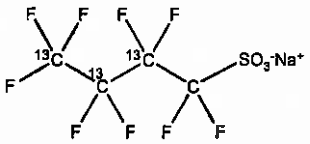
LCMPFBS_00003

r. 5/3/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M3PFBS	**LOT NUMBER:**	M3PFBS0815
COMPOUND:	Sodium perfluoro-1-[2,3,4-$^{13}C_3$]butanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_3{}^{12}CF_9SO_3Na$	**MOLECULAR WEIGHT:**	325.06
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 46.5 ± 2.3 µg/ml (M3PFBS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($2,3,4\text{-}^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	08/02/2016		
EXPIRY DATE: (mm/dd/yyyy)	08/02/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 08/05/2016 (mm/dd/yyyy)

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

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CALA

ANAB ACCREDITED

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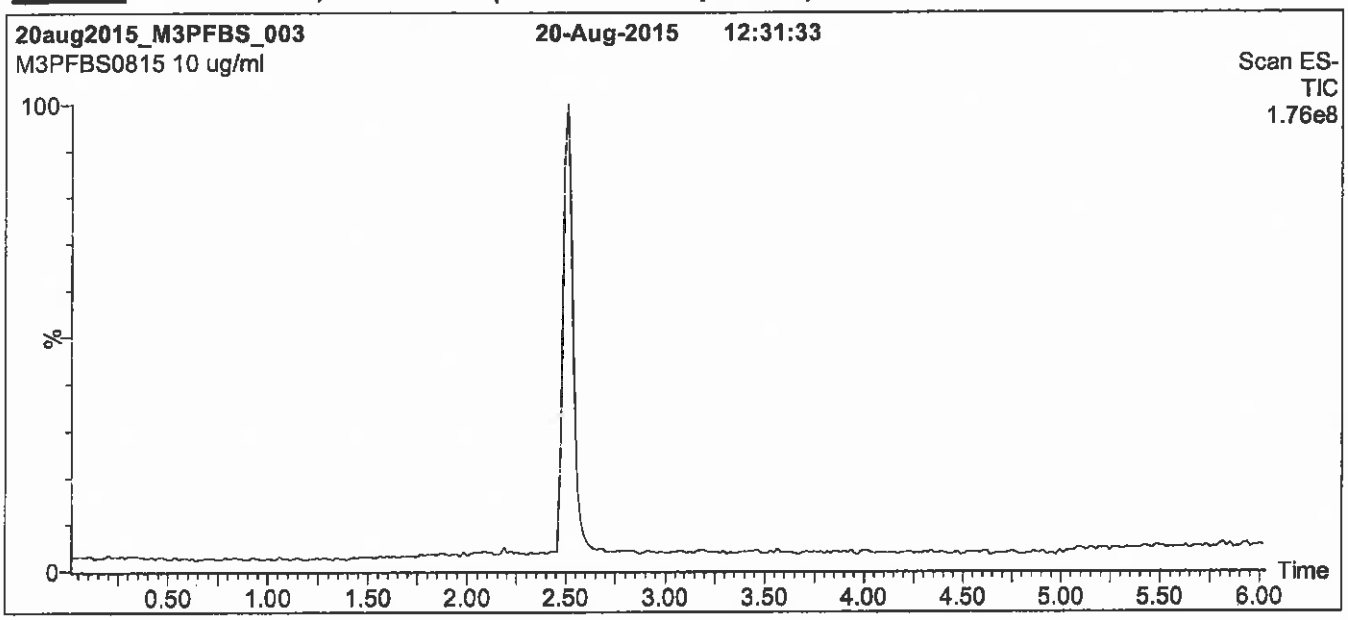
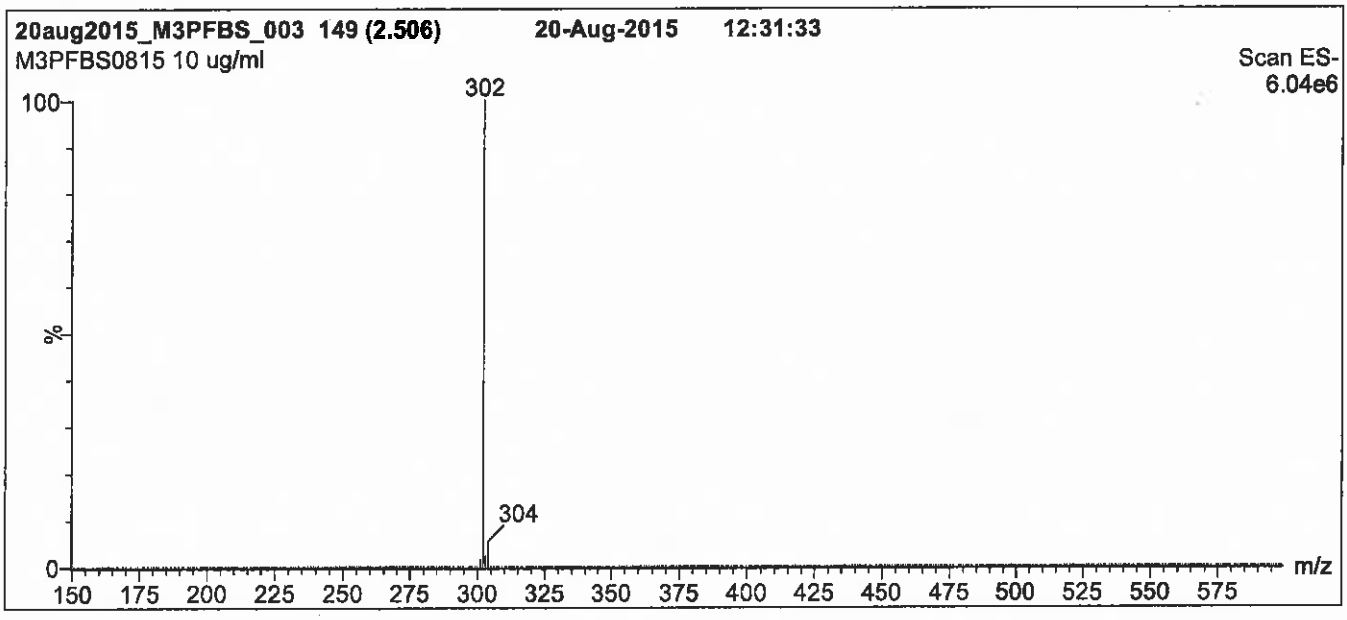
Figure 1: **M3PFBS; LC/MS Data (TIC and Mass Spectrum)**





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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

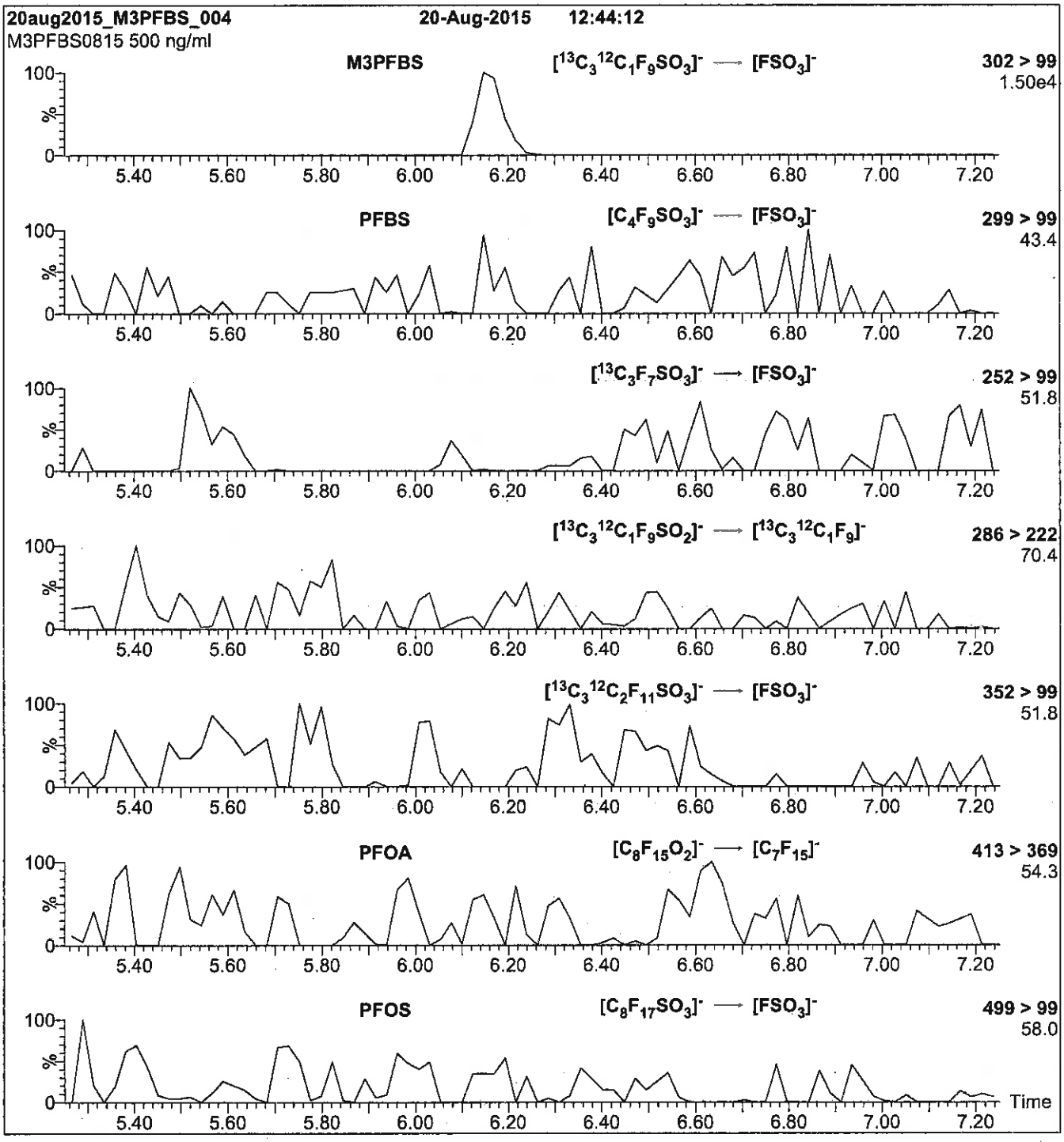
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Figure 2: **M3PFBS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M3PFBS)

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) = 25

Reagent

LCMPFBS_00004

r: 7/5/17 SN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

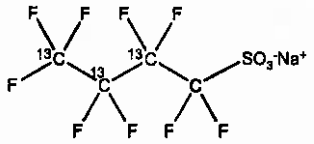
PRODUCT CODE: M3PFBS

LOT NUMBER: M3PFBS0815

COMPOUND: Sodium perfluoro-1-[2,3,4-$^{13}C_3$]butanesulfonate

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_3{}^{12}CF_9SO_3Na$

MOLECULAR WEIGHT: 325.06

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
46.5 ± 2.3 µg/ml (M3PFBS anion)

SOLVENT(S): Methanol

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ^{13}C (2,3,4-$^{13}C_3$)

LAST TESTED: (mm/dd/yyyy) 05/24/2017

EXPIRY DATE: (mm/dd/yyyy) 05/24/2022

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, General Manager

Date: 05/25/2017 (mm/dd/yyyy)

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

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

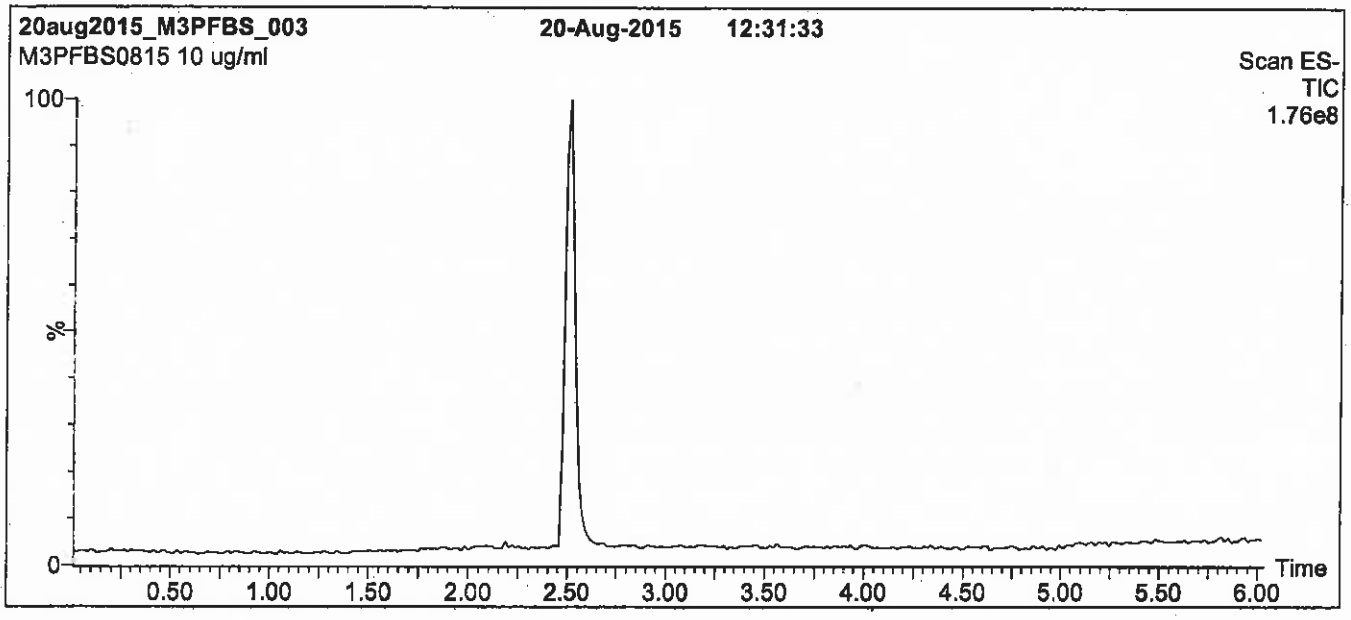
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

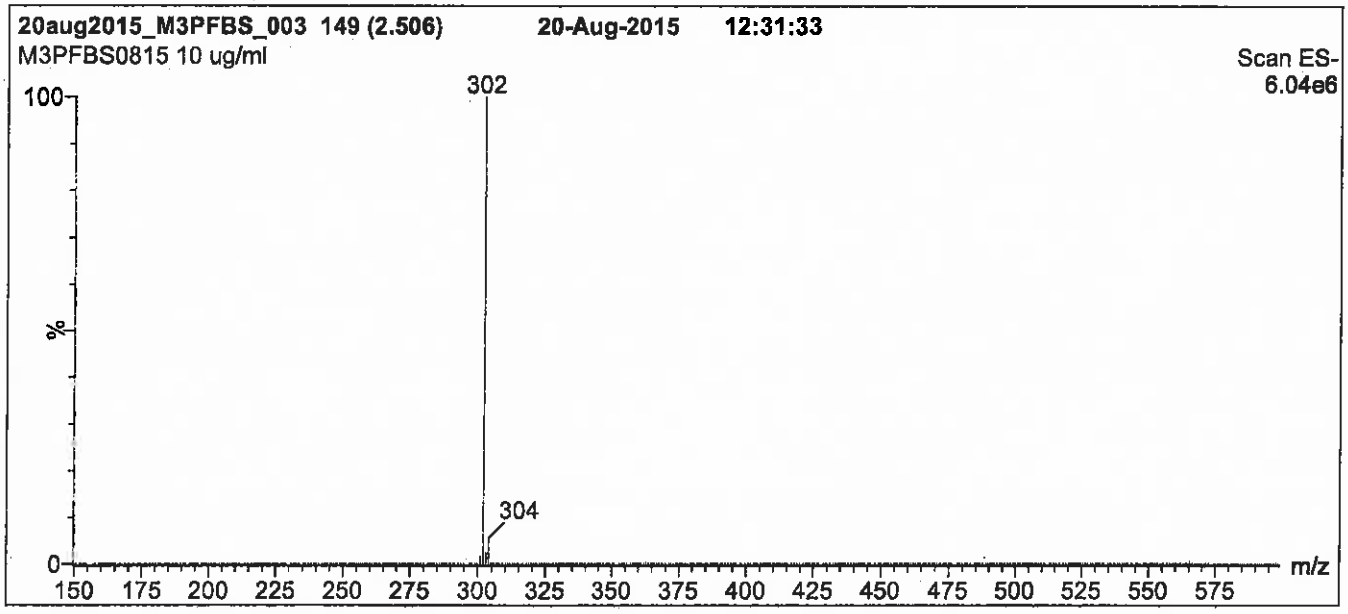
CALA

ANAB ACCREDITED 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: **M3PFBS; 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

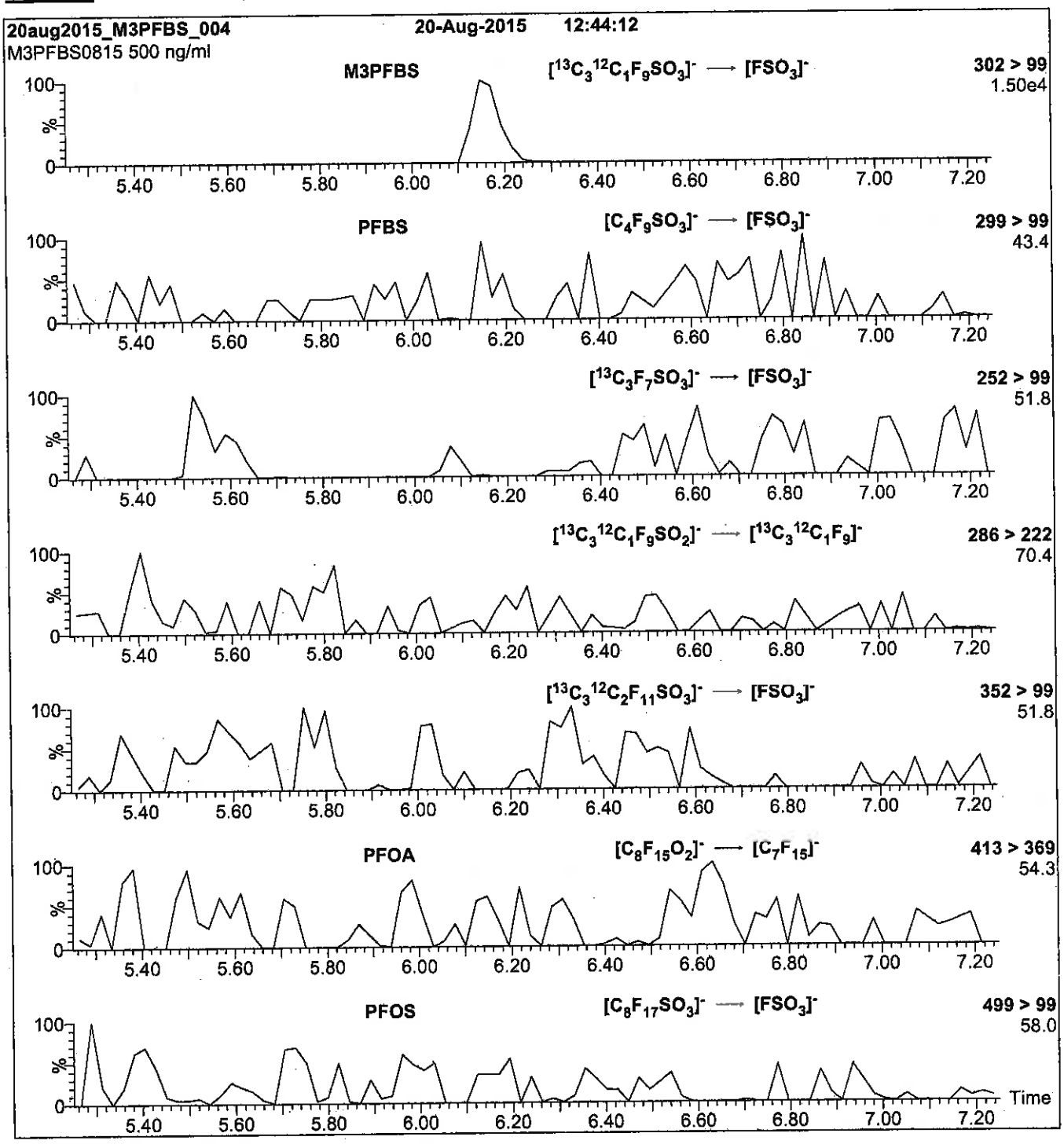
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Figure 2: **M3PFBS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M3PFBS)

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) = 25

Reagent

LCMPFDA_00015

P: 5/3/17-SKV
S: 5/8/17-SKV

WELLINGTON LABORATORIES

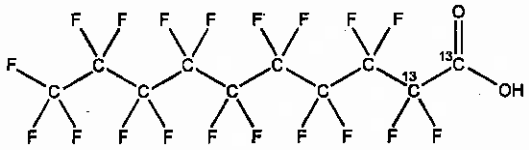
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFDA0916

STRUCTURE:

CAS #: Not available



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

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/30/2016
EXPIRY DATE: (mm/dd/yyyy) 09/30/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/07/2016 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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CALA

ANAB ACCREDITED

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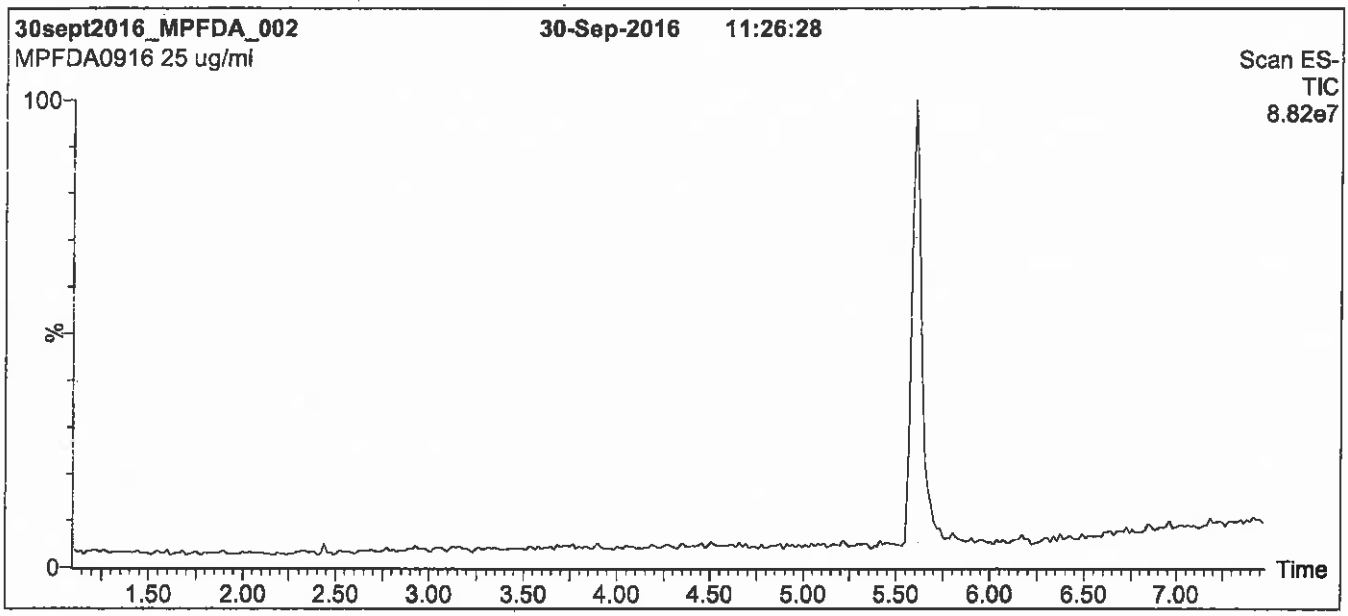
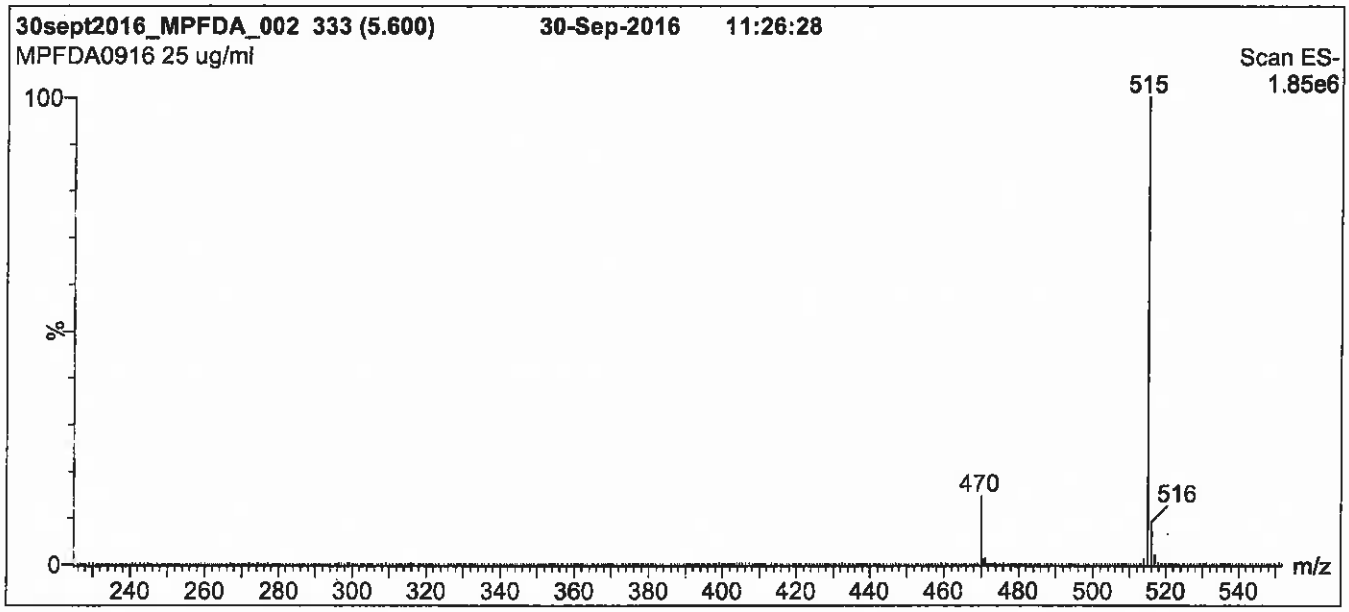




Conditions for Figure 1:

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

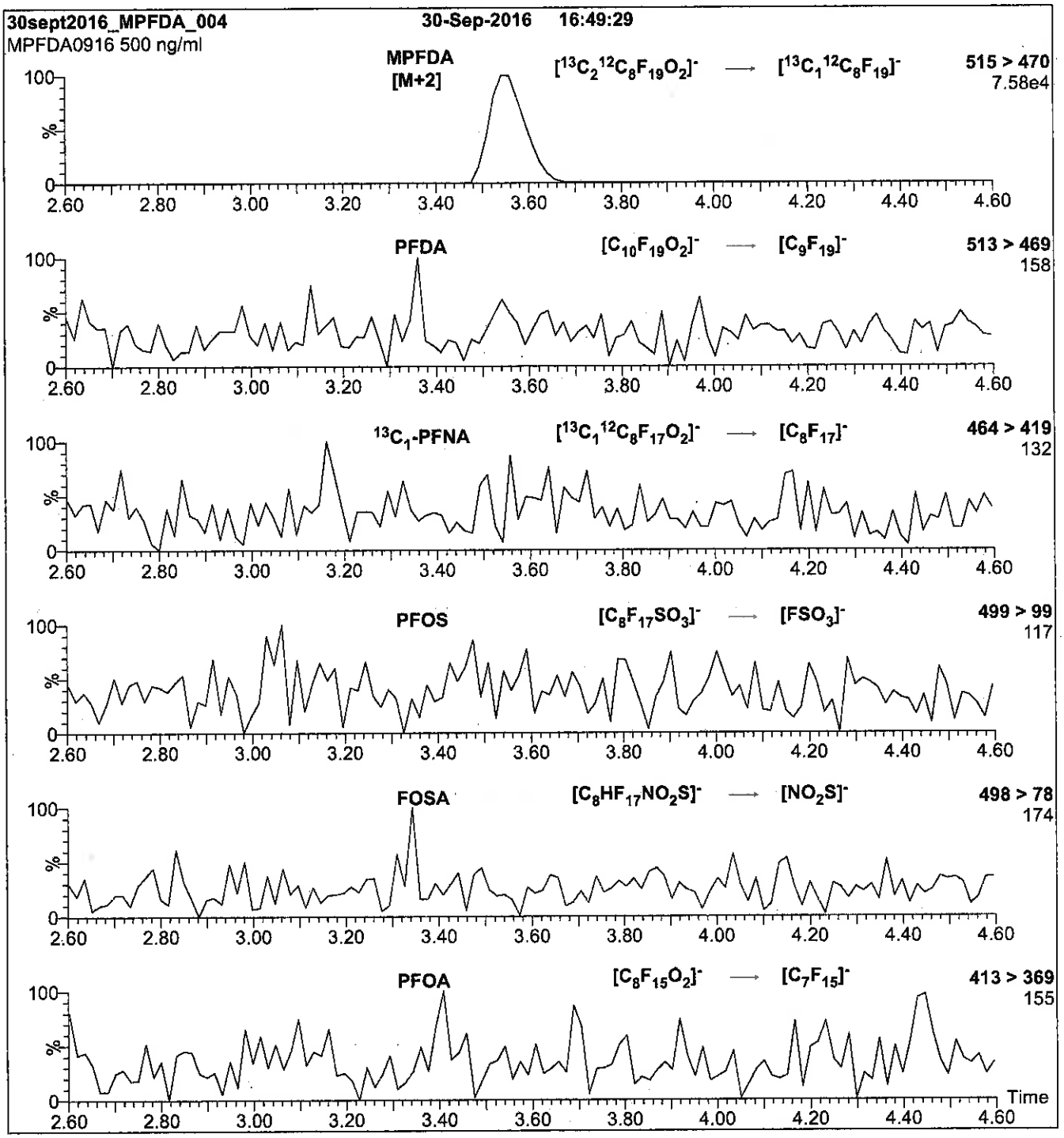
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFDA_00016

r: 7/5/17 SRV

WELLINGTON LABORATORIES

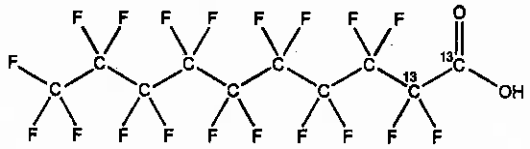
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFDA0916

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)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/07/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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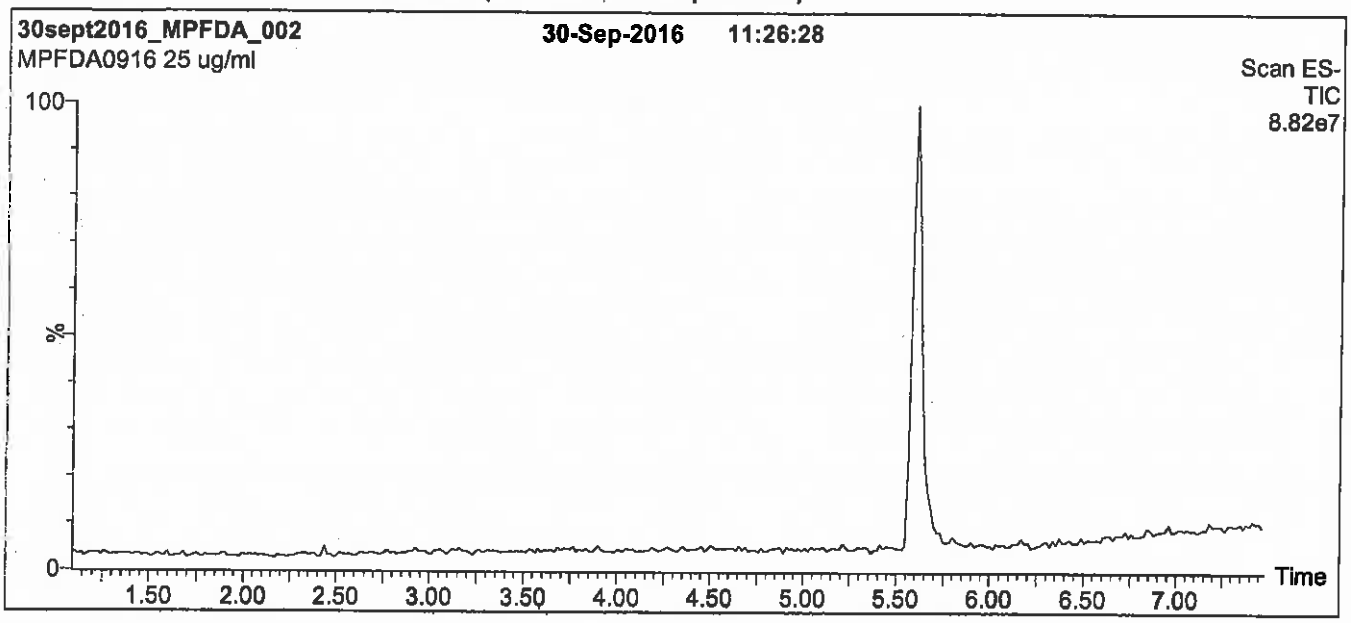
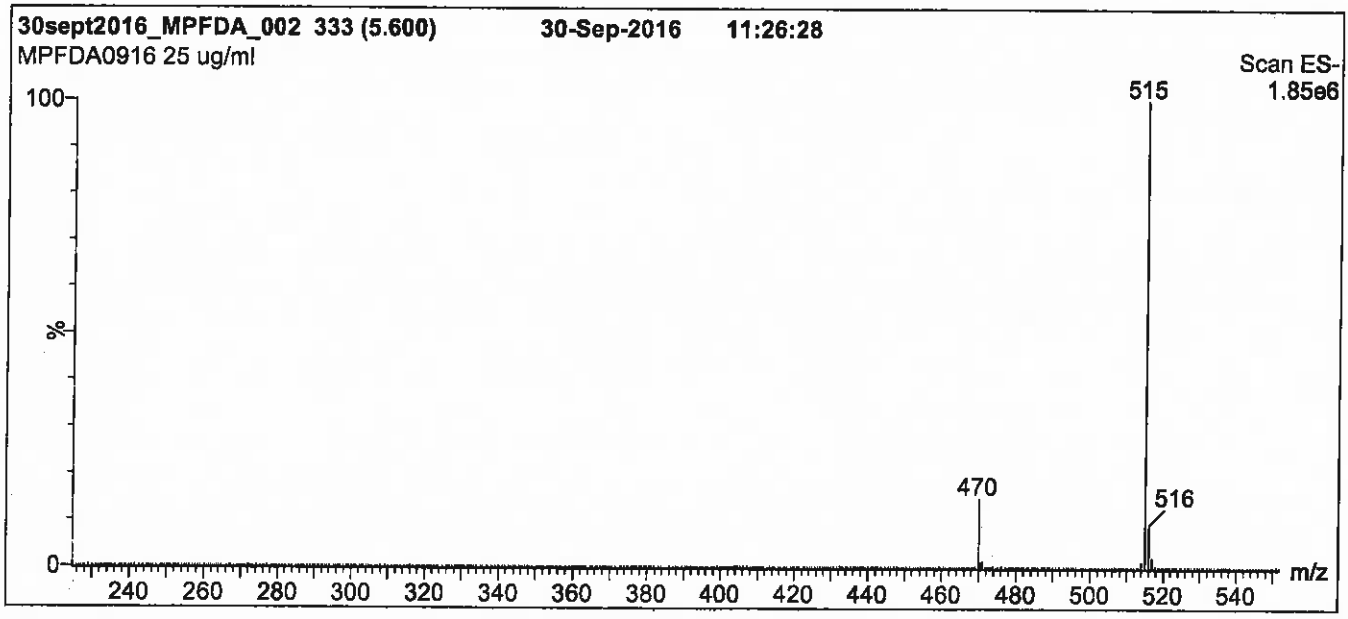
Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

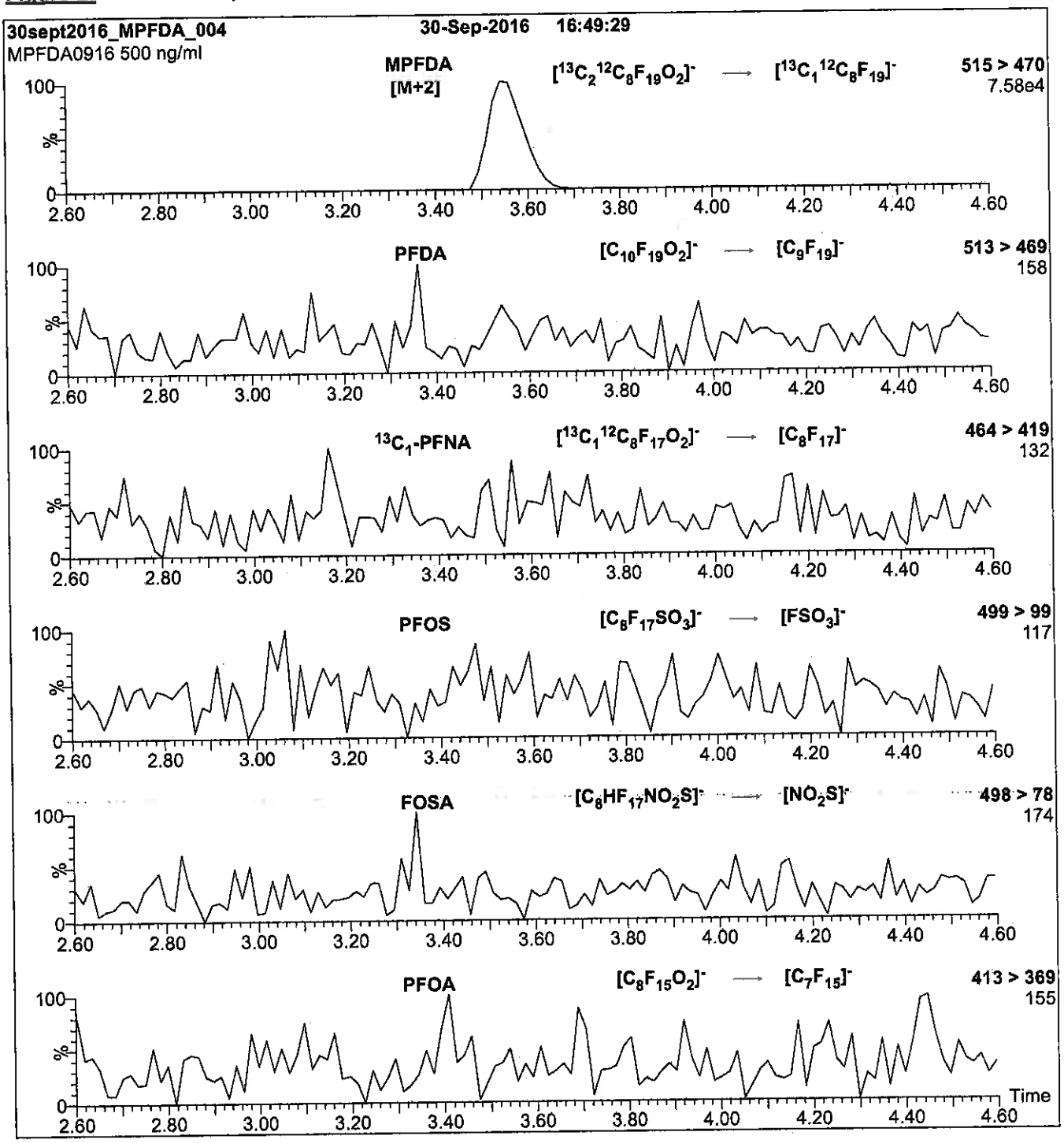
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

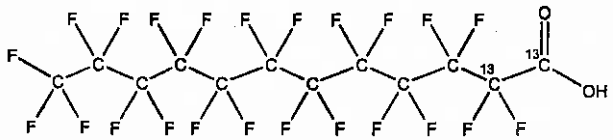
LCMPFDoA_00010

r: 5/3/19 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDoA	**LOT NUMBER:**	MPFDoA0416
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{10}HF_{23}O_2$	**MOLECULAR WEIGHT:**	616.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	04/08/2016		
EXPIRY DATE: (mm/dd/yyyy)	04/08/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

- See page 2 for further details.
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Certified By: _____ **Date:** 04/15/2016
B.G. Chittim (mm/dd/yyyy)

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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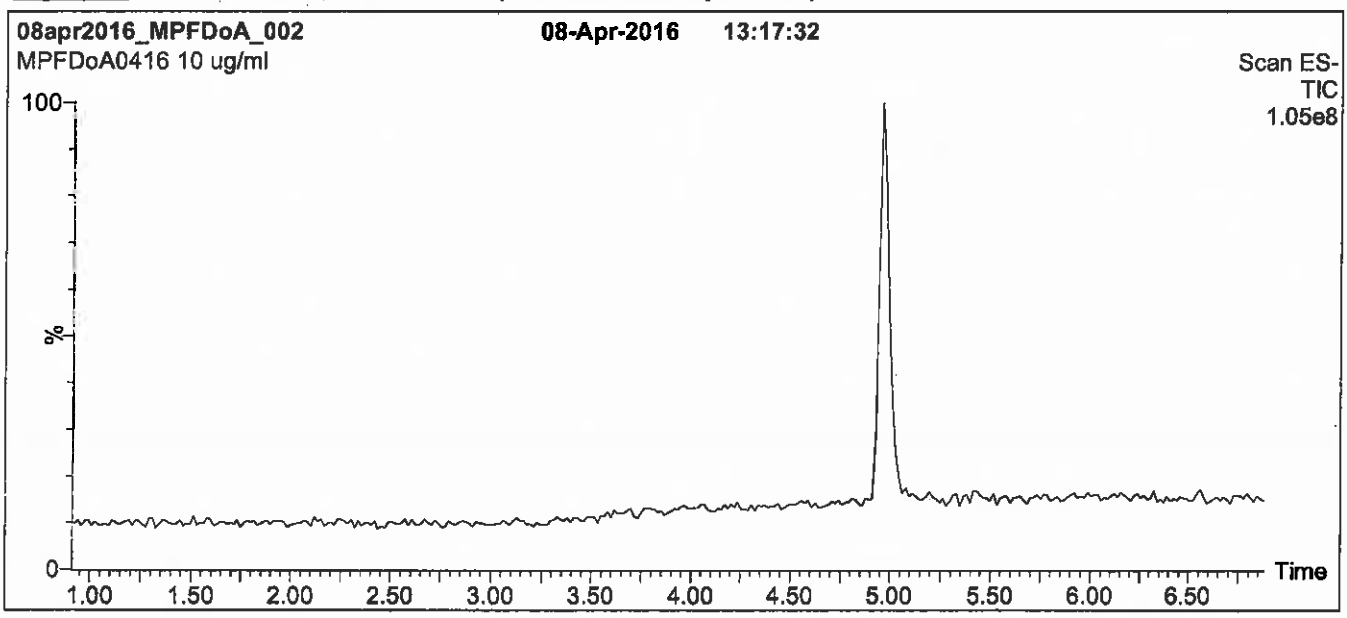
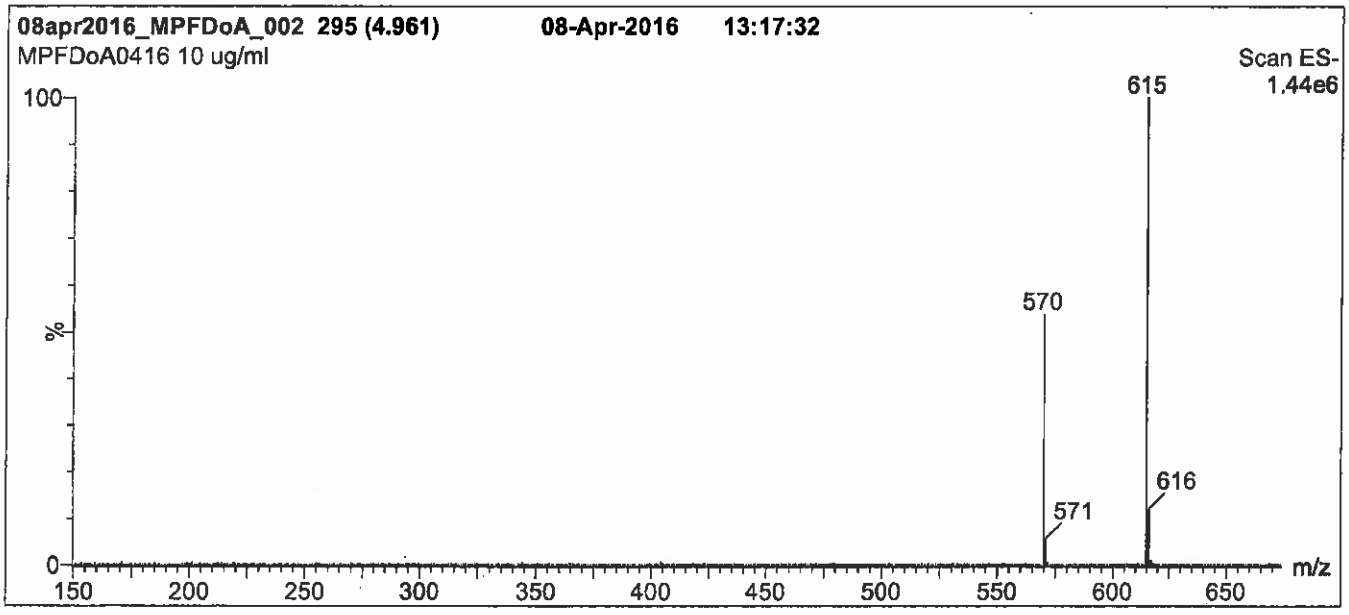
Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

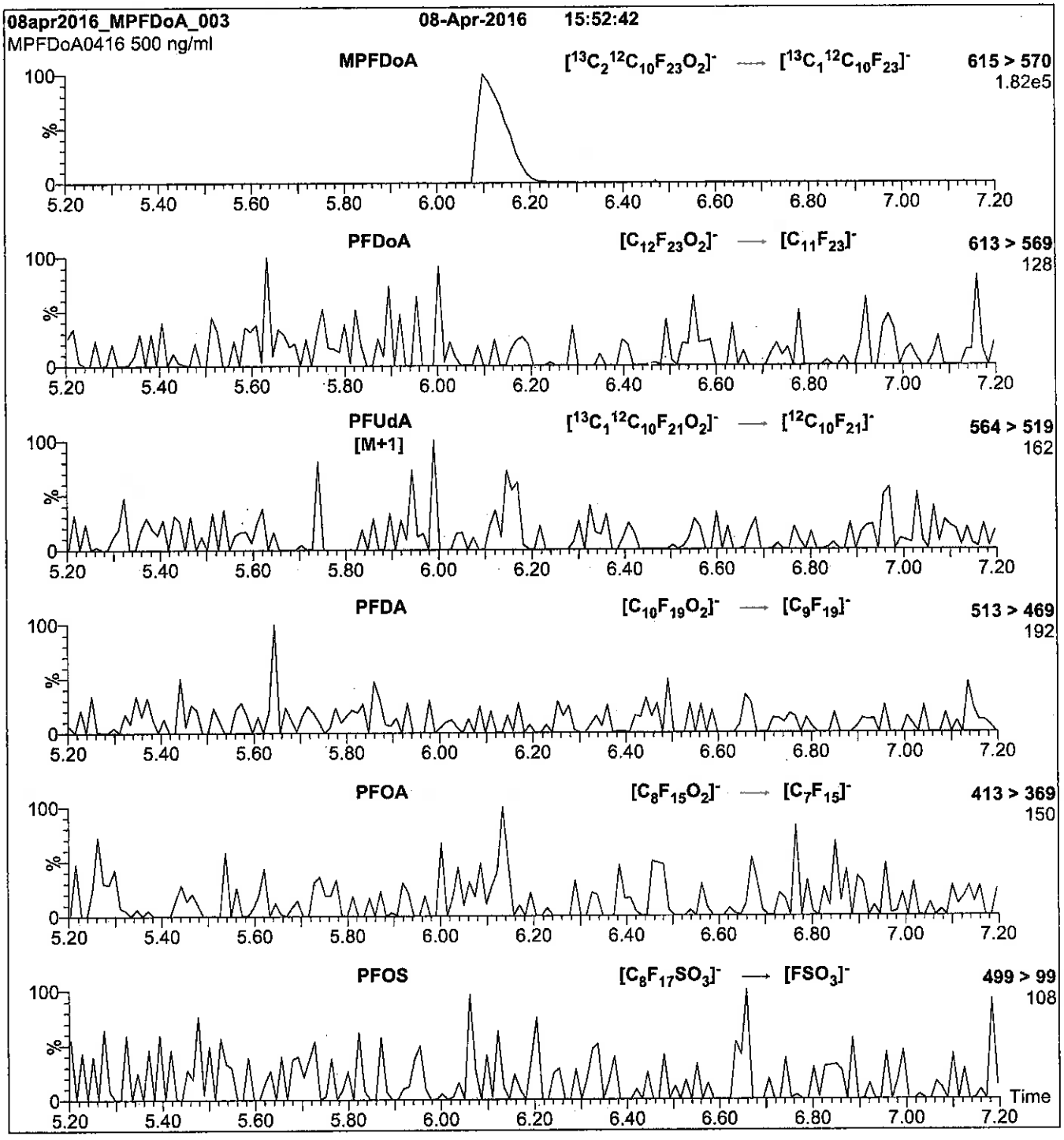
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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

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



Conditions for Figure 2:

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

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 13

Reagent

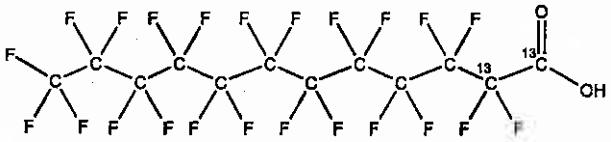
LCMPFDoA_00011

r: 7/5/17 SP/

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDoA	**LOT NUMBER:**	MPFDoA0517
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{10}HF_{23}O_2$	**MOLECULAR WEIGHT:**	616.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	05/23/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/23/2022		
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:** 05/26/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

INTENDED USE:

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HAZARDS:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

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CALA

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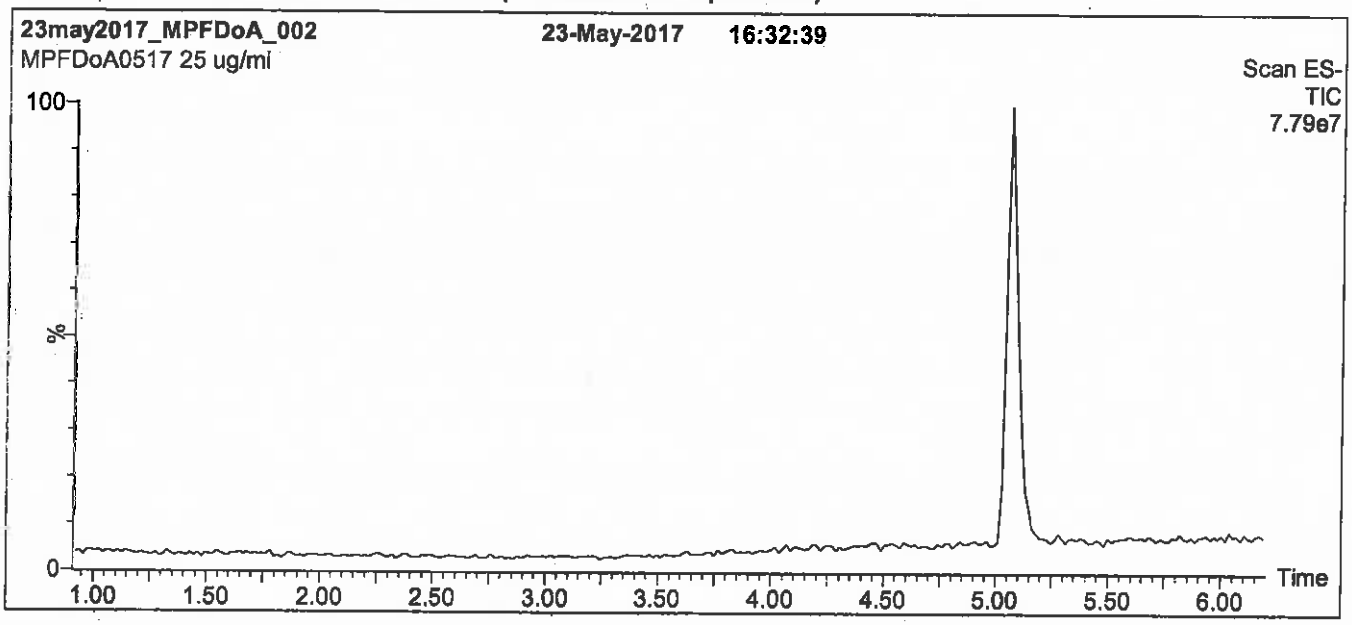

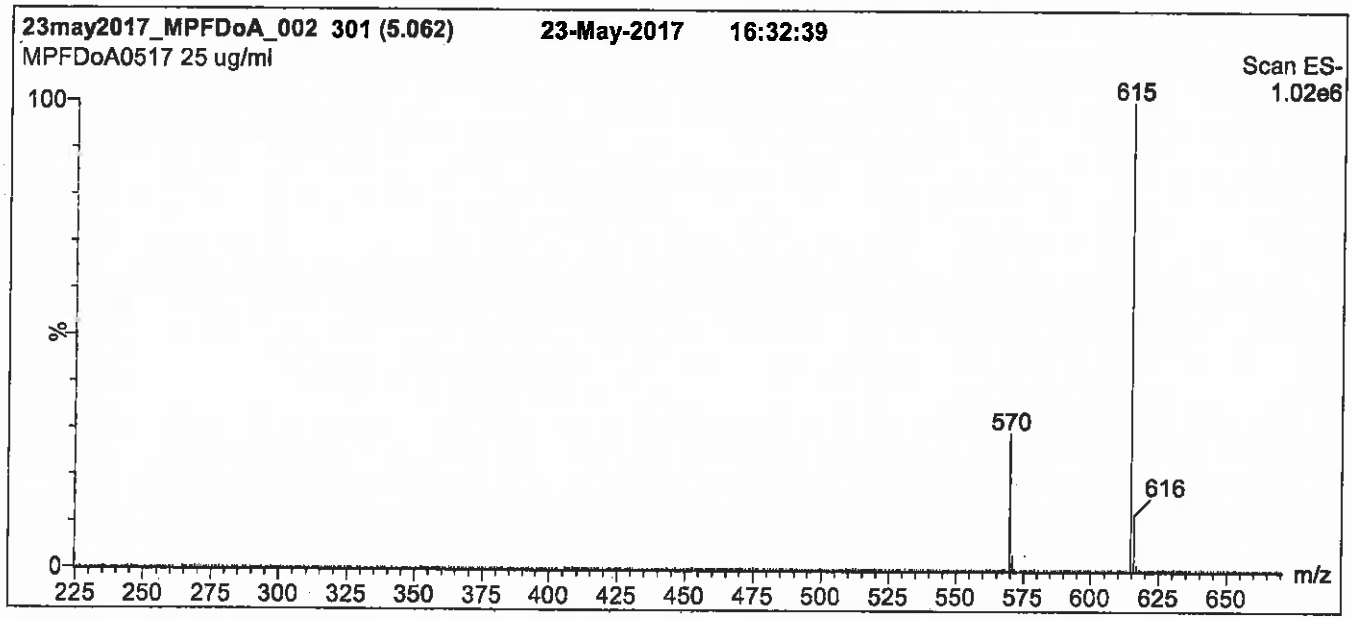

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Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

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

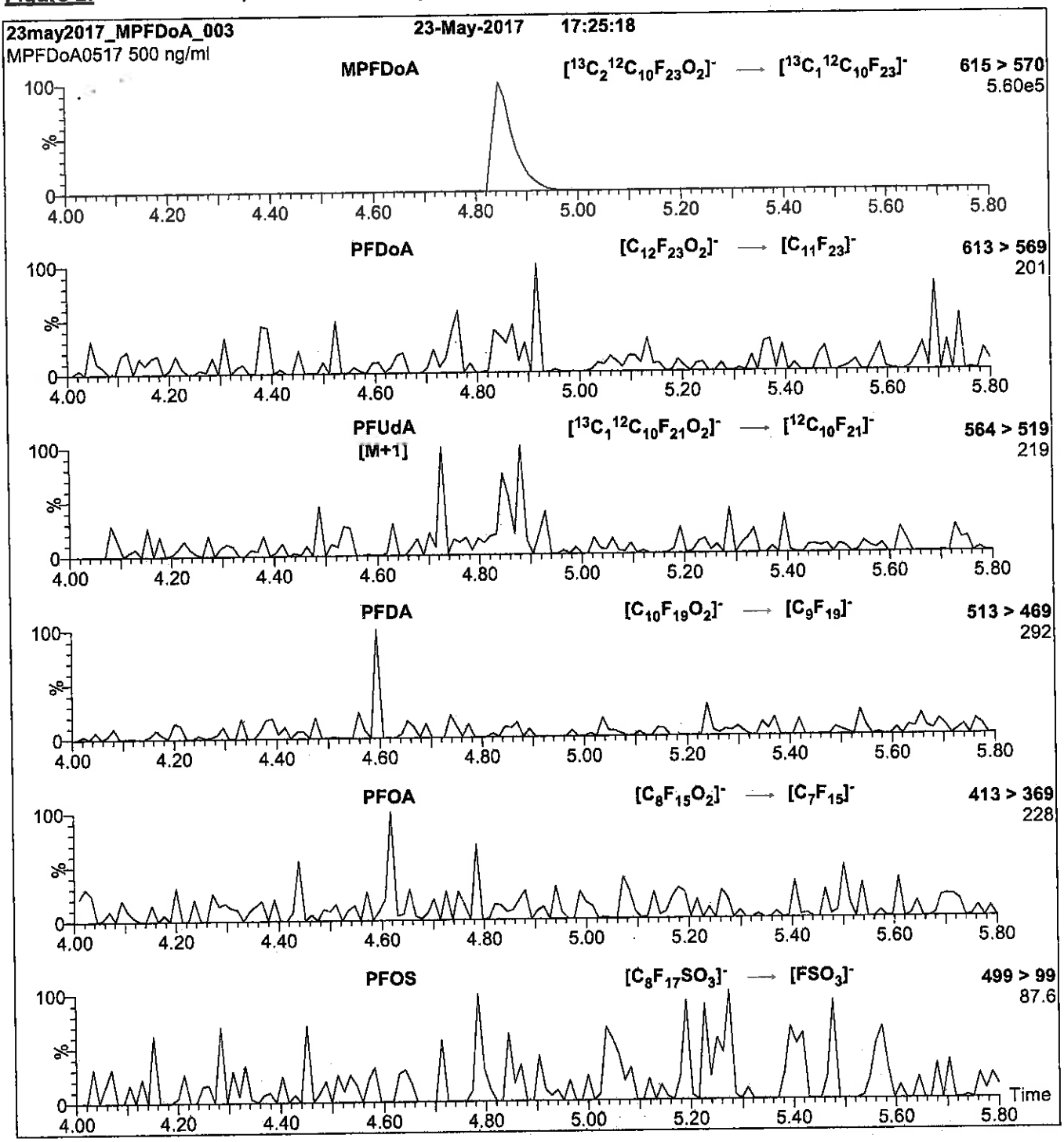
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 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 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) = 13

Reagent

LCMPFHxA_00016

r: 5/3/17 SKV
s: 5/8/17 SKV

WELLINGTON LABORATORIES

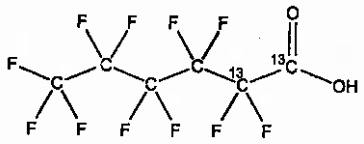
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFHxA1116

STRUCTURE:

CAS #: Not available



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

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/22/2016
EXPIRY DATE: (mm/dd/yyyy) 11/22/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/13/2016 (mm/dd/yyyy)

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

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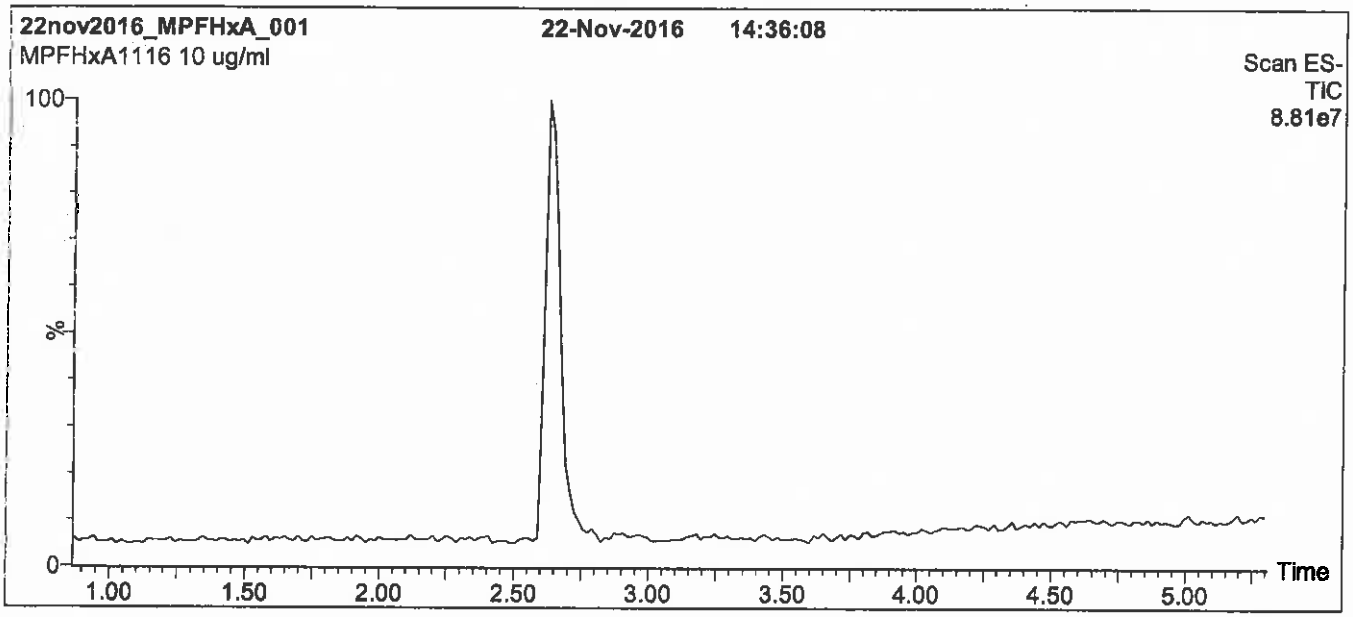
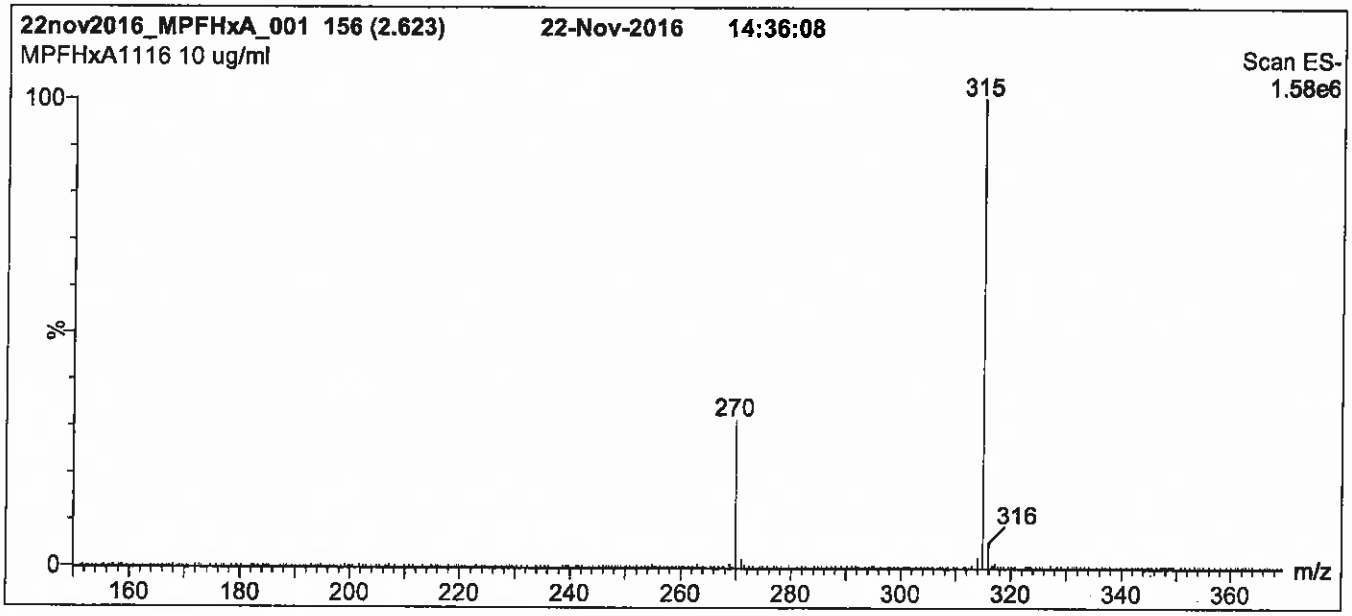




Conditions for Figure 1:

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

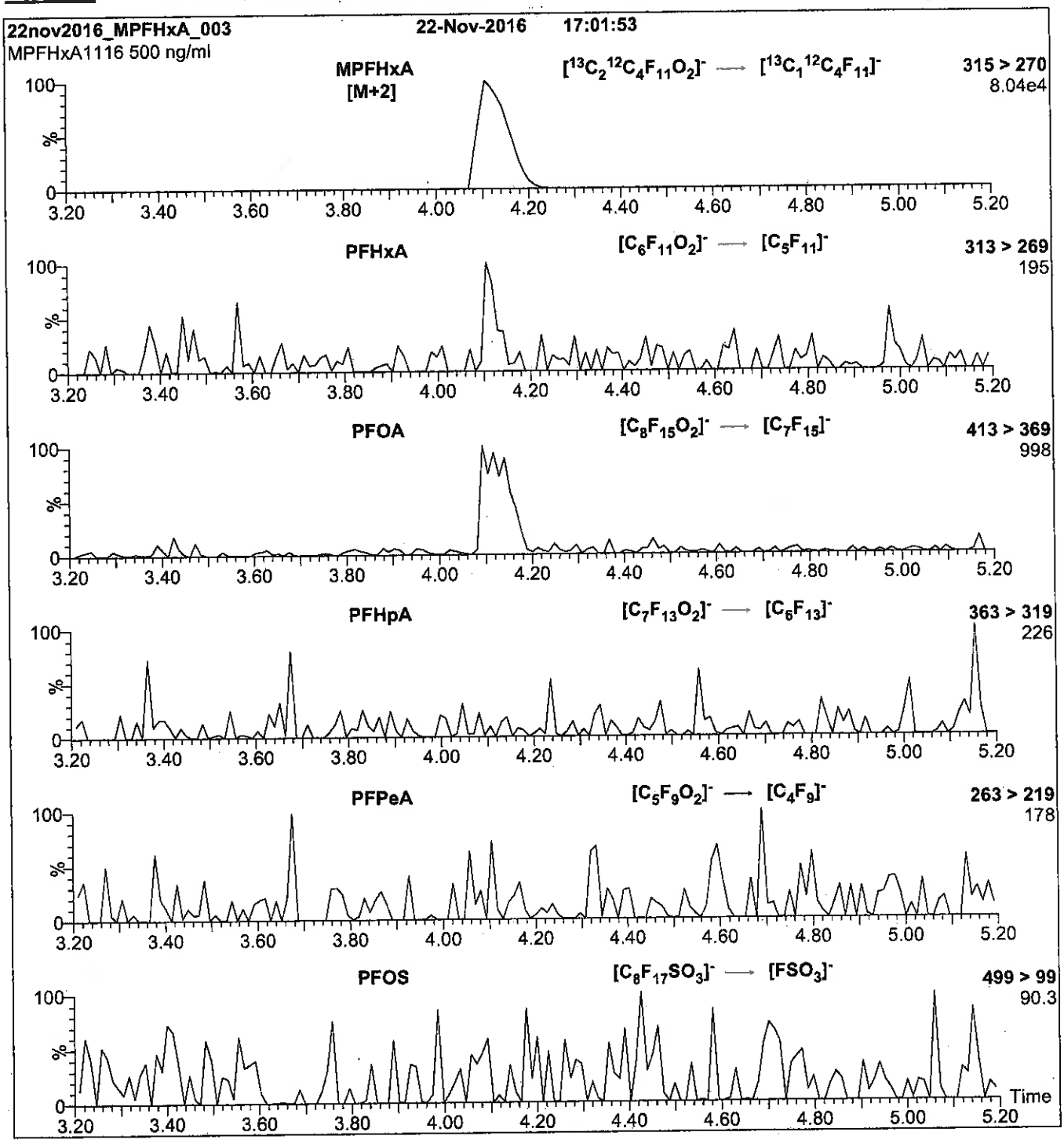
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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: **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) = 3.46e-3
Collision Energy (eV) = 10

Reagent

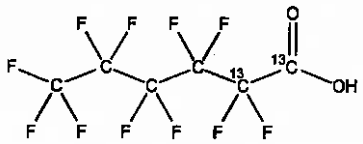
LCMPFHxA_00017

r: 7/5/17 sol

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFHxA	**LOT NUMBER:**	MPFHxA1116
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_4HF_{11}O_2$	**MOLECULAR WEIGHT:**	316.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/22/2016		
EXPIRY DATE: (mm/dd/yyyy)	11/22/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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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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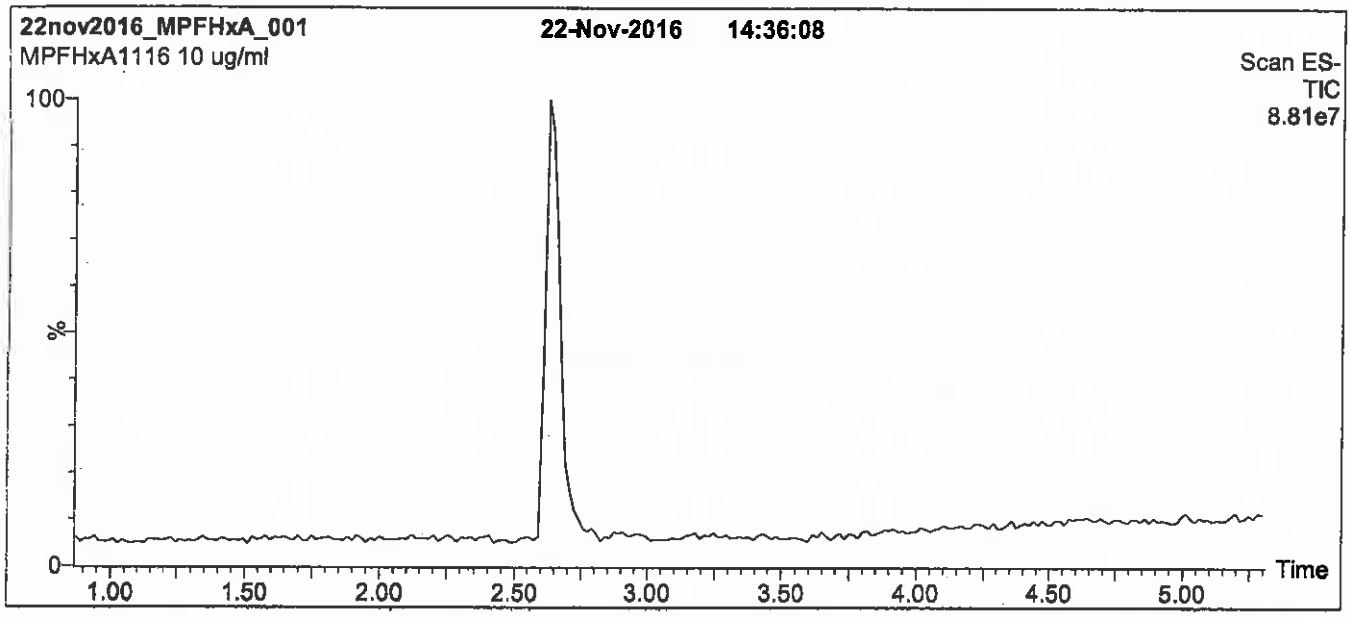

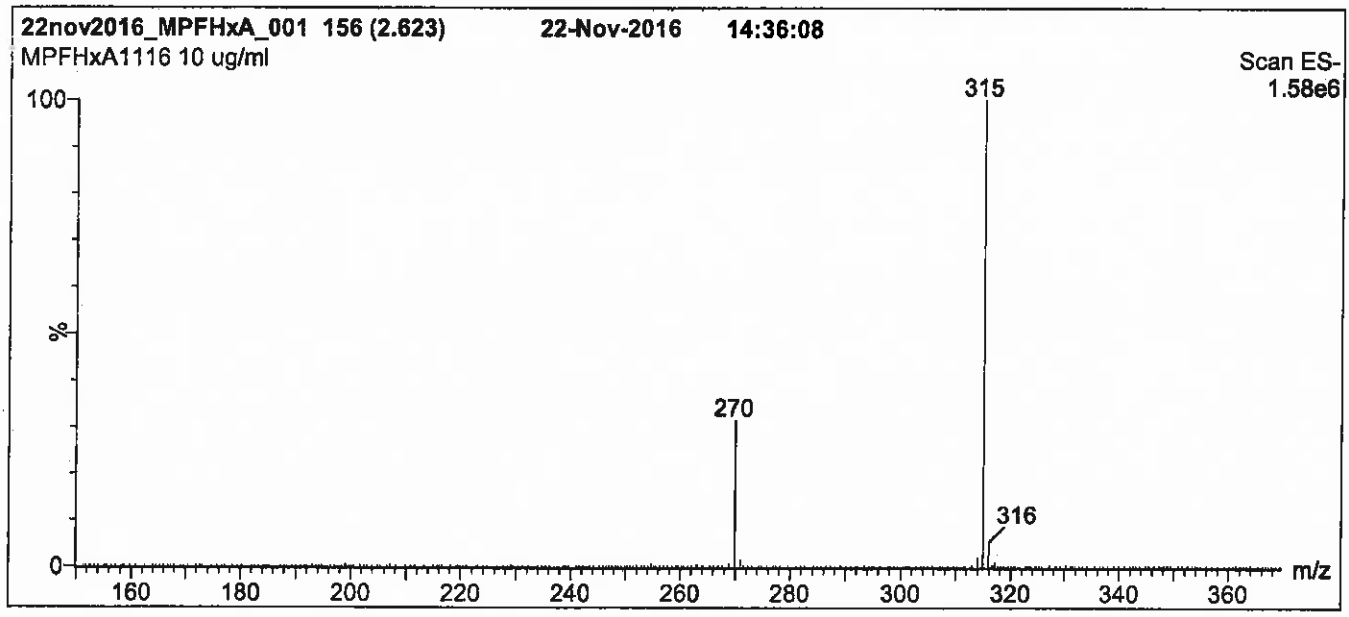

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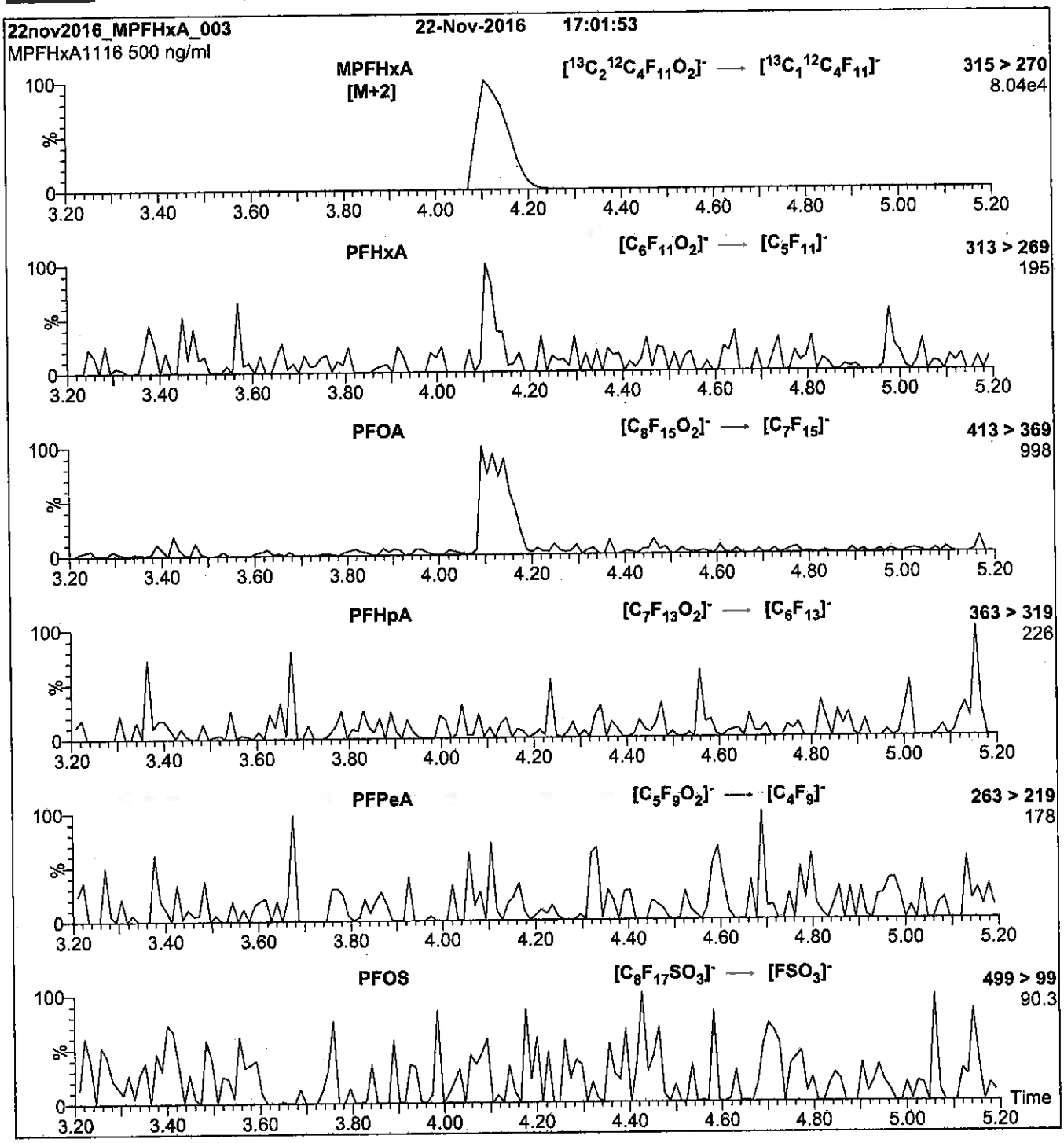
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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) = 3.46e-3
Collision Energy (eV) = 10

Reagent

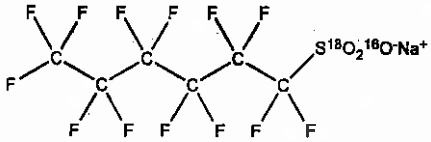
LCMPFHxS_00010

r: 5/3/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFHxS	**LOT NUMBER:**	MPFHxS0217
COMPOUND:	Sodium perfluoro-1-hexane[$^{18}O_2$]sulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_8F_{13}S^{18}O_2{}^{16}ONa$	**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)	02/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	02/17/2022		
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 ($C_8F_{13}S^{18}O_2{}^{16}O^-$) has been observed to be up to 10% lower than for PFHxS ($C_8F_{13}S^{16}O_3^-$) when both compounds are injected together. This difference may vary between instruments.
- Contains ~ 1.0% of sodium perfluoro-1-octane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFOS).
- Due to the isotopic purity of the starting material ($^{18}O_2$ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/02/2017 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

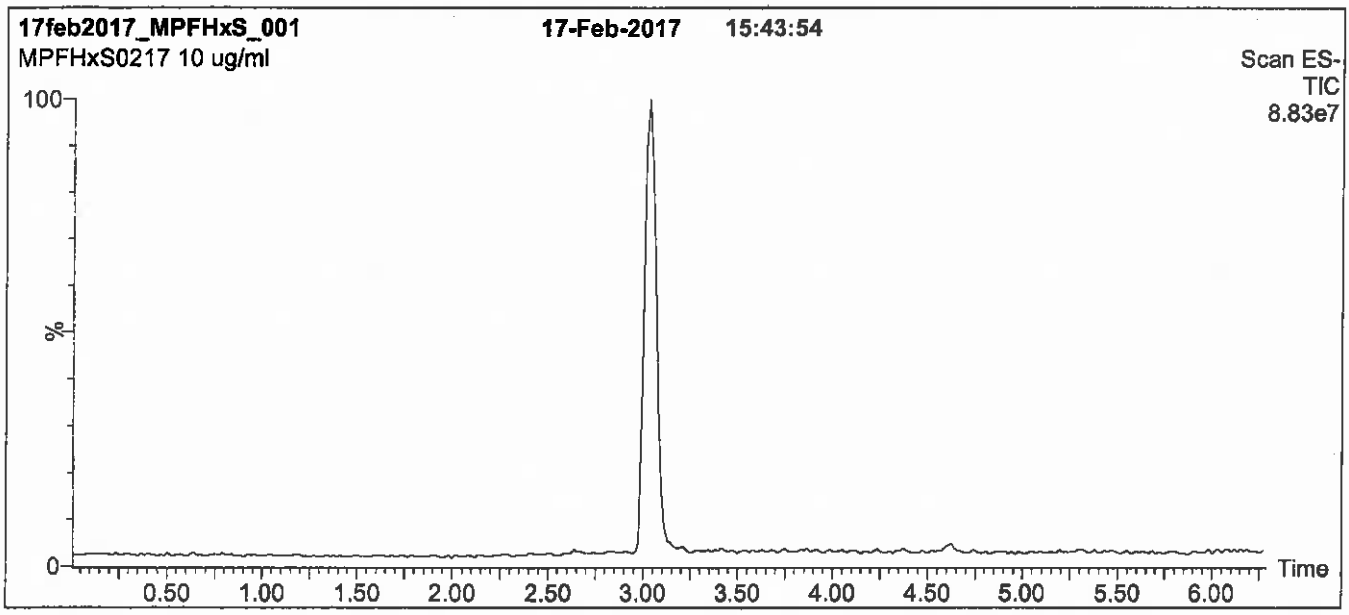
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

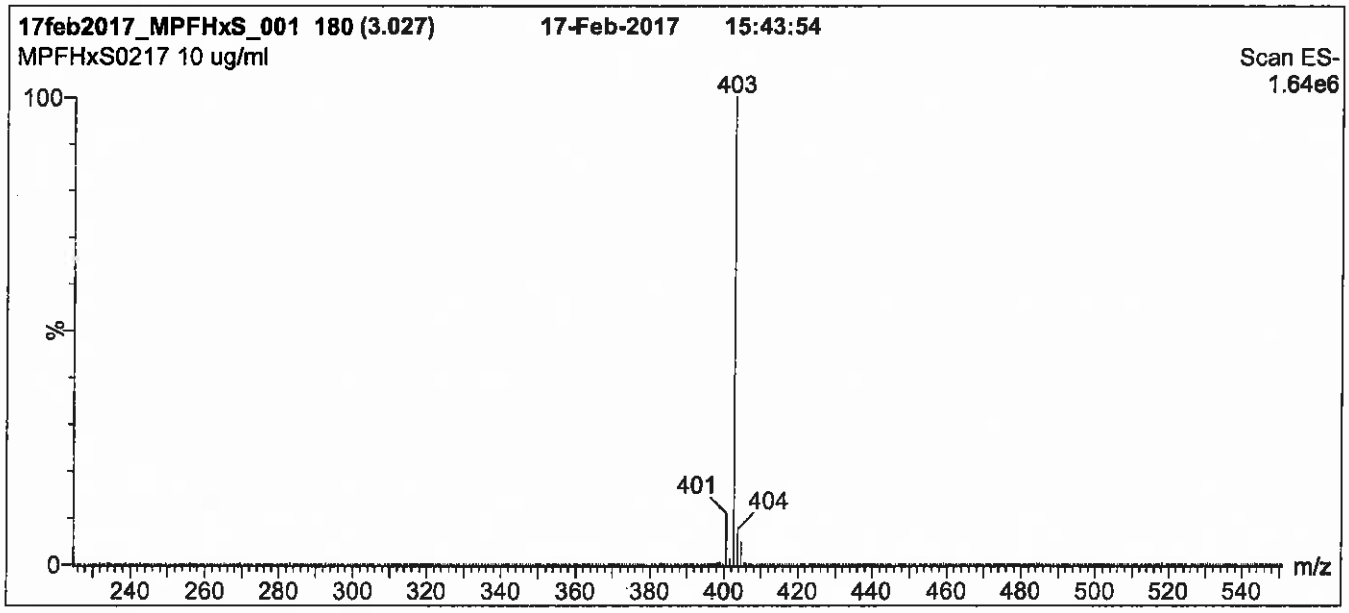
CALA

ANAB

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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 8 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

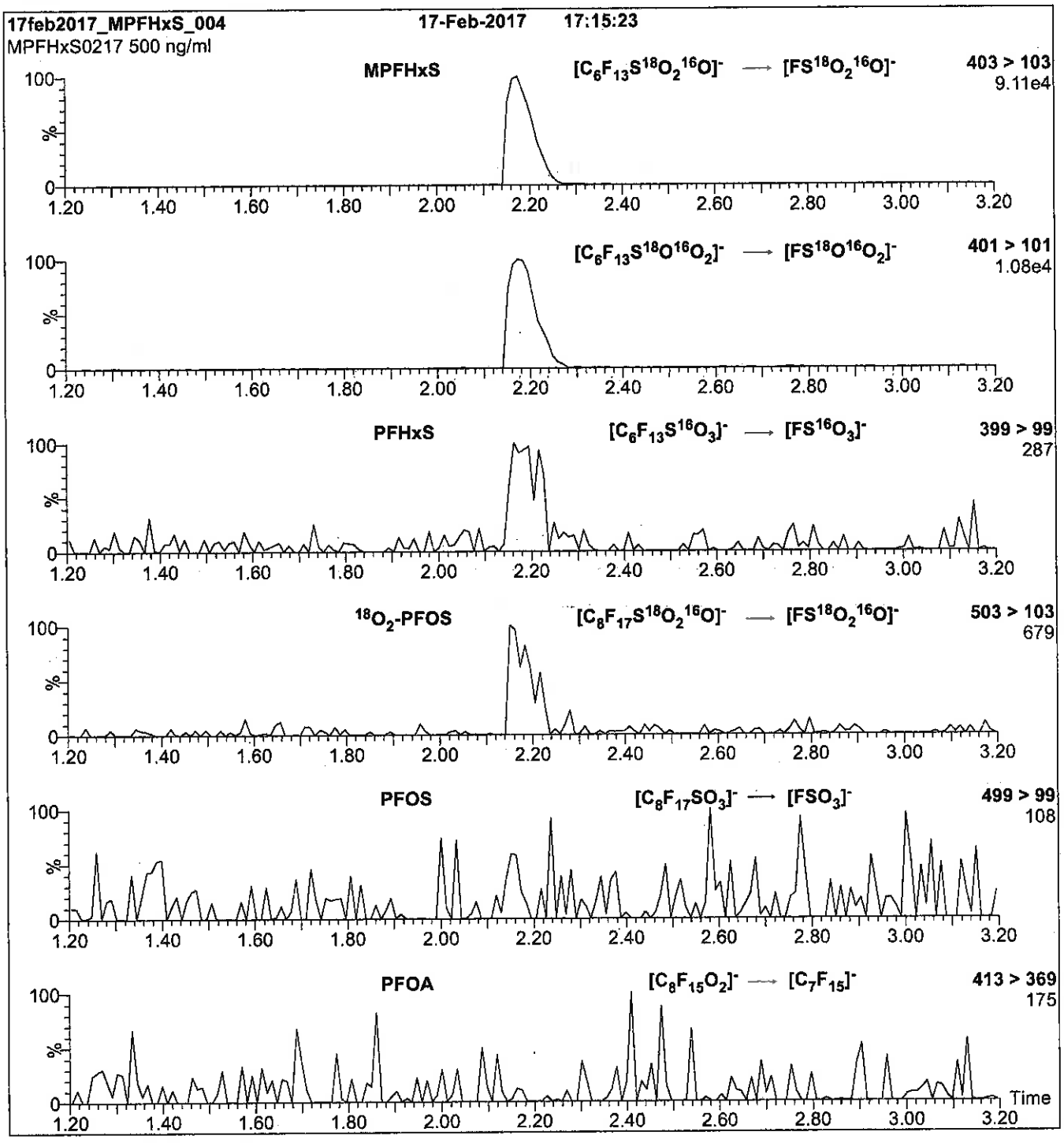
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFHxS_00011

P: 7/5/17 SW

WELLINGTON LABORATORIES

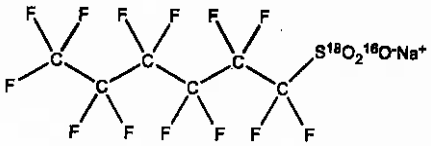
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFHxS0217

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)	02/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	02/17/2022		
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.
- Contains ~ 1.0% of sodium perfluoro-1-octane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFOS).
- Due to the isotopic purity of the starting material ($^{18}O_2$ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/02/2017 (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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HAZARDS:

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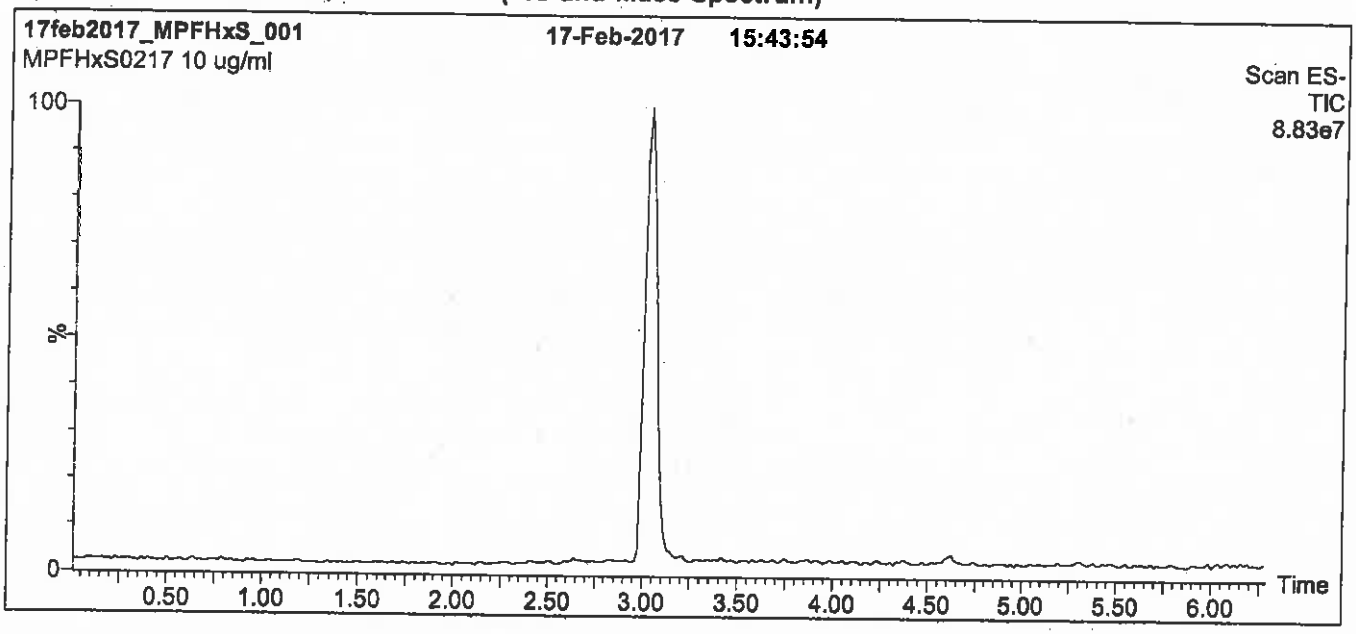
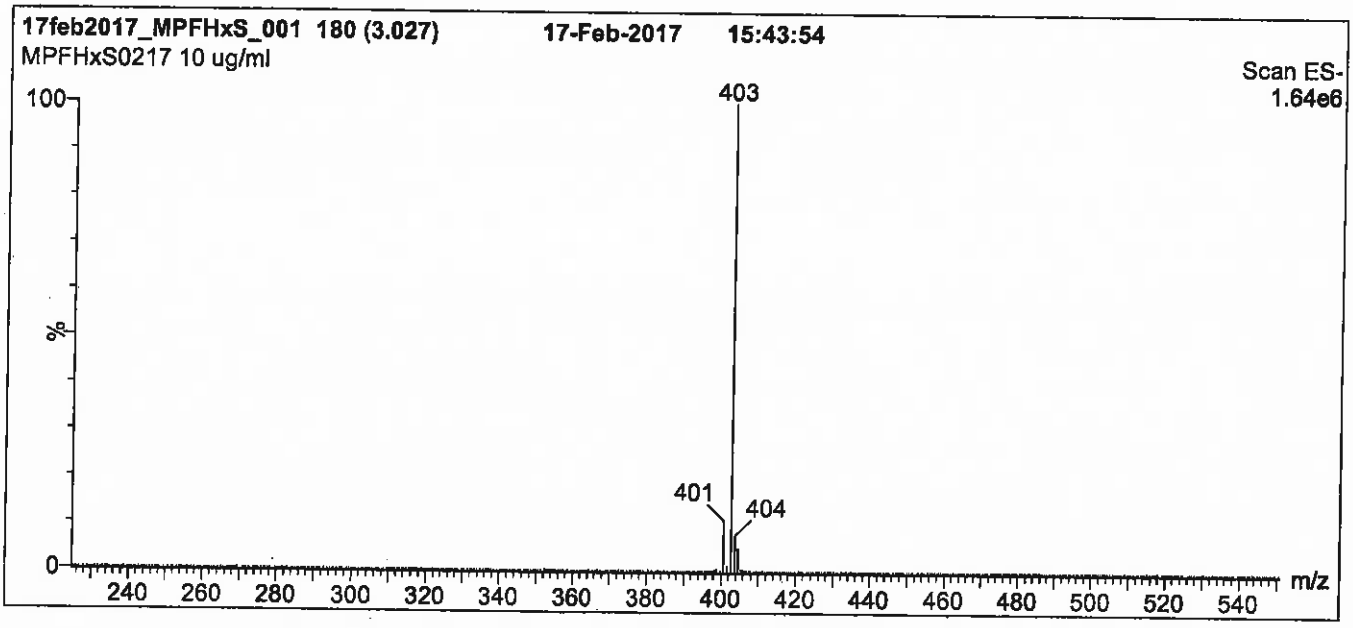
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

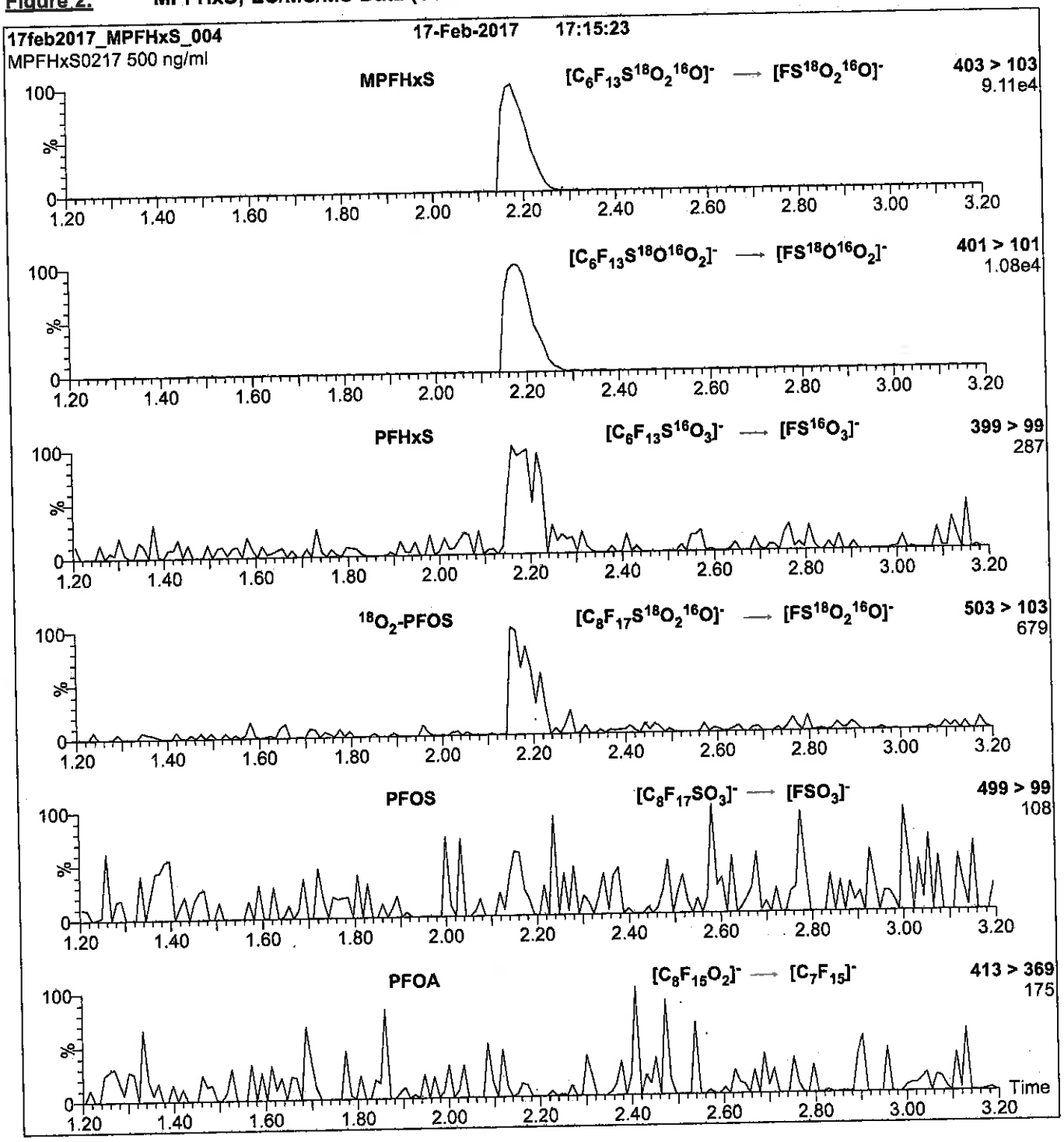
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

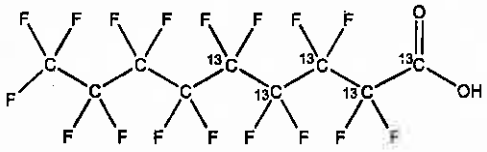
LCMPFNA_00010

r: 5/5/17 SCV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFNA	**LOT NUMBER:**	MPFNA0916
COMPOUND:	Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5{}^{12}C_4HF_{17}O_2$	**MOLECULAR WEIGHT:**	469.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4,5-$^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/11/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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CALA

ANAB ACCREDITED

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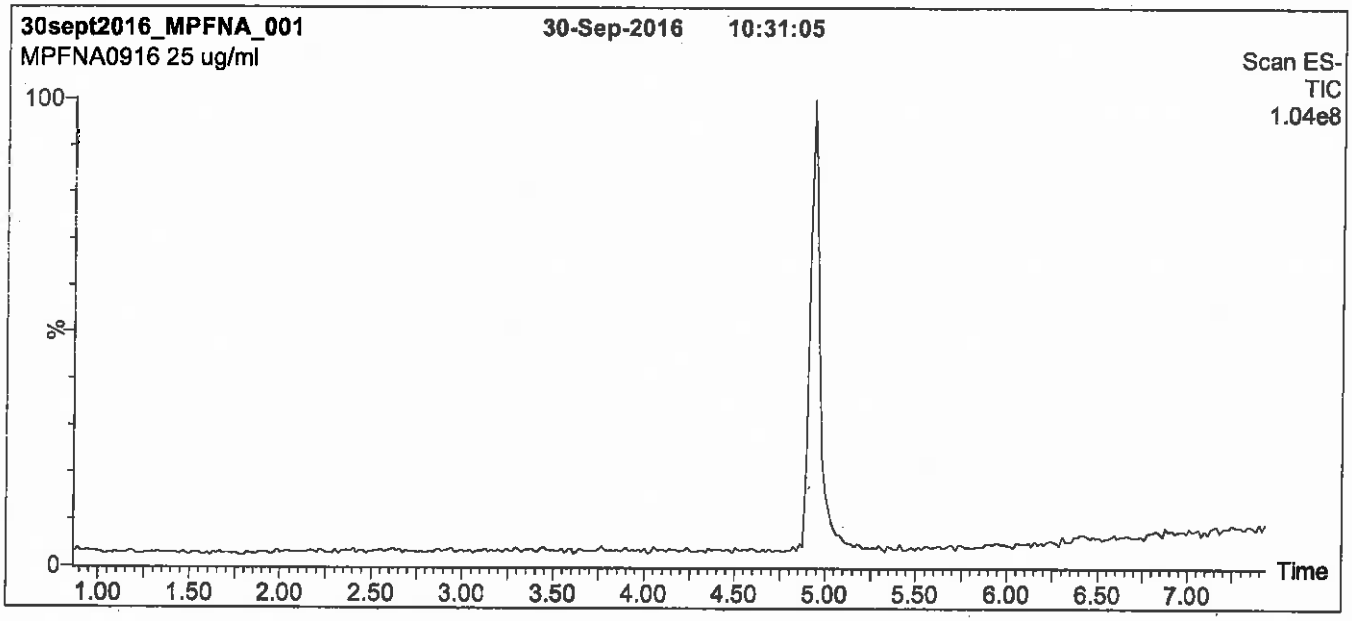

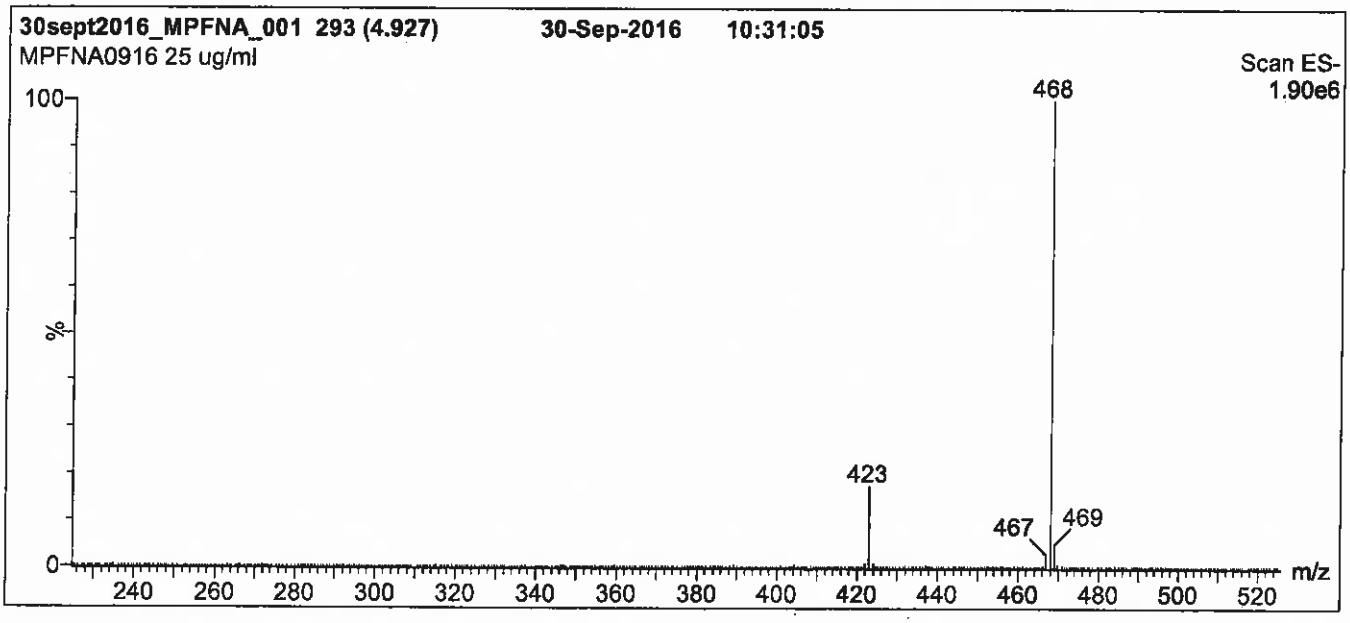

Conditions for Figure 1:

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

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

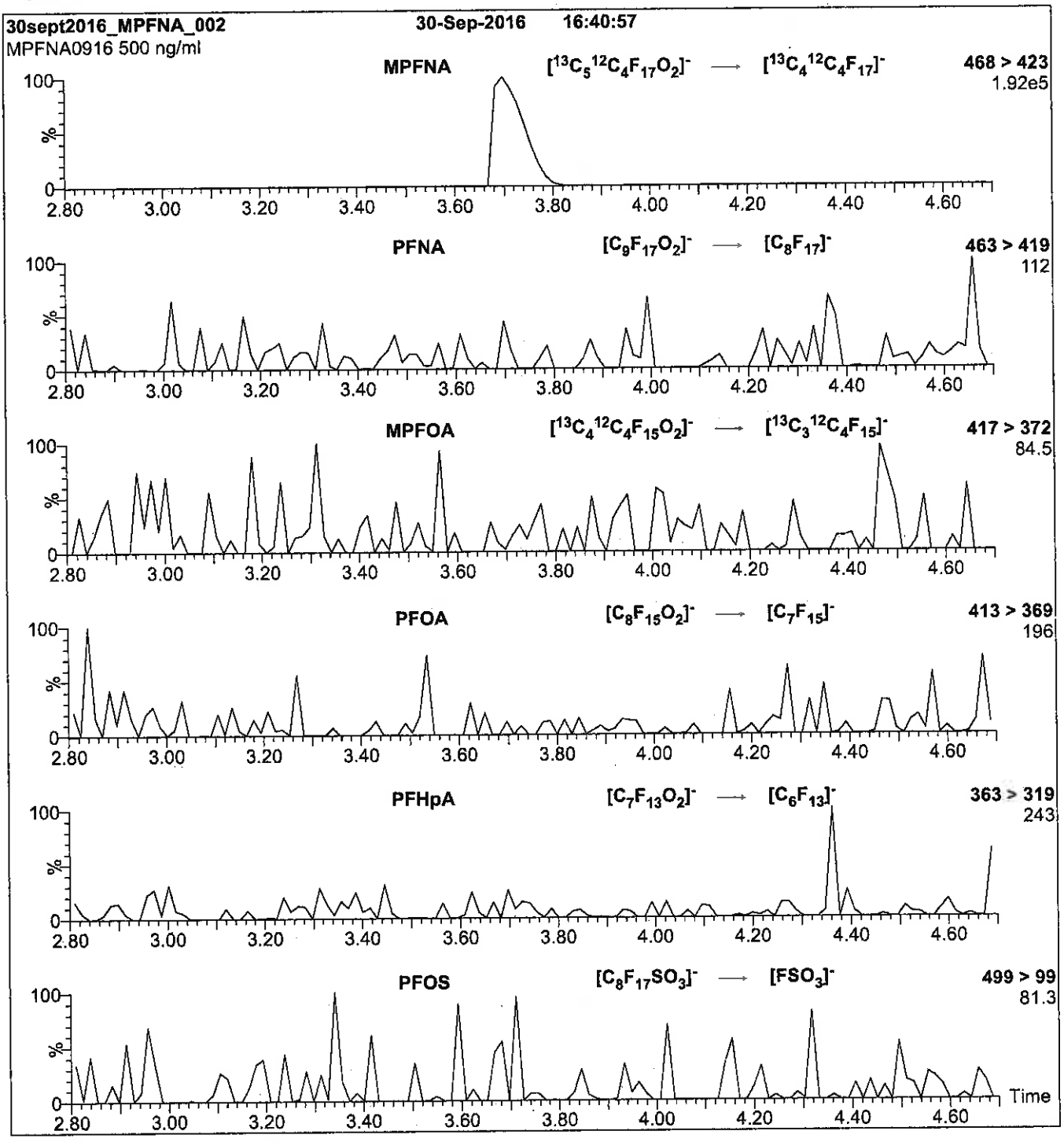
Flow: 300 µl/min

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: **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) = 3.39e-3
Collision Energy (eV) = 11

Reagent

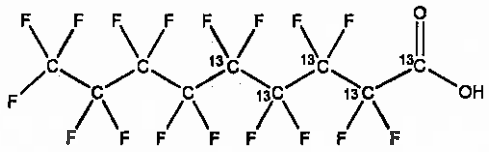
LCMPFNA_00011

r: 7/5/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFNA	**LOT NUMBER:**	MPFNA0916
COMPOUND:	Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5{}^{12}C_4HF_{17}O_2$	**MOLECULAR WEIGHT:**	469.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4,5-$^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/11/2016
B.G. Chittim (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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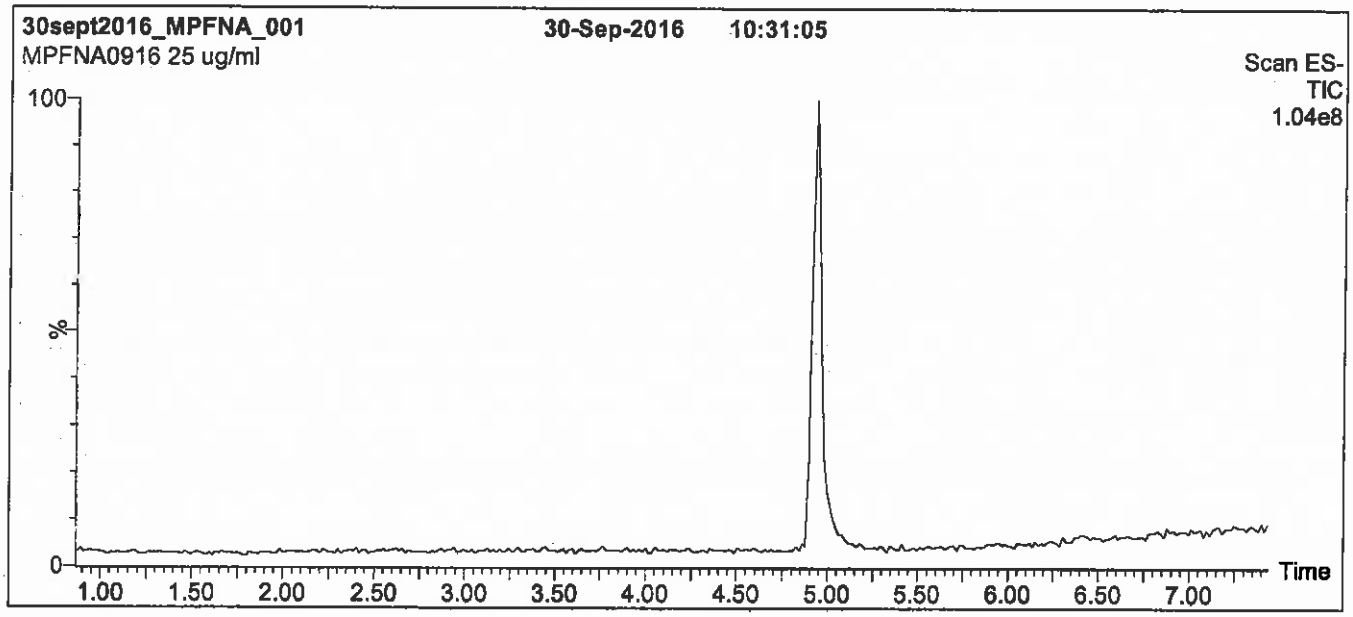
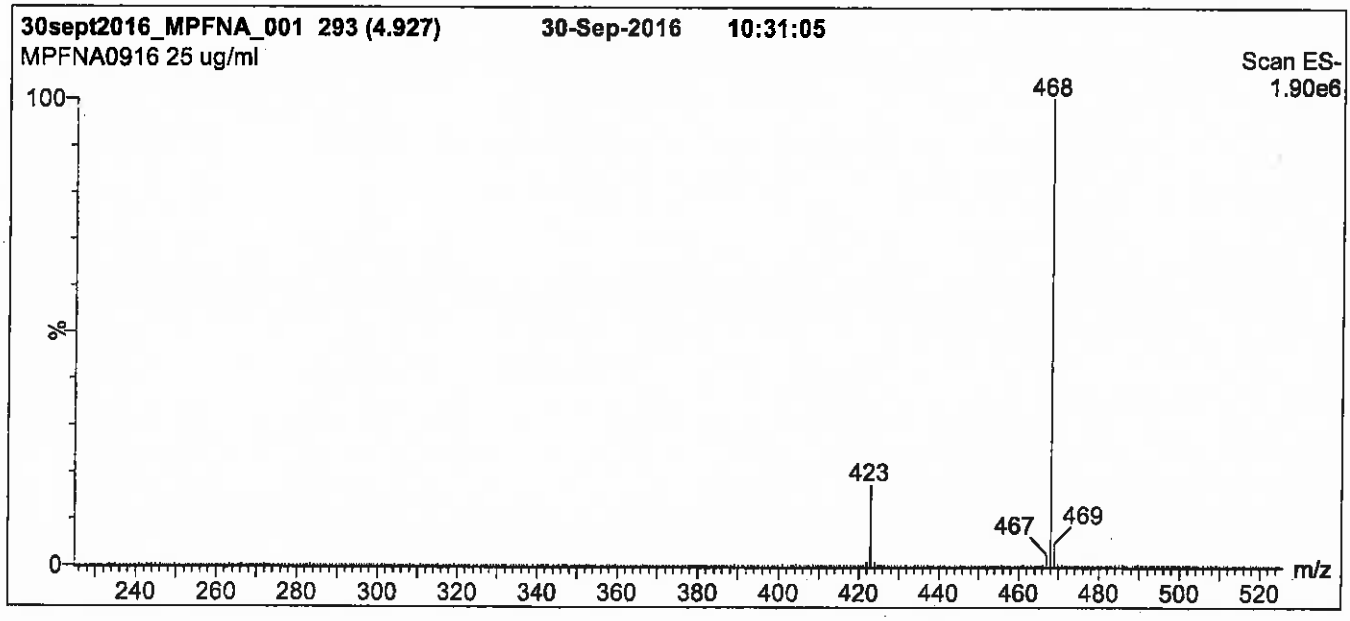
Figure 1: **MPFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

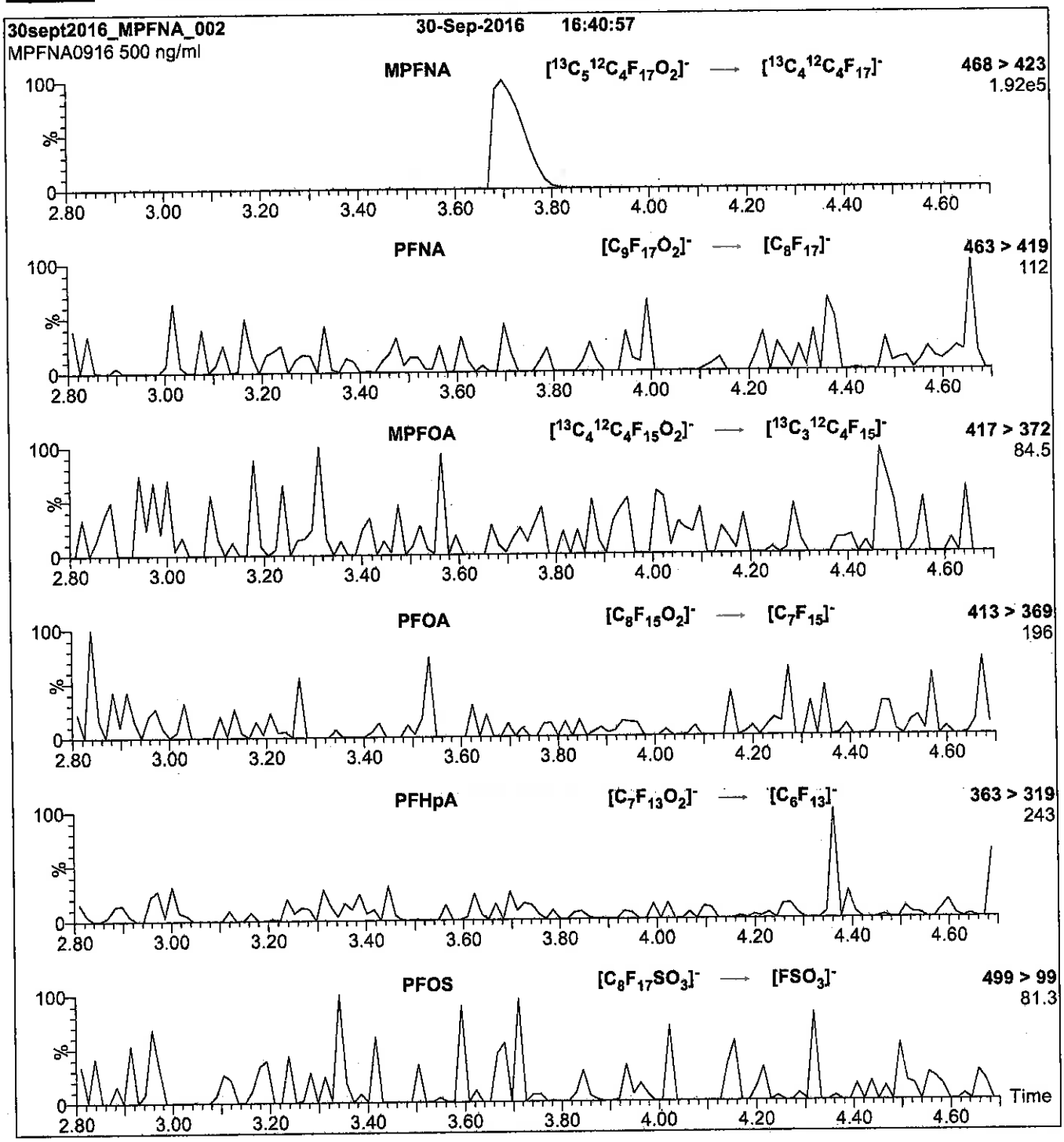
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Reagent

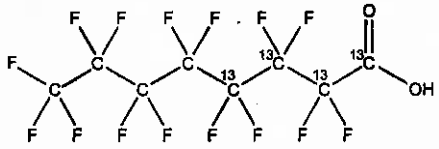
LCMPFOA_00014

V: 5/3/17

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFOA	**LOT NUMBER:**	MPFOA0417
COMPOUND:	Perfluoro-n-[1,2,3,4-$^{13}C_4$]octanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4HF_{15}O_2$	**MOLECULAR WEIGHT:**	418.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	04/12/2017		
EXPIRY DATE: (mm/dd/yyyy)	04/12/2022		
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).

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Certified By: _____ **Date:** 04/28/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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CALA

ANAB ACCREDITED

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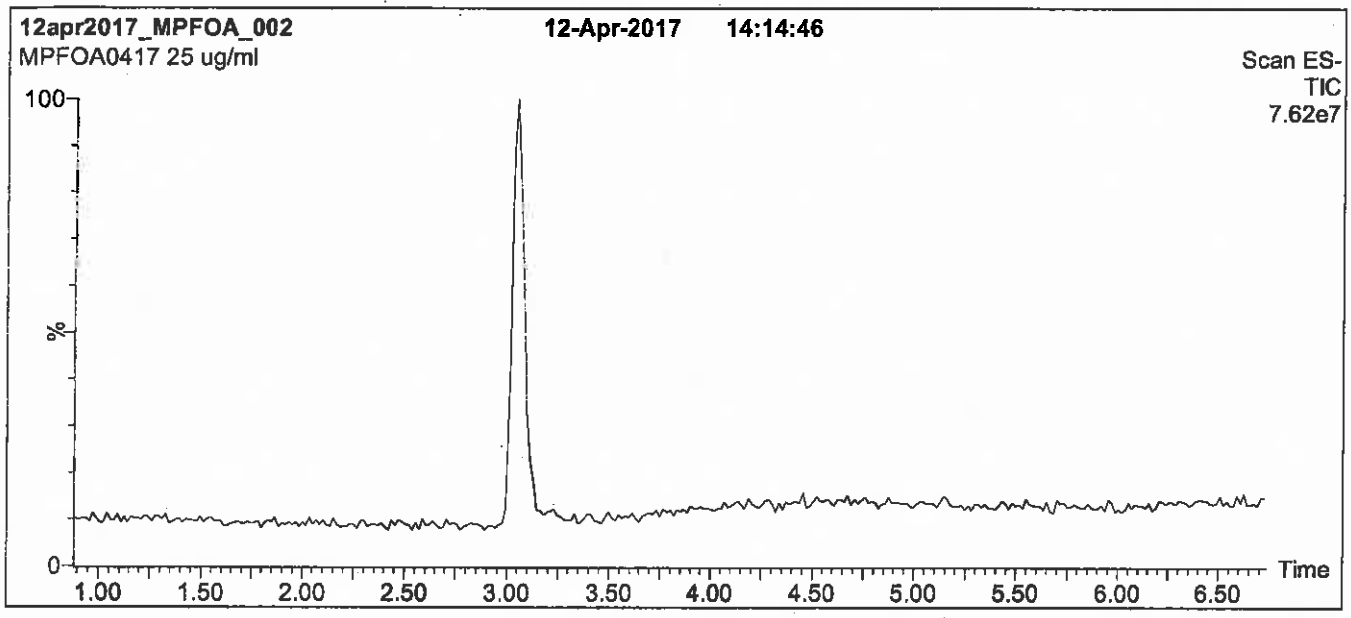
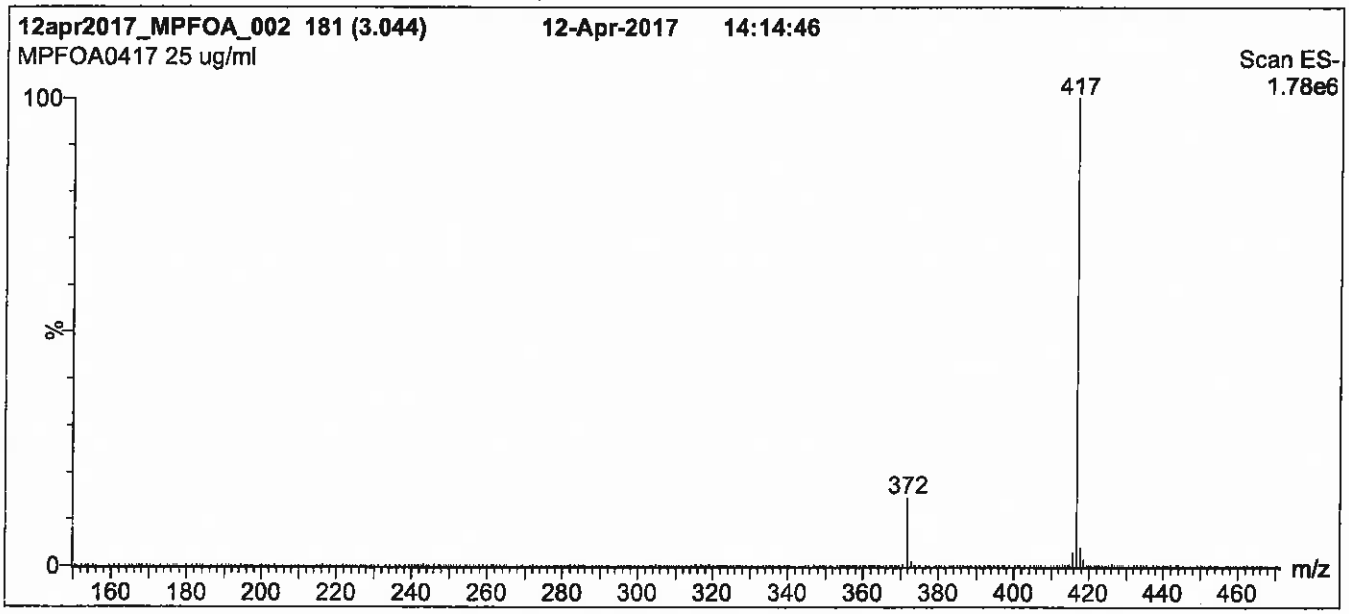




Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

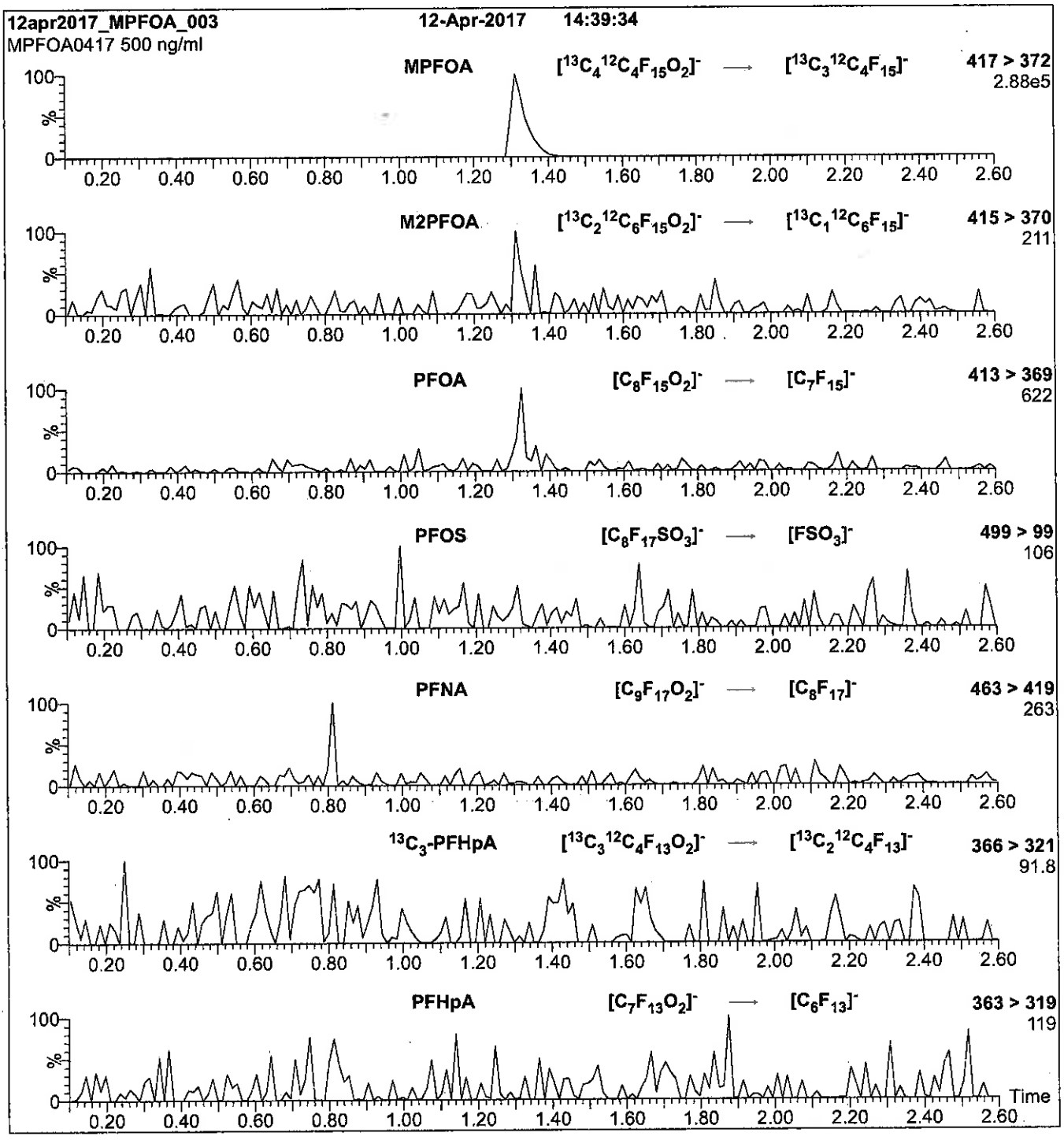
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 10

Reagent

LCMPFOA_00015

r: 7/5/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

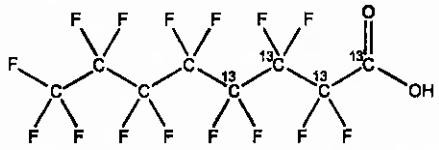
PRODUCT CODE: MPFOA

LOT NUMBER: MPFOA0417

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

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_4HF_{15}O_2$

MOLECULAR WEIGHT: 418.04

CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%

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

LAST TESTED: (mm/dd/yyyy) 04/12/2017

EXPIRY DATE: (mm/dd/yyyy) 04/12/2022

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
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CALA

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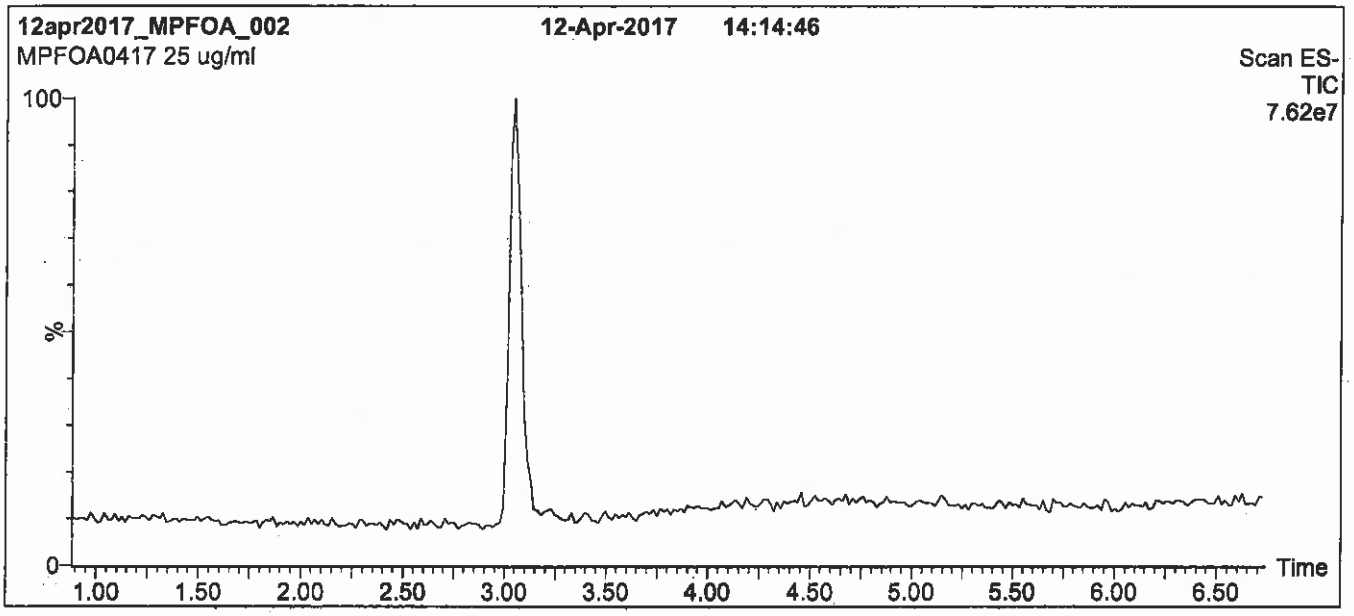
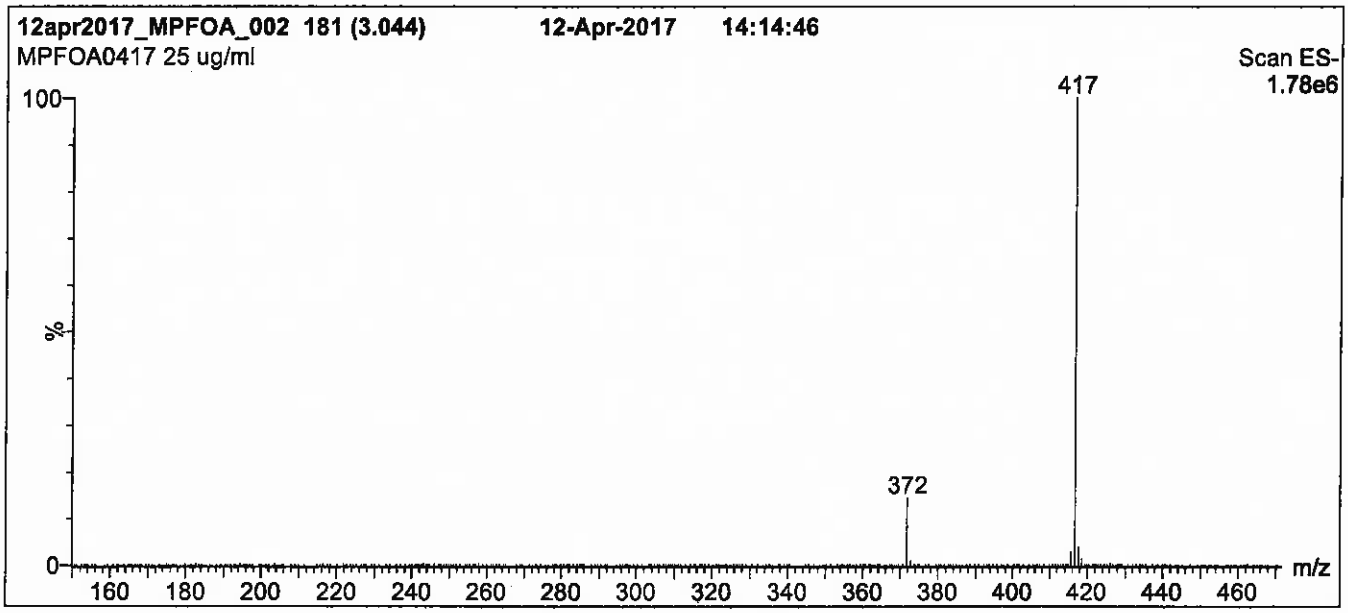




Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

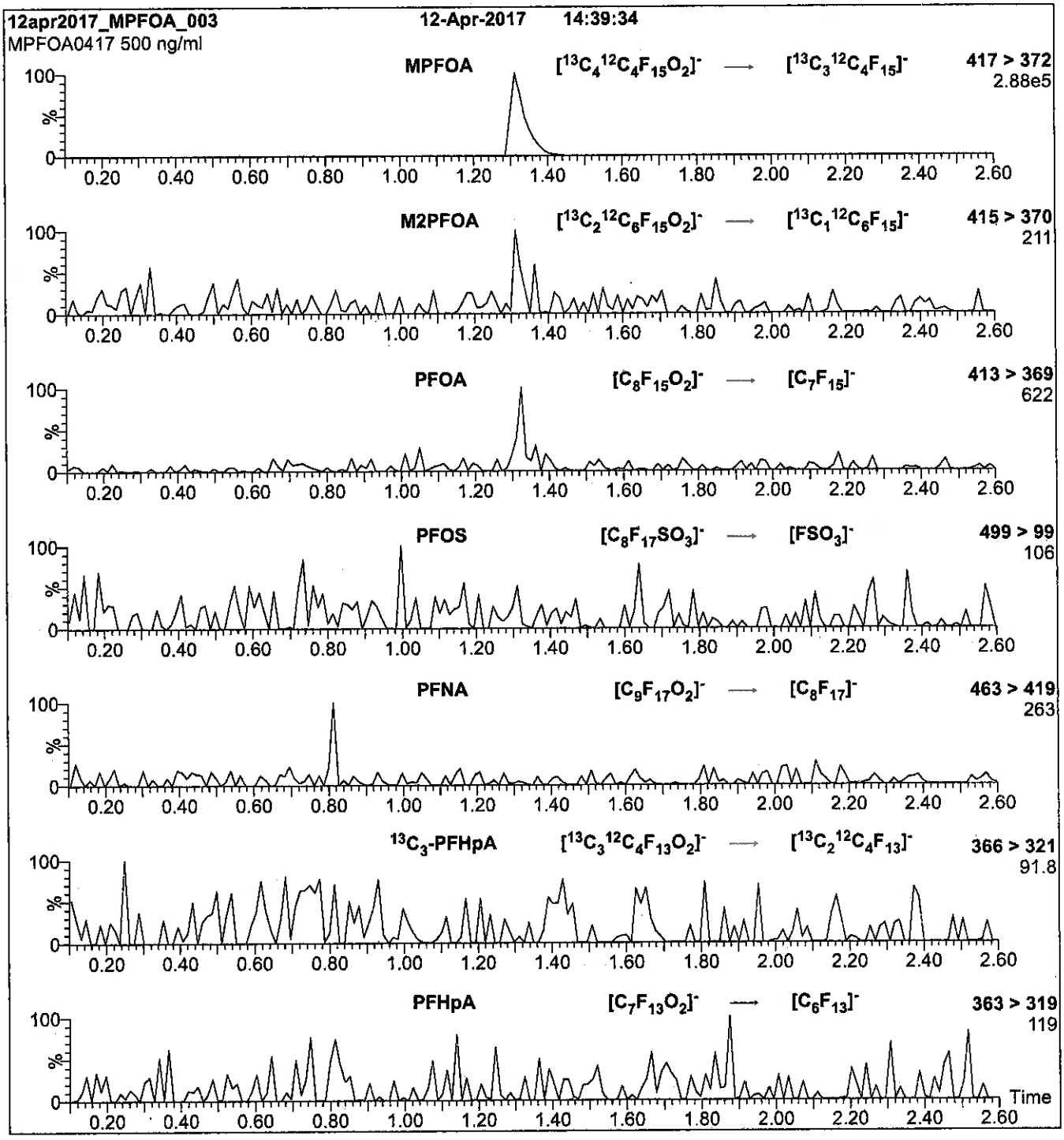
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 10

Reagent

LCMPFOS_00022

r: 5B|17SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

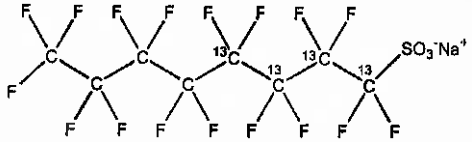
PRODUCT CODE: MPFOS

LOT NUMBER: MPFOS1216

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) 12/12/2016

EXPIRY DATE: (mm/dd/yyyy) 12/12/2021

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DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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Certified By: B.G. Chittim **Date:** 12/14/2016 (mm/dd/yyyy)

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UNCERTAINTY:

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

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

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

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

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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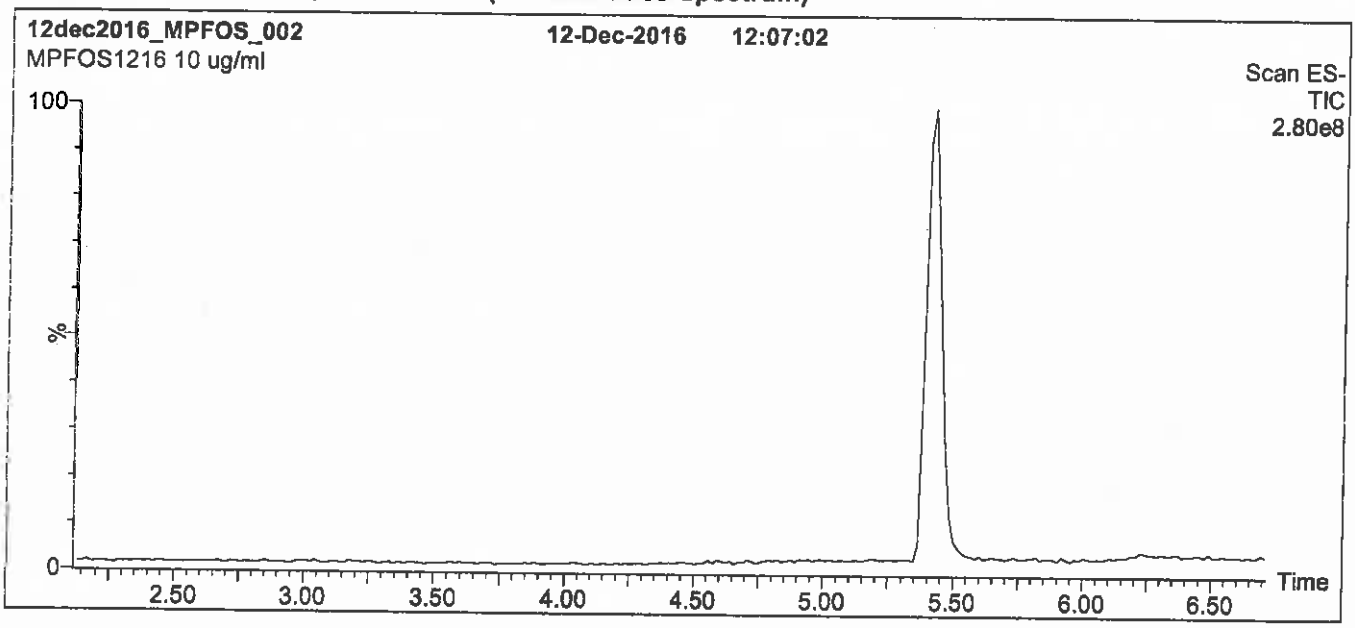
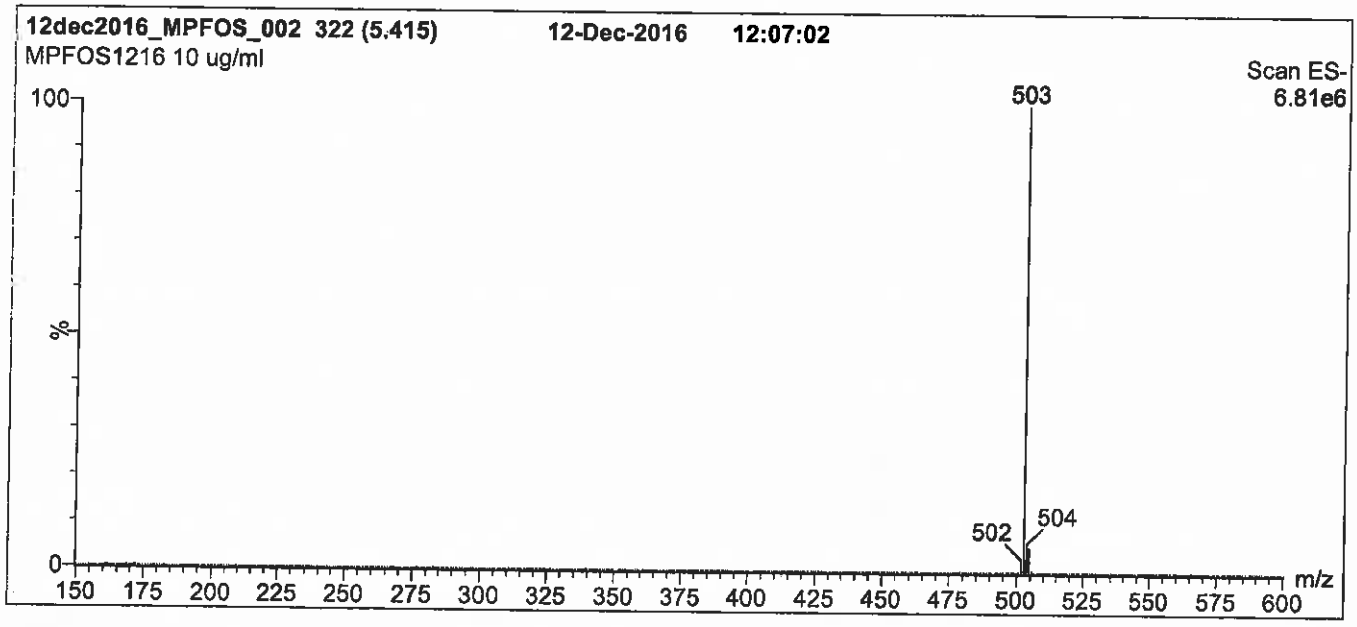
Figure 1: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

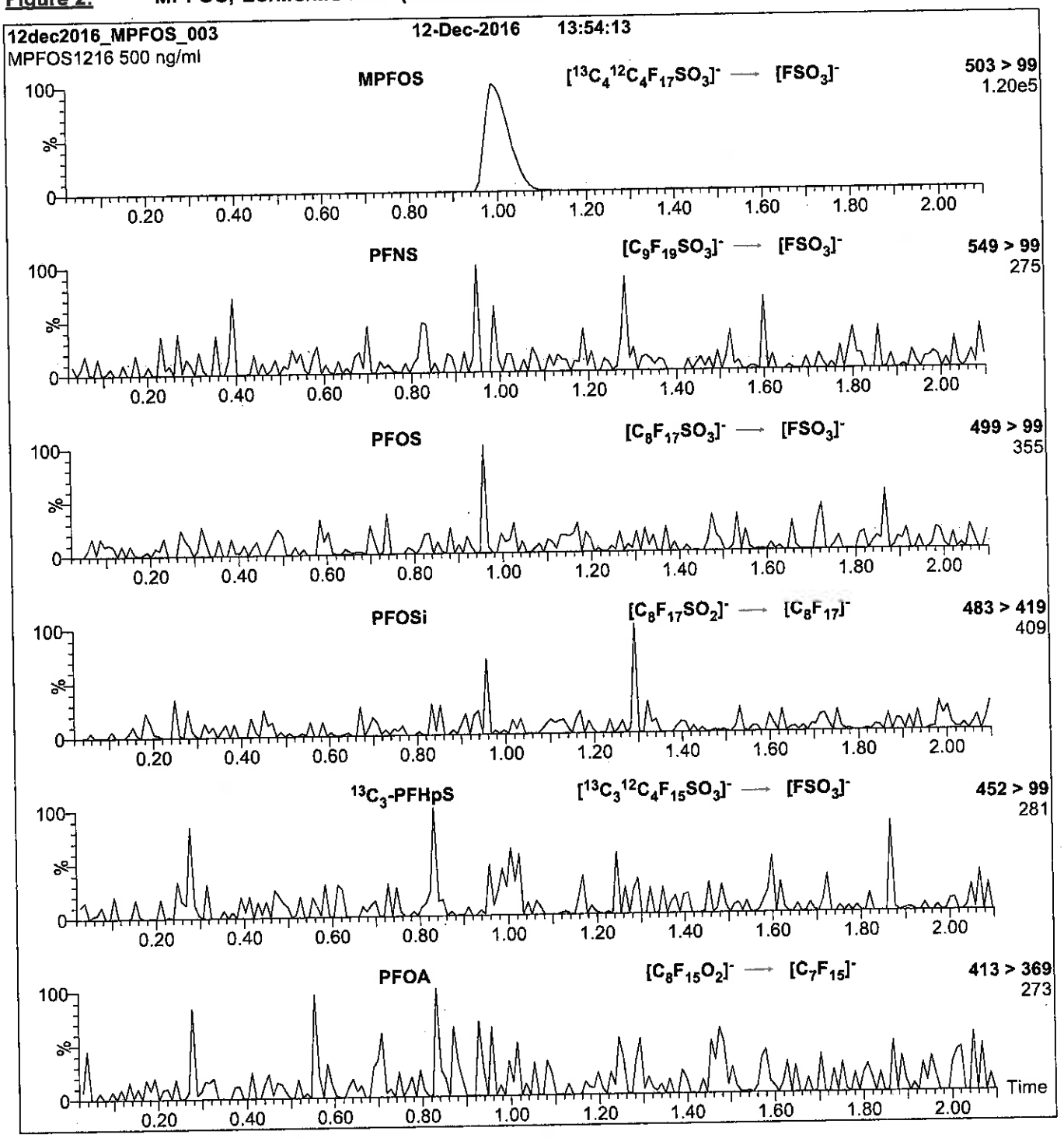
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

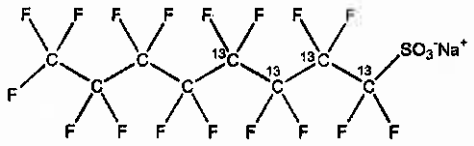
LCMPFOS_00023

r: 7/5/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFOS	**LOT NUMBER:**	MPFOS0517
COMPOUND:	Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4\text{-}^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	05/19/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/19/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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UNCERTAINTY:

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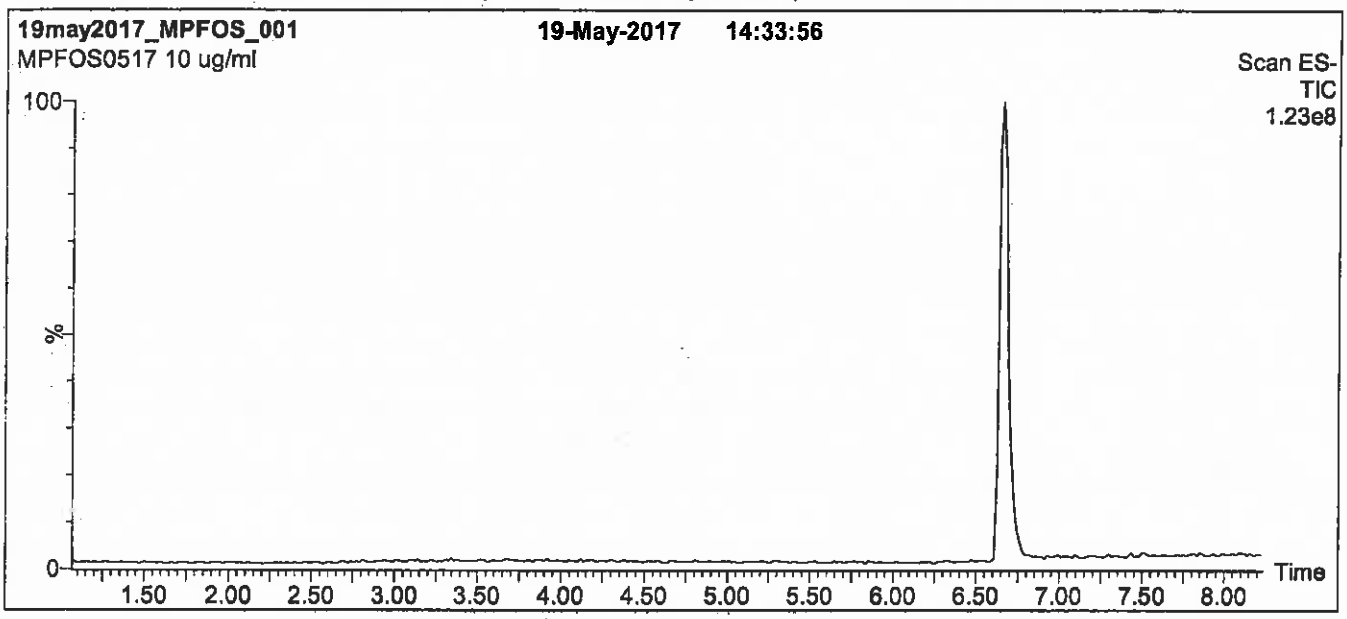
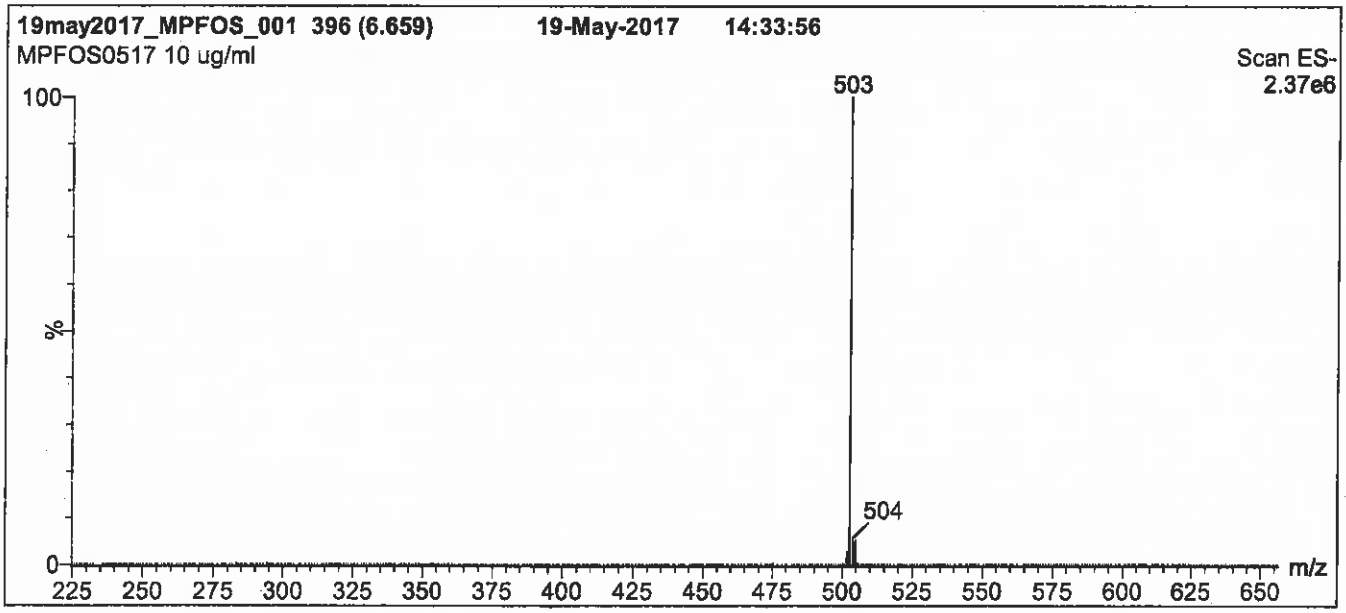




Conditions for Figure 1:

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

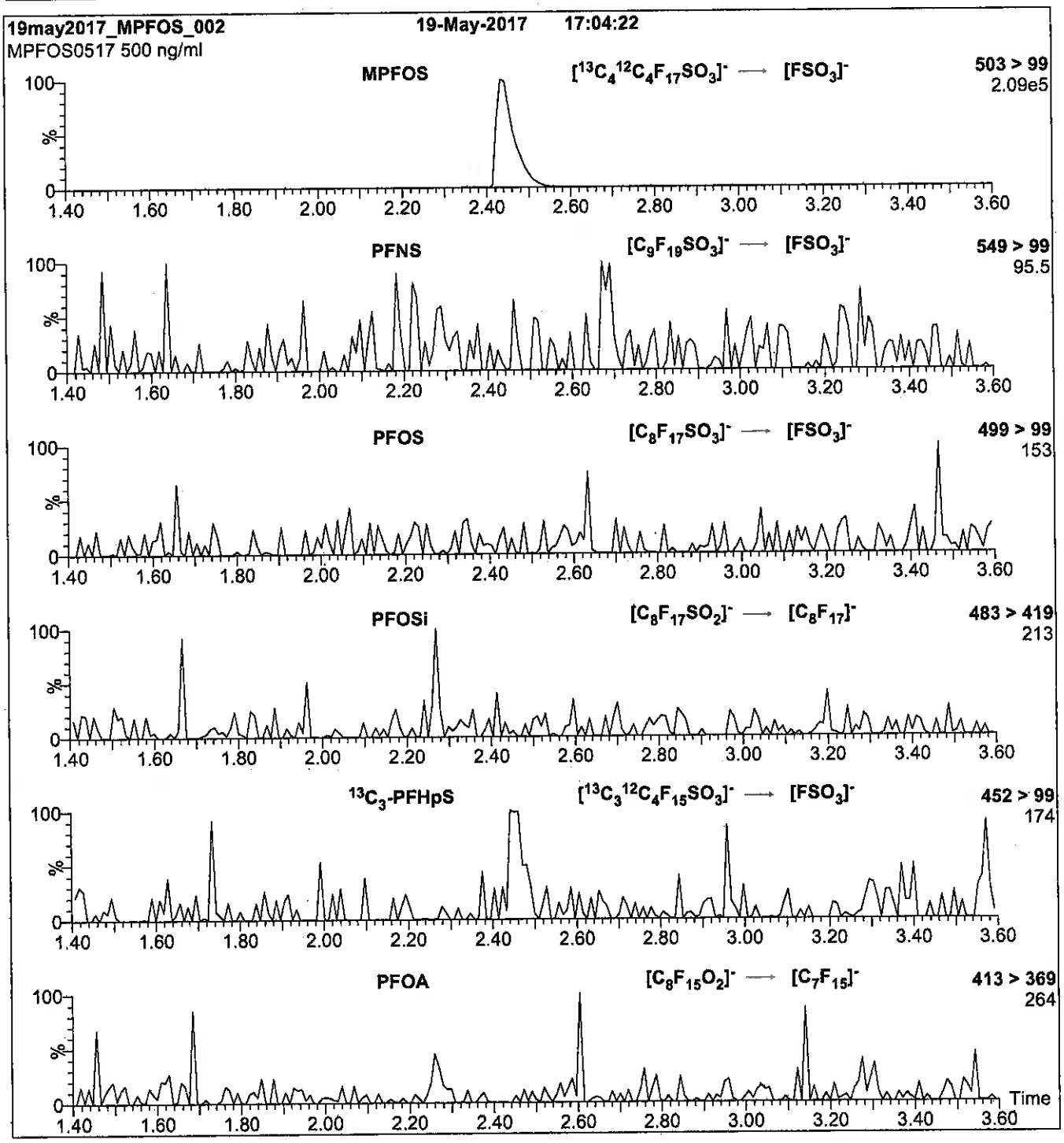
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
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) = 3.31e-3
Collision Energy (eV) = 40

Reagent

LCMPFUdA_00011

r: 5/3/14 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

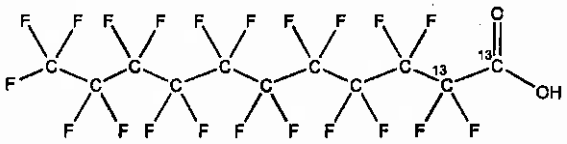
PRODUCT CODE: MPFUdA

LOT NUMBER: MPFUdA1116

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) 11/22/2016

EXPIRY DATE: (mm/dd/yyyy) 11/22/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- 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: 12/07/2016 (mm/dd/yyyy)

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

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CALA

ANAB ACCREDITED

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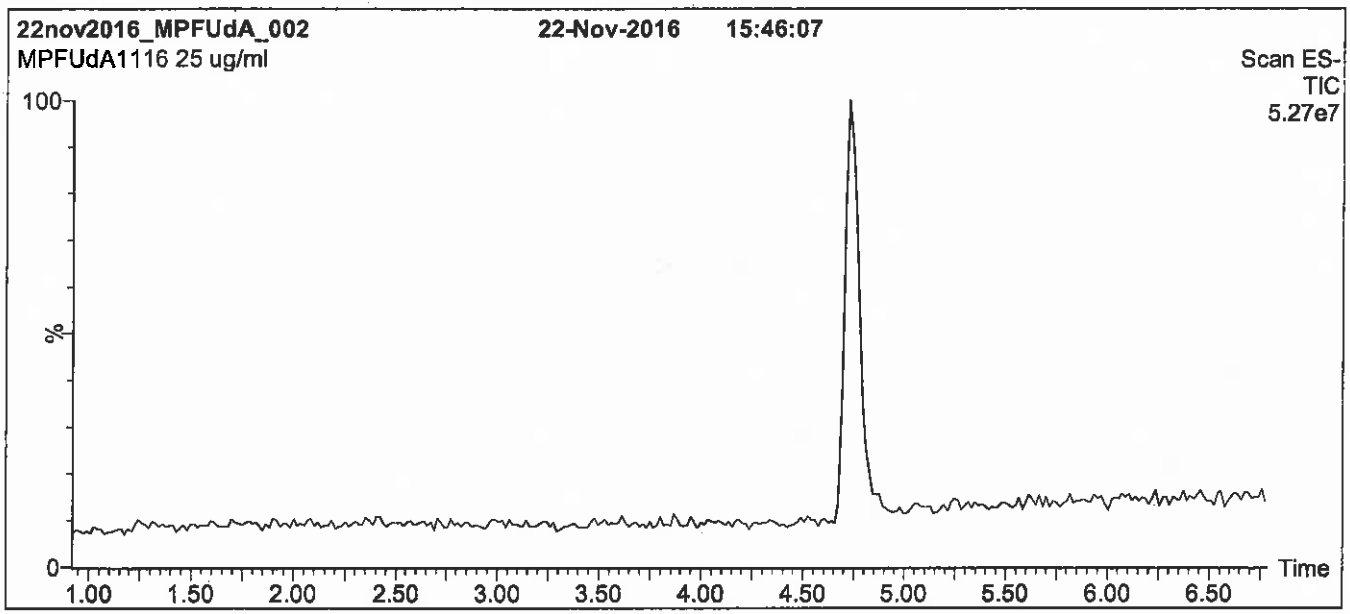
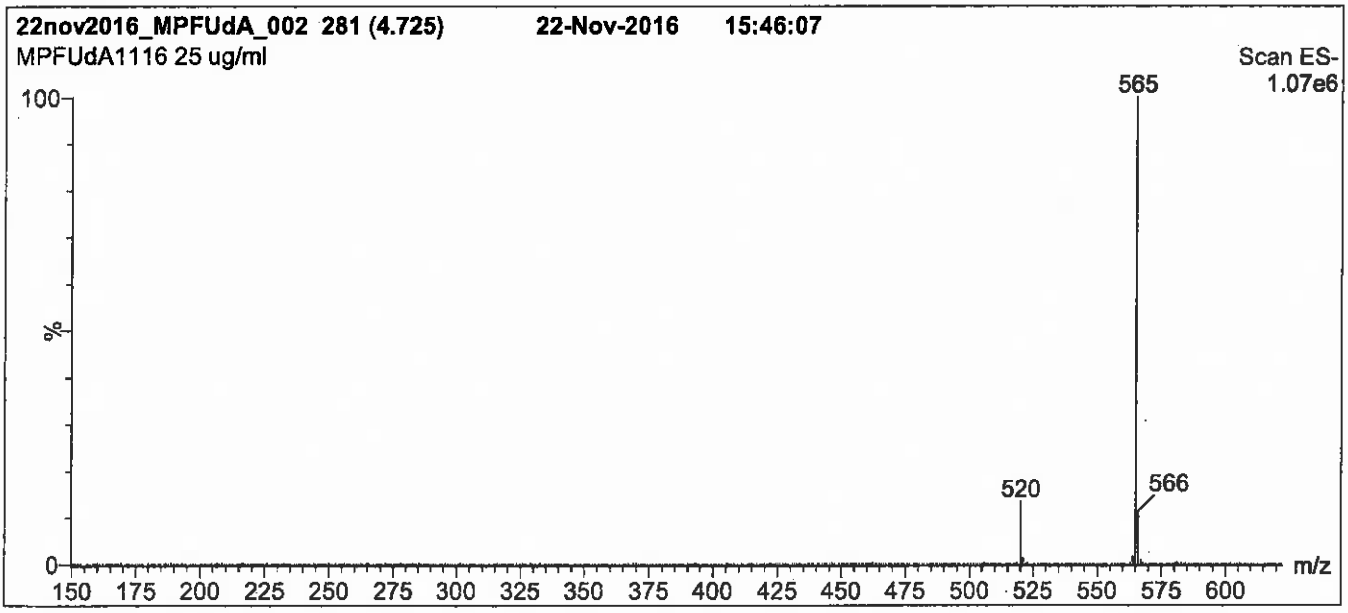




Conditions for Figure 1:

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: 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

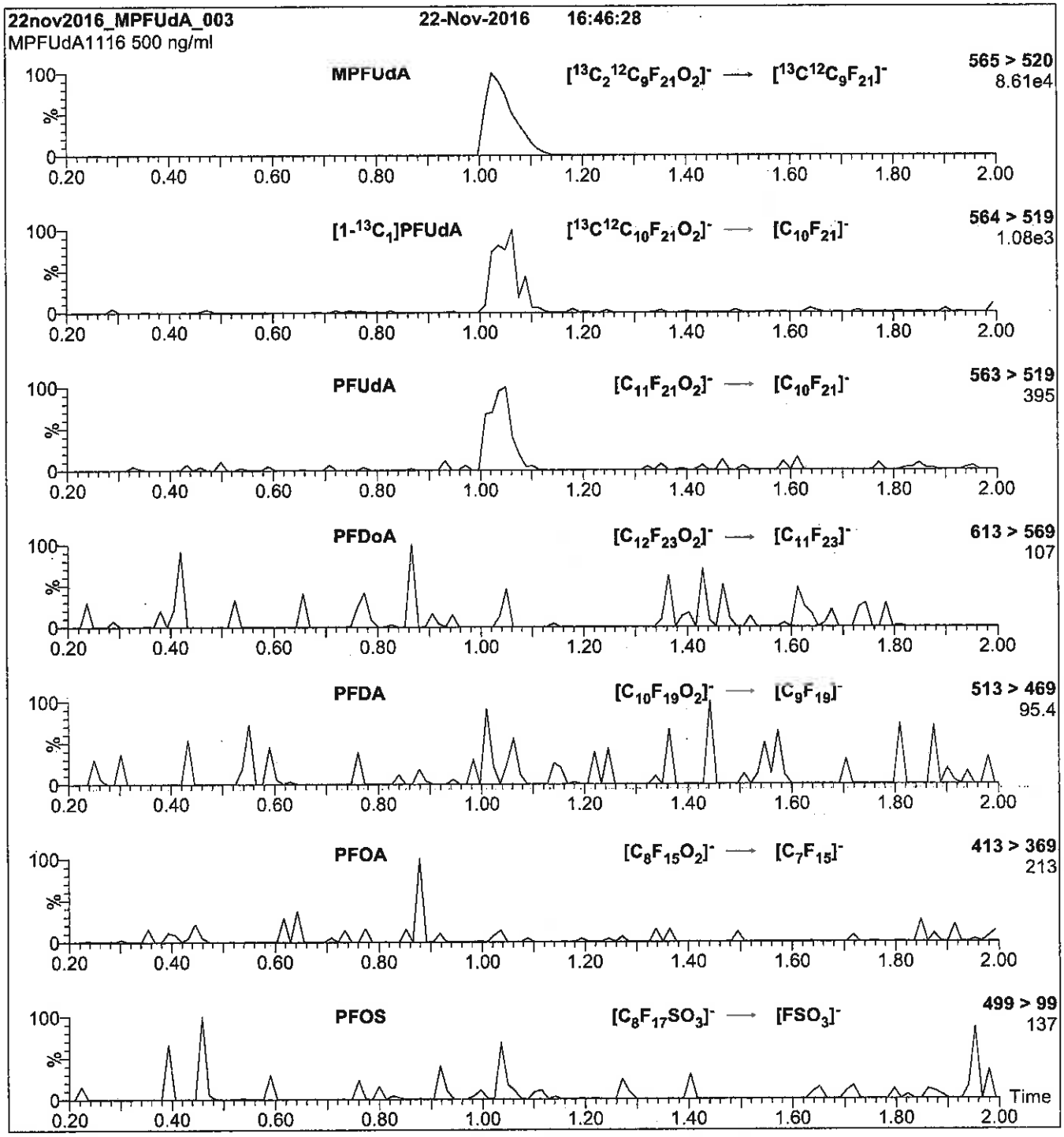
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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) = 3.46e-3
Collision Energy (eV) = 11

Reagent

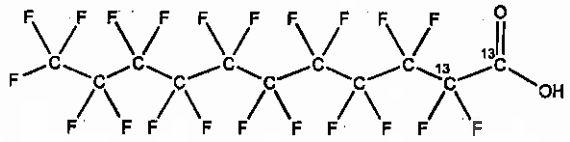
LCMPFUdA_00012

r: 7/5/17 SKJ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFUdA	**LOT NUMBER:**	MPFUdA1116
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)	11/22/2016		
EXPIRY DATE: (mm/dd/yyyy)	11/22/2021		
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The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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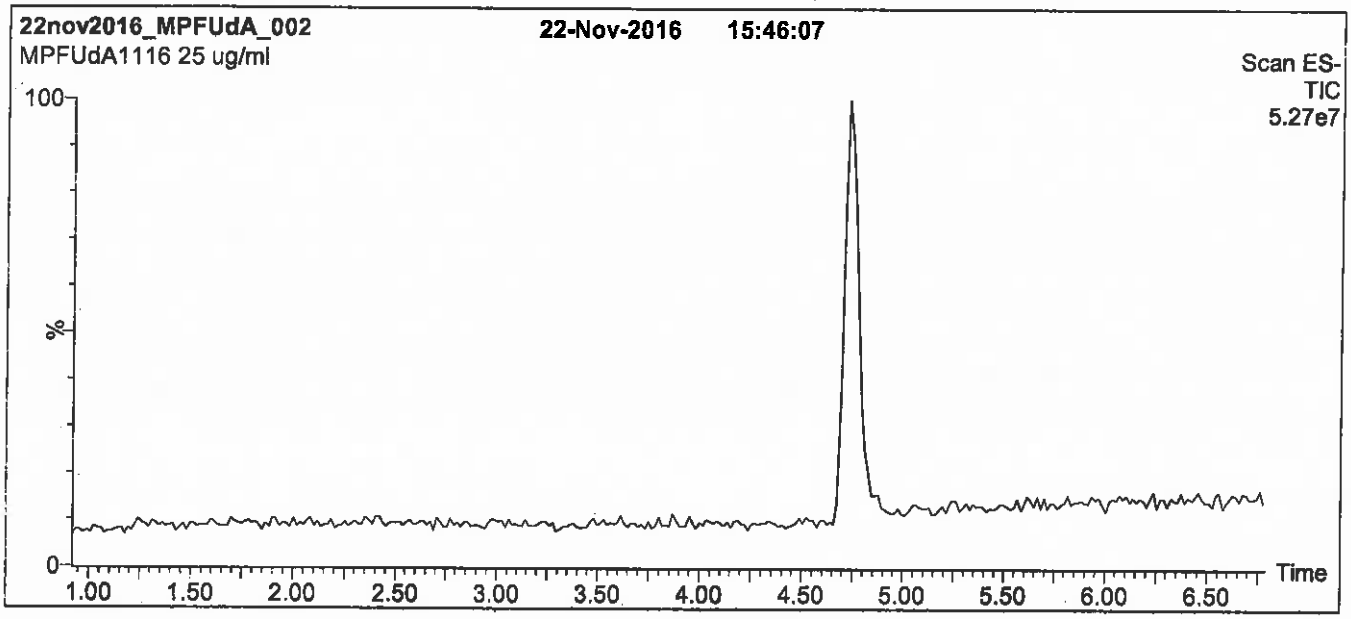
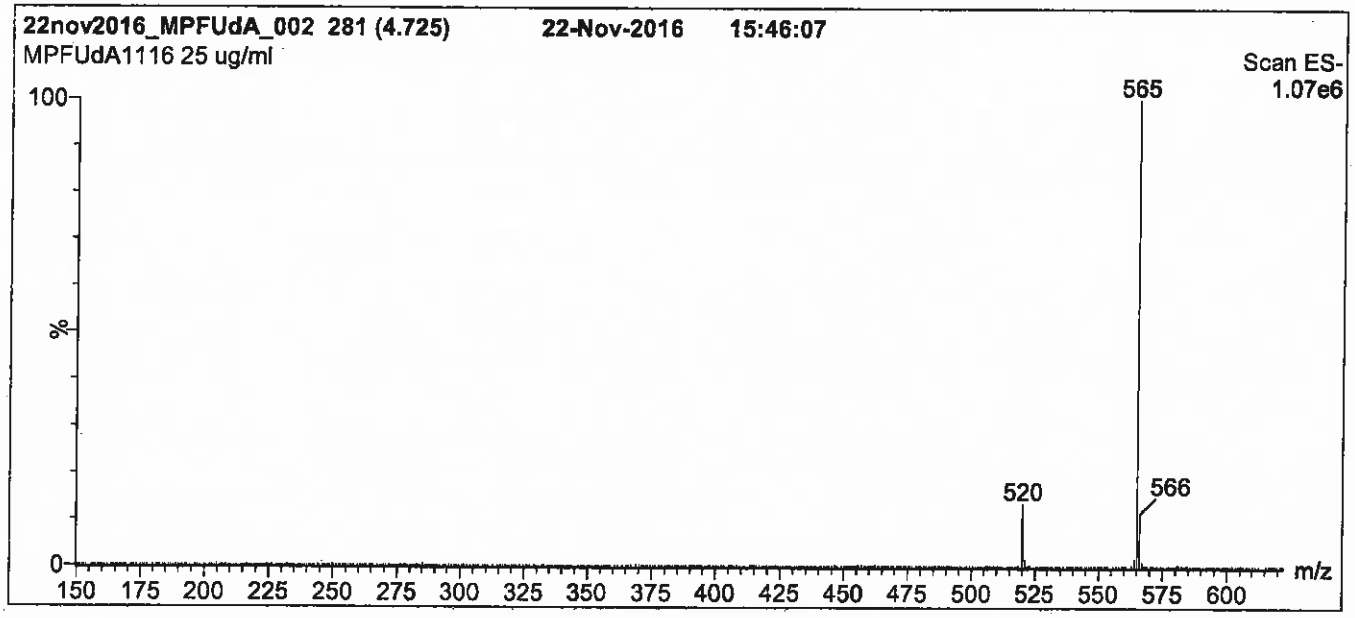
Figure 1: **MPFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: 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

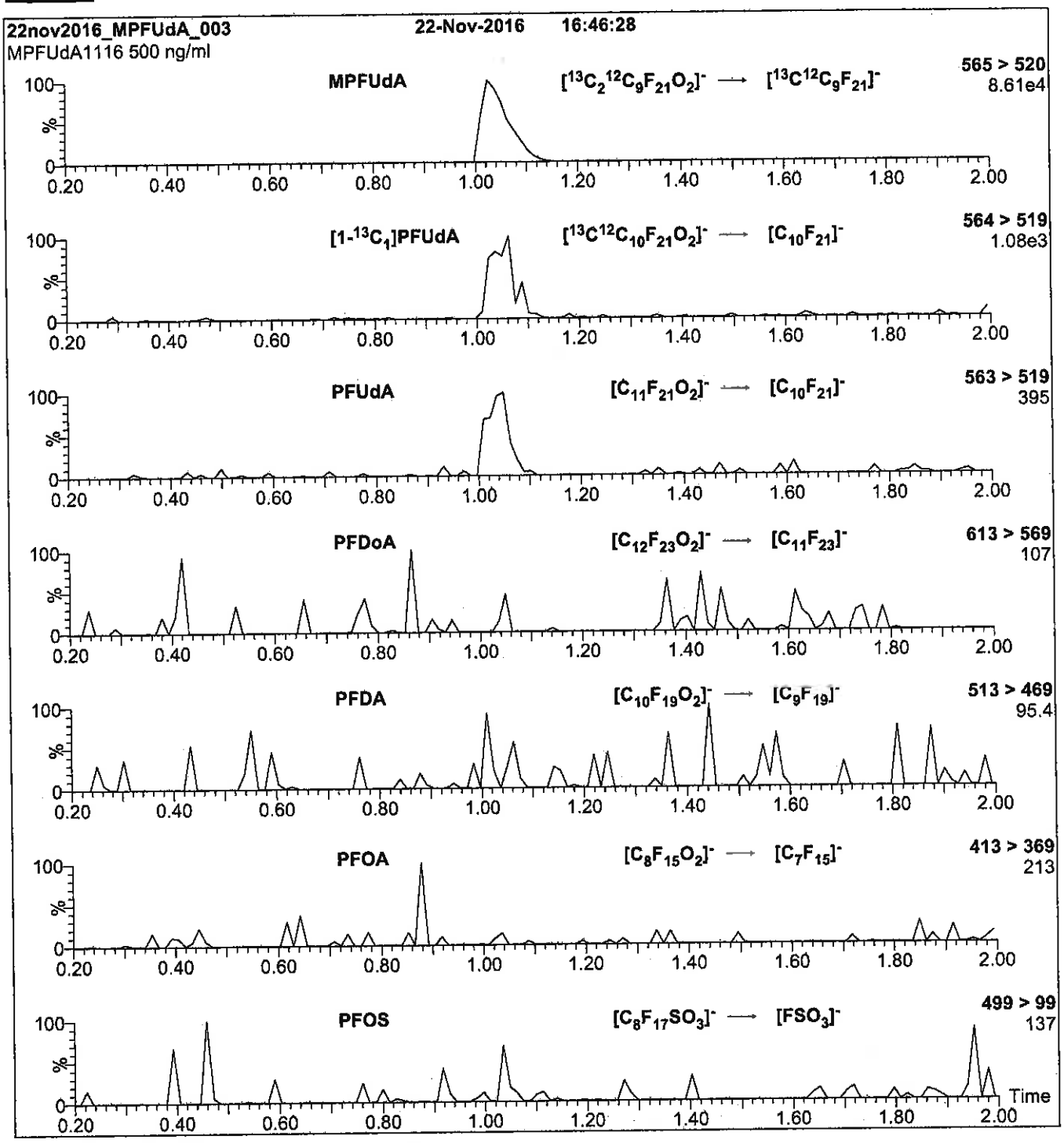
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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) = 3.46e-3
Collision Energy (eV) = 11

Reagent

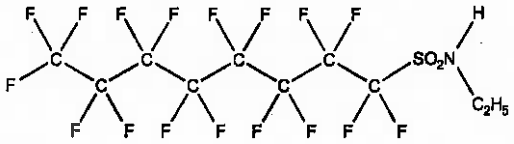
LCN-EtFOSA-M_00004

R: 12/20/16 SK✓

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-EtFOSA-M	**LOT NUMBER:**	NEtFOSA0516M
COMPOUND:	N-ethylperfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	4151-50-2



MOLECULAR FORMULA:	$C_{10}H_5F_{17}NO_2S$	**MOLECULAR WEIGHT:**	527.20
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/24/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: B.G. Chittim **Date:** 05/27/2016 (mm/dd/yyyy)

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

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CALA

ANAB ACCREDITED

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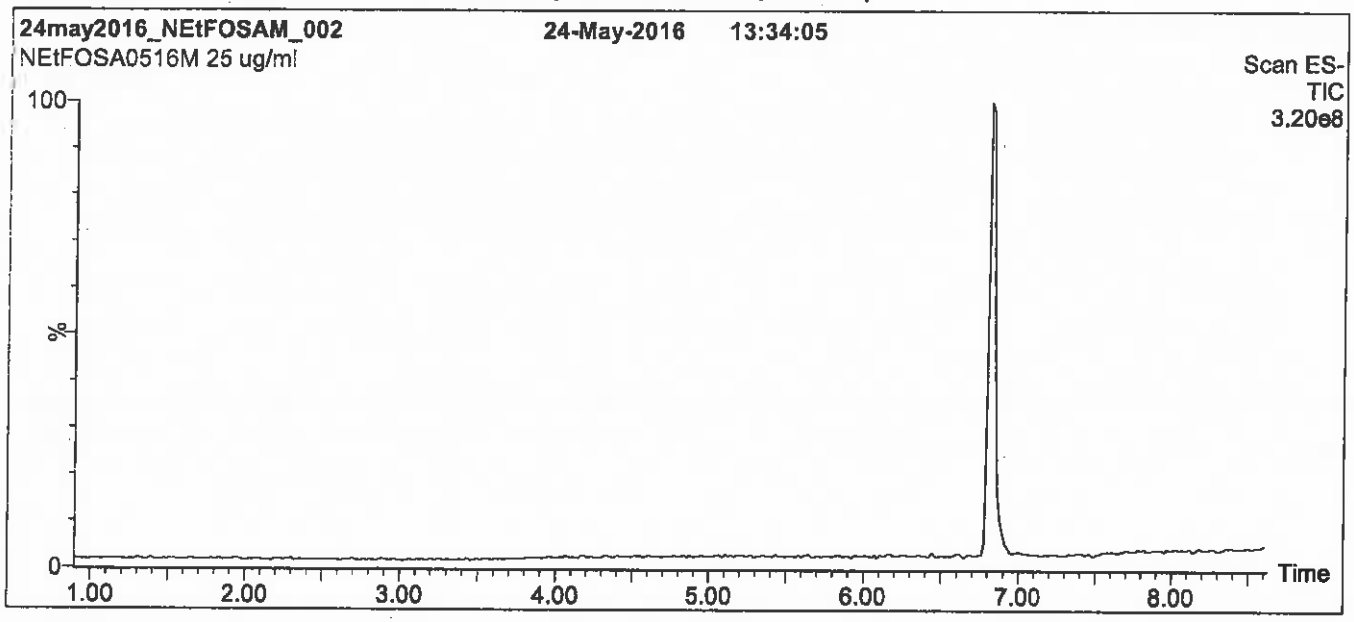
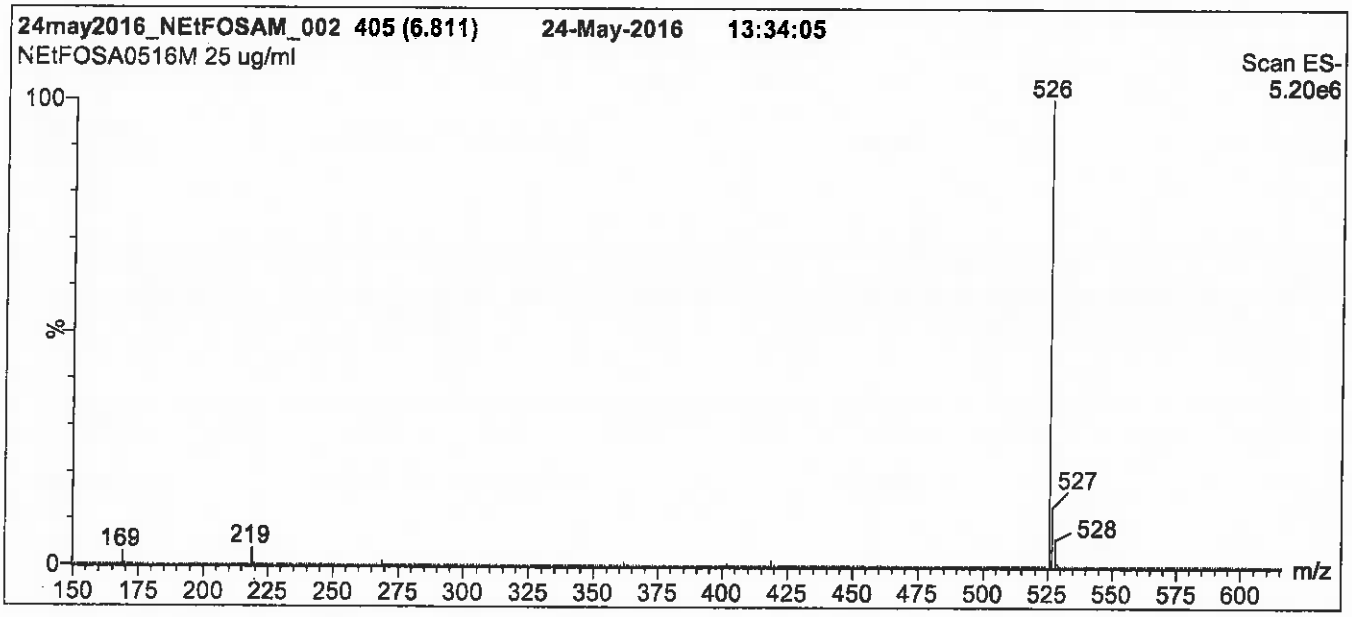
Figure 1: **N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





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: 45% H_2O / 55% (80:20 MeOH:ACN)
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

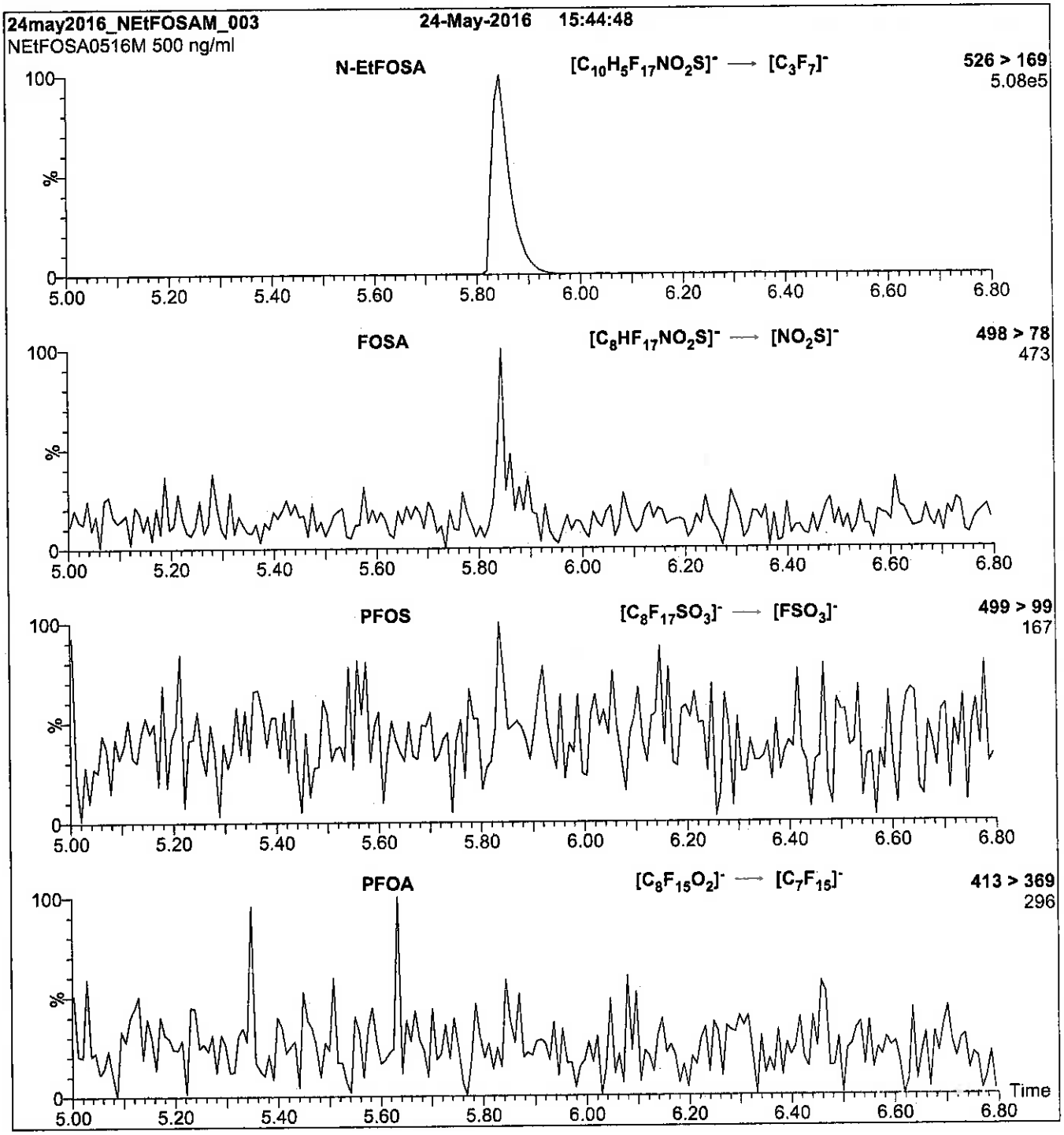
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml N-EtFOSA-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) = 3.54e-3
Collision Energy (eV) = 30

Reagent

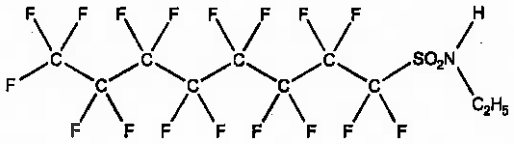
LCN-EtFOSA-M_00005

R: 12/20/16 SK✓

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-EtFOSA-M	**LOT NUMBER:**	NEtFOSA0516M
COMPOUND:	N-ethylperfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	4151-50-2



MOLECULAR FORMULA:	$C_{10}H_5F_{17}NO_2S$	**MOLECULAR WEIGHT:**	527.20
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/24/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: B.G. Chittim **Date:** 05/27/2016 (mm/dd/yyyy)

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CALA

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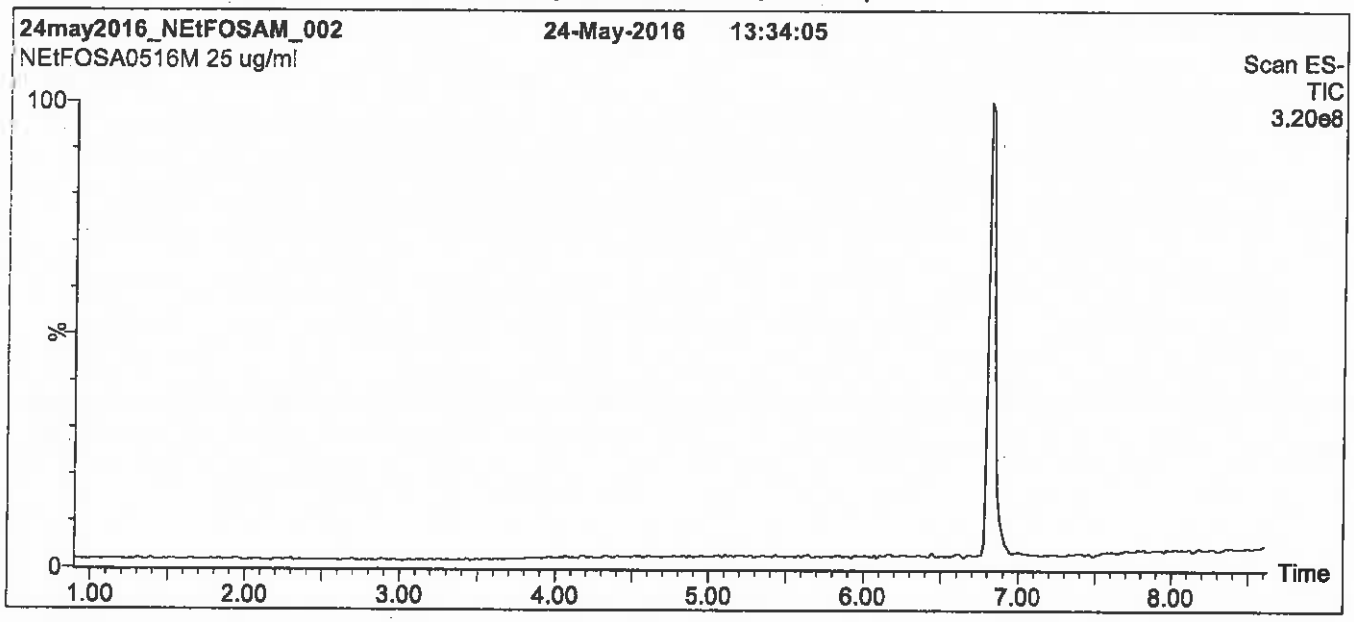
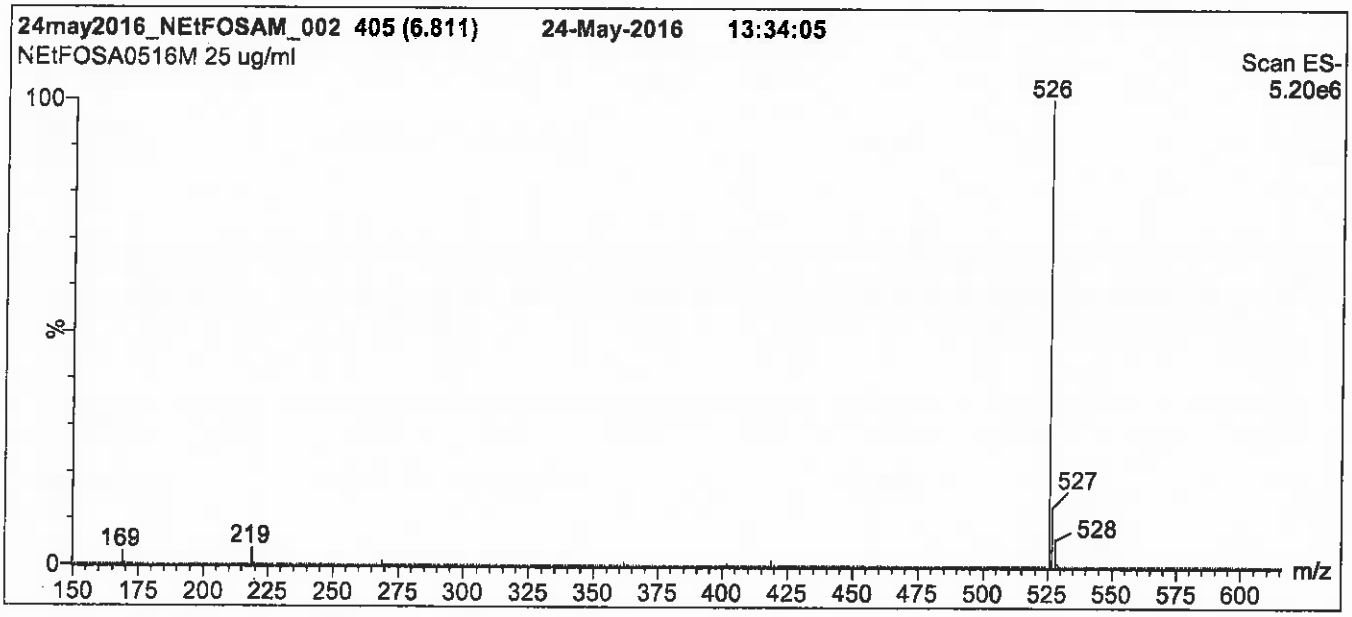
Figure 1: **N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





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: 45% H_2O / 55% (80:20 MeOH:ACN)
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

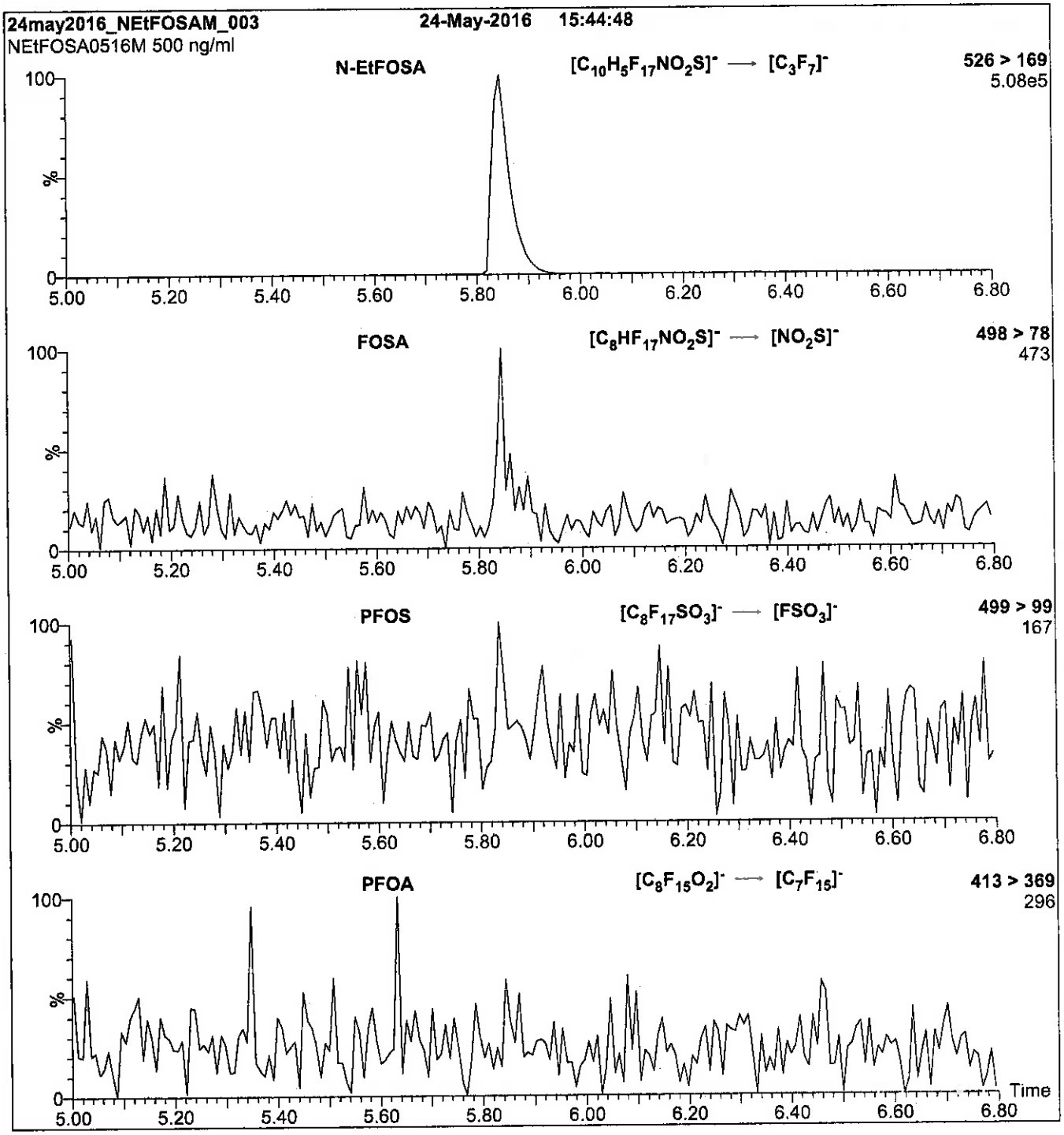
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml N-EtFOSA-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) = 3.54e-3
Collision Energy (eV) = 30

Reagent

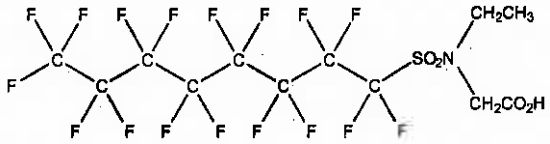
LCN-EtFOSAA_00003

P: 12/29/16 SFV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-EtFOSAA	**LOT NUMBER:**	NEtFOSAA0916
COMPOUND:	N-ethylperfluoro-1-octanesulfonamidoacetic acid		
STRUCTURE:		**CAS #:**	2991-50-6



MOLECULAR FORMULA:	$C_{12}H_8F_{17}NO_4S$	**MOLECULAR WEIGHT:**	585.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
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.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid molety to the methyl ester.

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Certified By: B.G. Chittim **Date:** 10/07/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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CALA

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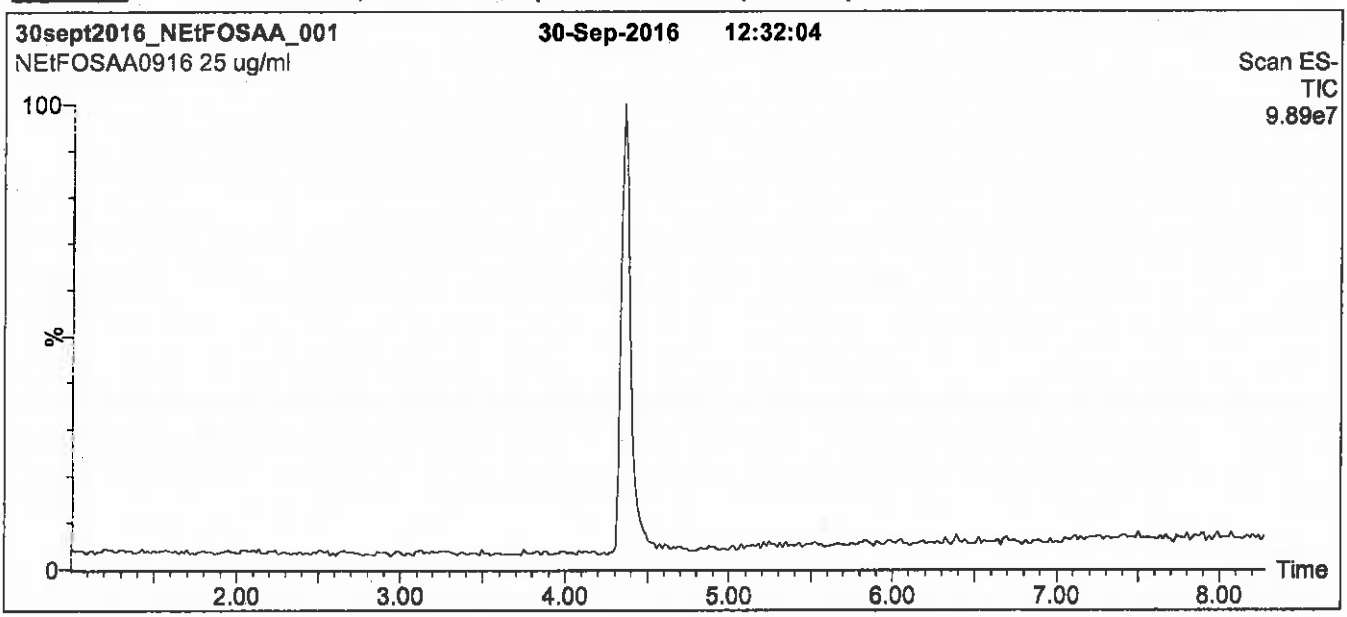

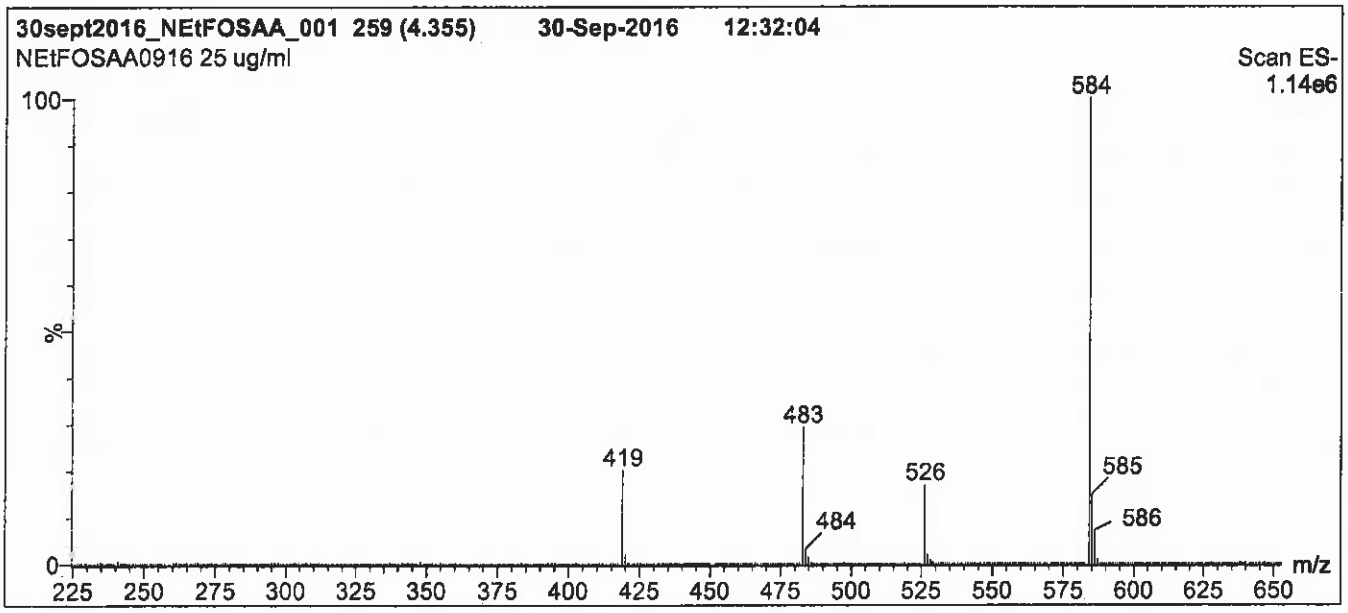

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LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

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1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
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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

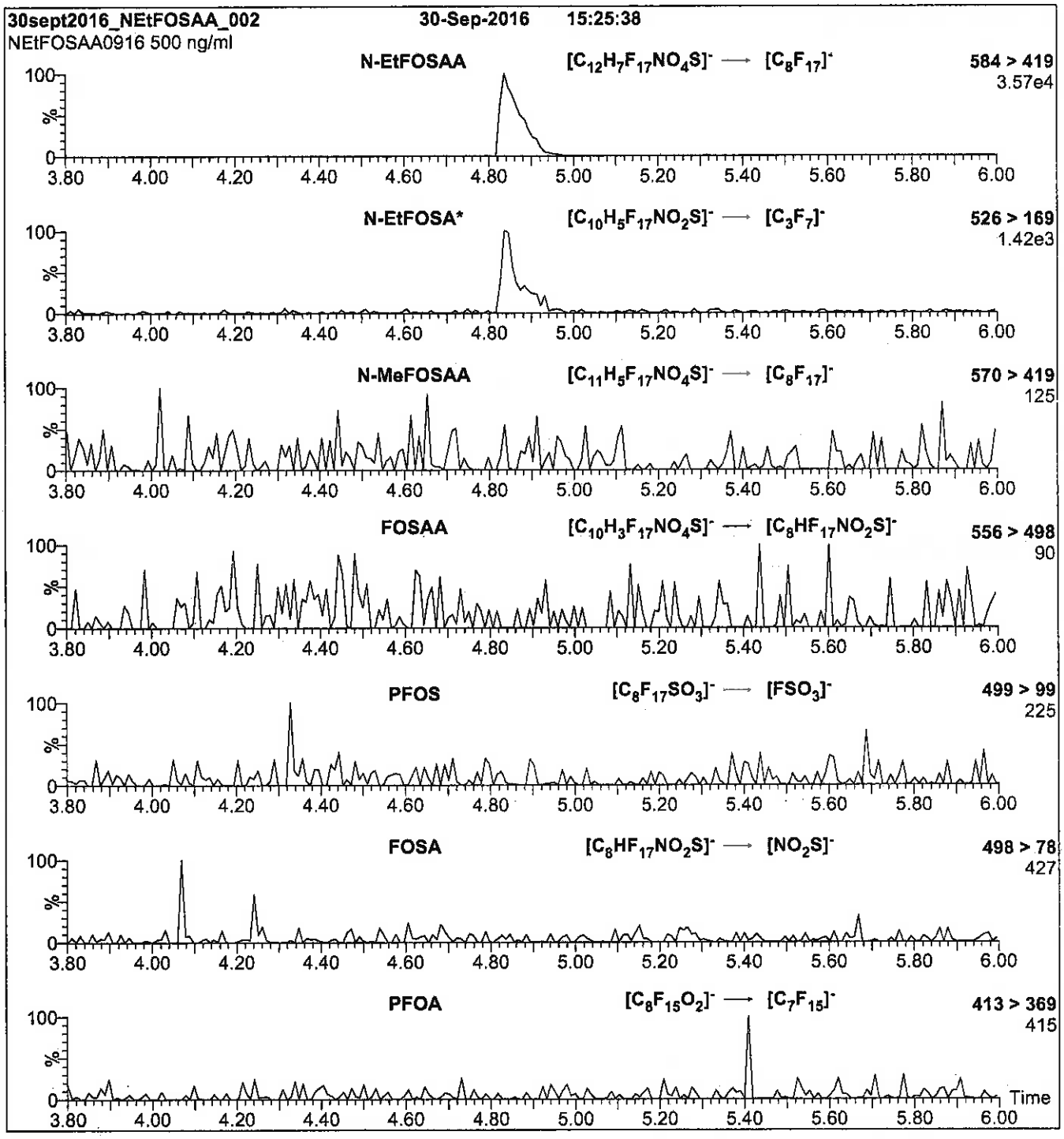
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Note: N-EtFOSA is formed by fragmentation of N-EtFOSAA.

Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml N-EtFOSAA)

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) = 20

Reagent

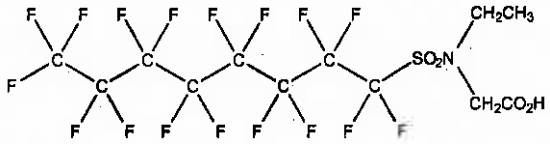
LCN-EtFOSAA_00004

P: 12/29/16 SFV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-EtFOSAA	**LOT NUMBER:**	NEtFOSAA0916
COMPOUND:	N-ethylperfluoro-1-octanesulfonamidoacetic acid		
STRUCTURE:		**CAS #:**	2991-50-6



MOLECULAR FORMULA:	$C_{12}H_8F_{17}NO_4S$	**MOLECULAR WEIGHT:**	585.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
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.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid molety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/07/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

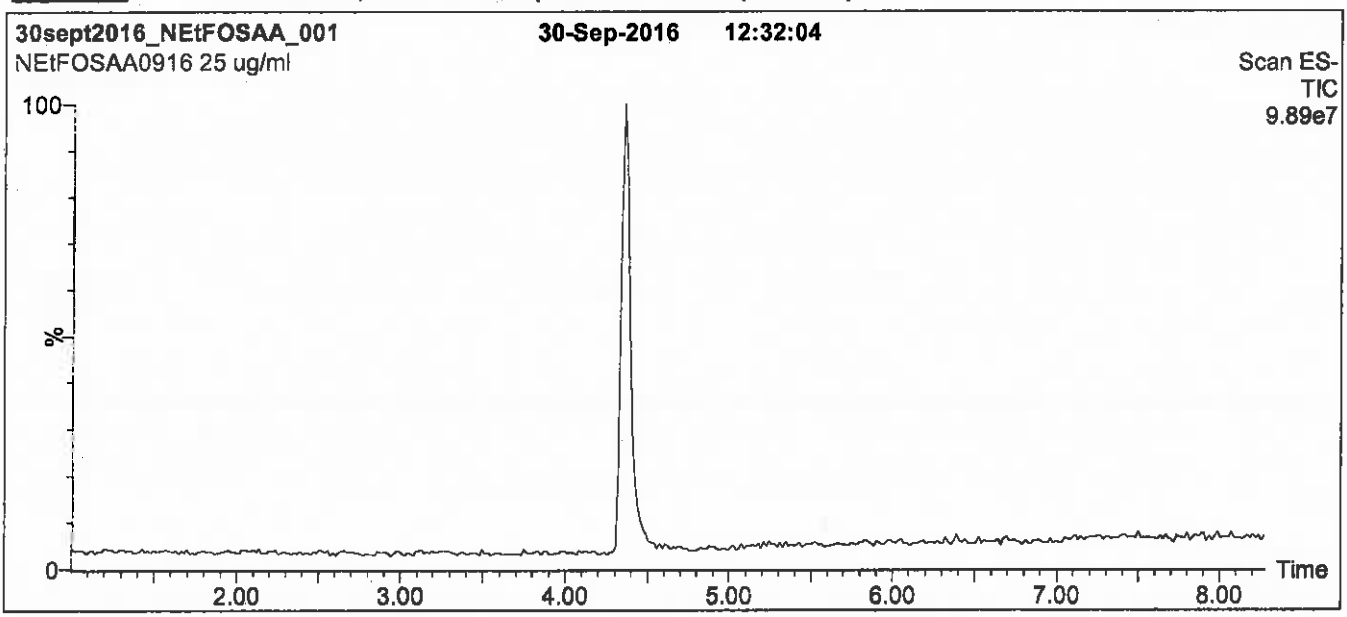
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

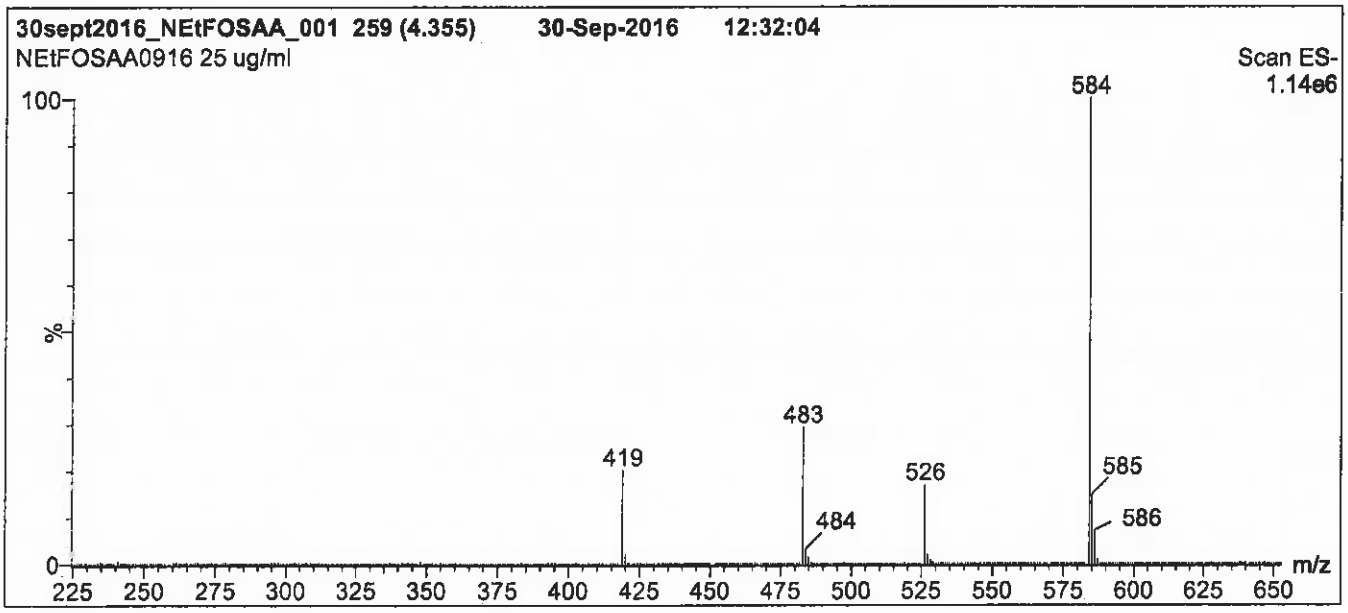
CALA

ANAB ACCREDITED

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: **N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

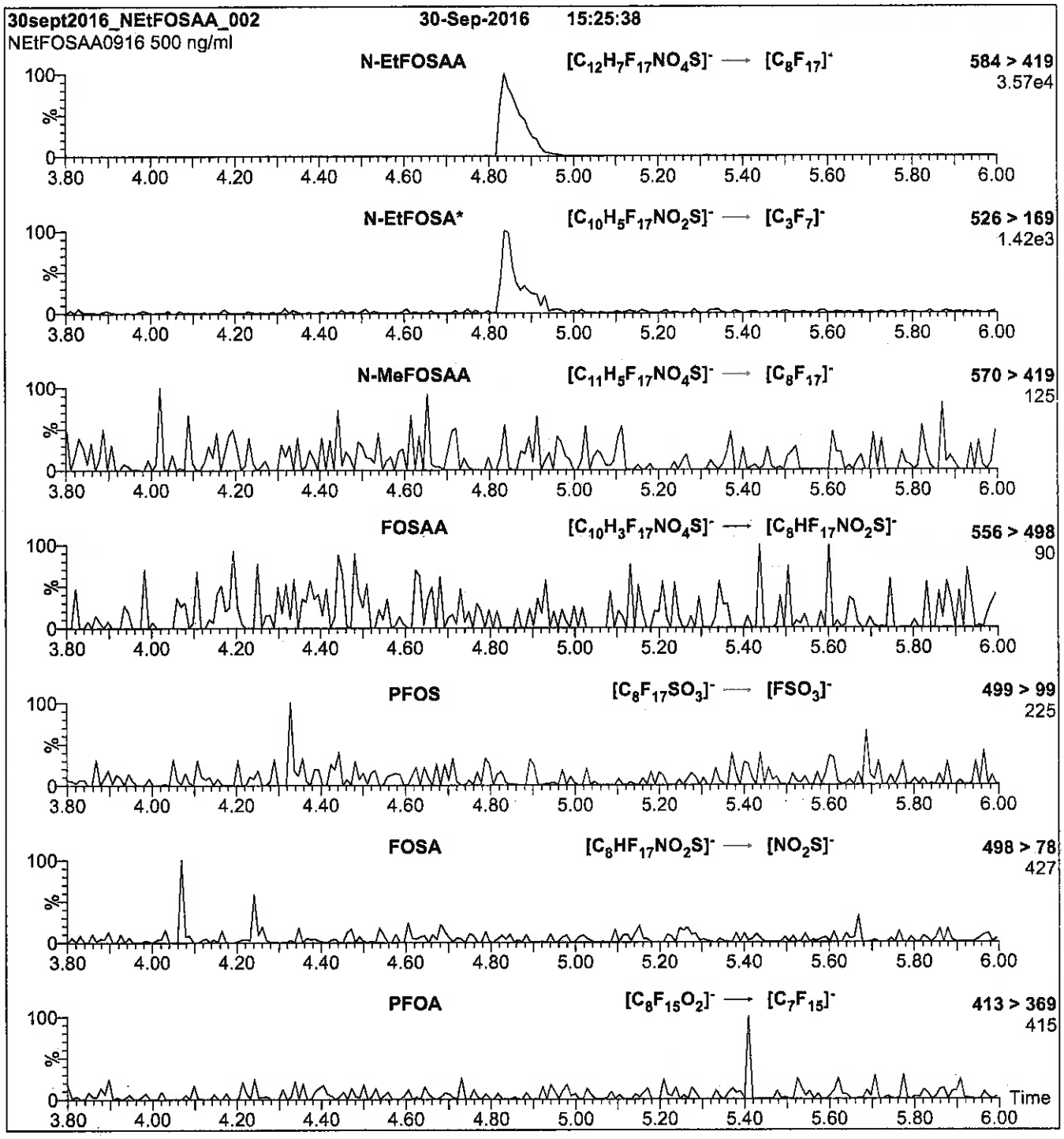
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Note: N-EtFOSA is formed by fragmentation of N-EtFOSAA.

Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml N-EtFOSAA)

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) = 20

Reagent

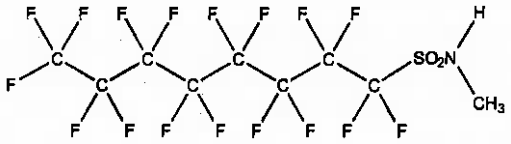
LCN-MeFOSA-M_00003

Pr 12/20/16 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	N-MeFOSA-M	**LOT NUMBER:**	NMeFOSA0516M
COMPOUND:	N-methylperfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	31506-32-8



MOLECULAR FORMULA:	$C_9H_4F_{17}NO_2S$	**MOLECULAR WEIGHT:**	513.17
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/24/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/26/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

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HOMOGENEITY:

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

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

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CALA

ANAB ACCREDITED

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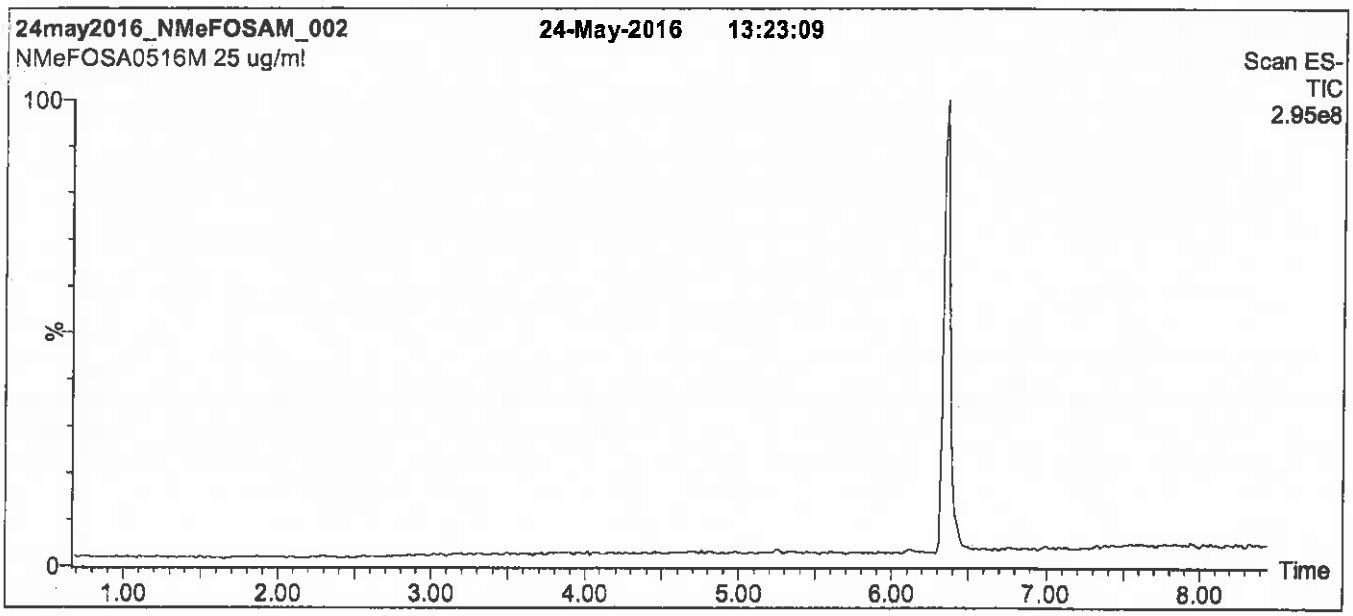
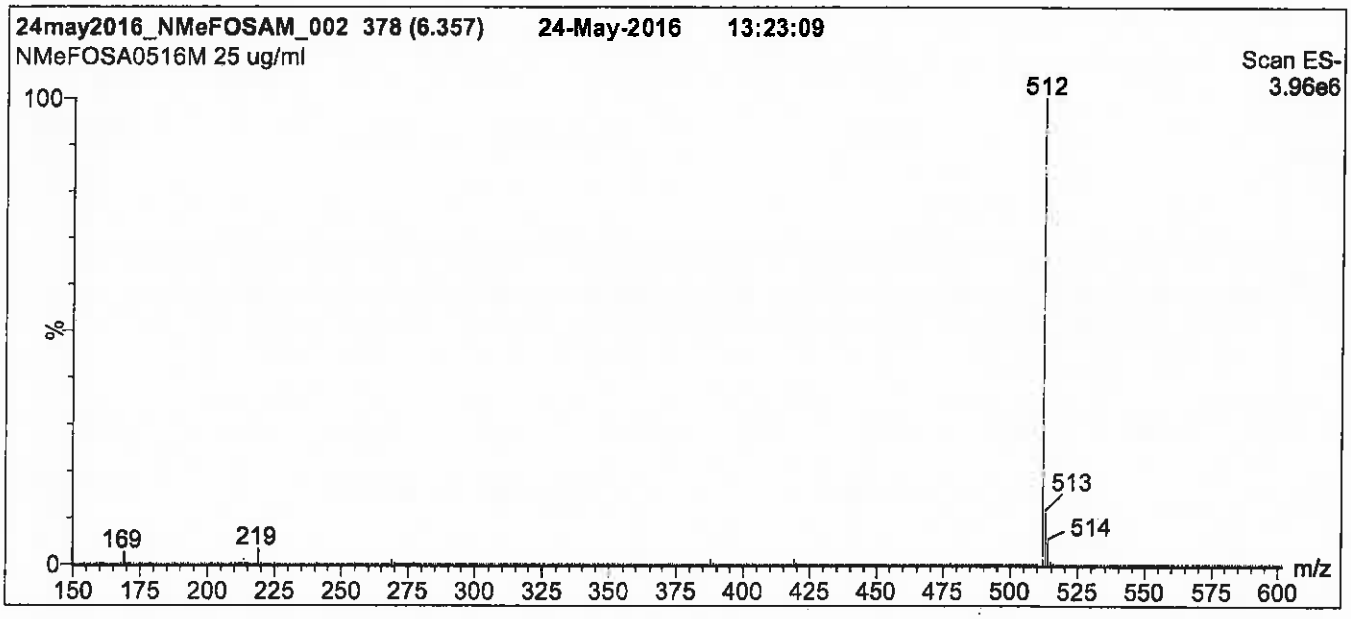
Figure 1: **N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





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

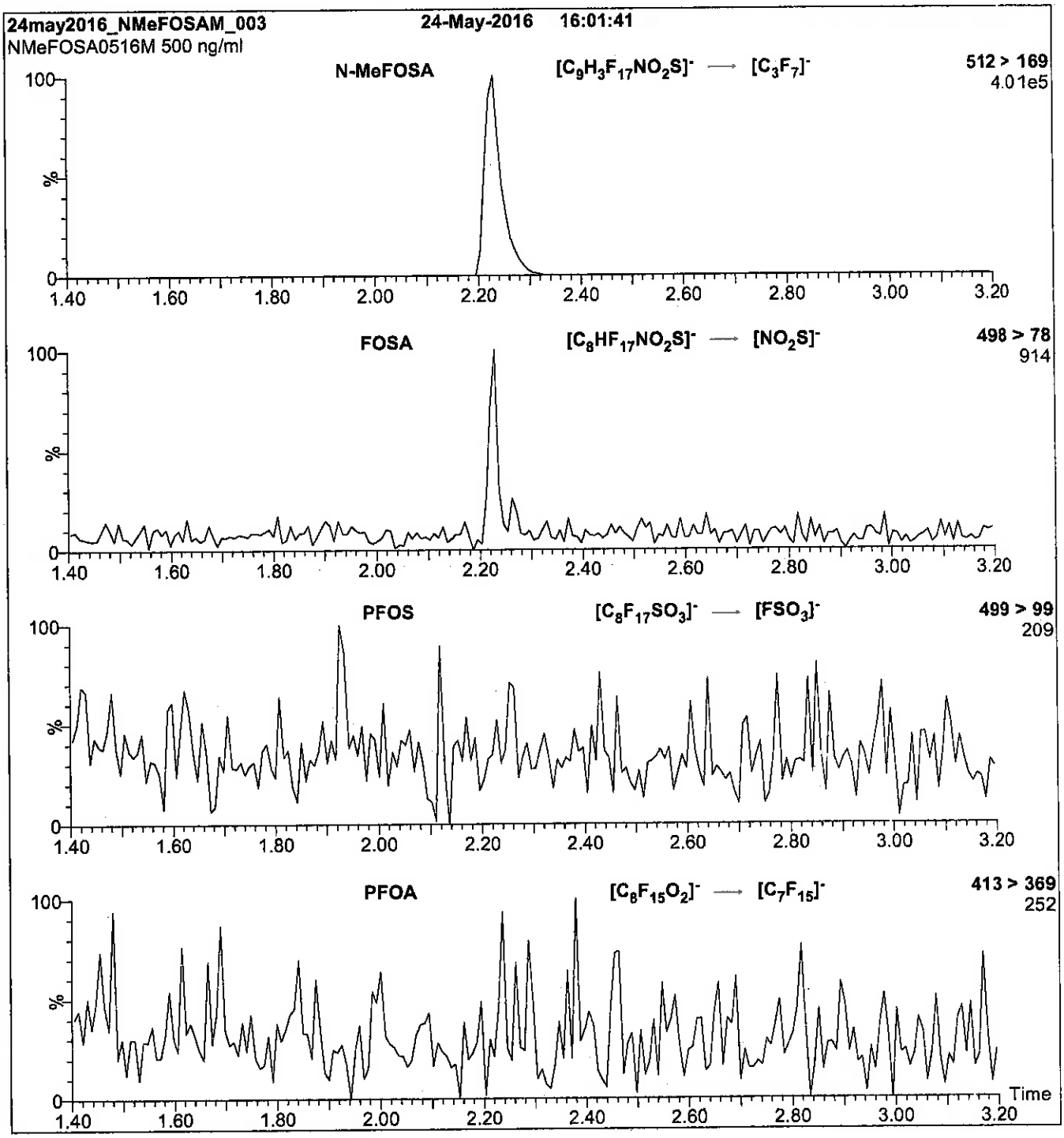
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml N-MeFOSA-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) = 3.54e-3
Collision Energy (eV) = 30

Reagent

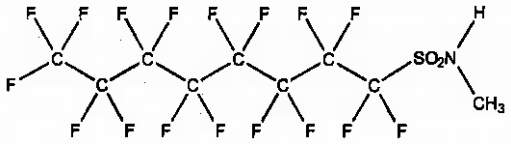
LCN-MeFOSA-M_00004

Pr 12/20/16 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-MeFOSA-M	**LOT NUMBER:**	NMeFOSA0516M
COMPOUND:	N-methylperfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	31506-32-8



MOLECULAR FORMULA:	$C_8H_4F_{17}NO_2S$	**MOLECULAR WEIGHT:**	513.17
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/24/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: B.G. Chittim **Date:** 05/26/2016 (mm/dd/yyyy)

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CALA

ANAB ACCREDITED

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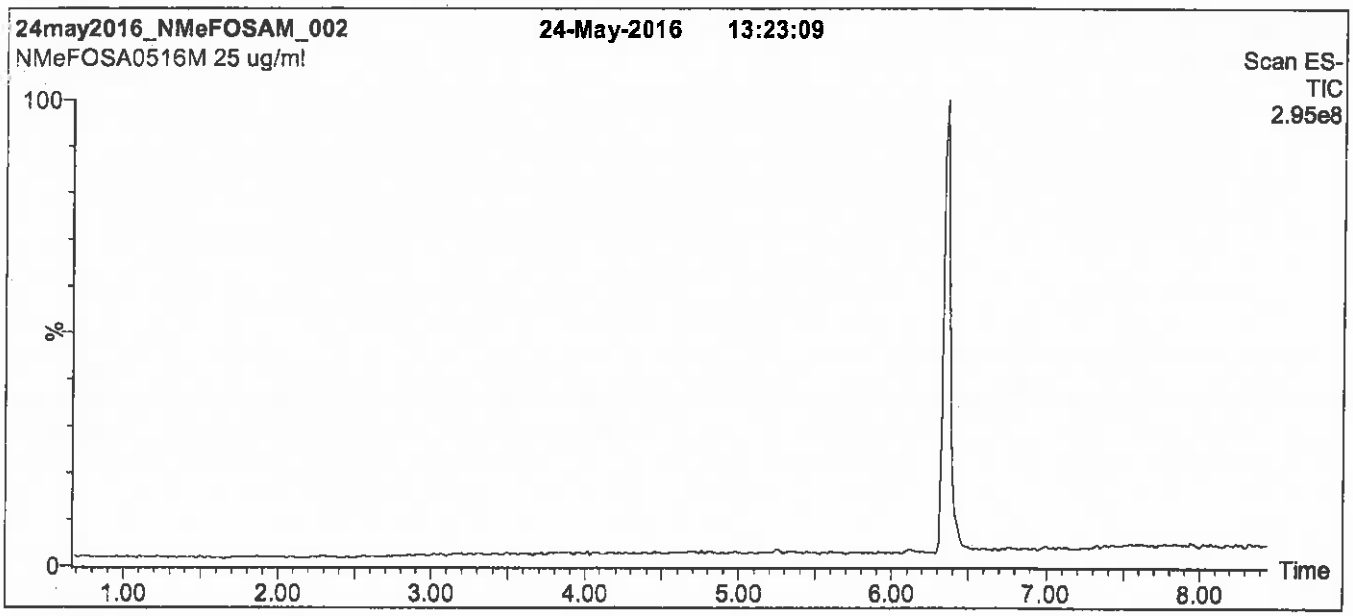
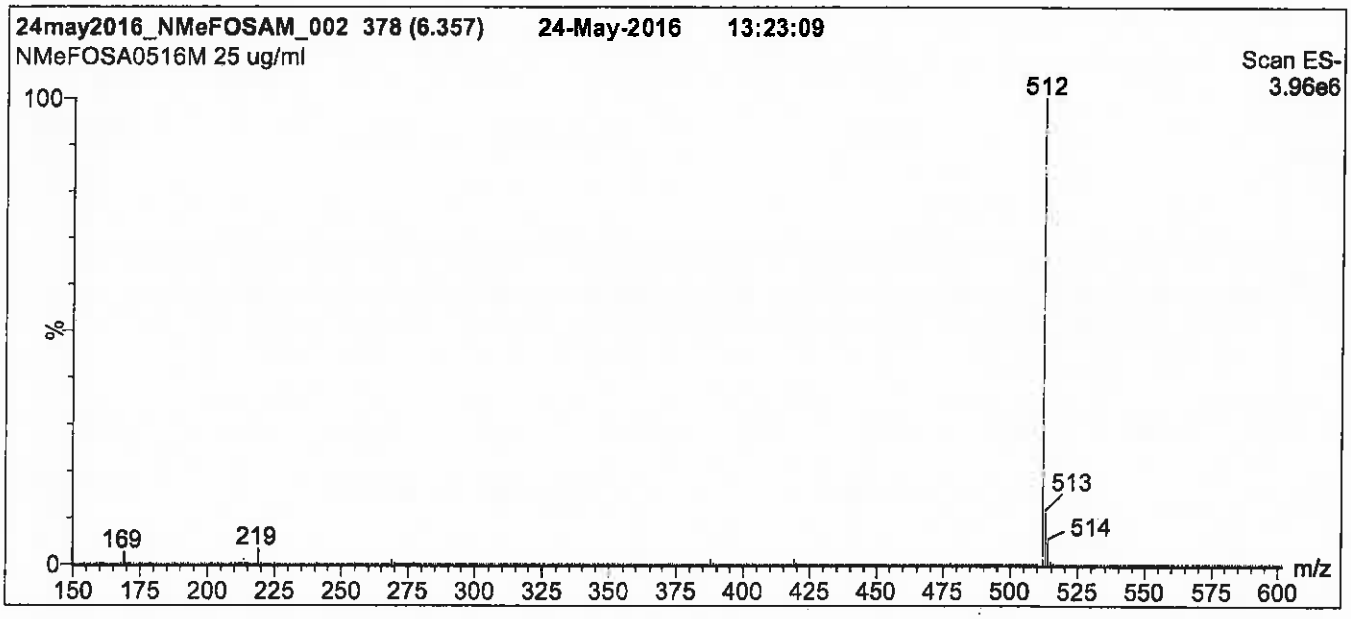
Figure 1: **N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





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

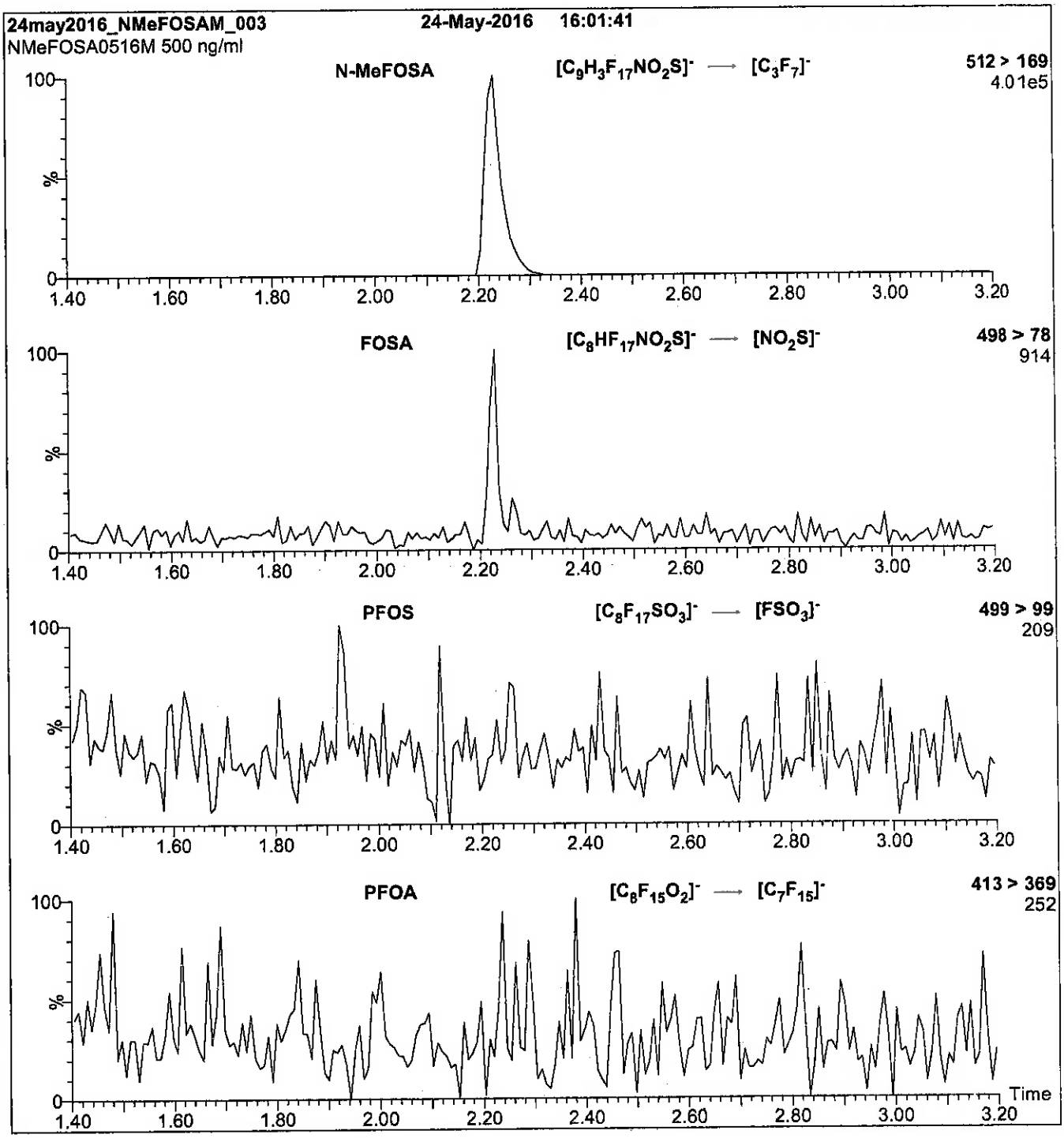
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml N-MeFOSA-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) = 3.54e-3
Collision Energy (eV) = 30

Reagent

LCN-MeFOSAA_00004

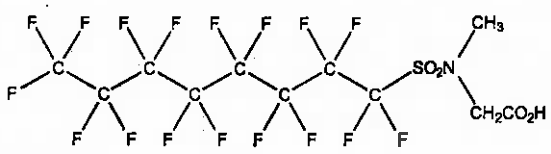
P: R/28/16 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-MeFOSAA
LOT NUMBER: NMeFOSAA0916
COMPOUND: N-methylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:
CAS #: 2355-31-9



MOLECULAR FORMULA:	$C_{11}H_8F_{17}NO_4S$	**MOLECULAR WEIGHT:**	571.21
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	10/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	10/12/2021		
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.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid molety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/25/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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

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LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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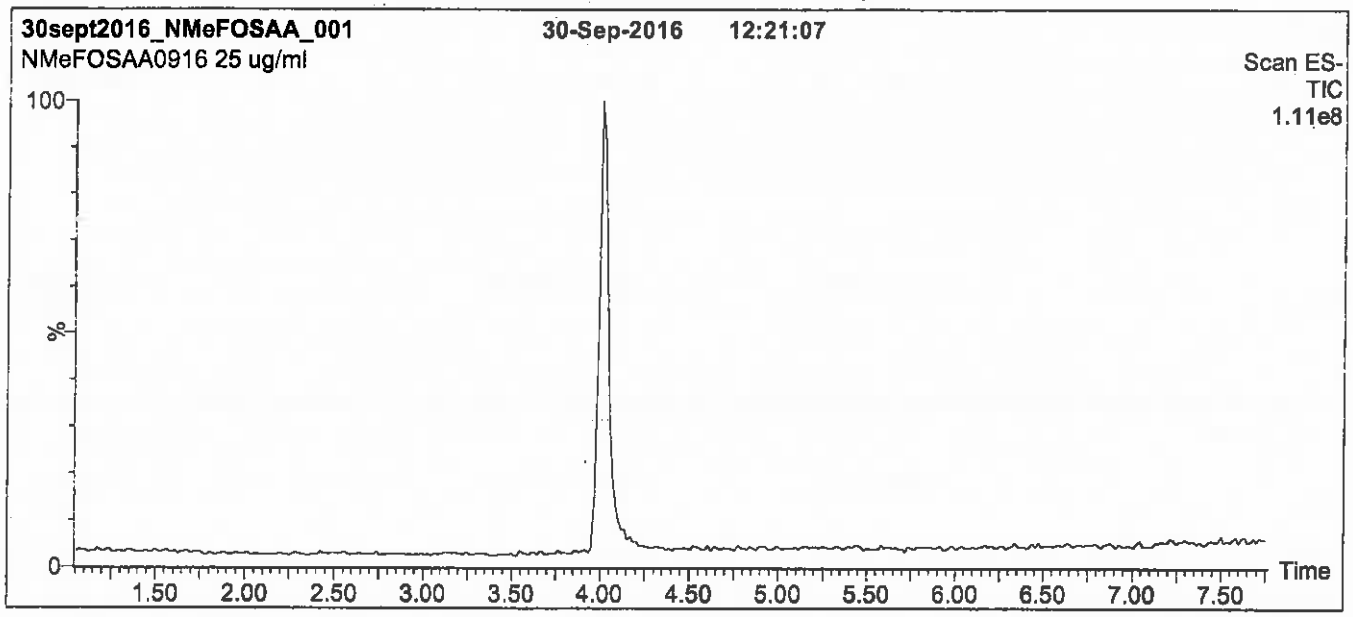
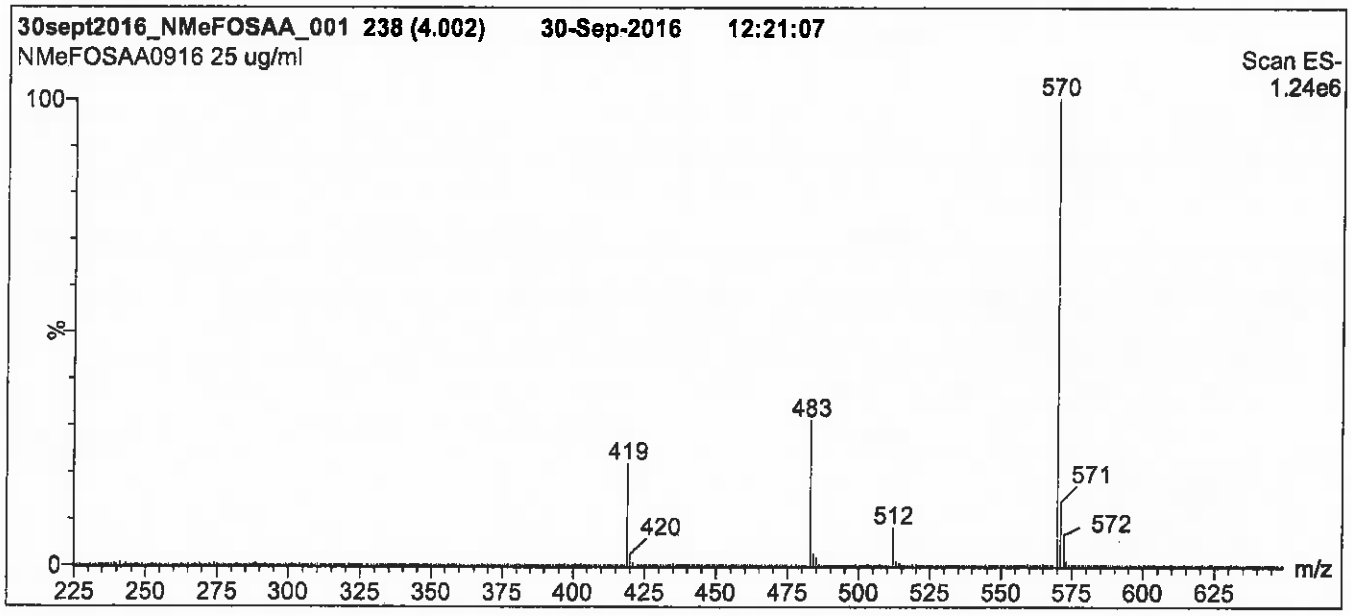
Figure 1: **N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

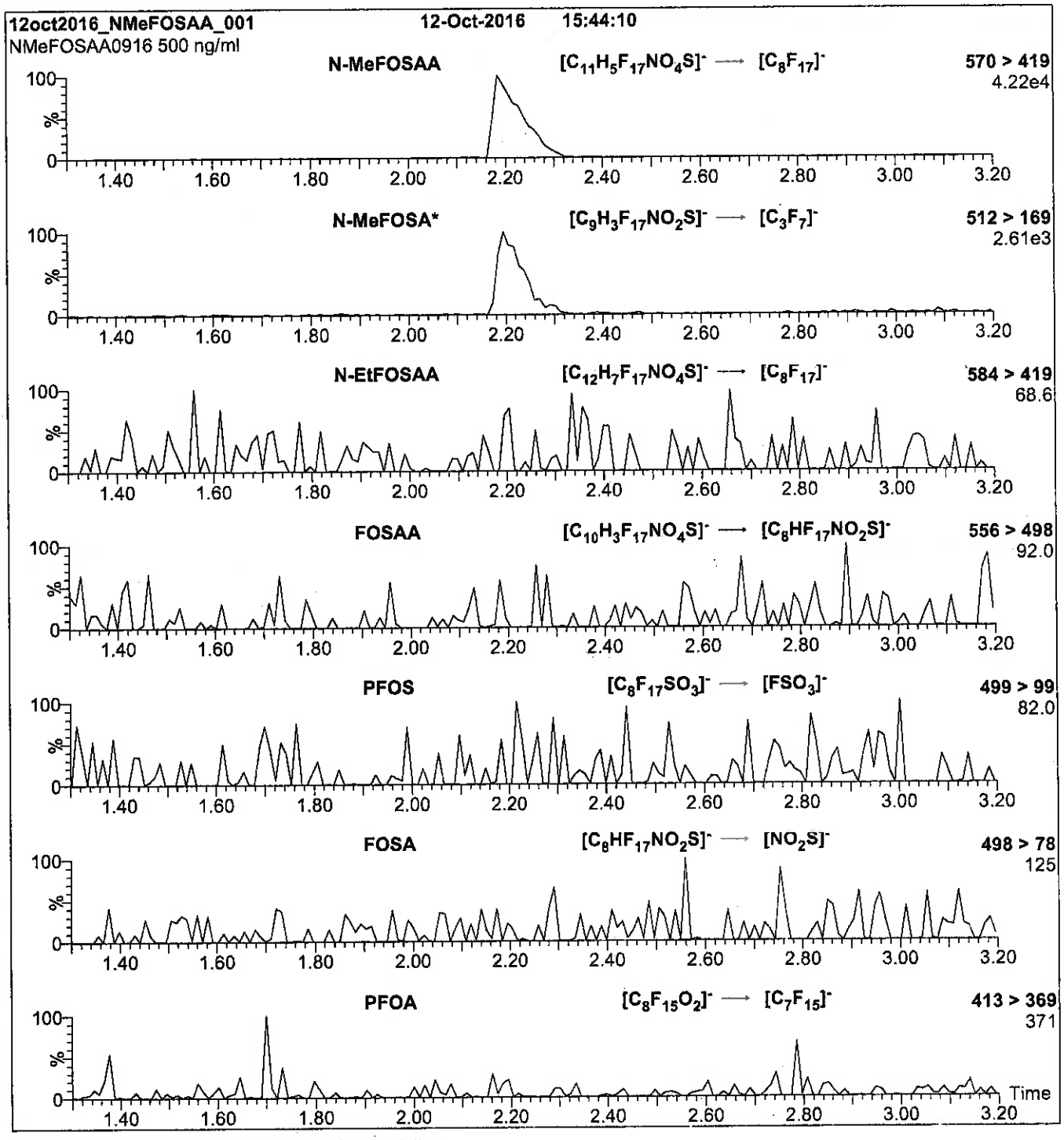
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



***Note**: N-MeFOSA is formed by in-source fragmentation.

Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml N-MeFOSAA)

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) = 20

Reagent

LCPFBA_00006

Scanned 10/16/14

R: SBC 9/13/16

730531
ID: LCPFBA_00005
Exp: 05/27/21 Prpd: SBC
PF-n-butanoic acid

730532
ID: LCPFBA_00006
Exp: 05/27/21 Prpd: SBC
PF-n-butanoic acid

WELLINGTON LABORATORIES

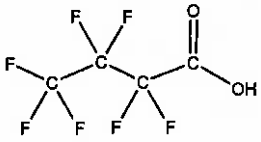
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFBA
COMPOUND: Perfluoro-n-butanoic acid

LOT NUMBER: PFBA0516

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) 05/27/2016
EXPIRY DATE: (mm/dd/yyyy) 05/27/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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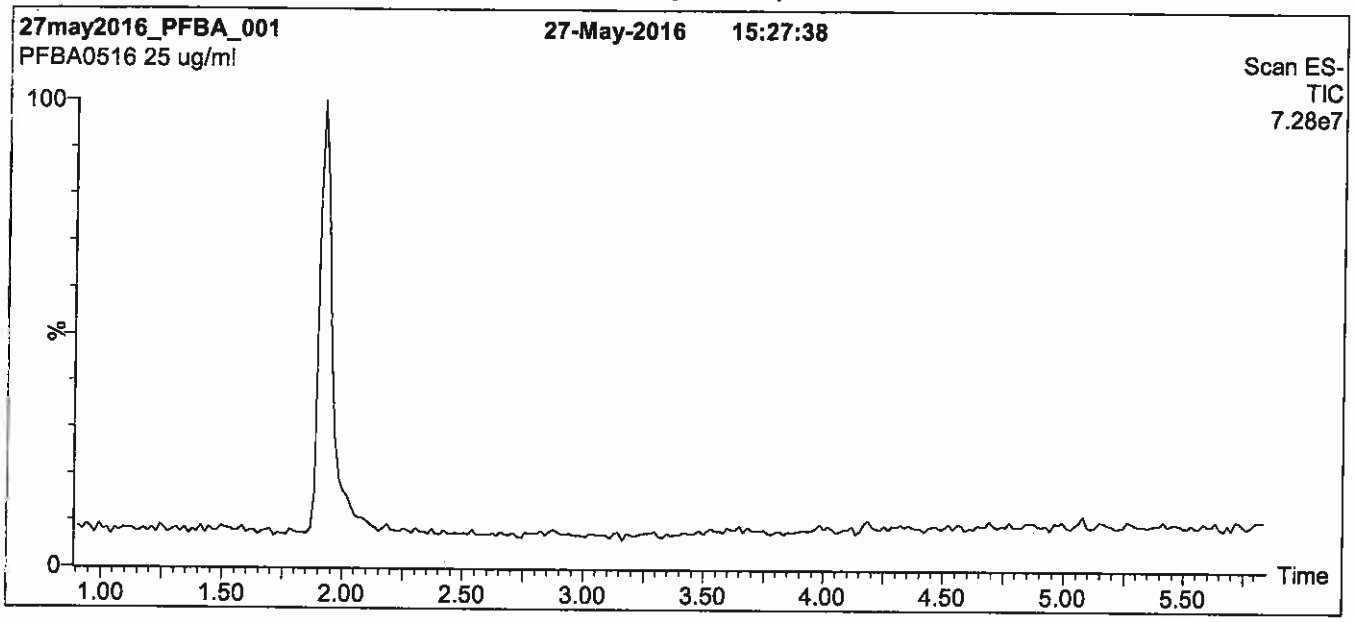

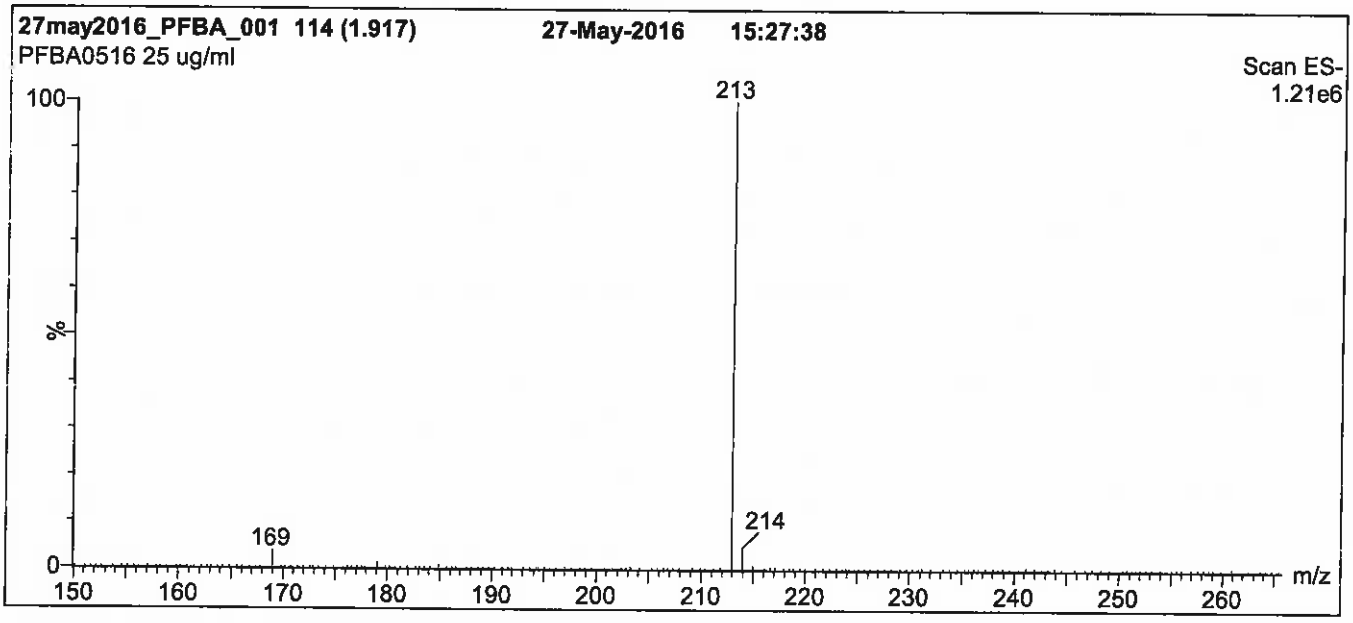

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MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% 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
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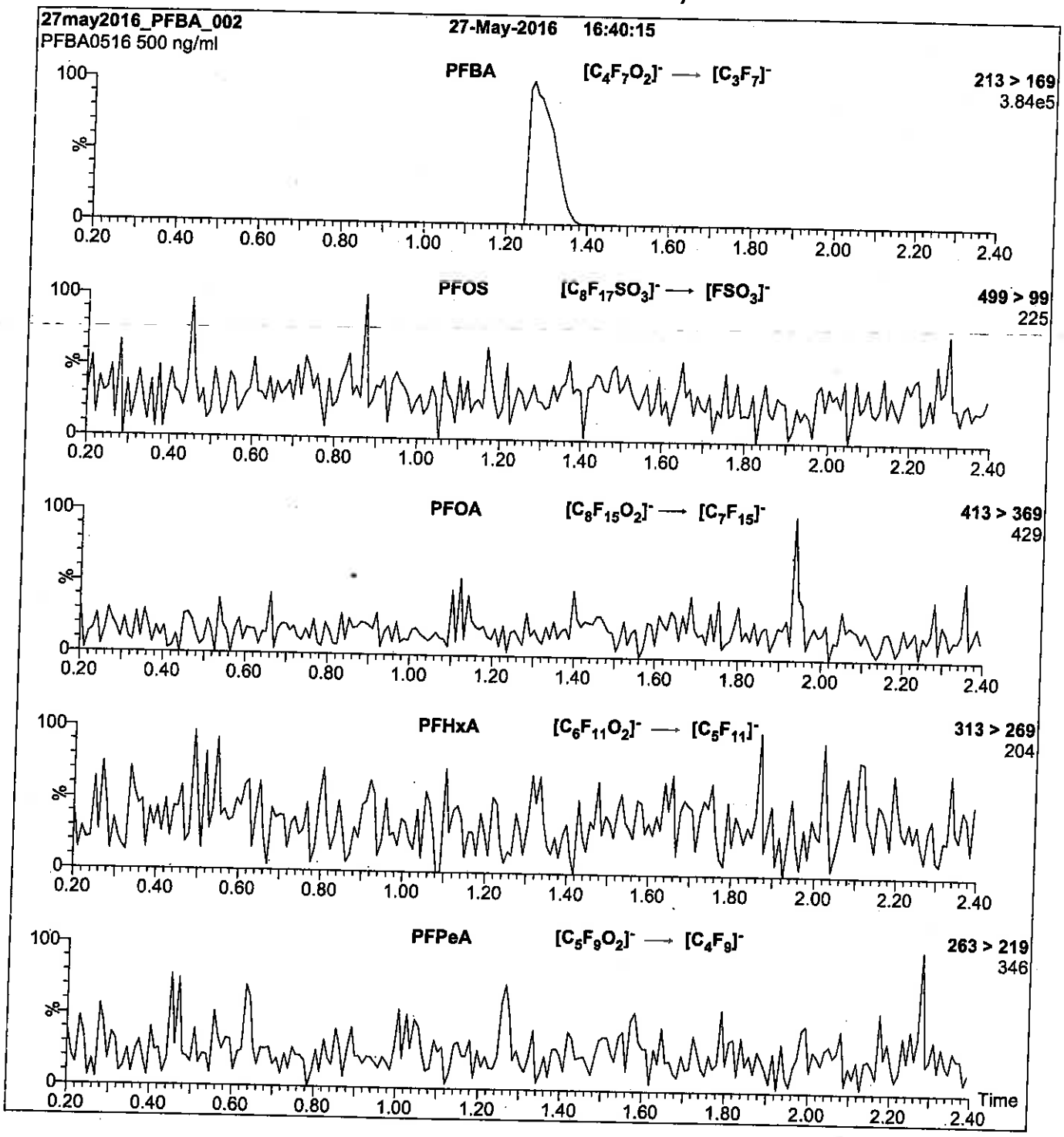

Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCPFBA_00007

r: 12/29/16 SN
S

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFBA
COMPOUND: Perfluoro-n-butanoic acid

LOT NUMBER: PFBA0516

STRUCTURE:

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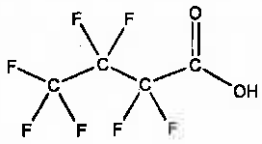

MOLECULAR FORMULA: $C_4HF_7O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 214.04
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
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CALA

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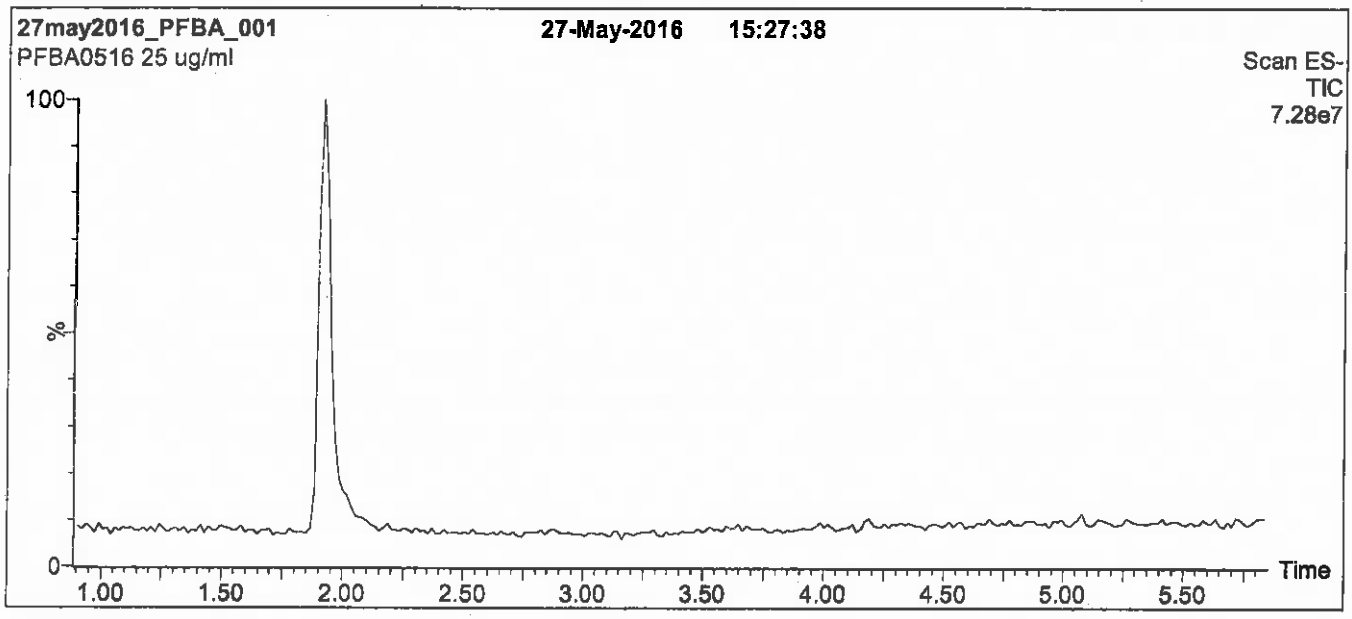

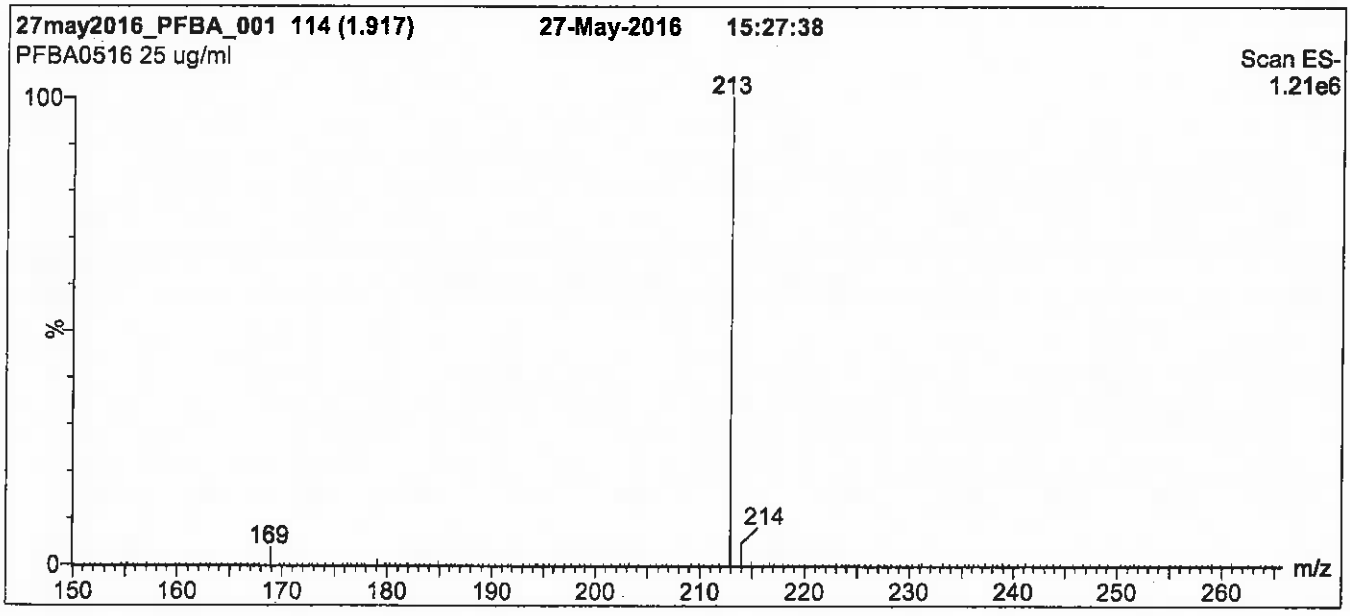

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MS: **Micromass Quattro *micro* API MS**

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1.7 µm, 2.1 x 100 mm

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(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) = 10.00
Cone Gas Flow (l/hr) = 100
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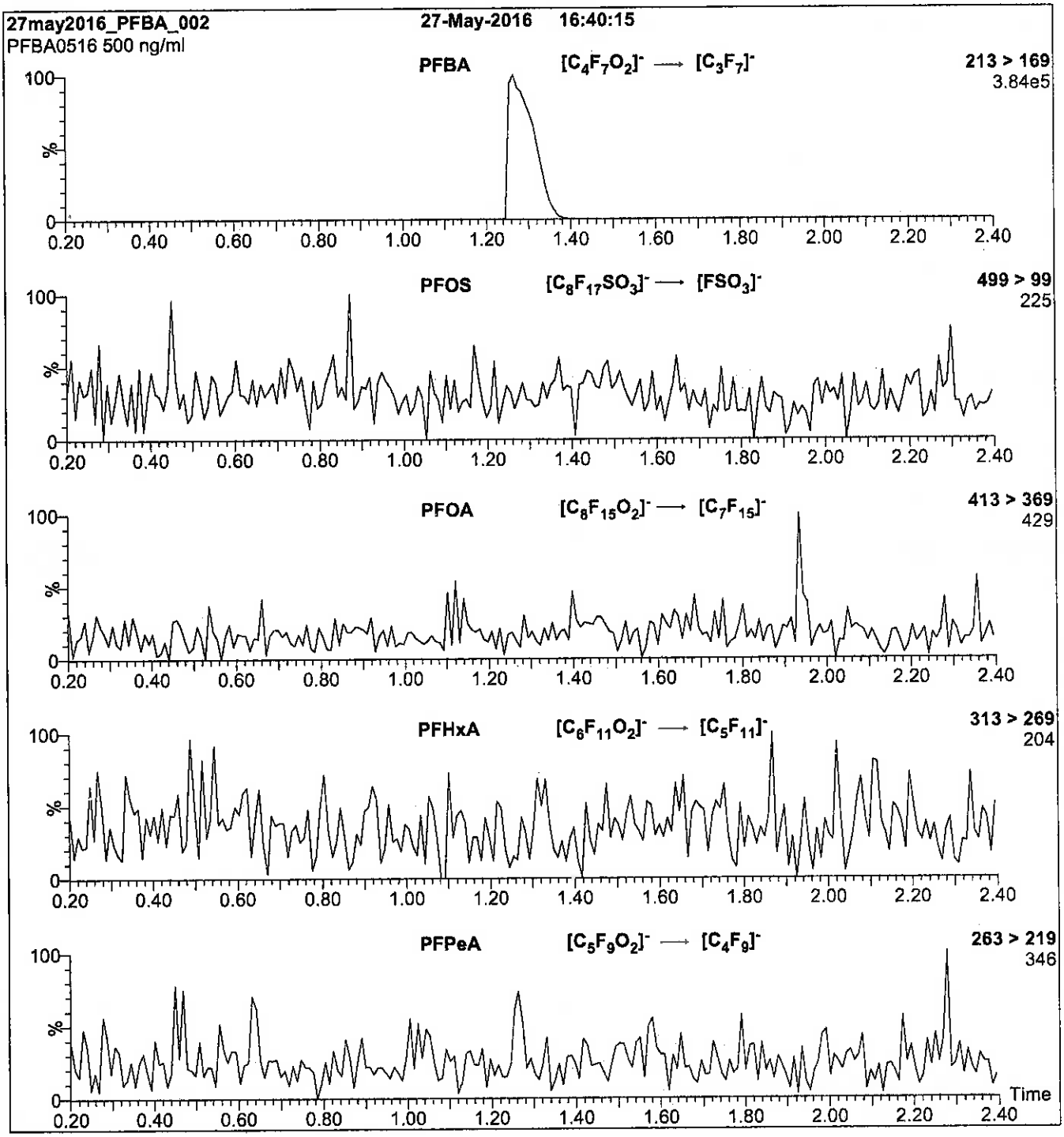
Figure 2: **PFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFBS_00006

R: SBC 9/13/16

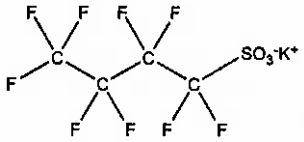
730511
ID: LCPFBS_00005
Exp: 03/15/21 Prpd: SBC
PF-1-butanesulfonate K sa

730512
ID: LCPFBS_00006
Exp: 03/15/21 Prpd: SBC
PF-1-butanesulfonate K sa

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	L-PFBS	**LOT NUMBER:**	LPFBS0316
COMPOUND:	Potassium perfluoro-1-butanesulfonate		
STRUCTURE:		**CAS #:**	29420-49-3



MOLECULAR FORMULA:	$C_4F_9SO_3K$	**MOLECULAR WEIGHT:**	338.19
CONCENTRATION:	50.0 ± 2.5 µg/ml (K salt) 44.2 ± 2.2 µg/ml (PFBS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	03/15/2016		
EXPIRY DATE: (mm/dd/yyyy)	03/15/2021		
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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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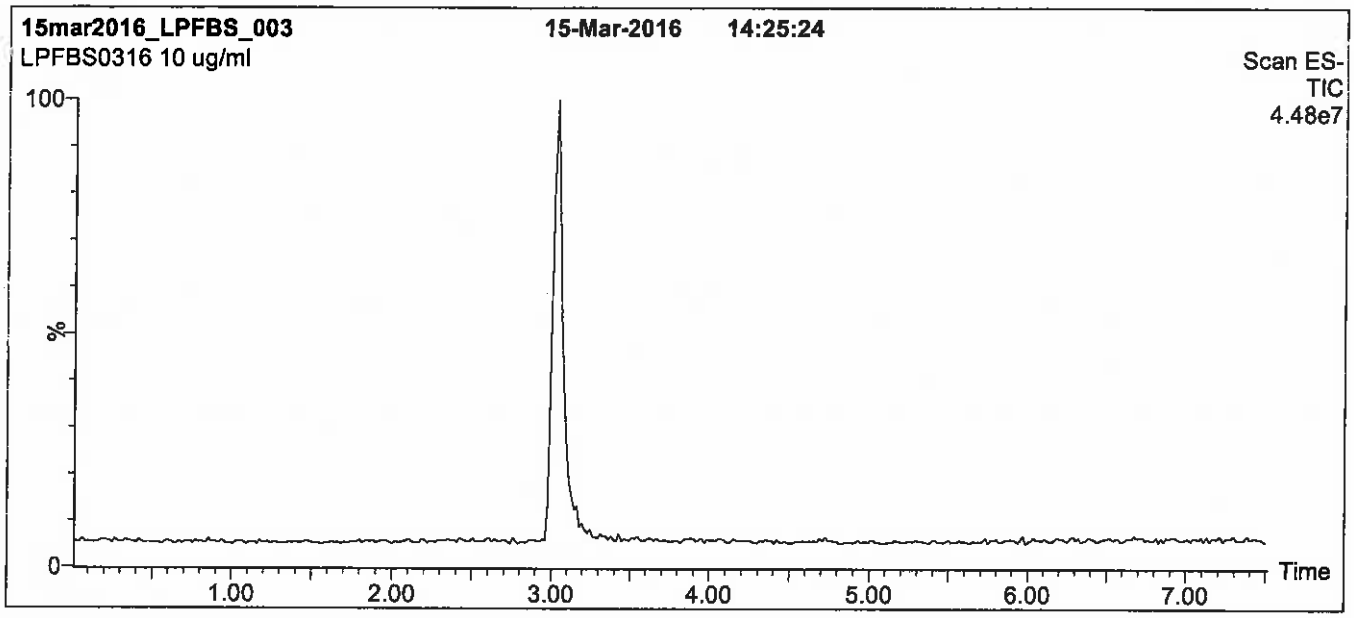
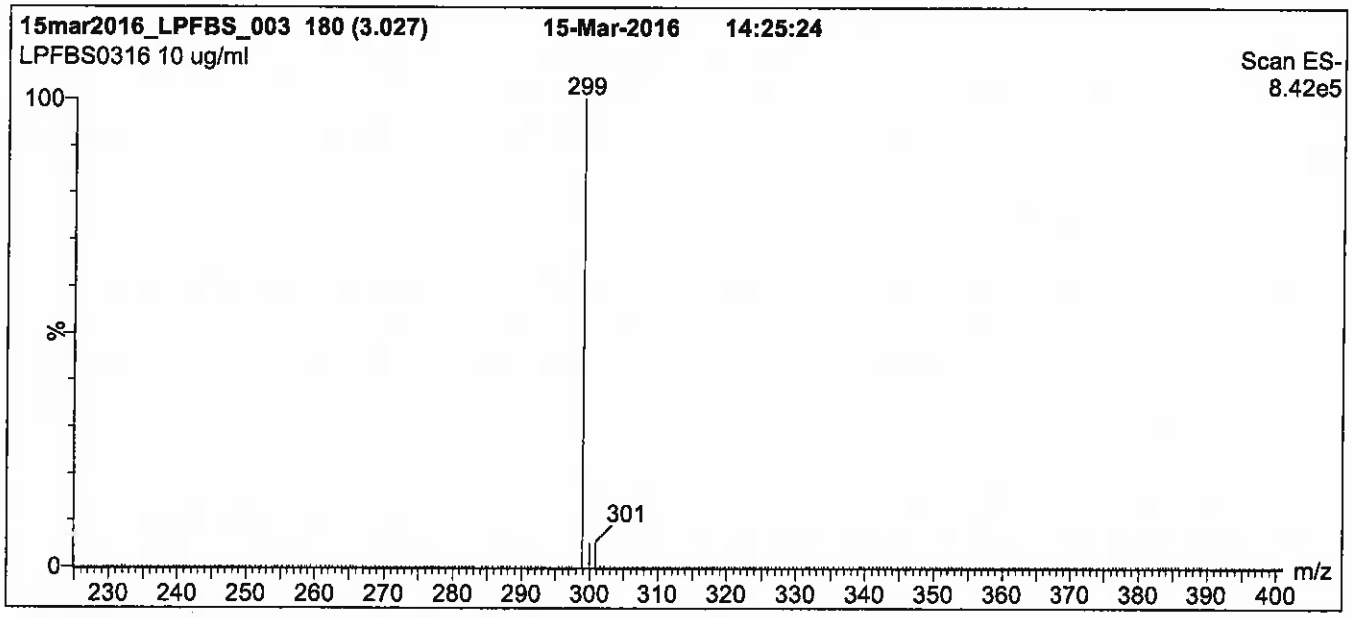
CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

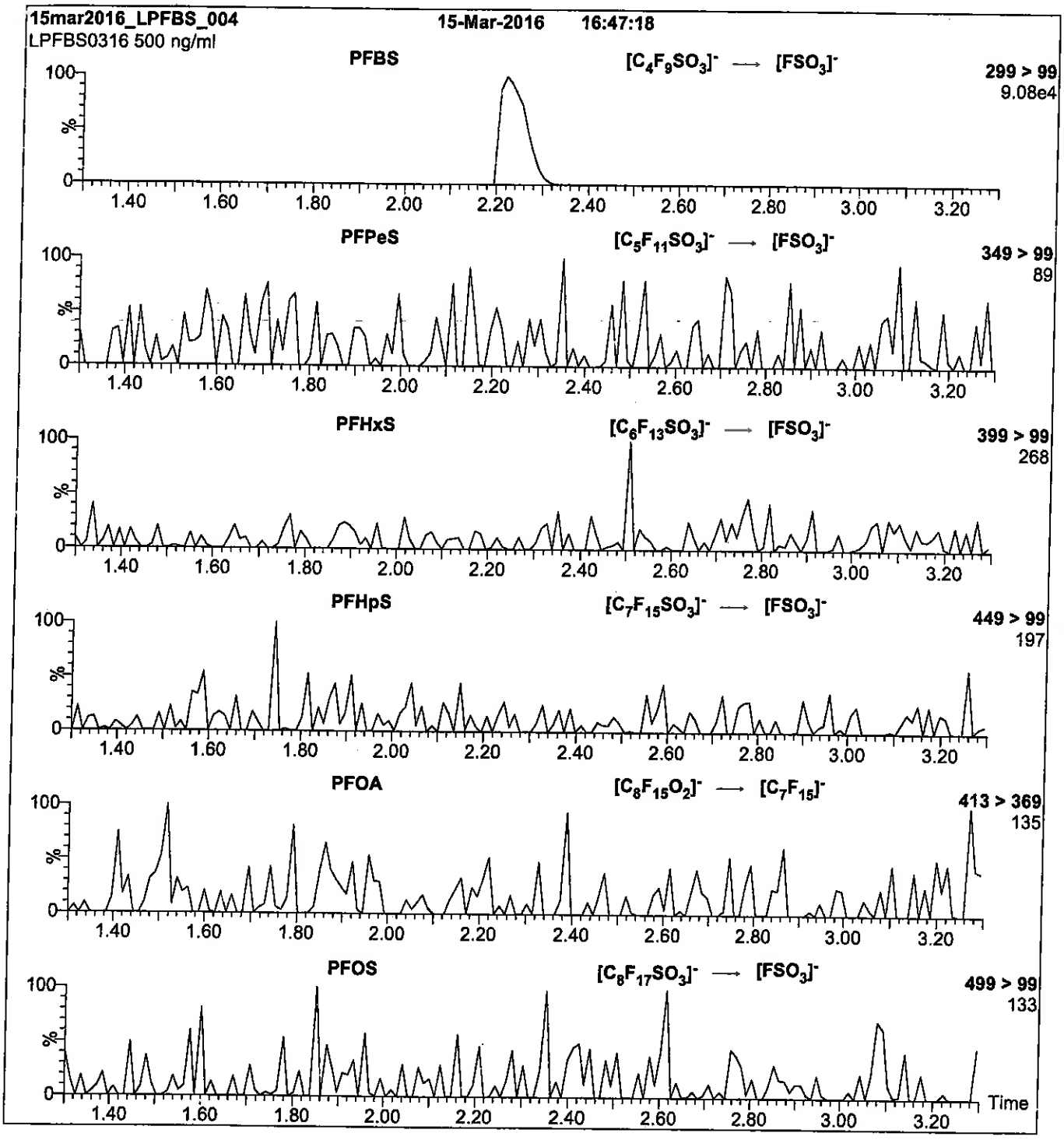
Flow: 300 µl/min

MS Parameters

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 25

Reagent

LCPFBS_00008

R: SBC 9/13/16

730724
ID: LCPFBS_00007
Exp: 03/15/21 Prpd: SBC
PF-1-butanesulfonate K sa

730725
ID: LCPFBS_00008
Exp: 03/15/21 Prpd: SBC
PF-1-butanesulfonate K sa

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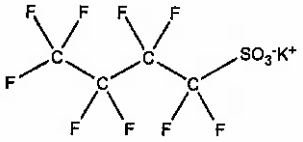
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: LPFBS0316

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)	03/15/2016		
EXPIRY DATE: (mm/dd/yyyy)	03/15/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/21/2016 (mm/dd/yyyy)

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

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HAZARDS:

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CALA

ANAB ACCREDITED

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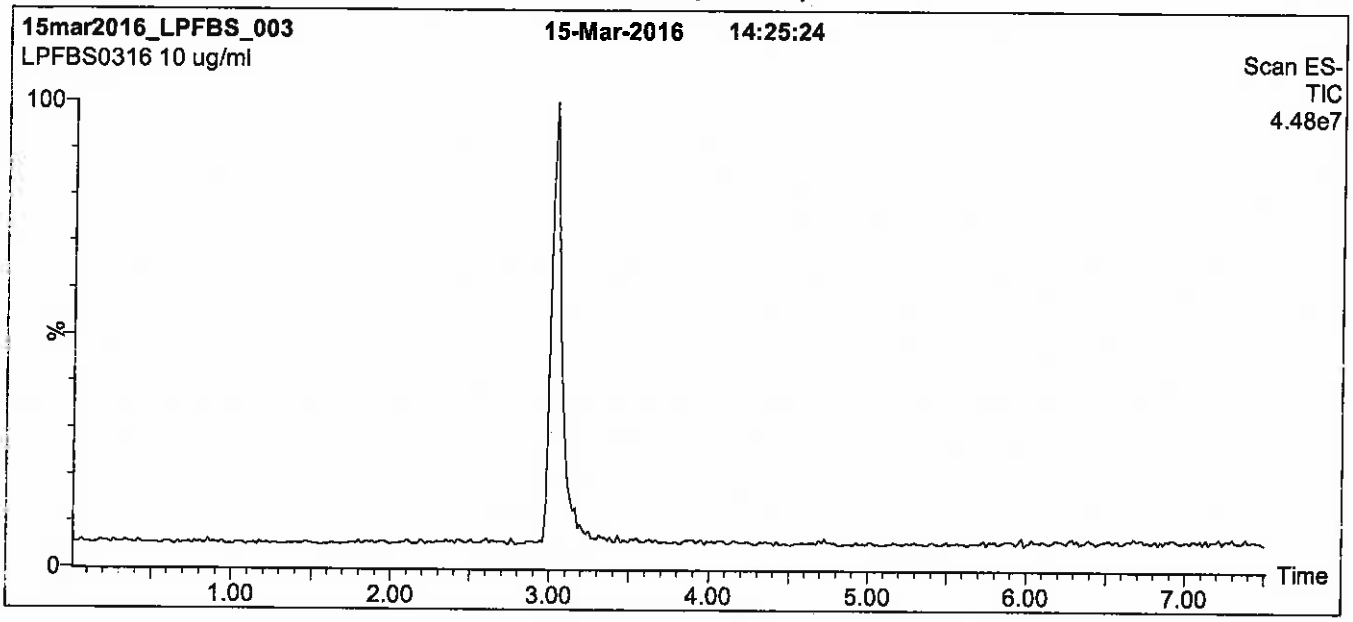
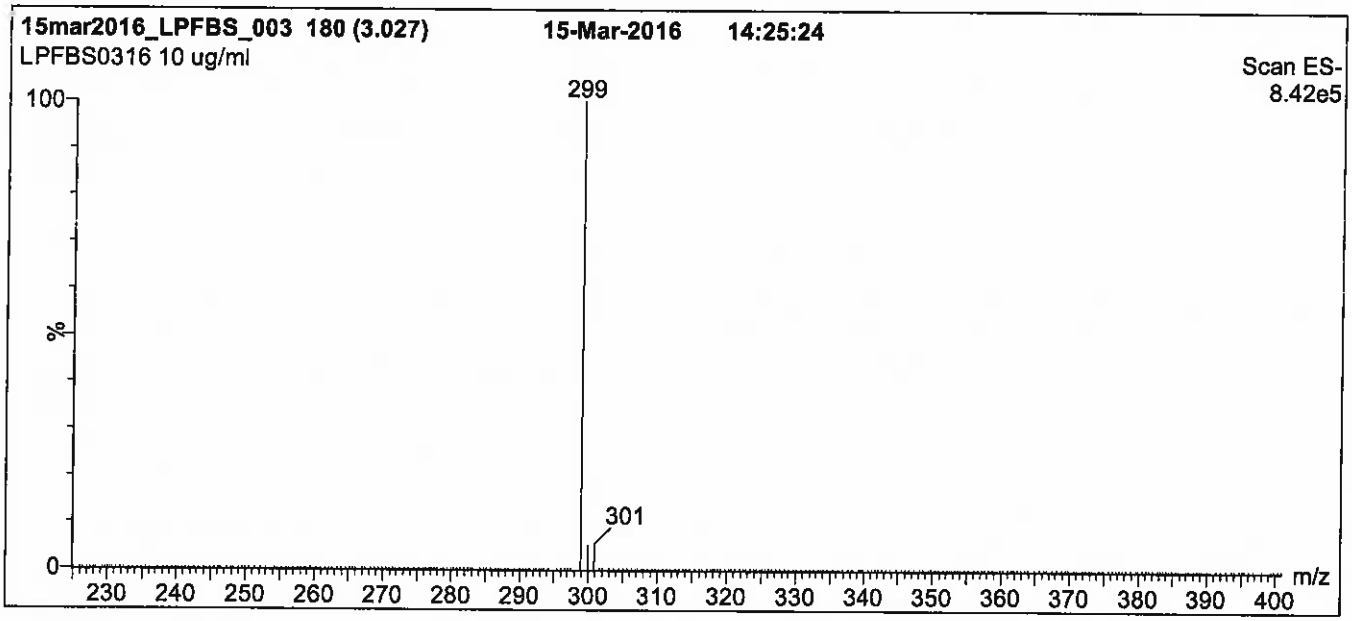




Conditions for Figure 1:

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

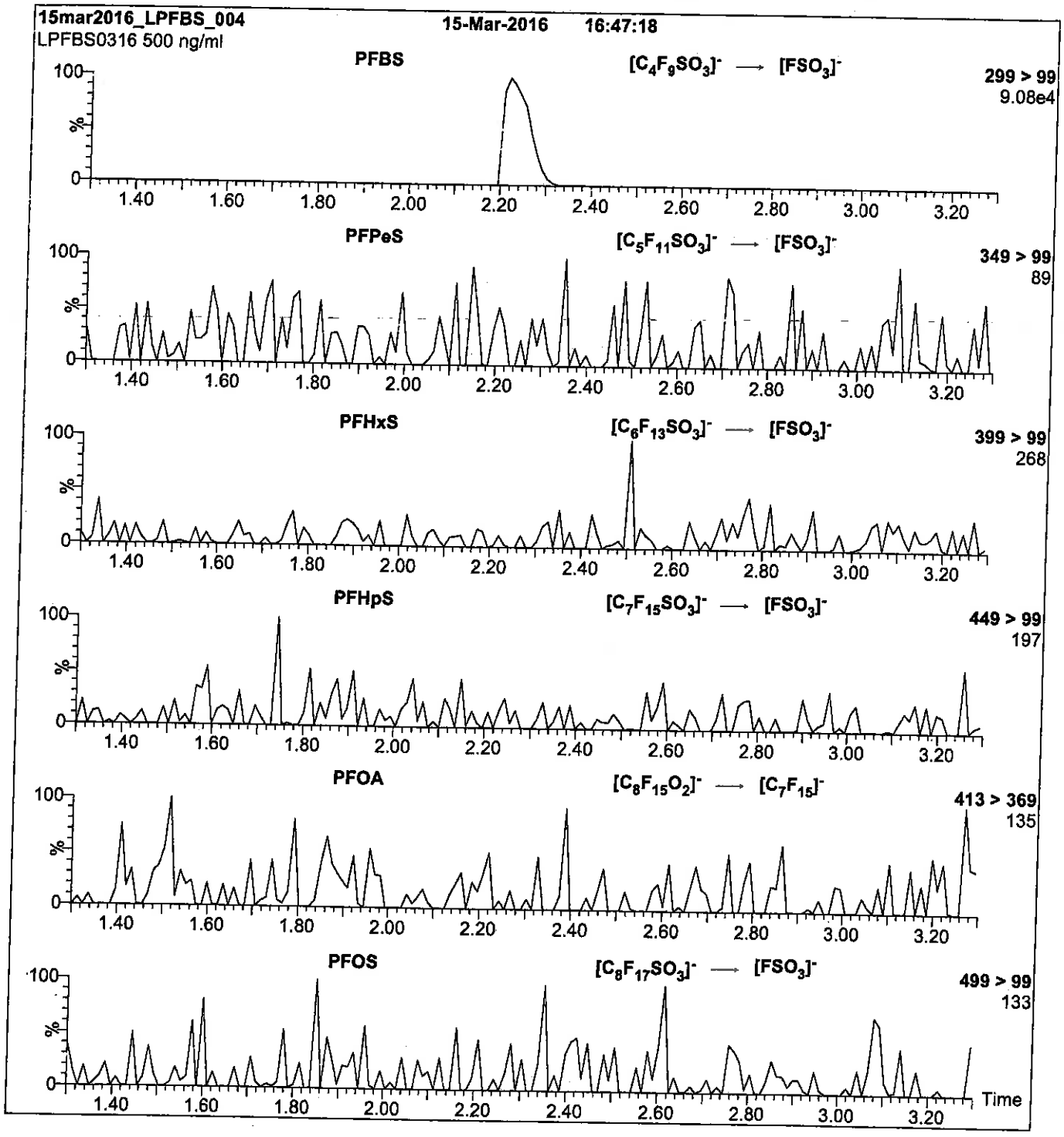
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 25

Reagent

LCPFDA_00007

R: SBC 9/13/16
scanned 10/4/16 SR

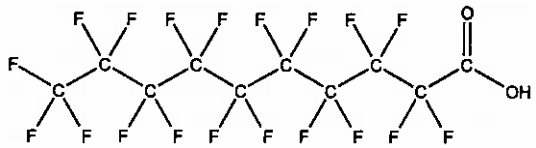
730620
ID: LCPFDA_00006
Exp: 05/31/21 Prpd: SBC
PF-n-decanoic acid

730621
ID: LCPFDA_00007
Exp: 05/31/21 Prpd: SBC
PF-n-decanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFDA	**LOT NUMBER:**	PFDA0516
COMPOUND:	Perfluoro-n-decanoic acid		
STRUCTURE:		**CAS #:**	335-76-2



MOLECULAR FORMULA:	$C_{10}HF_{19}O_2$	**MOLECULAR WEIGHT:**	514.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/31/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 06/13/2016 (mm/dd/yyyy)

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

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CALA

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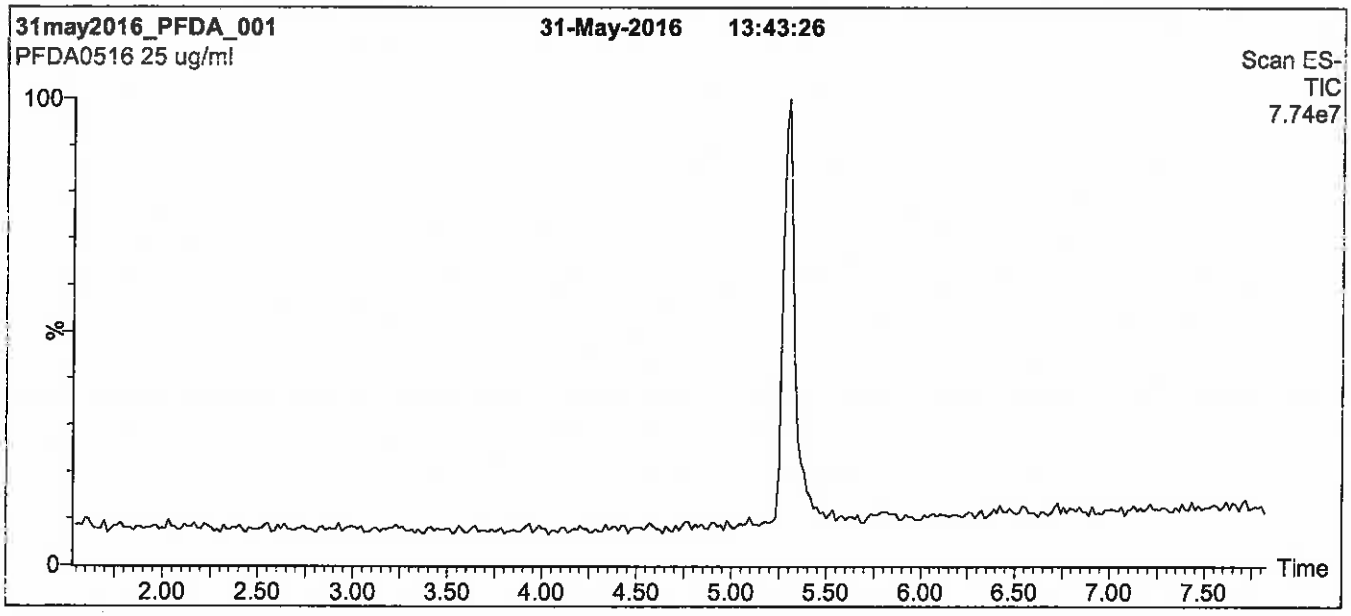
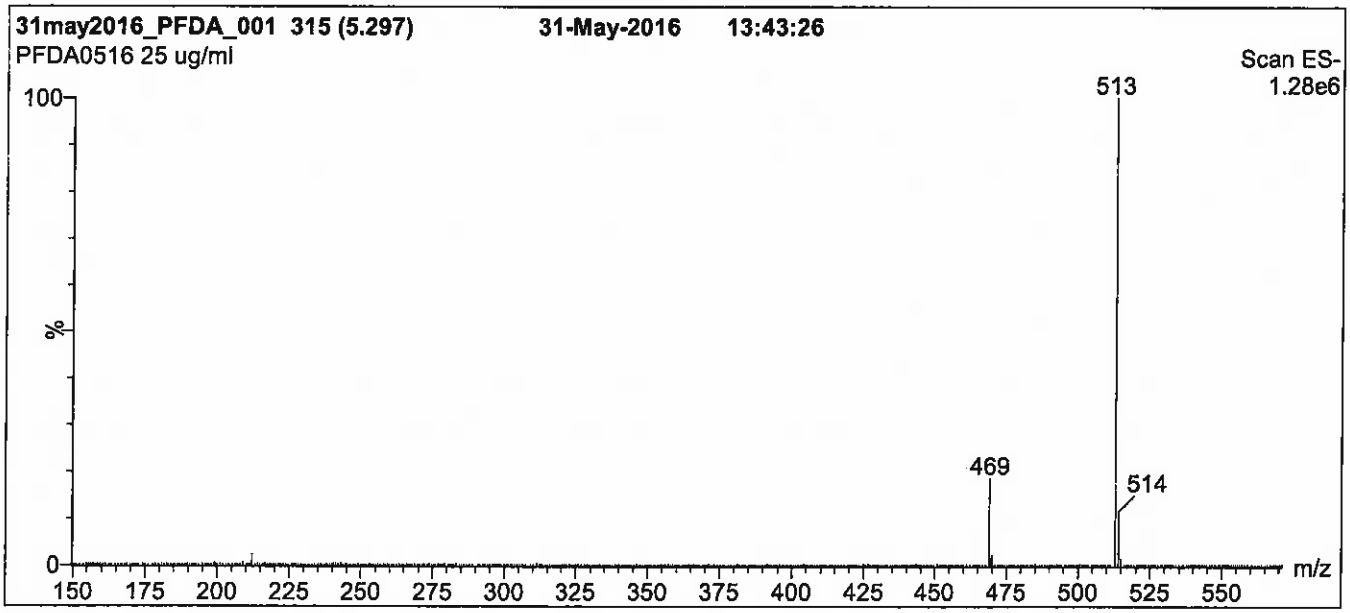




Conditions for Figure 1:

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

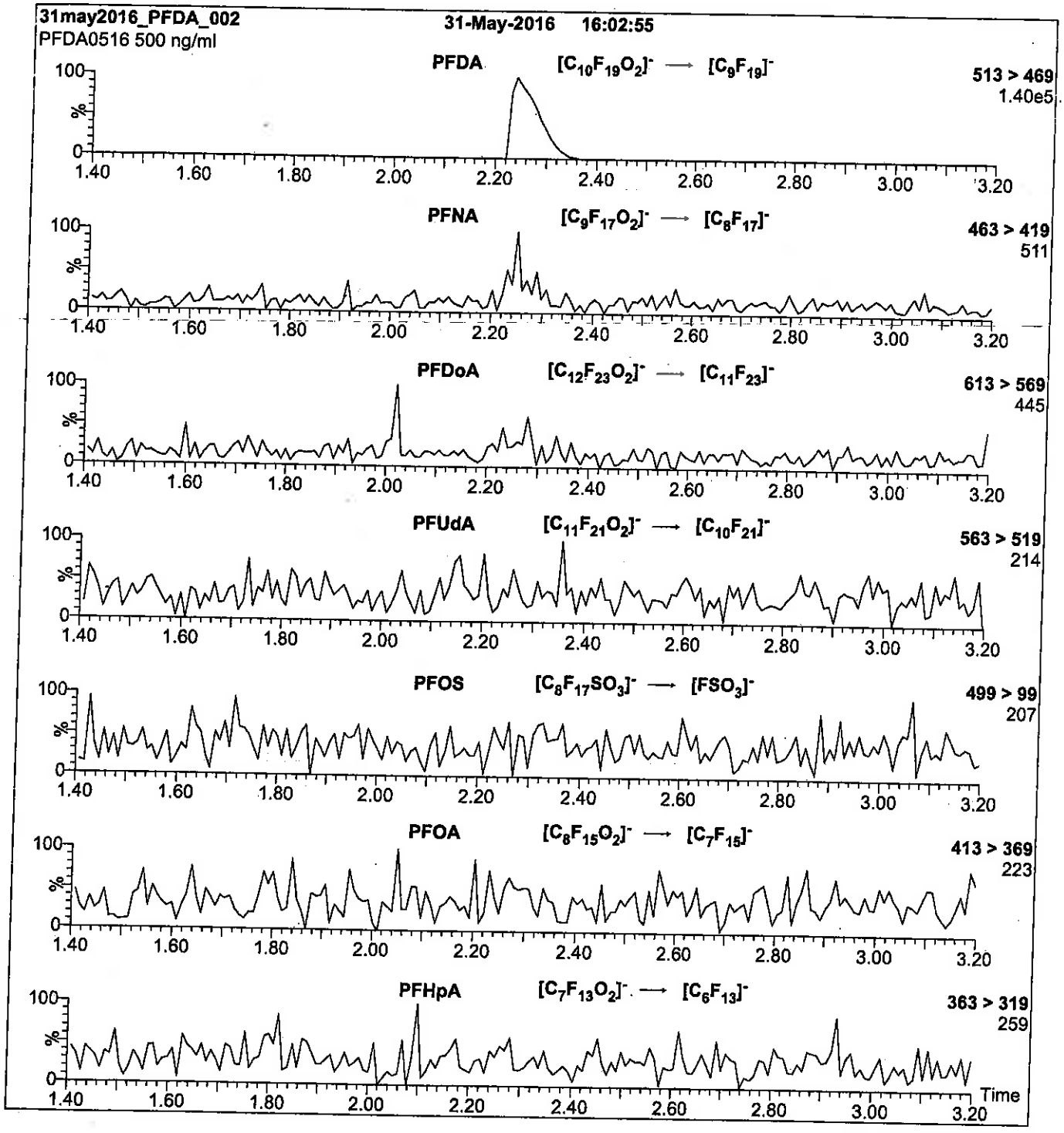
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 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) = 3.39e-3
Collision Energy (eV) = 13

Reagent

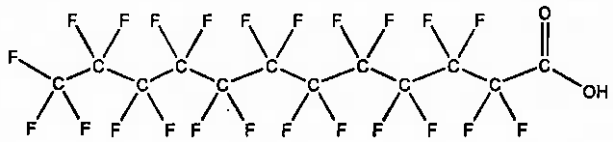
LCPFDoA_00007

r: 12/21/16 SPV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFDoA	**LOT NUMBER:**	PFDoA0516
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)	05/31/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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

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CALA

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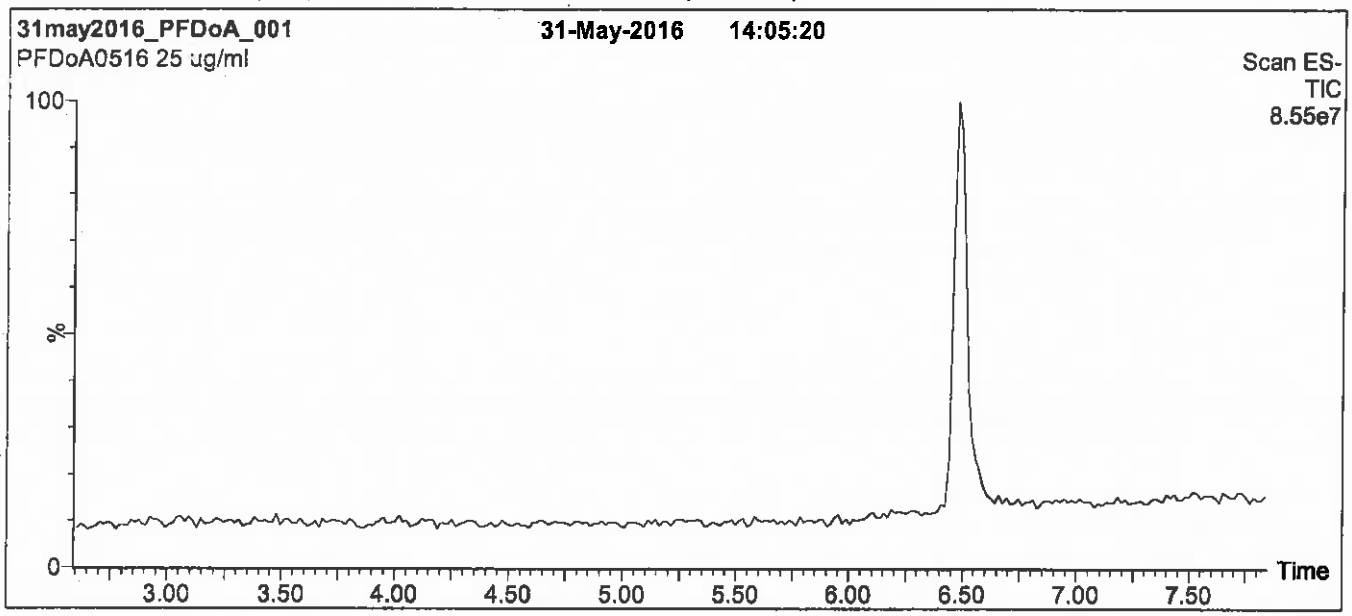
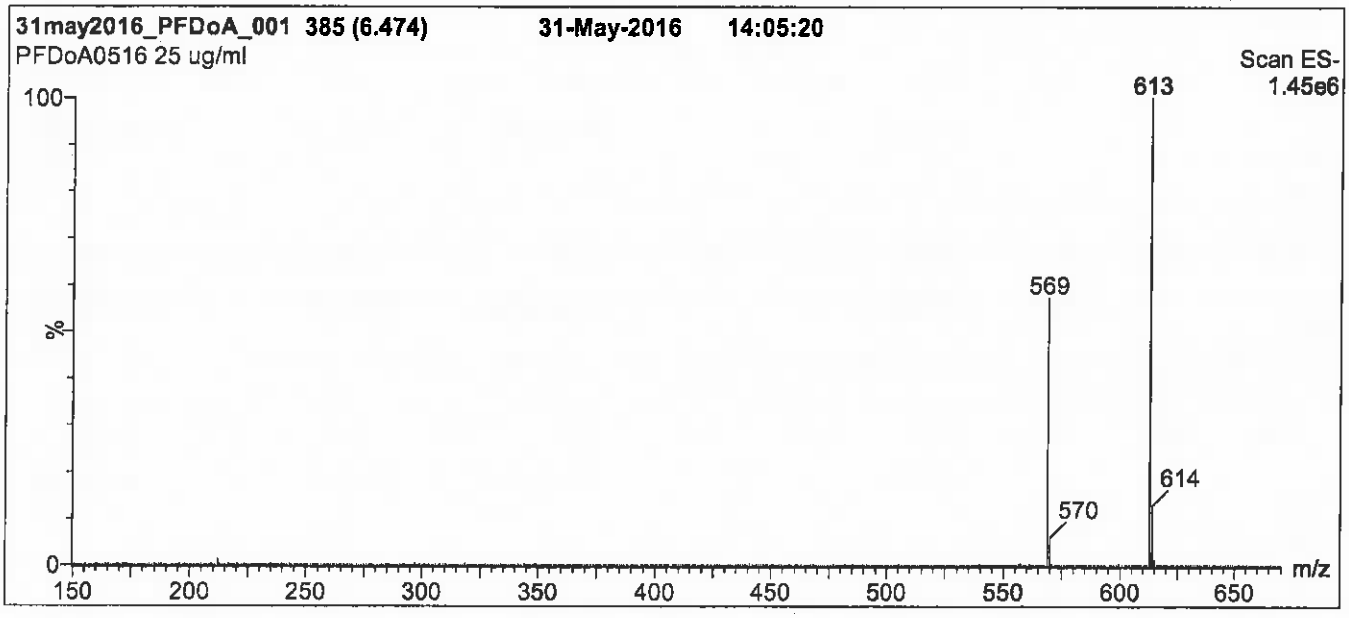
Figure 1: **PFDoA; LC/MS Data (TIC and Mass Spectrum)**





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

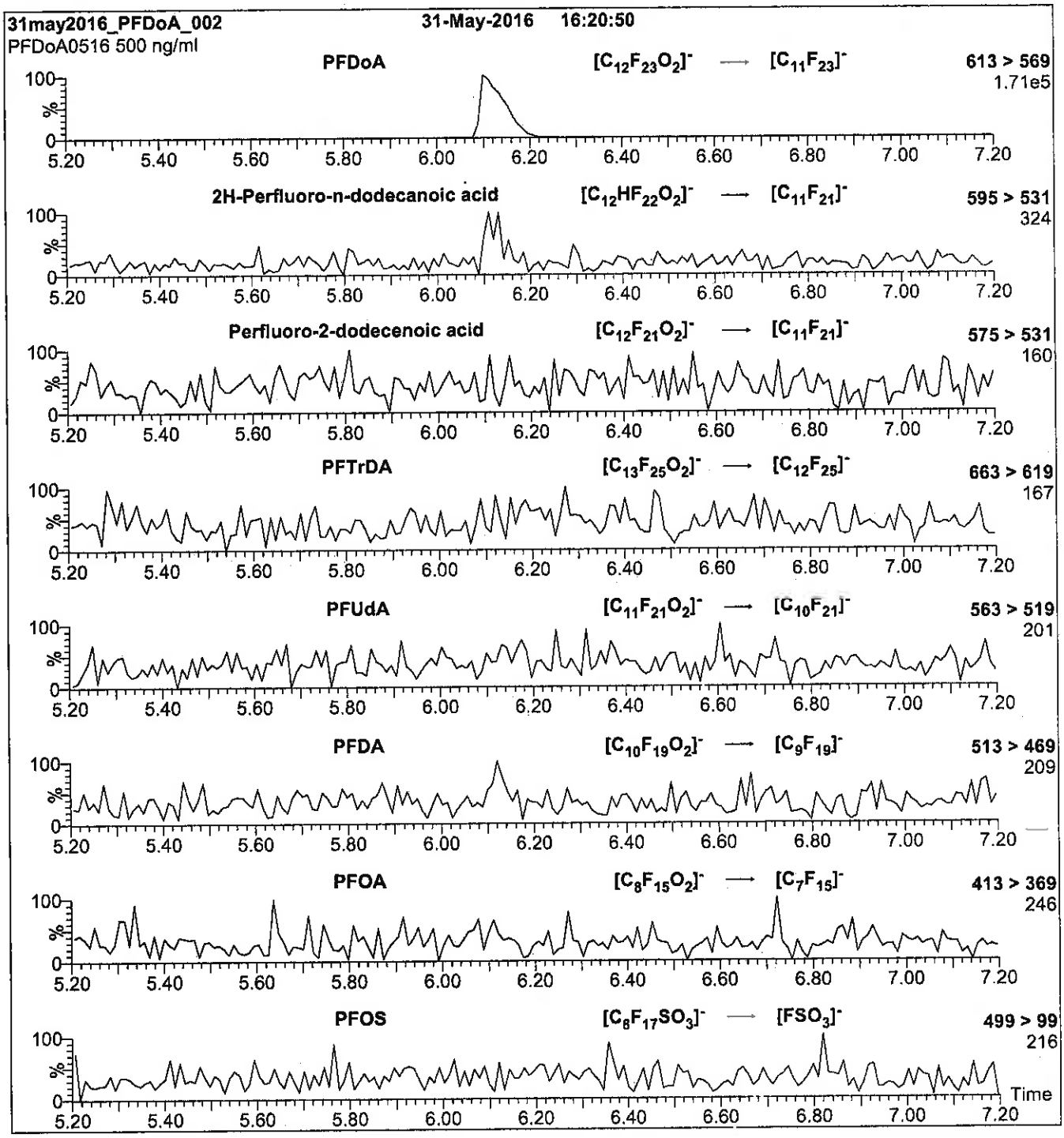
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFDS_00007

Scanned 10/14/16 SC R: SBC 9/13/16

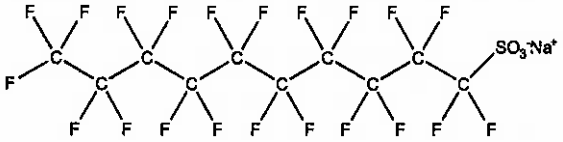
730549
ID: LCPFDS_00006
Exp: 05/24/21 Prpd: SBC
PF-1-decanesulfonate sodi

730550
ID: LCPFDS_00007
Exp: 05/24/21 Prpd: SBC
PF-1-decanesulfonate sodi

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFDS	**LOT NUMBER:**	LPFDS0516
COMPOUND:	Sodium perfluoro-1-decanesulfonate		
STRUCTURE:		**CAS #:**	2806-15-7



MOLECULAR FORMULA:	$C_{10}F_{21}SO_3Na$	**MOLECULAR WEIGHT:**	622.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.2 ± 2.4 µg/ml (PFDS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/24/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/26/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

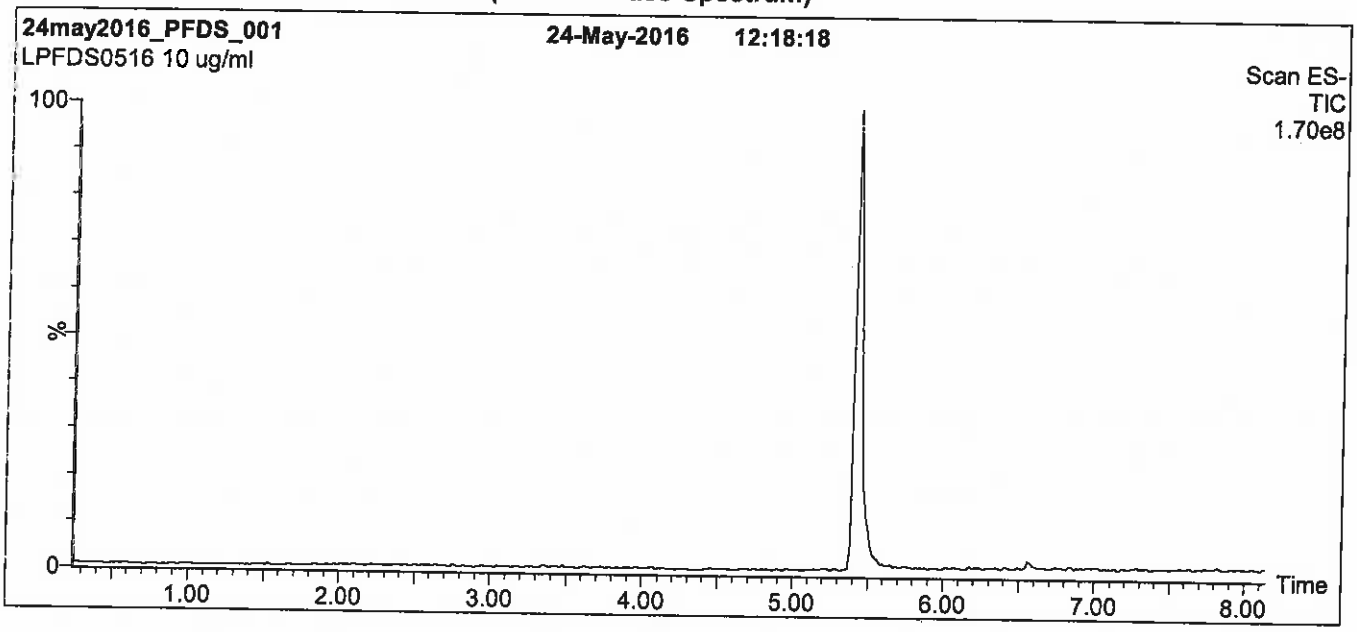
At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

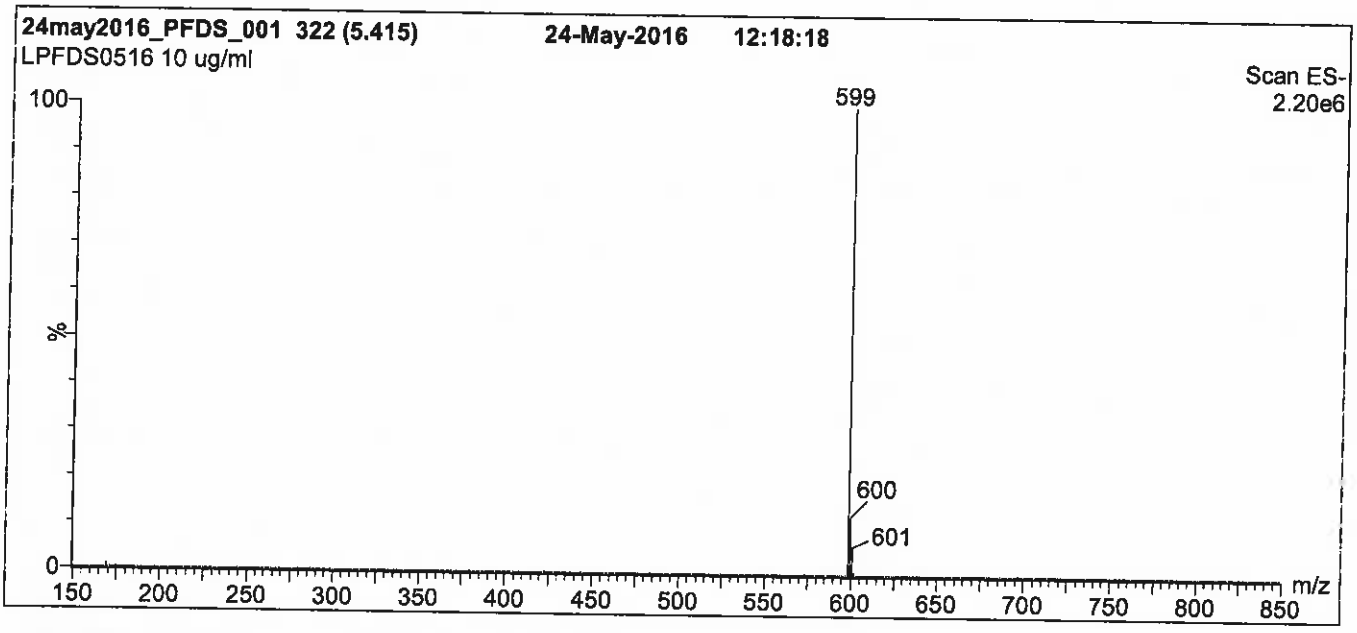
QUALITY MANAGEMENT:

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

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

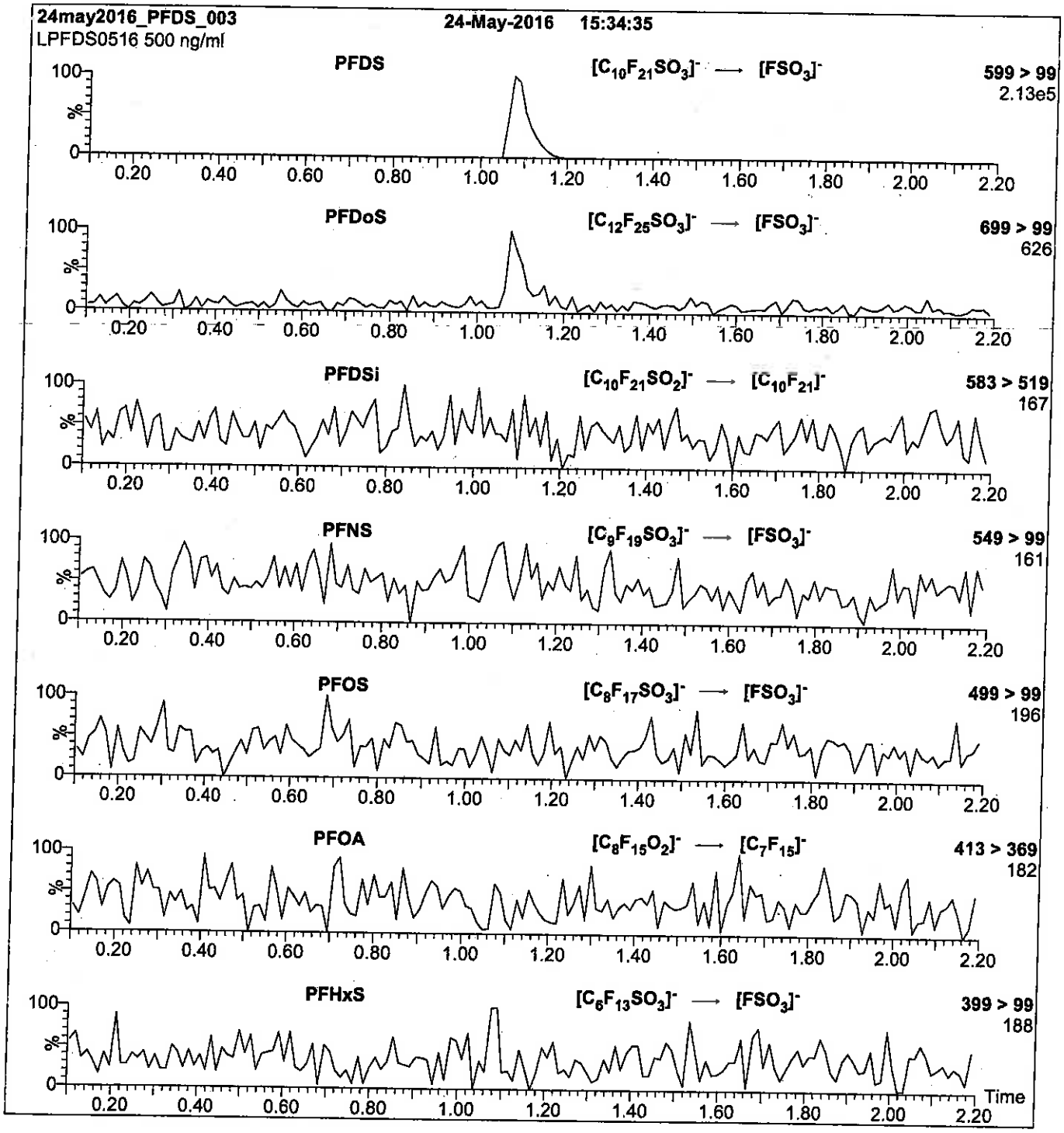
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.70e-3
Collision Energy (eV) = 50

Reagent

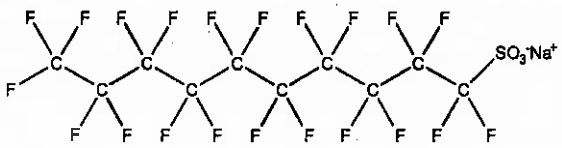
LCPFDSA_00002

D: 12/29/16 SK✓

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFDS	**LOT NUMBER:**	LPFDS0516
COMPOUND:	Sodium perfluoro-1-decanesulfonate		
STRUCTURE:		**CAS #:**	2806-15-7



MOLECULAR FORMULA:	$C_{10}F_{21}SO_3Na$	**MOLECULAR WEIGHT:**	622.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.2 ± 2.4 µg/ml (PFDS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/24/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/26/2016 (mm/dd/yyyy)

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

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HAZARDS:

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HOMOGENEITY:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED

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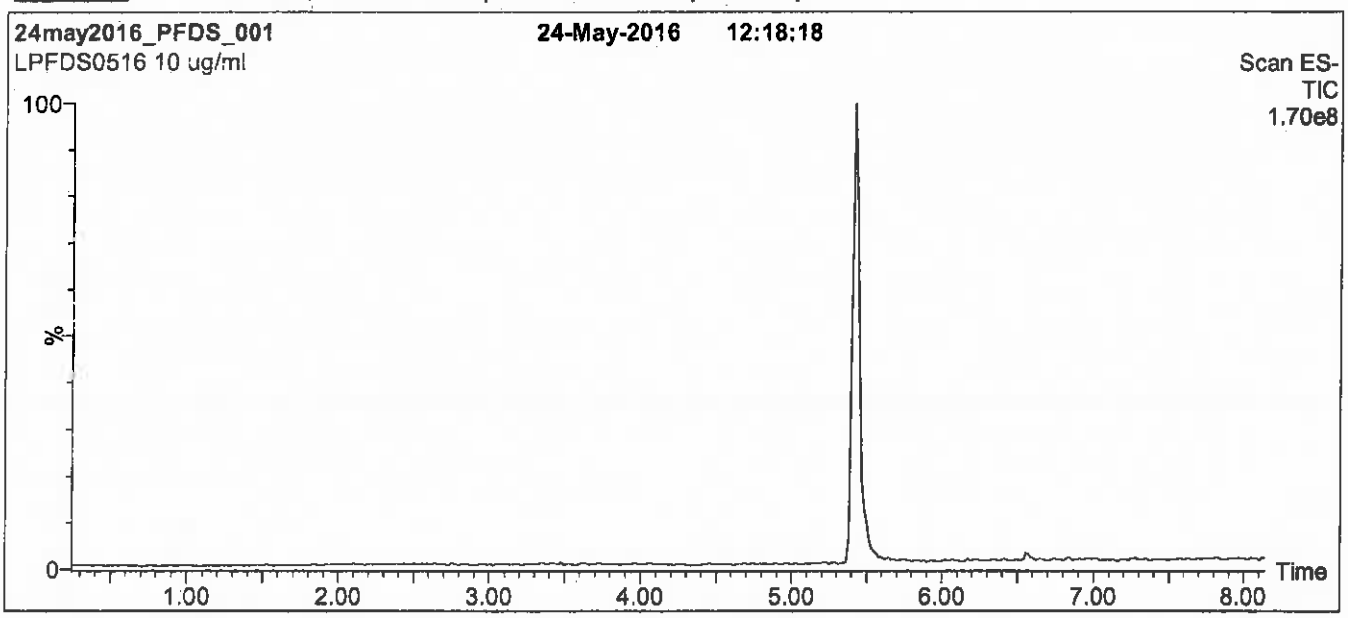
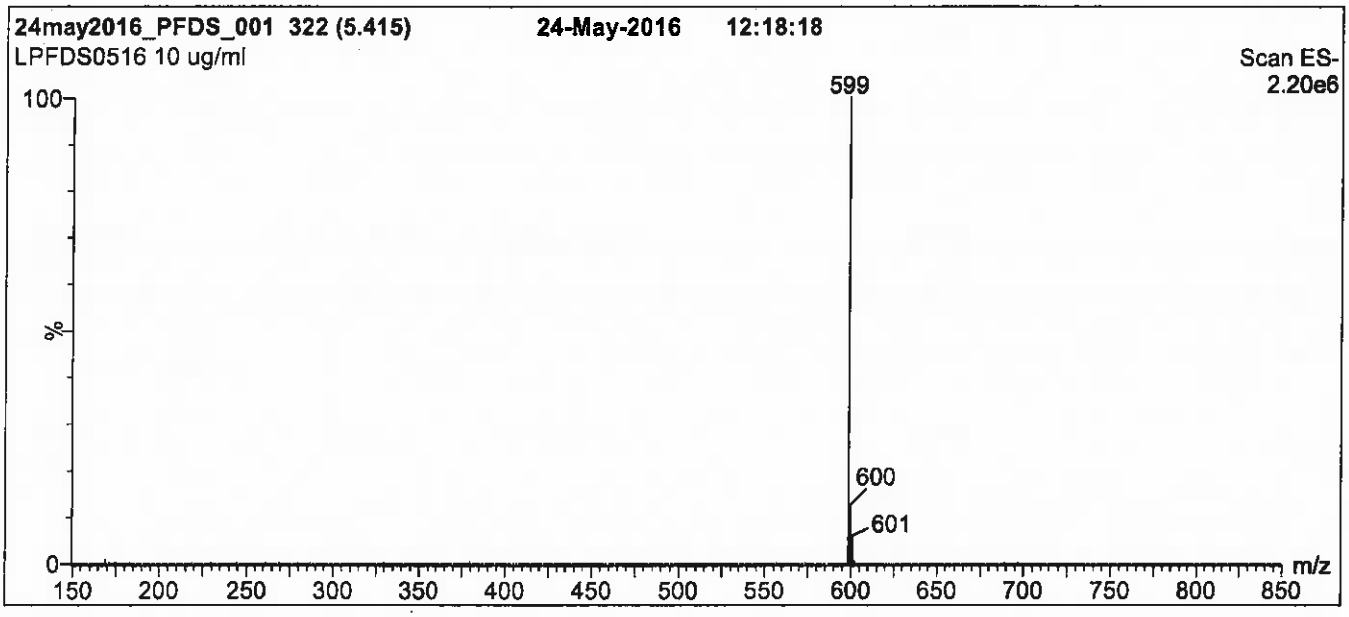
Figure 1: **L-PFDS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

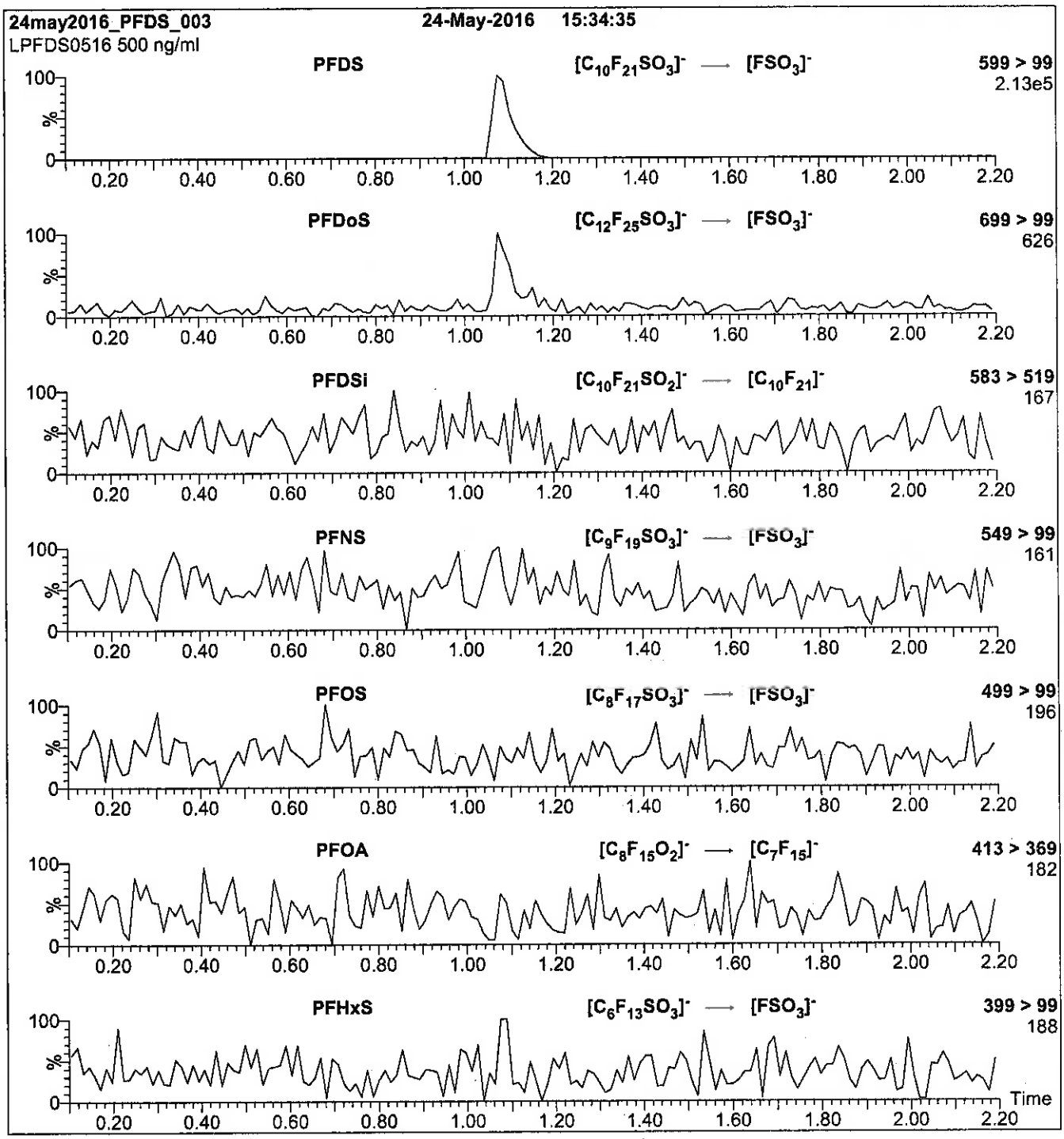
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.70e-3
Collision Energy (eV) = 50

Reagent

LCPFHpA_00007

Scanned 10/14/16 SM R: SBC 9/13/16

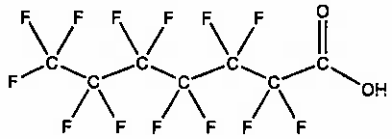
730517
ID: LCPFHpA_00006
Exp: 01/22/21 Prpd: SBC
PF-n-heptanoic acid

730518
ID: LCPFHpA_00007
Exp: 01/22/21 Prpd: SBC
PF-n-heptanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFHpA	**LOT NUMBER:**	PFHpA0116
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)	01/22/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/22/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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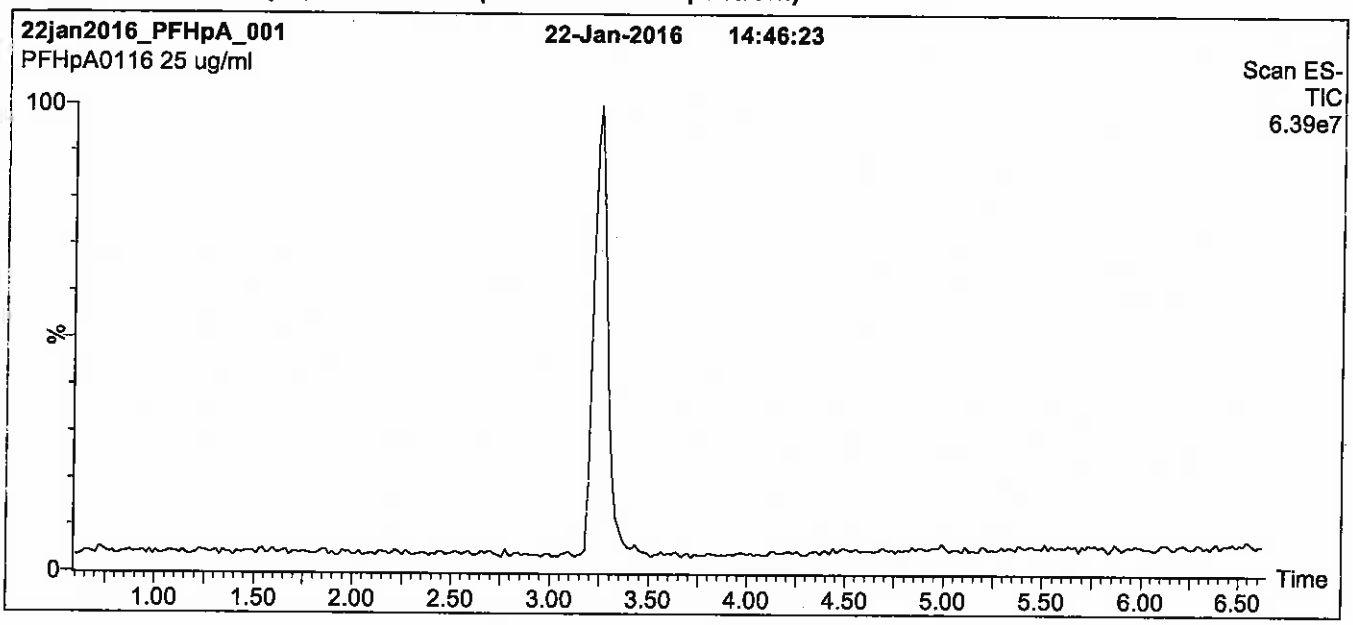
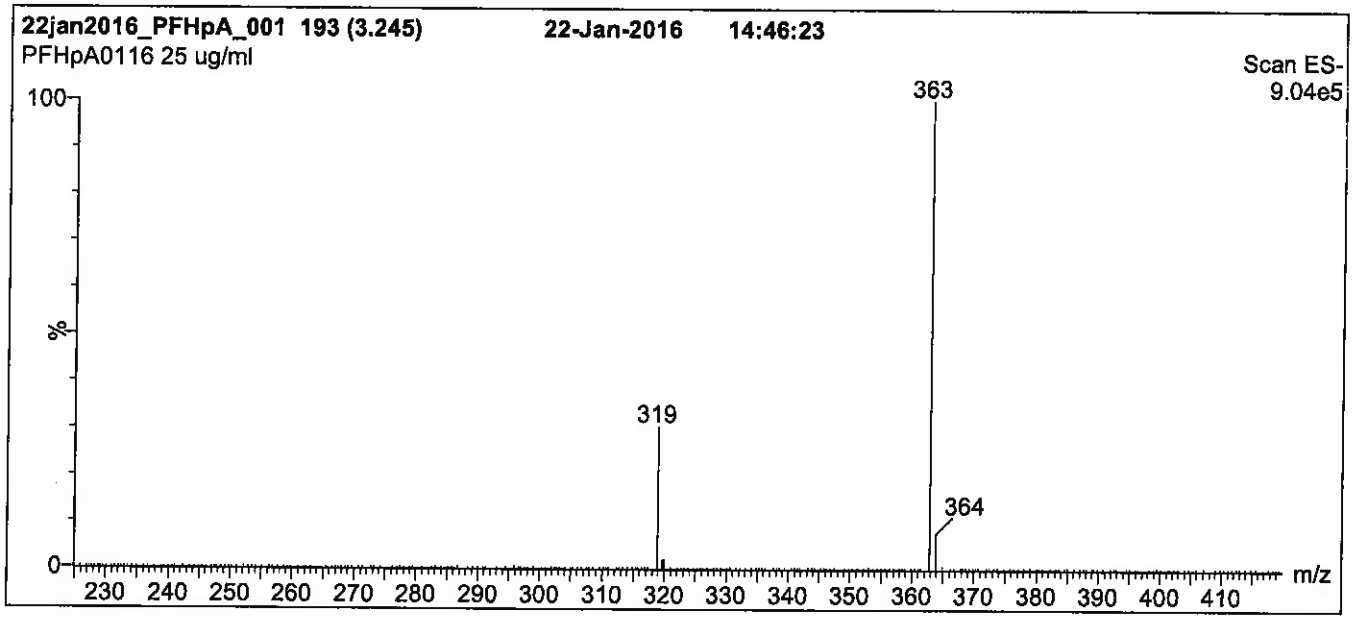
Figure 1: **PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

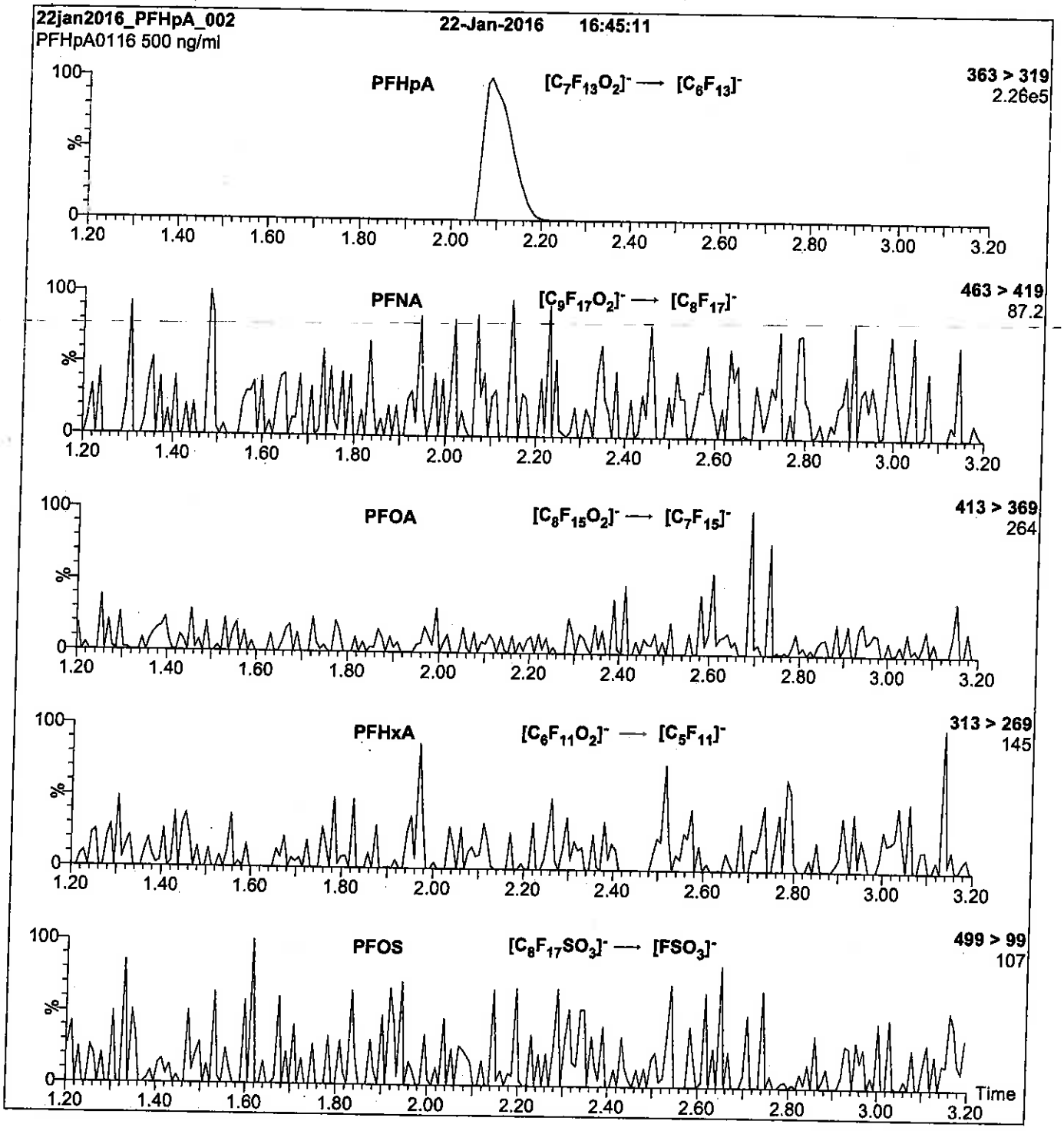
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

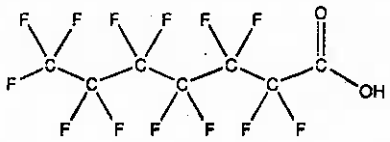
LCPFHpA_00008

P: 12/29/16 SKN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFHpA	**LOT NUMBER:**	PFHpA1216
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)	12/02/2016		
EXPIRY DATE: (mm/dd/yyyy)	12/02/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/12/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

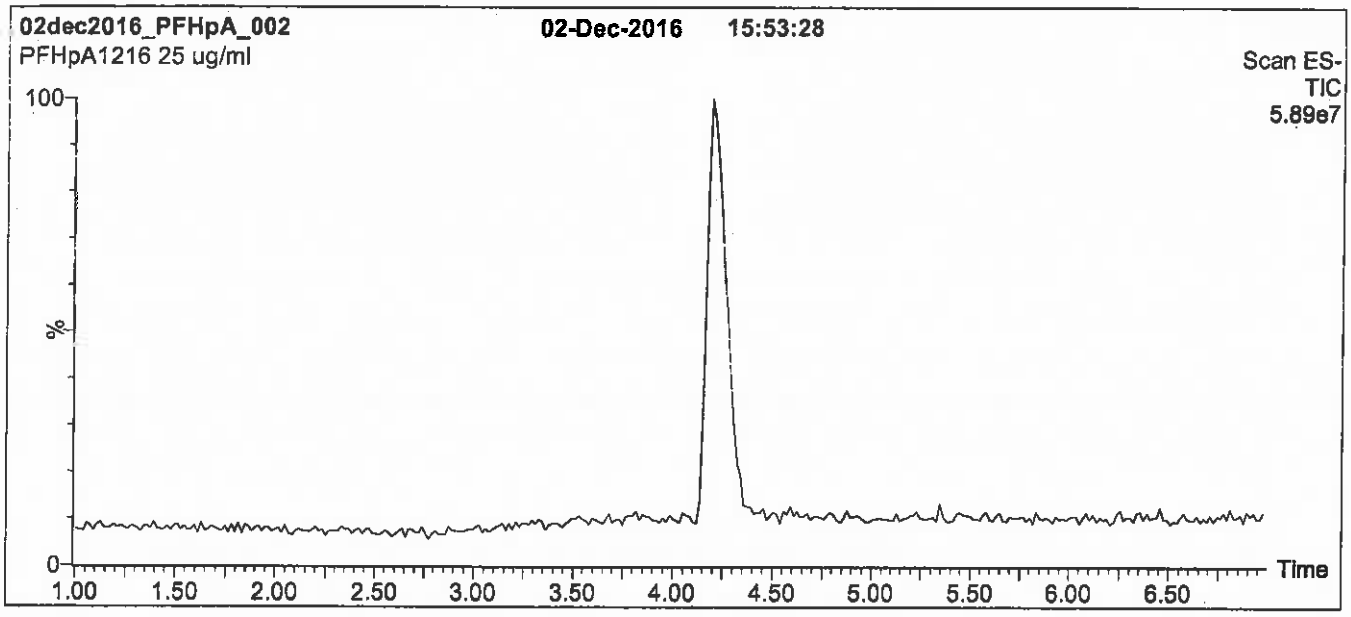
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

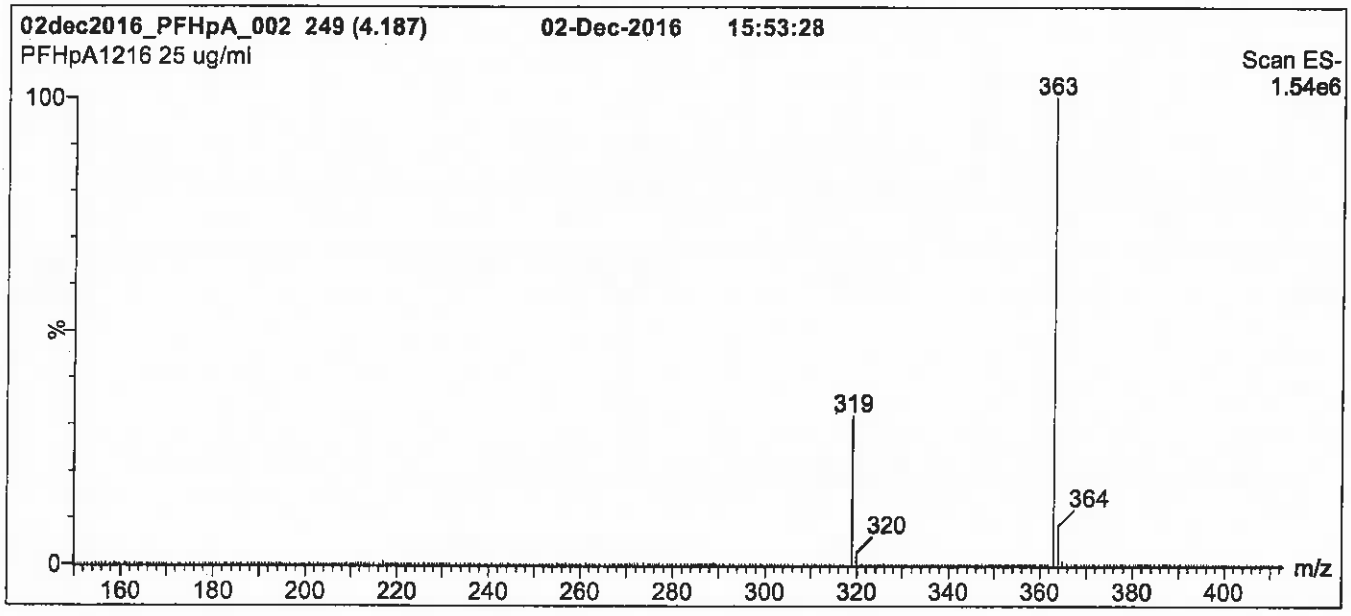
CALA

ANAB ACCREDITED

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: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

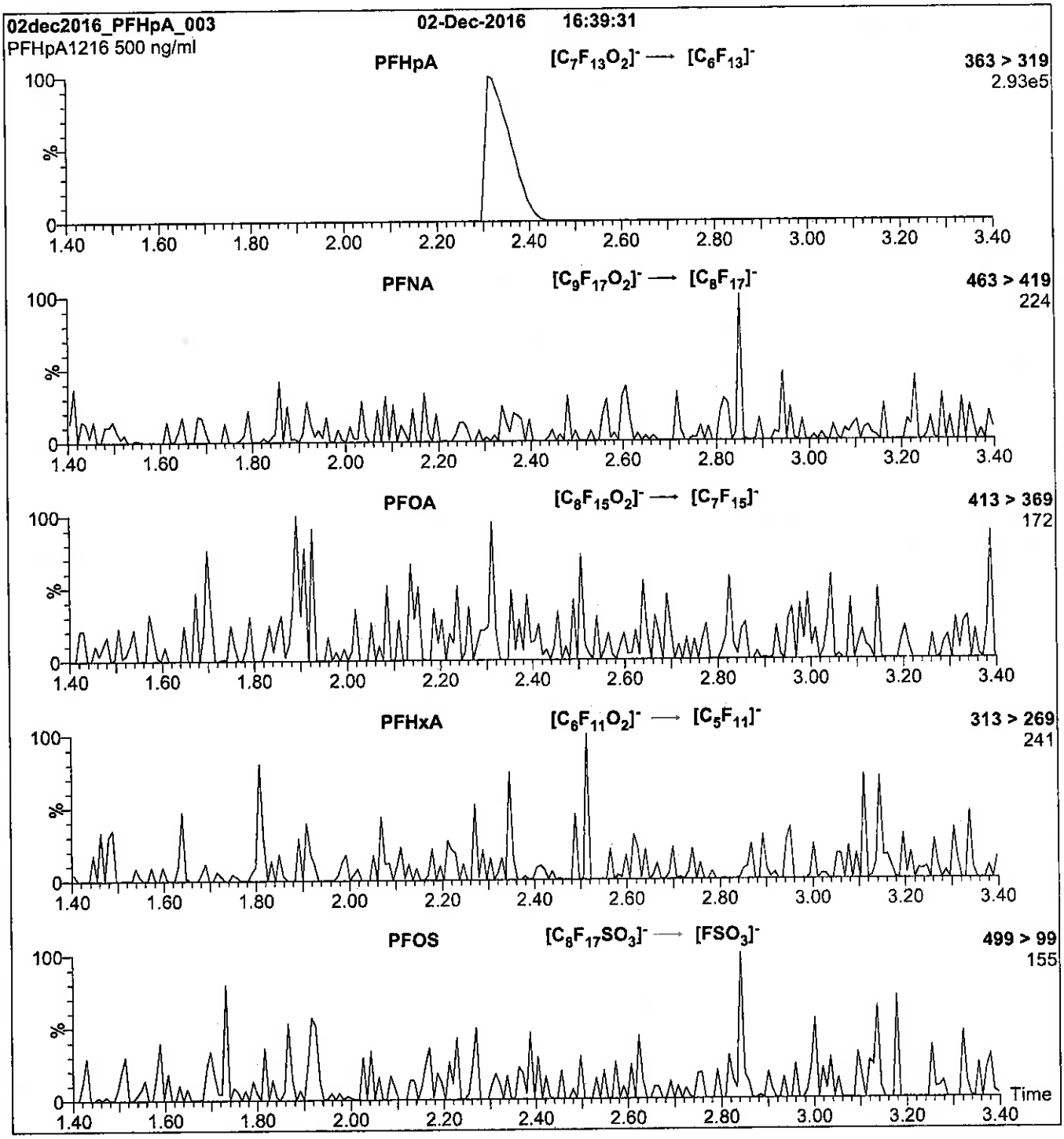
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFHpS_00010

Scanned 10/14/16 SP R: SBC 9/13/16

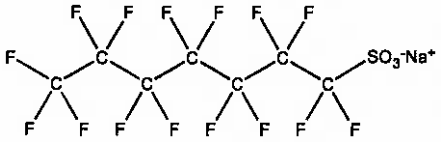
730635
ID: LCPFHpS_00009
Exp: 11/06/20 Prpd: SBC
PFHpS at 47.6ug/mL

730639
ID: LCPFHpS_00010
Exp: 11/06/20 Prpd: SBC
PFHpS at 47.6ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: L-PFHpS
COMPOUND: Sodium perfluoro-1-heptanesulfonate
LOT NUMBER: LPFHpS1115
STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$C_7F_{15}SO_3Na$	**MOLECULAR WEIGHT:**	472.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.6 ± 2.4 µg/ml (PFHpS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	11/06/2015		
EXPIRY DATE: (mm/dd/yyyy)	11/06/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.1% of L-PFHxS ($C_6F_{13}SO_3Na$) and ~ 0.2% of L-PFOS ($C_8F_{17}SO_3Na$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 11/09/2015 (mm/dd/yyyy)

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

INTENDED USE:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

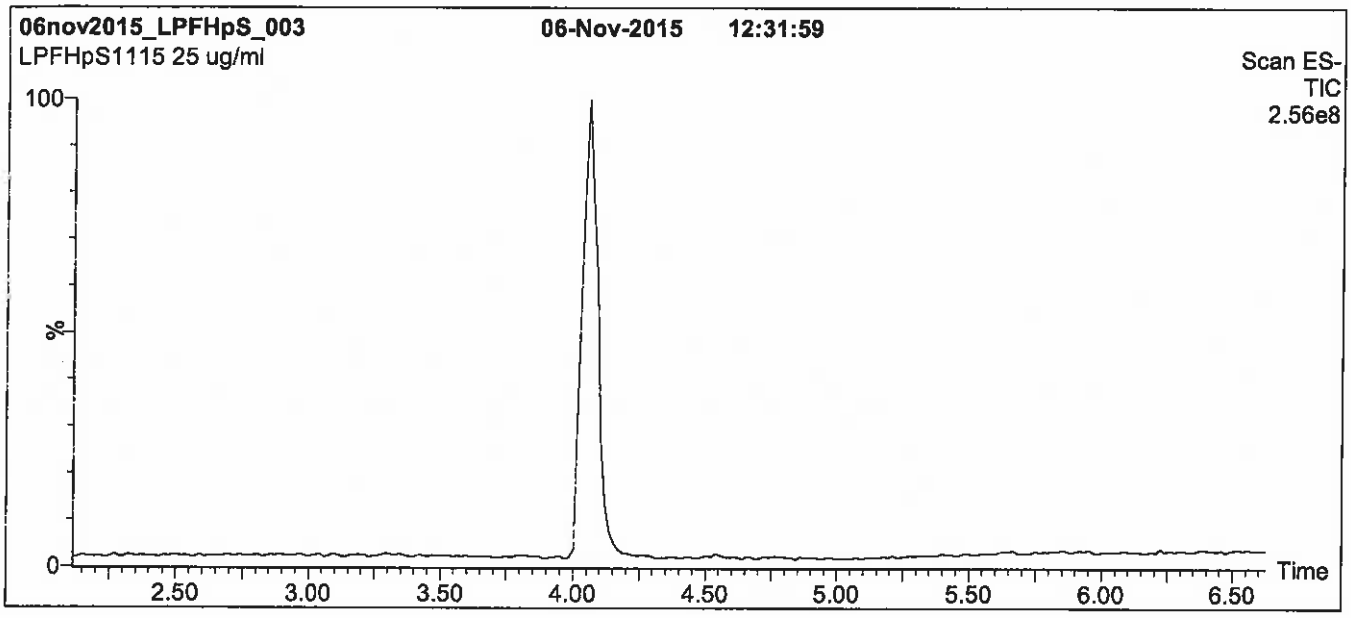
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

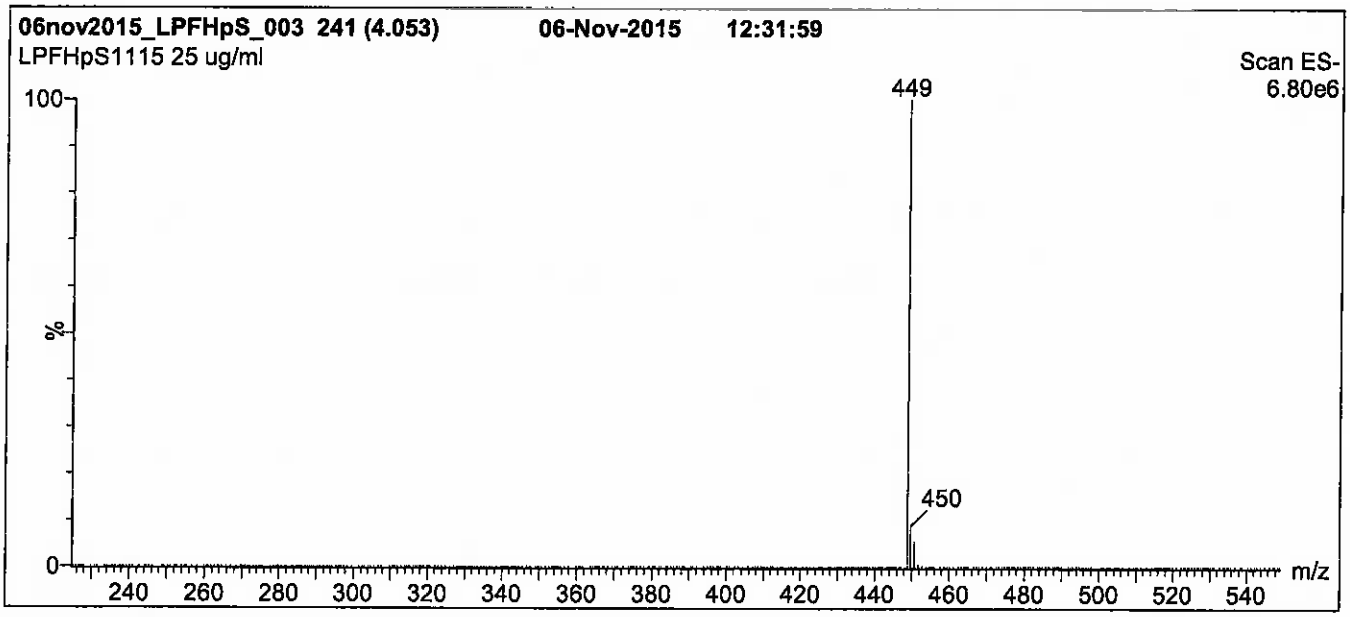
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

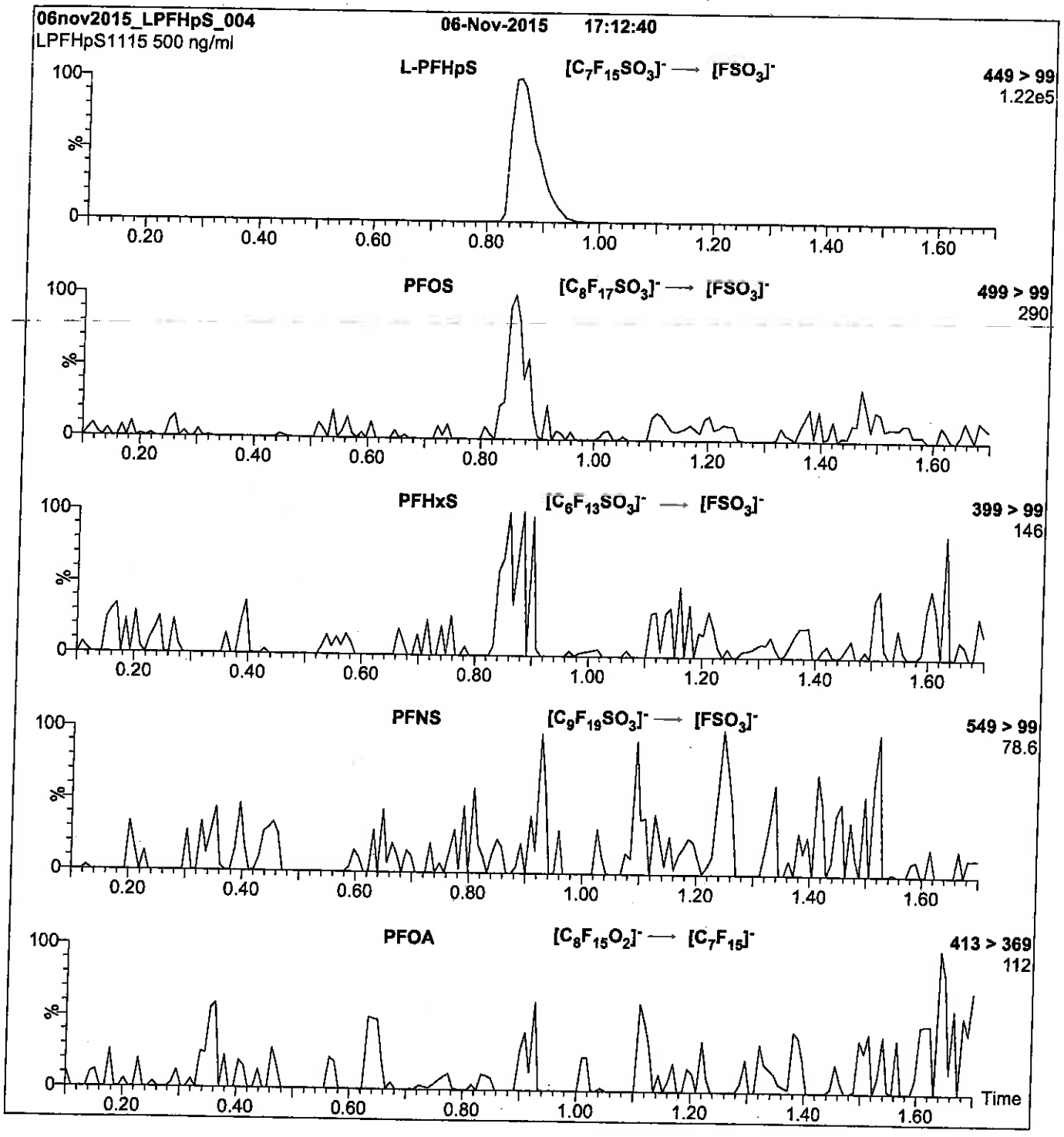
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 35

Reagent

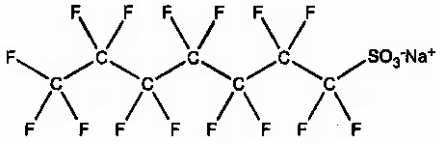
LCPFHpSA_00002

R: 12/20/16 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	L-PFHpS	**LOT NUMBER:**	LPFHpS1016
COMPOUND:	Sodium perfluoro-1-heptanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_7F_{15}SO_3Na$	**MOLECULAR WEIGHT:**	472.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.6 ± 2.4 µg/ml (PFHpS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	10/18/2016		
EXPIRY DATE: (mm/dd/yyyy)	10/18/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.2% of L-PFHxS ($C_6F_{13}SO_3Na$) and ~ 0.1% of L-PFOS ($C_8F_{17}SO_3Na$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/20/2016 (mm/dd/yyyy)

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

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CALA

ANAB

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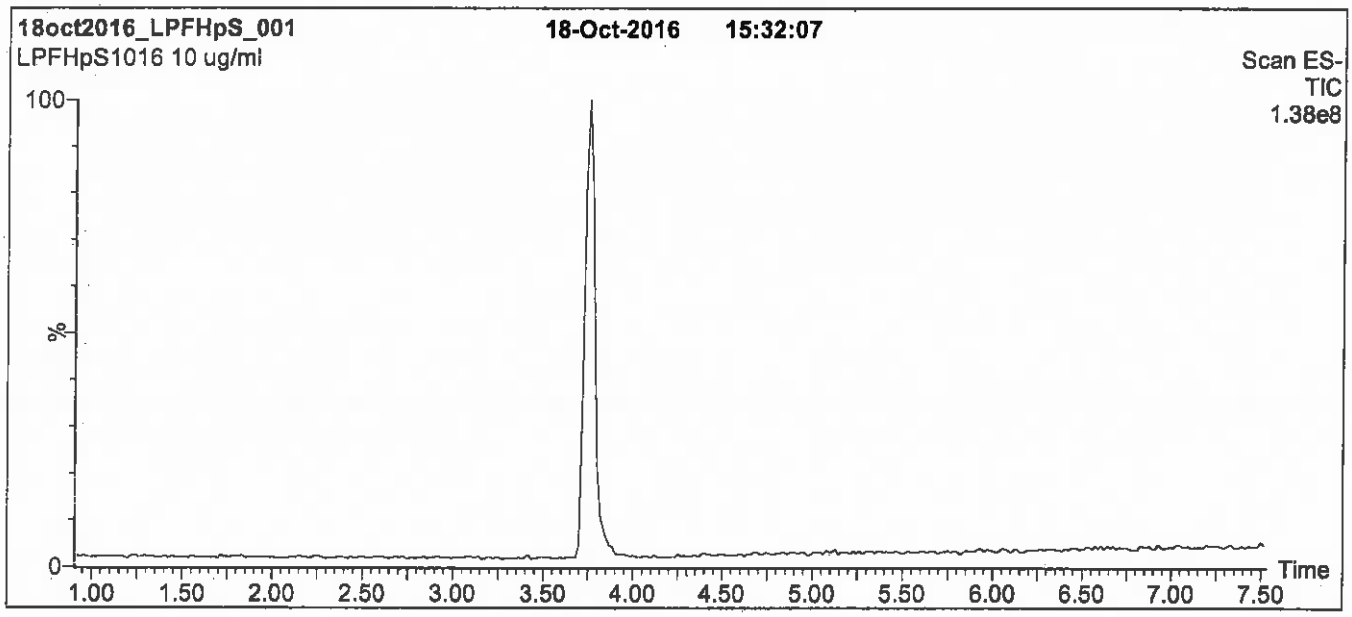
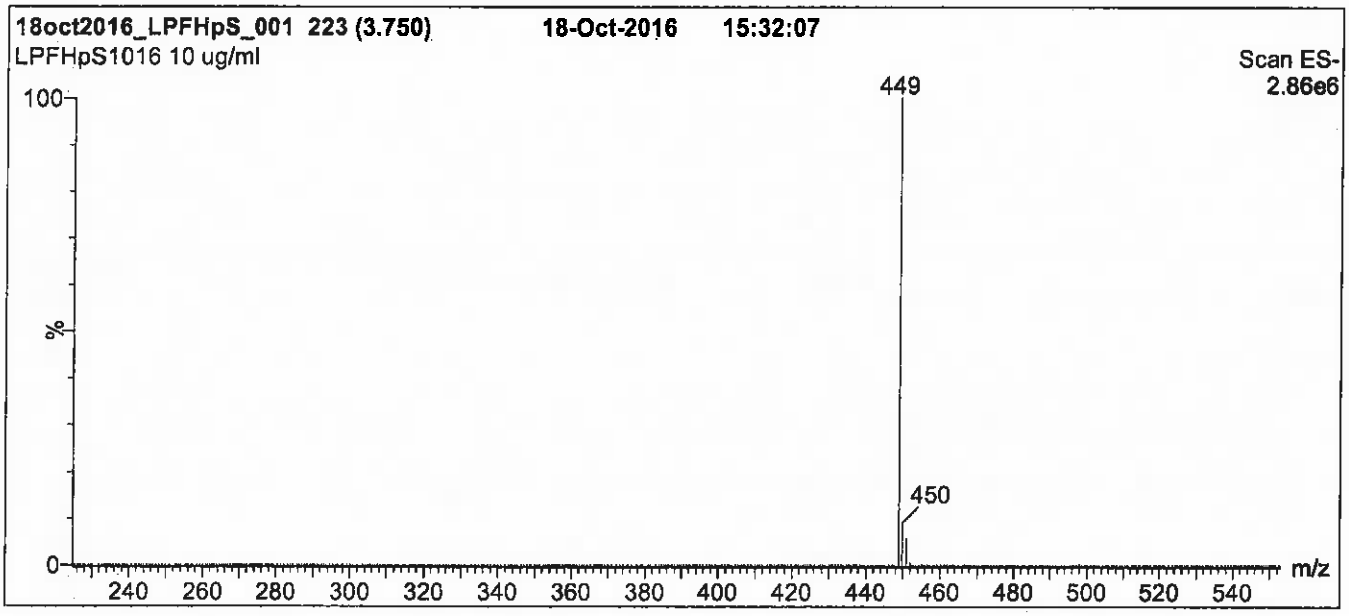
Figure 1: **L-PFHpS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

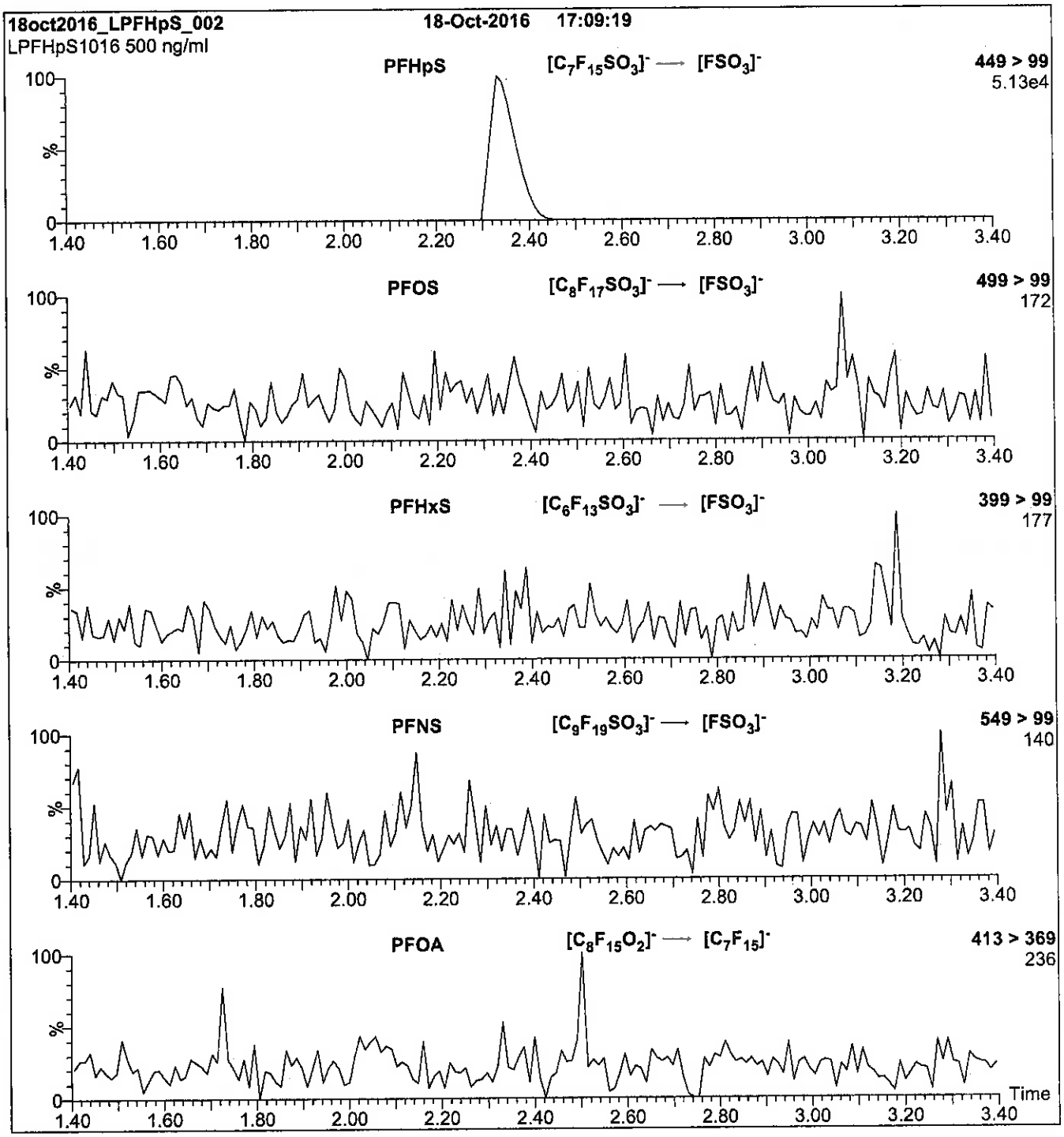
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 35

Reagent

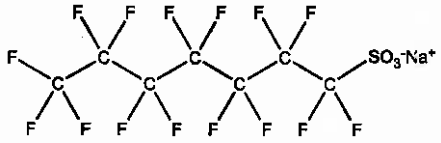
LCPFHpSA_00003

R: 9/21/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFHpS	**LOT NUMBER:**	LPFHpS0817
COMPOUND:	Sodium perfluoro-1-heptanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_7F_{15}SO_3Na$	**MOLECULAR WEIGHT:**	472.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.6 ± 2.4 µg/ml (PFHpS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/01/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/01/2022		
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 ~ 0.2% of L-PFHxS ($C_6F_{13}SO_3Na$) and ~ 0.1% of L-PFOS ($C_8F_{17}SO_3Na$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/07/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

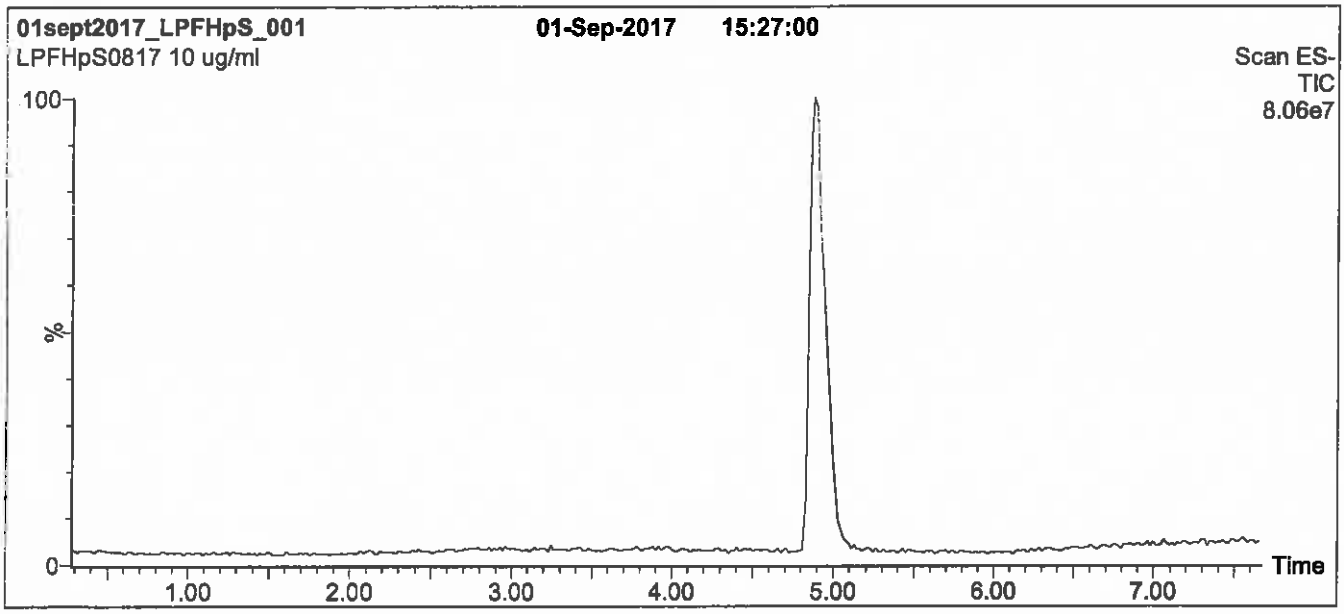
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

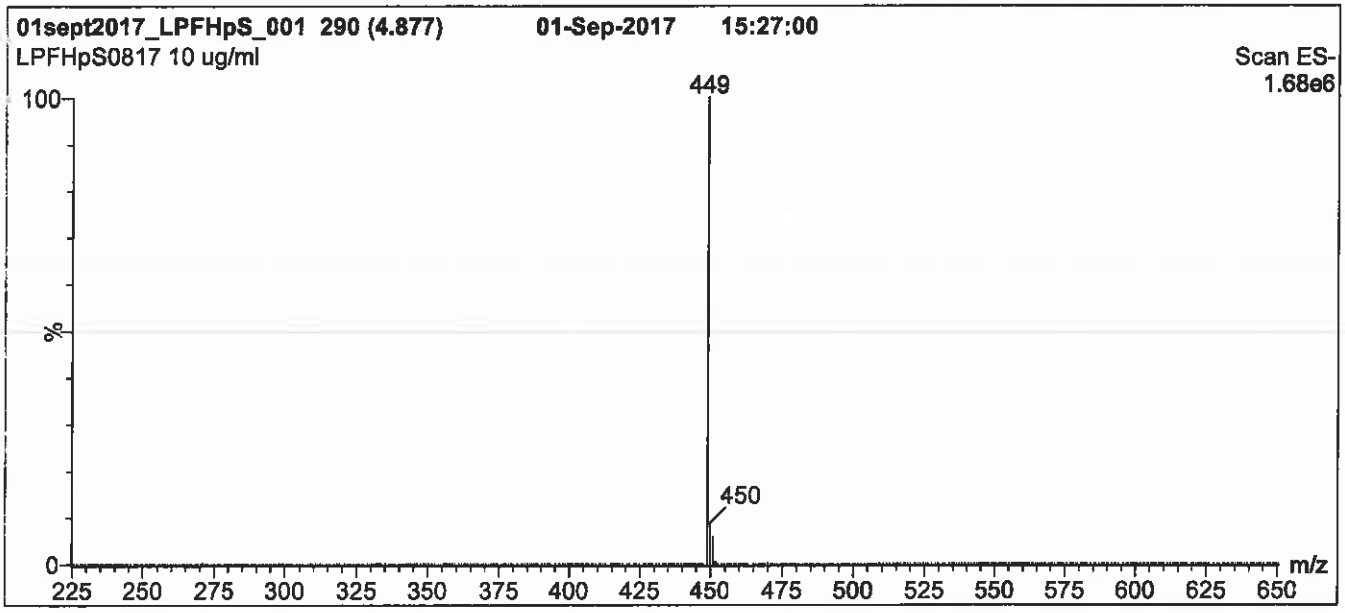
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold
for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

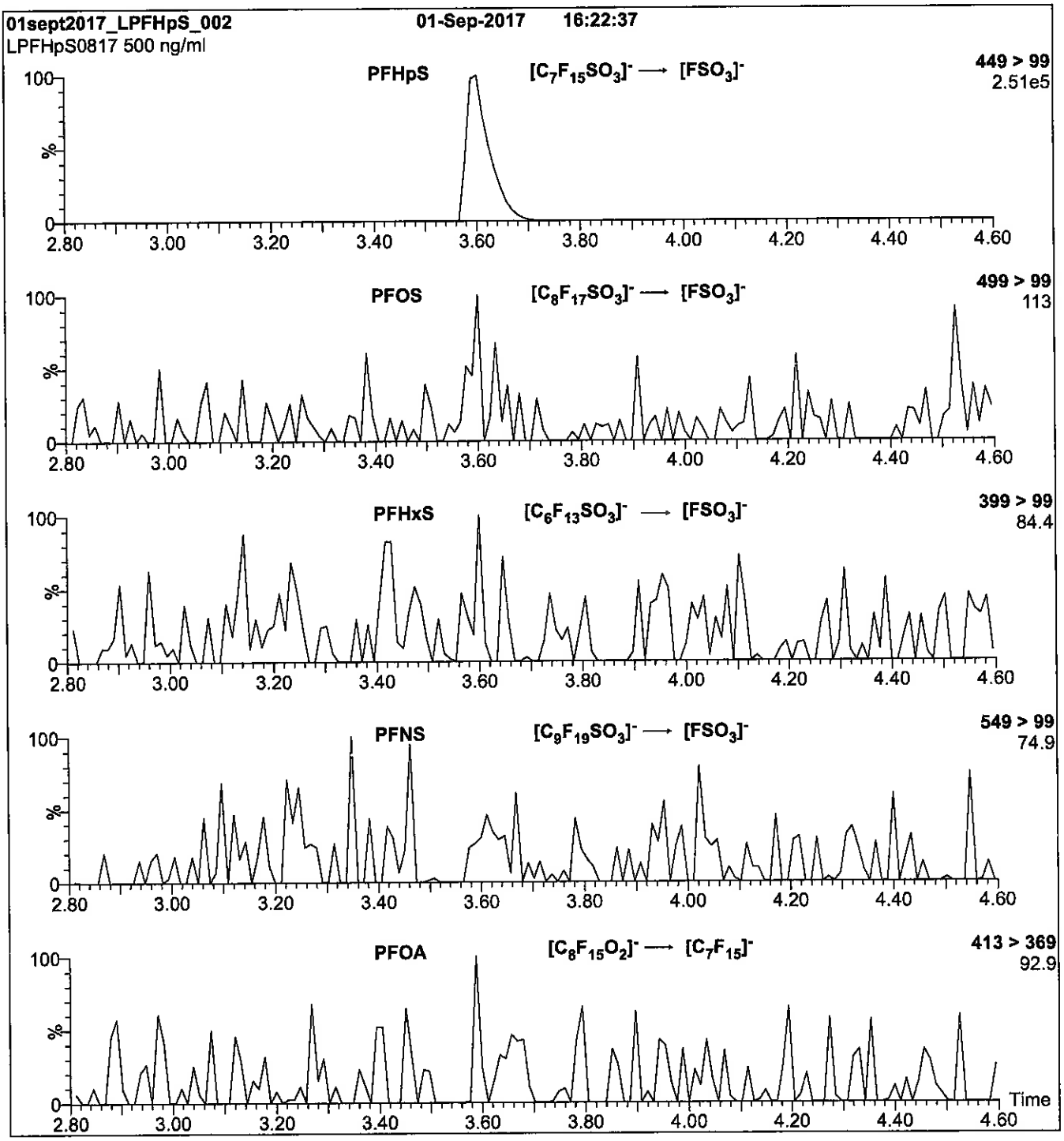
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 35

Reagent

LCPFHxA_00006

R: SBC 9/13/16

730551
ID: LCPFHxA_00005
Exp: 12/22/20 Prpd: SBC
PF-n-hexanoic acid

730552
ID: LCPFHxA_00006
Exp: 12/22/20 Prpd: SBC
PF-n-hexanoic acid

WELLINGTON LABORATORIES

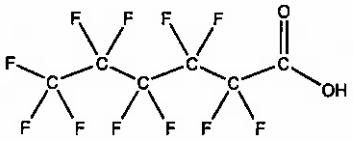
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: PFHxA1215

STRUCTURE:

CAS #: 307-24-4



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

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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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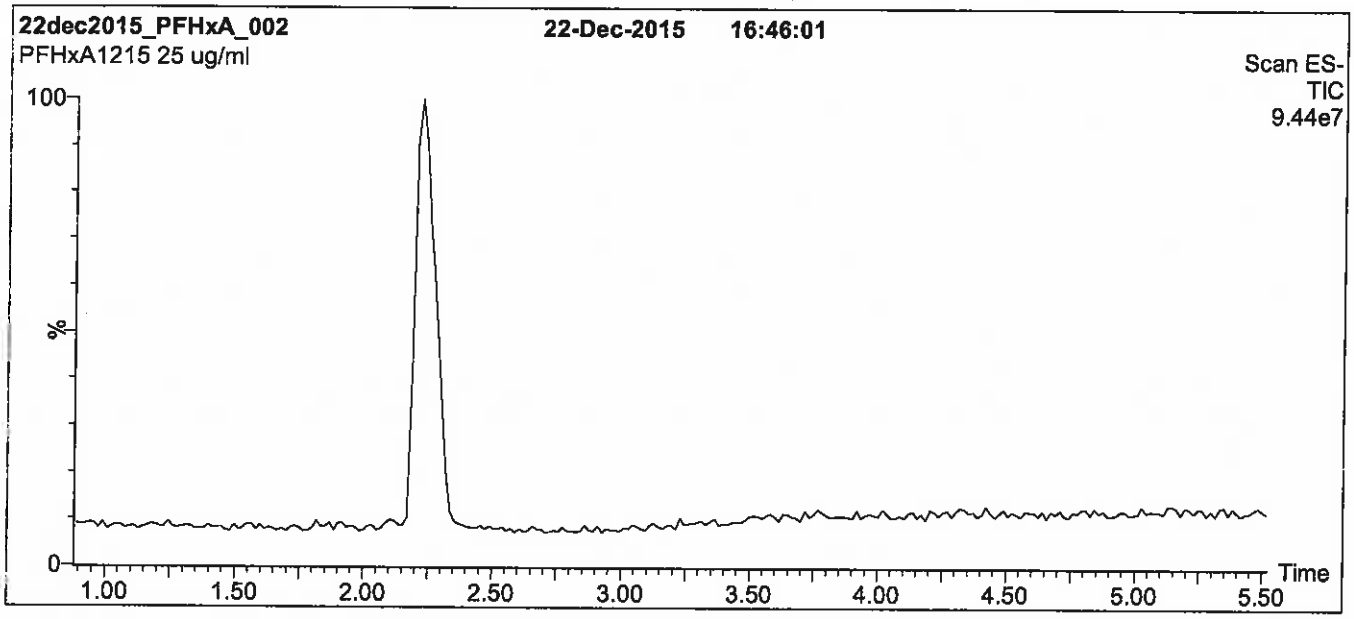
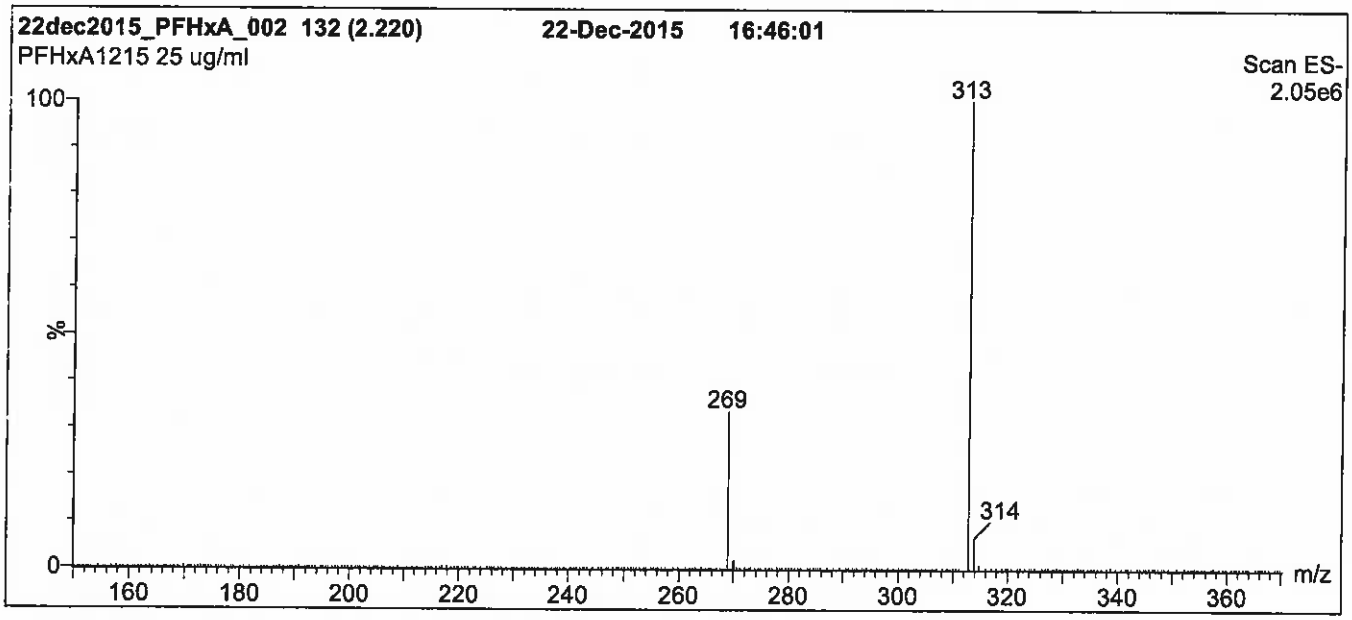
Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

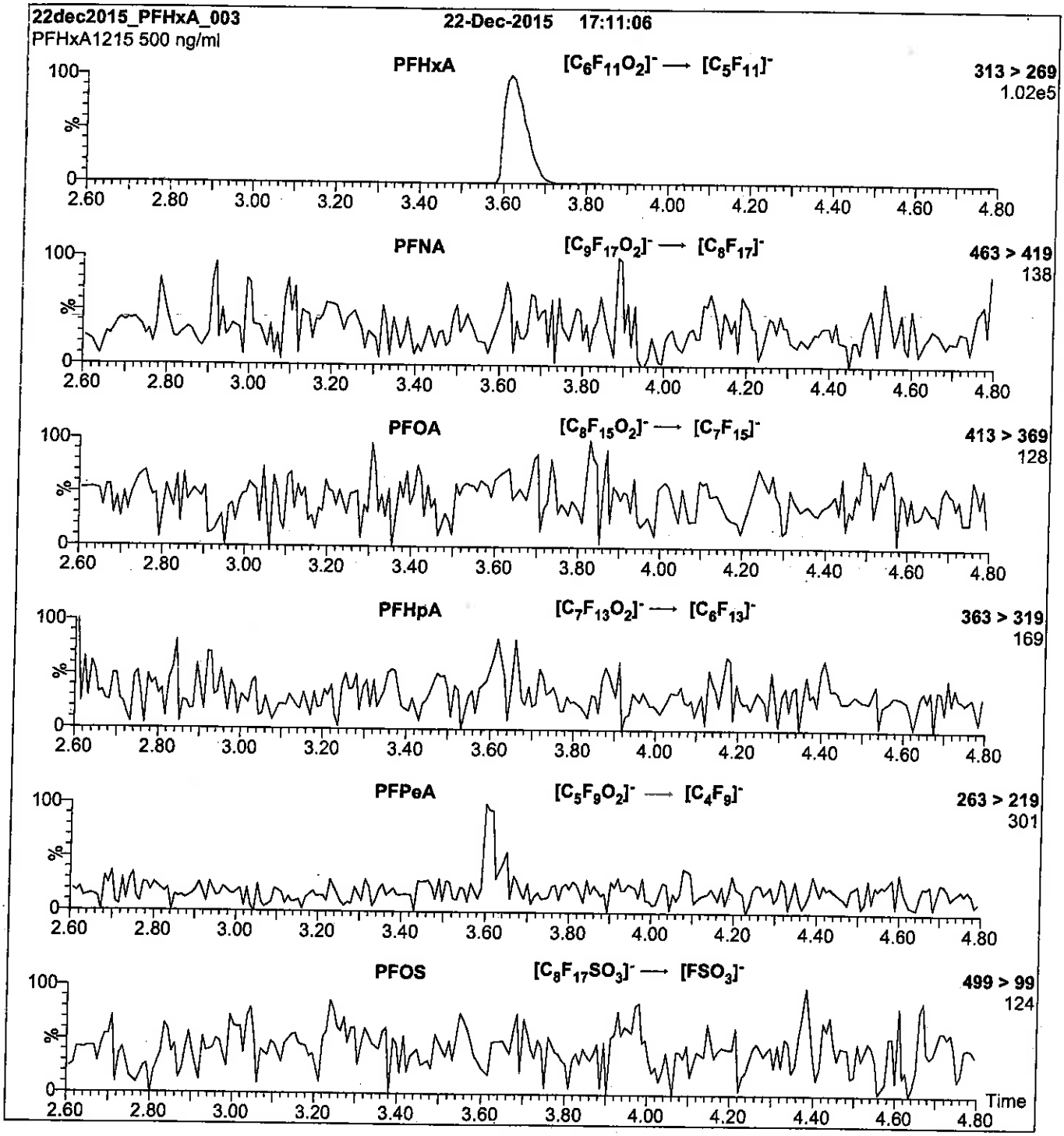
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

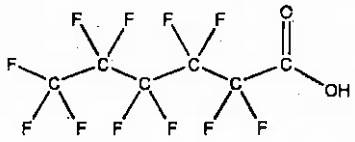
LCPFHxA_00007

R: 12/29/16 SAV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFHxA	**LOT NUMBER:**	PFHxA1215
COMPOUND:	Perfluoro-n-hexanoic acid		
STRUCTURE:		**CAS #:**	307-24-4



MOLECULAR FORMULA:	$C_6HF_{11}O_2$	**MOLECULAR WEIGHT:**	314.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/22/2015		
EXPIRY DATE: (mm/dd/yyyy)	12/22/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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UNCERTAINTY:

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

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

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

TRACEABILITY:

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CALA

ANAB ACCREDITED

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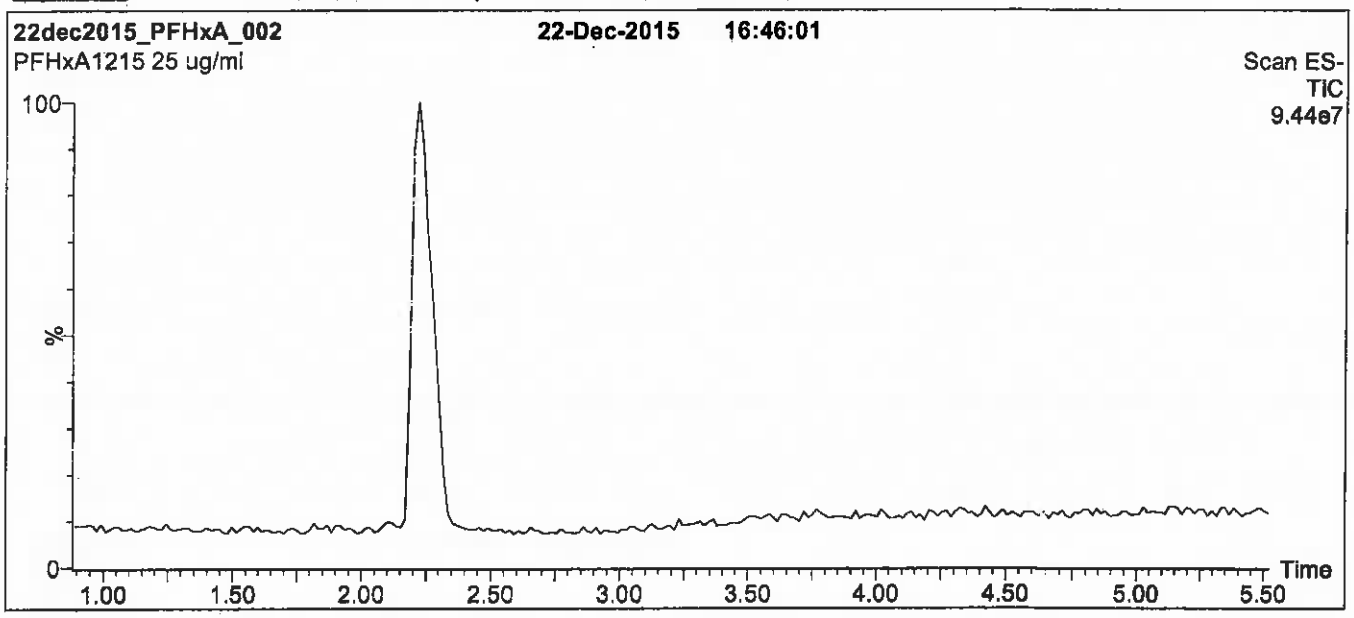
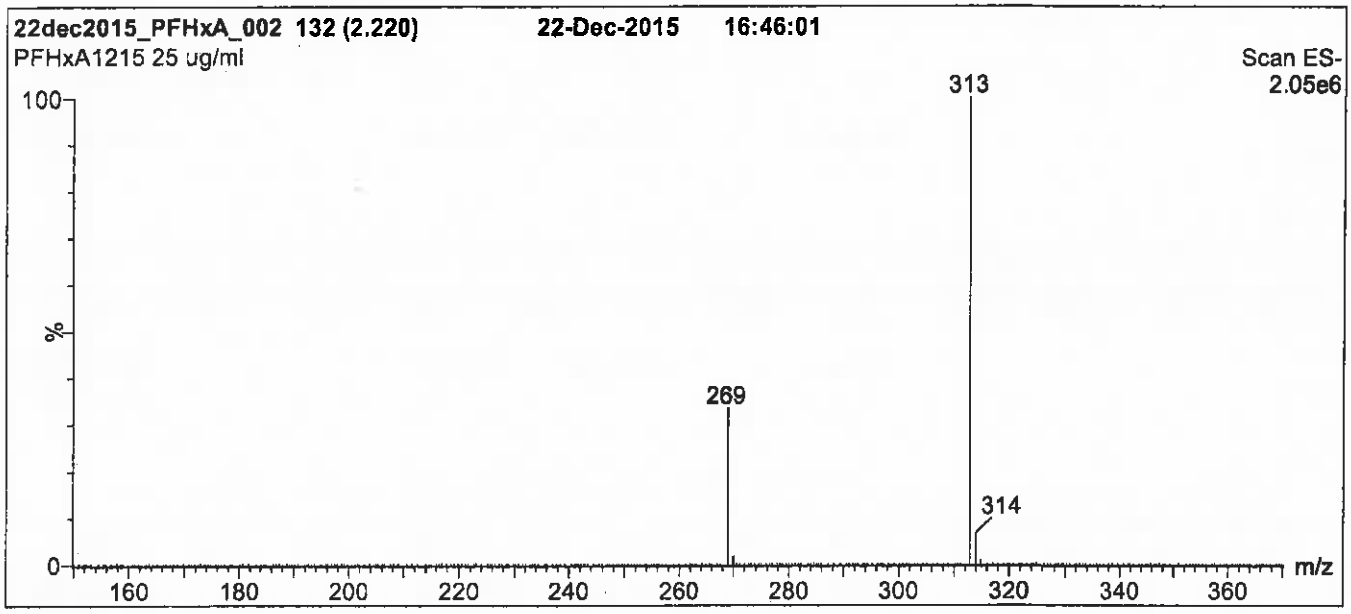
Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

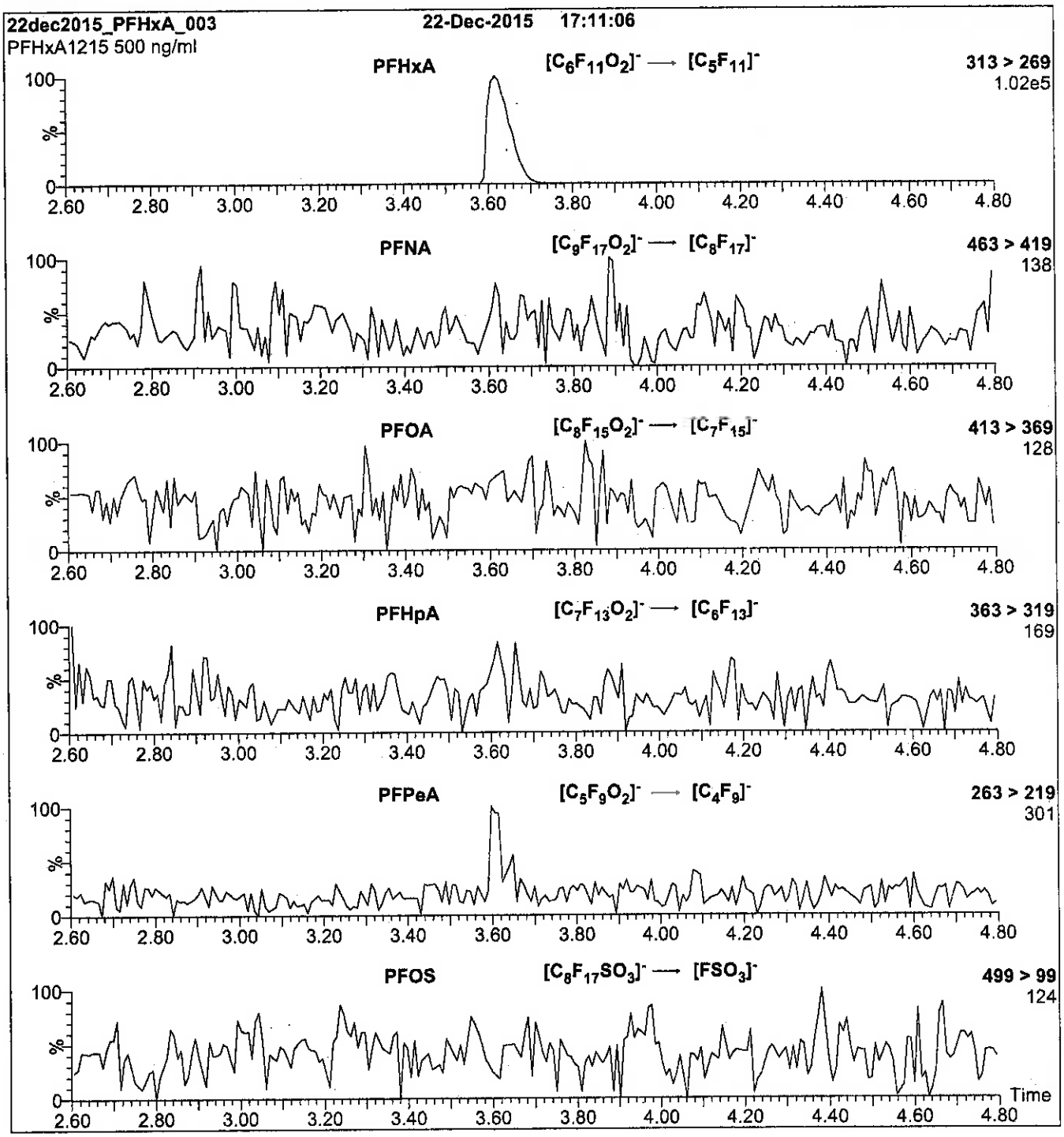
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFHxDA_00007

R: SBC 9/13/16
Scanned 10/14/16 SK

730630
ID: LCPFHxDA_00006
Exp: 05/25/21 Prpd: SBC
PFHxDA stock 50ug/mL

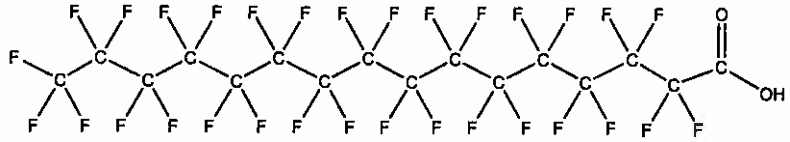
730631
ID: LCPFHxDA_00007
Exp: 05/25/21 Prpd: SBC
PFHxDA stock 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHxDA
LOT NUMBER: PFHxDA0516
COMPOUND: Perfluoro-n-hexadecanoic acid

STRUCTURE:
CAS #: 67905-19-5



MOLECULAR FORMULA: $C_{16}HF_{31}O_2$
MOLECULAR WEIGHT: 814.13
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/25/2016
EXPIRY DATE: (mm/dd/yyyy) 05/25/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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Certified By: B.G. Chittim **Date:** 05/27/2016 (mm/dd/yyyy)

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QUALITY MANAGEMENT:

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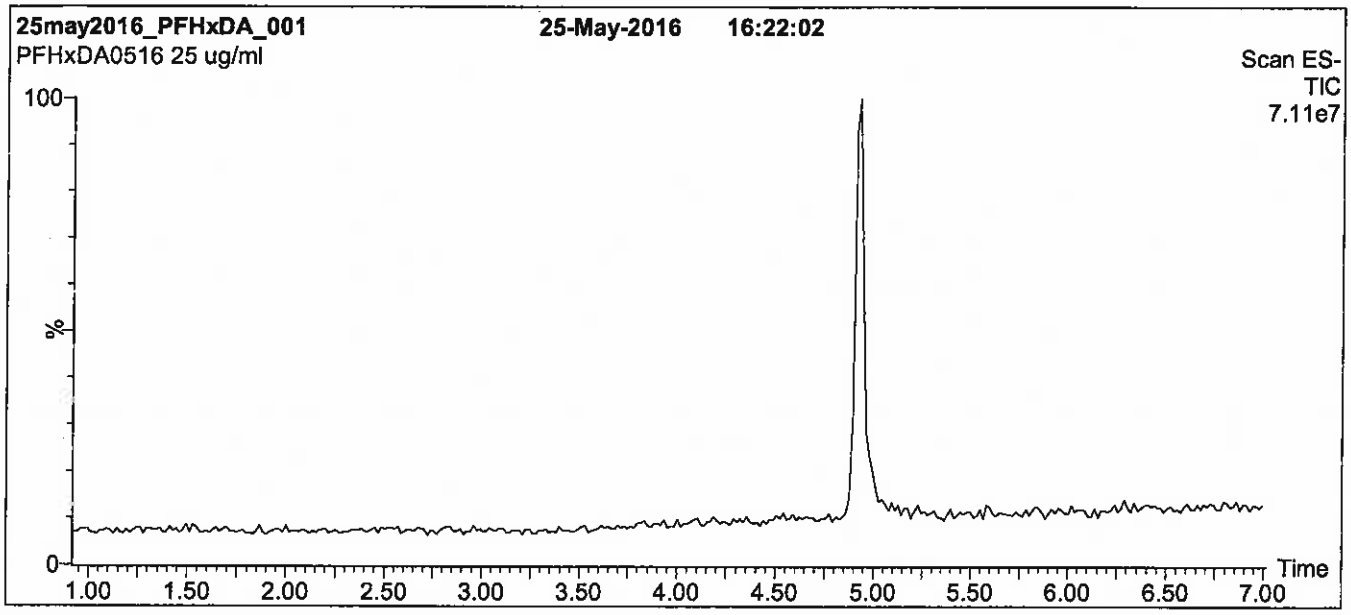
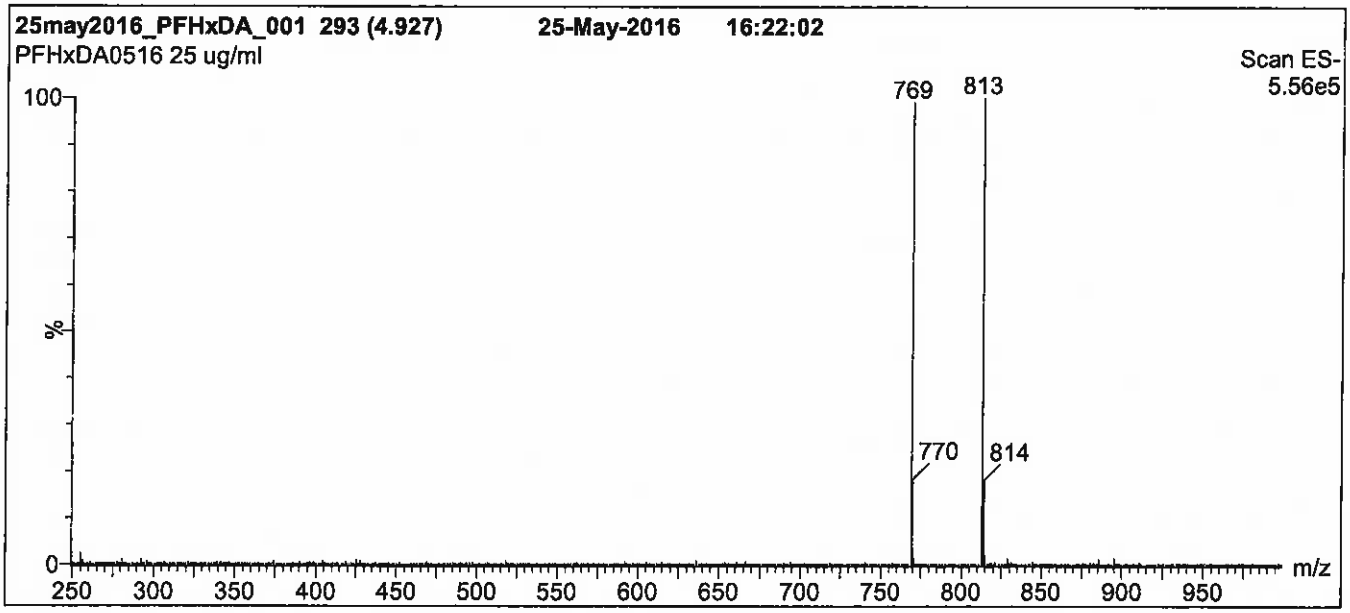
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFHxDA; 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 95% organic over 6 min and hold for 2.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

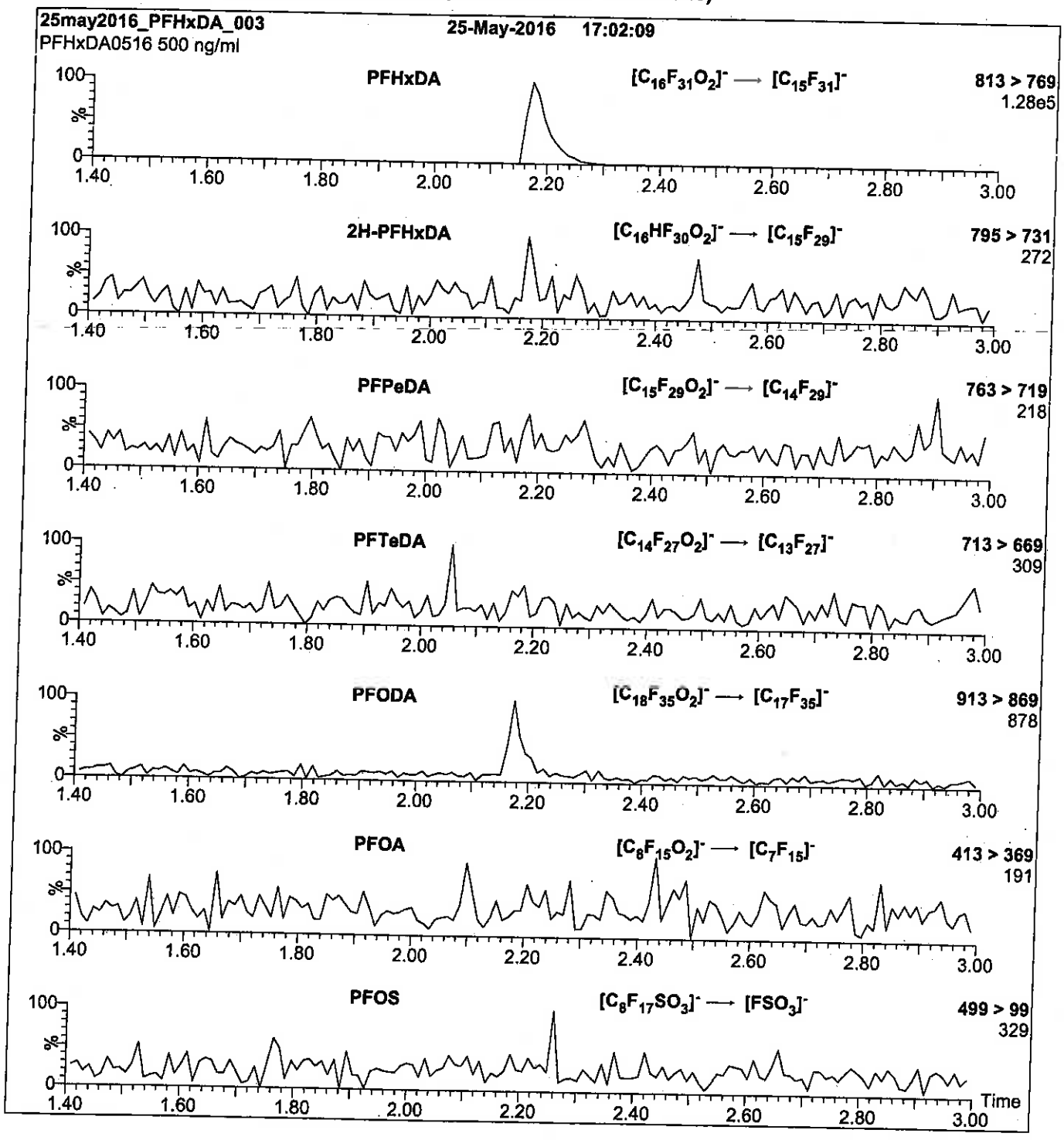
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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) = 15

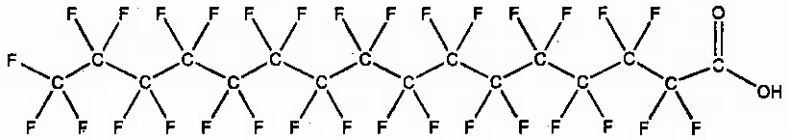
Reagent

LCPFHxDA_00008

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFHxDA	**LOT NUMBER:**	PFHxDA0516
COMPOUND:	Perfluoro-n-hexadecanoic acid		
STRUCTURE:		**CAS #:**	67905-19-5



MOLECULAR FORMULA:	$C_{16}HF_{31}O_2$	**MOLECULAR WEIGHT:**	814.13
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/25/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/25/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/27/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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CALA

ANAB ACCREDITED

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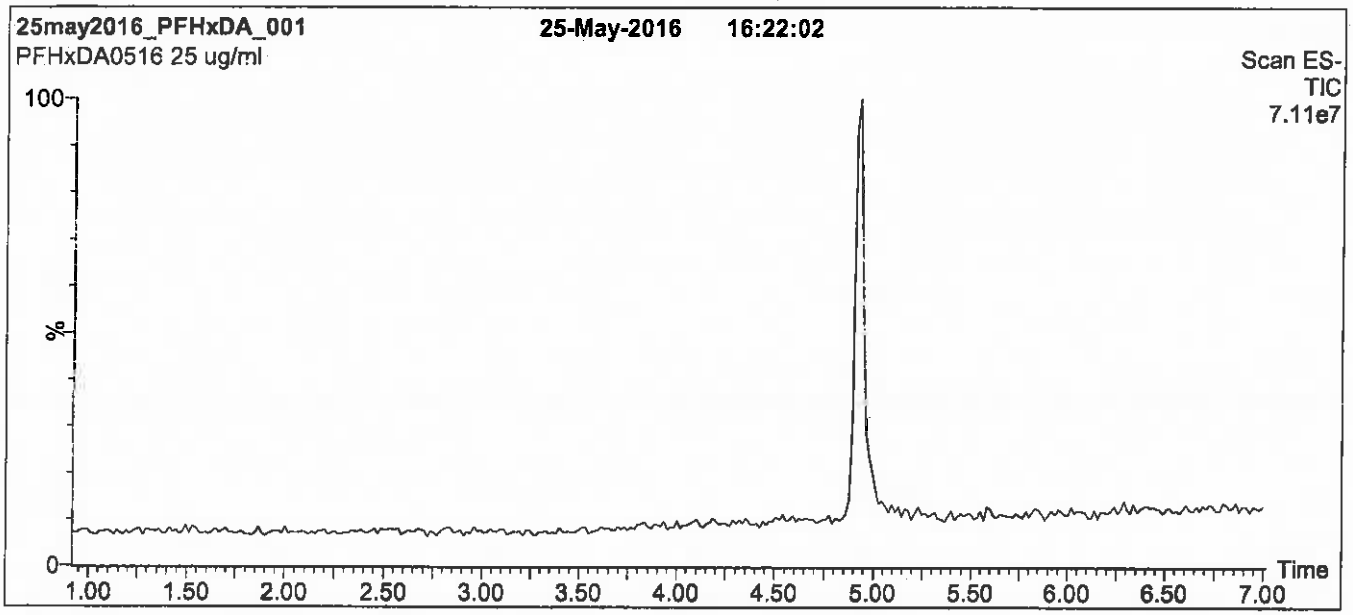
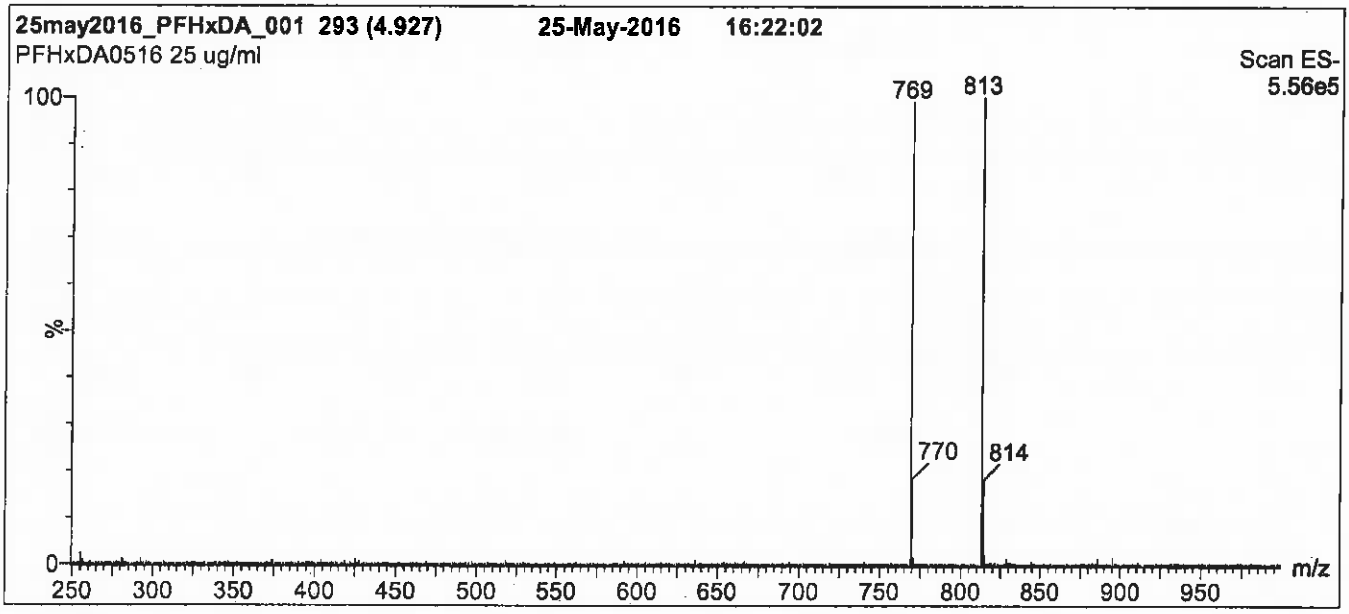




Conditions for Figure 1:

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: 70% (80:20 MeOH:ACN) / 30% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 95% organic over 6 min and hold for 2.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

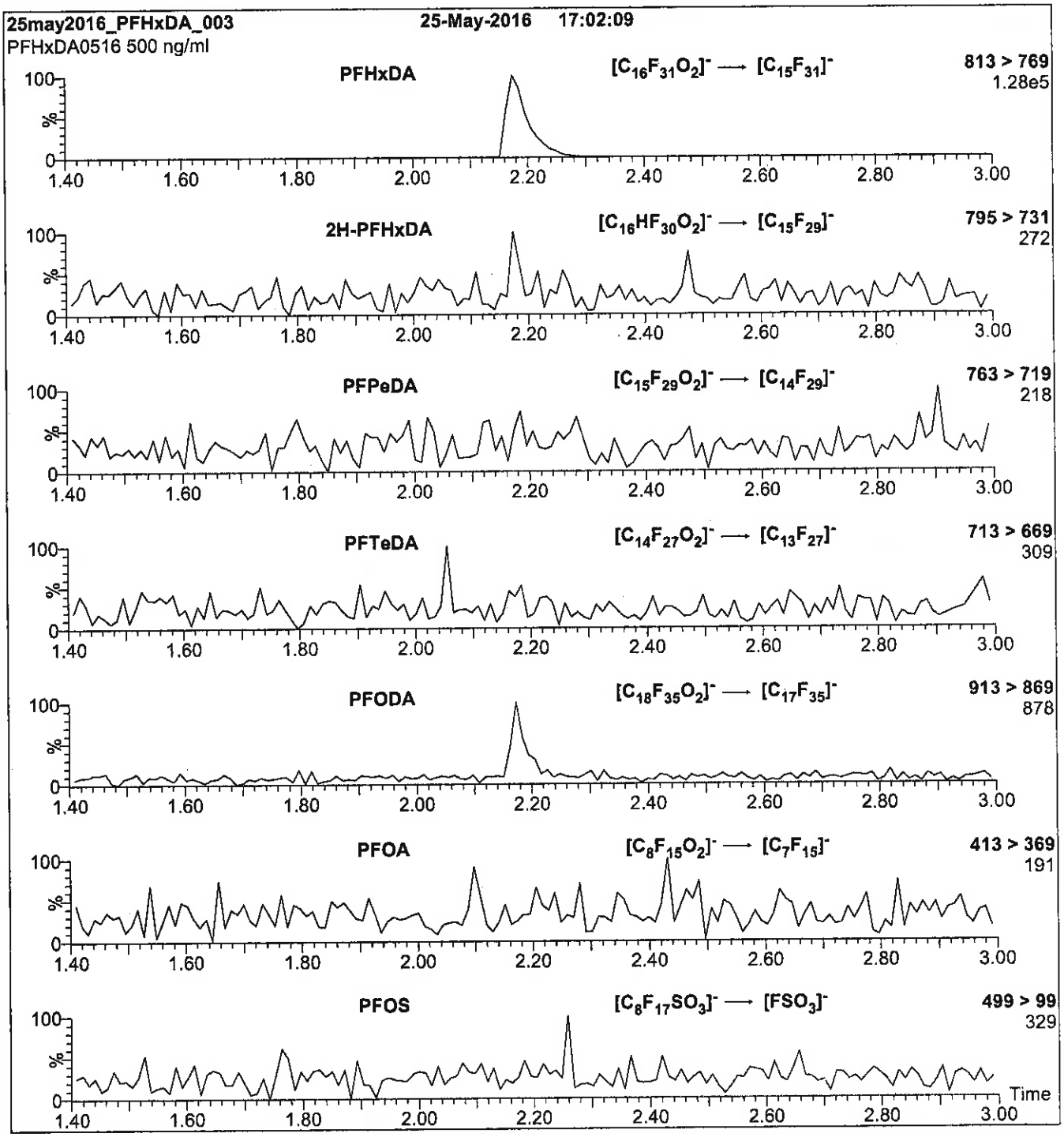
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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) = 15

Reagent

LCPFHxS-br_00003

SBC
R: 9/13/16

730513
ID: LCPFHxS-br_00002
Exp: 07/03/20 Prpd: SBC
Potassium Perfluorohexane

730514
ID: LCPFHxS-br_00003
Exp: 07/03/20 Prpd: SBC
Potassium Perfluorohexane

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate
Solution/Mixture of Linear and
Branched Isomers

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

DESCRIPTION:

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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HOMOGENEITY:

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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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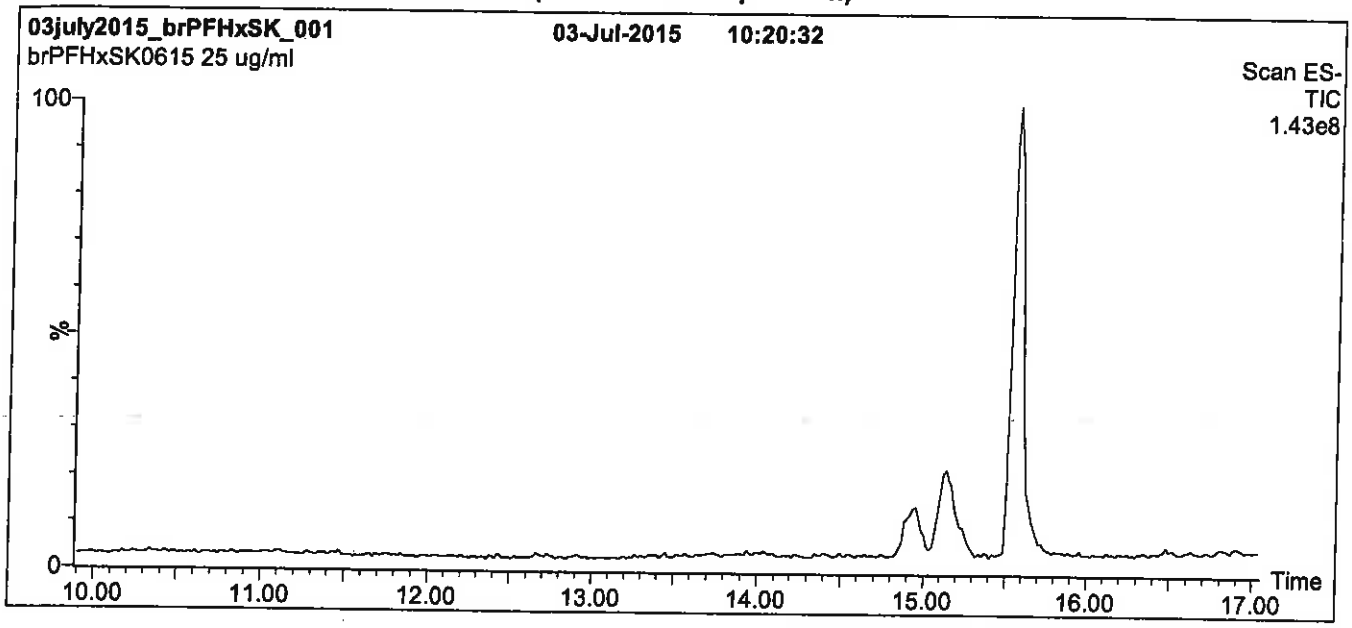
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

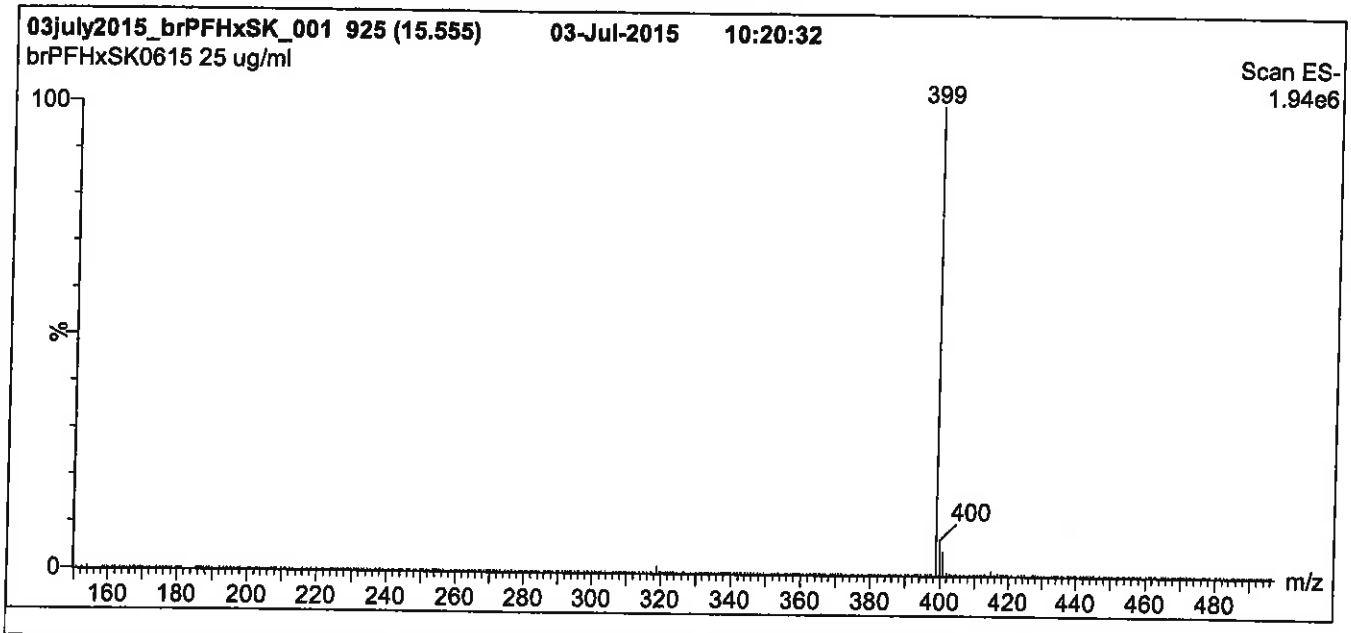
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

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

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

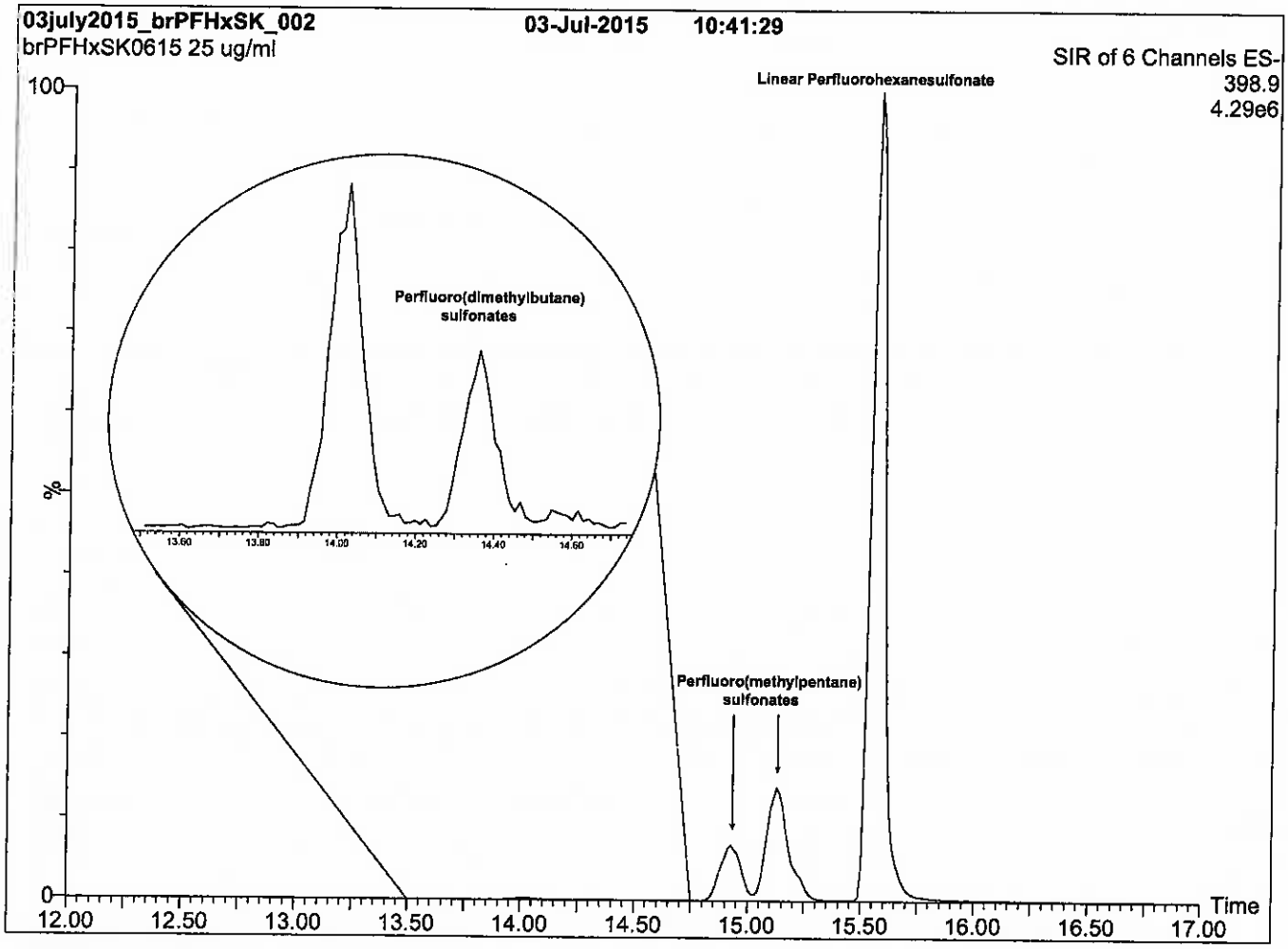
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

Chromatographic Conditions

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

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

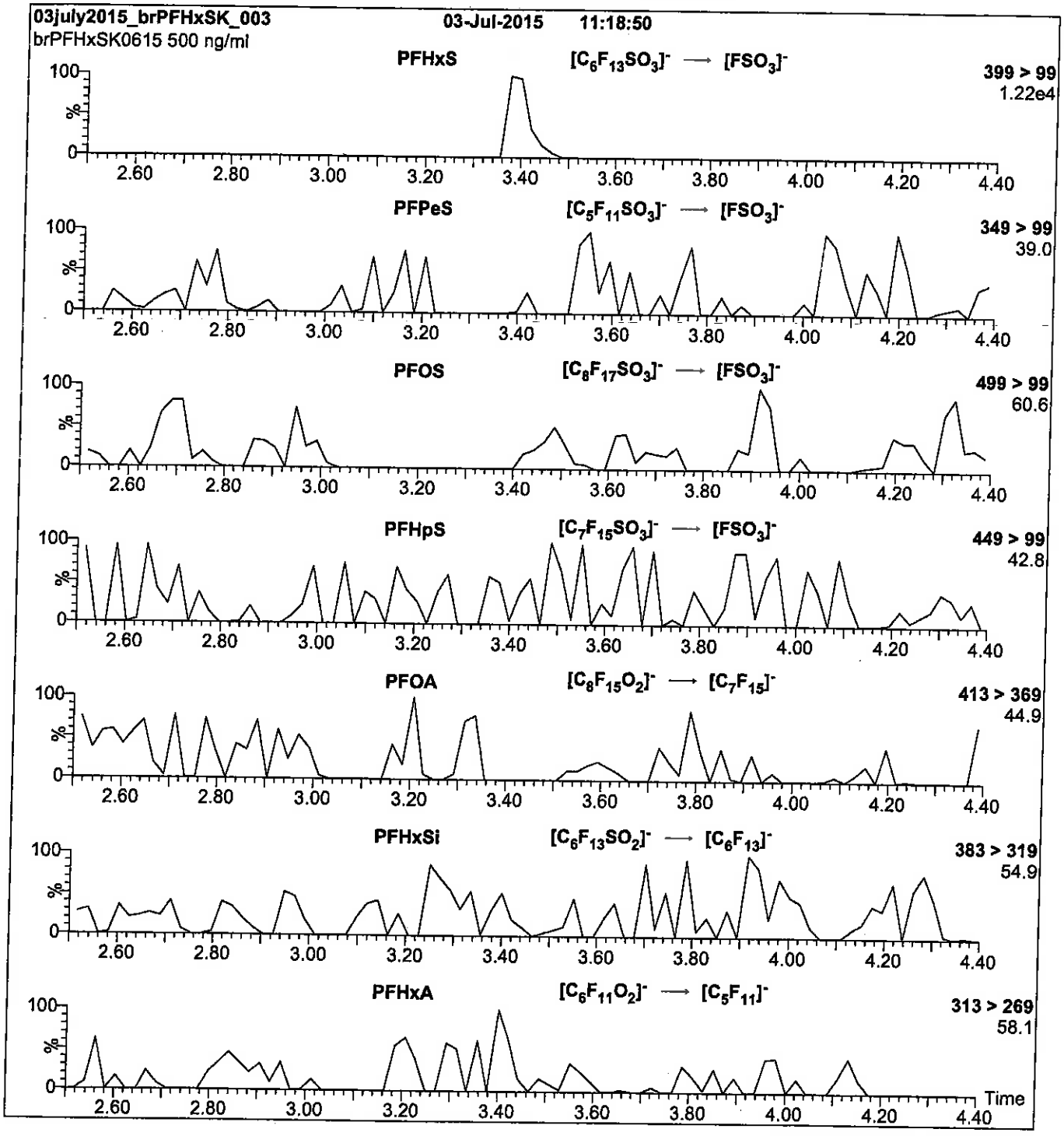
Flow: 300 µl/min

MS Parameters

Experiment: SIR (6 channels)

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

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



Conditions for Figure 3:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFHxS-br_00004

r: 12/29/16 SKd

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate
Solution/Mixture of Linear and
Branched Isomers

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

DESCRIPTION:

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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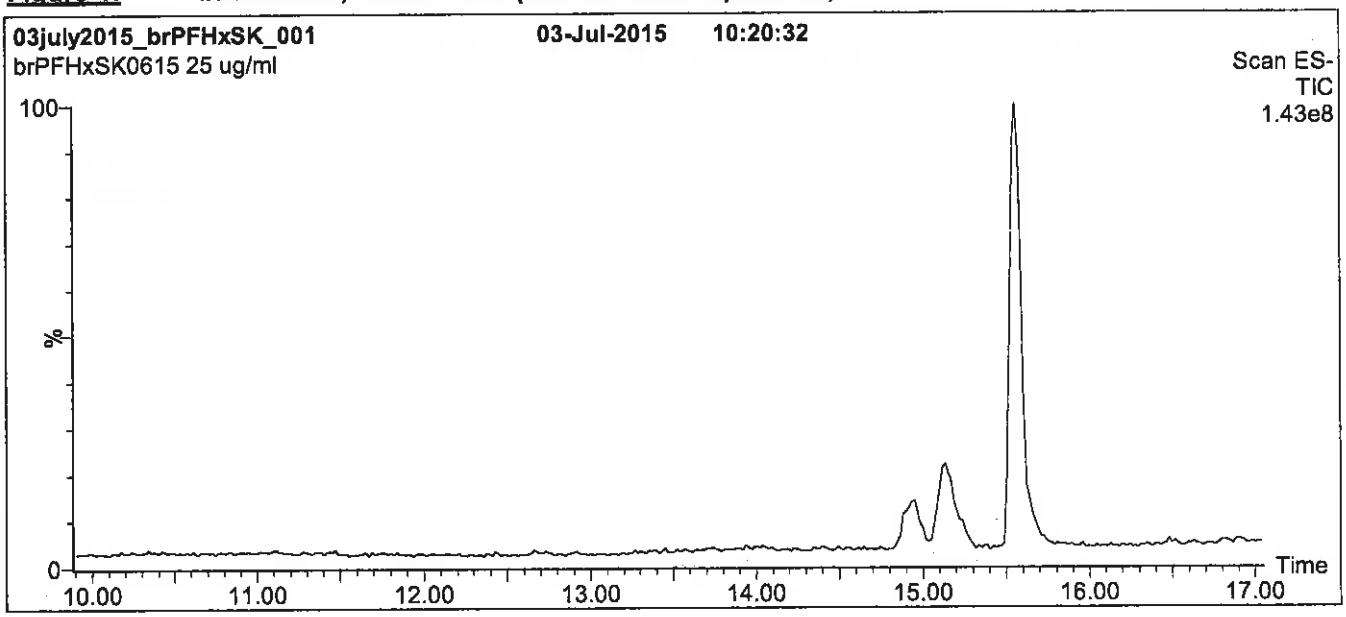
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

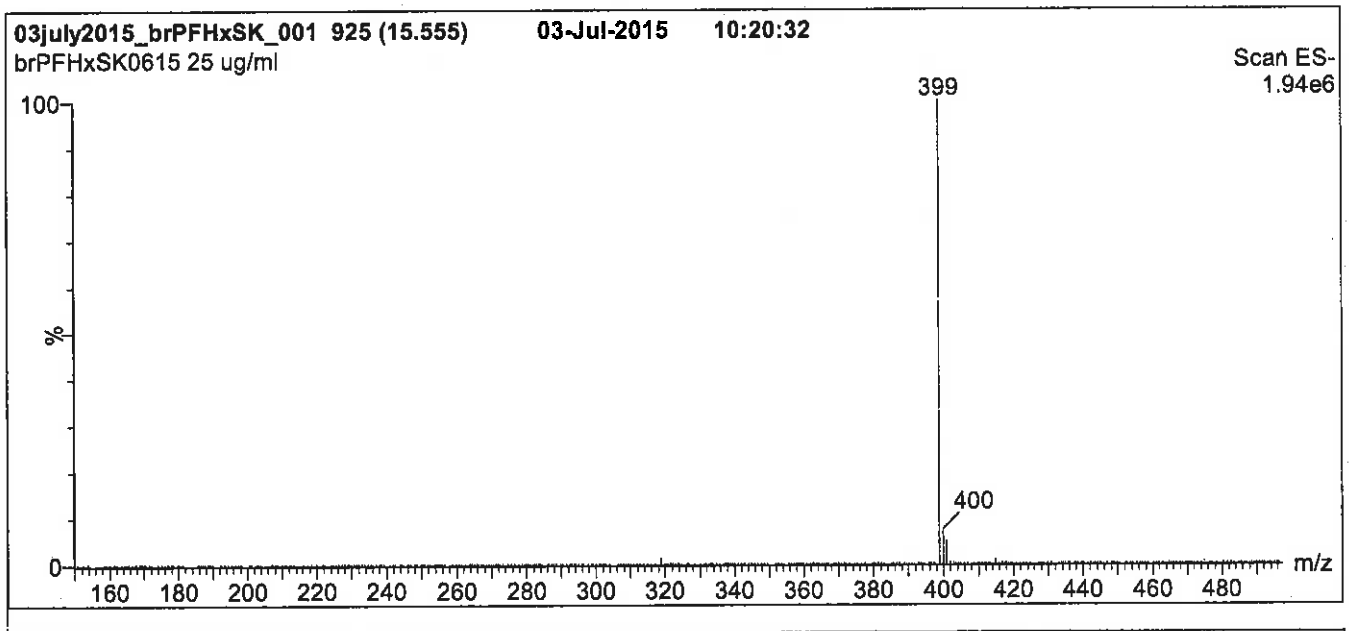
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

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

Certified By: _____ **Date:** 09/27/2016
B.G. Chittim (mm/dd/yyyy)

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

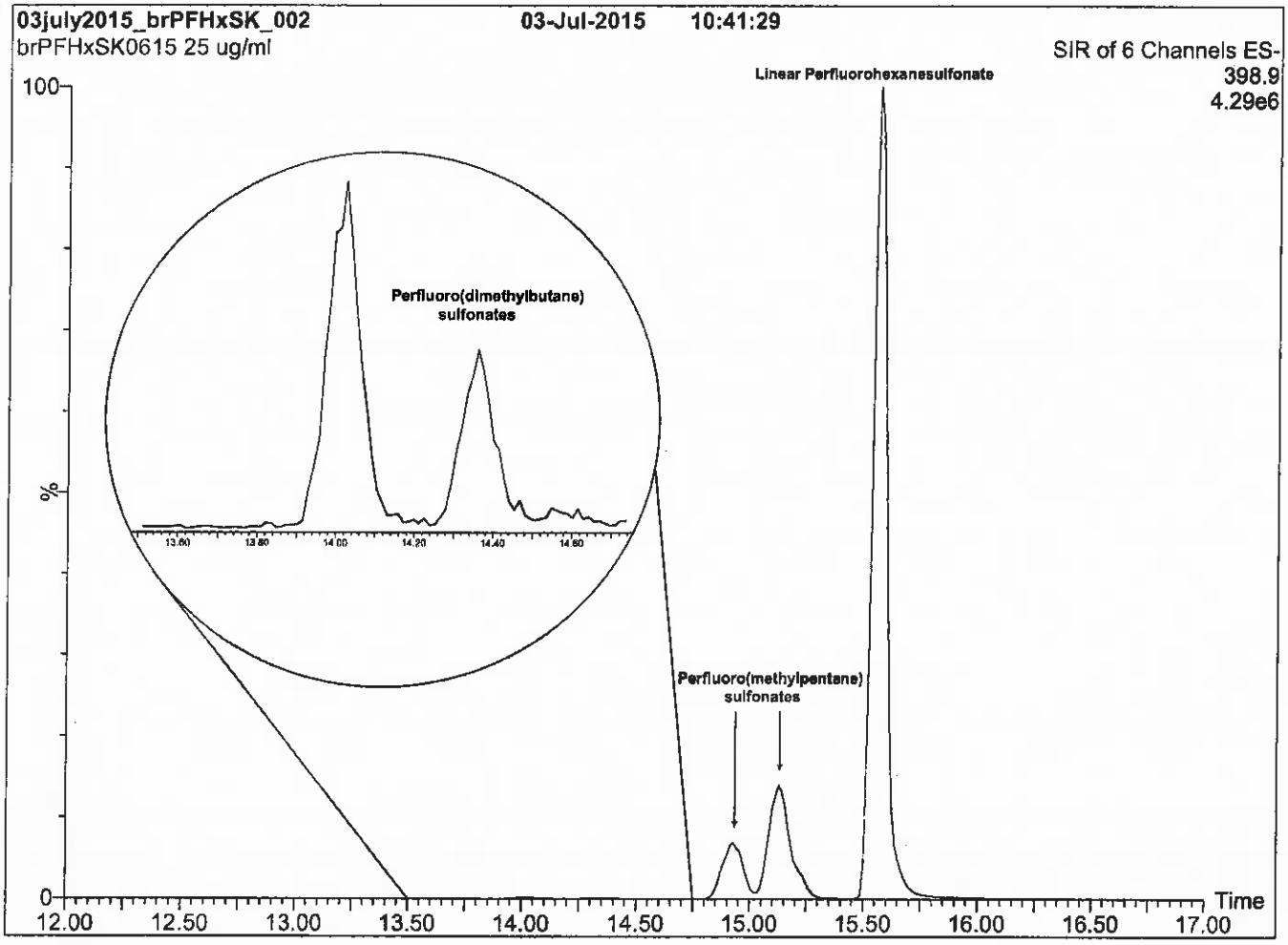
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

Chromatographic Conditions

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

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

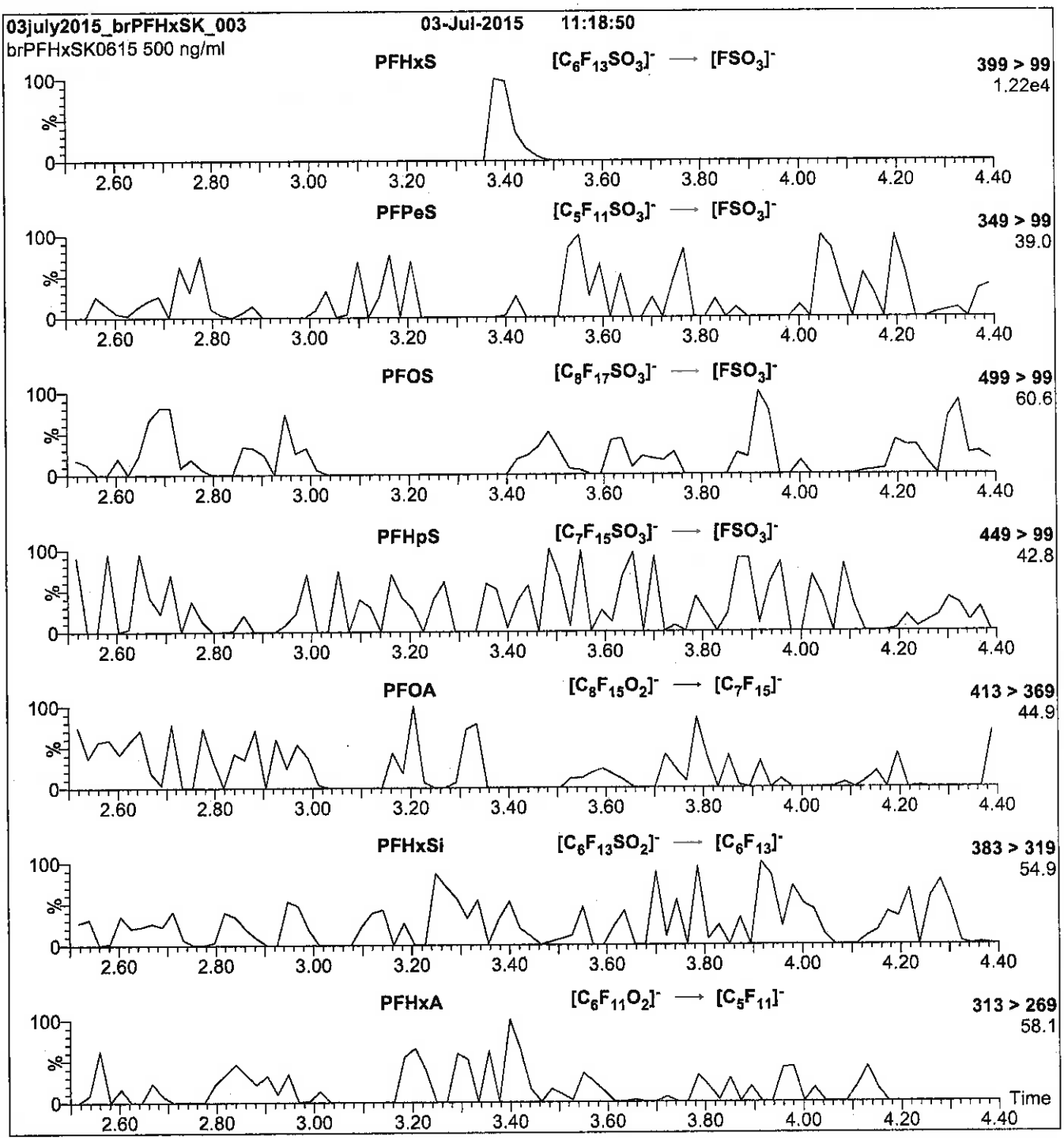
Flow: 300 µl/min

MS Parameters

Experiment: SIR (6 channels)

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

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



Conditions for Figure 3:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFNA_00007

R: SBC 9/13/16
Issued 10/14/16 SBC

730559
ID: LCPFNA_00006
Exp: 10/23/20 Prpd: SBC
PF-n-nonanoic acid

730560
ID: LCPFNA_00007
Exp: 10/23/20 Prpd: SBC
PF-n-nonanoic acid

WELLINGTON LABORATORIES

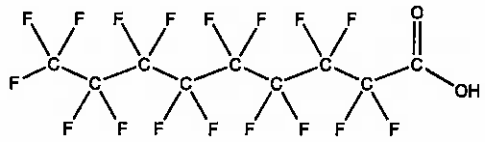
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: PFNA1015

STRUCTURE:

CAS #: 375-95-1



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

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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

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UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

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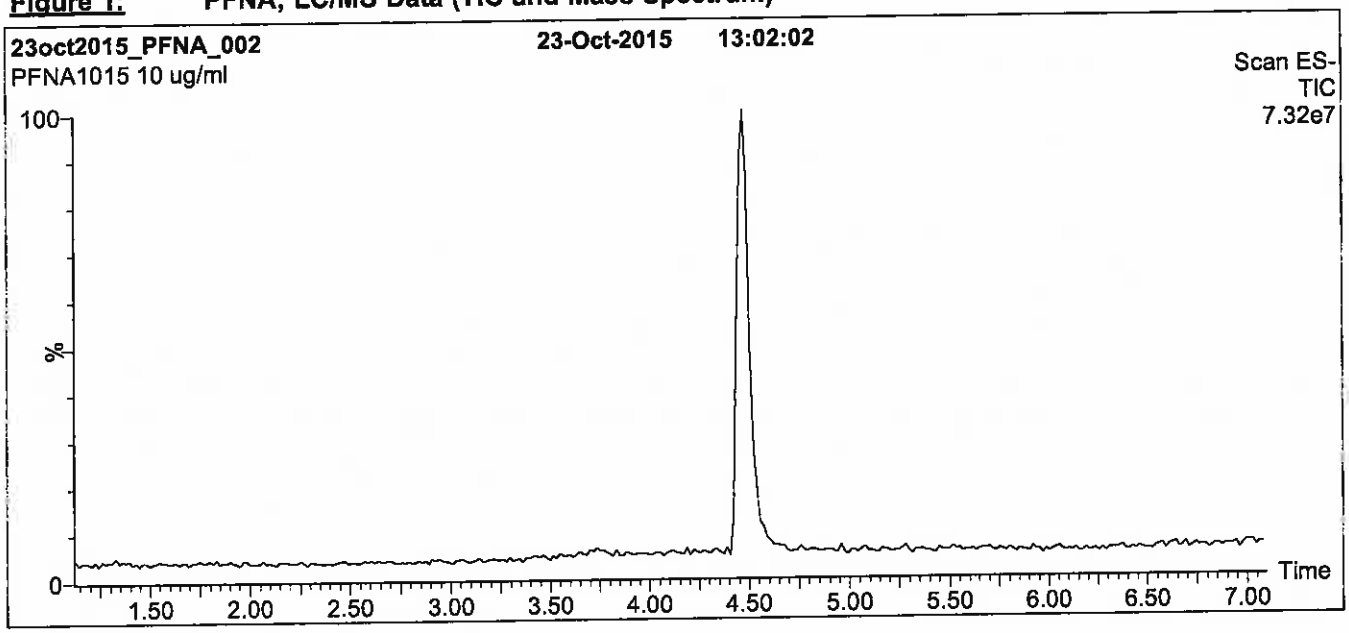
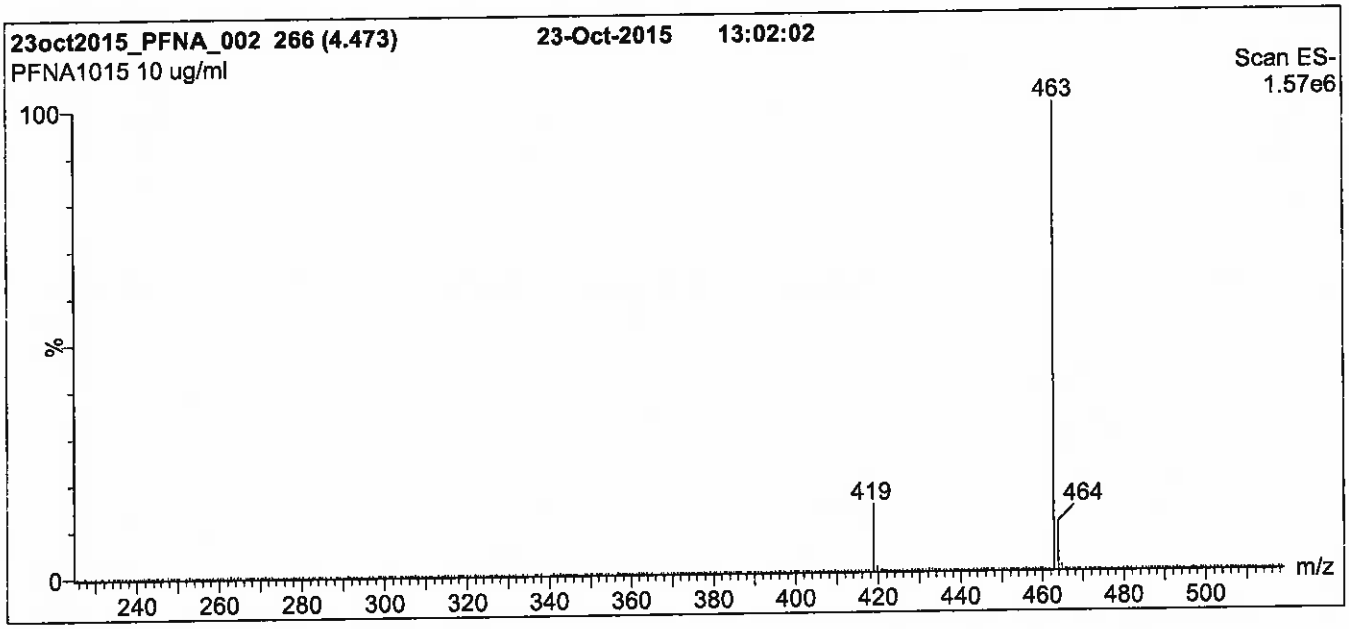




Conditions for Figure 1:

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

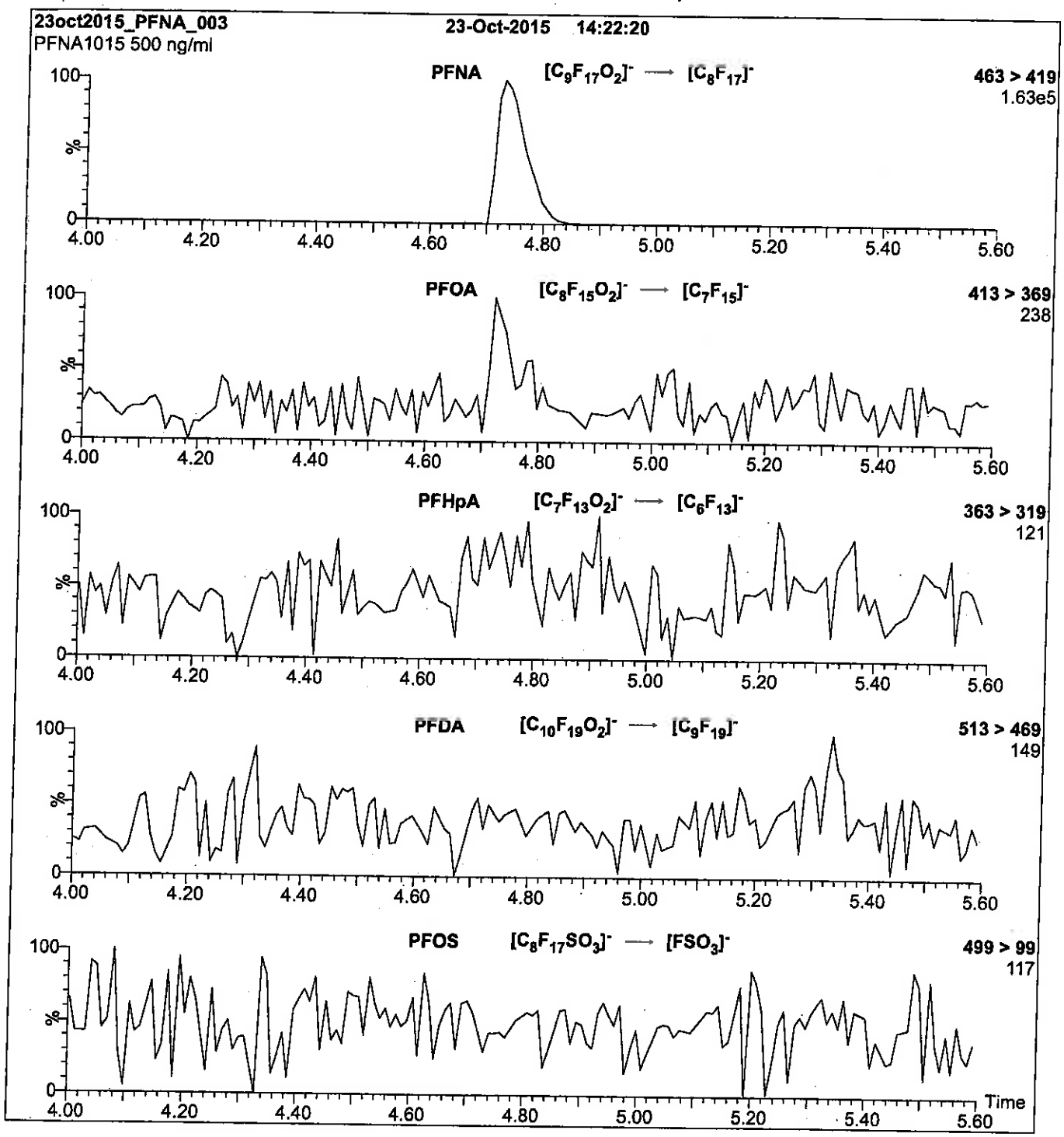
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

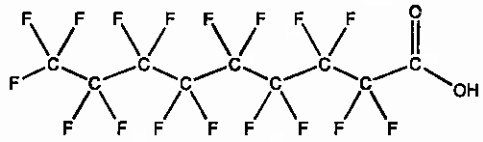
LCPFNA_00009

R: 9/21/17 SKJ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFNA	**LOT NUMBER:**	PFNA0717
COMPOUND:	Perfluoro-n-nonanoic acid		
STRUCTURE:		**CAS #:**	375-95-1



MOLECULAR FORMULA:	$C_9HF_{17}O_2$	**MOLECULAR WEIGHT:**	464.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/20/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/20/2022		
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), < 0.1% of perfluoro-n-heptanoic acid (PFHpA), and < 0.1% of perfluoro-n-undecanoic acid (PFUdA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/24/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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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UNCERTAINTY:

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

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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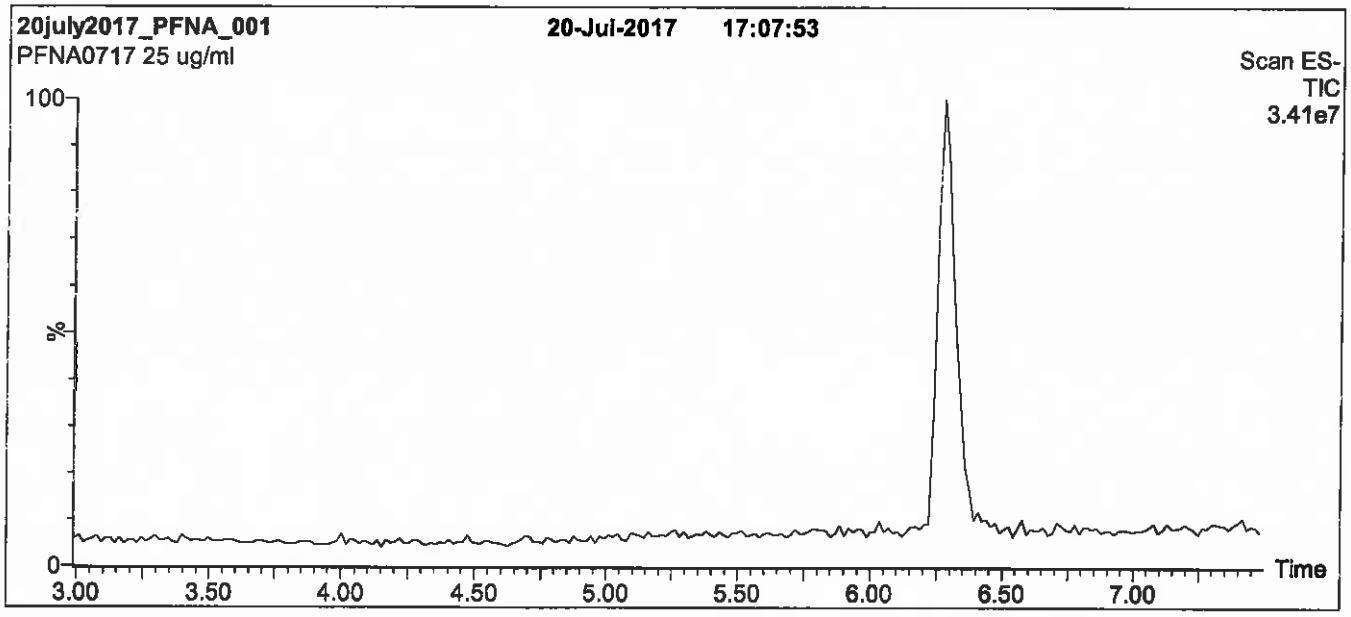

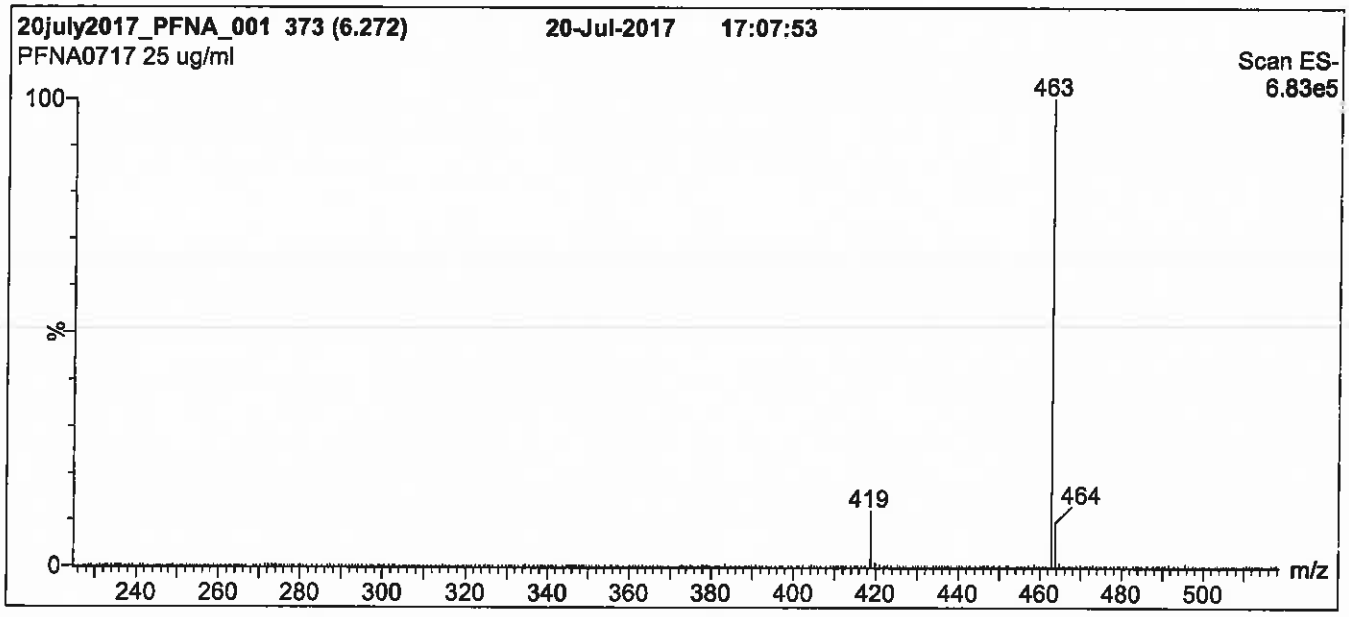

Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Hold for 1 min. Ramp to 90% organic over 7 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

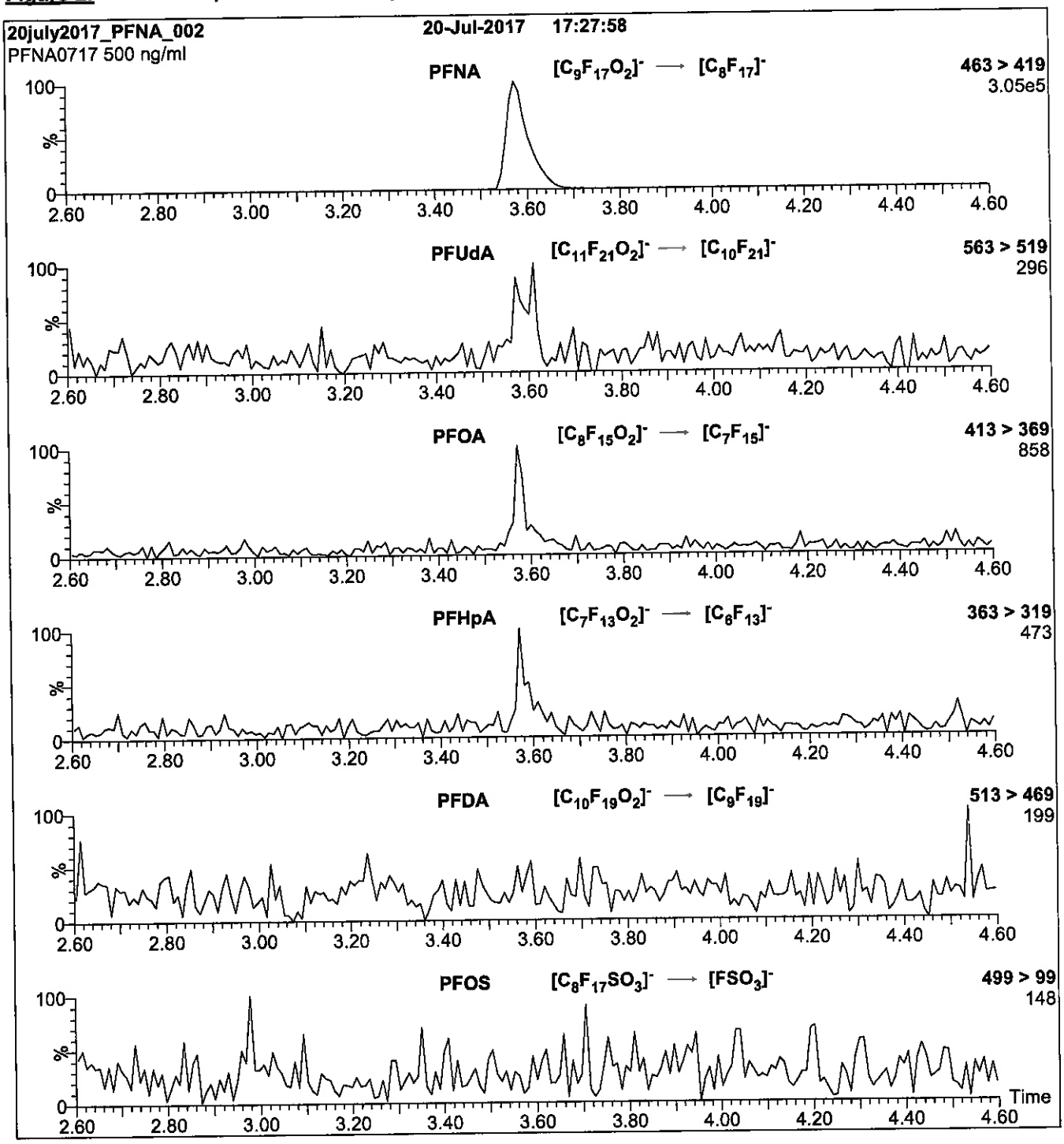
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 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) = 3.50e-3
Collision Energy (eV) = 11

Reagent

LCPFOA_00007

n: 12/29/16 Sgd

WELLINGTON LABORATORIES

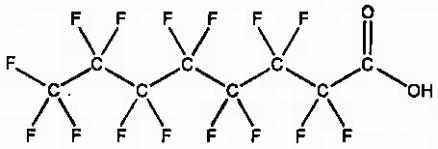
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: PFOA0716

STRUCTURE:

CAS #: 335-67-1



MOLECULAR FORMULA: $C_8HF_{16}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/02/2016
EXPIRY DATE: (mm/dd/yyyy) 08/02/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 08/05/2016 (mm/dd/yyyy)

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

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

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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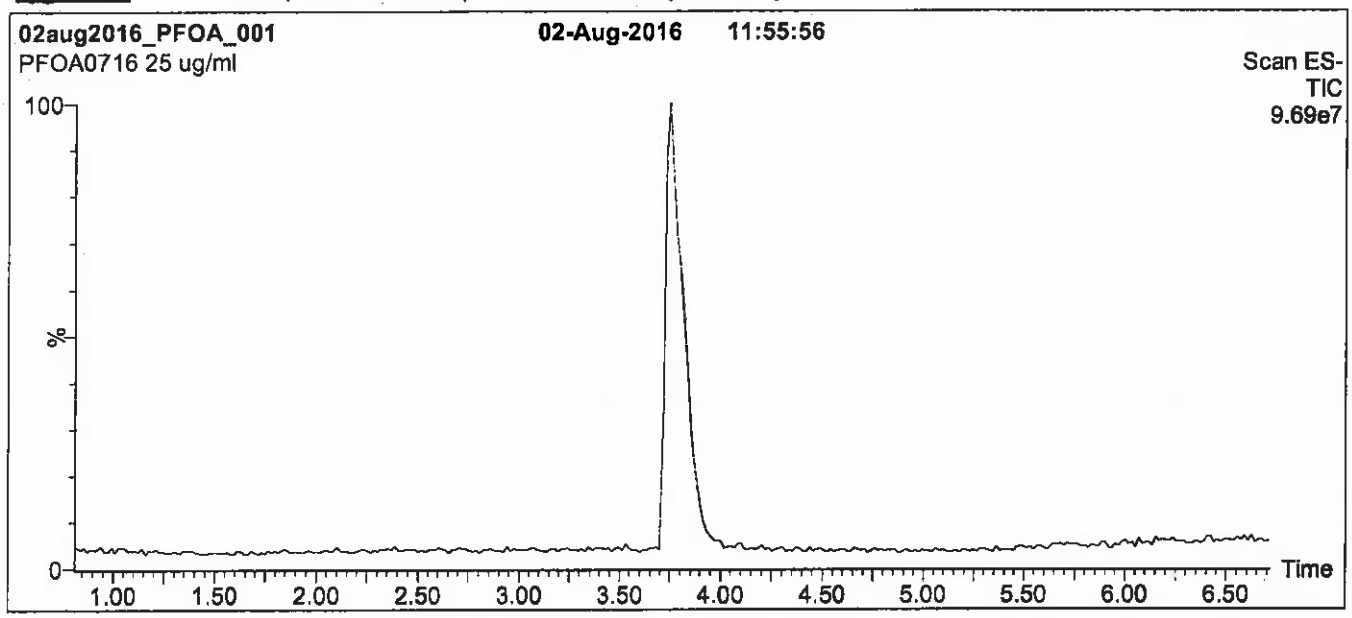
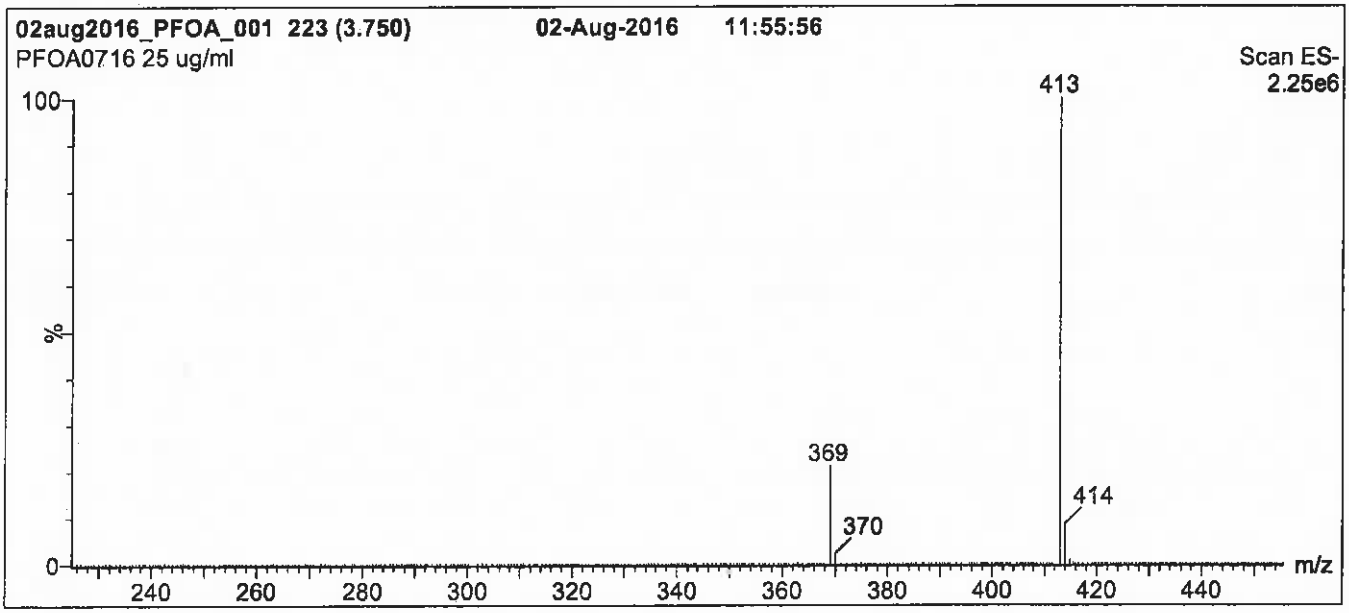
Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





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: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
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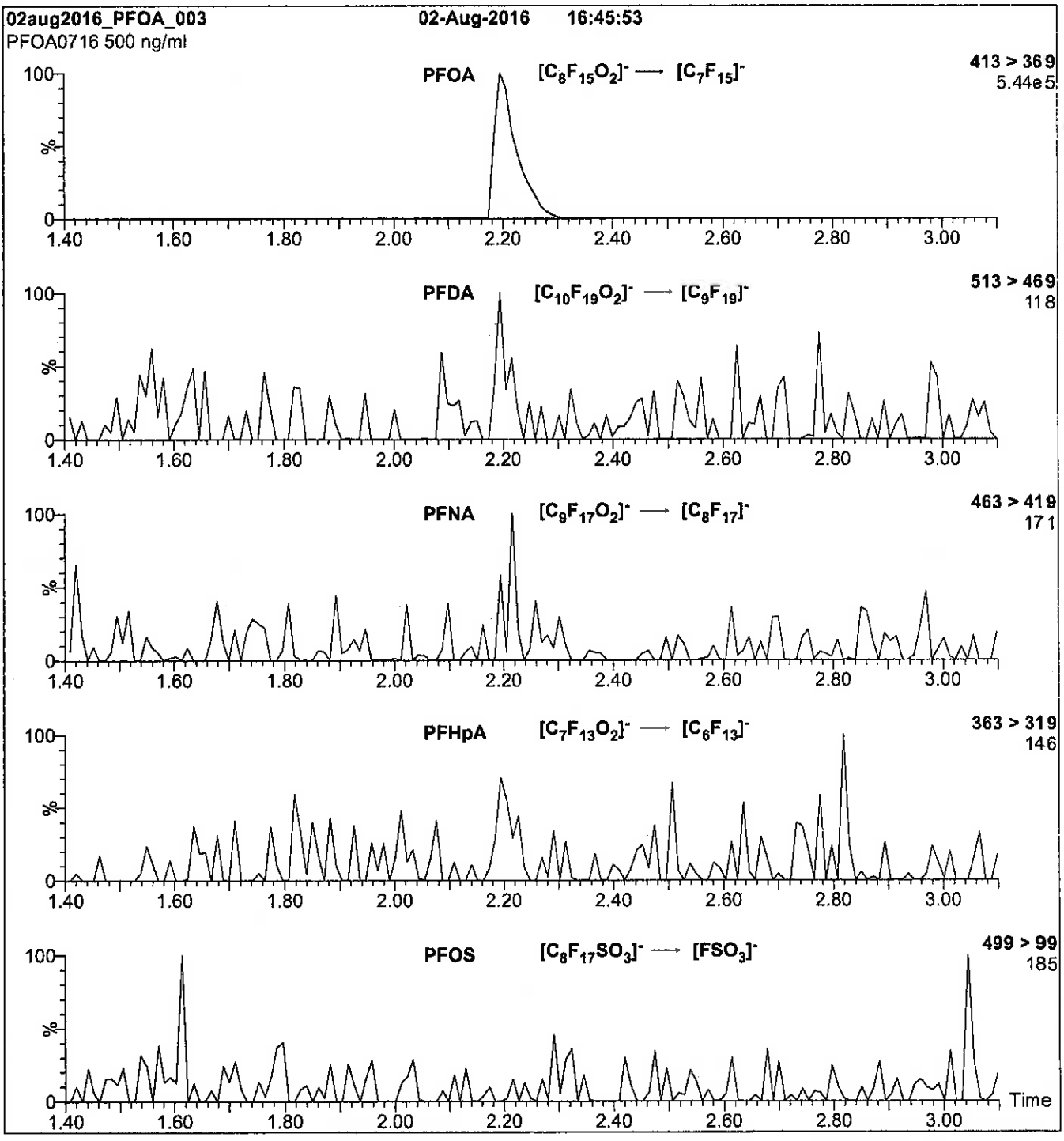
Figure 2: **PFOA; LC/MS/MS Data (Selected MRM Transitions)**



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) = 3.43e-3
Collision Energy (eV) = 10

Reagent

LCPFOA_00008

n: 12/29/16 SKW

WELLINGTON LABORATORIES

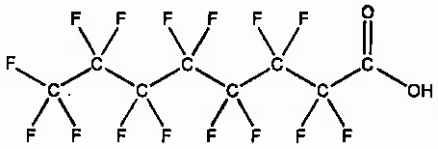
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFOA
COMPOUND: Perfluoro-n-octanoic acid

LOT NUMBER: PFOA0716

STRUCTURE:

CAS #: 335-67-1



MOLECULAR FORMULA: $C_8HF_{15}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 414.07
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/02/2016
EXPIRY DATE: (mm/dd/yyyy) 08/02/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 08/05/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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CALA

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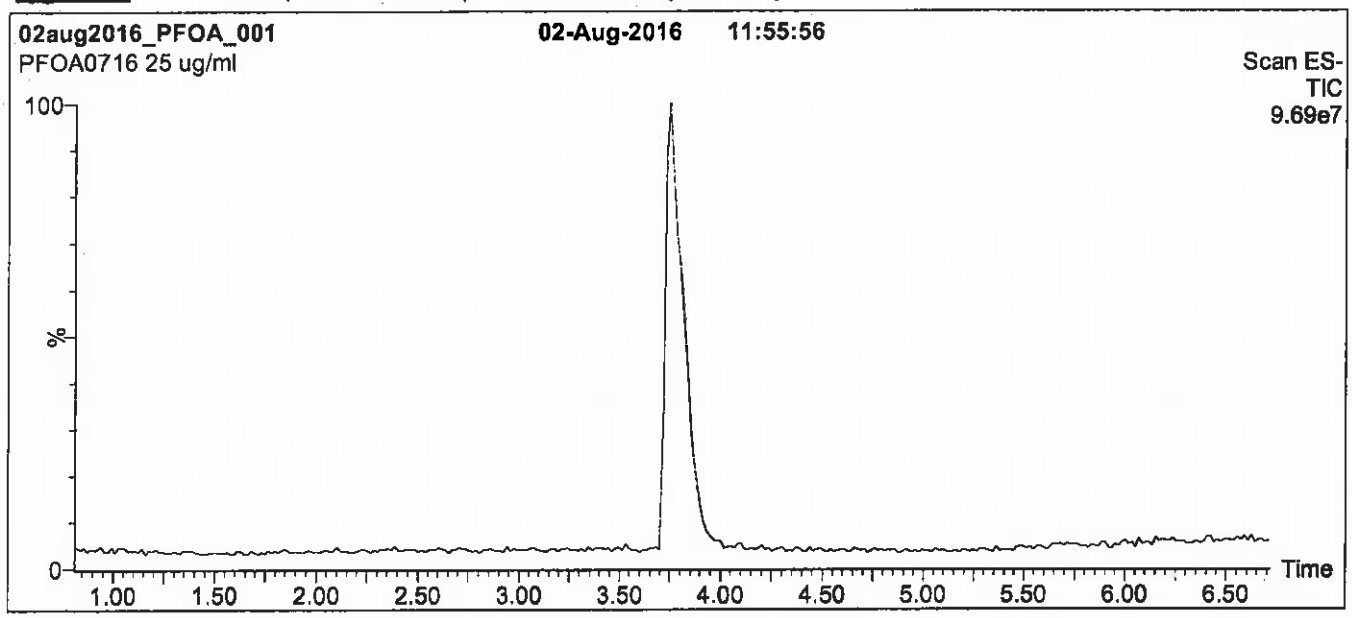
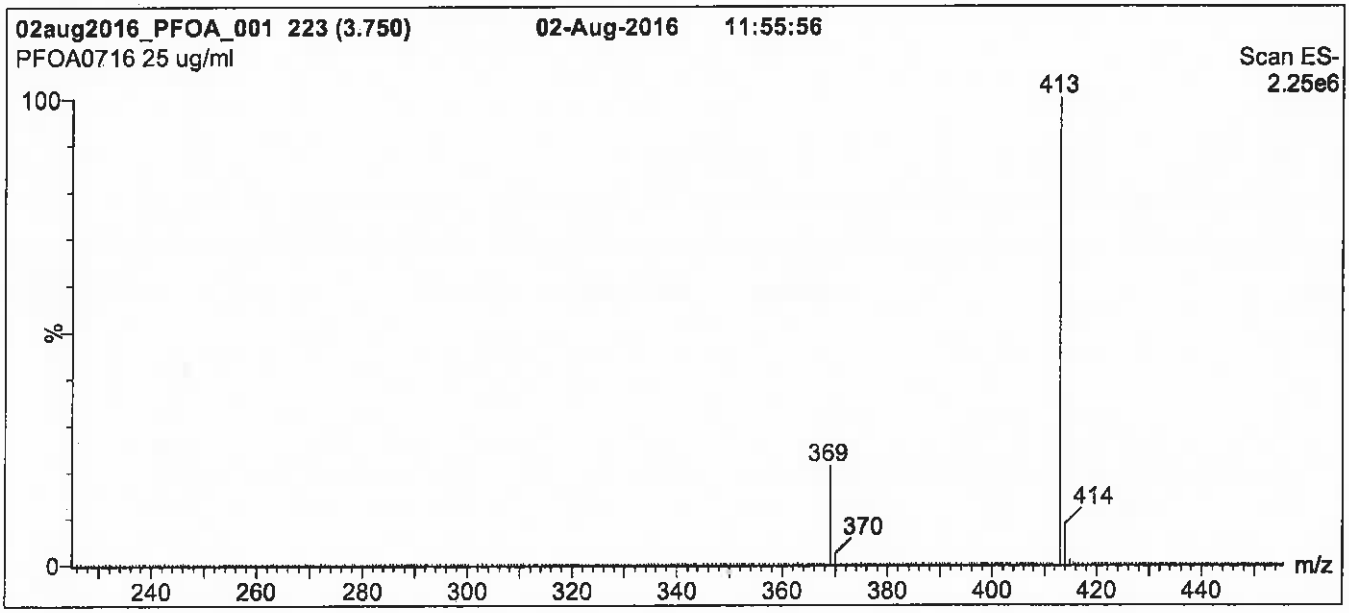




Conditions for Figure 1:

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
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

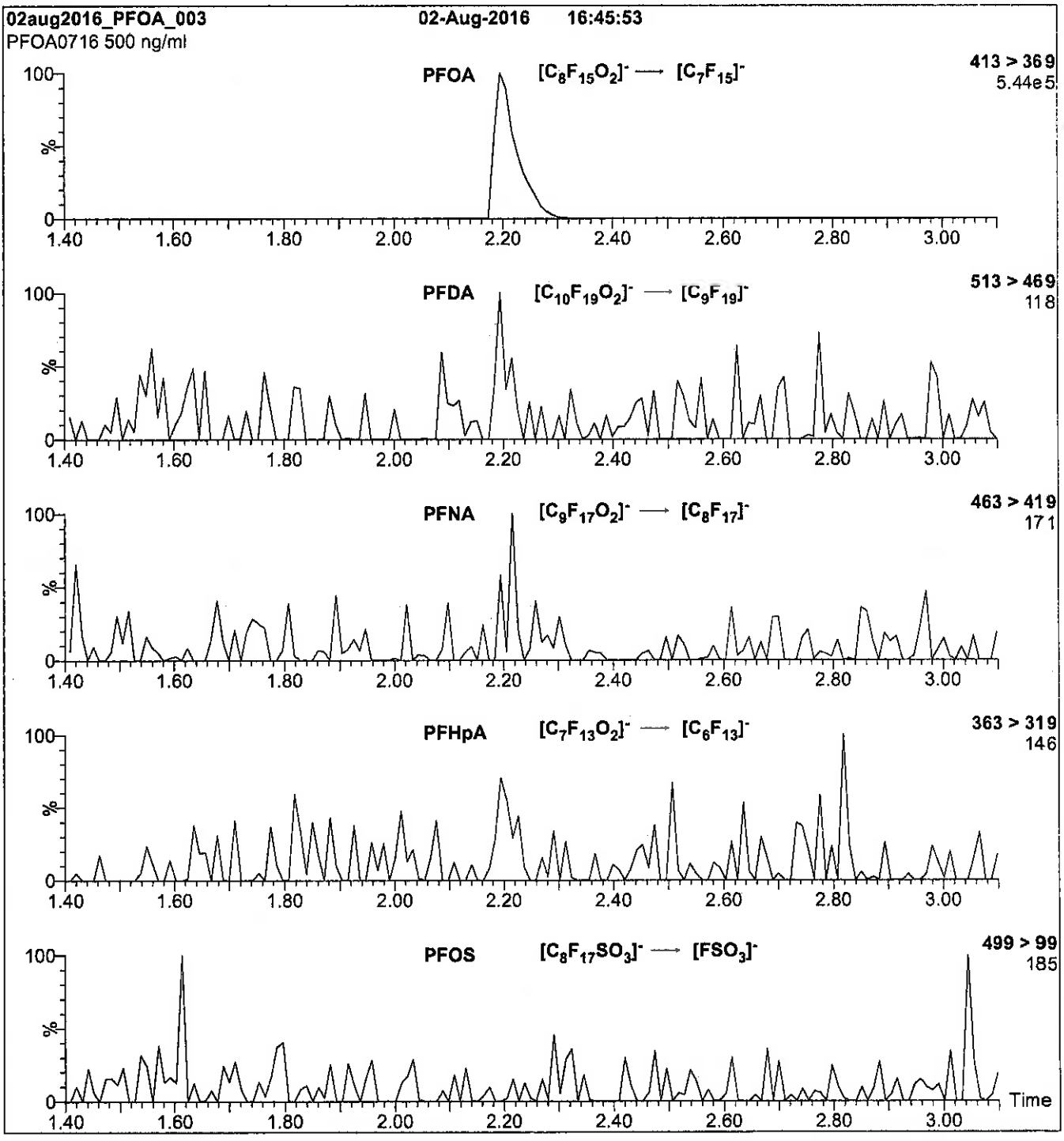
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 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) = 3.43e-3
Collision Energy (eV) = 10

Reagent

LCPFODA_00007

Scanned 10/14/16

R: SBC 9/13/16

730632
ID: LCPFODA_00006
Exp: 04/29/21 Prpd: SBC
PFODA stock 50ug/mL

730633
ID: LCPFODA_00007
Exp: 04/29/21 Prpd: SBC
PFODA stock 50ug/mL

WELLINGTON LABORATORIES

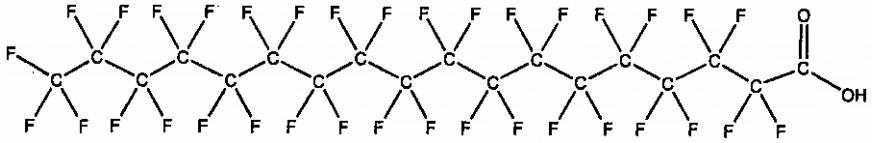
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFODA
COMPOUND: Perfluoro-n-octadecanoic acid

LOT NUMBER: PFODA0416

STRUCTURE:

CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 914.14
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/29/2016
EXPIRY DATE: (mm/dd/yyyy) 04/29/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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Certified By: B.G. Chittim **Date:** 05/20/2016 (mm/dd/yyyy)

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CALA Testing A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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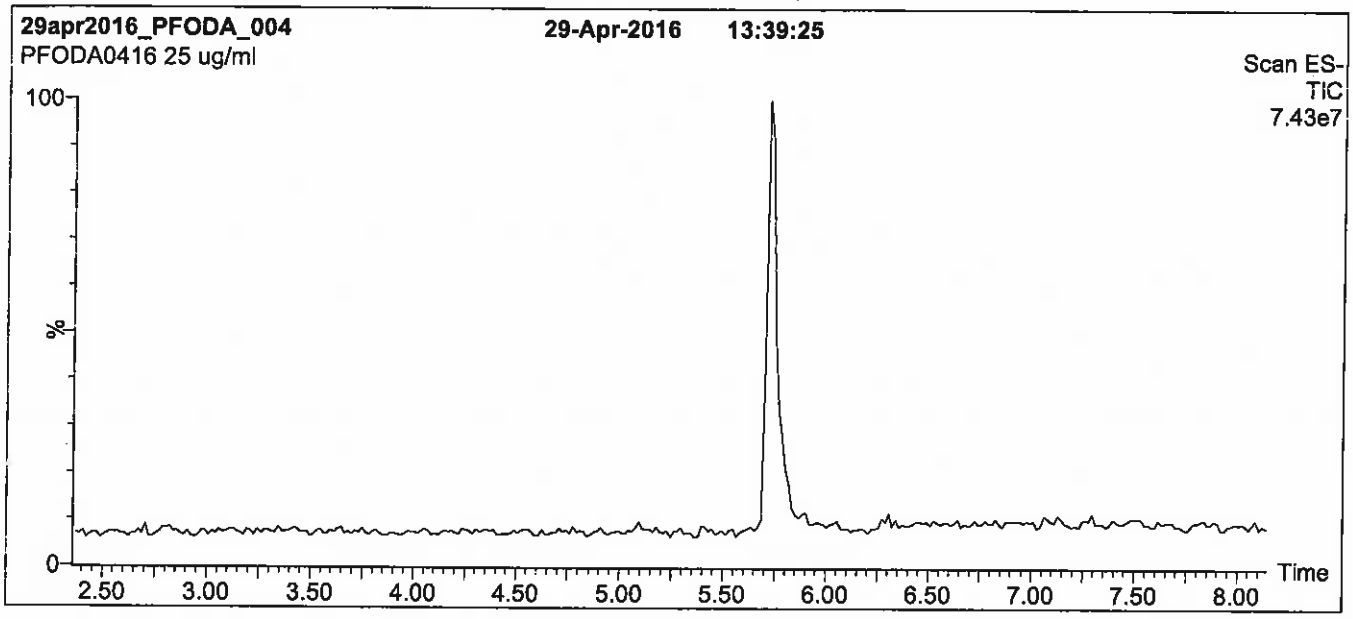

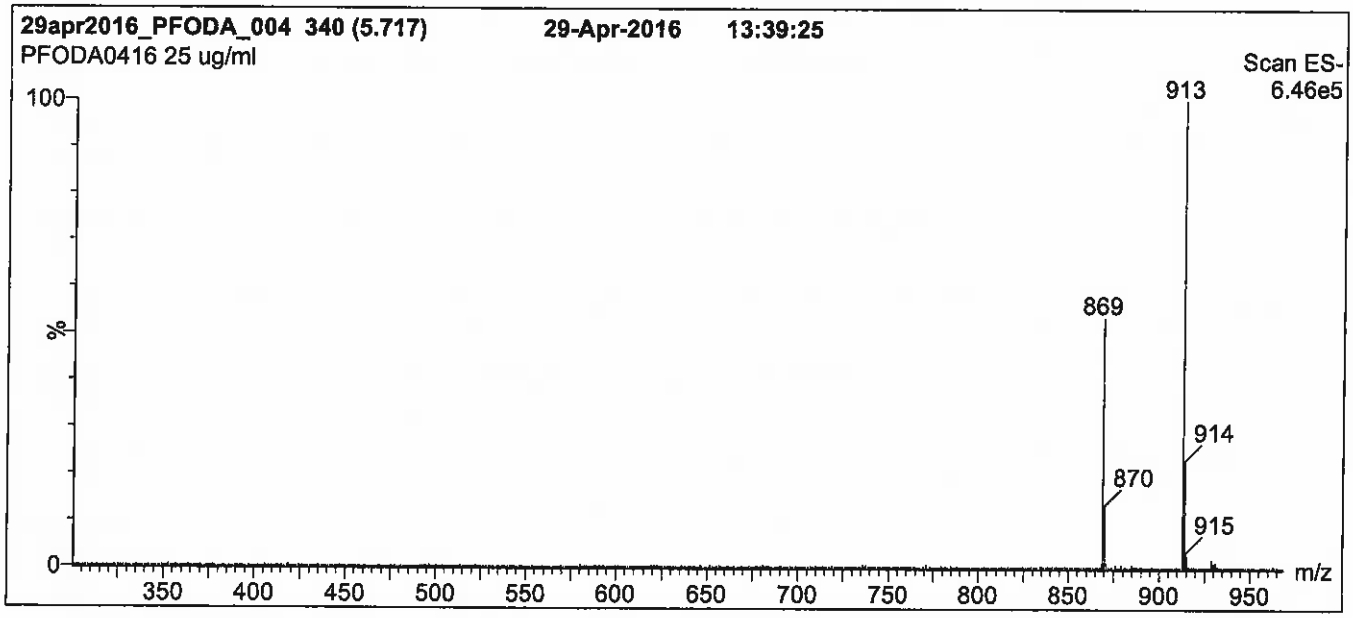

Conditions for Figure 1:

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MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 70% (80:20 MeOH:ACN) / 30% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 95% organic over 6 min and hold for
2.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 50
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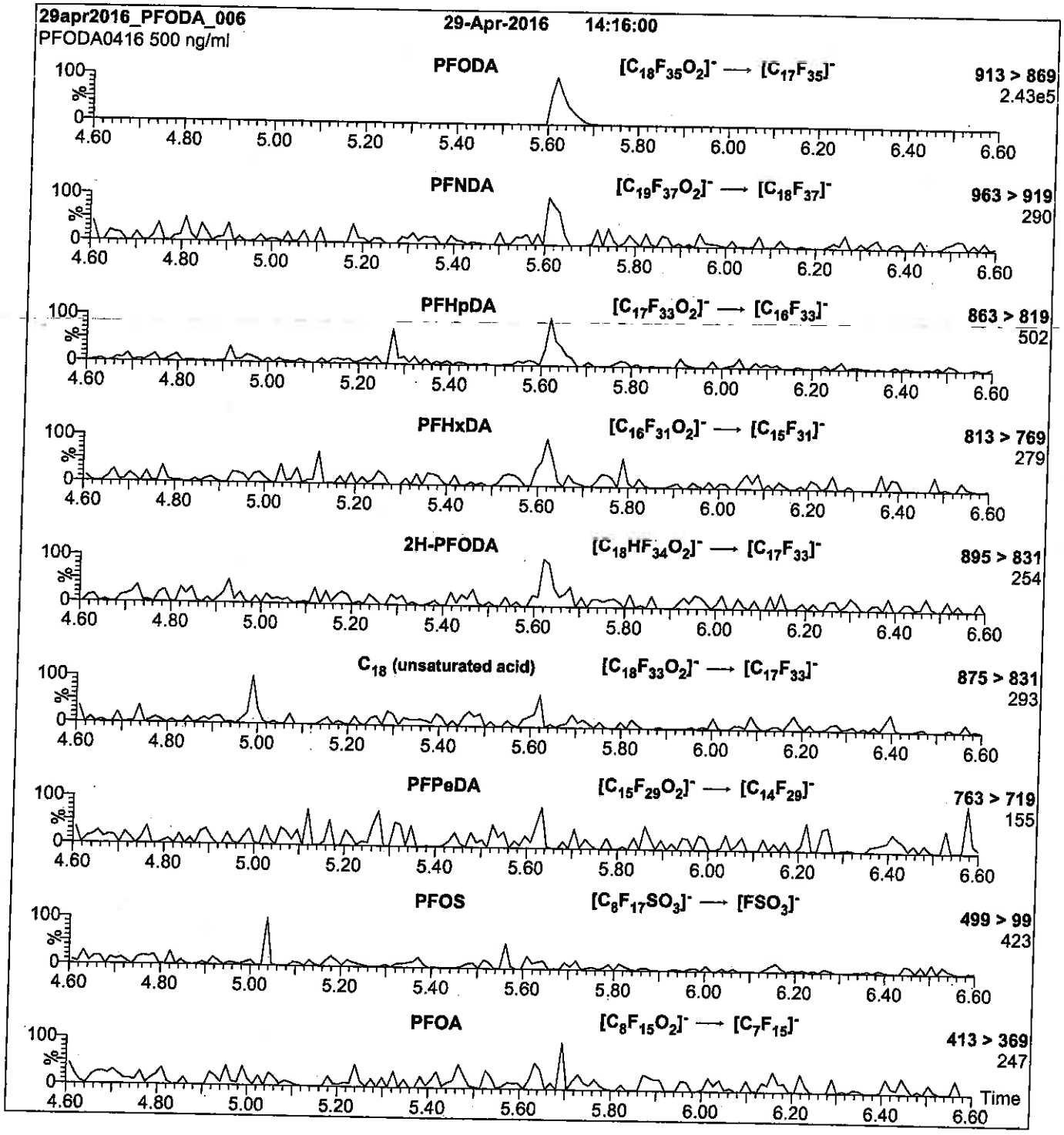


Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFODA)

Mobile phase: Isocratic 90% (80:20 MeOH:ACN) / 10% 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

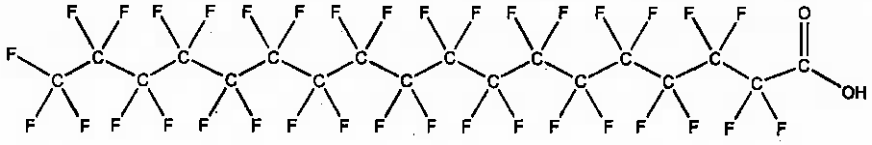
LCPFODA_00008

R: 12/20/16 SFN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFODA	**LOT NUMBER:**	PFODA0416
COMPOUND:	Perfluoro-n-octadecanoic acid		
STRUCTURE:		**CAS #:**	16517-11-6



MOLECULAR FORMULA:	$C_{18}HF_{35}O_2$	**MOLECULAR WEIGHT:**	914.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	04/29/2016		
EXPIRY DATE: (mm/dd/yyyy)	04/29/2021		
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Certified By: B.G. Chittim **Date:** 05/20/2016 (mm/dd/yyyy)

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CALA

ANAB ACCREDITED REFERENCE MATERIAL

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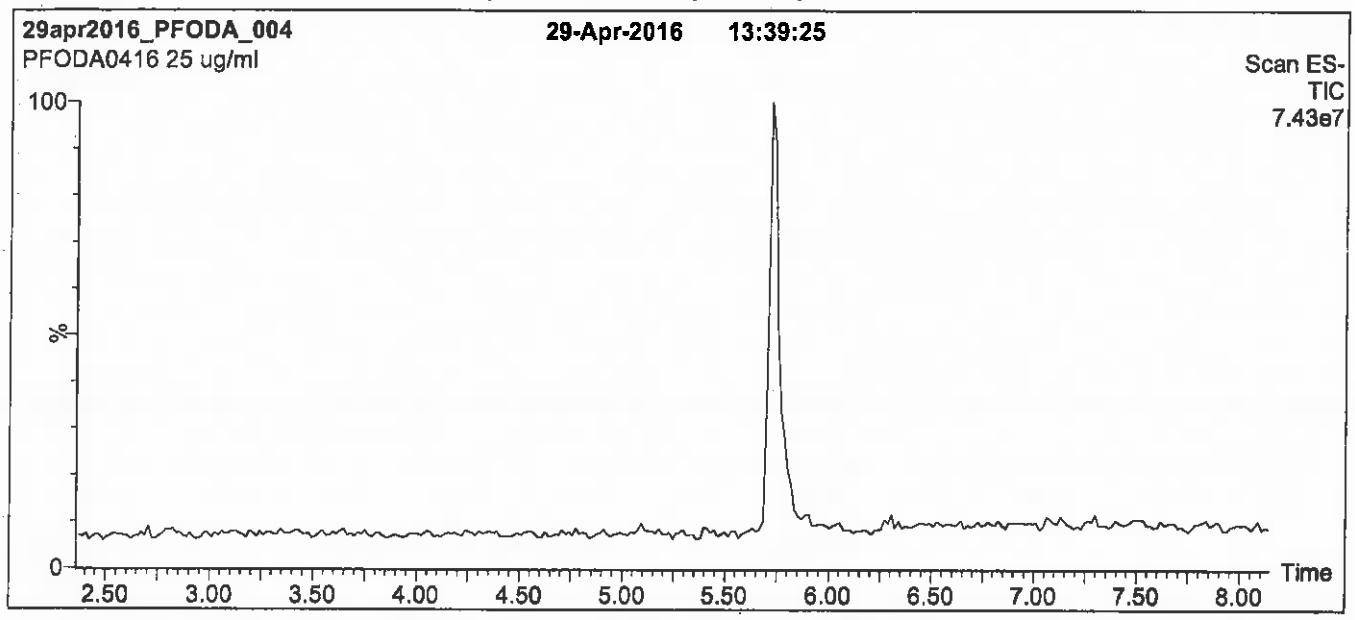

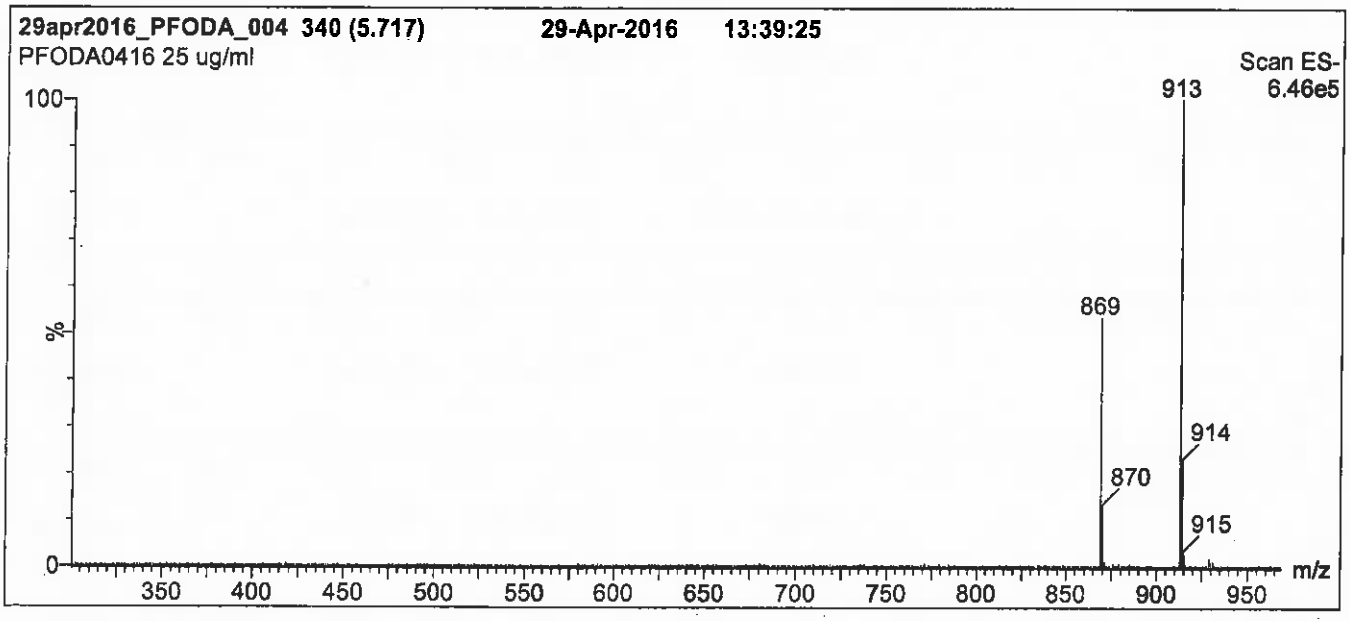

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MS: Micromass Quattro *micro* API MS

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1.7 µm, 2.1 x 100 mm

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(both with 10 mM NH_4OAc buffer)
Ramp to 95% organic over 6 min and hold for
2.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

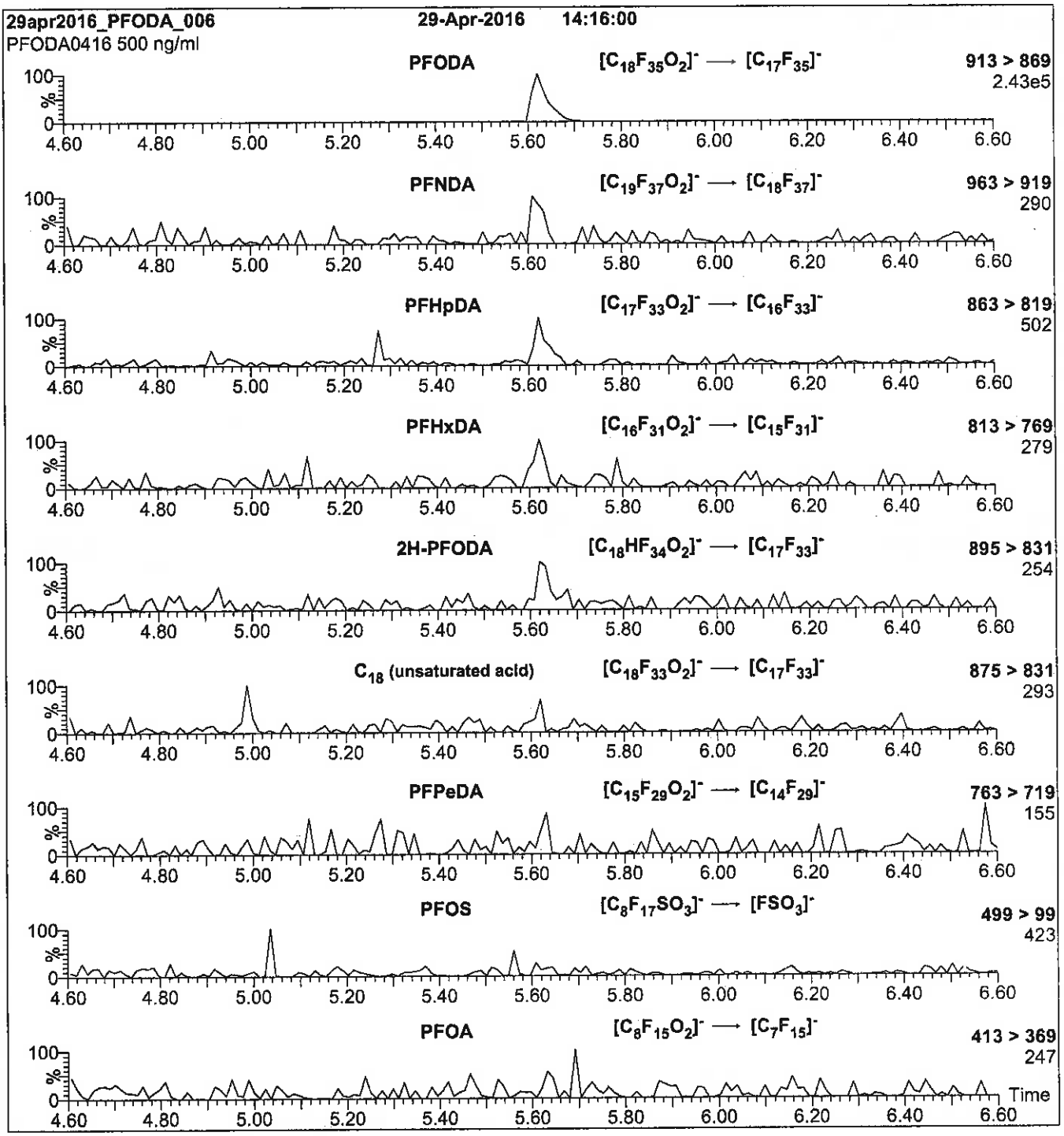
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFODA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFODA)

Mobile phase: Isocratic 90% (80:20 MeOH:ACN) / 10% 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

LCPFOS-br_00003

Scanned 10/14/16 SR

R: SBC 9/13/16

730515
ID: LCPFOS-br_00002
Exp: 10/14/20 Prpd: SBC
Potassium Perfluorooctane

730516
ID: LCPFOS-br_00003
Exp: 10/14/20 Prpd: SBC
Potassium Perfluorooctane

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK1015
CONCENTRATION:	50 ± 2.5 µg/ml (total potassium salt)
	46.4 ± 2.3 µg/ml (total PFOS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	10/13/2015
LAST TESTED: (mm/dd/yyyy)	10/14/2015
EXPIRY DATE: (mm/dd/yyyy)	10/14/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

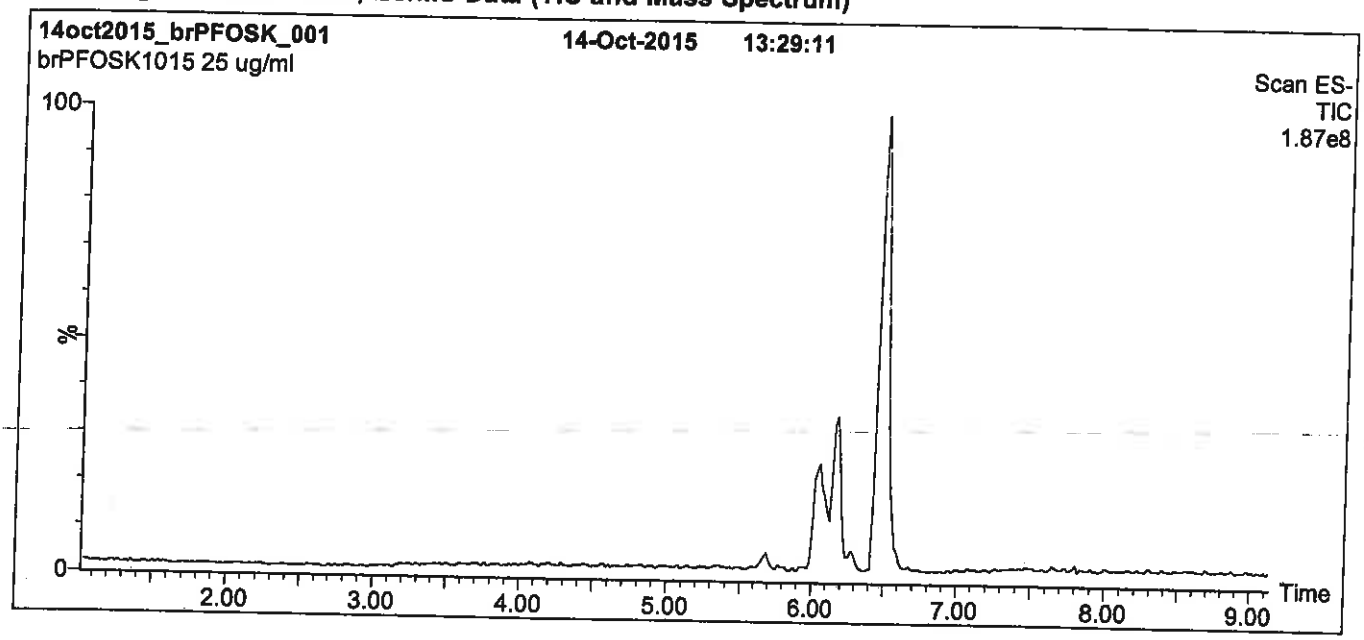
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

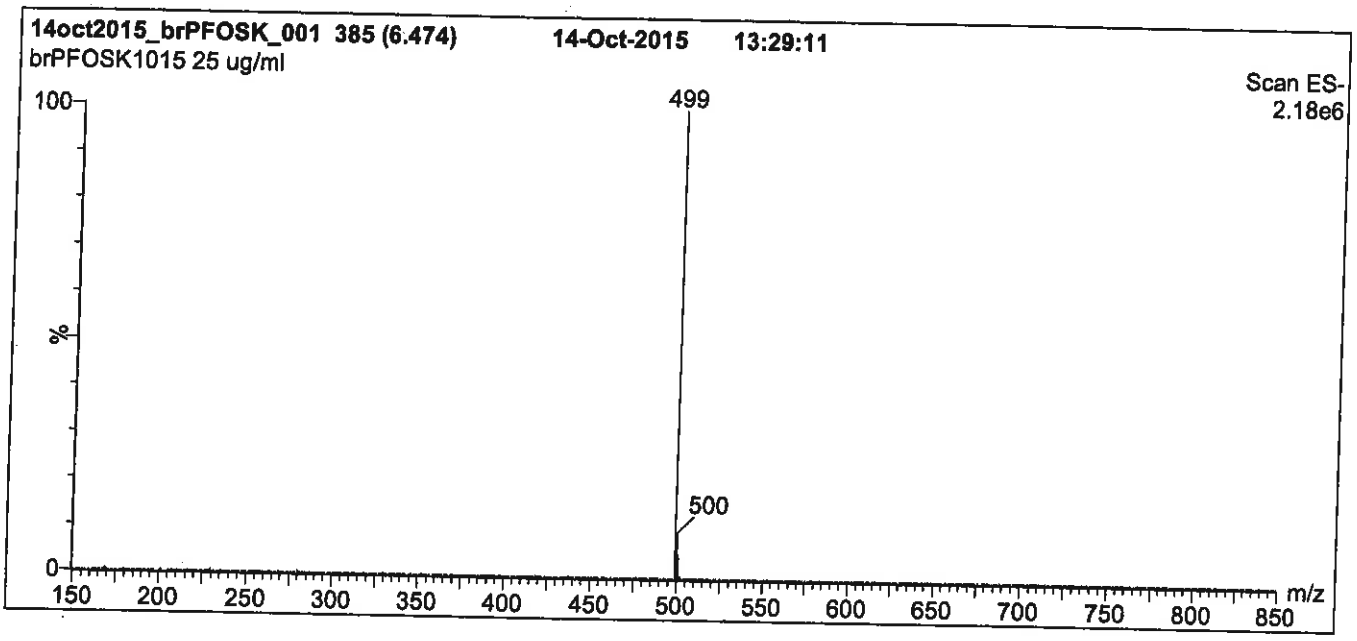
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CFSO_3^-K^+$ (CF$_3$ branch)	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CFCF_2SO_3^-K^+$ (CF$_3$ branch)	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CFCF_2CF_2SO_3^-K^+$ (CF$_3$ branch)	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CFCF_2CF_2CF_2SO_3^-K^+$ (CF$_3$ branch)	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CFCF_2CF_2CF_2CF_2SO_3^-K^+$ (CF$_3$ branch)	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CFCF_2CF_2CF_2CF_2CF_2SO_3^-K^+$ (CF$_3$ branch)	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-C(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2-C(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF_2-CF(CF_3)-CF_2CF_2SO_3^-K^+$	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: _____ **Date:** 10/15/2015
B.G. Chittim (mm/dd/yyyy)

Figure 1: **br-PFOSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

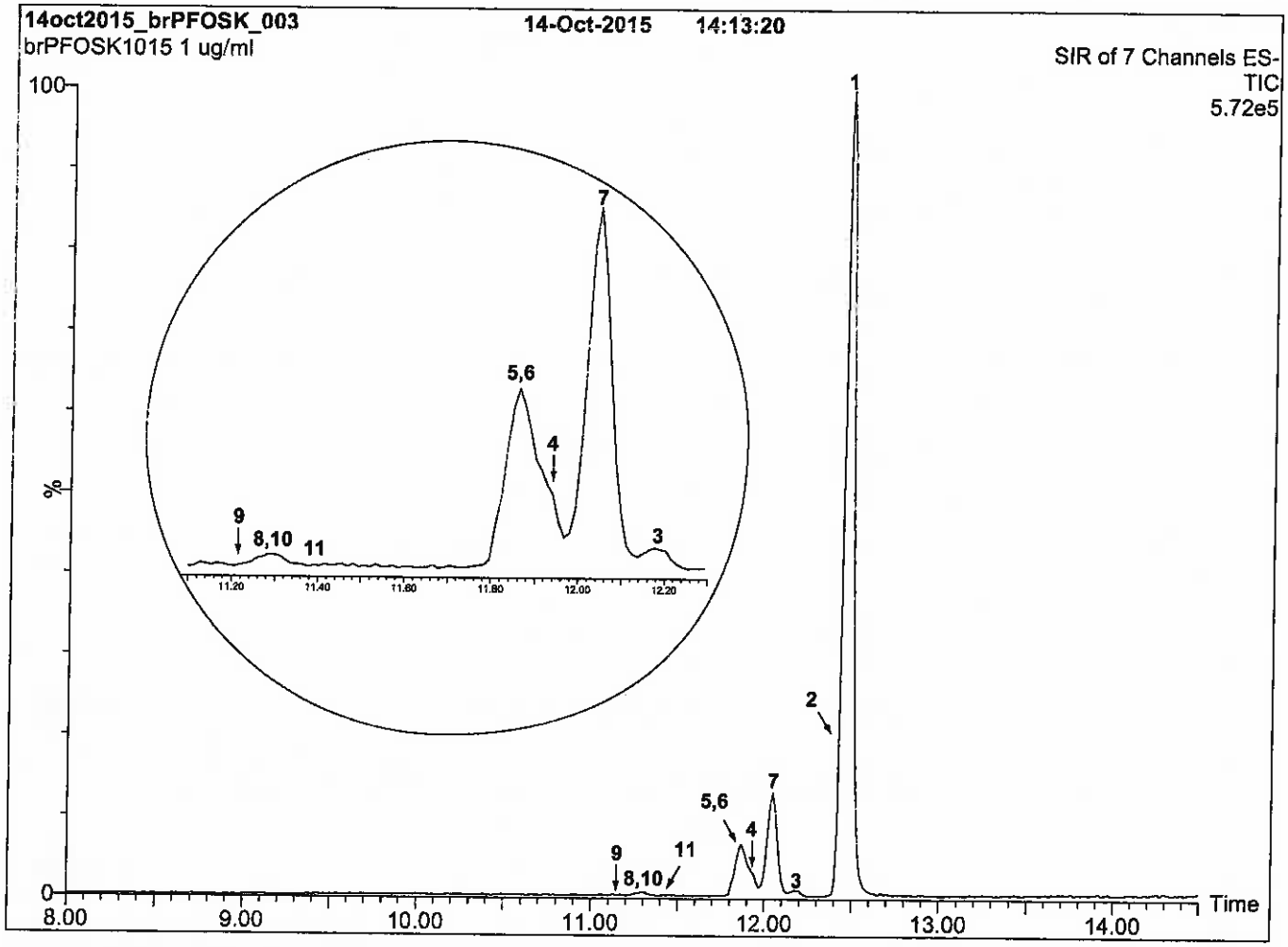
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFOSK; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP_{18} (1.7 µm, 2.1 x 100 mm)

Injection: 1.0 µg/ml of br-PFOSK

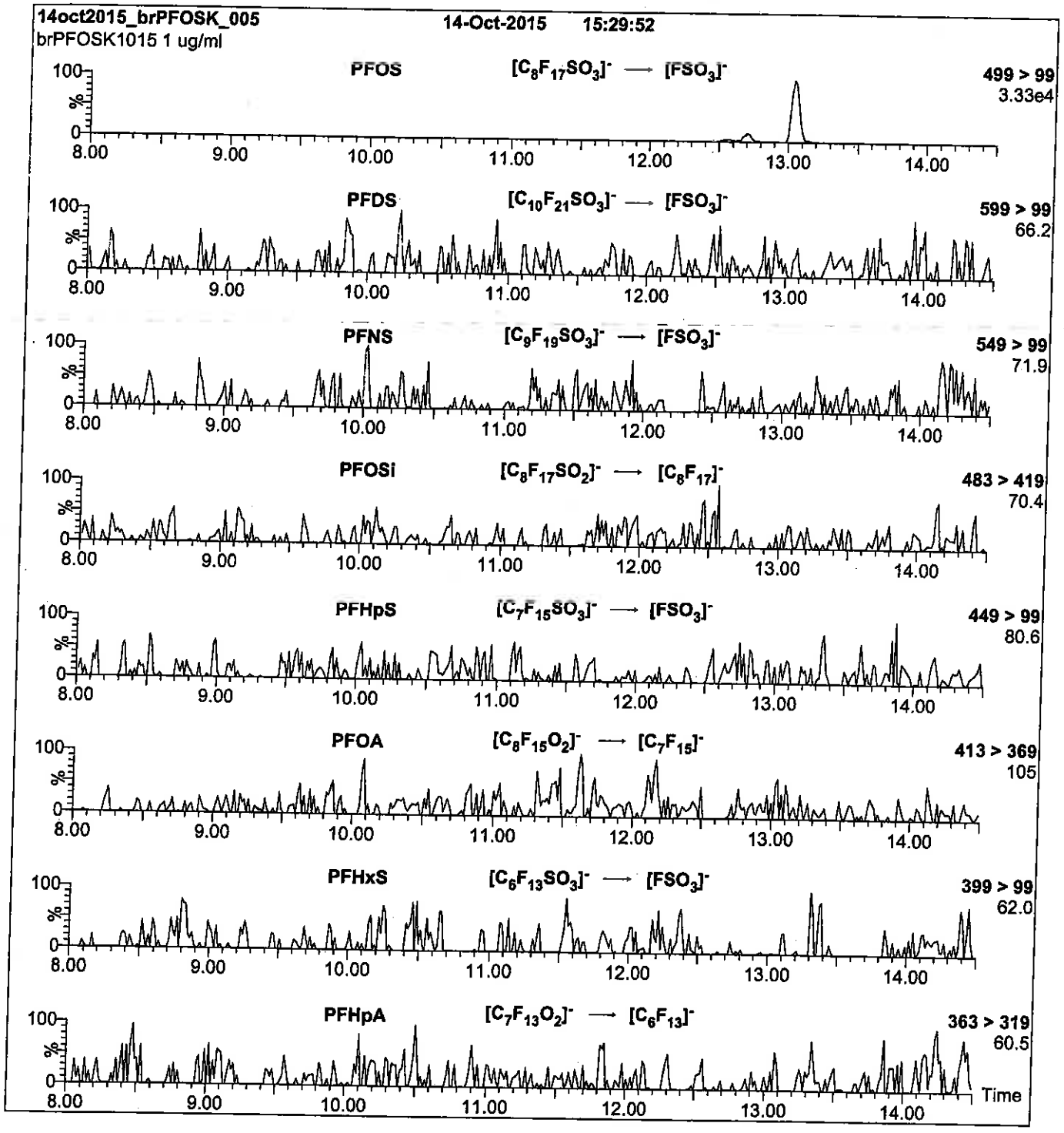
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

Figure 3: **br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.06e-3
Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOS-br_00004

T: 12/29/16 SFN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK1015
CONCENTRATION:	50 ± 2.5 µg/ml (total potassium salt)
	46.4 ± 2.3 µg/ml (total PFOS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	10/13/2015
LAST TESTED: (mm/dd/yyyy)	10/14/2015
EXPIRY DATE: (mm/dd/yyyy)	10/14/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

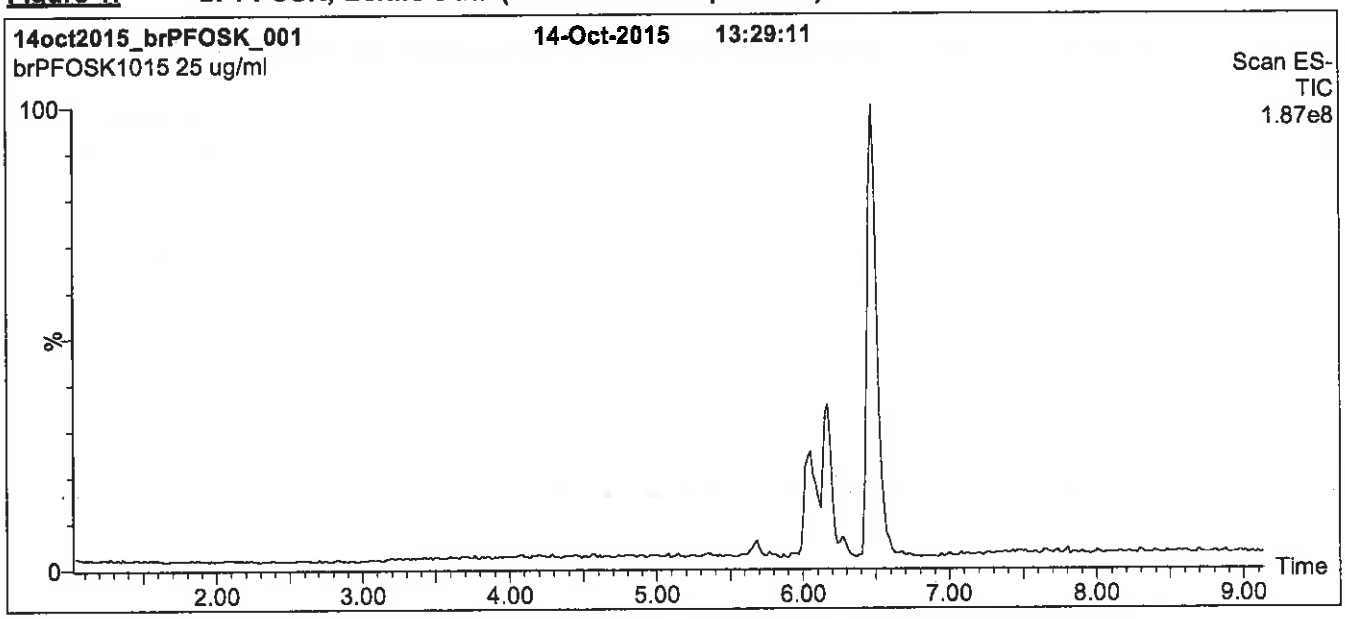
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

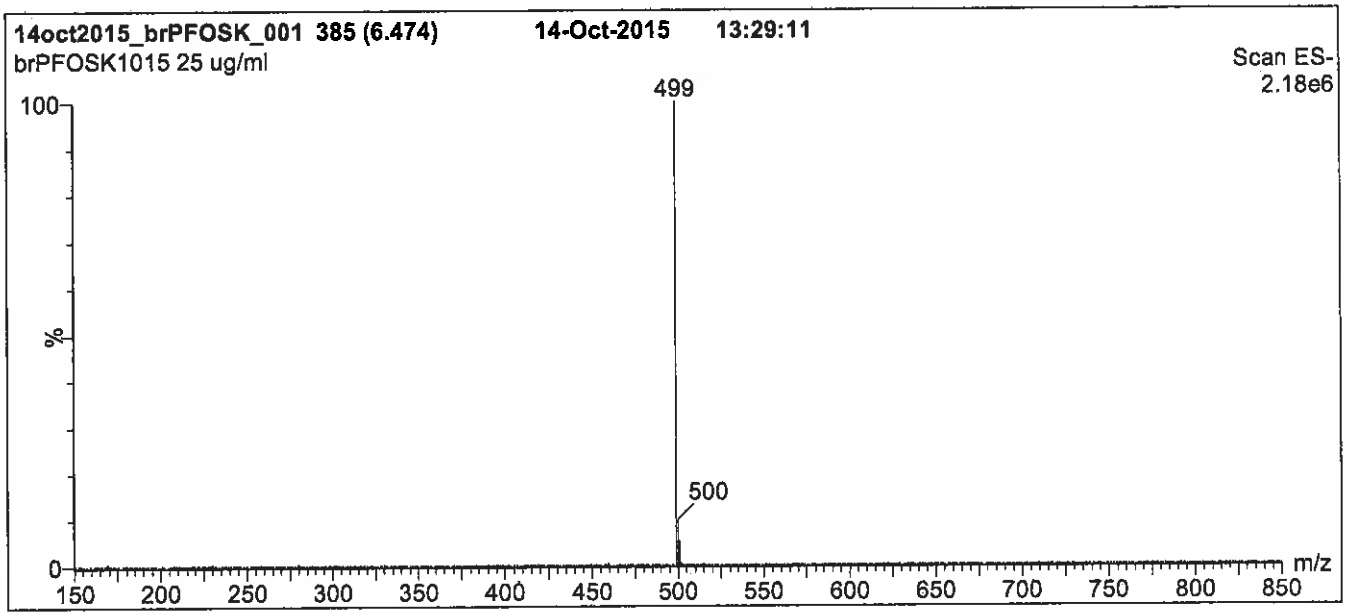
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-C(CF_3)(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2-C(CF_3)(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF_2-CF(CF_3)-CF_2CF_2SO_3^-K^+$	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: B.G. Chittim **Date:** 10/15/2015 (mm/dd/yyyy)

Figure 1: **br-PFOSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

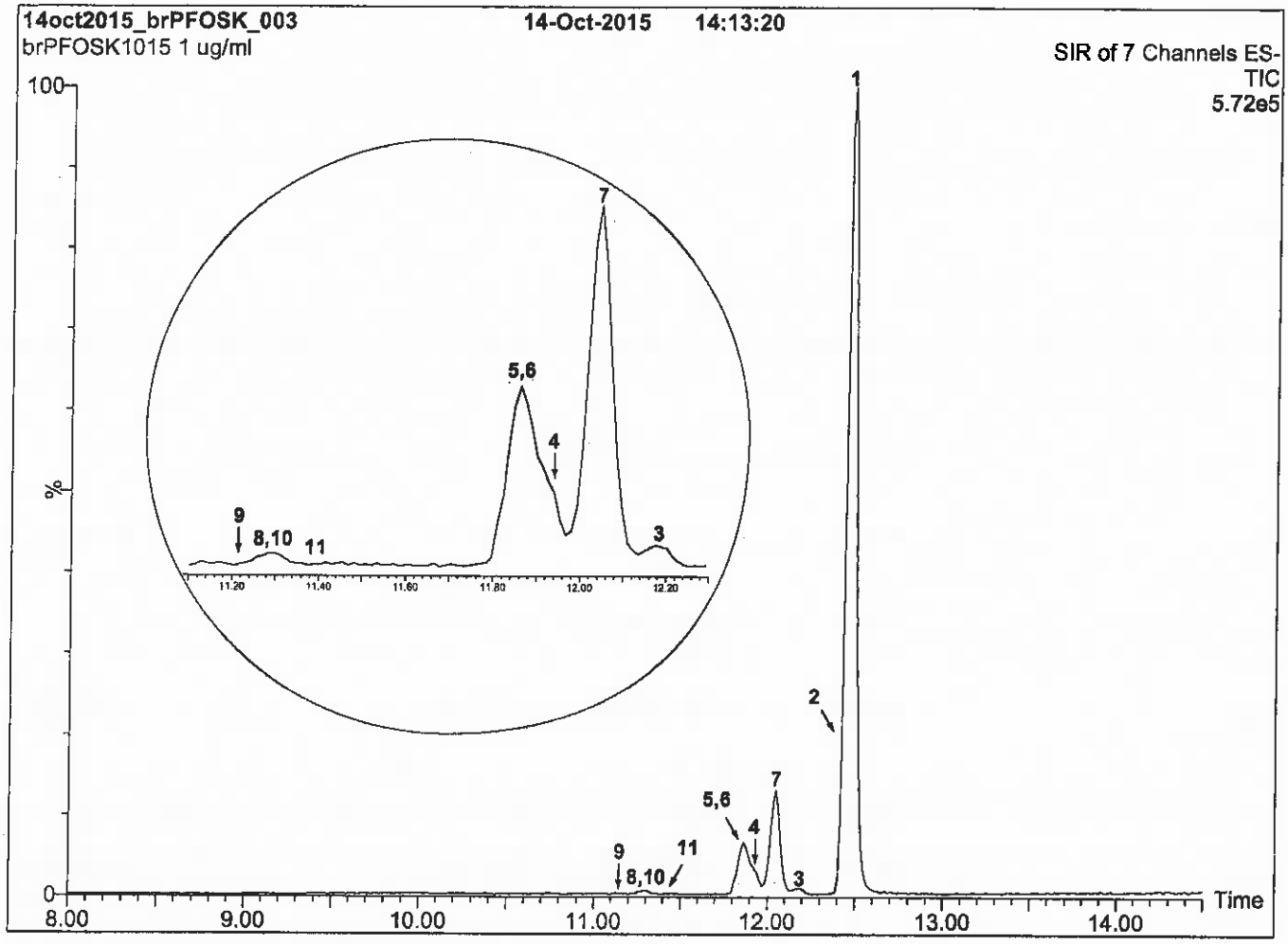
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFOSK; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP_{18} (1.7 µm, 2.1 x 100 mm)

Injection: 1.0 µg/ml of br-PFOSK

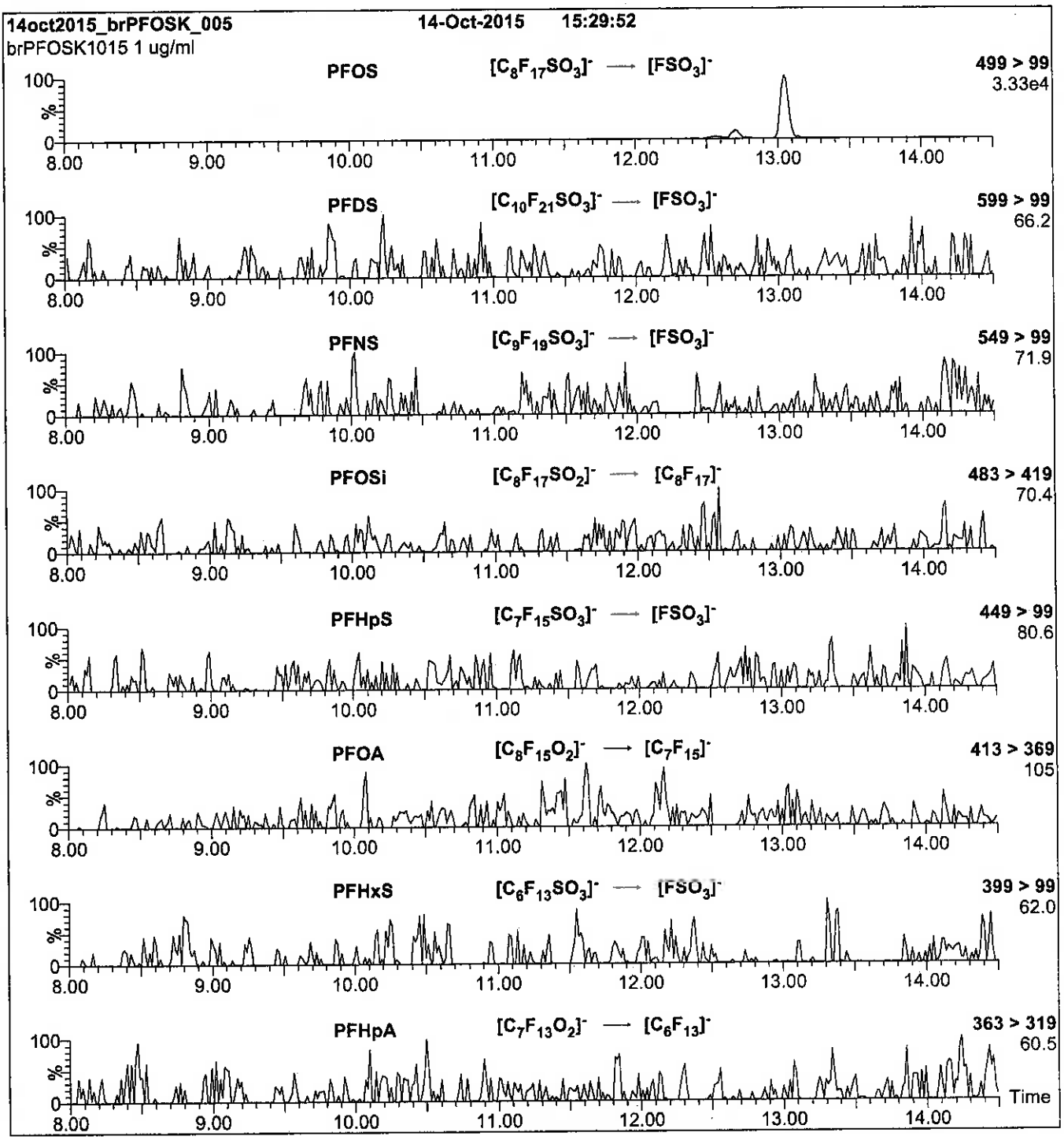
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

Figure 3: **br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.06e-3
Collision Energy (eV) = 11-50 (variable)

Reagent

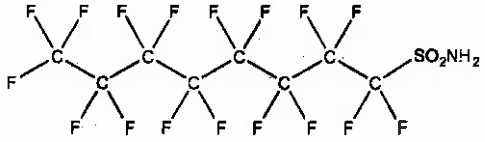
LCPFOSA_00010

12/20/16 SKJ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	FOSA-I	**LOT NUMBER:**	FOSA0916I
COMPOUND:	Perfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	754-91-6



MOLECULAR FORMULA:	$C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	499.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
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:** 10/07/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

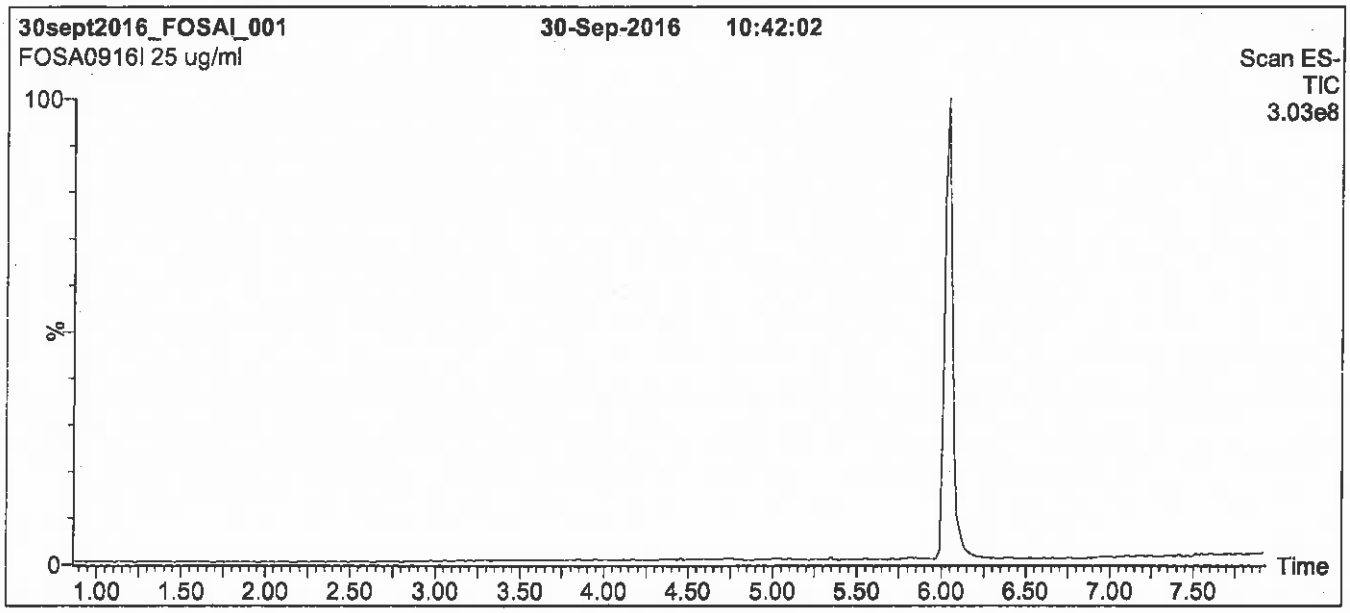
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

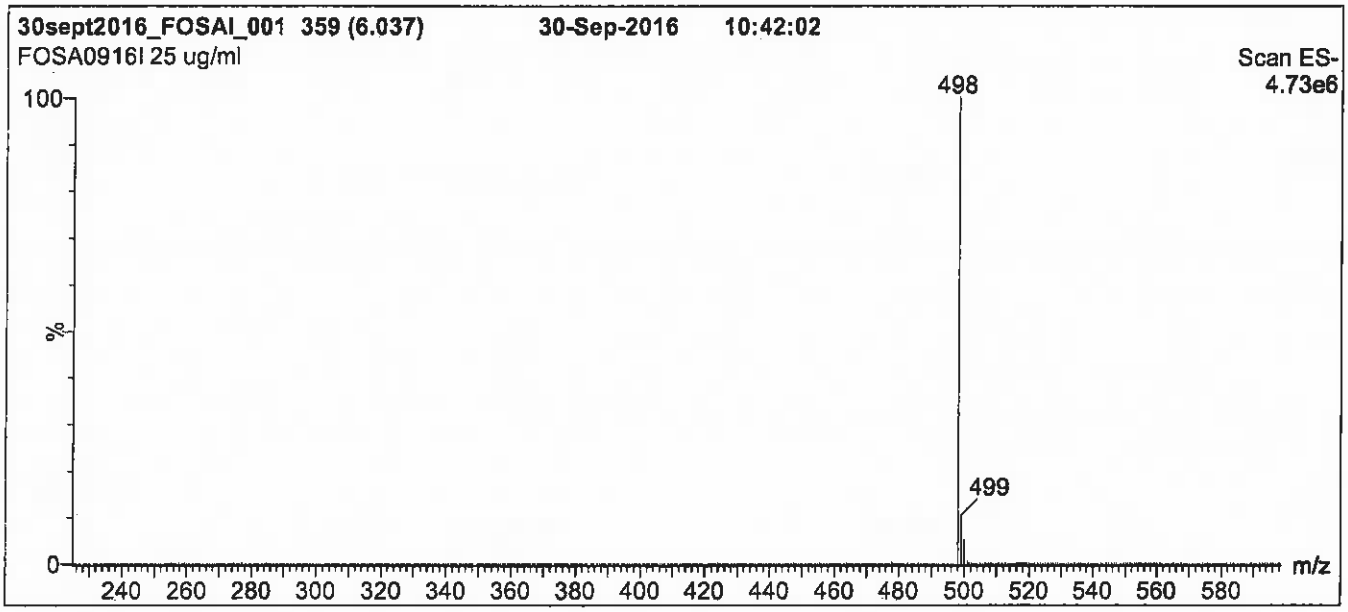
CALA

ANAB

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

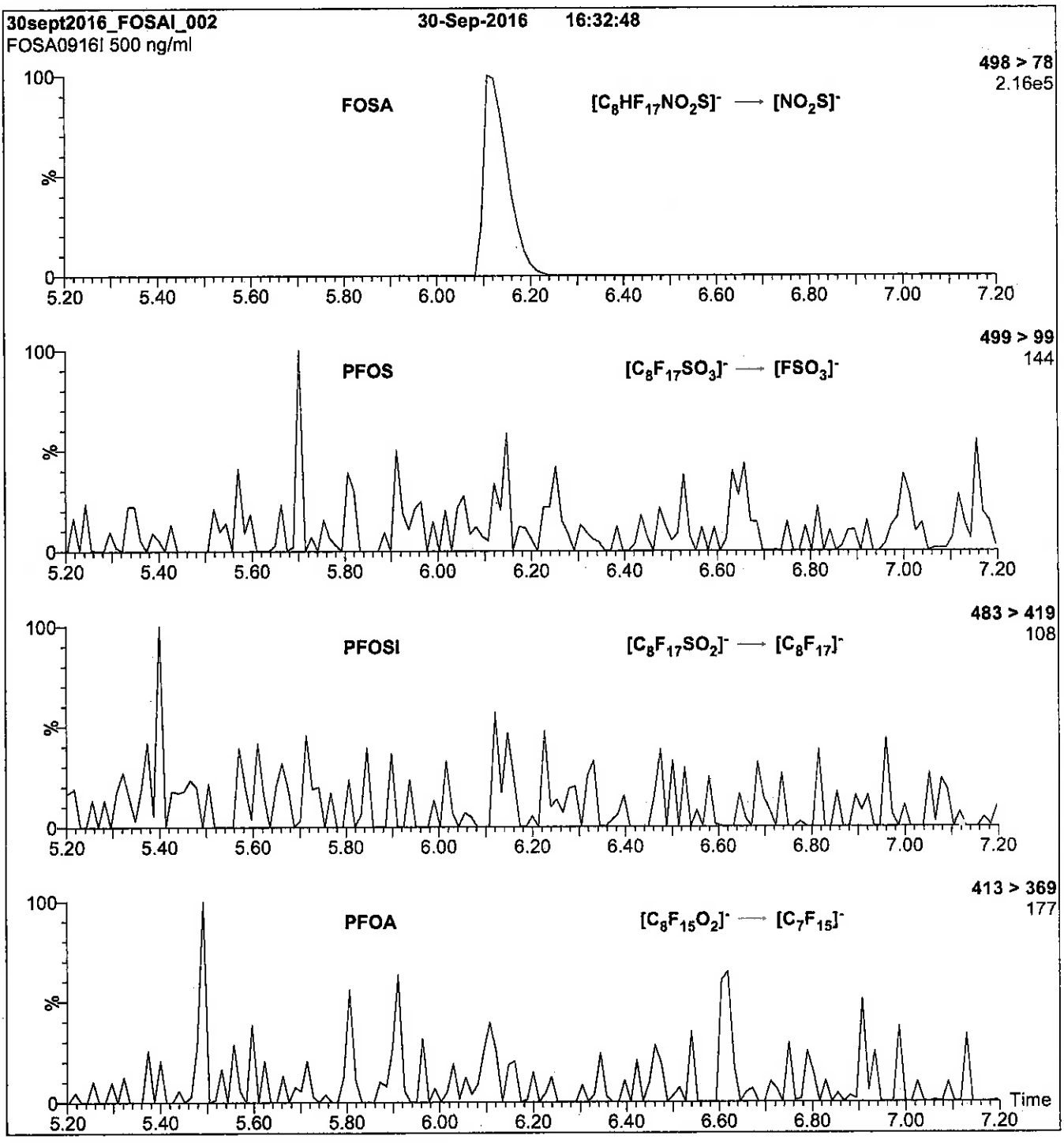
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 30

Reagent

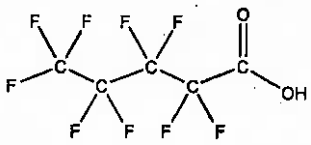
LCPFPeA_00006

r: 12/29/16 SH
s: 1/6/17 SH

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFPeA	**LOT NUMBER:**	PFPeA0516
COMPOUND:	Perfluoro-n-pentanoic acid		
STRUCTURE:		**CAS #:**	2706-90-3



MOLECULAR FORMULA:	$C_5HF_8O_2$	**MOLECULAR WEIGHT:**	264.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/31/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of 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:** 06/02/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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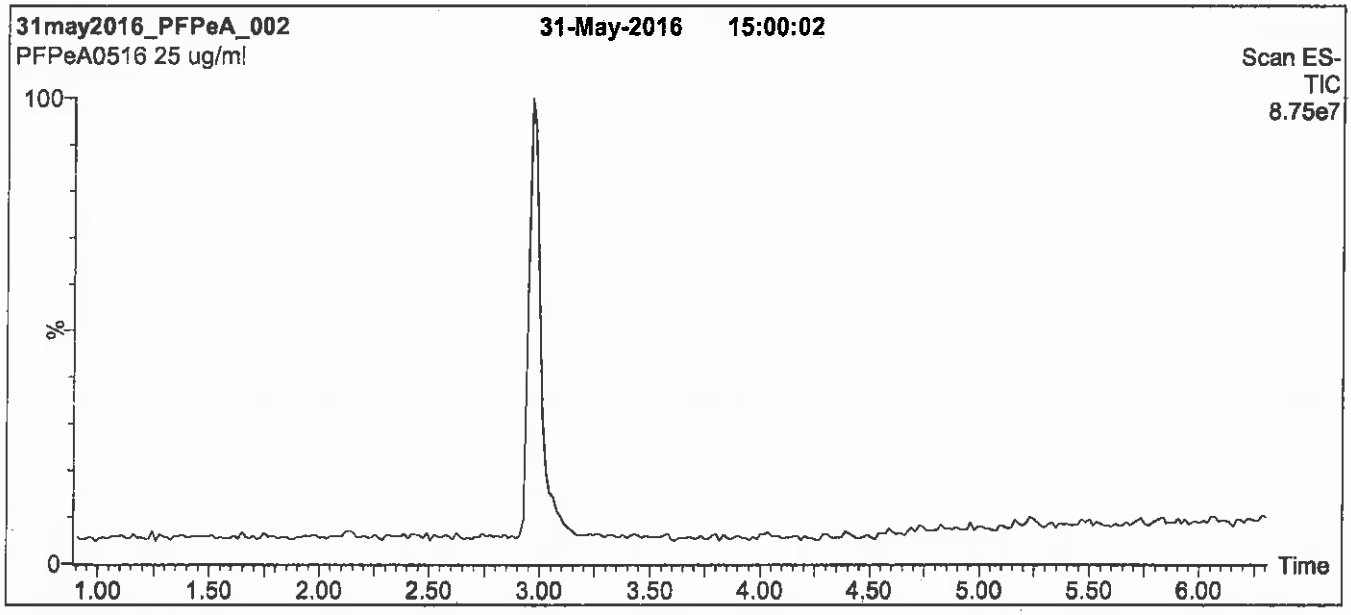
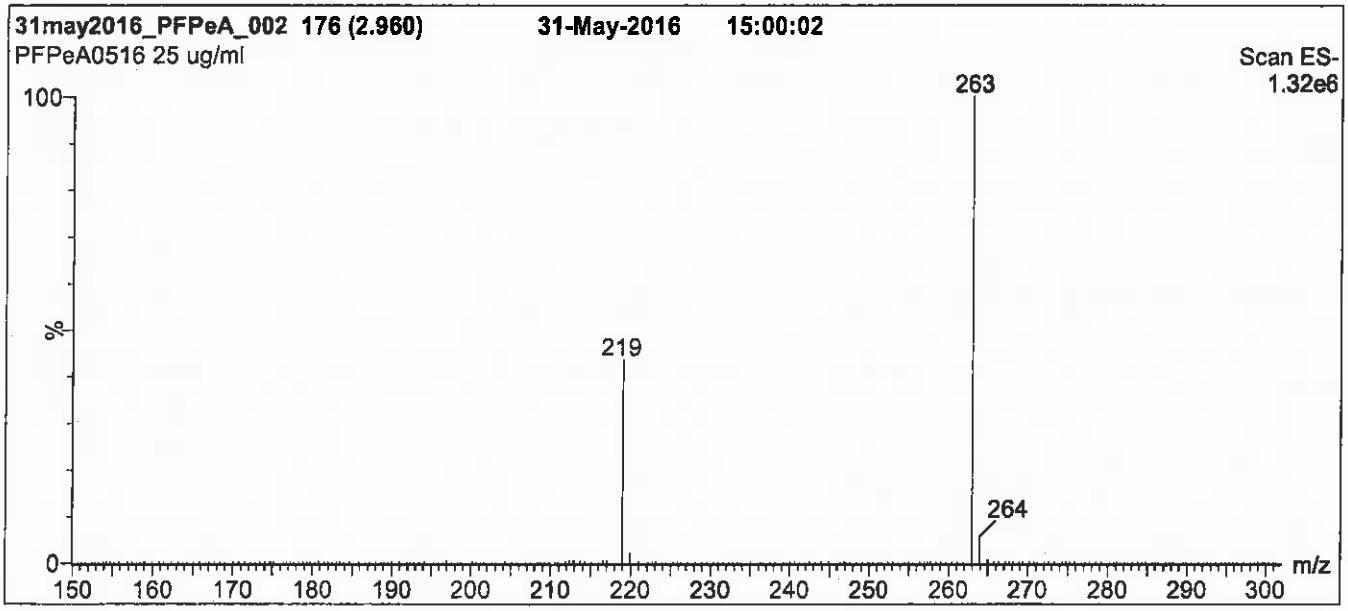
Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





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: 30% (80:20 MeOH:ACN) / 70% 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

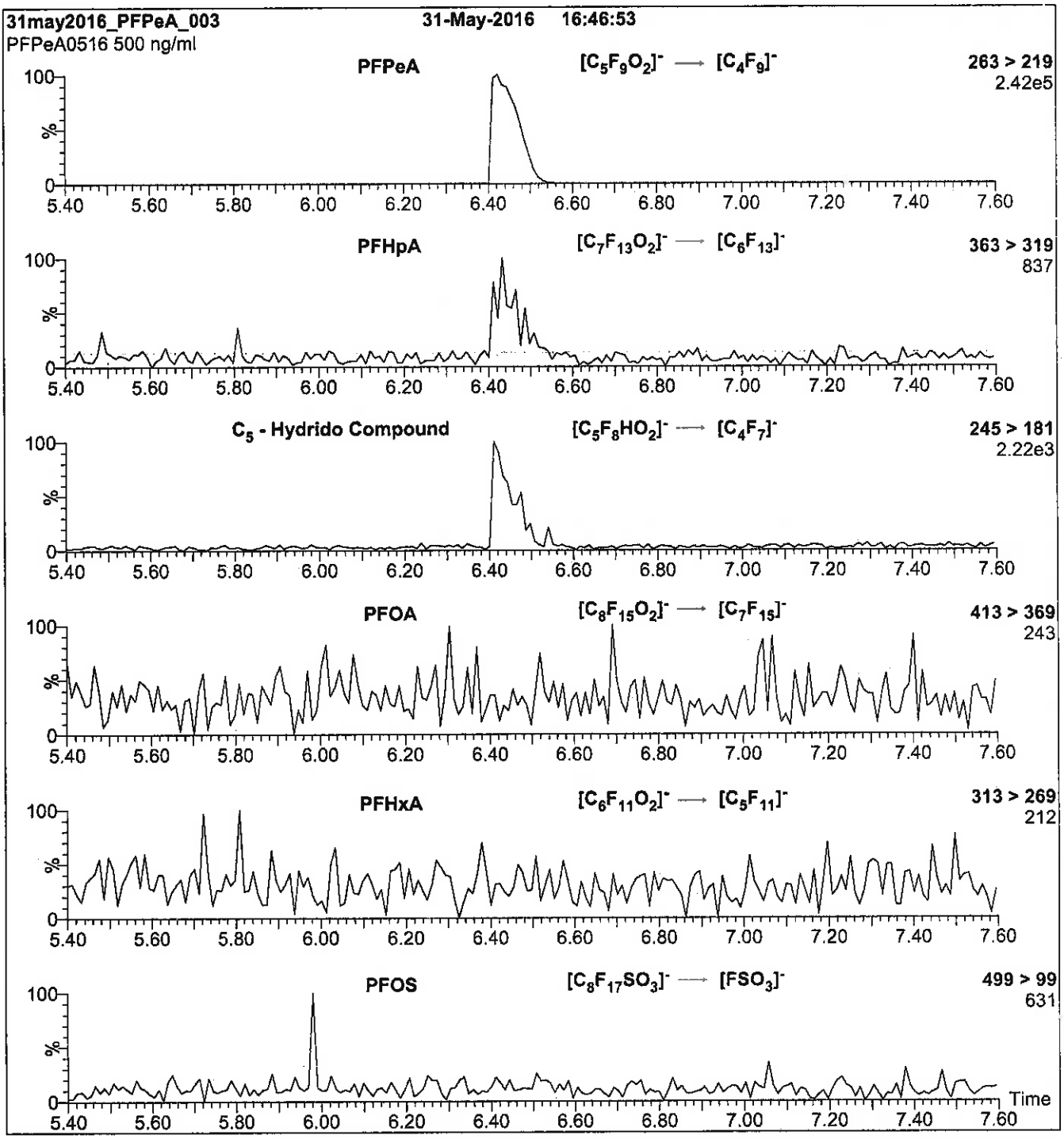
Flow: 300 µl/min

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) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 9

Reagent

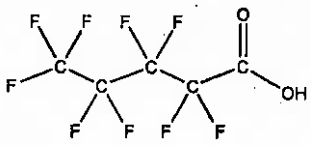
LCPFPeA_00007

r: 12/29/16 SM
s: 1/6/17 SM

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFPeA	**LOT NUMBER:**	PFPeA0516
COMPOUND:	Perfluoro-n-pentanoic acid		
STRUCTURE:		**CAS #:**	2706-90-3



MOLECULAR FORMULA:	$C_5HF_8O_2$	**MOLECULAR WEIGHT:**	264.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/31/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of 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:** 06/02/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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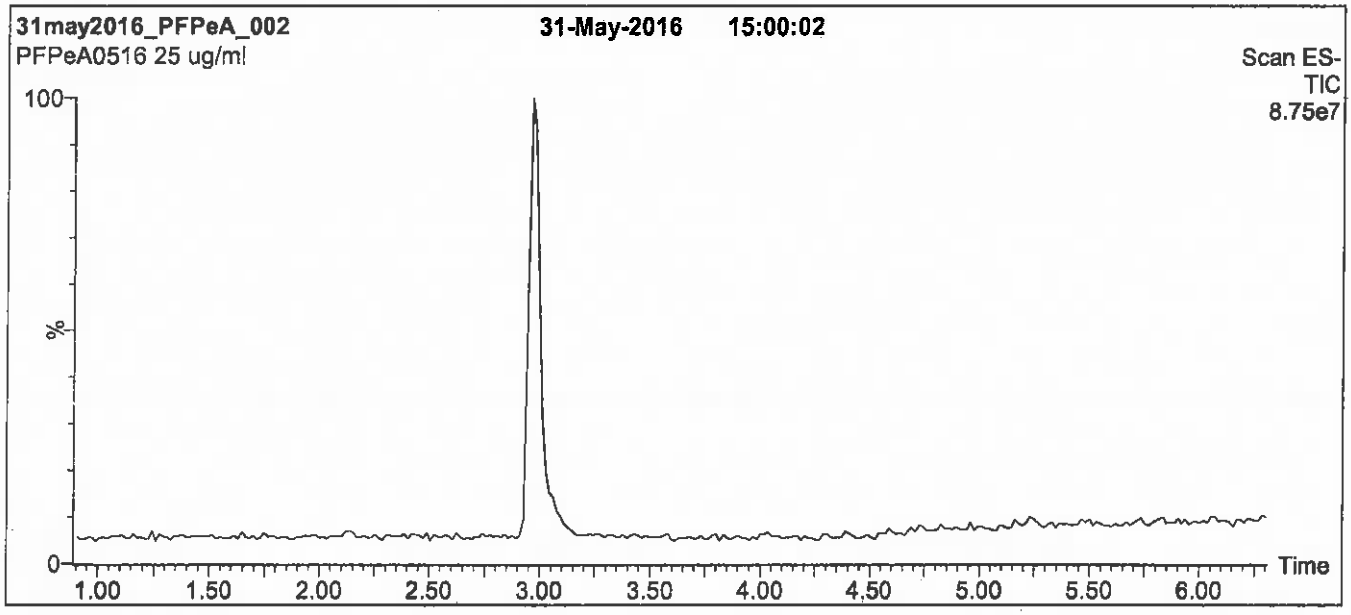
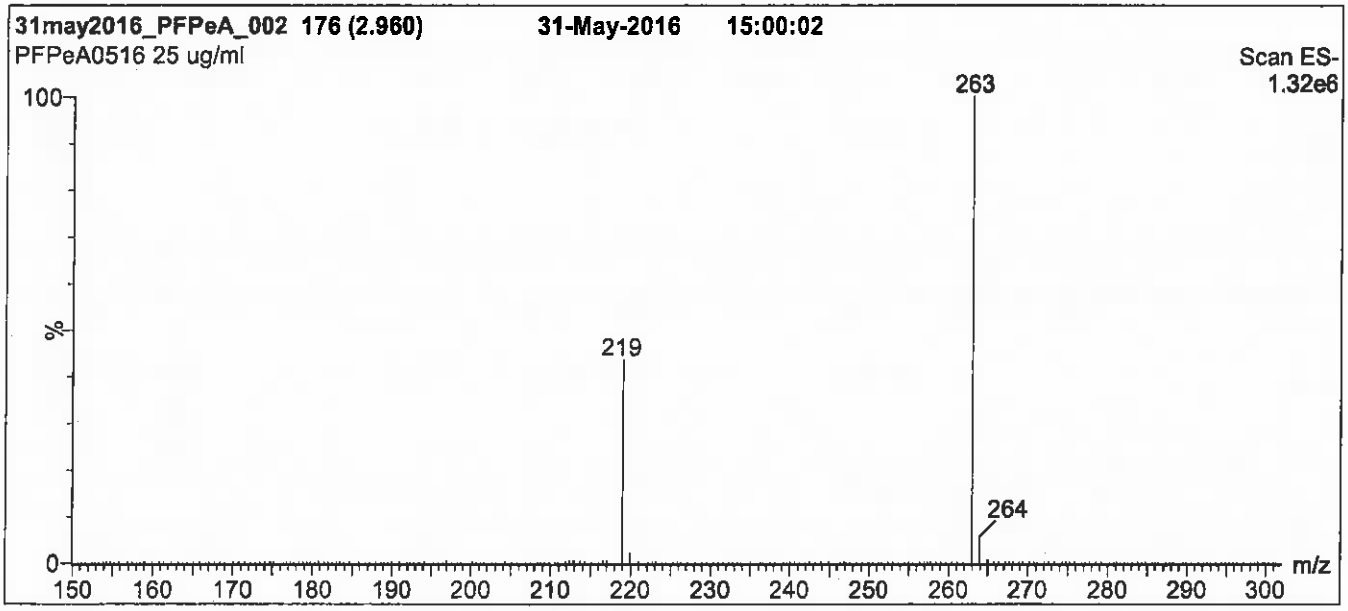




Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% 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

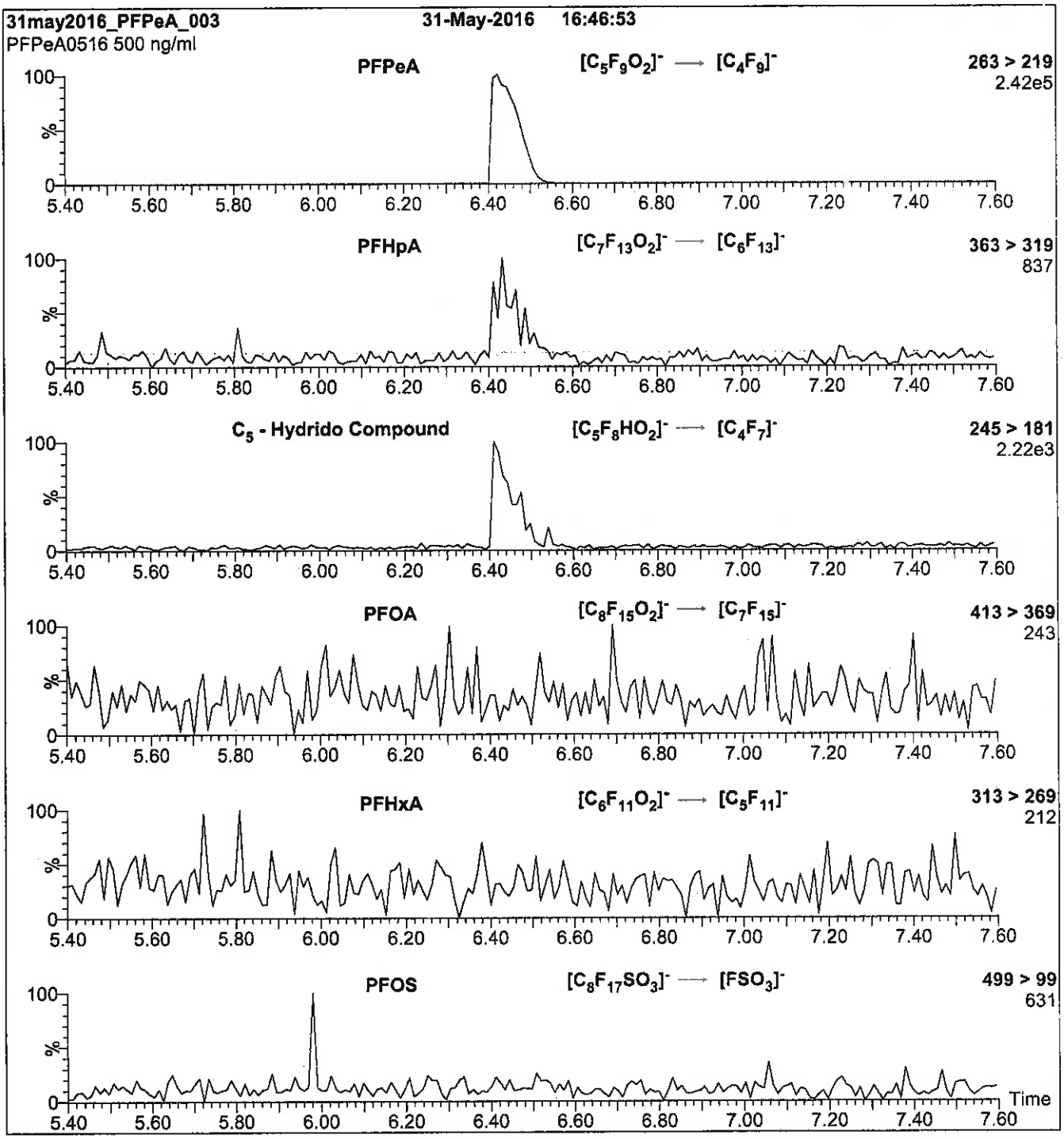
Flow: 300 µl/min

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) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 9

Reagent

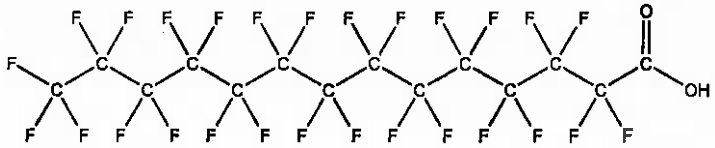
LCPFTeDA_00007

R: 12/20/16 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFTeDA	**LOT NUMBER:**	PFTeDA0916
COMPOUND:	Perfluoro-n-tetradecanoic acid		
STRUCTURE:		**CAS #:**	376-06-7



MOLECULAR FORMULA:	$C_{14}HF_{27}O_2$	**MOLECULAR WEIGHT:**	714.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

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Certified By: B.G. Chittim **Date:** 10/05/2016 (mm/dd/yyyy)

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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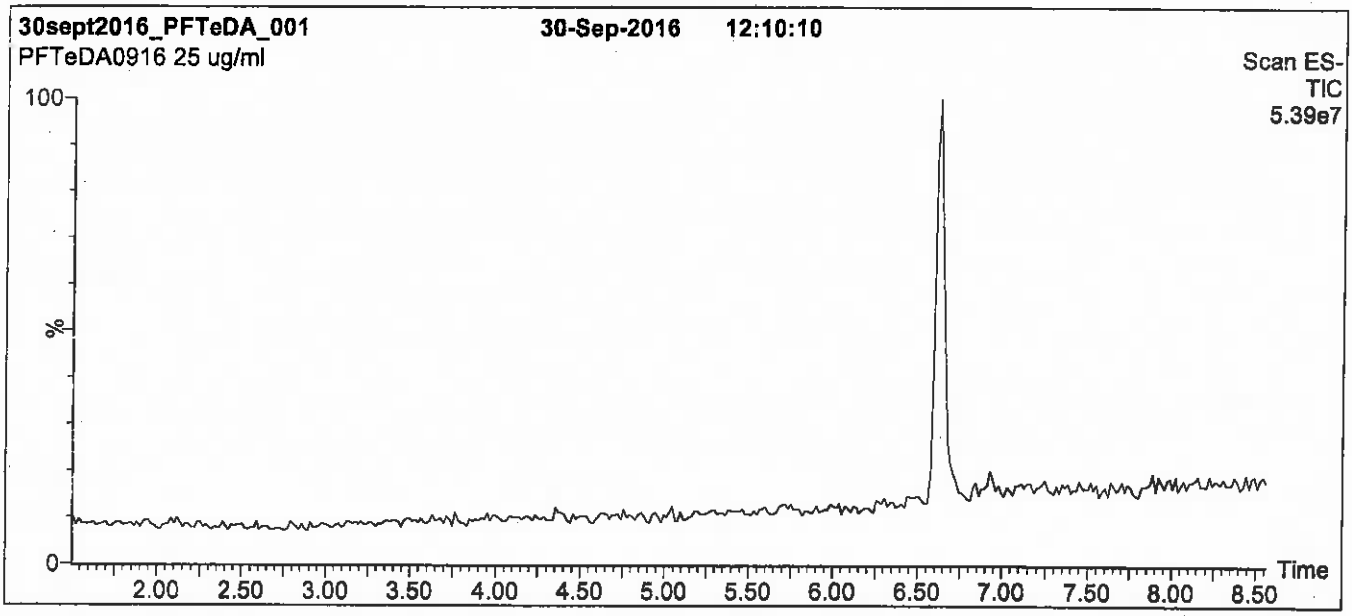
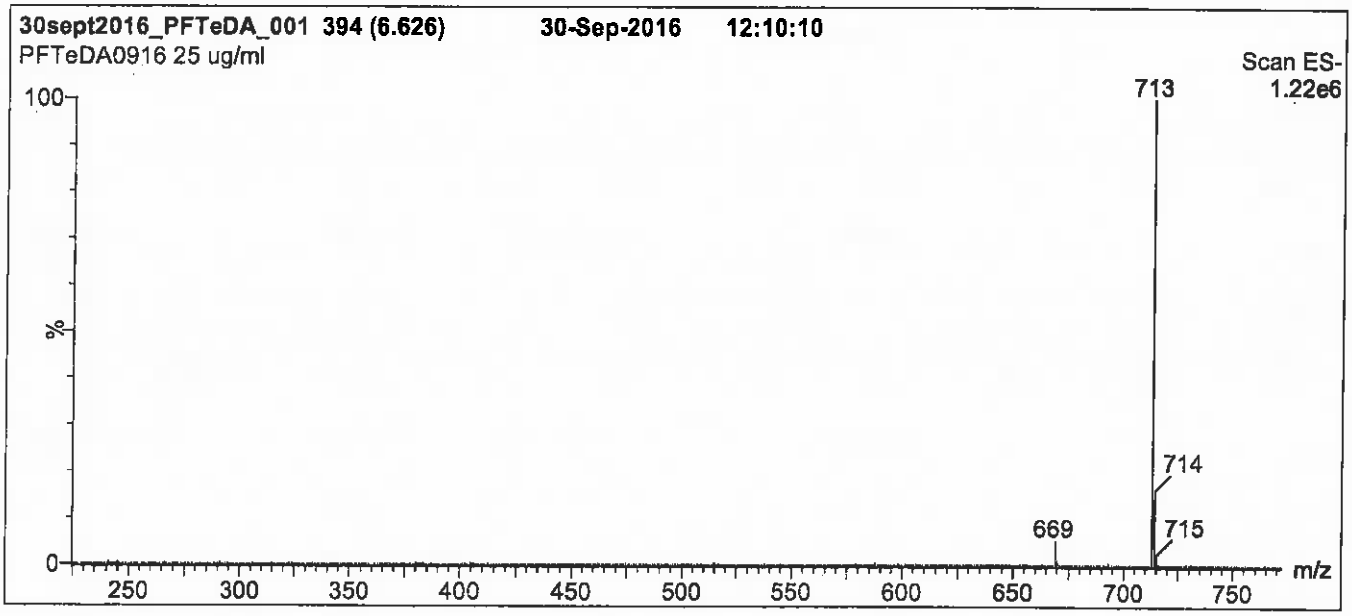
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

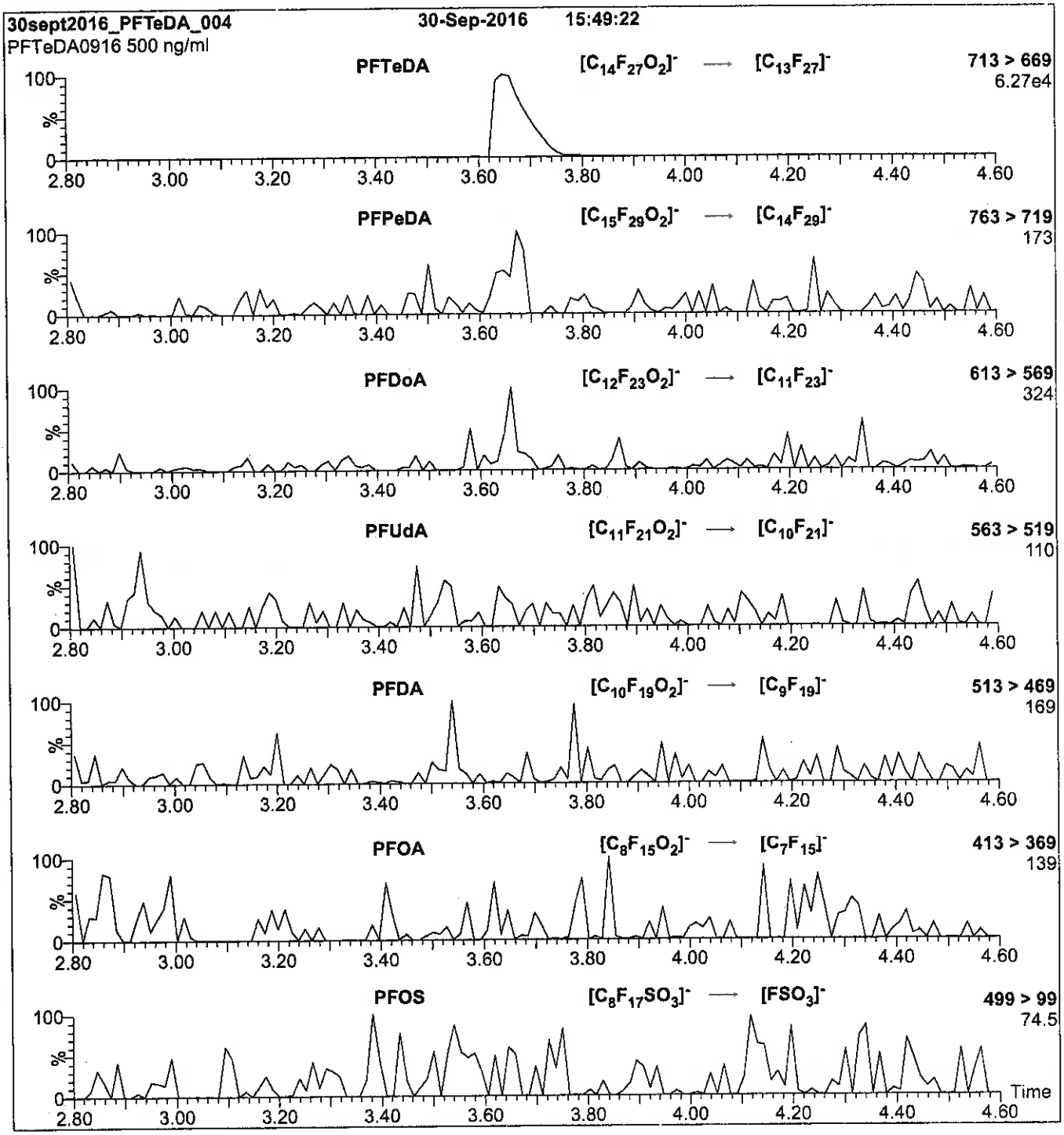
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 14

Reagent

LCPFTrDA_00007

r : 12/29/16 SJ

WELLINGTON LABORATORIES

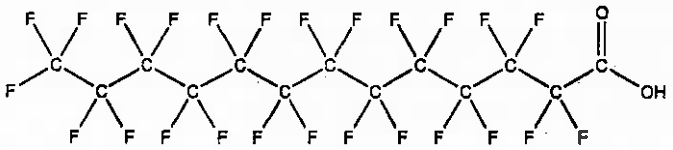
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTrDA
COMPOUND: Perfluoro-n-tridecanoic acid

LOT NUMBER: PFTrDA0216

STRUCTURE:

CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 664.11
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/12/2016
EXPIRY DATE: (mm/dd/yyyy) 02/12/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/16/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

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ANAB ACCREDITED

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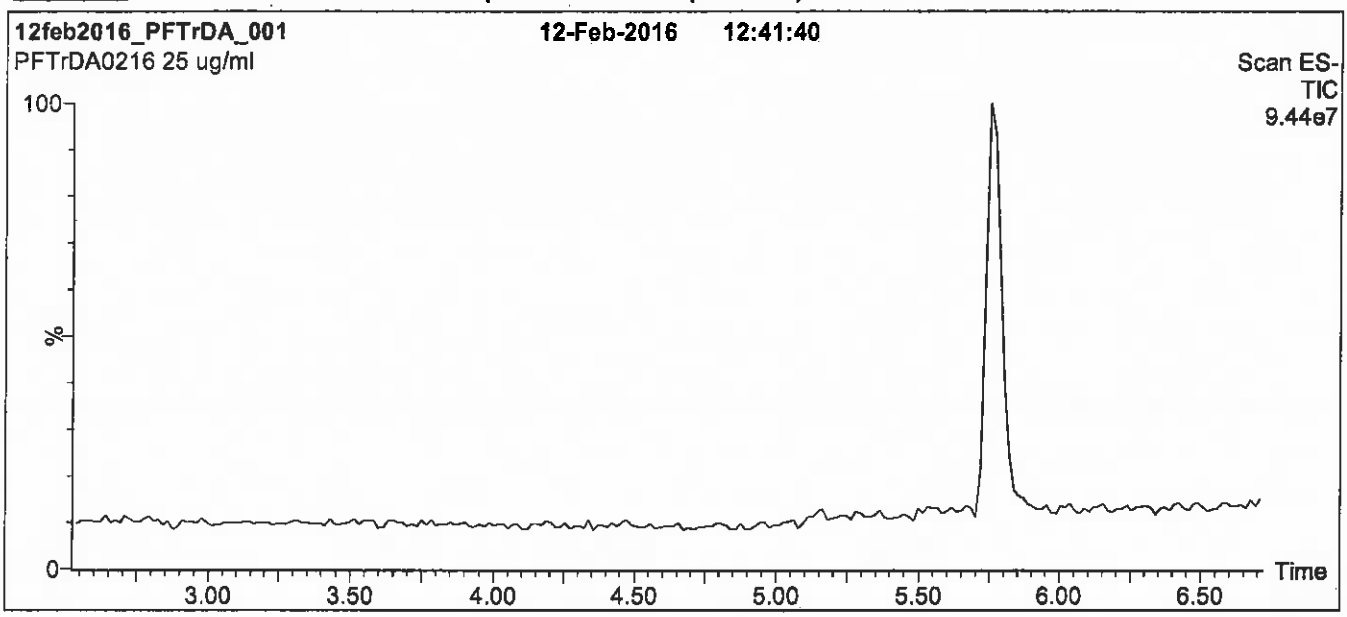
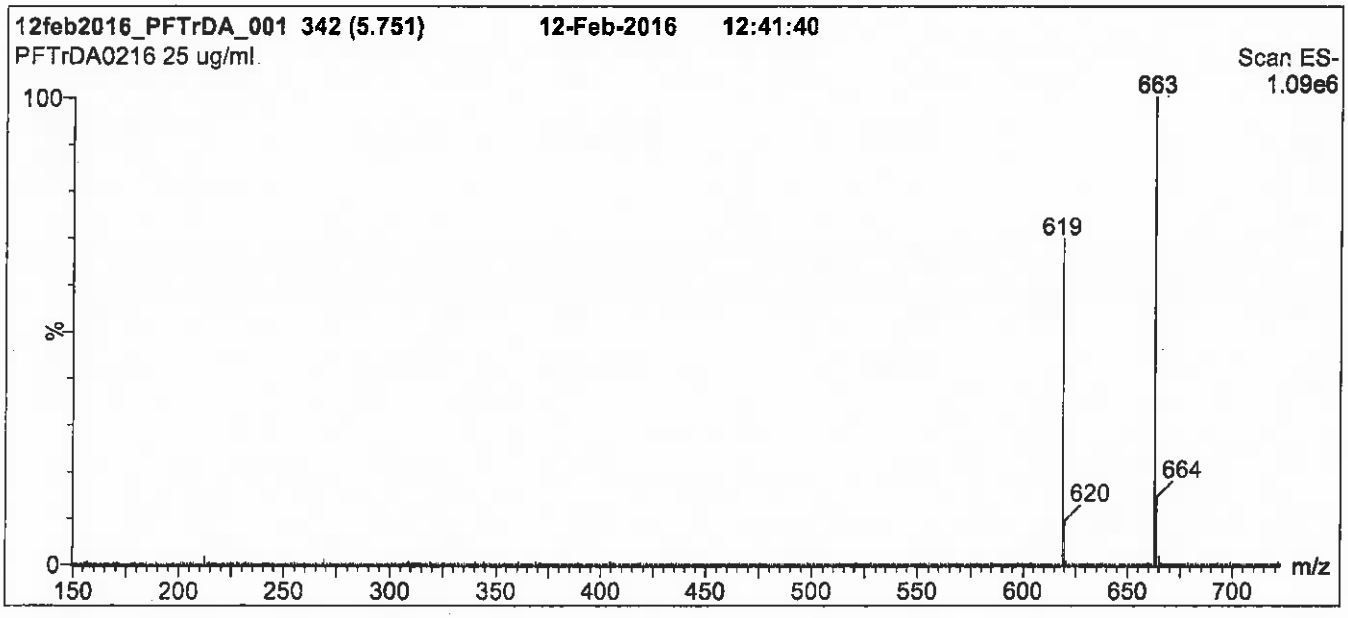




Conditions for Figure 1:

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: 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

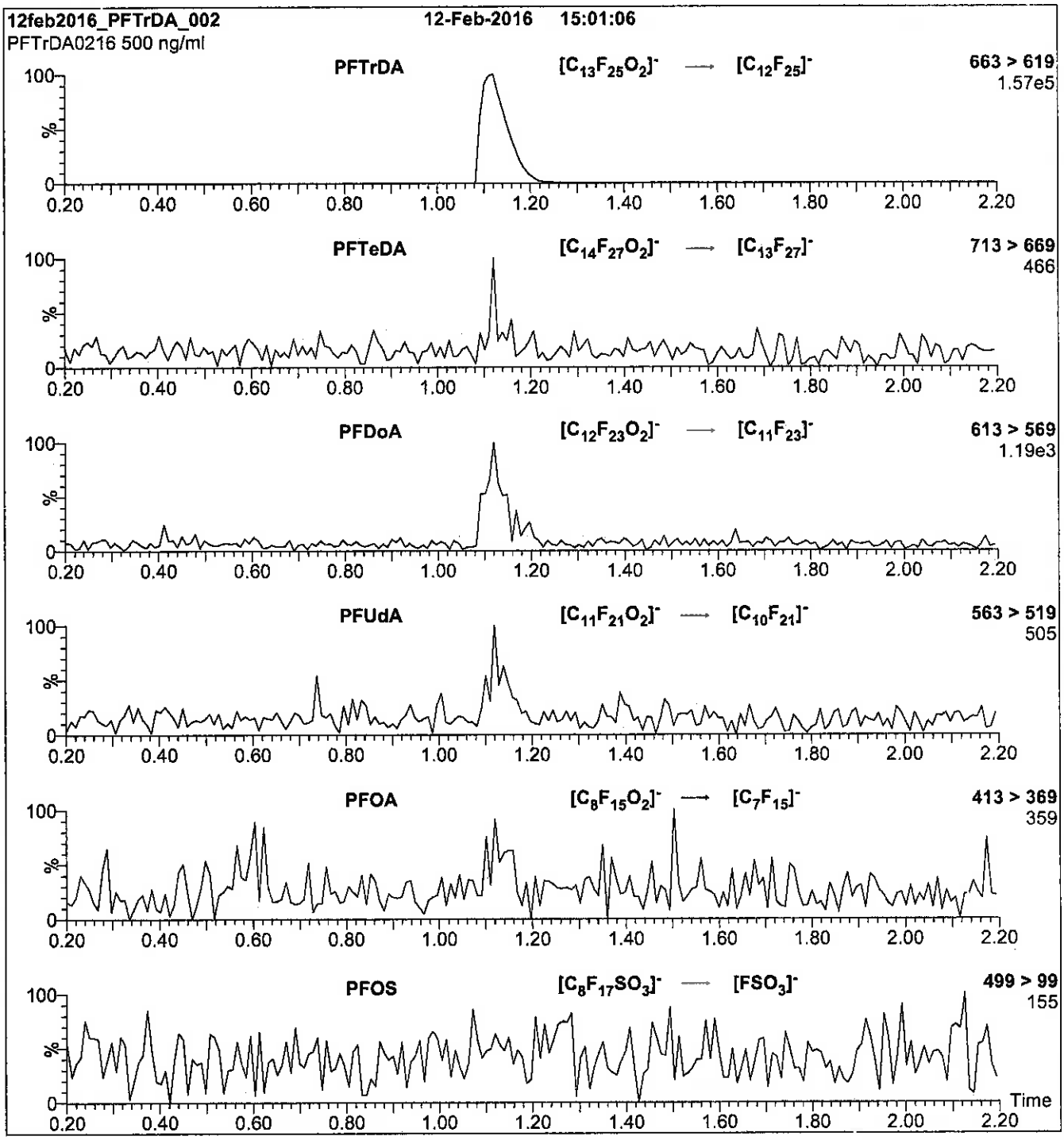
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

Figure 2: **PFTrDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 15

Reagent

LCPFUdA_00006

Scanned 10/14/16 R: SBC 9/13/16

730535
ID: LCPFUdA_00005
Exp: 08/19/20 Prpd: SBC
PF-n-undecanoic acid

730536
ID: LCPFUdA_00006
Exp: 08/19/20 Prpd: SBC
PF-n-undecanoic acid

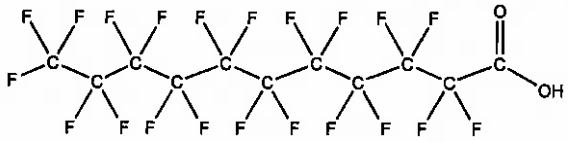
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFUdA
LOT NUMBER: PFUdA0815
COMPOUND: Perfluoro-n-undecanoic acid

STRUCTURE:

CAS #: 2058-94-8



MOLECULAR FORMULA: $C_{11}HF_{21}O_2$
MOLECULAR WEIGHT: 564.09
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/19/2015
EXPIRY DATE: (mm/dd/yyyy) 08/19/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 08/21/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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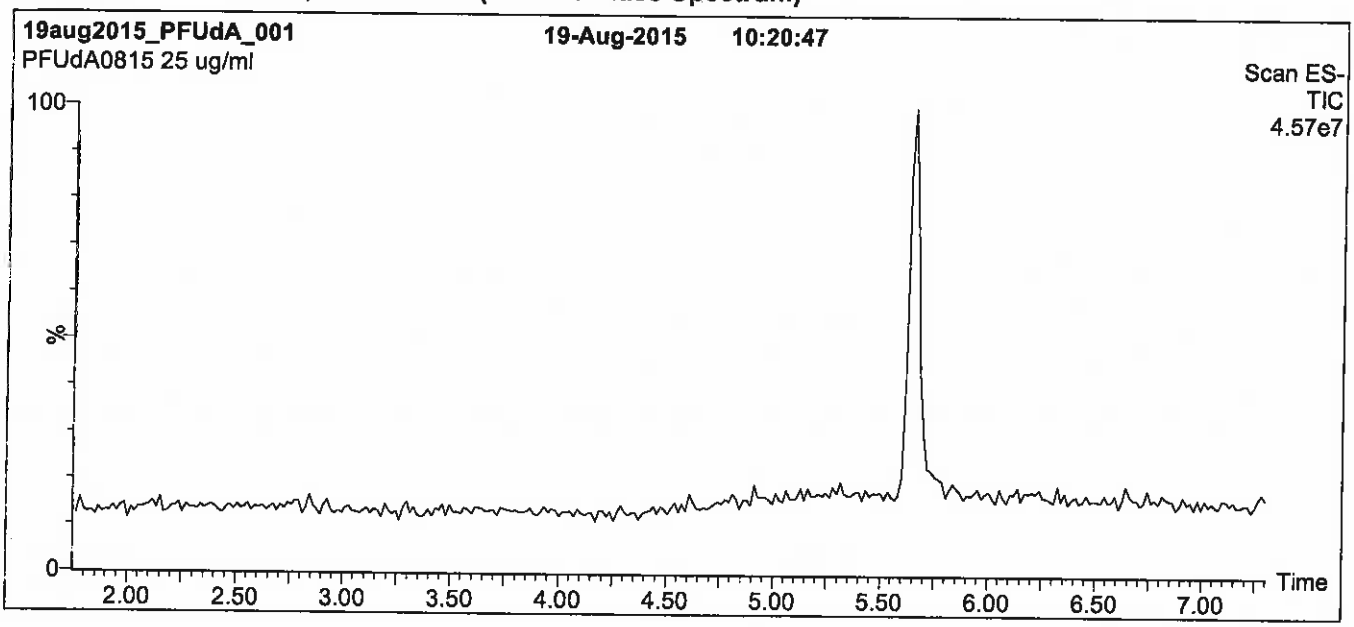
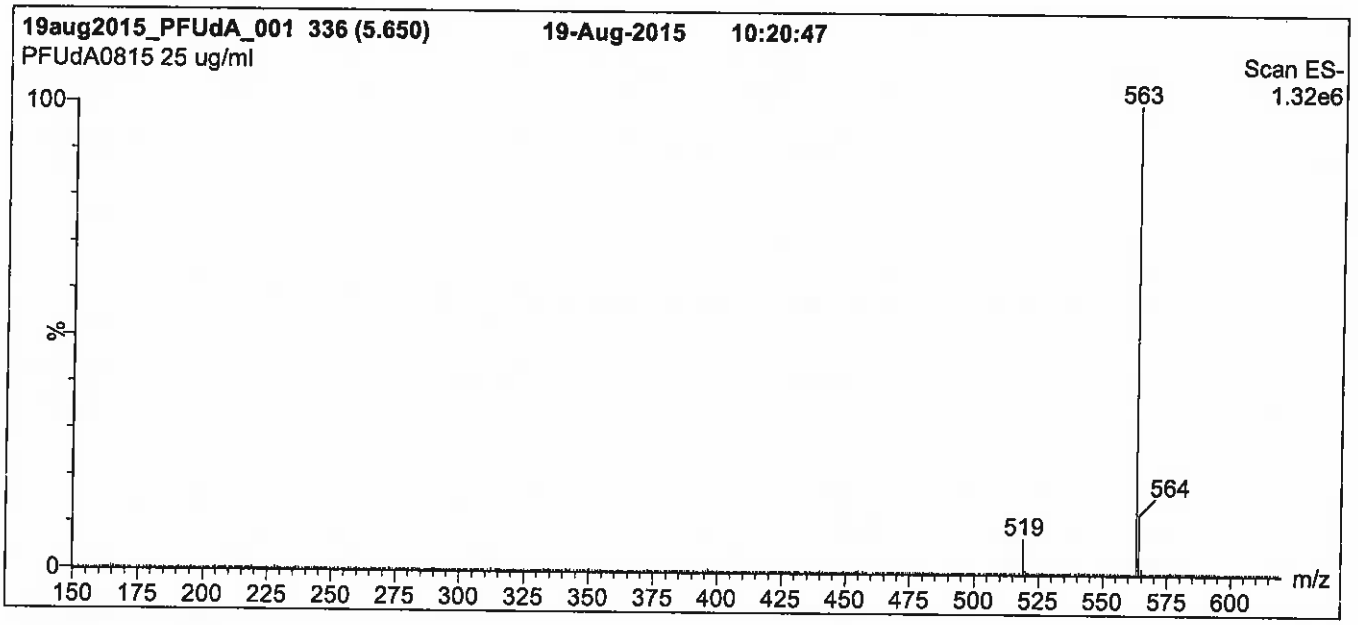
Figure 1: **PFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

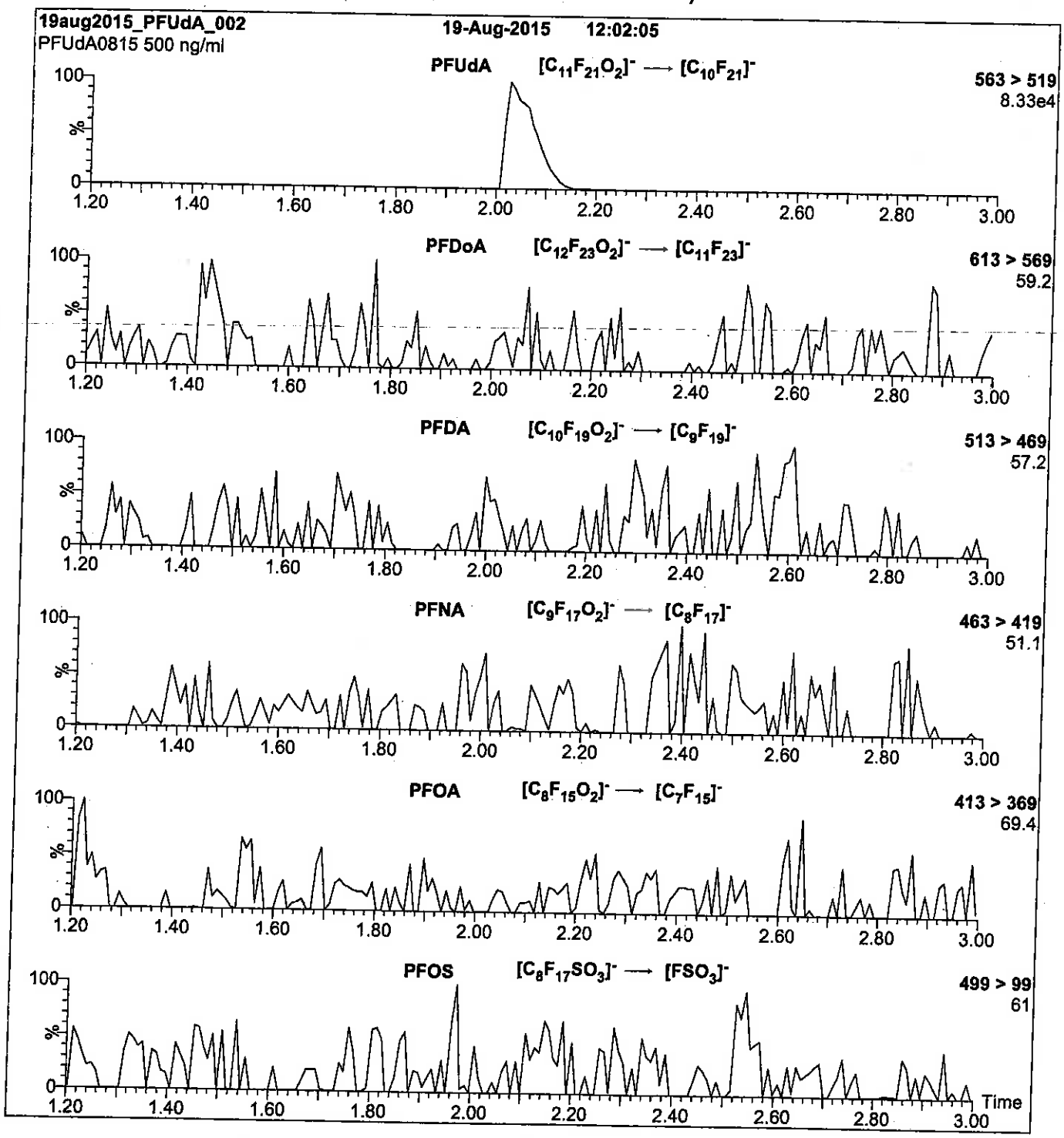
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 11

Reagent

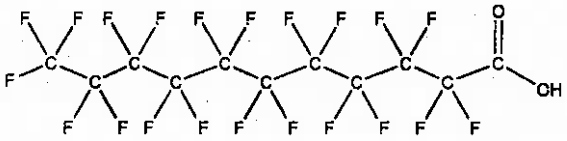
LCPFUdA_00007

r: 12/20/16 SK

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFUdA	**LOT NUMBER:**	PFUdA1016
COMPOUND:	Perfluoro-n-undecanoic acid		
STRUCTURE:		**CAS #:**	2058-94-8



MOLECULAR FORMULA:	$C_{11}HF_{21}O_2$	**MOLECULAR WEIGHT:**	564.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	10/18/2016		
EXPIRY DATE: (mm/dd/yyyy)	10/18/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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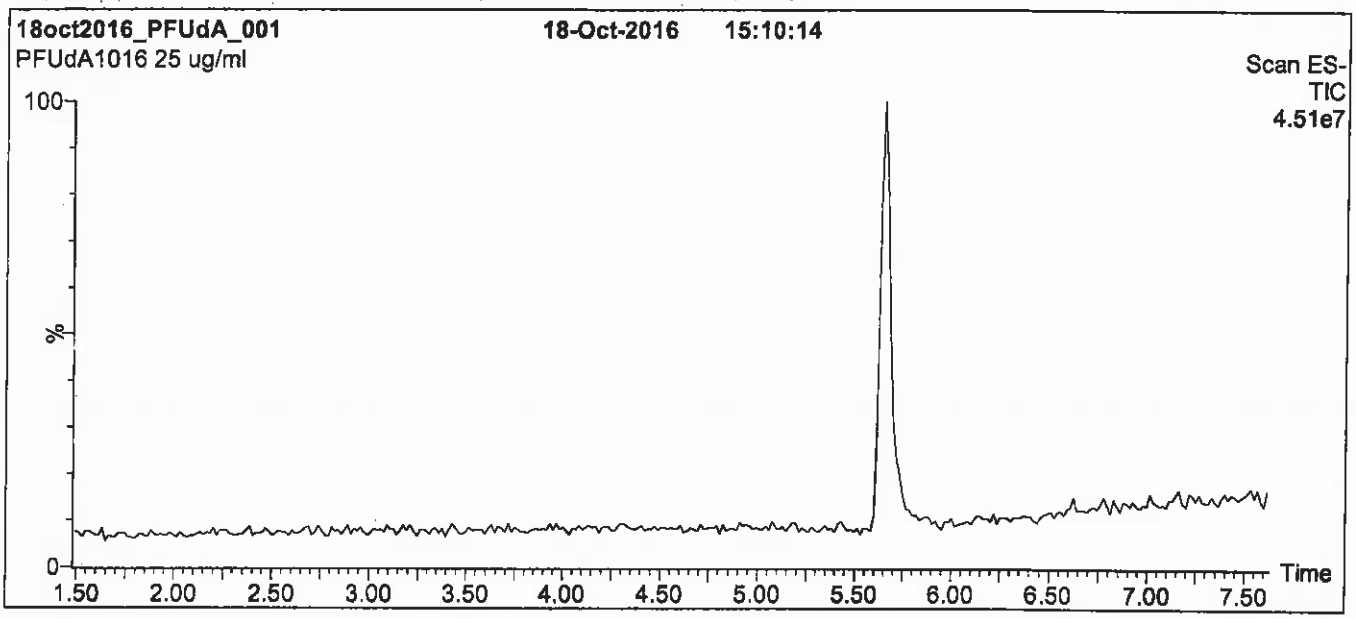

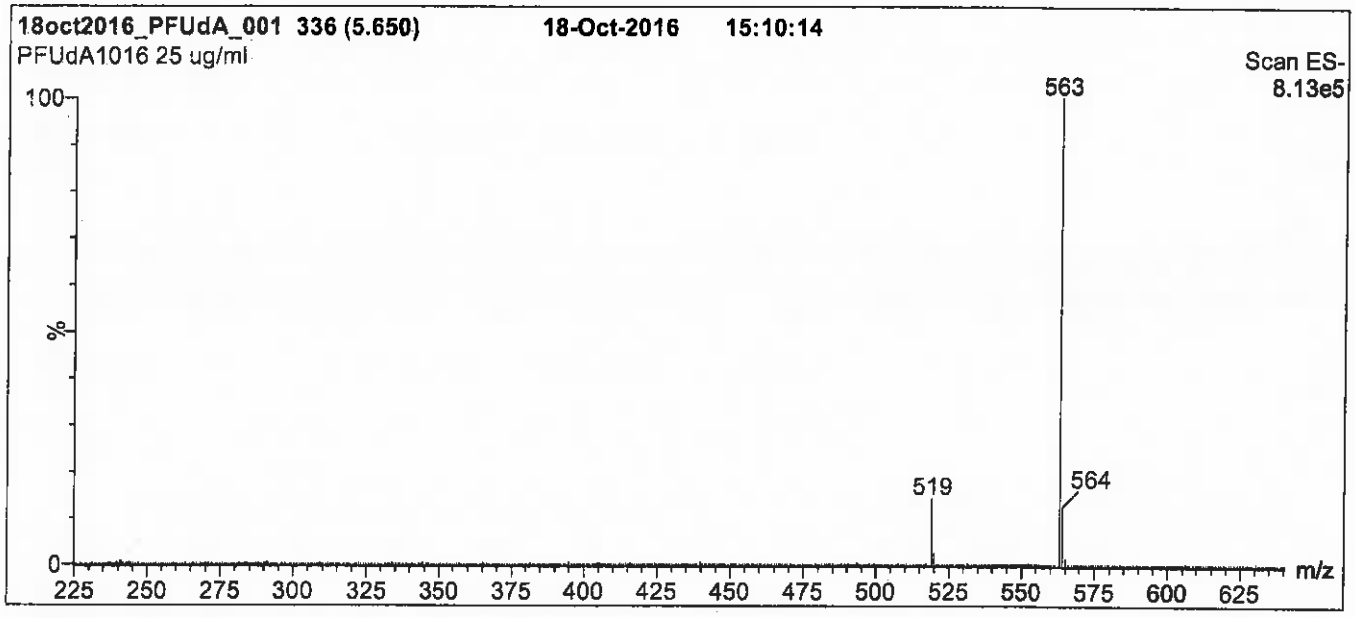

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1.7 µm, 2.1 x 100 mm

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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

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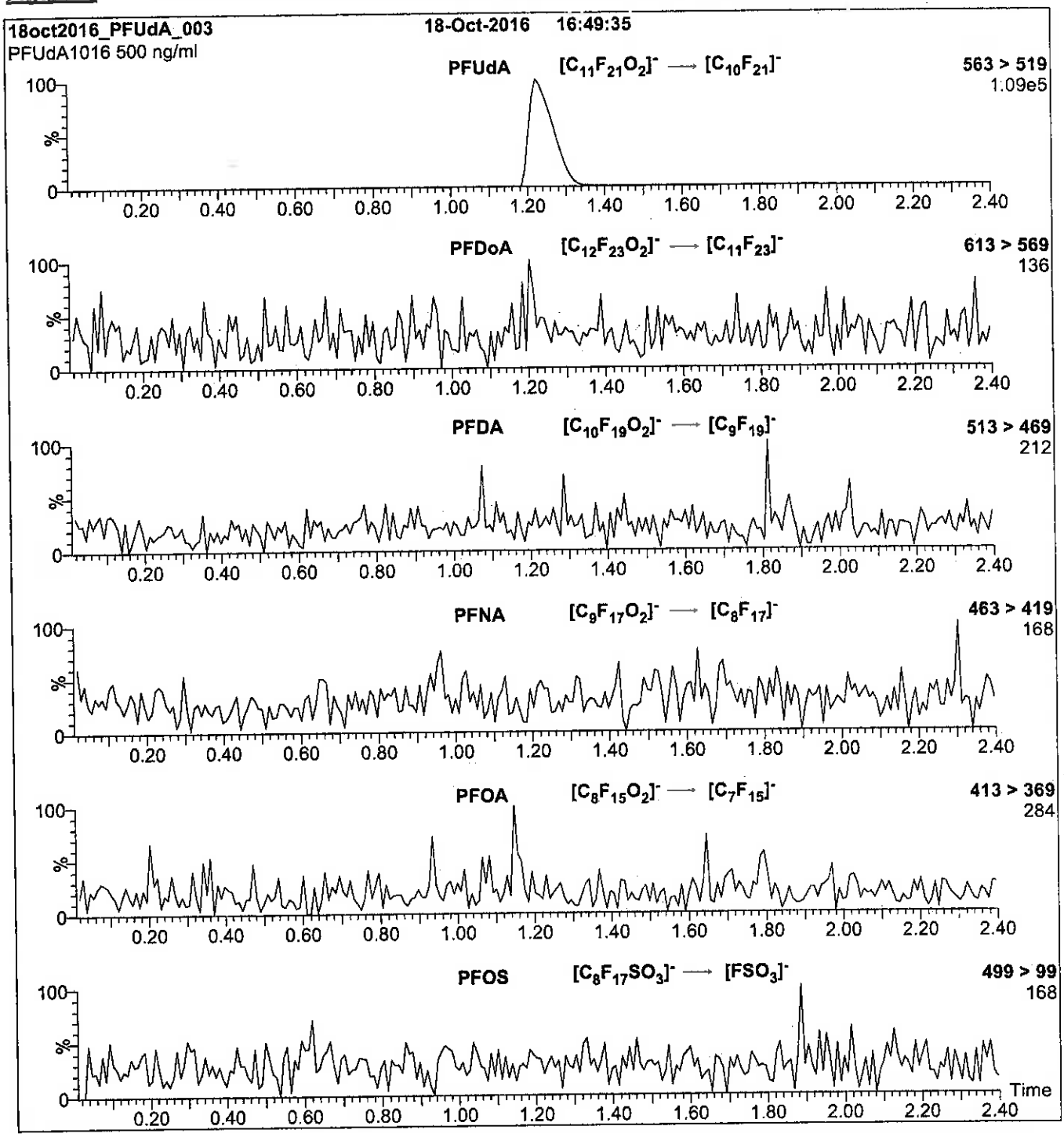
Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 11

Method PFC DOD

Fluorinated Hydrocarbons (LC/MS) by Method PFAS_DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBA	#	PFPeA	#	3C3-PFB	#	PFHxA	#	PFHpA	#	PFHxS	#	PFOA	#	PFNA	#
TP-PFC-023-TPI	320-33221-1	125	M	131		132		123		124		129		94		130	
TP-PFC-023-TPI DL	320-33221-1 DL	107		105		113		101		103		109		89		101	
TP-PFC-023-MID-CARBON	320-33221-2	109	M	109		114		111		112		116		95		111	
TP-PFC-023-TPE	320-33221-3	109	M	111		115		113		110		113		103		113	
TP-PFC-023-TPE-D	320-33221-4	108	M	110		114		108		112		112		98		113	
	MB 320-195219/1-A	111	M	111		119		107		113		114		104		112	
	LCS 320-195219/2-A	112	M	112		118		108		112		113		100		113	
	LCSD 320-195219/3-A	114	M	115		125		116		113		120		101		117	

	QC LIMITS
PFBA = 13C4 PFBA	25-150
PFPeA = 13C5 PFPeA	25-150
13C3-PFBS = 13C3-PFBS	25-150
PFHxA = 13C2 PFHxA	25-150
PFHpA = 13C4-PFHpA	25-150
PFHxS = 18O2 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFNA = 13C5 PFNA	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFOS #	PFDA #	PFOSA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-023-TPI	320-33221-1	131	139	126	130	125	124
TP-PFC-023-TPI DL	320-33221-1 DL	106	102	101	100	95	93
TP-PFC-023-MID-CARBON	320-33221-2	111	110	109	110	104	104
TP-PFC-023-TPE	320-33221-3	111	113	108	114	107	110
TP-PFC-023-TPE-D	320-33221-4	113	113	108	109	99	108
	MB 320-195219/1-A	109	115	105	119	108	107
	LCS 320-195219/2-A	113	117	106	121	102	102
	LCSD 320-195219/3-A	118	116	102	124	105	103

	QC LIMITS
PFOS = 13C4 PFOS	25-150
PFOSA = 13C8 FOSA	25-150
PFDA = 13C2 PFDA	25-150
PFUnA = 13C2 PFUnA	25-150
PFDoA = 13C2 PFDoA	25-150
PFTDA = 13C2-PFTeDA	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.11.18LLAXEA_003.d

Lab ID: LCS 320-195219/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	41.4	104	89-128	M
Perfluoropentanoic acid (PFPeA)	40.0	40.8	102	66-136	
Perfluorohexanoic acid (PFHxA)	40.0	42.1	105	86-126	
Perfluoroheptanoic acid (PFHpA)	40.0	40.0	100	89-127	
Perfluorooctanoic acid (PFOA)	40.0	41.5	104	80-120	
Perfluorononanoic acid (PFNA)	40.0	41.6	104	77-137	
Perfluorodecanoic acid (PFDA)	40.0	41.3	103	84-123	
Perfluoroundecanoic acid (PFUnA)	40.0	36.0	90	73-122	
Perfluorododecanoic acid (PFDoA)	40.0	44.5	111	82-122	
Perfluorotridecanoic Acid (PFTriA)	40.0	37.9	95	56-163	
Perfluorotetradecanoic acid (PFTeA)	40.0	39.4	99	66-120	
Perfluorobutanesulfonic acid (PFBS)	35.4	36.5	103	88-130	
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.4	97	87-126	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	39.5	104	92-135	
Perfluorooctanesulfonic acid (PFOS)	37.1	39.2	105	83-126	
Perfluorodecanesulfonic acid (PFDS)	38.6	39.0	101	80-129	
Perfluorooctane Sulfonamide (FOSA)	40.0	41.7	104	91-133	
13C8 FOSA	100	106	106	25-150	
13C4 PFBA	100	112	112	25-150	M
13C2 PFHxA	100	108	108	25-150	
13C4 PFOA	100	100	100	25-150	
13C5 PFNA	100	113	113	25-150	
13C2 PFDA	100	117	117	25-150	
13C2 PFUnA	100	121	121	25-150	
13C2 PFDoA	100	102	102	25-150	
18O2 PFHxS	94.6	107	113	25-150	
13C4 PFOS	95.6	108	113	25-150	
13C2-PFTeDA	100	102	102	25-150	
13C4-PFHpA	100	112	112	25-150	
13C5 PFPeA	100	112	112	25-150	
13C3-PFBS	93.0	110	118	25-150	

Column to be used to flag recovery and RPD values

FORM III 537 (modified)

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.11.18LLAXEA_004.d

Lab ID: LCSD 320-195219/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	40.3	101	3	30	89-128	M
Perfluoropentanoic acid (PFPeA)	40.0	40.3	101	1	30	66-136	
Perfluorohexanoic acid (PFHxA)	40.0	39.7	99	6	30	86-126	
Perfluoroheptanoic acid (PFHpA)	40.0	40.6	101	2	30	89-127	
Perfluorooctanoic acid (PFOA)	40.0	39.6	99	5	30	80-120	
Perfluorononanoic acid (PFNA)	40.0	38.4	96	8	30	77-137	
Perfluorodecanoic acid (PFDA)	40.0	40.0	100	3	30	84-123	
Perfluoroundecanoic acid (PFUnA)	40.0	35.1	88	3	30	73-122	
Perfluorododecanoic acid (PFDoA)	40.0	43.0	108	3	30	82-122	
Perfluorotridecanoic Acid (PFTriA)	40.0	38.8	97	2	30	56-163	
Perfluorotetradecanoic acid (PFTeA)	40.0	40.4	101	3	30	66-120	
Perfluorobutanesulfonic acid (PFBS)	35.4	34.2	97	6	30	88-130	
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.9	93	5	30	87-126	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	38.8	102	2	30	92-135	
Perfluorooctanesulfonic acid (PFOS)	37.1	37.1	100	5	30	83-126	
Perfluorodecanesulfonic acid (PFDS)	38.6	39.0	101	0	30	80-129	
Perfluorooctane Sulfonamide (FOSA)	40.0	40.7	102	2	30	91-133	
13C8 FOSA	100	102	102			25-150	
13C4 PFBA	100	114	114			25-150	M
13C2 PFHxA	100	116	116			25-150	
13C4 PFOA	100	101	101			25-150	
13C5 PFNA	100	117	117			25-150	
13C2 PFDA	100	116	116			25-150	
13C2 PFUnA	100	124	124			25-150	
13C2 PFDoA	100	105	105			25-150	
18O2 PFHxS	94.6	114	120			25-150	
13C4 PFOS	95.6	113	118			25-150	
13C2-PFTeDA	100	103	103			25-150	
13C4-PFHpA	100	113	113			25-150	
13C5 PFPeA	100	115	115			25-150	
13C3-PFBS	93.0	116	125			25-150	

Column to be used to flag recovery and RPD values

FORM III 537 (modified)

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab File ID: 2017.11.18LLAXEA_002.d Lab Sample ID: MB 320-195219/1-A

Matrix: Water Date Extracted: 11/16/2017 17:39

Instrument ID: A8_N Date Analyzed: 11/18/2017 16:55

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-195219/2-A	2017.11.18LLAXEA_003.d	11/18/2017 17:03
	LCSD 320-195219/3-A	2017.11.18LLAXEA_004.d	11/18/2017 17:11
TP-PFC-023-TPI	320-33221-1	2017.11.18LLAXEA_021.d	11/18/2017 19:25
TP-PFC-023-MID-CARBON	320-33221-2	2017.11.18LLAXEA_022.d	11/18/2017 19:33
TP-PFC-023-TPE	320-33221-3	2017.11.18LLAXEA_024.d	11/18/2017 19:48
TP-PFC-023-TPE-D	320-33221-4	2017.11.18LLAXEA_025.d	11/18/2017 19:56
TP-PFC-023-TPI DL	320-33221-1 DL	2017.11.24LLA_011.d	11/24/2017 15:04

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-TPI | Lab Sample ID: 320-33221-1

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_021.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 11:50

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 291.9(mL) | Date Analyzed: 11/18/2017 19:25

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	75	M	1.7	0.86	0.30
2706-90-3	Perfluoropentanoic acid (PFPeA)	200		1.7	0.86	0.42
307-24-4	Perfluorohexanoic acid (PFHxA)	340		3.4	1.7	0.50
375-85-9	Perfluoroheptanoic acid (PFHpA)	71		1.7	0.86	0.21
335-67-1	*Perfluorooctanoic acid (PFOA)*	*1300*	*M E*	*3.4*	1.7	*0.73*
375-95-1	Perfluorononanoic acid (PFNA)	2.3		1.7	0.86	0.23
335-76-2	Perfluorodecanoic acid (PFDA)	0.72	J	1.7	0.86	0.27
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.6	U	3.4	2.6	0.94
307-55-1	Perfluorododecanoic acid (PFDoA)	1.7	U	3.4	1.7	0.47
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	2.6	1.1
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.86	U	1.7	0.86	0.25
375-73-5	Perfluorobutanesulfonic acid (PFBS)	52		1.7	0.86	0.26
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	350		1.7	0.86	0.26
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	6.8		1.7	0.86	0.26
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	340		3.4	1.7	0.46
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.86	U	1.7	0.86	0.27
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.86	U	1.7	0.86	0.30

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-TPI | Lab Sample ID: 320-33221-1

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_021.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 11:50

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 291.9(mL) | Date Analyzed: 11/18/2017 19:25

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	126		25-150
STL00992	13C4 PFBA	125	M	25-150
STL00993	13C2 PFHxA	123		25-150
STL00990	13C4 PFOA	94		25-150
STL00995	13C5 PFNA	130		25-150
STL00996	13C2 PFDA	139		25-150
STL00997	13C2 PFUnA	130		25-150
STL00998	13C2 PFDoA	125		25-150
STL00994	18O2 PFHxS	129		25-150
STL00991	13C4 PFOS	131		25-150
STL02116	13C2-PFTeDA	124		25-150
STL01892	13C4-PFHpA	124		25-150
STL01893	13C5 PFPeA	131		25-150
STL02337	13C3-PFBS	132		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_021.d
Lims ID: 320-33221-A-1-A
Client ID: TP-PFC-023-TPI
Sample Type: Client
Inject. Date: 18-Nov-2017 19:25:10 ALS Bottle#: 20 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33221-a-1-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 24-Nov-2017 13:16:40 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK033

First Level Reviewer: hannigana Date: 24-Nov-2017 13:14:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										M
217.00 > 172.00	1.476	1.479	-0.003	0.550	6928981	3.12		125	19692	M
2 Perfluorobutyric acid										M
212.90 > 169.00	1.476	1.480	-0.004	1.000	5550360	2.19			472	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.749	1.738	0.011	0.652	4608056	3.28		131	30542	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.749	1.740	0.009	1.000	12099818	5.82			2681	
D 47 13C3-PFBS										
301.90 > 83.00	1.782	1.774	0.008	0.665	93954	3.06		132	2044	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.782	1.776	0.006	1.000	4524289	1.51			4308	
298.90 > 99.00	1.782	1.776	0.006	1.000	1852196		2.44(1.74-3.24)		3665	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.017	2.010	0.007	0.995	19526695	9.98			14218	
313.00 > 119.00	2.027	2.010	0.017	1.000	1637703		11.92(7.05-13.09)		13426	
D 7 13C2 PFHxA										
315.00 > 270.00	2.027	2.010	0.017	0.756	4891319	3.08		123	46253	
D 9 13C4-PFHpA										
367.00 > 322.00	2.337	2.332	0.005	0.872	4760184	3.11		124	64334	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.337	2.333	0.004	1.000	4041276	2.07			3167	
363.00 > 169.00	2.337	2.333	0.004	1.000	1589731		2.54(1.59-2.95)		6433	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.348	2.347	0.001	1.000	26481893	10.3			25354	
399.00 > 99.00	2.348	2.347	0.001	1.000	8851180		2.99(2.10-3.89)		23117	
D 11 18O2 PFHxS										
403.00 > 84.00	2.348	2.347	0.001	0.876	5529121	3.06		129	48915	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFOA										
417.00 > 372.00	2.681	2.680	0.001	1.000	4117553	2.34		93.7	48371	
15 Perfluorooctanoic acid										EM
413.00 > 369.00	2.681	2.680	0.001	1.000	65896253	37.9			12483	EM
413.00 > 169.00	2.681	2.680	0.001	1.000	46765635		1.41(1.18-2.19)		26579	M
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.689	2.687	0.002	1.000	414131	0.1999			120	
449.00 > 99.00	2.689	2.687	0.002	1.000	130048		3.18(2.72-5.05)		260	
* 62 13C2-PFOA										
415.00 > 370.00	2.681	2.695	-0.014		4265174	2.50			49737	
D 18 13C4 PFOS										
503.00 > 80.00	3.039	3.042	-0.003	1.133	3782937	3.13		131	25660	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.039	3.042	-0.003	1.000	16511464	9.94			16685	
499.00 > 99.00	3.039	3.042	-0.003	1.000	3698957		4.46(3.24-6.01)		110574	
D 19 13C5 PFNA										
468.00 > 423.00	3.039	3.042	-0.003	1.133	4187747	3.24		130	48245	
20 Perfluorononanoic acid										
463.00 > 419.00	3.039	3.045	-0.006	1.000	111962	0.0670			92.5	
463.00 > 169.00	3.039	3.045	-0.006	1.000	27500		4.07(2.65-4.93)		78.2	
D 21 13C8 FOSA										
506.00 > 78.00	3.393	3.393	0.0	1.265	4910872	3.16		126	31594	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.393	3.395	-0.002	1.000	16079	0.008522			55.0	
D 23 13C2 PFDA										
515.00 > 470.00	3.393	3.400	-0.007	1.265	3787696	3.48		139	41686	
24 Perfluorodecanoic acid										R
513.00 > 469.00	3.393	3.400	-0.007	1.000	30714	0.0209			73.6	R
513.00 > 169.00	3.401	3.400	0.001	1.002	4859		6.32(3.31-6.15)		42.4	
D 30 13C2 PFUnA										
565.00 > 520.00	3.724	3.730	-0.006	1.389	2819814	3.24		130	36688	
D 36 13C2 PFDoA										
615.00 > 570.00	4.013	4.024	-0.011	1.497	3147676	3.11		125	42747	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.514	4.526	-0.012	1.683	3856347	3.10		124	28774	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 24-Nov-2017 13:16:53 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_021.d

Injection Date: 18-Nov-2017 19:25:10 Instrument ID: A8_N

Lims ID: 320-33221-A-1-A Lab Sample ID: 320-33221-1

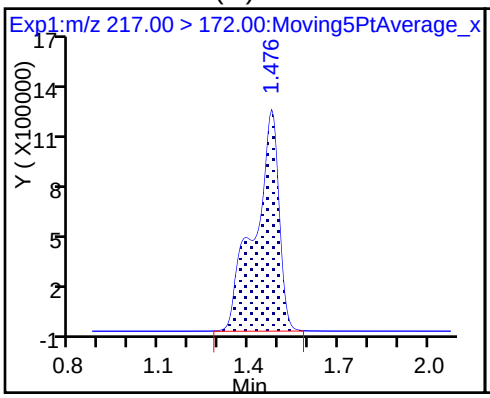
Client ID: TP-PFC-023-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 21

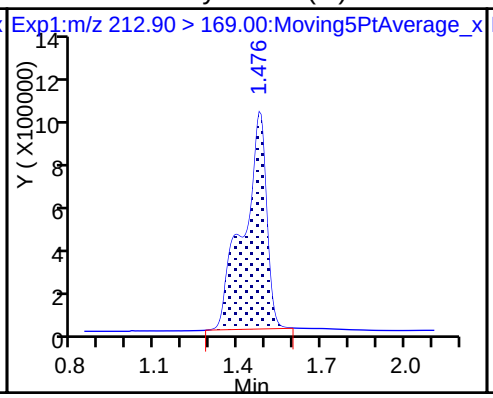
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

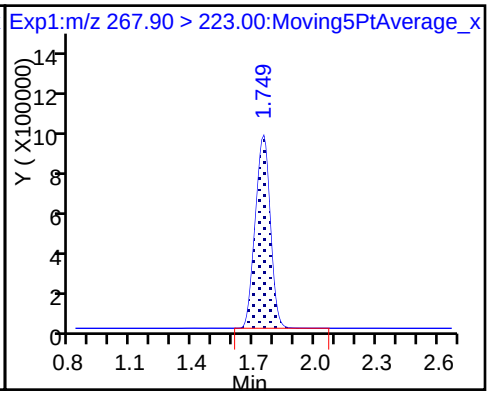
D 1 13C4 PFBA (M)



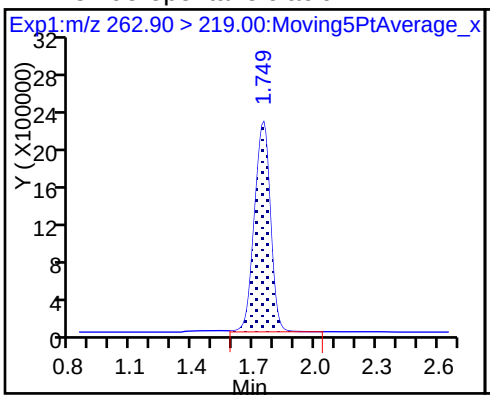
2 Perfluorobutyric acid (M)



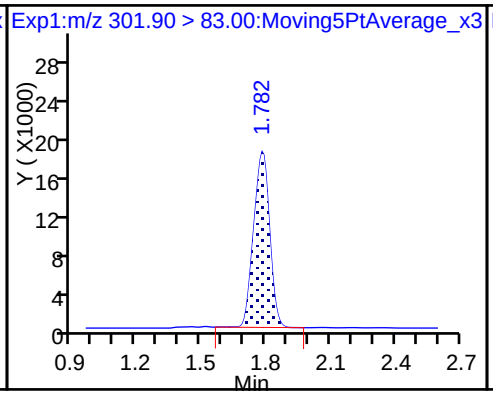
D 3 13C5-PFPeA



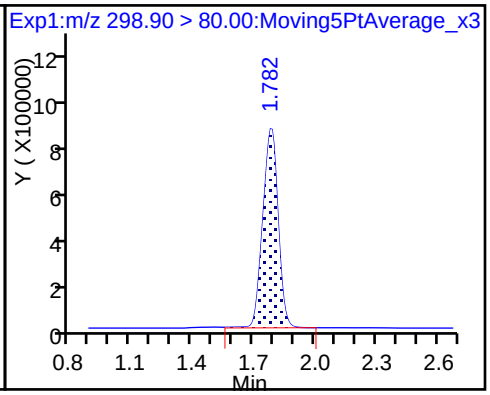
4 Perfluoropentanoic acid



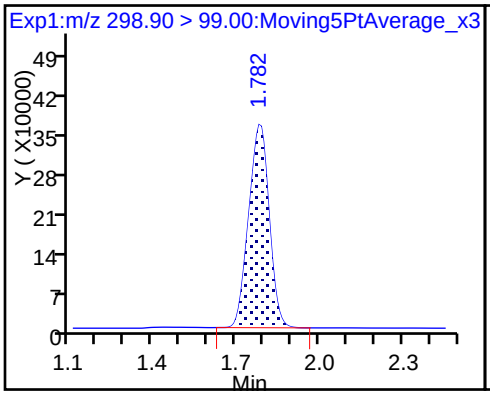
D 47 13C3-PFBS



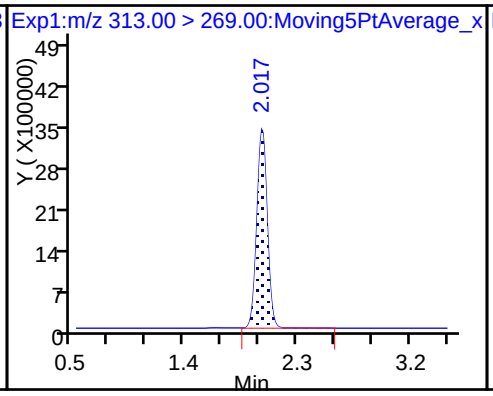
5 Perfluorobutanesulfonic acid



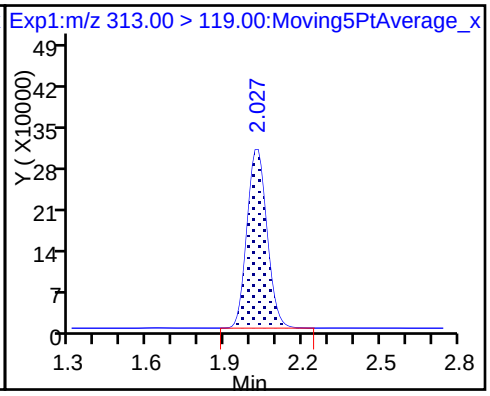
5 Perfluorobutanesulfonic acid



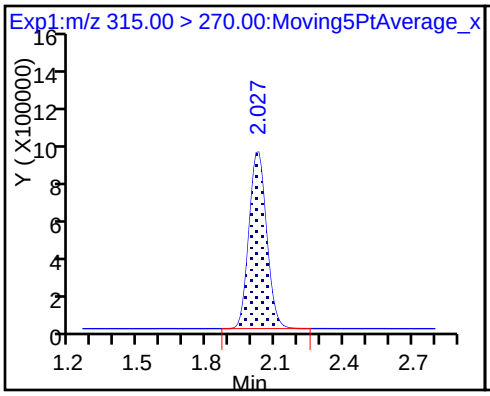
6 Perfluorohexanoic acid



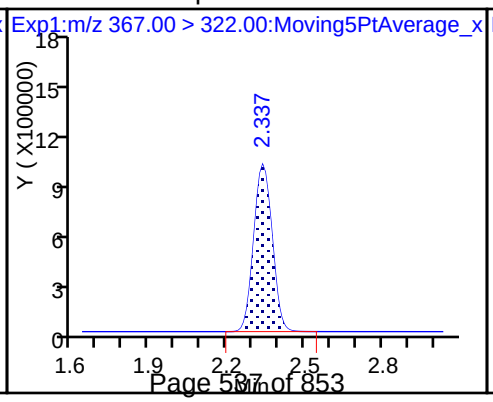
6 Perfluorohexanoic acid



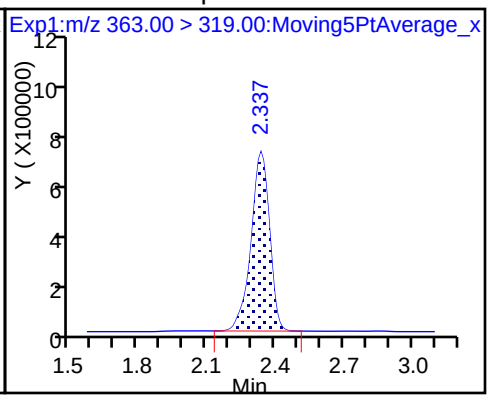
D 7 13C2 PFHxA



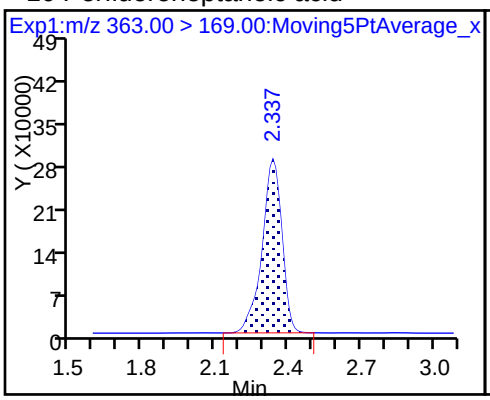
D 9 13C4-PFHpA



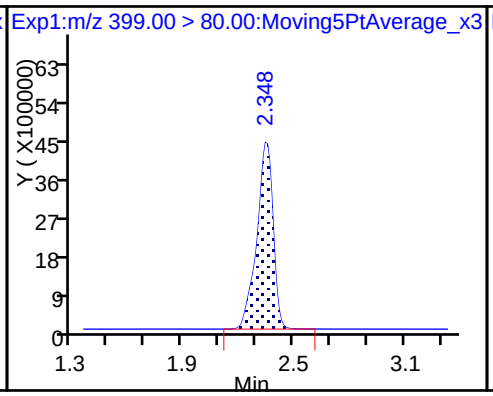
10 Perfluoroheptanoic acid



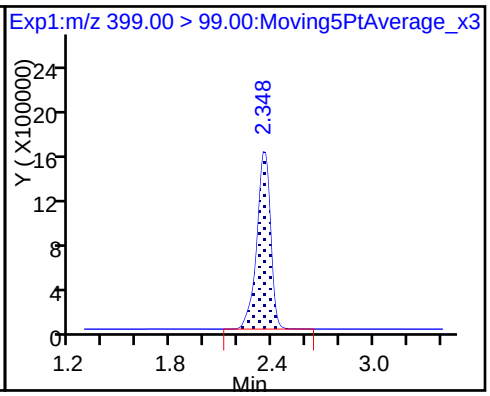
10 Perfluoroheptanoic acid



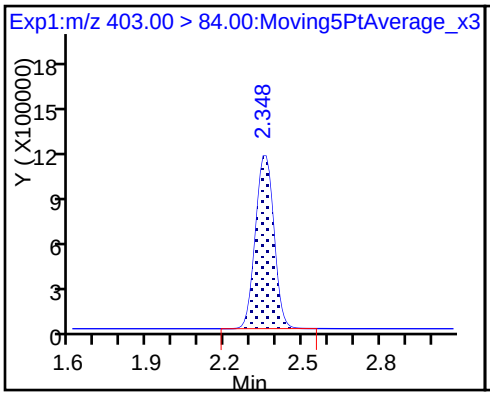
8 Perfluorohexanesulfonic acid



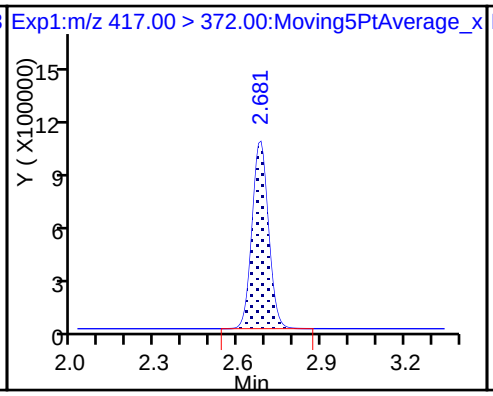
8 Perfluorohexanesulfonic acid



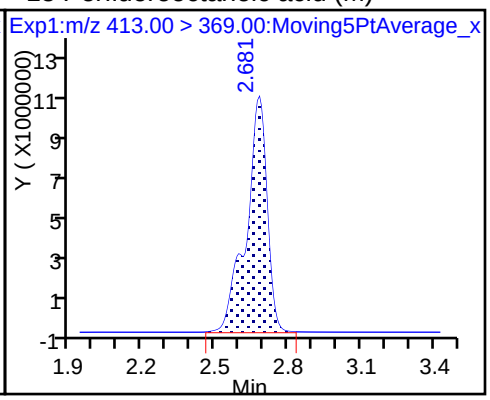
D 11 18O2 PFHxS



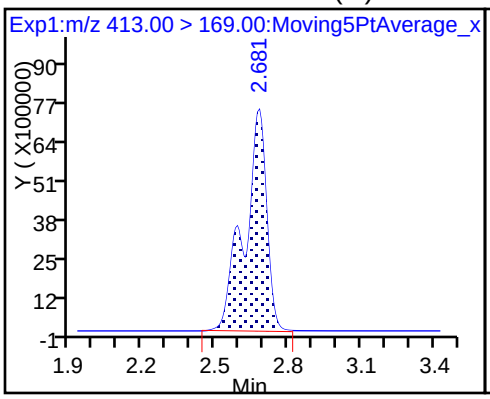
D 14 13C4 PFOA



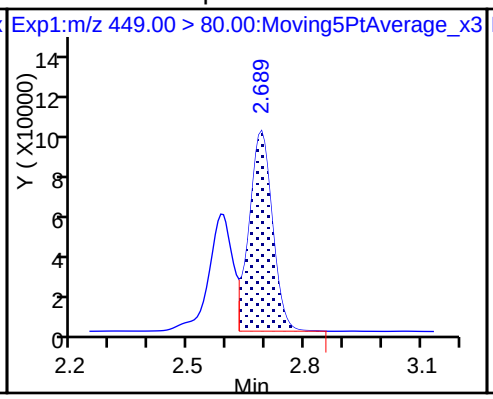
15 Perfluorooctanoic acid (M)



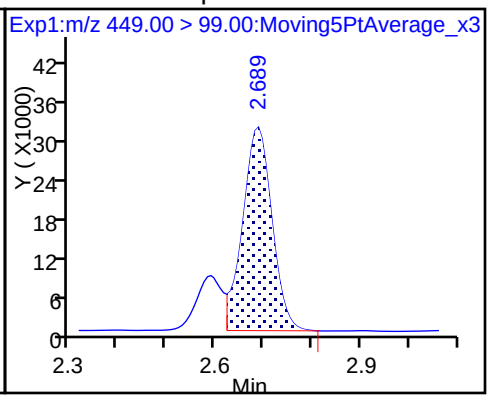
15 Perfluorooctanoic acid (M)



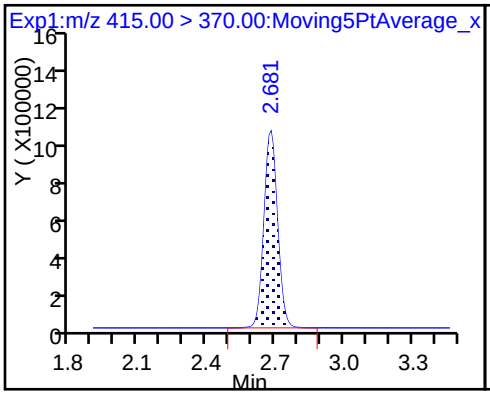
16 Perfluoroheptanesulfonic Acid



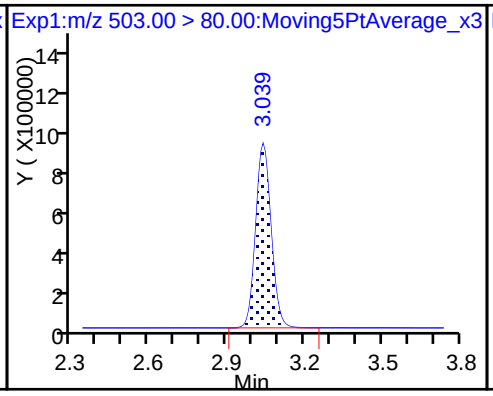
16 Perfluoroheptanesulfonic Acid



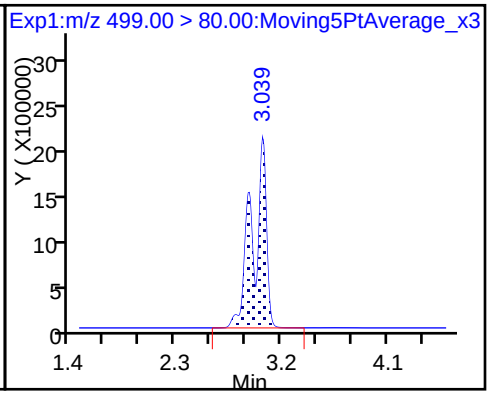
* 62 13C2-PFOA



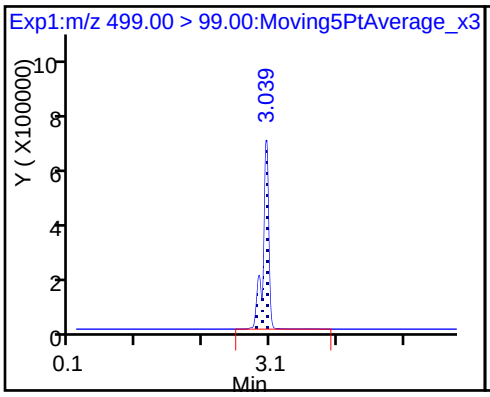
D 18 13C4 PFOS



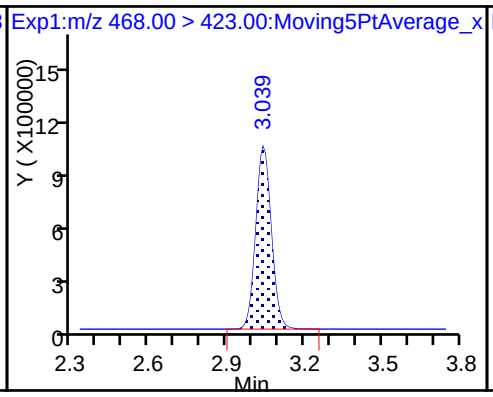
17 Perfluorooctane sulfonic acid



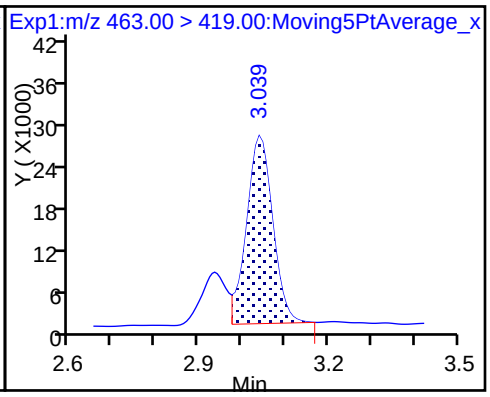
17 Perfluorooctane sulfonic acid



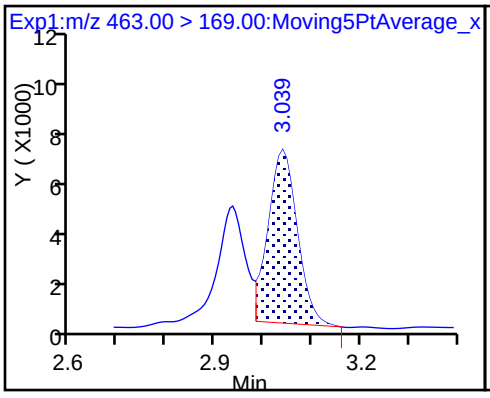
D 19 13C5 PFNA



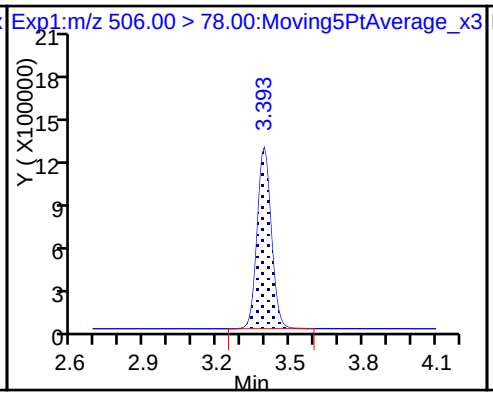
20 Perfluorononanoic acid



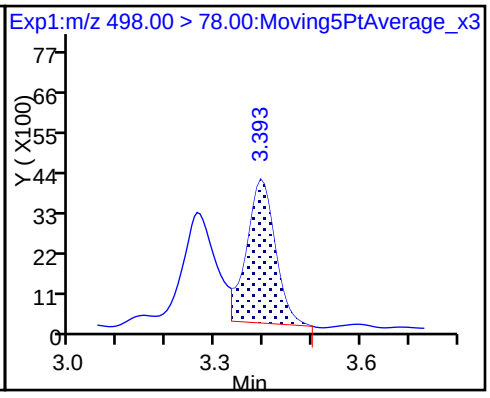
20 Perfluorononanoic acid



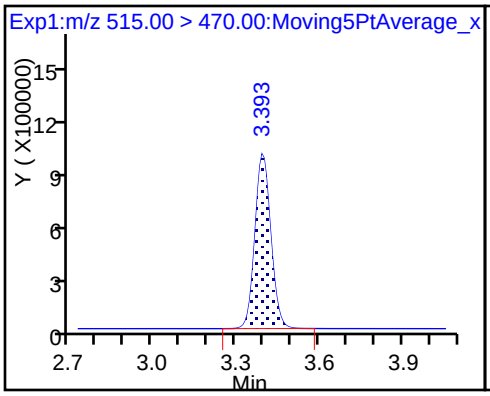
D 21 13C8 FOSA



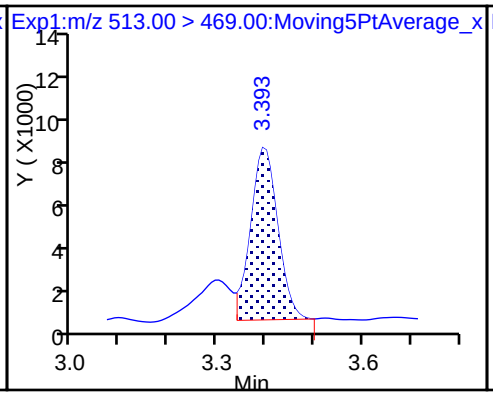
22 Perfluorooctane Sulfonamide



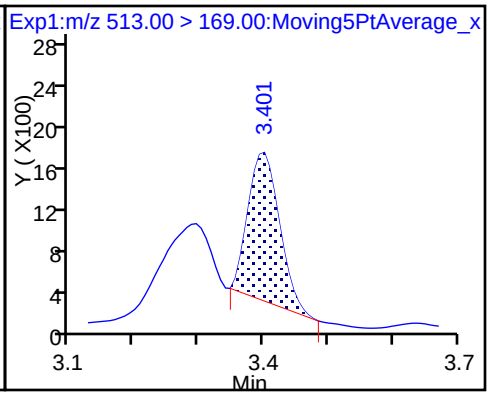
D 23 13C2 PFDA



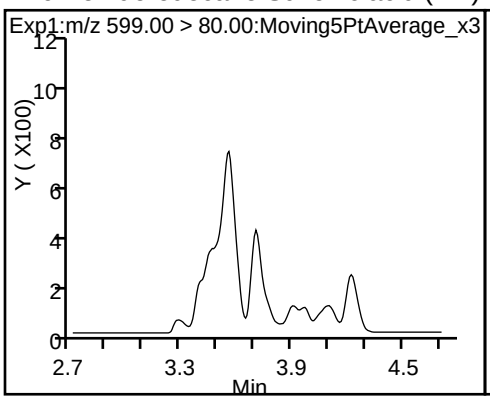
24 Perfluorodecanoic acid



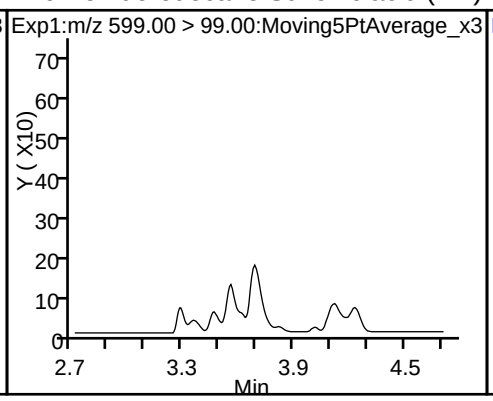
24 Perfluorodecanoic acid



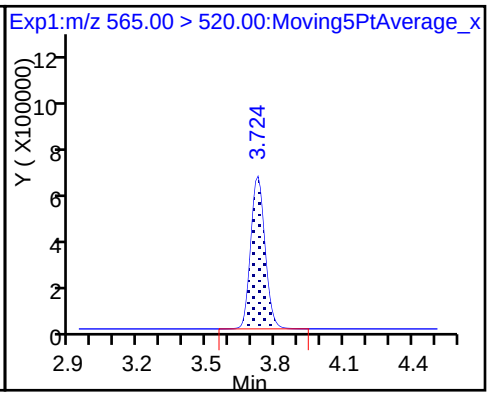
29 Perfluorodecane Sulfonic acid (ND)



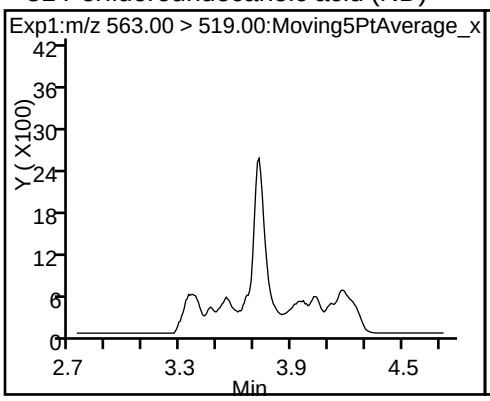
29 Perfluorodecane Sulfonic acid (ND)



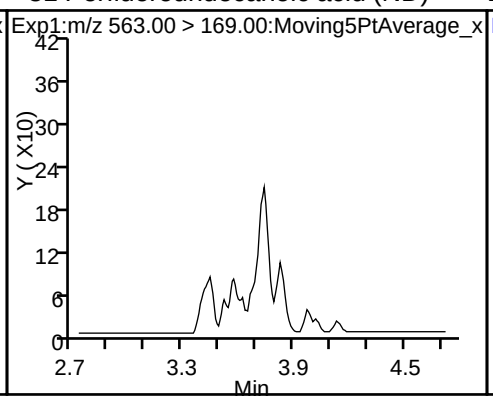
D 30 13C2 PFUnA



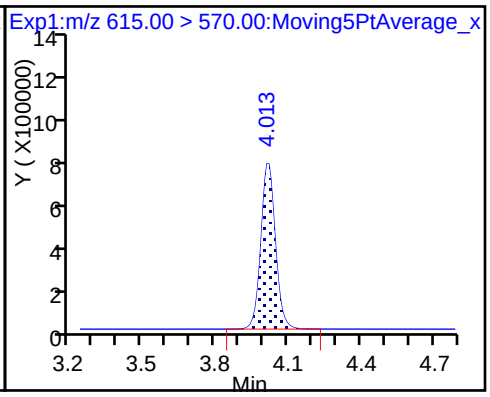
31 Perfluoroundecanoic acid (ND)



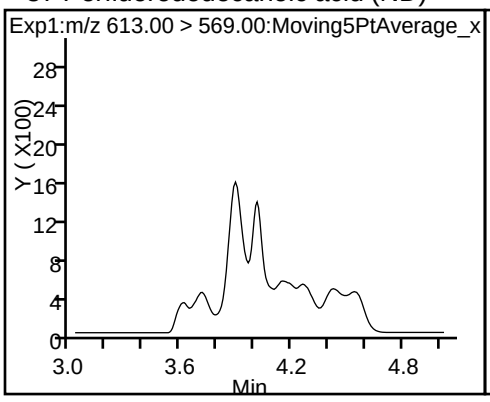
31 Perfluoroundecanoic acid (ND)



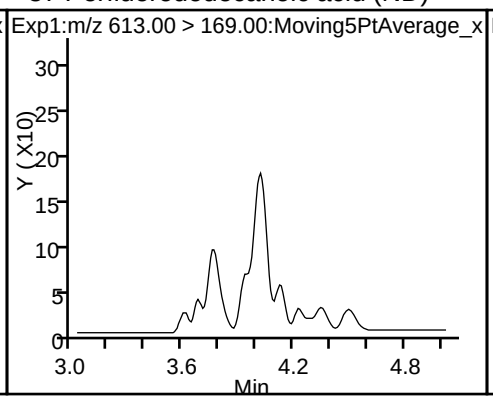
D 36 13C2 PFDoA



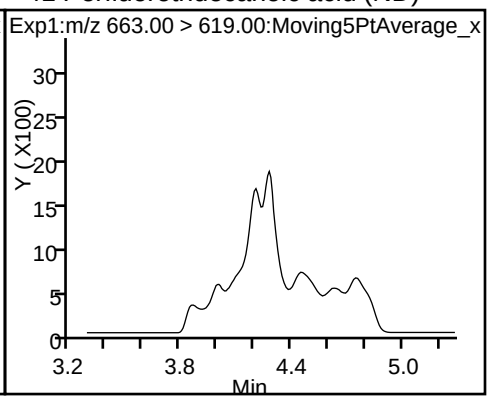
37 Perfluorododecanoic acid (ND)



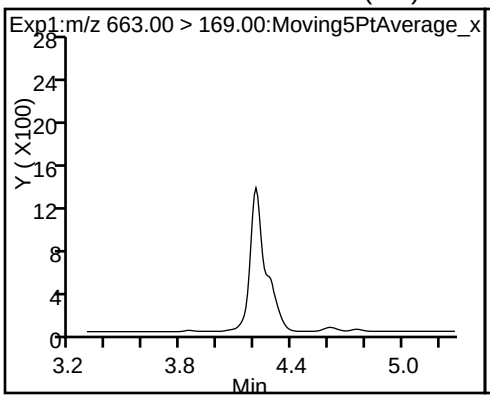
37 Perfluorododecanoic acid (ND)



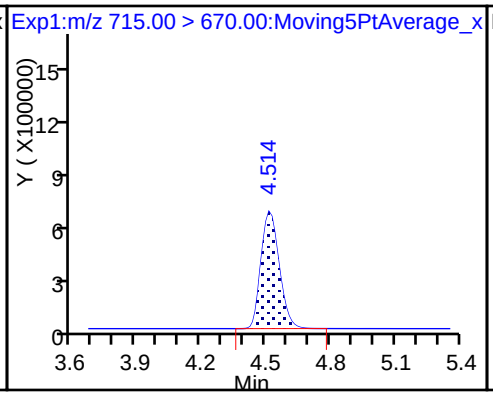
41 Perfluorotridecanoic acid (ND)



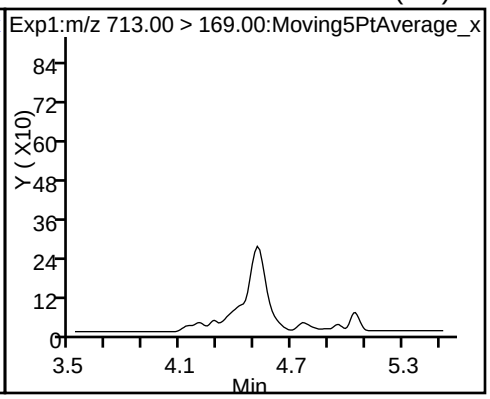
41 Perfluorotridecanoic acid (ND)



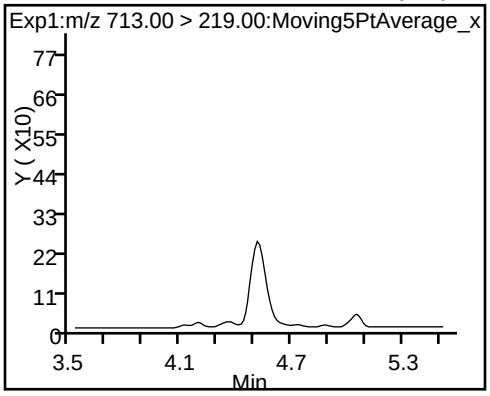
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_021.d				
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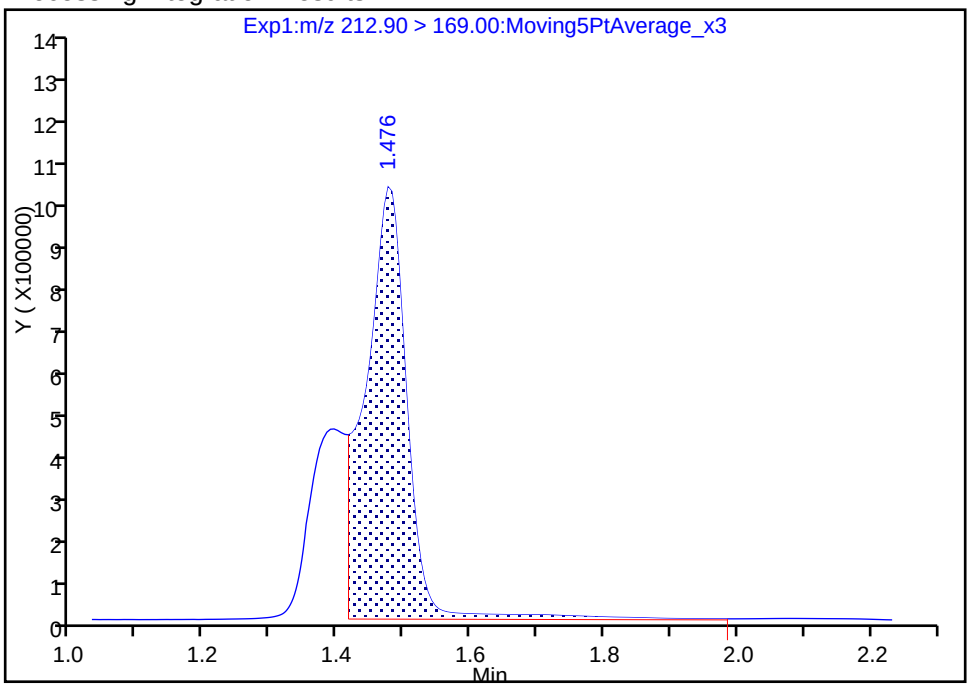
Lims ID:	320-33221-A-1-A	Lab Sample ID:	320-33221-1		
Client ID:	TP-PFC-023-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	20	Worklist Smp#:	21
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

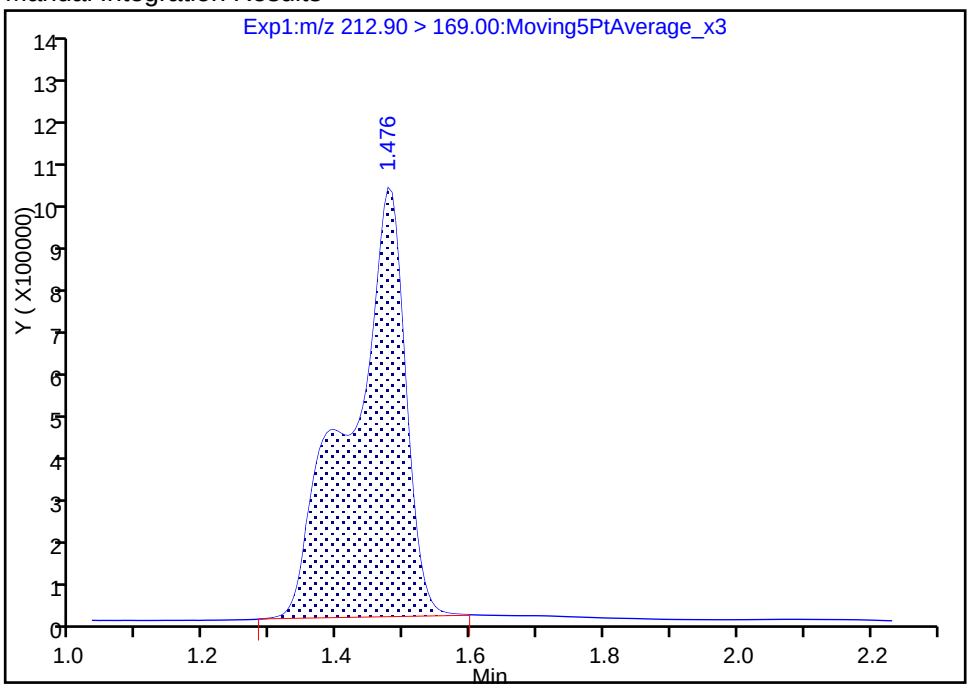
Processing Integration Results

RT: 1.48
Area: 4204562
Amount: 1.656978
Amount Units: ng/ml



Manual Integration Results

RT: 1.48
Area: 5550360
Amount: 2.187344
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:12:54

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_021.d				
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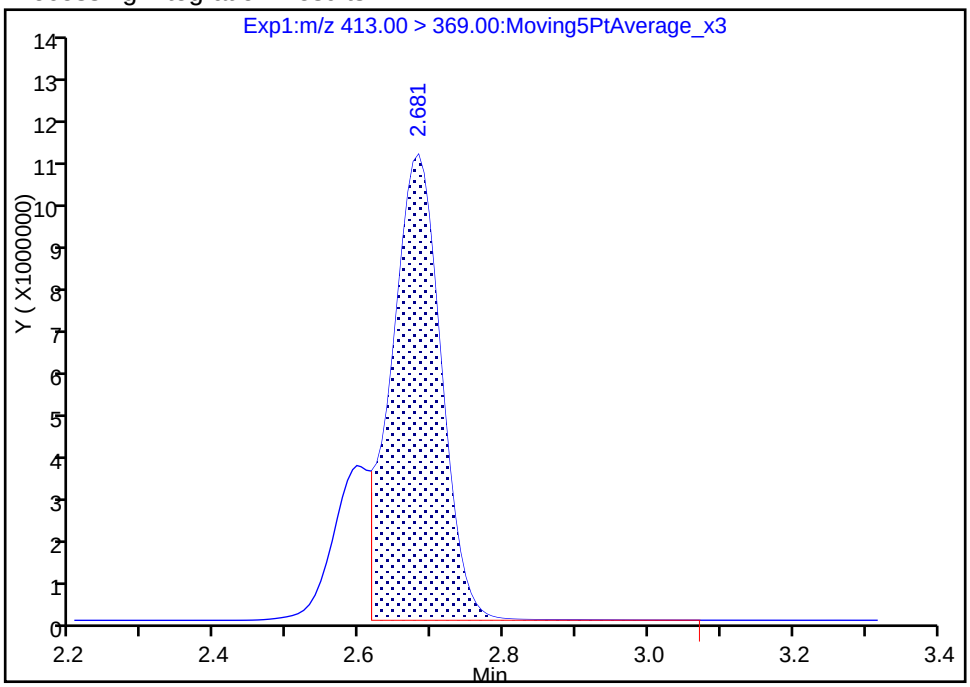
Lims ID:	320-33221-A-1-A	Lab Sample ID:	320-33221-1		
Client ID:	TP-PFC-023-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	20	Worklist Smp#:	21
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

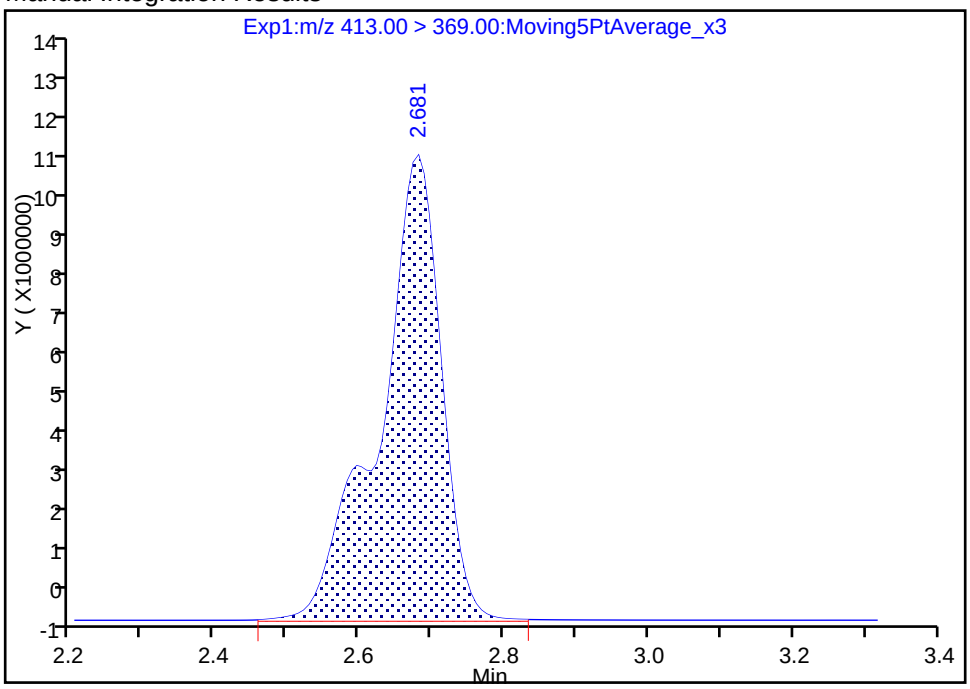
Processing Integration Results

RT: 2.68
Area: 52543744
Amount: 30.243036
Amount Units: ng/ml



Manual Integration Results

RT: 2.68
Area: 65896253
Amount: 37.928450
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:10:50
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

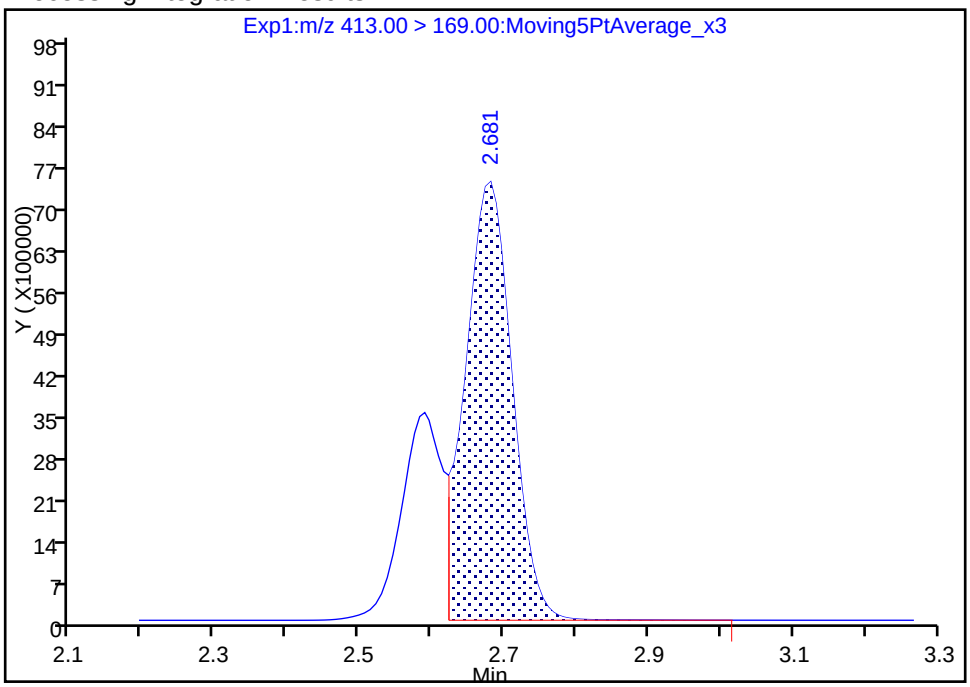
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_021.d				
Injection Date:	18-Nov-2017 19:25:10	Instrument ID:	A8_N		
Lims ID:	320-33221-A-1-A	Lab Sample ID:	320-33221-1		
Client ID:	TP-PFC-023-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	20	Worklist Smp#:	21
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

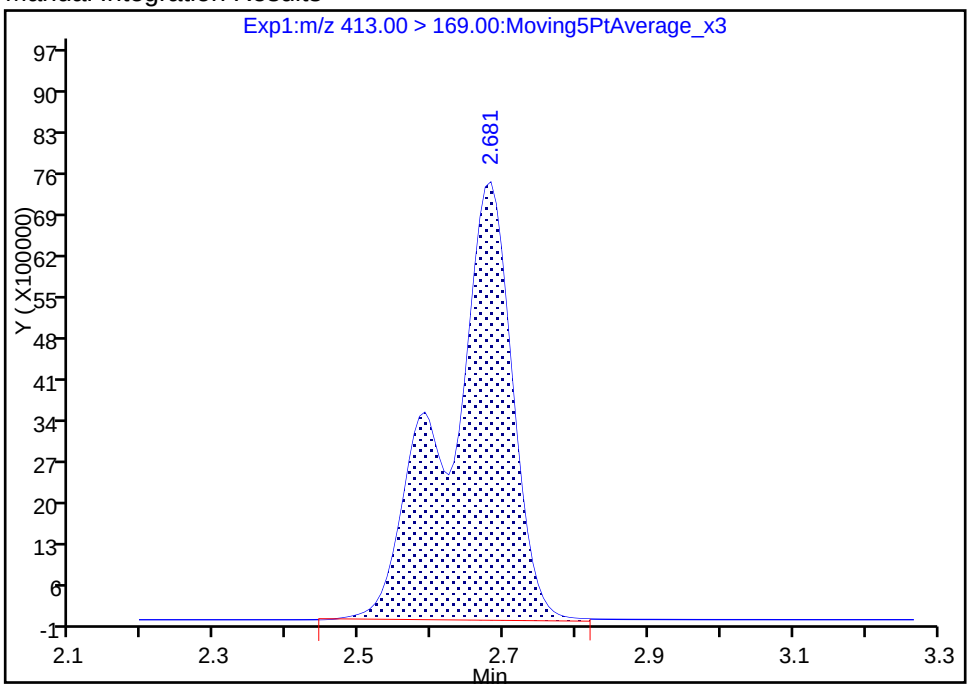
Processing Integration Results

RT: 2.68
Area: 32955590
Amount: 30.243036
Amount Units: ng/ml



Manual Integration Results

RT: 2.68
Area: 46765635
Amount: 37.928450
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:10:56

Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento

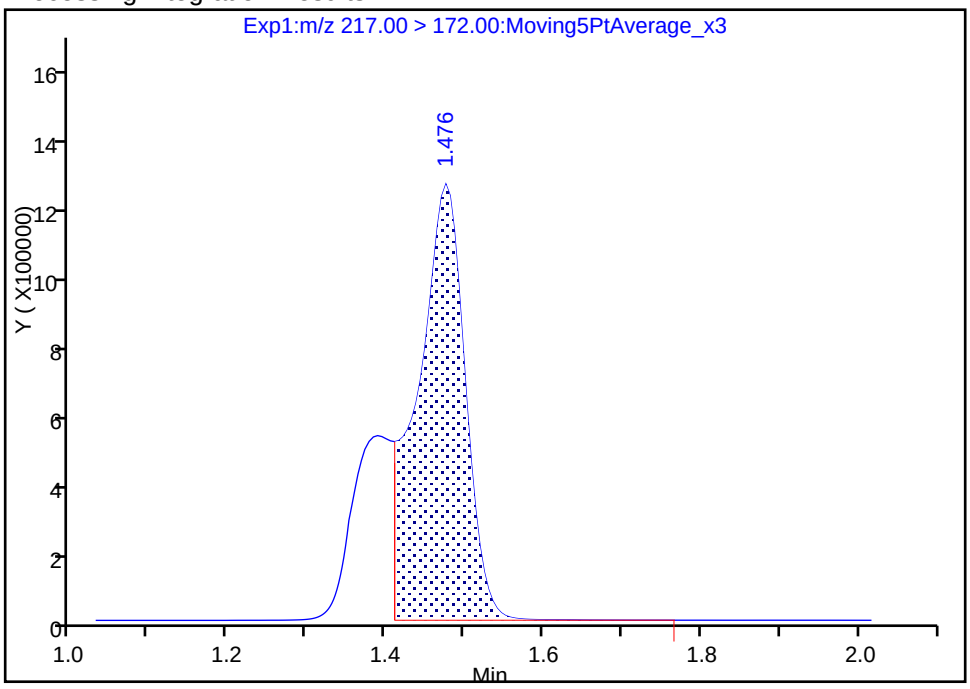
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_021.d
Injection Date: 18-Nov-2017 19:25:10 Instrument ID: A8_N
Lims ID: 320-33221-A-1-A Lab Sample ID: 320-33221-1
Client ID: TP-PFC-023-TPI
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

D 1 13C4 PFBA, CAS: STL00992

Signal: 1

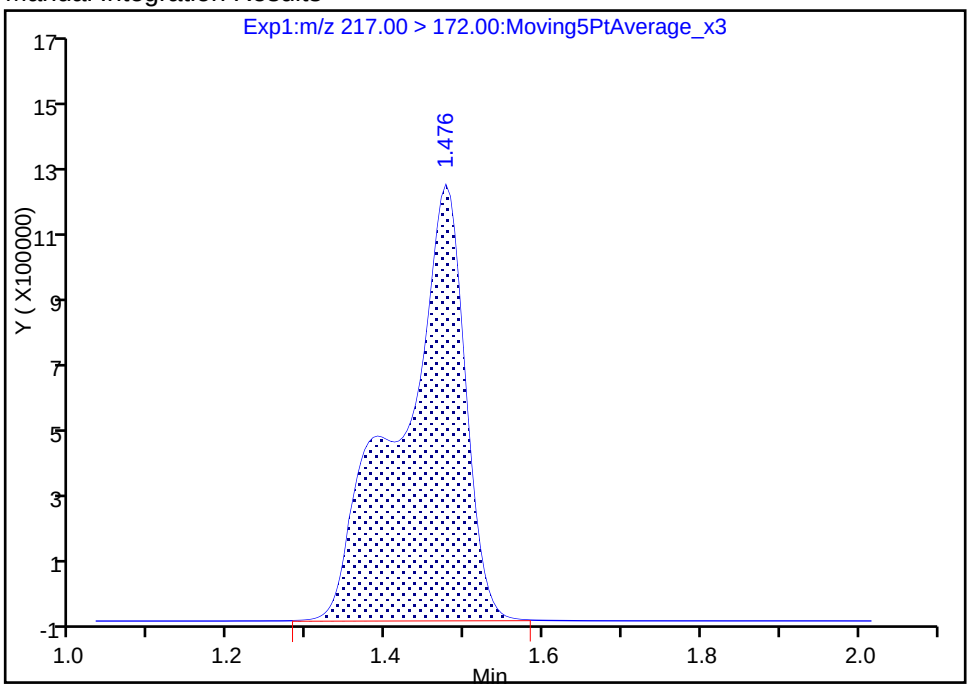
Processing Integration Results

RT: 1.48
Area: 5098154
Amount: 2.296255
Amount Units: ng/ml



Manual Integration Results

RT: 1.48
Area: 6928981
Amount: 3.120877
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:12:38
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-TPI DL | Lab Sample ID: 320-33221-1 DL

Matrix: Water | Lab File ID: 2017.11.24LLA_011.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 11:50

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 291.9(mL) | Date Analyzed: 11/24/2017 15:04

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 5

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 196712 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	*Perfluorobutanoic acid (PFBA)*	*75*	*D*	*8.6*	4.3	*1.5*
2706-90-3	*Perfluoropentanoic acid (PFPeA)*	*200*	*D*	*8.6*	4.3	*2.1*
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*370*	*D*	*17*	8.6	*2.5*
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*70*	*D*	*8.6*	4.3	*1.1*
335-67-1	Perfluorooctanoic acid (PFOA)	1800	D M	17	8.6	3.6
375-95-1	*Perfluorononanoic acid (PFNA)*	*2.7*	*J D*	*8.6*	4.3	*1.2*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*4.3*	*U*	*8.6*	4.3	*1.3*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*13*	*U*	*17*	13	*4.7*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*8.6*	*U*	*17*	8.6	*2.4*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*13*	*U*	*17*	13	*5.6*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*4.3*	*U*	*8.6*	4.3	*1.2*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*93*	*D*	*8.6*	4.3	*1.3*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*390*	*D*	*8.6*	4.3	*1.3*
375-92-8	*Perfluoroheptanesulfonic Acid (PFHpS)*	*7.9*	*J D*	*8.6*	4.3	*1.3*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*340*	*D*	*17*	8.6	*2.3*
335-77-3	*Perfluorodecanesulfonic acid (PFDS)*	*4.3*	*U*	*8.6*	4.3	*1.4*
754-91-6	*Perfluorooctane Sulfonamide (FOSA)*	*4.3*	*U*	*8.6*	4.3	*1.5*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-TPI DL | Lab Sample ID: 320-33221-1 DL

Matrix: Water | Lab File ID: 2017.11.24LLA_011.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 11:50

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 291.9(mL) | Date Analyzed: 11/24/2017 15:04

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 5

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 196712 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	101		25-150
STL00992	13C4 PFBA	107		25-150
STL00993	13C2 PFHxA	101		25-150
STL00990	13C4 PFOA	89		25-150
STL00995	13C5 PFNA	101		25-150
STL00996	13C2 PFDA	102		25-150
STL00997	13C2 PFUnA	100		25-150
STL00998	13C2 PFDoA	95		25-150
STL00994	18O2 PFHxS	109		25-150
STL00991	13C4 PFOS	106		25-150
STL02116	13C2-PFTeDA	93		25-150
STL01892	13C4-PFHpA	103		25-150
STL01893	13C5 PFPeA	105		25-150
STL02337	13C3-PFBS	113		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50938.b\2017.11.24LLA_011.d
Lims ID: 320-33221-A-1-A
Client ID: TP-PFC-023-TPI
Sample Type: Client
Inject. Date: 24-Nov-2017 15:04:38 ALS Bottle#: 2 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 5.0000
Sample Info: 320-33221-a-1-a 5X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50938.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 27-Nov-2017 15:12:18 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 27-Nov-2017 15:12:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.490	1.485	0.005	0.551	1521266	0.5364		107	9409	
2 Perfluorobutyric acid										
212.90 > 169.00	1.490	1.485	0.005	1.000	1213979	0.4358			170	
D 3 13C5-PFPeA										
267.90 > 223.00	1.754	1.755	-0.001	0.648	946464	0.5270		105	9612	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.754	1.755	-0.001	1.000	2525141	1.18			1101	
D 47 13C3-PFBS										
301.90 > 83.00	1.795	1.788	0.007	0.663	20667	0.5266		113	579	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.795	1.796	-0.001	1.000	1784081	0.5401			1021	
298.90 > 99.00	1.795	1.796	-0.001	1.000	756647		2.36(1.74-3.24)		887	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.034	2.035	-0.001	1.000	4413589	2.15			5827	
313.00 > 119.00	2.034	2.035	-0.001	1.000	347862		12.69(7.05-13.09)		3895	
D 7 13C2 PFHxA										
315.00 > 270.00	2.034	2.035	-0.001	0.752	1027744	0.5069		101	11536	
D 9 13C4-PFHpA										
367.00 > 322.00	2.352	2.354	-0.002	0.869	1007221	0.5143		103	14368	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.352	2.354	-0.002	1.000	839830	0.4067			1084	
363.00 > 169.00	2.352	2.354	-0.002	1.000	338619		2.48(1.59-2.95)		2063	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.373	2.375	-0.002	1.000	6269509	2.28			14190	
399.00 > 99.00	2.373	2.375	-0.002	1.000	1979817		3.17(2.10-3.89)		8340	
D 11 18O2 PFHxS										
403.00 > 84.00	2.373	2.375	-0.002	0.877	1187456	0.5138		109	18982	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFOA										
417.00 > 372.00	2.705	2.707	-0.002	1.000	997971	0.4444		88.9	16319	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.705	2.707	-0.002	1.000	21697681	10.3			7596	
413.00 > 169.00	2.705	2.707	-0.002	1.000	13088022		1.66(1.18-2.19)		21299	M
* 62 13C2-PFOA										
415.00 > 370.00	2.705	2.707	-0.002		1089737	0.5000			20534	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.713	2.714	-0.001	1.000	98173	0.0459			122	
449.00 > 99.00	2.705	2.714	-0.009	0.997	28748		3.41(2.72-5.05)		192	
D 18 13C4 PFOS										
503.00 > 80.00	3.072	3.074	-0.002	1.135	780927	0.5061		106	7225	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.072	3.074	-0.002	1.000	3372471	1.97			512	
499.00 > 99.00	3.072	3.074	-0.002	1.000	769489		4.38(3.24-6.01)		834	
D 19 13C5 PFNA										
468.00 > 423.00	3.072	3.074	-0.002	1.135	837199	0.5074		101	15823	
20 Perfluorononanoic acid										R
463.00 > 419.00	3.072	3.082	-0.010	1.000	26590	0.0159			43.9	R
463.00 > 169.00	3.072	3.082	-0.010	1.000	5203		5.11(2.65-4.93)		96.9	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.418	3.411	0.007	1.000	5910	0.003070			56.4	
D 21 13C8 FOSA										
506.00 > 78.00	3.418	3.411	0.007	1.263	1002087	0.5041		101	15010	
D 23 13C2 PFDA										
515.00 > 470.00	3.433	3.434	-0.001	1.269	709655	0.5099		102	14105	
D 30 13C2 PFUnA										
565.00 > 520.00	3.760	3.769	-0.009	1.390	554814	0.4991		99.8	9693	
D 36 13C2 PFDoA										
615.00 > 570.00	4.054	4.062	-0.008	1.498	613000	0.4749		95.0	11100	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.556	4.570	-0.014	1.684	738130	0.4651		93.0	7830	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 27-Nov-2017 15:12:22 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50938.b\2017.11.24LLA_011.d

Injection Date: 24-Nov-2017 15:04:38 Instrument ID: A8_N

Lims ID: 320-33221-A-1-A Lab Sample ID: 320-33221-1

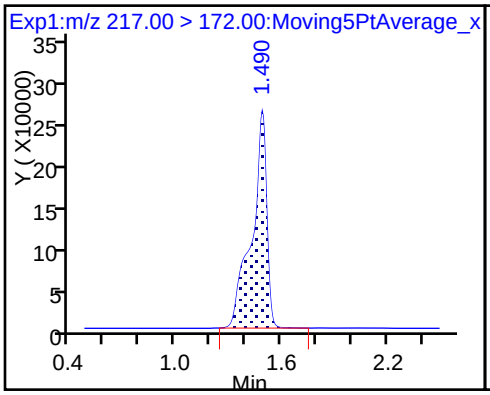
Client ID: TP-PFC-023-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 2

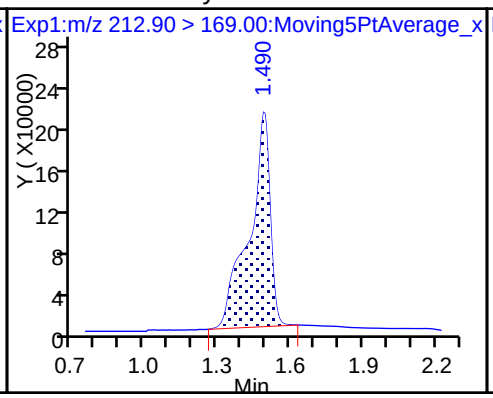
Injection Vol: 2.0 ul Dil. Factor: 5.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

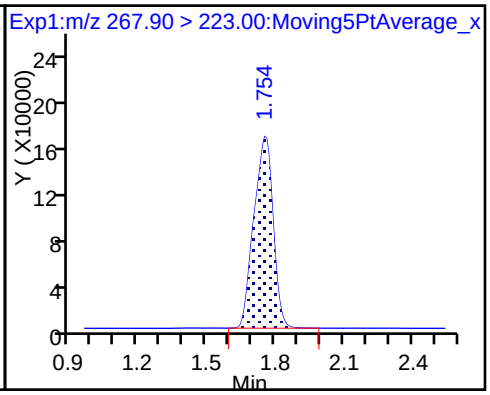
D 1 13C4 PFBA



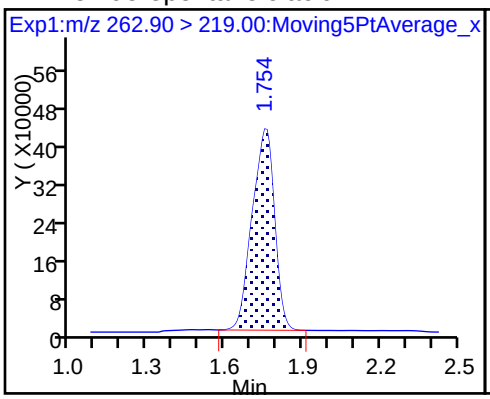
2 Perfluorobutyric acid



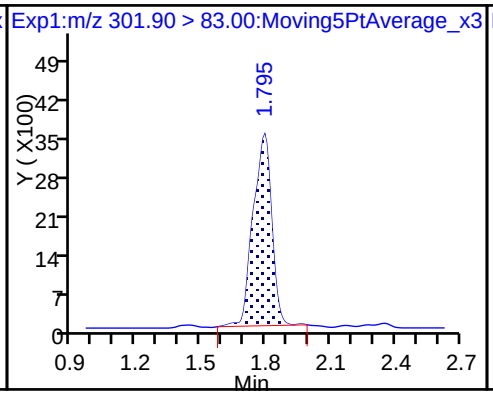
D 3 13C5-PFPeA



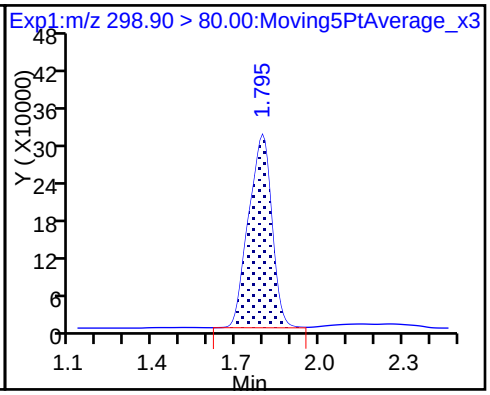
4 Perfluoropentanoic acid



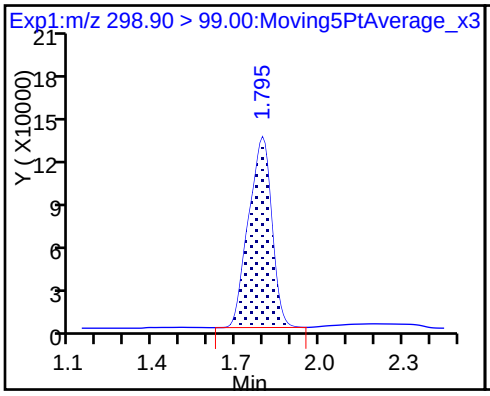
D 47 13C3-PFBS



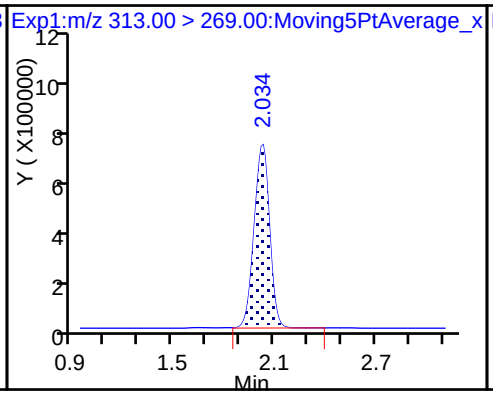
5 Perfluorobutanesulfonic acid



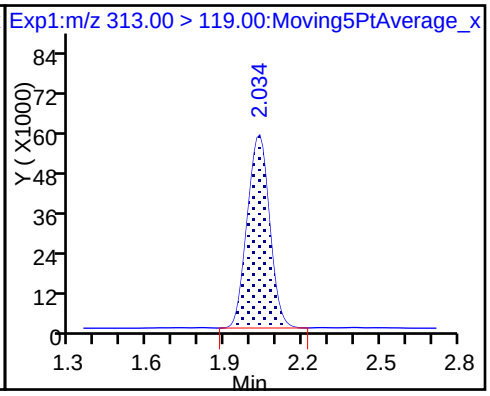
5 Perfluorobutanesulfonic acid



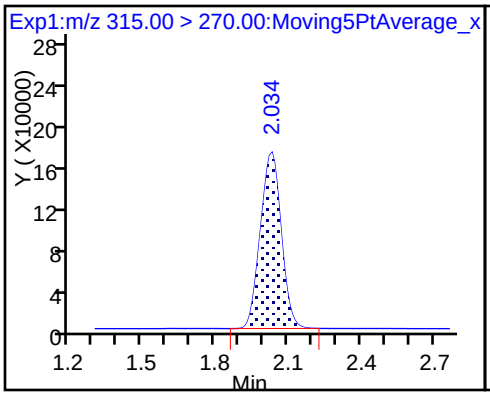
6 Perfluorohexanoic acid



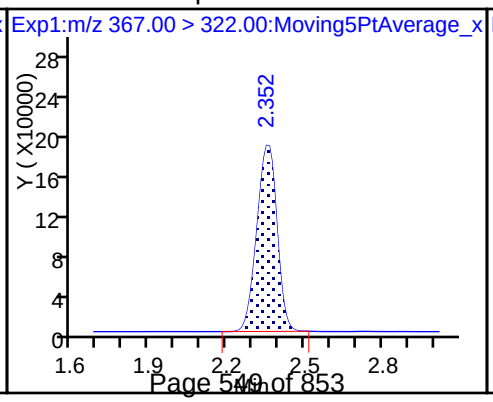
6 Perfluorohexanoic acid



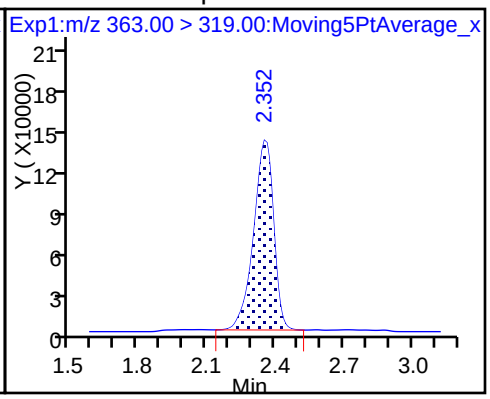
D 7 13C2 PFHxA



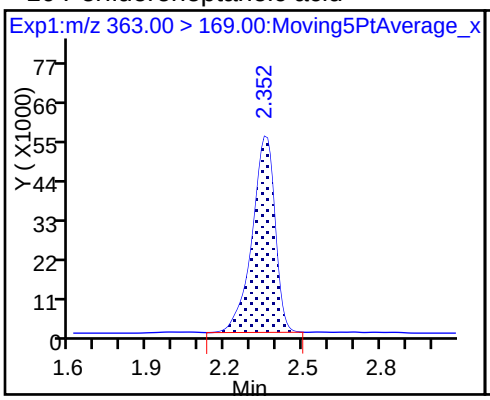
D 9 13C4-PFHpA



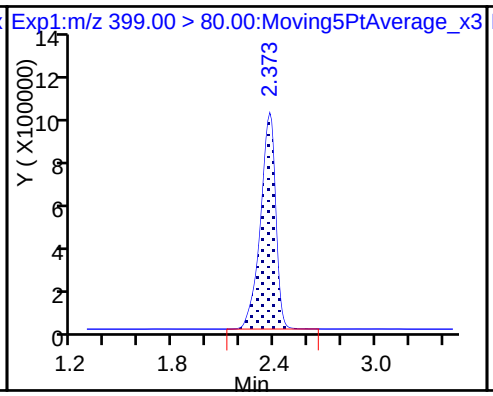
10 Perfluoroheptanoic acid



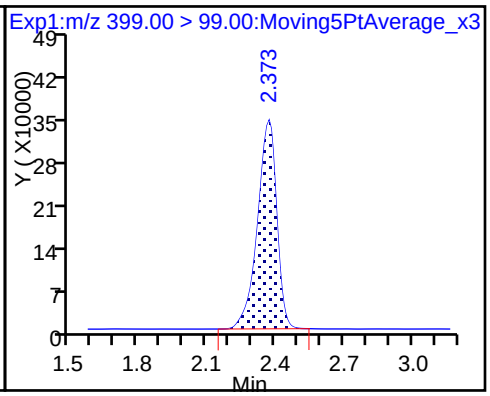
10 Perfluoroheptanoic acid



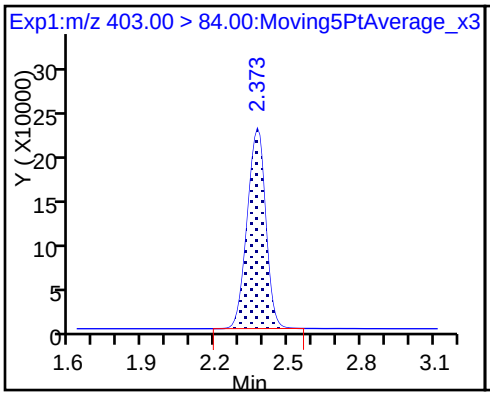
8 Perfluorohexanesulfonic acid



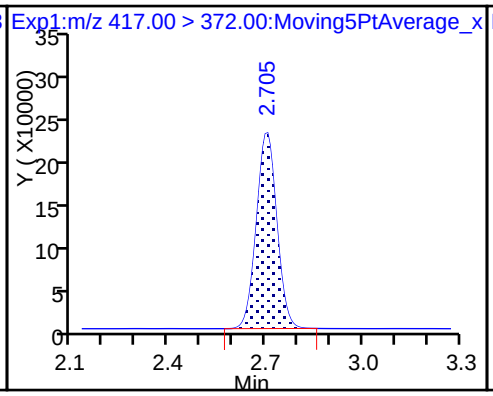
8 Perfluorohexanesulfonic acid



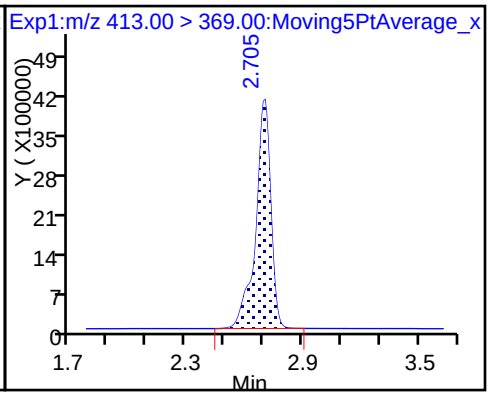
D 11 18O2 PFHxS



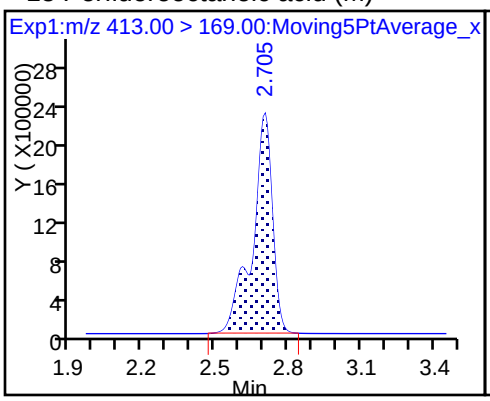
D 14 13C4 PFOA



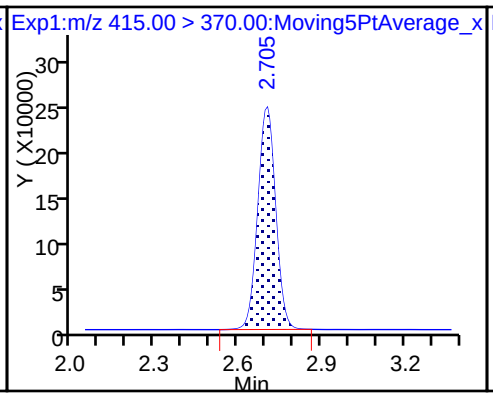
15 Perfluorooctanoic acid



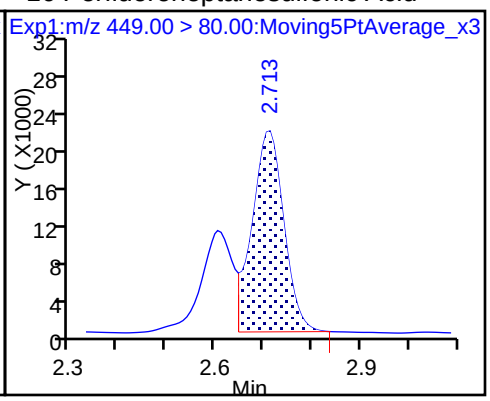
15 Perfluorooctanoic acid (M)



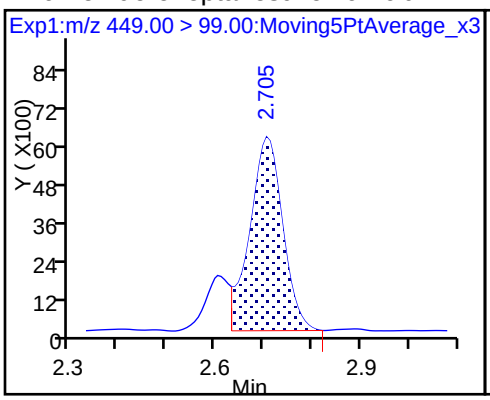
* 62 13C2-PFOA



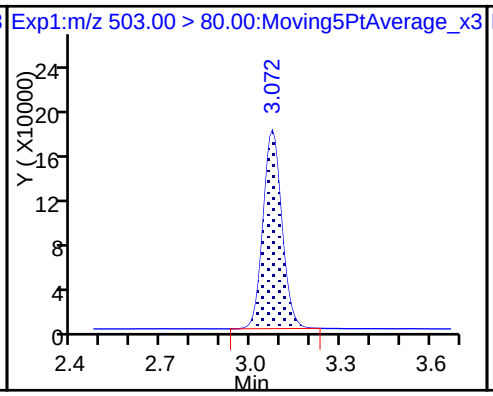
16 Perfluoroheptanesulfonic Acid



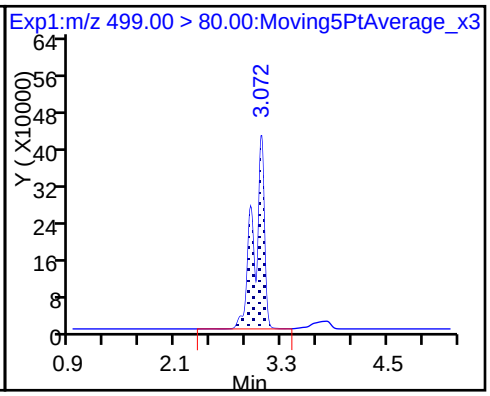
16 Perfluoroheptanesulfonic Acid



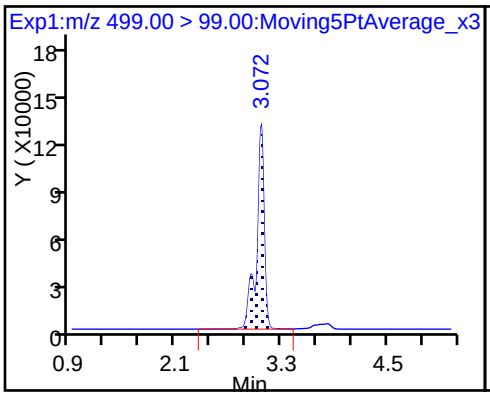
D 18 13C4 PFOS



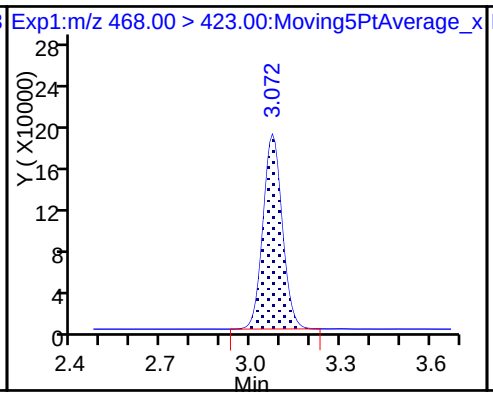
17 Perfluorooctane sulfonic acid



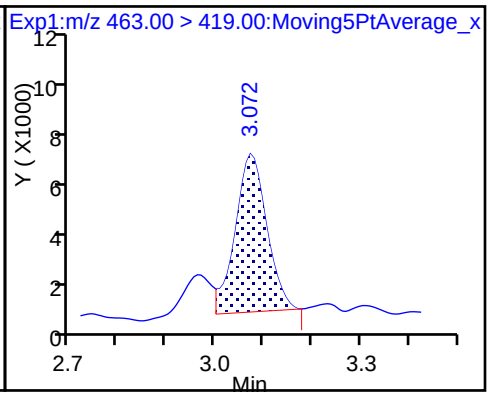
17 Perfluorooctane sulfonic acid



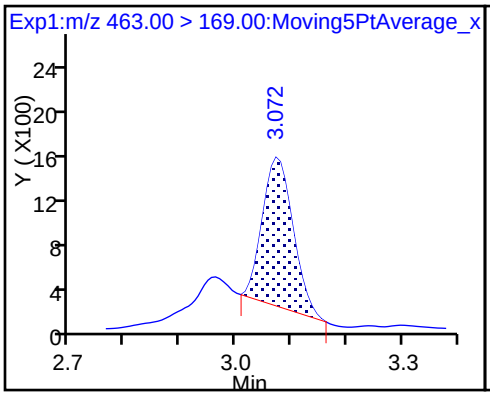
D 19 13C5 PFNA



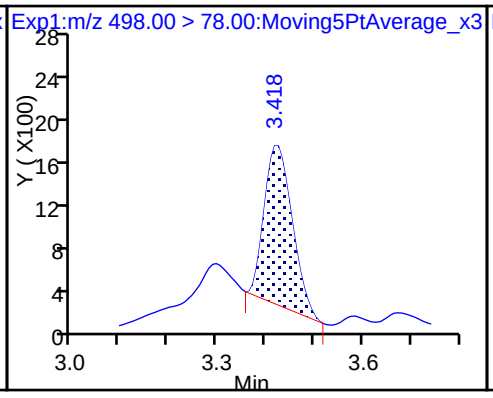
20 Perfluorononanoic acid



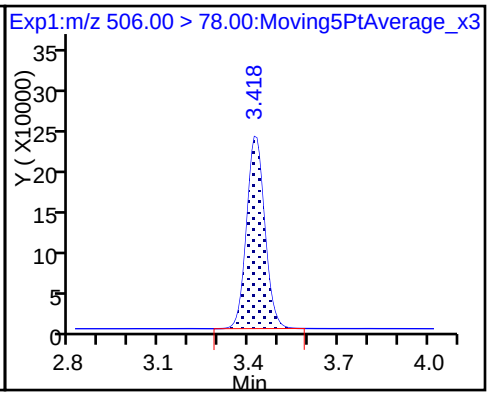
20 Perfluorononanoic acid



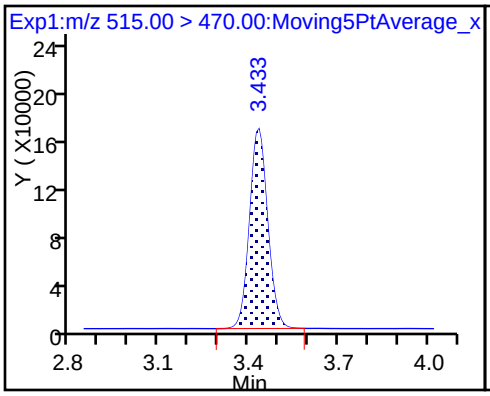
22 Perfluorooctane Sulfonamide



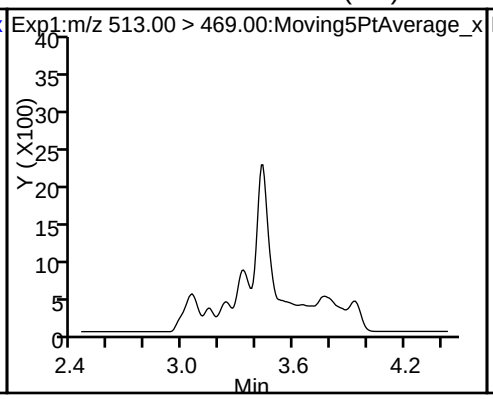
D 21 13C8 FOSA



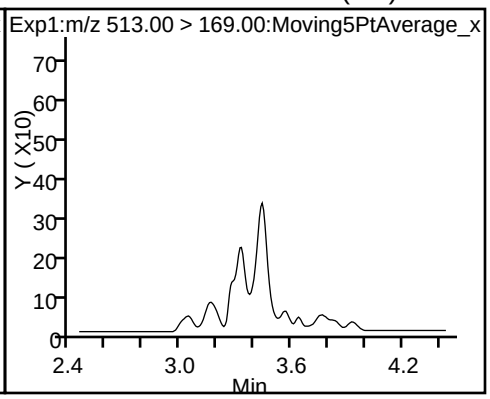
D 23 13C2 PFDA



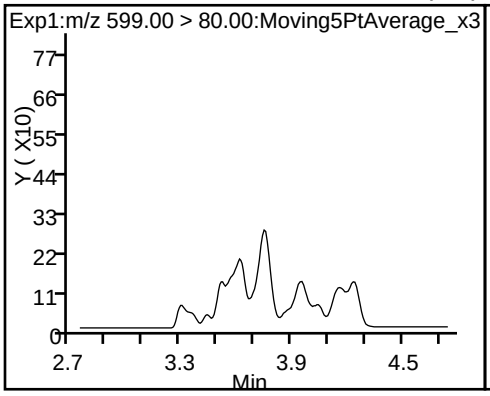
24 Perfluorodecanoic acid (ND)



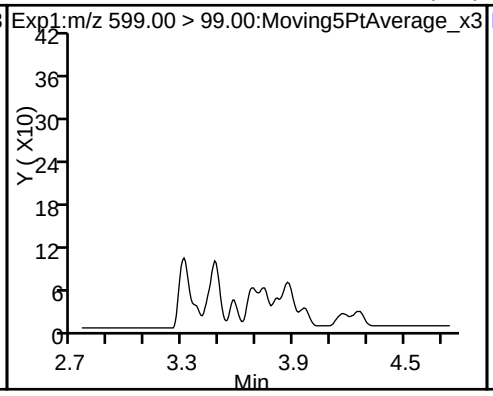
24 Perfluorodecanoic acid (ND)



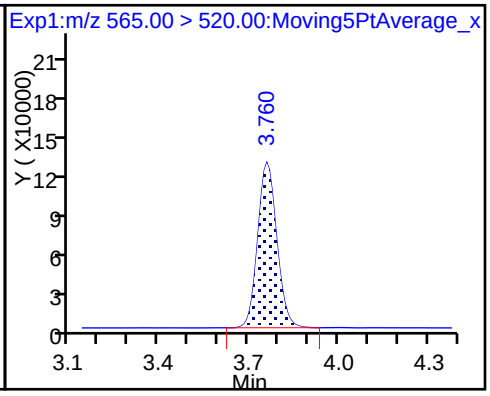
29 Perfluorodecane Sulfonic acid (ND)



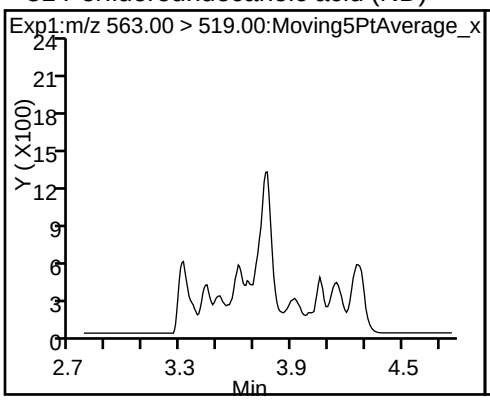
29 Perfluorodecane Sulfonic acid (ND)



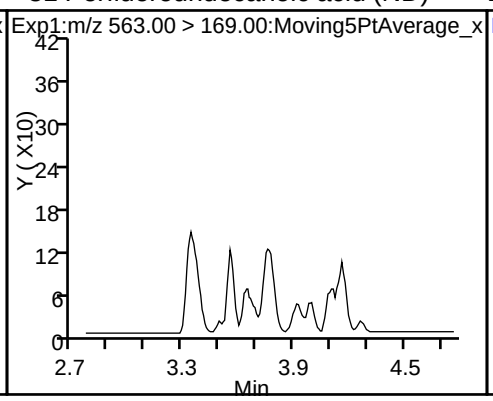
D 30 13C2 PFUnA



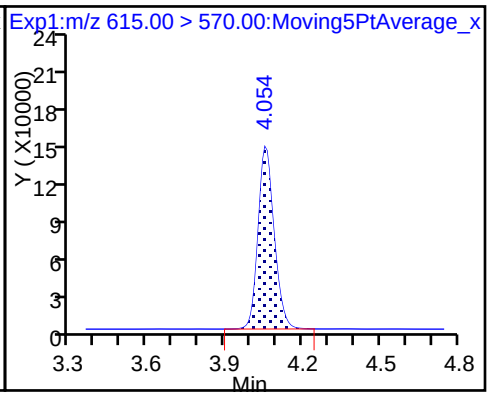
31 Perfluoroundecanoic acid (ND)



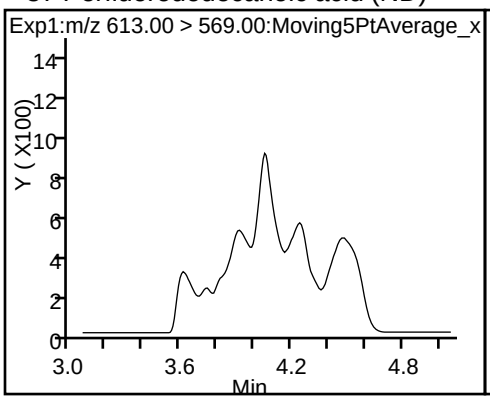
31 Perfluoroundecanoic acid (ND)



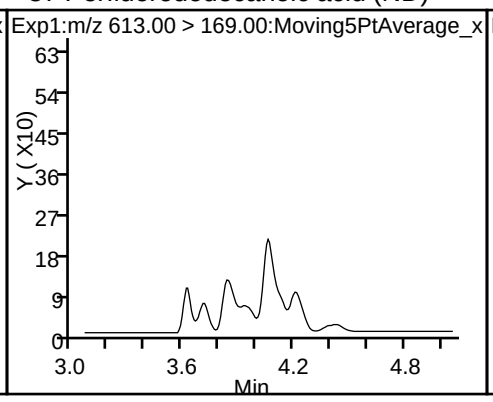
D 36 13C2 PFDoA



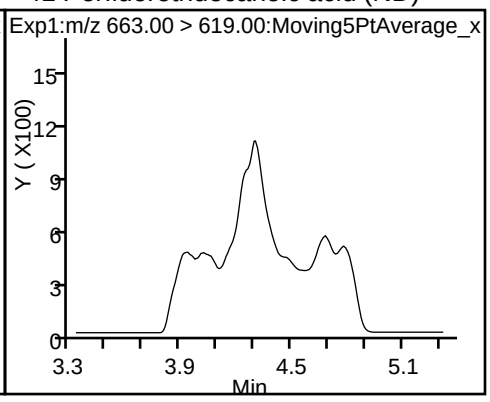
37 Perfluorododecanoic acid (ND)



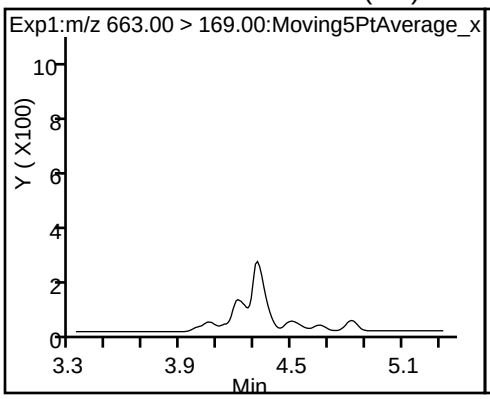
37 Perfluorododecanoic acid (ND)



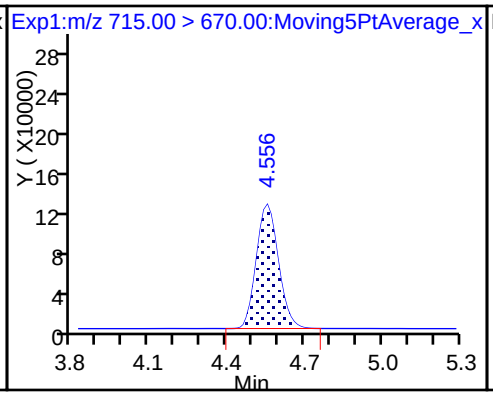
41 Perfluorotridecanoic acid (ND)



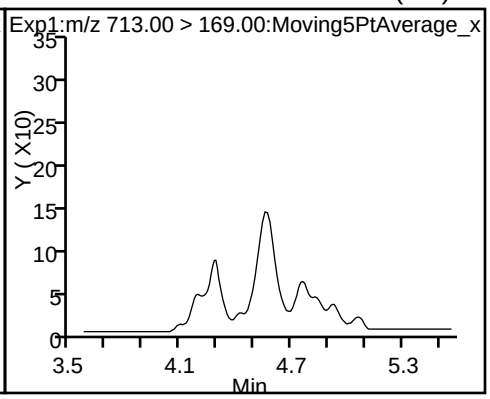
41 Perfluorotridecanoic acid (ND)



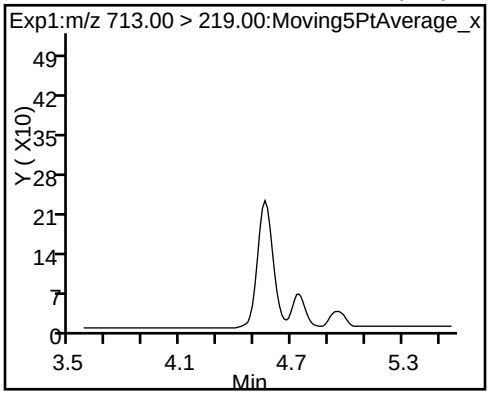
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

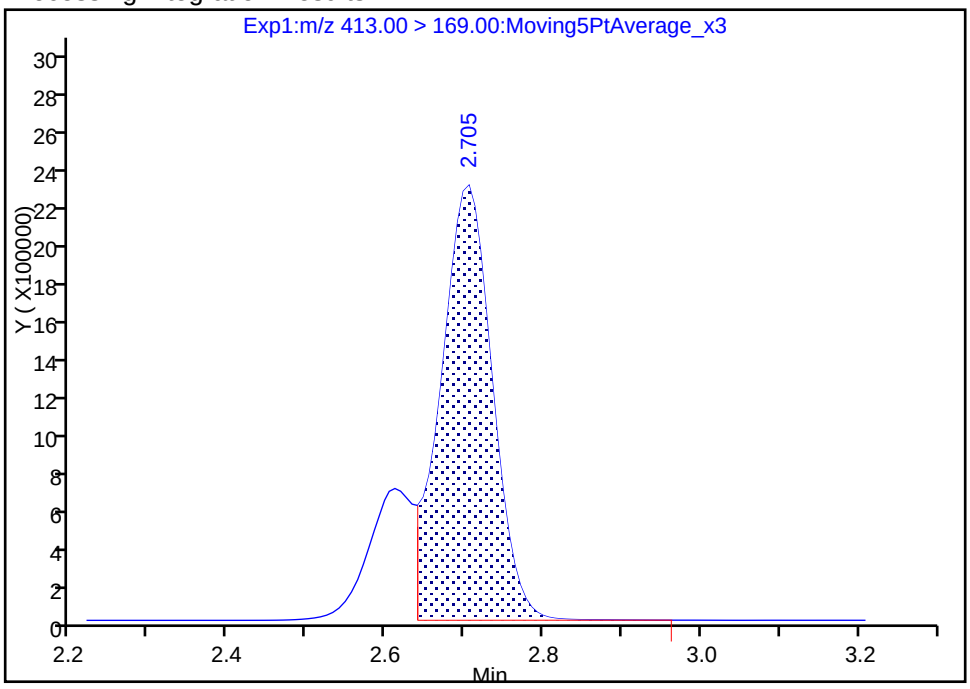
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171127-50938.b\2017.11.24LLA_011.d				
Injection Date:	24-Nov-2017 15:04:38	Instrument ID:	A8_N		
Lims ID:	320-33221-A-1-A	Lab Sample ID:	320-33221-1		
Client ID:	TP-PFC-023-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	2	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	5.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

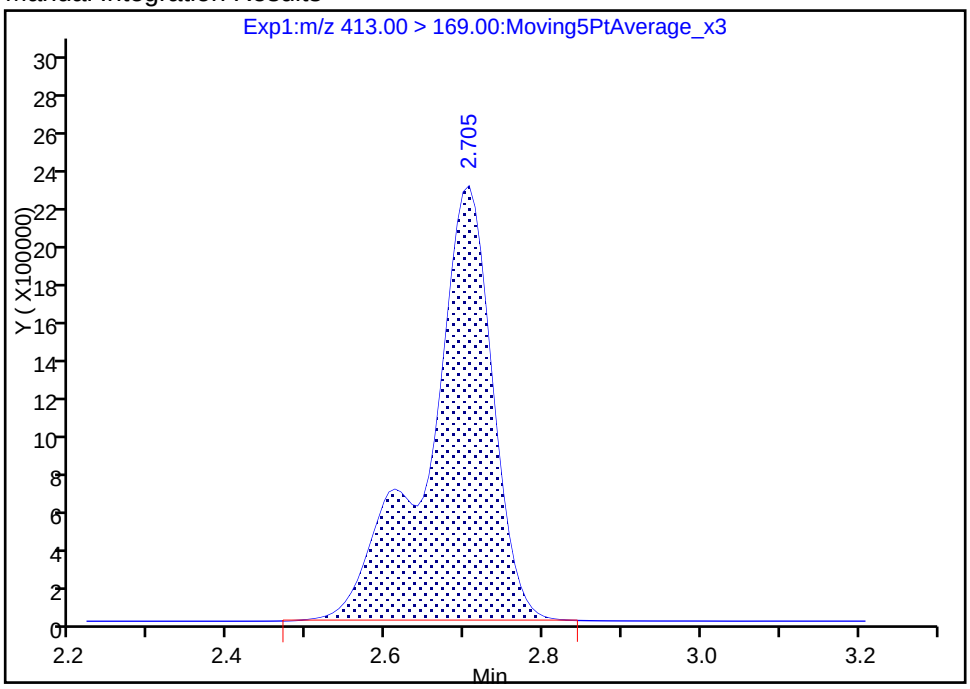
Processing Integration Results

RT: 2.71
Area: 10429859
Amount: 10.305498
Amount Units: ng/ml



Manual Integration Results

RT: 2.71
Area: 13088022
Amount: 10.305498
Amount Units: ng/ml



Reviewer: hannigana, 27-Nov-2017 15:11:30

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-MID-CARBON | Lab Sample ID: 320-33221-2

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_022.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 11:55

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 302.1(mL) | Date Analyzed: 11/18/2017 19:33

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	140	M	1.7	0.83	0.29
2706-90-3	Perfluoropentanoic acid (PFPeA)	79		1.7	0.83	0.41
307-24-4	Perfluorohexanoic acid (PFHxA)	13		3.3	1.7	0.48
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.83	U	1.7	0.83	0.21
335-67-1	Perfluorooctanoic acid (PFOA)	1.2	J M	3.3	1.7	0.70
375-95-1	Perfluorononanoic acid (PFNA)	0.83	U	1.7	0.83	0.22
335-76-2	Perfluorodecanoic acid (PFDA)	0.83	U	1.7	0.83	0.26
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.5	U	3.3	2.5	0.91
307-55-1	Perfluorododecanoic acid (PFDoA)	1.7	U	3.3	1.7	0.46
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.3	2.5	1.1
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.83	U	1.7	0.83	0.24
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.83	U	1.7	0.83	0.25
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.26	J	1.7	0.83	0.25
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.83	U	1.7	0.83	0.25
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.7	U	3.3	1.7	0.45
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.83	U	1.7	0.83	0.26
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.83	U	1.7	0.83	0.29

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-MID-CARBON Lab Sample ID: 320-33221-2

Matrix: Water Lab File ID: 2017.11.18LLAXEA_022.d

Analysis Method: 537 (modified) Date Collected: 11/09/2017 11:55

Extraction Method: 3535 Date Extracted: 11/16/2017 17:39

Sample wt/vol: 302.1(mL) Date Analyzed: 11/18/2017 19:33

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	109		25-150
STL00992	13C4 PFBA	109	M	25-150
STL00993	13C2 PFHxA	111		25-150
STL00990	13C4 PFOA	95		25-150
STL00995	13C5 PFNA	111		25-150
STL00996	13C2 PFDA	110		25-150
STL00997	13C2 PFUnA	110		25-150
STL00998	13C2 PFDoA	104		25-150
STL00994	18O2 PFHxS	116		25-150
STL00991	13C4 PFOS	111		25-150
STL02116	13C2-PFTeDA	104		25-150
STL01892	13C4-PFHpA	112		25-150
STL01893	13C5 PFPeA	109		25-150
STL02337	13C3-PFBS	114		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_022.d
Lims ID: 320-33221-A-2-A
Client ID: TP-PFC-023-MID-CARBON
Sample Type: Client
Inject. Date: 18-Nov-2017 19:33:01 ALS Bottle#: 21 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33221-a-2-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 24-Nov-2017 13:16:40 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK033

First Level Reviewer: hannigana Date: 24-Nov-2017 13:16:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										M
217.00 > 172.00	1.475	1.479	-0.004	0.551	7188909	2.72		109	28508	M
2 Perfluorobutyric acid										M
212.90 > 169.00	1.480	1.480	0.0	1.004	11494152	4.37			1983	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.747	1.738	0.009	0.652	4582233	2.74		109	52420	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.739	1.740	-0.001	0.995	4924286	2.38			2902	
D 47 13C3-PFBS										
301.90 > 83.00	1.788	1.774	0.014	0.668	96843	2.65		114	3781	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.780	1.776	0.004	0.995	13117	0.004237			63.5	
298.90 > 99.00	1.780	1.776	0.004	0.995	6769		1.94(1.74-3.24)		58.2	
6 Perfluorohexanoic acid										R
313.00 > 269.00	2.004	2.010	-0.006	0.990	820260	0.3917			1766	R
313.00 > 119.00	2.025	2.010	0.015	1.000	37239		22.03(7.05-13.09)		451	
D 7 13C2 PFHxA										
315.00 > 270.00	2.025	2.010	0.015	0.756	5232415	2.77		111	49031	
D 9 13C4-PFHpA										
367.00 > 322.00	2.344	2.332	0.012	0.875	5097300	2.79		112	51625	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.355	2.347	0.008	1.000	21497	0.007885			147	
399.00 > 99.00	2.355	2.347	0.008	1.000	7060		3.04(2.10-3.89)		64.5	
D 11 18O2 PFHxS										
403.00 > 84.00	2.355	2.347	0.008	0.879	5887086	2.73		116	45418	
D 14 13C4 PFOA										
417.00 > 372.00	2.679	2.680	-0.001	1.000	4964853	2.37		94.9	48185	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.679	2.680	-0.001	1.000	76692	0.0366			21.3	M
413.00 > 169.00	2.679	2.680	-0.001	1.000	51569		1.49(1.18-2.19)		154	M
* 62 13C2-PFOA										
415.00 > 370.00	2.679	2.695	-0.016		5079260	2.50			60574	
D 18 13C4 PFOS										
503.00 > 80.00	3.043	3.042	0.001	1.136	3819598	2.66		111	32292	
D 19 13C5 PFNA										
468.00 > 423.00	3.043	3.042	0.001	1.136	4275113	2.78		111	37149	
D 21 13C8 FOSA										
506.00 > 78.00	3.389	3.393	-0.004	1.265	5072528	2.74		109	29418	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.397	3.395	0.002	1.002	12809	0.006572			408	
D 23 13C2 PFDA										
515.00 > 470.00	3.397	3.400	-0.003	1.268	3561279	2.74		110	38950	
D 30 13C2 PFUnA										
565.00 > 520.00	3.727	3.730	-0.003	1.391	2843217	2.74		110	38885	
D 36 13C2 PFDoA										
615.00 > 570.00	4.017	4.024	-0.007	1.500	3118735	2.59		104	38318	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.518	4.526	-0.008	1.687	3831698	2.59		104	28578	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 24-Nov-2017 13:16:55 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_022.d

Injection Date: 18-Nov-2017 19:33:01 Instrument ID: A8_N

Lims ID: 320-33221-A-2-A Lab Sample ID: 320-33221-2

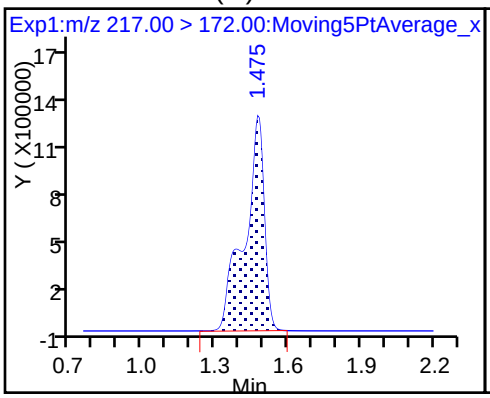
Client ID: TP-PFC-023-MID-CARBON

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 22

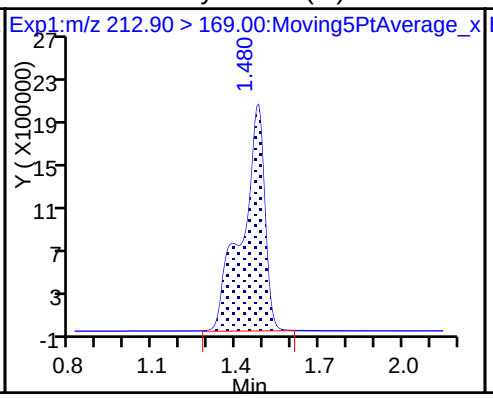
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

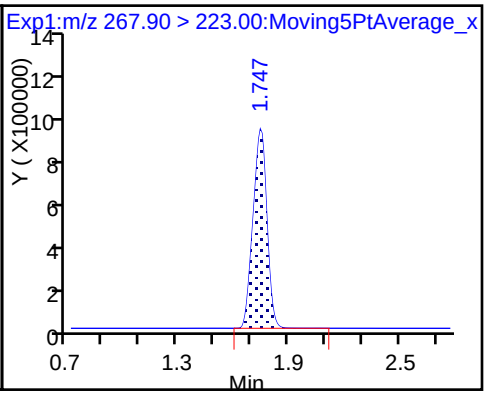
D 1 13C4 PFBA (M)



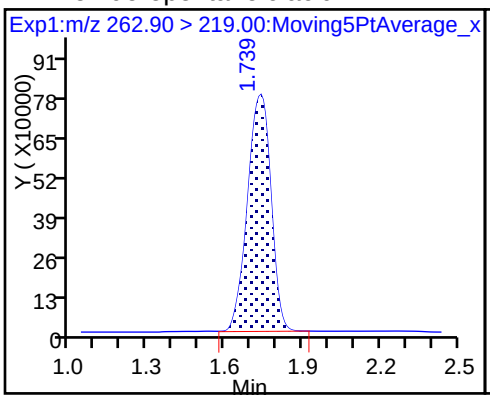
2 Perfluorobutyric acid (M)



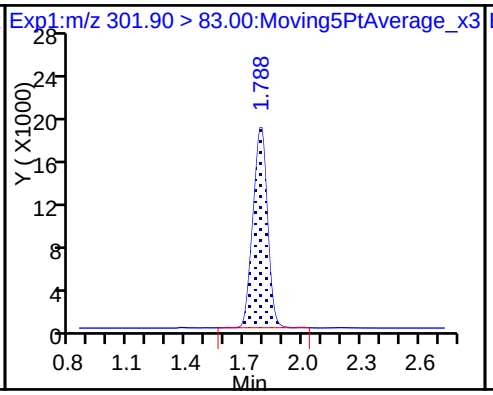
D 3 13C5-PFPeA



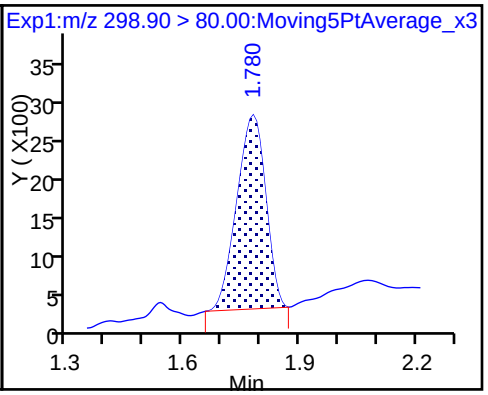
4 Perfluoropentanoic acid



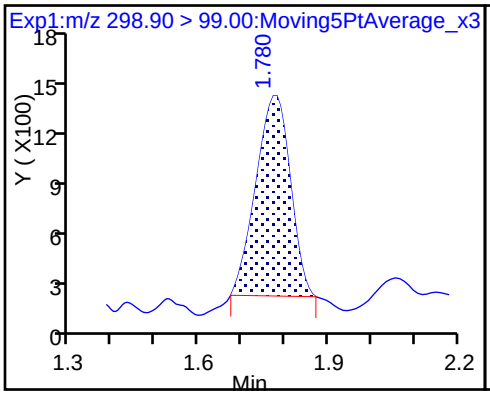
D 47 13C3-PFBS



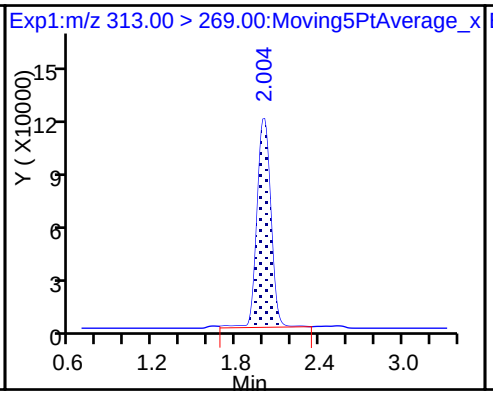
5 Perfluorobutanesulfonic acid



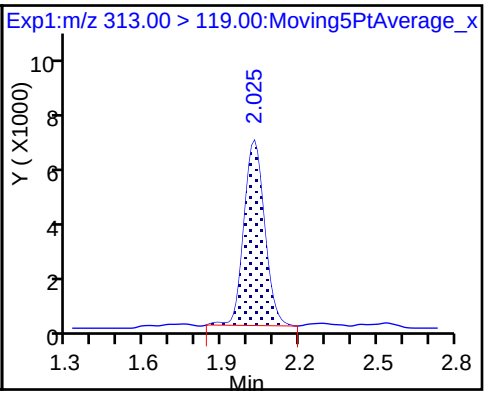
5 Perfluorobutanesulfonic acid



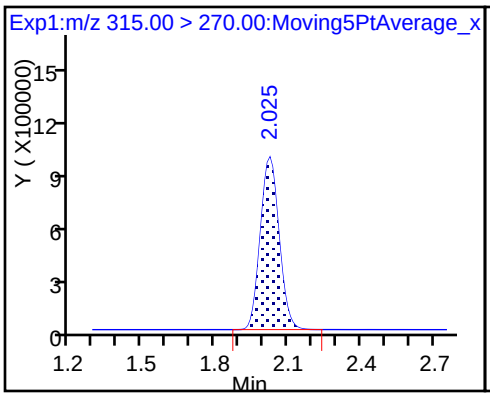
6 Perfluorohexanoic acid



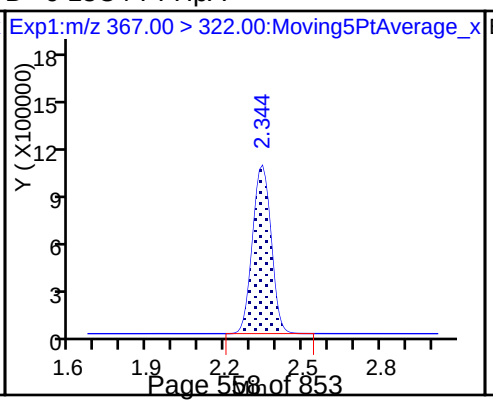
6 Perfluorohexanoic acid



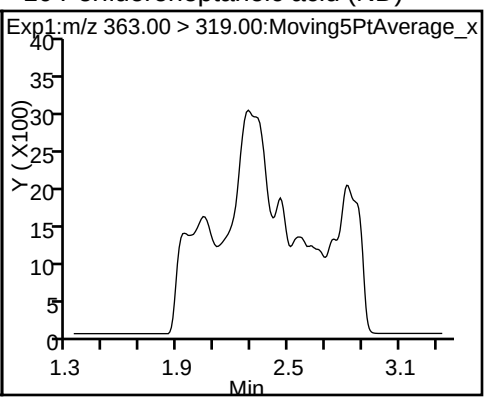
D 7 13C2 PFHxA



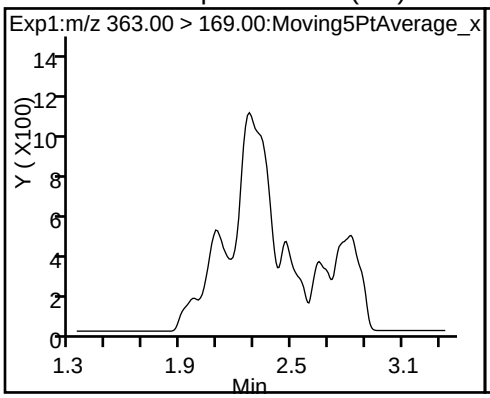
D 9 13C4-PFHpA



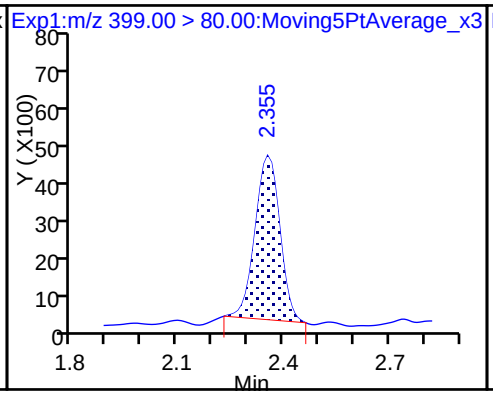
10 Perfluoroheptanoic acid (ND)



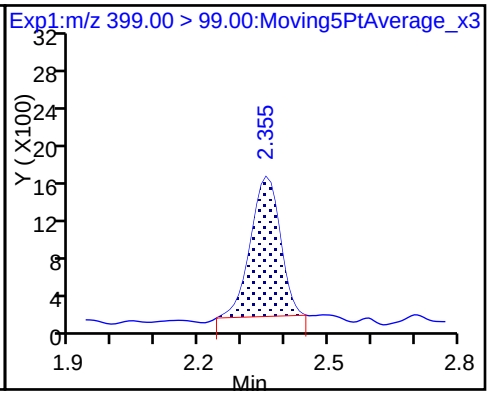
10 Perfluoroheptanoic acid (ND)



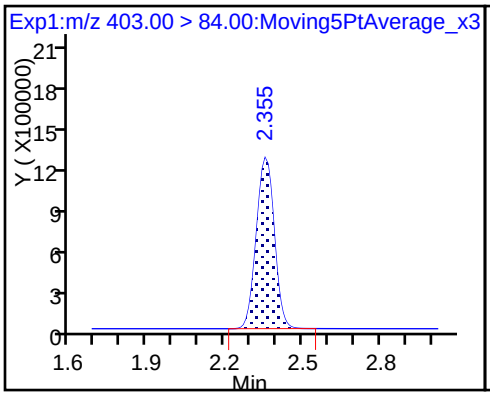
8 Perfluorohexanesulfonic acid



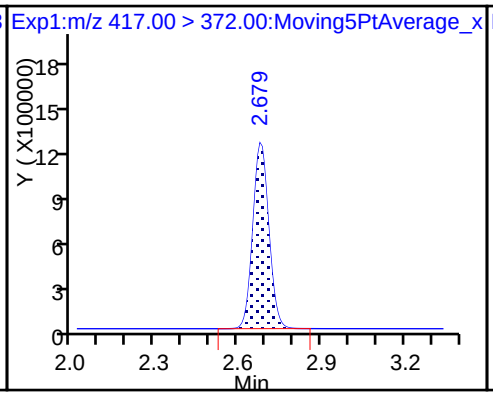
8 Perfluorohexanesulfonic acid



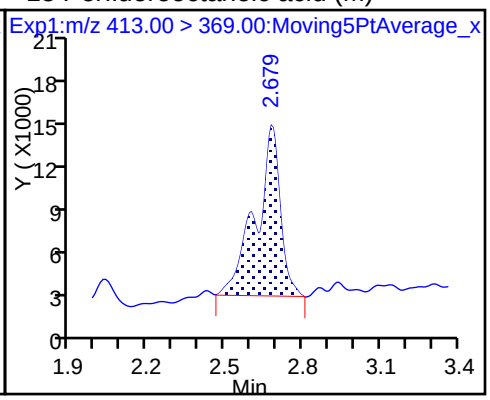
D 11 18O2 PFHxS



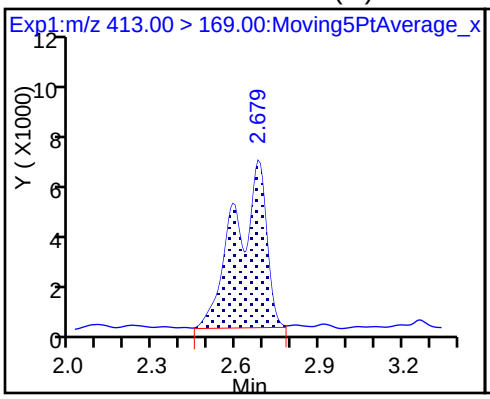
D 14 13C4 PFOA



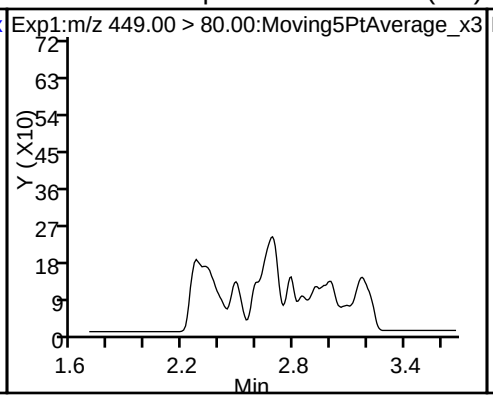
15 Perfluorooctanoic acid (M)



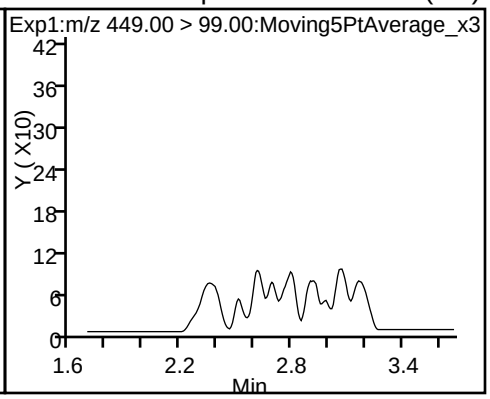
15 Perfluorooctanoic acid (M)



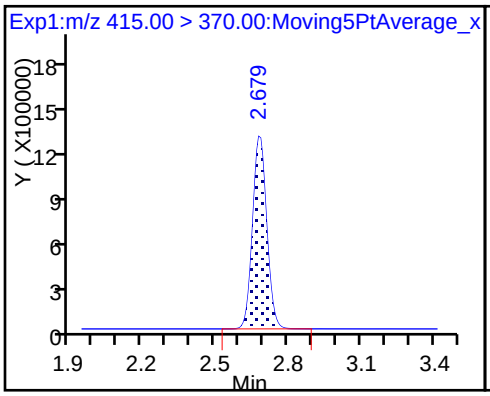
16 Perfluoroheptanesulfonic Acid (ND)



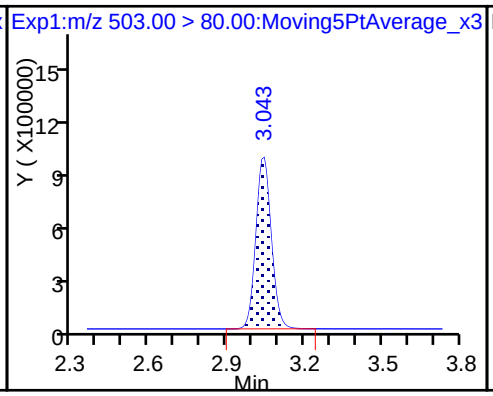
16 Perfluoroheptanesulfonic Acid (ND)



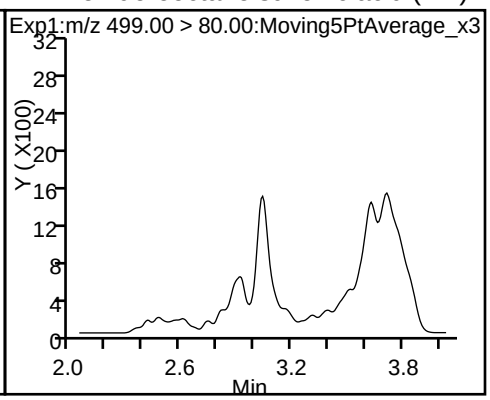
* 62 13C2-PFOA



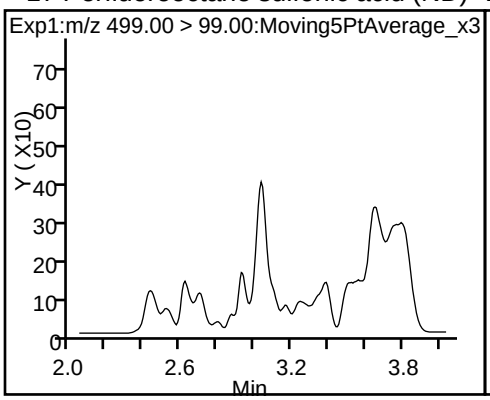
D 18 13C4 PFOS



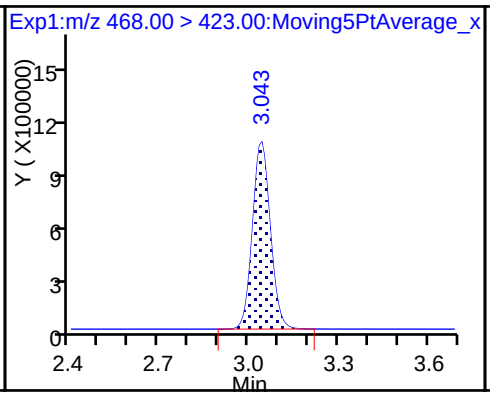
17 Perfluorooctane sulfonic acid (ND)



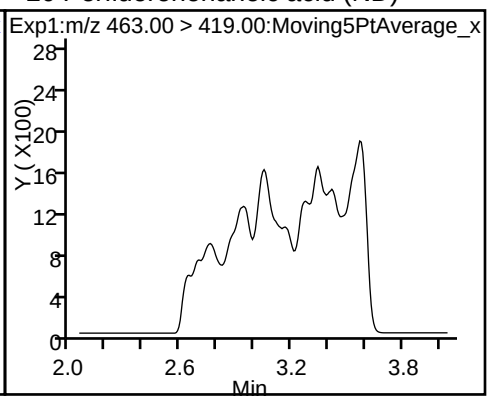
17 Perfluorooctane sulfonic acid (ND)



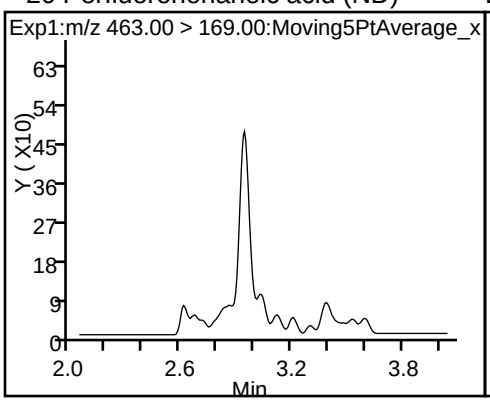
D 19 13C5 PFNA



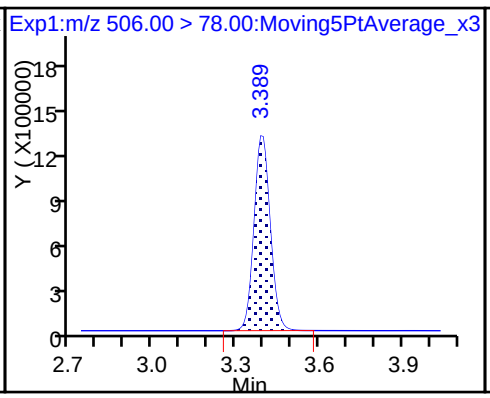
20 Perfluorononanoic acid (ND)



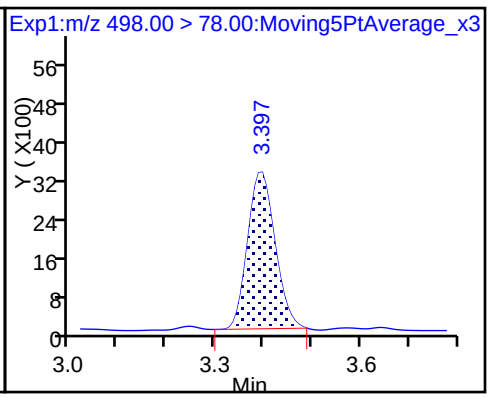
20 Perfluorononanoic acid (ND)



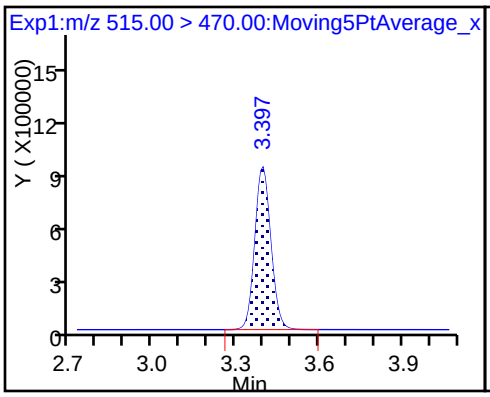
D 21 13C8 FOSA



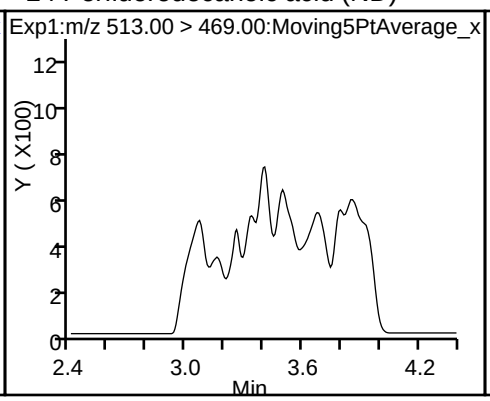
22 Perfluorooctane Sulfonamide



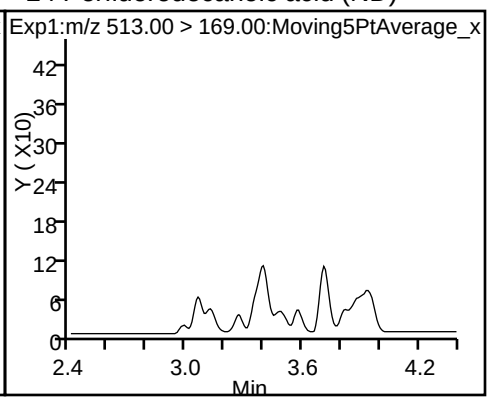
D 23 13C2 PFDA



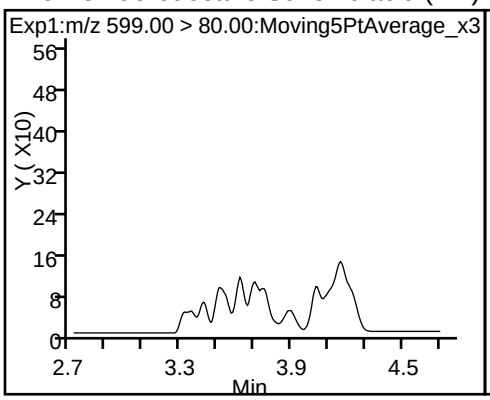
24 Perfluorodecanoic acid (ND)



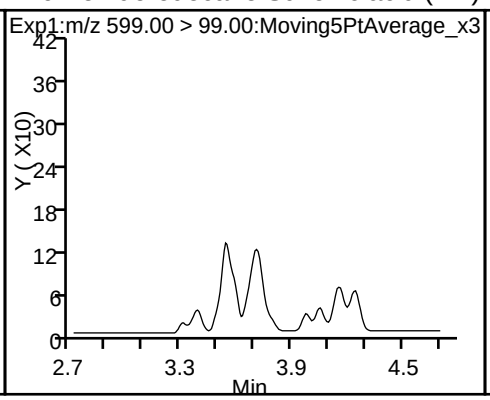
24 Perfluorodecanoic acid (ND)



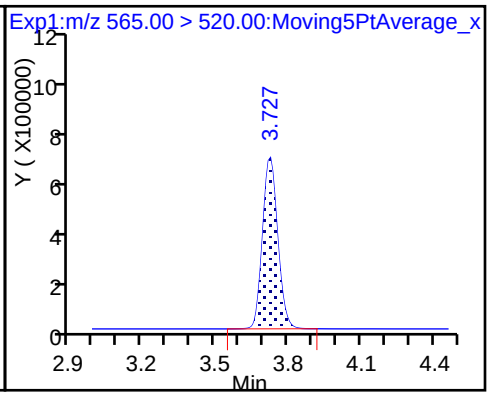
29 Perfluorodecane Sulfonic acid (ND)



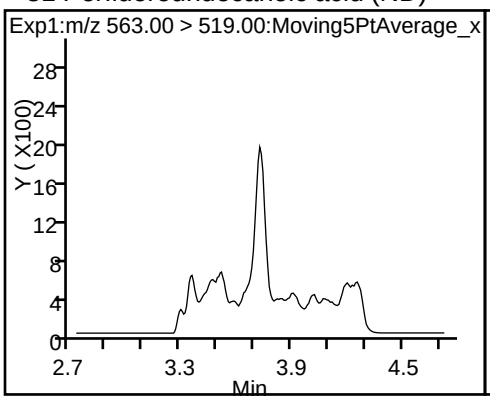
29 Perfluorodecane Sulfonic acid (ND)



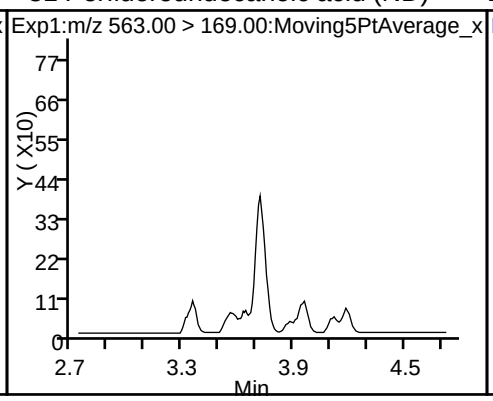
D 30 13C2 PFUnA



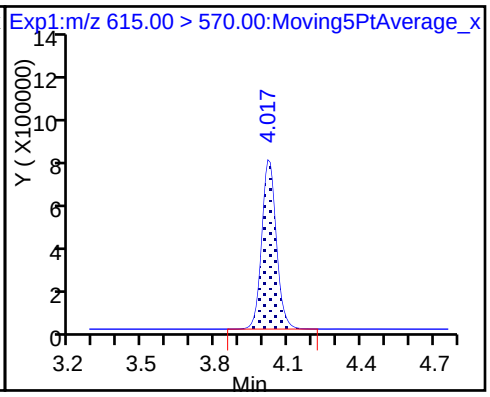
31 Perfluoroundecanoic acid (ND)



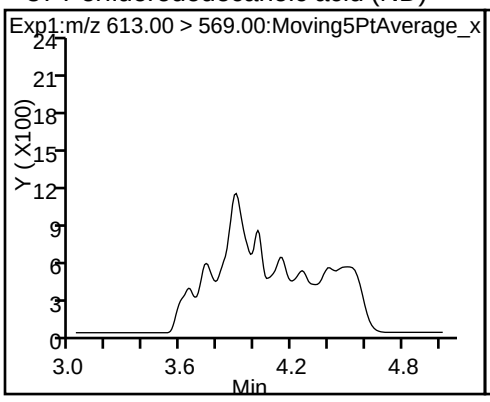
31 Perfluoroundecanoic acid (ND)



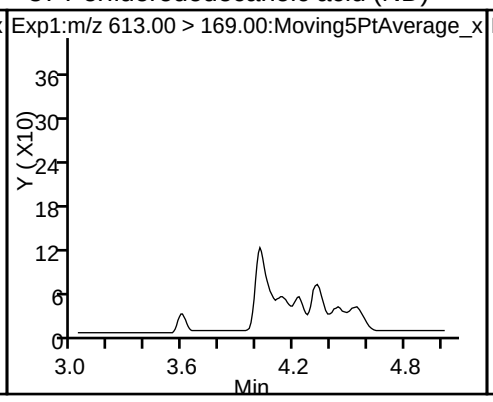
D 36 13C2 PFDoA



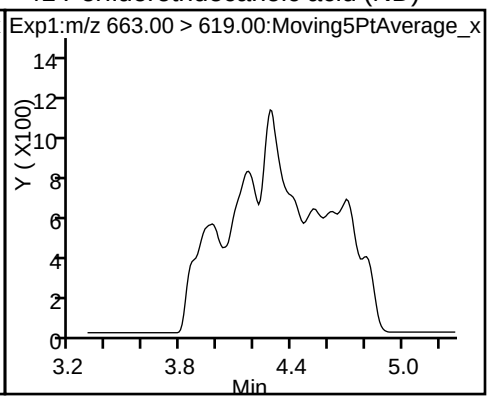
37 Perfluorododecanoic acid (ND)



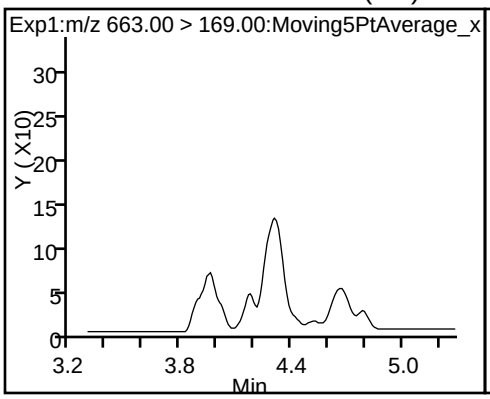
37 Perfluorododecanoic acid (ND)



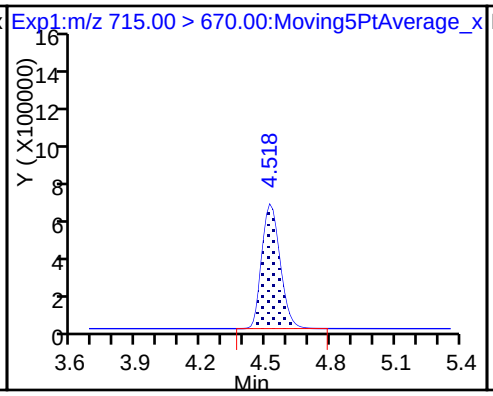
41 Perfluorotridecanoic acid (ND)



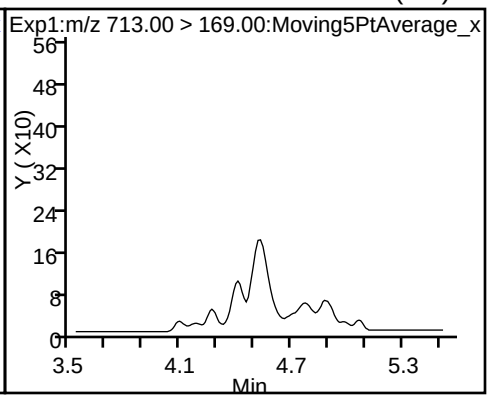
41 Perfluorotridecanoic acid (ND)



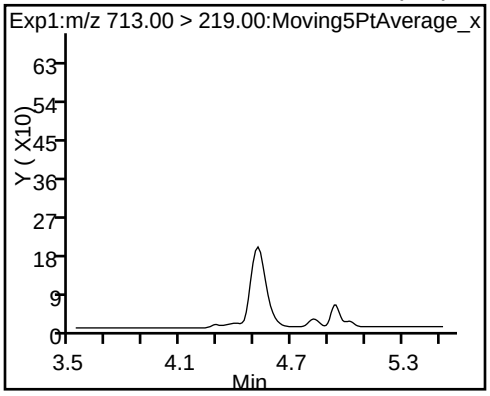
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



TestAmerica Sacramento

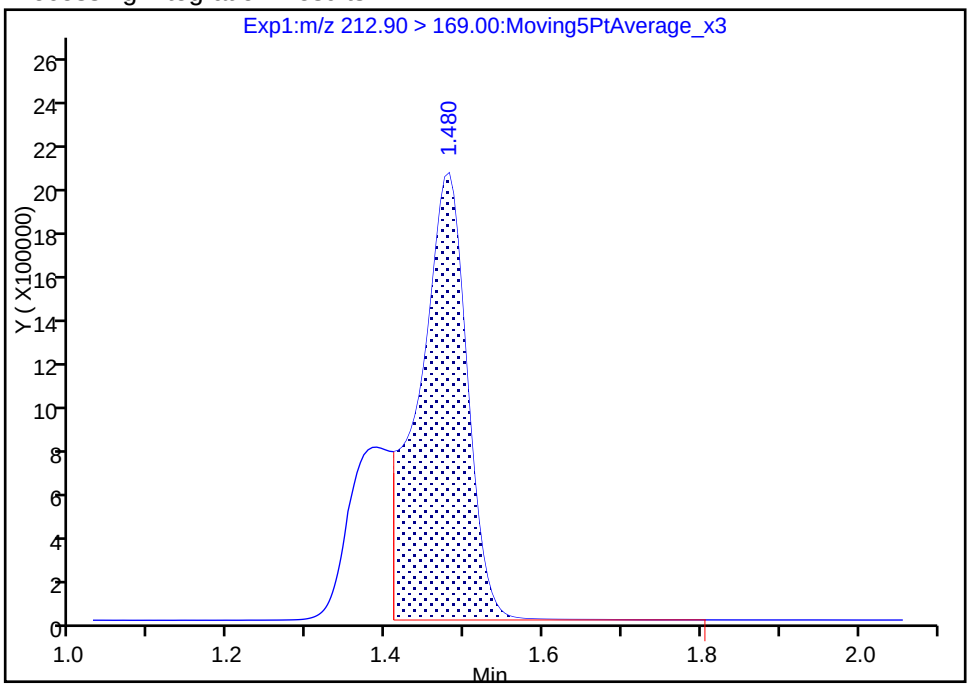
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_022.d				
Injection Date:	18-Nov-2017 19:33:01	Instrument ID:	A8_N		
Lims ID:	320-33221-A-2-A	Lab Sample ID:	320-33221-2		
Client ID:	TP-PFC-023-MID-CARBON				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	21	Worklist Smp#:	22
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

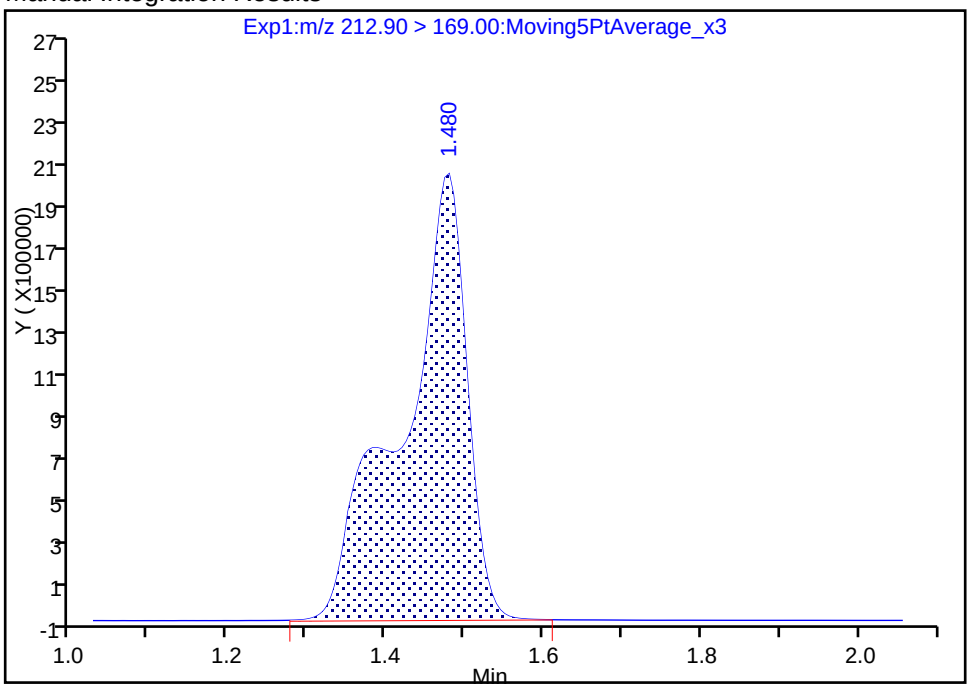
Processing Integration Results

RT: 1.48
Area: 8548568
Amount: 3.247100
Amount Units: ng/ml



Manual Integration Results

RT: 1.48
Area: 11494152
Amount: 4.365954
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:16:01
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_022.d				
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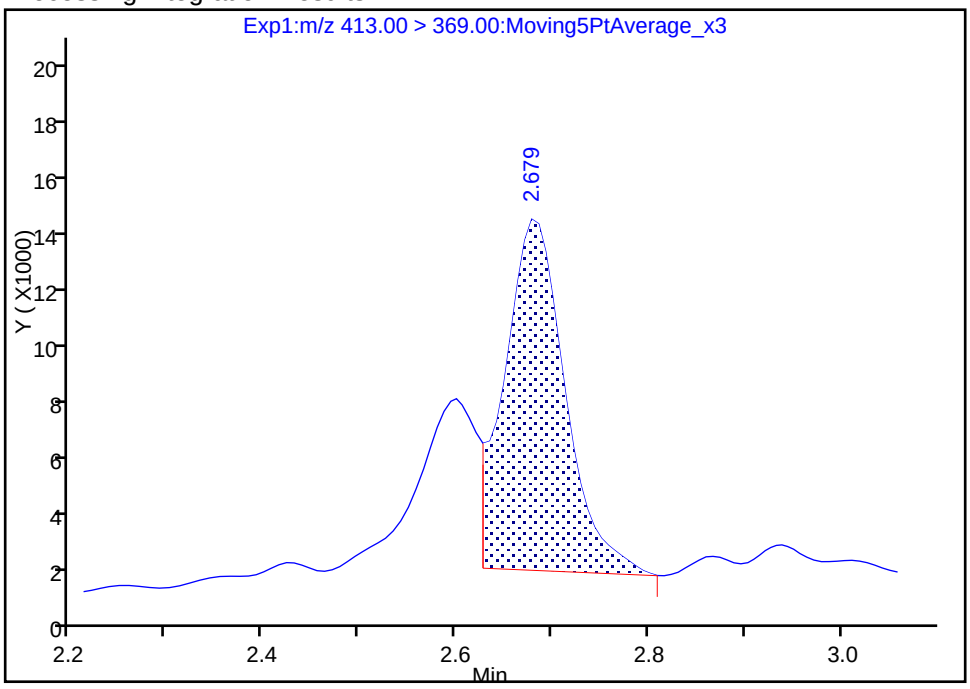
Lims ID:	320-33221-A-2-A	Lab Sample ID:	320-33221-2		
Client ID:	TP-PFC-023-MID-CARBON				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	21	Worklist Smp#:	22
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

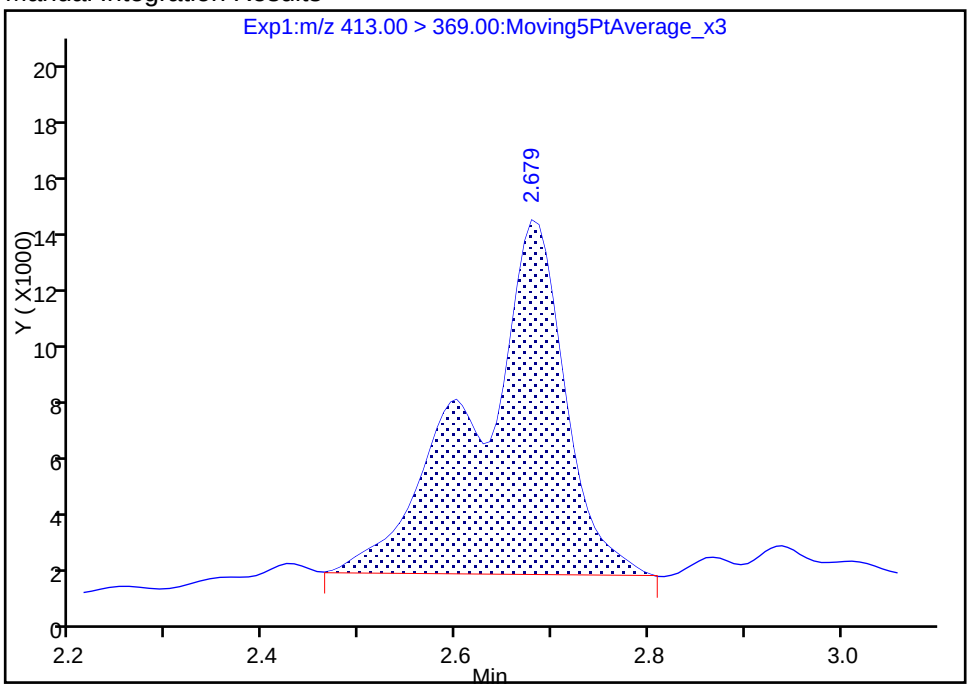
Processing Integration Results

RT: 2.68
Area: 50652
Amount: 0.024179
Amount Units: ng/ml



Manual Integration Results

RT: 2.68
Area: 76692
Amount: 0.036609
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:15:18

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

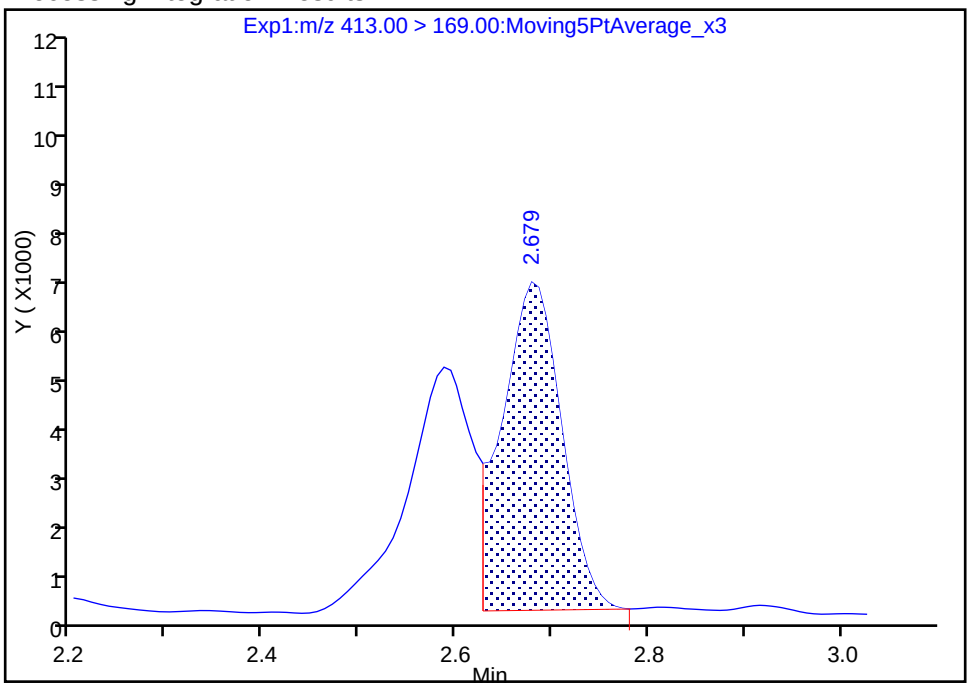
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_022.d				
Injection Date:	18-Nov-2017 19:33:01	Instrument ID:	A8_N		
Lims ID:	320-33221-A-2-A	Lab Sample ID:	320-33221-2		
Client ID:	TP-PFC-023-MID-CARBON				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	21	Worklist Smp#:	22
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

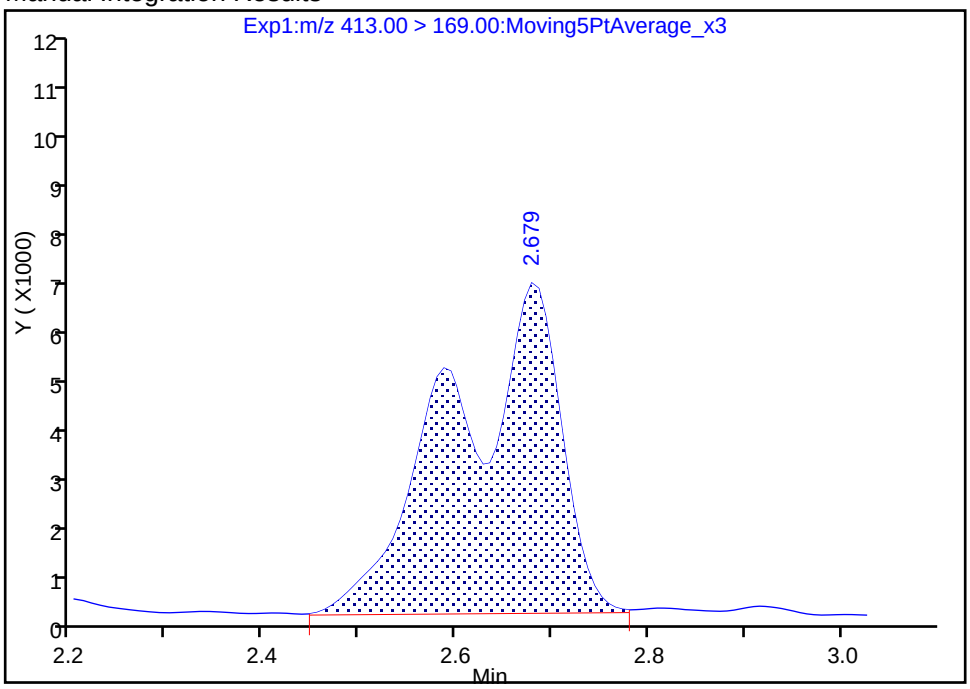
Processing Integration Results

RT: 2.68
Area: 27893
Amount: 0.024179
Amount Units: ng/ml



Manual Integration Results

RT: 2.68
Area: 51569
Amount: 0.036609
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:15:23

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

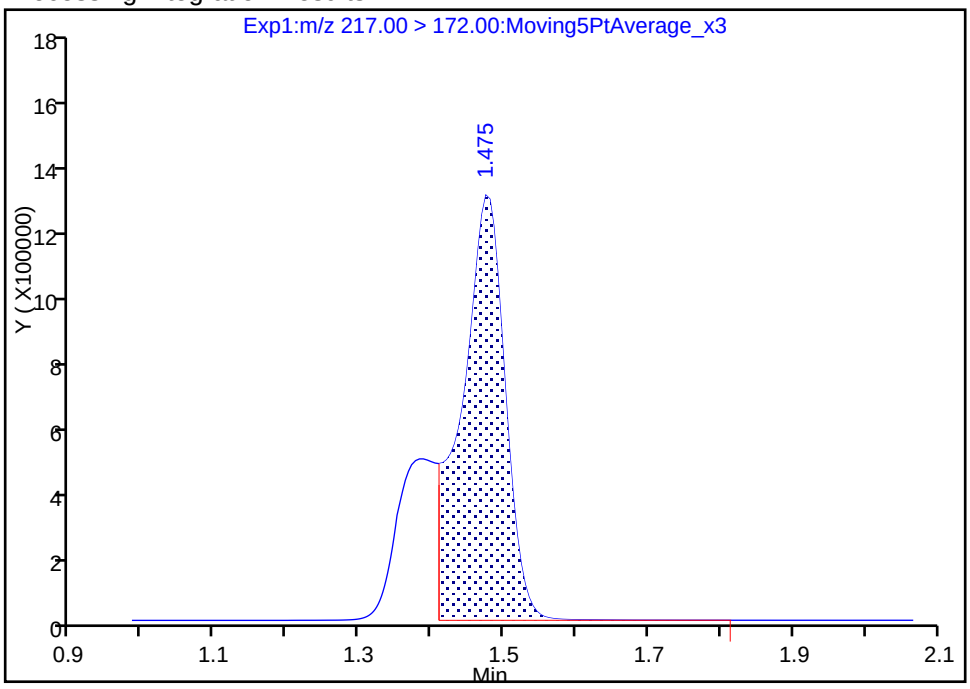
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_022.d				
Injection Date:	18-Nov-2017 19:33:01	Instrument ID:	A8_N		
Lims ID:	320-33221-A-2-A	Lab Sample ID:	320-33221-2		
Client ID:	TP-PFC-023-MID-CARBON				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	21	Worklist Smp#:	22
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

D 1 13C4 PFBA, CAS: STL00992

Signal: 1

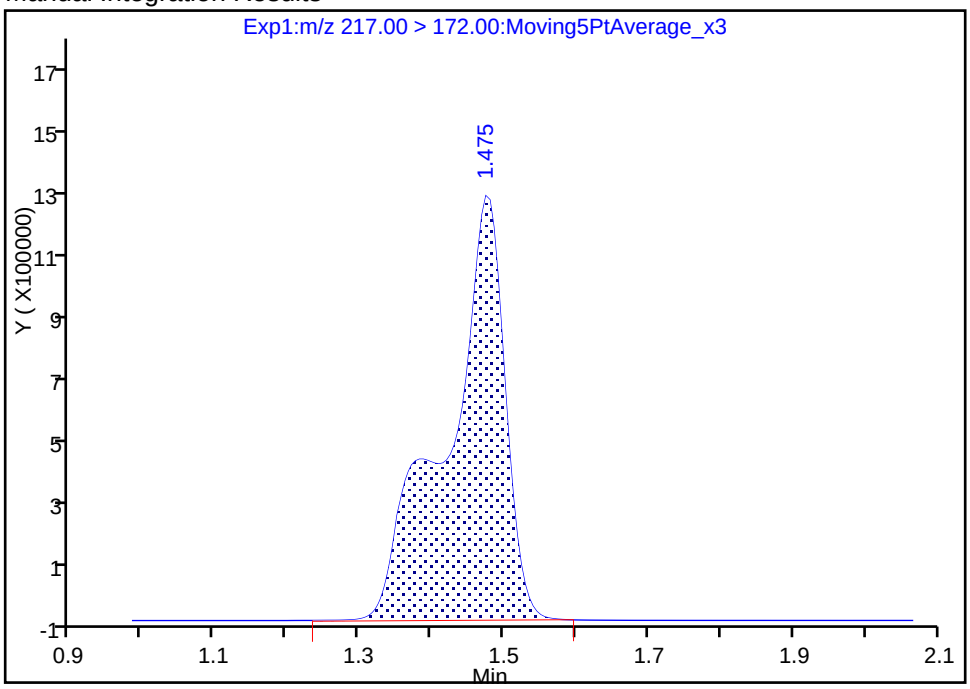
Processing Integration Results

RT: 1.47
Area: 5330812
Amount: 2.016215
Amount Units: ng/ml



Manual Integration Results

RT: 1.47
Area: 7188909
Amount: 2.718983
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:15:47

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-TPE | Lab Sample ID: 320-33221-3

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_024.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 12:00

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 294.7(mL) | Date Analyzed: 11/18/2017 19:48

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	140	M	1.7	0.85	0.30
2706-90-3	Perfluoropentanoic acid (PFPeA)	49		1.7	0.85	0.42
307-24-4	Perfluorohexanoic acid (PFHxA)	8.6		3.4	1.7	0.49
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.85	U	1.7	0.85	0.21
335-67-1	Perfluorooctanoic acid (PFOA)	1.7	U M	3.4	1.7	0.72
375-95-1	Perfluorononanoic acid (PFNA)	0.85	U	1.7	0.85	0.23
335-76-2	Perfluorodecanoic acid (PFDA)	0.85	U	1.7	0.85	0.26
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.5	U	3.4	2.5	0.93
307-55-1	Perfluorododecanoic acid (PFDoA)	1.7	U	3.4	1.7	0.47
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.4	2.5	1.1
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.85	U	1.7	0.85	0.25
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.85	U	1.7	0.85	0.25
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.34	J	1.7	0.85	0.25
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.85	U	1.7	0.85	0.25
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.59	J M	3.4	1.7	0.46
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.85	U	1.7	0.85	0.27
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.85	U	1.7	0.85	0.30

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-TPE | Lab Sample ID: 320-33221-3

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_024.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 12:00

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 294.7(mL) | Date Analyzed: 11/18/2017 19:48

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	108		25-150
STL00992	13C4 PFBA	109	M	25-150
STL00993	13C2 PFHxA	113		25-150
STL00990	13C4 PFOA	103		25-150
STL00995	13C5 PFNA	113		25-150
STL00996	13C2 PFDA	113		25-150
STL00997	13C2 PFUnA	114		25-150
STL00998	13C2 PFDoA	107		25-150
STL00994	18O2 PFHxS	113		25-150
STL00991	13C4 PFOS	111		25-150
STL02116	13C2-PFTeDA	110		25-150
STL01892	13C4-PFHpA	110		25-150
STL01893	13C5 PFPeA	111		25-150
STL02337	13C3-PFBS	115		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_024.d
Lims ID: 320-33221-A-3-A
Client ID: TP-PFC-023-TPE
Sample Type: Client
Inject. Date: 18-Nov-2017 19:48:44 ALS Bottle#: 22 Worklist Smp#: 24
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33221-a-3-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 24-Nov-2017 13:22:07 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK033

First Level Reviewer: hannigana Date: 24-Nov-2017 13:19:49

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										M
217.00 > 172.00	1.475	1.479	-0.004	0.549	7114670	2.73		109	24556	M
2 Perfluorobutyric acid										M
212.90 > 169.00	1.475	1.480	-0.005	1.000	10378709	3.98			1733	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.746	1.738	0.008	0.650	4565993	2.77		111	50196	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.729	1.740	-0.011	0.991	2986788	1.45			1746	
D 47 13C3-PFBS										
301.90 > 83.00	1.787	1.774	0.013	0.666	96108	2.67		115	2977	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.779	1.776	0.003	0.995	17332	0.005642			80.9	
298.90 > 99.00	1.787	1.776	0.011	1.000	9539		1.82(1.74-3.24)		93.6	
6 Perfluorohexanoic acid										R
313.00 > 269.00	2.002	2.010	-0.008	0.990	536608	0.2547			779	R
313.00 > 119.00	2.023	2.010	0.013	1.000	27812		19.29(7.05-13.09)		378	
D 7 13C2 PFHxA										
315.00 > 270.00	2.023	2.010	0.013	0.754	5263709	2.83		113	53264	
D 9 13C4-PFHpA										
367.00 > 322.00	2.342	2.332	0.010	0.873	4928196	2.74		110	53884	
8 Perfluorohexanesulfonic acid										R
399.00 > 80.00	2.352	2.347	0.005	1.000	26232	0.0100			169	R
399.00 > 99.00	2.352	2.347	0.005	1.000	6366		4.12(2.10-3.89)		63.3	
D 11 18O2 PFHxS										
403.00 > 84.00	2.352	2.347	0.005	0.877	5676647	2.68		113	57401	
D 14 13C4 PFOA										
417.00 > 372.00	2.684	2.680	0.004	1.000	5282415	2.56		103	59736	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.684	2.680	0.004	1.000	46372	0.0208			14.1	M
413.00 > 169.00	2.684	2.680	0.004	1.000	28005		1.66(1.18-2.19)		83.8	M
* 62 13C2-PFOA										
415.00 > 370.00	2.684	2.695	-0.011		5001457	2.50			45830	
D 18 13C4 PFOS										
503.00 > 80.00	3.040	3.042	-0.002	1.133	3763901	2.66		111	33393	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.040	3.042	-0.002	1.000	28593	0.0173			58.0	
499.00 > 99.00	3.040	3.042	-0.002	1.000	6516		4.39(3.24-6.01)		47.5	M
D 19 13C5 PFNA										
468.00 > 423.00	3.040	3.042	-0.002	1.133	4264252	2.82		113	46455	
D 21 13C8 FOSA										
506.00 > 78.00	3.395	3.393	0.002	1.265	4933465	2.70		108	25083	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.395	3.395	0.0	1.000	12914	0.006813			315	
D 23 13C2 PFDA										
515.00 > 470.00	3.403	3.400	0.003	1.268	3623405	2.84		113	37651	
D 30 13C2 PFUnA										
565.00 > 520.00	3.726	3.730	-0.004	1.388	2920591	2.86		114	29701	
D 36 13C2 PFDoA										
615.00 > 570.00	4.015	4.024	-0.009	1.496	3156128	2.66		107	40962	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.515	4.526	-0.011	1.682	4011131	2.75		110	23829	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

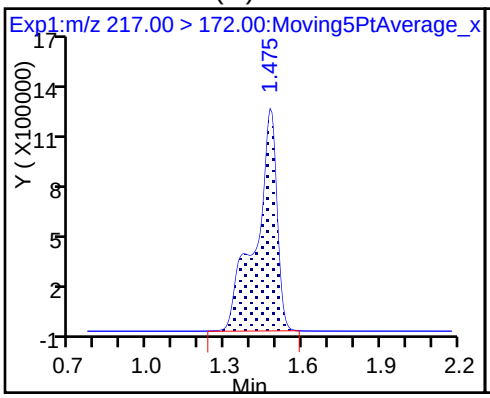
Report Date: 24-Nov-2017 13:22:11 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

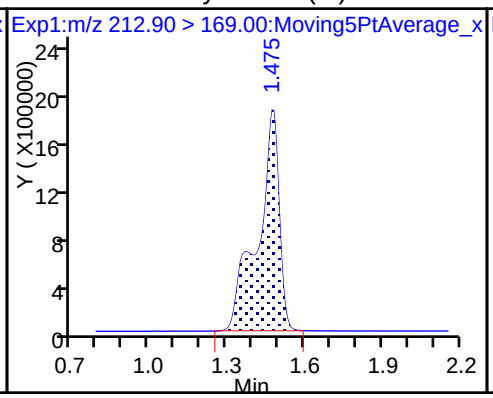
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_024.d

Injection Date:	18-Nov-2017 19:48:44	Instrument ID:	A8_N		
Lims ID:	320-33221-A-3-A	Lab Sample ID:	320-33221-3		
Client ID:	TP-PFC-023-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	22	Worklist Smp#:	24
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

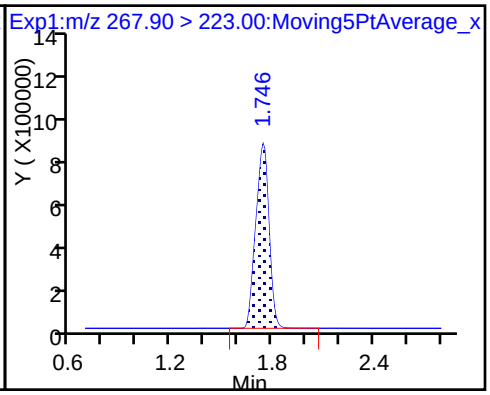
D 1 13C4 PFBA (M)



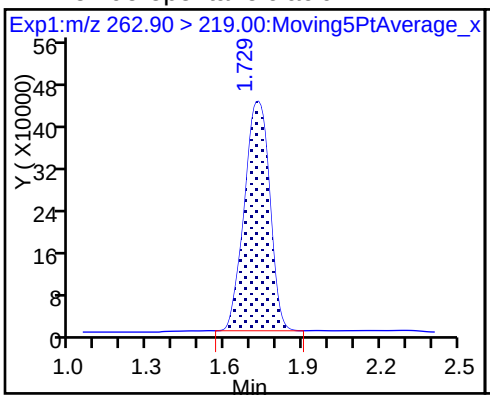
2 Perfluorobutyric acid (M)



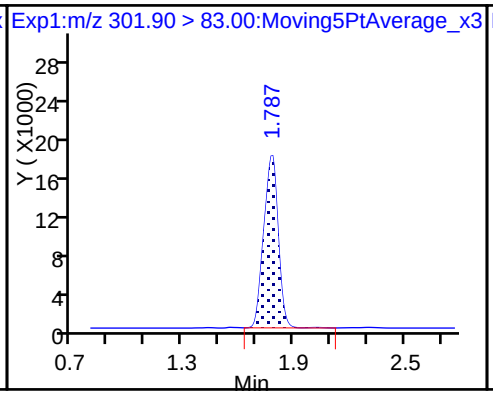
D 3 13C5-PFPeA



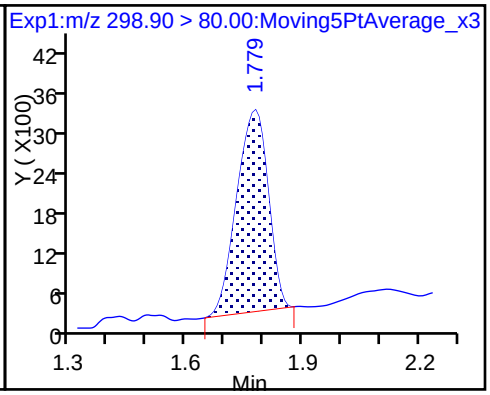
4 Perfluoropentanoic acid



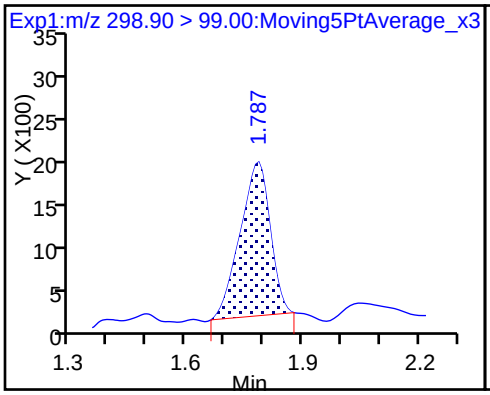
D 47 13C3-PFBS



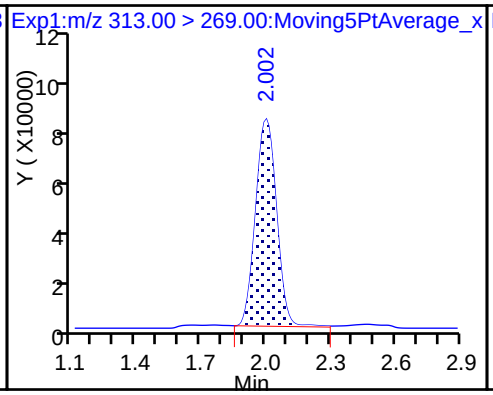
5 Perfluorobutanesulfonic acid



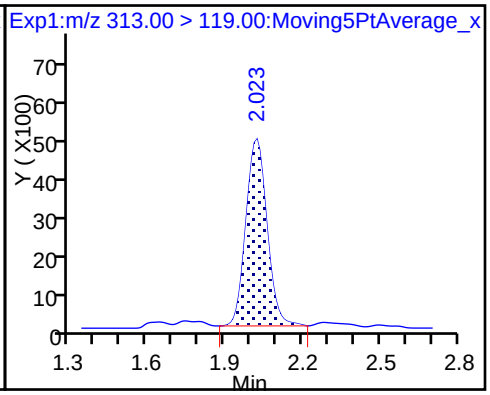
5 Perfluorobutanesulfonic acid



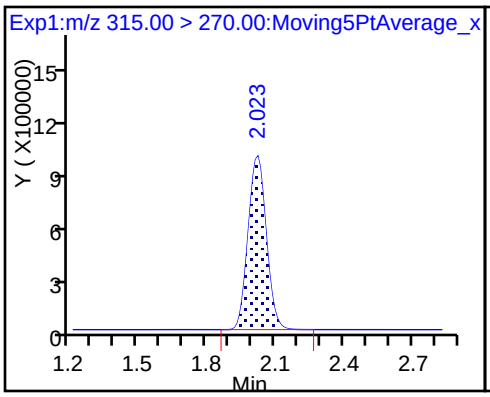
6 Perfluorohexanoic acid



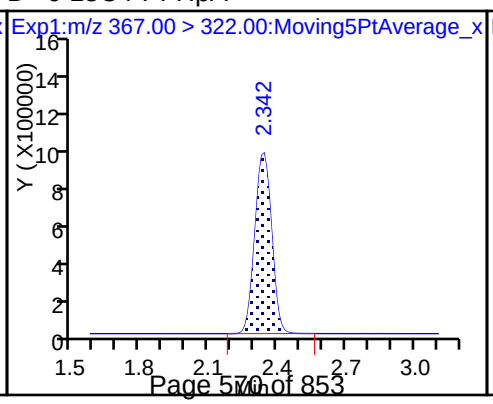
6 Perfluorohexanoic acid



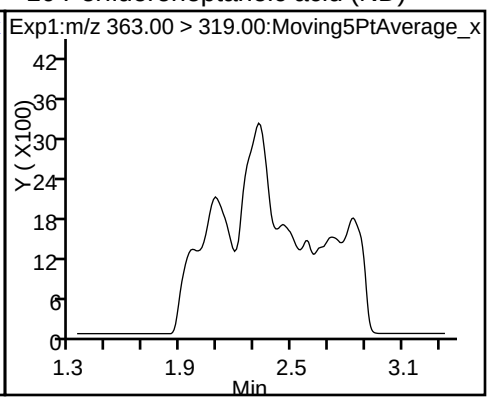
D 7 13C2 PFHxA



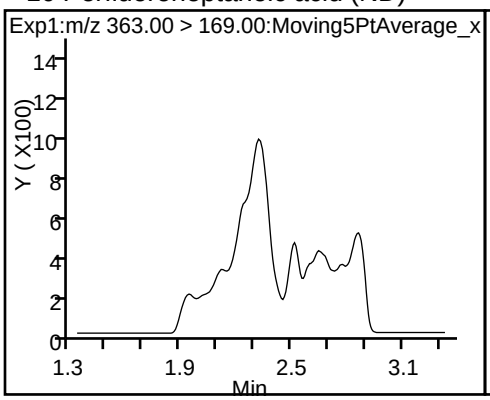
D 9 13C4-PFHpA



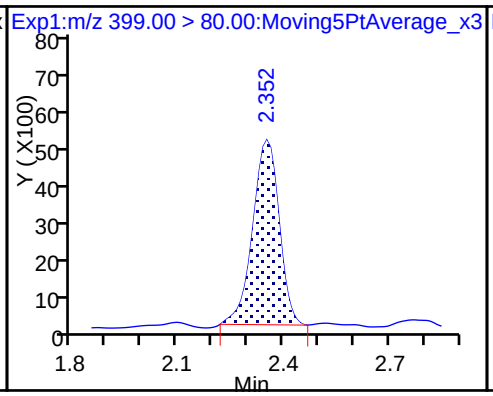
10 Perfluoroheptanoic acid (ND)



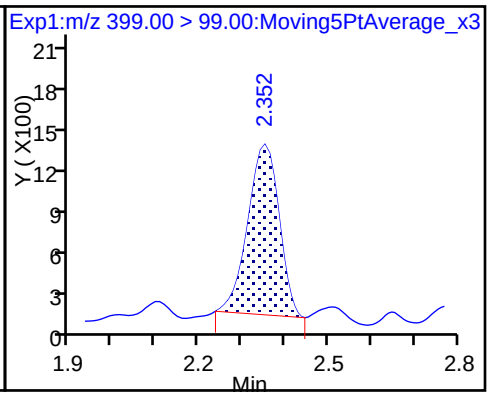
10 Perfluoroheptanoic acid (ND)



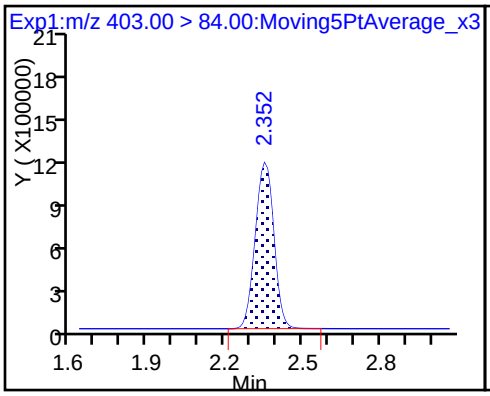
8 Perfluorohexanesulfonic acid



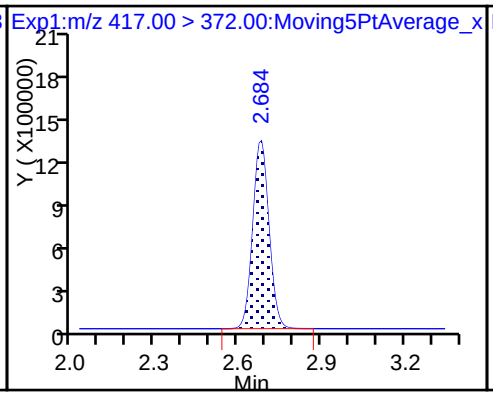
8 Perfluorohexanesulfonic acid



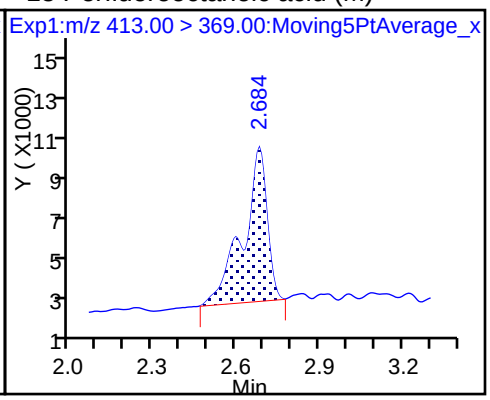
D 11 18O2 PFHxS



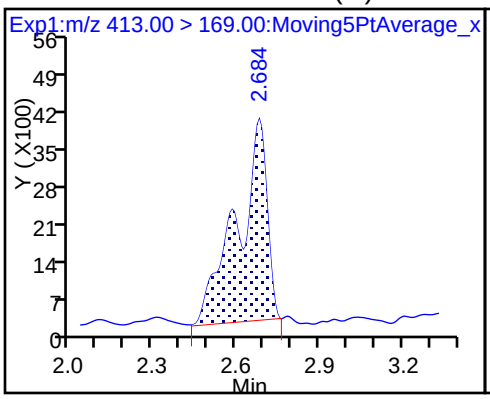
D 14 13C4 PFOA



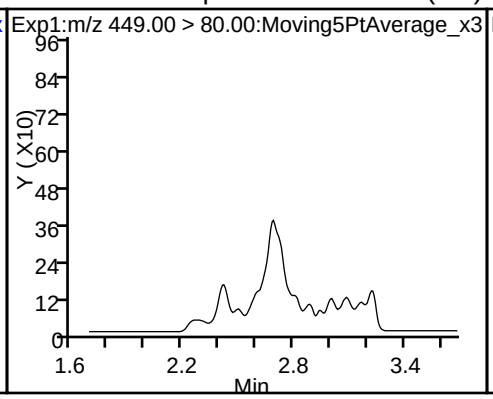
15 Perfluorooctanoic acid (M)



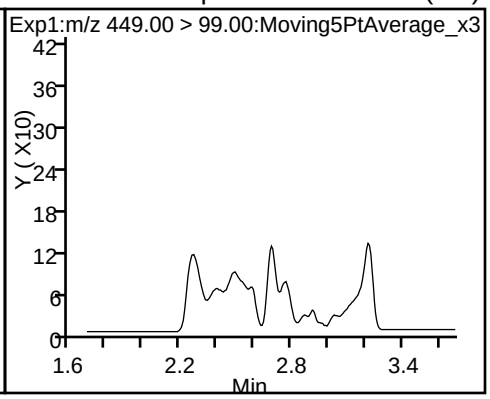
15 Perfluorooctanoic acid (M)



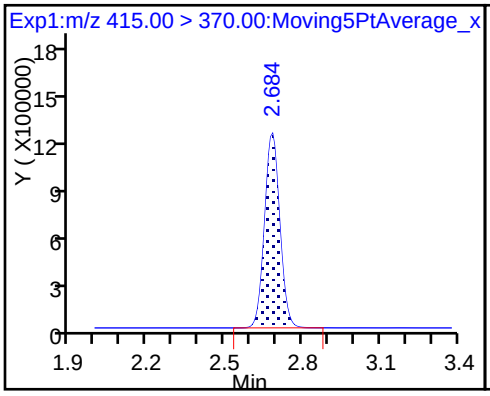
16 Perfluoroheptanesulfonic Acid (ND)



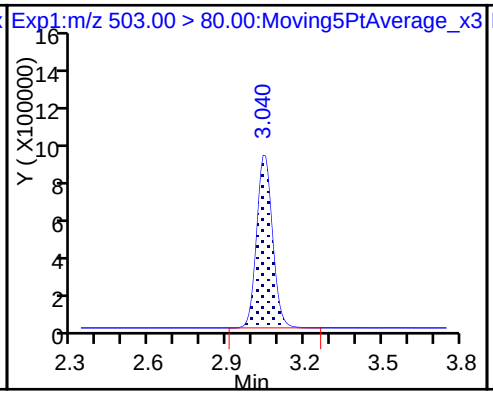
16 Perfluoroheptanesulfonic Acid (ND)



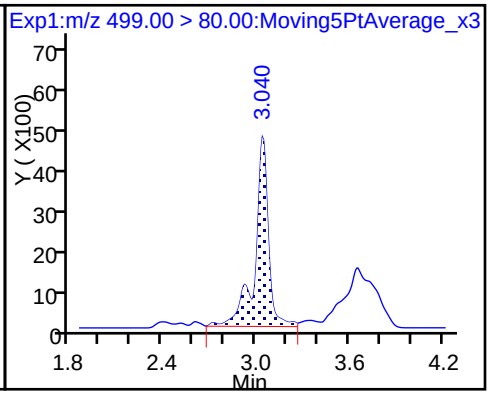
* 62 13C2-PFOA



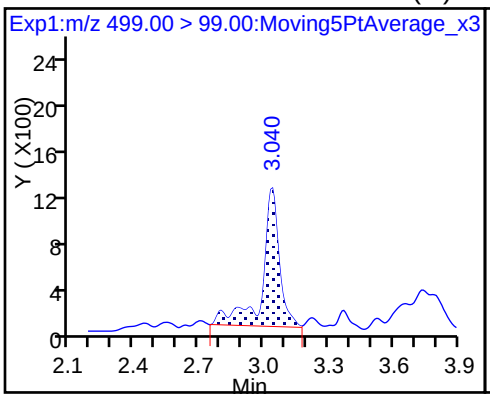
D 18 13C4 PFOS



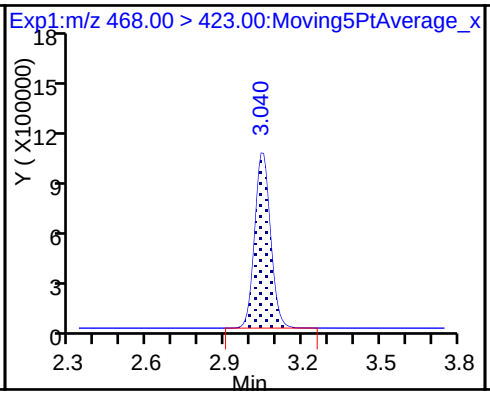
17 Perfluorooctane sulfonic acid



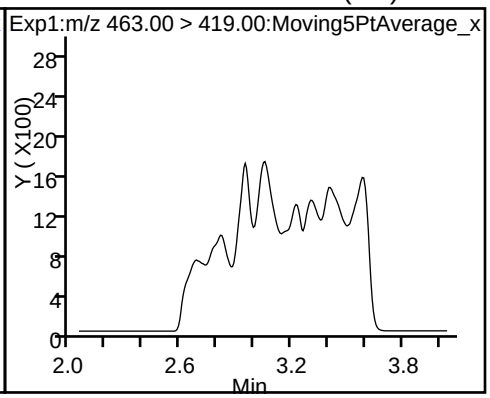
17 Perfluorooctane sulfonic acid (M)



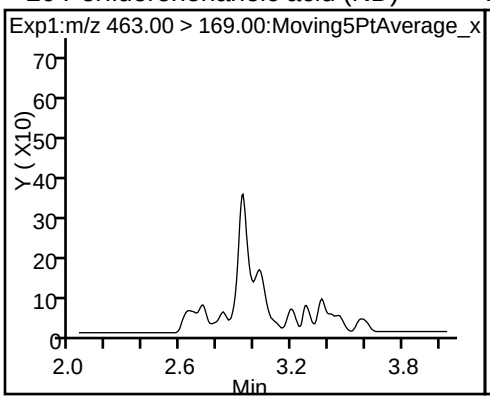
D 19 13C5 PFNA



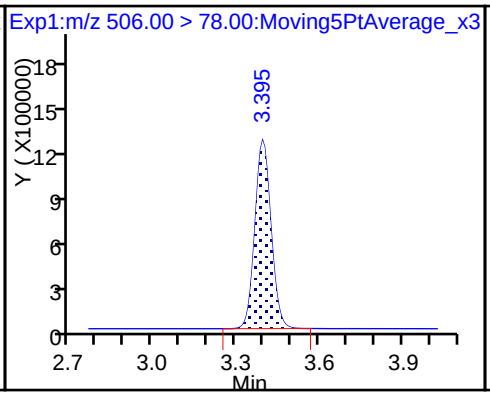
20 Perfluorononanoic acid (ND)



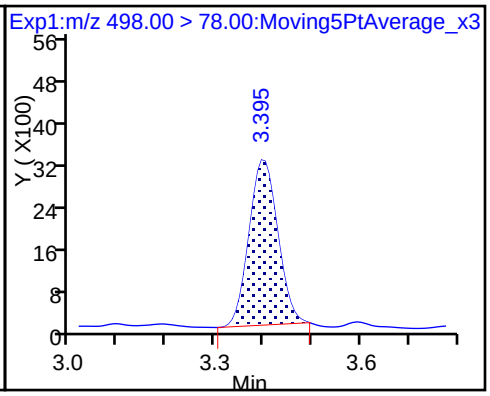
20 Perfluorononanoic acid (ND)



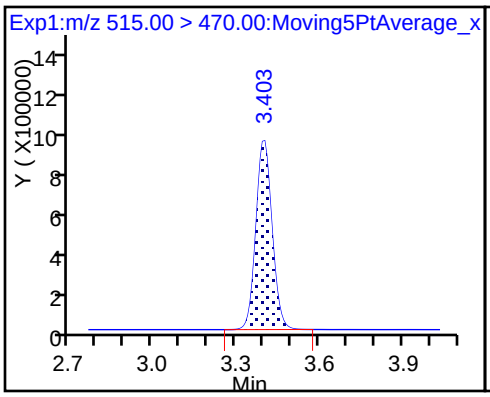
D 21 13C8 FOSA



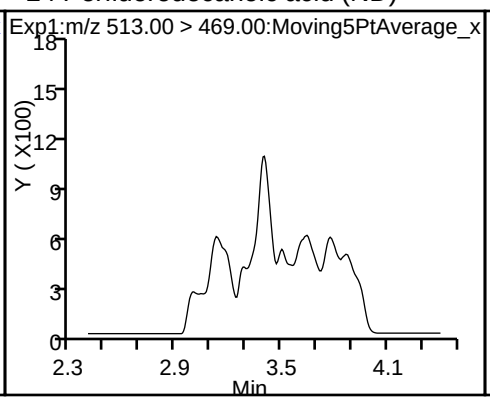
22 Perfluorooctane Sulfonamide



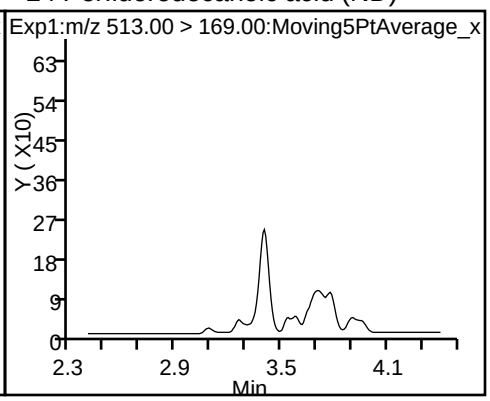
D 23 13C2 PFDA



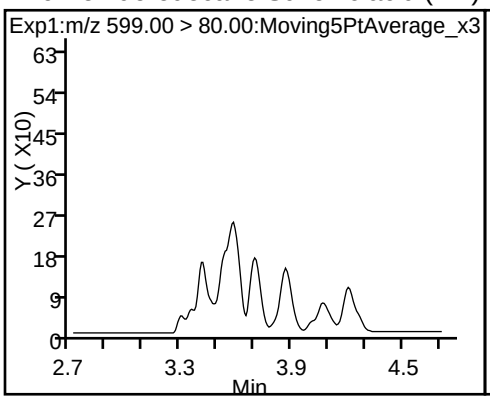
24 Perfluorodecanoic acid (ND)



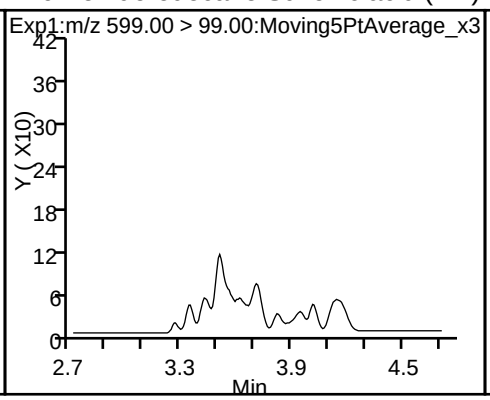
24 Perfluorodecanoic acid (ND)



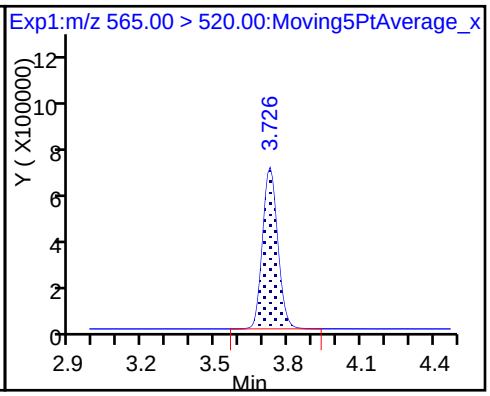
29 Perfluorodecane Sulfonic acid (ND)



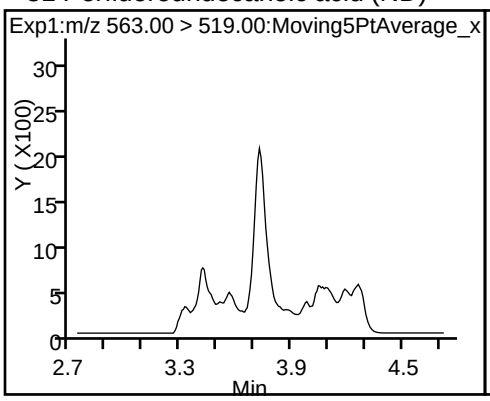
29 Perfluorodecane Sulfonic acid (ND)



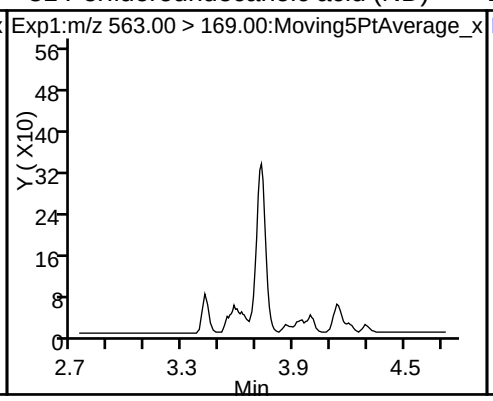
D 30 13C2 PFUnA



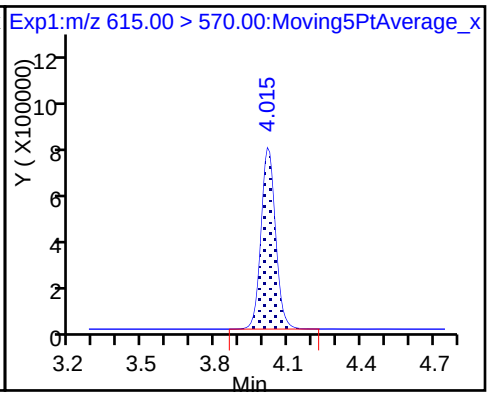
31 Perfluoroundecanoic acid (ND)



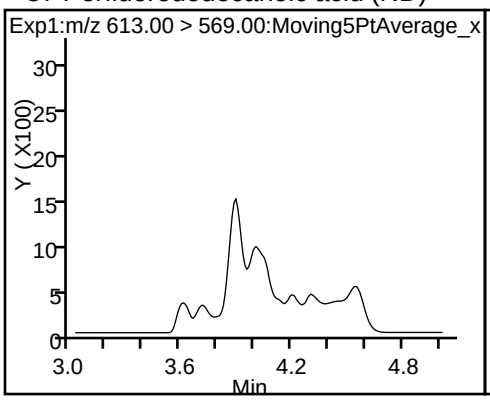
31 Perfluoroundecanoic acid (ND)



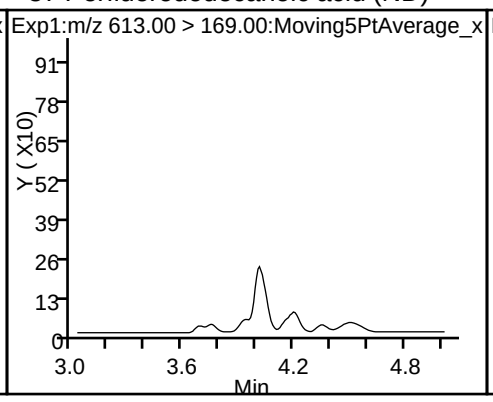
D 36 13C2 PFDoA



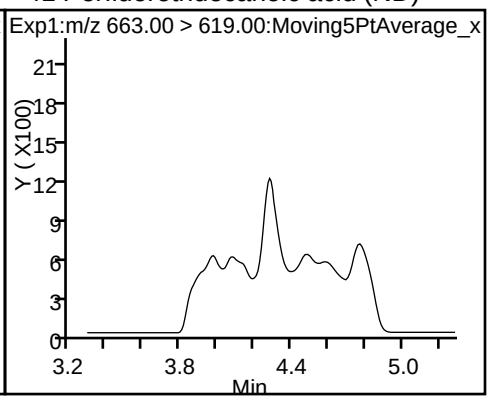
37 Perfluorododecanoic acid (ND)



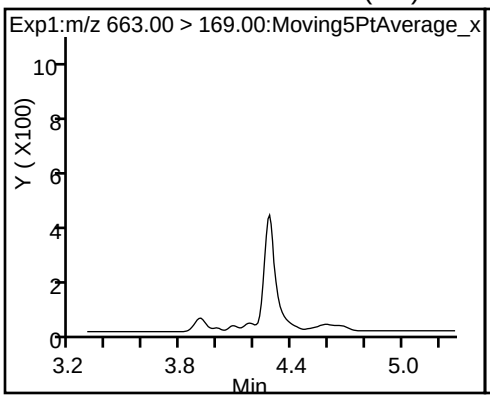
37 Perfluorododecanoic acid (ND)



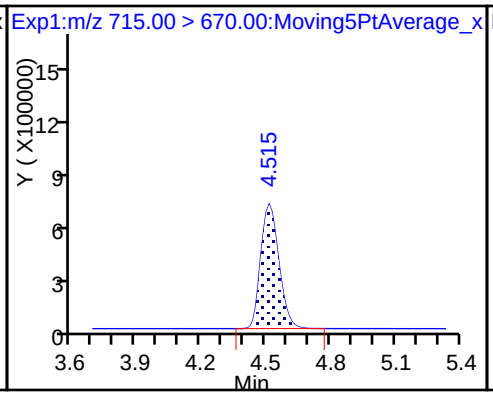
41 Perfluorotridecanoic acid (ND)



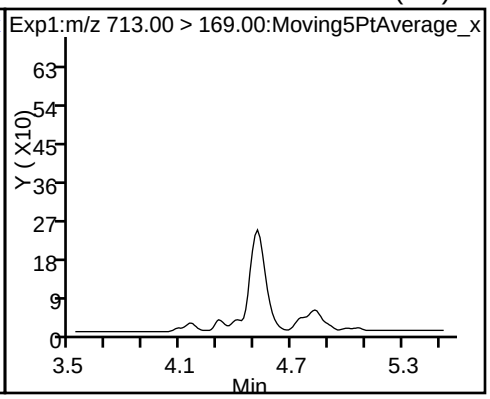
41 Perfluorotridecanoic acid (ND)



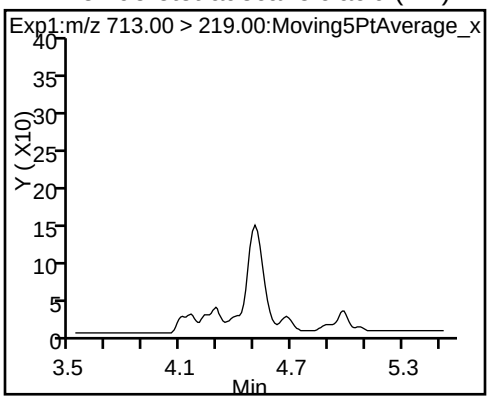
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



TestAmerica Sacramento

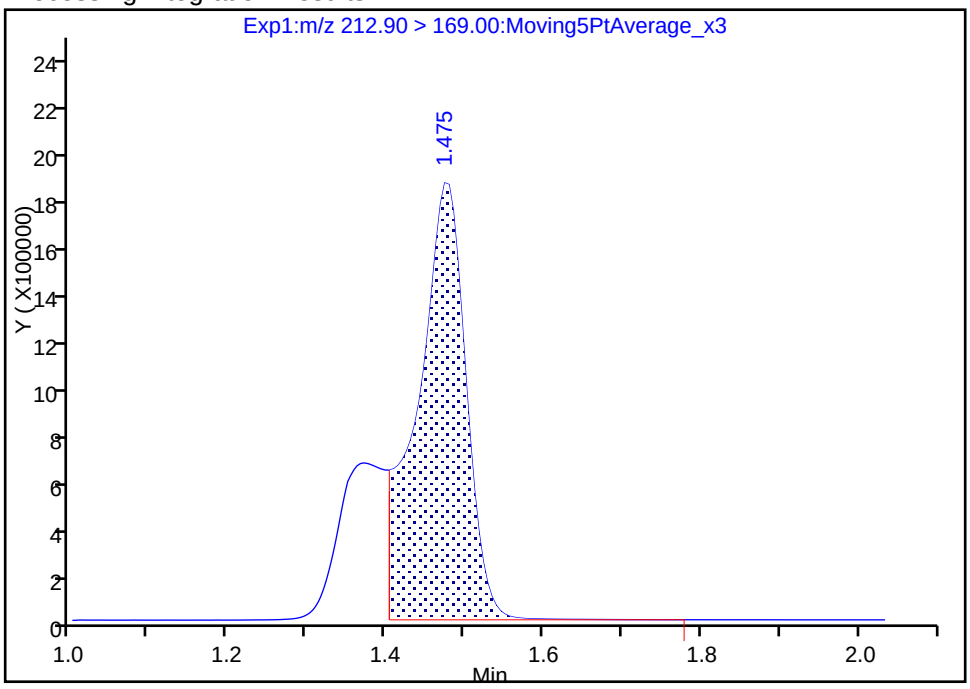
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_024.d				
Injection Date:	18-Nov-2017 19:48:44	Instrument ID:	A8_N		
Lims ID:	320-33221-A-3-A	Lab Sample ID:	320-33221-3		
Client ID:	TP-PFC-023-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	22	Worklist Smp#:	24
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

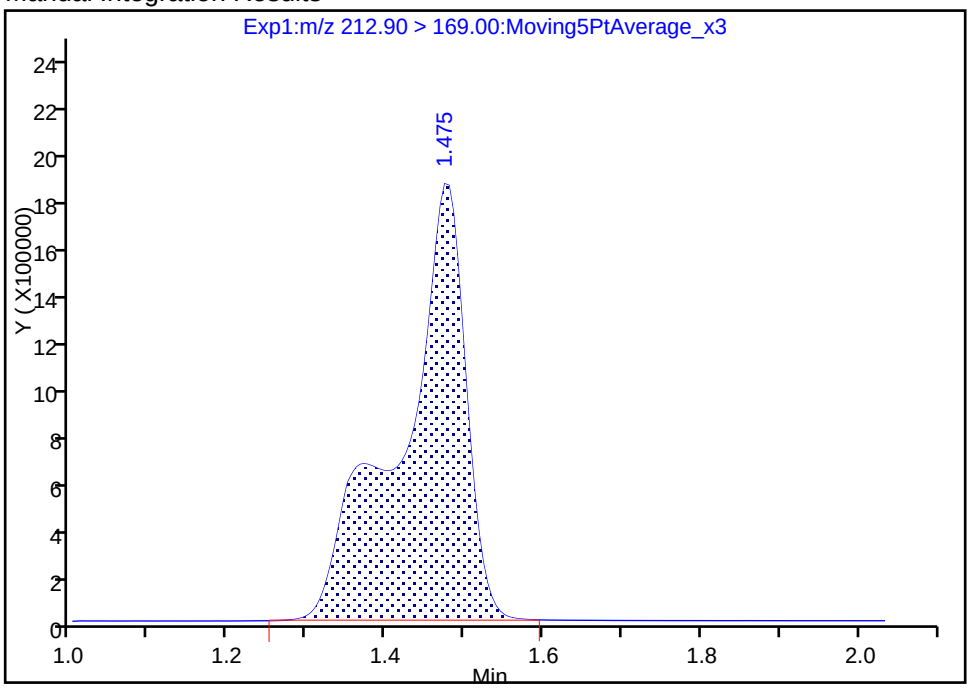
Processing Integration Results

RT: 1.47
Area: 7721535
Amount: 2.963563
Amount Units: ng/ml



Manual Integration Results

RT: 1.47
Area: 10378709
Amount: 3.983399
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:19:11
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

TestAmerica Sacramento

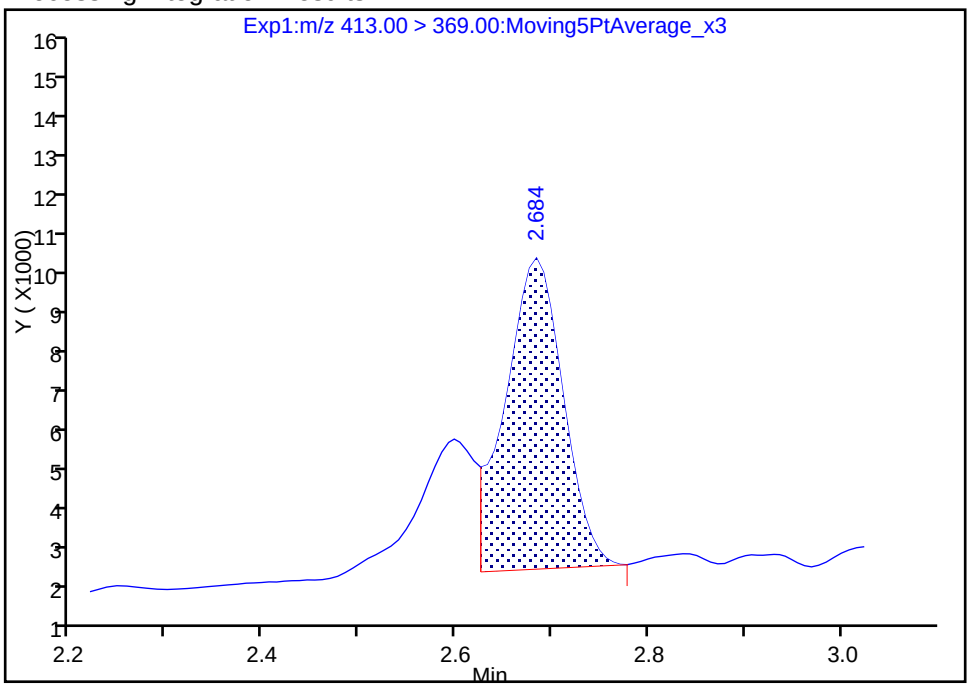
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_024.d		
Injection Date:	18-Nov-2017 19:48:44	Instrument ID:	A8_N
Lims ID:	320-33221-A-3-A	Lab Sample ID:	320-33221-3
Client ID:	TP-PFC-023-TPE		
Operator ID:	SACINSTLCMS01	ALS Bottle#:	22 Worklist Smp#: 24
Injection Vol:	2.0 ul	Dil. Factor:	1.0000
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL
Column:		Detector	EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

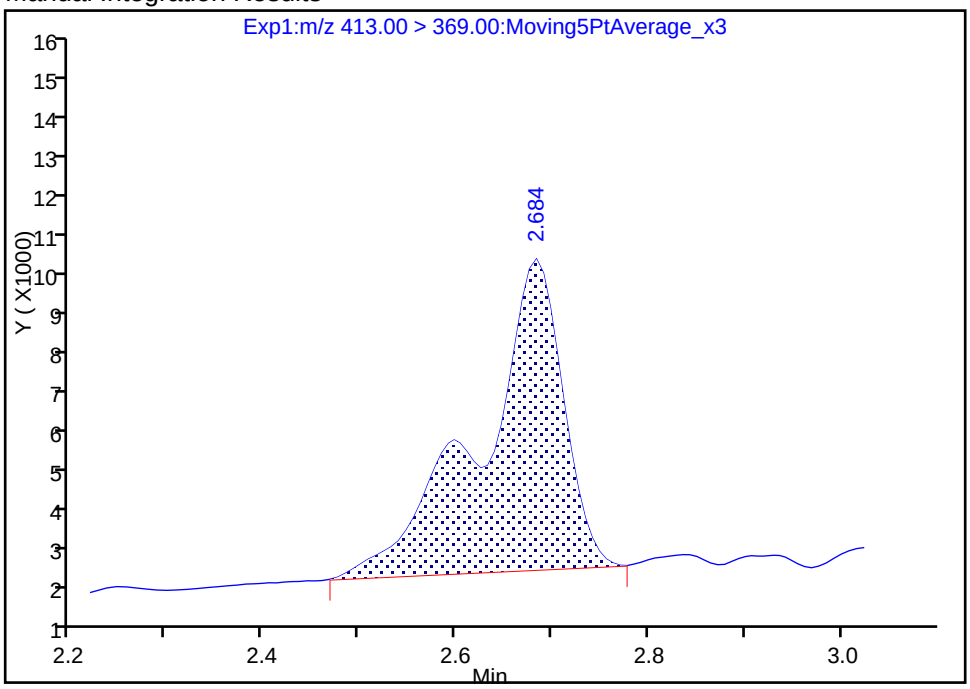
Processing Integration Results

RT: 2.68
Area: 32039
Amount: 0.014374
Amount Units: ng/ml



Manual Integration Results

RT: 2.68
Area: 46372
Amount: 0.020805
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:18:18
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

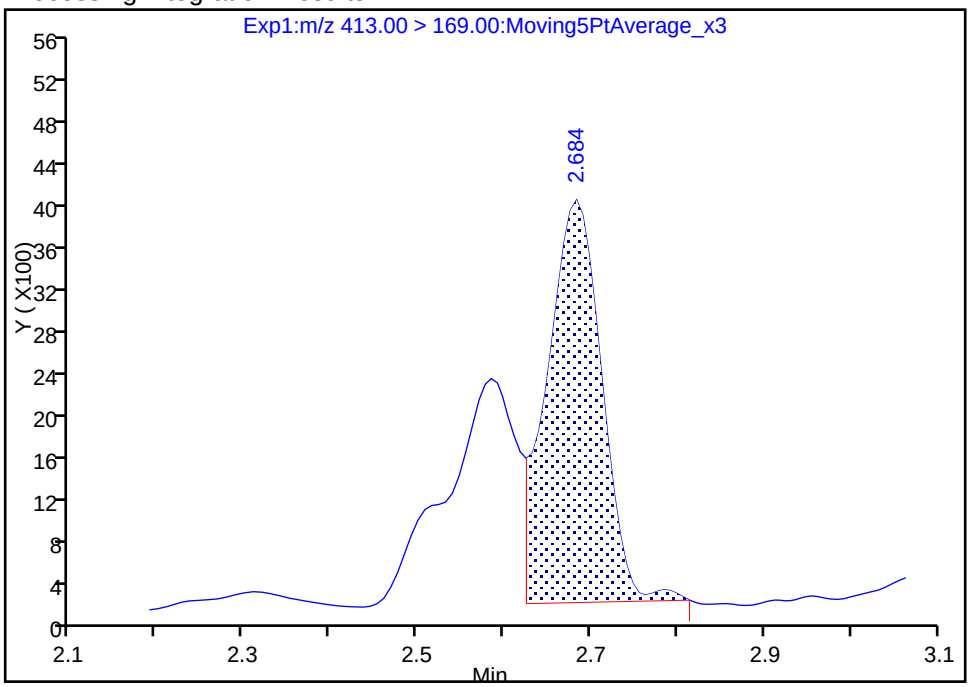
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_024.d				
Injection Date:	18-Nov-2017 19:48:44	Instrument ID:	A8_N		
Lims ID:	320-33221-A-3-A	Lab Sample ID:	320-33221-3		
Client ID:	TP-PFC-023-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	22	Worklist Smp#:	24
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

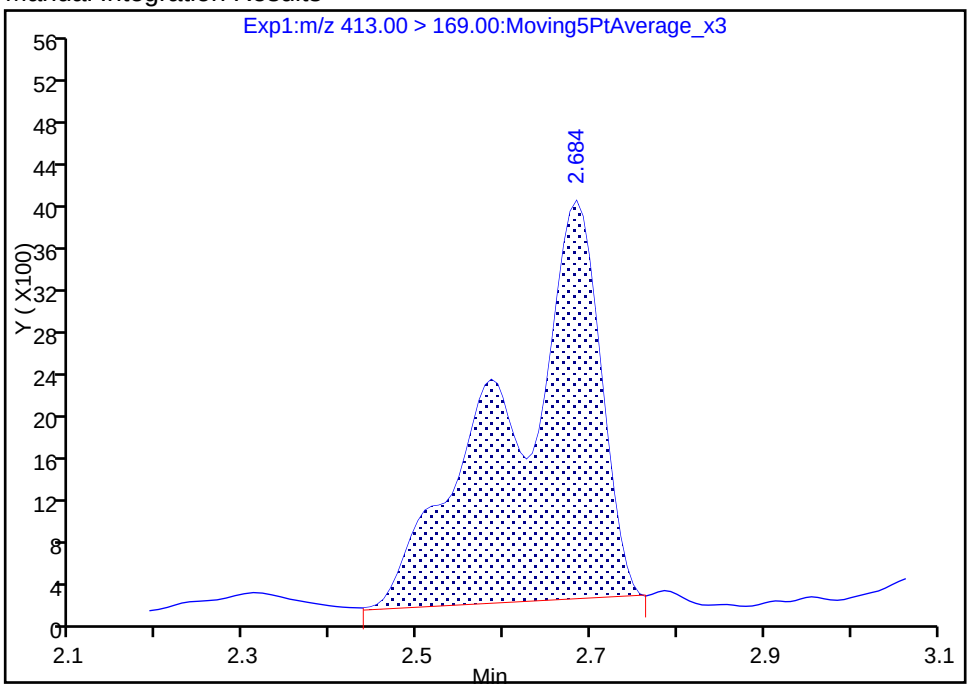
Processing Integration Results

RT: 2.68
Area: 16637
Amount: 0.014374
Amount Units: ng/ml



Manual Integration Results

RT: 2.68
Area: 28005
Amount: 0.020805
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:18:23

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

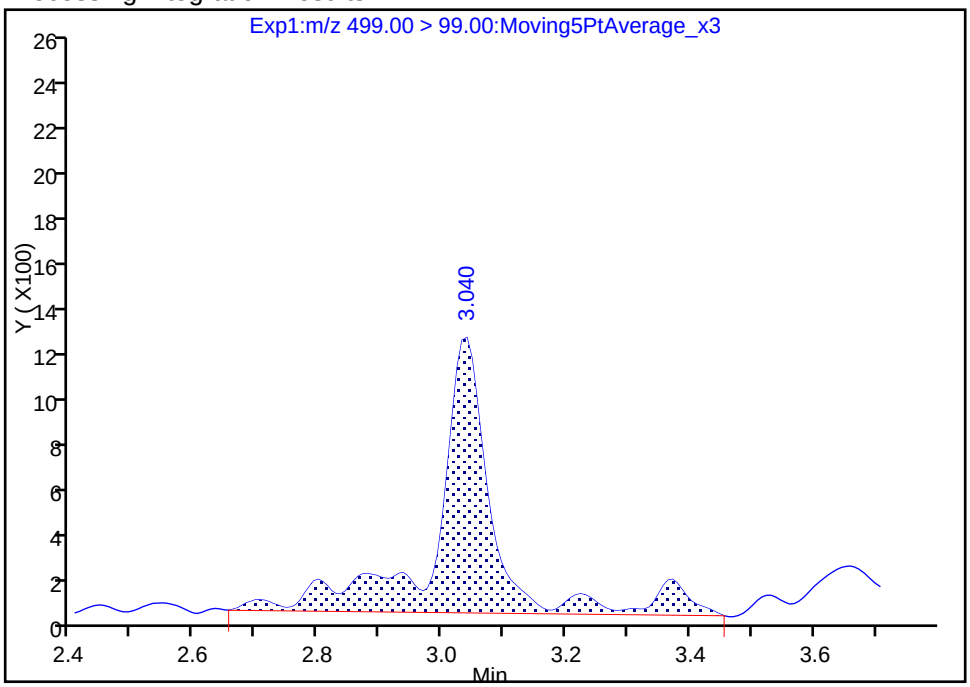
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_024.d				
Injection Date:	18-Nov-2017 19:48:44	Instrument ID:	A8_N		
Lims ID:	320-33221-A-3-A	Lab Sample ID:	320-33221-3		
Client ID:	TP-PFC-023-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	22	Worklist Smp#:	24
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

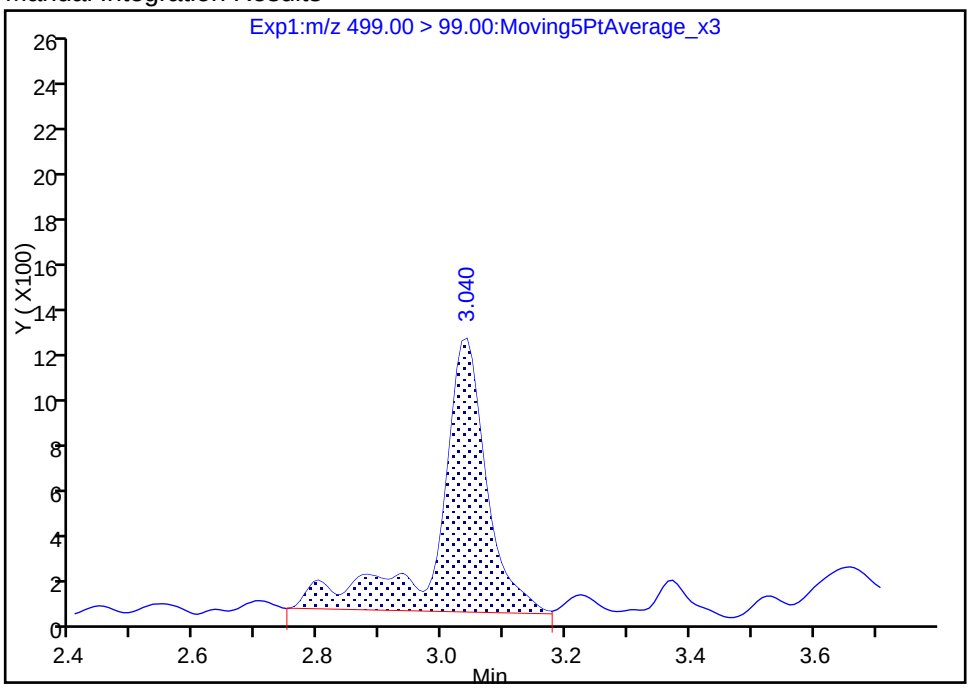
Processing Integration Results

RT: 3.04
Area: 7853
Amount: 0.017302
Amount Units: ng/ml



Manual Integration Results

RT: 3.04
Area: 6516
Amount: 0.017302
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:18:43

Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

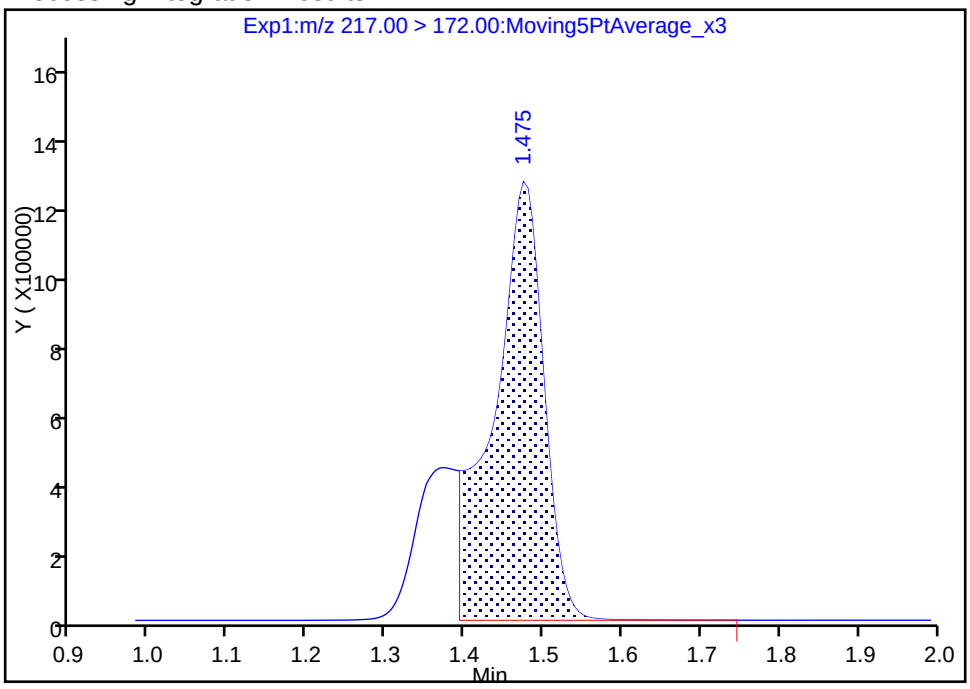
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_024.d
Injection Date: 18-Nov-2017 19:48:44 Instrument ID: A8_N
Lims ID: 320-33221-A-3-A Lab Sample ID: 320-33221-3
Client ID: TP-PFC-023-TPE
Operator ID: SACINSTLCMS01 ALS Bottle#: 22 Worklist Smp#: 24
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

D 1 13C4 PFBA, CAS: STL00992

Signal: 1

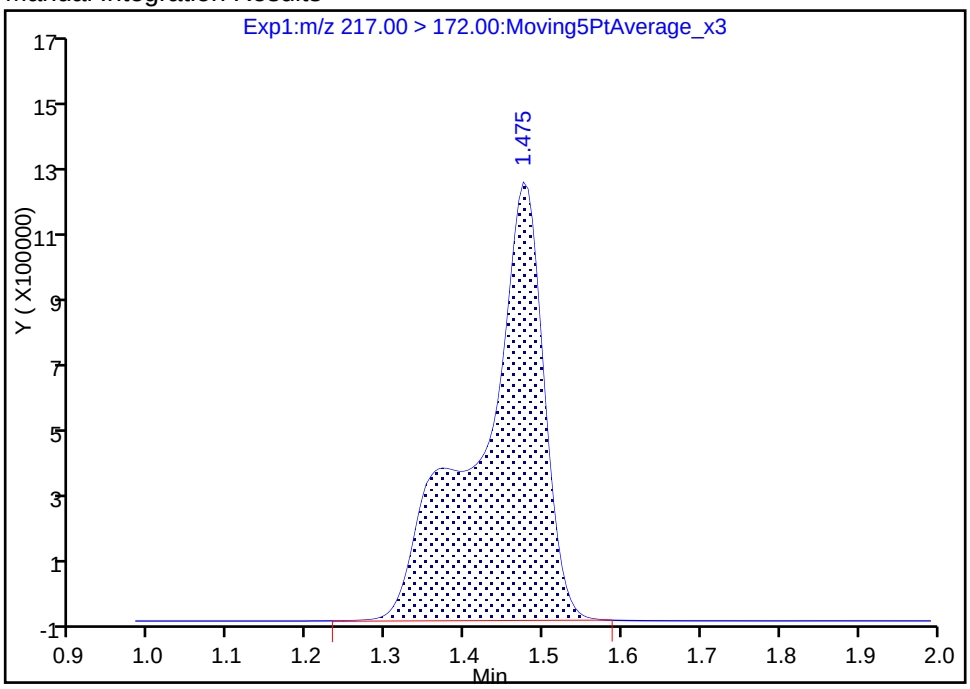
Processing Integration Results

RT: 1.47
Area: 5536433
Amount: 2.126559
Amount Units: ng/ml



Manual Integration Results

RT: 1.47
Area: 7114670
Amount: 2.732764
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:18:56
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-TPE-D | Lab Sample ID: 320-33221-4

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_025.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 00:00

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 301.1(mL) | Date Analyzed: 11/18/2017 19:56

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	140	M	1.7	0.83	0.29
2706-90-3	Perfluoropentanoic acid (PFPeA)	48		1.7	0.83	0.41
307-24-4	Perfluorohexanoic acid (PFHxA)	8.9		3.3	1.7	0.48
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.83	U	1.7	0.83	0.21
335-67-1	Perfluorooctanoic acid (PFOA)	1.7	U M	3.3	1.7	0.71
375-95-1	Perfluorononanoic acid (PFNA)	0.83	U	1.7	0.83	0.22
335-76-2	Perfluorodecanoic acid (PFDA)	0.83	U	1.7	0.83	0.26
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.5	U	3.3	2.5	0.91
307-55-1	Perfluorododecanoic acid (PFDoA)	1.7	U	3.3	1.7	0.46
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.3	2.5	1.1
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.34	J	1.7	0.83	0.24
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.83	U	1.7	0.83	0.25
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.29	J	1.7	0.83	0.25
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.83	U	1.7	0.83	0.25
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.7	U	3.3	1.7	0.45
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.83	U	1.7	0.83	0.27
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.83	U	1.7	0.83	0.29

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-TPE-D | Lab Sample ID: 320-33221-4

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_025.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 00:00

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 301.1(mL) | Date Analyzed: 11/18/2017 19:56

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	108		25-150
STL00992	13C4 PFBA	108	M	25-150
STL00993	13C2 PFHxA	108		25-150
STL00990	13C4 PFOA	98		25-150
STL00995	13C5 PFNA	113		25-150
STL00996	13C2 PFDA	113		25-150
STL00997	13C2 PFUnA	109		25-150
STL00998	13C2 PFDoA	99		25-150
STL00994	18O2 PFHxS	112		25-150
STL00991	13C4 PFOS	113		25-150
STL02116	13C2-PFTeDA	108		25-150
STL01892	13C4-PFHpA	112		25-150
STL01893	13C5 PFPeA	110		25-150
STL02337	13C3-PFBS	114		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_025.d
Lims ID: 320-33221-A-4-A
Client ID: TP-PFC-023-TPE-D
Sample Type: Client
Inject. Date: 18-Nov-2017 19:56:36 ALS Bottle#: 23 Worklist Smp#: 25
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-33221-a-4-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 24-Nov-2017 13:22:07 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK033

First Level Reviewer: hannigana Date: 24-Nov-2017 13:21:31

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										M
217.00 > 172.00	1.475	1.479	-0.004	0.550	7248117	2.70		108	21258	M
2 Perfluorobutyric acid										M
212.90 > 169.00	1.475	1.480	-0.005	1.000	10980133	4.14			1932	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.748	1.738	0.010	0.652	4677844	2.75		110	69549	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.723	1.740	-0.017	0.986	3072184	1.46			1881	
D 47 13C3-PFBS										
301.90 > 83.00	1.781	1.774	0.007	0.664	98204	2.64		114	3866	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.781	1.776	0.005	1.000	19069	0.006075			87.8	
298.90 > 99.00	1.781	1.776	0.005	1.000	9822		1.94(1.74-3.24)		80.3	
6 Perfluorohexanoic acid										R
313.00 > 269.00	2.005	2.010	-0.005	0.995	558017	0.2689			895	R
313.00 > 119.00	2.015	2.010	0.005	1.000	26646		20.94(7.05-13.09)		334	
D 7 13C2 PFHxA										
315.00 > 270.00	2.015	2.010	0.005	0.752	5185941	2.70		108	51293	
D 9 13C4-PFHpA										
367.00 > 322.00	2.336	2.332	0.004	0.871	5209895	2.81		112	55581	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.357	2.347	0.010	1.000	23436	0.008738			181	
399.00 > 99.00	2.357	2.347	0.010	1.000	6042		3.88(2.10-3.89)		63.1	
D 11 18O2 PFHxS										
403.00 > 84.00	2.357	2.347	0.010	0.879	5791488	2.65		112	58892	
D 14 13C4 PFOA										
417.00 > 372.00	2.682	2.680	0.002	1.000	5205636	2.45		98.0	65028	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.682	2.680	0.002	1.000	43483	0.0198			13.3	M
413.00 > 169.00	2.682	2.680	0.002	1.000	28822		1.51(1.18-2.19)		98.3	M
* 62 13C2-PFOA										
415.00 > 370.00	2.682	2.695	-0.013		5155328	2.50			51863	
D 18 13C4 PFOS										
503.00 > 80.00	3.039	3.042	-0.003	1.133	3934052	2.69		113	32306	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.039	3.042	-0.003	1.000	12296	0.007119			14.6	
499.00 > 99.00	3.039	3.042	-0.003	1.000	3107		3.96(3.24-6.01)		21.9	
D 19 13C5 PFNA										
468.00 > 423.00	3.039	3.042	-0.003	1.133	4413179	2.83		113	45030	
D 21 13C8 FOSA										
506.00 > 78.00	3.393	3.393	0.0	1.265	5068671	2.69		108	27566	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.393	3.395	-0.002	1.000	11191	0.005746			399	
D 23 13C2 PFDA										
515.00 > 470.00	3.393	3.400	-0.007	1.265	3713715	2.82		113	78606	
D 30 13C2 PFUnA										
565.00 > 520.00	3.723	3.730	-0.007	1.388	2876577	2.74		109	45129	
D 36 13C2 PFDoA										
615.00 > 570.00	4.020	4.024	-0.004	1.499	3013316	2.47		98.7	33596	
37 Perfluorododecanoic acid										R
613.00 > 569.00	4.020	4.025	-0.005	1.000	10186	0.008626			31.3	R
613.00 > 169.00	4.028	4.025	0.003	1.002	2315		4.40(2.19-4.07)		125	
41 Perfluorotridecanoic acid										R
663.00 > 619.00	4.279	4.287	-0.008	1.000	13762	0.009328			39.0	R
663.00 > 169.00	4.279	4.287	-0.008	1.000	4118		3.34(1.76-3.26)		214	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.513	4.526	-0.013	1.683	4058265	2.70		108	28974	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.513	4.526	-0.013	1.000	4055	0.0102			120	
713.00 > 219.00	4.513	4.526	-0.013	1.000	2601		1.56(1.00-1.85)		118	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

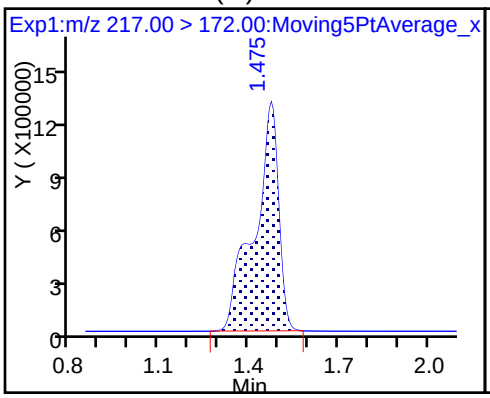
Report Date: 24-Nov-2017 13:22:12 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

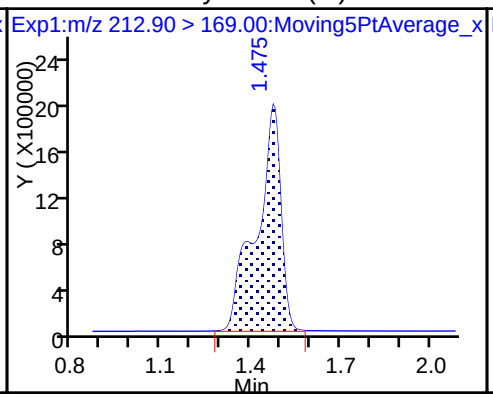
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_025.d

Injection Date:	18-Nov-2017 19:56:36	Instrument ID:	A8_N		
Lims ID:	320-33221-A-4-A	Lab Sample ID:	320-33221-4		
Client ID:	TP-PFC-023-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	23	Worklist Smp#:	25
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

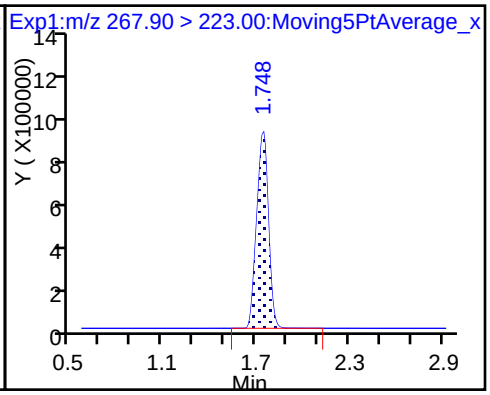
D 1 13C4 PFBA (M)



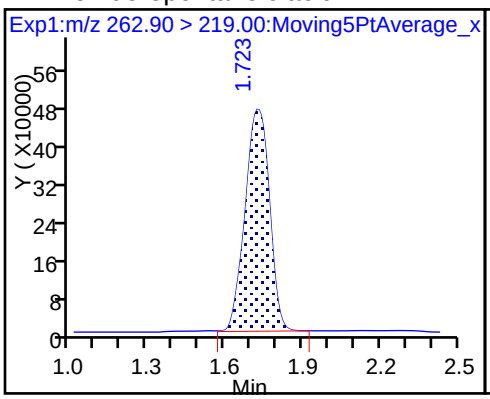
2 Perfluorobutyric acid (M)



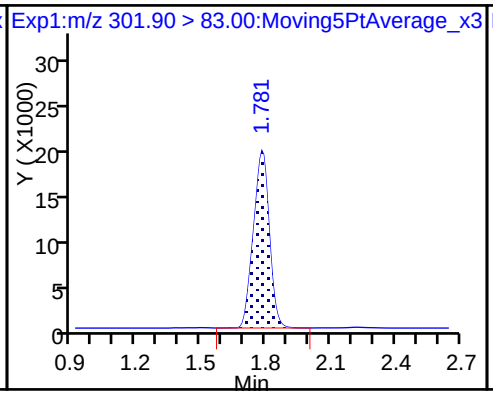
D 3 13C5-PFPeA



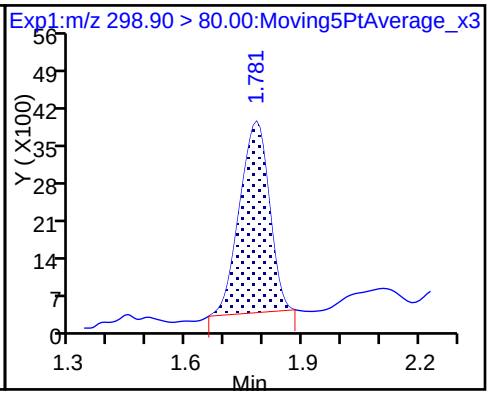
4 Perfluoropentanoic acid



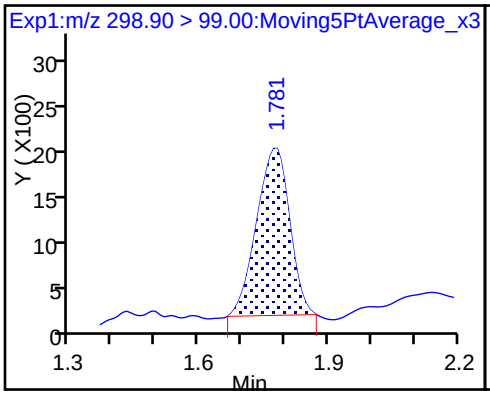
D 47 13C3-PFBS



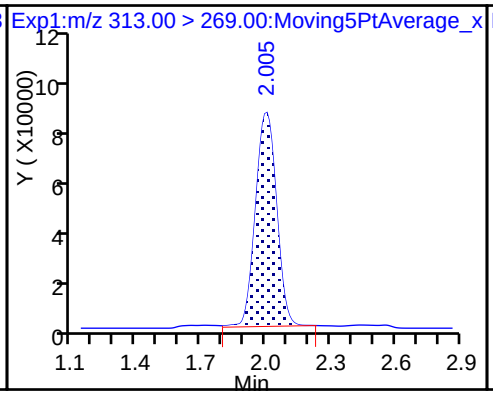
5 Perfluorobutanesulfonic acid



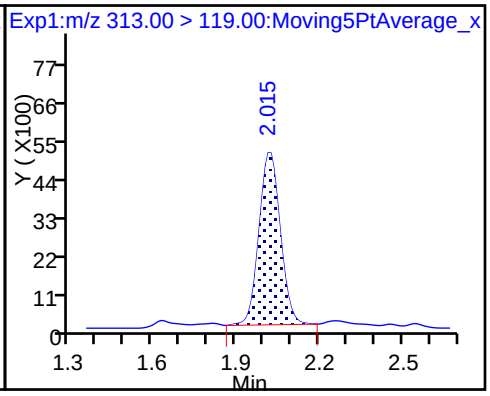
5 Perfluorobutanesulfonic acid



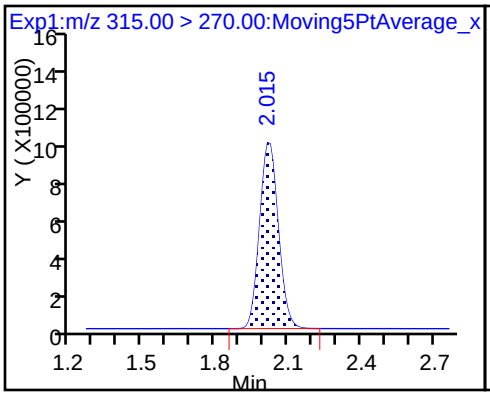
6 Perfluorohexanoic acid



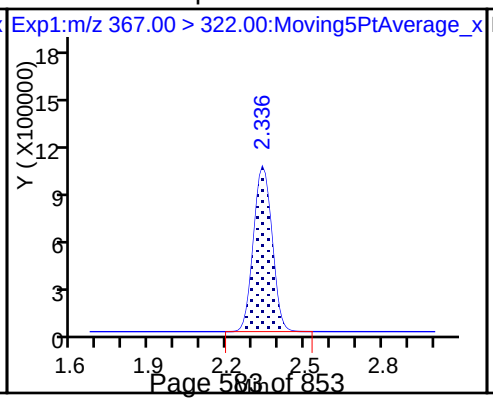
6 Perfluorohexanoic acid



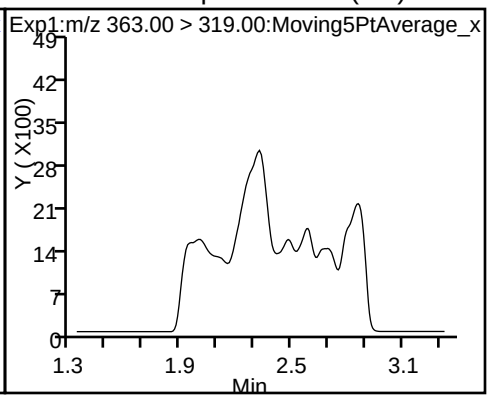
D 7 13C2 PFHxA



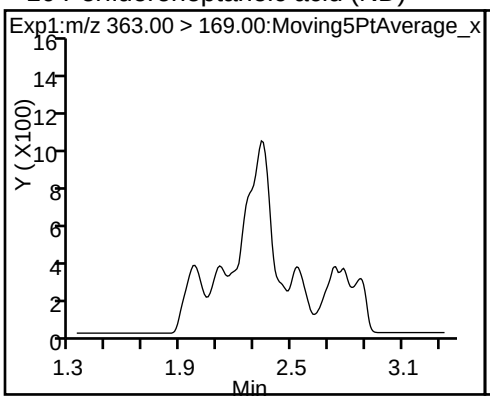
D 9 13C4-PFHpA



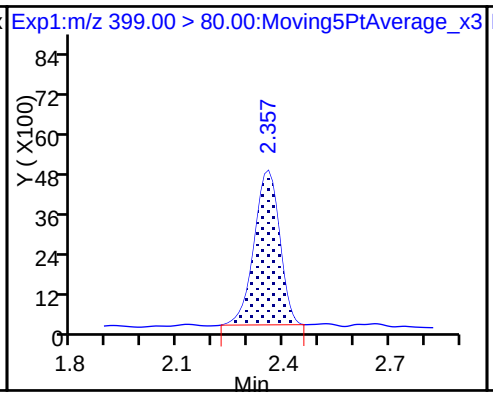
10 Perfluoroheptanoic acid (ND)



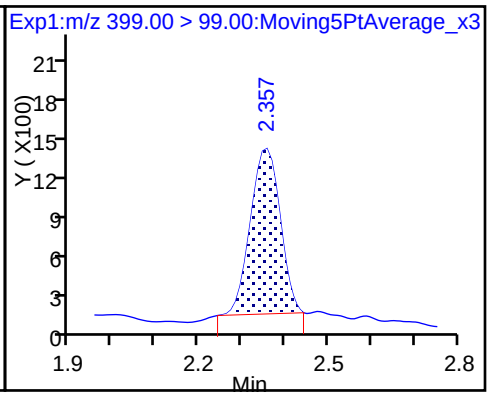
10 Perfluoroheptanoic acid (ND)



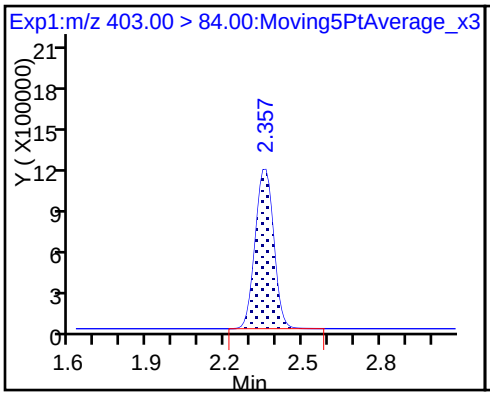
8 Perfluorohexanesulfonic acid



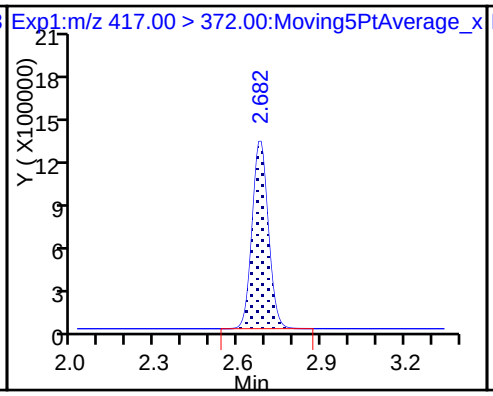
8 Perfluorohexanesulfonic acid



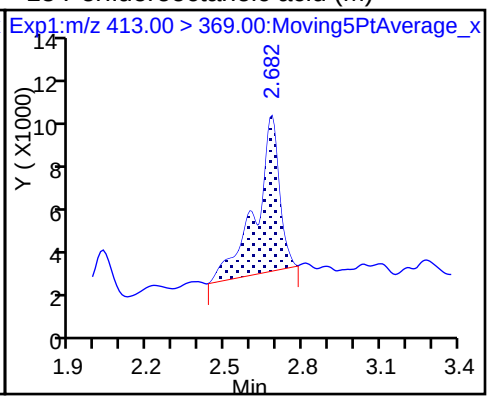
D 11 18O2 PFHxS



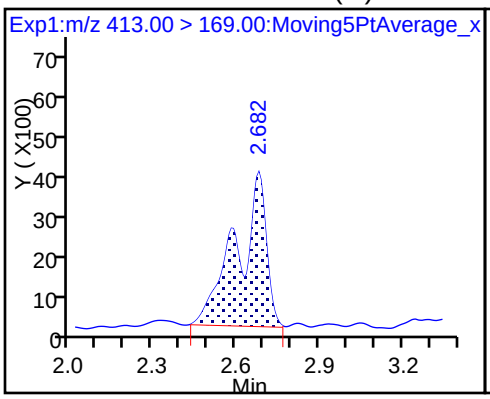
D 14 13C4 PFOA



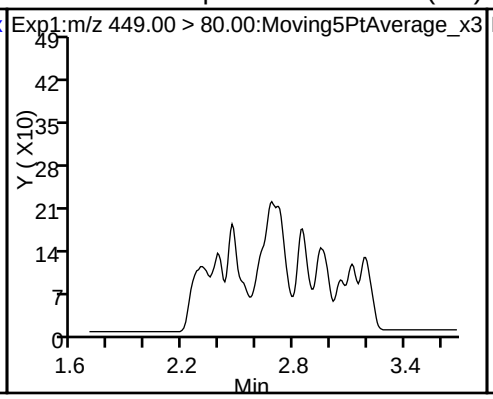
15 Perfluorooctanoic acid (M)



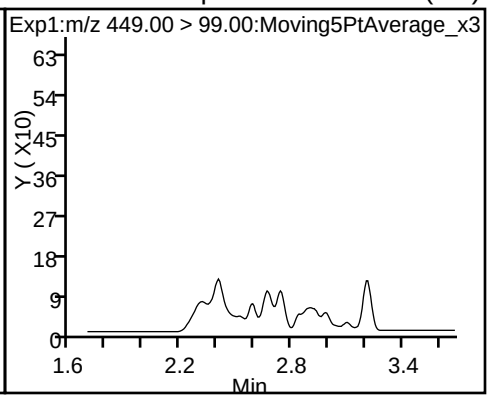
15 Perfluorooctanoic acid (M)



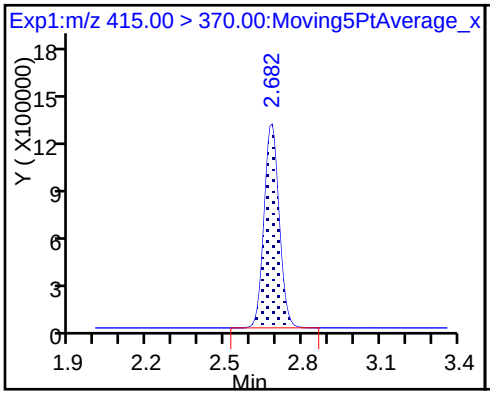
16 Perfluoroheptanesulfonic Acid (ND)



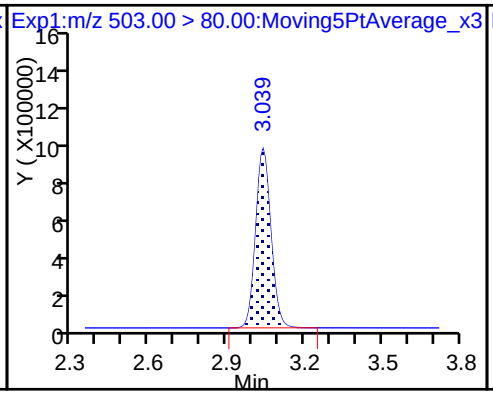
16 Perfluoroheptanesulfonic Acid (ND)



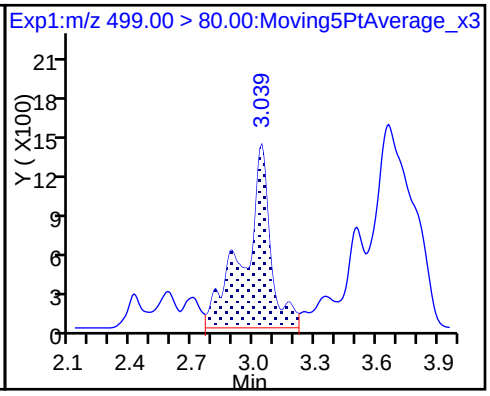
* 62 13C2-PFOA



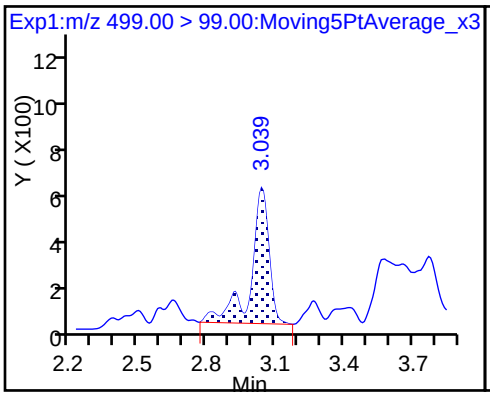
D 18 13C4 PFOS



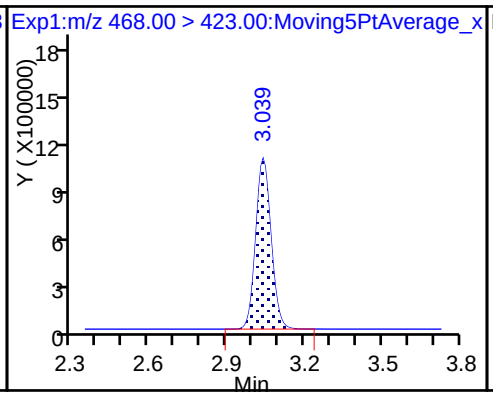
17 Perfluorooctane sulfonic acid



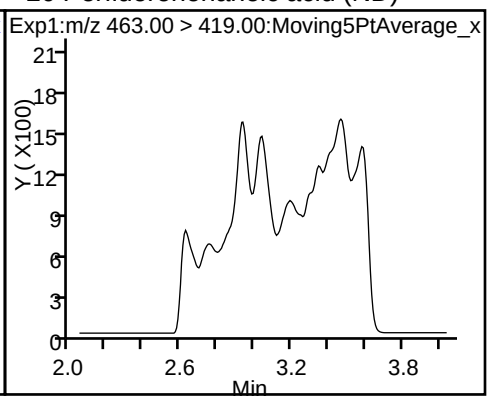
17 Perfluorooctane sulfonic acid



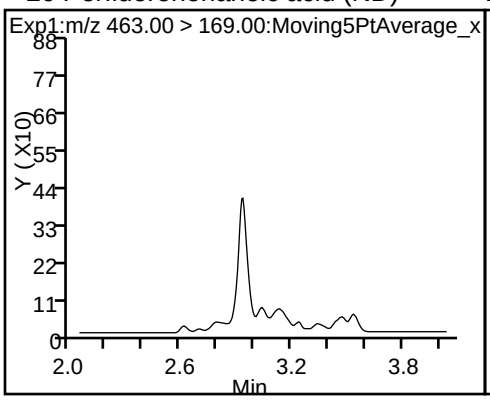
D 19 13C5 PFNA



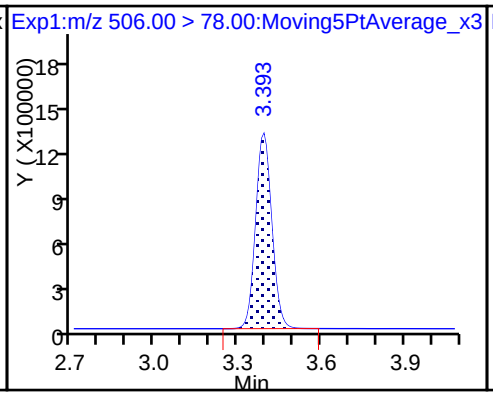
20 Perfluorononanoic acid (ND)



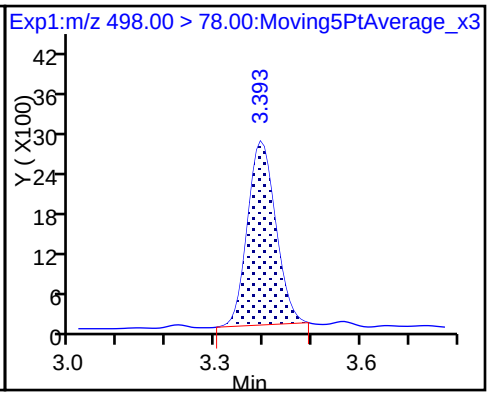
20 Perfluorononanoic acid (ND)



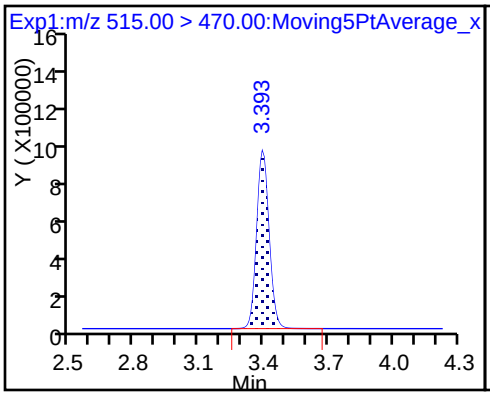
D 21 13C8 FOSA



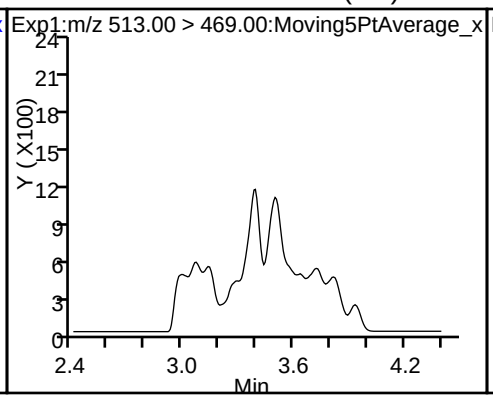
22 Perfluorooctane Sulfonamide



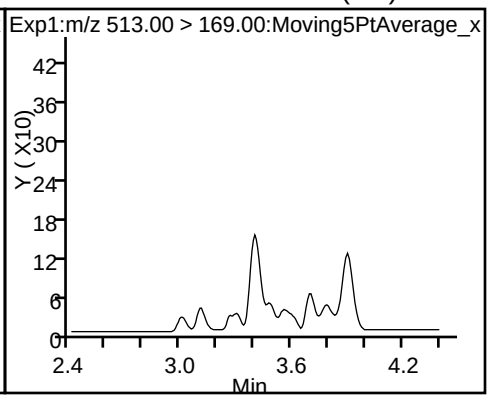
D 23 13C2 PFDA



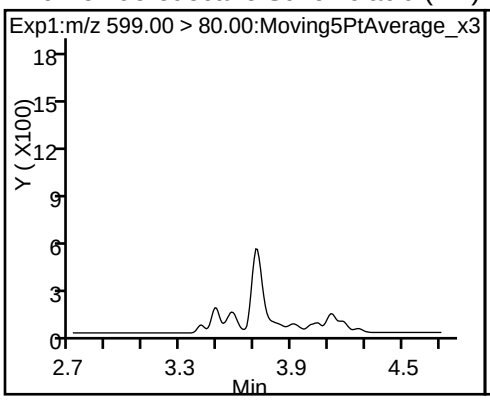
24 Perfluorodecanoic acid (ND)



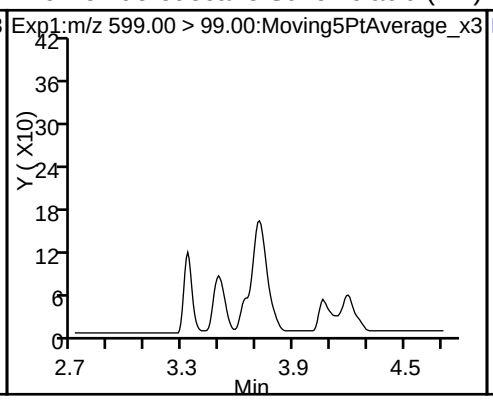
24 Perfluorodecanoic acid (ND)



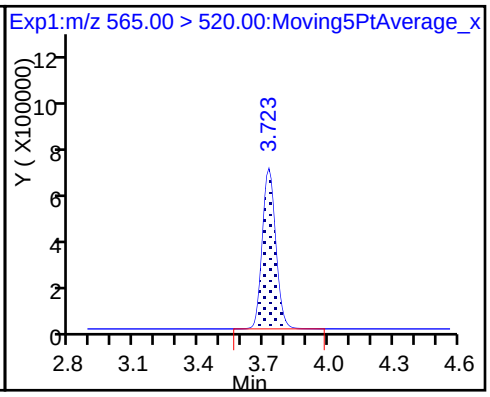
29 Perfluorodecane Sulfonic acid (ND)



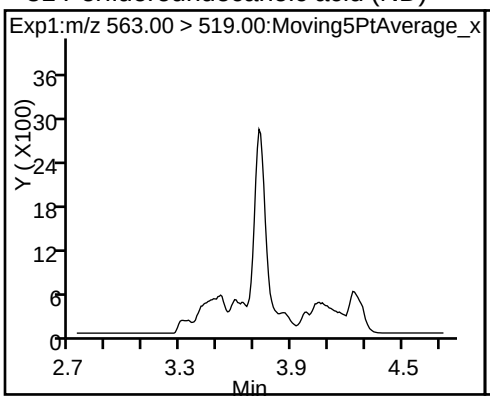
29 Perfluorodecane Sulfonic acid (ND)



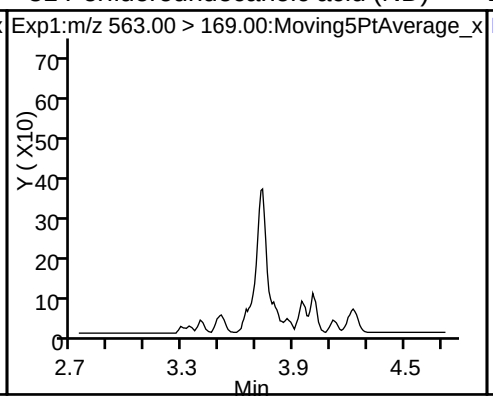
D 30 13C2 PFUnA



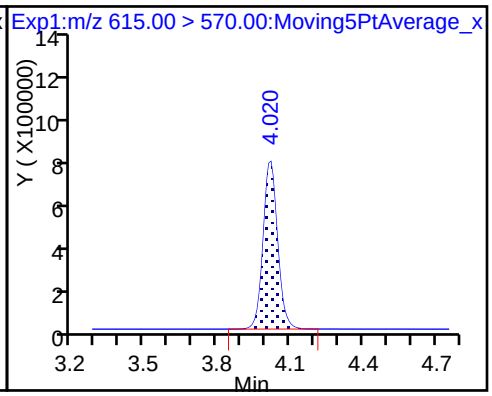
31 Perfluoroundecanoic acid (ND)



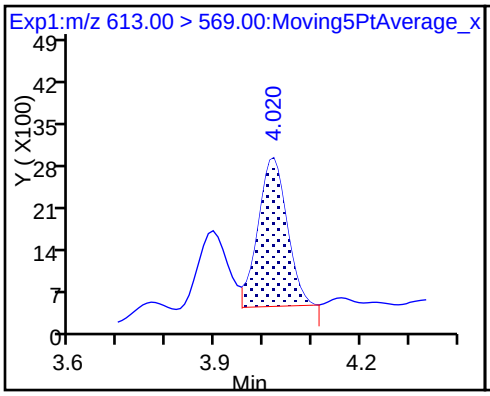
31 Perfluoroundecanoic acid (ND)



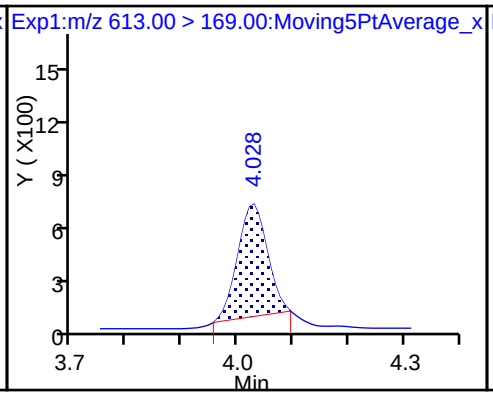
D 36 13C2 PFDoA



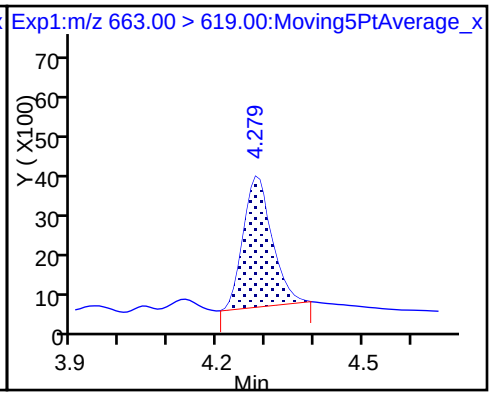
37 Perfluorododecanoic acid



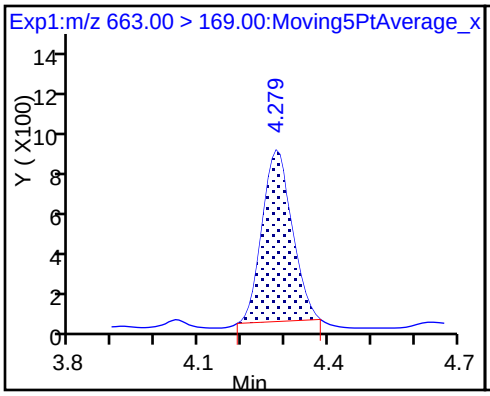
37 Perfluorododecanoic acid



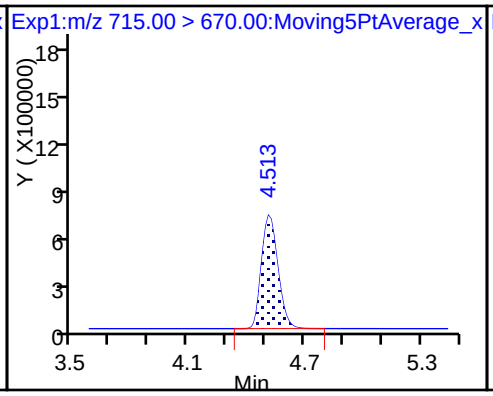
41 Perfluorotridecanoic acid



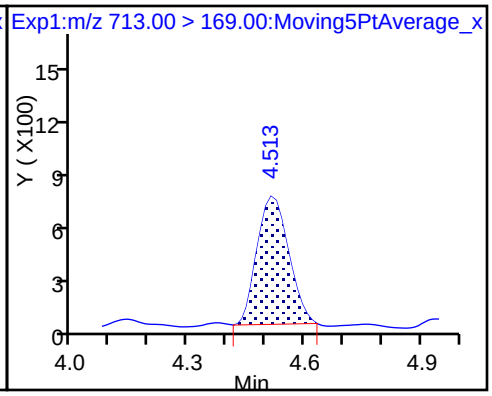
41 Perfluorotridecanoic acid



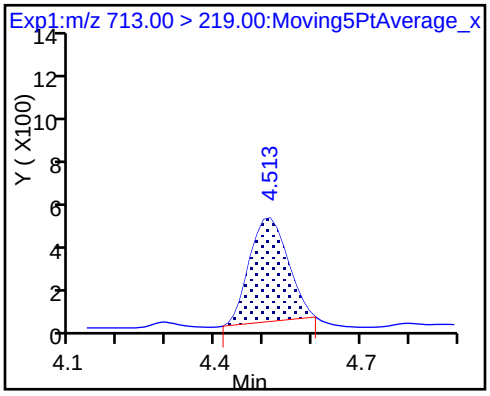
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

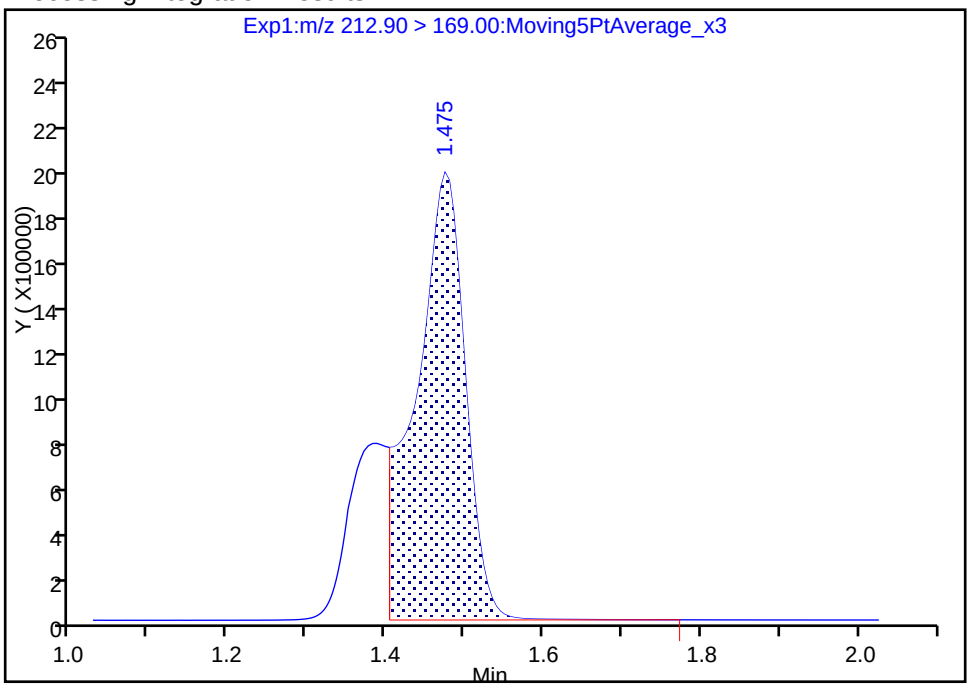
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_025.d				
Injection Date:	18-Nov-2017 19:56:36	Instrument ID:	A8_N		
Lims ID:	320-33221-A-4-A	Lab Sample ID:	320-33221-4		
Client ID:	TP-PFC-023-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	23	Worklist Smp#:	25
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

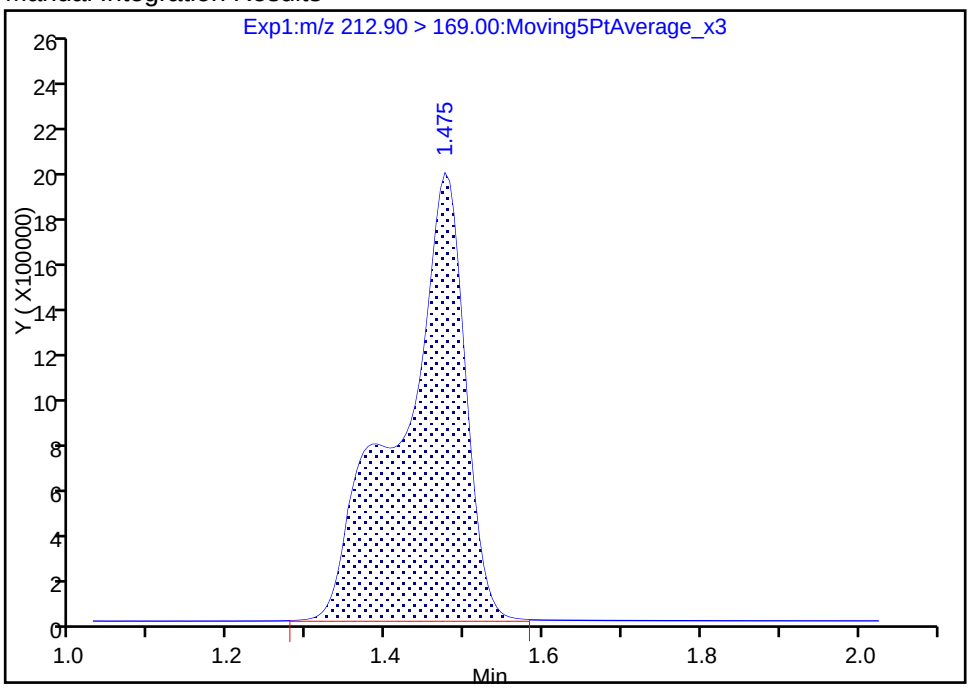
Processing Integration Results

RT: 1.48
Area: 8339144
Amount: 3.141677
Amount Units: ng/ml



Manual Integration Results

RT: 1.48
Area: 10980133
Amount: 4.136639
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:20:44

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

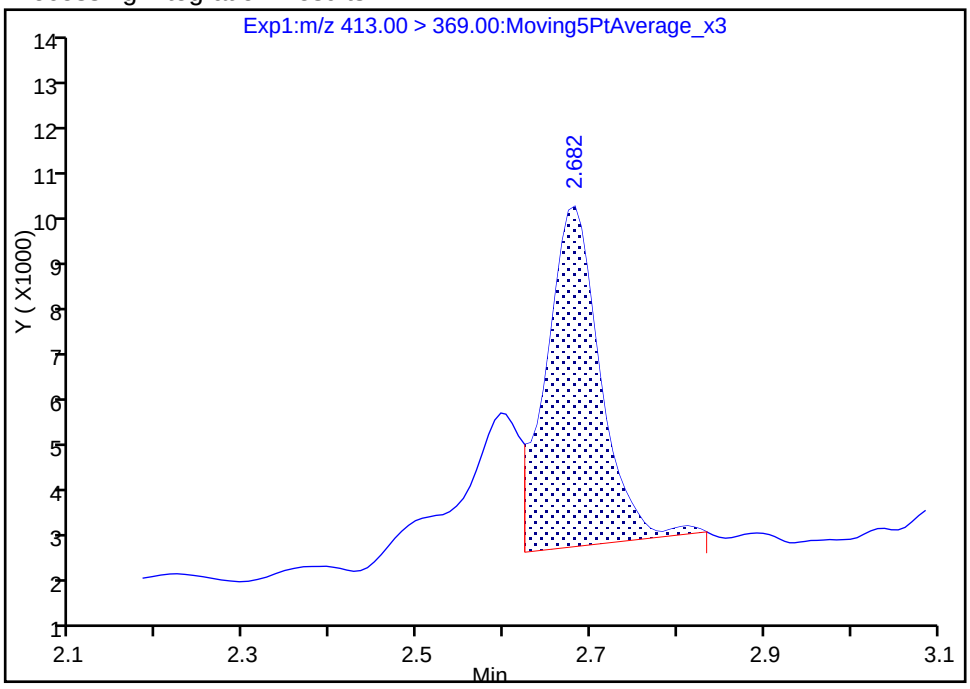
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_025.d				
Injection Date:	18-Nov-2017 19:56:36	Instrument ID:	A8_N		
Lims ID:	320-33221-A-4-A	Lab Sample ID:	320-33221-4		
Client ID:	TP-PFC-023-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	23	Worklist Smp#:	25
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

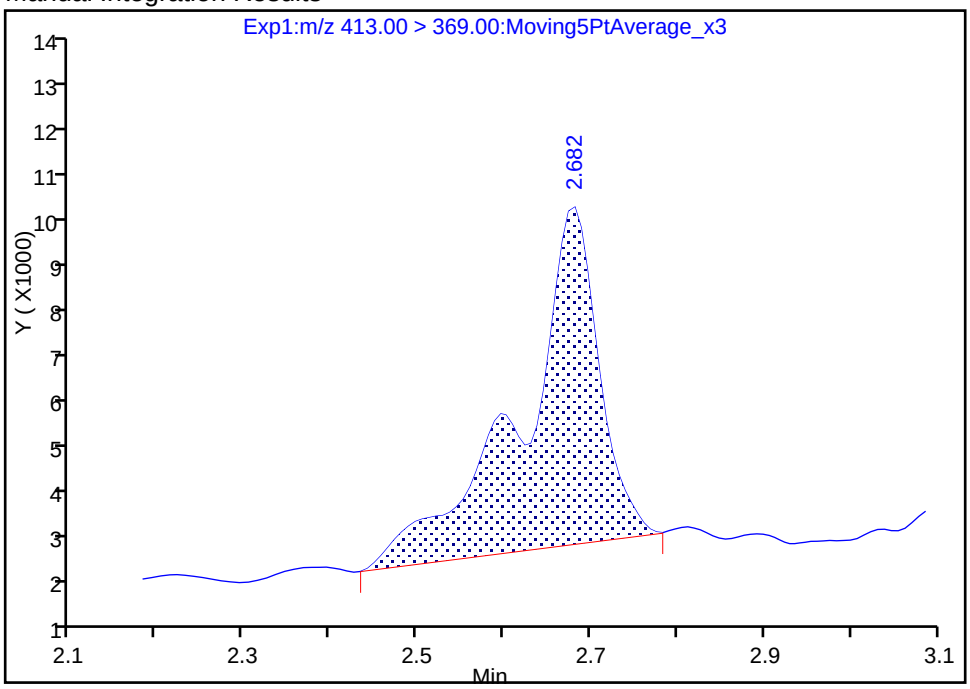
Processing Integration Results

RT: 2.68
Area: 30012
Amount: 0.013664
Amount Units: ng/ml



Manual Integration Results

RT: 2.68
Area: 43483
Amount: 0.019797
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:20:06

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

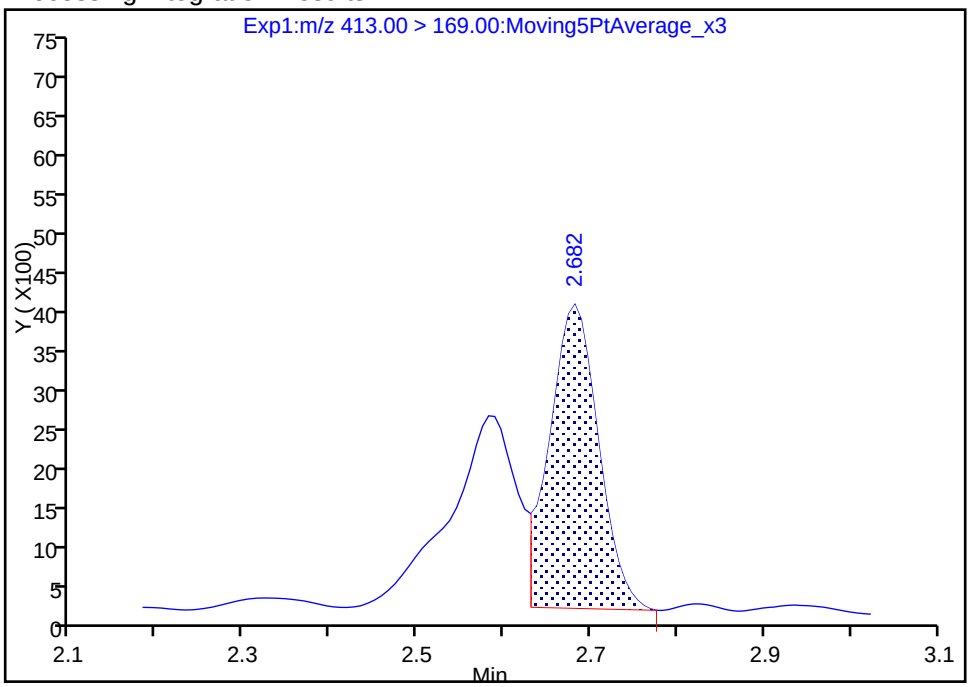
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_025.d				
Injection Date:	18-Nov-2017 19:56:36	Instrument ID:	A8_N		
Lims ID:	320-33221-A-4-A	Lab Sample ID:	320-33221-4		
Client ID:	TP-PFC-023-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	23	Worklist Smp#:	25
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

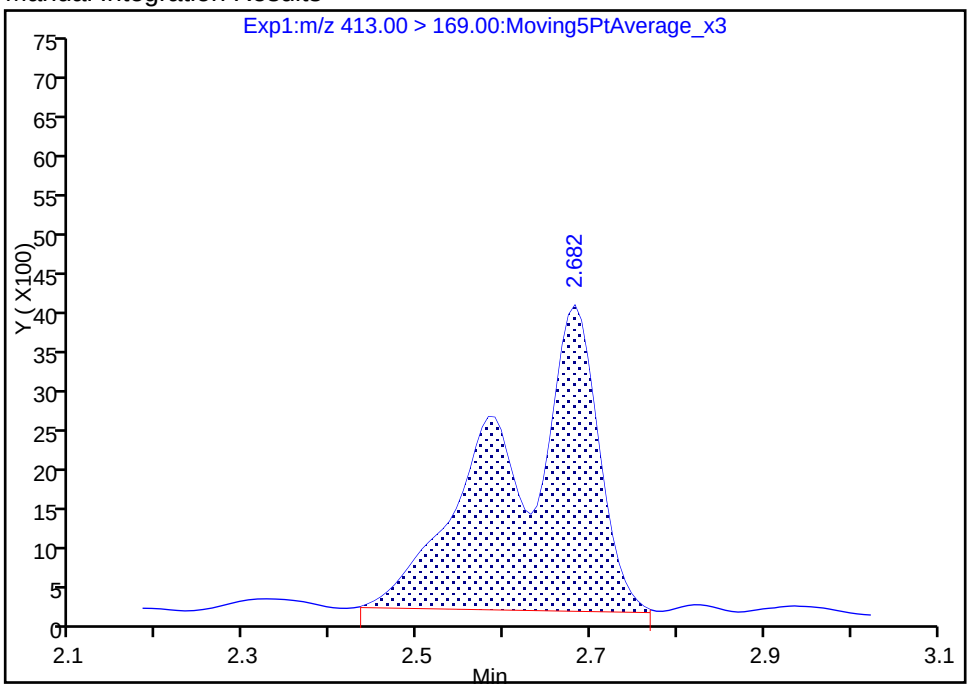
Processing Integration Results

RT: 2.68
Area: 15187
Amount: 0.013664
Amount Units: ng/ml



Manual Integration Results

RT: 2.68
Area: 28822
Amount: 0.019797
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:20:11

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

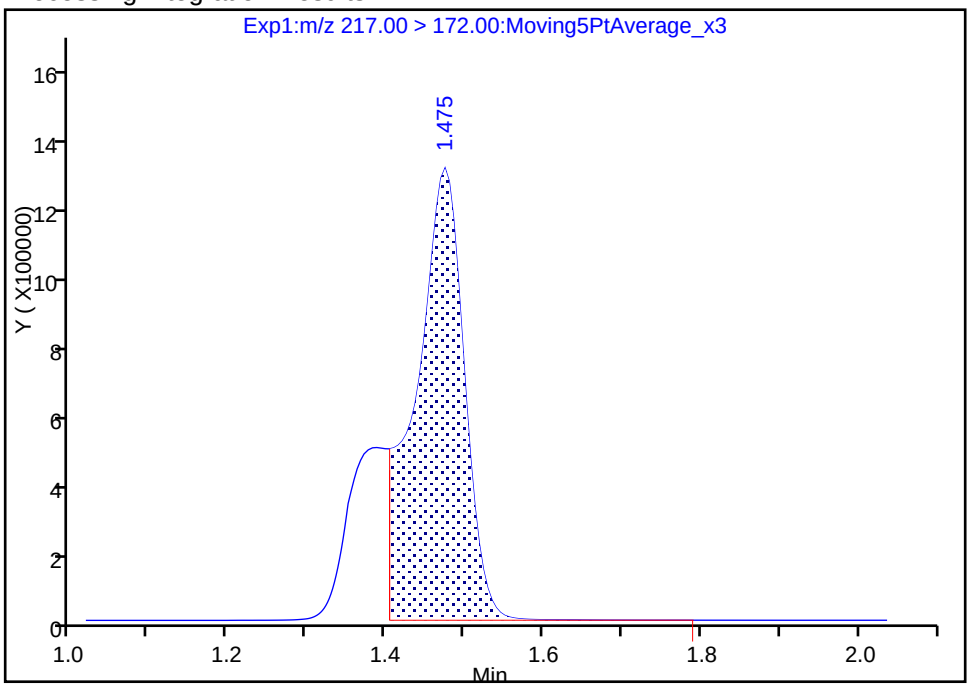
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_025.d				
Injection Date:	18-Nov-2017 19:56:36	Instrument ID:	A8_N		
Lims ID:	320-33221-A-4-A	Lab Sample ID:	320-33221-4		
Client ID:	TP-PFC-023-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	23	Worklist Smp#:	25
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

D 1 13C4 PFBA, CAS: STL00992

Signal: 1

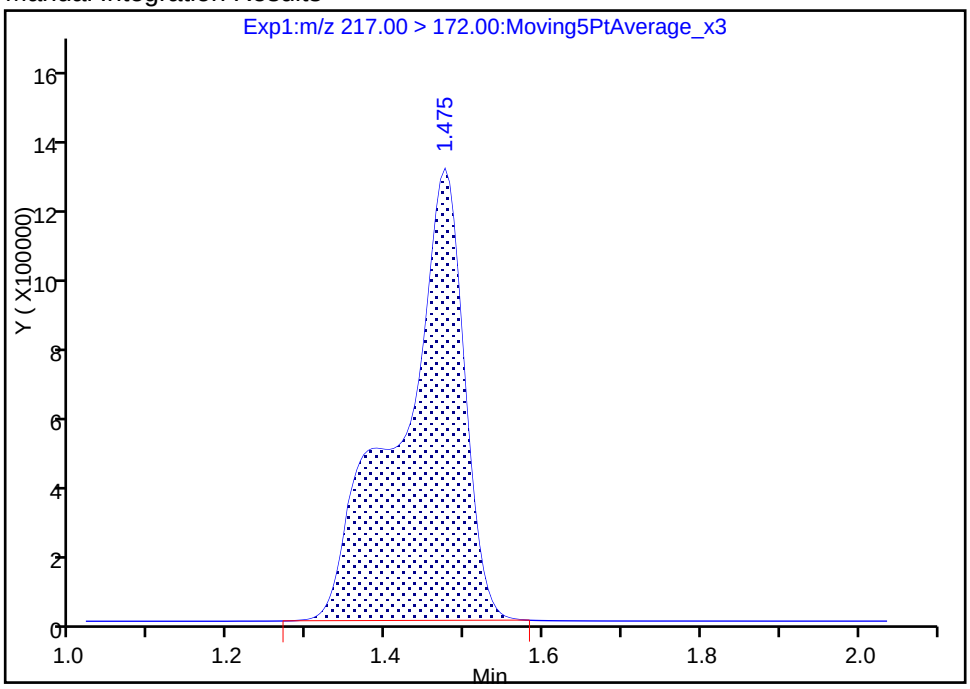
Processing Integration Results

RT: 1.48
Area: 5531100
Amount: 2.061101
Amount Units: ng/ml



Manual Integration Results

RT: 1.48
Area: 7248117
Amount: 2.700927
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 13:20:30

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1 Analy Batch No.: 195190

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/16/2017 13:20 Calibration End Date: 11/16/2017 14:23 Calibration ID: 36394

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-195190/2	2017.11.16LLICAL_002.d
Level 2	IC 320-195190/3	2017.11.16LLICAL_003.d
Level 3	IC 320-195190/4	2017.11.16LLICAL_004.d
Level 4	IC 320-195190/5	2017.11.16LLICAL_005.d
Level 5	IC 320-195190/6	2017.11.16LLICAL_006.d
Level 6	IC 320-195190/7	2017.11.16LLICAL_007.d
Level 7	IC 320-195190/8	2017.11.16LLICAL_008.d
Level 8	IC 320-195190/9	2017.11.16LLICAL_009.d

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 8	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	0.8755 0.9384	0.9058 0.9260	0.9547 0.8449	0.9333	0.9456	AveID		0.9155				4.1		35.0			
Perfluoropentanoic acid (PFPeA)	1.2113 1.1454	1.1462 1.1174	1.1463 1.0260	1.0885	1.1406	AveID		1.1277				4.8		35.0			
Perfluorobutanesulfonic acid (PFBS)	70.208 79.187	76.081 72.860	78.780 60.533	76.889	80.008	AveID		74.318				8.7		50.0			
4:2 FTS	0.5770 0.7794	0.7949 +++++	0.9154 +++++	0.6843	0.7229	AveID		0.7456				15.3		35.0			
Perfluorohexanoic acid (PFHxA)	1.0384 1.0142	1.0844 1.0023	1.0274 0.8917	0.9754	0.9700	AveID		1.0005				5.7		35.0			
Perfluoroheptanoic acid (PFHpA)	1.1490 1.0069	1.0442 0.9826	1.0564 0.9386	1.0149	1.0089	AveID		1.0252				6.0		35.0			
Perfluorohexanesulfonic acid (PFHxS)	1.3232 1.0718	1.2072 1.0137	1.0598 0.9848	1.0381	1.0634	AveID		1.0952				10.3		35.0			
6:2FTS	1.4603 1.6705	1.5615 1.6651	1.6030 +++++	1.6164	1.6556	AveID		1.6046				4.7		35.0			
Perfluorooctanoic acid (PFOA)	1.2593 1.0501	1.1053 0.9816	1.0514 0.9015	1.0546	1.0350	AveID		1.0549				9.7		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.2249 1.3588	1.3486 1.3252	1.3563 1.1624	1.3191	1.3764	AveID		1.3090				5.8		50.0			
Perfluorooctanesulfonic acid (PFOS)	0.9566 1.0709	1.0205 1.1016	1.0541 1.0380	1.0557	1.0973	AveID		1.0493				4.4		35.0			
Perfluorononanoic acid (PFNA)	0.9958 1.0268	0.9533 0.9841	1.0406 0.9198	1.0298	1.0269	AveID		0.9971				4.3		35.0			
8:2FTS	1.1276 1.2015	1.2410 1.2084	1.2362 1.1953	1.3106	1.1942	AveID		1.2143				4.3		35.0			
Perfluorooctane Sulfonamide (FOSA)	0.9816 0.9822	0.9857 0.9046	0.9997 0.8316	0.9969	1.0020	AveID		0.9605				6.3		35.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1 Analy Batch No.: 195190

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/16/2017 13:20 Calibration End Date: 11/16/2017 14:23 Calibration ID: 36394

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 8	LVL 4	LVL 5		B	M1	M2								
Perfluorodecanoic acid (PFDA)	0.9246 1.0042	0.9829 0.9756	0.9732 0.8908	1.0176	1.0010	AveID		0.9712				4.4		35.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9972 1.0580	1.0262 1.0742	1.0761 1.0400	1.0742	1.0404	AveID		1.0483				2.7		35.0			
Perfluorodecanesulfonic acid (PFDS)	0.4608 0.6372	0.6075 0.6267	0.6568 0.5763	0.6236	0.6455	AveID		0.6043				10.4		50.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.7828 0.9816	0.9504 0.9832	1.0016 1.0293	0.9620	0.9792	AveID		0.9588				7.8		35.0			
Perfluoroundecanoic acid (PFUnA)	0.9539 0.8694	0.9735 0.9093	0.8556 0.8902	0.9159	0.8734	AveID		0.9051				4.6		35.0			
MeFOSA	0.8634 0.9670	1.0875 0.9793	0.9696 0.9391	1.0391	1.0061	AveID		0.9814				6.8		35.0			
Perfluorododecanoic acid (PFDoA)	1.0105 1.0616	0.9309 0.9848	0.9736 0.9047	0.9756	0.9963	AveID		0.9797				4.9		35.0			
N-EtFOSA-M	0.7203 1.0439	1.0011 1.0521	1.0908 1.0054	1.0506	1.0497	AveID		1.0017				11.7		35.0			
Perfluorotridecanoic Acid (PFTriA)	1.1618 1.3128	1.1977 1.1806	1.2836 1.1090	1.2961	1.2509	AveID		1.2241				5.9		50.0			
Perfluorotetradecanoic acid (PFTeA)	0.2606 0.2380	0.2784 0.2361	0.2385 0.2355	0.2397	0.2352	AveID		0.2452				6.4		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 0.9214	1.2644 0.8281	0.9721 +++++	0.9158	0.9098	L2ID	0.0190	0.8873							0.9990		0.9900
Perfluoro-n-octadecanoic acid (PFODA)	0.9774 1.0207	1.0077 0.9507	1.0862 0.8092	1.0377	1.0700	AveID		0.9949				8.8		50.0			
13C4 PFBA	1.2681 1.3302	1.2688 1.3181	1.2889 1.4178	1.2651	1.2538	Ave		1.3014				4.2		50.0			
13C5 PFPeA	0.8173 0.8269	0.8118 0.8210	0.8329 0.8556	0.8221	0.8045	Ave		0.8240				1.9		50.0			
13C3-PFBS	0.0173 0.0180	0.0172 0.0180	0.0180 0.0202	0.0181	0.0173	Ave		0.0180				5.3		50.0			
13C2 PFHxA	0.9457 0.9366	0.9090 0.9190	0.9369 0.9739	0.9145	0.9060	Ave		0.9302				2.5		50.0			
13C4-PFHpA	0.8976 0.9287	0.8650 0.8896	0.9323 0.8929	0.8914	0.8910	Ave		0.8986				2.4		50.0			
18O2 PFHxS	1.0713 1.0760	1.0413 1.0602	1.0941 1.0582	1.0692	1.0133	Ave		1.0605				2.3		50.0			
M2-6:2FTS	0.5198 0.4602	0.4508 0.2949	0.4019 +++++	0.5496	0.4726	Ave		0.4500				18.5		50.0			
13C4 PFOA	1.0570 1.0262	1.0364 0.9907	1.0409 1.0220	1.0401	1.0292	Ave		1.0303				1.9		50.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1 Analy Batch No.: 195190

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/16/2017 13:20 Calibration End Date: 11/16/2017 14:23 Calibration ID: 36394

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 8	LVL 4	LVL 5		B	M1	M2								
13C4 PFOS	0.7322 0.7204	0.6934 0.6923	0.7078 0.7292	0.7043	0.6845	Ave		0.7080				2.5		50.0			
13C5 PFNA	0.7518 0.7698	0.7595 0.7486	0.7720 0.7670	0.7547	0.7325	Ave		0.7570				1.7		50.0			
M2-8:2FTS	0.2434 0.2502	0.2322 0.2294	0.2471 0.2389	0.2253	0.2466	Ave		0.2391				3.9		50.0			
13C8 FOSA	0.9078 0.9345	0.8926 0.9138	0.9314 0.9219	0.8985	0.8960	Ave		0.9121				1.8		50.0			
13C2 PFDA	0.6070 0.6649	0.6296 0.6417	0.6448 0.6745	0.6328	0.6134	Ave		0.6386				3.6		50.0			
d3-NMeFOSAA	0.3378 0.3504	0.3386 0.3446	0.3478 0.3514	0.3372	0.3354	Ave		0.3429				1.9		50.0			
d5-NEtFOSAA	0.3525 0.3185	0.3532 0.3057	0.3552 0.2920	0.3394	0.3199	Ave		0.3296				7.3		50.0			
13C2 PFUnA	0.5354 0.5079	0.5036 0.4890	0.5315 0.5000	0.5097	0.5029	Ave		0.5100				3.1		50.0			
d-N-MeFOSA-M	0.2551 0.2750	0.2449 0.2770	0.2603 0.3035	0.2482	0.2535	Ave		0.2647				7.4		50.0			
13C2 PFDoA	0.5866 0.5853	0.5964 0.5838	0.6181 0.6001	0.5922	0.5758	Ave		0.5923				2.2		50.0			
d-N-EtFOSA-M	0.2364 0.2488	0.2289 0.2541	0.2432 0.2756	0.2383	0.2399	Ave		0.2457				5.8		50.0			
13C2-PFTeDA	0.7421 0.7308	0.7228 0.7224	0.7484 0.7194	0.7322	0.7071	Ave		0.7282				1.8		50.0			
13C2-PFHxDA	1.3471 1.2658	1.3103 1.2428	1.2972 1.2873	1.3029	1.2529	Ave		1.2883				2.6		50.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1 Analy Batch No.: 195190

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/16/2017 13:20 Calibration End Date: 11/16/2017 14:23 Calibration ID: 36394

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-195190/2	2017.11.16LLICAL_002.d
Level 2	IC 320-195190/3	2017.11.16LLICAL_003.d
Level 3	IC 320-195190/4	2017.11.16LLICAL_004.d
Level 4	IC 320-195190/5	2017.11.16LLICAL_005.d
Level 5	IC 320-195190/6	2017.11.16LLICAL_006.d
Level 6	IC 320-195190/7	2017.11.16LLICAL_007.d
Level 7	IC 320-195190/8	2017.11.16LLICAL_008.d
Level 8	IC 320-195190/9	2017.11.16LLICAL_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	67714 14487072	145832 27744725	749687 48504541	2861665	7145757	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	60380 10991094	118077 20852686	581733 35544778	2168870	5530477	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	65301 14583493	147134 26327862	761950 43733553	2987210	7392943	0.0221 4.42	0.0442 8.84	0.221 17.7	0.884	2.21
4:2 FTS		AveID	17085 3887946	42466 +++++	209357 +++++	851277	1923230	0.0234 4.67	0.0467 +++++	0.234 +++++	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	59892 11023882	125071 20937572	586501 35161513	2161947	5296129	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoroheptanoic acid (PFHpA)		AveID	62896 10852203	114615 19870003	600093 33933295	2192514	5417527	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	78675 12179289	145149 22232121	642840 38397438	2448140	5909781	0.0228 4.55	0.0455 9.10	0.228 18.2	0.910	2.28
6:2FTS		AveID	43890 8458095	84669 10582688	372103 +++++	2041107	4470839	0.0237 4.74	0.0474 9.48	0.237 +++++	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	81179 12505913	145357 22105971	666805 37306505	2658602	6420325	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	52073 10815149	112954 19853443	556831 32673416	2143584	5405676	0.0238 4.76	0.0476 9.52	0.238 19.0	0.952	2.38
Perfluorooctanesulfonic acid (PFOS)		AveID	39642 8308904	83315 16088092	421851 28442036	1672296	4200814	0.0232 4.64	0.0464 9.28	0.232 18.6	0.928	2.32
Perfluorononanoic acid (PFNA)		AveID	45659 9173164	91876 16747453	489404 28564550	1883751	4533217	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
8:2FTS		AveID	16035 3341743	35025 6035706	178303 11075967	685641	1700566	0.0240 4.79	0.0479 9.58	0.240 19.2	0.958	2.40
Perfluorooctane Sulfonamide (FOSA)		AveID	54345 10652244	111648 18790588	567301 31041452	2170870	5410709	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorodecanoic acid (PFDA)		AveID	34229 7748375	78514 14230247	382352 24327508	1560625	3700623	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1 Analy Batch No.: 195190

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/16/2017 13:20 Calibration End Date: 11/16/2017 14:23 Calibration ID: 36394

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	20546 4302023	44093 8414297	228051 14796369	878031	2103253	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	19835 5135985	51522 9507505	273040 16403565	1026058	2567135	0.0241 4.82	0.0482 9.64	0.241 19.3	0.964	2.41
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	16830 3628658	42597 6831812	216779 12168812	791351	1887930	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoroundecanoic acid (PFUnA)		AveID	31146 5124927	62210 10108101	277066 18023951	1131416	2647005	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
MeFOSA		AveID	13431 3086095	33792 6166606	153755 11542463	625010	1537275	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	36153 7211647	70443 13068841	366653 21984506	1400135	3457618	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
N-EtFOSA-M		AveID	10384 3014716	29082 6076755	161649 11220168	606762	1517464	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	41563 8918159	90630 15667846	483385 26948788	1860119	4341357	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	11794 2018908	25529 3877317	108760 6859088	425441	1002364	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	+++++ 13534458	210217 23394318	768340 +++++	2891987	6870216	+++++ 5.00	0.0500 10.0	0.250 +++++	1.00	2.50
Perfluoro-n-octadecanoic acid (PFODA)		AveID	80295 14994103	167537 26858942	858466 42176267	3276971	8079511	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
13C4 PFBA	13PFOA	Ave	7734012 7718918	8049676 7490628	7852971 7175815	7665544	7556463	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C5 PFPeA	13PFOA	Ave	4984605 4798053	5150633 4665515	5074840 4330436	4981182	4848661	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C3-PFBS	13PFOA	Ave	97850 96874	101727 95038	101752 95009	102182	97211	2.33 2.33	2.33 2.33	2.33 2.33	2.33	2.33
13C2 PFHxA	13PFOA	Ave	5767539 5434859	5766713 5222423	5708542 4928948	5541300	5460202	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C4-PFHpA	13PFOA	Ave	5474075 5388818	5488149 5055553	5680339 4519230	5400977	5369819	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
18O2 PFHxS	13PFOA	Ave	6181003 5906386	6249728 5699801	6305886 5066637	6128980	5777244	2.37 2.37	2.37 2.37	2.37 2.37	2.37	2.37
M2-6:2FTS	13PFOA	Ave	3011895 2536952	2716938 1592267	2326123 +++++	3163534	2706131	2.38 2.38	2.38 2.38	2.38 +++++	2.38	2.38
13C4 PFOA	13PFOA	Ave	6446365 5954610	6575575 5630061	6341775 5172731	6302328	6202933	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C4 PFOS	13PFOA	Ave	4269043 3996454	4205377 3761176	4122883 3528339	4079597	3943985	2.39 2.39	2.39 2.39	2.39 2.39	2.39	2.39
13C5 PFNA	13PFOA	Ave	4585024 4467006	4818743 4254420	4703253 3882012	4573222	4414356	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1 Analy Batch No.: 195190

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/16/2017 13:20 Calibration End Date: 11/16/2017 14:23 Calibration ID: 36394

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5
M2-8:2FTS	13PF OA	Ave	1422087 1390682	1411196 1248667	1442295 1158291	1307919	1424072	2.40 2.40	2.40 2.40	2.40 2.40	2.40	2.40
13C8 FOSA	13PF OA	Ave	5536373 5422637	5663121 5192863	5674580 4665749	5444253	5400065	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C2 PFDA	13PF OA	Ave	3702160 3858028	3994110 3646507	3928765 3413649	3834115	3696857	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	2060361 2033106	2148368 1958283	2119322 1778417	2043435	2021651	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	2150007 1848391	2240958 1737053	2164393 1477824	2056463	1927943	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	3265071 2947353	3195205 2778942	3238414 2530870	3088221	3030852	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
d-N-MeFOSA-M	13PF OA	Ave	1555589 1595757	1553660 1574190	1585711 1536293	1503671	1527986	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	3577608 3396599	3783480 3317790	3765998 3037495	3588054	3470465	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
d-N-EtFOSA-M	13PF OA	Ave	1441663 1443976	1452513 1443998	1481982 1395035	1443790	1445580	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	4526109 4240619	4585582 4105559	4559867 3641191	4436784	4261836	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	8215532 7344806	8312870 7062925	7903586 6515348	7894637	7551220	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution
L2ID = Linear 1/conc^2 IsoDil

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1 Analy Batch No.: 195190

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/16/2017 13:20 Calibration End Date: 11/16/2017 14:23 Calibration ID: 36394

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-195190/2	2017.11.16LLICAL_002.d
Level 2	IC 320-195190/3	2017.11.16LLICAL_003.d
Level 3	IC 320-195190/4	2017.11.16LLICAL_004.d
Level 4	IC 320-195190/5	2017.11.16LLICAL_005.d
Level 5	IC 320-195190/6	2017.11.16LLICAL_006.d
Level 6	IC 320-195190/7	2017.11.16LLICAL_007.d
Level 7	IC 320-195190/8	2017.11.16LLICAL_008.d
Level 8	IC 320-195190/9	2017.11.16LLICAL_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 # LVL 8 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2 LVL 8	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanoic acid (PFBA)	1.1	-1.1 -7.7	4.3	1.9	3.3	2.5	25	25 25	25	25	25	25
Perfluoropentanoic acid (PFPeA)	-0.9	1.6 -9.0	1.6	-3.5	1.1	1.6	25	25 25	25	25	25	25
Perfluorobutanesulfonic acid (PFBS)	-2.0	2.4 -18.5	6.0	3.5	7.7	6.6	25	25 25	25	25	25	25
4:2 FTS	+++++	6.6 +++++	22.8	-8.2	-3.1	4.5		25	25	25	25	25
Perfluorohexanoic acid (PFHxA)	0.2	8.4 -10.9	2.7	-2.5	-3.1	1.4	25	25 25	25	25	25	25
Perfluoroheptanoic acid (PFHpA)	-4.2	1.9 -8.4	3.0	-1.0	-1.6	-1.8	25	25 25	25	25	25	25
Perfluorohexanesulfonic acid (PFHxS)	-7.4	10.2 -10.1	-3.2	-5.2	-2.9	-2.1	25	25 25	25	25	25	25
6:2FTS	3.8	-2.7 +++++	-0.1	0.7	3.2	4.1	25	25	25	25	25	25
Perfluorooctanoic acid (PFOA)	-6.9	4.8 -14.5	-0.3	0.0	-1.9	-0.5	25	25 25	25	25	25	25
Perfluoroheptanesulfonic Acid (PFHpS)	1.2	3.0 -11.2	3.6	0.8	5.2	3.8	25	25 25	25	25	25	25
Perfluorooctanesulfonic acid (PFOS)	5.0	-2.8 -1.1	0.5	0.6	4.6	2.1	25	25 25	25	25	25	25
Perfluorononanoic acid (PFNA)	-1.3	-4.4 -7.8	4.4	3.3	3.0	3.0	25	25 25	25	25	25	25
8:2FTS	-0.5	2.2 -1.6	1.8	7.9	-1.7	-1.1	25	25 25	25	25	25	25
Perfluorooctane Sulfonamide (FOSA)	-5.8	2.6 -13.4	4.1	3.8	4.3	2.3	25	25 25	25	25	25	25
Perfluorodecanoic acid (PFDA)	0.5	1.2 -8.3	0.2	4.8	3.1	3.4	25	25 25	25	25	25	25

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1 Analy Batch No.: 195190

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/16/2017 13:20 Calibration End Date: 11/16/2017 14:23 Calibration ID: 36394

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 # LVL 8 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2 LVL 8	LVL 3	LVL 4	LVL 5	LVL 6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2.5	-2.1 -0.8	2.7	2.5	-0.8	0.9	25	25 25	25	25	25	25
Perfluorodecanesulfonic acid (PFDS)	3.7	0.5 -4.6	8.7	3.2	6.8	5.5	25	25 25	25	25	25	25
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2.6	-0.9 7.4	4.5	0.3	2.1	2.4	25	25 25	25	25	25	25
Perfluoroundecanoic acid (PFUnA)	0.5	7.6 -1.7	-5.5	1.2	-3.5	-3.9	25	25 25	25	25	25	25
MeFOSA	-0.2	10.8 -4.3	-1.2	5.9	2.5	-1.5	25	25 25	25	25	25	25
Perfluorododecanoic acid (PFDoA)	0.5	-5.0 -7.7	-0.6	-0.4	1.7	8.4	25	25 25	25	25	25	25
N-EtFOSA-M	5.0	-0.1 0.4	8.9	4.9	4.8	4.2	25	25 25	25	25	25	25
Perfluorotridecanoic Acid (PFTriA)	-3.6	-2.2 -9.4	4.9	5.9	2.2	7.3	25	25 25	25	25	25	25
Perfluorotetradecanoic acid (PFTeA)	-3.7	13.5 -4.0	-2.7	-2.3	-4.1	-2.9	25	25 25	25	25	25	25
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ -6.9	+++++	1.0	1.1	1.7	3.4	25		25	25	25	25
Perfluoro-n-octadecanoic acid (PFODA)	-4.4	1.3 -18.7	9.2	4.3	7.5	2.6	25	25 25	25	25	25	25

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_002.d
Lims ID: IC L1 Full
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 16-Nov-2017 13:20:12 ALS Bottle#: 28 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub19

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Nov-2017 10:26:21 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 17-Nov-2017 10:06:49

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.480	1.479	0.001	0.551	7734012	2.44		97.4	58532	
2 Perfluorobutyric acid										
212.90 > 169.00	1.480	1.480	0.0	1.000	67714	0.0239		95.6	23.4	
D 3 13C5-PFPeA										
267.90 > 223.00	1.739	1.738	0.001	0.647	4984605	2.48		99.2	76664	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.747	1.740	0.007	1.005	60380	0.0269		107	43.6	
D 47 13C3-PFBS										
301.90 > 83.00	1.780	1.774	0.006	0.663	97850	2.23		95.8	3985	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.780	1.776	0.004	1.000	65301	0.0209		94.5	397	
298.90 > 99.00	1.780	1.776	0.004	1.000	31044		2.10(1.74-3.24)	94.5	445	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.983	1.977	0.006	1.000	17085	0.0181		77.4	932	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.014	2.010	0.004	1.000	59892	0.0259		104	121	
313.00 > 119.00	2.014	2.010	0.004	1.000	6528		9.17(7.05-13.09)	104	106	
D 7 13C2 PFHxA										
315.00 > 270.00	2.014	2.010	0.004	0.750	5767539	2.54		102	61286	
D 9 13C4-PFHpA										
367.00 > 322.00	2.334	2.332	0.002	0.869	5474075	2.50		99.9	31570	
10 Perfluoroheptanoic acid										R
363.00 > 319.00	2.344	2.333	0.011	1.004	62896	0.0280		112	96.6	R
363.00 > 169.00	2.334	2.333	0.001	1.000	20574		3.06(1.59-2.95)	112	145	
D 11 18O2 PFHxS										
403.00 > 84.00	2.355	2.347	0.008	0.877	6181003	2.39		101	40089	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.355	2.347	0.008	1.000	78675	0.0275		121	519	
399.00 > 99.00	2.355	2.347	0.008	1.000	27373		2.87(2.10-3.89)	121	296	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.679	2.671	0.009	1.000	43890	0.0216		91.0	1508	
D 12 M2-6:2FTS										
429.00 > 81.00	2.679	2.671	0.008	0.997	3011895	2.74		116	66878	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.686	2.680	0.006	1.000	81179	0.0298		119	25.2	
413.00 > 169.00	2.686	2.680	0.006	1.000	41018		1.98(1.18-2.19)	119	174	
D 14 13C4 PFOA										
417.00 > 372.00	2.686	2.680	0.006	1.000	6446365	2.56		103	56955	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.693	2.687	0.006	1.000	52073	0.0223		93.6	881	
449.00 > 99.00	2.693	2.687	0.006	1.000	13758		3.78(2.72-5.05)	93.6	505	
* 62 13C2-PFOA										
415.00 > 370.00	2.686	2.695	-0.009		6098752	2.50			50287	
D 19 13C5 PFNA										
468.00 > 423.00	3.044	3.042	0.002	1.133	4585024	2.48		99.3	42287	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.044	3.042	0.002	1.000	39642	0.0211		91.2	262	M
499.00 > 99.00	3.044	3.042	0.002	1.000	10963		3.62(3.24-6.01)	91.2	166	
D 18 13C4 PFOS										
503.00 > 80.00	3.044	3.042	0.002	1.133	4269043	2.47		103	26878	
20 Perfluorononanoic acid										
463.00 > 419.00	3.052	3.045	0.007	1.003	45659	0.0250		99.9	74.9	
463.00 > 169.00	3.052	3.045	0.007	1.003	10371		4.40(2.65-4.93)	99.9	219	
D 26 M2-8:2FTS										
529.00 > 81.00	3.391	3.390	0.001	1.262	1422087	2.44		102	22615	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.391	3.392	-0.001	1.000	16035	0.0222		92.9	568	
D 21 13C8 FOSA										
506.00 > 78.00	3.399	3.393	0.006	1.265	5536373	2.49		99.5	31279	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.399	3.395	0.004	1.000	54345	0.0255		102	1300	
D 23 13C2 PFDA										
515.00 > 470.00	3.406	3.400	0.006	1.268	3702160	2.38		95.1	27593	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.399	3.400	-0.001	0.998	34229	0.0238		95.2	151	
513.00 > 169.00	3.406	3.400	0.006	1.000	6625		5.17(3.31-6.15)	95.2	202	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.558	3.557	0.001	1.324	2060361	2.46		98.5	13983	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.565	3.561	0.004	1.002	20546	0.0238		95.1	167	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.712	3.714	-0.002	1.000	19835	0.0184		76.2	778	
599.00 > 99.00	3.712	3.714	-0.002	1.000	7919		2.50(1.94-3.60)	76.2	391	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.729	3.725	0.004	1.388	2150007	2.67		107	14438	
D 30 13C2 PFUnA										
565.00 > 520.00	3.729	3.730	-0.001	1.388	3265071	2.62		105	50154	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.729	3.731	-0.002	1.000	16830	0.0204		81.6	372	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.738	3.731	0.007	1.002	31146	0.0263		105	138	
563.00 > 169.00	3.729	3.731	-0.002	1.000	5481		5.68(0.00-0.00)	105	233	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.892	3.896	-0.004	1.449	1555589	2.41		96.4	3196	
35 MeFOSA										
512.00 > 169.00	3.902	3.903	-0.001	1.003	13431	0.0220		88.0	420	
D 36 13C2 PFDoA										
615.00 > 570.00	4.026	4.024	0.002	1.499	3577608	2.48		99.0	43617	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.026	4.025	0.001	1.000	36153	0.0258		103	105	
613.00 > 169.00	4.026	4.025	0.001	1.000	9061		3.99(2.19-4.07)	103	425	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.083	4.084	-0.001	1.520	1441663	2.41		96.2	2519	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.093	4.091	0.002	1.002	10384	0.0180		71.9	307	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.286	4.287	-0.001	1.000	41563	0.0237		94.9	121	
663.00 > 169.00	4.286	4.287	-0.001	1.000	15766		2.64(1.76-3.26)	94.9	701	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.526	4.526	0.0	1.000	11794	0.0266		106	342	
713.00 > 219.00	4.512	4.526	-0.014	0.997	8290		1.42(1.00-1.85)	106	467	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.526	4.526	0.0	1.685	4526109	2.55		102	28585	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.939	4.938	0.001	1.839	8215532	2.61		105	32195	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.939	4.939	0.0	1.000	134882	0.0249		99.5	90.8	R
813.00 > 169.00	4.939	4.939	0.0	1.000	23285		5.79(2.50-4.65)	99.5	660	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.281	5.286	-0.005	1.000	80295	0.0246		98.2	29.7	
913.00 > 169.00	5.281	5.286	-0.005	1.000	9725		8.26(0.00-0.00)	98.2	170	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL1_00002 Amount Added: 1.00 Units: mL

Report Date: 17-Nov-2017 10:26:21 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_002.d

Injection Date: 16-Nov-2017 13:20:12 Instrument ID: A8_N

Lims ID: IC L1 Full

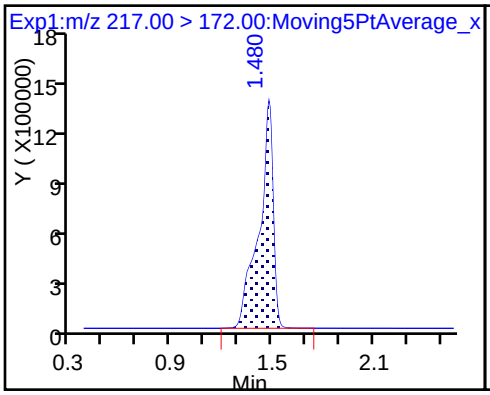
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 28 Worklist Smp#: 2

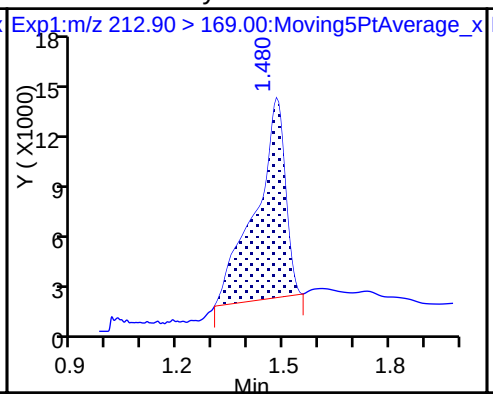
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

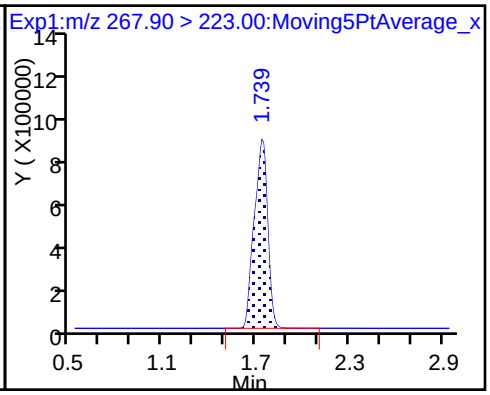
D 1 13C4 PFBA



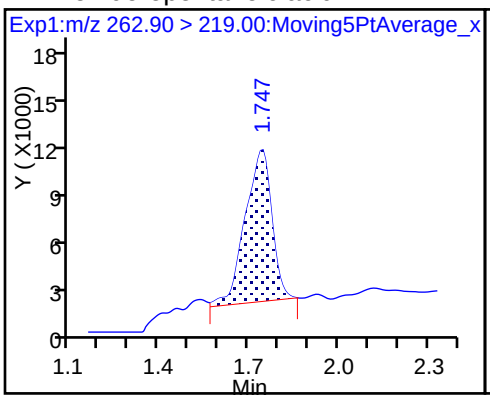
2 Perfluorobutyric acid



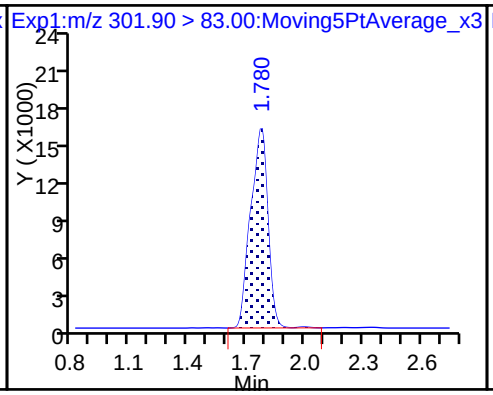
D 3 13C5-PFPeA



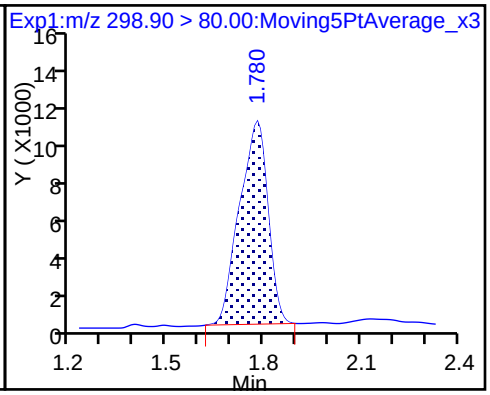
4 Perfluoropentanoic acid



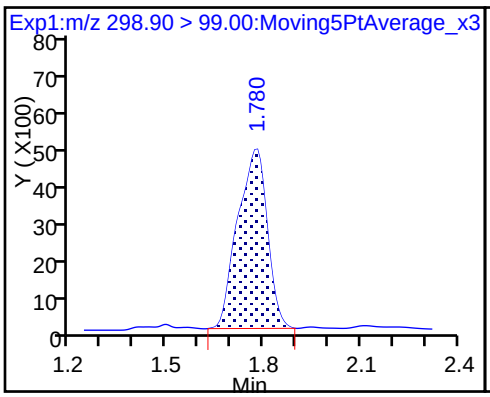
D 47 13C3-PFBS



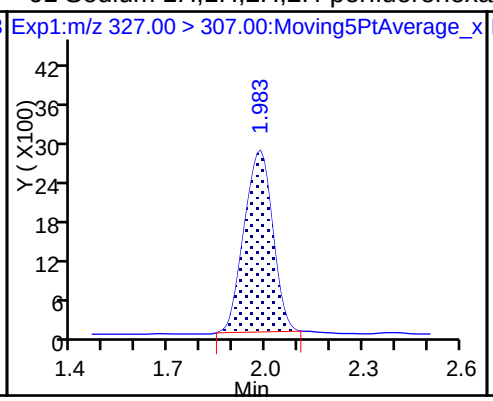
5 Perfluorobutanesulfonic acid



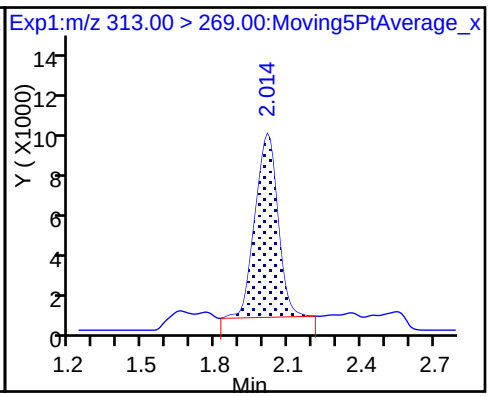
5 Perfluorobutanesulfonic acid



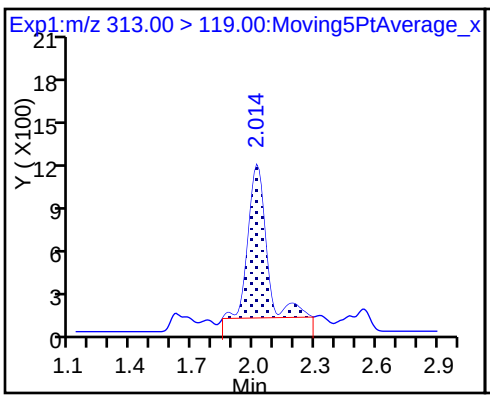
61 Sodium 1H,1H,2H,2H-perfluorohexane



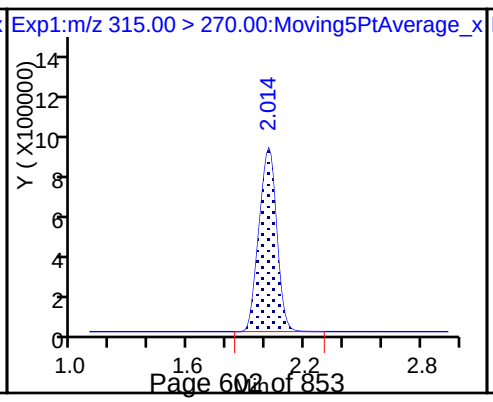
6 Perfluorohexanoic acid



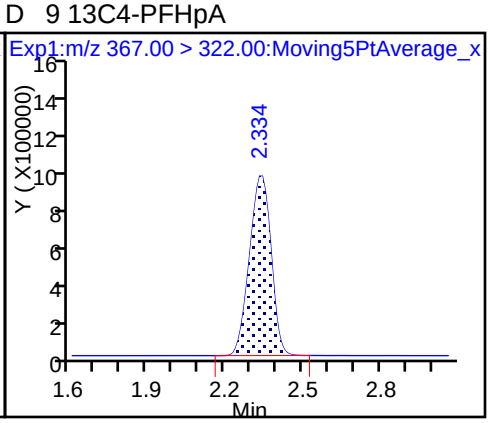
6 Perfluorohexanoic acid



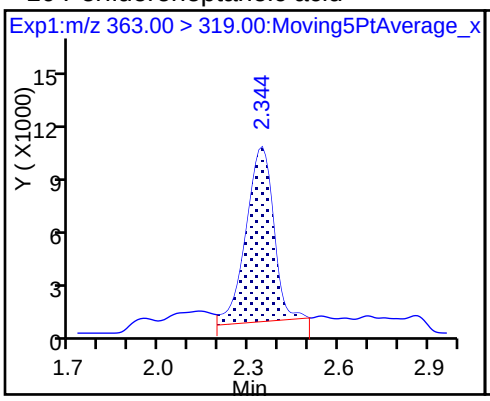
D 7 13C2 PFHxA



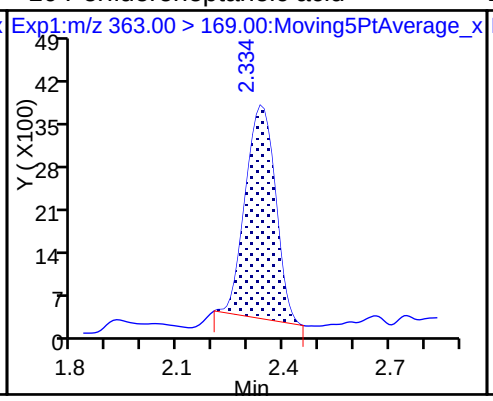
D 9 13C4-PFHpA



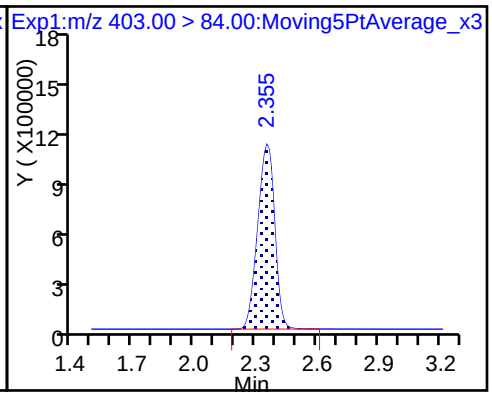
10 Perfluoroheptanoic acid



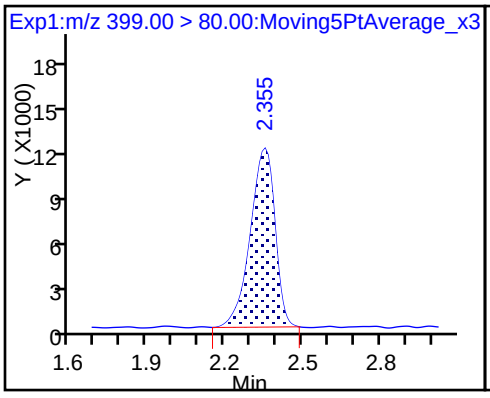
10 Perfluoroheptanoic acid



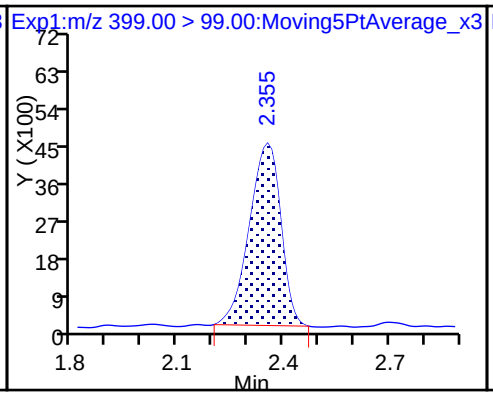
D 11 18O2 PFHxS



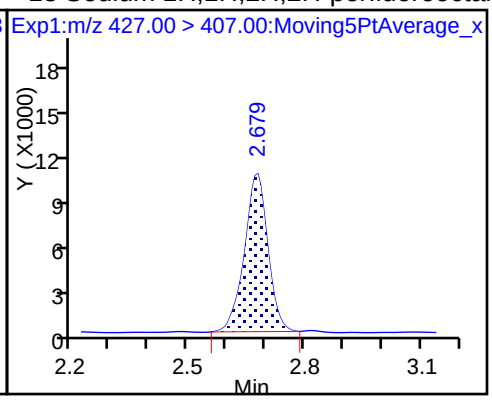
8 Perfluorohexanesulfonic acid



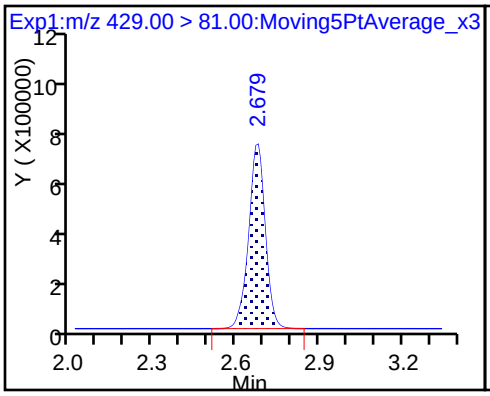
8 Perfluorohexanesulfonic acid



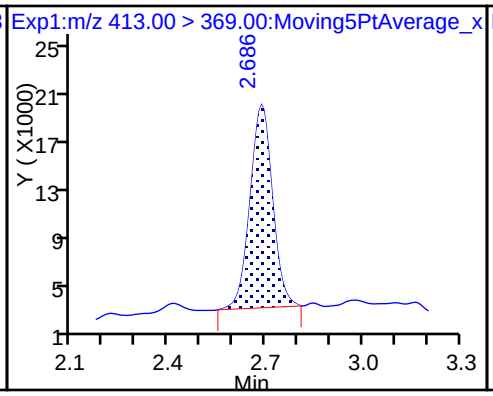
13 Sodium 1H,1H,2H,2H-perfluorooctane



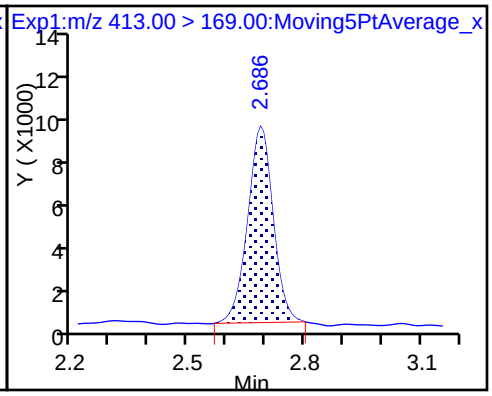
D 12 M2-6:2FTS



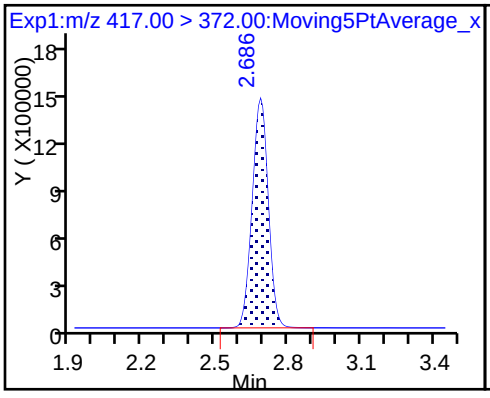
15 Perfluorooctanoic acid



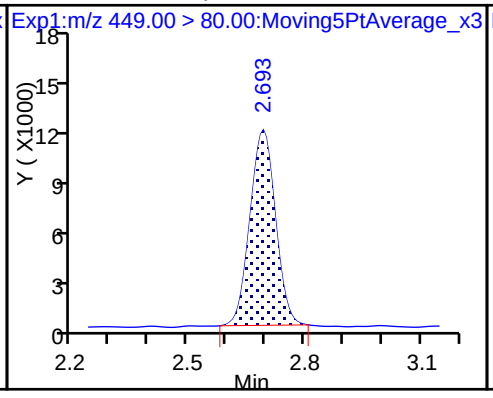
15 Perfluorooctanoic acid



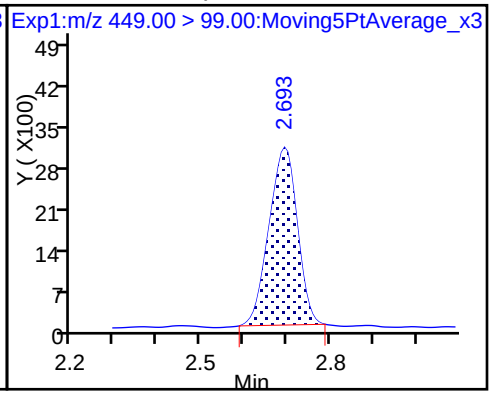
D 14 13C4 PFOA



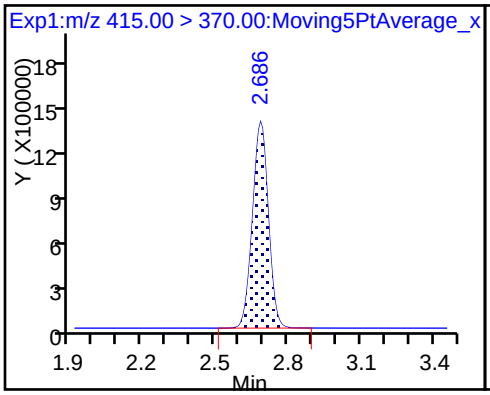
16 Perfluoroheptanesulfonic Acid



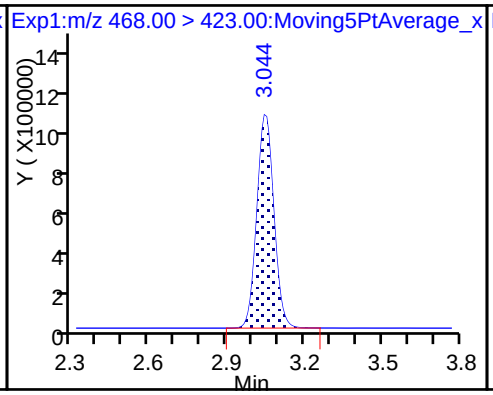
16 Perfluoroheptanesulfonic Acid



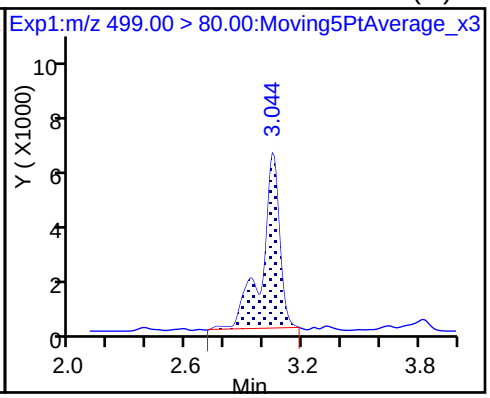
* 62 13C2-PFOA



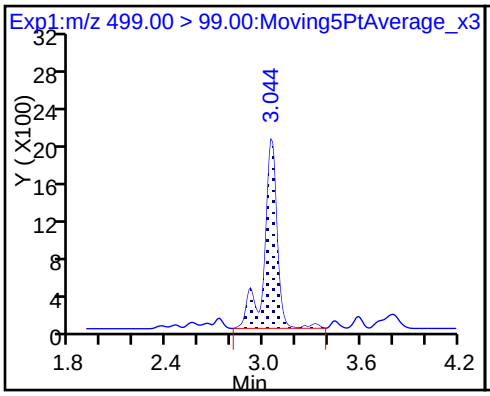
D 19 13C5 PFNA



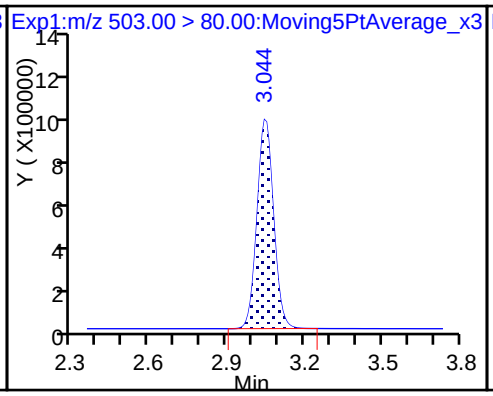
17 Perfluorooctane sulfonic acid (M)



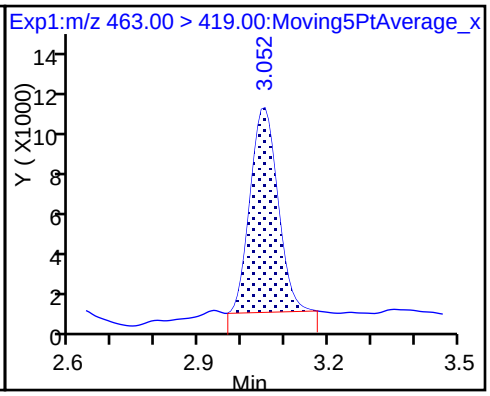
17 Perfluorooctane sulfonic acid



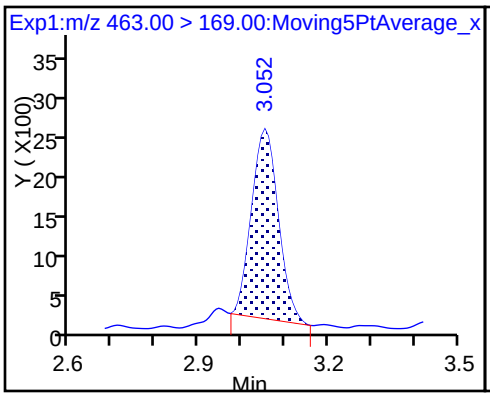
D 18 13C4 PFOS



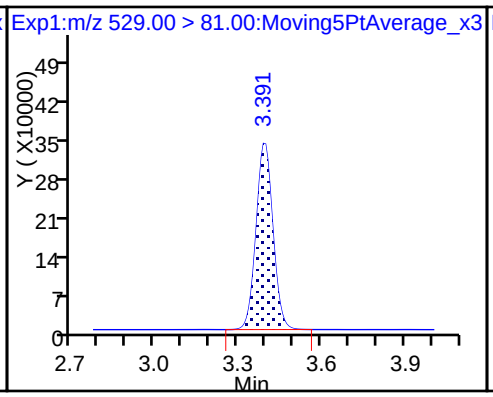
20 Perfluorononanoic acid



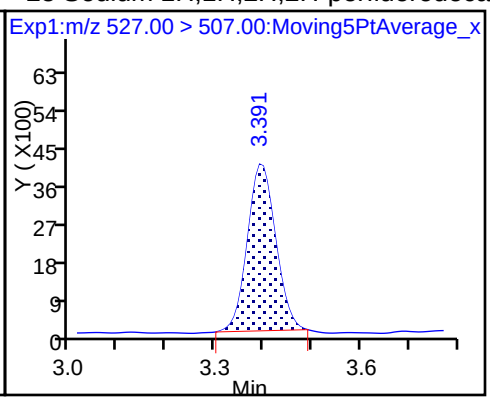
20 Perfluorononanoic acid



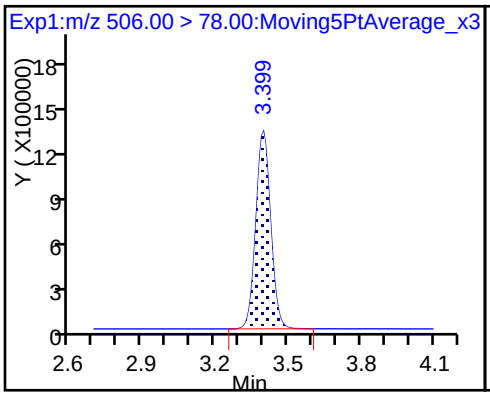
D 26 M2-8:2FTS



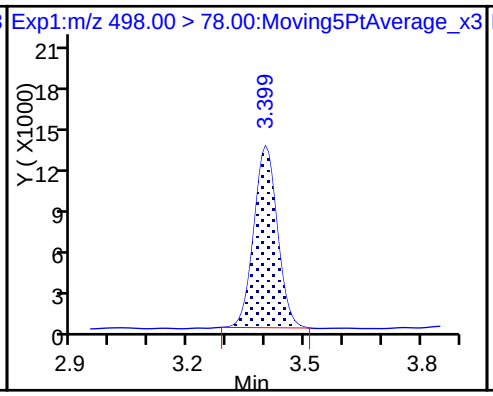
25 Sodium 1H,1H,2H,2H-perfluorodecane



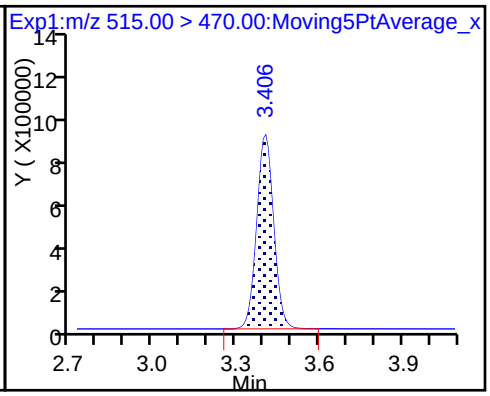
D 21 13C8 FOSA



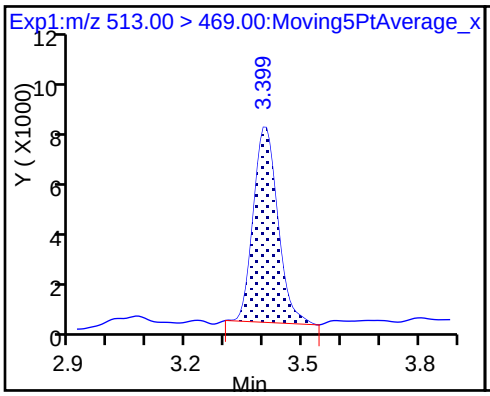
22 Perfluorooctane Sulfonamide



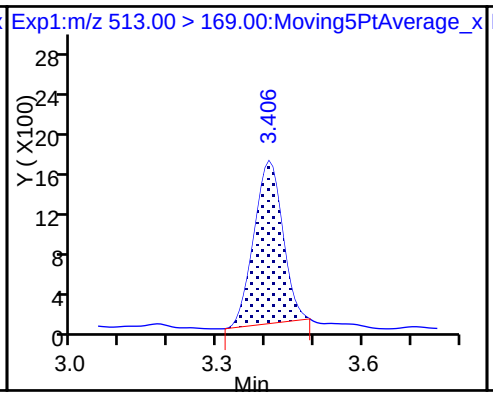
D 23 13C2 PFDA



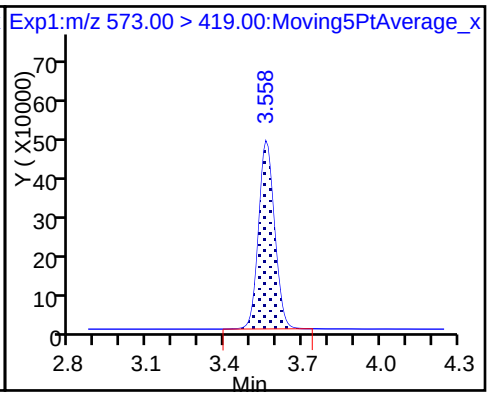
24 Perfluorodecanoic acid



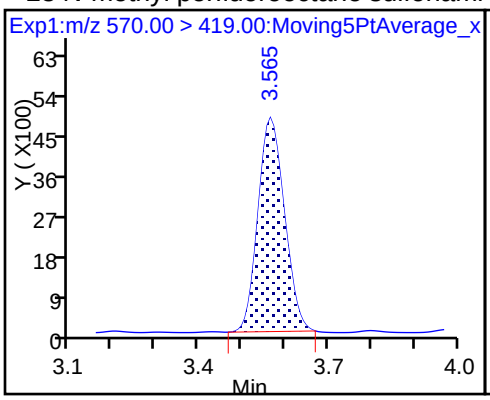
24 Perfluorodecanoic acid



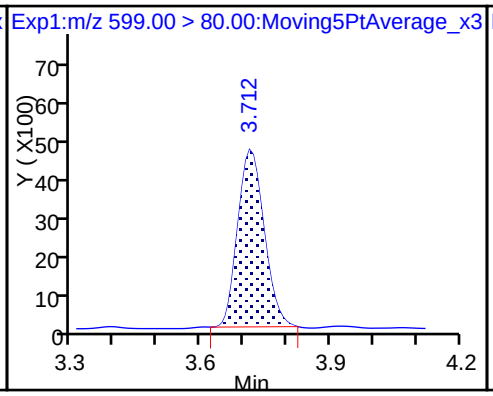
D 27 d3-NMeFOSAA



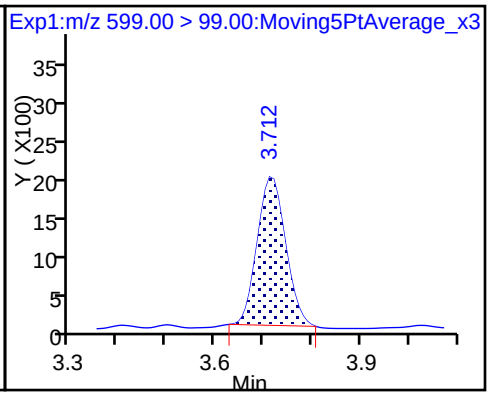
28 N-methyl perfluorooctane sulfonami



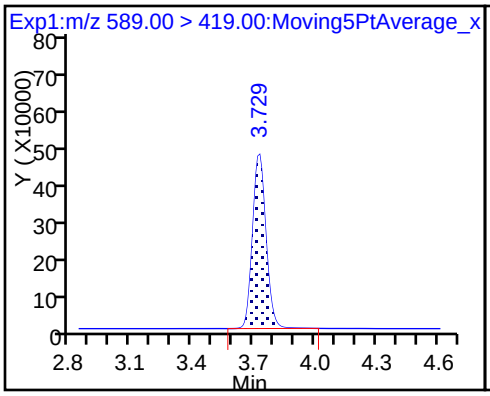
29 Perfluorodecane Sulfonic acid



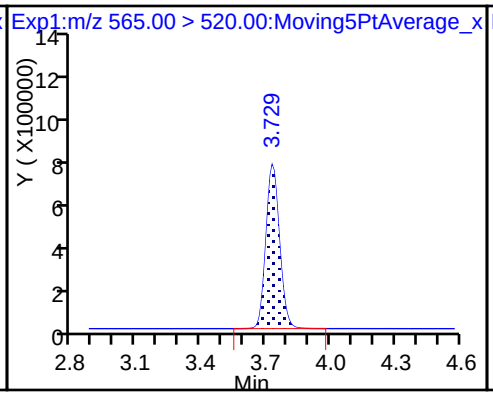
29 Perfluorodecane Sulfonic acid



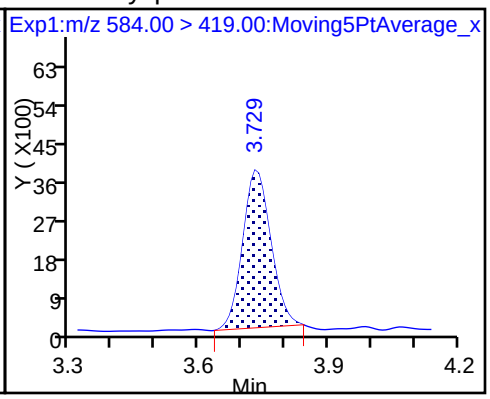
D 32 d5-NEtFOSAA



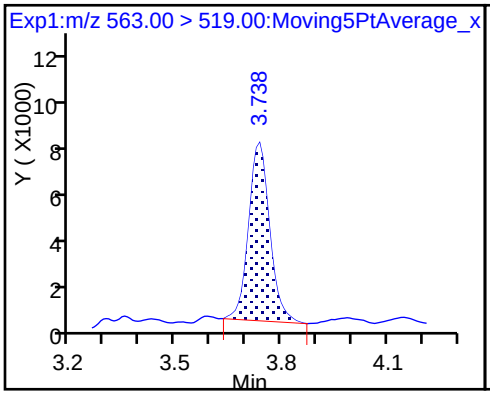
D 30 13C2 PFUnA



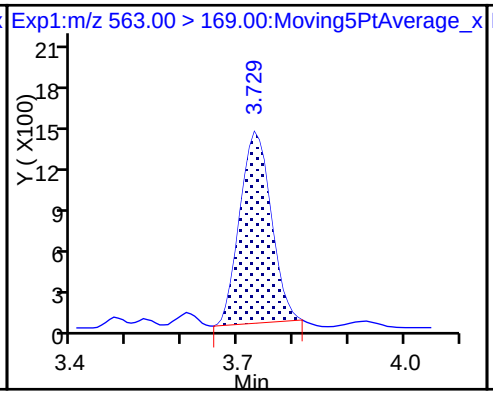
33 N-ethyl perfluorooctane sulfonamid



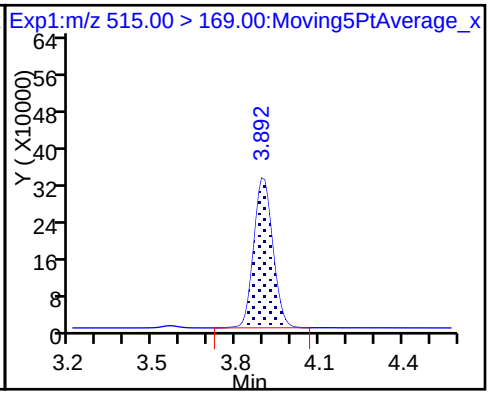
31 Perfluoroundecanoic acid



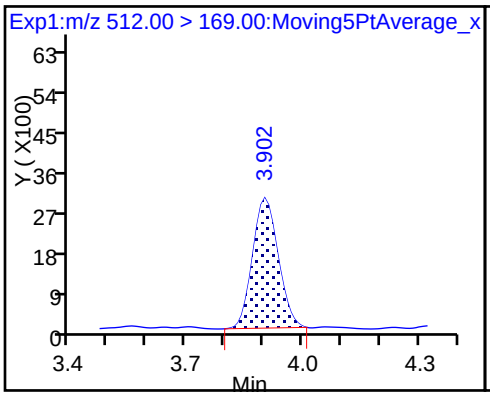
31 Perfluoroundecanoic acid



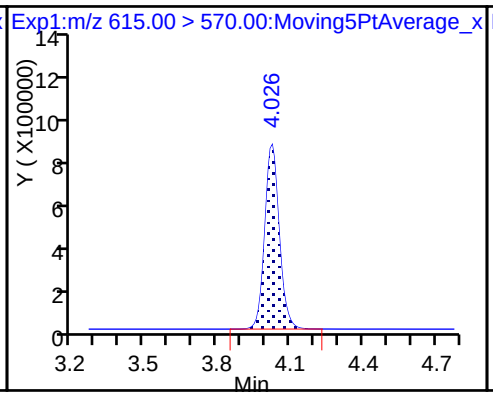
D 34 d-N-MeFOSA-M



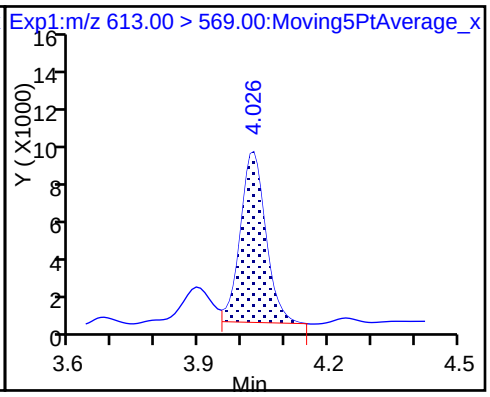
35 MeFOSA



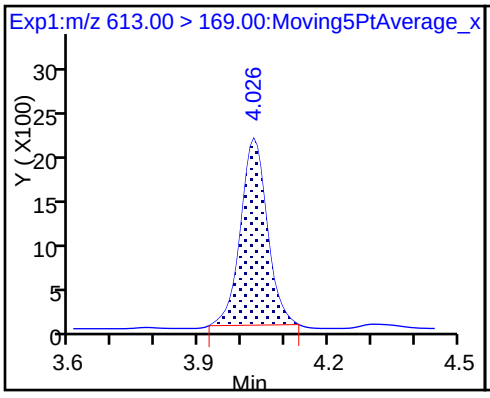
D 36 13C2 PFDoA



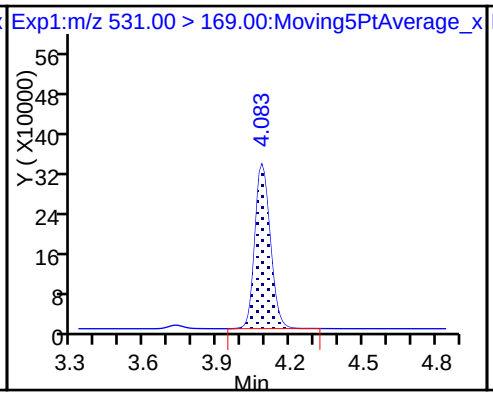
37 Perfluorododecanoic acid



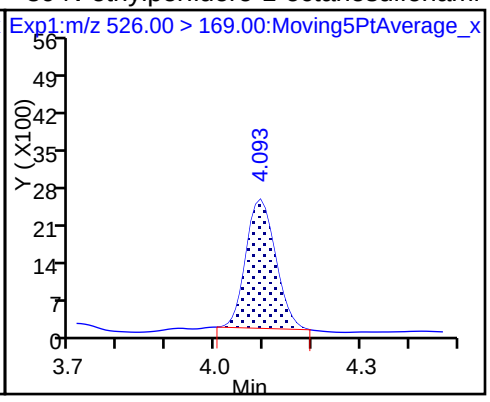
37 Perfluorododecanoic acid



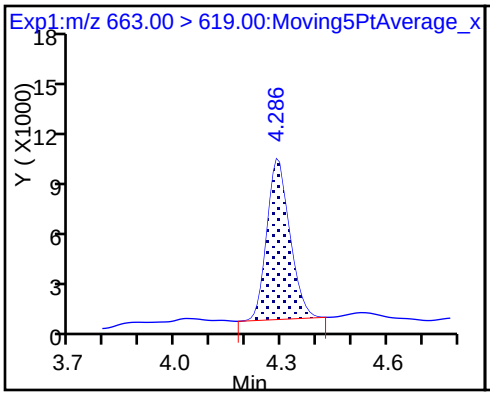
D 38 d-N-EtFOSA-M



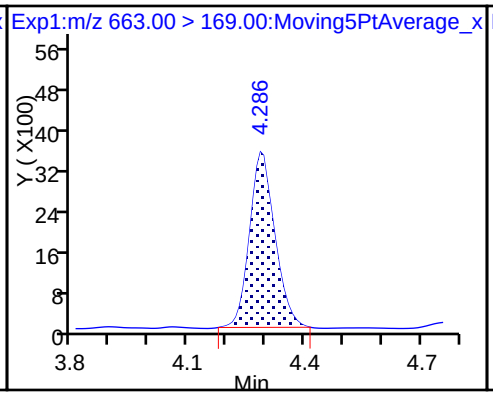
39 N-ethylperfluoro-1-octanesulfonami



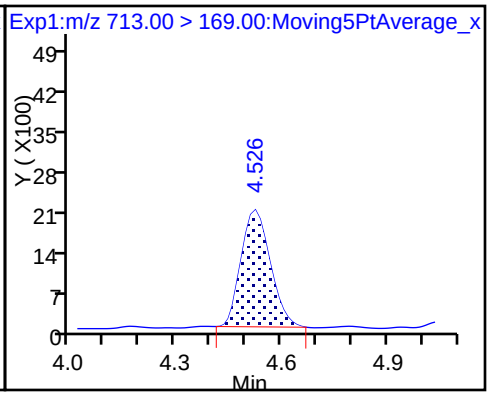
41 Perfluorotridecanoic acid



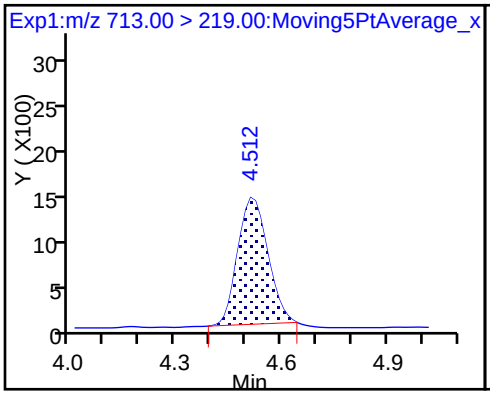
41 Perfluorotridecanoic acid



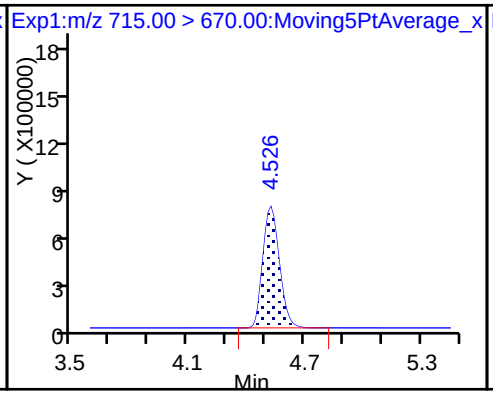
42 Perfluorotetradecanoic acid



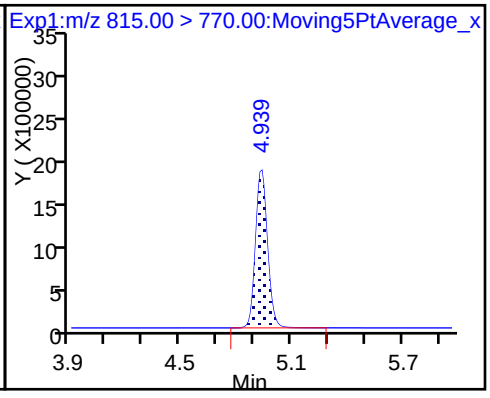
42 Perfluorotetradecanoic acid



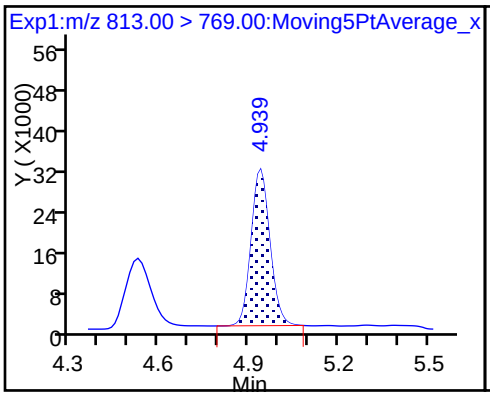
D 43 13C2-PFTeDA



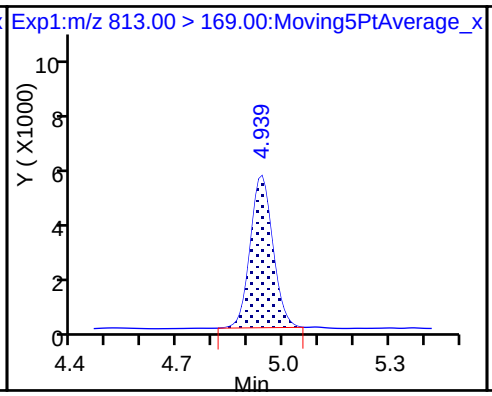
D 44 13C2-PFHxDA



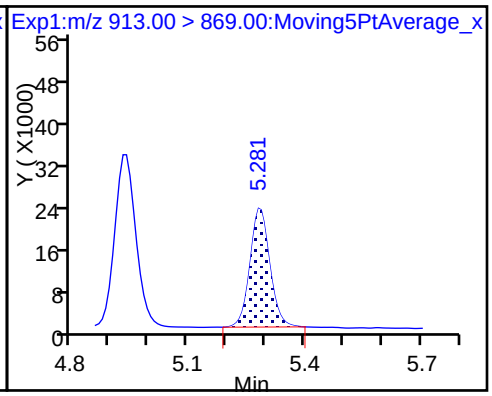
45 Perfluorohexadecanoic acid



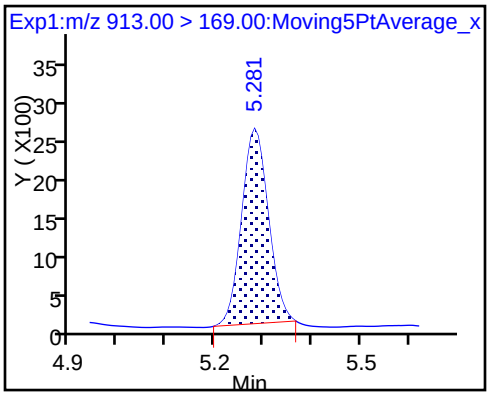
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento

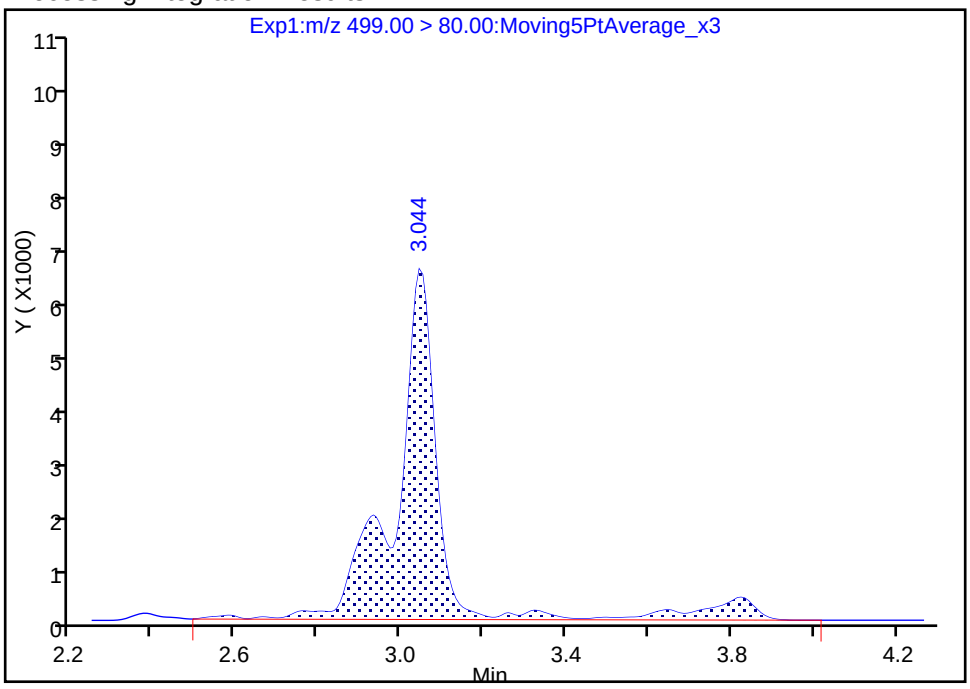
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_002.d
Injection Date: 16-Nov-2017 13:20:12 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 28 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

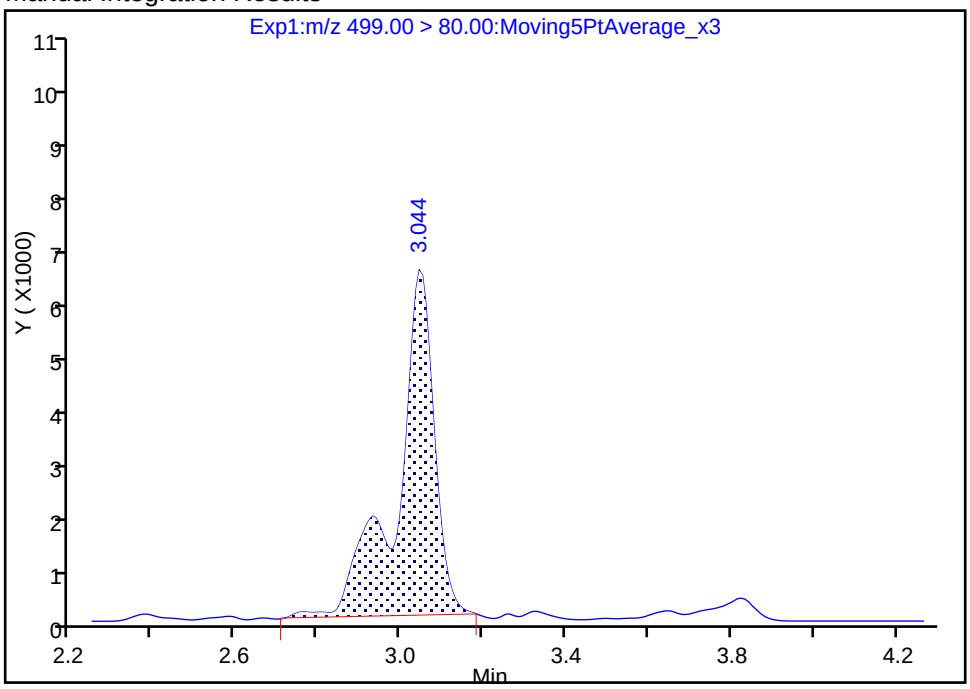
Processing Integration Results

RT: 3.04
Area: 47668
Amount: 0.024859
Amount Units: ng/ml



Manual Integration Results

RT: 3.04
Area: 39642
Amount: 0.021150
Amount Units: ng/ml



Reviewer: phomsophat, 17-Nov-2017 10:06:29
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_003.d
Lims ID: IC L2 Full
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 16-Nov-2017 13:28:06 ALS Bottle#: 29 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub19

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Nov-2017 10:26:24 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 17-Nov-2017 10:07:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.480	1.479	0.001	0.552	8049676	2.44		97.5	71107	
2 Perfluorobutyric acid										
212.90 > 169.00	1.480	1.480	0.0	1.000	145832	0.0495		98.9	47.7	
D 3 13C5-PFPeA										
267.90 > 223.00	1.738	1.738	0.0	0.649	5150633	2.46		98.5	69726	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.738	1.740	-0.002	1.000	118077	0.0508		102	88.7	
D 47 13C3-PFBS										
301.90 > 83.00	1.771	1.774	-0.003	0.661	101727	2.23		95.8	2924	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.780	1.776	0.004	1.005	147134	0.0452		102	997	
298.90 > 99.00	1.780	1.776	0.004	1.005	62510		2.35(1.74-3.24)	102	984	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.983	1.977	0.006	1.000	42466	0.0498		107	2432	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.014	2.010	0.004	1.000	125071	0.0542		108	250	
313.00 > 119.00	2.014	2.010	0.004	1.000	9869		12.67(7.05-13.09)	108	124	
D 7 13C2 PFHxA										
315.00 > 270.00	2.014	2.010	0.004	0.752	5766713	2.44		97.7	55961	
D 9 13C4-PFHpA										
367.00 > 322.00	2.334	2.332	0.002	0.871	5488149	2.41		96.3	46602	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.334	2.333	0.001	1.000	114615	0.0509		102	185	
363.00 > 169.00	2.334	2.333	0.001	1.000	48091		2.38(1.59-2.95)	102	391	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.344	2.347	-0.003	1.000	145149	0.0502		110	1165	
399.00 > 99.00	2.344	2.347	-0.003	1.000	44572		3.26(2.10-3.89)	110	558	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.344	2.347	-0.003	0.875	6249728	2.32		98.2	41326	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.671	2.671	0.001	1.000	84669	0.0461		97.3	2932	
D 12 M2-6:2FTS										
429.00 > 81.00	2.671	2.671	0.0	0.997	2716938	2.38		100	65447	
D 14 13C4 PFOA										
417.00 > 372.00	2.679	2.680	-0.001	1.000	6575575	2.51		101	57113	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.679	2.680	-0.001	1.000	145357	0.0524		105	47.1	
413.00 > 169.00	2.679	2.680	-0.001	1.000	77714		1.87(1.18-2.19)	105	321	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.686	2.687	-0.001	1.000	112954	0.0490		103	1788	
449.00 > 99.00	2.686	2.687	-0.001	1.000	31071		3.64(2.72-5.05)	103	849	
* 62 13C2-PFOA										
415.00 > 370.00	2.679	2.695	-0.016		6344335	2.50			55388	
D 18 13C4 PFOS										
503.00 > 80.00	3.044	3.042	0.002	1.136	4205377	2.34		97.9	31817	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.044	3.042	0.002	1.000	83315	0.0451		97.2	666	
499.00 > 99.00	3.044	3.042	0.002	1.000	18126		4.60(3.24-6.01)	97.2	260	
D 19 13C5 PFNA										
468.00 > 423.00	3.044	3.042	0.002	1.136	4818743	2.51		100	38941	
20 Perfluorononanoic acid										
463.00 > 419.00	3.044	3.045	-0.001	1.000	91876	0.0478		95.6	160	
463.00 > 169.00	3.044	3.045	-0.001	1.000	22745		4.04(2.65-4.93)	95.6	521	
D 26 M2-8:2FTS										
529.00 > 81.00	3.391	3.390	0.001	1.266	1411196	2.33		97.1	26328	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.391	3.392	-0.001	1.000	35025	0.0490		102	1058	
D 21 13C8 FOSA										
506.00 > 78.00	3.391	3.393	-0.002	1.266	5663121	2.45		97.9	32032	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.399	3.395	0.004	1.002	111648	0.0513		103	3365	
D 23 13C2 PFDA										
515.00 > 470.00	3.399	3.400	-0.001	1.269	3994110	2.46		98.6	38907	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.399	3.400	-0.001	1.000	78514	0.0506		101	291	
513.00 > 169.00	3.399	3.400	-0.001	1.000	12911		6.08(3.31-6.15)	101	624	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.557	3.557	0.0	1.328	2148368	2.47		98.7	16512	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.565	3.561	0.004	1.002	44093	0.0489		97.9	268	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.712	3.714	-0.002	1.000	51522	0.0485		101	1513	
599.00 > 99.00	3.720	3.714	0.006	1.002	17680		2.91(1.94-3.60)	101	707	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.729	3.725	0.004	1.392	2240958	2.68		107	10554	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFUnA										
565.00 > 520.00	3.729	3.730	-0.001	1.392	3195205	2.47		98.7	33485	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.729	3.731	-0.002	1.000	42597	0.0496		99.1	791	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.729	3.731	-0.002	1.000	62210	0.0538		108	301	
563.00 > 169.00	3.729	3.731	-0.002	1.000	15124		4.11(0.00-0.00)	108	663	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.902	3.896	0.006	1.457	1553660	2.31		92.5	3502	
35 MeFOSA										
512.00 > 169.00	3.902	3.903	-0.001	1.000	33792	0.0554		111	1023	
D 36 13C2 PFDoA										
615.00 > 570.00	4.026	4.024	0.002	1.503	3783480	2.52		101	51495	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.026	4.025	0.001	1.000	70443	0.0475		95.0	199	
613.00 > 169.00	4.026	4.025	0.001	1.000	18748		3.76(2.19-4.07)	95.0	775	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.083	4.084	-0.001	1.524	1452513	2.33		93.2	2406	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.093	4.091	0.002	1.002	29082	0.0500		99.9	843	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.286	4.287	-0.001	1.000	90630	0.0489		97.8	278	
663.00 > 169.00	4.286	4.287	-0.001	1.000	29574		3.06(1.76-3.26)	97.8	919	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.523	4.526	-0.003	1.688	4585582	2.48		99.3	28997	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.523	4.526	-0.003	1.000	25529	0.0568		114	1098	
713.00 > 219.00	4.523	4.526	-0.003	1.000	14389		1.77(1.00-1.85)	114	633	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.937	4.938	-0.001	1.843	8312870	2.54		102	33374	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.937	4.939	-0.002	1.000	210217	0.0499		99.7	147	R
813.00 > 169.00	4.937	4.939	-0.002	1.000	36833		5.71(2.50-4.65)	99.7	846	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.286	5.286	0.0	1.000	167537	0.0506		101	62.2	
913.00 > 169.00	5.286	5.286	0.0	1.000	19473		8.60(0.00-0.00)	101	299	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL2_00002 Amount Added: 1.00 Units: mL

Report Date: 17-Nov-2017 10:26:24 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_003.d

Injection Date: 16-Nov-2017 13:28:06 Instrument ID: A8_N

Lims ID: IC L2 Full

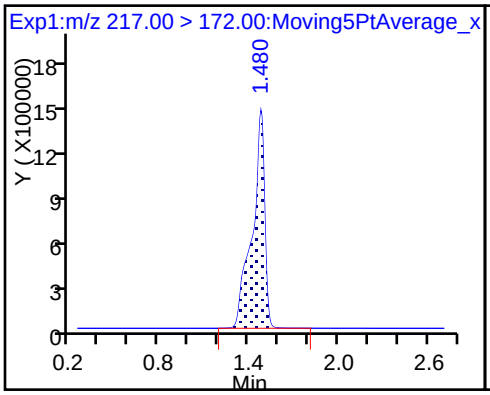
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 29 Worklist Smp#: 3

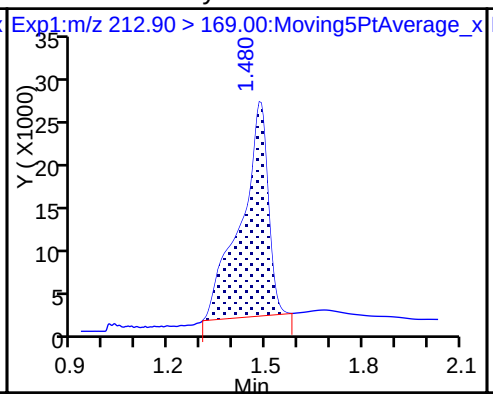
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

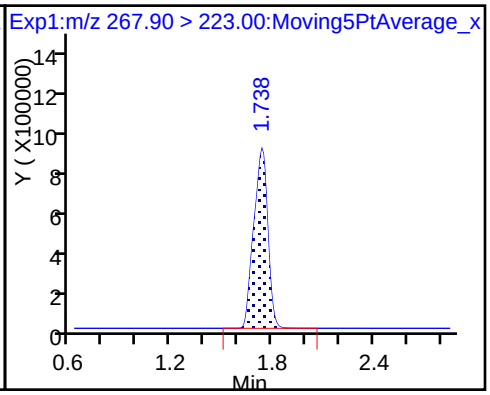
D 1 13C4 PFBA



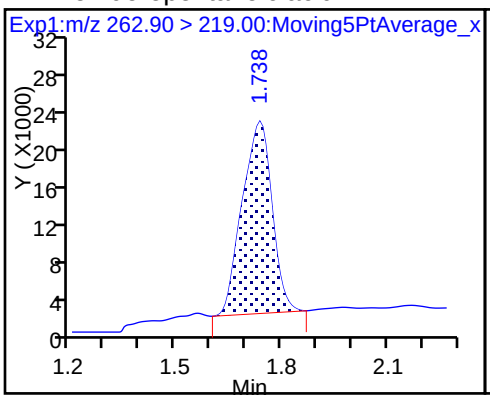
2 Perfluorobutyric acid



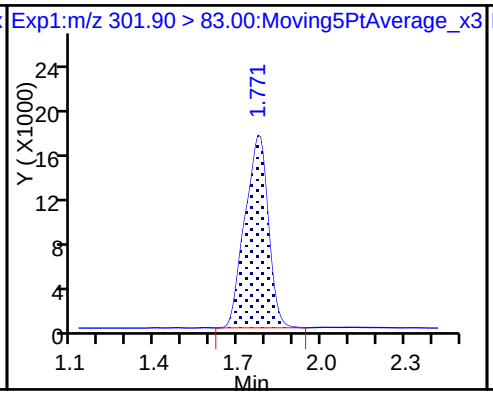
D 3 13C5-PFPeA



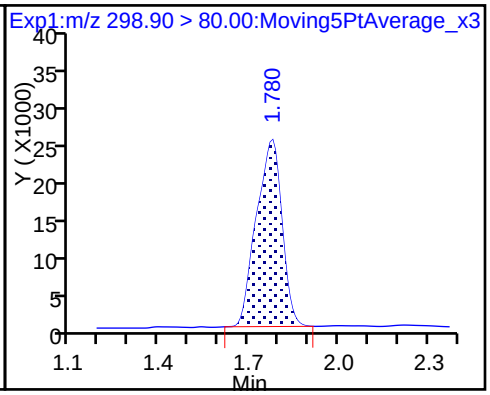
4 Perfluoropentanoic acid



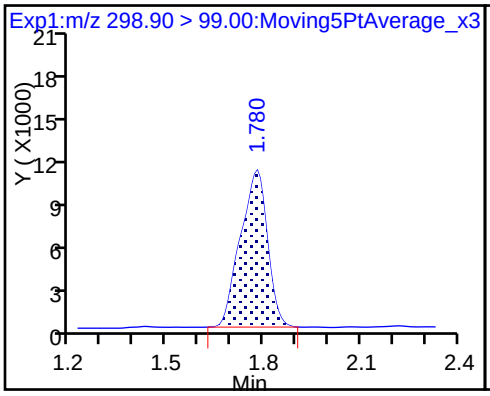
D 47 13C3-PFBS



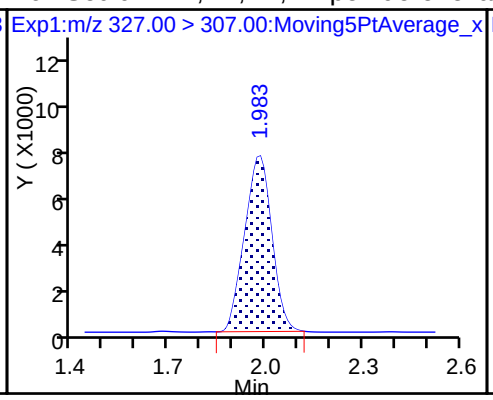
5 Perfluorobutanesulfonic acid



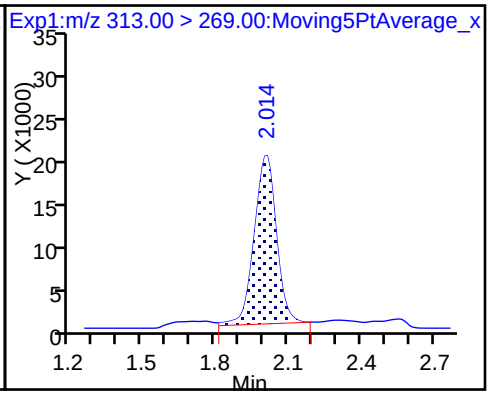
5 Perfluorobutanesulfonic acid



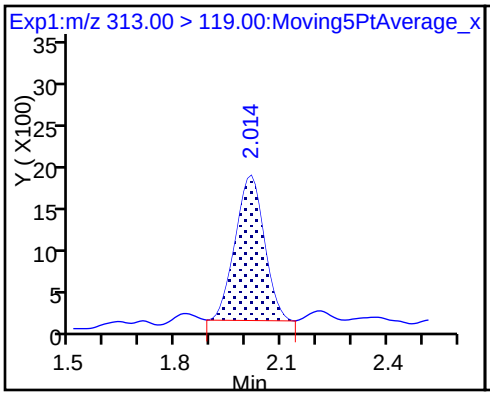
61 Sodium 1H,1H,2H,2H-perfluorohexane



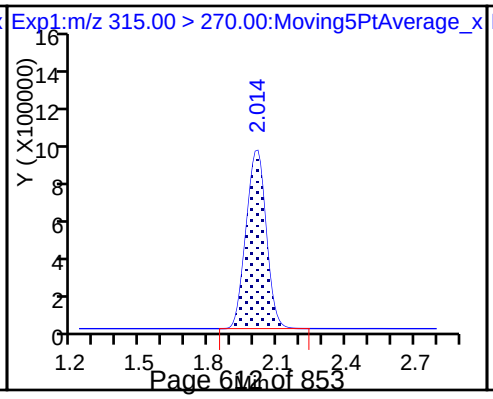
6 Perfluorohexanoic acid



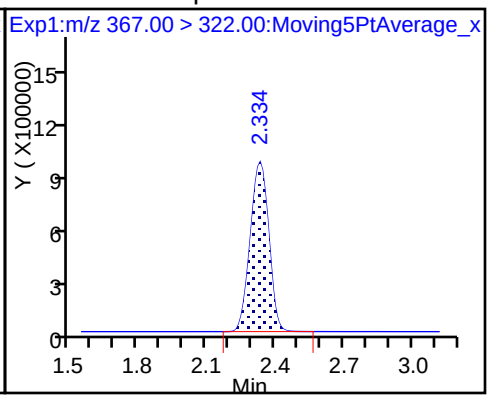
6 Perfluorohexanoic acid



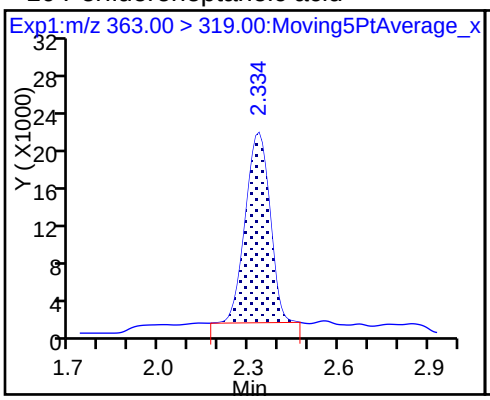
D 7 13C2 PFHxA



D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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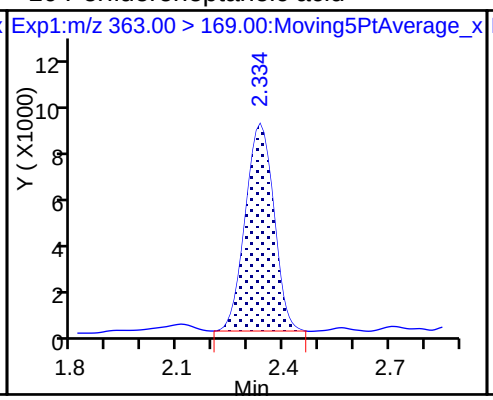
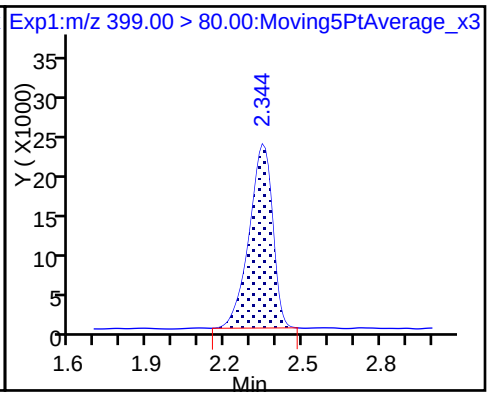


8 Perfluorohexanesulfonic acid



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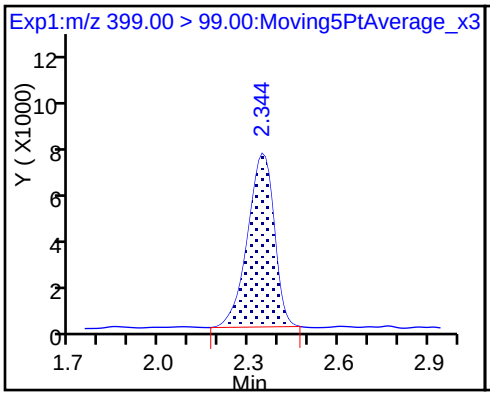
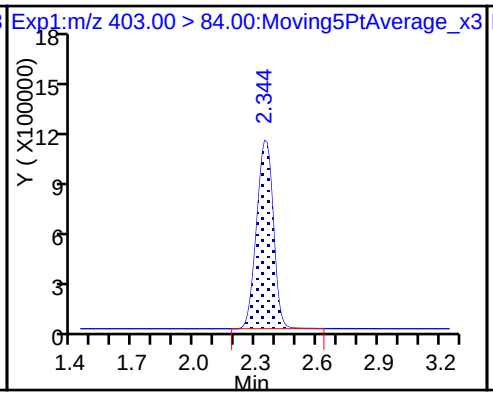
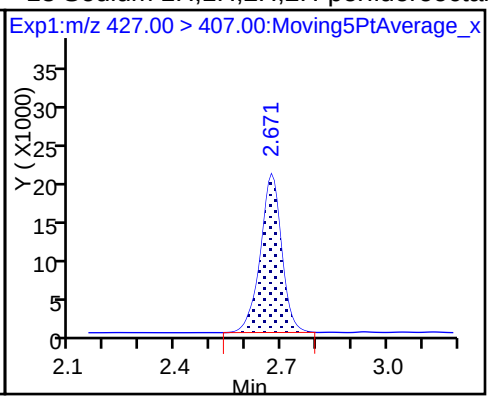


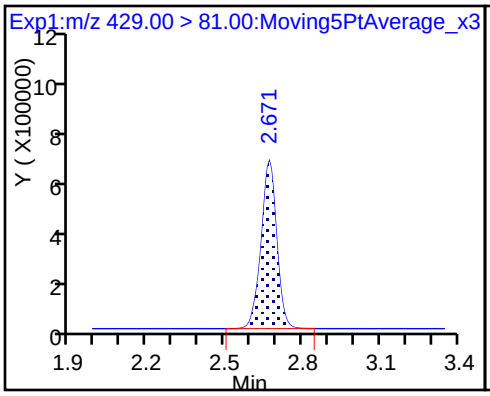
D 11 18O2 PFHxS



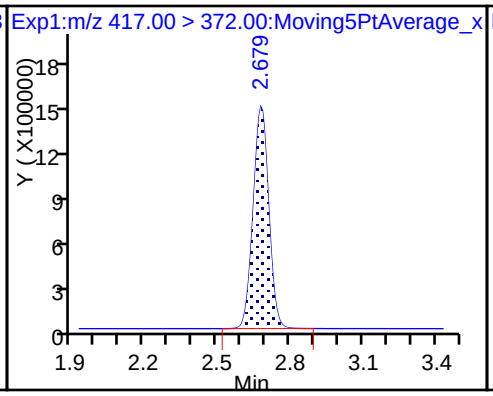
13 Sodium 1H,1H,2H,2H-perfluorooctane



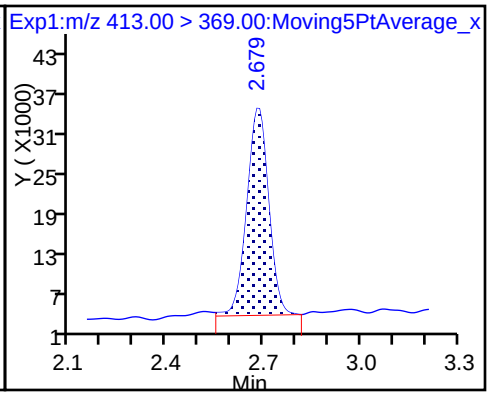
D 12 M2-6:2FTS



D 14 13C4 PFOA



15 Perfluorooctanoic acid



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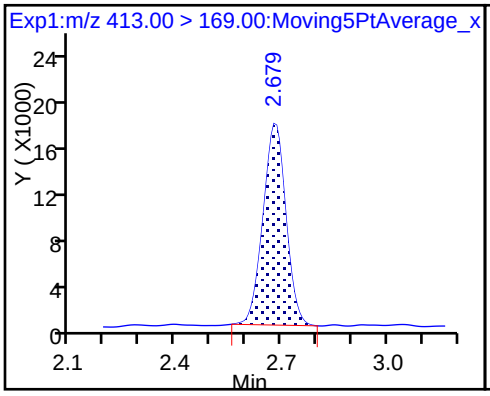
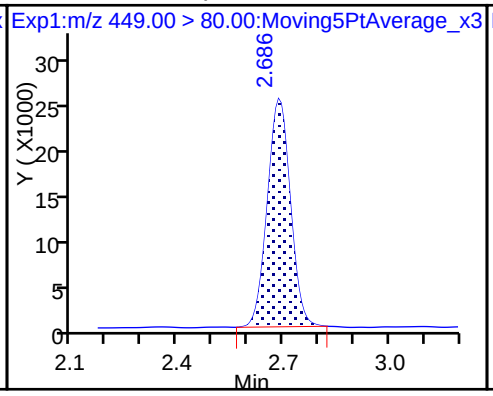
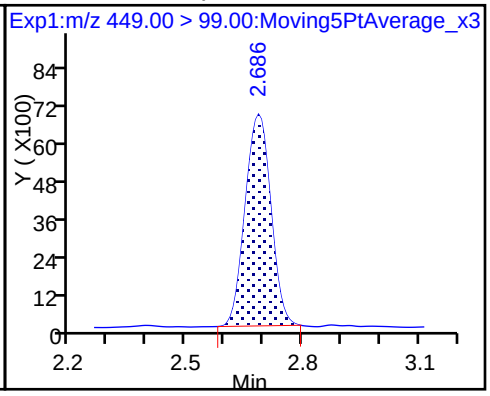


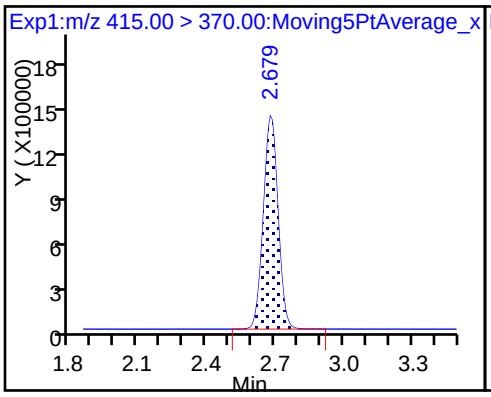
16 Perfluoroheptanesulfonic Acid



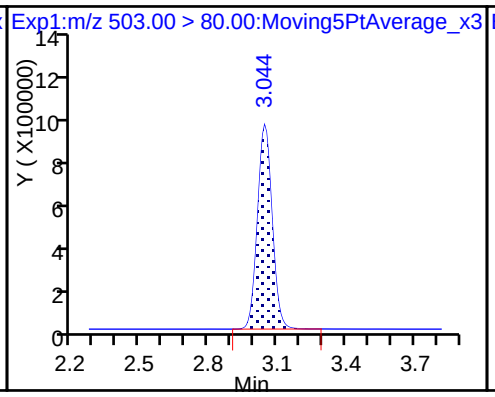
16 Perfluoroheptanesulfonic Acid



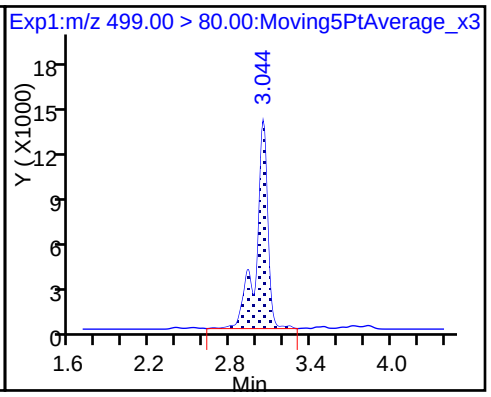
* 62 13C2-PFOA



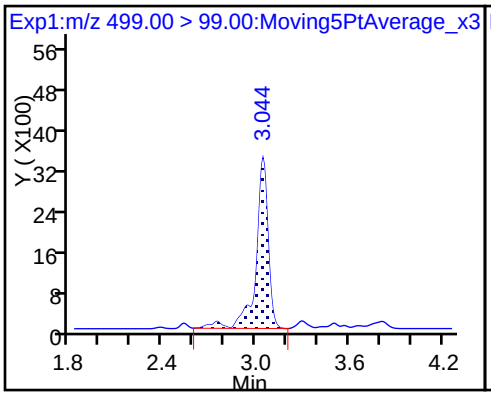
D 18 13C4 PFOS



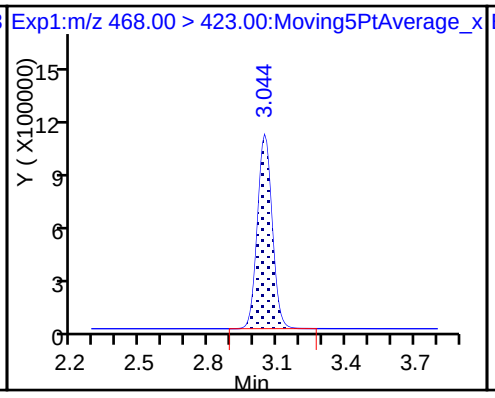
17 Perfluorooctane sulfonic acid



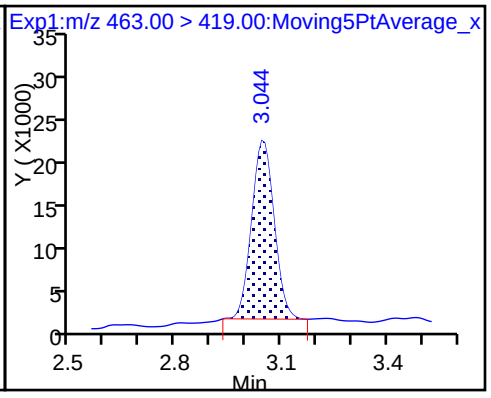
17 Perfluorooctane sulfonic acid



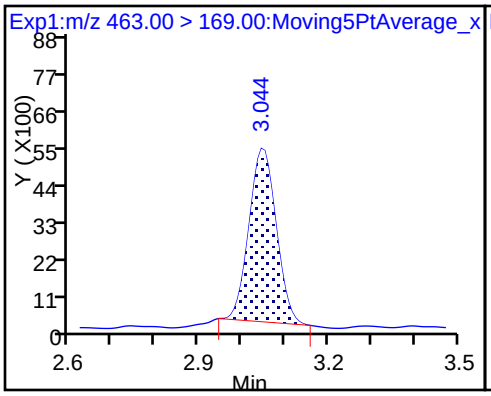
D 19 13C5 PFNA



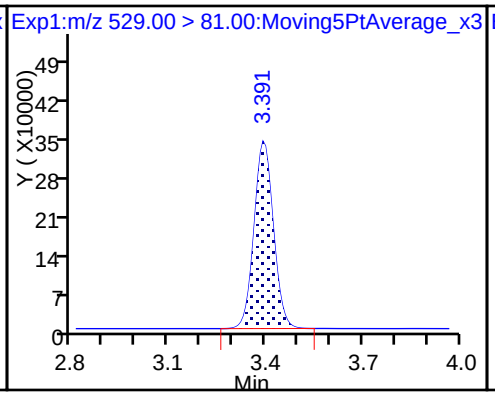
20 Perfluorononanoic acid



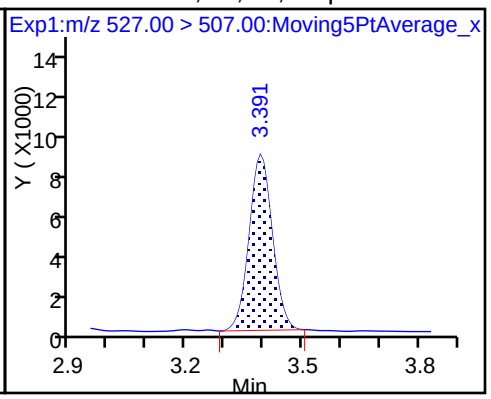
20 Perfluorononanoic acid



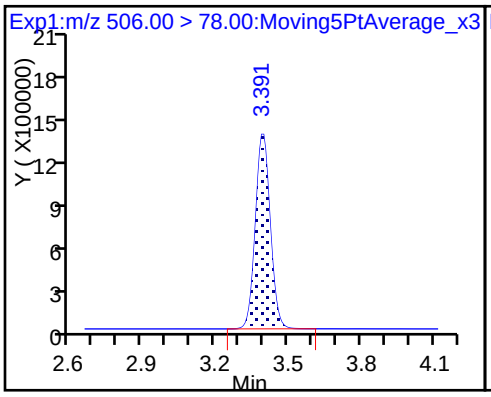
D 26 M2-8:2FTS



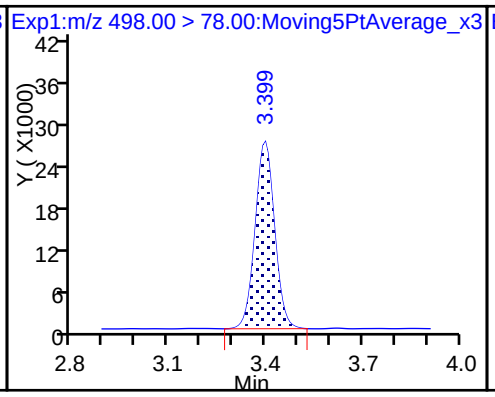
25 Sodium 1H,1H,2H,2H-perfluorodecane



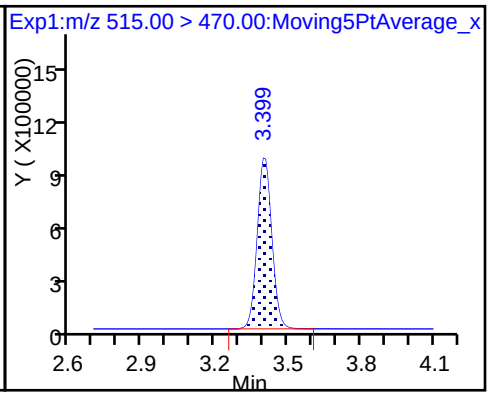
D 21 13C8 FOSA



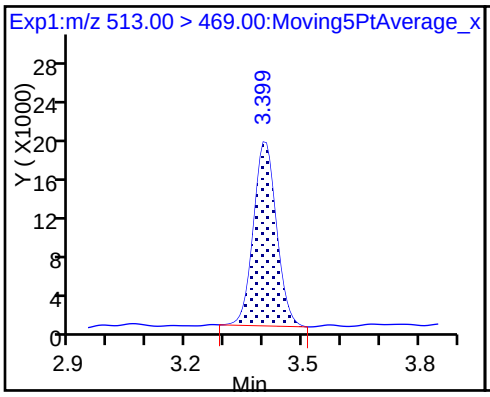
22 Perfluorooctane Sulfonamide



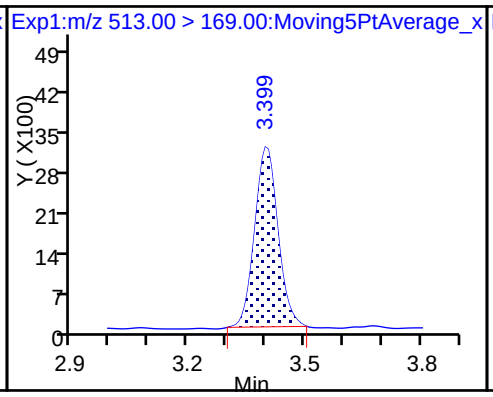
D 23 13C2 PFDA



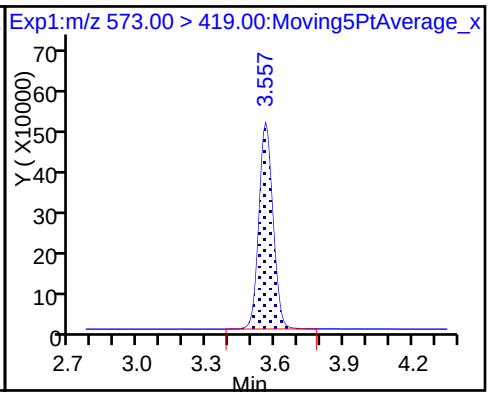
24 Perfluorodecanoic acid



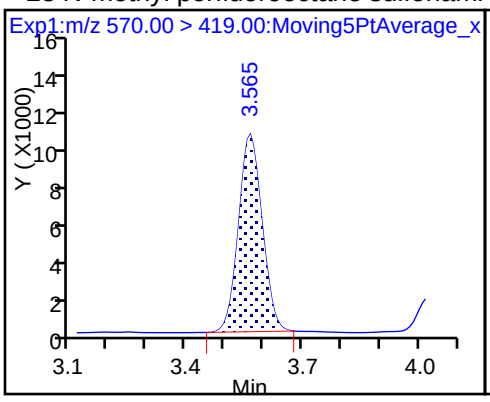
24 Perfluorodecanoic acid



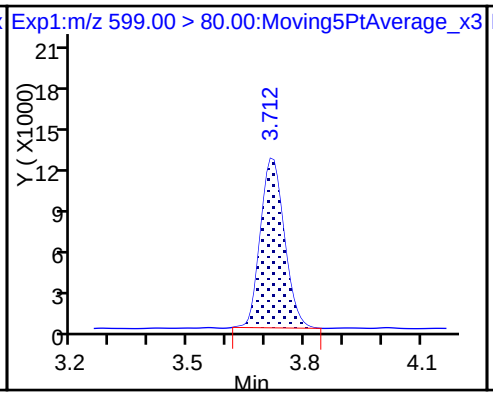
D 27 d3-NMeFOSAA



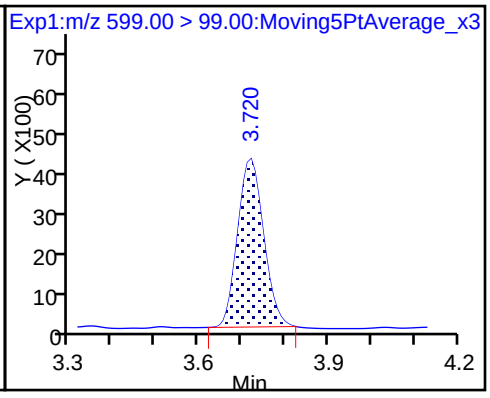
28 N-methyl perfluorooctane sulfonami



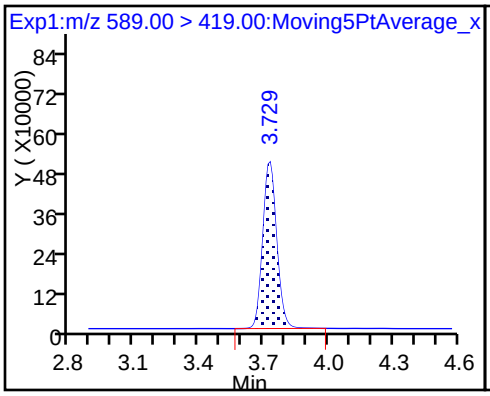
29 Perfluorodecane Sulfonic acid



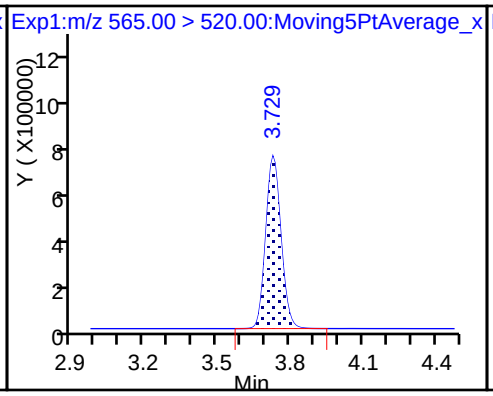
29 Perfluorodecane Sulfonic acid



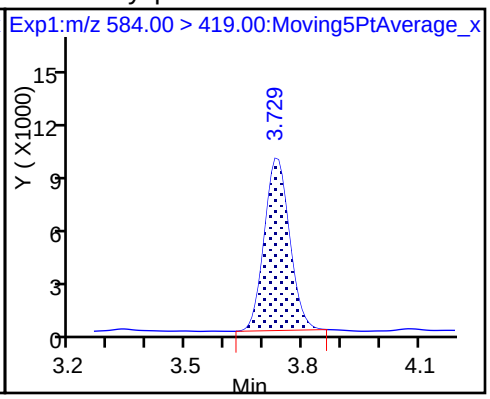
D 32 d5-NEtFOSAA



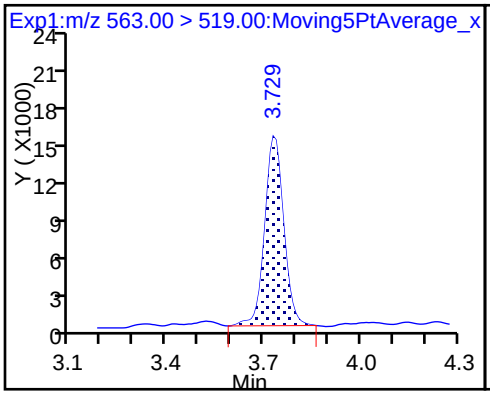
D 30 13C2 PFUnA



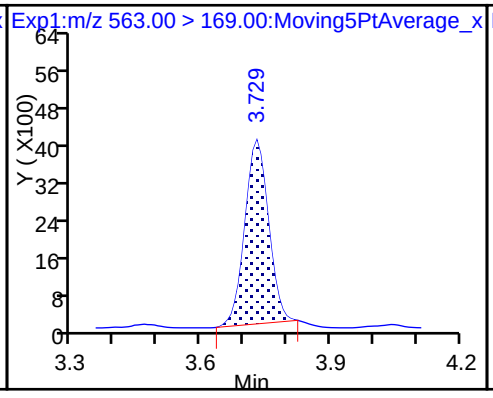
33 N-ethyl perfluorooctane sulfonamid



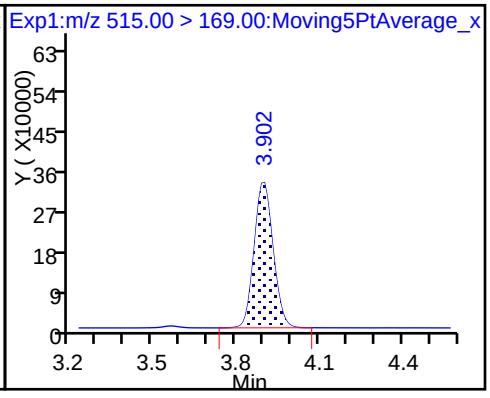
31 Perfluoroundecanoic acid



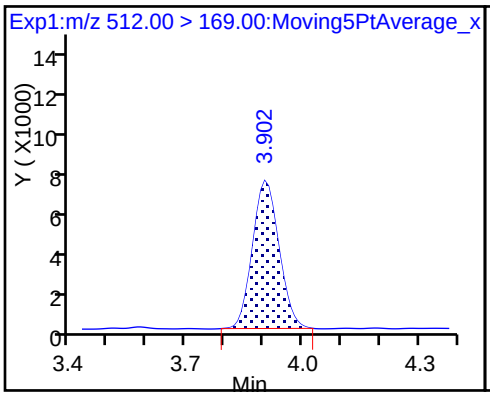
31 Perfluoroundecanoic acid



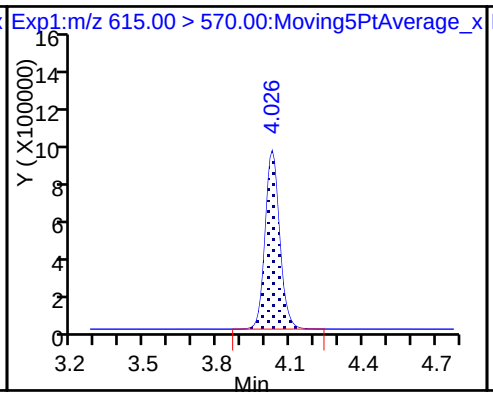
D 34 d-N-MeFOSA-M



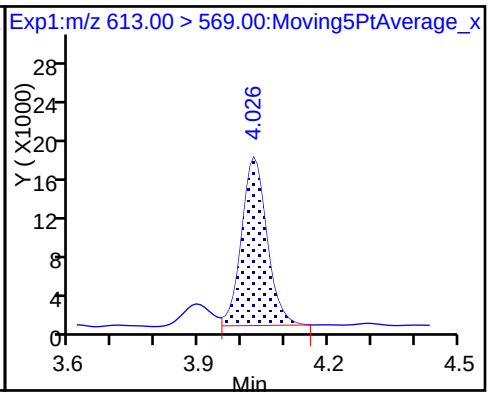
35 MeFOSA



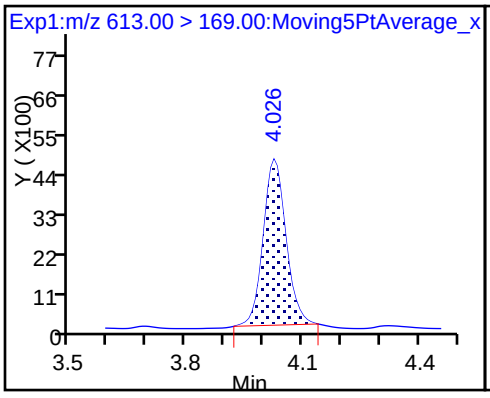
D 36 13C2 PFDoA



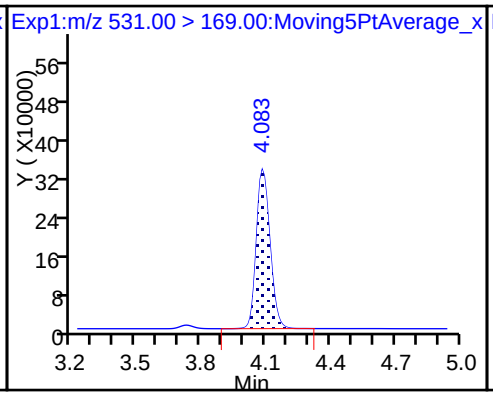
37 Perfluorododecanoic acid



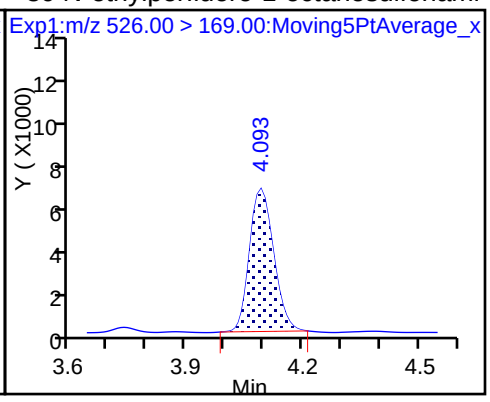
37 Perfluorododecanoic acid



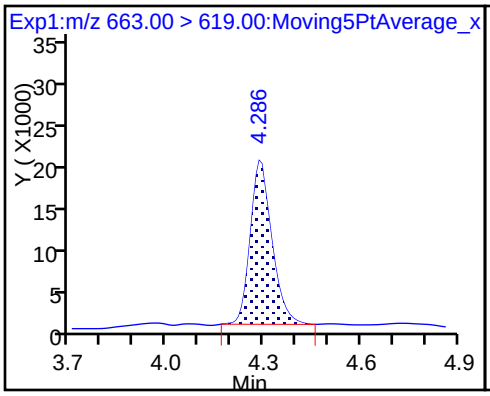
D 38 d-N-EtFOSA-M



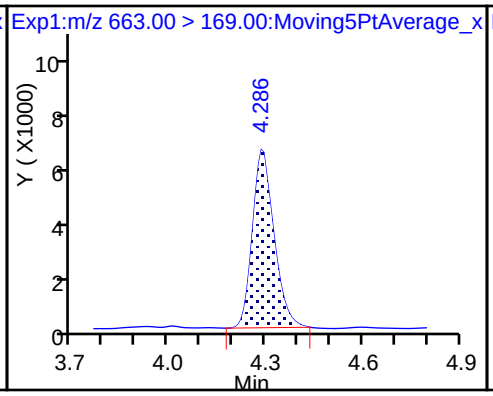
39 N-ethylperfluoro-1-octanesulfonami



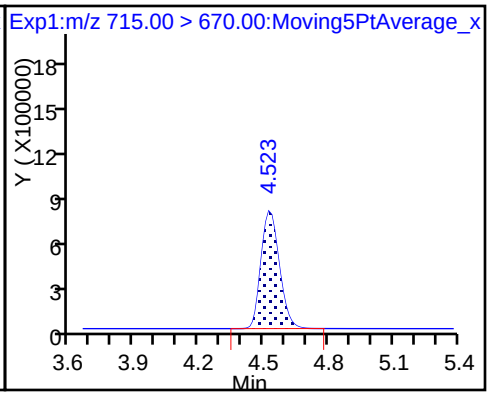
41 Perfluorotridecanoic acid



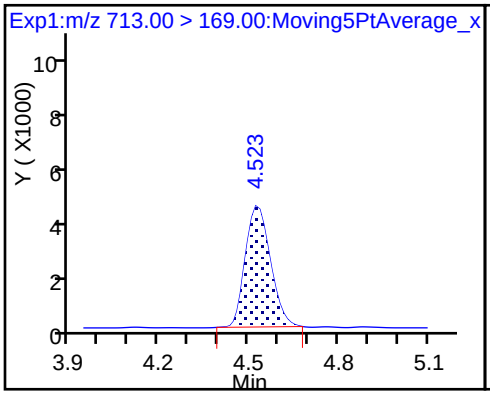
41 Perfluorotridecanoic acid



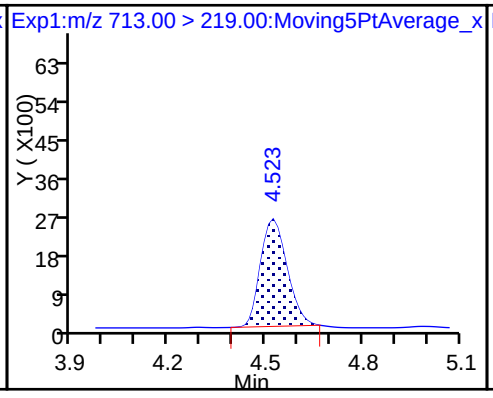
D 43 13C2-PFTeDA



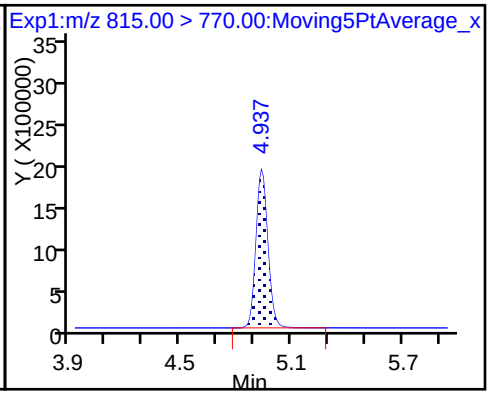
42 Perfluorotetradecanoic acid



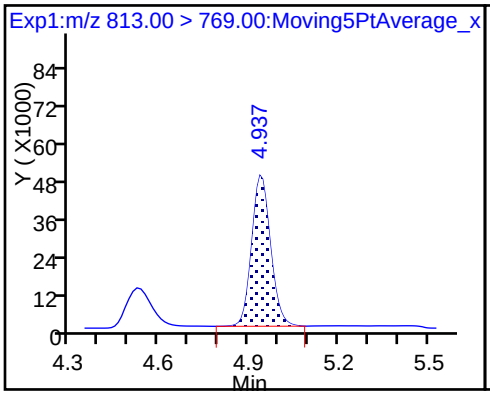
42 Perfluorotetradecanoic acid



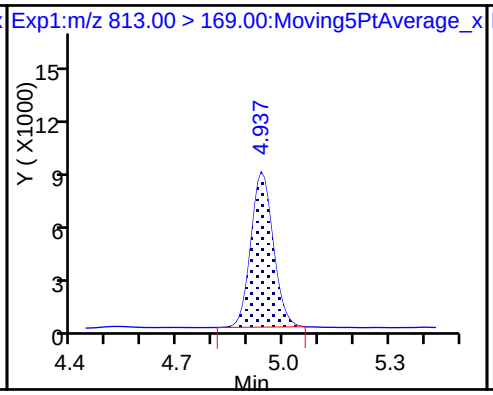
D 44 13C2-PFHxDA



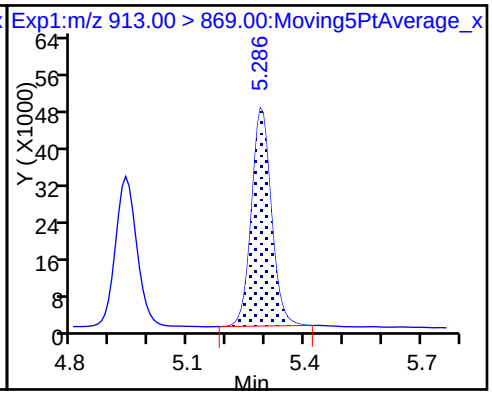
45 Perfluorohexadecanoic acid



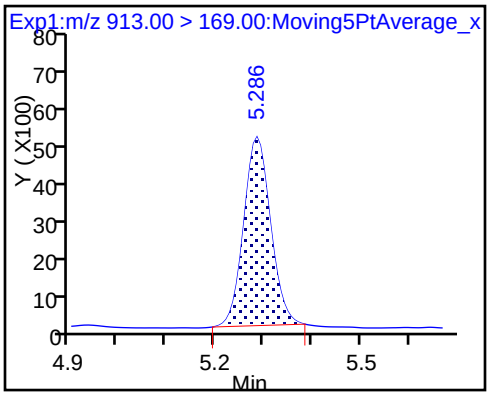
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_004.d
Lims ID: IC L3 Full
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 16-Nov-2017 13:36:00 ALS Bottle#: 30 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub19

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Nov-2017 10:26:27 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 17-Nov-2017 10:07:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.480	1.479	0.001	0.551	7852971	2.48		99.0	75159	
2 Perfluorobutyric acid										
212.90 > 169.00	1.485	1.480	0.005	1.004	749687	0.2607		104	225	
D 3 13C5-PFPeA										
267.90 > 223.00	1.737	1.738	-0.001	0.647	5074840	2.53		101	62022	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.746	1.740	0.006	1.005	581733	0.2541		102	447	
D 47 13C3-PFBS										
301.90 > 83.00	1.779	1.774	0.005	0.663	101752	2.32		99.7	4307	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.779	1.776	0.003	1.000	761950	0.2343		106	4637	
298.90 > 99.00	1.779	1.776	0.003	1.000	324779		2.35(1.74-3.24)	106	5032	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.982	1.977	0.005	1.000	209357	0.2867		123	8529	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.013	2.010	0.003	1.000	586501	0.2567		103	1228	
313.00 > 119.00	2.013	2.010	0.003	1.000	56569		10.37(7.05-13.09)	103	895	
D 7 13C2 PFHxA										
315.00 > 270.00	2.013	2.010	0.003	0.750	5708542	2.52		101	61868	
D 9 13C4-PFHpA										
367.00 > 322.00	2.332	2.332	0.0	0.869	5680339	2.59		104	56593	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.332	2.333	-0.001	1.000	600093	0.2576		103	975	
363.00 > 169.00	2.332	2.333	-0.001	1.000	219255		2.74(1.59-2.95)	103	1729	
D 11 18O2 PFHxS										
403.00 > 84.00	2.353	2.347	0.006	0.877	6305886	2.44		103	28809	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.353	2.347	0.006	1.000	642840	0.2201		96.8	3608	
399.00 > 99.00	2.353	2.347	0.006	1.000	209859		3.06(2.10-3.89)	96.8	2113	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.677	2.671	0.007	1.000	372103	0.2368		99.9	12116	
D 12 M2-6:2FTS										
429.00 > 81.00	2.677	2.671	0.006	0.997	2326123	2.12		89.3	44009	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.684	2.680	0.004	1.000	666805	0.2492		99.7	237	
413.00 > 169.00	2.684	2.680	0.004	1.000	340820		1.96(1.18-2.19)	99.7	1435	
D 14 13C4 PFOA										
417.00 > 372.00	2.684	2.680	0.004	1.000	6341775	2.53		101	47202	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.691	2.687	0.004	1.000	556831	0.2466		104	8097	
449.00 > 99.00	2.691	2.687	0.004	1.000	146611		3.80(2.72-5.05)	104	3985	
* 62 13C2-PFOA										
415.00 > 370.00	2.684	2.695	-0.011		6092687	2.50			40655	
D 19 13C5 PFNA										
468.00 > 423.00	3.049	3.042	0.006	1.136	4703253	2.55		102	40891	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.049	3.042	0.006	1.000	421851	0.2330		100	3028	
499.00 > 99.00	3.049	3.042	0.006	1.000	90735		4.65(3.24-6.01)	100	2164	
D 18 13C4 PFOS										
503.00 > 80.00	3.049	3.042	0.006	1.136	4122883	2.39		100.0	24418	
20 Perfluorononanoic acid										
463.00 > 419.00	3.049	3.045	0.003	1.000	489404	0.2609		104	935	
463.00 > 169.00	3.049	3.045	0.003	1.000	112888		4.34(2.65-4.93)	104	1959	
D 26 M2-8:2FTS										
529.00 > 81.00	3.396	3.390	0.006	1.265	1442295	2.47		103	25195	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.396	3.392	0.004	1.000	178303	0.2438		102	3917	
D 21 13C8 FOSA										
506.00 > 78.00	3.396	3.393	0.003	1.265	5674580	2.55		102	34597	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.396	3.395	0.001	1.000	567301	0.2602		104	9543	
D 23 13C2 PFDA										
515.00 > 470.00	3.403	3.400	0.003	1.268	3928765	2.52		101	33847	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.403	3.400	0.003	1.000	382352	0.2505		100	1822	
513.00 > 169.00	3.403	3.400	0.003	1.000	67676		5.65(3.31-6.15)	100	1356	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.563	3.557	0.006	1.327	2119322	2.54		101	18089	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.563	3.561	0.002	1.000	228051	0.2566		103	1387	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.717	3.714	0.003	1.000	273040	0.2619		109	9109	
599.00 > 99.00	3.717	3.714	0.003	1.000	95300		2.87(1.94-3.60)	109	3682	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.725	3.725	0.0	1.388	2164393	2.69		108	9768	
D 30 13C2 PFUnA										
565.00 > 520.00	3.734	3.730	0.004	1.391	3238414	2.61		104	49622	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.734	3.731	0.003	1.002	216779	0.2612		104	3481	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.734	3.731	0.003	1.000	277066	0.2363		94.5	1377	
563.00 > 169.00	3.734	3.731	0.003	1.000	62203		4.45(0.00-0.00)	94.5	1762	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.897	3.896	0.001	1.452	1585711	2.46		98.3	3206	
35 MeFOSA										
512.00 > 169.00	3.907	3.903	0.004	1.003	153755	0.2470		98.8	1919	
D 36 13C2 PFDoA										
615.00 > 570.00	4.031	4.024	0.007	1.502	3765998	2.61		104	57974	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.031	4.025	0.006	1.000	366653	0.2484		99.4	1272	
613.00 > 169.00	4.031	4.025	0.006	1.000	91327		4.01(2.19-4.07)	99.4	3744	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.087	4.084	0.003	1.523	1481982	2.48		99.0	2798	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.097	4.091	0.006	1.002	161649	0.2722		109	2158	
41 Perfluorotridecanoic acid										R
663.00 > 619.00	4.289	4.287	0.002	1.000	483385	0.2622		105	1543	R
663.00 > 169.00	4.289	4.287	0.002	1.000	145613		3.32(1.76-3.26)	105	5360	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.529	4.526	0.003	1.000	108760	0.2431		97.3	3082	
713.00 > 219.00	4.515	4.526	-0.011	0.997	78010		1.39(1.00-1.85)	97.3	3298	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.529	4.526	0.003	1.687	4559867	2.57		103	32363	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.942	4.938	0.004	1.841	7903586	2.52		101	23677	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.942	4.939	0.003	1.000	768340	0.2525		101	491	R
813.00 > 169.00	4.942	4.939	0.003	1.000	132891		5.78(2.50-4.65)	101	3382	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.290	5.286	0.004	1.000	858466	0.2729		109	300	
913.00 > 169.00	5.290	5.286	0.004	1.000	101182		8.48(0.00-0.00)	109	1166	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL3_00002 Amount Added: 1.00 Units: mL

Report Date: 17-Nov-2017 10:26:28 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_004.d

Injection Date: 16-Nov-2017 13:36:00 Instrument ID: A8_N

Lims ID: IC L3 Full

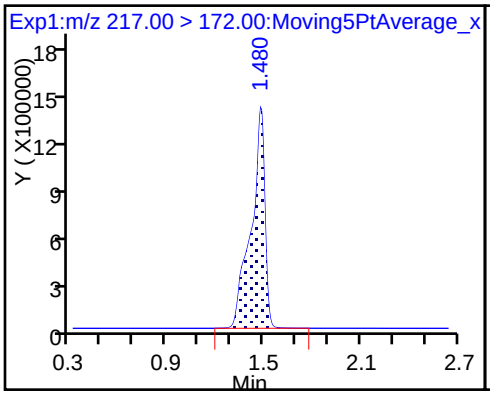
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 30 Worklist Smp#: 4

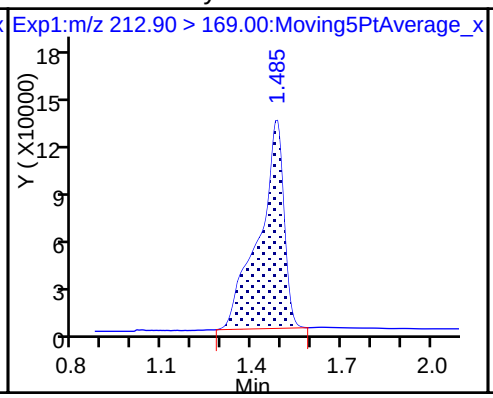
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

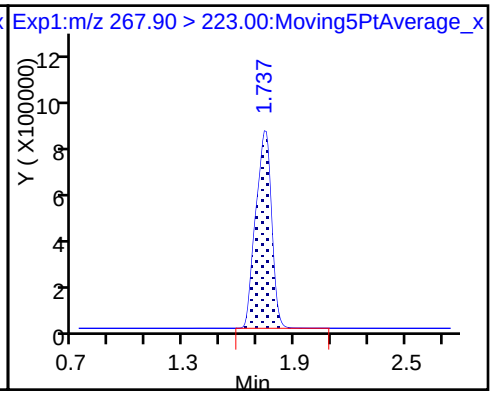
D 1 13C4 PFBA



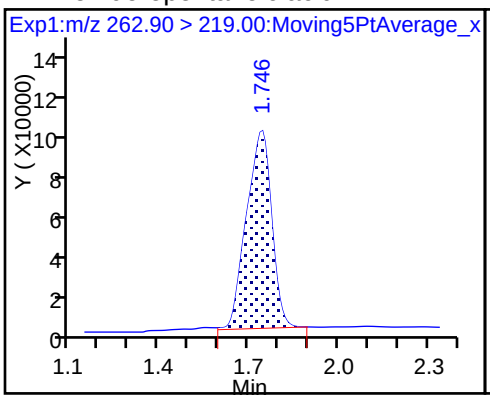
2 Perfluorobutyric acid



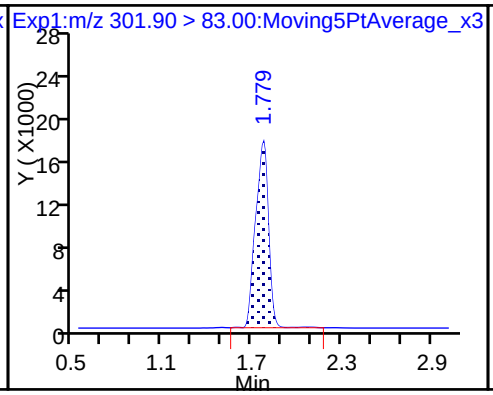
D 3 13C5-PFPeA



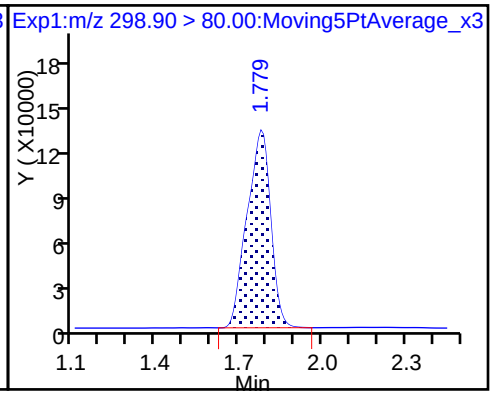
4 Perfluoropentanoic acid



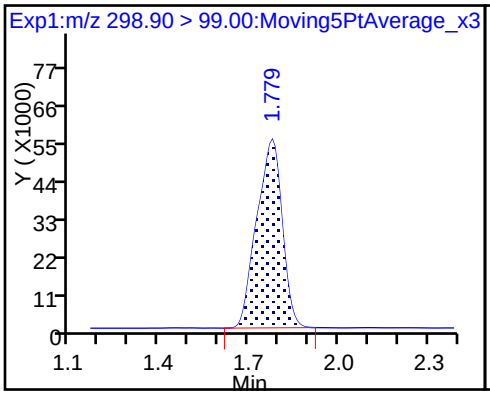
D 47 13C3-PFBS



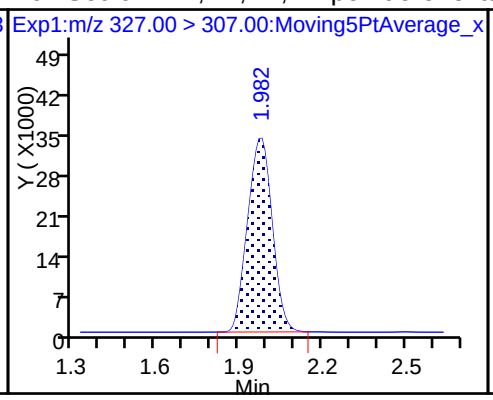
5 Perfluorobutanesulfonic acid



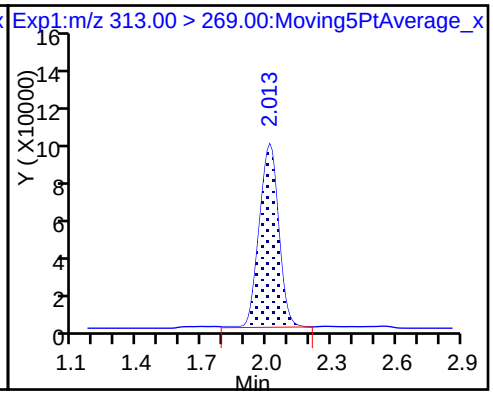
5 Perfluorobutanesulfonic acid



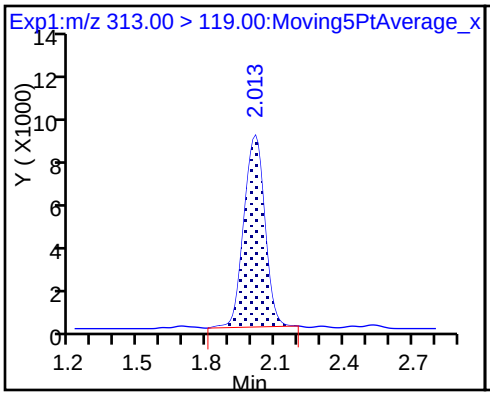
61 Sodium 1H,1H,2H,2H-perfluorohexane



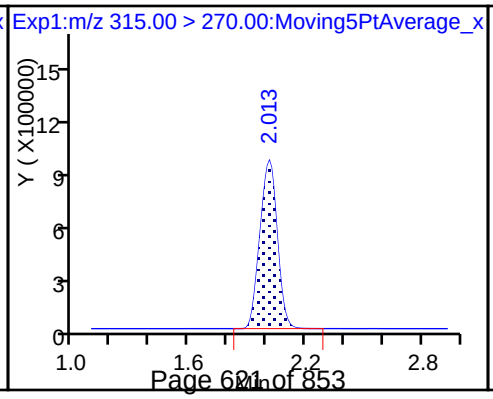
6 Perfluorohexanoic acid



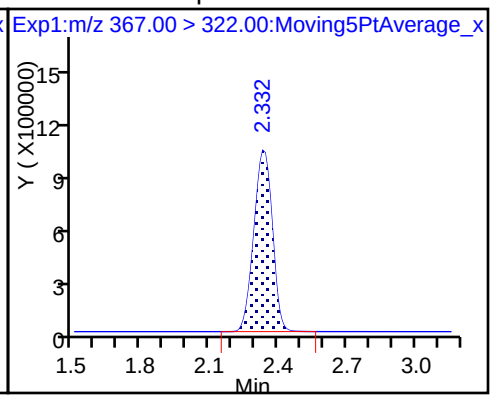
6 Perfluorohexanoic acid



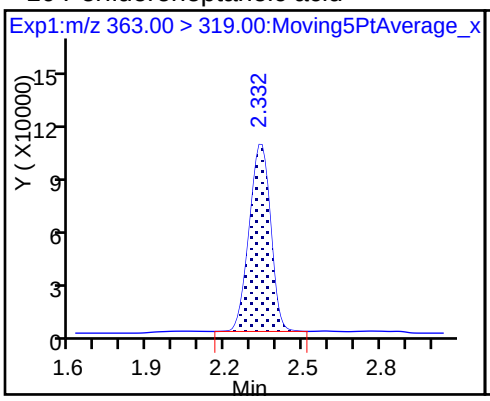
D 7 13C2 PFHxA



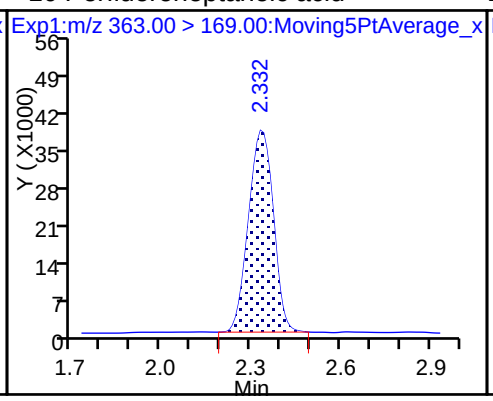
D 9 13C4-PFHpA



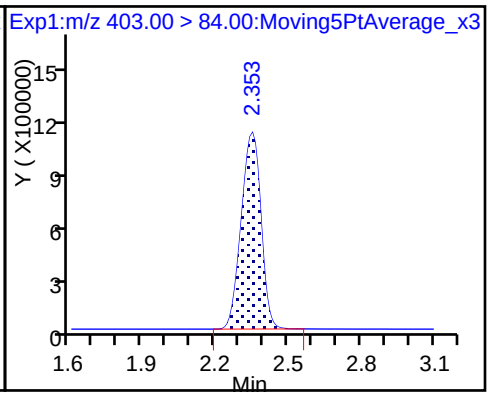
10 Perfluoroheptanoic acid



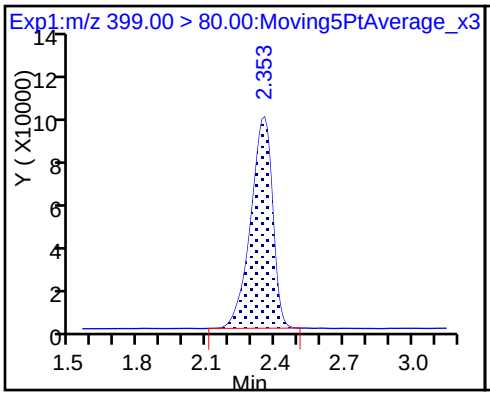
10 Perfluoroheptanoic acid



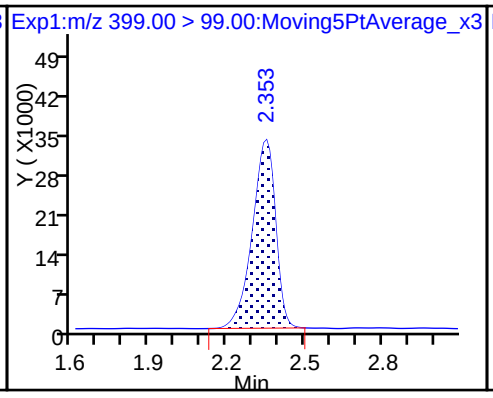
D 11 18O2 PFHxS



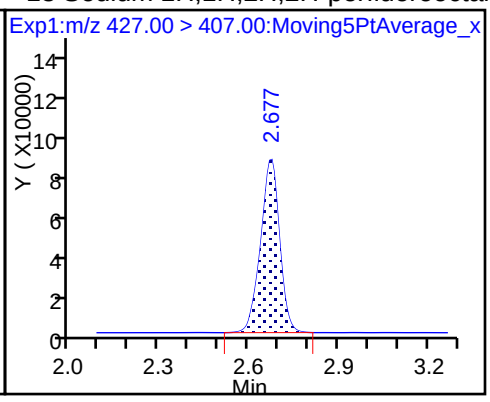
8 Perfluorohexanesulfonic acid



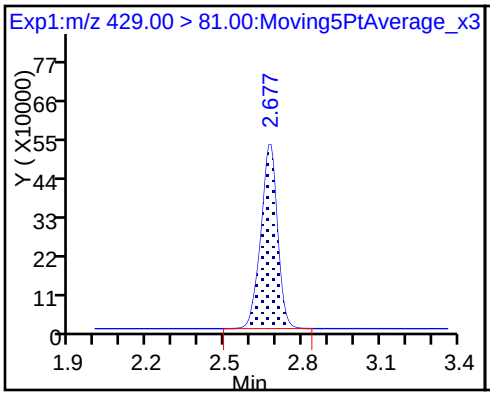
8 Perfluorohexanesulfonic acid



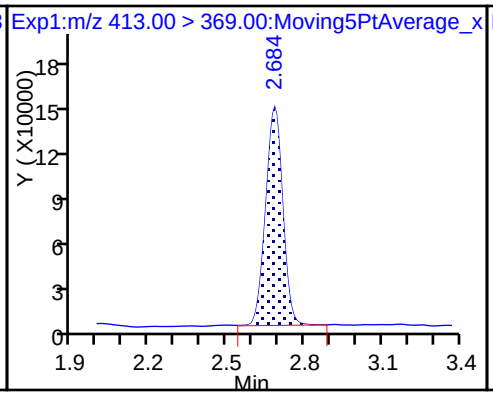
13 Sodium 1H,1H,2H,2H-perfluorooctane



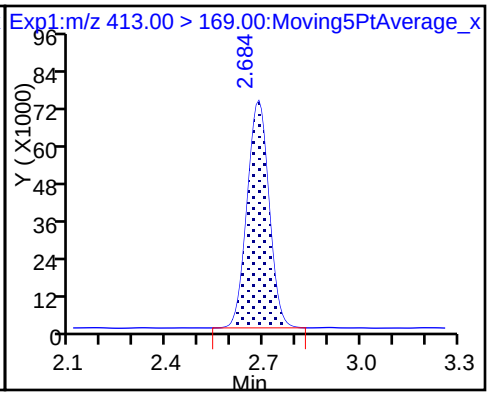
D 12 M2-6:2FTS



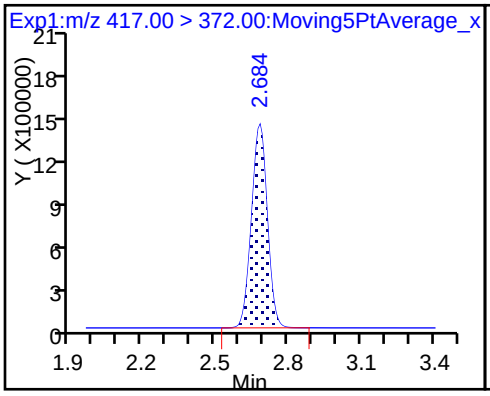
15 Perfluorooctanoic acid



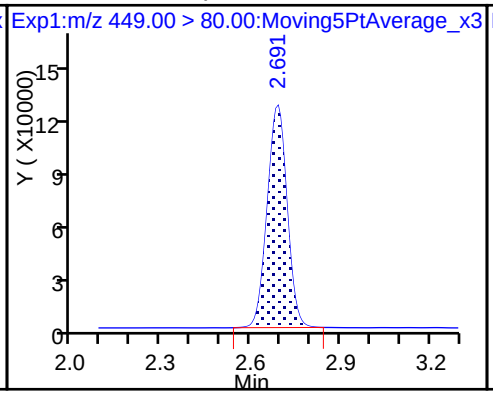
15 Perfluorooctanoic acid



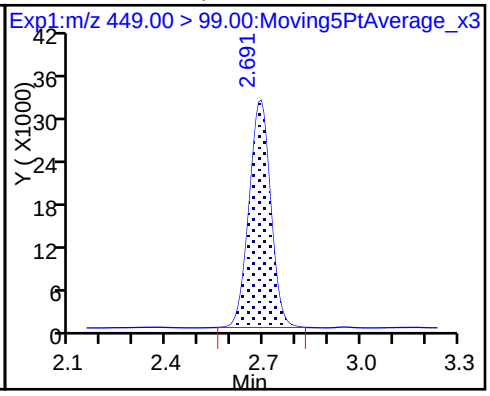
D 14 13C4 PFOA



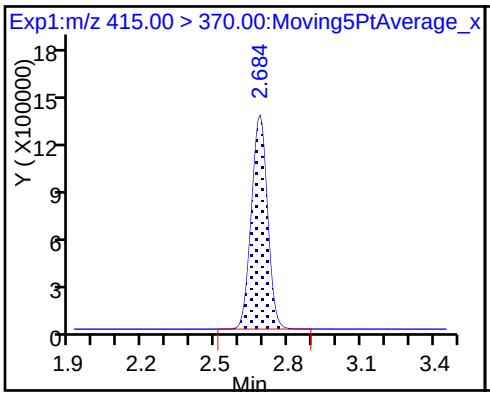
16 Perfluoroheptanesulfonic Acid



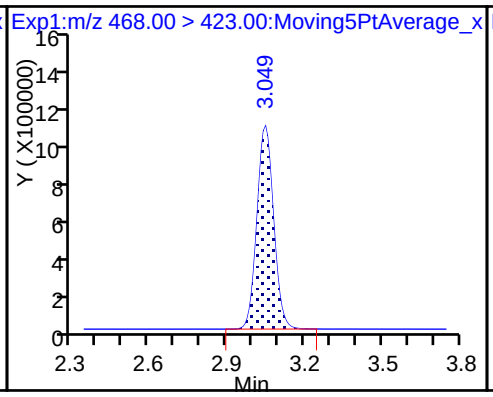
16 Perfluoroheptanesulfonic Acid



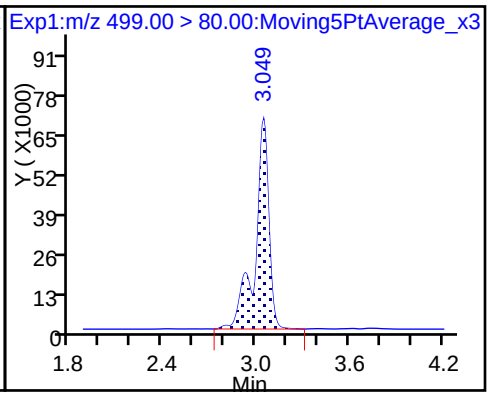
* 62 13C2-PFOA



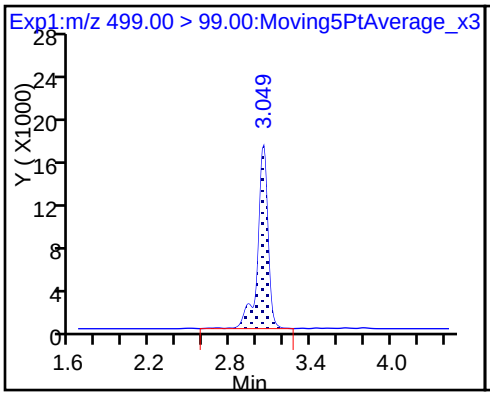
D 19 13C5 PFNA



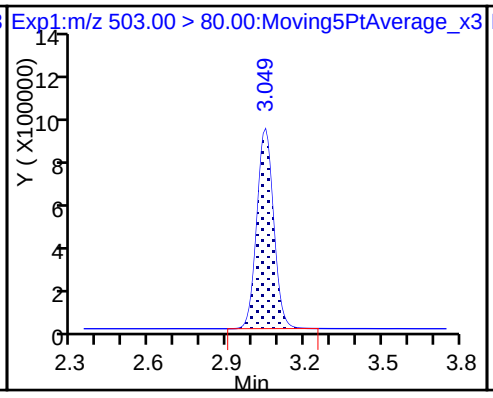
17 Perfluorooctane sulfonic acid



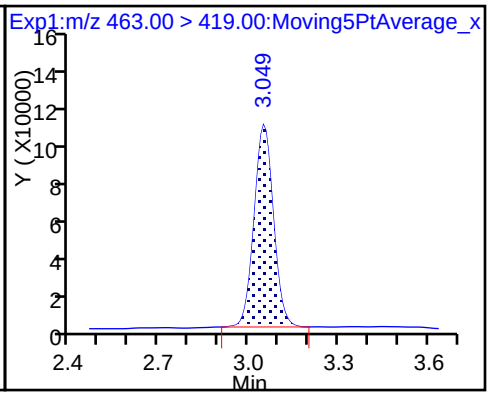
17 Perfluorooctane sulfonic acid



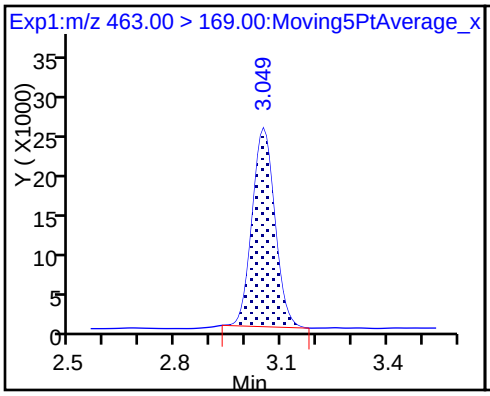
D 18 13C4 PFOS



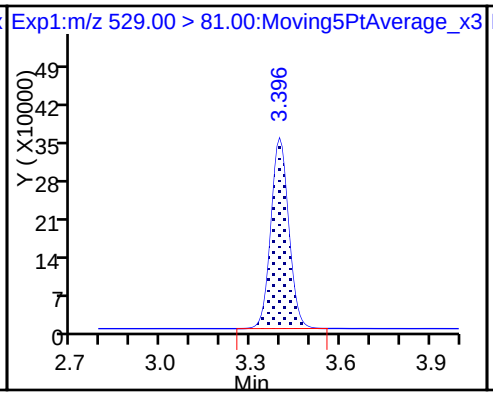
20 Perfluorononanoic acid



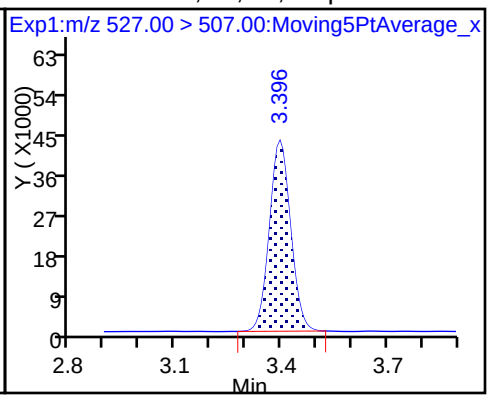
20 Perfluorononanoic acid



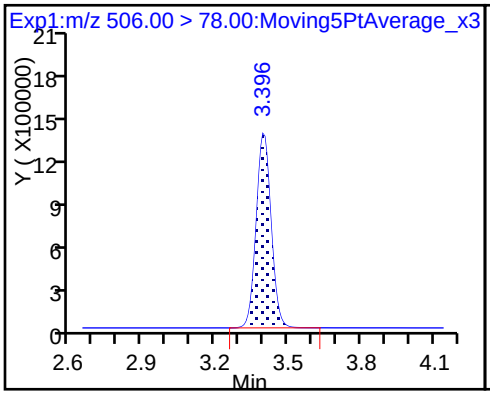
D 26 M2-8:2FTS



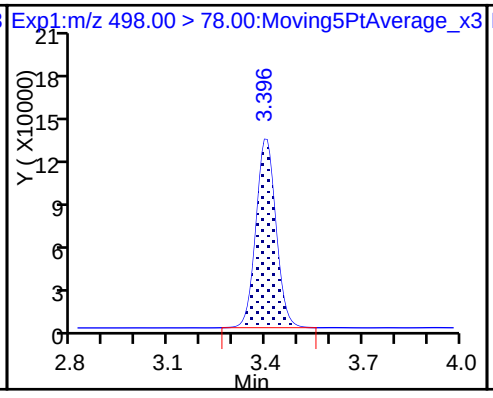
25 Sodium 1H,1H,2H,2H-perfluorodecane



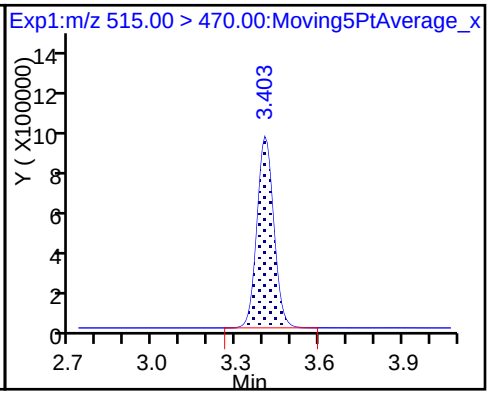
D 21 13C8 FOSA



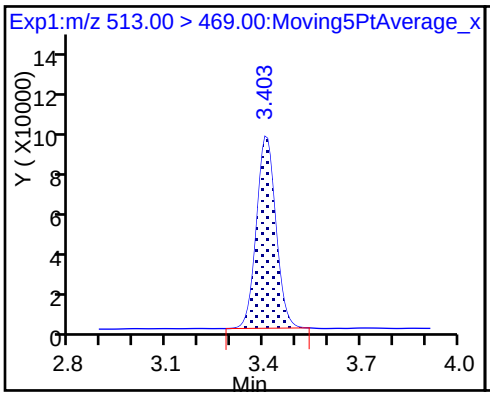
22 Perfluorooctane Sulfonamide



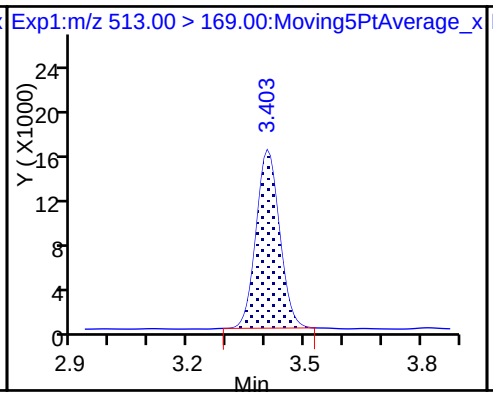
D 23 13C2 PFDA



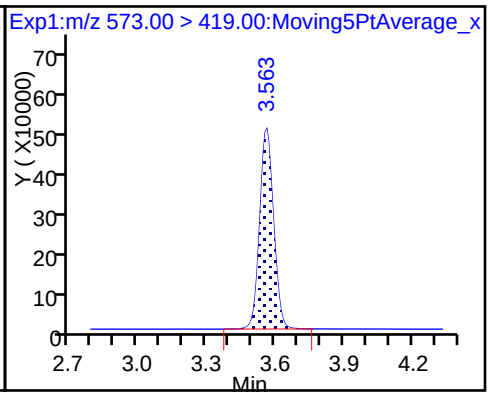
24 Perfluorodecanoic acid



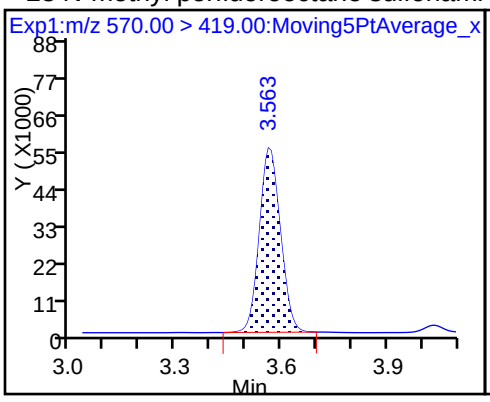
24 Perfluorodecanoic acid



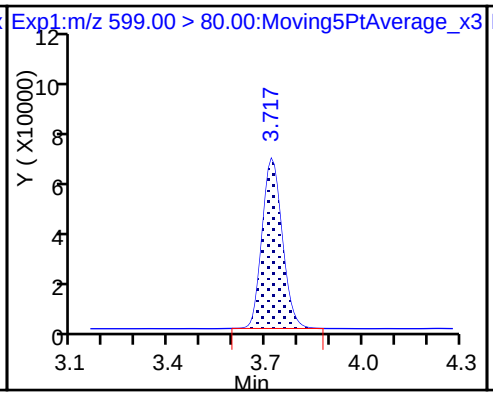
D 27 d3-NMeFOSAA



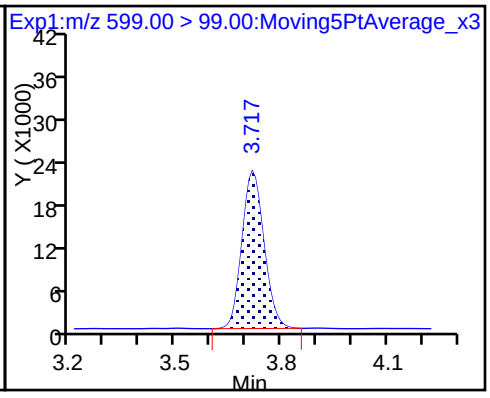
28 N-methyl perfluorooctane sulfonami



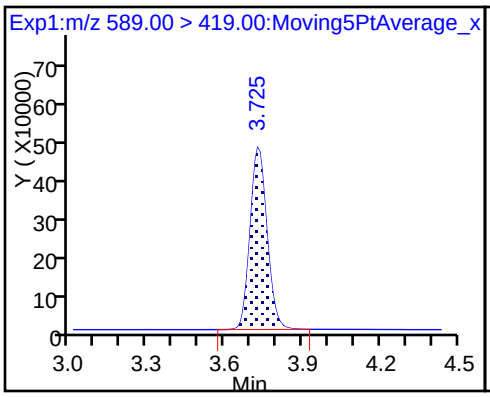
29 Perfluorodecane Sulfonic acid



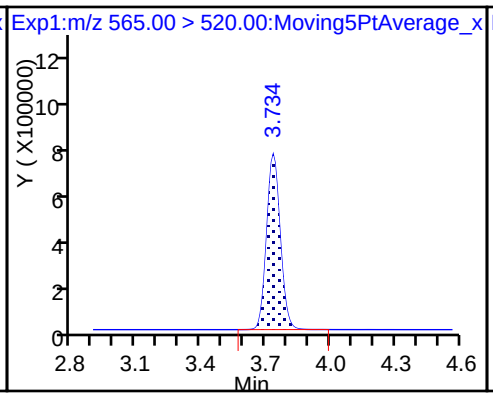
29 Perfluorodecane Sulfonic acid



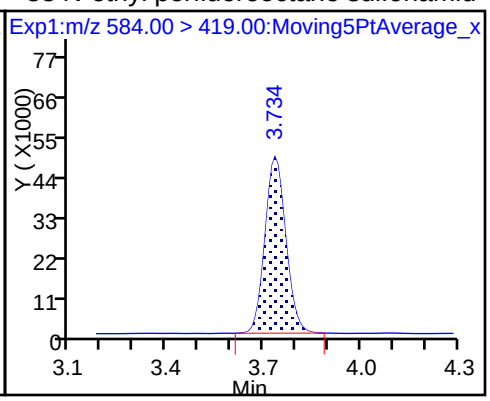
D 32 d5-NEtFOSAA



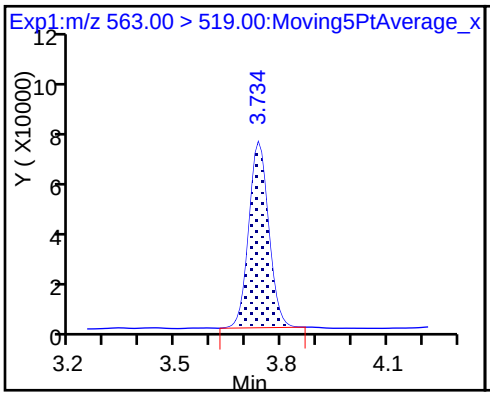
D 30 13C2 PFUnA



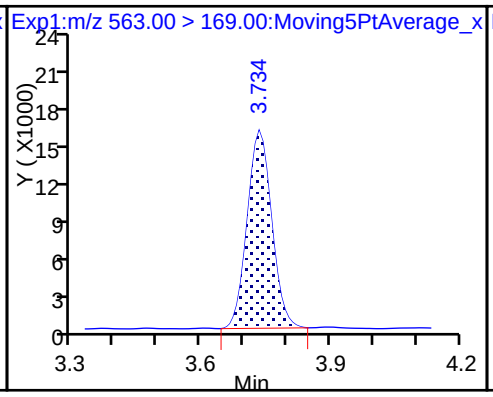
33 N-ethyl perfluorooctane sulfonamid



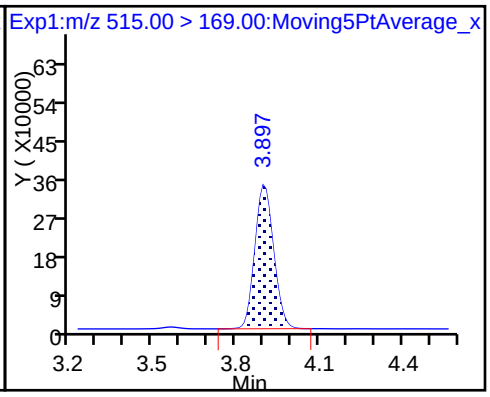
31 Perfluoroundecanoic acid



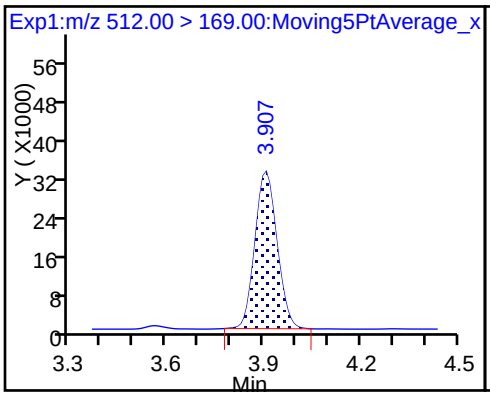
31 Perfluoroundecanoic acid



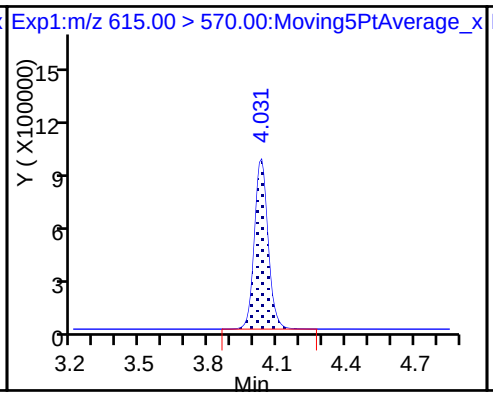
D 34 d-N-MeFOSA-M



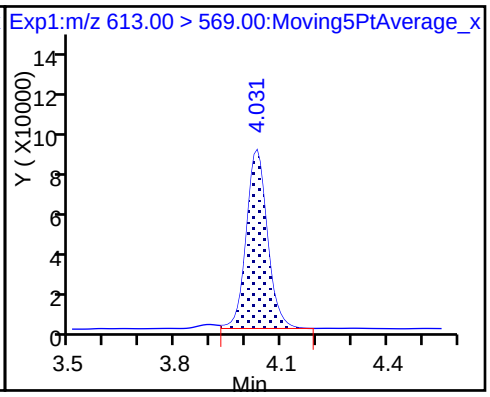
35 MeFOSA



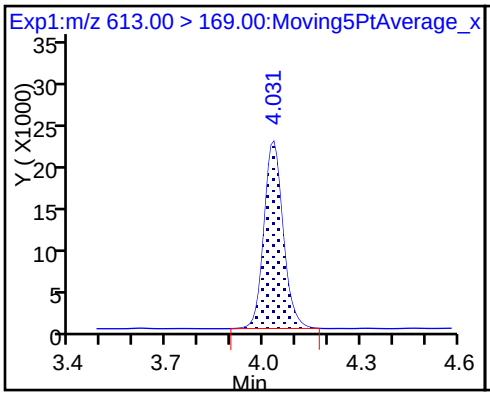
D 36 13C2 PFDoA



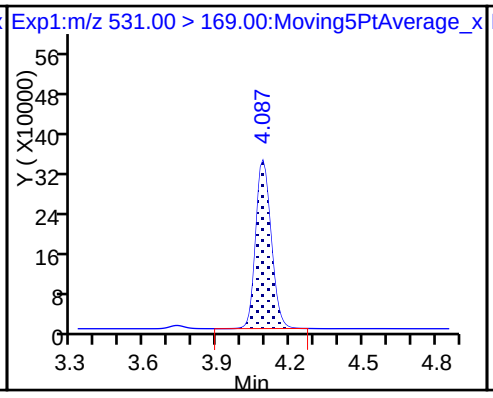
37 Perfluorododecanoic acid



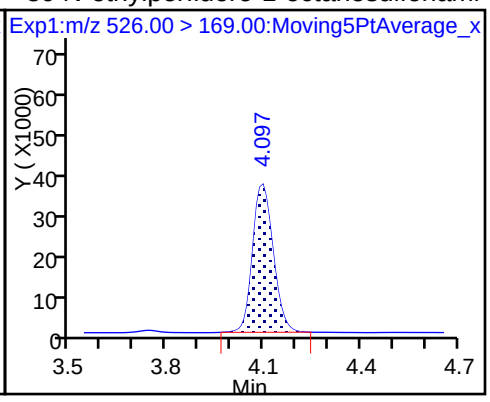
37 Perfluorododecanoic acid



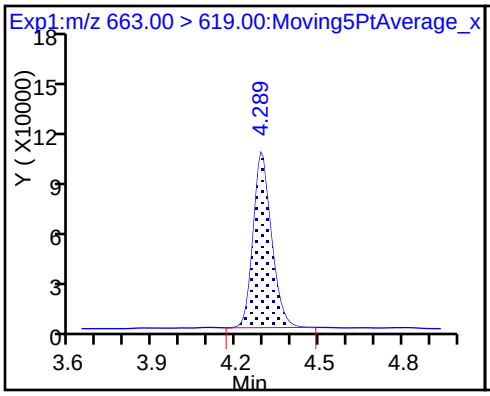
D 38 d-N-EtFOSA-M



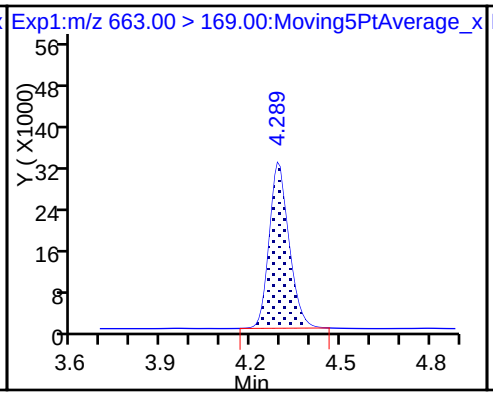
39 N-ethylperfluoro-1-octanesulfonami



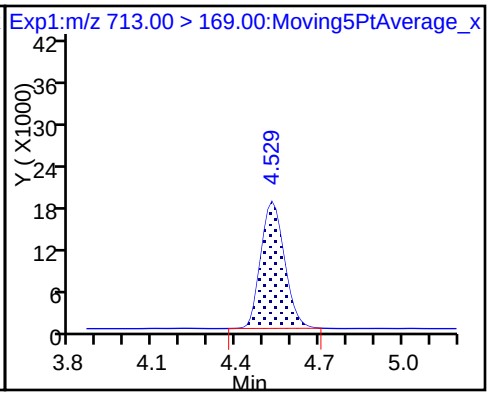
41 Perfluorotridecanoic acid



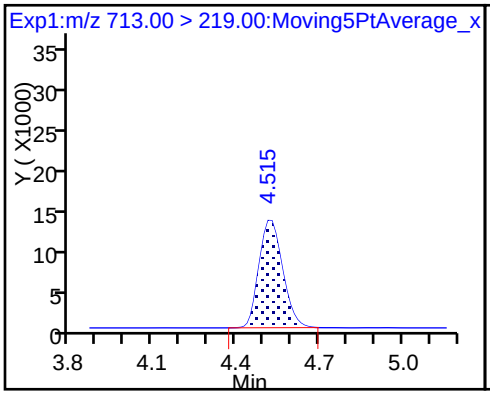
41 Perfluorotridecanoic acid



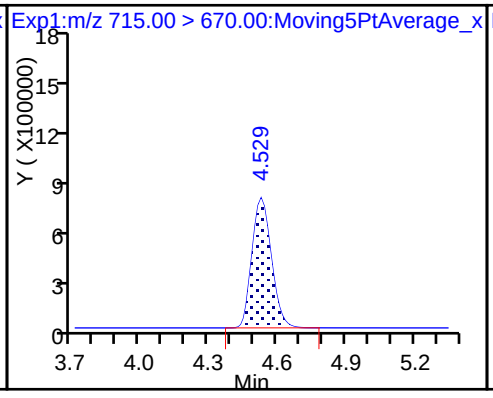
42 Perfluorotetradecanoic acid



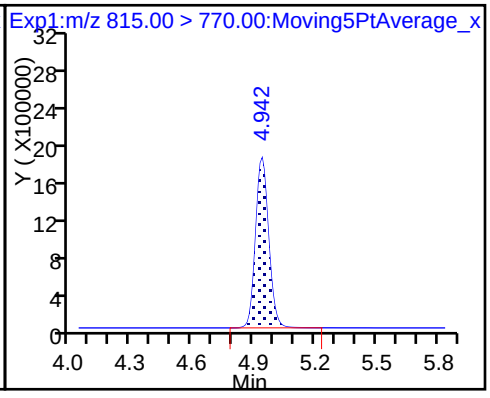
42 Perfluorotetradecanoic acid



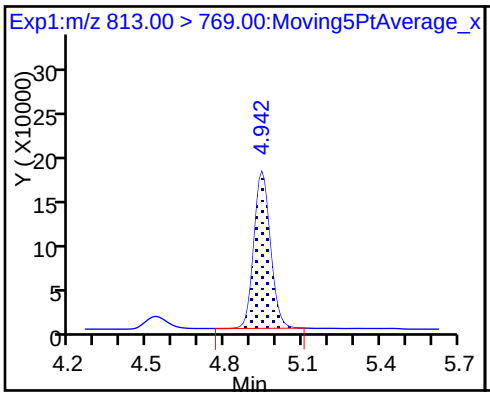
D 43 13C2-PFTeDA



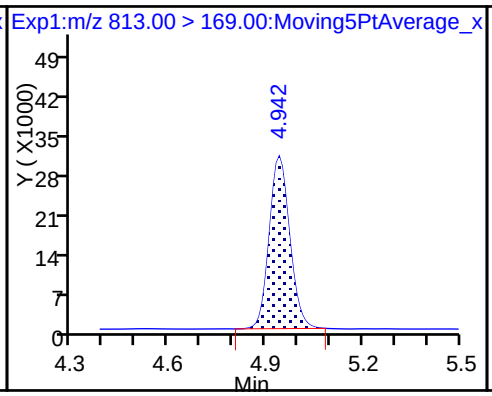
D 44 13C2-PFHxDA



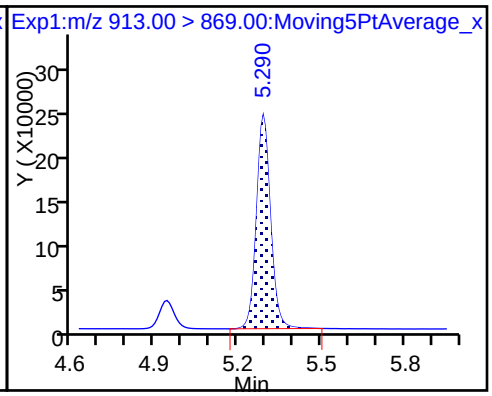
45 Perfluorohexadecanoic acid



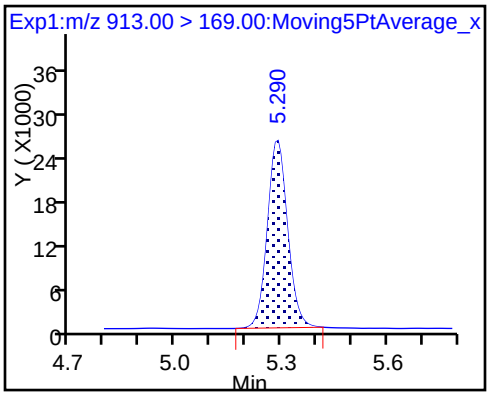
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_005.d
Lims ID: IC L4 Full
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 16-Nov-2017 13:43:53 ALS Bottle#: 31 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub19

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Nov-2017 10:26:31 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 16-Nov-2017 16:37:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.480	1.479	0.001	0.553	7665544	2.43		97.2	69650	
2 Perfluorobutyric acid										
212.90 > 169.00	1.480	1.480	0.0	1.000	2861665	1.02		102	948	
D 3 13C5-PFPeA										
267.90 > 223.00	1.739	1.738	0.001	0.649	4981182	2.49		99.8	64559	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.739	1.740	-0.001	1.000	2168870	0.9652		96.5	1742	
D 47 13C3-PFBS										
301.90 > 83.00	1.772	1.774	-0.002	0.661	102182	2.34		101	3347	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.780	1.776	0.004	1.005	2987210	0.9146		103	18411	
298.90 > 99.00	1.772	1.776	-0.004	1.000	1226019		2.44(1.74-3.24)	103	15915	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.973	1.977	-0.004	1.000	851277	0.8571		91.8	34578	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.004	2.010	-0.006	0.995	2161947	0.9749		97.5	4569	
313.00 > 119.00	2.014	2.010	0.004	1.000	205376		10.53(7.05-13.09)	97.5	3305	
D 7 13C2 PFHxA										
315.00 > 270.00	2.014	2.010	0.004	0.752	5541300	2.46		98.3	49431	
D 9 13C4-PFHpA										
367.00 > 322.00	2.334	2.332	0.002	0.871	5400977	2.48		99.2	37665	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.334	2.333	0.001	1.000	2192514	0.9899		99.0	3449	
363.00 > 169.00	2.334	2.333	0.001	1.000	858224		2.55(1.59-2.95)	99.0	7157	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.344	2.347	-0.003	1.000	2448140	0.8625		94.8	11124	
399.00 > 99.00	2.344	2.347	-0.003	1.000	806661		3.03(2.10-3.89)	94.8	6147	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.344	2.347	-0.003	0.875	6128980	2.38		101	33581	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.664	2.671	-0.006	1.000	2041107	0.9550		101	50185	
D 12 M2-6:2FTS										
429.00 > 81.00	2.664	2.671	-0.007	0.995	3163534	2.90		122	61671	
D 14 13C4 PFOA										
417.00 > 372.00	2.679	2.680	-0.001	1.000	6302328	2.52		101	57330	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.679	2.680	-0.001	1.000	2658602	1.00		100.0	847	
413.00 > 169.00	2.679	2.680	-0.001	1.000	1381689		1.92(1.18-2.19)	100.0	5983	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.679	2.687	-0.008	1.000	2143584	0.9594		101	17819	
449.00 > 99.00	2.679	2.687	-0.008	1.000	551587		3.89(2.72-5.05)	101	9887	
* 62 13C2-PFOA										
415.00 > 370.00	2.679	2.695	-0.016		6059309	2.50			53391	
D 18 13C4 PFOS										
503.00 > 80.00	3.036	3.042	-0.006	1.133	4079597	2.38		99.5	21327	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.036	3.042	-0.006	1.000	1672296	0.9336		101	12205	
499.00 > 99.00	3.036	3.042	-0.006	1.000	351574		4.76(3.24-6.01)	101	9521	
D 19 13C5 PFNA										
468.00 > 423.00	3.036	3.042	-0.006	1.133	4573222	2.49		99.7	36402	
20 Perfluorononanoic acid										
463.00 > 419.00	3.036	3.045	-0.009	1.000	1883751	1.03		103	3443	
463.00 > 169.00	3.036	3.045	-0.009	1.000	446702		4.22(2.65-4.93)	103	7642	
D 26 M2-8:2FTS										
529.00 > 81.00	3.391	3.390	0.001	1.266	1307919	2.26		94.2	20376	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.391	3.392	-0.001	1.000	685641	1.03		108	16146	
D 21 13C8 FOSA										
506.00 > 78.00	3.391	3.393	-0.002	1.266	5444253	2.46		98.5	28395	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.391	3.395	-0.004	1.000	2170870	1.04		104	18153	
D 23 13C2 PFDA										
515.00 > 470.00	3.398	3.400	-0.002	1.269	3834115	2.48		99.1	43776	
24 Perfluorodecanoic acid										R
513.00 > 469.00	3.398	3.400	-0.002	1.000	1560625	1.05		105	7235	R
513.00 > 169.00	3.398	3.400	-0.002	1.000	251788		6.20(3.31-6.15)	105	2010	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.557	3.557	0.0	1.328	2043435	2.46		98.3	16036	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.557	3.561	-0.004	1.000	878031	1.02		102	5042	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.712	3.714	-0.002	1.000	1026058	0.99		103	21589	
599.00 > 99.00	3.712	3.714	-0.002	1.000	337563		3.04(1.94-3.60)	103	11153	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.720	3.725	-0.005	1.389	2056463	2.57		103	14350	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFUnA										
565.00 > 520.00	3.729	3.730	-0.001	1.392	3088221	2.50		99.9	44370	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.729	3.731	-0.002	1.002	791351	1.00		100	9223	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.729	3.731	-0.002	1.000	1131416	1.01		101	5414	
563.00 > 169.00	3.729	3.731	-0.002	1.000	245605		4.61(0.00-0.00)	101	7981	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.892	3.896	-0.004	1.453	1503671	2.34		93.8	3348	
35 MeFOSA										
512.00 > 169.00	3.902	3.903	-0.001	1.003	625010	1.06		106	3173	
D 36 13C2 PFDoA										
615.00 > 570.00	4.018	4.024	-0.006	1.500	3588054	2.50		100.0	66885	
37 Perfluorododecanoic acid										R
613.00 > 569.00	4.026	4.025	0.001	1.002	1400135	1.00		99.6	5056	R
613.00 > 169.00	4.026	4.025	0.001	1.002	338483		4.14(2.19-4.07)	99.6	20447	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.083	4.084	-0.001	1.524	1443790	2.42		97.0	2925	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.093	4.091	0.002	1.002	606762	1.05		105	2194	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.286	4.287	-0.001	1.000	1860119	1.06		106	6361	
663.00 > 169.00	4.286	4.287	-0.001	1.000	575424		3.23(1.76-3.26)	106	18059	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.523	4.526	-0.003	1.688	4436784	2.51		101	34672	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.523	4.526	-0.003	1.000	425441	0.9775		97.7	12092	
713.00 > 219.00	4.523	4.526	-0.003	1.000	301024		1.41(1.00-1.85)	97.7	10229	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.937	4.938	-0.001	1.843	7894637	2.53		101	26822	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.937	4.939	-0.002	1.000	2891987	1.01		101	1817	R
813.00 > 169.00	4.937	4.939	-0.002	1.000	495512		5.84(2.50-4.65)	101	7568	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.286	5.286	0.0	1.000	3276971	1.04		104	989	
913.00 > 169.00	5.286	5.286	0.0	1.000	394877		8.30(0.00-0.00)	104	2341	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL4_00002 Amount Added: 1.00 Units: mL

Report Date: 17-Nov-2017 10:26:31 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_005.d

Injection Date: 16-Nov-2017 13:43:53 Instrument ID: A8_N

Lims ID: IC L4 Full

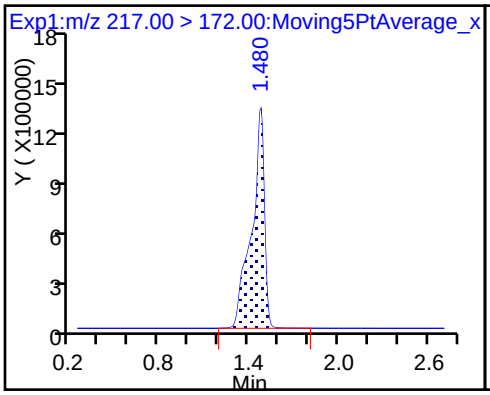
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 31 Worklist Smp#: 5

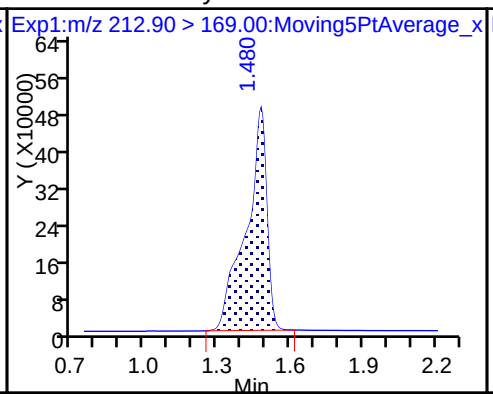
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

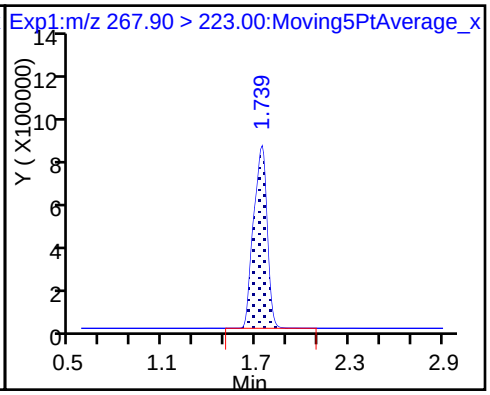
D 1 13C4 PFBA



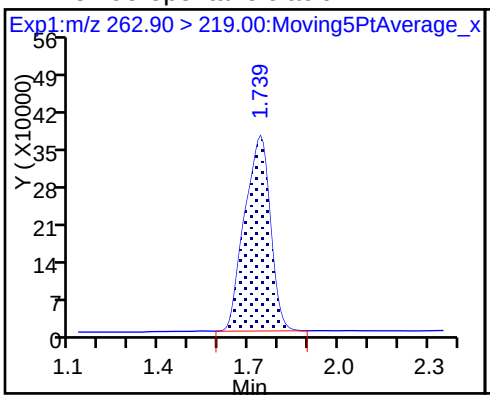
2 Perfluorobutyric acid



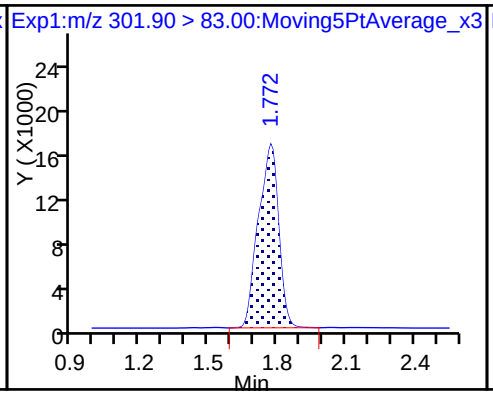
D 3 13C5-PFPeA



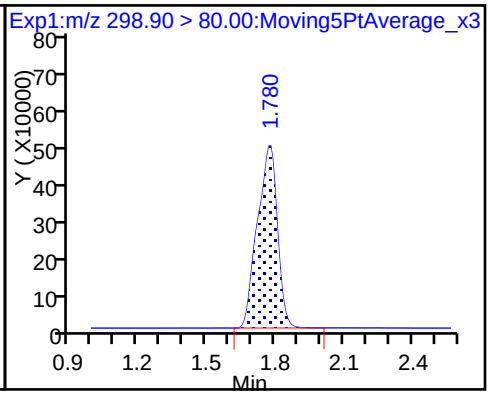
4 Perfluoropentanoic acid



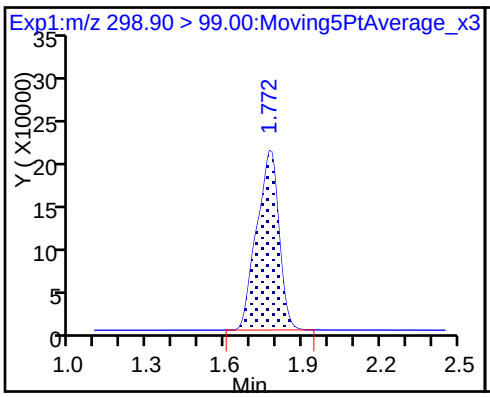
D 47 13C3-PFBS



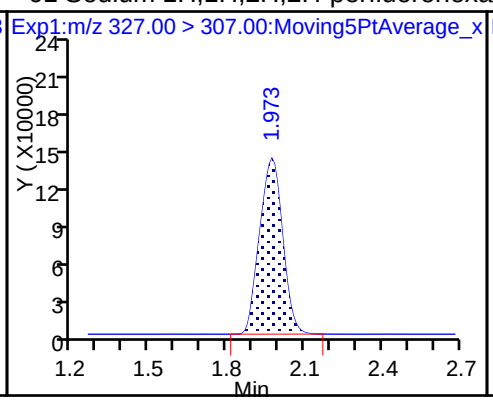
5 Perfluorobutanesulfonic acid



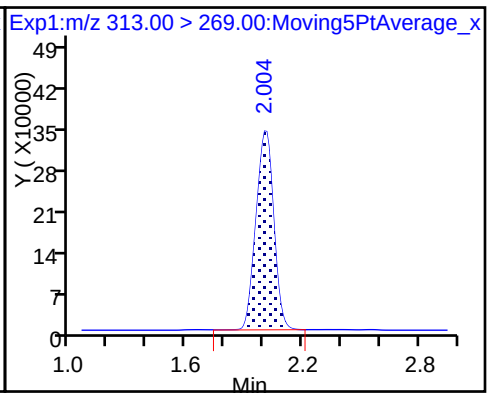
5 Perfluorobutanesulfonic acid



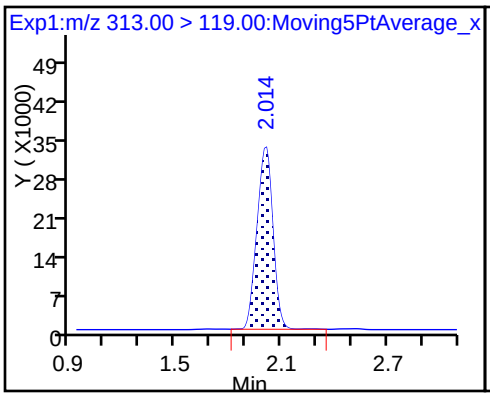
61 Sodium 1H,1H,2H,2H-perfluorohexane



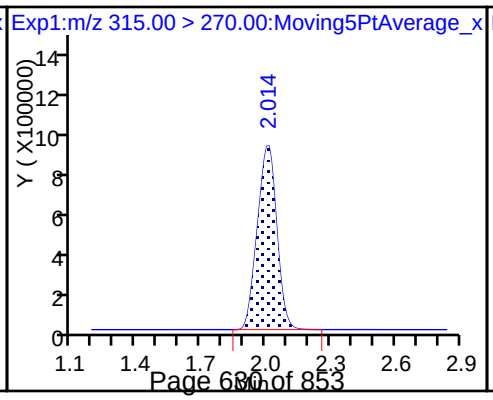
6 Perfluorohexanoic acid



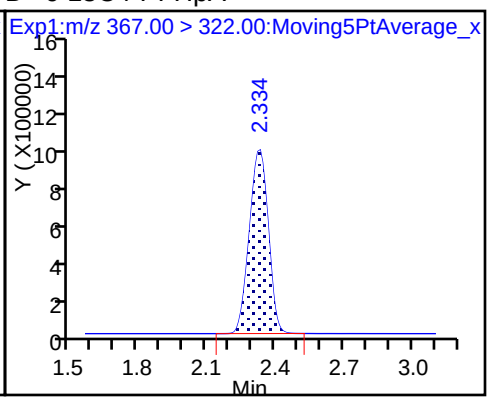
6 Perfluorohexanoic acid



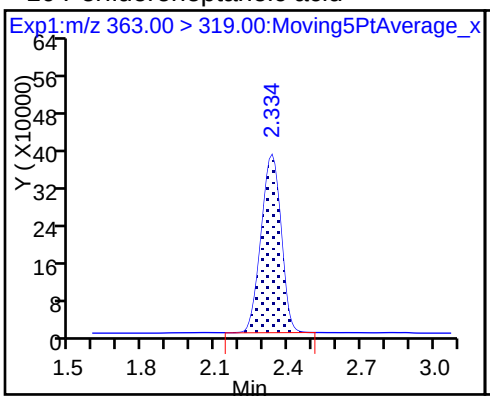
D 7 13C2 PFHxA



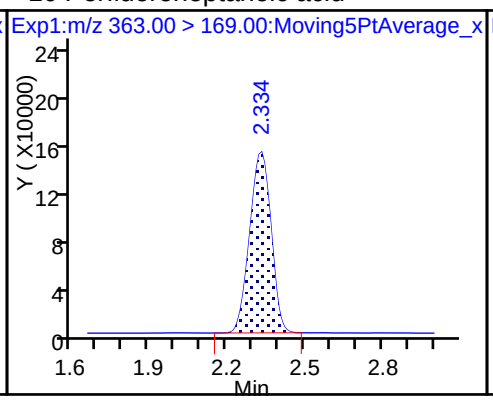
D 9 13C4-PFHpA



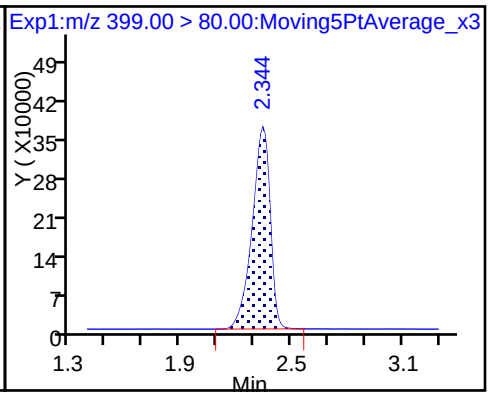
10 Perfluoroheptanoic acid



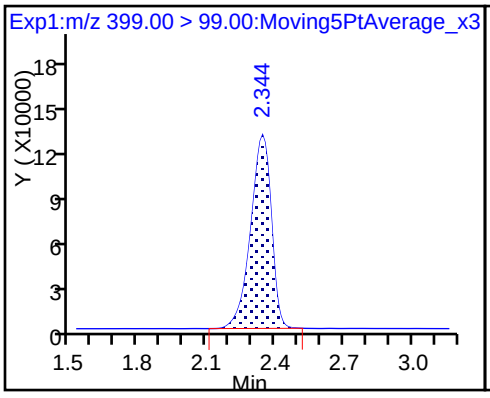
10 Perfluoroheptanoic acid



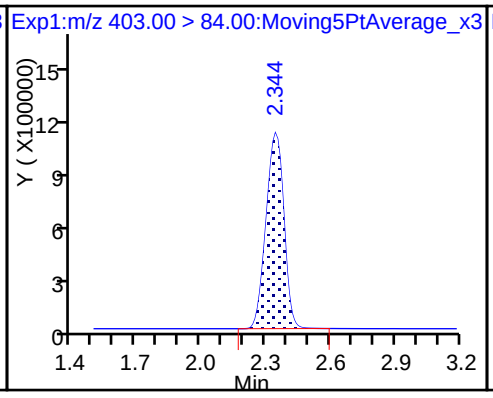
8 Perfluorohexanesulfonic acid



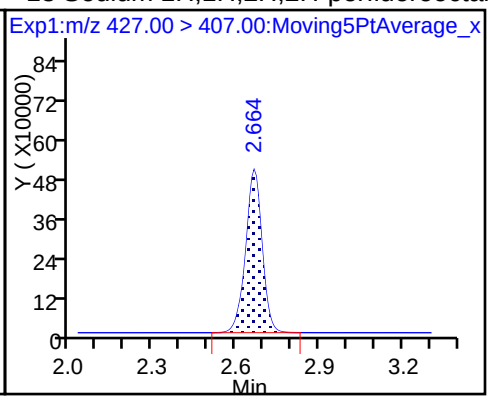
8 Perfluorohexanesulfonic acid



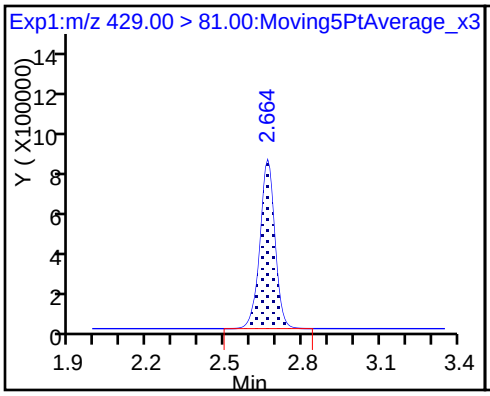
D 11 18O2 PFHxS



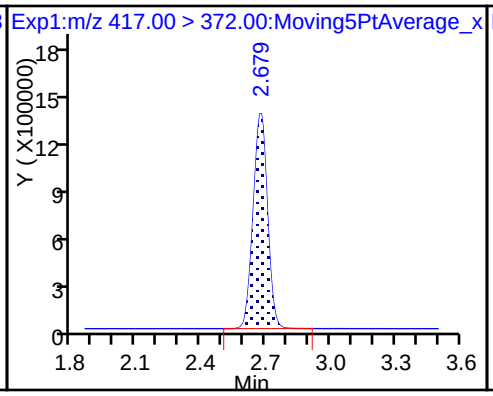
13 Sodium 1H,1H,2H,2H-perfluorooctane



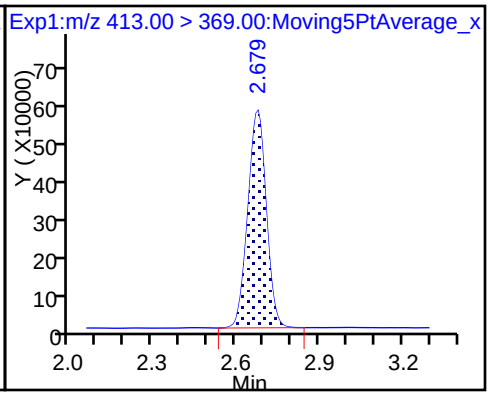
D 12 M2-6:2FTS



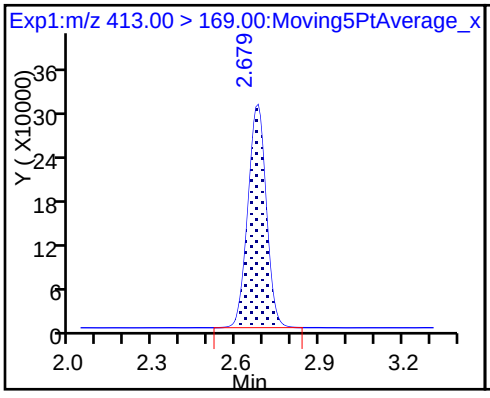
D 14 13C4 PFOA



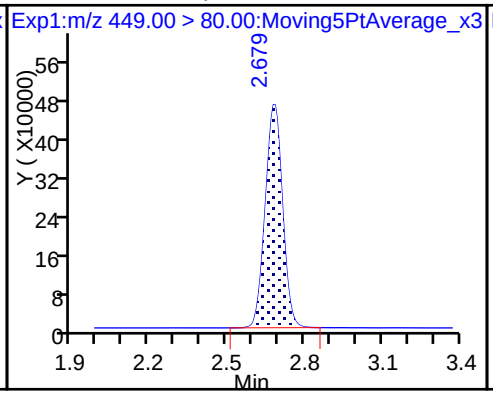
15 Perfluorooctanoic acid



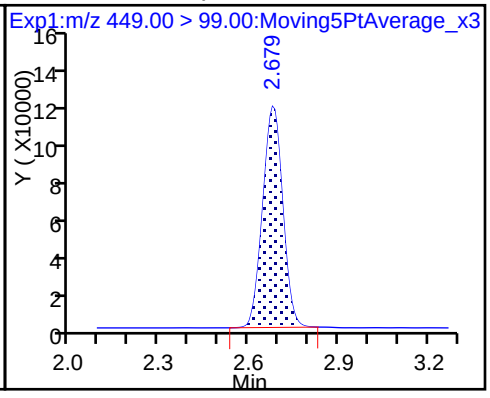
15 Perfluorooctanoic acid



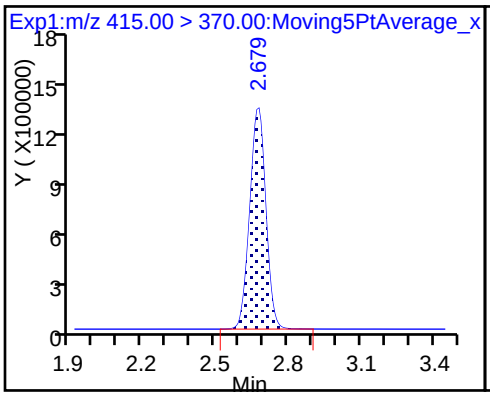
16 Perfluoroheptanesulfonic Acid



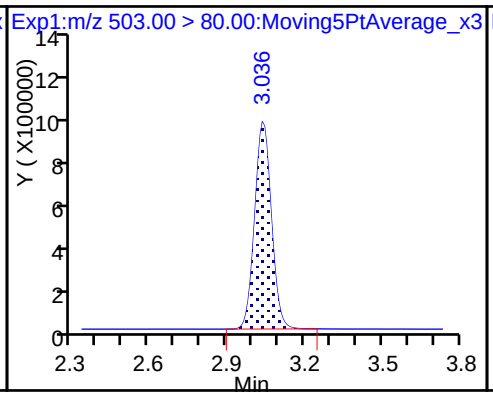
16 Perfluoroheptanesulfonic Acid



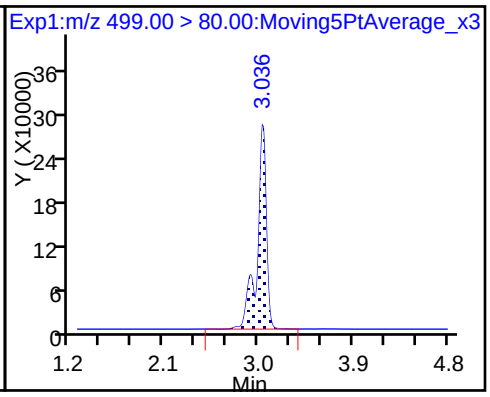
* 62 13C2-PFOA



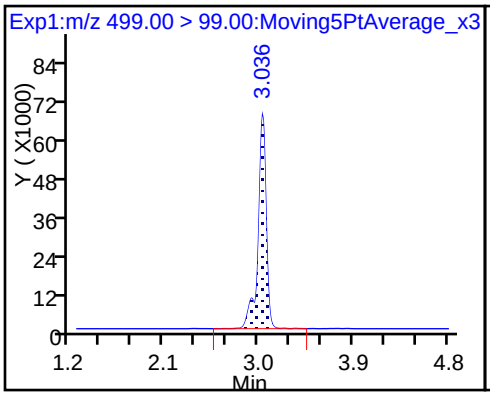
D 18 13C4 PFOS



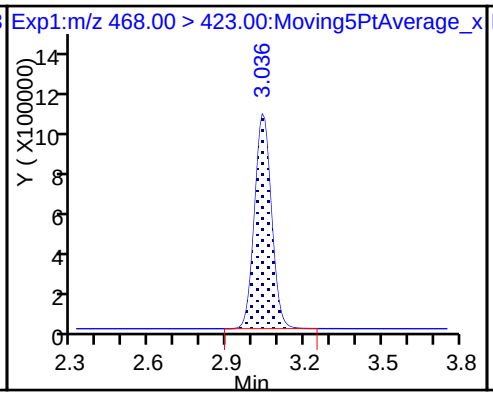
17 Perfluorooctane sulfonic acid



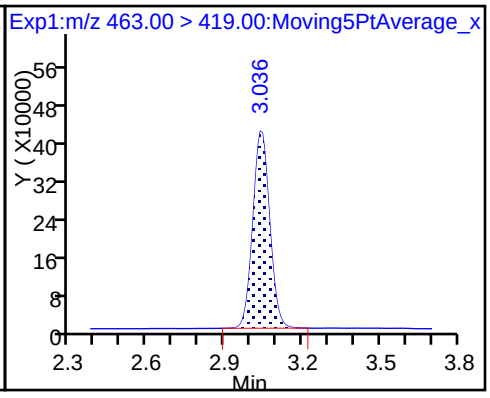
17 Perfluorooctane sulfonic acid



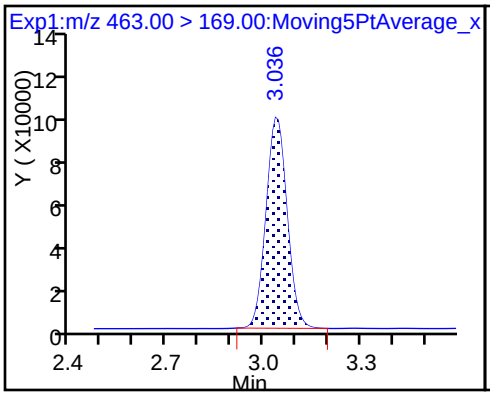
D 19 13C5 PFNA



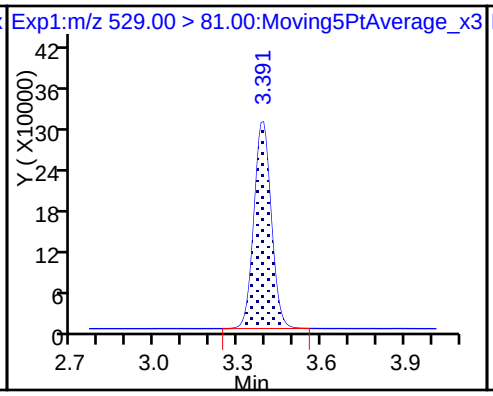
20 Perfluorononanoic acid



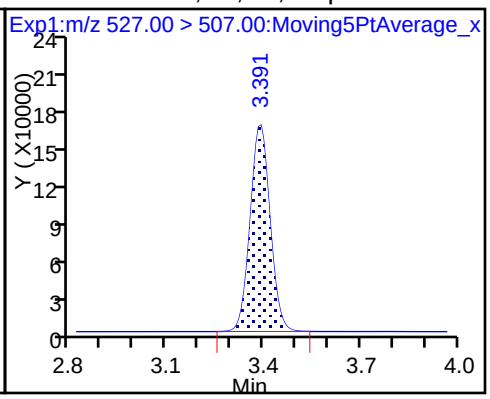
20 Perfluorononanoic acid



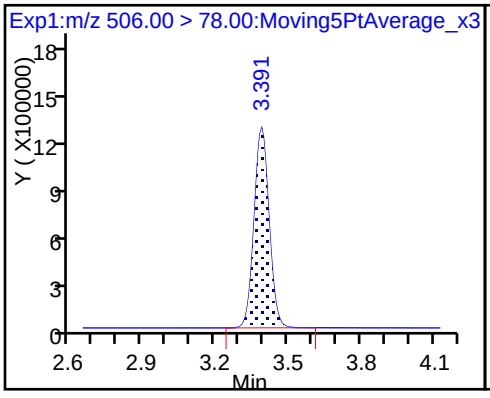
D 26 M2-8:2FTS



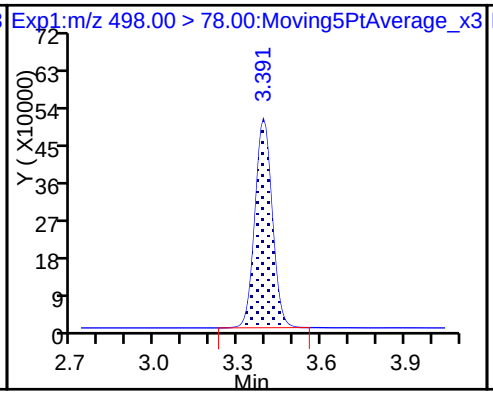
25 Sodium 1H,1H,2H,2H-perfluorodecane



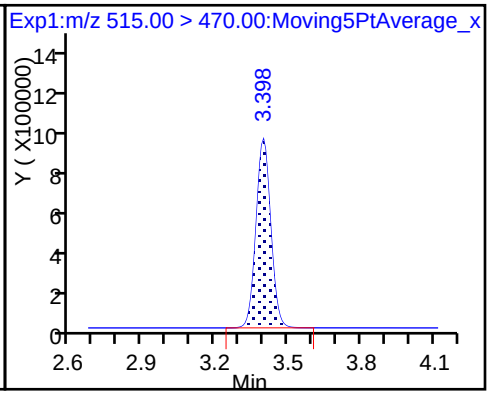
D 21 13C8 FOSA



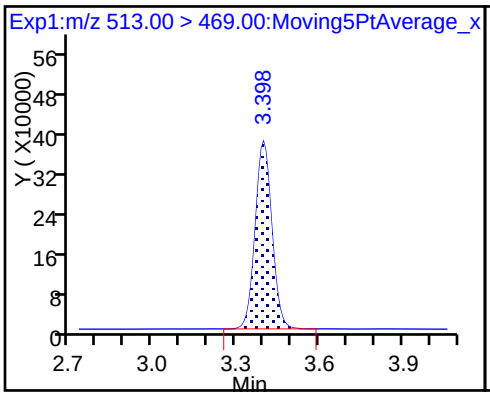
22 Perfluorooctane Sulfonamide



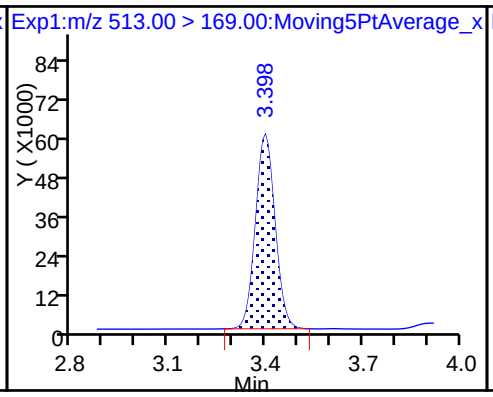
D 23 13C2 PFDA



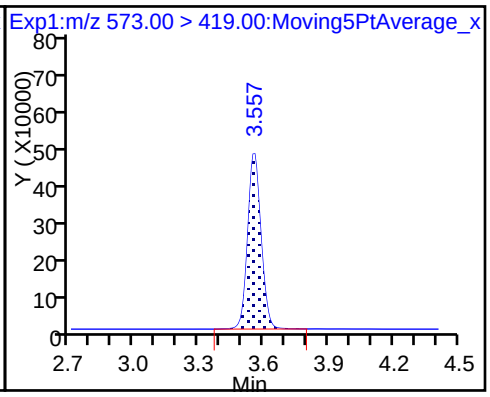
24 Perfluorodecanoic acid



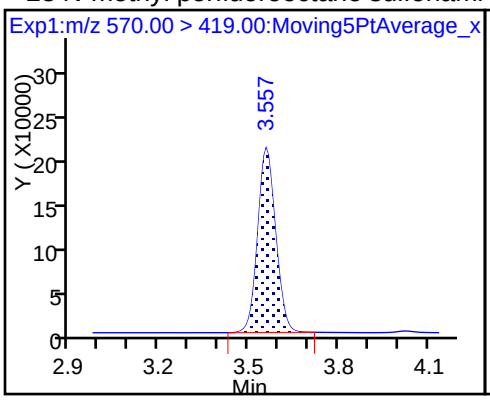
24 Perfluorodecanoic acid



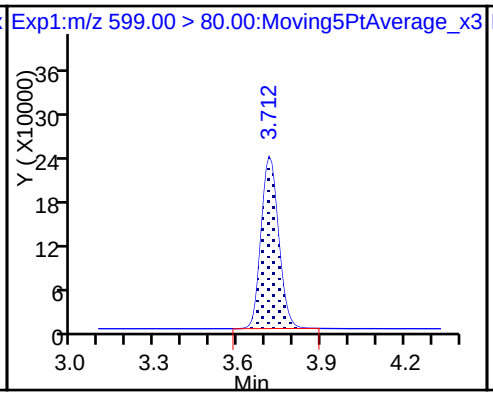
D 27 d3-NMeFOSAA



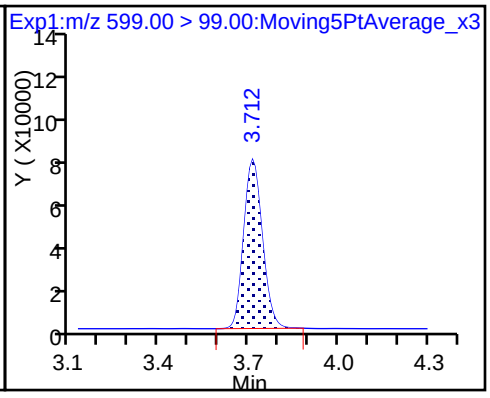
28 N-methyl perfluorooctane sulfonami



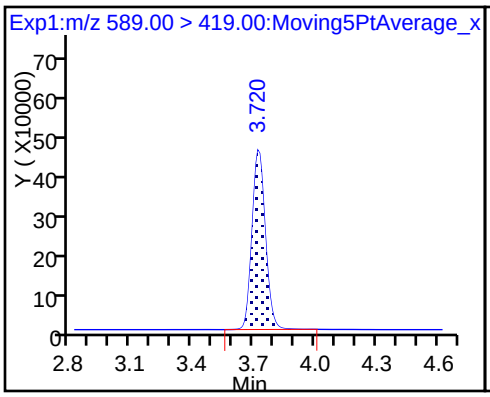
29 Perfluorodecane Sulfonic acid



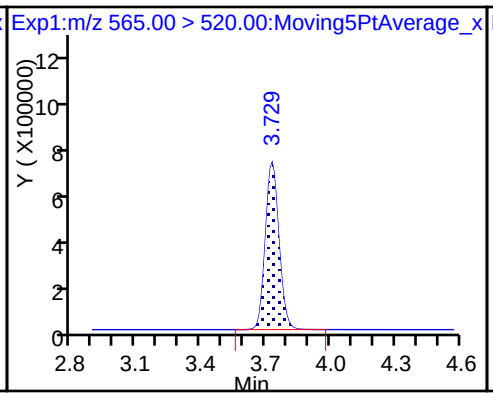
29 Perfluorodecane Sulfonic acid



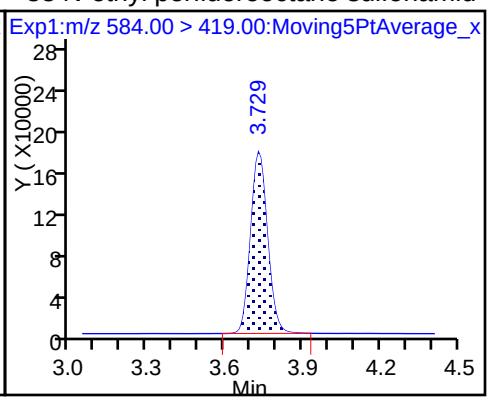
D 32 d5-NEtFOSAA



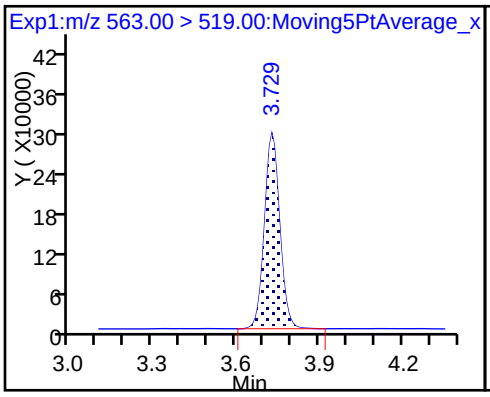
D 30 13C2 PFUnA



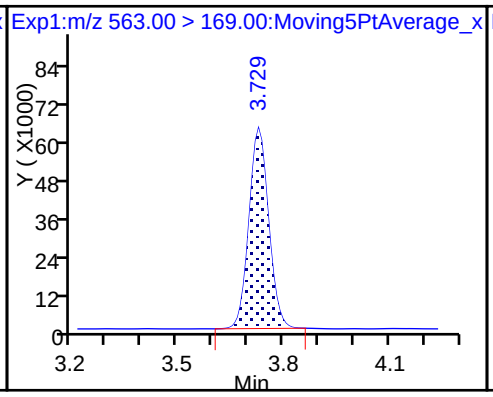
33 N-ethyl perfluorooctane sulfonamid



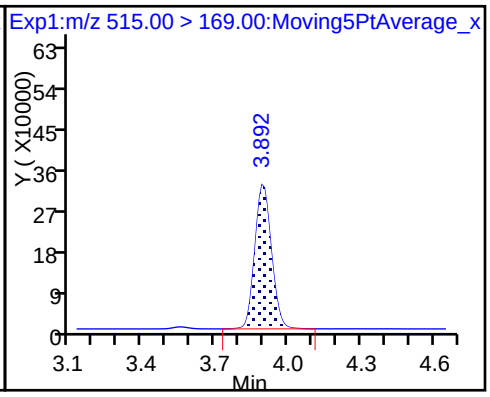
31 Perfluoroundecanoic acid



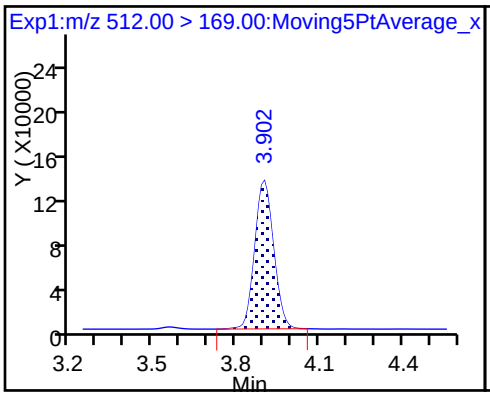
31 Perfluoroundecanoic acid



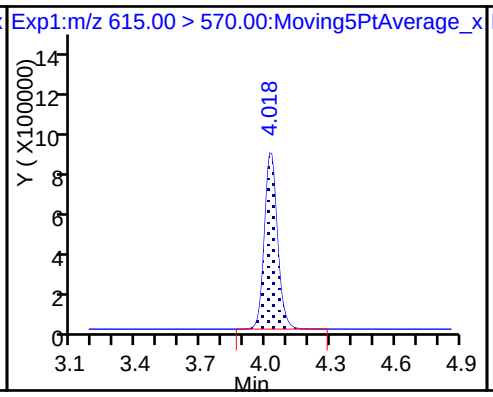
D 34 d-N-MeFOSA-M



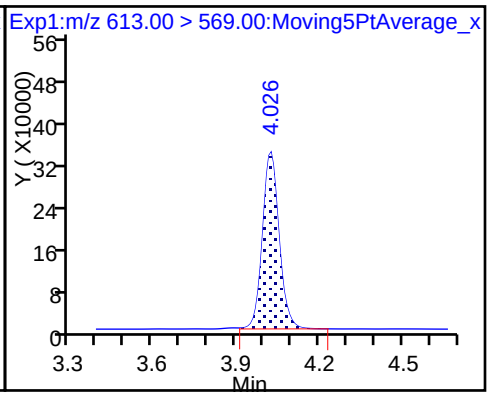
35 MeFOSA



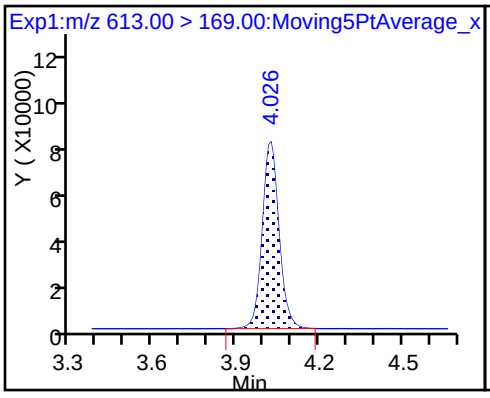
D 36 13C2 PFDoA



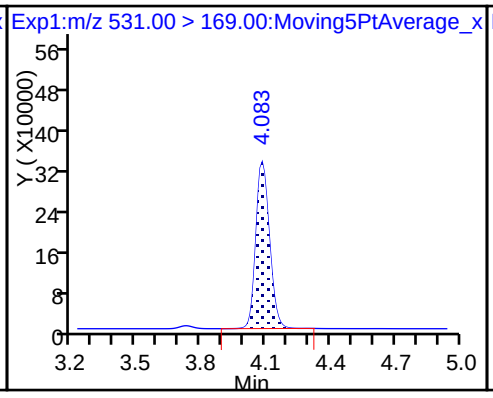
37 Perfluorododecanoic acid



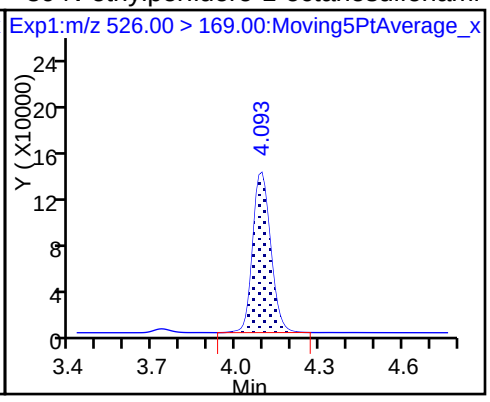
37 Perfluorododecanoic acid



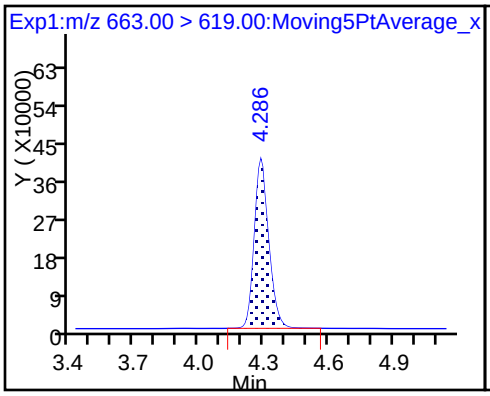
D 38 d-N-EtFOSA-M



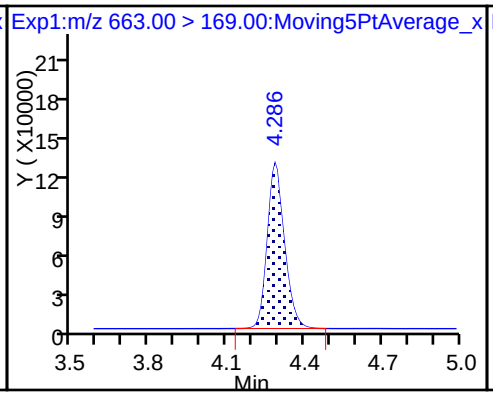
39 N-ethylperfluoro-1-octanesulfonami



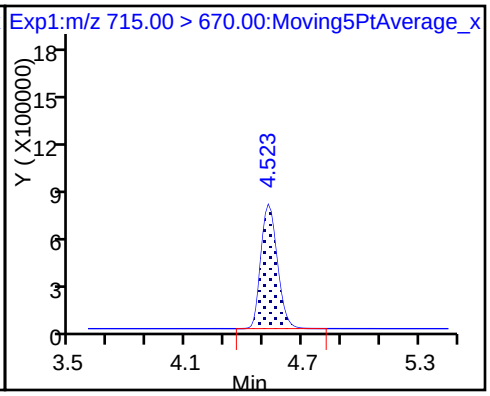
41 Perfluorotridecanoic acid



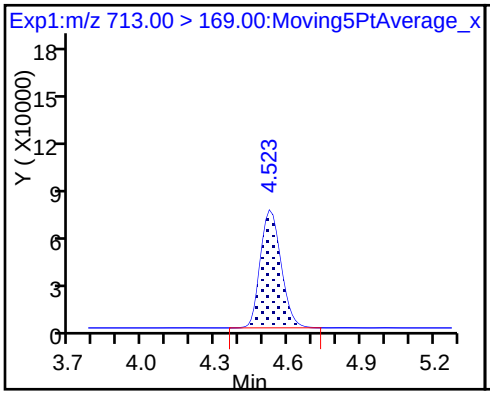
41 Perfluorotridecanoic acid



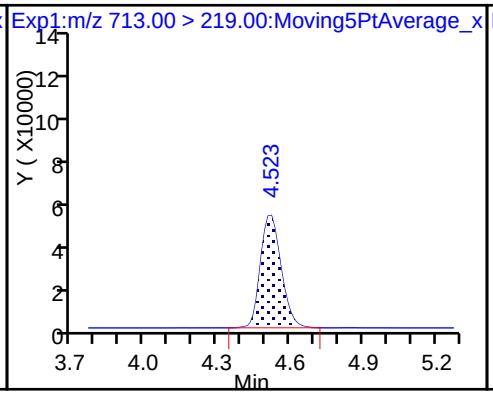
D 43 13C2-PFTeDA



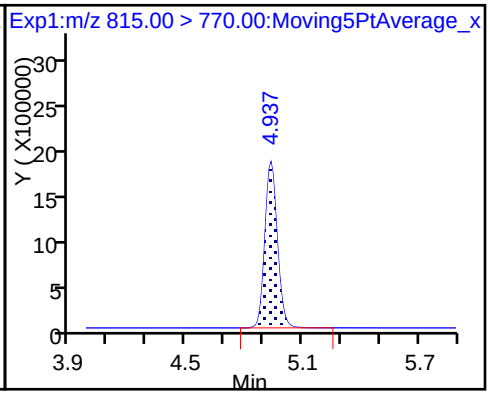
42 Perfluorotetradecanoic acid



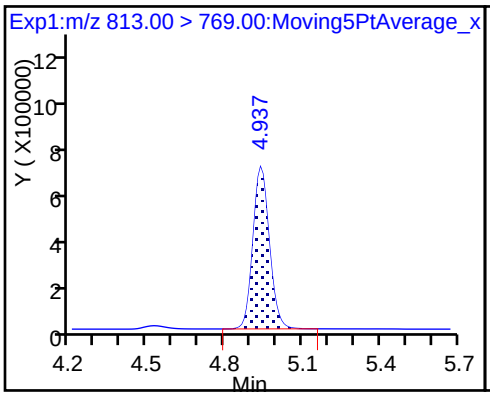
42 Perfluorotetradecanoic acid



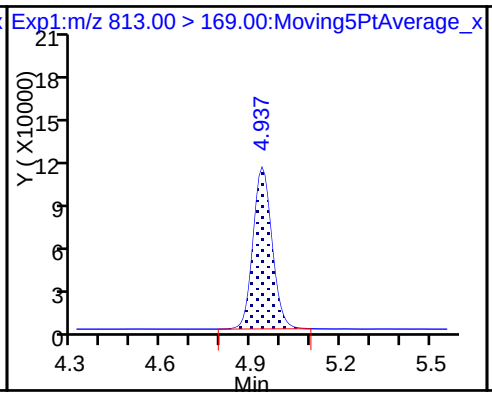
D 44 13C2-PFHxDA



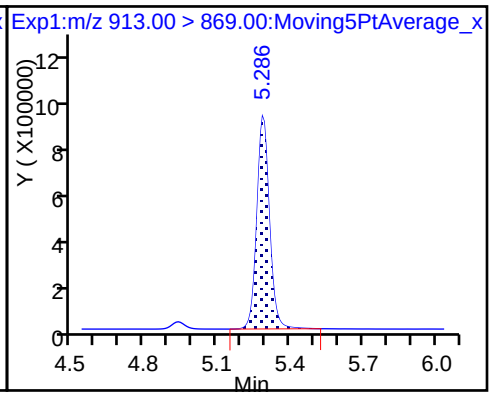
45 Perfluorohexadecanoic acid



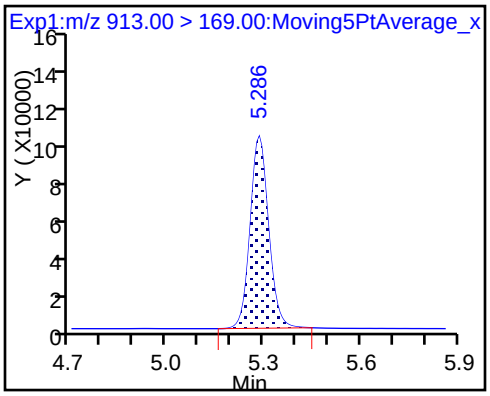
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_006.d
Lims ID: IC L5 Full
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 16-Nov-2017 13:51:48 ALS Bottle#: 32 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub19

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Nov-2017 10:26:34 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 17-Nov-2017 10:08:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.476	1.479	-0.003	0.552	7556463	2.41		96.3	58951	
2 Perfluorobutyric acid										
212.90 > 169.00	1.476	1.480	-0.004	1.000	7145757	2.58		103	2423	
D 3 13C5-PFPeA										
267.90 > 223.00	1.732	1.738	-0.006	0.648	4848661	2.44		97.6	81710	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.732	1.740	-0.008	1.000	5530477	2.53		101	4888	
D 47 13C3-PFBS										
301.90 > 83.00	1.774	1.774	0.0	0.663	97211	2.24		96.3	3231	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.774	1.776	-0.002	1.000	7392943	2.38		108	44418	
298.90 > 99.00	1.774	1.776	-0.002	1.000	3026177		2.44(1.74-3.24)	108	33775	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.976	1.977	-0.001	1.000	1923230	2.26		96.9	63048	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.006	2.010	-0.004	1.000	5296129	2.42		96.9	12815	
313.00 > 119.00	2.006	2.010	-0.004	1.000	493544		10.73(7.05-13.09)	96.9	8754	
D 7 13C2 PFHxA										
315.00 > 270.00	2.006	2.010	-0.004	0.750	5460202	2.43		97.4	55057	
D 9 13C4-PFHpA										
367.00 > 322.00	2.327	2.332	-0.005	0.870	5369819	2.48		99.2	46533	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.327	2.333	-0.006	1.000	5417527	2.46		98.4	10190	
363.00 > 169.00	2.327	2.333	-0.006	1.000	2117689		2.56(1.59-2.95)	98.4	13119	
D 11 18O2 PFHxS										
403.00 > 84.00	2.348	2.347	0.001	0.878	5777244	2.26		95.6	32087	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.348	2.347	0.001	1.000	5909781	2.21		97.1	16906	
399.00 > 99.00	2.337	2.347	-0.010	0.996	1895691		3.12(2.10-3.89)	97.1	10762	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.667	2.671	-0.003	1.000	4470839	2.45		103	90779	
D 12 M2-6:2FTS										
429.00 > 81.00	2.667	2.671	-0.004	0.997	2706131	2.49		105	50951	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.675	2.680	-0.005	1.000	6420325	2.45		98.1	2255	
413.00 > 169.00	2.675	2.680	-0.005	1.000	3318200		1.93(1.18-2.19)	98.1	11986	
D 14 13C4 PFOA										
417.00 > 372.00	2.675	2.680	-0.005	1.000	6202933	2.50		99.9	54262	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.682	2.687	-0.005	1.000	5405676	2.50		105	31734	
449.00 > 99.00	2.682	2.687	-0.005	1.000	1408650		3.84(2.72-5.05)	105	18056	
* 62 13C2-PFOA										
415.00 > 370.00	2.675	2.695	-0.020		6026784	2.50			51346	
D 19 13C5 PFNA										
468.00 > 423.00	3.039	3.042	-0.003	1.136	4414356	2.42		96.8	37789	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.039	3.042	-0.003	1.000	4200814	2.43		105	21522	
499.00 > 99.00	3.039	3.042	-0.003	1.000	878823		4.78(3.24-6.01)	105	18503	
D 18 13C4 PFOS										
503.00 > 80.00	3.039	3.042	-0.003	1.136	3943985	2.31		96.7	23749	
20 Perfluorononanoic acid										
463.00 > 419.00	3.039	3.045	-0.006	1.000	4533217	2.57		103	8073	
463.00 > 169.00	3.039	3.045	-0.006	1.000	1045801		4.33(2.65-4.93)	103	17808	
D 26 M2-8:2FTS										
529.00 > 81.00	3.387	3.390	-0.003	1.266	1424072	2.47		103	26726	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.387	3.392	-0.005	1.000	1700566	2.36		98.3	29184	
D 21 13C8 FOSA										
506.00 > 78.00	3.387	3.393	-0.006	1.266	5400065	2.46		98.2	35033	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.395	3.395	0.0	1.002	5410709	2.61		104	36515	
D 23 13C2 PFDA										
515.00 > 470.00	3.395	3.400	-0.005	1.269	3696857	2.40		96.1	42348	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.402	3.400	0.002	1.002	3700623	2.58		103	13423	
513.00 > 169.00	3.395	3.400	-0.005	1.000	659451		5.61(3.31-6.15)	103	2253	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.554	3.557	-0.003	1.329	2021651	2.45		97.8	14723	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.561	3.561	0.0	1.002	2103253	2.48		99.2	9711	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.716	3.714	0.002	1.000	2567135	2.57		107	39275	
599.00 > 99.00	3.716	3.714	0.002	1.000	840548		3.05(1.94-3.60)	107	17449	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.725	3.725	0.0	1.393	1927943	2.43		97.1	9698	
D 30 13C2 PFUnA										
565.00 > 520.00	3.725	3.730	-0.005	1.393	3030852	2.47		98.6	40749	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.734	3.731	0.003	1.002	1887930	2.55		102	13660	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.725	3.731	-0.006	1.000	2647005	2.41		96.5	14390	
563.00 > 169.00	3.734	3.731	0.003	1.002	597011		4.43(0.00-0.00)	96.5	25325	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.897	3.896	0.001	1.457	1527986	2.39		95.8	3175	
35 MeFOSA										
512.00 > 169.00	3.897	3.903	-0.006	1.000	1537275	2.56		103	2944	
D 36 13C2 PFDoA										
615.00 > 570.00	4.022	4.024	-0.002	1.504	3470465	2.43		97.2	36822	
37 Perfluorododecanoic acid										R
613.00 > 569.00	4.022	4.025	-0.003	1.000	3457618	2.54		102	21444	R
613.00 > 169.00	4.022	4.025	-0.003	1.000	819022		4.22(2.19-4.07)	102	24790	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.077	4.084	-0.007	1.524	1445580	2.44		97.6	2305	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.087	4.091	-0.004	1.002	1517464	2.62		105	2524	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.289	4.287	0.002	1.000	4341357	2.55		102	14651	
663.00 > 169.00	4.289	4.287	0.002	1.000	1331827		3.26(1.76-3.26)	102	32297	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.529	4.526	0.003	1.000	1002364	2.40		95.9	18867	
713.00 > 219.00	4.515	4.526	-0.011	0.997	743247		1.35(1.00-1.85)	95.9	18106	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.529	4.526	0.003	1.693	4261836	2.43		97.1	28842	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.932	4.938	-0.006	1.844	7551220	2.43		97.3	34149	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.941	4.939	0.002	1.002	6870216	2.54		102	4116	R
813.00 > 169.00	4.932	4.939	-0.007	1.000	1189345		5.78(2.50-4.65)	102	10749	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.283	5.286	-0.003	1.000	8079511	2.69		108	2183	
913.00 > 169.00	5.283	5.286	-0.003	1.000	947596		8.53(0.00-0.00)	108	3338	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL5_00002 Amount Added: 1.00 Units: mL

Report Date: 17-Nov-2017 10:26:35 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_006.d

Injection Date: 16-Nov-2017 13:51:48 Instrument ID: A8_N

Lims ID: IC L5 Full

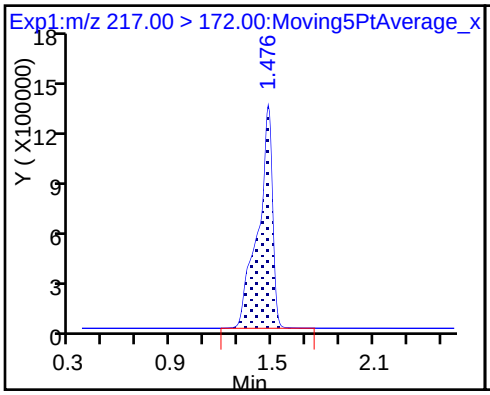
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 32 Worklist Smp#: 6

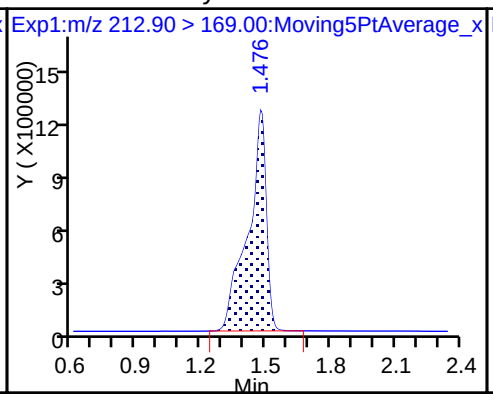
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

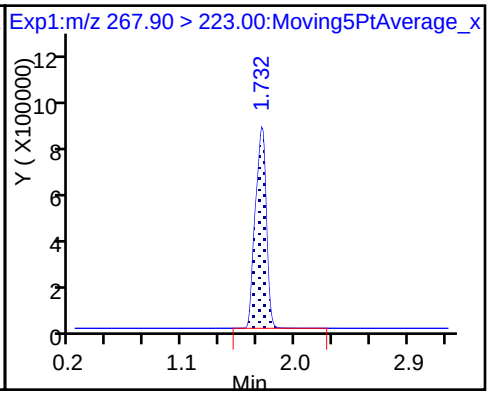
D 1 13C4 PFBA



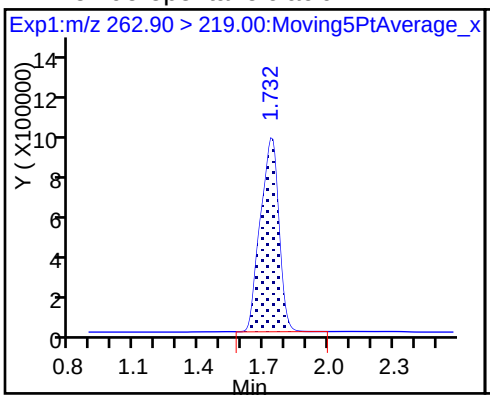
2 Perfluorobutyric acid



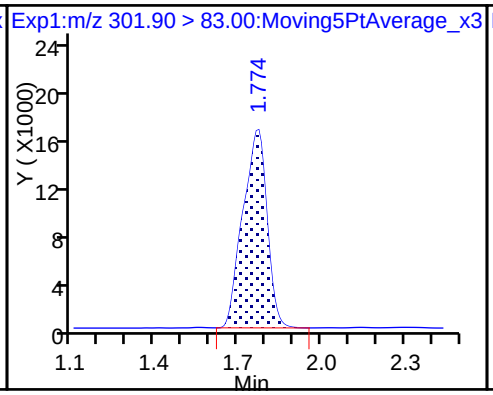
D 3 13C5-PFPeA



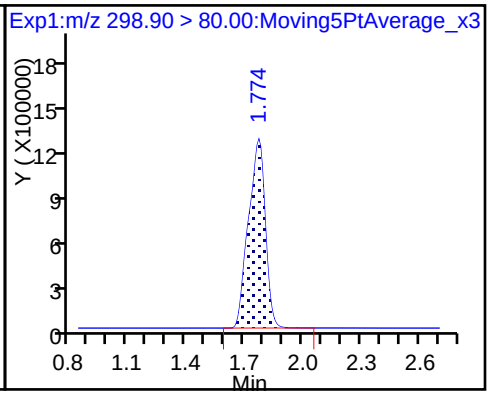
4 Perfluoropentanoic acid



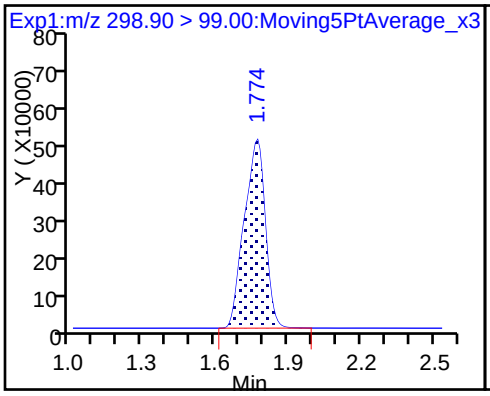
D 47 13C3-PFBS



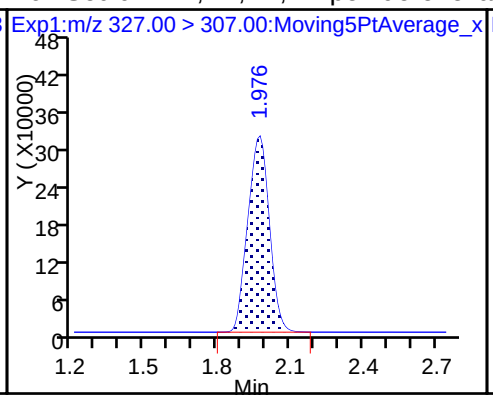
5 Perfluorobutanesulfonic acid



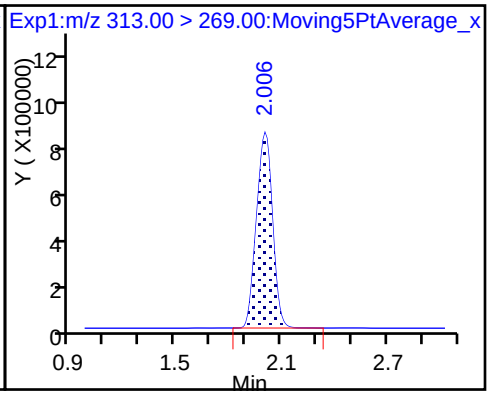
5 Perfluorobutanesulfonic acid



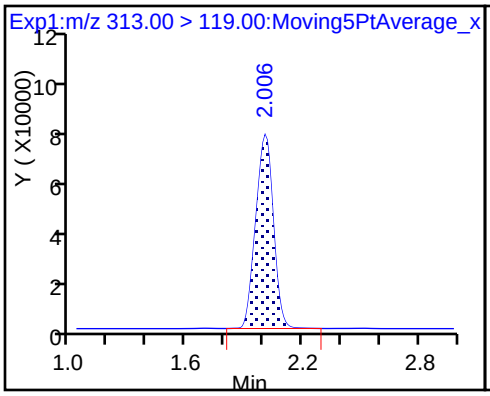
61 Sodium 1H,1H,2H,2H-perfluorohexane



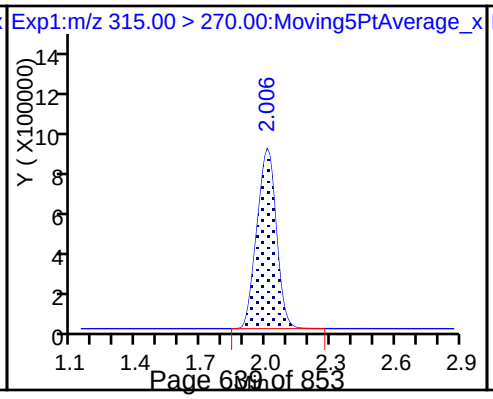
6 Perfluorohexanoic acid



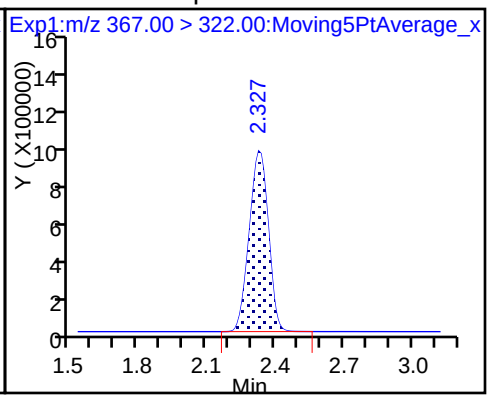
6 Perfluorohexanoic acid



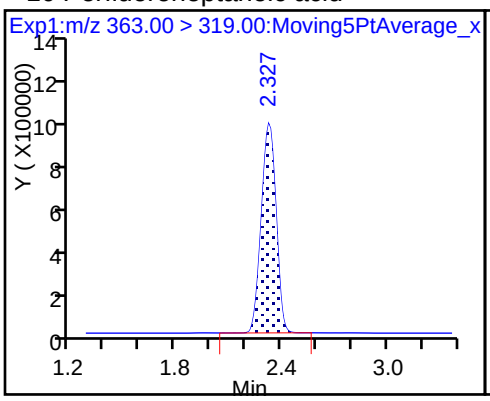
D 7 13C2 PFHxA



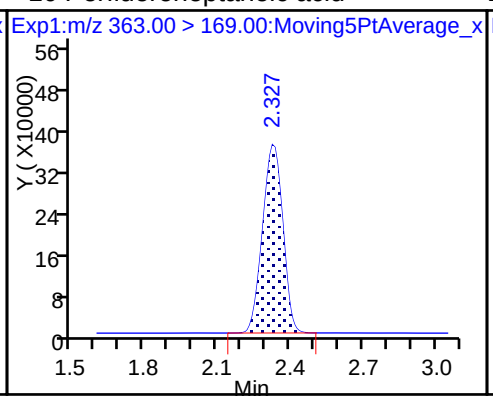
D 9 13C4-PFHpA



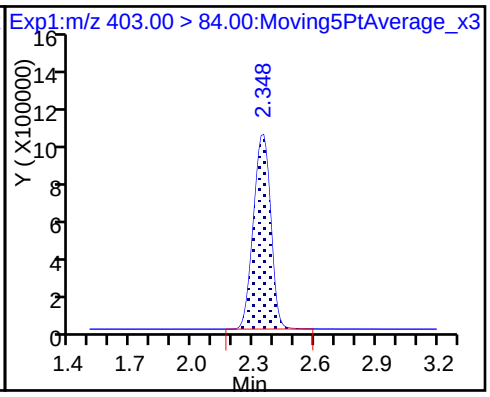
10 Perfluoroheptanoic acid



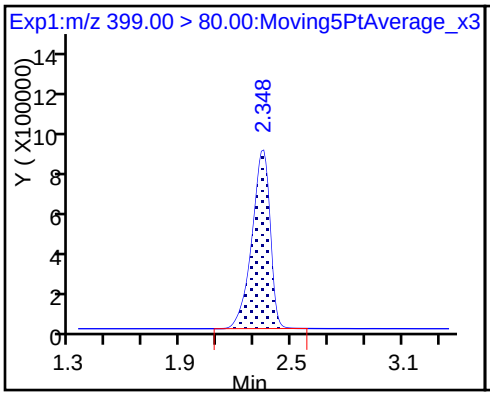
10 Perfluoroheptanoic acid



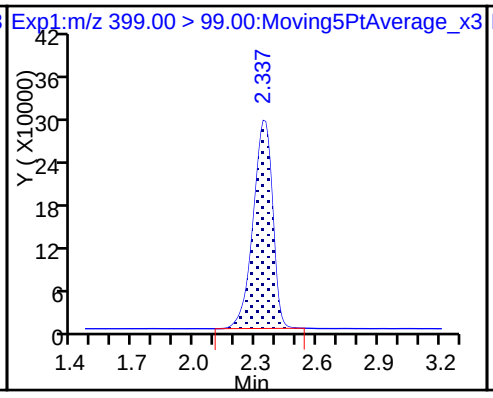
D 11 18O2 PFHxS



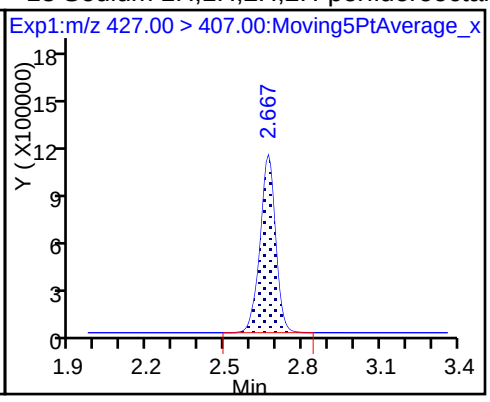
8 Perfluorohexanesulfonic acid



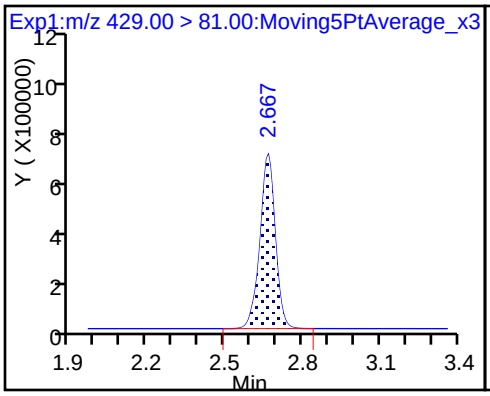
8 Perfluorohexanesulfonic acid



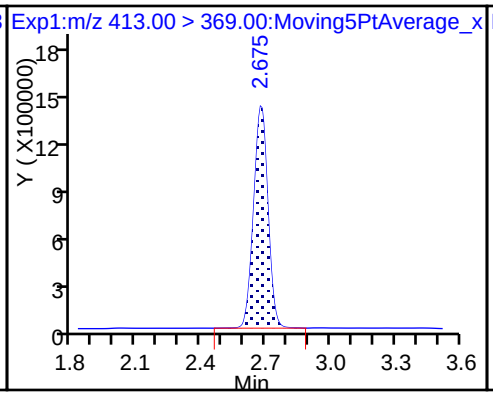
13 Sodium 1H,1H,2H,2H-perfluorooctane



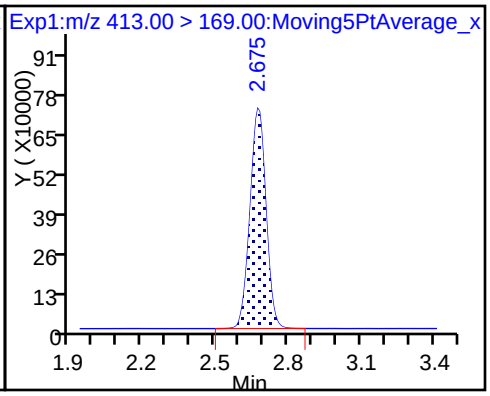
D 12 M2-6:2FTS



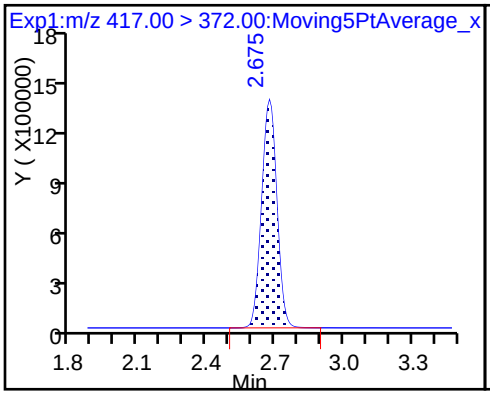
15 Perfluorooctanoic acid



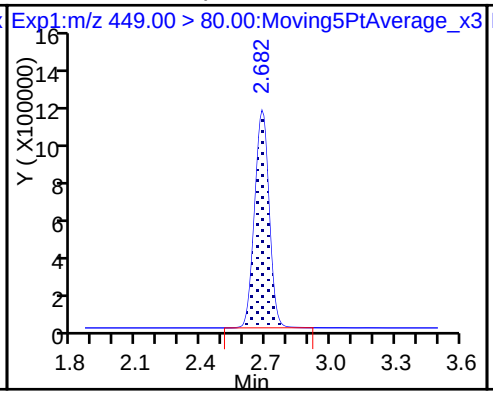
15 Perfluorooctanoic acid



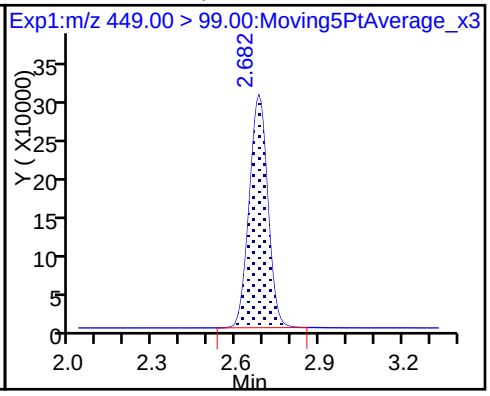
D 14 13C4 PFOA



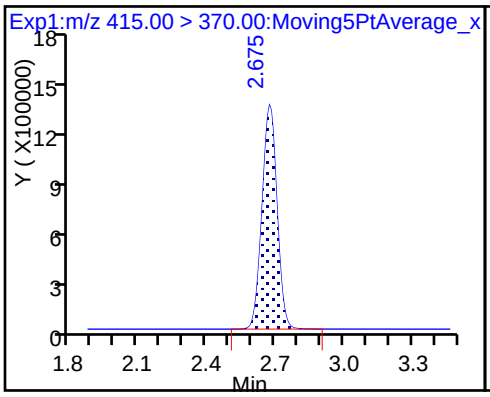
16 Perfluoroheptanesulfonic Acid



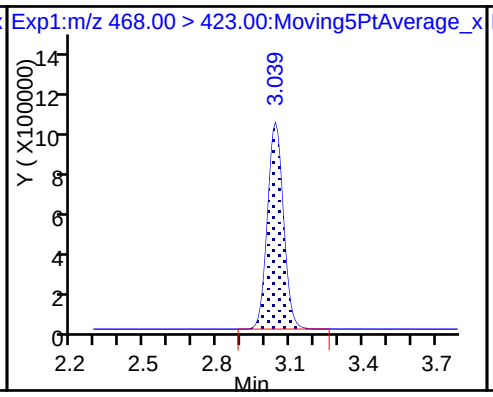
16 Perfluoroheptanesulfonic Acid



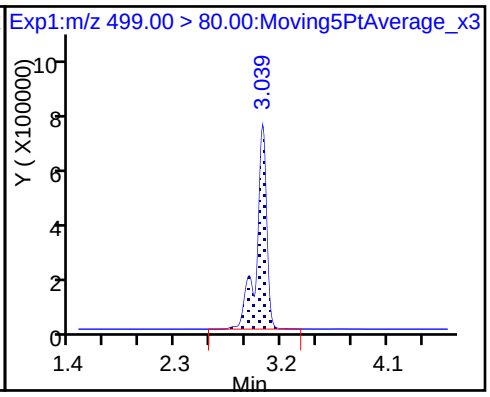
* 62 13C2-PFOA



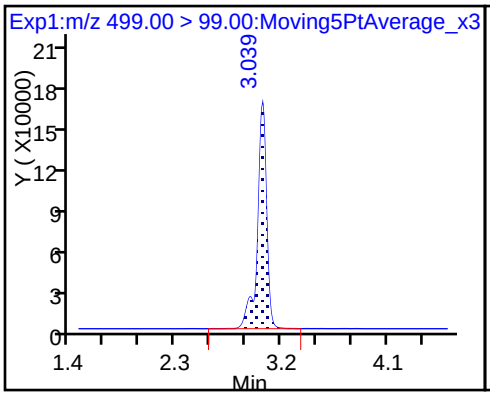
D 19 13C5 PFNA



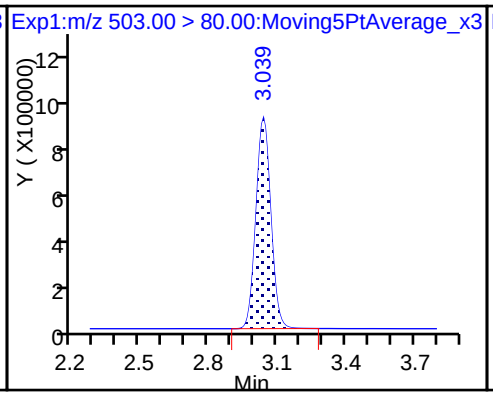
17 Perfluorooctane sulfonic acid



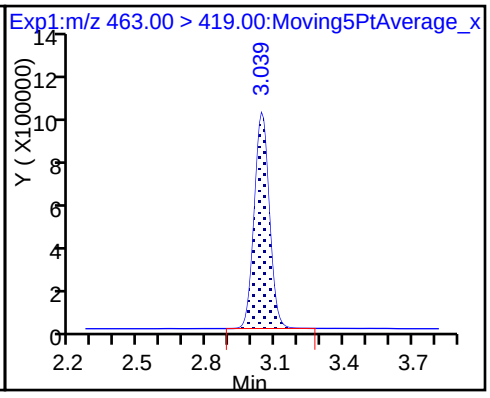
17 Perfluorooctane sulfonic acid



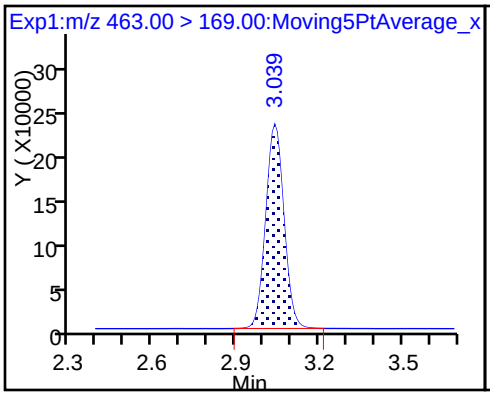
D 18 13C4 PFOS



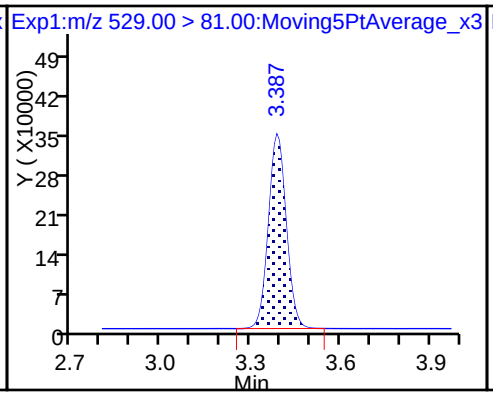
20 Perfluorononanoic acid



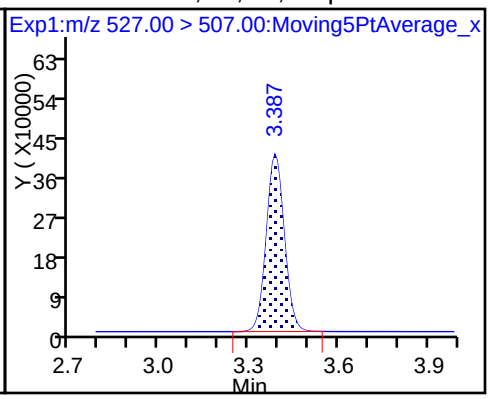
20 Perfluorononanoic acid



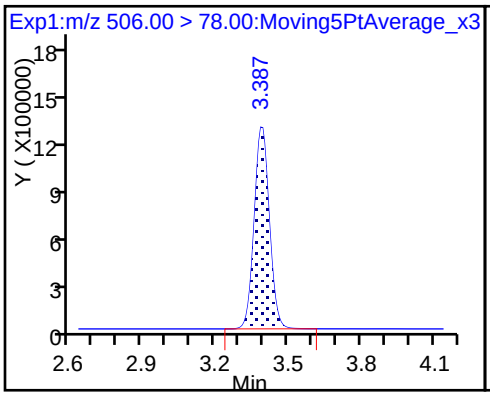
D 26 M2-8:2FTS



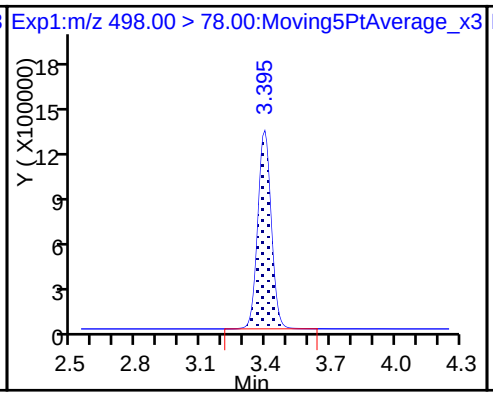
25 Sodium 1H,1H,2H,2H-perfluorodecane



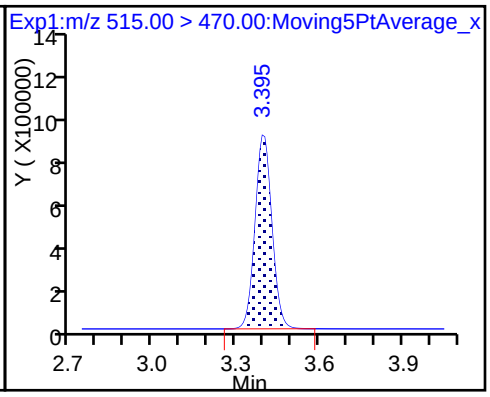
D 21 13C8 FOSA



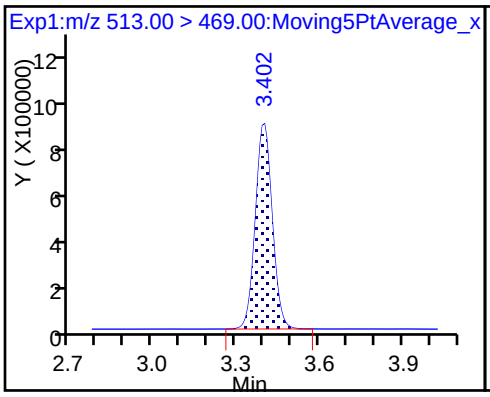
22 Perfluorooctane Sulfonamide



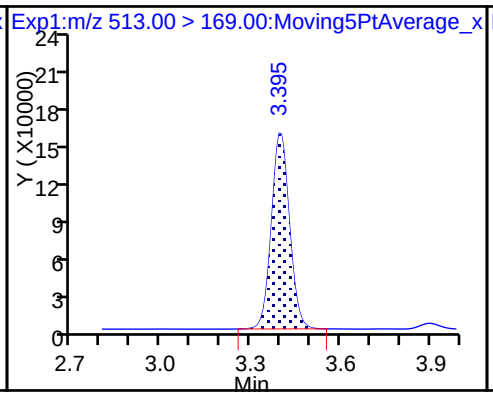
D 23 13C2 PFDA



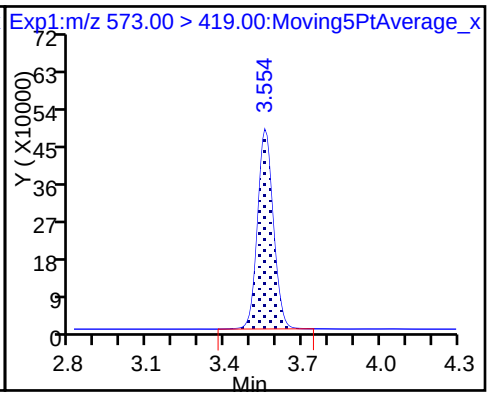
24 Perfluorodecanoic acid



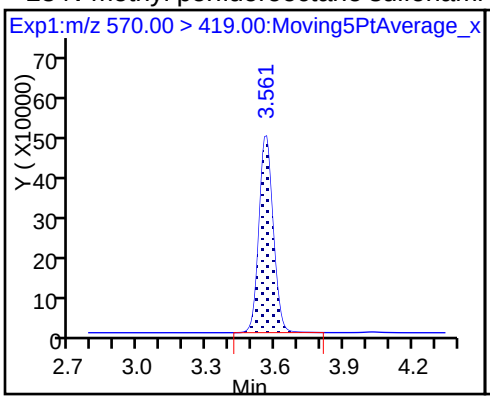
24 Perfluorodecanoic acid



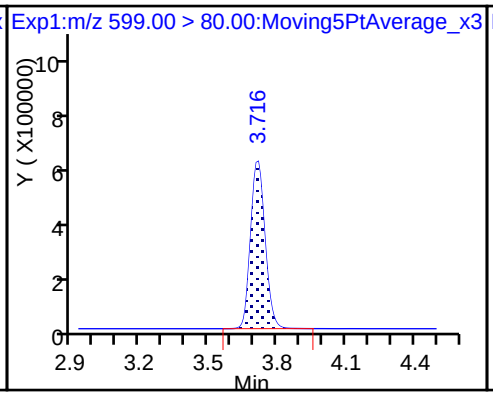
D 27 d3-NMeFOSAA



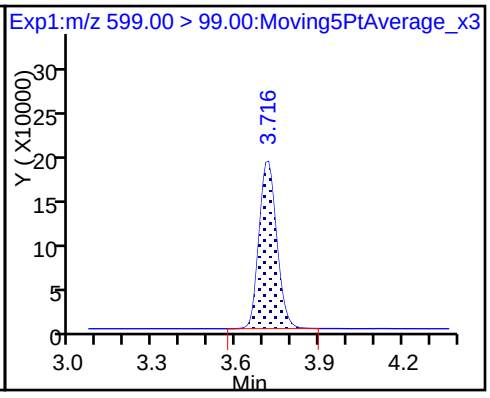
28 N-methyl perfluorooctane sulfonami



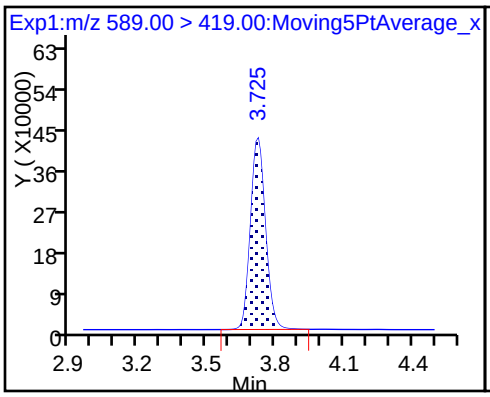
29 Perfluorodecane Sulfonic acid



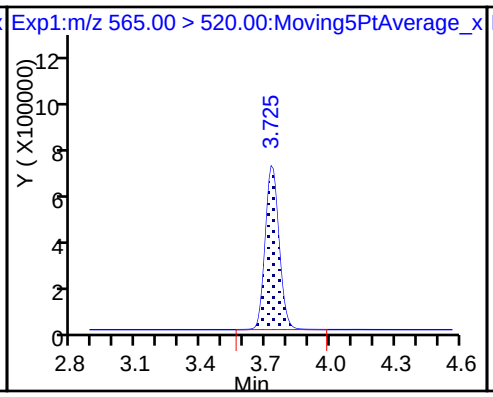
29 Perfluorodecane Sulfonic acid



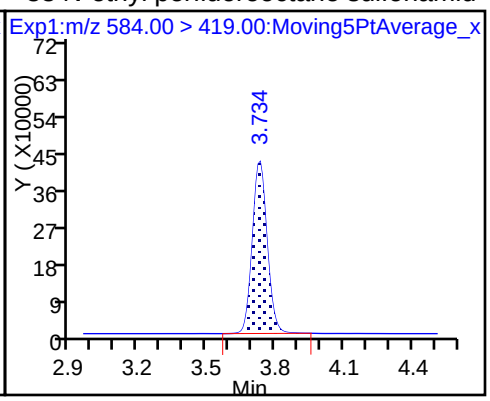
D 32 d5-NEtFOSAA



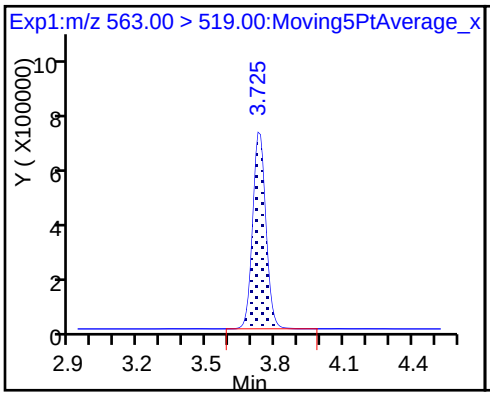
D 30 13C2 PFUnA



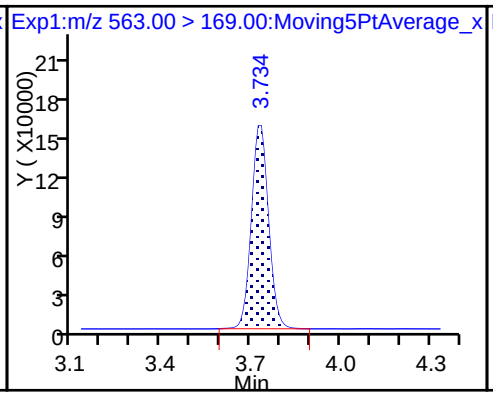
33 N-ethyl perfluorooctane sulfonamid



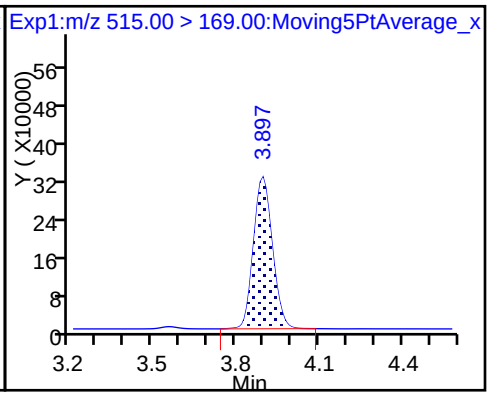
31 Perfluoroundecanoic acid



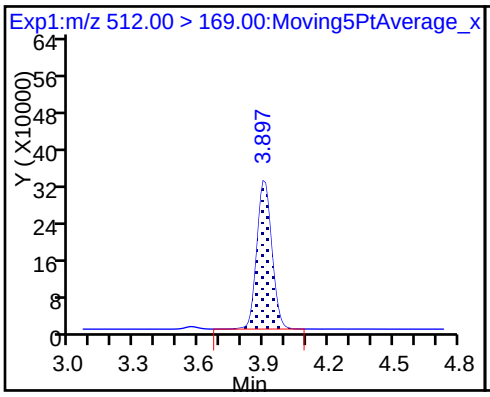
31 Perfluoroundecanoic acid



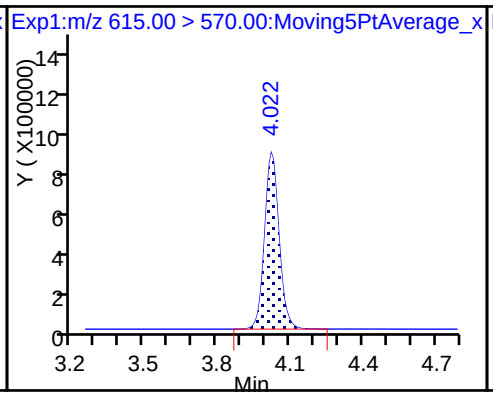
D 34 d-N-MeFOSA-M



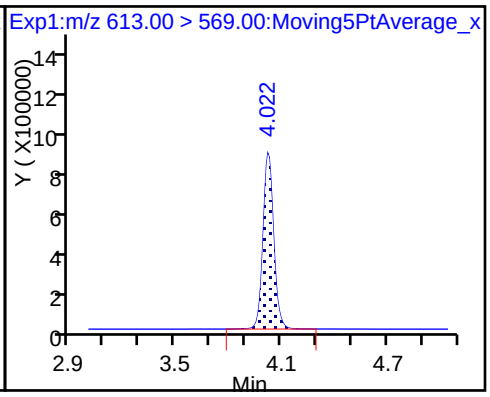
35 MeFOSA



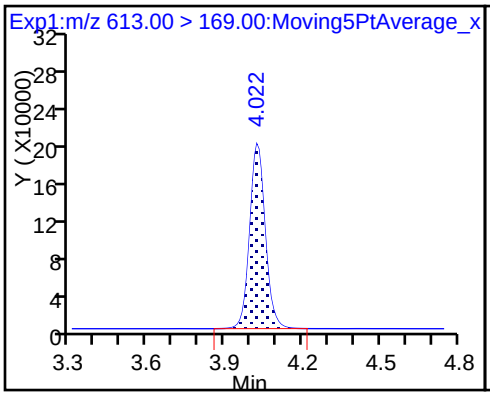
D 36 13C2 PFDoA



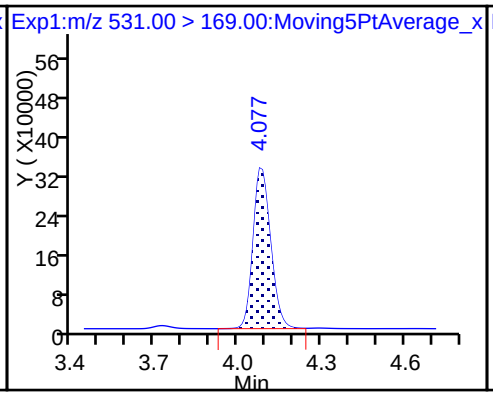
37 Perfluorododecanoic acid



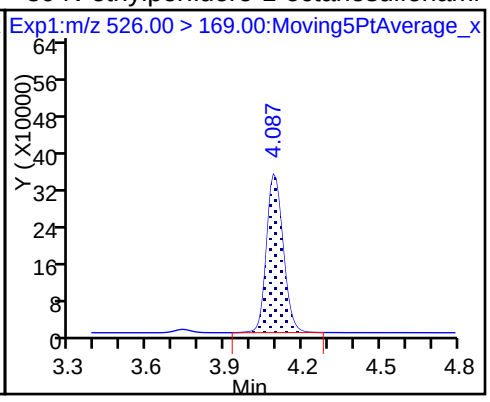
37 Perfluorododecanoic acid



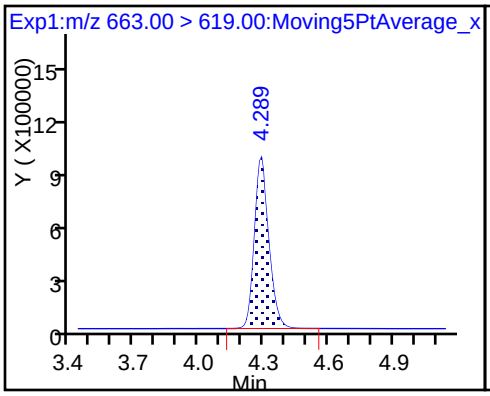
D 38 d-N-EtFOSA-M



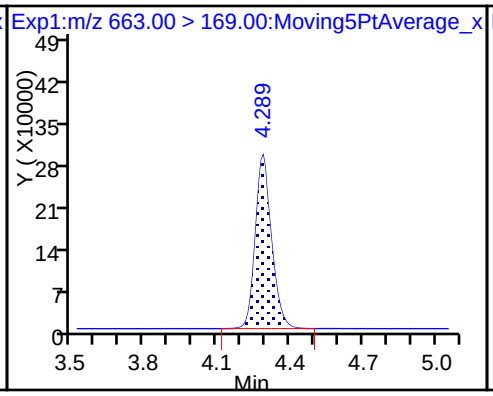
39 N-ethylperfluoro-1-octanesulfonami



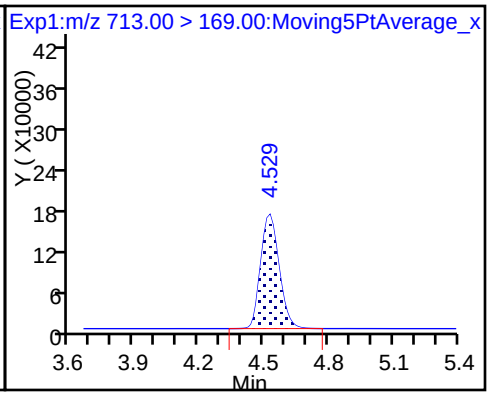
41 Perfluorotridecanoic acid



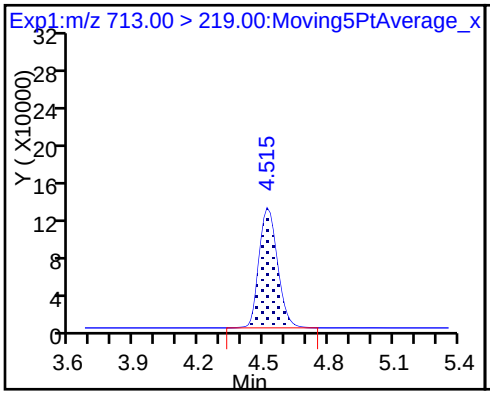
41 Perfluorotridecanoic acid



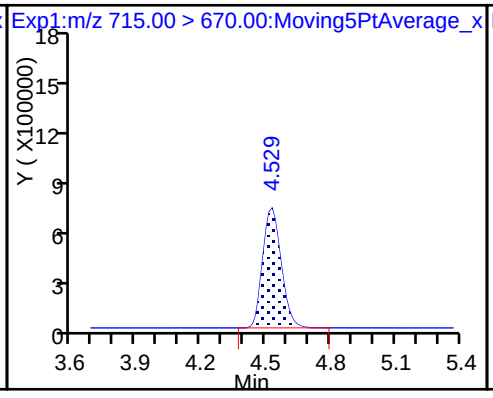
42 Perfluorotetradecanoic acid



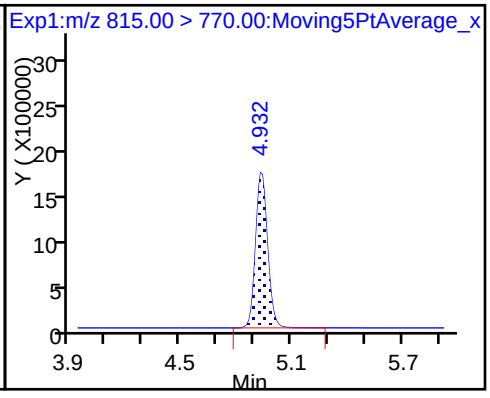
42 Perfluorotetradecanoic acid



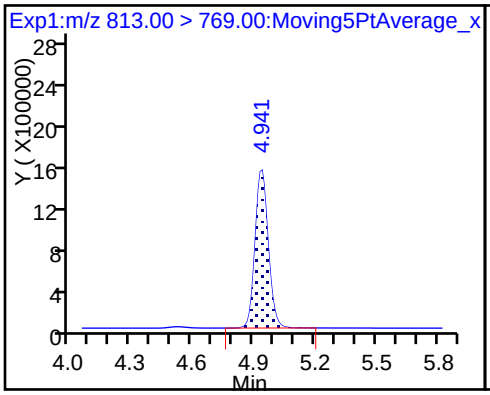
D 43 13C2-PFTeDA



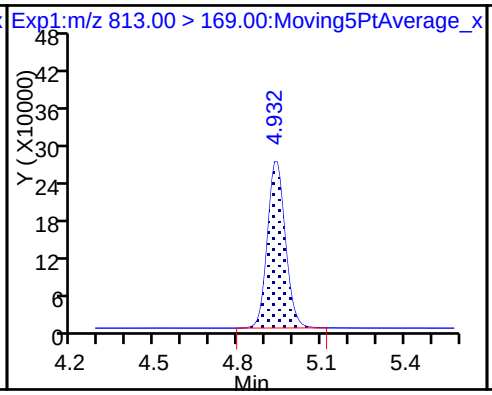
D 44 13C2-PFHxDA



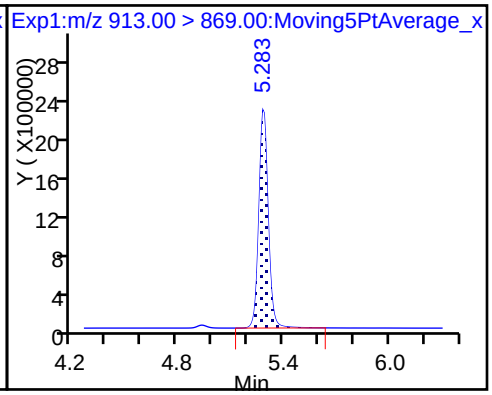
45 Perfluorohexadecanoic acid



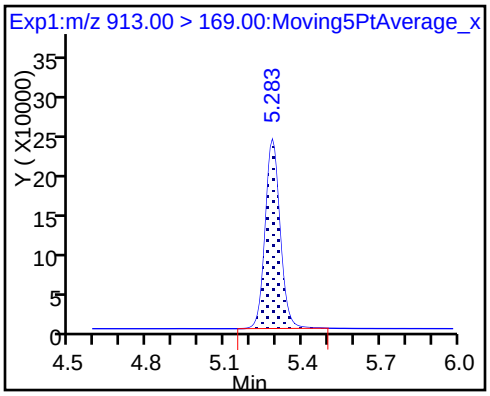
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_007.d
Lims ID: IC L6 Full
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 16-Nov-2017 13:59:41 ALS Bottle#: 33 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub19

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Nov-2017 10:26:38 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 17-Nov-2017 10:09:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.475	1.479	-0.004	0.551	7718918	2.56		102	63464	
2 Perfluorobutyric acid										
212.90 > 169.00	1.480	1.480	0.0	1.004	14487072	5.12		102	4449	
D 3 13C5-PFPeA										
267.90 > 223.00	1.739	1.738	0.001	0.649	4798053	2.51		100	48305	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.739	1.740	-0.001	1.000	10991094	5.08		102	10540	
D 47 13C3-PFBS										
301.90 > 83.00	1.772	1.774	-0.002	0.661	96874	2.32		99.7	3251	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.772	1.776	-0.004	1.000	14583493	4.71		107	72701	
298.90 > 99.00	1.772	1.776	-0.004	1.000	6163509		2.37(1.74-3.24)	107	70148	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.973	1.977	-0.004	1.000	3887946	4.88		105	107701	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.004	2.010	-0.006	1.000	11023882	5.07		101	45185	
313.00 > 119.00	2.004	2.010	-0.006	1.000	983928		11.20(7.05-13.09)	101	12329	
D 7 13C2 PFHxA										
315.00 > 270.00	2.004	2.010	-0.006	0.748	5434859	2.52		101	52374	
D 9 13C4-PFHpA										
367.00 > 322.00	2.334	2.332	0.002	0.871	5388818	2.58		103	53452	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.334	2.333	0.001	1.000	10852203	4.91		98.2	17536	
363.00 > 169.00	2.334	2.333	0.001	1.000	4209263		2.58(1.59-2.95)	98.2	24808	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.344	2.347	-0.003	1.000	12179289	4.45		97.9	30021	
399.00 > 99.00	2.344	2.347	-0.003	1.000	3959978		3.08(2.10-3.89)	97.9	16445	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.344	2.347	-0.003	0.875	5906386	2.40		101	39023	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.672	2.671	0.002	1.000	8458095	4.93		104	169029	
D 12 M2-6:2FTS										
429.00 > 81.00	2.672	2.671	0.001	0.997	2536952	2.43		102	54298	
D 14 13C4 PFOA										
417.00 > 372.00	2.679	2.680	-0.001	1.000	5954610	2.49		99.6	50585	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.679	2.680	-0.001	1.000	12505913	4.98		99.5	4560	
413.00 > 169.00	2.679	2.680	-0.001	1.000	6597967		1.90(1.18-2.19)	99.5	24351	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.686	2.687	-0.001	1.000	10815149	4.94		104	62750	
449.00 > 99.00	2.686	2.687	-0.001	1.000	2827986		3.82(2.72-5.05)	104	26085	
* 62 13C2-PFOA										
415.00 > 370.00	2.679	2.695	-0.016		5802717	2.50			44166	
D 18 13C4 PFOS										
503.00 > 80.00	3.037	3.042	-0.005	1.134	3996454	2.43		102	25861	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.037	3.042	-0.005	1.000	8308904	4.74		102	29568	
499.00 > 99.00	3.037	3.042	-0.005	1.000	1715560		4.84(3.24-6.01)	102	65355	
D 19 13C5 PFNA										
468.00 > 423.00	3.037	3.042	-0.005	1.134	4467006	2.54		102	38170	
20 Perfluorononanoic acid										
463.00 > 419.00	3.045	3.045	0.0	1.003	9173164	5.15		103	16199	
463.00 > 169.00	3.045	3.045	0.0	1.003	2170334		4.23(2.65-4.93)	103	28295	
D 26 M2-8:2FTS										
529.00 > 81.00	3.384	3.390	-0.006	1.263	1390682	2.51		105	41012	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.391	3.392	-0.001	1.002	3341743	4.74		98.9	44160	
D 21 13C8 FOSA										
506.00 > 78.00	3.391	3.393	-0.002	1.266	5422637	2.56		102	41689	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.391	3.395	-0.004	1.000	10652244	5.11		102	39818	
D 23 13C2 PFDA										
515.00 > 470.00	3.399	3.400	-0.001	1.269	3858028	2.60		104	42456	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.399	3.400	-0.001	1.000	7748375	5.17		103	31693	
513.00 > 169.00	3.399	3.400	-0.001	1.000	1304216		5.94(3.31-6.15)	103	2790	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.550	3.557	-0.007	1.325	2033106	2.55		102	20217	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.558	3.561	-0.003	1.002	4302023	5.05		101	15562	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.712	3.714	-0.002	1.000	5135985	5.08		105	51675	
599.00 > 99.00	3.712	3.714	-0.002	1.000	1630396		3.15(1.94-3.60)	105	28762	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.721	3.725	-0.004	1.389	1848391	2.42		96.7	12001	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFUnA										
565.00 > 520.00	3.729	3.730	-0.001	1.392	2947353	2.49		99.6	37291	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.729	3.731	-0.002	1.002	3628658	5.12		102	18376	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.729	3.731	-0.002	1.000	5124927	4.80		96.1	24033	
563.00 > 169.00	3.729	3.731	-0.002	1.000	1149803		4.46(0.00-0.00)	96.1	32842	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.892	3.896	-0.004	1.453	1595757	2.60		104	3547	
35 MeFOSA										
512.00 > 169.00	3.902	3.903	-0.001	1.003	3086095	4.93		98.5	3178	
D 36 13C2 PFDoA										
615.00 > 570.00	4.018	4.024	-0.006	1.500	3396599	2.47		98.8	37518	
37 Perfluorododecanoic acid										R
613.00 > 569.00	4.018	4.025	-0.007	1.000	7211647	5.42		108	25725	R
613.00 > 169.00	4.018	4.025	-0.007	1.000	1661461		4.34(2.19-4.07)	108	36484	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.083	4.084	-0.001	1.524	1443976	2.53		101	2220	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.083	4.091	-0.008	1.000	3014716	5.21		104	2527	
41 Perfluorotridecanoic acid										R
663.00 > 619.00	4.286	4.287	-0.001	1.000	8918159	5.36		107	32389	R
663.00 > 169.00	4.286	4.287	-0.001	1.000	2702405		3.30(1.76-3.26)	107	58678	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.523	4.526	-0.003	1.688	4240619	2.51		100	31587	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.523	4.526	-0.003	1.000	2018908	4.85		97.1	38325	
713.00 > 219.00	4.509	4.526	-0.017	0.997	1423580		1.42(1.00-1.85)	97.1	30291	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.937	4.938	-0.001	1.843	7344806	2.46		98.3	29580	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.937	4.939	-0.002	1.000	13534458	5.17		103	7800	R
813.00 > 169.00	4.937	4.939	-0.002	1.000	2273680		5.95(2.50-4.65)	103	12551	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.286	5.286	0.0	1.000	14994103	5.13		103	3053	
913.00 > 169.00	5.279	5.286	-0.007	0.999	1843232		8.13(0.00-0.00)	103	3640	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL6_00002 Amount Added: 1.00 Units: mL

Report Date: 17-Nov-2017 10:26:39 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_007.d

Injection Date: 16-Nov-2017 13:59:41 Instrument ID: A8_N

Lims ID: IC L6 Full

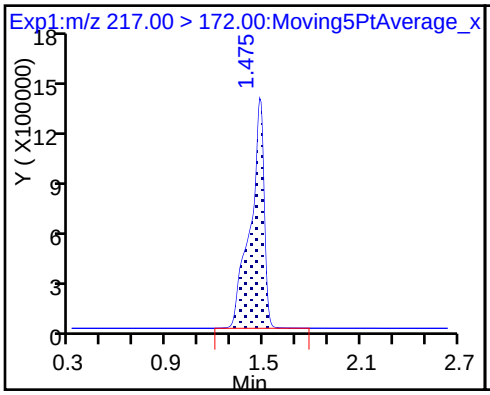
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 33 Worklist Smp#: 7

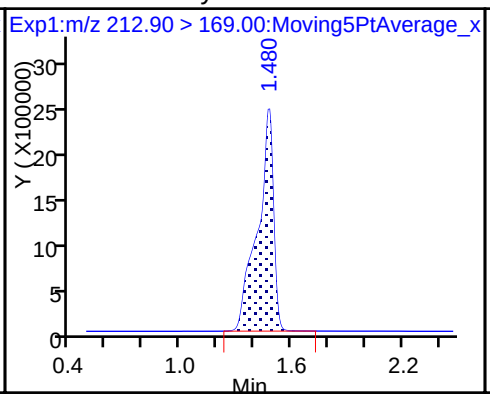
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

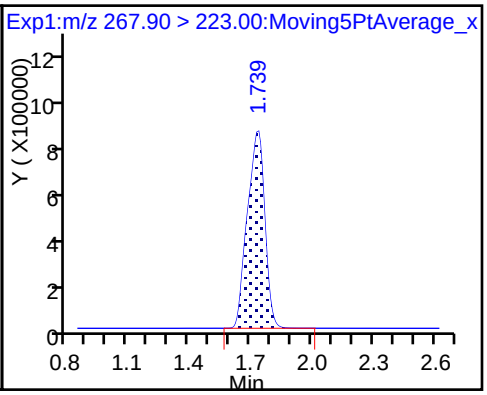
D 1 13C4 PFBA



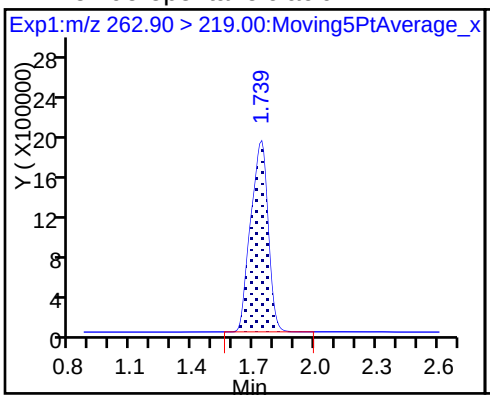
2 Perfluorobutyric acid



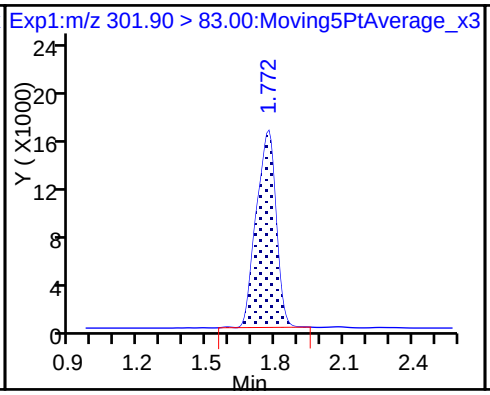
D 3 13C5-PFPeA



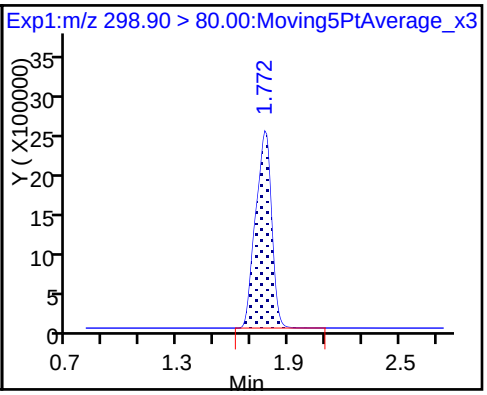
4 Perfluoropentanoic acid



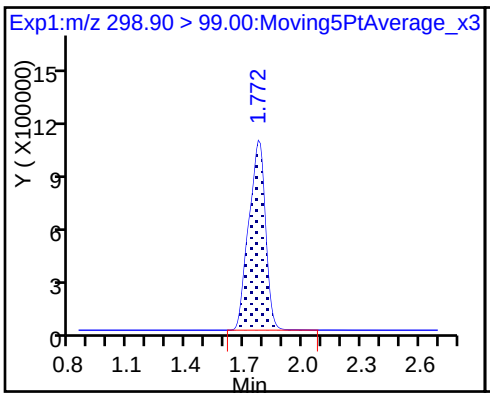
D 47 13C3-PFBS



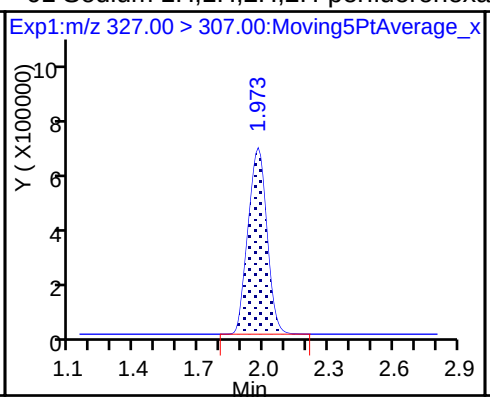
5 Perfluorobutanesulfonic acid



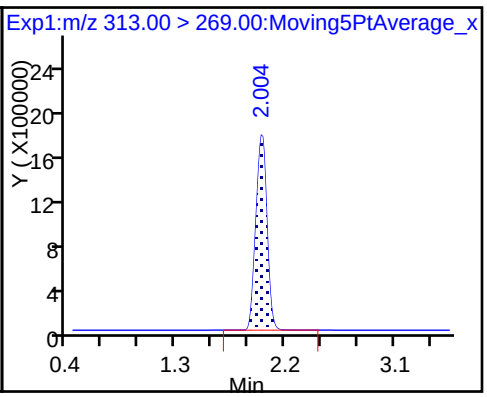
5 Perfluorobutanesulfonic acid



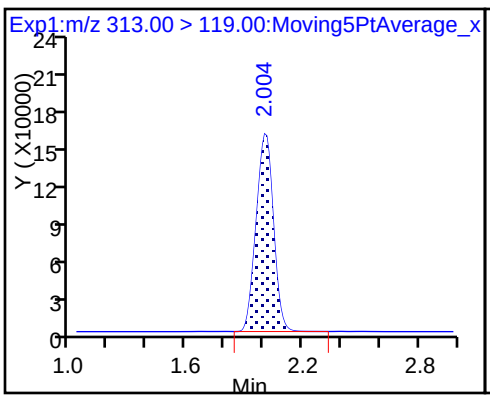
61 Sodium 1H,1H,2H,2H-perfluorohexane



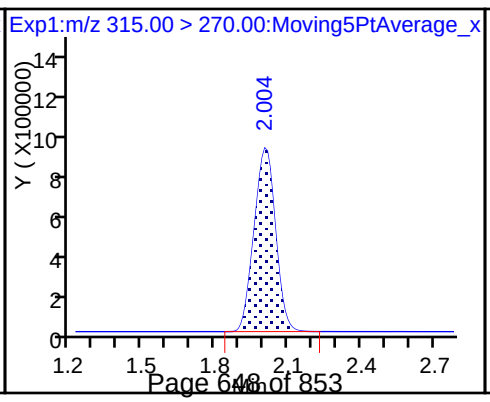
6 Perfluorohexanoic acid



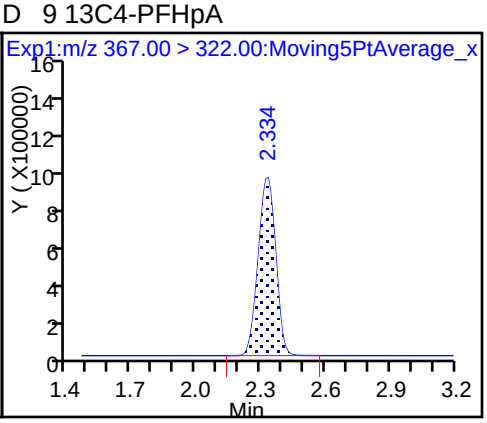
6 Perfluorohexanoic acid



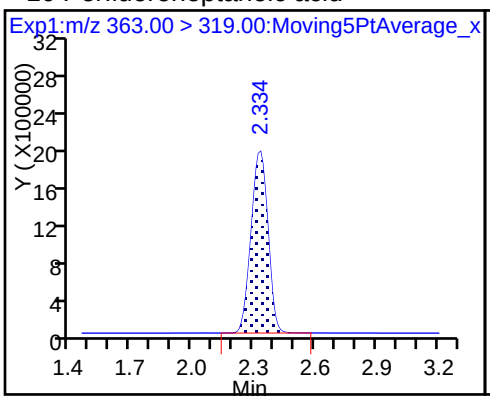
D 7 13C2 PFHxA



D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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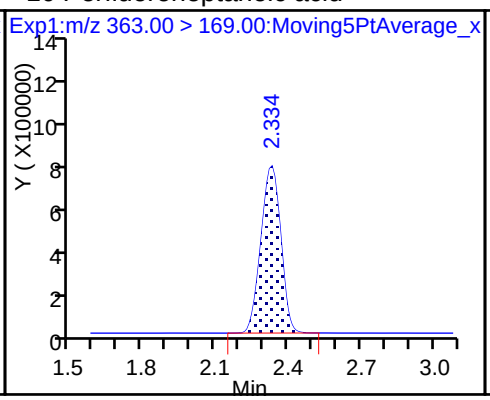
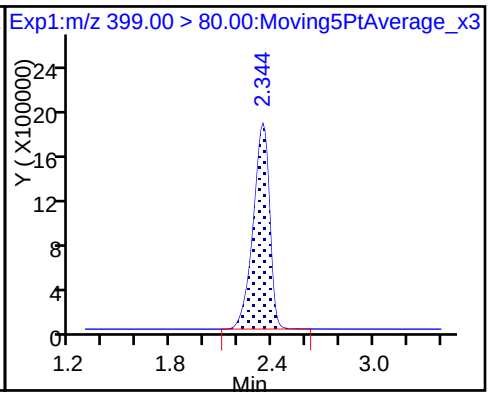
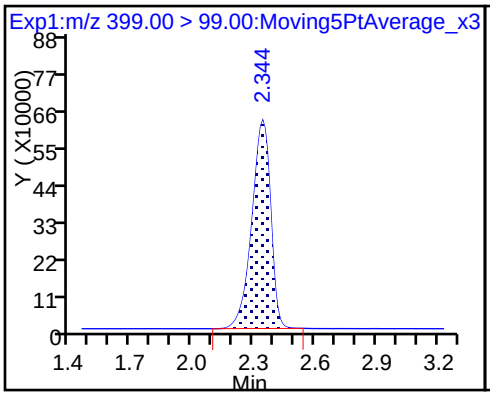


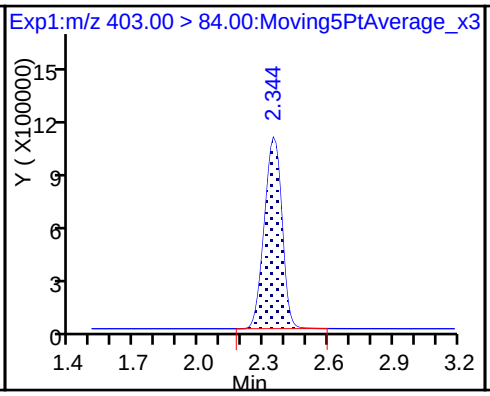
8 Perfluorohexanesulfonic acid



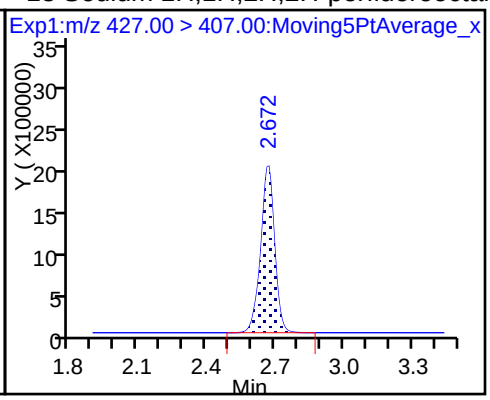
8 Perfluorohexanesulfonic acid



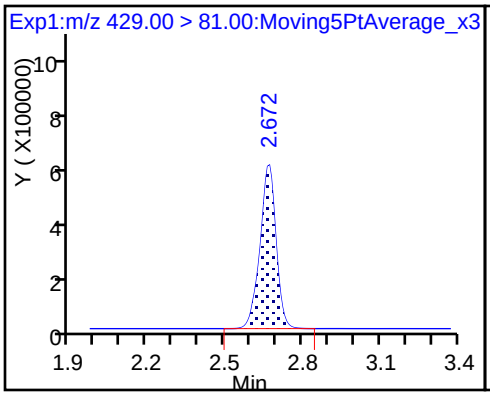
D 11 18O2 PFHxS



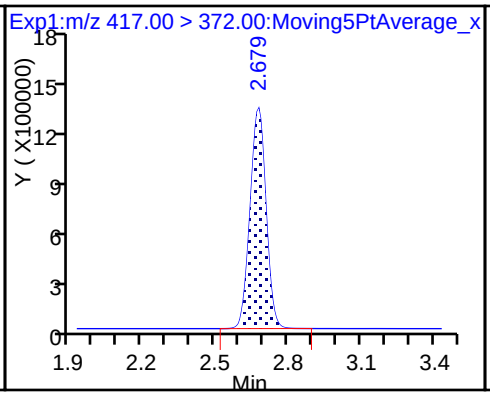
13 Sodium 1H,1H,2H,2H-perfluorooctane



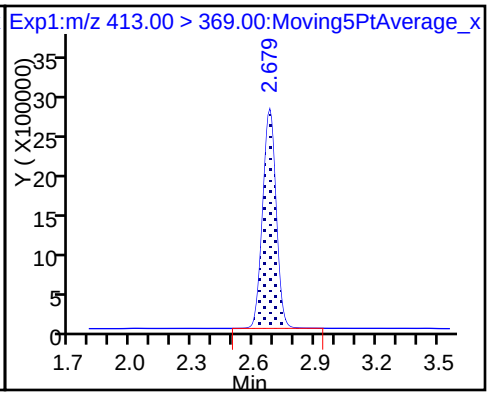
D 12 M2-6:2FTS



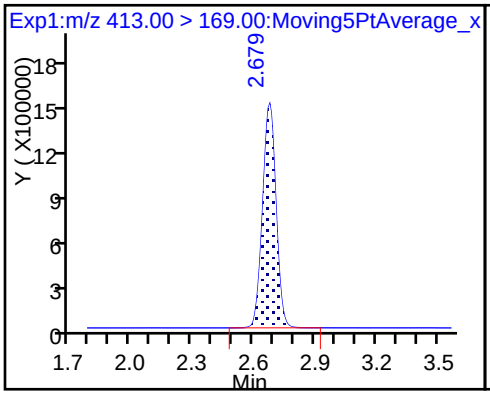
D 14 13C4 PFOA



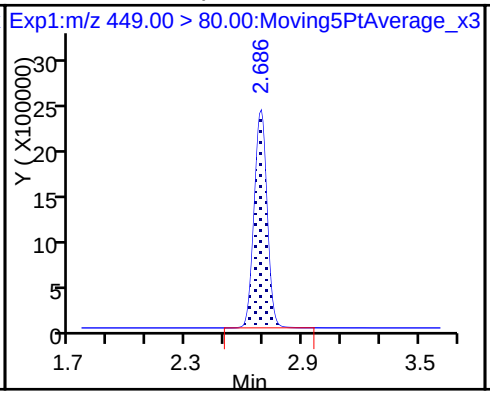
15 Perfluorooctanoic acid



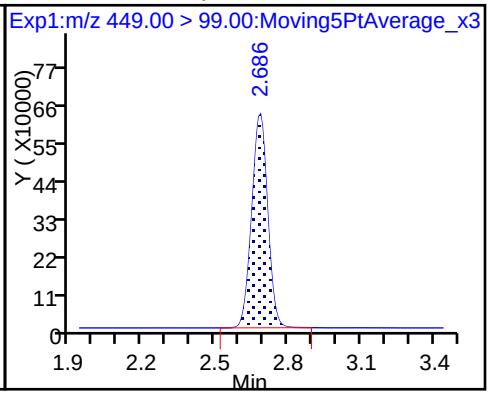
15 Perfluorooctanoic acid



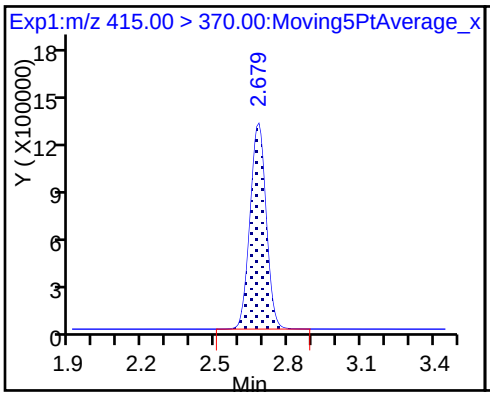
16 Perfluoroheptanesulfonic Acid



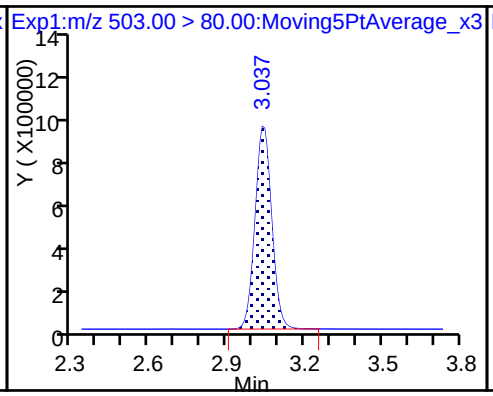
16 Perfluoroheptanesulfonic Acid



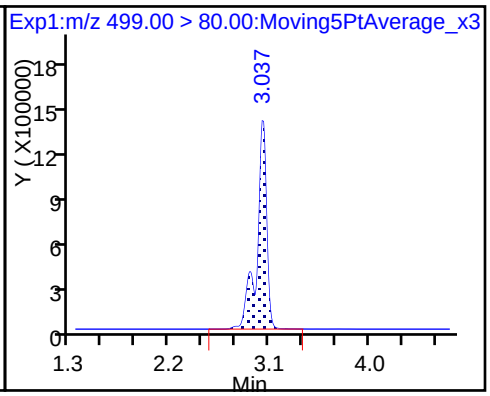
* 62 13C2-PFOA



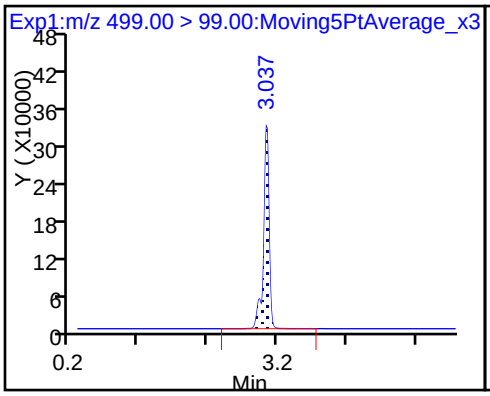
D 18 13C4 PFOS



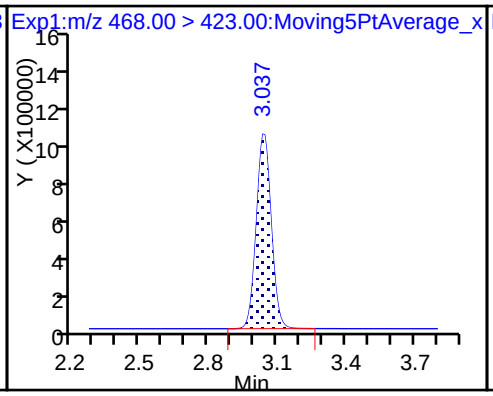
17 Perfluorooctane sulfonic acid



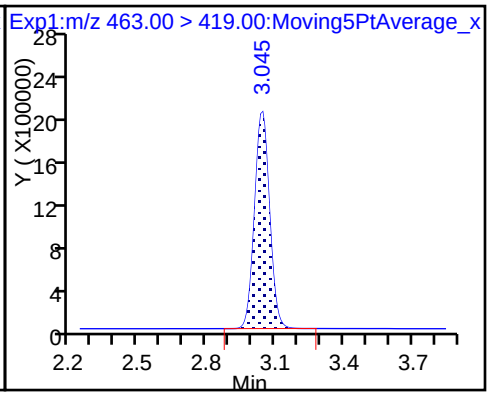
17 Perfluorooctane sulfonic acid



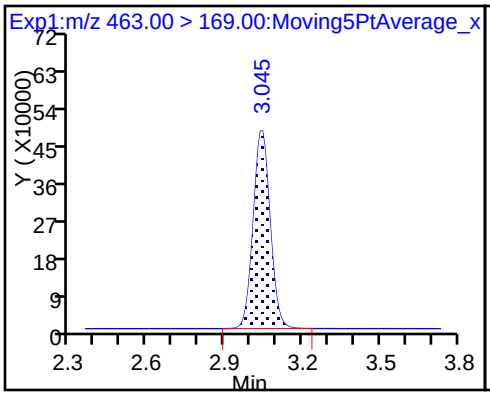
D 19 13C5 PFNA



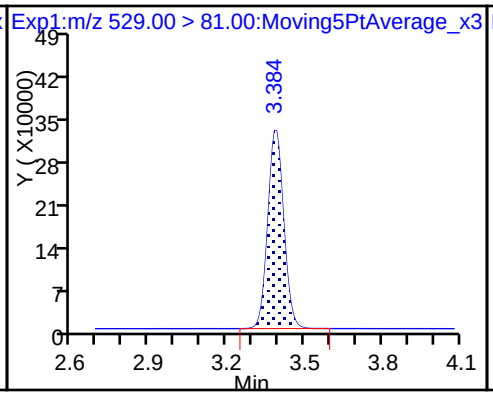
20 Perfluorononanoic acid



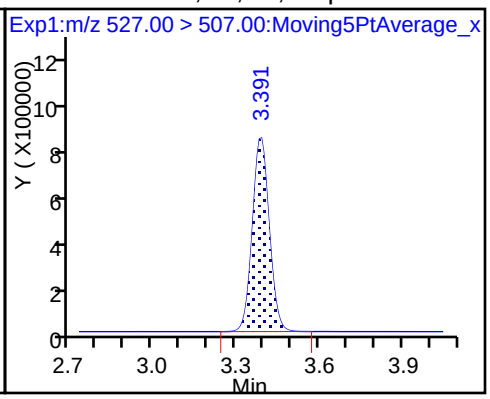
20 Perfluorononanoic acid



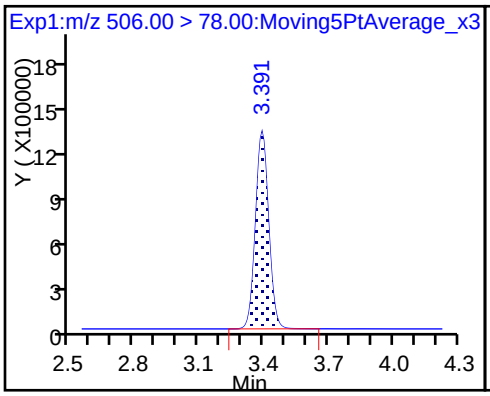
D 26 M2-8:2FTS



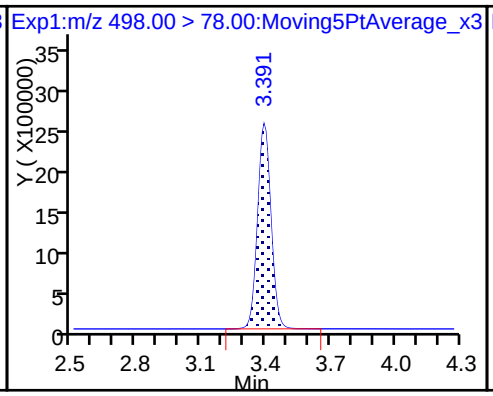
25 Sodium 1H,1H,2H,2H-perfluorodecane



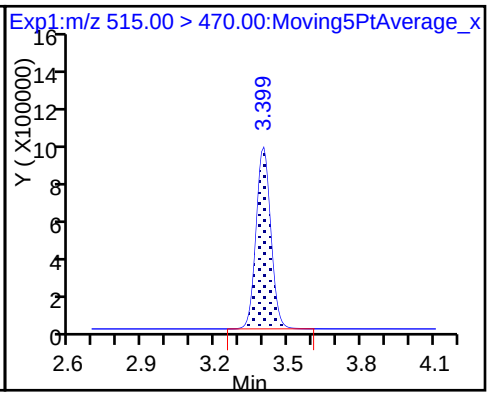
D 21 13C8 FOSA



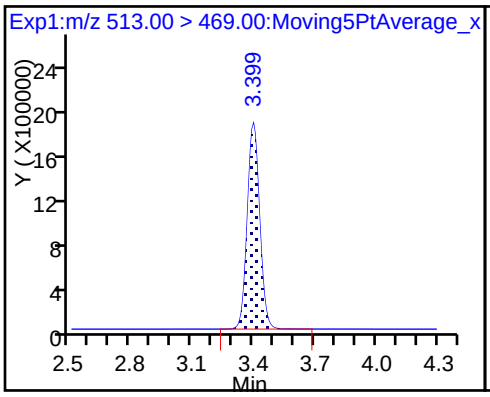
22 Perfluorooctane Sulfonamide



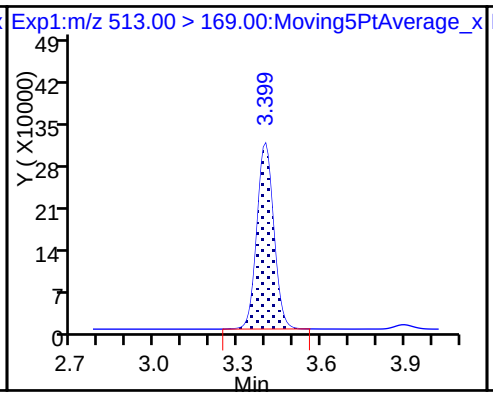
D 23 13C2 PFDA



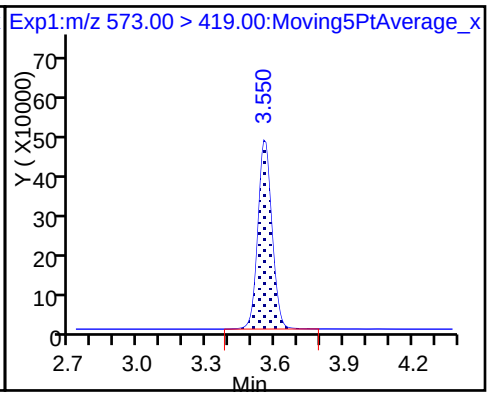
24 Perfluorodecanoic acid



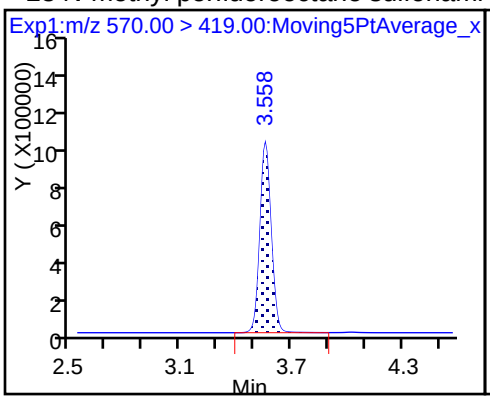
24 Perfluorodecanoic acid



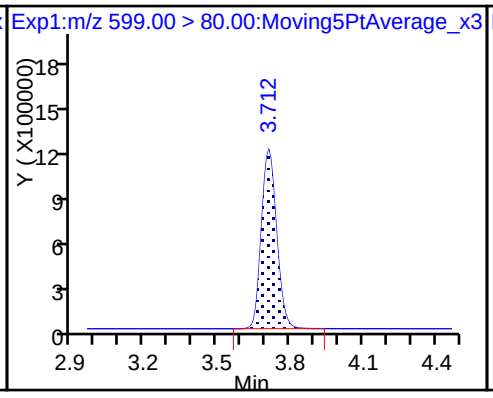
D 27 d3-NMeFOSAA



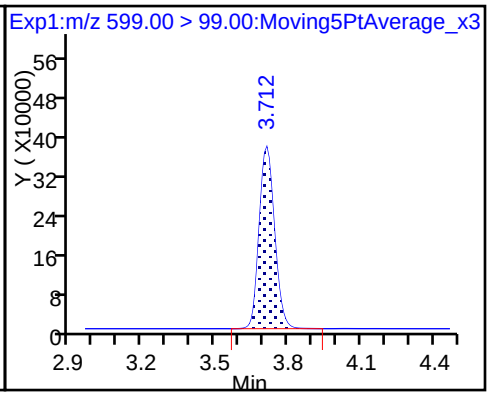
28 N-methyl perfluorooctane sulfonami



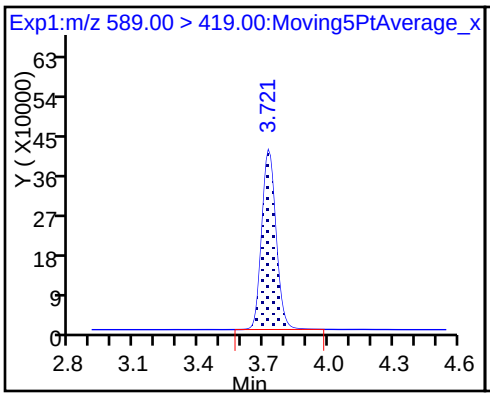
29 Perfluorodecane Sulfonic acid



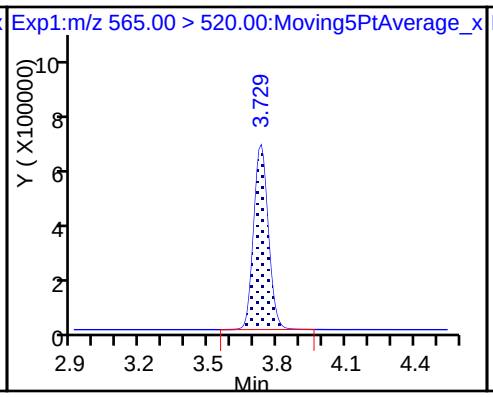
29 Perfluorodecane Sulfonic acid



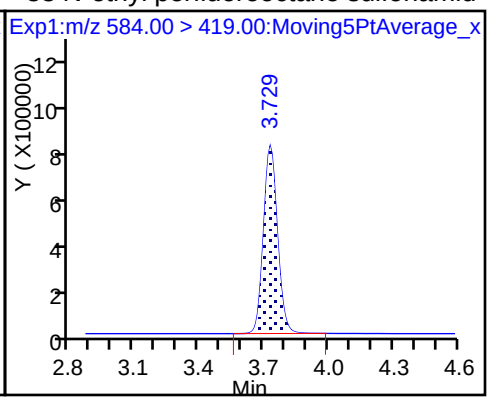
D 32 d5-NEtFOSAA



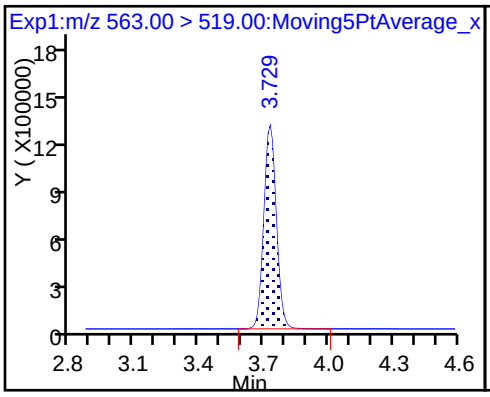
D 30 13C2 PFUnA



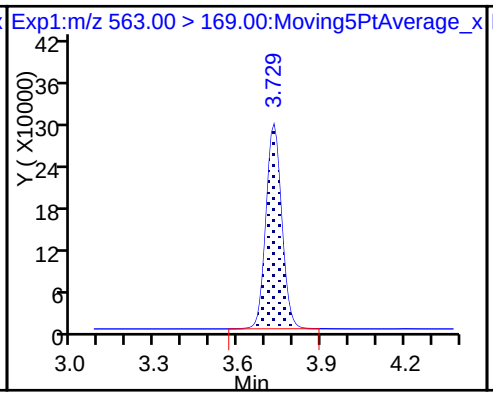
33 N-ethyl perfluorooctane sulfonamid



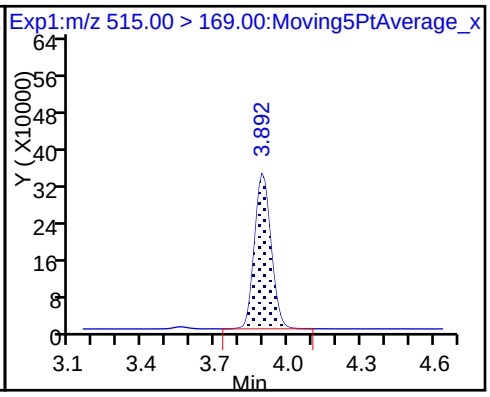
31 Perfluoroundecanoic acid



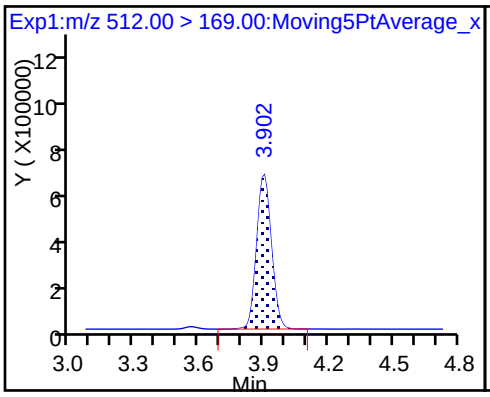
31 Perfluoroundecanoic acid



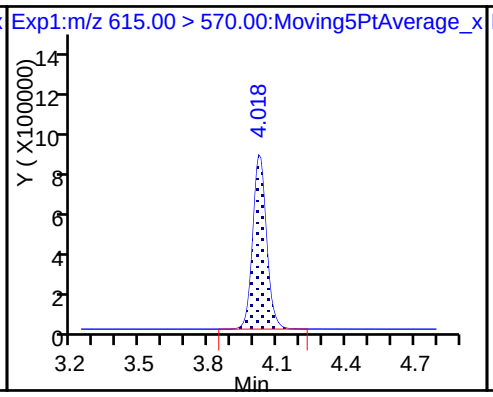
D 34 d-N-MeFOSA-M



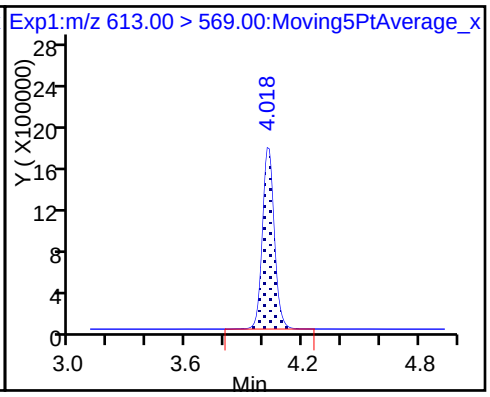
35 MeFOSA



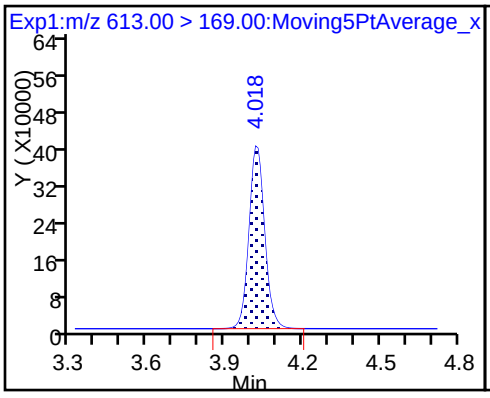
D 36 13C2 PFDoA



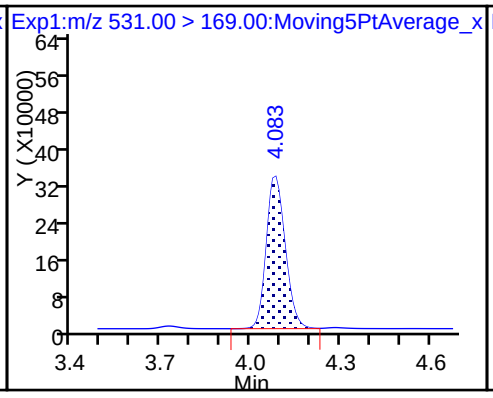
37 Perfluorododecanoic acid



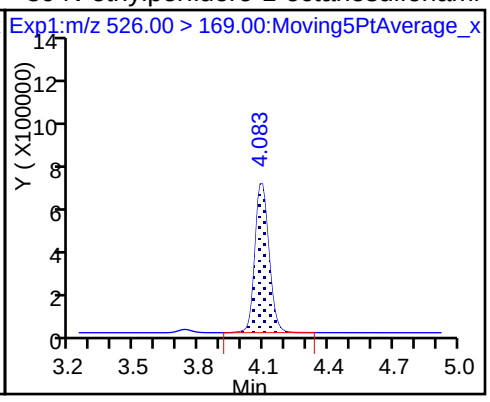
37 Perfluorododecanoic acid



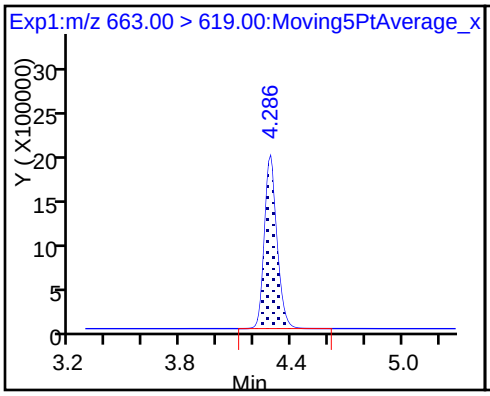
D 38 d-N-EtFOSA-M



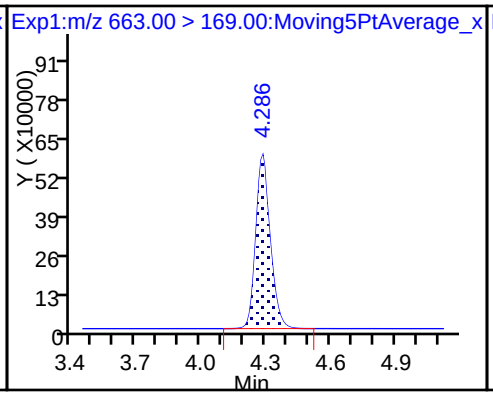
39 N-ethylperfluoro-1-octanesulfonami



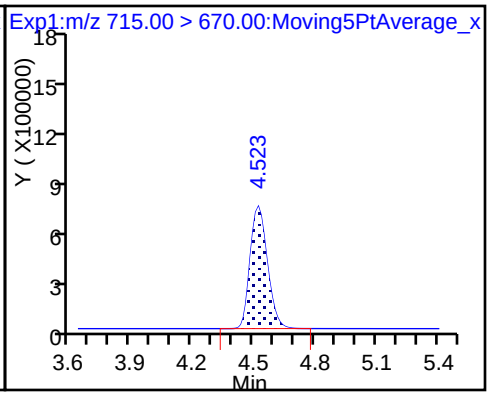
41 Perfluorotridecanoic acid



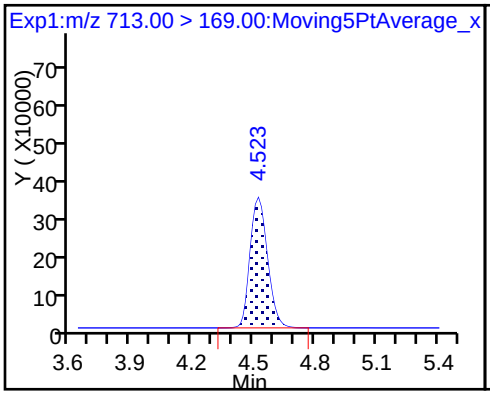
41 Perfluorotridecanoic acid



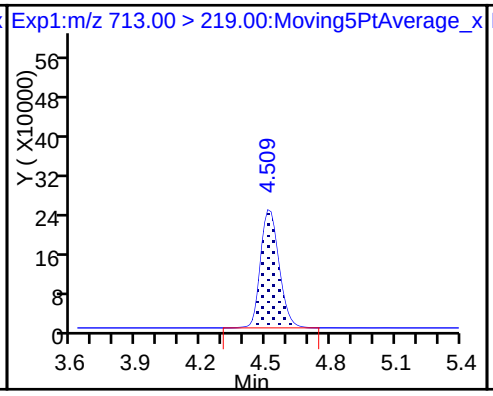
D 43 13C2-PFTeDA



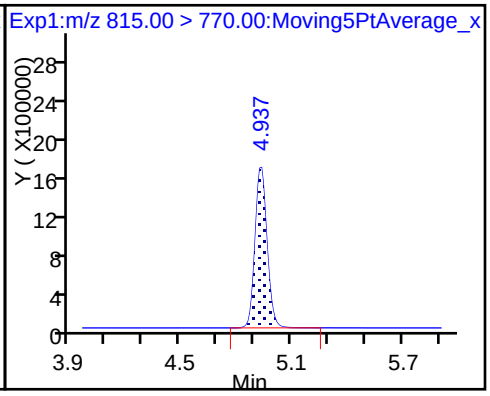
42 Perfluorotetradecanoic acid



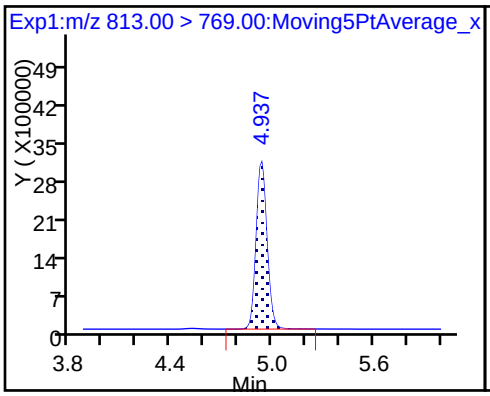
42 Perfluorotetradecanoic acid



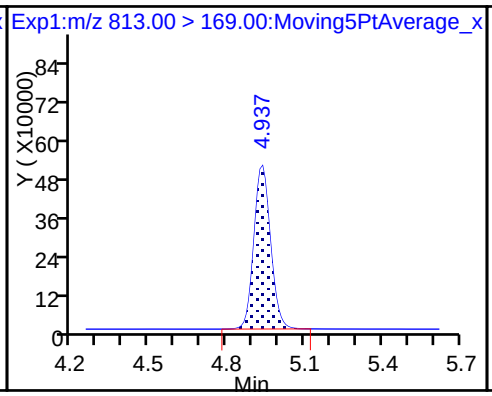
D 44 13C2-PFHxDA



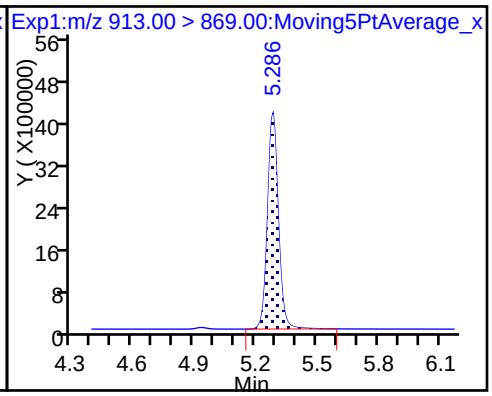
45 Perfluorohexadecanoic acid



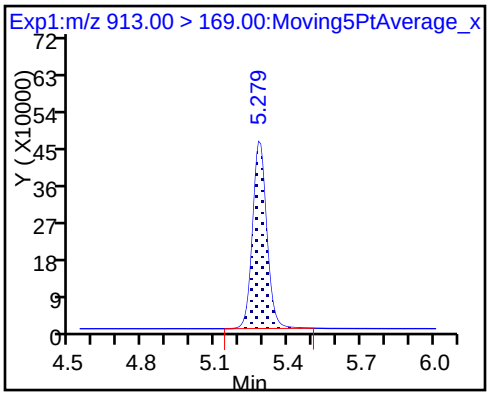
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_008.d
Lims ID: IC L7 Full
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 16-Nov-2017 14:07:34 ALS Bottle#: 34 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L7-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub19

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Nov-2017 10:26:41 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 17-Nov-2017 10:09:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.482	1.479	0.003	0.552	7490628	2.53		101	63168	
2 Perfluorobutyric acid										
212.90 > 169.00	1.482	1.480	0.002	1.000	27744725	10.1		101	7634	
D 3 13C5-PFPeA										
267.90 > 223.00	1.741	1.738	0.003	0.649	4665515	2.49		99.6	44472	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.741	1.740	0.001	1.000	20852686	9.91		99.1	18375	
D 47 13C3-PFBS										
301.90 > 83.00	1.774	1.774	0.0	0.661	95038	2.32		99.9	3153	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.774	1.776	-0.002	1.000	26327862	8.67		98.0	114457	
298.90 > 99.00	1.774	1.776	-0.002	1.000	11836265		2.22(1.74-3.24)	98.0	140827	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.976	1.977	-0.001	1.000	7635712	15.3		164	209411	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.006	2.010	-0.004	1.000	20937572	10.0		100	64096	
313.00 > 119.00	2.006	2.010	-0.004	1.000	1903195		11.00(7.05-13.09)	100	23143	
D 7 13C2 PFHxA										
315.00 > 270.00	2.006	2.010	-0.004	0.748	5222423	2.47		98.8	49187	
D 9 13C4-PFHpA										
367.00 > 322.00	2.327	2.332	-0.005	0.868	5055553	2.48		99.0	40267	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.327	2.333	-0.006	1.000	19870003	9.58		95.8	31028	
363.00 > 169.00	2.327	2.333	-0.006	1.000	8270226		2.40(1.59-2.95)	95.8	49649	
D 11 18O2 PFHxS										
403.00 > 84.00	2.348	2.347	0.001	0.875	5699801	2.36		100.0	34256	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.348	2.347	0.001	1.000	22232121	8.42		92.6	28845	
399.00 > 99.00	2.348	2.347	0.001	1.000	7555127		2.94(2.10-3.89)	92.6	23619	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.668	2.671	-0.002	1.000	10582688	9.84		104	92515	
D 12 M2-6:2FTS										
429.00 > 81.00	2.668	2.671	-0.003	0.995	1592267	1.56		65.5	31710	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.682	2.680	0.002	1.000	22105971	9.31		93.1	7763	
413.00 > 169.00	2.682	2.680	0.002	1.000	12464094		1.77(1.18-2.19)	93.1	33707	
D 14 13C4 PFOA										
417.00 > 372.00	2.682	2.680	0.002	1.000	5630061	2.40		96.2	47028	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.689	2.687	0.002	1.000	19853443	9.64		101	100384	
449.00 > 99.00	2.689	2.687	0.002	1.000	5485656		3.62(2.72-5.05)	101	43848	
* 62 13C2-PFOA										
415.00 > 370.00	2.682	2.695	-0.013		5682944	2.50			58992	
D 19 13C5 PFNA										
468.00 > 423.00	3.040	3.042	-0.002	1.133	4254420	2.47		98.9	29456	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.040	3.042	-0.002	1.000	16088092	9.74		105	642864	
499.00 > 99.00	3.040	3.042	-0.002	1.000	3420182		4.70(3.24-6.01)	105	214212	
D 18 13C4 PFOS										
503.00 > 80.00	3.040	3.042	-0.002	1.133	3761176	2.34		97.8	18260	
20 Perfluorononanoic acid										
463.00 > 419.00	3.048	3.045	0.003	1.003	16747453	9.87		98.7	25313	
463.00 > 169.00	3.048	3.045	0.003	1.003	4243089		3.95(2.65-4.93)	98.7	42501	
D 26 M2-8:2FTS										
529.00 > 81.00	3.387	3.390	-0.003	1.263	1248667	2.30		95.9	18370	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.395	3.392	0.003	1.002	6035706	9.53		99.5	57978	
D 21 13C8 FOSA										
506.00 > 78.00	3.395	3.393	0.002	1.266	5192863	2.50		100	39168	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.395	3.395	0.0	1.000	18790588	9.42		94.2	65630	
D 23 13C2 PFDA										
515.00 > 470.00	3.403	3.400	0.002	1.269	3646507	2.51		100	29877	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.403	3.400	0.002	1.000	14230247	10.0		100	34729	
513.00 > 169.00	3.403	3.400	0.002	1.000	2579258		5.52(3.31-6.15)	100	2602	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.561	3.557	0.004	1.328	1958283	2.51		100	16492	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.561	3.561	0.0	1.000	8414297	10.2		102	17270	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.717	3.714	0.003	1.000	9507505	10.0		104	52911	
599.00 > 99.00	3.717	3.714	0.003	1.000	3243832		2.93(1.94-3.60)	104	39088	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.726	3.725	0.001	1.389	1737053	2.32		92.7	11197	
D 30 13C2 PFUnA										
565.00 > 520.00	3.734	3.730	0.004	1.392	2778942	2.40		95.9	30002	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.734	3.731	0.003	1.002	6831812	10.3		103	22190	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.734	3.731	0.003	1.000	10108101	10.0		100	35587	
563.00 > 169.00	3.734	3.731	0.003	1.000	2217707		4.56(0.00-0.00)	100	33106	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.897	3.896	0.001	1.453	1574190	2.62		105	3424	
35 MeFOSA										
512.00 > 169.00	3.907	3.903	0.004	1.003	6166606	9.98		99.8	3292	
D 36 13C2 PFDoA										
615.00 > 570.00	4.023	4.024	-0.001	1.500	3317790	2.46		98.6	30716	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.023	4.025	-0.002	1.000	13068841	10.1		101	64572	
613.00 > 169.00	4.023	4.025	-0.002	1.000	3229583		4.05(2.19-4.07)	101	43024	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.088	4.084	0.004	1.524	1443998	2.59		103	1680	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.088	4.091	-0.003	1.000	6076755	10.5		105	2812	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.289	4.287	0.002	1.000	15667846	9.64		96.4	45460	
663.00 > 169.00	4.289	4.287	0.002	1.000	5209861		3.01(1.76-3.26)	96.4	87376	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.529	4.526	0.003	1.000	3877317	9.63		96.3	36453	
713.00 > 219.00	4.516	4.526	-0.010	0.997	2918355		1.33(1.00-1.85)	96.3	44929	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.529	4.526	0.003	1.689	4105559	2.48		99.2	29100	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.942	4.938	0.004	1.843	7062925	2.41		96.5	31231	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.942	4.939	0.003	1.000	23394318	9.31		93.1	13121	R
813.00 > 169.00	4.942	4.939	0.003	1.000	4392975		5.33(2.50-4.65)	93.1	22248	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.291	5.286	0.005	1.000	26858942	9.56		95.6	4525	
913.00 > 169.00	5.291	5.286	0.005	1.000	3641113		7.38(0.00-0.00)	95.6	5462	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL7_00002 Amount Added: 1.00 Units: mL

Report Date: 17-Nov-2017 10:26:42 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_008.d

Injection Date: 16-Nov-2017 14:07:34 Instrument ID: A8_N

Lims ID: IC L7 Full

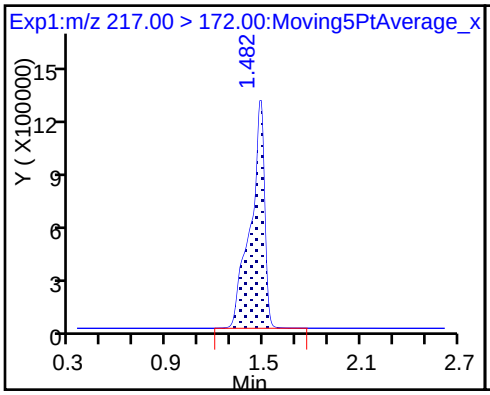
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 34 Worklist Smp#: 8

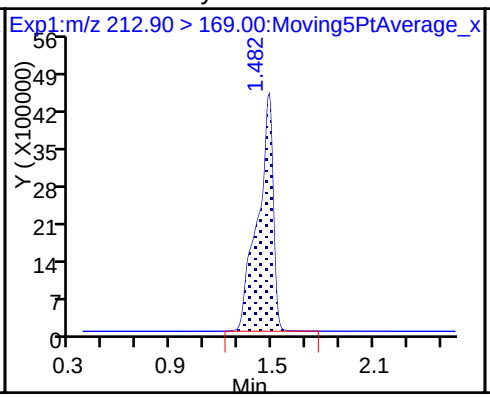
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

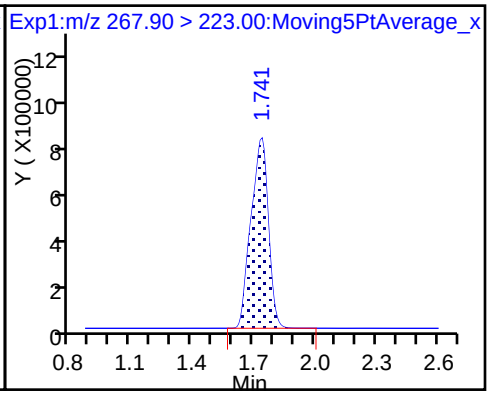
D 1 13C4 PFBA



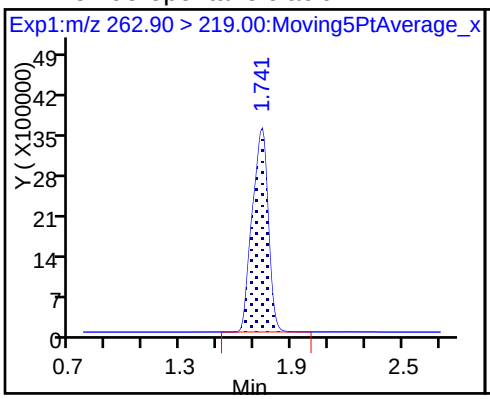
2 Perfluorobutyric acid



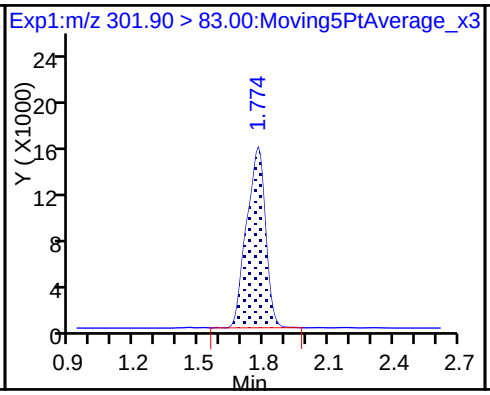
D 3 13C5-PFPeA



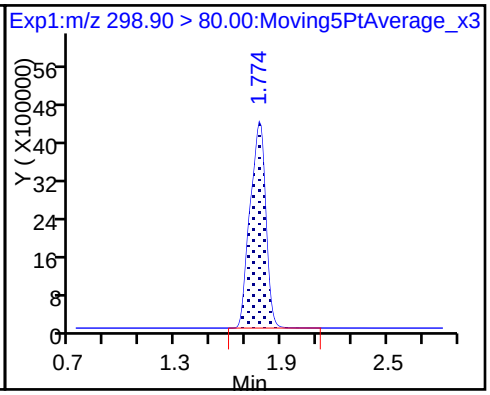
4 Perfluoropentanoic acid



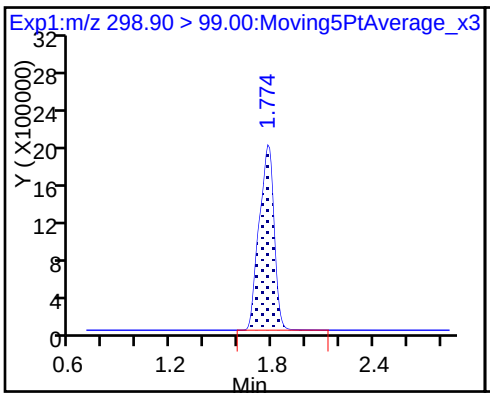
D 47 13C3-PFBS



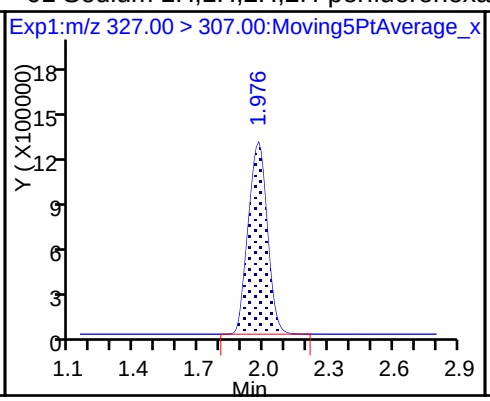
5 Perfluorobutanesulfonic acid



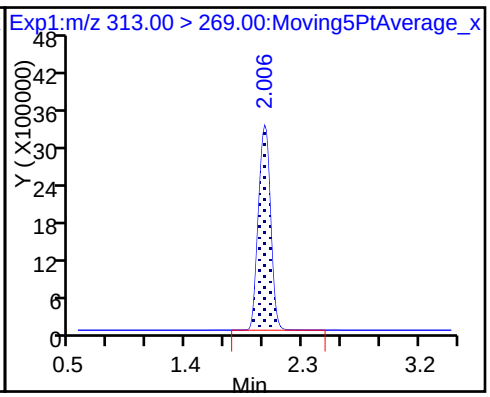
5 Perfluorobutanesulfonic acid



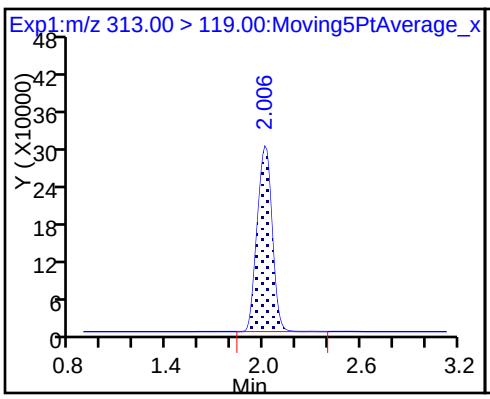
61 Sodium 1H,1H,2H,2H-perfluorohexane



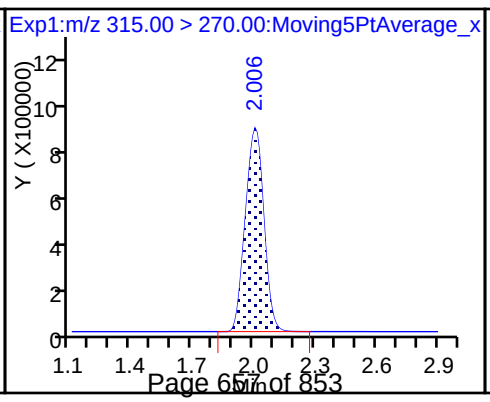
6 Perfluorohexanoic acid



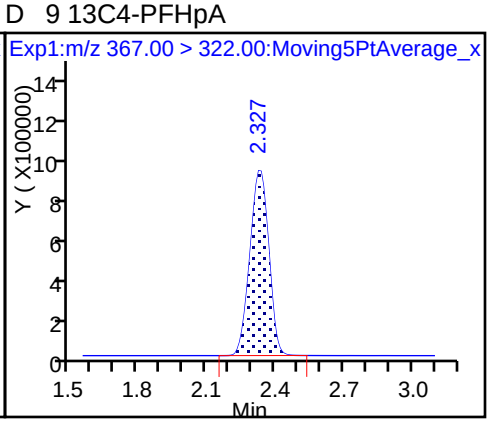
6 Perfluorohexanoic acid



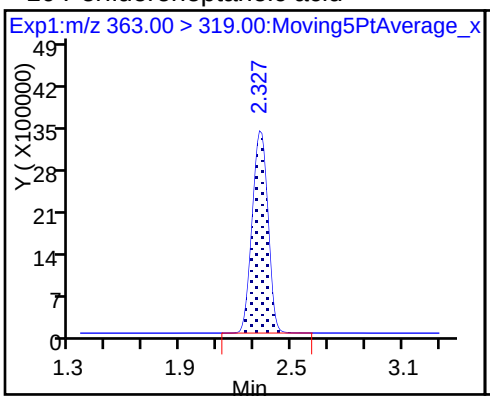
D 7 13C2 PFHxA



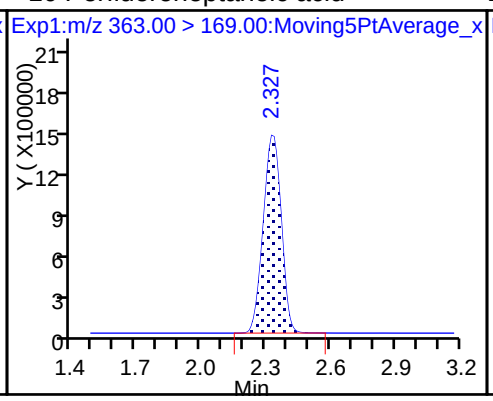
D 9 13C4-PFHpA



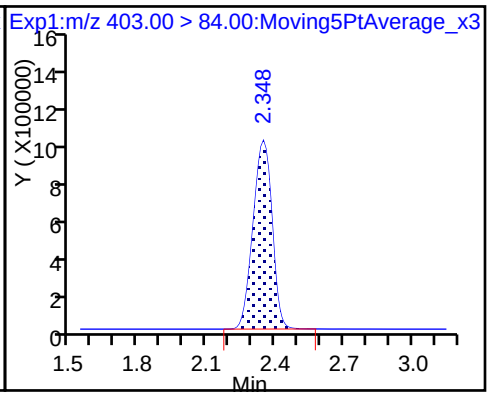
10 Perfluoroheptanoic acid



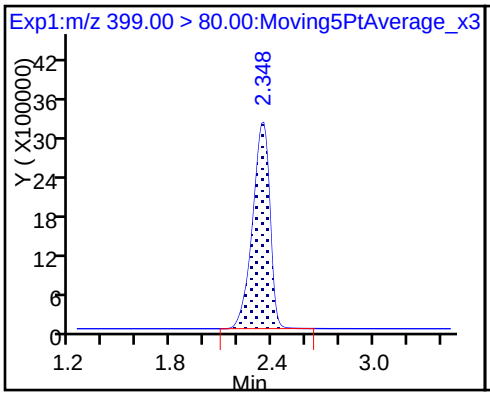
10 Perfluoroheptanoic acid



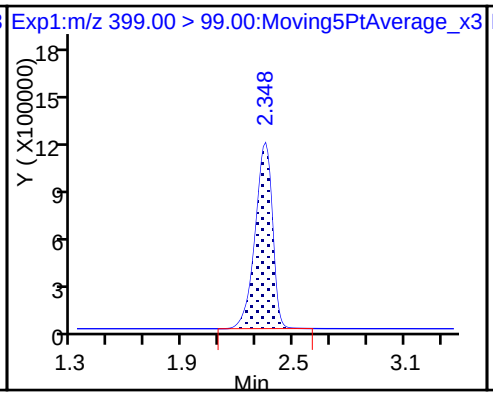
D 11 18O2 PFHxS



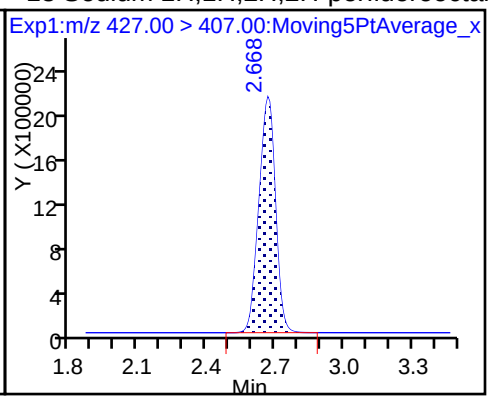
8 Perfluorohexanesulfonic acid



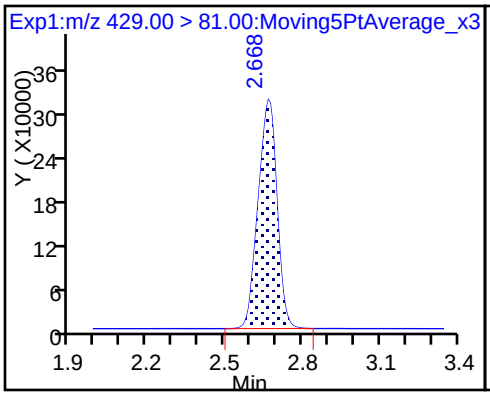
8 Perfluorohexanesulfonic acid



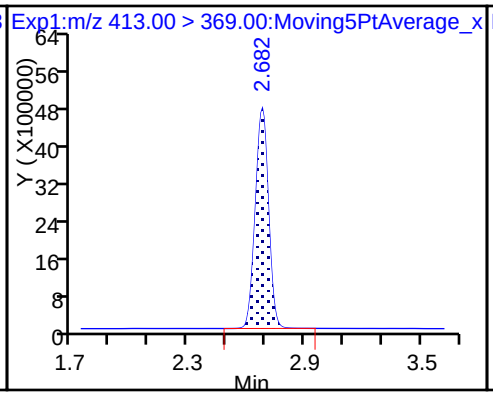
13 Sodium 1H,1H,2H,2H-perfluorooctane



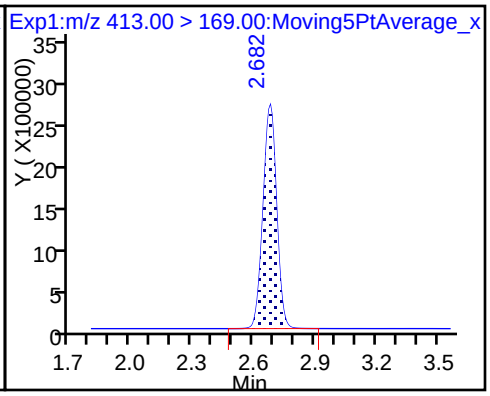
D 12 M2-6:2FTS



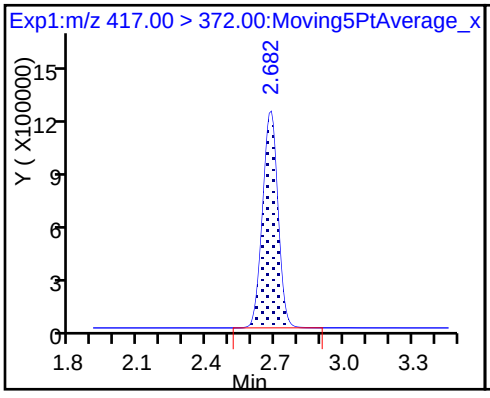
15 Perfluorooctanoic acid



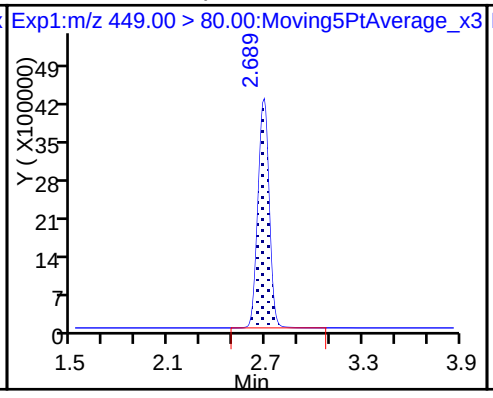
15 Perfluorooctanoic acid



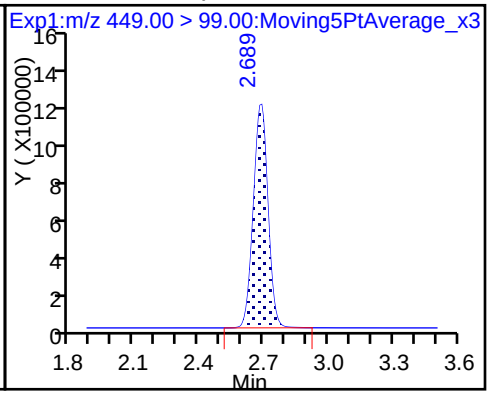
D 14 13C4 PFOA



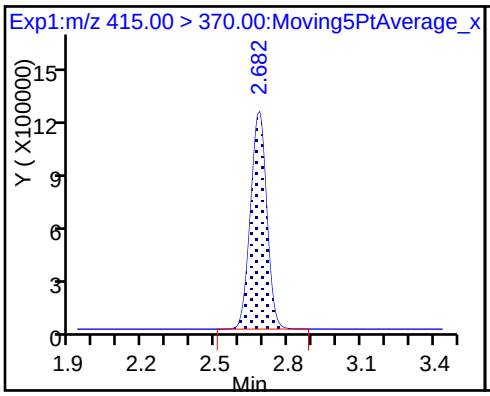
16 Perfluoroheptanesulfonic Acid



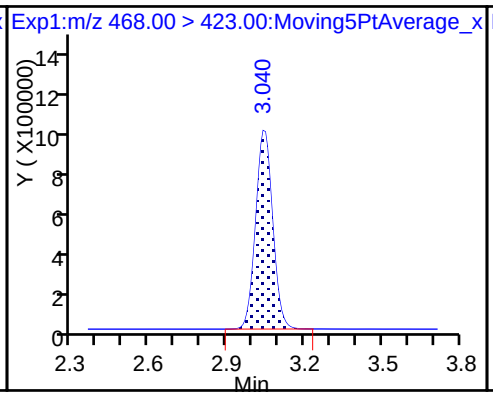
16 Perfluoroheptanesulfonic Acid



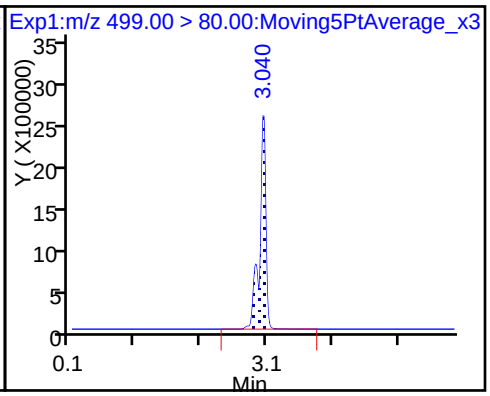
* 62 13C2-PFOA



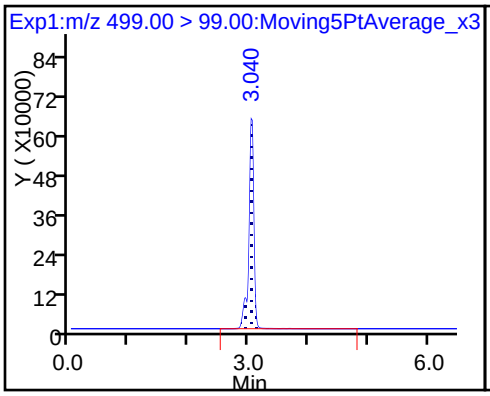
D 19 13C5 PFNA



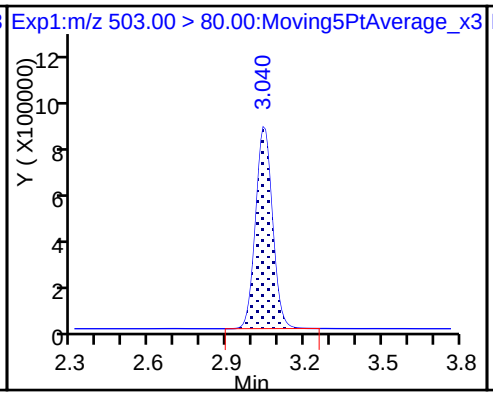
17 Perfluorooctane sulfonic acid



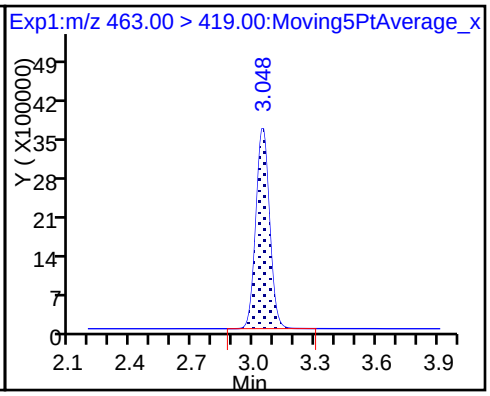
17 Perfluorooctane sulfonic acid



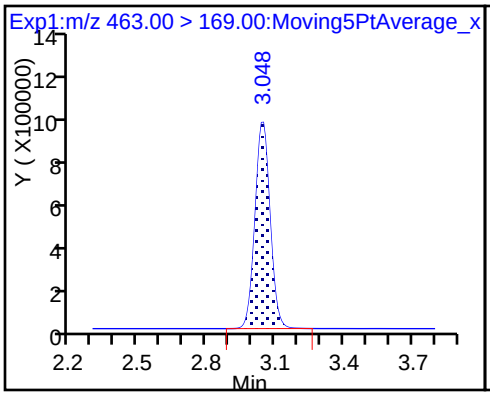
D 18 13C4 PFOS



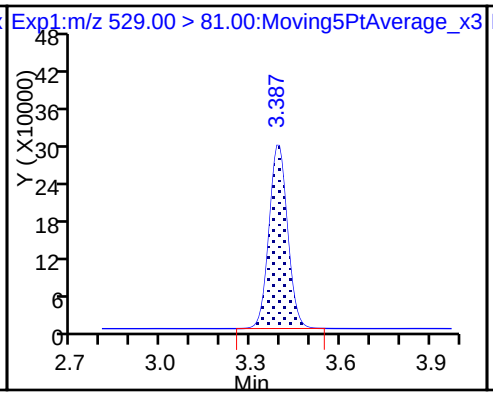
20 Perfluorononanoic acid



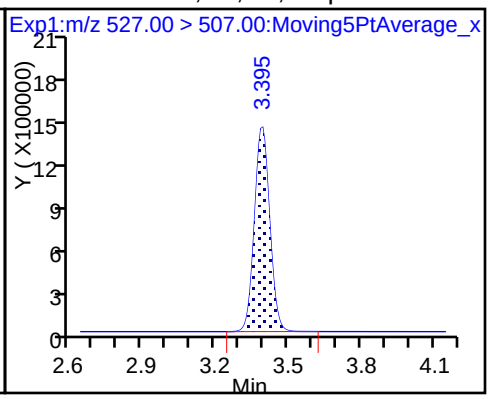
20 Perfluorononanoic acid



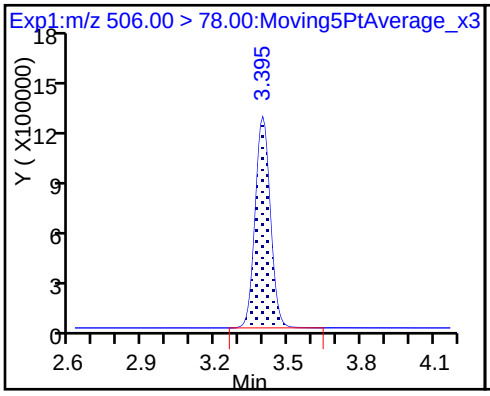
D 26 M2-8:2FTS



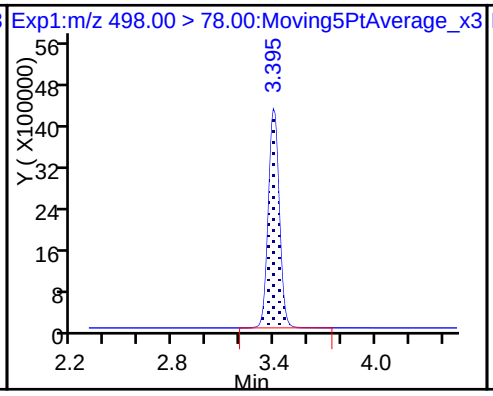
25 Sodium 1H,1H,2H,2H-perfluorodecane



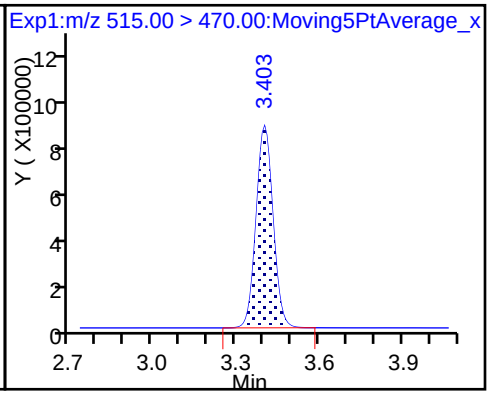
D 21 13C8 FOSA



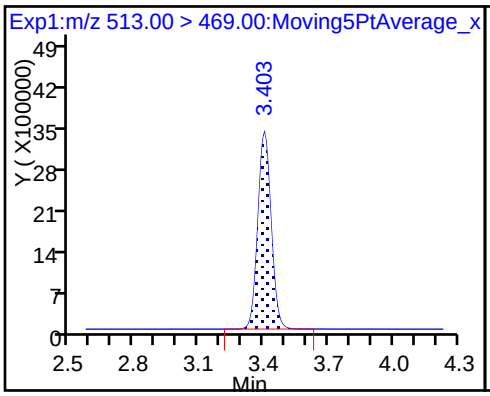
22 Perfluorooctane Sulfonamide



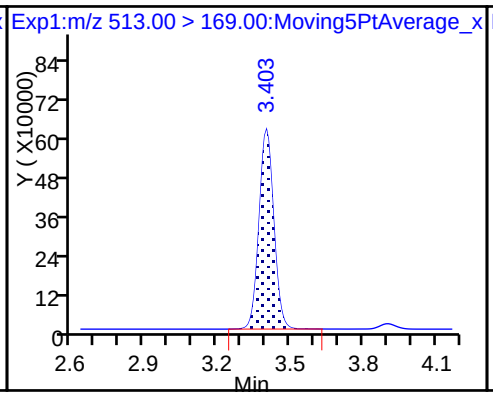
D 23 13C2 PFDA



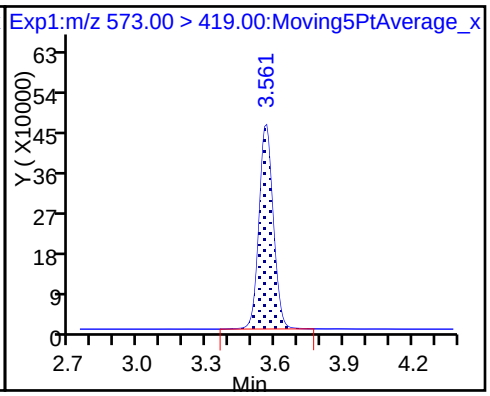
24 Perfluorodecanoic acid



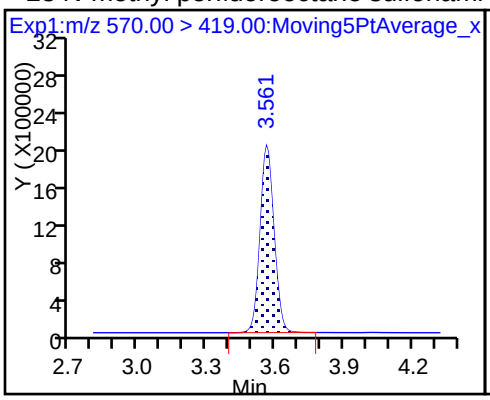
24 Perfluorodecanoic acid



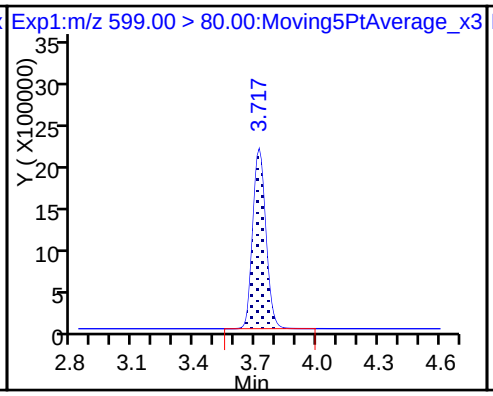
D 27 d3-NMeFOSAA



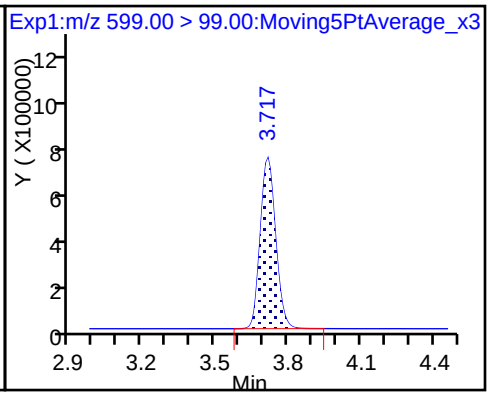
28 N-methyl perfluorooctane sulfonami



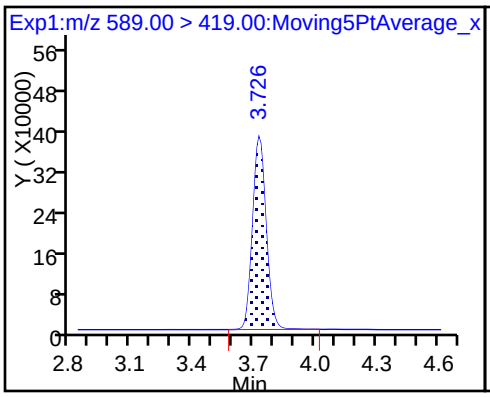
29 Perfluorodecane Sulfonic acid



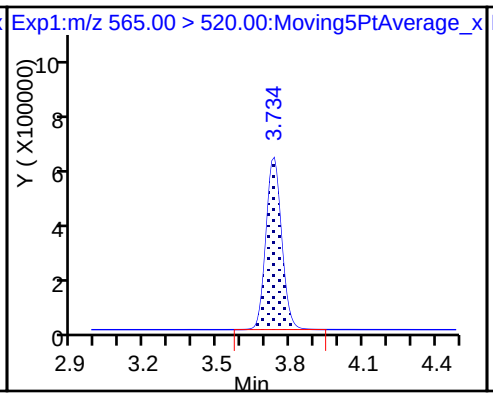
29 Perfluorodecane Sulfonic acid



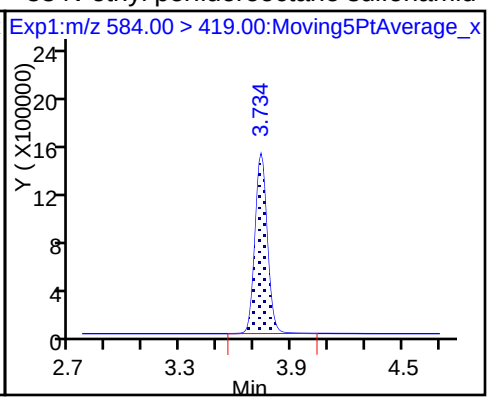
D 32 d5-NEtFOSAA



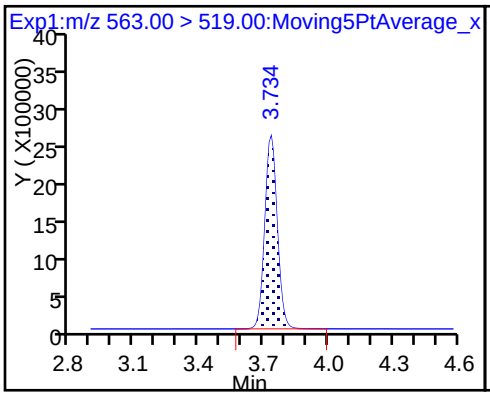
D 30 13C2 PFUnA



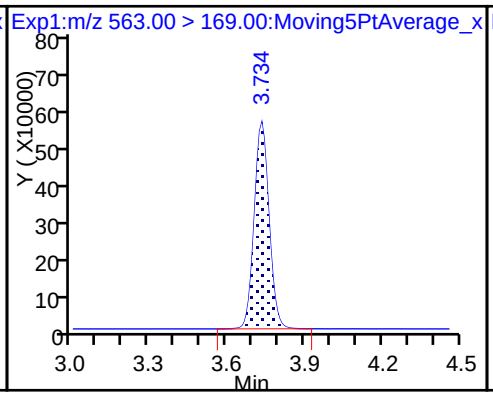
33 N-ethyl perfluorooctane sulfonamid



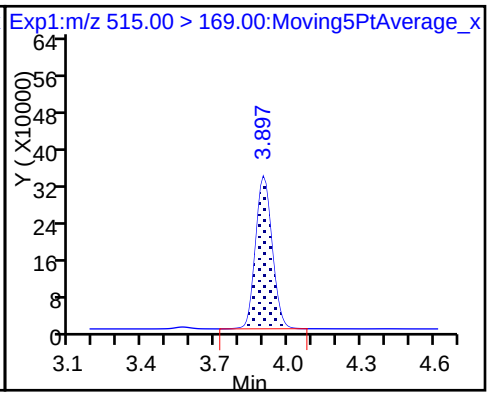
31 Perfluoroundecanoic acid



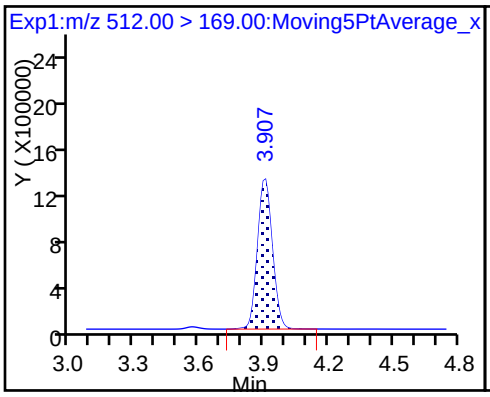
31 Perfluoroundecanoic acid



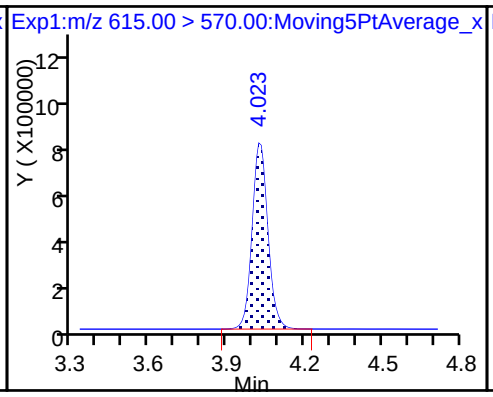
D 34 d-N-MeFOSA-M



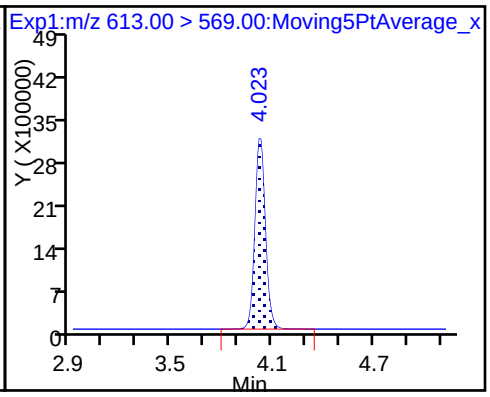
35 MeFOSA



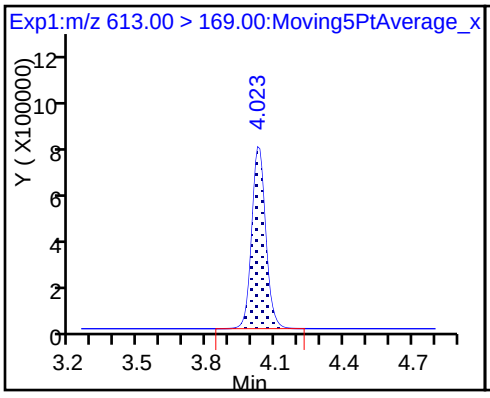
D 36 13C2 PFDoA



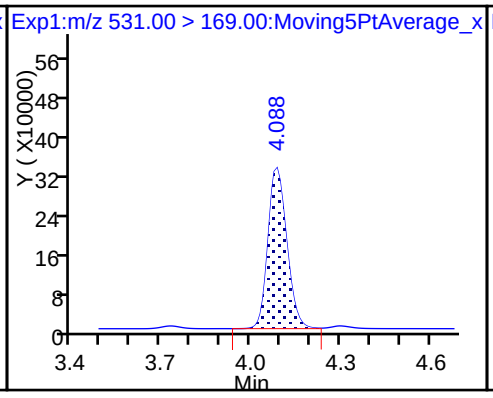
37 Perfluorododecanoic acid



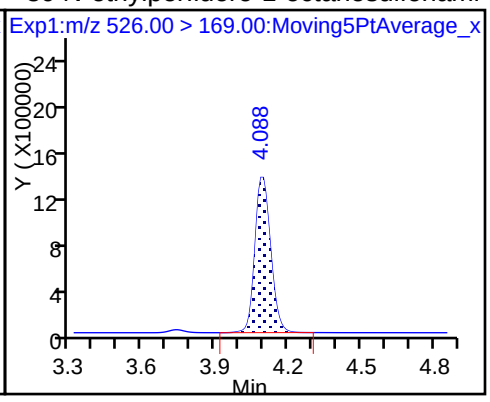
37 Perfluorododecanoic acid



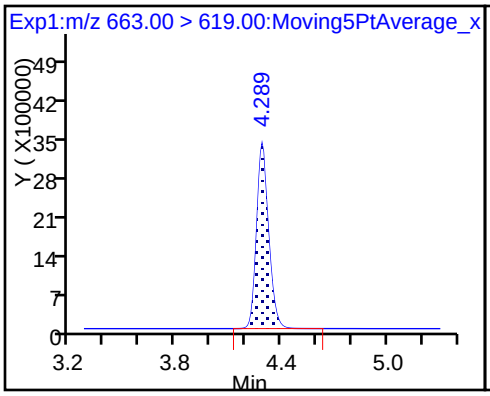
D 38 d-N-EtFOSA-M



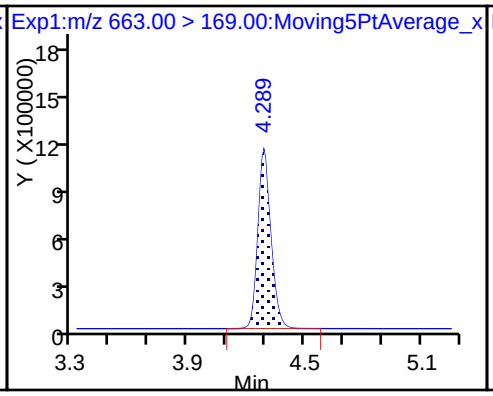
39 N-ethylperfluoro-1-octanesulfonami



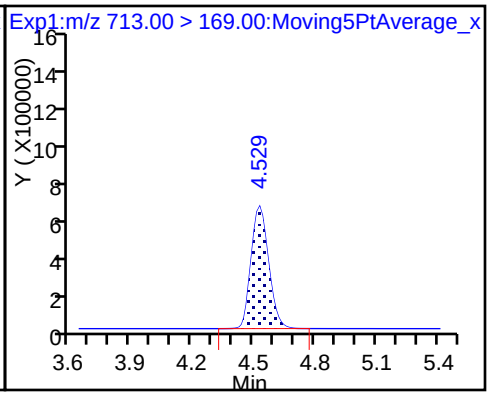
41 Perfluorotridecanoic acid



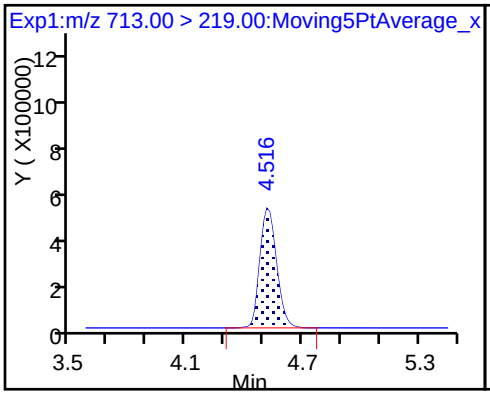
41 Perfluorotridecanoic acid



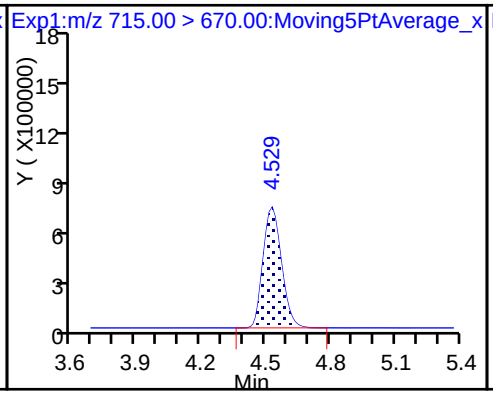
42 Perfluorotetradecanoic acid



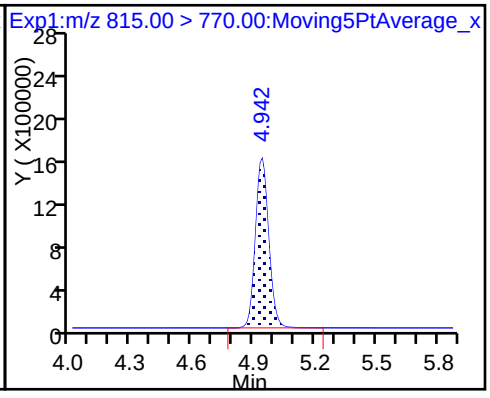
42 Perfluorotetradecanoic acid



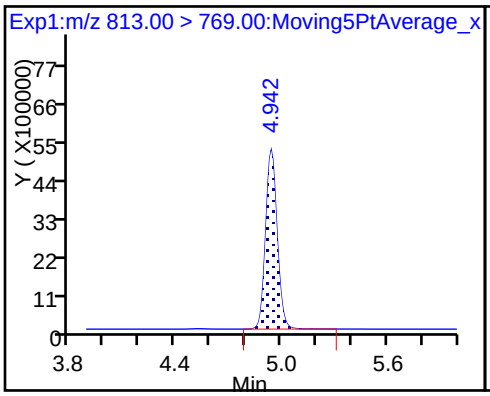
D 43 13C2-PFTeDA



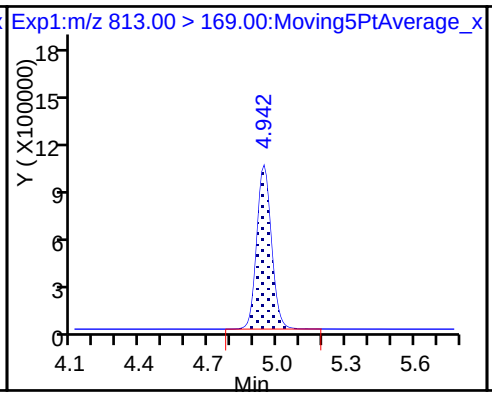
D 44 13C2-PFHxDA



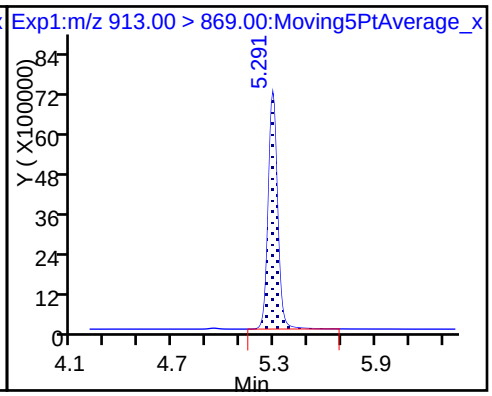
45 Perfluorohexadecanoic acid



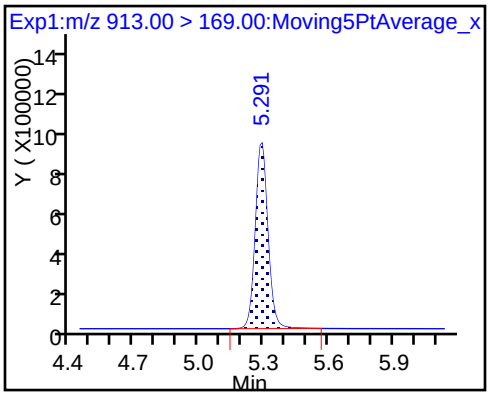
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_009.d
Lims ID: IC L8 Full
Client ID:
Sample Type: IC Calib Level: 8
Inject. Date: 16-Nov-2017 14:15:26 ALS Bottle#: 35 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L8-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub19

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Nov-2017 10:26:46 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 17-Nov-2017 10:10:03

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.480	1.479	0.001	0.552	7175815	2.72		109	70389	
2 Perfluorobutyric acid										
212.90 > 169.00	1.480	1.480	0.0	1.000	48504541	18.5		92.3	14425	
D 3 13C5-PFPeA										
267.90 > 223.00	1.739	1.738	0.001	0.649	4330436	2.60		104	51097	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.739	1.740	-0.001	1.000	35544778	18.2		91.0	29003	
D 47 13C3-PFBS										
301.90 > 83.00	1.772	1.774	-0.002	0.661	95009	2.61		112	2237	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.772	1.776	-0.004	1.000	43733553	14.4		81.5	127728	
298.90 > 99.00	1.772	1.776	-0.004	1.000	21200450		2.06(1.74-3.24)	81.5	164250	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.973	1.977	-0.004	1.000	13320442	27.7		148	270038	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.014	2.010	0.004	1.005	35161513	17.8		89.1	358255	
313.00 > 119.00	2.014	2.010	0.004	1.005	3584164		9.81(7.05-13.09)	89.1	47266	
D 7 13C2 PFHxA										
315.00 > 270.00	2.004	2.010	-0.006	0.748	4928948	2.62		105	51677	
D 9 13C4-PFHpA										
367.00 > 322.00	2.334	2.332	0.002	0.871	4519230	2.48		99.4	35489	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.334	2.333	0.001	1.000	33933295	18.3		91.6	48915	
363.00 > 169.00	2.334	2.333	0.001	1.000	14766365		2.30(1.59-2.95)	91.6	58857	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.344	2.347	-0.003	1.000	38397438	16.4		89.9	36142	
399.00 > 99.00	2.344	2.347	-0.003	1.000	14089082		2.73(2.10-3.89)	89.9	29498	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.344	2.347	-0.003	0.875	5066637	2.36		99.8	37989	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.666	2.671	-0.004	0.997	20038148	19.3		102	120665	
D 12 M2-6:2FTS										
429.00 > 81.00	2.673	2.671	0.002	0.997	1533486	1.68		70.9	26182	
D 14 13C4 PFOA										
417.00 > 372.00	2.680	2.680	0.0	1.000	5172731	2.48		99.2	42403	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.680	2.680	0.0	1.000	37306505	17.1		85.5	14258	
413.00 > 169.00	2.680	2.680	0.0	1.000	21416921		1.74(1.18-2.19)	85.5	59205	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.688	2.687	0.001	1.000	32673416	16.9		88.8	89106	
449.00 > 99.00	2.688	2.687	0.001	1.000	10010318		3.26(2.72-5.05)	88.8	37998	
* 62 13C2-PFOA										
415.00 > 370.00	2.680	2.695	-0.015		5061276	2.50			43475	
D 18 13C4 PFOS										
503.00 > 80.00	3.045	3.042	0.003	1.136	3528339	2.46		103	15262	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.045	3.042	0.003	1.000	28442036	18.4		98.9	34198	
499.00 > 99.00	3.045	3.042	0.003	1.000	6491585		4.38(3.24-6.01)	98.9	80785	
D 19 13C5 PFNA										
468.00 > 423.00	3.045	3.042	0.003	1.136	3882012	2.53		101	40179	
20 Perfluorononanoic acid										
463.00 > 419.00	3.045	3.045	0.0	1.000	28564550	18.4		92.2	53041	
463.00 > 169.00	3.045	3.045	0.0	1.000	7575607		3.77(2.65-4.93)	92.2	58468	
D 26 M2-8:2FTS										
529.00 > 81.00	3.393	3.390	0.003	1.266	1158291	2.39		99.9	19191	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.393	3.392	0.001	1.000	11075967	18.9		98.4	76736	
D 21 13C8 FOSA										
506.00 > 78.00	3.393	3.393	0.0	1.266	4665749	2.53		101	23375	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.393	3.395	-0.002	1.000	31041452	17.3		86.6	81600	
D 23 13C2 PFDA										
515.00 > 470.00	3.400	3.400	0.0	1.269	3413649	2.64		106	33307	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.400	3.400	0.0	1.000	24327508	18.3		91.7	76059	
513.00 > 169.00	3.400	3.400	0.0	1.000	4769958		5.10(3.31-6.15)	91.7	2405	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.559	3.557	0.002	1.328	1778417	2.56		102	10996	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.559	3.561	-0.002	1.000	14796369	19.8		99.2	37103	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.714	3.714	0.0	1.000	16403565	18.4		95.4	111806	
599.00 > 99.00	3.714	3.714	0.0	1.000	5714905		2.87(1.94-3.60)	95.4	52039	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.723	3.725	-0.002	1.389	1477824	2.21		88.6	10569	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFUnA										
565.00 > 520.00	3.732	3.730	0.002	1.392	2530870	2.45		98.0	25678	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.732	3.731	0.001	1.002	12168812	21.5		107	24247	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.732	3.731	0.001	1.000	18023951	19.7		98.3	46919	
563.00 > 169.00	3.732	3.731	0.001	1.000	4040650		4.46(0.00-0.00)	98.3	56675	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.895	3.896	-0.001	1.453	1536293	2.87		115	3658	
35 MeFOSA										
512.00 > 169.00	3.905	3.903	0.002	1.003	11542463	19.1		95.7	3604	
D 36 13C2 PFDoA										
615.00 > 570.00	4.028	4.024	0.004	1.503	3037495	2.53		101	38112	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.028	4.025	0.003	1.000	21984506	18.5		92.3	76593	
613.00 > 169.00	4.028	4.025	0.003	1.000	5856677		3.75(2.19-4.07)	92.3	53312	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.085	4.084	0.001	1.524	1395035	2.80		112	1357	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.095	4.091	0.004	1.002	11220168	20.1		100	3188	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.287	4.287	0.0	1.000	26948788	18.1		90.6	83345	
663.00 > 169.00	4.287	4.287	0.0	1.000	9232277		2.92(1.76-3.26)	90.6	131025	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.527	4.526	0.001	1.689	3641191	2.47		98.8	36079	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.527	4.526	0.001	1.000	6859088	19.2		96.0	45991	
713.00 > 219.00	4.514	4.526	-0.012	0.997	5079159		1.35(1.00-1.85)	96.0	42562	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.940	4.938	0.002	1.843	6515348	2.50		99.9	30931	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.940	4.939	0.001	1.000	36818628	15.9		79.5	17589	
813.00 > 169.00	4.940	4.939	0.001	1.000	8009994		4.60(2.50-4.65)	79.5	22411	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.289	5.286	0.003	1.000	42176267	16.3		81.3	7724	
913.00 > 169.00	5.282	5.286	-0.004	0.999	6722298		6.27(0.00-0.00)	81.3	6394	

Reagents:

LCPFC_LL8_00001 Amount Added: 1.00 Units: mL

Report Date: 17-Nov-2017 10:26:46 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_009.d

Injection Date: 16-Nov-2017 14:15:26 Instrument ID: A8_N

Lims ID: IC L8 Full

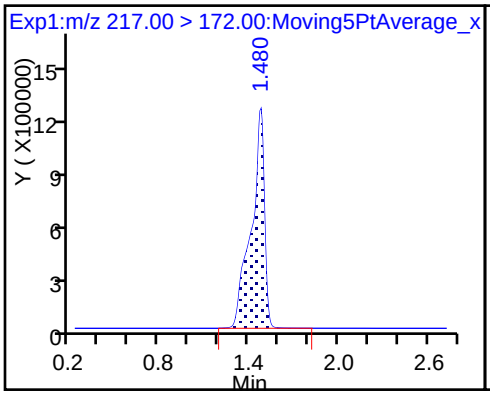
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 35 Worklist Smp#: 9

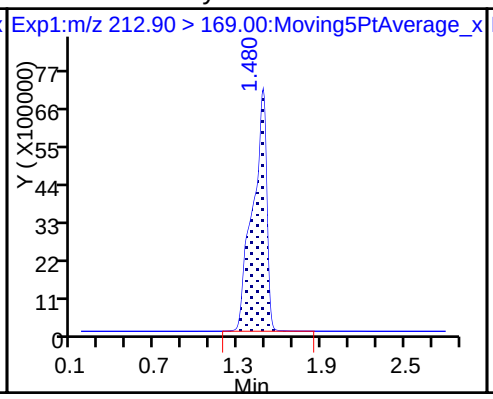
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

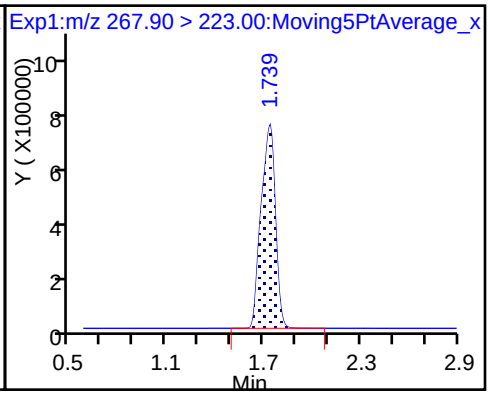
D 1 13C4 PFBA



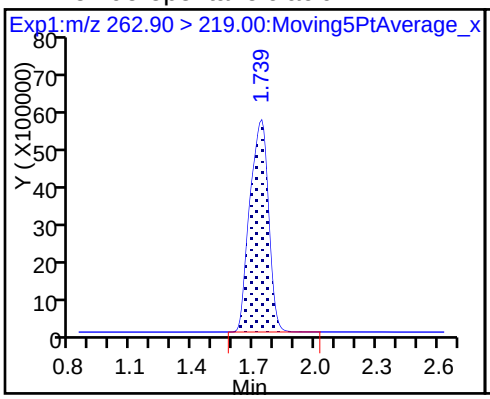
2 Perfluorobutyric acid



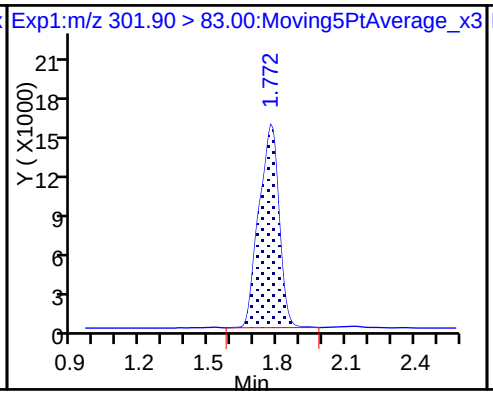
D 3 13C5-PFPeA



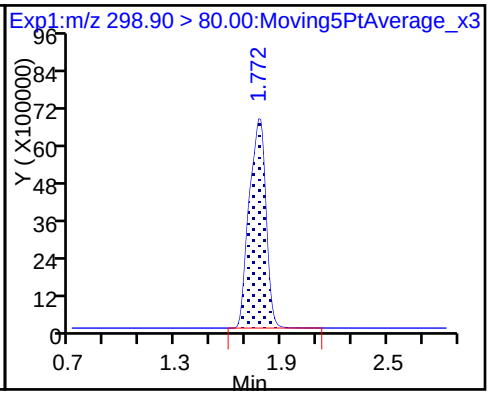
4 Perfluoropentanoic acid



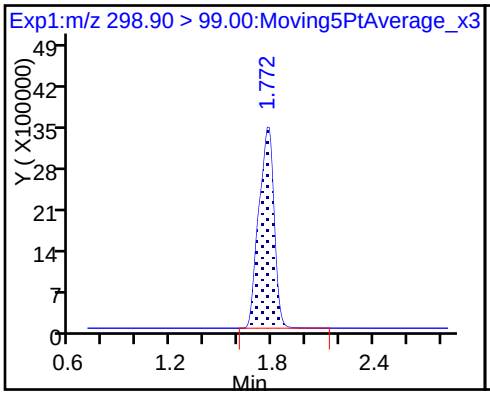
D 47 13C3-PFBS



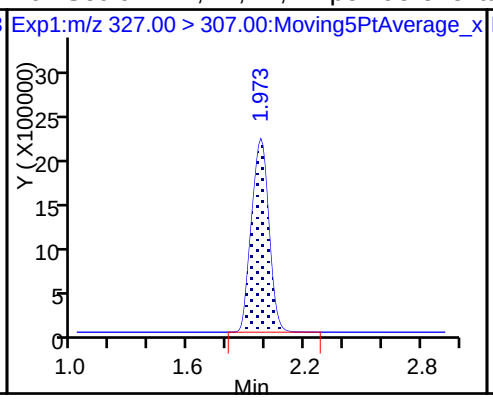
5 Perfluorobutanesulfonic acid



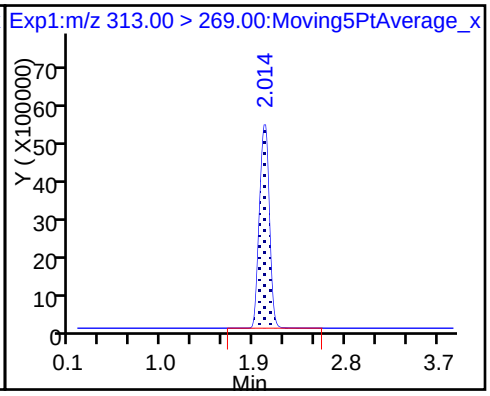
5 Perfluorobutanesulfonic acid



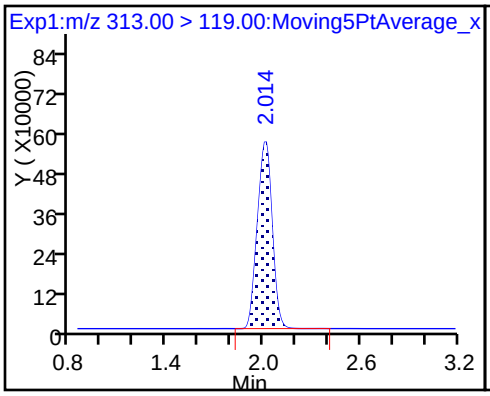
61 Sodium 1H,1H,2H,2H-perfluorohexane



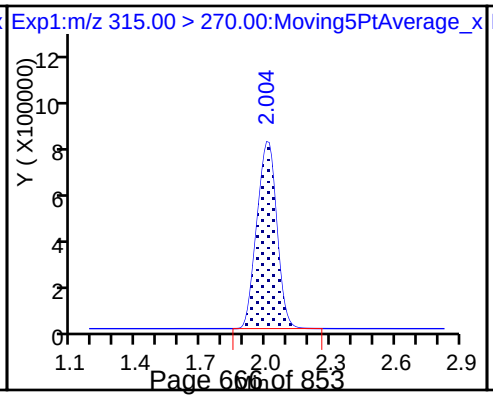
6 Perfluorohexanoic acid



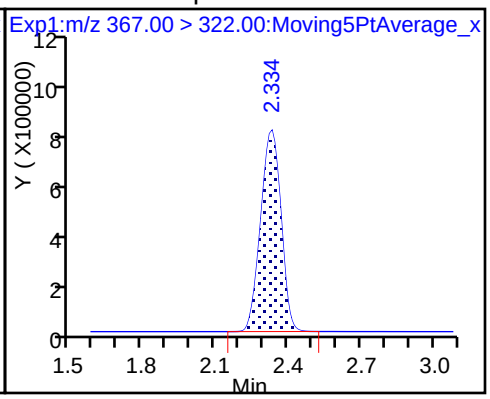
6 Perfluorohexanoic acid



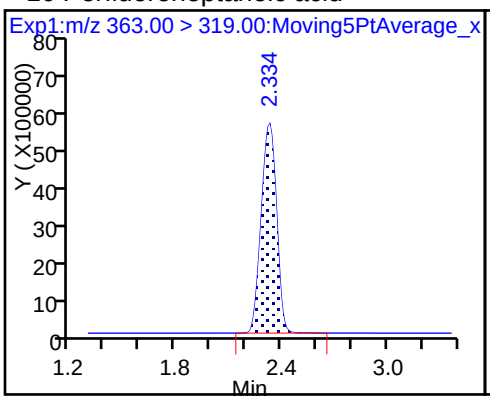
D 7 13C2 PFHxA



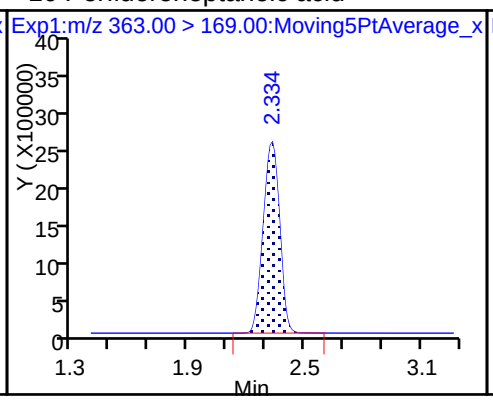
D 9 13C4-PFHpA



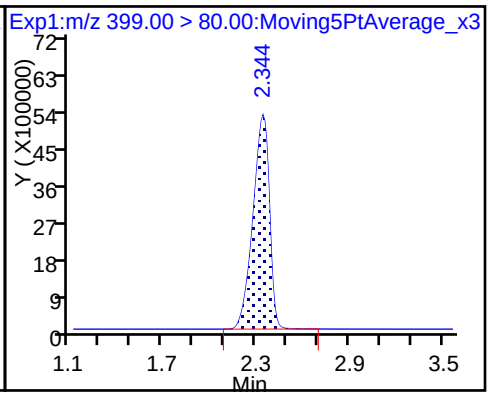
10 Perfluoroheptanoic acid



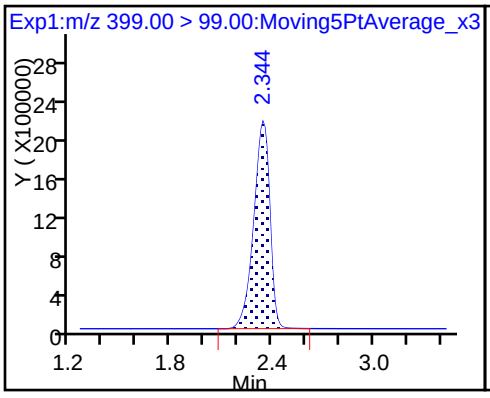
10 Perfluoroheptanoic acid



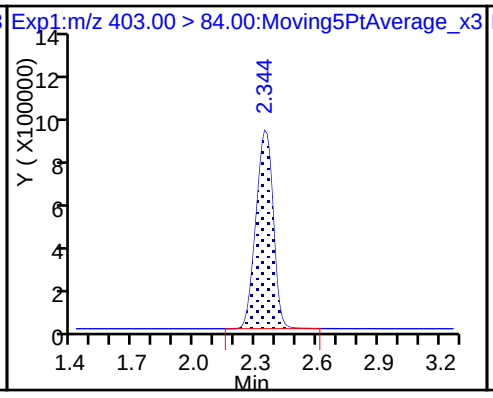
8 Perfluorohexanesulfonic acid



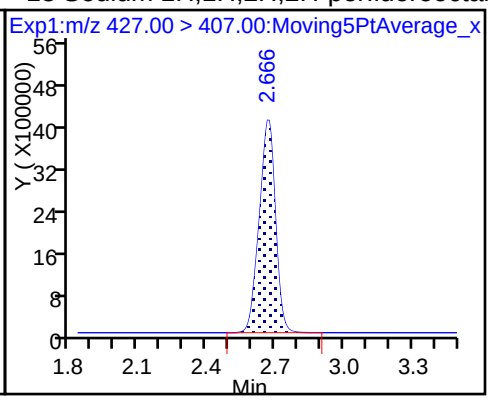
8 Perfluorohexanesulfonic acid



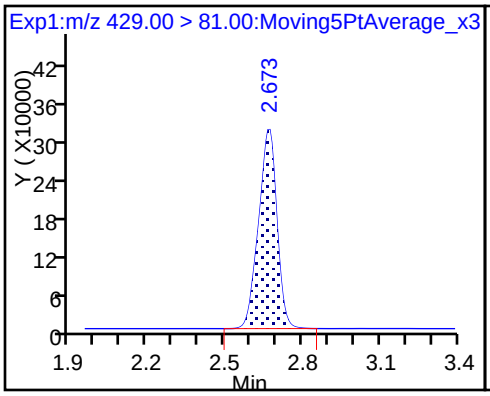
D 11 18O2 PFHxS



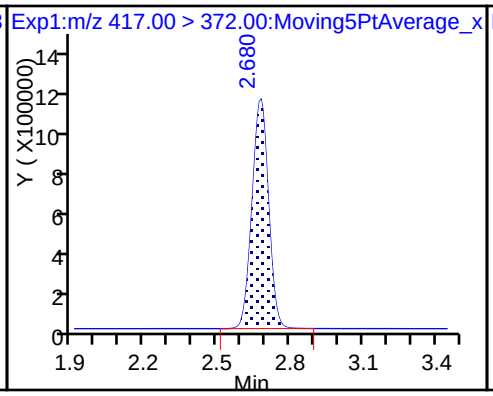
13 Sodium 1H,1H,2H,2H-perfluorooctane



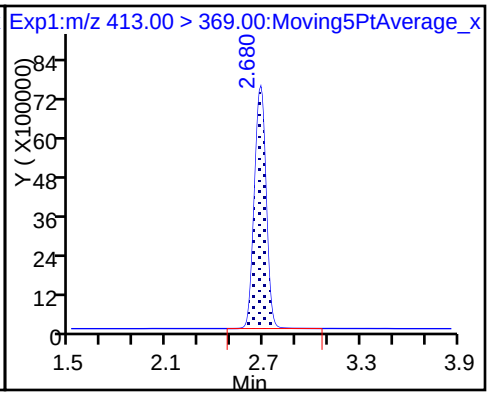
D 12 M2-6:2FTS



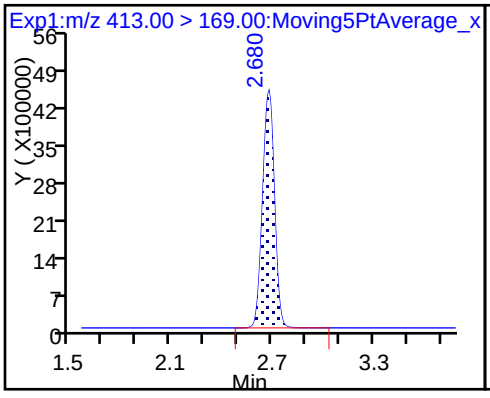
D 14 13C4 PFOA



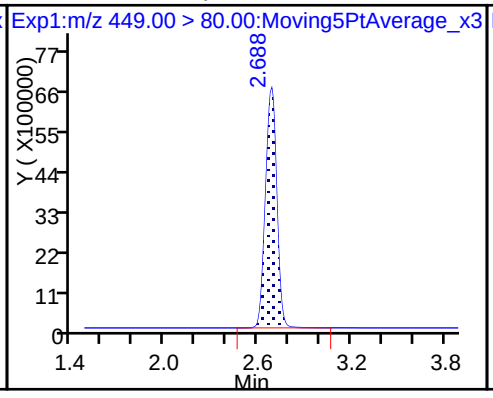
15 Perfluorooctanoic acid



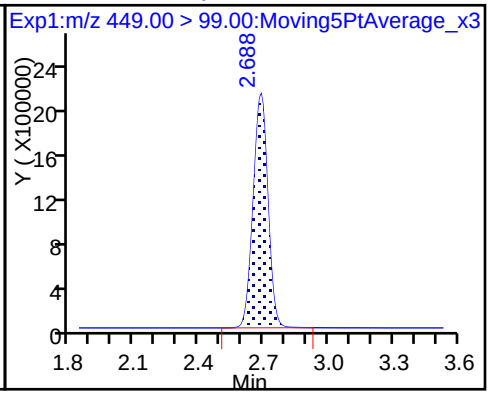
15 Perfluorooctanoic acid



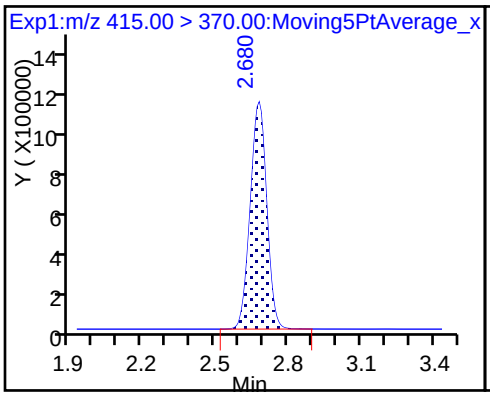
16 Perfluoroheptanesulfonic Acid



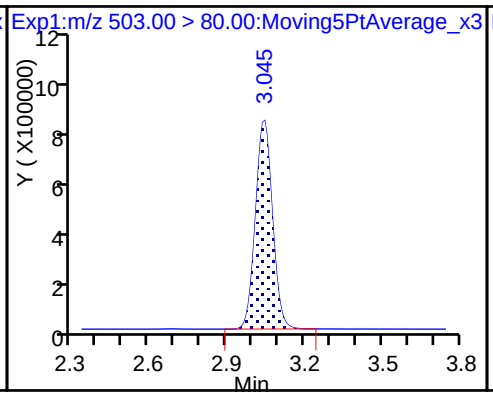
16 Perfluoroheptanesulfonic Acid



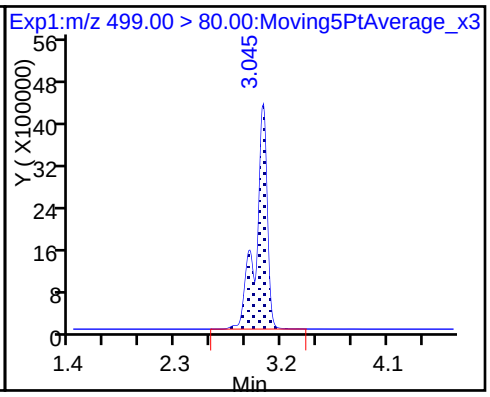
* 62 13C2-PFOA



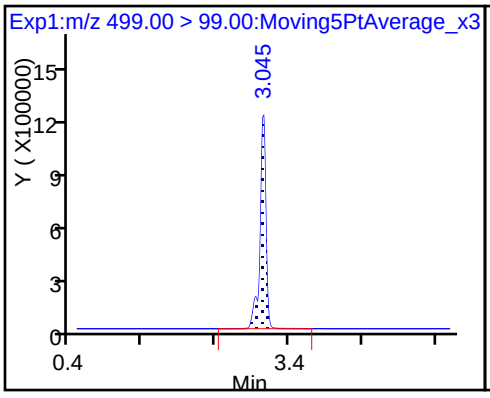
D 18 13C4 PFOS



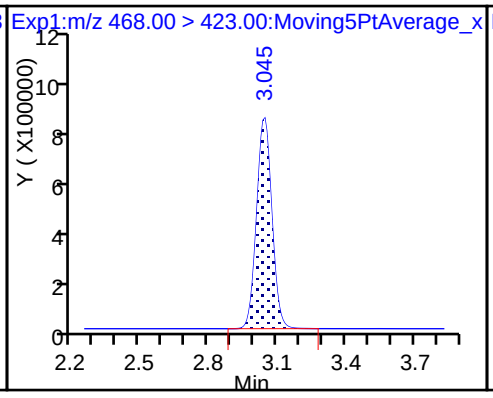
17 Perfluorooctane sulfonic acid



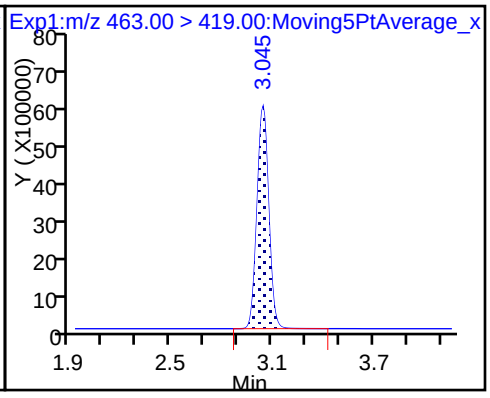
17 Perfluorooctane sulfonic acid



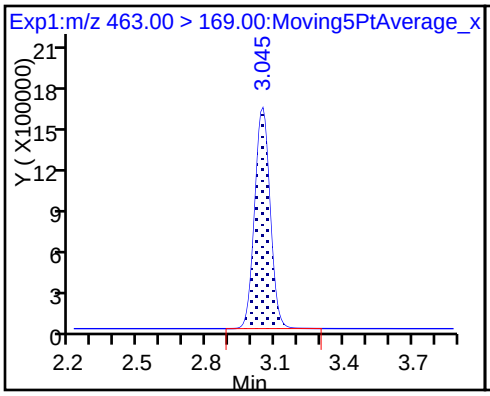
D 19 13C5 PFNA



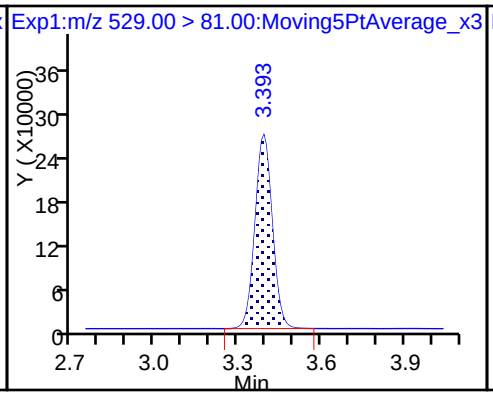
20 Perfluorononanoic acid



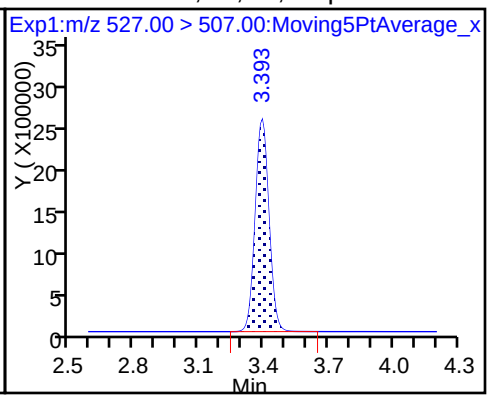
20 Perfluorononanoic acid



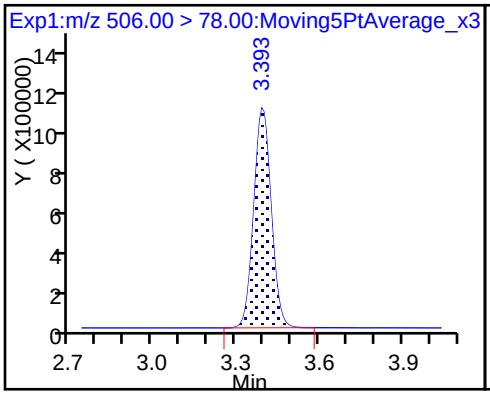
D 26 M2-8:2FTS



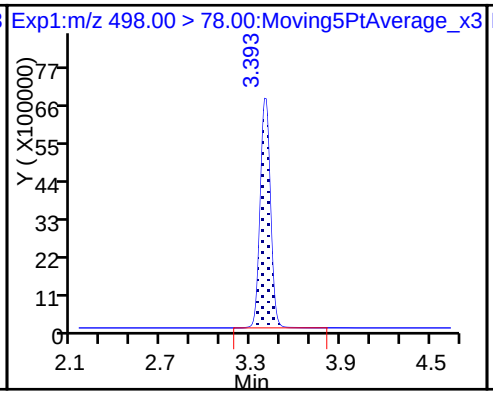
25 Sodium 1H,1H,2H,2H-perfluorodecane



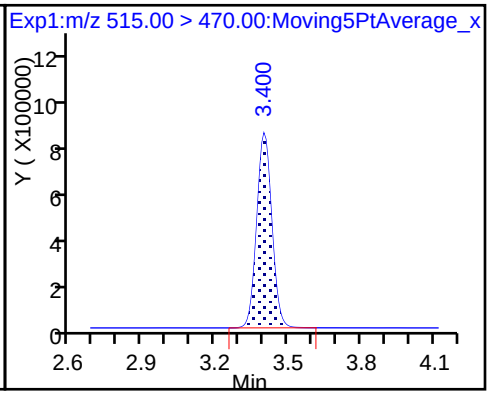
D 21 13C8 FOSA



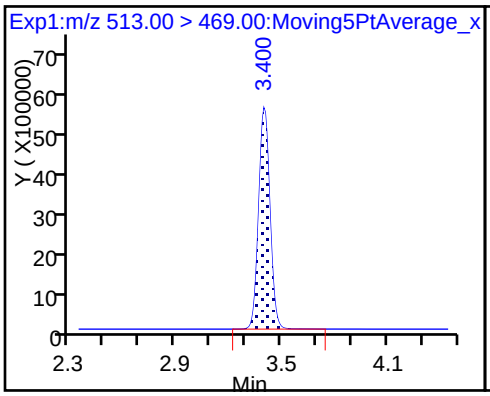
22 Perfluorooctane Sulfonamide



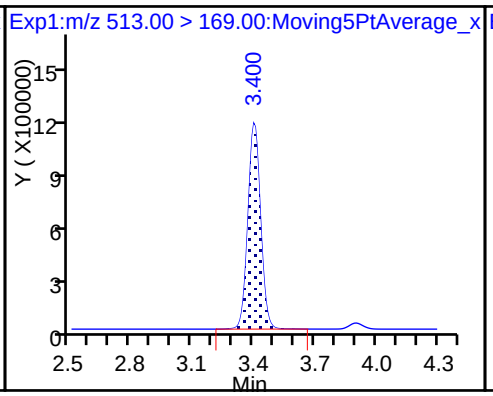
D 23 13C2 PFDA



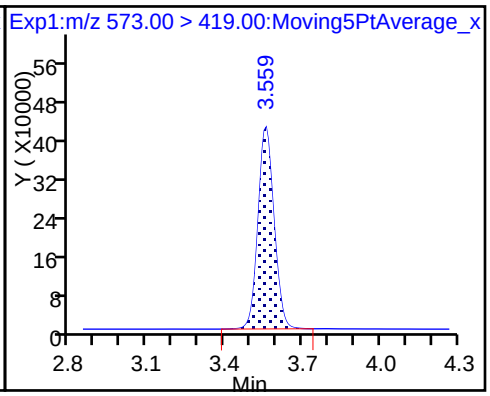
24 Perfluorodecanoic acid



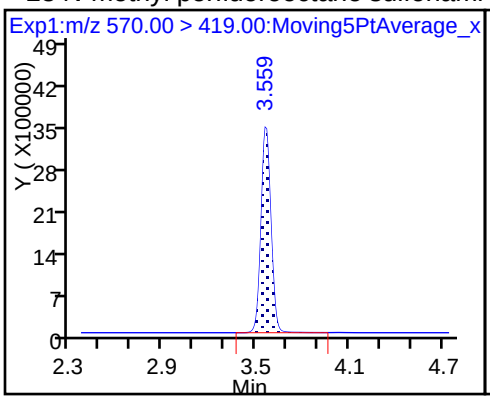
24 Perfluorodecanoic acid



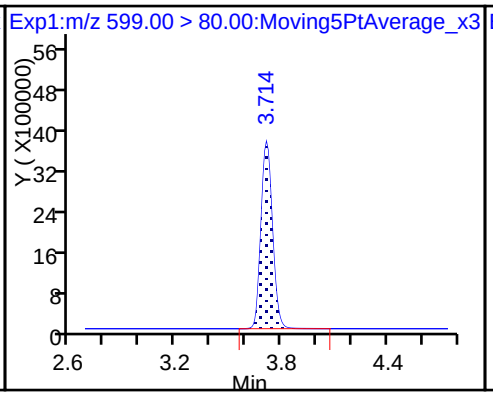
D 27 d3-NMeFOSAA



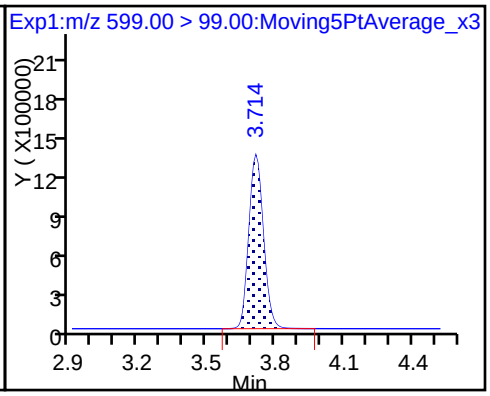
28 N-methyl perfluorooctane sulfonami



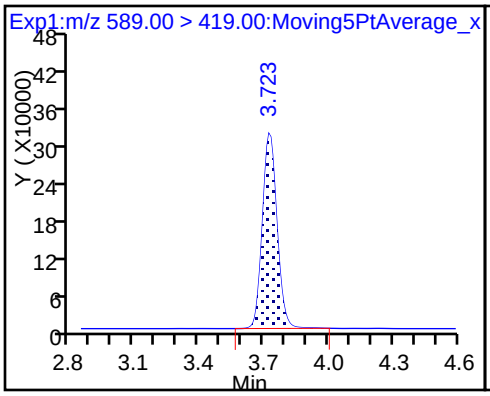
29 Perfluorodecane Sulfonic acid



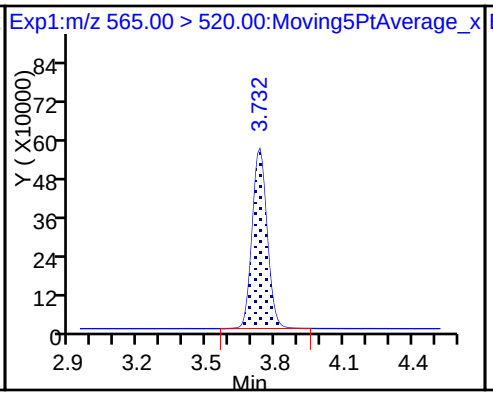
29 Perfluorodecane Sulfonic acid



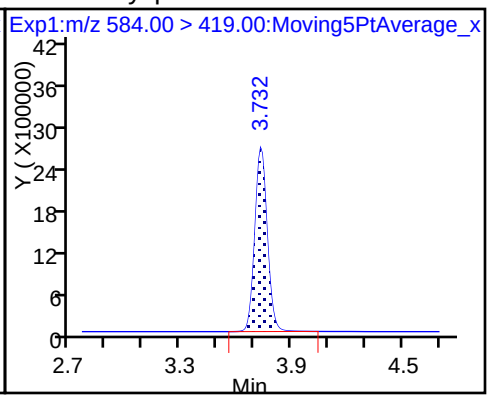
D 32 d5-NEtFOSAA



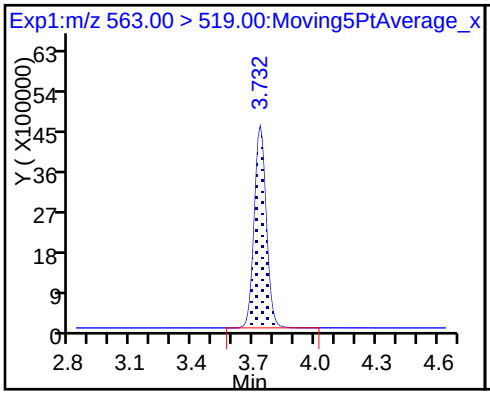
D 30 13C2 PFUnA



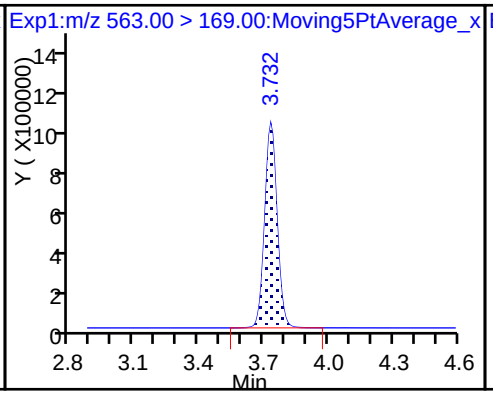
33 N-ethyl perfluorooctane sulfonamid



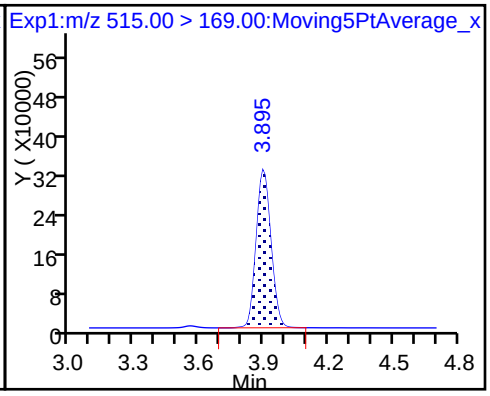
31 Perfluoroundecanoic acid



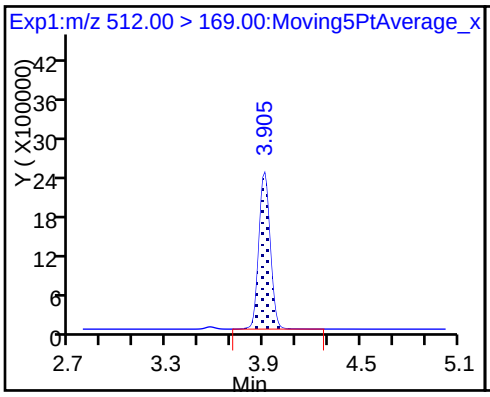
31 Perfluoroundecanoic acid



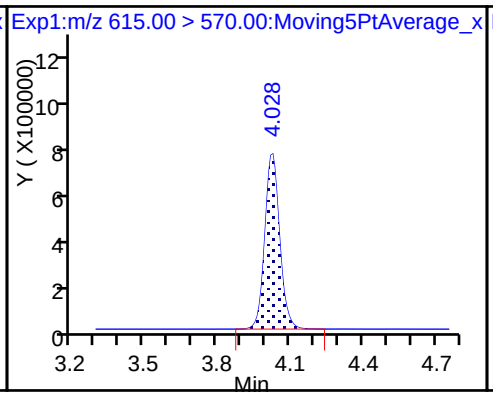
D 34 d-N-MeFOSA-M



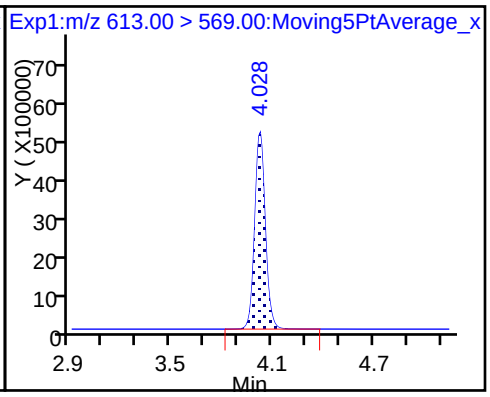
35 MeFOSA



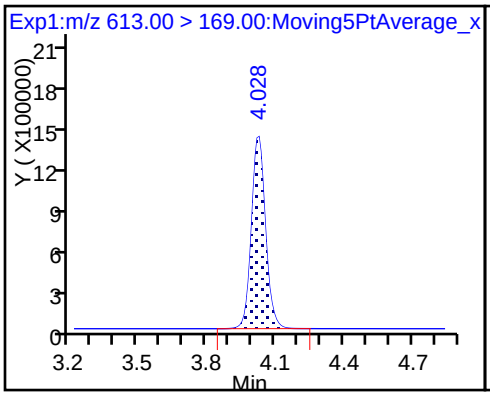
D 36 13C2 PFDoA



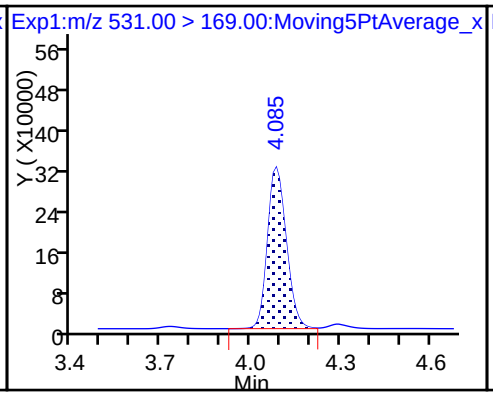
37 Perfluorododecanoic acid



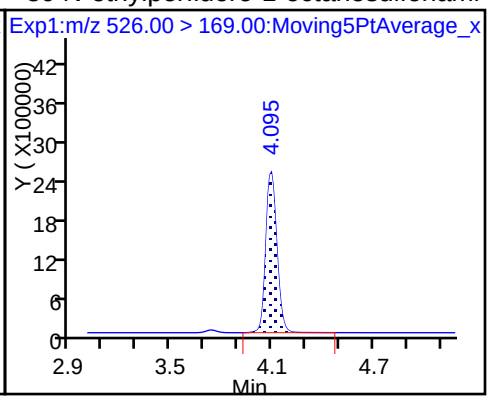
37 Perfluorododecanoic acid



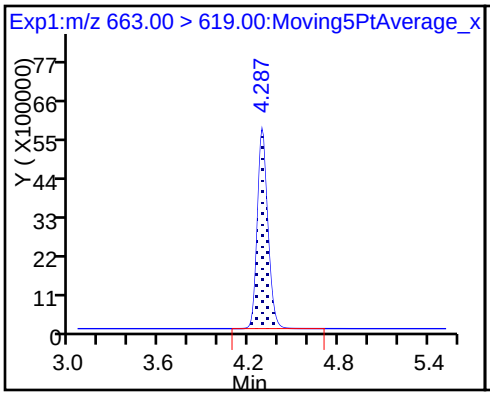
D 38 d-N-EtFOSA-M



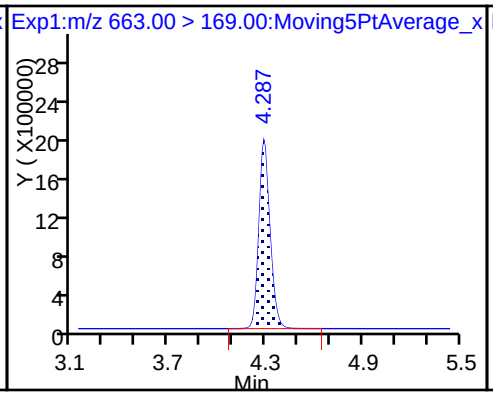
39 N-ethylperfluoro-1-octanesulfonami



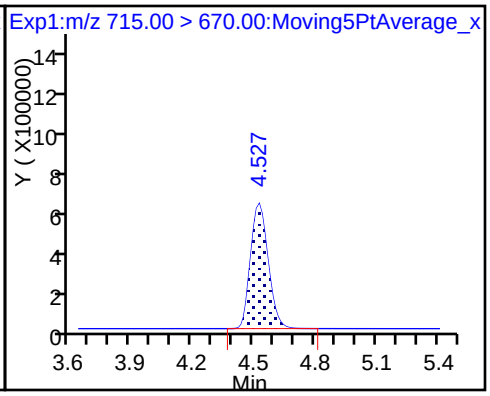
41 Perfluorotridecanoic acid



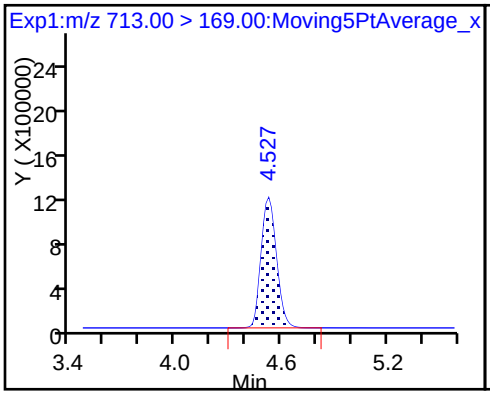
41 Perfluorotridecanoic acid



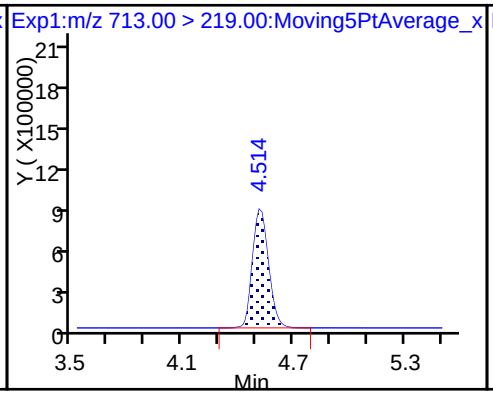
D 43 13C2-PFTeDA



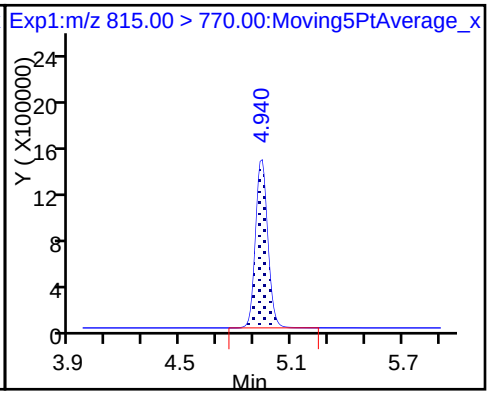
42 Perfluorotetradecanoic acid



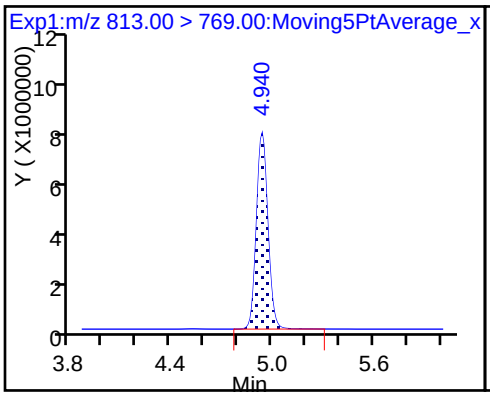
42 Perfluorotetradecanoic acid



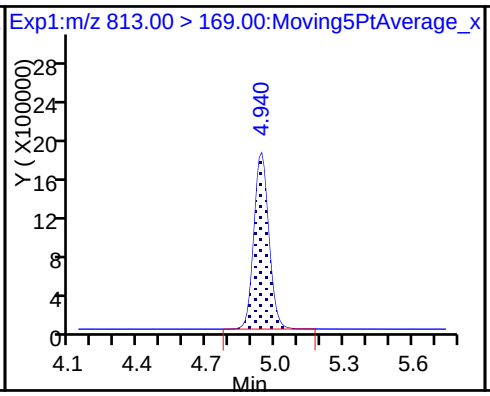
D 44 13C2-PFHxDA



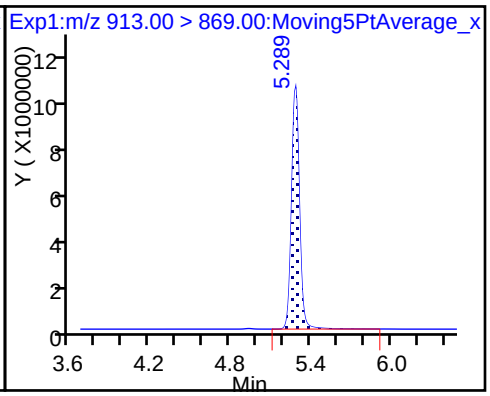
45 Perfluorohexadecanoic acid



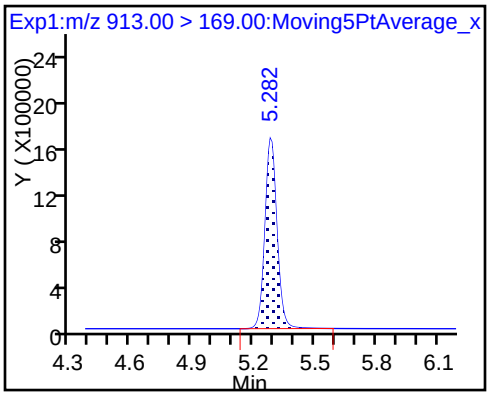
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d
Lims ID: IC M2-4:2FTS
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 16-Nov-2017 14:23:17 ALS Bottle#: 22 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: M2:4-2FTS Calibration Std
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub19

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Nov-2017 10:30:57 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK001

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 60 M2-4:2FTS										
329.00 > 81.00	1.983	1.983	0.0	0.738	934783	NC			43648	
* 62 13C2-PFOA										
415.00 > 370.00	2.686	2.695	-0.009		6343839	2.50			55034	

QC Flag Legend

Processing Flags
NC - Not Calibrated

Reagents:

LCM2-4:2LLIC_00002 Amount Added: 1.00 Units: mL

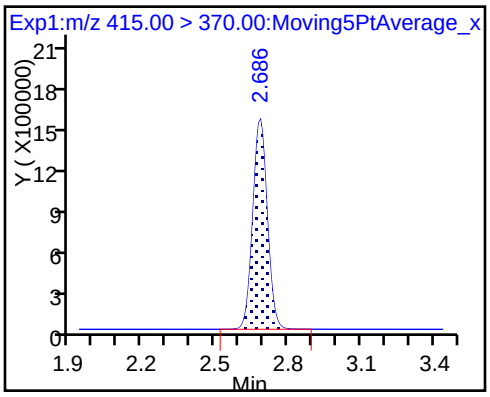
Report Date: 17-Nov-2017 10:30:58 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Injection Date:	16-Nov-2017 14:23:17	Instrument ID:	A8_N		
Lims ID:	IC M2-4:2FTS				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	22	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

* 62 13C2-PFOA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: ICV 320-195190/12 Calibration Date: 11/16/2017 14:38

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.16LLICAL_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9101		2.49	2.50	-0.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.122		2.49	2.50	-0.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	77.16		2.30	2.21	3.8	25.0
4:2 FTS	AveID	0.7456	0.9906		3.10	2.34	32.8*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	0.9920		2.48	2.50	-0.8	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	1.009		2.46	2.50	-1.6	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	0.9794		2.11	2.36	-10.6	25.0
6:2FTS	AveID	1.605	1.594		2.35	2.37	-0.6	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.087		2.58	2.50	3.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.341		2.44	2.38	2.5	25.0
Perfluorononanoic acid (PFNA)	AveID	0.997	1.008		2.53	2.50	1.1	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.014		2.31	2.39	-3.4	25.0
8:2FTS	AveID	1.214	1.244		2.45	2.40	2.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	0.9538		2.46	2.50	-1.8	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	0.9652		2.51	2.50	0.5	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	0.9928		2.37	2.50	-5.3	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.6322		2.52	2.41	4.6	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9253		2.41	2.50	-3.5	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.8861		2.45	2.50	-2.1	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	1.005		2.56	2.50	2.6	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.197		2.45	2.50	-2.2	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2334		2.38	2.50	-4.8	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8715		2.43	2.50	-2.6	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	0.9773		2.46	2.50	-1.8	25.0
MeFOSA	AveID	0.9814			0.500	2.50		
N-EtFOSA-M	AveID	1.002			0.500	2.50		
13C4 PFBA	Ave	1.301	1.313		2.52	2.50	0.9	50.0
13C5 PFPeA	Ave	0.8240	0.8241		2.50	2.50	0.0	50.0
13C3-PFBS	Ave	0.0180	0.0182		2.35	2.33	1.0	50.0
13C2 PFHxA	Ave	0.9302	0.9047		2.43	2.50	-2.7	50.0
13C4-PFHpA	Ave	0.8986	0.9013		2.51	2.50	0.3	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: ICV 320-195190/12 Calibration Date: 11/16/2017 14:38

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.16LLICAL_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.049		2.34	2.37	-1.1	50.0
M2-6:2FTS	Ave	0.4500	0.3449		1.82	2.38	-23.4	50.0
13C4 PFOA	Ave	1.030	0.9631		2.34	2.50	-6.5	50.0
13C4 PFOS	Ave	0.7080	0.7037		2.38	2.39	-0.6	50.0
13C5 PFNA	Ave	0.7570	0.7619		2.52	2.50	0.6	50.0
13C8 FOSA	Ave	0.9121	0.9041		2.48	2.50	-0.9	50.0
M2-8:2FTS	Ave	0.2391	0.2295		2.30	2.40	-4.0	50.0
13C2 PFDA	Ave	0.6386	0.6509		2.55	2.50	1.9	50.0
d3-NMeFOSAA	Ave	0.3429	0.3569		2.60	2.50	4.1	50.0
d5-NEtFOSAA	Ave	0.3296	0.3531		2.68	2.50	7.2	50.0
13C2 PFUnA	Ave	0.5100	0.4952		2.43	2.50	-2.9	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2589		2.45	2.50	-2.2	50.0
13C2 PFDoA	Ave	0.5923	0.5815		2.45	2.50	-1.8	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2555		2.60	2.50	4.0	50.0
13C2-PFTeDA	Ave	0.7282	0.7378		2.53	2.50	1.3	50.0
13C2-PFHxDA	Ave	1.288	1.281		2.49	2.50	-0.6	50.0

FORM VII 537 (modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_012.d
Lims ID: ICV Full
Client ID:
Sample Type: ICV
Inject. Date: 16-Nov-2017 14:38:59 ALS Bottle#: 36 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Nov-2017 10:32:22 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 16-Nov-2017 16:39:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.480	1.479	0.001	0.552	7014385	2.52		101	60141	
2 Perfluorobutyric acid										
212.90 > 169.00	1.480	1.480	0.0	1.000	6383466	2.49			2221	
D 3 13C5-PFPeA										
267.90 > 223.00	1.739	1.738	0.001	0.649	4401420	2.50		100	69123	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.739	1.740	-0.001	1.000	4936784	2.49			4472	
D 47 13C3-PFBS										
301.90 > 83.00	1.772	1.774	-0.002	0.661	90374	2.35		101	2456	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.780	1.776	0.004	1.005	6635658	2.30			46836	
298.90 > 99.00	1.780	1.776	0.004	1.005	2741496		2.42(1.74-3.24)		41680	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.973	1.977	-0.004	1.000	1704328	3.10			68402	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.014	2.010	0.004	1.000	4793745	2.48			10571	
313.00 > 119.00	2.014	2.010	0.004	1.000	445917		10.75(7.05-13.09)		5890	
D 7 13C2 PFHxA										
315.00 > 270.00	2.014	2.010	0.004	0.752	4832205	2.43		97.3	40544	
D 9 13C4-PFHpA										
367.00 > 322.00	2.334	2.332	0.002	0.871	4814125	2.51		100	35322	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.334	2.333	0.001	1.000	4858159	2.46			7559	
363.00 > 169.00	2.334	2.333	0.001	1.000	1870205		2.60(1.59-2.95)		11365	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.344	2.347	-0.003	1.000	5184915	2.11			14017	
399.00 > 99.00	2.344	2.347	-0.003	1.000	1708060		3.04(2.10-3.89)		10292	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.344	2.347	-0.003	0.875	5299821	2.34		98.9	32072	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.672	2.671	0.002	1.000	2784391	2.35			53833	
D 12 M2-6:2FTS										
429.00 > 81.00	2.672	2.671	0.001	0.997	1750065	1.82		76.6	33371	
D 14 13C4 PFOA										
417.00 > 372.00	2.679	2.680	-0.001	1.000	5144256	2.34		93.5	49179	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.679	2.680	-0.001	1.000	5591588	2.58			2222	
413.00 > 169.00	2.679	2.680	-0.001	1.000	2918736		1.92(1.18-2.19)		11338	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.686	2.687	-0.001	1.000	4799051	2.44			55008	
449.00 > 99.00	2.686	2.687	-0.001	1.000	1251674		3.83(2.72-5.05)		20862	
* 62 13C2-PFOA										
415.00 > 370.00	2.679	2.695	-0.016		5341159	2.50			42061	
D 18 13C4 PFOS										
503.00 > 80.00	3.044	3.042	0.002	1.136	3592983	2.38		99.4	23508	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.044	3.042	0.002	1.000	3639226	2.31			20537	
499.00 > 99.00	3.044	3.042	0.002	1.000	777245		4.68(3.24-6.01)		16758	
D 19 13C5 PFNA										
468.00 > 423.00	3.044	3.042	0.002	1.136	4069403	2.52		101	32240	
20 Perfluorononanoic acid										
463.00 > 419.00	3.044	3.045	-0.001	1.000	4103122	2.53			7203	
463.00 > 169.00	3.044	3.045	-0.001	1.000	952890		4.31(2.65-4.93)		19204	
D 26 M2-8:2FTS										
529.00 > 81.00	3.391	3.390	0.001	1.266	1174462	2.30		96.0	25067	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.391	3.392	-0.001	1.000	1461373	2.45			26758	
D 21 13C8 FOSA										
506.00 > 78.00	3.391	3.393	-0.002	1.266	4828663	2.48		99.1	29847	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.398	3.395	0.003	1.002	4660522	2.51			31838	
D 23 13C2 PFDA										
515.00 > 470.00	3.398	3.400	-0.002	1.269	3476422	2.55		102	33704	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.398	3.400	-0.002	1.000	3315881	2.46			14282	
513.00 > 169.00	3.398	3.400	-0.002	1.000	561689		5.90(3.31-6.15)		13528	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.557	3.557	0.0	1.328	1906252	2.60		104	16181	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.557	3.561	-0.004	1.000	1892589	2.37			7916	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.712	3.714	-0.002	1.000	2292669	2.52			29594	
599.00 > 99.00	3.712	3.714	-0.002	1.000	758374		3.02(1.94-3.60)		14566	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.720	3.725	-0.005	1.389	1886113	2.68		107	10663	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFUnA										
565.00 > 520.00	3.729	3.730	-0.001	1.392	2645144	2.43		97.1	27626	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.729	3.731	-0.002	1.002	1745131	2.41			14361	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.729	3.731	-0.002	1.000	2343888	2.45			11414	
563.00 > 169.00	3.729	3.731	-0.002	1.000	503117		4.66(0.00-0.00)		11718	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.892	3.896	-0.004	1.453	1382815	2.45		97.8	2803	
D 36 13C2 PFDoA										
615.00 > 570.00	4.026	4.024	0.002	1.503	3105860	2.45		98.2	31119	
37 Perfluorododecanoic acid										R
613.00 > 569.00	4.026	4.025	0.001	1.000	3120873	2.56			17447	R
613.00 > 169.00	4.026	4.025	0.001	1.000	739966		4.22(2.19-4.07)		29636	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.083	4.084	-0.001	1.524	1364751	2.60		104	2091	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.286	4.287	-0.001	1.000	3719169	2.45			13522	
663.00 > 169.00	4.286	4.287	-0.001	1.000	1148964		3.24(1.76-3.26)		36341	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.519	4.526	-0.007	1.687	3940420	2.53		101	35070	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.519	4.526	-0.007	1.000	919748	2.38			17156	
713.00 > 219.00	4.519	4.526	-0.007	1.000	661365		1.39(1.00-1.85)		18831	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.934	4.938	-0.004	1.842	6840307	2.49		99.4	19866	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.934	4.939	-0.005	1.000	5960994	2.43			3992	R
813.00 > 169.00	4.934	4.939	-0.005	1.000	977489		6.10(2.50-4.65)		10632	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.285	5.286	-0.001	1.000	6685287	2.46			1914	
913.00 > 169.00	5.285	5.286	-0.001	1.000	776956		8.60(0.00-0.00)		2942	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Reagents:

LCPFCIC_FULL_00007 Amount Added: 0.25 Units: mL

Report Date: 17-Nov-2017 10:32:23 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_012.d

Injection Date: 16-Nov-2017 14:38:59 Instrument ID: A8_N

Lims ID: ICV Full

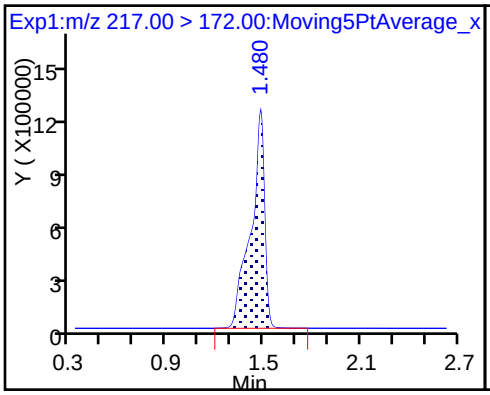
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 36 Worklist Smp#: 12

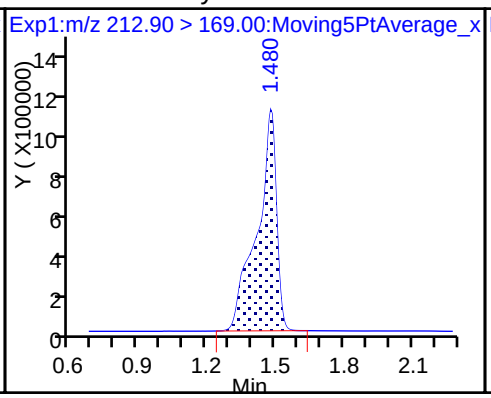
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

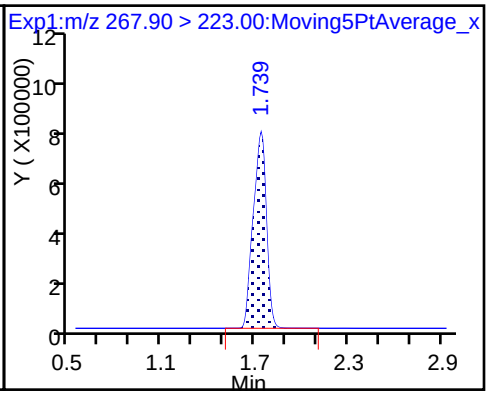
D 1 13C4 PFBA



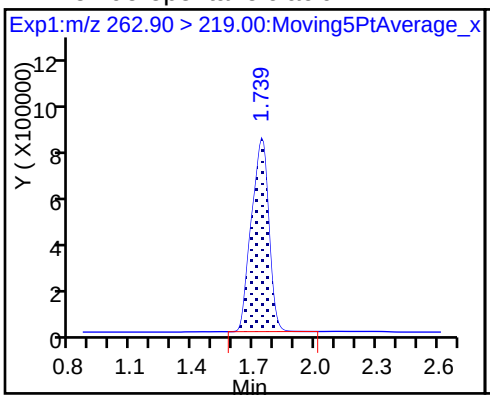
2 Perfluorobutyric acid



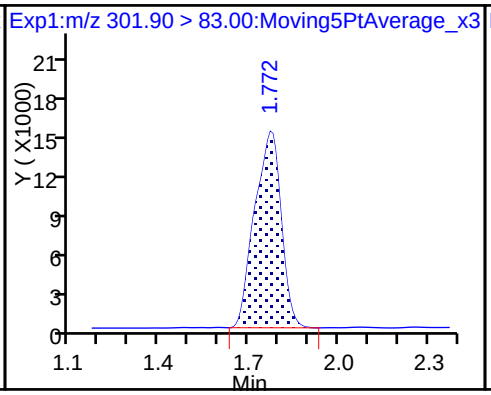
D 3 13C5-PFPeA



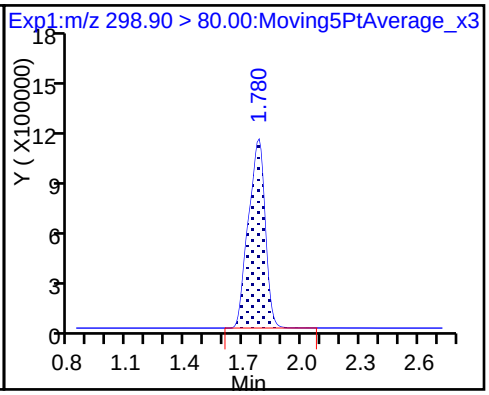
4 Perfluoropentanoic acid



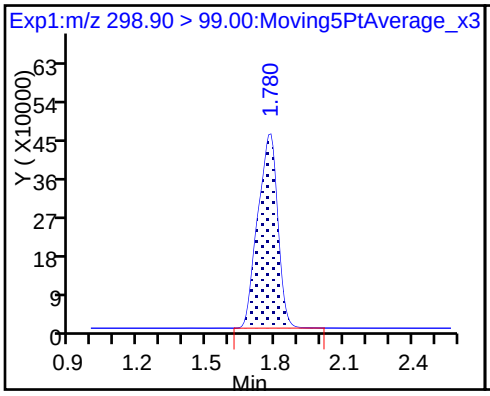
D 47 13C3-PFBS



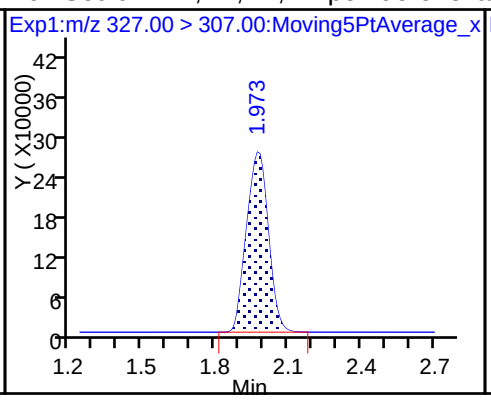
5 Perfluorobutanesulfonic acid



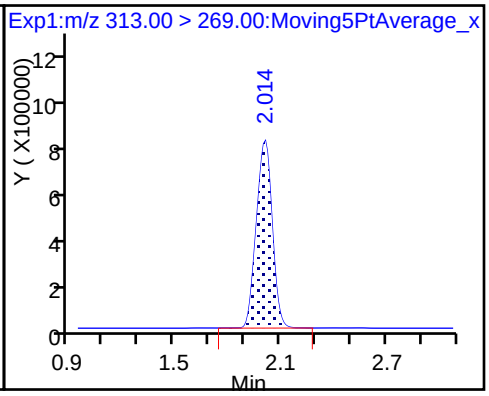
5 Perfluorobutanesulfonic acid



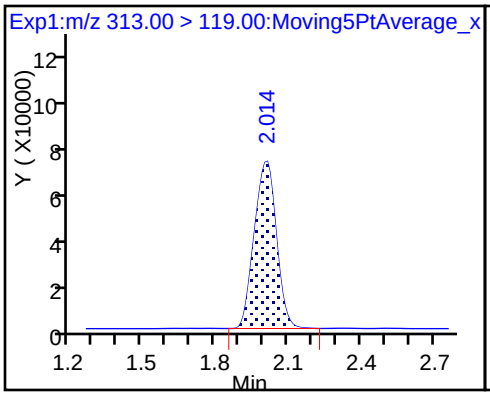
61 Sodium 1H,1H,2H,2H-perfluorohexane



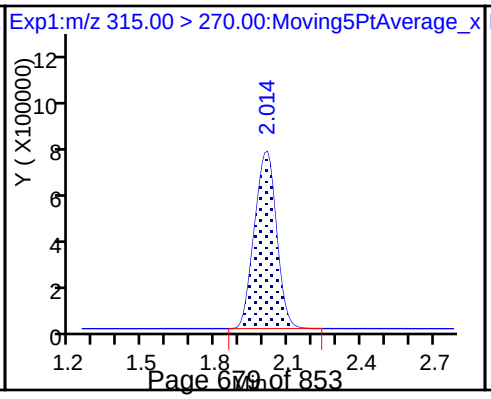
6 Perfluorohexanoic acid



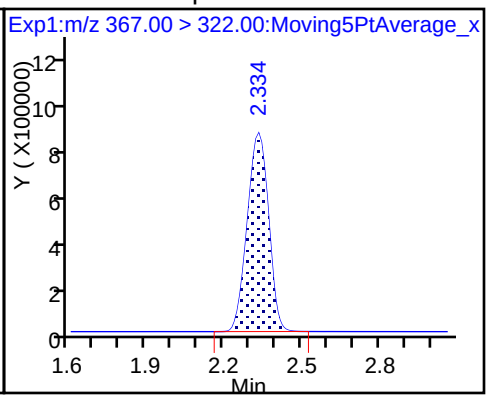
6 Perfluorohexanoic acid



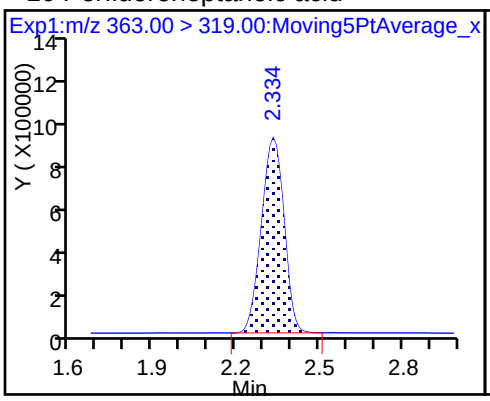
D 7 13C2 PFHxA



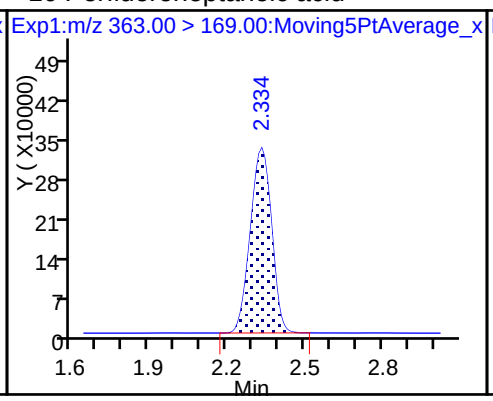
D 9 13C4-PFHpA



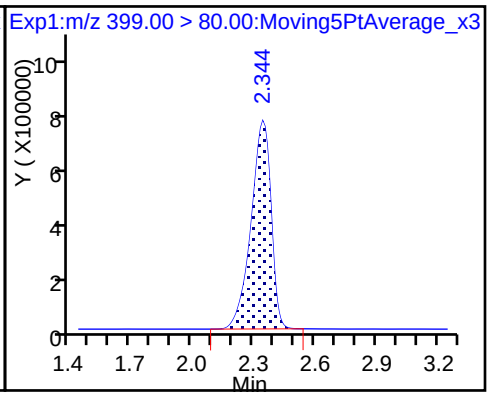
10 Perfluoroheptanoic acid



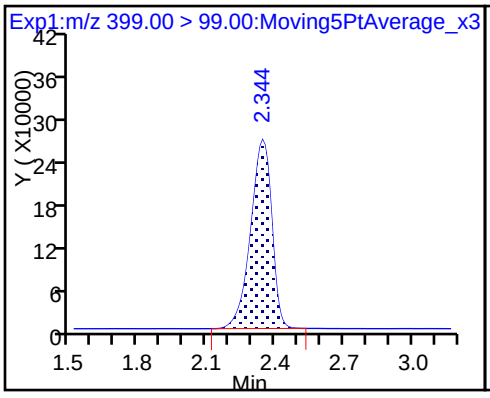
10 Perfluoroheptanoic acid



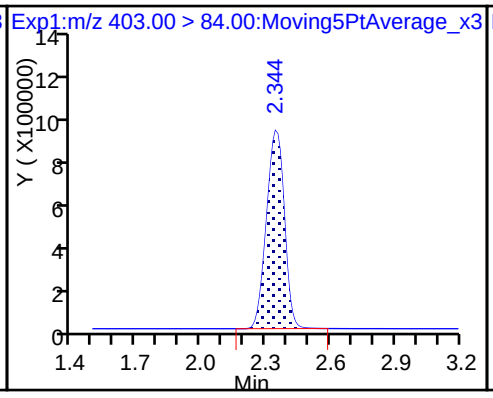
8 Perfluorohexanesulfonic acid



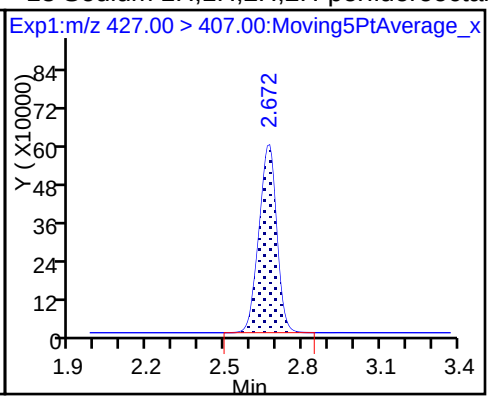
8 Perfluorohexanesulfonic acid



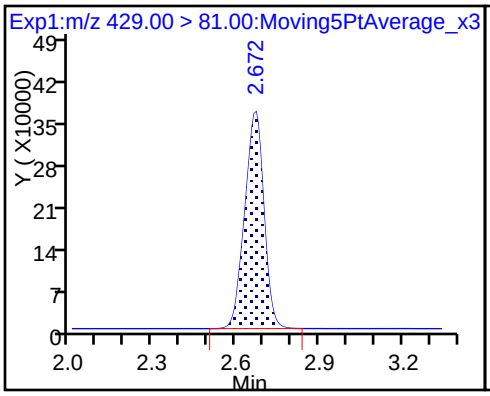
D 11 18O2 PFHxS



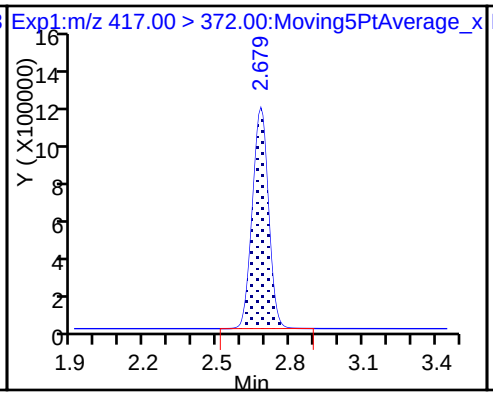
13 Sodium 1H,1H,2H,2H-perfluorooctane



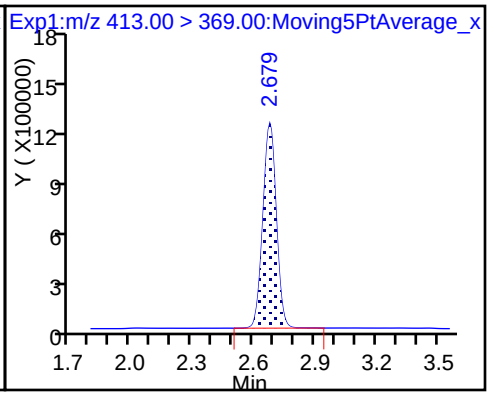
D 12 M2-6:2FTS



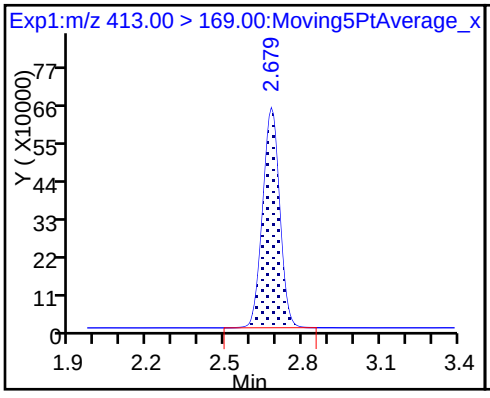
D 14 13C4 PFOA



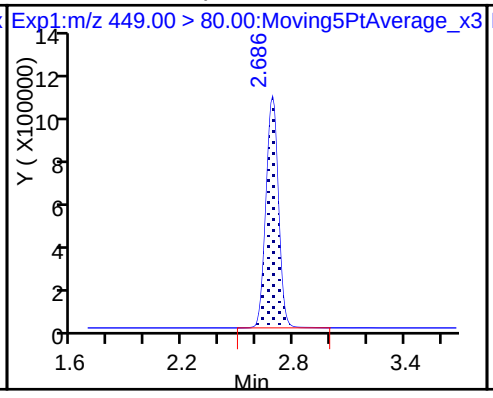
15 Perfluorooctanoic acid



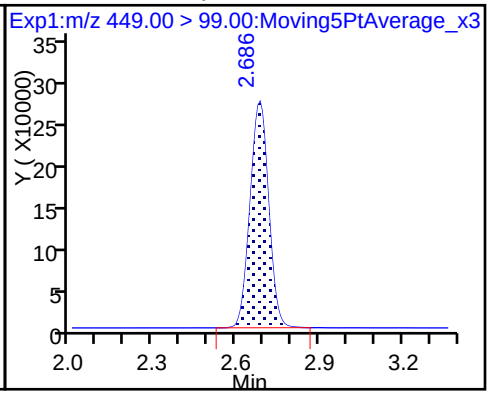
15 Perfluorooctanoic acid



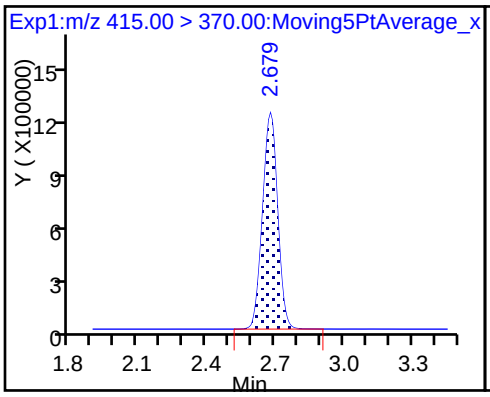
16 Perfluoroheptanesulfonic Acid



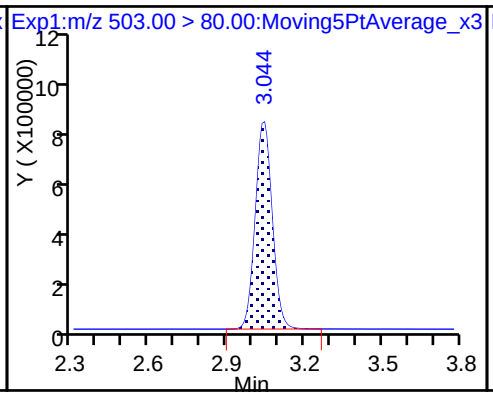
16 Perfluoroheptanesulfonic Acid



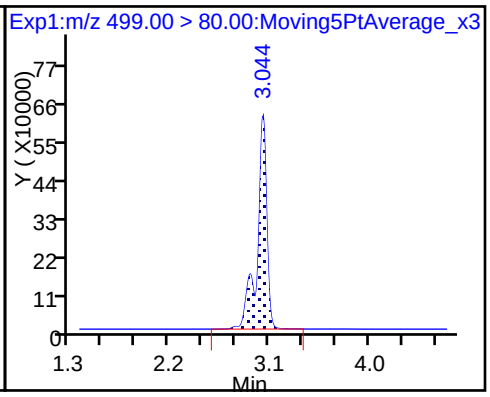
* 62 13C2-PFOA



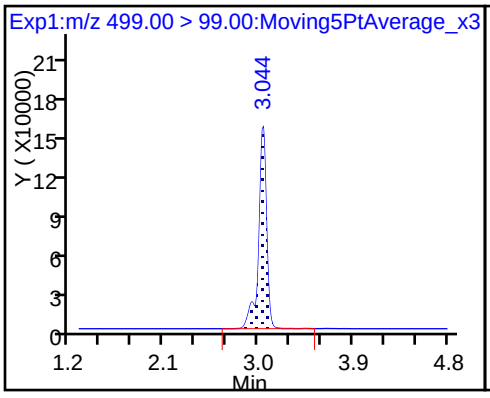
D 18 13C4 PFOS



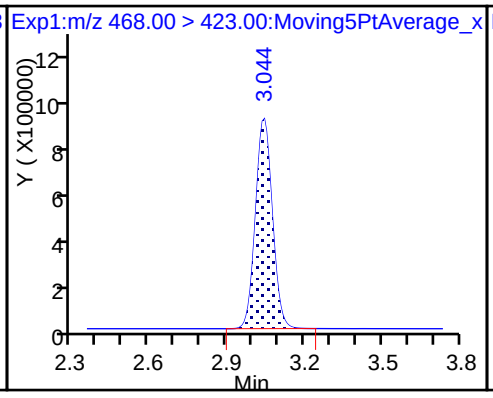
17 Perfluorooctane sulfonic acid



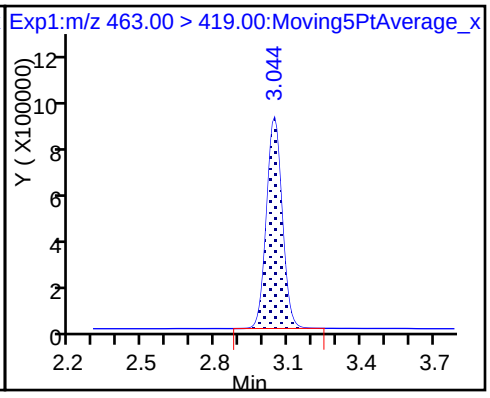
17 Perfluorooctane sulfonic acid



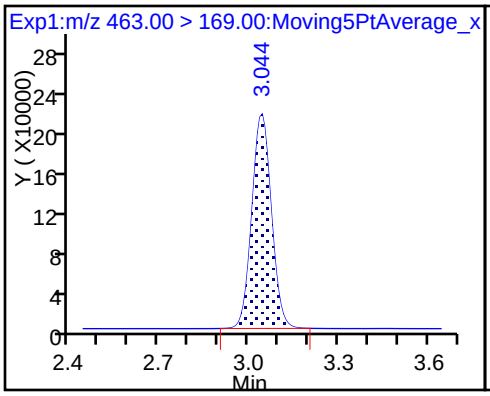
D 19 13C5 PFNA



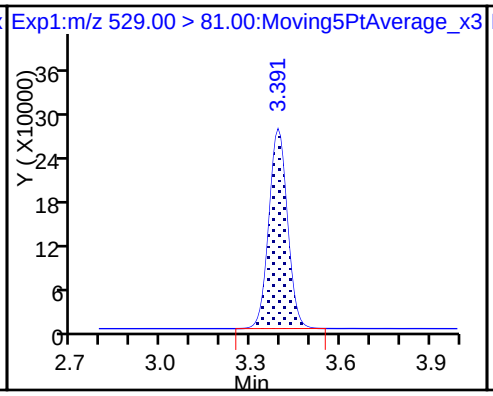
20 Perfluorononanoic acid



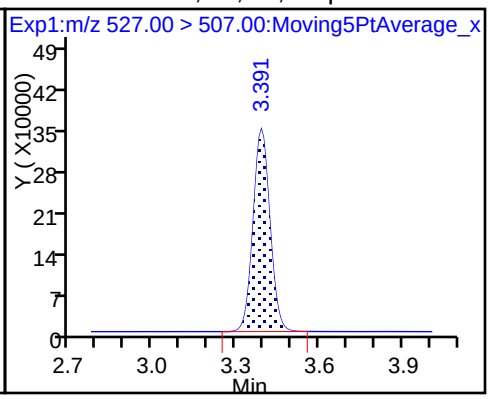
20 Perfluorononanoic acid



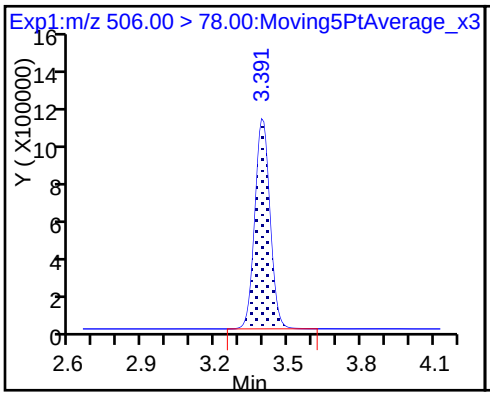
D 26 M2-8:2FTS



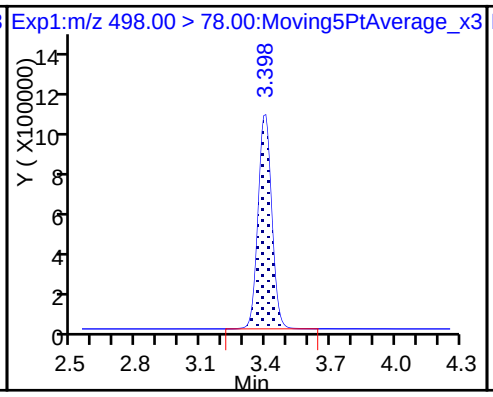
25 Sodium 1H,1H,2H,2H-perfluorodecane



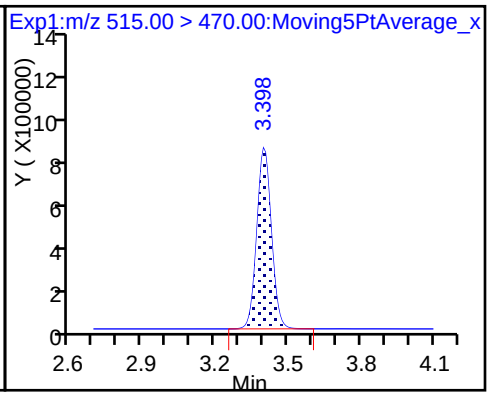
D 21 13C8 FOSA



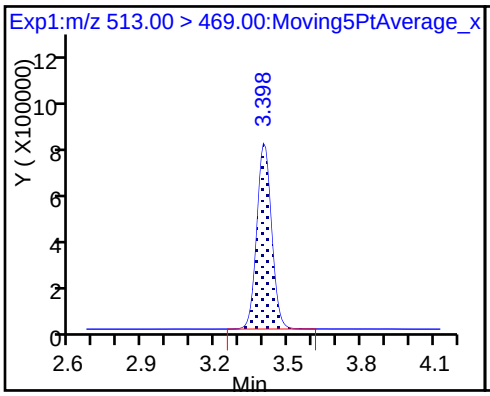
22 Perfluorooctane Sulfonamide



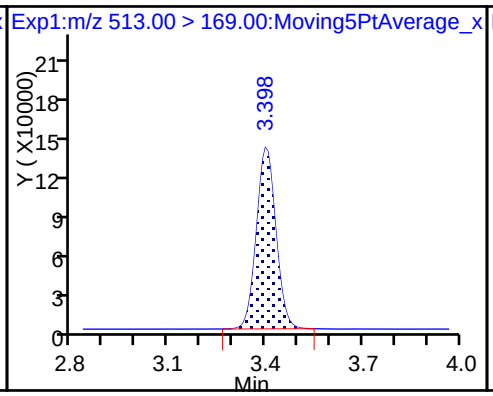
D 23 13C2 PFDA



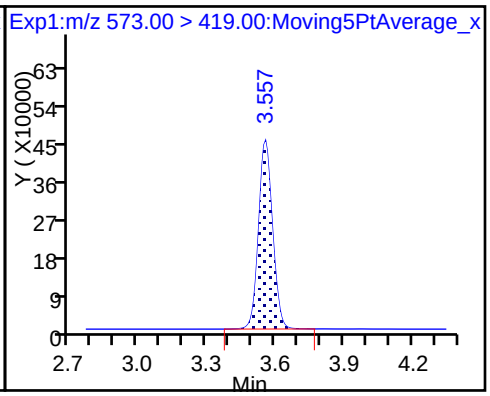
24 Perfluorodecanoic acid



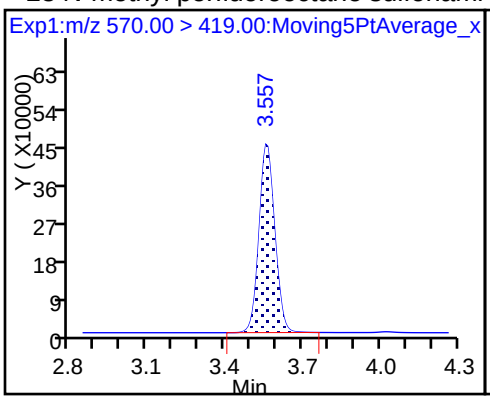
24 Perfluorodecanoic acid



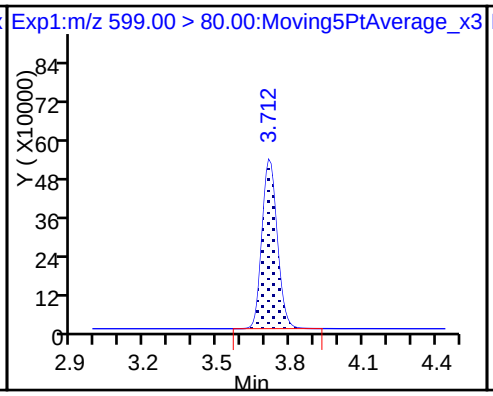
D 27 d3-NMeFOSAA



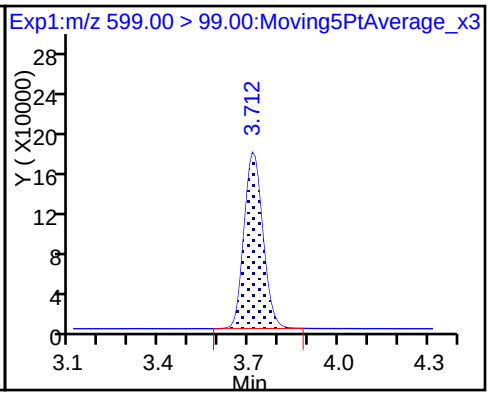
28 N-methyl perfluorooctane sulfonami



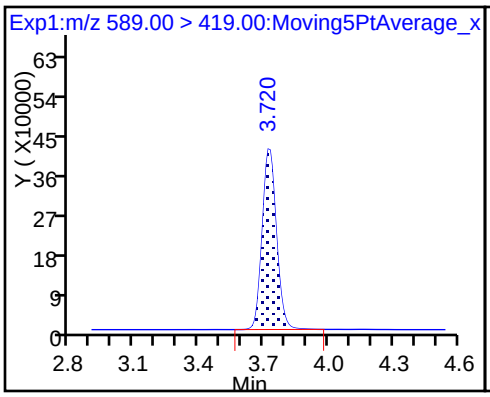
29 Perfluorodecane Sulfonic acid



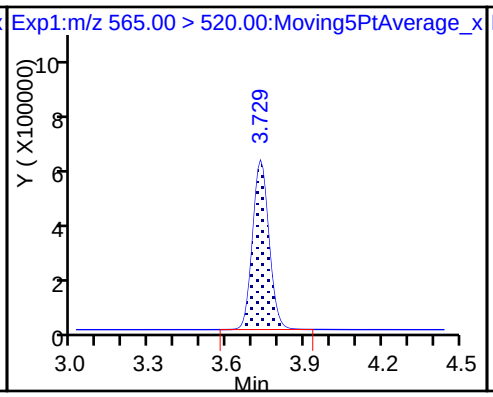
29 Perfluorodecane Sulfonic acid



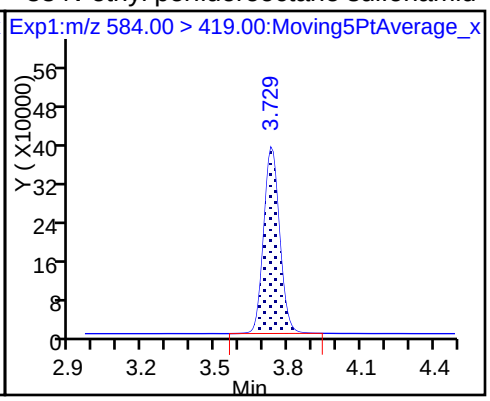
D 32 d5-NEtFOSAA



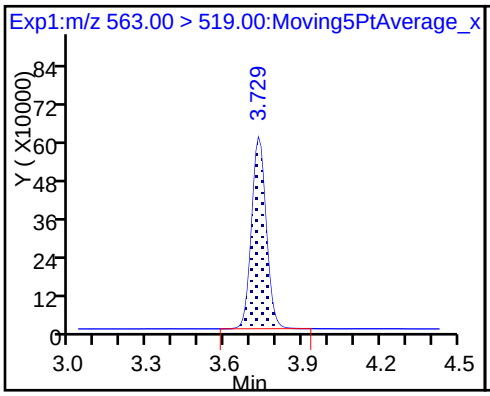
D 30 13C2 PFUnA



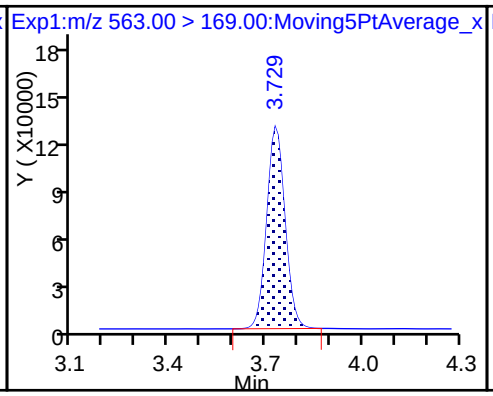
33 N-ethyl perfluorooctane sulfonamid



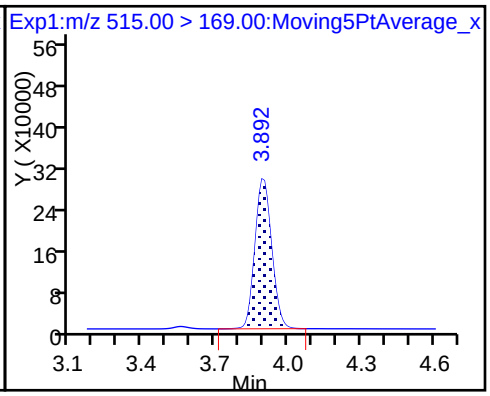
31 Perfluoroundecanoic acid



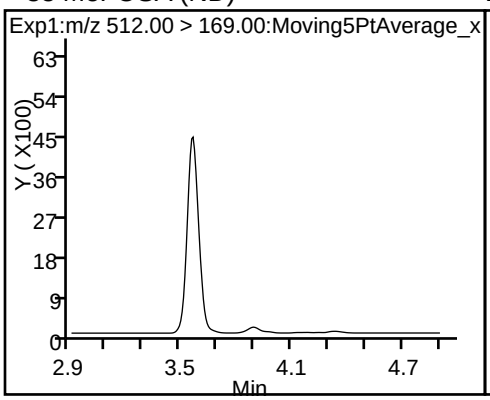
31 Perfluoroundecanoic acid



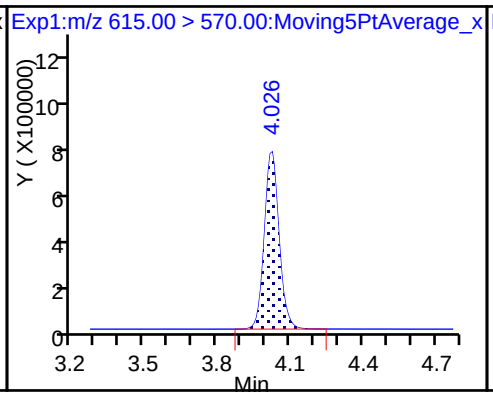
D 34 d-N-MeFOSA-M



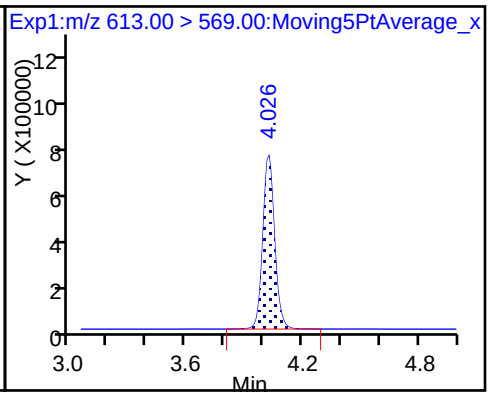
35 MeFOSA (ND)



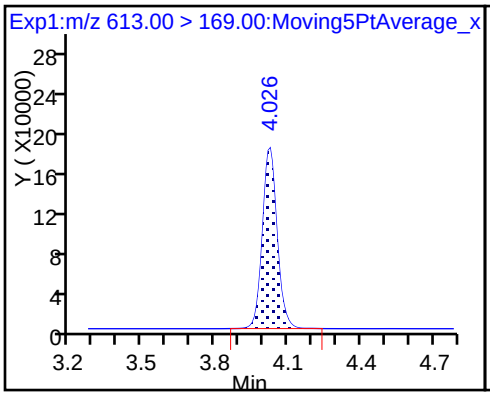
D 36 13C2 PFDoA



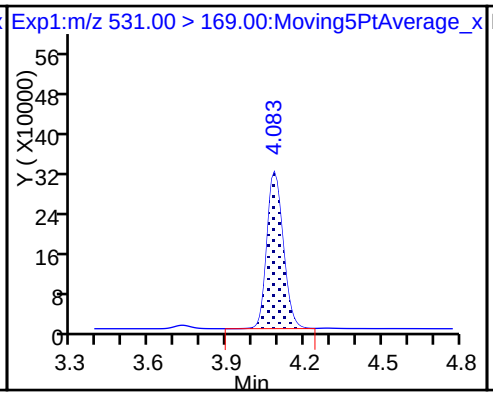
37 Perfluorododecanoic acid



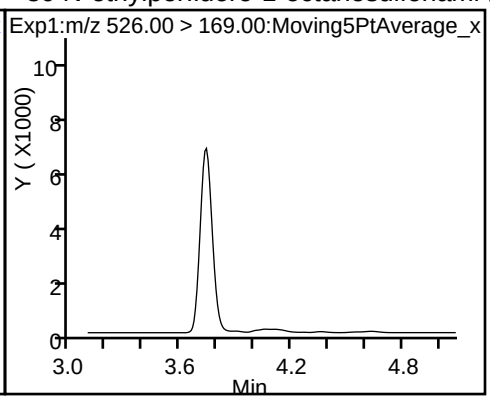
37 Perfluorododecanoic acid



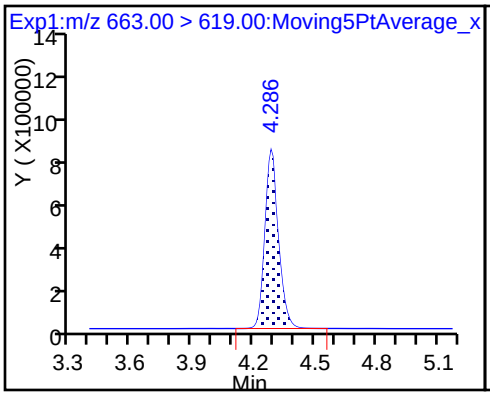
D 38 d-N-EtFOSA-M



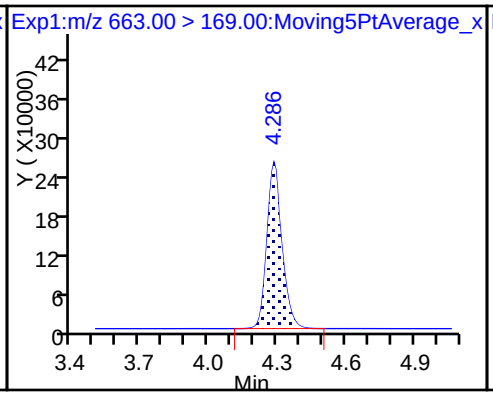
39 N-ethylperfluoro-1-octanesulfonami (ND)



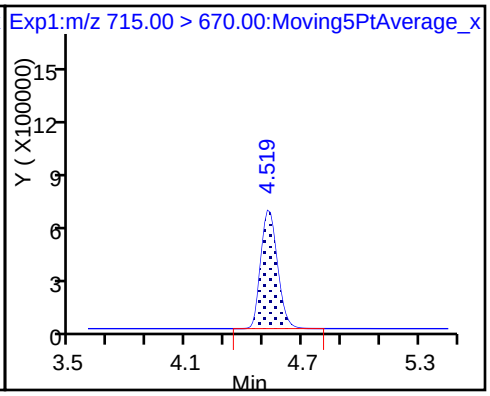
41 Perfluorotridecanoic acid



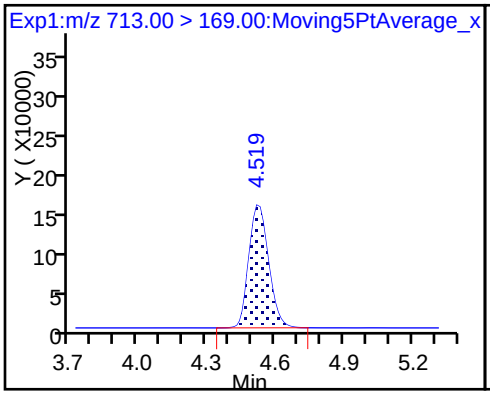
41 Perfluorotridecanoic acid



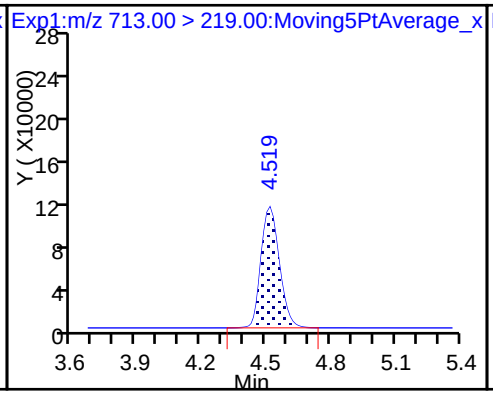
D 43 13C2-PFTeDA



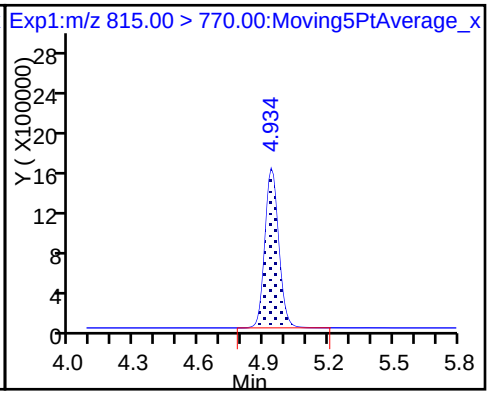
42 Perfluorotetradecanoic acid



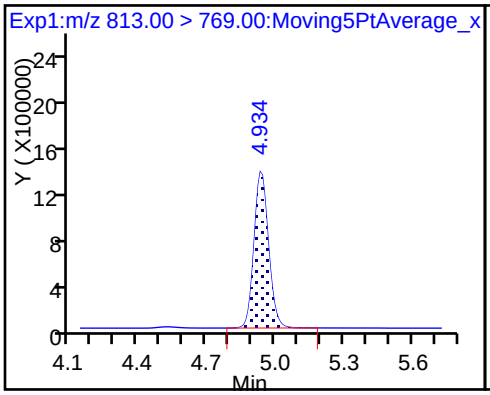
42 Perfluorotetradecanoic acid



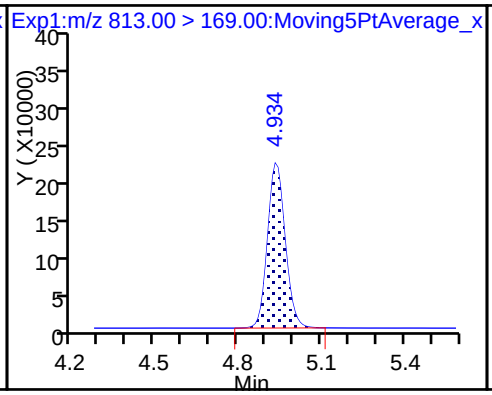
D 44 13C2-PFHxDA



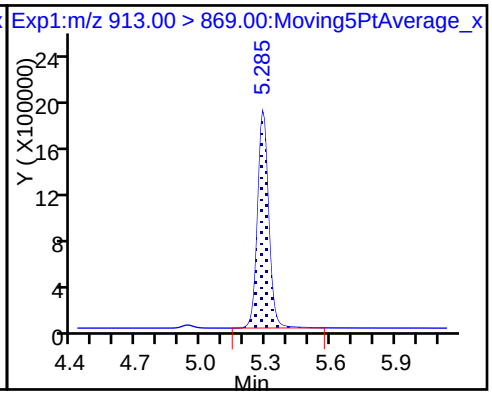
45 Perfluorohexadecanoic acid



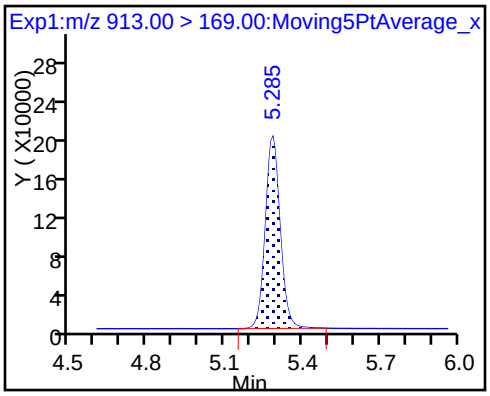
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCVL 320-195558/1 Calibration Date: 11/18/2017 14:13

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXE_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9052		0.0494	0.0500	-1.1	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.190		0.0527	0.0500	5.5	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	84.19		0.0501	0.0442	13.3	50.0
4:2 FTS	AveID	0.7456	0.8935		0.560	0.467	19.8	50.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	1.088		0.0544	0.0500	8.8	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	1.058		0.0516	0.0500	3.2	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	1.184		0.0492	0.0455	8.1	50.0
6:2FTS	AveID	1.605	1.676		0.495	0.474	4.5	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.165		0.0552	0.0500	10.4	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.392		0.0506	0.0476	6.3	50.0
Perfluorononanoic acid (PFNA)	AveID	0.997	1.026		0.0515	0.0500	2.9	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.451		0.0642	0.0464	38.3	50.0
8:2FTS	AveID	1.214	1.210		0.477	0.479	-0.3	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	0.9302		0.0484	0.0500	-3.2	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	1.055		0.0543	0.0500	8.6	50.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	1.076		0.513	0.500	2.6	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.5849		0.0467	0.0482	-3.2	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9427		0.492	0.500	-1.7	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.9685		0.0535	0.0500	7.0	50.0
MeFOSA	AveID	0.9814	1.006		0.512	0.500	2.5	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	0.9018		0.0460	0.0500	-8.0	50.0
N-EtFOSA-M	AveID	1.002	1.073		0.536	0.500	7.2	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.180		0.0482	0.0500	-3.6	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2705		0.0551	0.0500	10.3	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.360		0.0552	0.0500	10.4	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	1.144		0.0575	0.0500	15.0	50.0
13C4 PFBA	Ave	1.301	1.274		2.45	2.50	-2.1	50.0
13C5 PFPeA	Ave	0.8240	0.8362		2.54	2.50	1.5	50.0
13C3-PFBS	Ave	0.0180	0.0177		2.28	2.33	-1.8	50.0
13C2 PFHxA	Ave	0.9302	0.9491		2.55	2.50	2.0	50.0
13C4-PFHpA	Ave	0.8986	0.8985		2.50	2.50	0.0	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCVL 320-195558/1 Calibration Date: 11/18/2017 14:13

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXE_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.097		2.45	2.37	3.4	50.0
M2-6:2FTS	Ave	0.4500	0.4268		2.25	2.38	-5.2	50.0
13C4 PFOA	Ave	1.030	1.005		2.44	2.50	-2.4	50.0
13C4 PFOS	Ave	0.7080	0.7251		2.45	2.39	2.4	50.0
13C5 PFNA	Ave	0.7570	0.7817		2.58	2.50	3.3	50.0
13C8 FOSA	Ave	0.9121	0.9409		2.58	2.50	3.2	50.0
M2-8:2FTS	Ave	0.2391	0.2537		2.54	2.40	6.1	50.0
13C2 PFDA	Ave	0.6386	0.6330		2.48	2.50	-0.9	50.0
d3-NMeFOSAA	Ave	0.3429	0.3534		2.58	2.50	3.1	50.0
d5-NEtFOSAA	Ave	0.3296	0.3592		2.72	2.50	9.0	50.0
13C2 PFUnA	Ave	0.5100	0.5130		2.51	2.50	0.6	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2549		2.41	2.50	-3.7	50.0
13C2 PFDoA	Ave	0.5923	0.5863		2.47	2.50	-1.0	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2425		2.47	2.50	-1.3	50.0
13C2-PFTeDA	Ave	0.7282	0.6989		2.40	2.50	-4.0	50.0
13C2-PFHxDA	Ave	1.288	1.228		2.38	2.50	-4.7	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50642.b\2017.11.18LLAXE_004.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 18-Nov-2017 14:13:16 ALS Bottle#: 21 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCVL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub18

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50642.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 20-Nov-2017 11:06:02 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK052

First Level Reviewer: phomsophat Date: 18-Nov-2017 15:39:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.480	1.479	0.001	0.553	7489640	2.45		97.9	109965	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.480	1.480	0.0	1.000	135593	0.0494		98.9	35.2	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.745	1.738	0.007	0.652	4915034	2.54		101	59738	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.745	1.740	0.005	1.000	116939	0.0527		105	68.6	
D 47 13C3-PFBS										
301.90 > 83.00	1.778	1.774	0.004	0.664	96658	2.28		98.2	3248	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.787	1.776	0.011	1.005	154708	0.0501		113	597	
298.90 > 99.00	1.778	1.776	0.002	1.000	64660		2.39(1.74-3.24)		521	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.981	1.977	0.004	1.000	418671	0.5596		120	22847	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.013	2.010	0.003	1.000	121408	0.0544		109	224	
313.00 > 119.00	2.013	2.010	0.003	1.000	12042		10.08(7.05-13.09)		178	
D 7 13C2 PFHxA										
315.00 > 270.00	2.013	2.010	0.003	0.752	5578710	2.55		102	64316	
D 9 13C4-PFHpA										
367.00 > 322.00	2.331	2.332	-0.001	0.871	5281424	2.50		100	36471	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.331	2.333	-0.002	1.000	111709	0.0516		103	133	
363.00 > 169.00	2.331	2.333	-0.002	1.000	46442		2.41(1.59-2.95)		293	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.342	2.347	-0.005	0.996	138914	0.0492		108	796	
399.00 > 99.00	2.352	2.347	0.005	1.000	43981		3.16(2.10-3.89)		363	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.352	2.347	0.005	0.879	6098292	2.45		103	36129	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.669	2.671	-0.001	1.000	797272	0.4952		104	5550	
D 12 M2-6:2FTS										
429.00 > 81.00	2.669	2.671	-0.002	0.997	2382914	2.25		94.8	36249	
D 14 13C4 PFOA										
417.00 > 372.00	2.676	2.680	-0.004	1.000	5909233	2.44		97.6	44590	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.676	2.680	-0.004	1.000	137628	0.0552		110	46.4	
413.00 > 169.00	2.676	2.680	-0.004	1.000	79849		1.72(1.18-2.19)		480	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.684	2.687	-0.003	1.000	112935	0.0506		106	1662	
449.00 > 99.00	2.684	2.687	-0.003	1.000	32046		3.52(2.72-5.05)		727	
* 62 13C2-PFOA										
415.00 > 370.00	2.676	2.695	-0.019		5877777	2.50			49823	
D 18 13C4 PFOS										
503.00 > 80.00	3.040	3.042	-0.002	1.136	4074204	2.45		102	27875	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.040	3.042	-0.002	1.000	114791	0.0642		138	159	
499.00 > 99.00	3.040	3.042	-0.002	1.000	26582		4.32(3.24-6.01)		168	
D 19 13C5 PFNA										
468.00 > 423.00	3.040	3.042	-0.002	1.136	4594521	2.58		103	38590	
20 Perfluorononanoic acid										
463.00 > 419.00	3.040	3.045	-0.005	1.000	94291	0.0515		103	174	
463.00 > 169.00	3.040	3.045	-0.005	1.000	20551		4.59(2.65-4.93)		453	
D 26 M2-8:2FTS										
529.00 > 81.00	3.395	3.390	0.005	1.269	1428437	2.54		106	17204	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.395	3.392	0.003	1.000	345773	0.4774		99.7	10287	
D 21 13C8 FOSA										
506.00 > 78.00	3.395	3.393	0.002	1.269	5530315	2.58		103	26345	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.395	3.395	0.0	1.000	102884	0.0484		96.8	2238	
D 23 13C2 PFDA										
515.00 > 470.00	3.403	3.400	0.003	1.271	3720849	2.48		99.1	53314	
24 Perfluorodecanoic acid										R
513.00 > 469.00	3.403	3.400	0.003	1.000	78491	0.0543		109	370	R
513.00 > 169.00	3.403	3.400	0.003	1.000	12018		6.53(3.31-6.15)		169	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.562	3.557	0.005	1.331	2077335	2.58		103	13067	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.562	3.561	0.001	1.000	447017	0.5132		103	2723	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.717	3.714	0.003	1.000	48058	0.0467		96.8	1118	
599.00 > 99.00	3.717	3.714	0.003	1.000	16885		2.85(1.94-3.60)		568	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.726	3.725	0.001	1.392	2111161	2.72		109	9880	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFUnA										
565.00 > 520.00	3.734	3.730	0.004	1.395	3014999	2.51		101	40648	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.734	3.731	0.003	1.002	398042	0.4916		98.3	4461	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.734	3.731	0.003	1.000	58398	0.0535		107	254	
563.00 > 169.00	3.726	3.731	-0.005	0.998	12193		4.79(0.00-0.00)		447	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.897	3.896	0.001	1.456	1498257	2.41		96.3	3183	
35 MeFOSA										
512.00 > 169.00	3.907	3.903	0.004	1.003	301385	0.5124		102	2161	
D 36 13C2 PFDoA										
615.00 > 570.00	4.023	4.024	-0.001	1.503	3446025	2.47		99.0	42944	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.023	4.025	-0.002	1.000	62154	0.0460		92.0	201	
613.00 > 169.00	4.023	4.025	-0.002	1.000	18462		3.37(2.19-4.07)		662	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.088	4.084	0.004	1.527	1425162	2.47		98.7	2404	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.097	4.091	0.006	1.002	305946	0.5358		107	1891	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.289	4.287	0.002	1.000	81327	0.0482		96.4	251	
663.00 > 169.00	4.281	4.287	-0.006	0.998	25712		3.16(1.76-3.26)		968	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.529	4.526	0.003	1.692	4107922	2.40		96.0	26620	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.515	4.526	-0.011	0.997	22224	0.0551		110	764	
713.00 > 219.00	4.515	4.526	-0.011	0.997	16135		1.38(1.00-1.85)		913	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.932	4.938	-0.006	1.843	7215334	2.38		95.3	16358	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.932	4.939	-0.007	1.000	196186	0.0552		110	122	R
813.00 > 169.00	4.932	4.939	-0.007	1.000	35746		5.49(2.50-4.65)		1018	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.283	5.286	-0.003	1.000	165158	0.0575		115	58.2	
913.00 > 169.00	5.283	5.286	-0.003	1.000	19389		8.52(0.00-0.00)		262	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_CCVL_00001 Amount Added: 1.00 Units: mL

Report Date: 20-Nov-2017 11:06:03 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50642.b\2017.11.18LLAXE_004.d

Injection Date: 18-Nov-2017 14:13:16 Instrument ID: A8_N

Lims ID: CCVL

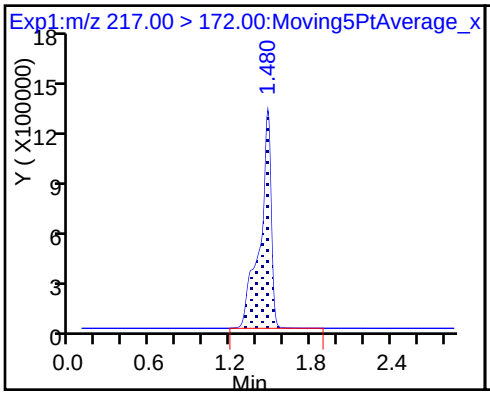
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 1

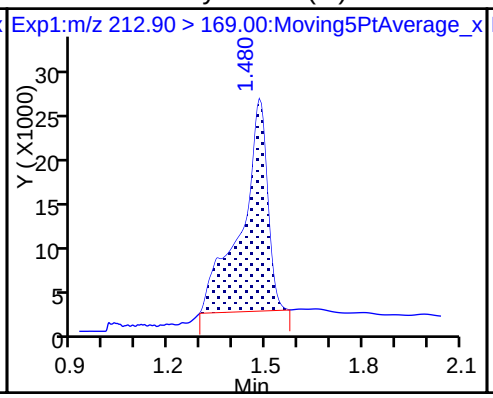
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

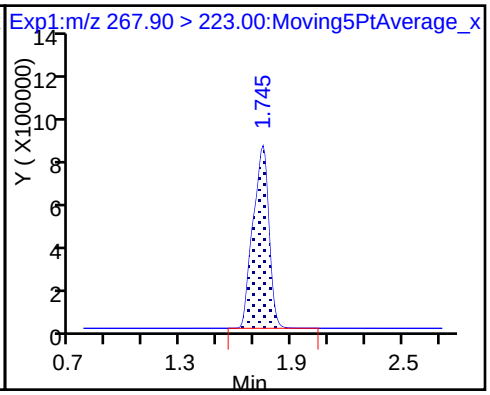
D 1 13C4 PFBA



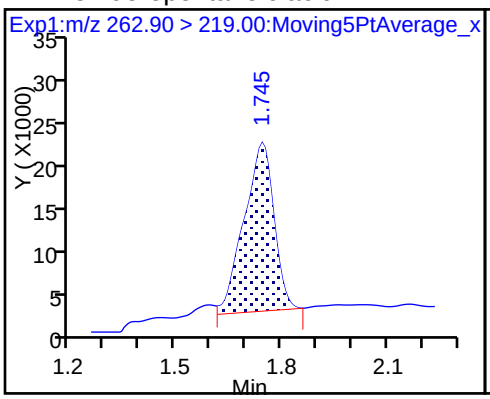
2 Perfluorobutyric acid (M)



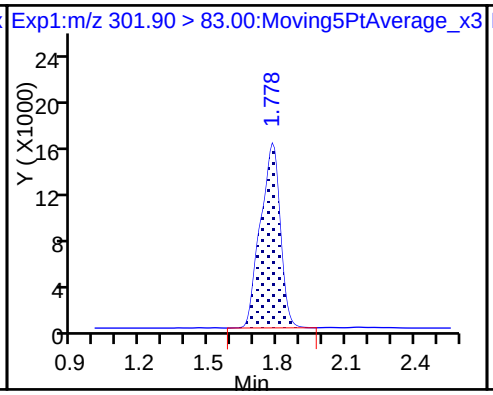
D 3 13C5-PFPeA



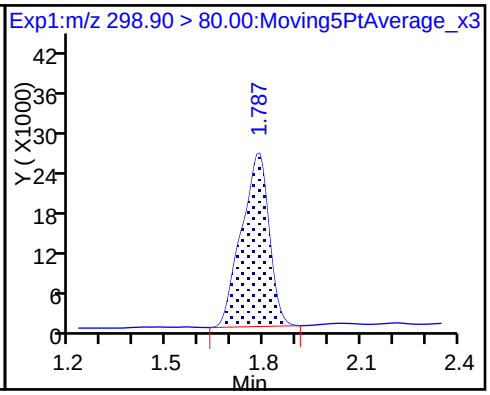
4 Perfluoropentanoic acid



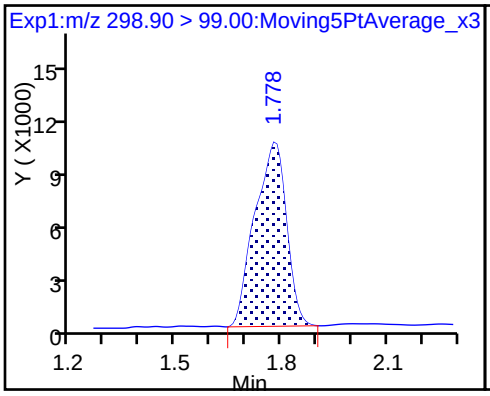
D 47 13C3-PFBS



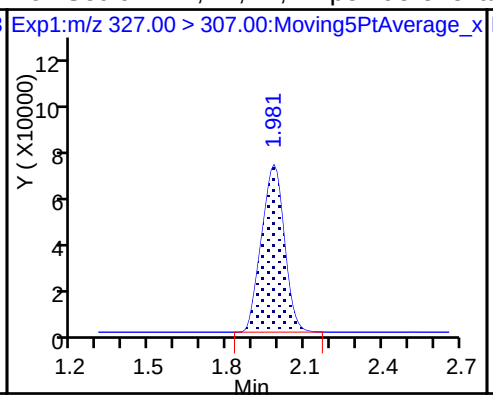
5 Perfluorobutanesulfonic acid



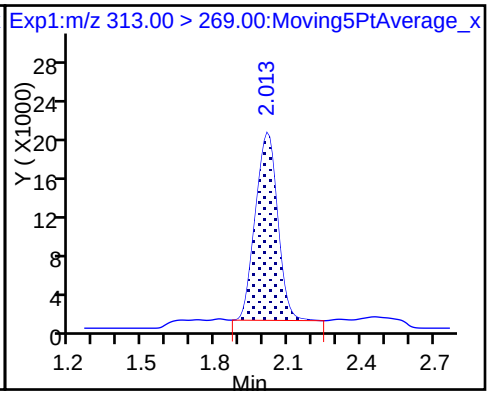
5 Perfluorobutanesulfonic acid



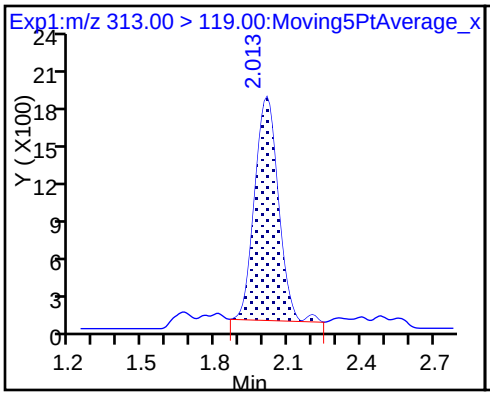
61 Sodium 1H,1H,2H,2H-perfluorohexane



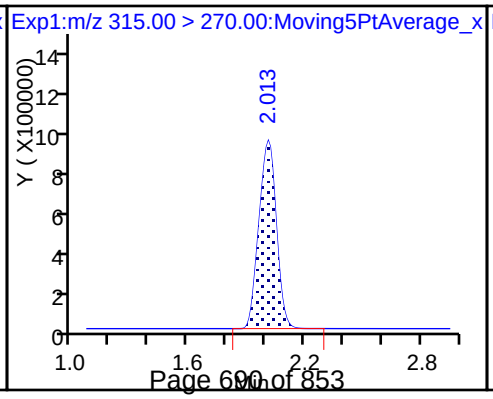
6 Perfluorohexanoic acid



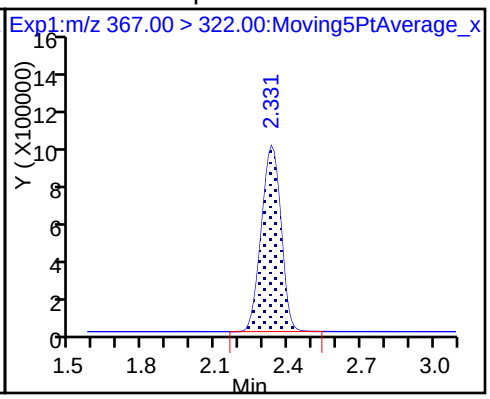
6 Perfluorohexanoic acid



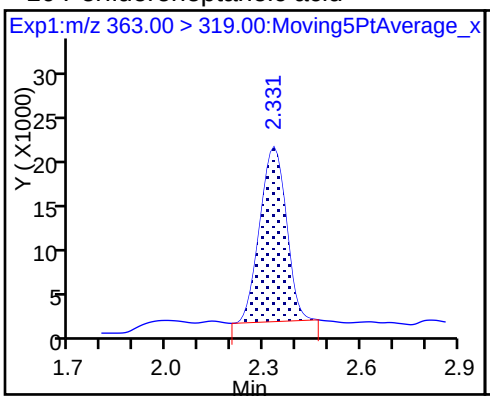
D 7 13C2 PFHxA



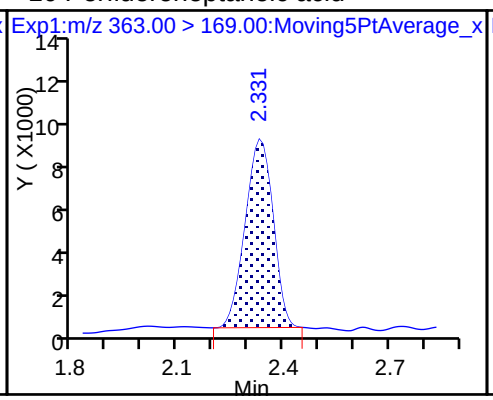
D 9 13C4-PFHpA



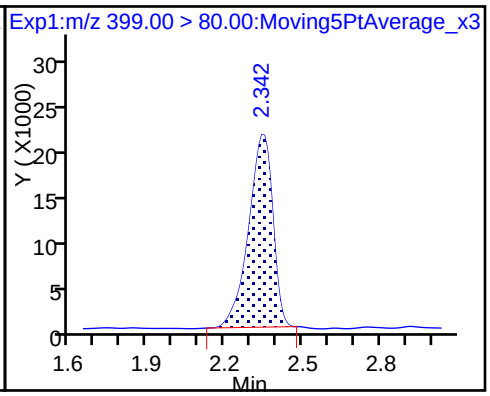
10 Perfluoroheptanoic acid



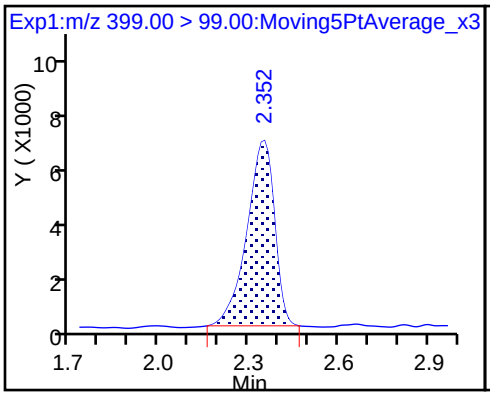
10 Perfluoroheptanoic acid



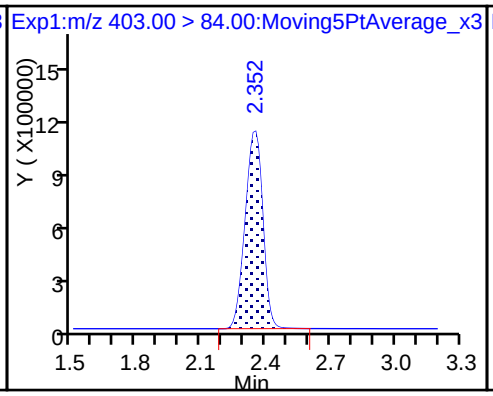
8 Perfluorohexanesulfonic acid



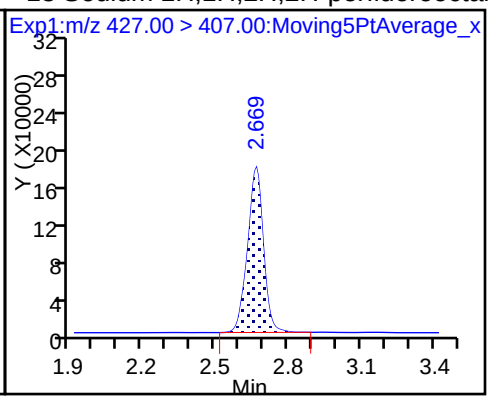
8 Perfluorohexanesulfonic acid



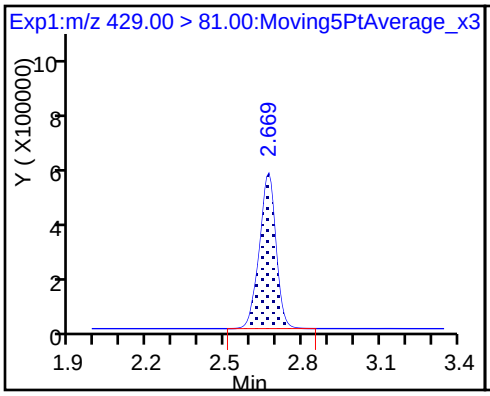
D 11 18O2 PFHxS



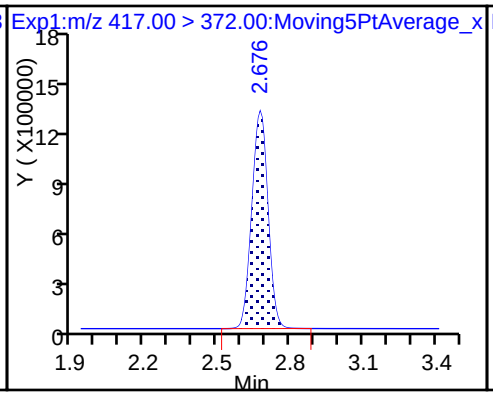
13 Sodium 1H,1H,2H,2H-perfluorooctane



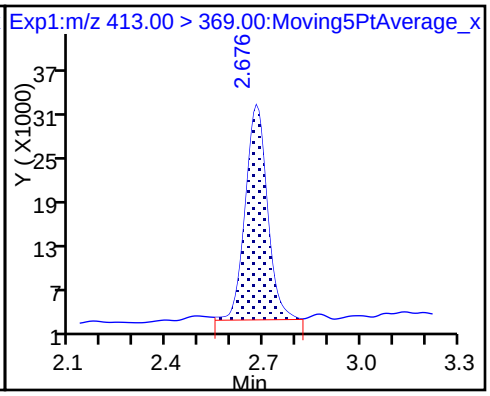
D 12 M2-6:2FTS



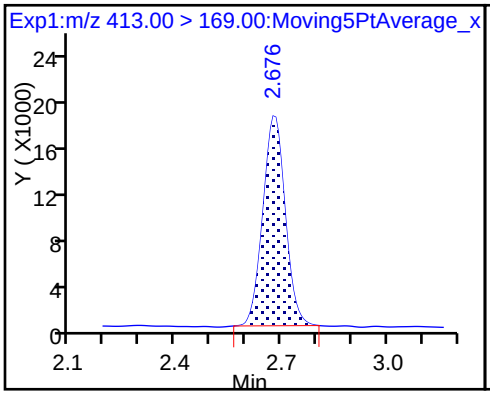
D 14 13C4 PFOA



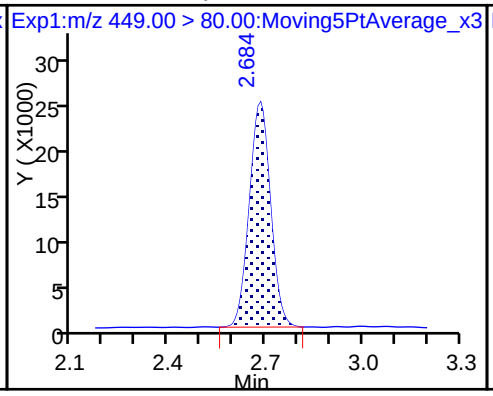
15 Perfluorooctanoic acid



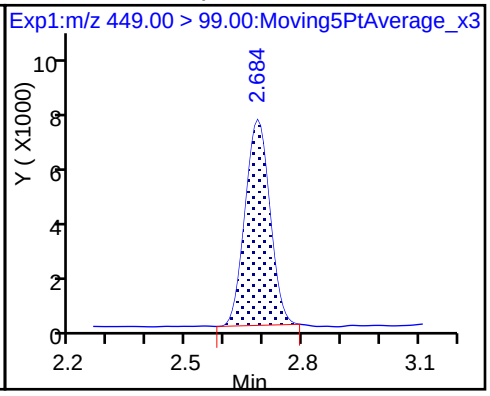
15 Perfluorooctanoic acid



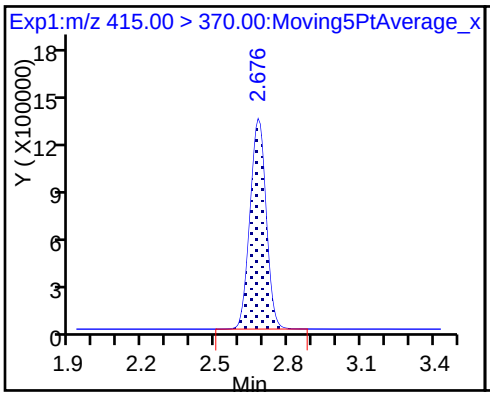
16 Perfluoroheptanesulfonic Acid



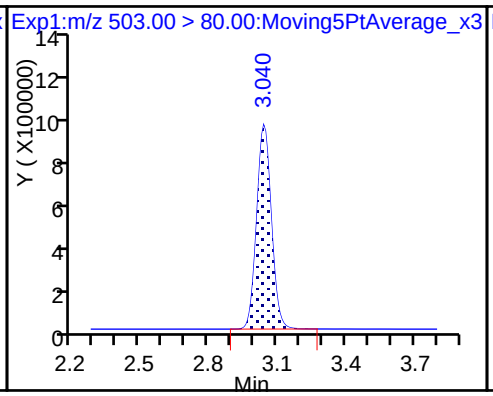
16 Perfluoroheptanesulfonic Acid



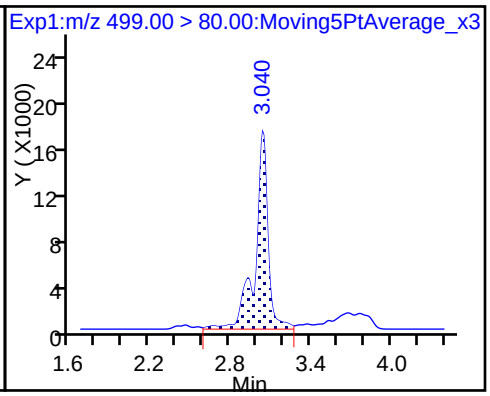
* 62 13C2-PFOA



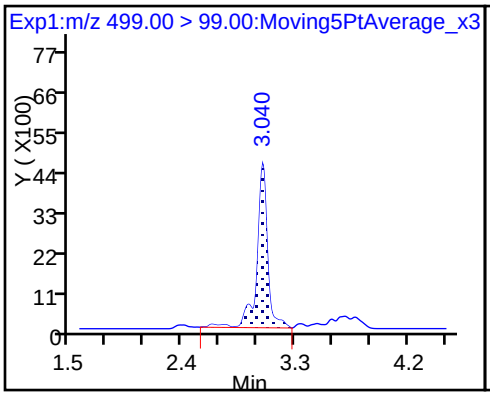
D 18 13C4 PFOS



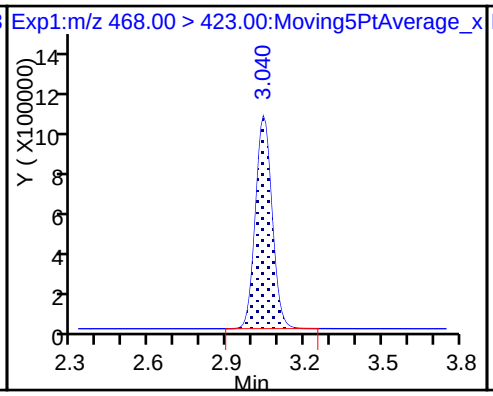
17 Perfluorooctane sulfonic acid



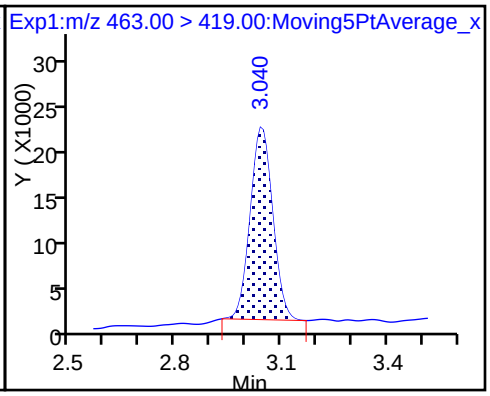
17 Perfluorooctane sulfonic acid



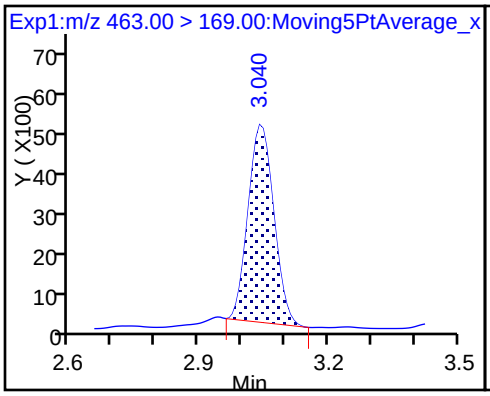
D 19 13C5 PFNA



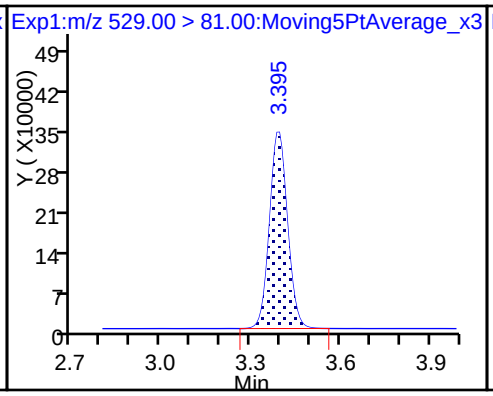
20 Perfluorononanoic acid



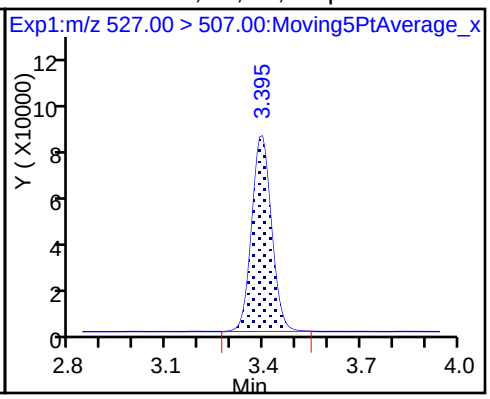
20 Perfluorononanoic acid



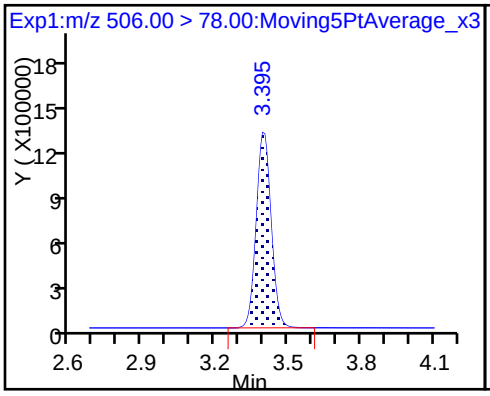
D 26 M2-8:2FTS



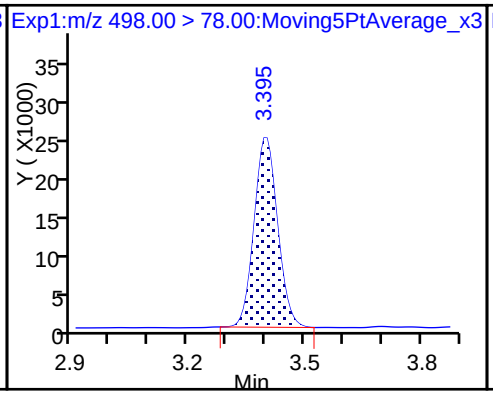
25 Sodium 1H,1H,2H,2H-perfluorodecane



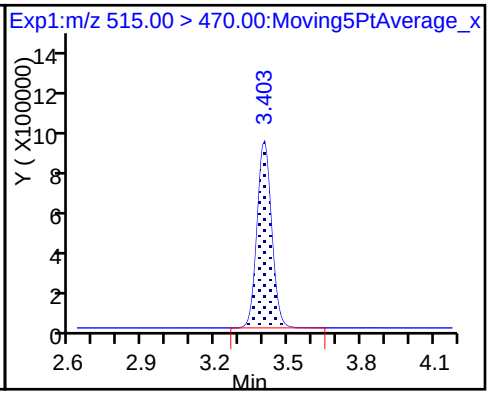
D 21 13C8 FOSA



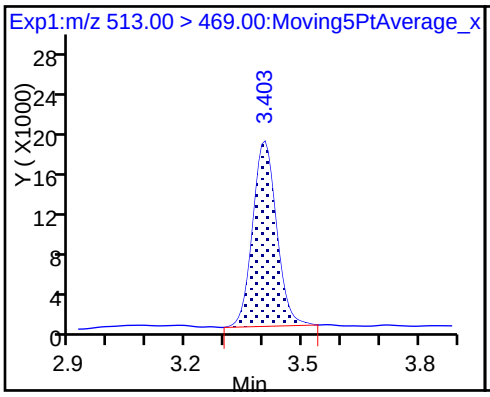
22 Perfluorooctane Sulfonamide



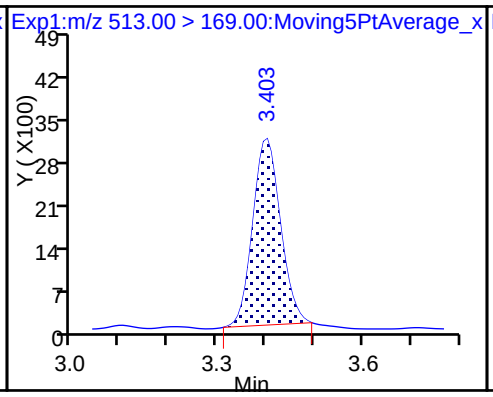
D 23 13C2 PFDA



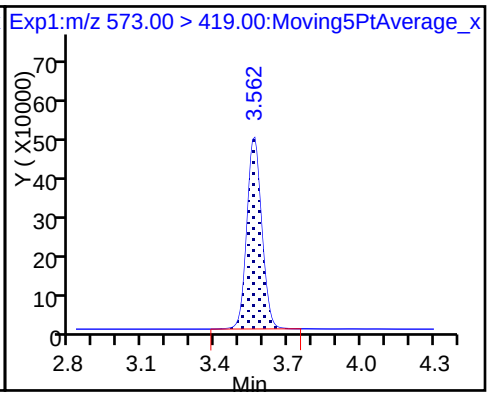
24 Perfluorodecanoic acid



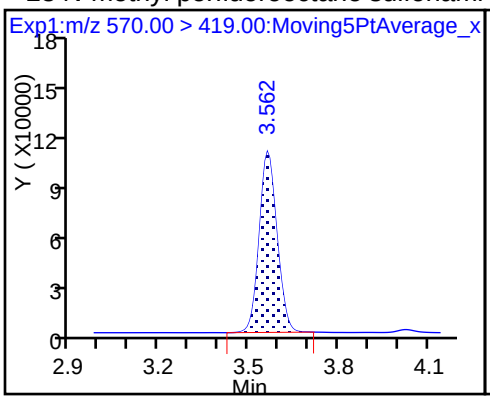
24 Perfluorodecanoic acid



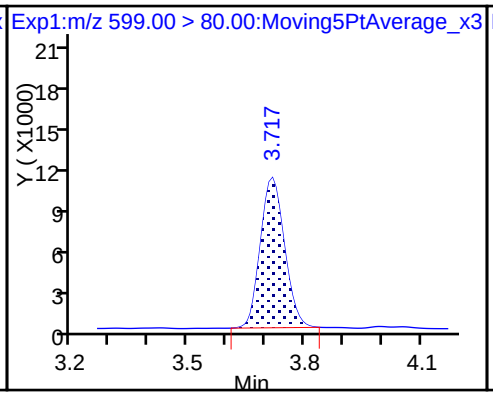
D 27 d3-NMeFOSAA



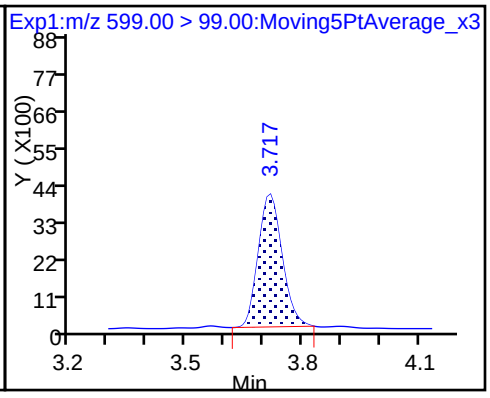
28 N-methyl perfluorooctane sulfonami



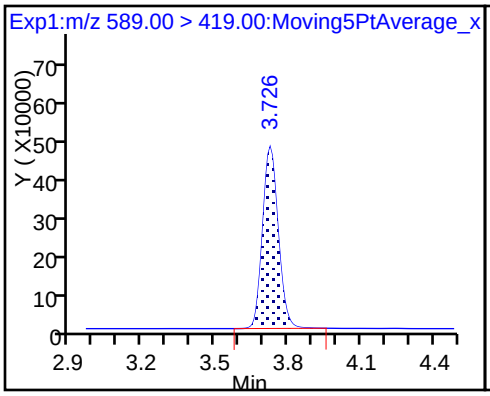
29 Perfluorodecane Sulfonic acid



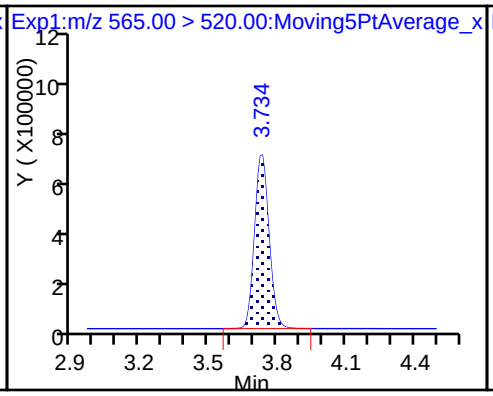
29 Perfluorodecane Sulfonic acid



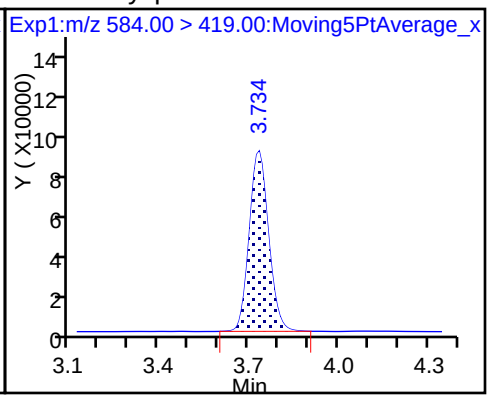
D 32 d5-NEtFOSAA



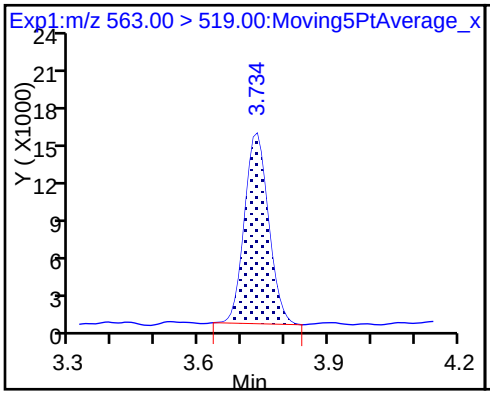
D 30 13C2 PFUnA



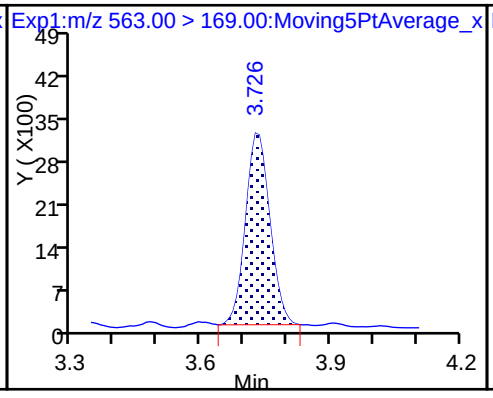
33 N-ethyl perfluorooctane sulfonamid



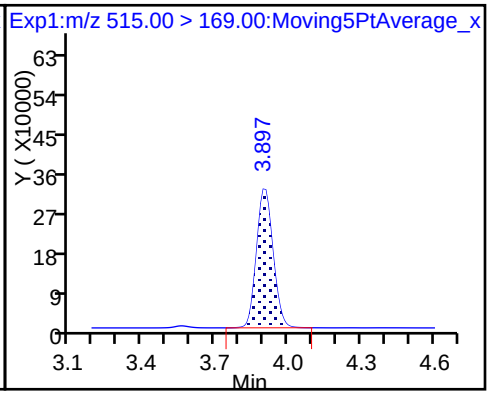
31 Perfluoroundecanoic acid



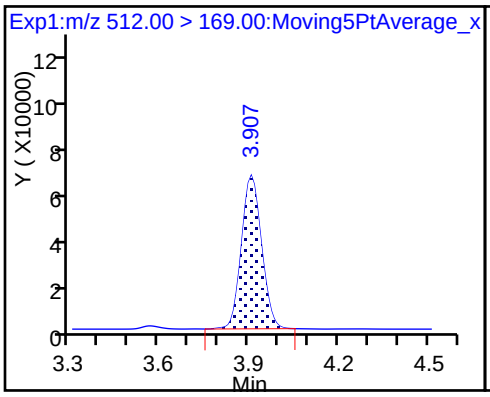
31 Perfluoroundecanoic acid



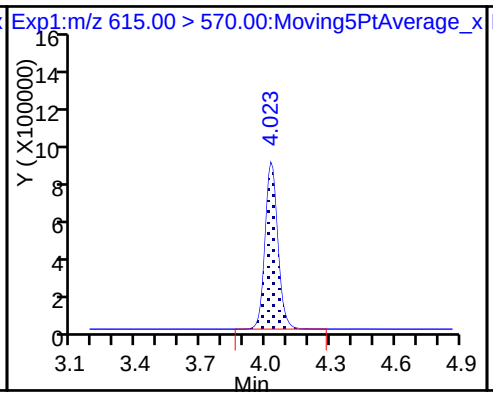
D 34 d-N-MeFOSA-M



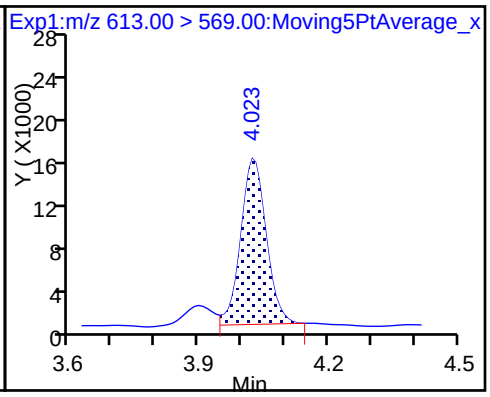
35 MeFOSA



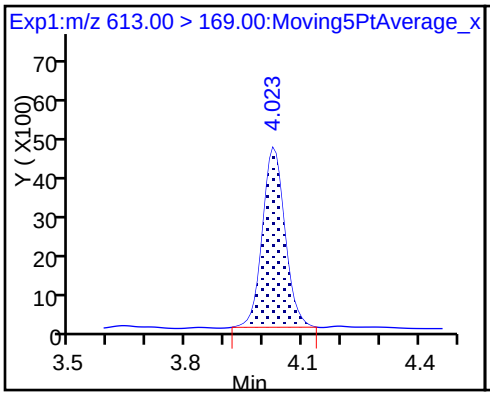
D 36 13C2 PFDoA



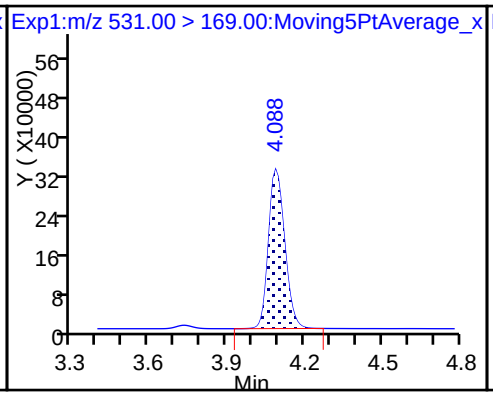
37 Perfluorododecanoic acid



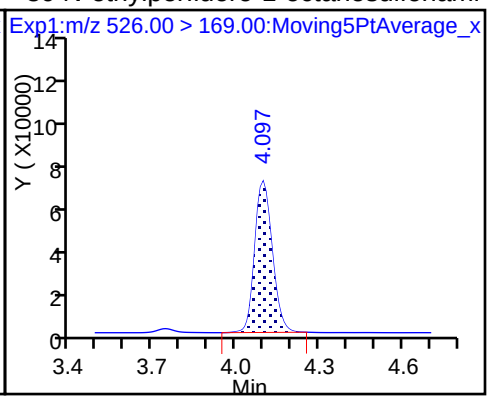
37 Perfluorododecanoic acid



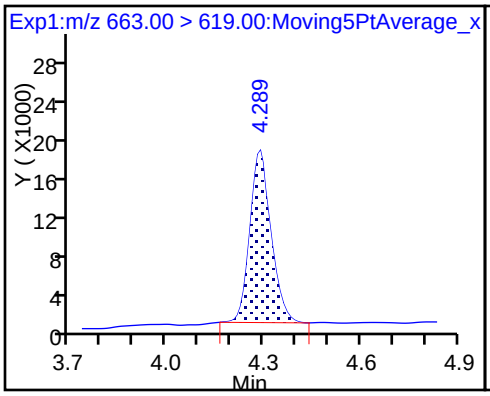
D 38 d-N-EtFOSA-M



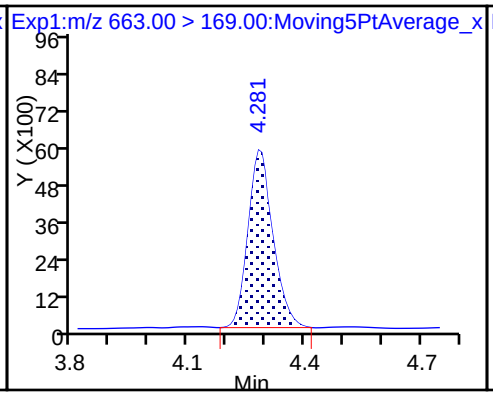
39 N-ethylperfluoro-1-octanesulfonami



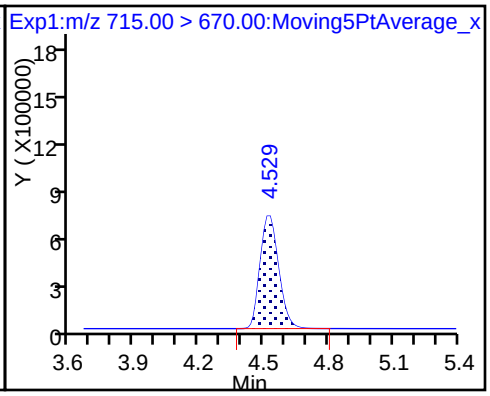
41 Perfluorotridecanoic acid



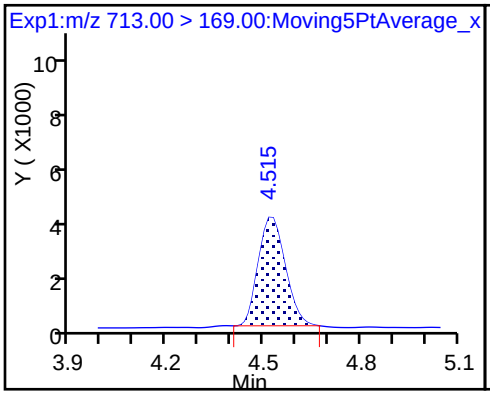
41 Perfluorotridecanoic acid



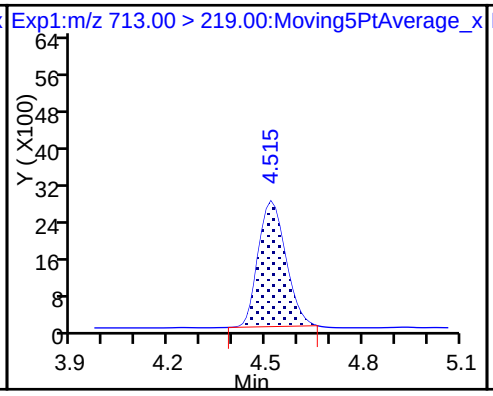
D 43 13C2-PFTeDA



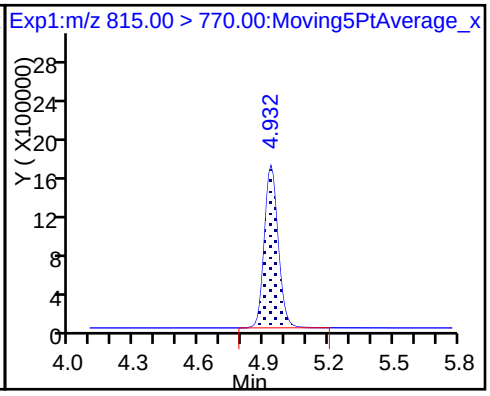
42 Perfluorotetradecanoic acid



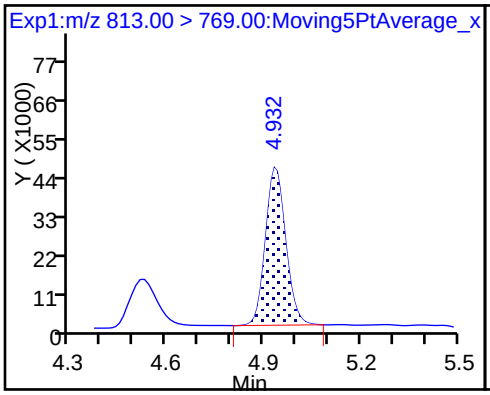
42 Perfluorotetradecanoic acid



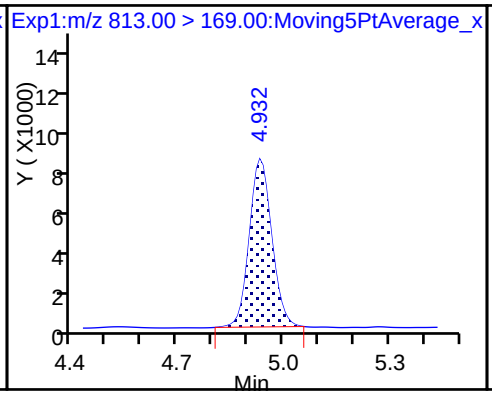
D 44 13C2-PFHxDA



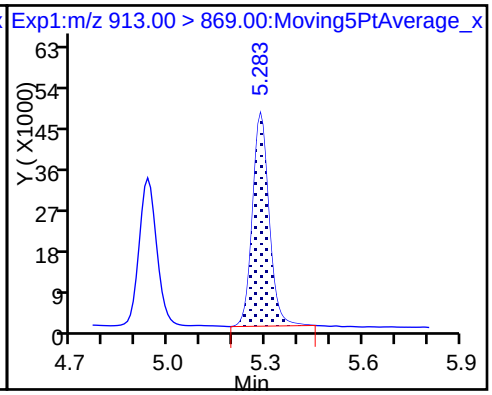
45 Perfluorohexadecanoic acid



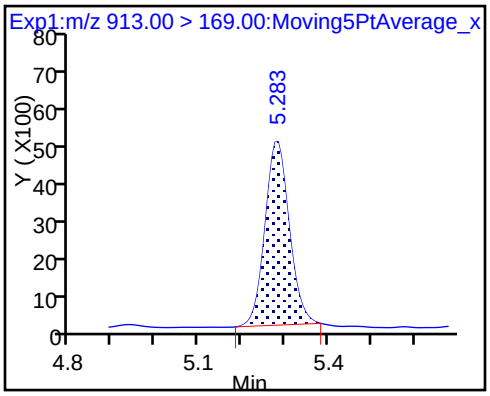
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

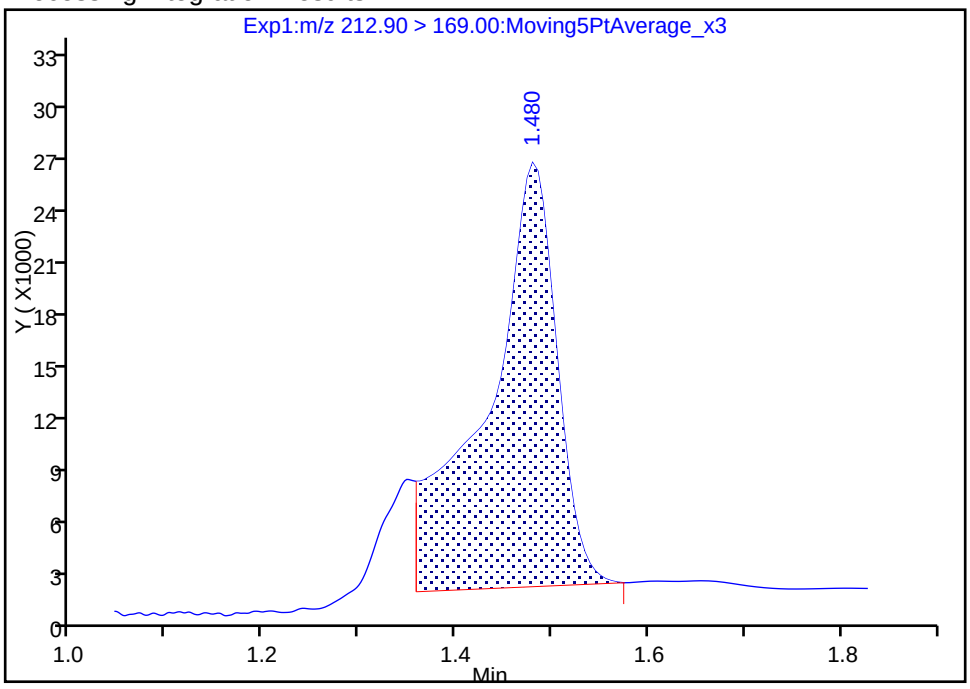
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50642.b\2017.11.18LLAXE_004.d
Injection Date: 18-Nov-2017 14:13:16 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

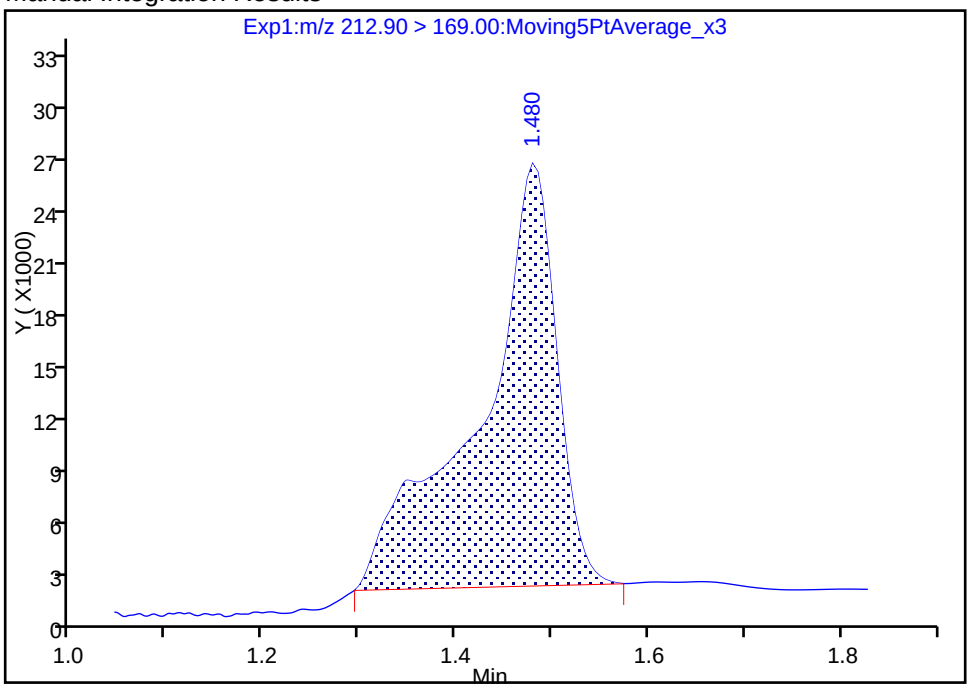
Processing Integration Results

RT: 1.48
Area: 122928
Amount: 0.044818
Amount Units: ng/ml



Manual Integration Results

RT: 1.48
Area: 135593
Amount: 0.049436
Amount Units: ng/ml



Reviewer: hannigana, 18-Nov-2017 18:04:49
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-195562/1 Calibration Date: 11/18/2017 16:47

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXEA_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9457		1.03	1.00	3.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.109		0.984	1.00	-1.6	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	77.89		0.926	0.884	4.8	25.0
4:2 FTS	AveID	0.7456	0.8565		1.07	0.934	14.9	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	0.9850		0.985	1.00	-1.5	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	0.9944		0.970	1.00	-3.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	0.998		0.829	0.910	-8.9	25.0
6:2FTS	AveID	1.605	1.843		1.09	0.948	14.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.340		0.975	0.952	2.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.101		1.04	1.00	4.4	25.0
Perfluorononanoic acid (PFNA)	AveID	0.997	1.041		1.04	1.00	4.4	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.088		0.962	0.928	3.7	25.0
8:2FTS	AveID	1.214	1.208		0.953	0.958	-0.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	0.9662		1.01	1.00	0.6	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	0.9758		1.00	1.00	0.5	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	1.073		1.02	1.00	2.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.6249		0.997	0.964	3.4	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9268		0.967	1.00	-3.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.9070		1.00	1.00	0.2	25.0
MeFOSA	AveID	0.9814	1.069		1.09	1.00	8.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	1.042		1.06	1.00	6.3	25.0
N-EtFOSA-M	AveID	1.002	1.057		1.06	1.00	5.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.145		0.935	1.00	-6.5	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2456		1.00	1.00	0.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9172		1.01	1.00	1.2	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	1.064		1.07	1.00	7.0	25.0
13C4 PFBA	Ave	1.301	1.287		2.47	2.50	-1.1	50.0
13C5 PFPeA	Ave	0.8240	0.8370		2.54	2.50	1.6	50.0
13C3-PFBS	Ave	0.0180	0.0182		2.35	2.33	1.1	50.0
13C2 PFHxA	Ave	0.9302	0.9159		2.46	2.50	-1.5	50.0
13C4-PFHpA	Ave	0.8986	0.8892		2.47	2.50	-1.0	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-195562/1 Calibration Date: 11/18/2017 16:47

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXEA_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.118		2.49	2.37	5.5	50.0
M2-6:2FTS	Ave	0.4500	0.4579		2.42	2.38	1.8	50.0
13C4 PFOA	Ave	1.030	1.003		2.43	2.50	-2.7	50.0
13C4 PFOS	Ave	0.7080	0.7214		2.44	2.39	1.9	50.0
13C5 PFNA	Ave	0.7570	0.7412		2.45	2.50	-2.1	50.0
13C8 FOSA	Ave	0.9121	0.9543		2.62	2.50	4.6	50.0
M2-8:2FTS	Ave	0.2391	0.2660		2.66	2.40	11.2	50.0
13C2 PFDA	Ave	0.6386	0.6481		2.54	2.50	1.5	50.0
d3-NMeFOSAA	Ave	0.3429	0.3653		2.66	2.50	6.5	50.0
13C2 PFUnA	Ave	0.5100	0.5323		2.61	2.50	4.4	50.0
d5-NEtFOSAA	Ave	0.3296	0.3931		2.98	2.50	19.3	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2644		2.50	2.50	-0.1	50.0
13C2 PFDoA	Ave	0.5923	0.5962		2.52	2.50	0.7	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2492		2.54	2.50	1.4	50.0
13C2-PFTeDA	Ave	0.7282	0.7179		2.46	2.50	-1.4	50.0
13C2-PFHxDA	Ave	1.288	1.221		2.37	2.50	-5.2	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_001.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 18-Nov-2017 16:47:36 ALS Bottle#: 13 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub18

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 24-Nov-2017 11:45:18 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK033

First Level Reviewer: hannigana Date: 24-Nov-2017 11:27:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.469	1.479	-0.010	0.549	7495412	2.47		98.9	57560	
2 Perfluorobutyric acid										
212.90 > 169.00	1.469	1.480	-0.011	1.000	2835427	1.03		103	670	
D 3 13C5-PFPeA										
267.90 > 223.00	1.747	1.738	0.009	0.652	4875481	2.54		102	51003	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.747	1.740	0.007	1.000	2163193	0.9836		98.4	1549	
D 47 13C3-PFBS										
301.90 > 83.00	1.780	1.774	0.006	0.665	98639	2.35		101	3126	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.788	1.776	0.012	1.005	2921085	0.9265		105	12586	
298.90 > 99.00	1.788	1.776	0.012	1.005	1232473		2.37(1.74-3.24)		9589	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.983	1.977	0.006	1.000	853345	1.07		115	34778	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.025	2.010	0.015	1.000	2101815	0.9845		98.5	4206	
313.00 > 119.00	2.025	2.010	0.015	1.000	199913		10.51(7.05-13.09)		2333	
D 7 13C2 PFHxA										
315.00 > 270.00	2.025	2.010	0.015	0.756	5334662	2.46		98.5	42752	
D 9 13C4-PFHpA										
367.00 > 322.00	2.334	2.332	0.002	0.871	5179038	2.47		99.0	51090	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.334	2.333	0.001	1.000	2060075	0.9700		97.0	2397	
363.00 > 169.00	2.334	2.333	0.001	1.000	873167		2.36(1.59-2.95)		4190	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.344	2.347	-0.003	0.996	2365876	0.8291		91.1	8119	
399.00 > 99.00	2.344	2.347	-0.003	0.996	827351		2.86(2.10-3.89)		5013	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.354	2.347	0.007	0.879	6161868	2.49		105	32935	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.664	2.671	-0.006	1.000	1864089	1.09		115	3553	
D 12 M2-6:2FTS										
429.00 > 81.00	2.664	2.671	-0.007	0.995	2533548	2.42		102	42013	
D 14 13C4 PFOA										
417.00 > 372.00	2.679	2.680	-0.002	1.000	5841859	2.43		97.3	48897	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.679	2.680	-0.002	1.000	2573161	1.04		104	886	
413.00 > 169.00	2.679	2.680	-0.002	1.000	1379489		1.87(1.18-2.19)		7245	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.679	2.687	-0.009	1.000	2144741	0.9749		102	17887	
449.00 > 99.00	2.686	2.687	-0.001	1.003	584618		3.67(2.72-5.05)		8456	
* 62 13C2-PFOA										
415.00 > 370.00	2.679	2.695	-0.017		5824693	2.50			51456	
D 18 13C4 PFOS										
503.00 > 80.00	3.035	3.042	-0.007	1.133	4016806	2.44		102	23735	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.035	3.042	-0.007	1.000	1696616	0.9620		104	2615	
499.00 > 99.00	3.035	3.042	-0.007	1.000	374087		4.54(3.24-6.01)		14267	
D 19 13C5 PFNA										
468.00 > 423.00	3.035	3.042	-0.007	1.133	4317417	2.45		97.9	28449	
20 Perfluorononanoic acid										
463.00 > 419.00	3.035	3.045	-0.010	1.000	1797058	1.04		104	3471	
463.00 > 169.00	3.035	3.045	-0.010	1.000	437572		4.11(2.65-4.93)		8257	
D 26 M2-8:2FTS										
529.00 > 81.00	3.381	3.390	-0.009	1.262	1484041	2.66		111	17228	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.381	3.392	-0.011	1.000	716934	0.9528		99.5	19335	
D 21 13C8 FOSA										
506.00 > 78.00	3.381	3.393	-0.012	1.262	5558765	2.62		105	33079	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.381	3.395	-0.014	1.000	2148311	1.01		101	24132	
D 23 13C2 PFDA										
515.00 > 470.00	3.389	3.400	-0.011	1.265	3775235	2.54		101	42190	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.389	3.400	-0.011	1.000	1473545	1.00		100	5728	
513.00 > 169.00	3.389	3.400	-0.011	1.000	272609		5.41(3.31-6.15)		2176	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.541	3.557	-0.016	1.322	2127677	2.66		107	17918	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.548	3.561	-0.013	1.002	913266	1.02		102	4273	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.701	3.714	-0.013	1.000	1012372	1.00		103	14915	
599.00 > 99.00	3.701	3.714	-0.013	1.000	346320		2.92(1.94-3.60)		9081	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.710	3.725	-0.015	1.385	2289632	2.98		119	13024	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFUnA										
565.00 > 520.00	3.710	3.730	-0.020	1.385	3100565	2.61		104	31069	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.719	3.731	-0.012	1.002	848820	0.9667		96.7	8308	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.719	3.731	-0.012	1.002	1124910	1.00		100	5235	
563.00 > 169.00	3.719	3.731	-0.012	1.002	256415		4.39(0.00-0.00)		11072	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.890	3.896	-0.006	1.452	1540072	2.50		99.9	3191	
35 MeFOSA										
512.00 > 169.00	3.890	3.903	-0.013	1.000	658458	1.09		109	2628	
D 36 13C2 PFDoA										
615.00 > 570.00	4.010	4.024	-0.014	1.497	3472881	2.52		101	29979	
37 Perfluorododecanoic acid										R
613.00 > 569.00	4.010	4.025	-0.015	1.000	1447390	1.06		106	6854	R
613.00 > 169.00	4.010	4.025	-0.015	1.000	350239		4.13(2.19-4.07)		17043	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.072	4.084	-0.012	1.520	1451620	2.54		101	2683	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.082	4.091	-0.009	1.002	613730	1.06		106	2192	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.276	4.287	-0.011	1.000	1589899	0.9350		93.5	5704	
663.00 > 169.00	4.276	4.287	-0.011	1.000	500328		3.18(1.76-3.26)		14110	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.504	4.526	-0.022	1.682	4181334	2.46		98.6	25549	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.504	4.526	-0.022	1.000	410845	1.00		100	7756	
713.00 > 219.00	4.504	4.526	-0.022	1.000	286364		1.43(1.00-1.85)		9884	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.924	4.938	-0.014	1.838	7114709	2.37		94.8	22695	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.924	4.939	-0.015	1.000	2610206	1.01		101	1570	R
813.00 > 169.00	4.924	4.939	-0.015	1.000	459493		5.68(2.50-4.65)		6991	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.269	5.286	-0.017	1.000	3029136	1.07		107	915	
913.00 > 169.00	5.262	5.286	-0.024	0.999	370183		8.18(0.00-0.00)		2054	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL4_00002 Amount Added: 1.00 Units: mL

Report Date: 24-Nov-2017 11:45:19 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_001.d

Injection Date: 18-Nov-2017 16:47:36 Instrument ID: A8_N

Lims ID: CCV L4

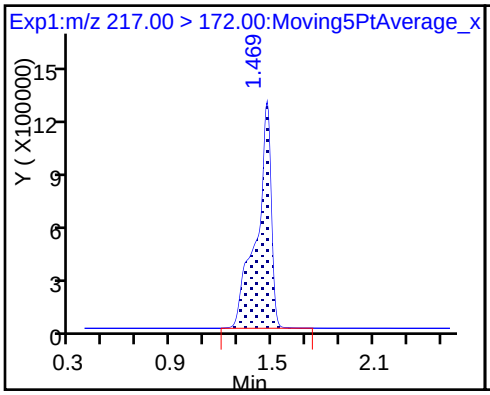
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 1

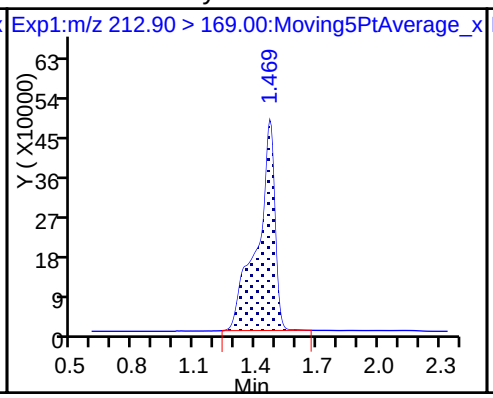
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

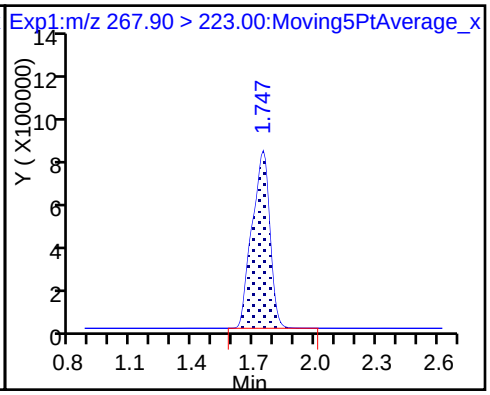
D 1 13C4 PFBA



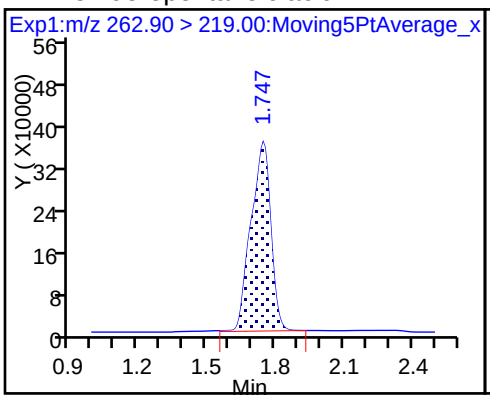
2 Perfluorobutyric acid



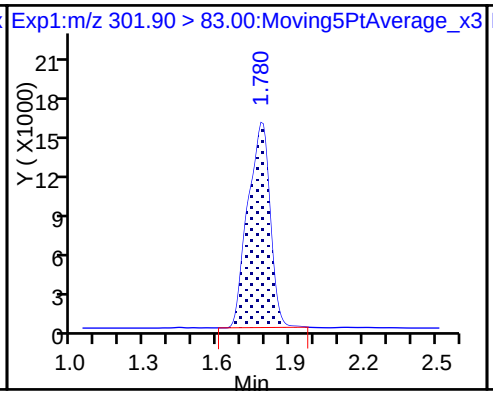
D 3 13C5-PFPeA



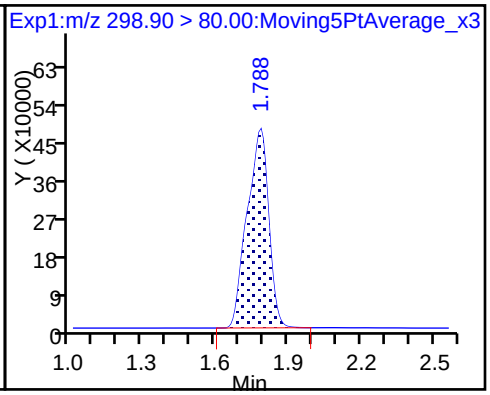
4 Perfluoropentanoic acid



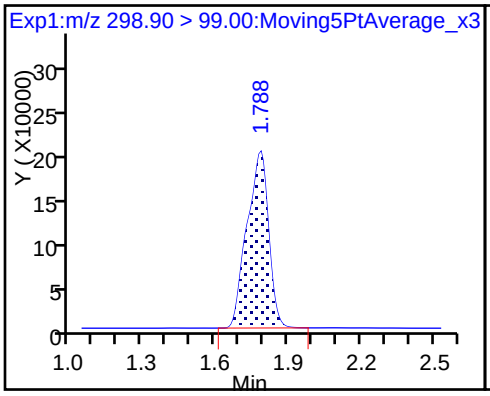
D 47 13C3-PFBS



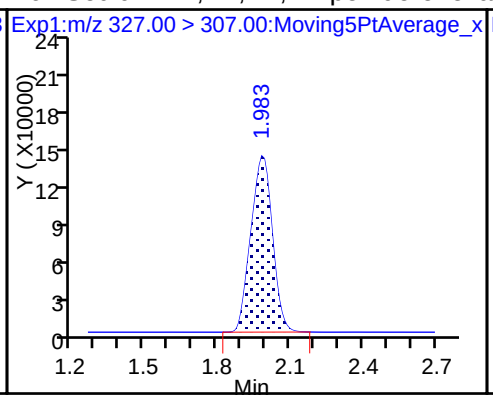
5 Perfluorobutanesulfonic acid



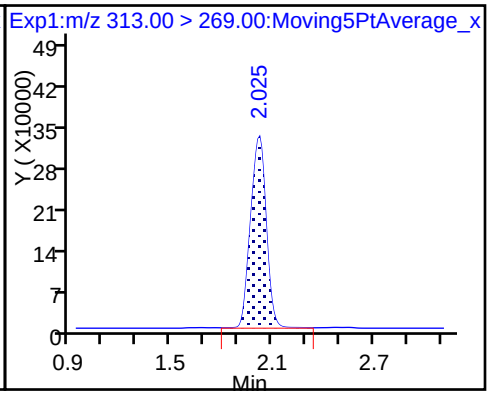
5 Perfluorobutanesulfonic acid



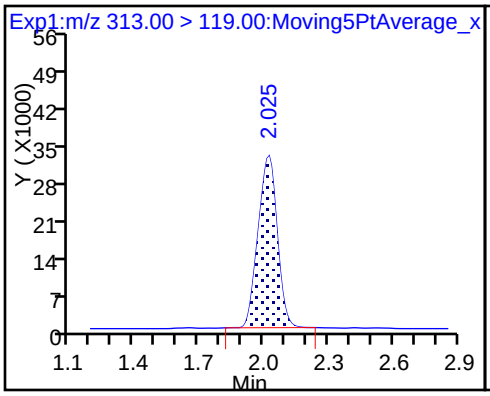
61 Sodium 1H,1H,2H,2H-perfluorohexane



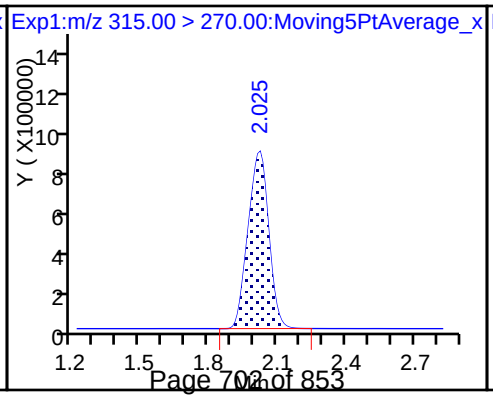
6 Perfluorohexanoic acid



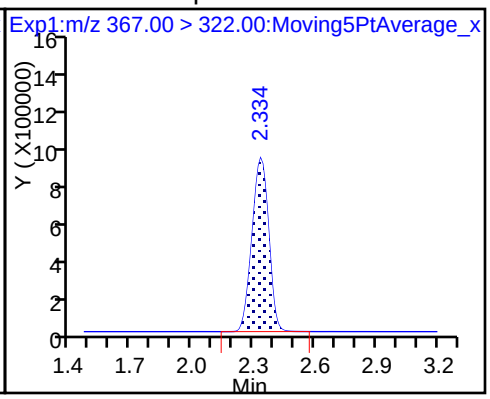
6 Perfluorohexanoic acid



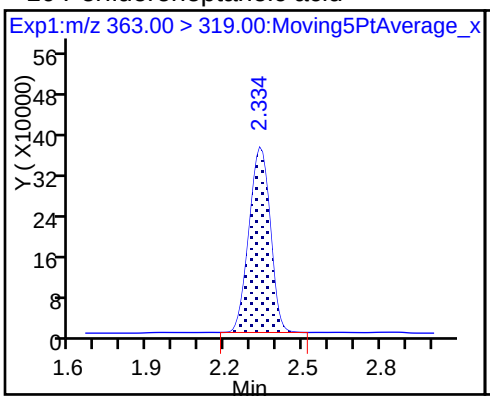
D 7 13C2 PFHxA



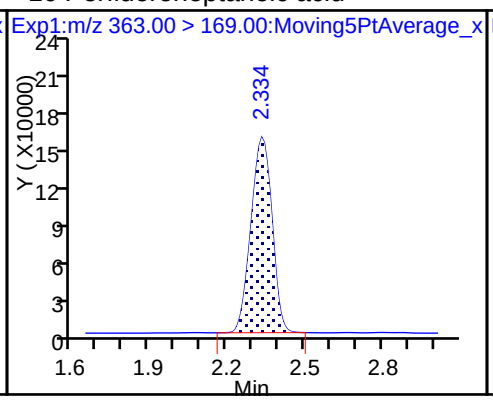
D 9 13C4-PFHpA



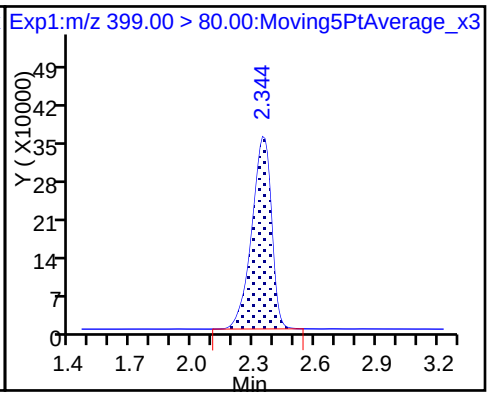
10 Perfluoroheptanoic acid



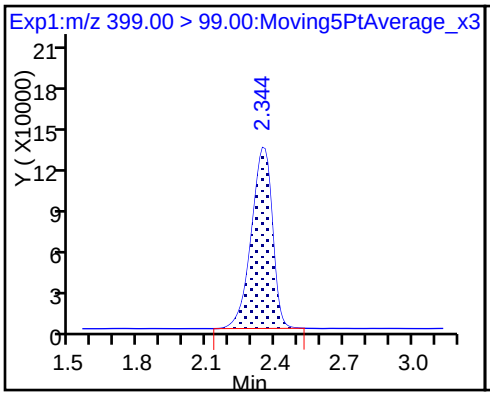
10 Perfluoroheptanoic acid



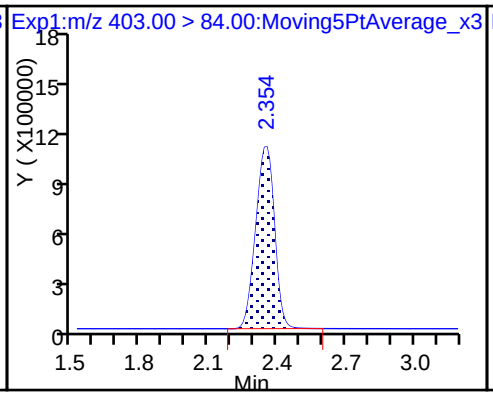
8 Perfluorohexanesulfonic acid



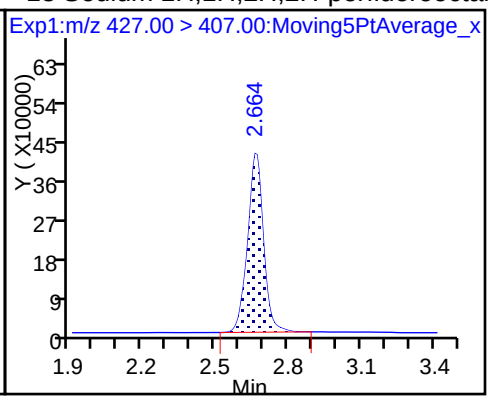
8 Perfluorohexanesulfonic acid



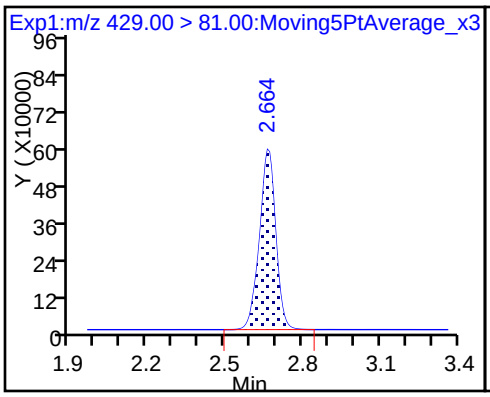
D 11 18O2 PFHxS



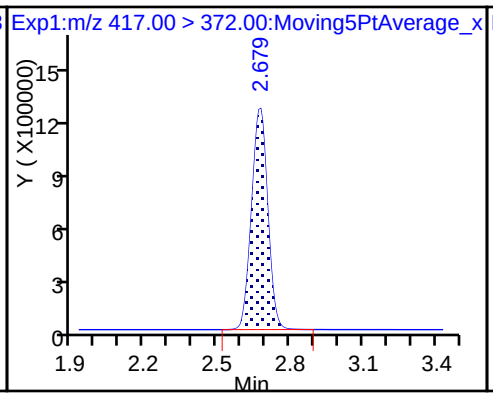
13 Sodium 1H,1H,2H,2H-perfluorooctane



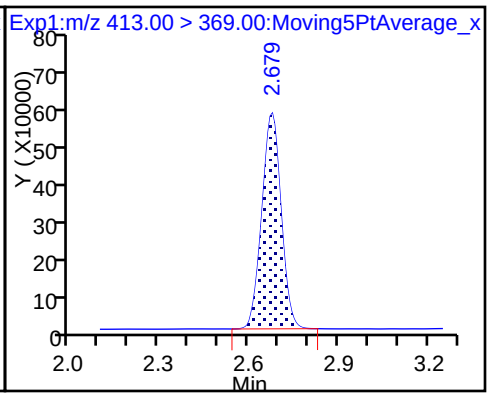
D 12 M2-6:2FTS



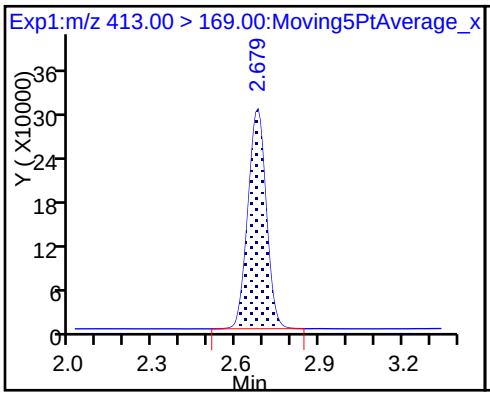
D 14 13C4 PFOA



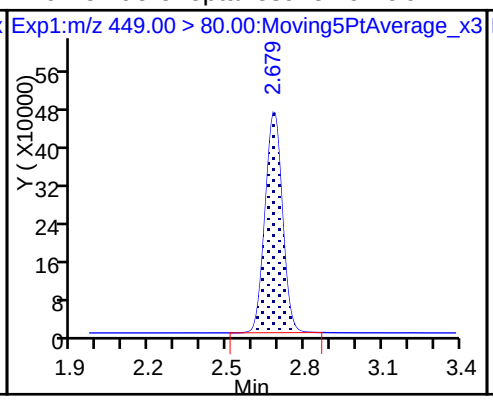
15 Perfluorooctanoic acid



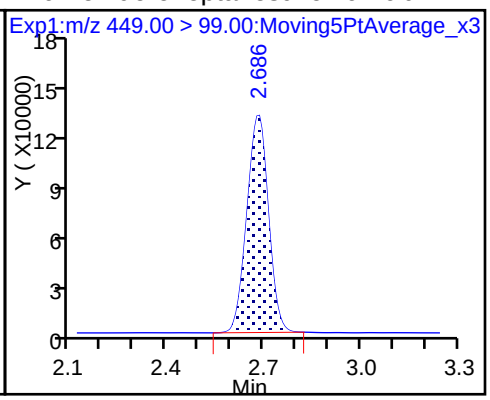
15 Perfluorooctanoic acid



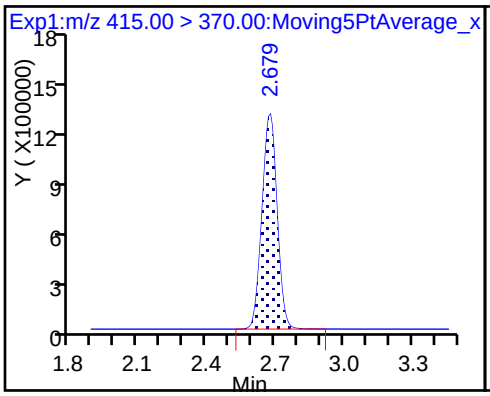
16 Perfluoroheptanesulfonic Acid



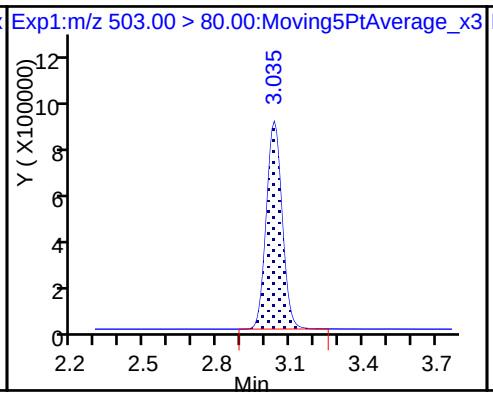
16 Perfluoroheptanesulfonic Acid



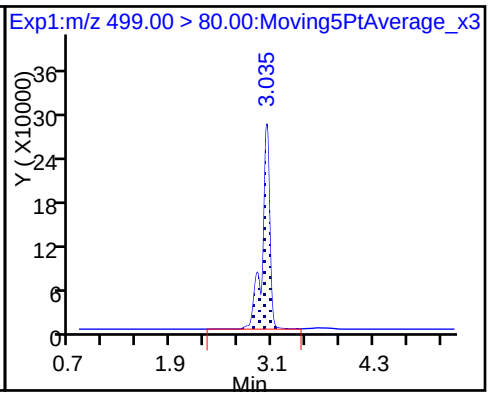
* 62 13C2-PFOA



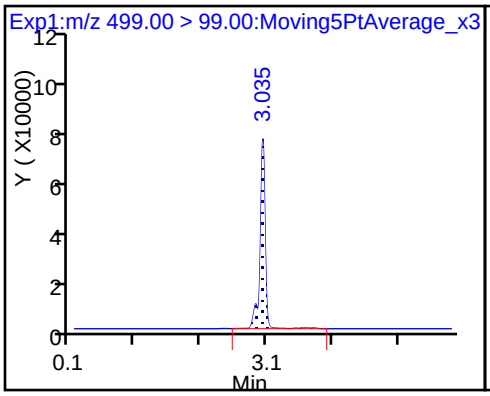
D 18 13C4 PFOS



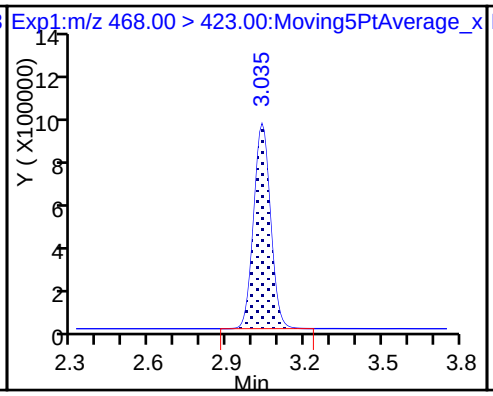
17 Perfluorooctane sulfonic acid



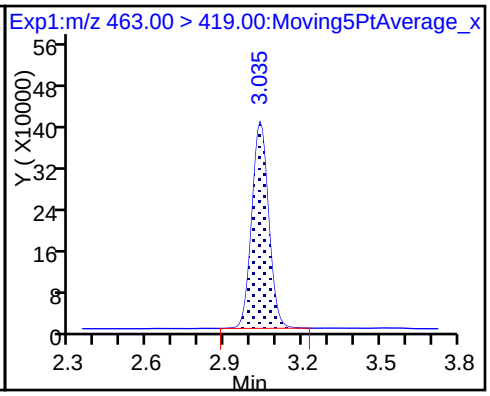
17 Perfluorooctane sulfonic acid



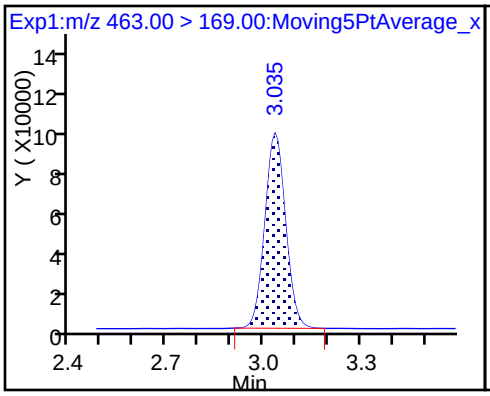
D 19 13C5 PFNA



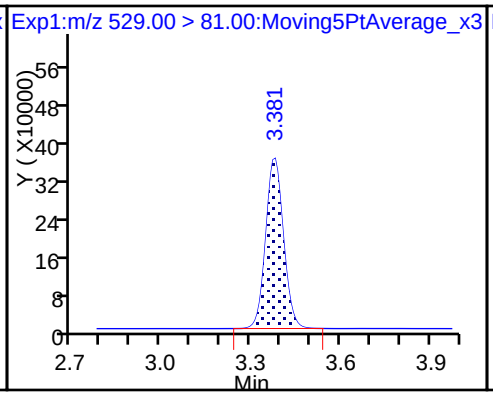
20 Perfluorononanoic acid



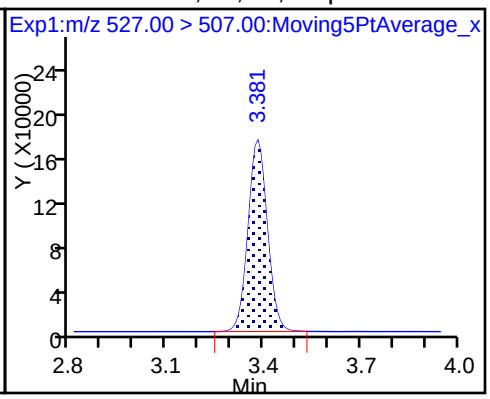
20 Perfluorononanoic acid



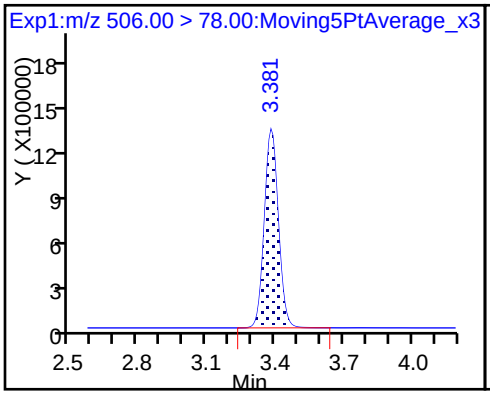
D 26 M2-8:2FTS



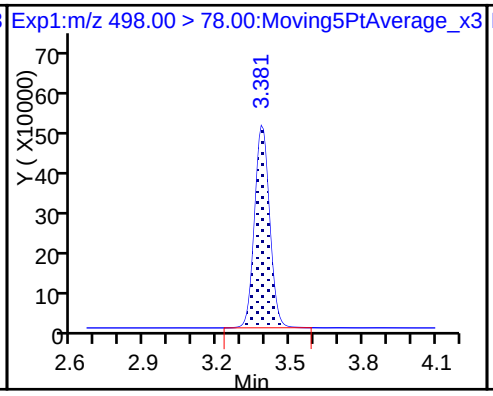
25 Sodium 1H,1H,2H,2H-perfluorodecane



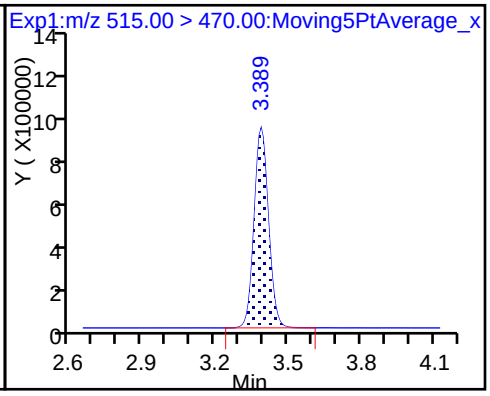
D 21 13C8 FOSA



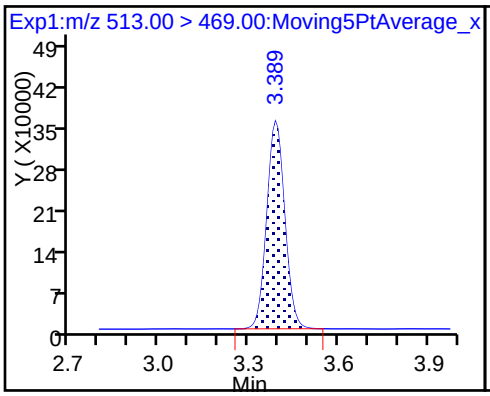
22 Perfluorooctane Sulfonamide



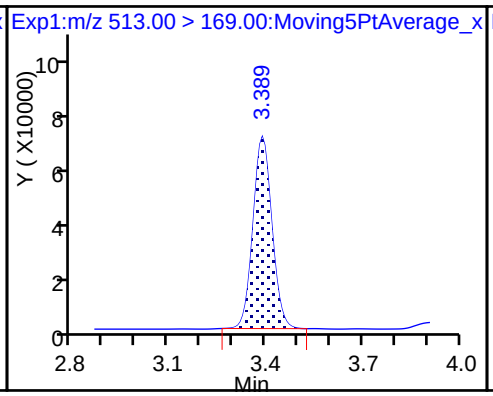
D 23 13C2 PFDA



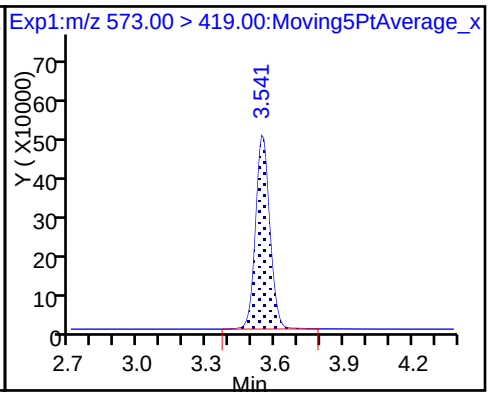
24 Perfluorodecanoic acid



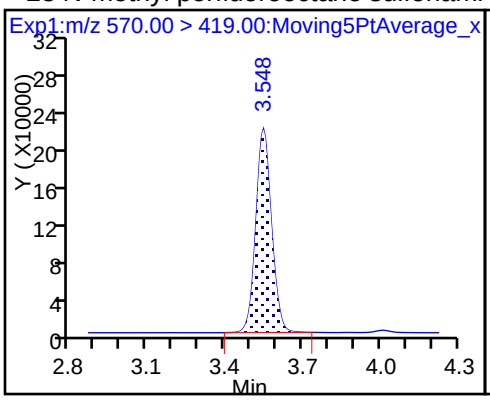
24 Perfluorodecanoic acid



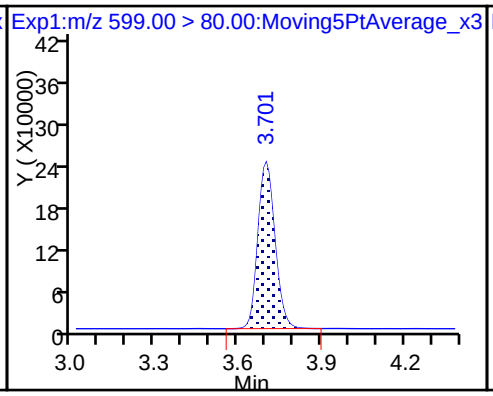
D 27 d3-NMeFOSAA



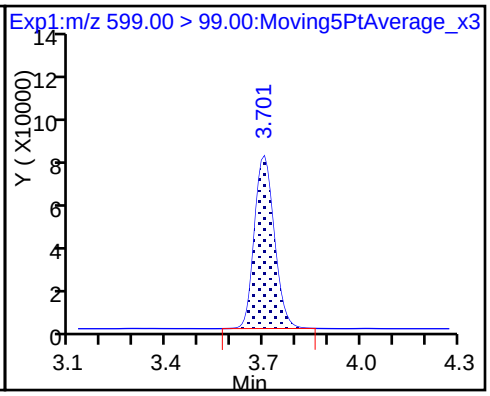
28 N-methyl perfluorooctane sulfonami



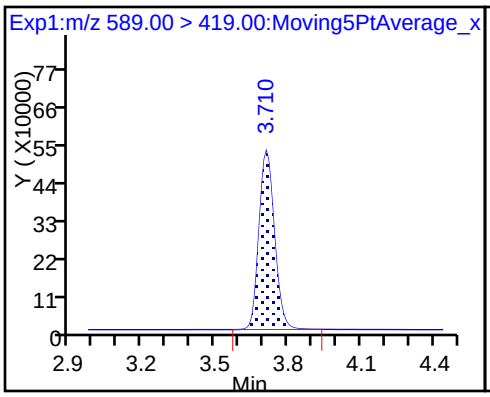
29 Perfluorodecane Sulfonic acid



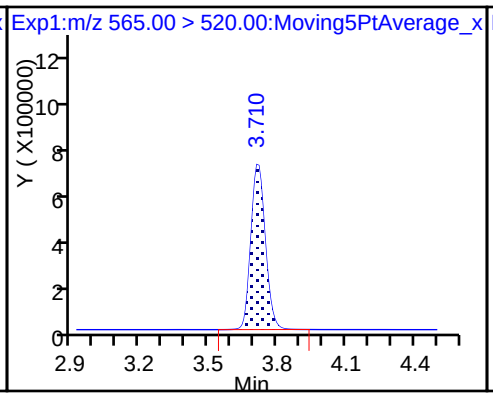
29 Perfluorodecane Sulfonic acid



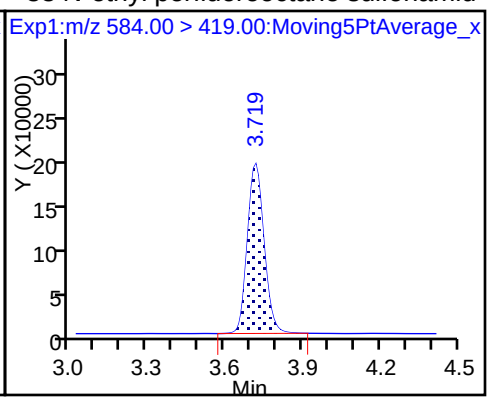
D 32 d5-NEtFOSAA



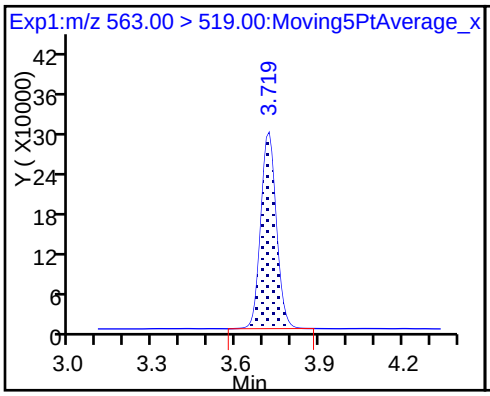
D 30 13C2 PFUnA



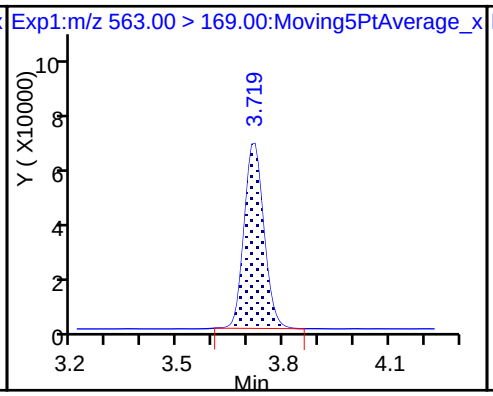
33 N-ethyl perfluorooctane sulfonamid



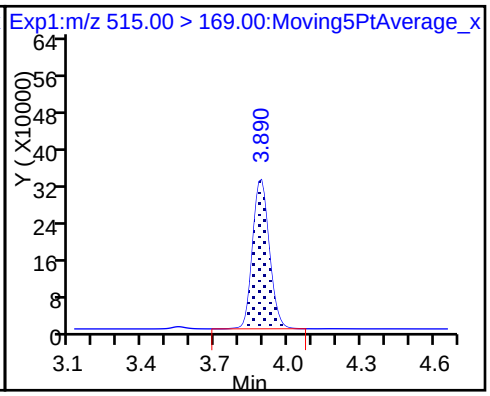
31 Perfluoroundecanoic acid



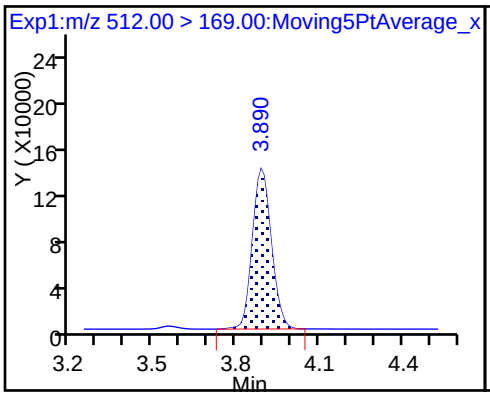
31 Perfluoroundecanoic acid



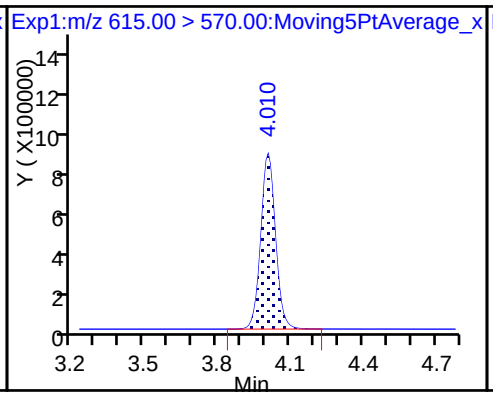
D 34 d-N-MeFOSA-M



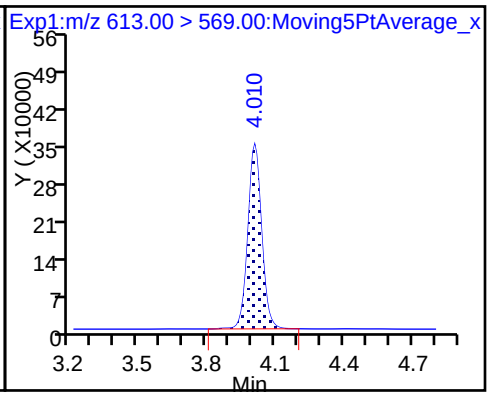
35 MeFOSA



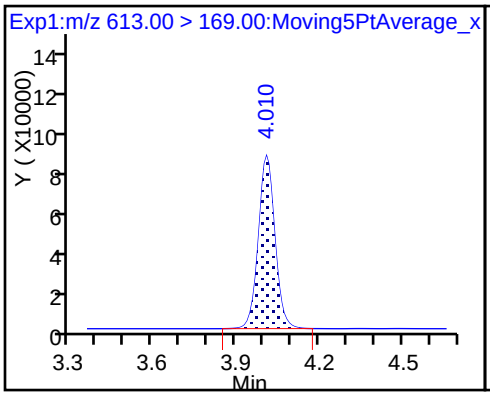
D 36 13C2 PFDoA



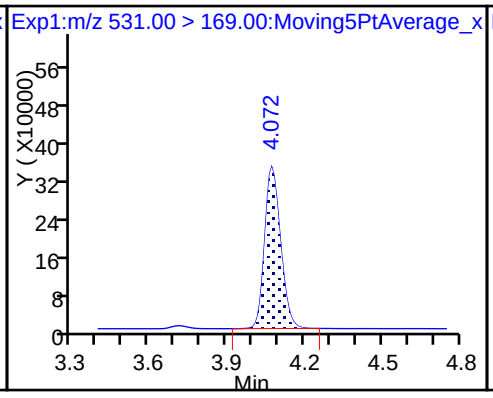
37 Perfluorododecanoic acid



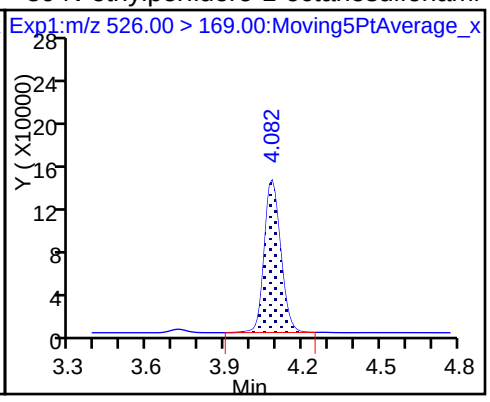
37 Perfluorododecanoic acid



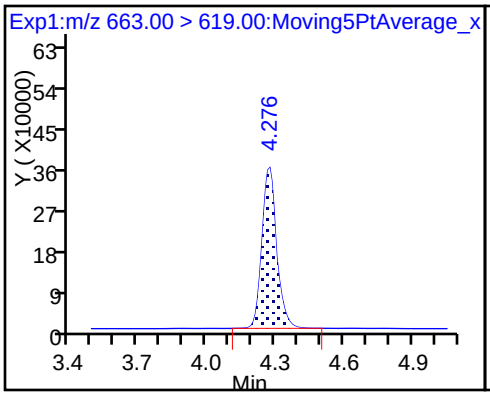
D 38 d-N-EtFOSA-M



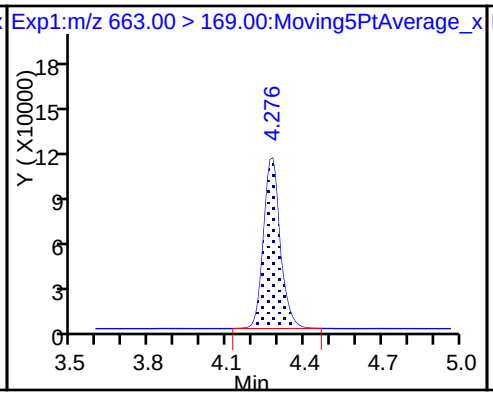
39 N-ethylperfluoro-1-octanesulfonami



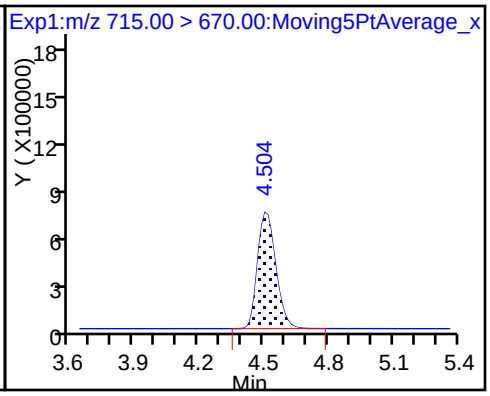
41 Perfluorotridecanoic acid



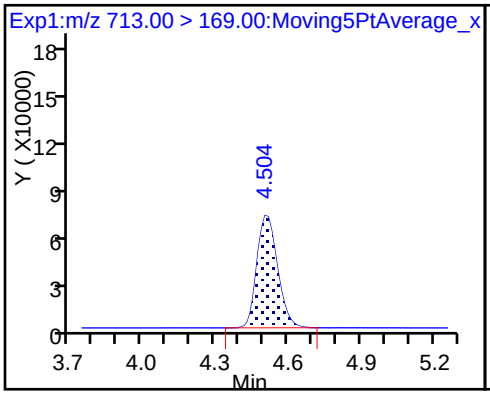
41 Perfluorotridecanoic acid



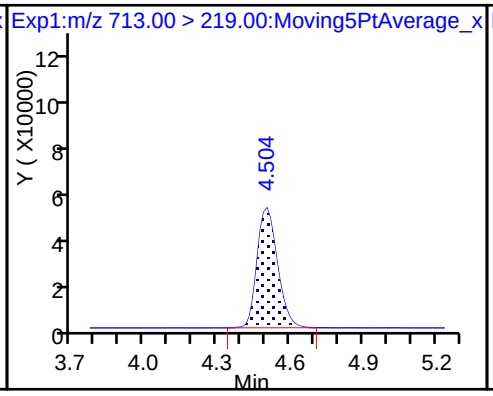
D 43 13C2-PFTeDA



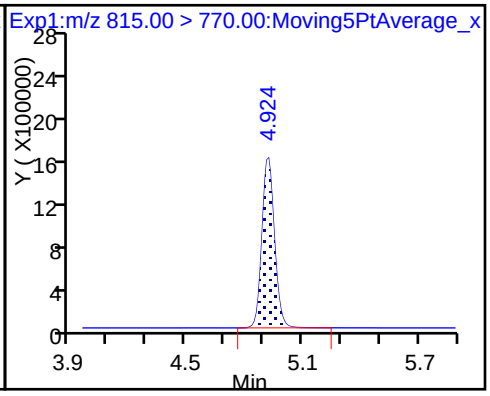
42 Perfluorotetradecanoic acid



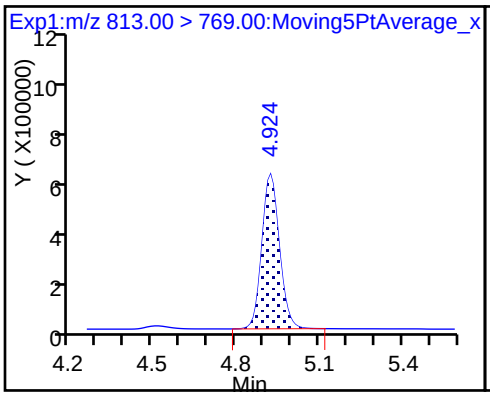
42 Perfluorotetradecanoic acid



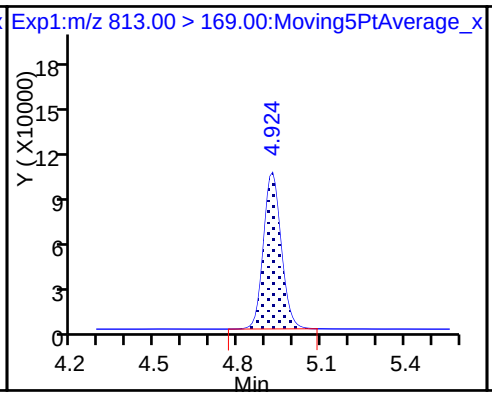
D 44 13C2-PFHxDA



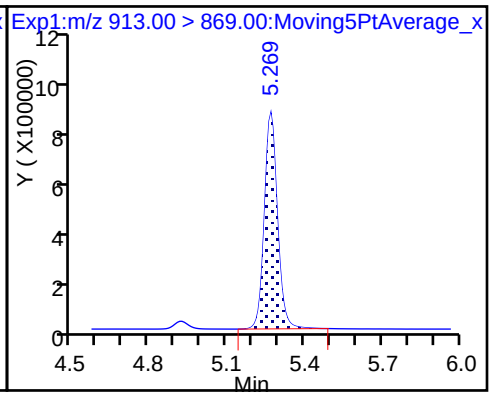
45 Perfluorohexadecanoic acid



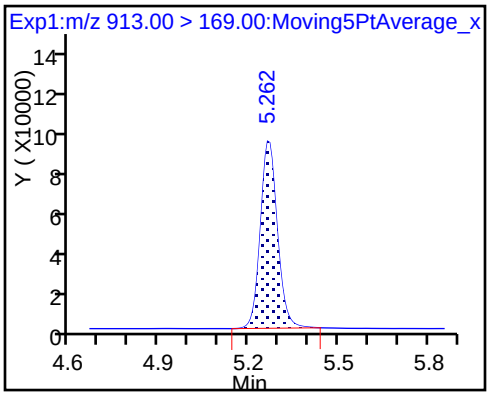
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-195562/12 Calibration Date: 11/18/2017 18:14

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXEA_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9462		2.58	2.50	3.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.116		2.47	2.50	-1.1	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	76.81		2.28	2.21	3.4	25.0
4:2 FTS	AveID	0.7456	0.9600		3.01	2.34	28.7*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	0.9862		2.46	2.50	-1.4	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	1.076		2.62	2.50	5.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	1.070		2.22	2.28	-2.3	25.0
6:2FTS	AveID	1.605	1.589		2.35	2.37	-1.0	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.085		2.57	2.50	2.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.339		2.44	2.38	2.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.997	1.007		2.52	2.50	1.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.067		2.36	2.32	1.7	25.0
8:2FTS	AveID	1.214	1.264		2.49	2.40	4.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	0.9796		2.52	2.50	0.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	1.014		2.64	2.50	5.5	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	1.085		2.59	2.50	3.5	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.6385		2.55	2.41	5.7	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9547		2.49	2.50	-0.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.9306		2.57	2.50	2.8	25.0
MeFOSA	AveID	0.9814	1.013		2.58	2.50	3.2	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	0.9834		2.51	2.50	0.4	25.0
N-EtFOSA-M	AveID	1.002	1.039		2.59	2.50	3.8	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.186		2.42	2.50	-3.1	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2436		2.48	2.50	-0.7	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8983		2.51	2.50	0.4	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	1.041		2.62	2.50	4.6	25.0
13C4 PFBA	Ave	1.301	1.292		2.48	2.50	-0.7	50.0
13C5 PFPeA	Ave	0.8240	0.8214		2.49	2.50	-0.3	50.0
13C3-PFBS	Ave	0.0180	0.0186		2.40	2.33	3.1	50.0
13C2 PFHxA	Ave	0.9302	0.9643		2.59	2.50	3.7	50.0
13C4-PFHpA	Ave	0.8986	0.8933		2.49	2.50	-0.6	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-195562/12 Calibration Date: 11/18/2017 18:14

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXEA_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.090		2.43	2.37	2.8	50.0
M2-6:2FTS	Ave	0.4500	0.3954		2.09	2.38	-12.1	50.0
13C4 PFOA	Ave	1.030	1.016		2.46	2.50	-1.4	50.0
13C4 PFOS	Ave	0.7080	0.7293		2.46	2.39	3.0	50.0
13C5 PFNA	Ave	0.7570	0.7715		2.55	2.50	1.9	50.0
M2-8:2FTS	Ave	0.2391	0.2612		2.62	2.40	9.2	50.0
13C2 PFDA	Ave	0.6386	0.6545		2.56	2.50	2.5	50.0
13C8 FOSA	Ave	0.9121	0.9416		2.58	2.50	3.2	50.0
d3-NMeFOSAA	Ave	0.3429	0.3622		2.64	2.50	5.6	50.0
13C2 PFUnA	Ave	0.5100	0.5447		2.67	2.50	6.8	50.0
d5-NEtFOSAA	Ave	0.3296	0.3790		2.88	2.50	15.0	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2662		2.51	2.50	0.6	50.0
13C2 PFDoA	Ave	0.5923	0.6037		2.55	2.50	1.9	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2588		2.63	2.50	5.4	50.0
13C2-PFTeDA	Ave	0.7282	0.7157		2.46	2.50	-1.7	50.0
13C2-PFHxDA	Ave	1.288	1.255		2.44	2.50	-2.6	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_012.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 18-Nov-2017 18:14:12 ALS Bottle#: 14 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub18

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 24-Nov-2017 11:45:52 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK033

First Level Reviewer: hannigana Date: 24-Nov-2017 11:43:55

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.471	1.479	-0.008	0.550	7323278	2.48		99.3	75844	
2 Perfluorobutyric acid										
212.90 > 169.00	1.471	1.480	-0.009	1.000	6929170	2.58		103	1260	
D 3 13C5-PFPeA										
267.90 > 223.00	1.742	1.738	0.004	0.651	4655154	2.49		99.7	76916	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.742	1.740	0.002	1.000	5193330	2.47		98.9	3566	
D 47 13C3-PFBS										
301.90 > 83.00	1.783	1.774	0.009	0.667	97854	2.40		103	2684	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.783	1.776	0.007	1.000	7144462	2.28		103	30307	
298.90 > 99.00	1.783	1.776	0.007	1.000	2995079		2.39(1.74-3.24)		19038	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.986	1.977	0.009	1.000	2009299	3.01		129	65717	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.018	2.010	0.008	1.000	5389995	2.46		98.6	9904	
313.00 > 119.00	2.018	2.010	0.008	1.000	526395		10.24(7.05-13.09)		9392	
D 7 13C2 PFHxA										
315.00 > 270.00	2.018	2.010	0.008	0.754	5465318	2.59		104	58335	
D 9 13C4-PFHpA										
367.00 > 322.00	2.328	2.332	-0.004	0.870	5062441	2.49		99.4	49586	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.328	2.333	-0.005	1.000	5448731	2.62		105	6606	
363.00 > 169.00	2.328	2.333	-0.005	1.000	2028819		2.69(1.59-2.95)		8892	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.349	2.347	0.002	1.000	6019102	2.22		97.7	16587	
399.00 > 99.00	2.349	2.347	0.002	1.000	1964909		3.06(2.10-3.89)		10341	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.349	2.347	0.002	0.878	5846453	2.43		103	38372	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.668	2.671	-0.002	1.000	3374790	2.35		99.0	16118	
D 12 M2-6:2FTS										
429.00 > 81.00	2.668	2.671	-0.003	0.997	2128959	2.09		87.9	36059	
D 14 13C4 PFOA										
417.00 > 372.00	2.675	2.680	-0.005	1.000	5756850	2.46		98.6	36572	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.675	2.680	-0.005	1.000	6248206	2.57		103	2522	
413.00 > 169.00	2.675	2.680	-0.005	1.000	3304427		1.89(1.18-2.19)		14930	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.682	2.687	-0.005	1.000	5270539	2.44		102	25317	
449.00 > 99.00	2.682	2.687	-0.005	1.000	1397728		3.77(2.72-5.05)		14421	
* 62 13C2-PFOA										
415.00 > 370.00	2.675	2.695	-0.020		5667463	2.50			39019	
D 18 13C4 PFOS										
503.00 > 80.00	3.032	3.042	-0.010	1.133	3951570	2.46		103	20444	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.032	3.042	-0.010	1.000	4092932	2.36		102	6044	
499.00 > 99.00	3.032	3.042	-0.010	1.000	881943		4.64(3.24-6.01)		55755	
D 19 13C5 PFNA										
468.00 > 423.00	3.032	3.042	-0.010	1.133	4372450	2.55		102	34083	
20 Perfluorononanoic acid										
463.00 > 419.00	3.032	3.045	-0.013	1.000	4403256	2.52		101	8109	
463.00 > 169.00	3.032	3.045	-0.013	1.000	1069339		4.12(2.65-4.93)		19953	
D 26 M2-8:2FTS										
529.00 > 81.00	3.380	3.390	-0.010	1.264	1418039	2.62		109	18669	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.380	3.392	-0.012	1.000	1792449	2.49		104	32935	
D 21 13C8 FOSA										
506.00 > 78.00	3.387	3.393	-0.006	1.266	5336433	2.58		103	36234	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.387	3.395	-0.008	1.000	5410195	2.64		106	36436	
D 23 13C2 PFDA										
515.00 > 470.00	3.387	3.400	-0.013	1.266	3709205	2.56		102	38786	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.387	3.400	-0.013	1.000	3633363	2.52		101	14013	
513.00 > 169.00	3.395	3.400	-0.005	1.002	645870		5.63(3.31-6.15)		2764	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.547	3.557	-0.011	1.326	2052922	2.64		106	17028	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.554	3.561	-0.007	1.002	2227878	2.59		104	9590	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.708	3.714	-0.006	1.000	2544370	2.55		106	39300	
599.00 > 99.00	3.699	3.714	-0.015	0.998	832990		3.05(1.94-3.60)		19374	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.717	3.725	-0.008	1.389	2148194	2.88		115	10517	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFUnA										
565.00 > 520.00	3.717	3.730	-0.013	1.389	3087214	2.67		107	27548	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.717	3.731	-0.014	1.000	2050783	2.49		99.6	17601	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.717	3.731	-0.014	1.000	2873024	2.57		103	11635	
563.00 > 169.00	3.717	3.731	-0.014	1.000	604801		4.75(0.00-0.00)		21955	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.897	3.896	0.001	1.457	1508401	2.51		101	3148	
35 MeFOSA										
512.00 > 169.00	3.897	3.903	-0.006	1.000	1527811	2.58		103	2560	
D 36 13C2 PFDoA										
615.00 > 570.00	4.015	4.024	-0.009	1.501	3421378	2.55		102	34711	
37 Perfluorododecanoic acid										R
613.00 > 569.00	4.015	4.025	-0.010	1.000	3364682	2.51		100	18058	R
613.00 > 169.00	4.015	4.025	-0.010	1.000	795715		4.23(2.19-4.07)		19274	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.078	4.084	-0.006	1.524	1466853	2.63		105	2869	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.087	4.091	-0.004	1.002	1524558	2.59		104	2542	
41 Perfluorotridecanoic acid										R
663.00 > 619.00	4.272	4.287	-0.015	1.000	4058717	2.42		96.9	14528	R
663.00 > 169.00	4.272	4.287	-0.015	1.000	1219535		3.33(1.76-3.26)		29931	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.515	4.526	-0.011	1.688	4056439	2.46		98.3	23135	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.515	4.526	-0.011	1.000	987996	2.48		99.3	16821	
713.00 > 219.00	4.501	4.526	-0.025	0.997	701223		1.41(1.00-1.85)		15002	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.923	4.938	-0.015	1.841	7114202	2.44		97.4	23486	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.923	4.939	-0.016	1.000	6390614	2.51		100	4008	R
813.00 > 169.00	4.923	4.939	-0.016	1.000	1123194		5.69(2.50-4.65)		11174	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.269	5.286	-0.017	1.000	7407158	2.62		105	2026	
913.00 > 169.00	5.269	5.286	-0.017	1.000	899099		8.24(0.00-0.00)		2956	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL5_00002 Amount Added: 1.00 Units: mL

Report Date: 24-Nov-2017 11:45:53 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_012.d

Injection Date: 18-Nov-2017 18:14:12 Instrument ID: A8_N

Lims ID: CCV L5

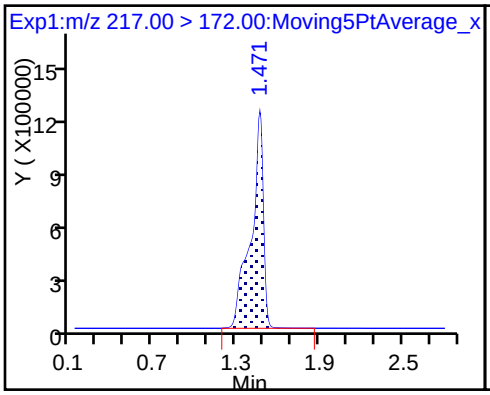
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 12

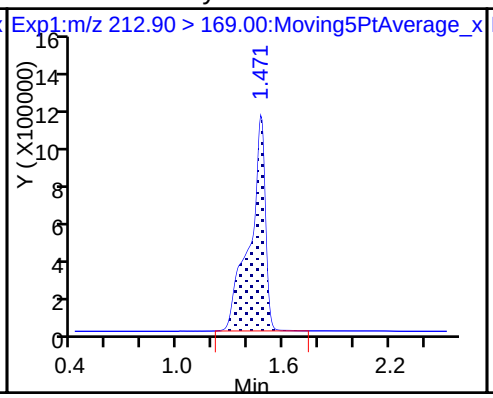
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

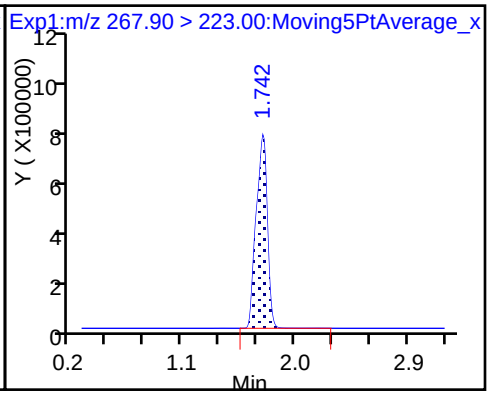
D 1 13C4 PFBA



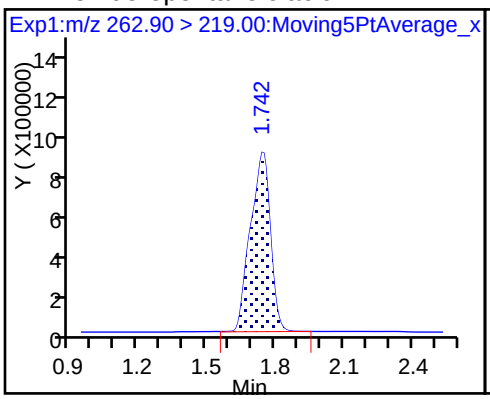
2 Perfluorobutyric acid



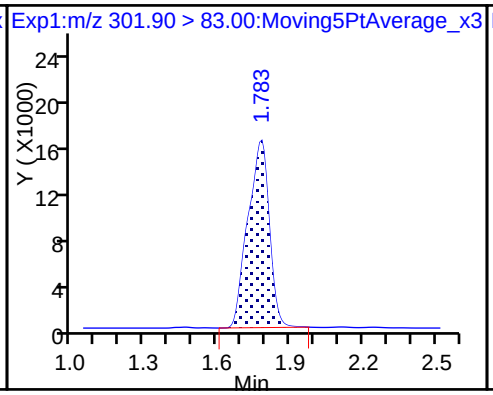
D 3 13C5-PFPeA



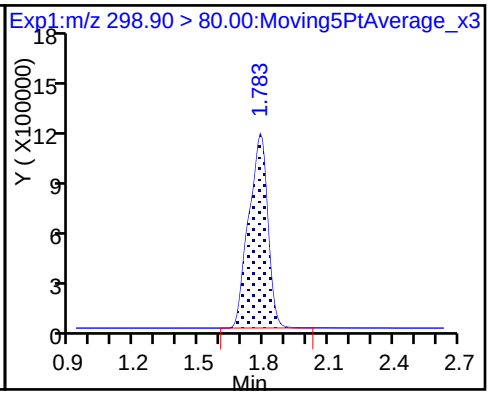
4 Perfluoropentanoic acid



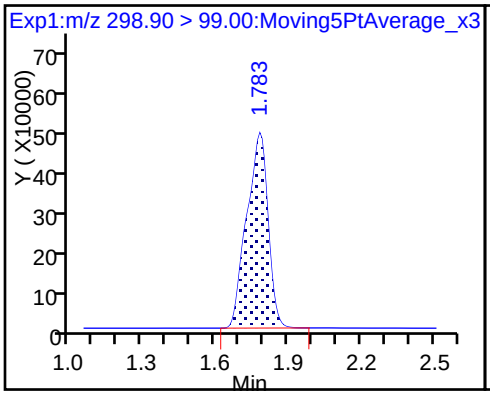
D 47 13C3-PFBS



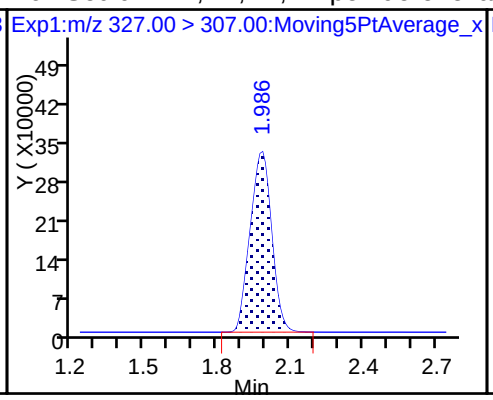
5 Perfluorobutanesulfonic acid



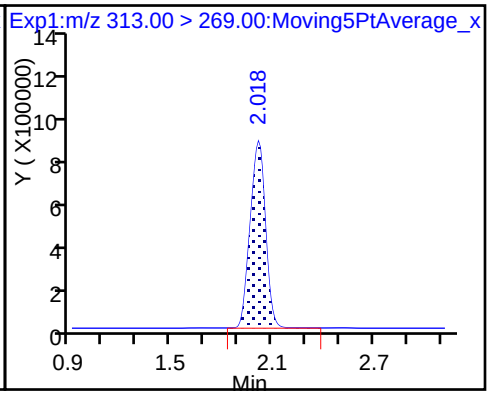
5 Perfluorobutanesulfonic acid



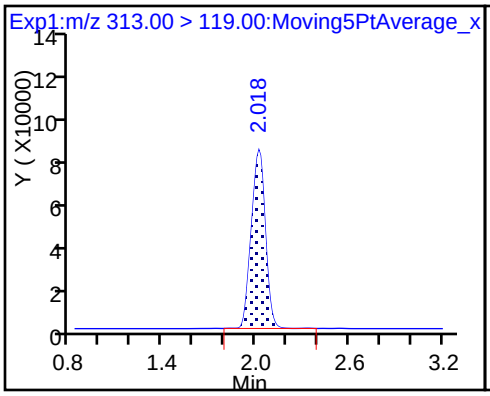
61 Sodium 1H,1H,2H,2H-perfluorohexane



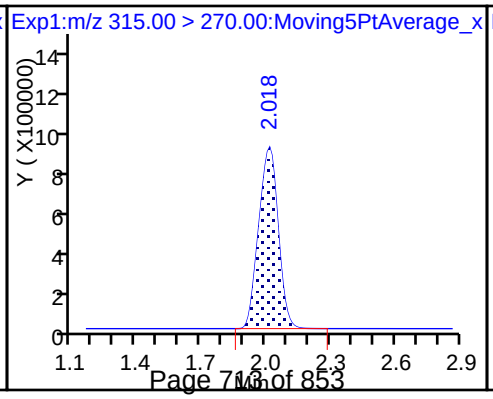
6 Perfluorohexanoic acid



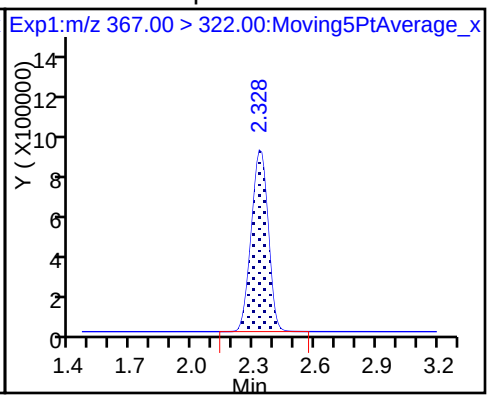
6 Perfluorohexanoic acid



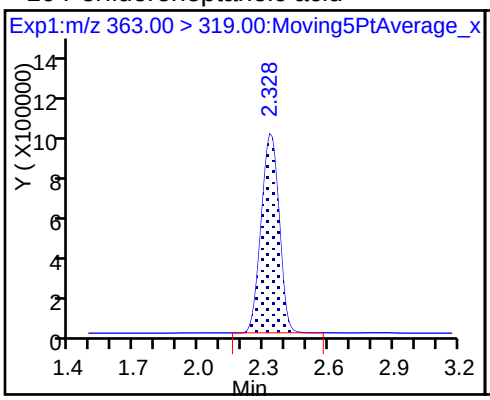
D 7 13C2 PFHxA



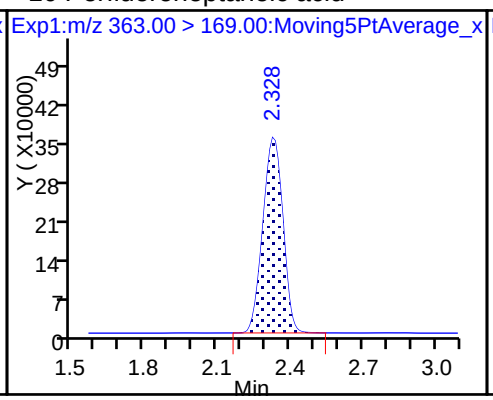
D 9 13C4-PFHpA



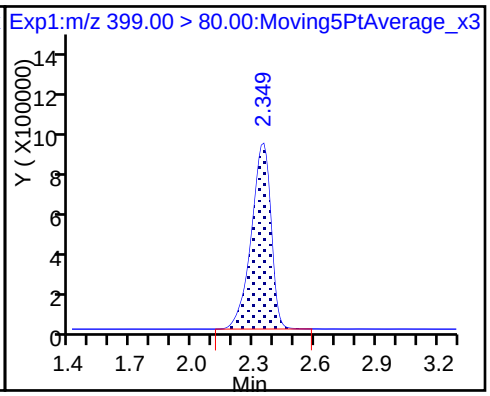
10 Perfluoroheptanoic acid



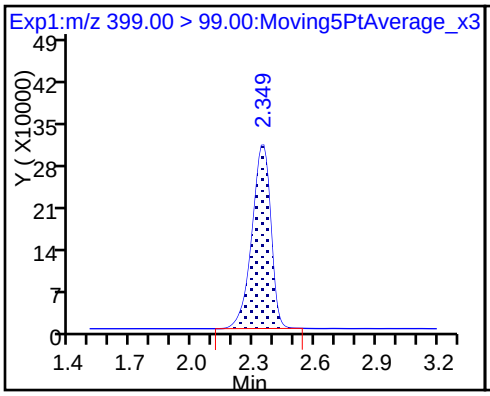
10 Perfluoroheptanoic acid



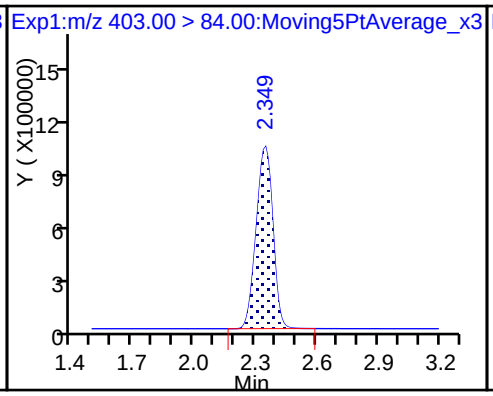
8 Perfluorohexanesulfonic acid



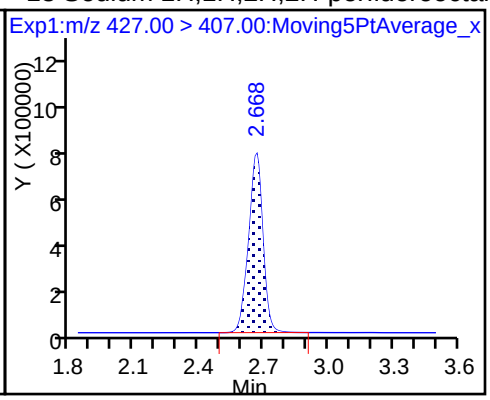
8 Perfluorohexanesulfonic acid



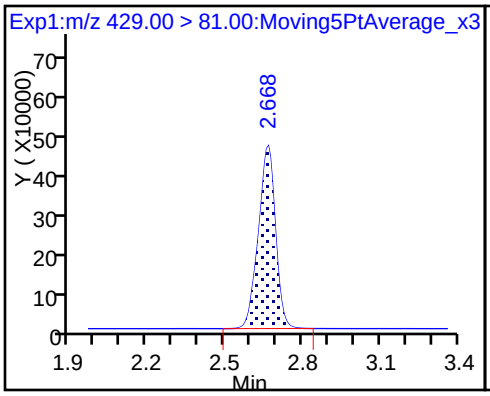
D 11 18O2 PFHxS



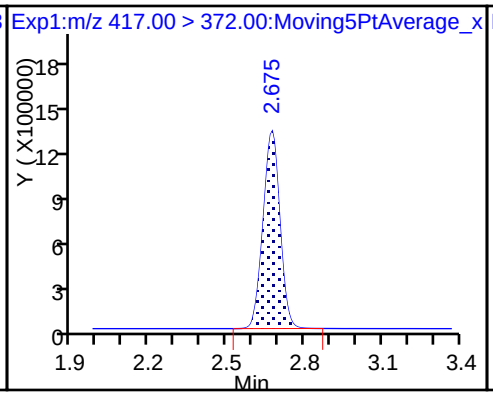
13 Sodium 1H,1H,2H,2H-perfluorooctane



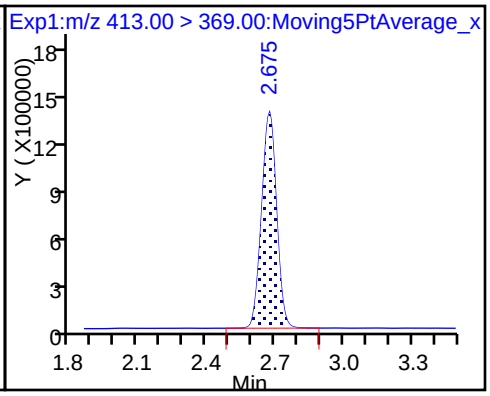
D 12 M2-6:2FTS



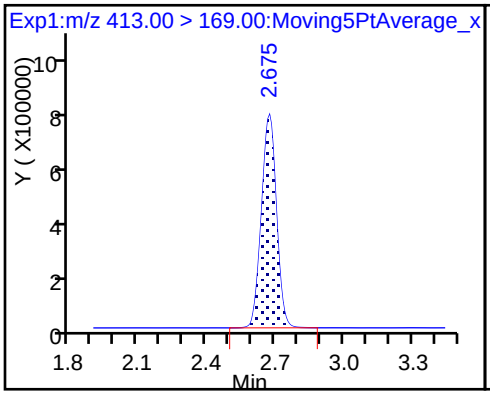
D 14 13C4 PFOA



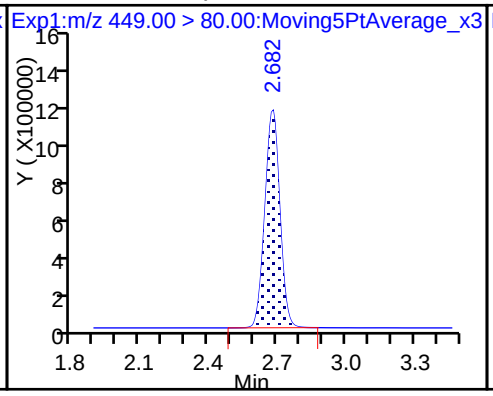
15 Perfluorooctanoic acid



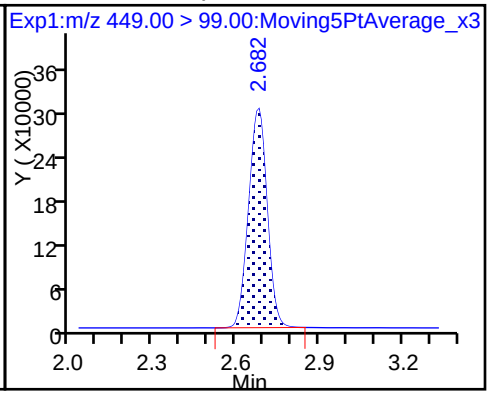
15 Perfluorooctanoic acid



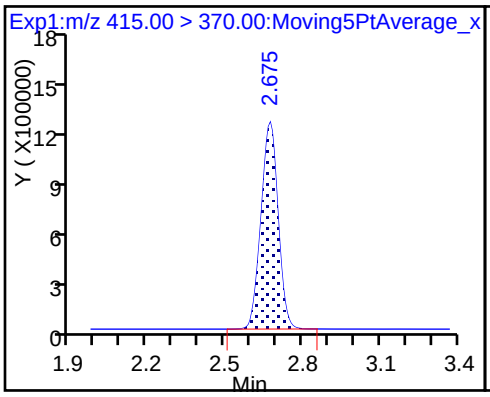
16 Perfluoroheptanesulfonic Acid



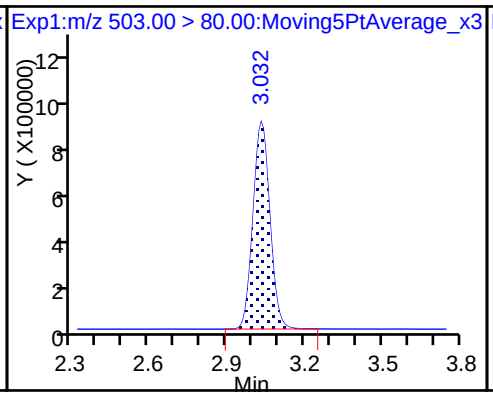
16 Perfluoroheptanesulfonic Acid



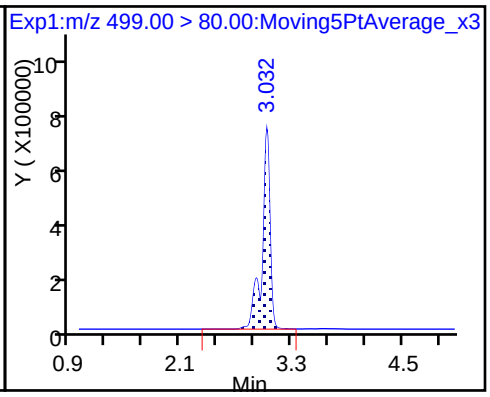
* 62 13C2-PFOA



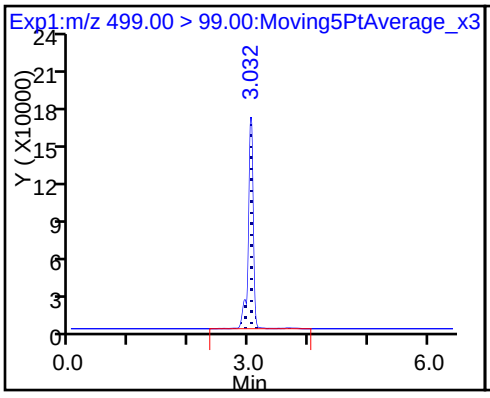
D 18 13C4 PFOS



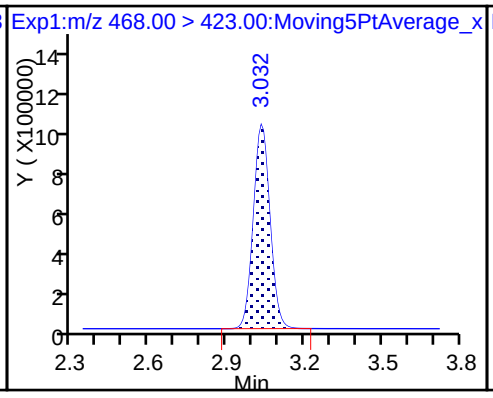
17 Perfluorooctane sulfonic acid



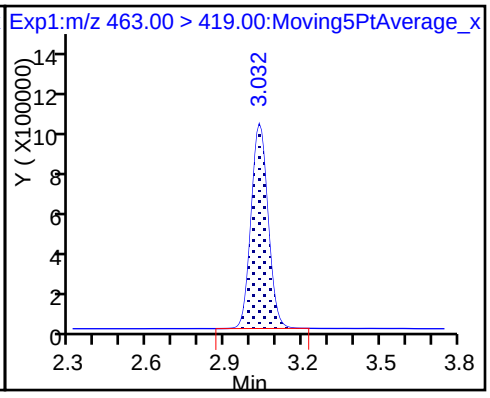
17 Perfluorooctane sulfonic acid



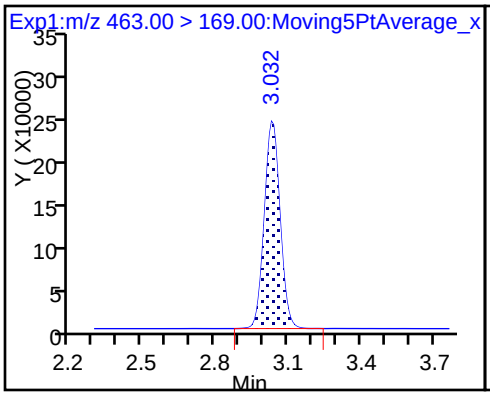
D 19 13C5 PFNA



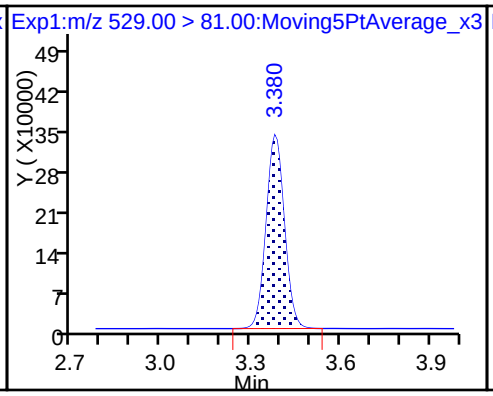
20 Perfluorononanoic acid



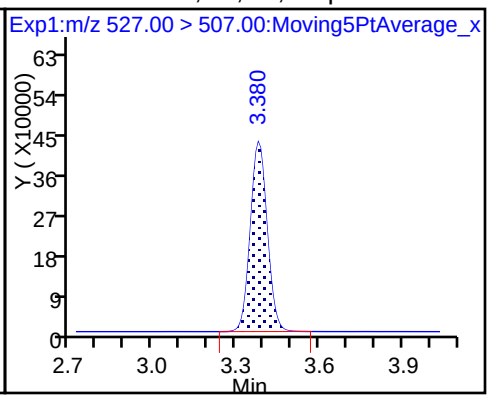
20 Perfluorononanoic acid



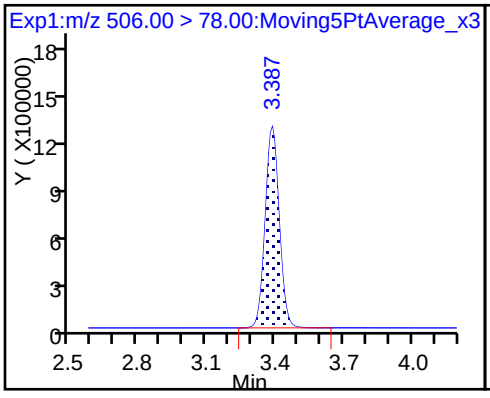
D 26 M2-8:2FTS



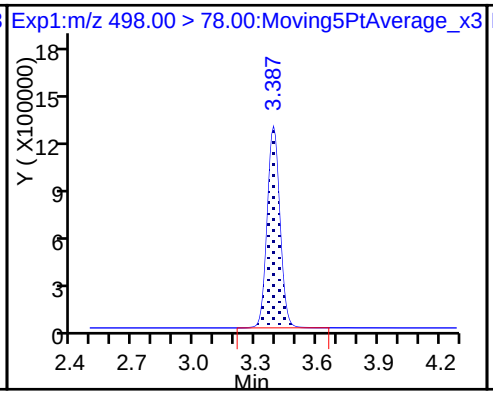
25 Sodium 1H,1H,2H,2H-perfluorodecane



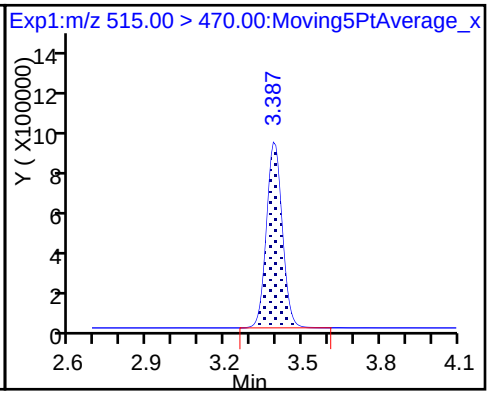
D 21 13C8 FOSA



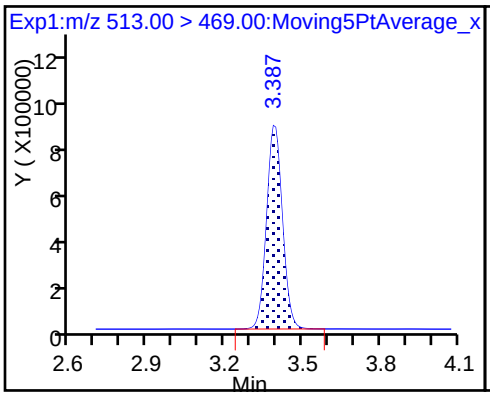
22 Perfluorooctane Sulfonamide



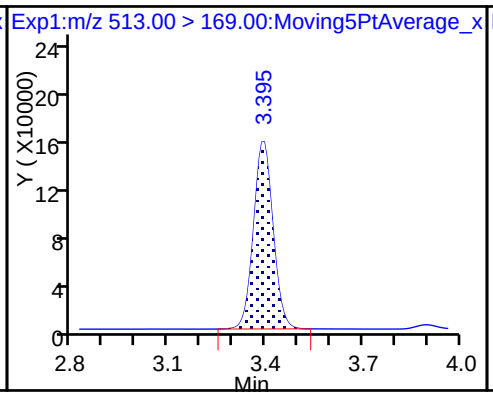
D 23 13C2 PFDA



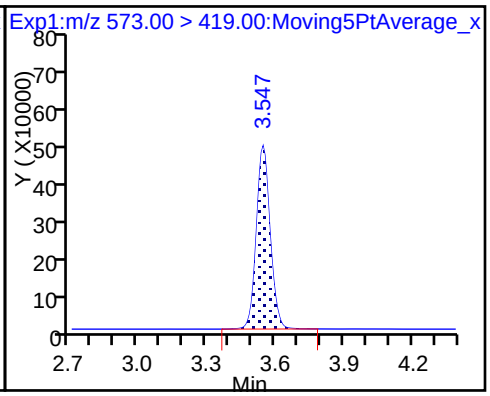
24 Perfluorodecanoic acid



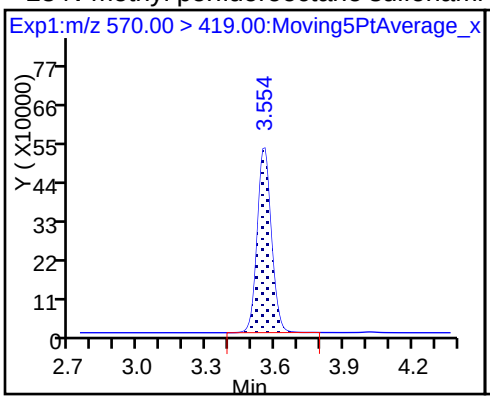
24 Perfluorodecanoic acid



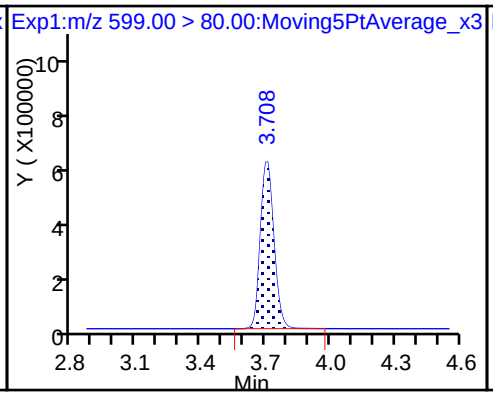
D 27 d3-NMeFOSAA



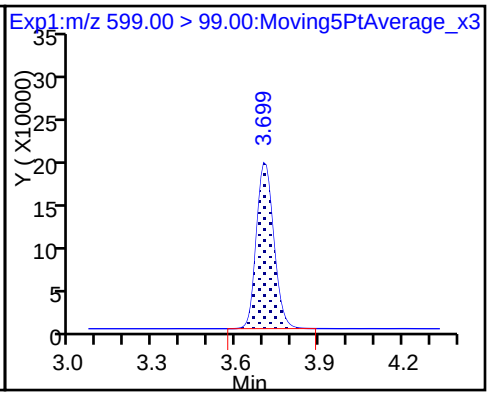
28 N-methyl perfluorooctane sulfonami



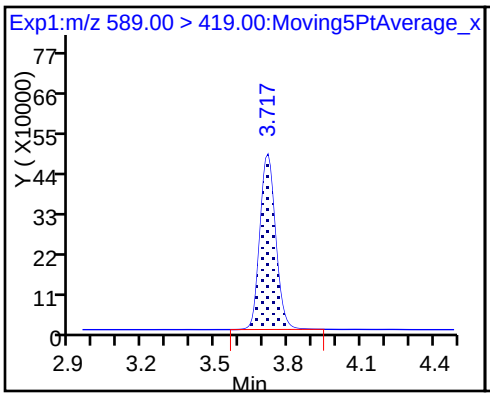
29 Perfluorodecane Sulfonic acid



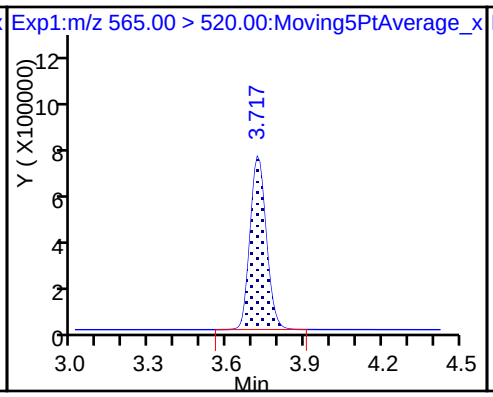
29 Perfluorodecane Sulfonic acid



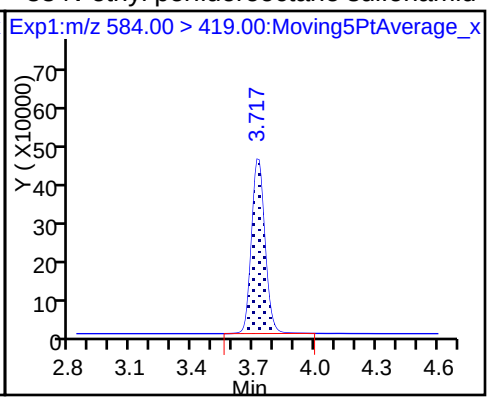
D 32 d5-NEtFOSAA



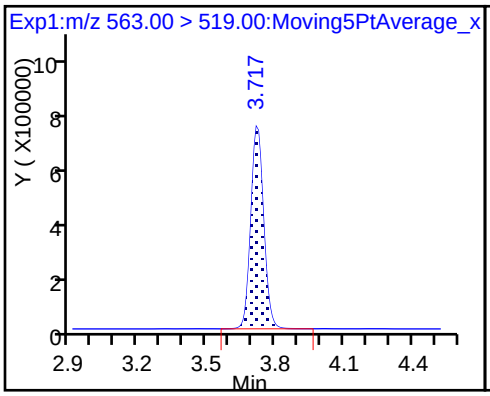
D 30 13C2 PFUnA



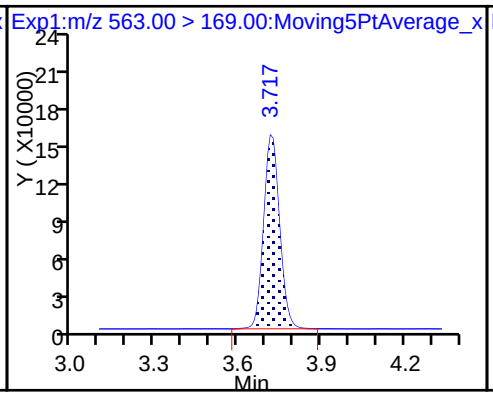
33 N-ethyl perfluorooctane sulfonamid



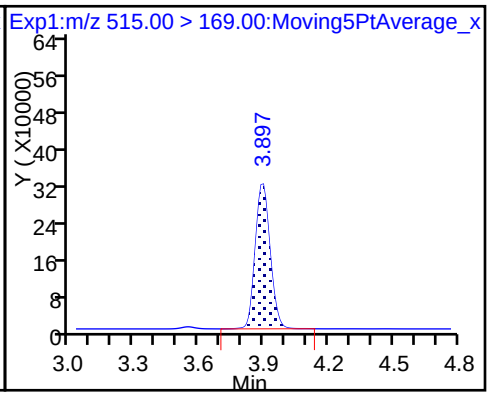
31 Perfluoroundecanoic acid



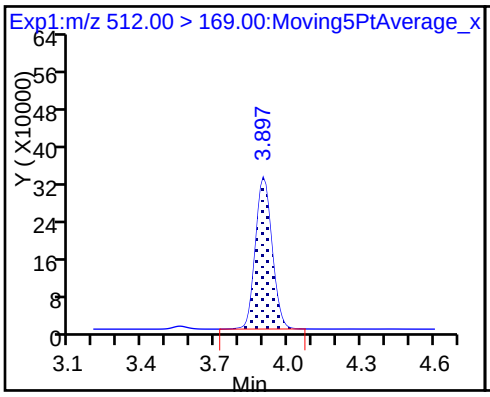
31 Perfluoroundecanoic acid



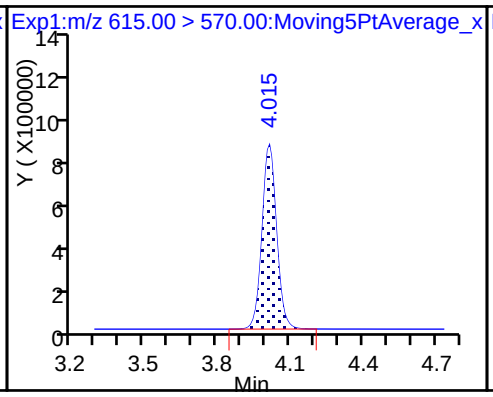
D 34 d-N-MeFOSA-M



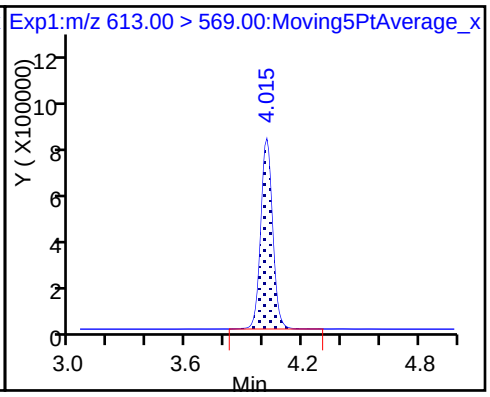
35 MeFOSA



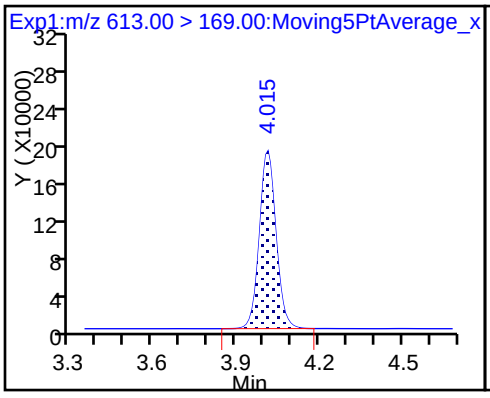
D 36 13C2 PFDoA



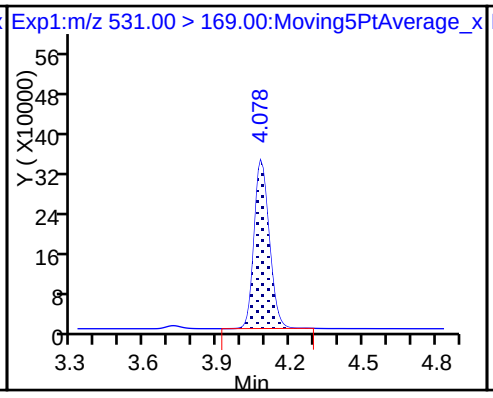
37 Perfluorododecanoic acid



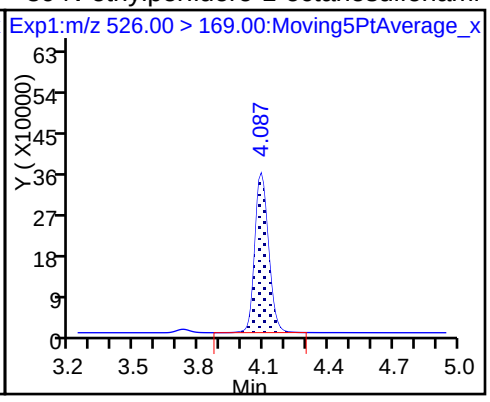
37 Perfluorododecanoic acid



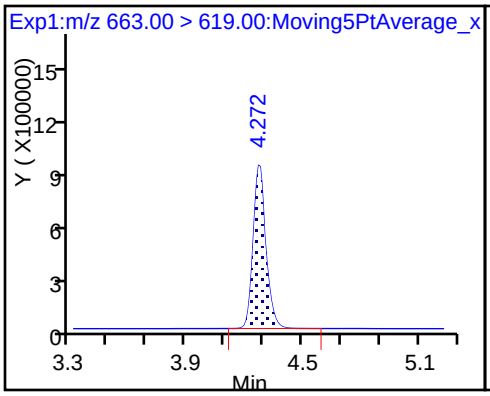
D 38 d-N-EtFOSA-M



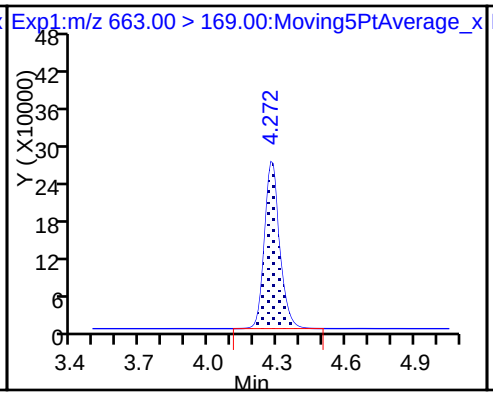
39 N-ethylperfluoro-1-octanesulfonami



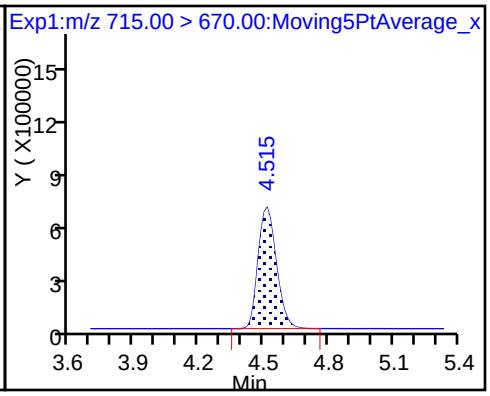
41 Perfluorotridecanoic acid



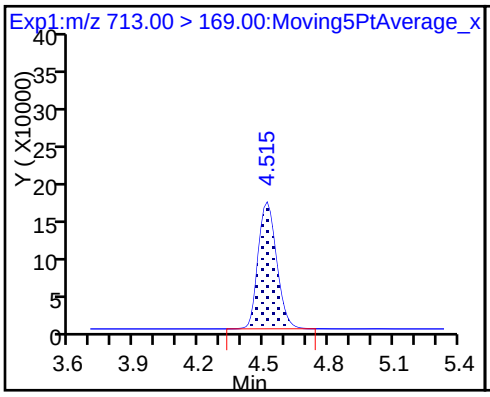
41 Perfluorotridecanoic acid



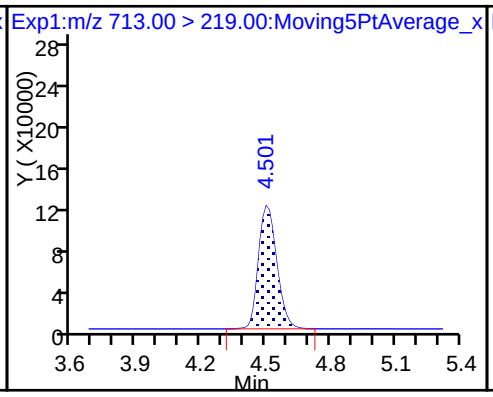
D 43 13C2-PFTeDA



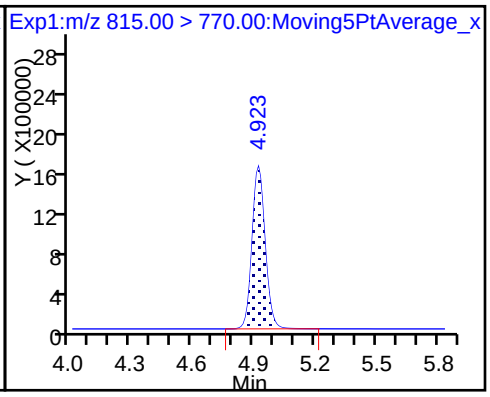
42 Perfluorotetradecanoic acid



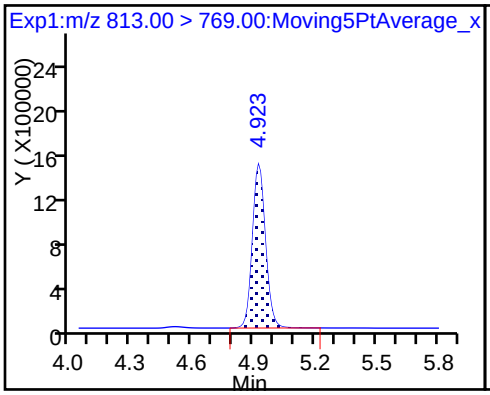
42 Perfluorotetradecanoic acid



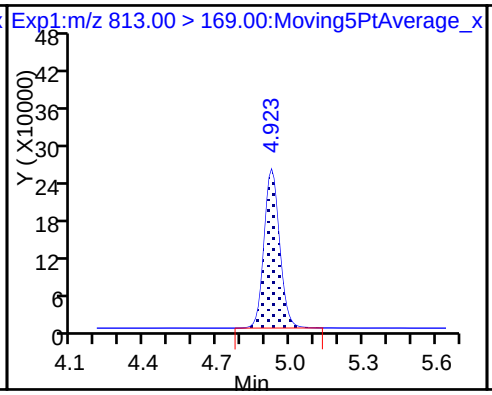
D 44 13C2-PFHxDA



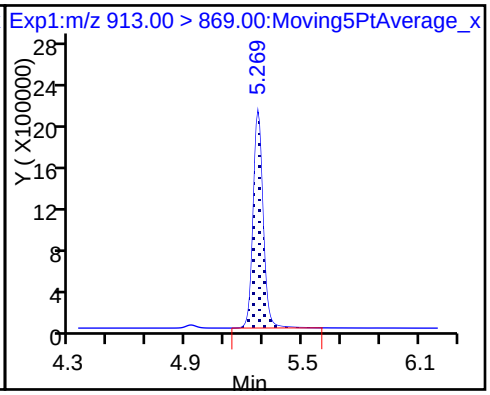
45 Perfluorohexadecanoic acid



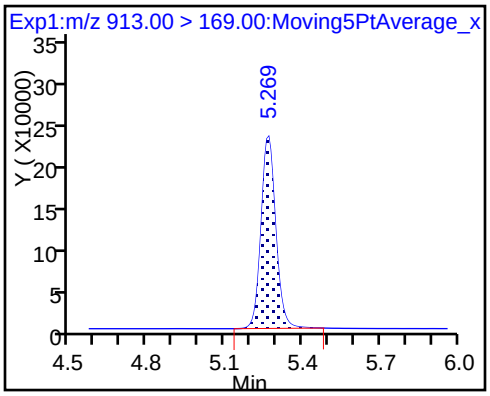
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-195562/23 Calibration Date: 11/18/2017 19:40

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXEA_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9269		1.01	1.00	1.2	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.111		0.985	1.00	-1.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	77.28		0.919	0.884	4.0	25.0
4:2 FTS	AveID	0.7456	1.190		1.49	0.934	59.6*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	0.9429		0.942	1.00	-5.8	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	0.9949		0.970	1.00	-3.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	1.039		0.863	0.910	-5.1	25.0
6:2FTS	AveID	1.605	1.703		1.01	0.948	6.1	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.350		0.982	0.952	3.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.045		0.991	1.00	-0.9	25.0
Perfluorononanoic acid (PFNA)	AveID	0.997	1.034		1.04	1.00	3.7	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.057		0.934	0.928	0.7	25.0
8:2FTS	AveID	1.214	1.292		1.02	0.958	6.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	1.012		1.05	1.00	5.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	0.9775		1.01	1.00	0.6	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	1.082		1.03	1.00	3.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.6349		1.01	0.964	5.1	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9711		1.01	1.00	1.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.8901		0.983	1.00	-1.7	25.0
MeFOSA	AveID	0.9814	1.002		1.02	1.00	2.1	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	1.014		1.04	1.00	3.5	25.0
N-EtFOSA-M	AveID	1.002	1.039		1.04	1.00	3.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.179		0.963	1.00	-3.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2421		0.987	1.00	-1.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9356		1.03	1.00	3.3	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	1.055		1.06	1.00	6.0	25.0
13C4 PFBA	Ave	1.301	1.315		2.53	2.50	1.0	50.0
13C5 PFPeA	Ave	0.8240	0.8681		2.63	2.50	5.4	50.0
13C3-PFBS	Ave	0.0180	0.0192		2.48	2.33	6.5	50.0
13C2 PFHxA	Ave	0.9302	0.999		2.69	2.50	7.4	50.0
13C4-PFHpA	Ave	0.8986	0.9344		2.60	2.50	4.0	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-195562/23 Calibration Date: 11/18/2017 19:40

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXEA_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.119		2.49	2.37	5.5	50.0
M2-6:2FTS	Ave	0.4500	0.3375		1.78	2.38	-25.0	50.0
13C4 PFOA	Ave	1.030	1.060		2.57	2.50	2.9	50.0
13C4 PFOS	Ave	0.7080	0.7440		2.51	2.39	5.1	50.0
13C5 PFNA	Ave	0.7570	0.7767		2.57	2.50	2.6	50.0
M2-8:2FTS	Ave	0.2391	0.2630		2.63	2.40	10.0	50.0
13C2 PFDA	Ave	0.6386	0.6794		2.66	2.50	6.4	50.0
13C8 FOSA	Ave	0.9121	0.9830		2.69	2.50	7.8	50.0
d3-NMeFOSAA	Ave	0.3429	0.3557		2.59	2.50	3.7	50.0
13C2 PFUnA	Ave	0.5100	0.5445		2.67	2.50	6.8	50.0
d5-NEtFOSAA	Ave	0.3296	0.3704		2.81	2.50	12.4	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2714		2.56	2.50	2.5	50.0
13C2 PFDoA	Ave	0.5923	0.6002		2.53	2.50	1.3	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2590		2.64	2.50	5.4	50.0
13C2-PFTeDA	Ave	0.7282	0.7236		2.48	2.50	-0.6	50.0
13C2-PFHxDA	Ave	1.288	1.285		2.49	2.50	-0.3	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_023.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 18-Nov-2017 19:40:54 ALS Bottle#: 13 Worklist Smp#: 23
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub18

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 24-Nov-2017 13:22:07 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK033

First Level Reviewer: hannigana Date: 24-Nov-2017 11:25:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.480	1.479	0.001	0.554	7481183	2.53		101	157172	
2 Perfluorobutyric acid										
212.90 > 169.00	1.480	1.480	0.0	1.000	2773691	1.01		101	518	
D 3 13C5-PFPeA										
267.90 > 223.00	1.748	1.738	0.010	0.654	4940285	2.63		105	59227	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.748	1.740	0.008	1.000	2194970	0.9849		98.5	2153	
D 47 13C3-PFBS										
301.90 > 83.00	1.789	1.774	0.015	0.669	101484	2.48		106	3317	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.789	1.776	0.013	1.000	2982068	0.9193		104	11236	
298.90 > 99.00	1.789	1.776	0.013	1.000	1214639		2.46(1.74-3.24)		9419	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.984	1.977	0.007	1.000	853700	1.49		160	34922	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.015	2.010	0.005	1.000	2144240	0.9425		94.2	2895	
313.00 > 119.00	2.015	2.010	0.005	1.000	204007		10.51(7.05-13.09)		2297	
D 7 13C2 PFHxA										
315.00 > 270.00	2.015	2.010	0.005	0.754	5685193	2.69		107	50445	
D 9 13C4-PFHpA										
367.00 > 322.00	2.336	2.332	0.004	0.874	5317351	2.60		104	40587	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.336	2.333	0.003	1.000	2116065	0.9704		97.0	2429	
363.00 > 169.00	2.336	2.333	0.003	1.000	837791		2.53(1.59-2.95)		3446	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.346	2.347	-0.001	1.000	2408017	0.8634		94.9	8149	
399.00 > 99.00	2.346	2.347	-0.001	1.000	824700		2.92(2.10-3.89)		5189	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.346	2.347	-0.001	0.877	6022264	2.49		105	32046	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.667	2.671	-0.003	1.000	1239806	1.01		106	8215	
D 12 M2-6:2FTS										
429.00 > 81.00	2.667	2.671	-0.004	0.997	1824324	1.78		75.0	29137	
D 14 13C4 PFOA										
417.00 > 372.00	2.681	2.680	0.001	1.003	6032971	2.57		103	50395	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.681	2.680	0.001	1.000	2522720	0.99		99.1	932	
413.00 > 169.00	2.681	2.680	0.001	1.000	1309292		1.93(1.18-2.19)		5936	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.681	2.687	-0.006	1.000	2177146	0.9821		103	19681	
449.00 > 99.00	2.681	2.687	-0.006	1.000	561565		3.88(2.72-5.05)		8118	
* 62 13C2-PFOA										
415.00 > 370.00	2.674	2.695	-0.021		5690683	2.50			40424	
D 18 13C4 PFOS										
503.00 > 80.00	3.039	3.042	-0.003	1.136	4047634	2.51		105	21646	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.039	3.042	-0.003	1.000	1660590	0.9344		101	3148	
499.00 > 99.00	3.039	3.042	-0.003	1.000	367562		4.52(3.24-6.01)		23443	
D 19 13C5 PFNA										
468.00 > 423.00	3.039	3.042	-0.003	1.136	4419917	2.57		103	42992	
20 Perfluorononanoic acid										
463.00 > 419.00	3.039	3.045	-0.006	1.000	1827889	1.04		104	2669	
463.00 > 169.00	3.039	3.045	-0.006	1.000	425655		4.29(2.65-4.93)		7849	
D 26 M2-8:2FTS										
529.00 > 81.00	3.385	3.390	-0.005	1.266	1433714	2.63		110	13736	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.385	3.392	-0.007	1.000	741188	1.02		106	17919	
D 21 13C8 FOSA										
506.00 > 78.00	3.393	3.393	0.0	1.269	5593631	2.69		108	27624	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.393	3.395	-0.002	1.000	2264746	1.05		105	22325	
D 23 13C2 PFDA										
515.00 > 470.00	3.393	3.400	-0.007	1.269	3866022	2.66		106	35733	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.400	3.400	0.0	1.002	1511609	1.01		101	5714	
513.00 > 169.00	3.393	3.400	-0.007	1.000	261882		5.77(3.31-6.15)		2151	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.552	3.557	-0.005	1.328	2024284	2.59		104	13513	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.559	3.561	-0.002	1.002	875776	1.03		103	5200	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.706	3.714	-0.008	1.000	1036507	1.01		105	15938	
599.00 > 99.00	3.706	3.714	-0.008	1.000	356192		2.91(1.94-3.60)		11801	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.723	3.725	-0.002	1.392	2107628	2.81		112	11363	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFUnA										
565.00 > 520.00	3.723	3.730	-0.007	1.392	3098519	2.67		107	31123	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.723	3.731	-0.008	1.000	818650	1.01		101	11321	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.723	3.731	-0.008	1.000	1103248	0.9834		98.3	4527	
563.00 > 169.00	3.723	3.731	-0.008	1.000	245044		4.50(0.00-0.00)		7997	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.895	3.896	-0.001	1.456	1544163	2.56		103	3222	
35 MeFOSA										
512.00 > 169.00	3.905	3.903	0.002	1.003	618721	1.02		102	2643	
D 36 13C2 PFDoA										
615.00 > 570.00	4.020	4.024	-0.004	1.503	3415700	2.53		101	29878	
37 Perfluorododecanoic acid										R
613.00 > 569.00	4.020	4.025	-0.005	1.000	1385667	1.04		104	6711	R
613.00 > 169.00	4.020	4.025	-0.005	1.000	329563		4.20(2.19-4.07)		10028	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.085	4.084	0.001	1.528	1474090	2.64		105	2415	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.095	4.091	0.004	1.002	612802	1.04		104	2833	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.278	4.287	-0.009	1.000	1610200	0.9628		96.3	5030	
663.00 > 169.00	4.278	4.287	-0.009	1.000	513730		3.13(1.76-3.26)		16331	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.513	4.526	-0.013	1.688	4117825	2.48		99.4	24271	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.513	4.526	-0.013	1.000	398755	0.9871		98.7	9766	
713.00 > 219.00	4.513	4.526	-0.013	1.000	279147		1.43(1.00-1.85)		7947	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.921	4.938	-0.017	1.840	7311153	2.49		99.7	23452	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.930	4.939	-0.009	1.002	2736037	1.03		103	1488	R
813.00 > 169.00	4.930	4.939	-0.009	1.002	457599		5.98(2.50-4.65)		6027	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.274	5.286	-0.012	1.000	3084760	1.06		106	910	
913.00 > 169.00	5.274	5.286	-0.012	1.000	374112		8.25(0.00-0.00)		2181	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL4_00002 Amount Added: 1.00 Units: mL

Report Date: 24-Nov-2017 13:22:08 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_023.d

Injection Date: 18-Nov-2017 19:40:54 Instrument ID: A8_N

Lims ID: CCV L4

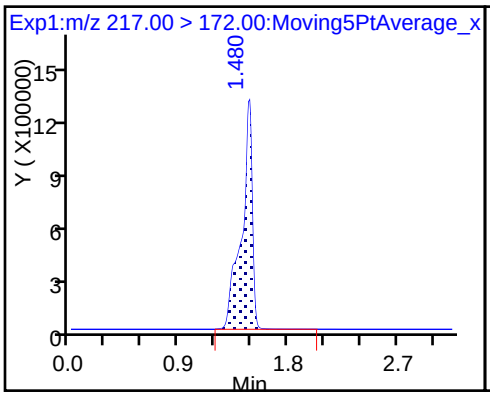
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 23

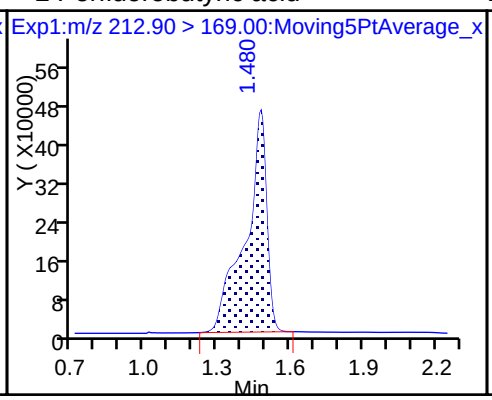
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

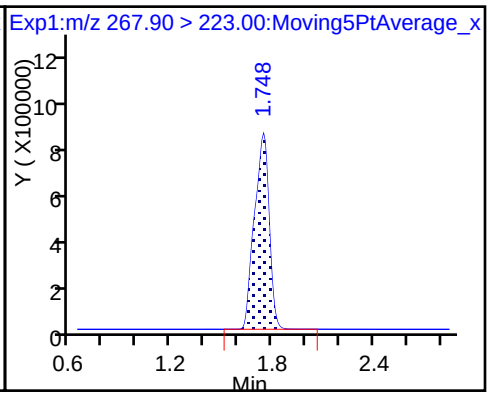
D 1 13C4 PFBA



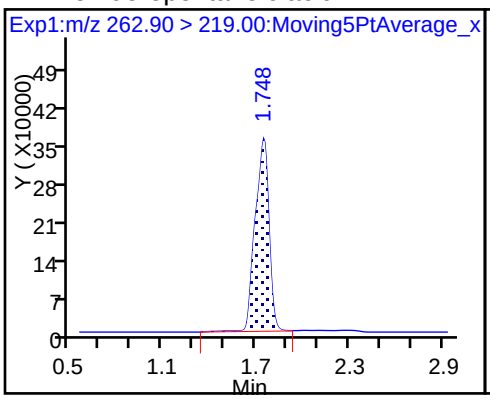
2 Perfluorobutyric acid



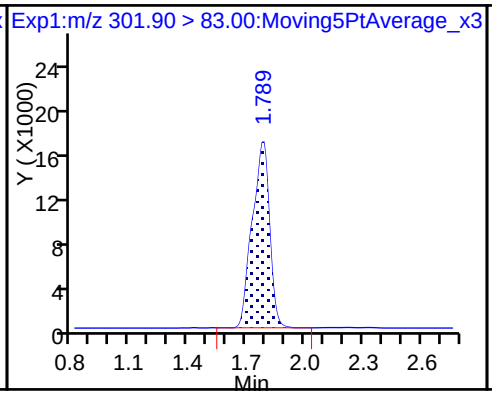
D 3 13C5-PFPeA



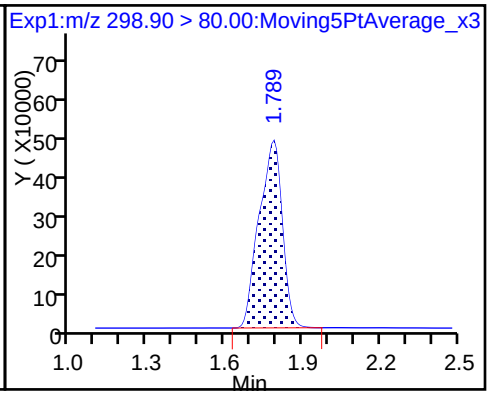
4 Perfluoropentanoic acid



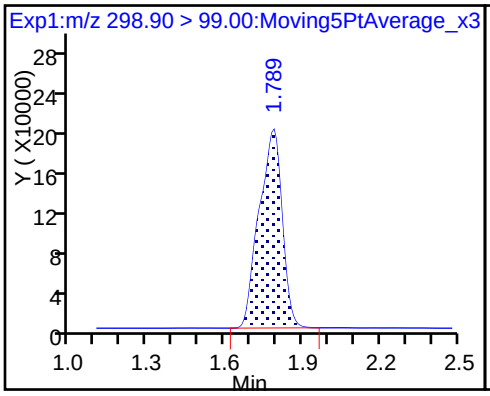
D 47 13C3-PFBS



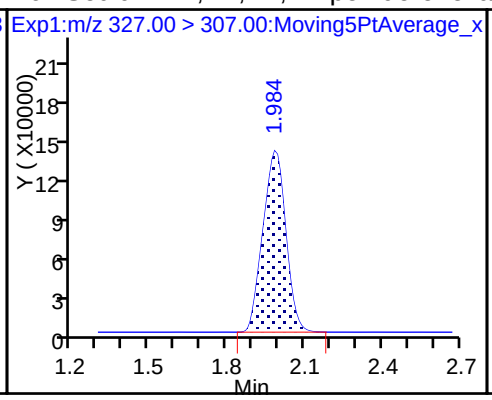
5 Perfluorobutanesulfonic acid



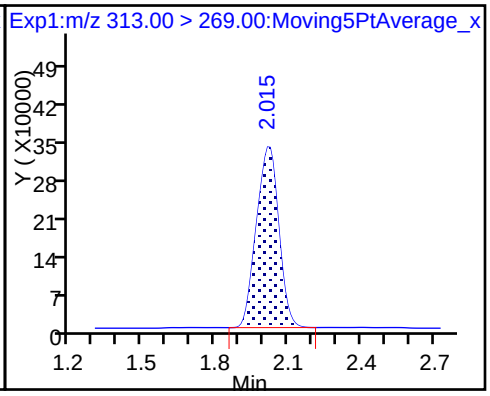
5 Perfluorobutanesulfonic acid



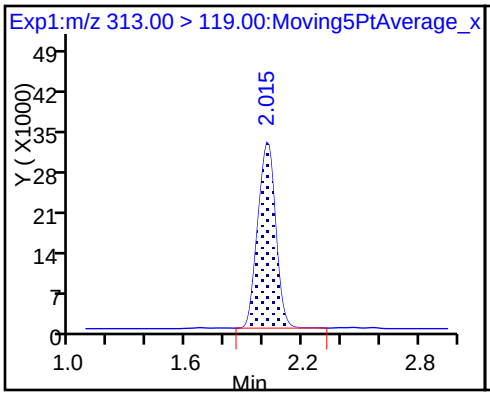
61 Sodium 1H,1H,2H,2H-perfluorohexane



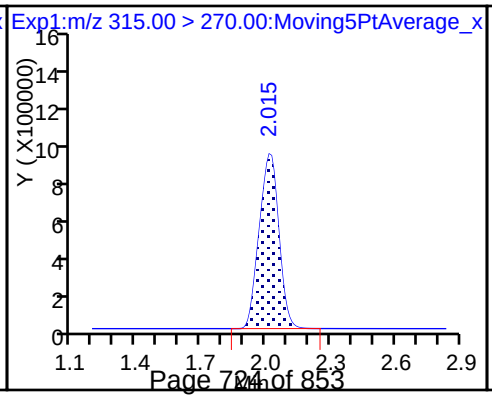
6 Perfluorohexanoic acid



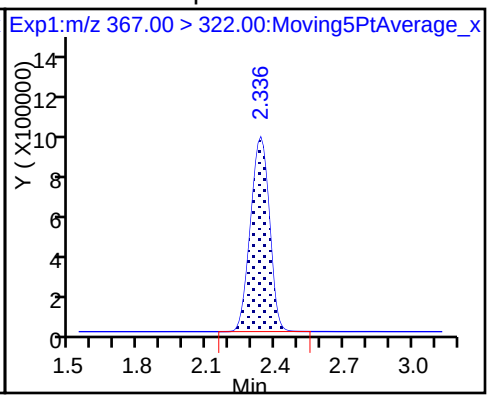
6 Perfluorohexanoic acid



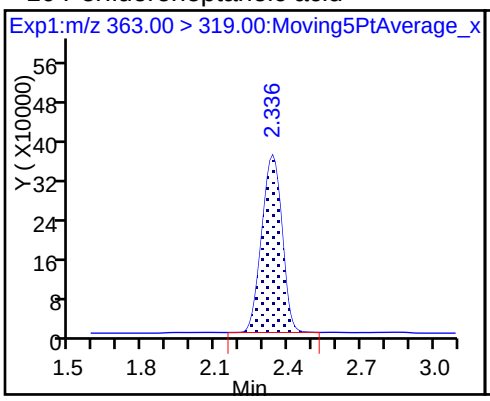
D 7 13C2 PFHxA



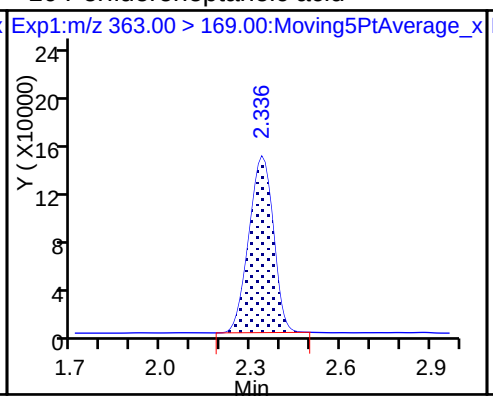
D 9 13C4-PFHpA



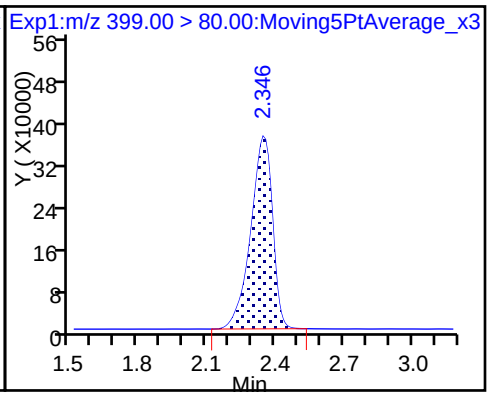
10 Perfluoroheptanoic acid



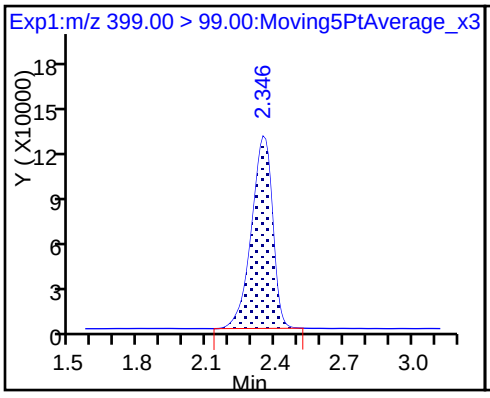
10 Perfluoroheptanoic acid



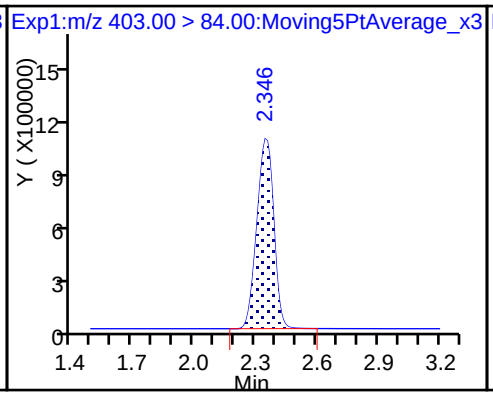
8 Perfluorohexanesulfonic acid



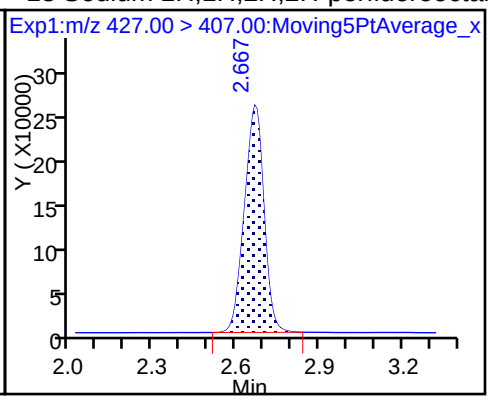
8 Perfluorohexanesulfonic acid



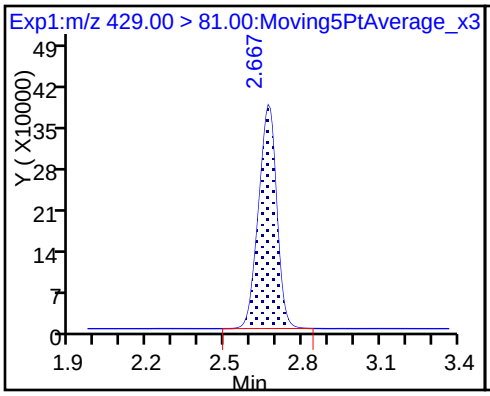
D 11 18O2 PFHxS



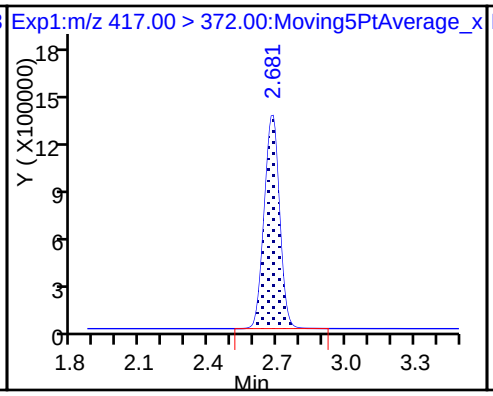
13 Sodium 1H,1H,2H,2H-perfluorooctane



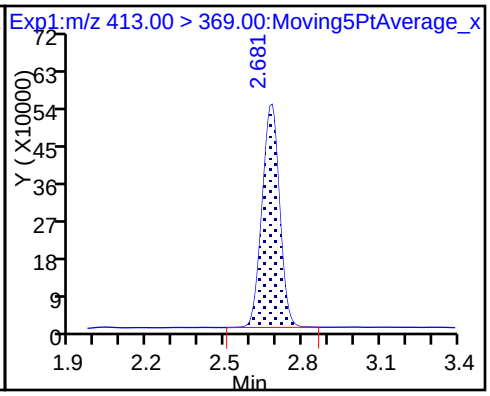
D 12 M2-6:2FTS



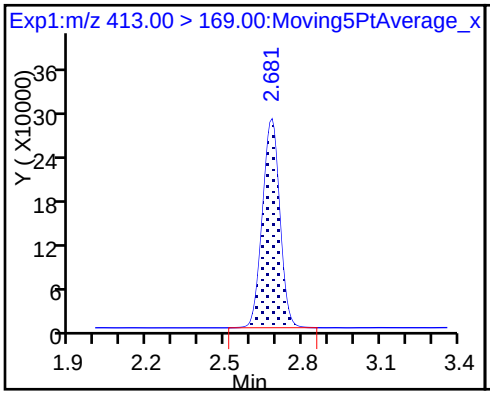
D 14 13C4 PFOA



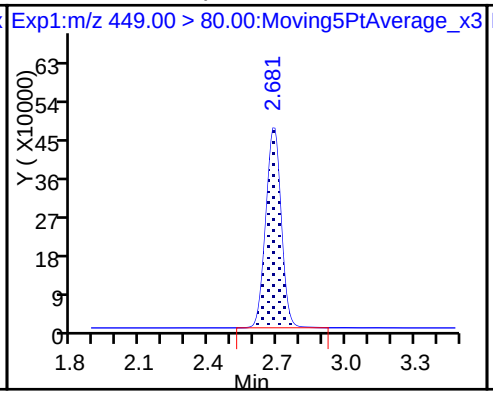
15 Perfluorooctanoic acid



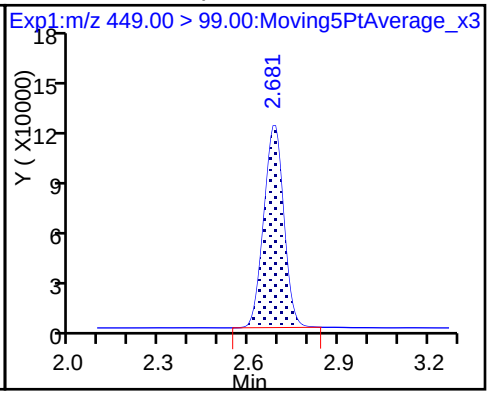
15 Perfluorooctanoic acid



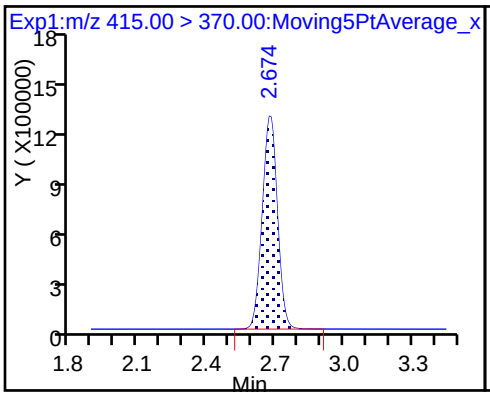
16 Perfluoroheptanesulfonic Acid



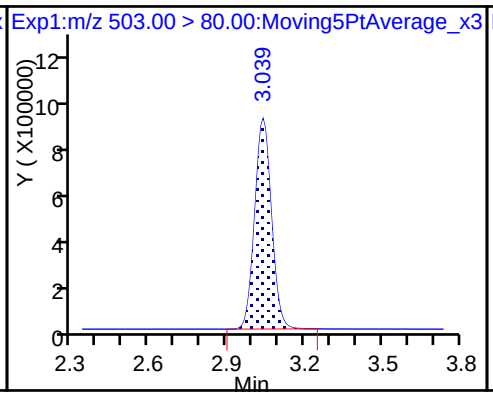
16 Perfluoroheptanesulfonic Acid



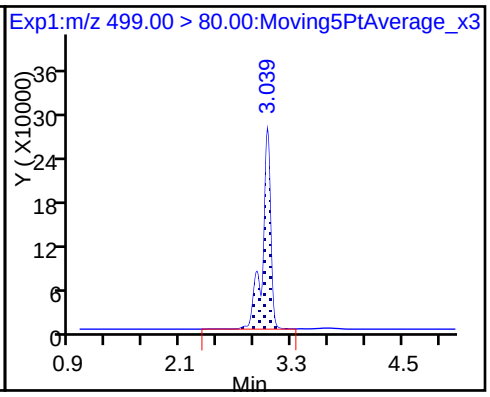
* 62 13C2-PFOA



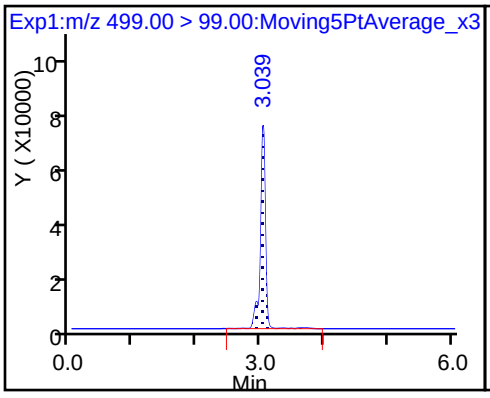
D 18 13C4 PFOS



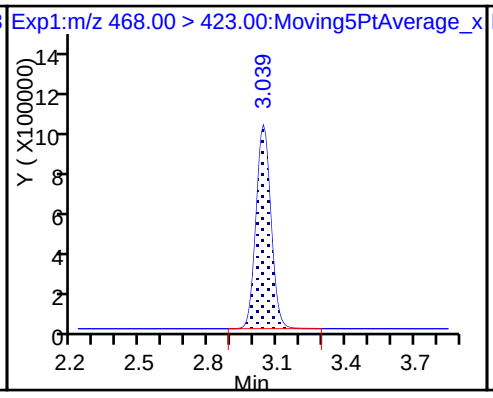
17 Perfluorooctane sulfonic acid



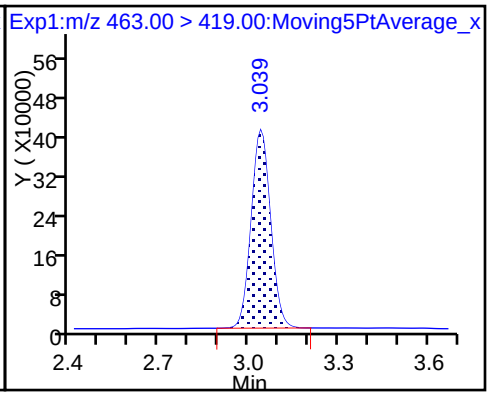
17 Perfluorooctane sulfonic acid



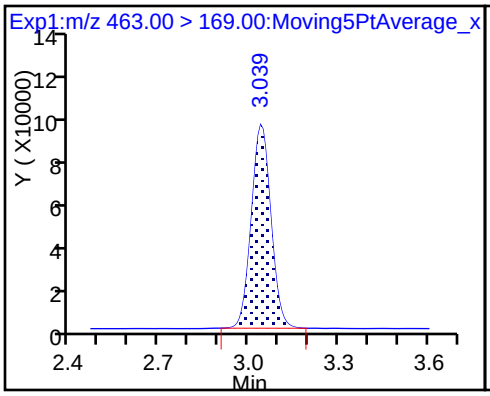
D 19 13C5 PFNA



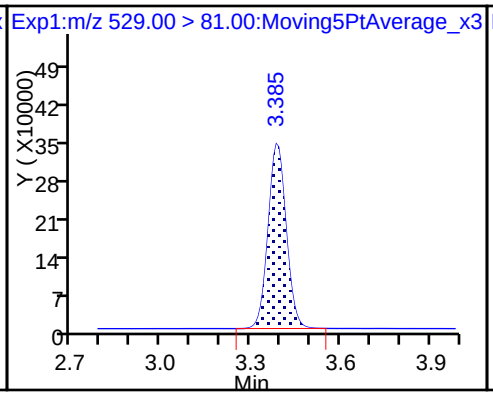
20 Perfluorononanoic acid



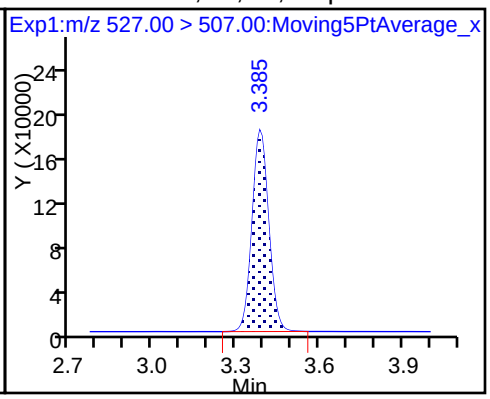
20 Perfluorononanoic acid



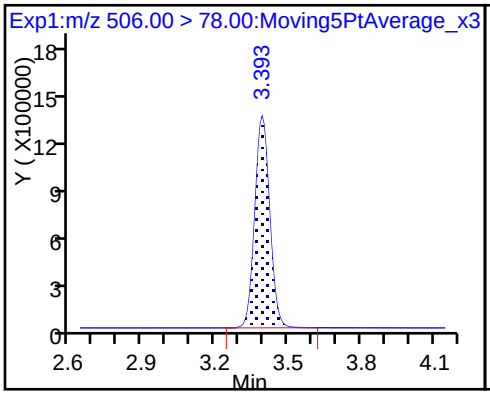
D 26 M2-8:2FTS



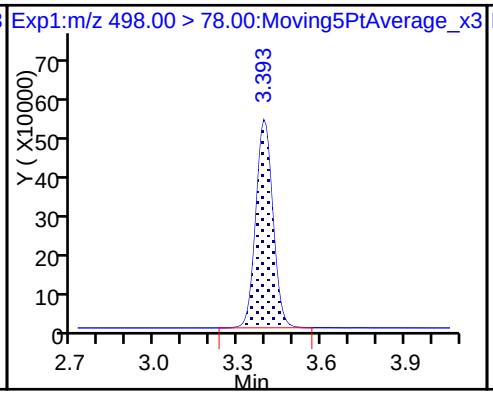
25 Sodium 1H,1H,2H,2H-perfluorodecane



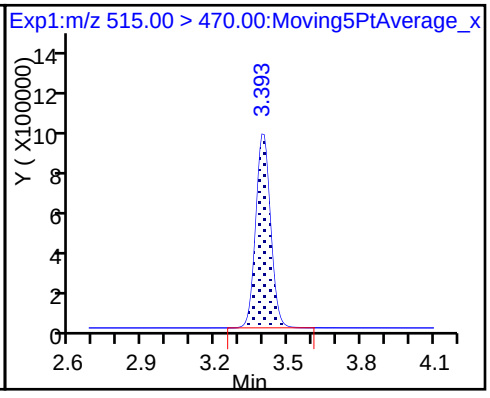
D 21 13C8 FOSA



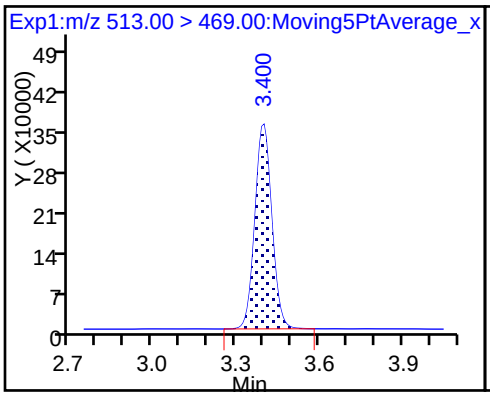
22 Perfluorooctane Sulfonamide



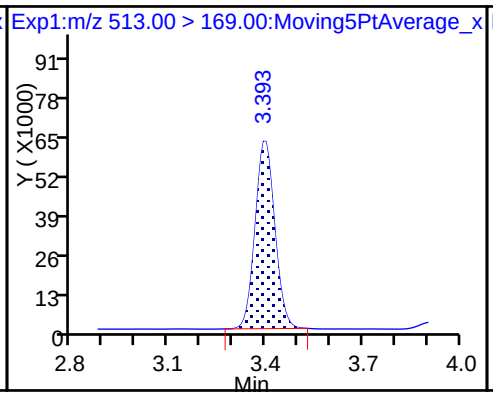
D 23 13C2 PFDA



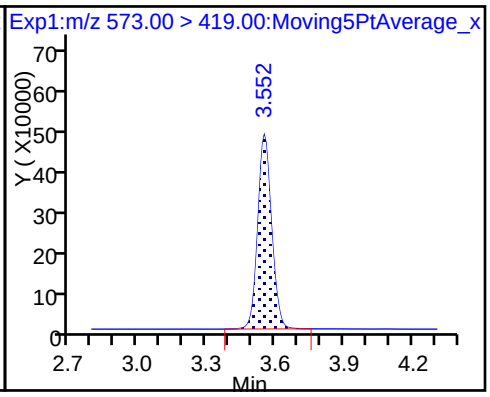
24 Perfluorodecanoic acid



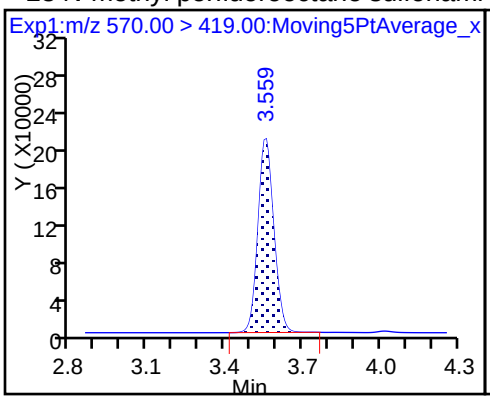
24 Perfluorodecanoic acid



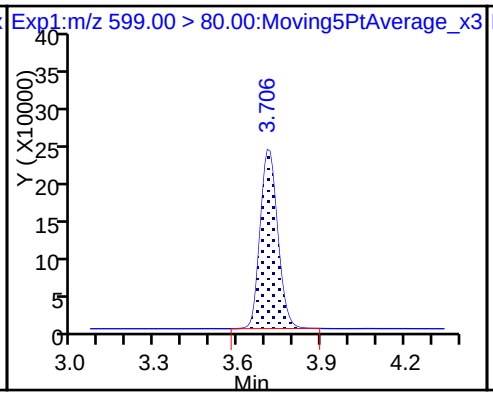
D 27 d3-NMeFOSAA



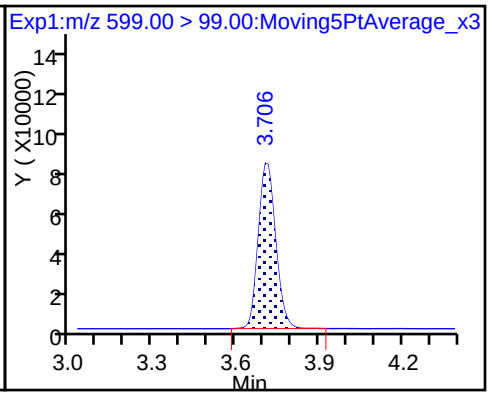
28 N-methyl perfluorooctane sulfonami



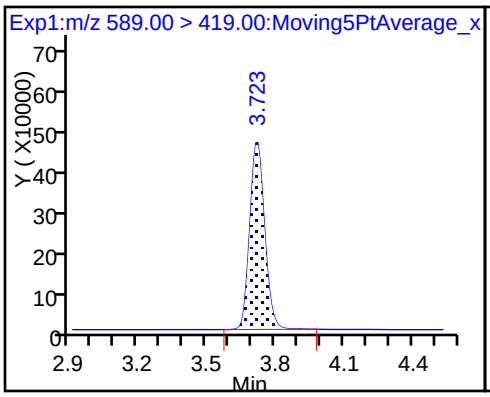
29 Perfluorodecane Sulfonic acid



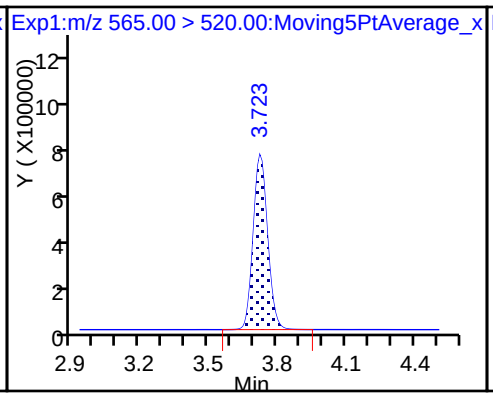
29 Perfluorodecane Sulfonic acid



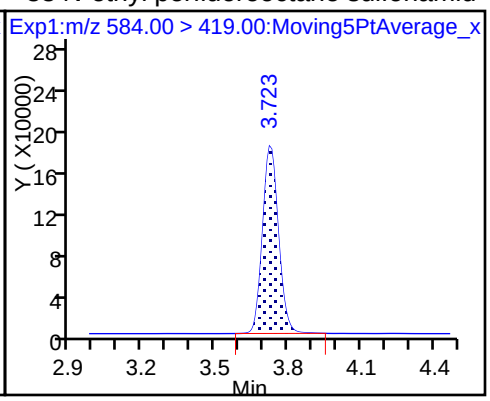
D 32 d5-NEtFOSAA



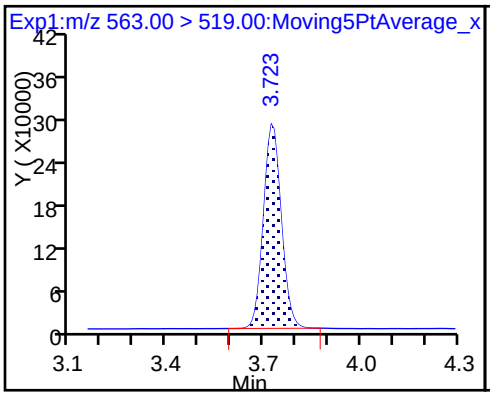
D 30 13C2 PFUnA



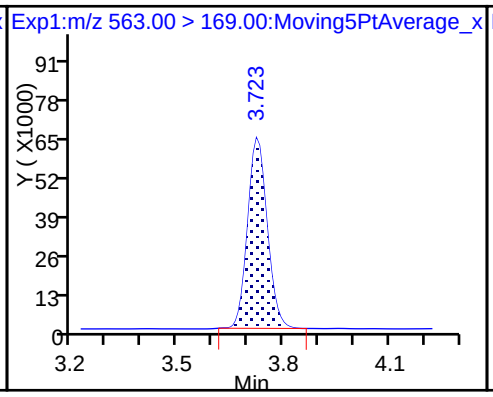
33 N-ethyl perfluorooctane sulfonamid



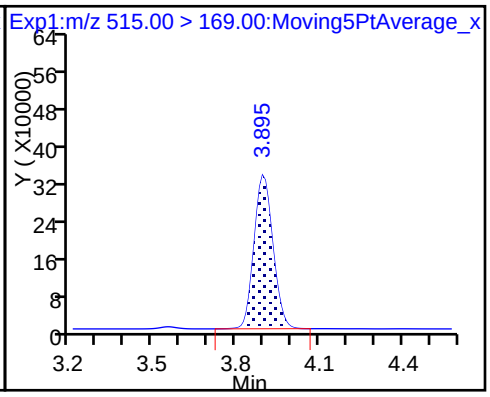
31 Perfluoroundecanoic acid



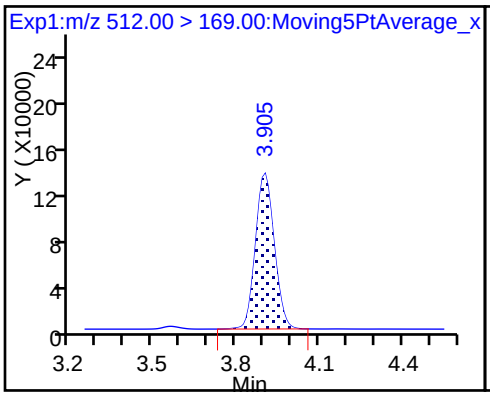
31 Perfluoroundecanoic acid



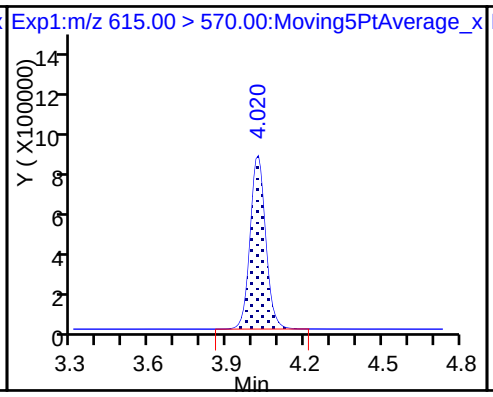
D 34 d-N-MeFOSA-M



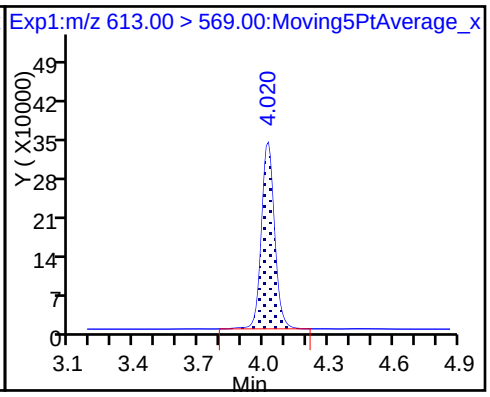
35 MeFOSA



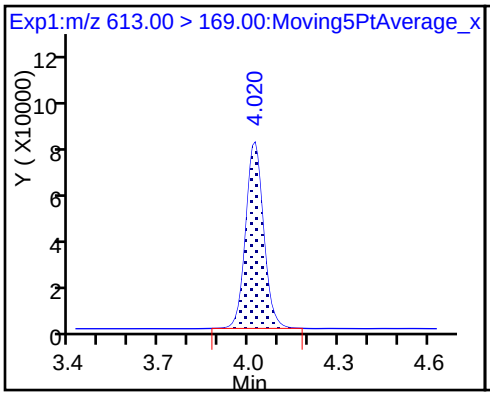
D 36 13C2 PFDoA



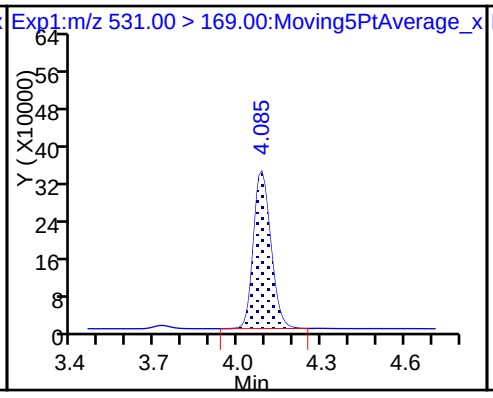
37 Perfluorododecanoic acid



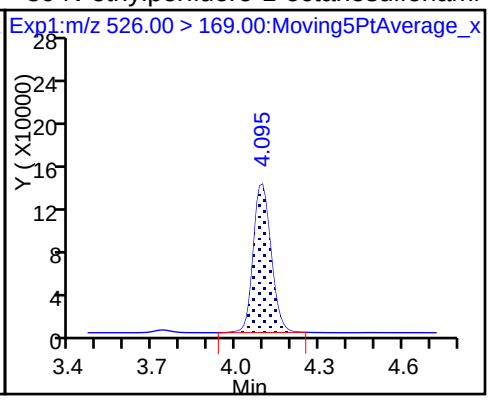
37 Perfluorododecanoic acid



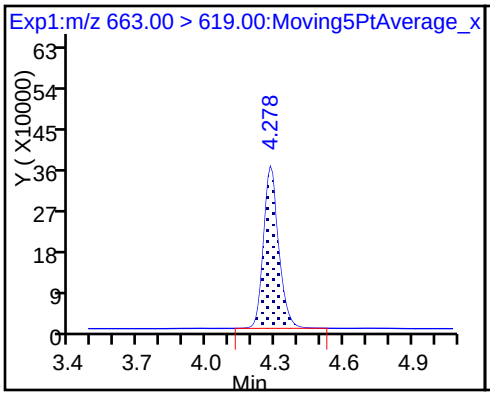
D 38 d-N-EtFOSA-M



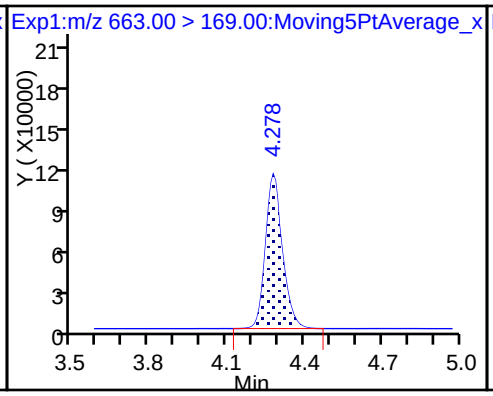
39 N-ethylperfluoro-1-octanesulfonami



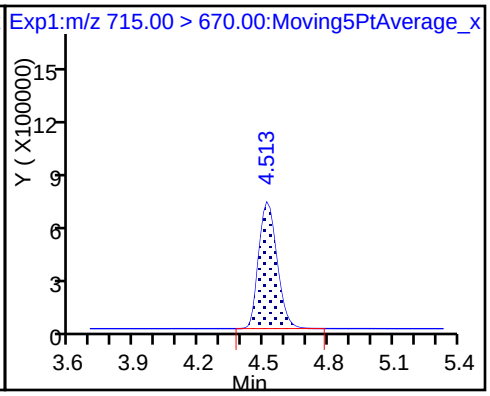
41 Perfluorotridecanoic acid



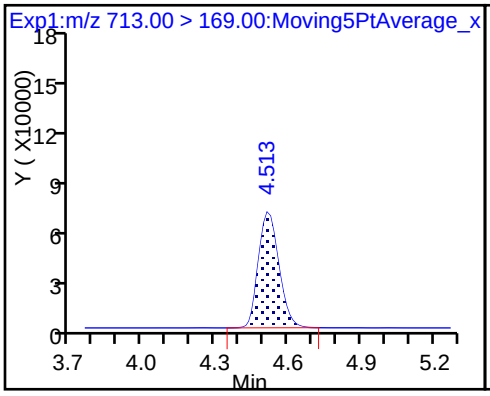
41 Perfluorotridecanoic acid



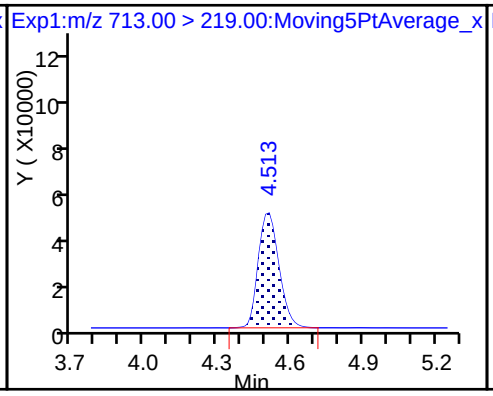
D 43 13C2-PFTeDA



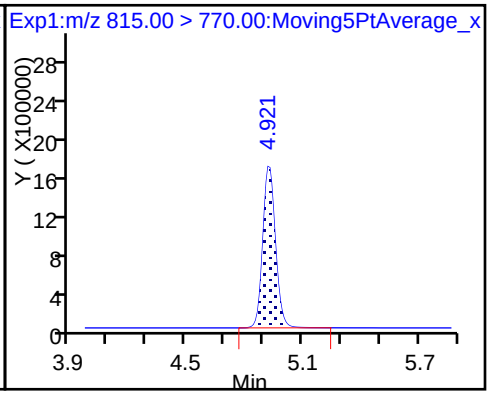
42 Perfluorotetradecanoic acid



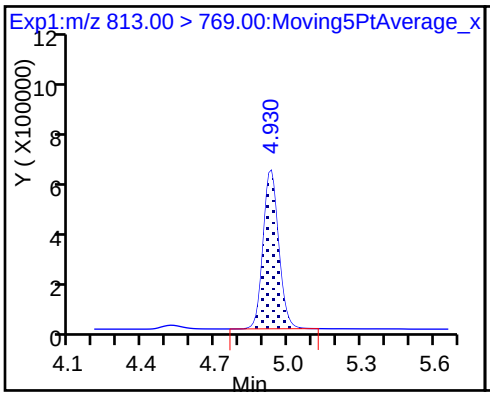
42 Perfluorotetradecanoic acid



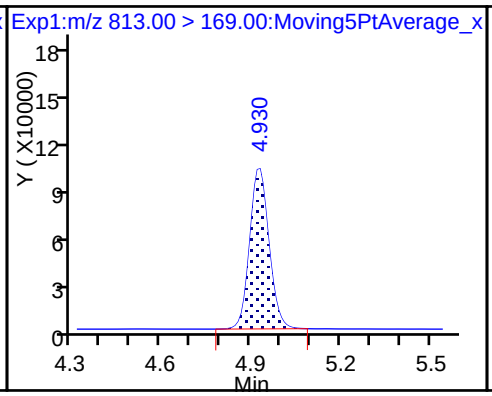
D 44 13C2-PFHxDA



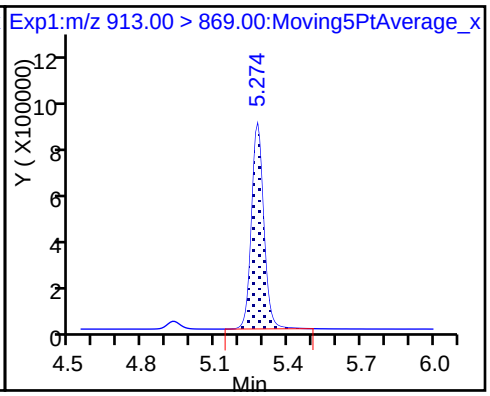
45 Perfluorohexadecanoic acid



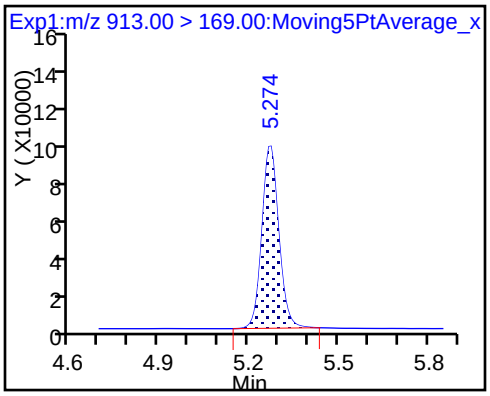
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-195562/27 Calibration Date: 11/18/2017 20:12

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXEA_027.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9368		2.56	2.50	2.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.127		2.50	2.50	-0.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	77.52		2.31	2.21	4.3	25.0
4:2 FTS	AveID	0.7456	0.9921		3.11	2.34	33.1*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	1.000		2.50	2.50	-0.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	1.023		2.49	2.50	-0.2	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	1.023		2.12	2.28	-6.6	25.0
6:2FTS	AveID	1.605	1.633		2.41	2.37	1.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.090		2.58	2.50	3.3	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.392		2.53	2.38	6.4	25.0
Perfluorononanoic acid (PFNA)	AveID	0.997	1.010		2.53	2.50	1.3	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.069		2.36	2.32	1.9	25.0
8:2FTS	AveID	1.214	1.231		2.43	2.40	1.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	0.9876		2.54	2.50	1.7	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	1.005		2.62	2.50	4.6	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	1.052		2.51	2.50	0.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.6401		2.55	2.41	5.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.9063		2.50	2.50	0.1	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9465		2.47	2.50	-1.3	25.0
MeFOSA	AveID	0.9814	0.9879		2.52	2.50	0.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	0.995		2.54	2.50	1.6	25.0
N-EtFOSA-M	AveID	1.002	1.039		2.59	2.50	3.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.206		2.46	2.50	-1.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2357		2.40	2.50	-3.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9119		2.55	2.50	1.9	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	1.029		2.58	2.50	3.4	25.0
13C4 PFBA	Ave	1.301	1.346		2.58	2.50	3.4	50.0
13C5 PFPeA	Ave	0.8240	0.8697		2.64	2.50	5.5	50.0
13C3-PFBS	Ave	0.0180	0.0190		2.45	2.33	5.3	50.0
13C2 PFHxA	Ave	0.9302	0.9922		2.67	2.50	6.7	50.0
13C4-PFHpA	Ave	0.8986	0.9291		2.58	2.50	3.4	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-195562/27 Calibration Date: 11/18/2017 20:12

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXEA_027.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.141		2.54	2.37	7.6	50.0
M2-6:2FTS	Ave	0.4500	0.3708		1.96	2.38	-17.6	50.0
13C4 PFOA	Ave	1.030	1.043		2.53	2.50	1.2	50.0
13C4 PFOS	Ave	0.7080	0.7498		2.53	2.39	5.9	50.0
13C5 PFNA	Ave	0.7570	0.7882		2.60	2.50	4.1	50.0
M2-8:2FTS	Ave	0.2391	0.2583		2.59	2.40	8.0	50.0
13C8 FOSA	Ave	0.9121	0.9810		2.69	2.50	7.6	50.0
13C2 PFDA	Ave	0.6386	0.6678		2.61	2.50	4.6	50.0
d3-NMeFOSAA	Ave	0.3429	0.3655		2.66	2.50	6.6	50.0
13C2 PFUnA	Ave	0.5100	0.5179		2.54	2.50	1.5	50.0
d5-NEtFOSAA	Ave	0.3296	0.3758		2.85	2.50	14.0	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2848		2.69	2.50	7.6	50.0
13C2 PFDoA	Ave	0.5923	0.6004		2.53	2.50	1.4	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2680		2.73	2.50	9.1	50.0
13C2-PFTeDA	Ave	0.7282	0.7207		2.47	2.50	-1.0	50.0
13C2-PFHxDA	Ave	1.288	1.307		2.54	2.50	1.4	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_027.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 18-Nov-2017 20:12:20 ALS Bottle#: 14 Worklist Smp#: 27
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub18

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 24-Nov-2017 13:22:33 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK033

First Level Reviewer: hannigana Date: 24-Nov-2017 11:21:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.474	1.479	-0.005	0.551	7497215	2.58		103	66215	
2 Perfluorobutyric acid										
212.90 > 169.00	1.474	1.480	-0.006	1.000	7023632	2.56		102	1382	
D 3 13C5-PFPeA										
267.90 > 223.00	1.745	1.738	0.007	0.652	4845476	2.64		106	47948	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.745	1.740	0.005	1.000	5462829	2.50		100.0	3966	
D 47 13C3-PFBS										
301.90 > 83.00	1.778	1.774	0.004	0.665	98201	2.45		105	3271	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.787	1.776	0.011	1.005	7236204	2.31		104	31920	
298.90 > 99.00	1.787	1.776	0.011	1.005	3075581		2.35(1.74-3.24)		24115	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.981	1.977	0.004	1.000	1914341	3.11		133	61399	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.013	2.010	0.003	1.000	5526621	2.50		99.9	10175	
313.00 > 119.00	2.013	2.010	0.003	1.000	505786		10.93(7.05-13.09)		7320	
D 7 13C2 PFHxA										
315.00 > 270.00	2.013	2.010	0.003	0.752	5528086	2.67		107	46917	
D 9 13C4-PFHpA										
367.00 > 322.00	2.331	2.332	-0.001	0.871	5176455	2.58		103	41311	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.331	2.333	-0.002	1.000	5294692	2.49		99.8	7267	
363.00 > 169.00	2.331	2.333	-0.002	1.000	2109797		2.51(1.59-2.95)		9254	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.342	2.347	-0.005	0.996	5914851	2.12		93.4	15379	
399.00 > 99.00	2.342	2.347	-0.005	0.996	2007330		2.95(2.10-3.89)		9904	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.352	2.347	0.005	0.879	6011718	2.54		108	29304	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.669	2.671	-0.001	1.000	3198344	2.41		102	22129	
D 12 M2-6:2FTS										
429.00 > 81.00	2.669	2.671	-0.002	0.997	1962556	1.96		82.4	38188	
D 14 13C4 PFOA										
417.00 > 372.00	2.676	2.680	-0.004	1.000	5809945	2.53		101	43422	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.676	2.680	-0.004	1.000	6333439	2.58		103	2378	
413.00 > 169.00	2.676	2.680	-0.004	1.000	3219707		1.97(1.18-2.19)		12704	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.683	2.687	-0.004	1.000	5536966	2.53		106	33687	
449.00 > 99.00	2.683	2.687	-0.004	1.000	1410775		3.92(2.72-5.05)		16189	
* 62 13C2-PFOA										
415.00 > 370.00	2.676	2.695	-0.019		5571742	2.50			41499	
D 18 13C4 PFOS										
503.00 > 80.00	3.040	3.042	-0.002	1.136	3993769	2.53		106	26975	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.040	3.042	-0.002	1.000	4146050	2.36		102	7173	
499.00 > 99.00	3.032	3.042	-0.010	0.997	914592		4.53(3.24-6.01)		57933	
D 19 13C5 PFNA										
468.00 > 423.00	3.040	3.042	-0.002	1.136	4391745	2.60		104	32080	
20 Perfluorononanoic acid										
463.00 > 419.00	3.040	3.045	-0.005	1.000	4434411	2.53		101	7153	
463.00 > 169.00	3.040	3.045	-0.005	1.000	1087307		4.08(2.65-4.93)		22004	
D 26 M2-8:2FTS										
529.00 > 81.00	3.380	3.390	-0.010	1.263	1378499	2.59		108	18378	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.380	3.392	-0.012	1.000	1697329	2.43		101	25487	
D 21 13C8 FOSA										
506.00 > 78.00	3.387	3.393	-0.006	1.266	5465877	2.69		108	29638	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.395	3.395	0.0	1.002	5492108	2.62		105	40378	
D 23 13C2 PFDA										
515.00 > 470.00	3.395	3.400	-0.005	1.269	3720539	2.61		105	37361	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.395	3.400	-0.005	1.000	3674206	2.54		102	12879	
513.00 > 169.00	3.395	3.400	-0.005	1.000	635050		5.79(3.31-6.15)		2426	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.546	3.557	-0.011	1.325	2036458	2.66		107	15567	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.554	3.561	-0.007	1.002	2142256	2.51		100	8768	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.708	3.714	-0.006	1.000	2577694	2.55		106	23083	
599.00 > 99.00	3.708	3.714	-0.006	1.000	842646		3.06(1.94-3.60)		17772	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.717	3.725	-0.008	1.389	2093609	2.85		114	10185	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFUnA										
565.00 > 520.00	3.717	3.730	-0.013	1.389	2885466	2.54		102	24581	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.725	3.731	-0.006	1.002	1981573	2.47		98.7	12252	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.717	3.731	-0.014	1.000	2615166	2.50		100	11570	
563.00 > 169.00	3.725	3.731	-0.006	1.002	575994		4.54(0.00-0.00)		21216	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.897	3.896	0.001	1.456	1586945	2.69		108	3129	
35 MeFOSA										
512.00 > 169.00	3.897	3.903	-0.006	1.000	1567698	2.52		101	2643	
D 36 13C2 PFDoA										
615.00 > 570.00	4.015	4.024	-0.009	1.500	3345319	2.53		101	48100	
37 Perfluorododecanoic acid										R
613.00 > 569.00	4.015	4.025	-0.010	1.000	3330103	2.54		102	13840	R
613.00 > 169.00	4.015	4.025	-0.010	1.000	806840		4.13(2.19-4.07)		19609	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.078	4.084	-0.006	1.524	1493387	2.73		109	2452	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.087	4.091	-0.004	1.002	1551327	2.59		104	2490	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.281	4.287	-0.006	1.000	4035512	2.46		98.6	14890	
663.00 > 169.00	4.281	4.287	-0.006	1.000	1274427		3.17(1.76-3.26)		40441	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.515	4.526	-0.011	1.687	4015788	2.47		99.0	28595	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.515	4.526	-0.011	1.000	946450	2.40		96.1	16047	
713.00 > 219.00	4.515	4.526	-0.011	1.000	690140		1.37(1.00-1.85)		16702	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.923	4.938	-0.015	1.840	7281829	2.54		101	27478	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.932	4.939	-0.007	1.002	6640225	2.55		102	3983	R
813.00 > 169.00	4.923	4.939	-0.016	1.000	1150610		5.77(2.50-4.65)		10882	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.276	5.286	-0.010	1.000	7489510	2.58		103	1818	
913.00 > 169.00	5.269	5.286	-0.018	0.999	896422		8.35(0.00-0.00)		3134	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL5_00002 Amount Added: 1.00 Units: mL

Report Date: 24-Nov-2017 13:22:33 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_027.d

Injection Date: 18-Nov-2017 20:12:20 Instrument ID: A8_N

Lims ID: CCV L5

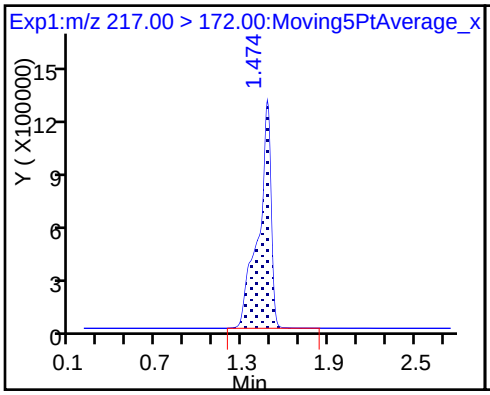
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 27

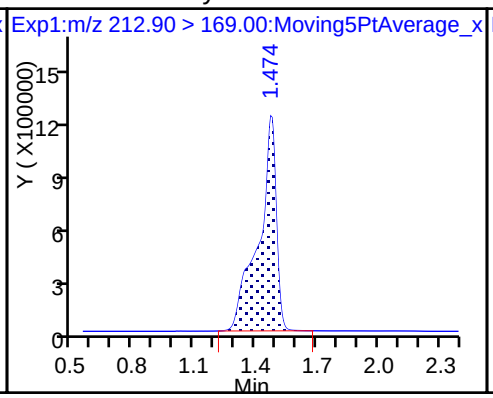
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

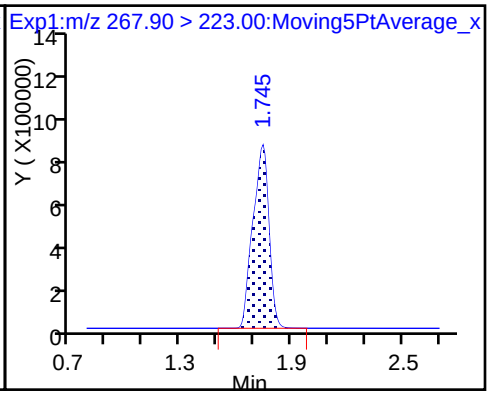
D 1 13C4 PFBA



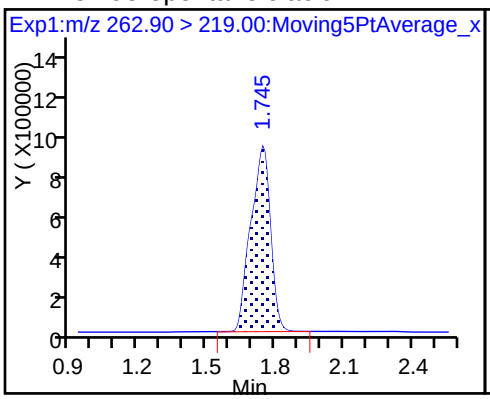
2 Perfluorobutyric acid



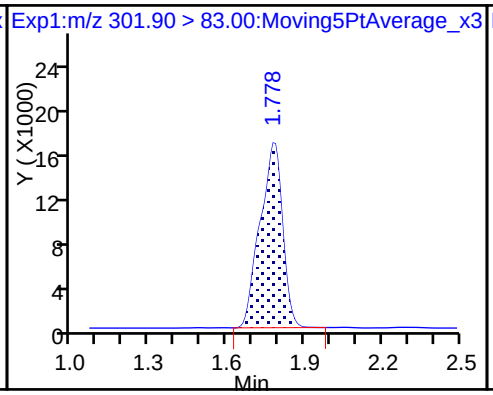
D 3 13C5-PFPeA



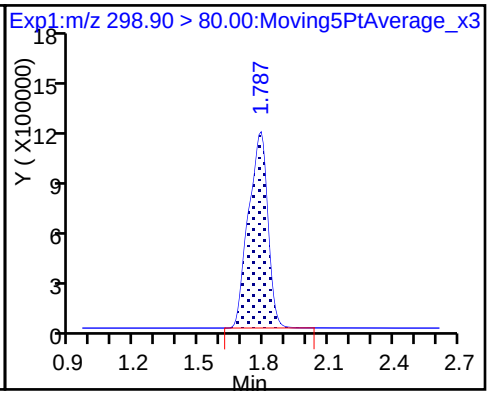
4 Perfluoropentanoic acid



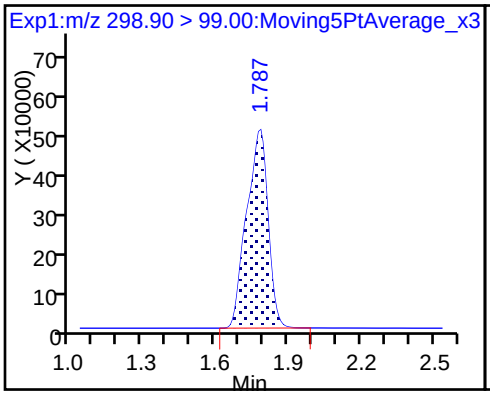
D 47 13C3-PFBS



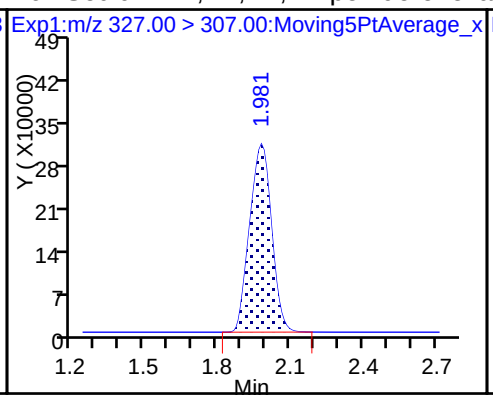
5 Perfluorobutanesulfonic acid



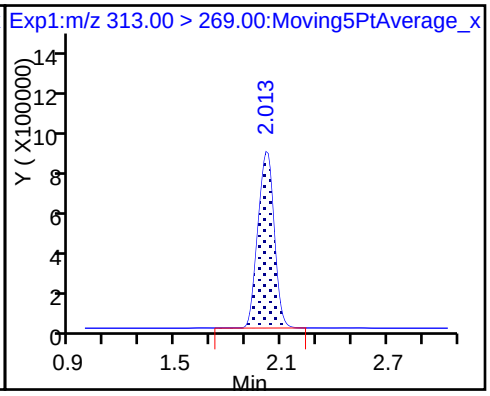
5 Perfluorobutanesulfonic acid



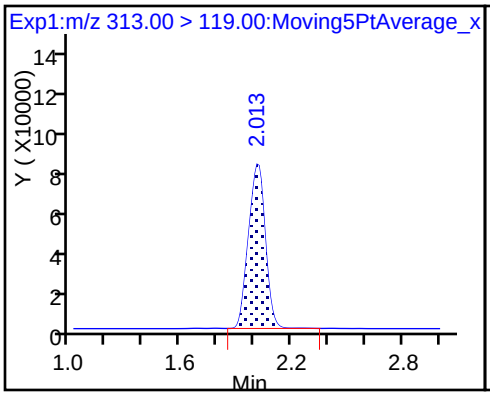
61 Sodium 1H,1H,2H,2H-perfluorohexane



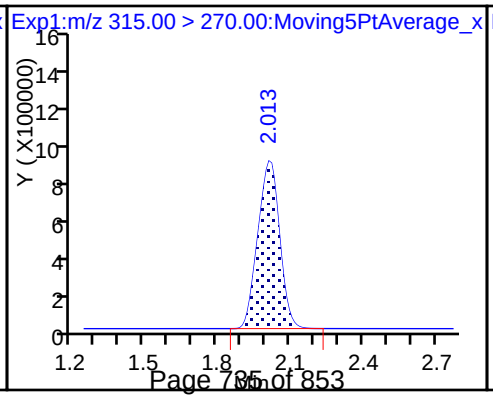
6 Perfluorohexanoic acid



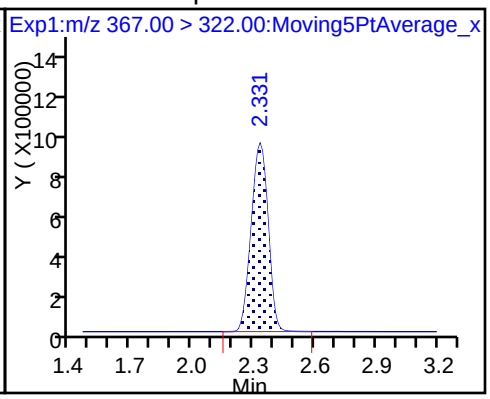
6 Perfluorohexanoic acid



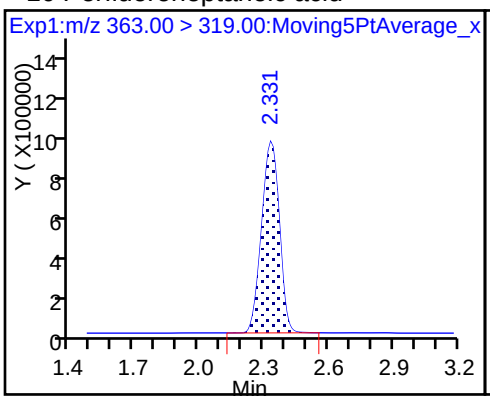
D 7 13C2 PFHxA



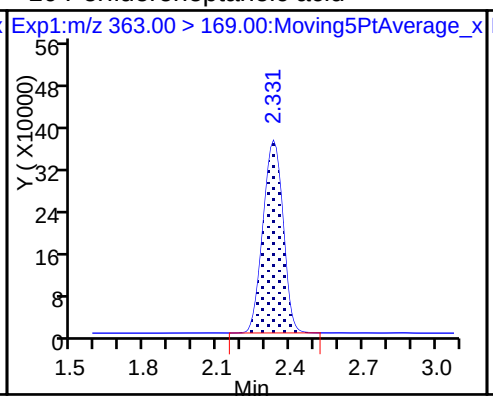
D 9 13C4-PFHpA



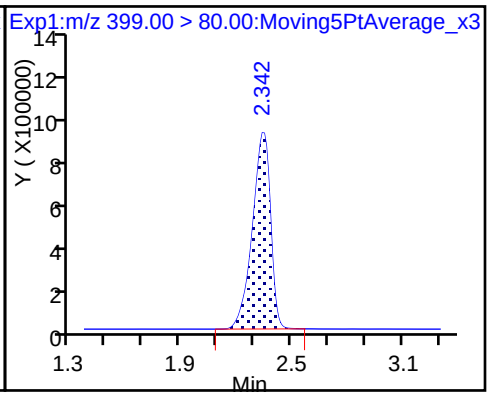
10 Perfluoroheptanoic acid



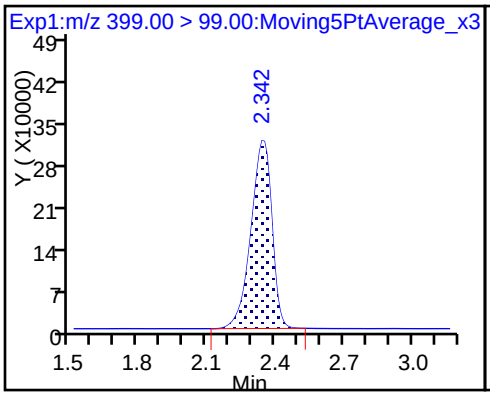
10 Perfluoroheptanoic acid



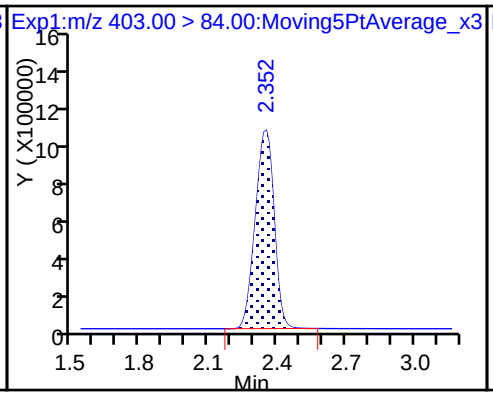
8 Perfluorohexanesulfonic acid



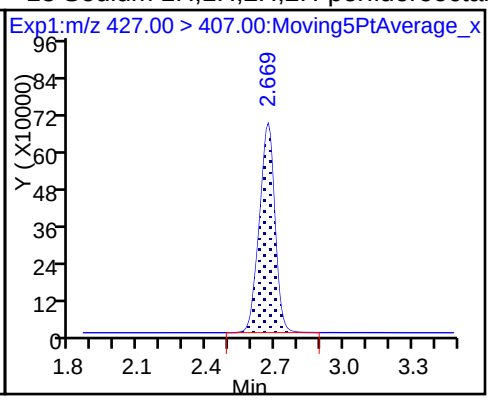
8 Perfluorohexanesulfonic acid



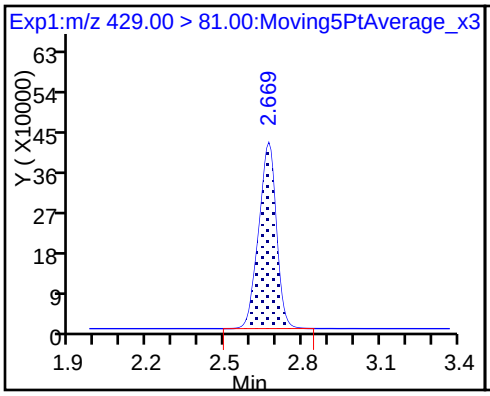
D 11 18O2 PFHxS



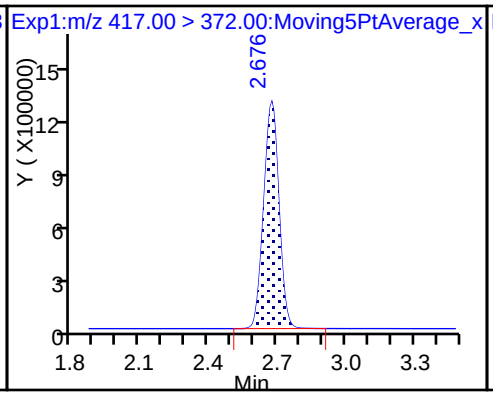
13 Sodium 1H,1H,2H,2H-perfluorooctane



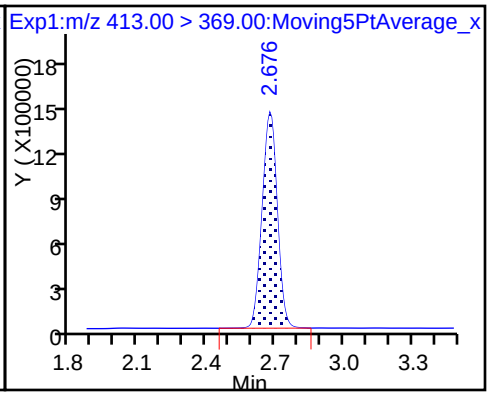
D 12 M2-6:2FTS



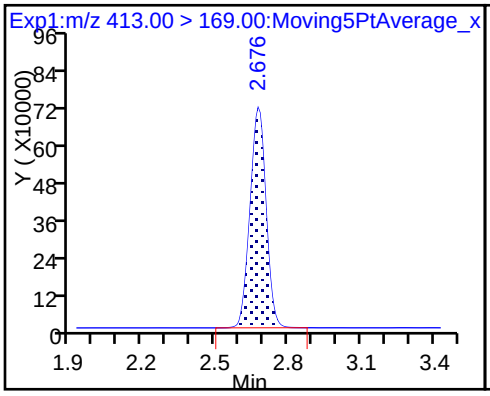
D 14 13C4 PFOA



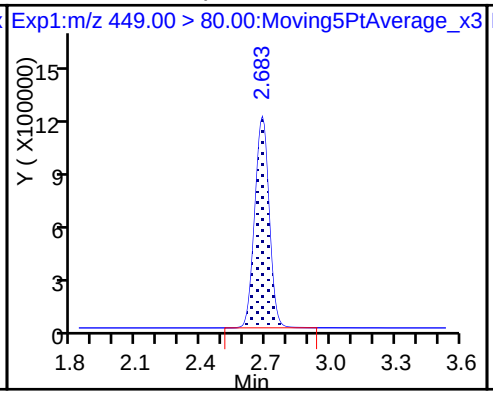
15 Perfluorooctanoic acid



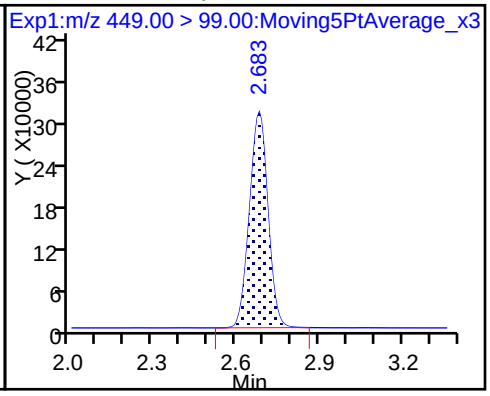
15 Perfluorooctanoic acid



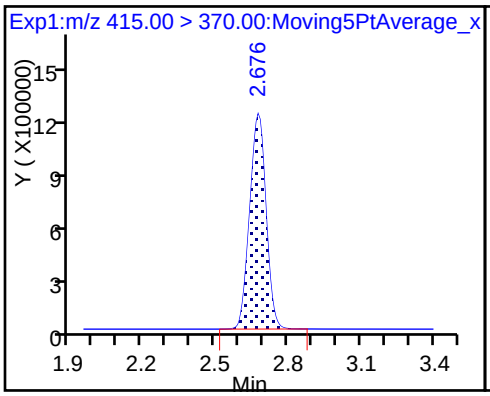
16 Perfluoroheptanesulfonic Acid



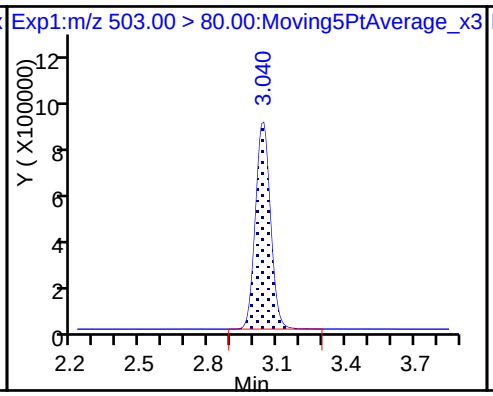
16 Perfluoroheptanesulfonic Acid



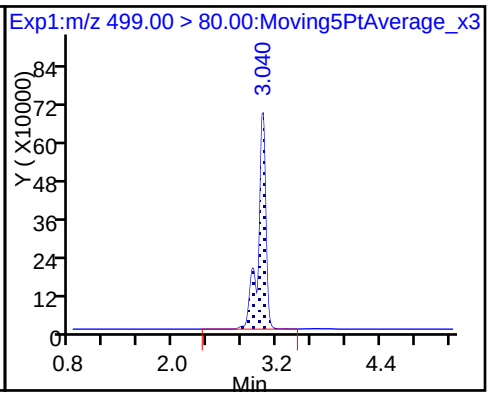
* 62 13C2-PFOA



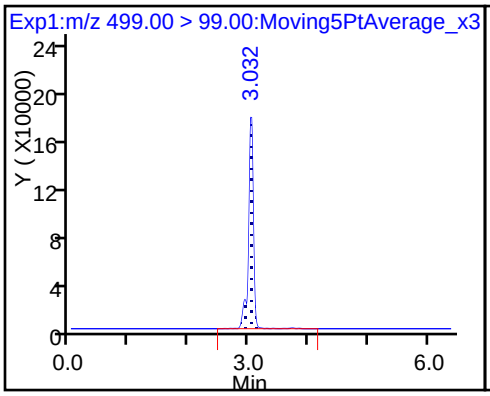
D 18 13C4 PFOS



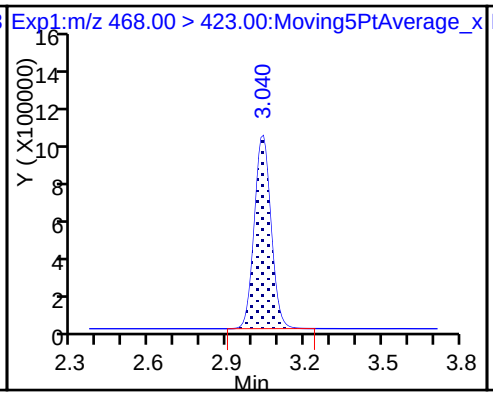
17 Perfluorooctane sulfonic acid



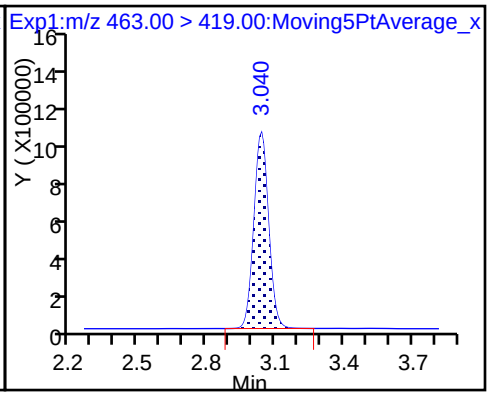
17 Perfluorooctane sulfonic acid



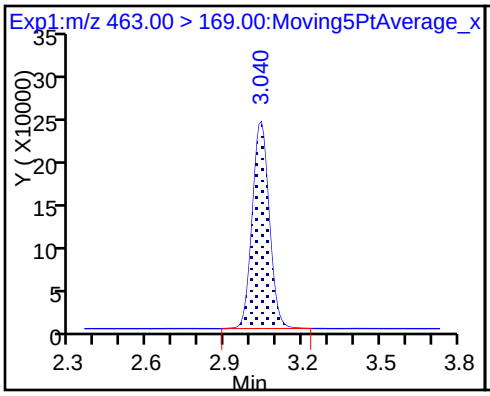
D 19 13C5 PFNA



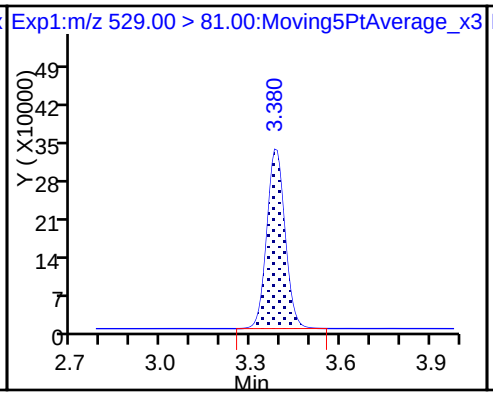
20 Perfluorononanoic acid



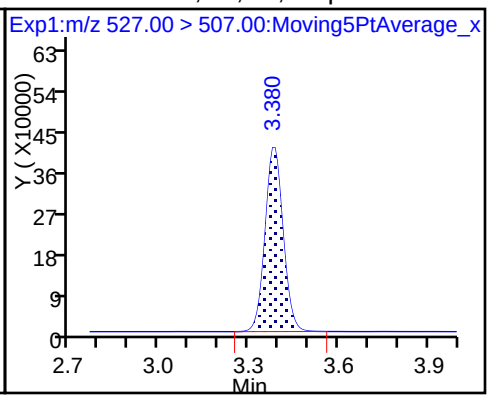
20 Perfluorononanoic acid



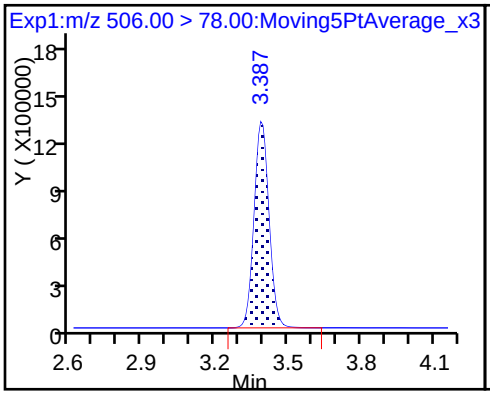
D 26 M2-8:2FTS



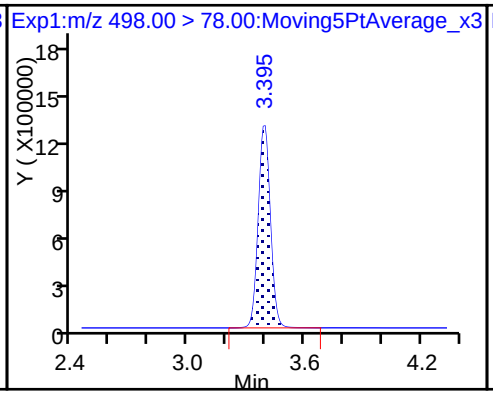
25 Sodium 1H,1H,2H,2H-perfluorodecane



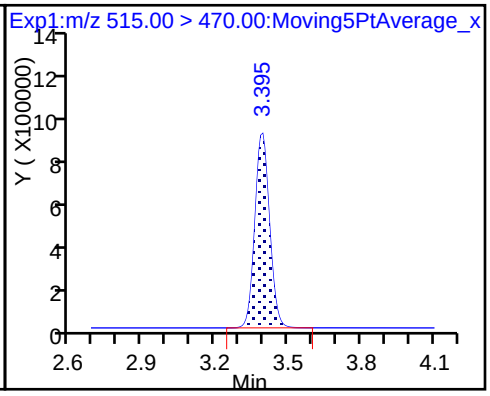
D 21 13C8 FOSA



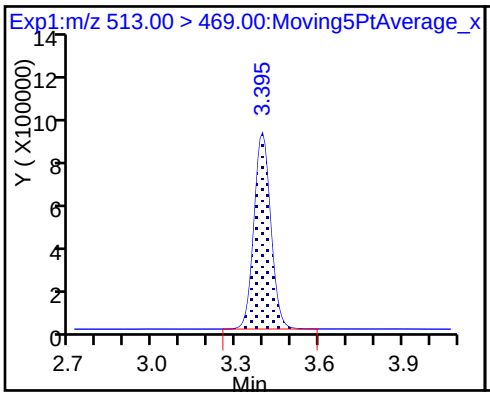
22 Perfluorooctane Sulfonamide



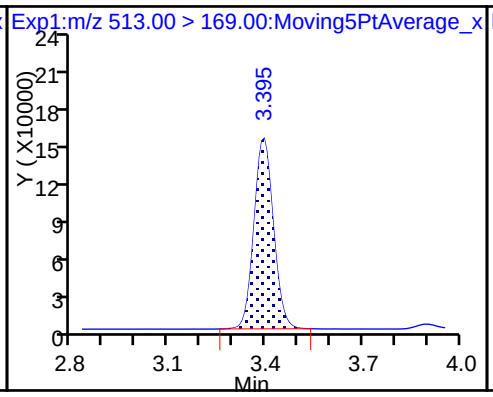
D 23 13C2 PFDA



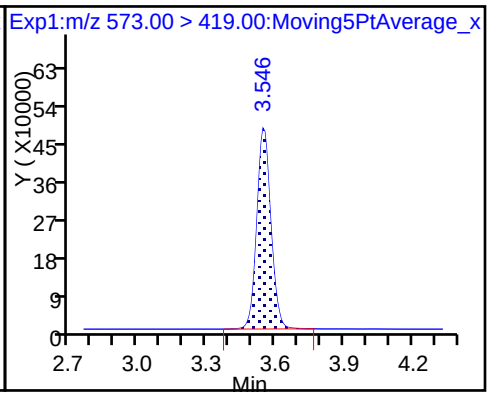
24 Perfluorodecanoic acid



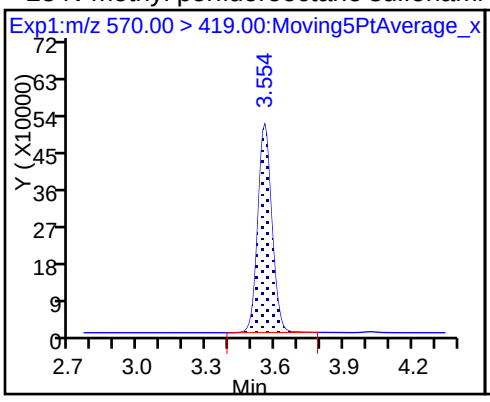
24 Perfluorodecanoic acid



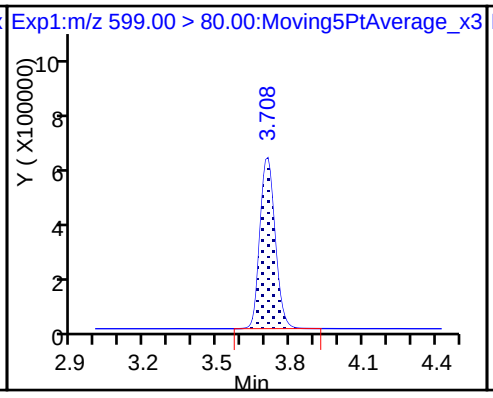
D 27 d3-NMeFOSAA



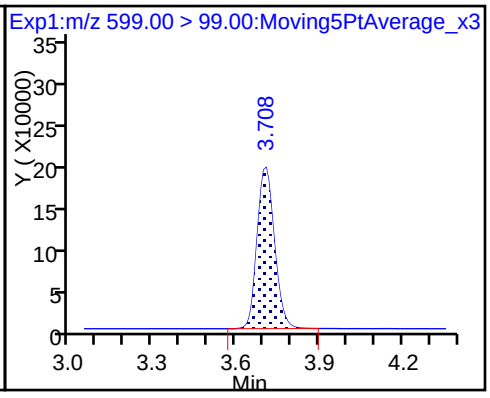
28 N-methyl perfluorooctane sulfonami



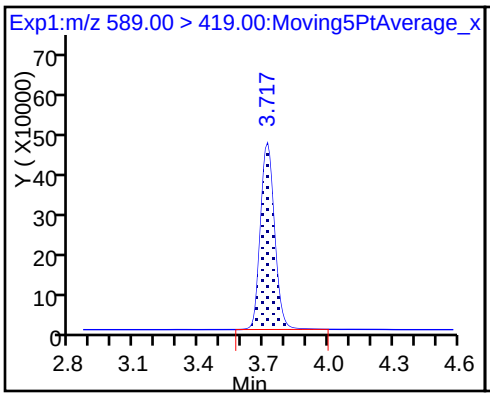
29 Perfluorodecane Sulfonic acid



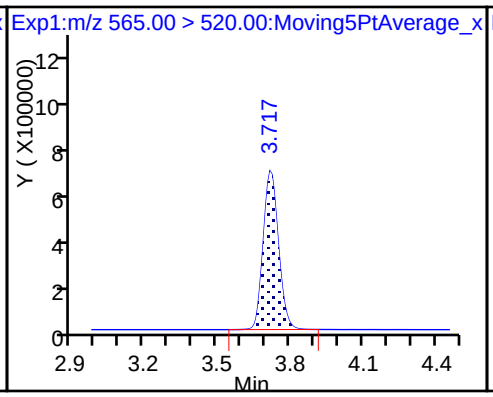
29 Perfluorodecane Sulfonic acid



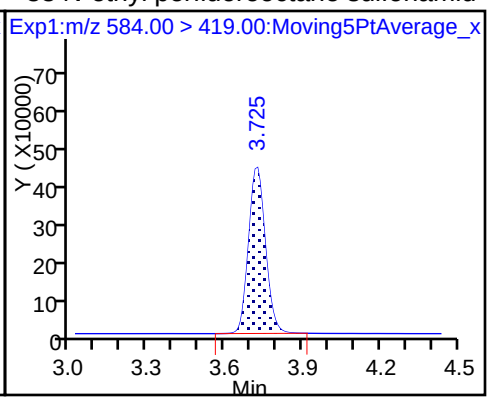
D 32 d5-NEtFOSAA



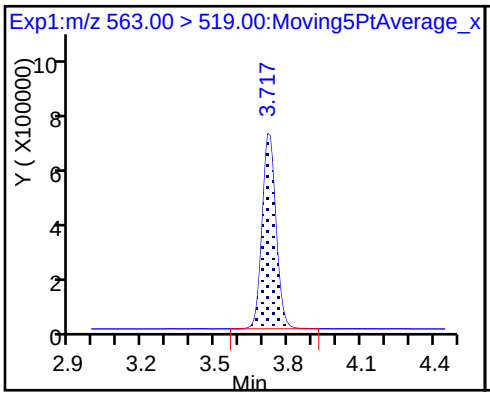
D 30 13C2 PFUnA



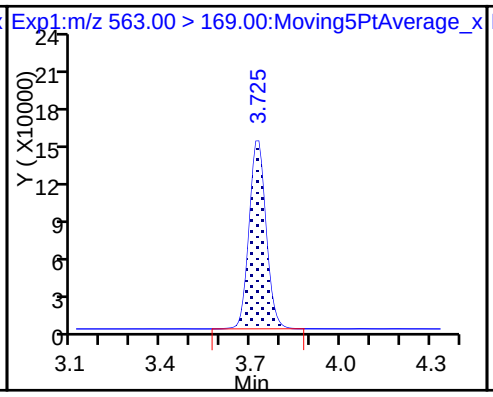
33 N-ethyl perfluorooctane sulfonamid



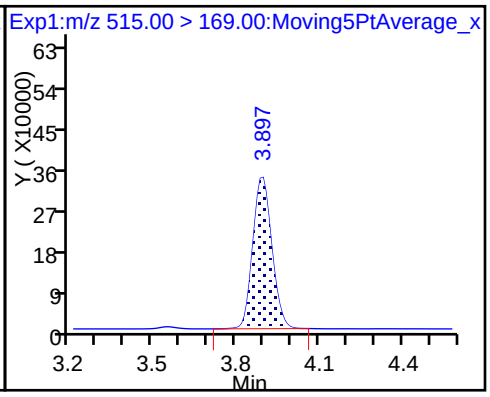
31 Perfluoroundecanoic acid



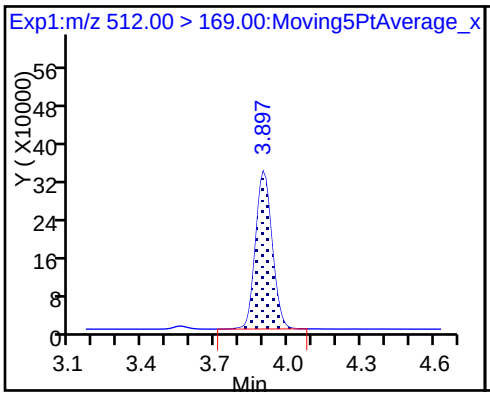
31 Perfluoroundecanoic acid



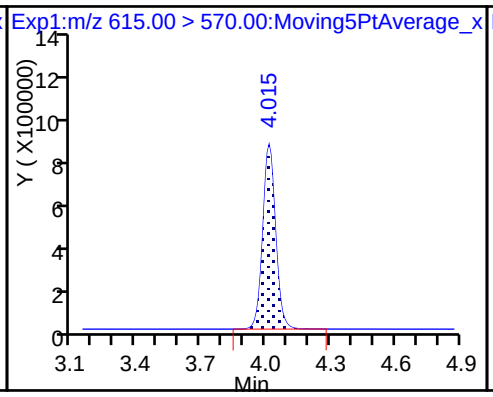
D 34 d-N-MeFOSA-M



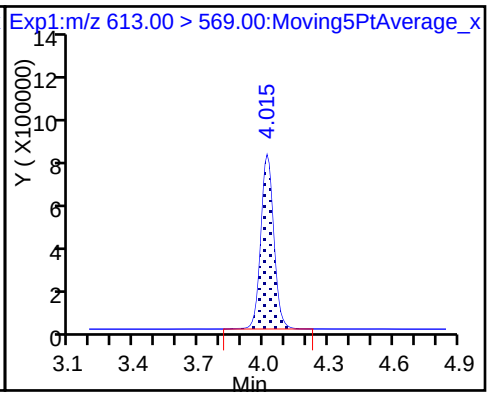
35 MeFOSA



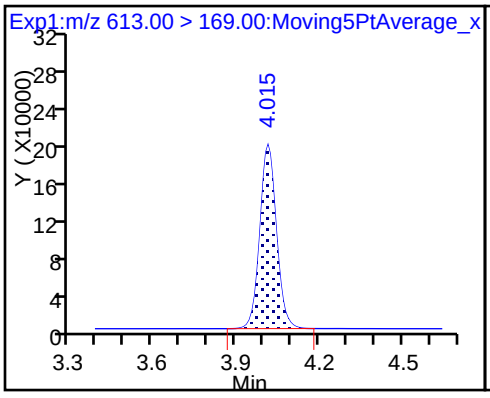
D 36 13C2 PFDoA



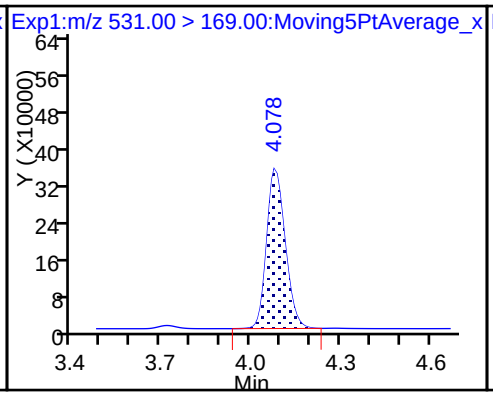
37 Perfluorododecanoic acid



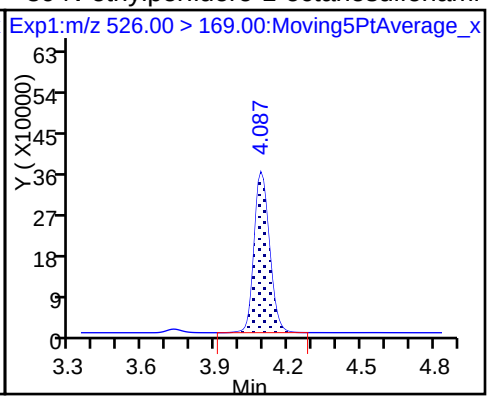
37 Perfluorododecanoic acid



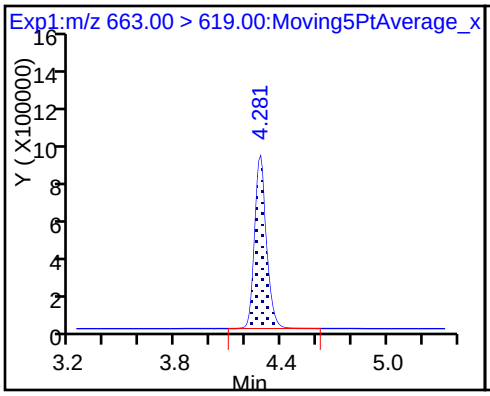
D 38 d-N-EtFOSA-M



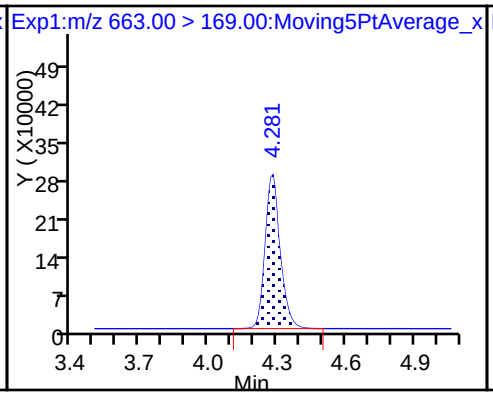
39 N-ethylperfluoro-1-octanesulfonami



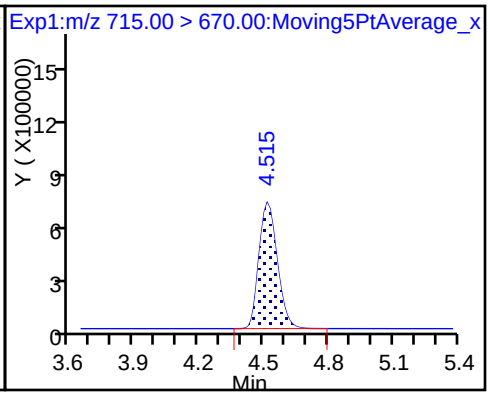
41 Perfluorotridecanoic acid



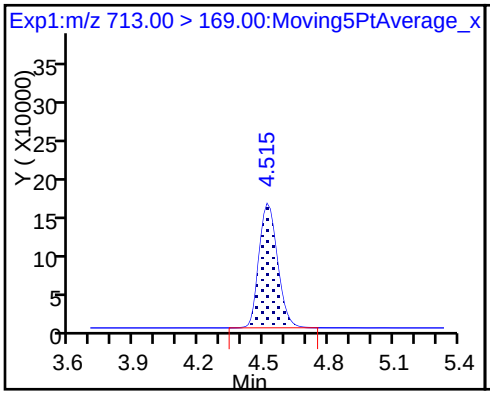
41 Perfluorotridecanoic acid



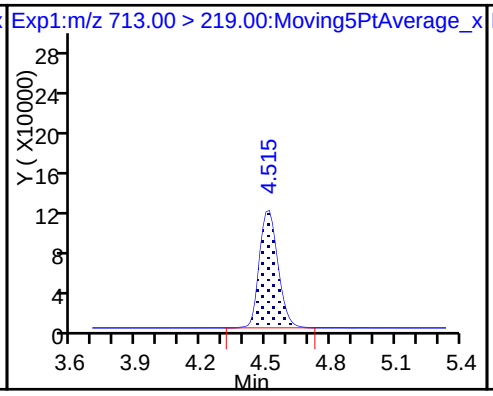
D 43 13C2-PFTeDA



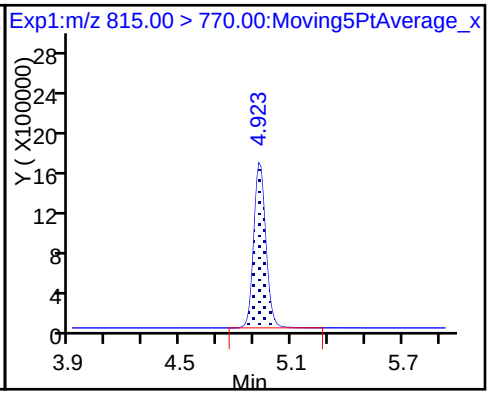
42 Perfluorotetradecanoic acid



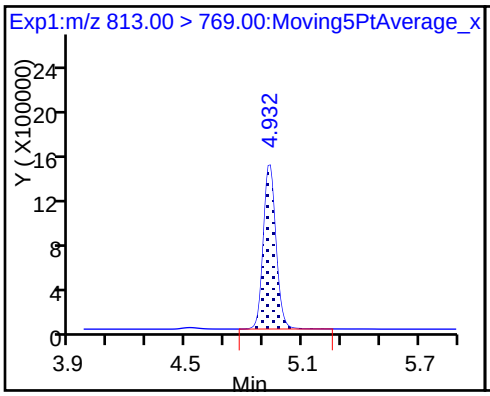
42 Perfluorotetradecanoic acid



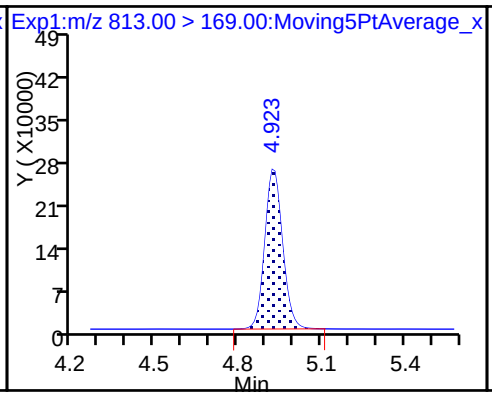
D 44 13C2-PFHxDA



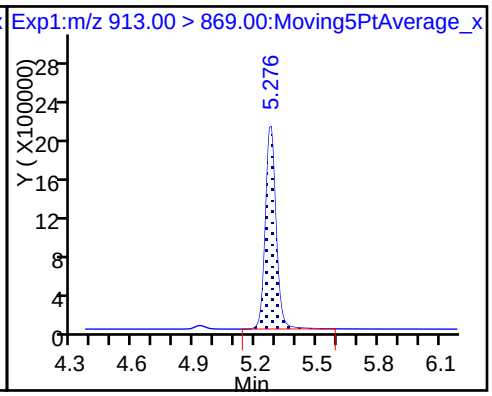
45 Perfluorohexadecanoic acid



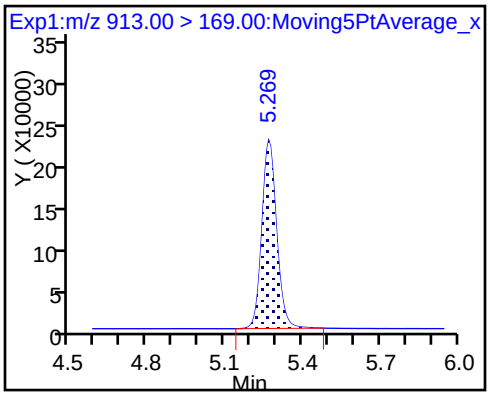
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCVL 320-196679/5 Calibration Date: 11/24/2017 14:17

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.24LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9458		0.0517	0.0500	3.3	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.204		0.0534	0.0500	6.8	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	84.21		0.0501	0.0442	13.3	50.0
4:2 FTS	AveID	0.7456	0.6894		0.432	0.467	-7.5	50.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	1.102		0.0551	0.0500	10.1	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	1.027		0.0501	0.0500	0.2	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	1.166		0.0484	0.0455	6.5	50.0
6:2FTS	AveID	1.605	1.708		0.505	0.474	6.5	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.153		0.0546	0.0500	9.3	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.268		0.0461	0.0476	-3.1	50.0
Perfluorononanoic acid (PFNA)	AveID	0.997	0.9648		0.0484	0.0500	-3.2	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.208		0.0534	0.0464	15.2	50.0
8:2FTS	AveID	1.214	1.240		0.489	0.479	2.1	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	0.9685		0.0504	0.0500	0.8	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	1.073		0.0552	0.0500	10.5	50.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	1.080		0.515	0.500	3.0	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.6196		0.0494	0.0482	2.5	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9739		0.508	0.500	1.6	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.9220		0.0509	0.0500	1.9	50.0
MeFOSA	AveID	0.9814	1.023		0.521	0.500	4.2	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	1.021		0.0521	0.0500	4.2	50.0
N-EtFOSA-M	AveID	1.002	1.095		0.546	0.500	9.3	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.228		0.0502	0.0500	0.3	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2235		0.0456	0.0500	-8.9	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.344		0.0544	0.0500	8.7	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	0.9874		0.0496	0.0500	-0.8	50.0
13C4 PFBA	Ave	1.301	1.242		2.39	2.50	-4.5	50.0
13C5 PFPeA	Ave	0.8240	0.7770		2.36	2.50	-5.7	50.0
13C3-PFBS	Ave	0.0180	0.0177		2.28	2.33	-1.9	50.0
13C2 PFHxA	Ave	0.9302	0.8933		2.40	2.50	-4.0	50.0
13C4-PFHpA	Ave	0.8986	0.8617		2.40	2.50	-4.1	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCVL 320-196679/5 Calibration Date: 11/24/2017 14:17

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.24LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.093		2.44	2.37	3.1	50.0
M2-6:2FTS	Ave	0.4500	0.4619		2.44	2.38	2.6	50.0
13C4 PFOA	Ave	1.030	1.004		2.44	2.50	-2.6	50.0
13C4 PFOS	Ave	0.7080	0.7058		2.38	2.39	-0.3	50.0
13C5 PFNA	Ave	0.7570	0.7723		2.55	2.50	2.0	50.0
13C8 FOSA	Ave	0.9121	0.9011		2.47	2.50	-1.2	50.0
M2-8:2FTS	Ave	0.2391	0.2080		2.08	2.40	-13.0	50.0
13C2 PFDA	Ave	0.6386	0.6059		2.37	2.50	-5.1	50.0
d3-NMeFOSAA	Ave	0.3429	0.3092		2.25	2.50	-9.8	50.0
d5-NEtFOSAA	Ave	0.3296	0.3278		2.49	2.50	-0.5	50.0
13C2 PFUnA	Ave	0.5100	0.4885		2.39	2.50	-4.2	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2400		2.27	2.50	-9.3	50.0
13C2 PFDoA	Ave	0.5923	0.5620		2.37	2.50	-5.1	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2148		2.19	2.50	-12.6	50.0
13C2-PFTeDA	Ave	0.7282	0.6960		2.39	2.50	-4.4	50.0
13C2-PFHxDA	Ave	1.288	1.200		2.33	2.50	-6.8	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50921.b\2017.11.24LLA_005.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 24-Nov-2017 14:17:25 ALS Bottle#: 21 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCVL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub18

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50921.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 27-Nov-2017 09:38:29 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 27-Nov-2017 09:38:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.485	1.485	0.0	0.552	7596227	2.39		95.5	65691	
2 Perfluorobutyric acid										
212.90 > 169.00	1.485	1.485	0.0	1.000	143689	0.0517		103	24.4	
D 3 13C5-PFPeA										
267.90 > 223.00	1.754	1.755	-0.001	0.652	4751577	2.36		94.3	66456	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.754	1.755	-0.001	1.000	114453	0.0534		107	75.8	
D 47 13C3-PFBS										
301.90 > 83.00	1.787	1.788	-0.001	0.664	100485	2.28		98.1	3380	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.787	1.796	-0.009	1.000	160874	0.0501		113	101	
298.90 > 99.00	1.787	1.796	-0.009	1.000	67118		2.40(1.74-3.24)		95.7	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.992	1.993	-0.001	1.000	363698	0.4318		92.5	14913	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.023	2.035	-0.012	1.000	120357	0.0551		110	232	
313.00 > 119.00	2.023	2.035	-0.012	1.000	14030		8.58(7.05-13.09)		167	
D 7 13C2 PFHxA										
315.00 > 270.00	2.023	2.035	-0.012	0.752	5462644	2.40		96.0	58648	
D 9 13C4-PFHpA										
367.00 > 322.00	2.342	2.354	-0.012	0.870	5269533	2.40		95.9	31004	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.352	2.354	-0.002	1.004	108260	0.0501		100	148	
363.00 > 169.00	2.342	2.354	-0.012	1.000	41061		2.64(1.59-2.95)		240	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.363	2.375	-0.012	1.000	141837	0.0484		106	473	
399.00 > 99.00	2.363	2.375	-0.012	1.000	47699		2.97(2.10-3.89)		269	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.363	2.375	-0.012	0.878	6322868	2.44		103	36763	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.684	2.693	-0.009	1.000	914694	0.5046		106	27690	
D 12 M2-6:2FTS										
429.00 > 81.00	2.684	2.693	-0.009	0.997	2683068	2.44		103	54592	
D 14 13C4 PFOA										
417.00 > 372.00	2.691	2.707	-0.016	1.000	6137842	2.44		97.4	46705	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.691	2.707	-0.016	1.000	141528	0.0546		109	56.6	
413.00 > 169.00	2.691	2.707	-0.016	1.000	72153		1.96(1.18-2.19)		389	
* 62 13C2-PFOA										
415.00 > 370.00	2.691	2.707	-0.016		6115073	2.50			48281	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.698	2.714	-0.016	1.000	104226	0.0461		96.9	1542	
449.00 > 99.00	2.698	2.714	-0.016	1.000	30727		3.39(2.72-5.05)		653	
D 18 13C4 PFOS										
503.00 > 80.00	3.056	3.074	-0.018	1.136	4126208	2.38		99.7	23547	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.056	3.074	-0.018	1.000	96804	0.0534		115	17.9	
499.00 > 99.00	3.056	3.074	-0.018	1.000	22181		4.36(3.24-6.01)		23.9	
D 19 13C5 PFNA										
468.00 > 423.00	3.056	3.074	-0.018	1.136	4722695	2.55		102	34687	
20 Perfluorononanoic acid										
463.00 > 419.00	3.056	3.082	-0.026	1.000	91128	0.0484		96.8	203	
463.00 > 169.00	3.056	3.082	-0.026	1.000	22263		4.09(2.65-4.93)		456	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.411	3.411	-0.001	1.000	106735	0.0504		101	2785	
D 21 13C8 FOSA										
506.00 > 78.00	3.411	3.411	-0.001	1.267	5510283	2.47		98.8	36174	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.411	3.426	-0.016	1.000	302231	0.4891		102	10236	
D 26 M2-8:2FTS										
529.00 > 81.00	3.411	3.426	-0.016	1.267	1218687	2.08		87.0	19138	
D 23 13C2 PFDA										
515.00 > 470.00	3.418	3.434	-0.016	1.270	3704825	2.37		94.9	40306	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.418	3.441	-0.023	1.000	79516	0.0552		110	349	
513.00 > 169.00	3.418	3.441	-0.023	1.000	13371		5.95(3.31-6.15)		205	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.577	3.595	-0.018	1.329	1891027	2.25		90.2	23420	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.577	3.603	-0.026	1.000	408387	0.5150		103	2853	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.734	3.752	-0.018	1.000	51559	0.0494		103	1700	
599.00 > 99.00	3.725	3.752	-0.027	0.998	14491		3.56(1.94-3.60)		541	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.742	3.760	-0.018	1.391	2004378	2.49		99.5	8953	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFUnA										
565.00 > 520.00	3.751	3.769	-0.018	1.394	2987169	2.39		95.8	33682	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.751	3.769	-0.018	1.002	390394	0.5079		102	5469	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.751	3.769	-0.018	1.000	55085	0.0509		102	287	
563.00 > 169.00	3.751	3.769	-0.018	1.000	12472		4.42(0.00-0.00)		583	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.917	3.907	0.010	1.456	1467768	2.27		90.7	3380	
35 MeFOSA										
512.00 > 169.00	3.917	3.907	0.010	1.000	300188	0.5210		104	2466	
D 36 13C2 PFDoA										
615.00 > 570.00	4.038	4.062	-0.024	1.501	3436474	2.37		94.9	47689	
37 Perfluorododecanoic acid										R
613.00 > 569.00	4.046	4.062	-0.016	1.002	70139	0.0521		104	244	R
613.00 > 169.00	4.046	4.062	-0.016	1.002	16973		4.13(2.19-4.07)		1042	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.097	4.097	0.0	1.522	1313362	2.19		87.4	2446	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.106	4.097	0.009	1.002	287537	0.5464		109	1870	
41 Perfluorotridecanoic acid										R
663.00 > 619.00	4.304	4.327	-0.023	1.000	84397	0.0502		100	327	R
663.00 > 169.00	4.304	4.327	-0.023	1.000	22875		3.69(1.76-3.26)		823	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.542	4.570	-0.028	1.688	4256046	2.39		95.6	30068	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.542	4.570	-0.028	1.000	19023	0.0456		91.1	642	
713.00 > 219.00	4.528	4.570	-0.042	0.997	14800		1.29(1.00-1.85)		657	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.950	4.986	-0.036	1.839	7338959	2.33		93.2	24627	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.950	4.986	-0.036	1.000	197330	0.0544		109	136	R
813.00 > 169.00	4.950	4.986	-0.036	1.000	33932		5.82(2.50-4.65)		953	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.297	5.347	-0.050	1.000	144927	0.0496		99.2	56.9	
913.00 > 169.00	5.297	5.347	-0.050	1.000	16784		8.63(0.00-0.00)		341	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Reagents:

LCPFC_CCVL_00001 Amount Added: 1.00 Units: mL

Report Date: 27-Nov-2017 09:38:30 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50921.b\2017.11.24LLA_005.d

Injection Date: 24-Nov-2017 14:17:25 Instrument ID: A8_N

Lims ID: CCVL

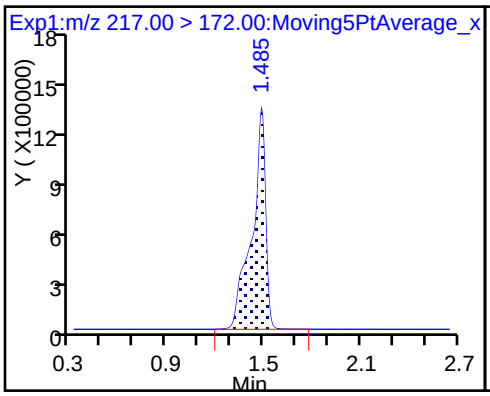
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 5

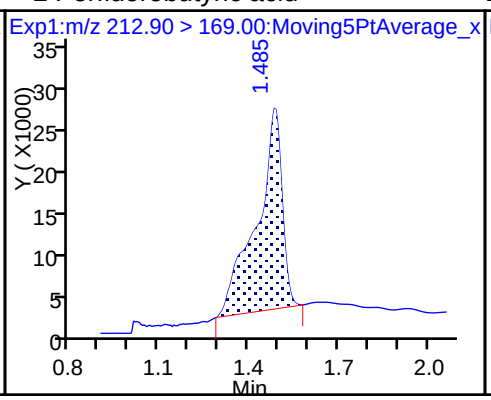
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

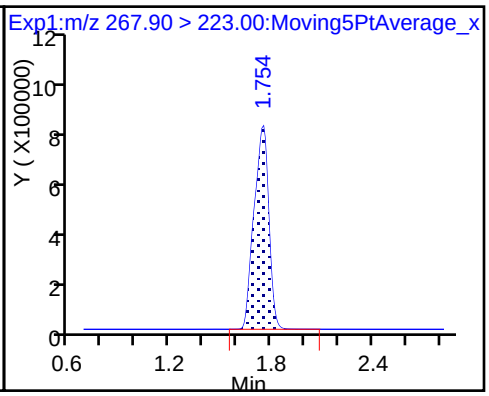
D 1 13C4 PFBA



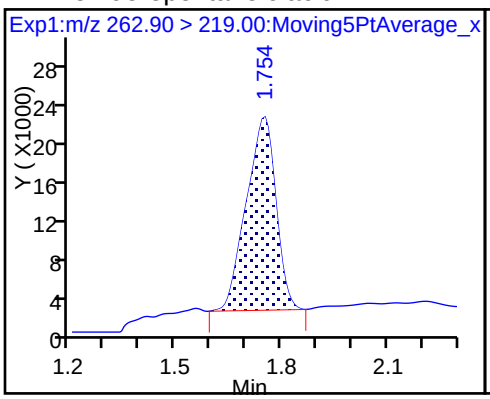
2 Perfluorobutyric acid



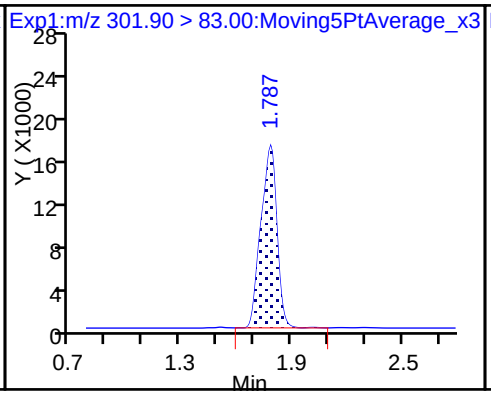
D 3 13C5-PFPeA



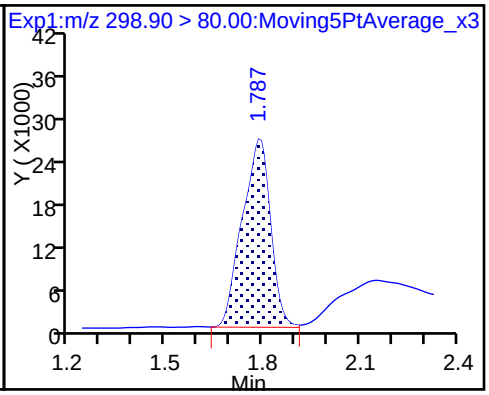
4 Perfluoropentanoic acid



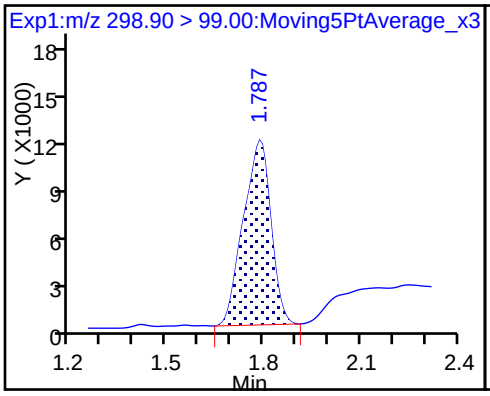
D 47 13C3-PFBS



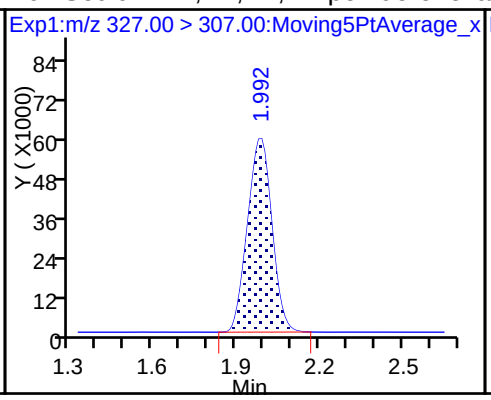
5 Perfluorobutanesulfonic acid



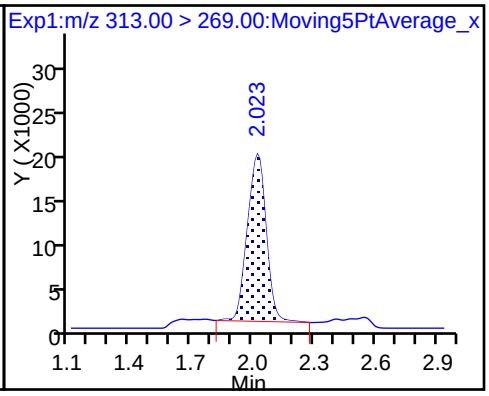
5 Perfluorobutanesulfonic acid



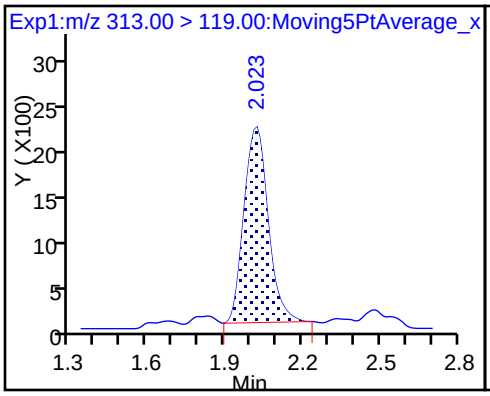
61 Sodium 1H,1H,2H,2H-perfluorohexane



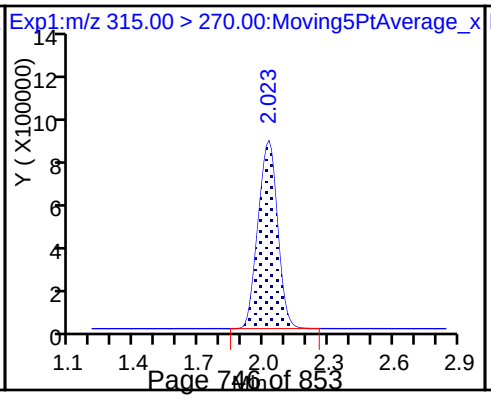
6 Perfluorohexanoic acid



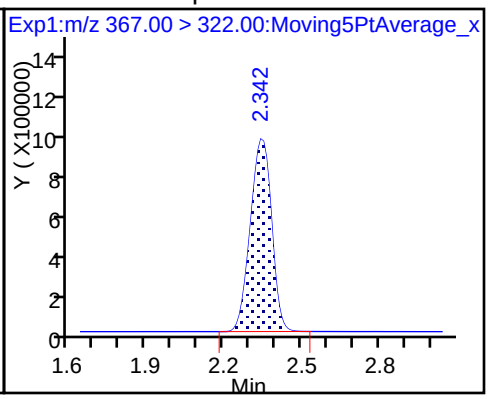
6 Perfluorohexanoic acid



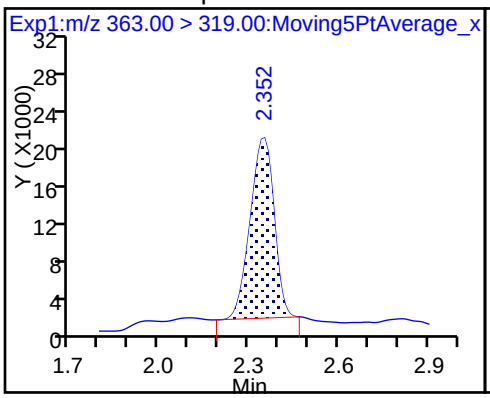
D 7 13C2 PFHxA



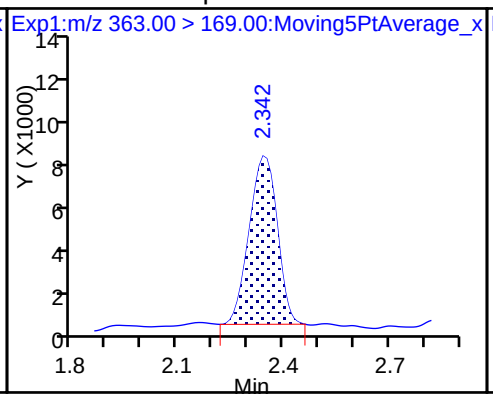
D 9 13C4-PFHpA



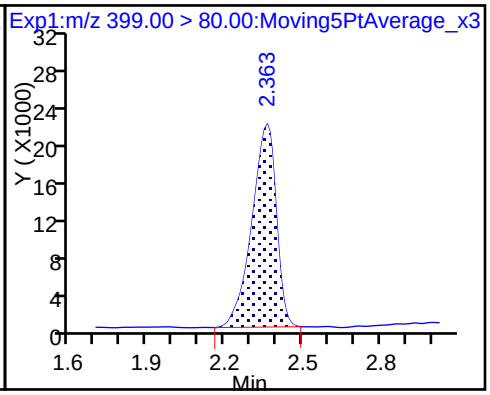
10 Perfluoroheptanoic acid



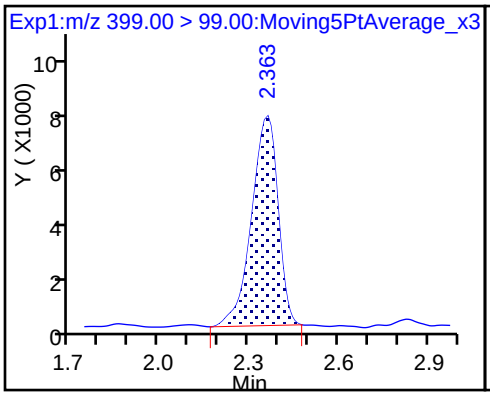
10 Perfluoroheptanoic acid



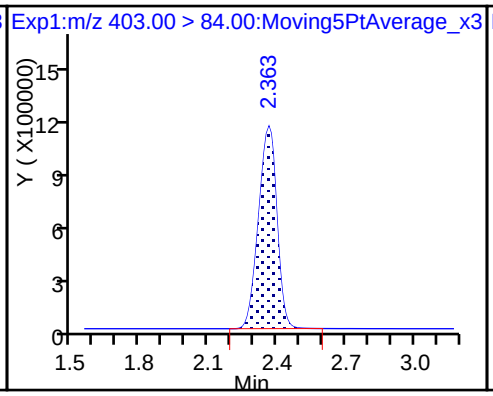
8 Perfluorohexanesulfonic acid



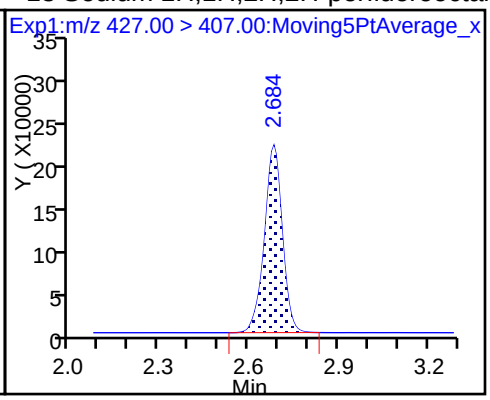
8 Perfluorohexanesulfonic acid



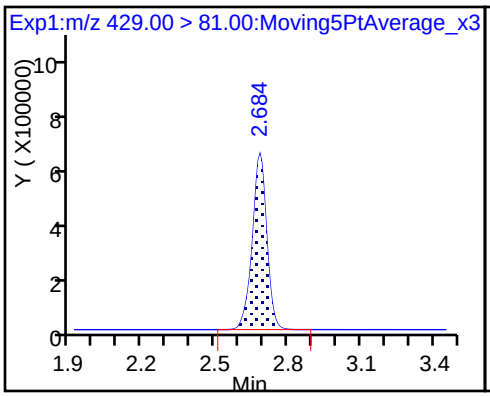
D 11 18O2 PFHxS



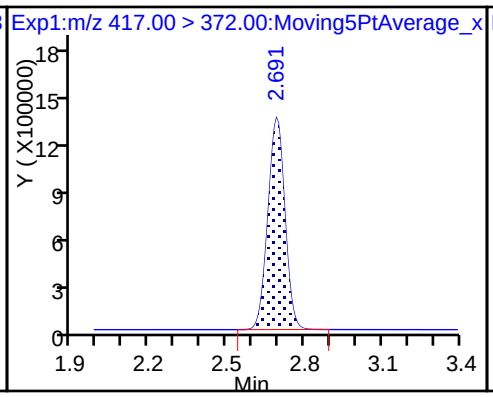
13 Sodium 1H,1H,2H,2H-perfluorooctane



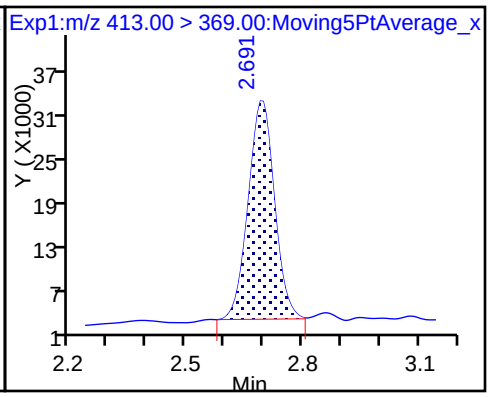
D 12 M2-6:2FTS



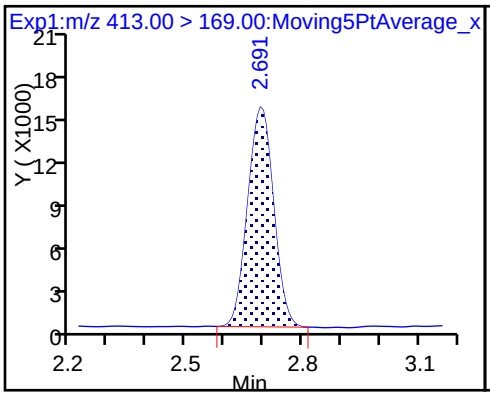
D 14 13C4 PFOA



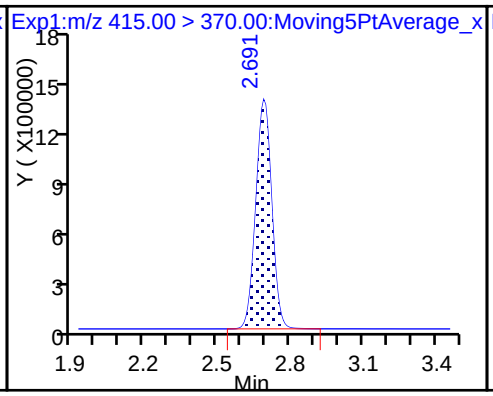
15 Perfluorooctanoic acid



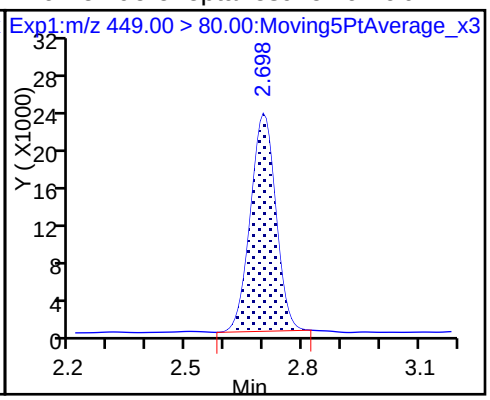
15 Perfluorooctanoic acid



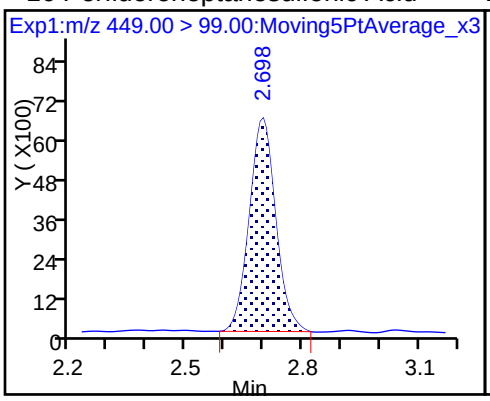
* 62 13C2-PFOA



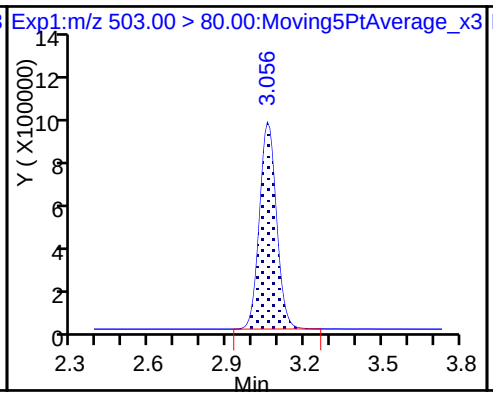
16 Perfluoroheptanesulfonic Acid



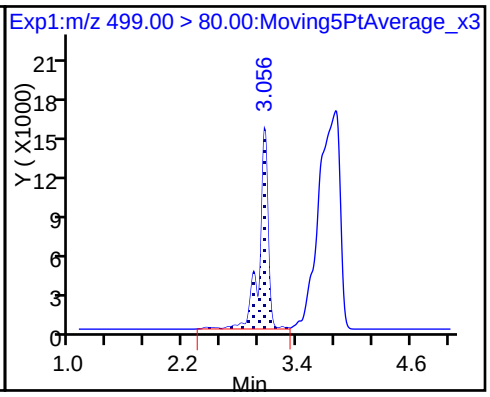
16 Perfluoroheptanesulfonic Acid



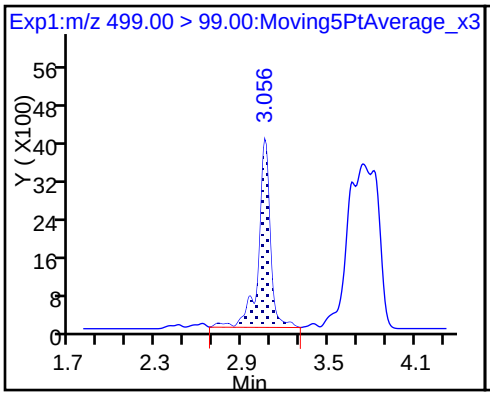
D 18 13C4 PFOS



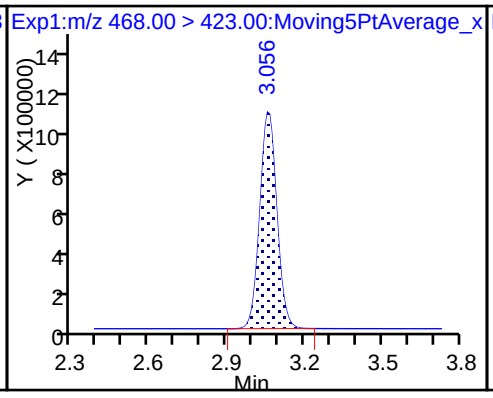
17 Perfluorooctane sulfonic acid



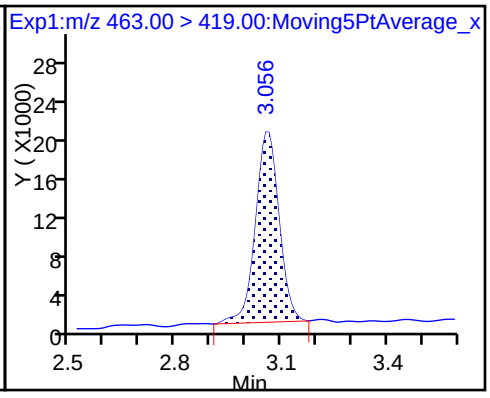
17 Perfluorooctane sulfonic acid



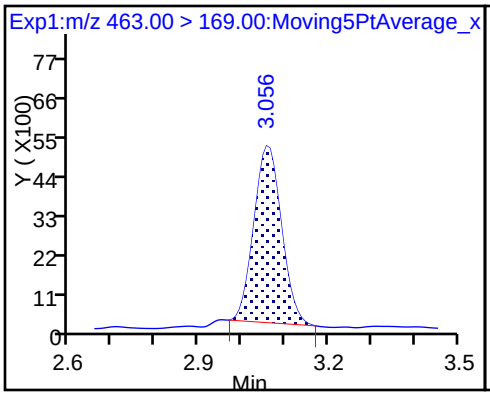
D 19 13C5 PFNA



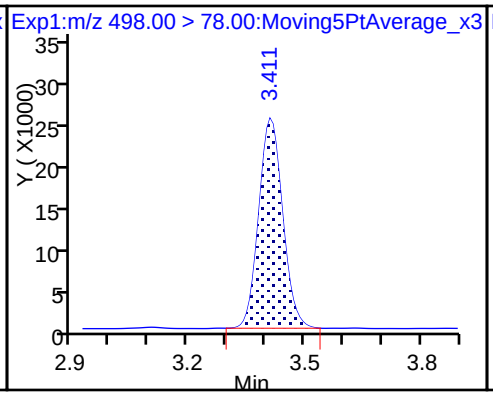
20 Perfluorononanoic acid



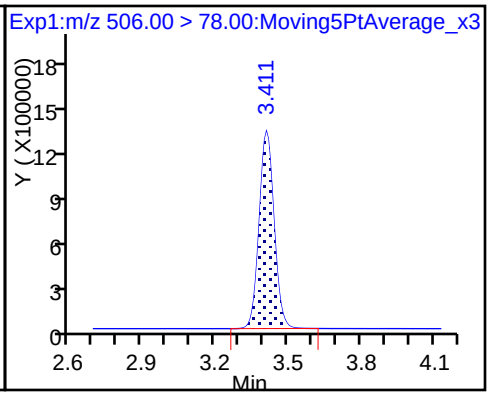
20 Perfluorononanoic acid



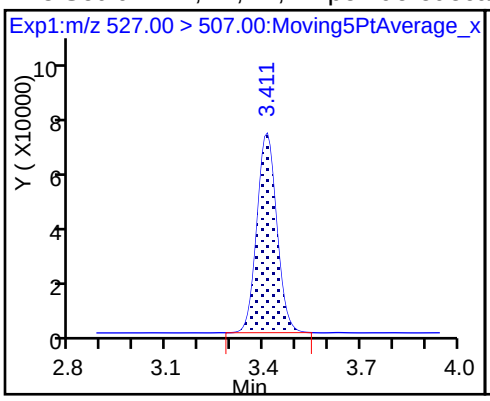
22 Perfluorooctane Sulfonamide



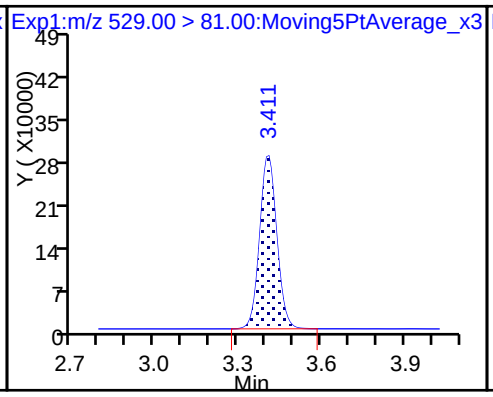
D 21 13C8 FOSA



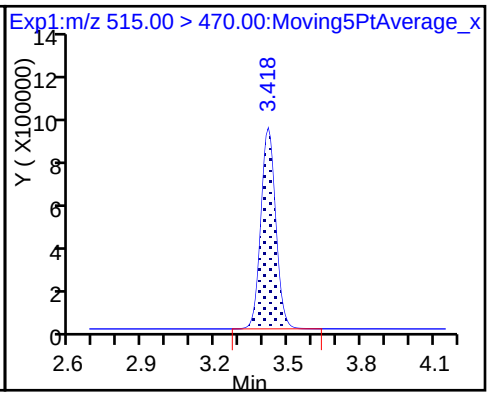
25 Sodium 1H,1H,2H,2H-perfluorodecane



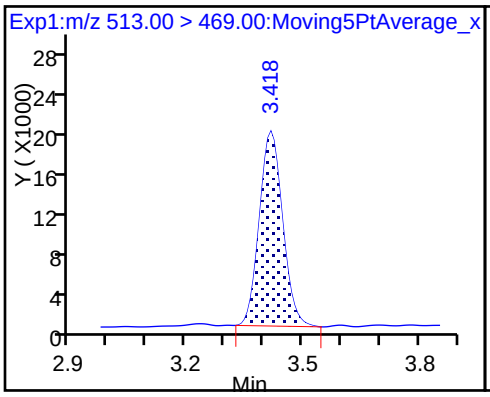
D 26 M2-8:2FTS



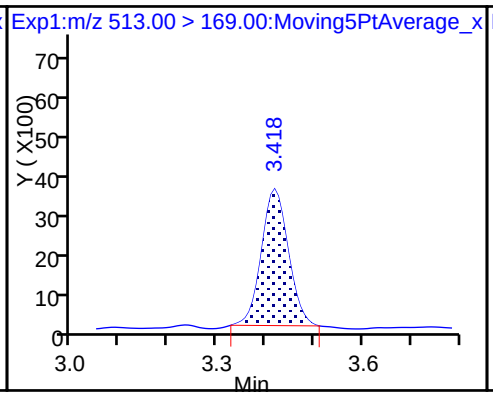
D 23 13C2 PFDA



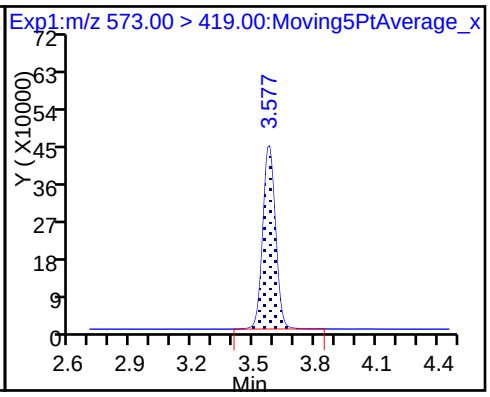
24 Perfluorodecanoic acid



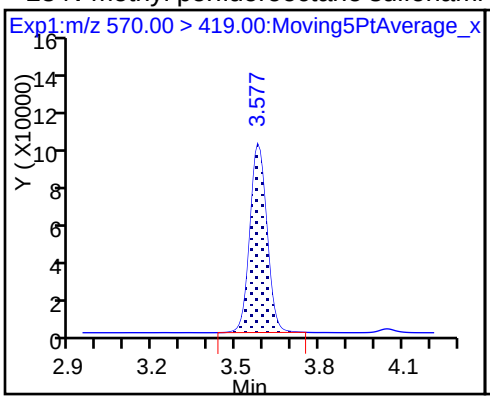
24 Perfluorodecanoic acid



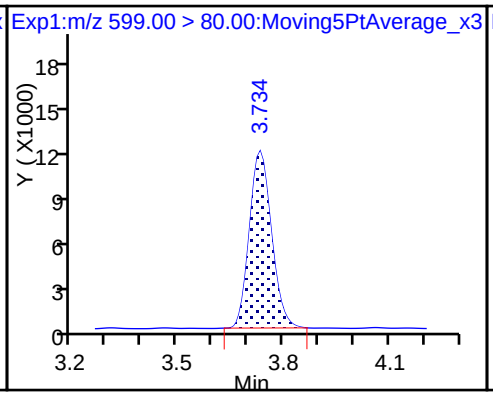
D 27 d3-NMeFOSAA



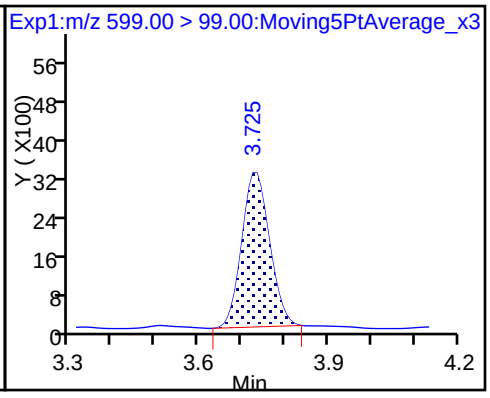
28 N-methyl perfluorooctane sulfonami



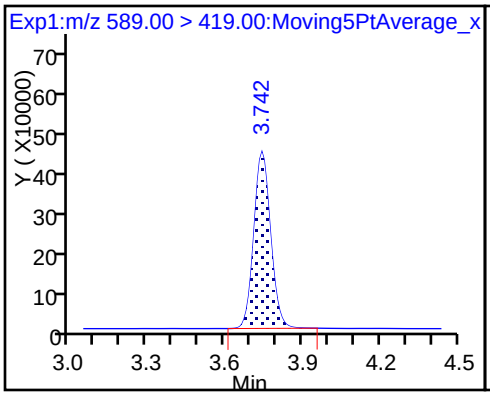
29 Perfluorodecane Sulfonic acid



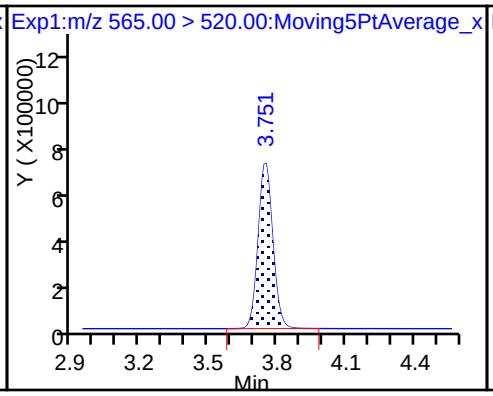
29 Perfluorodecane Sulfonic acid



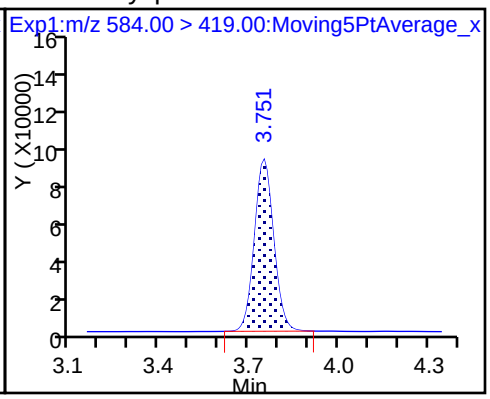
D 32 d5-NEtFOSAA



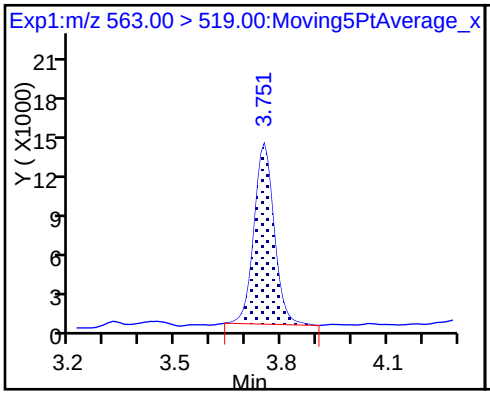
D 30 13C2 PFUnA



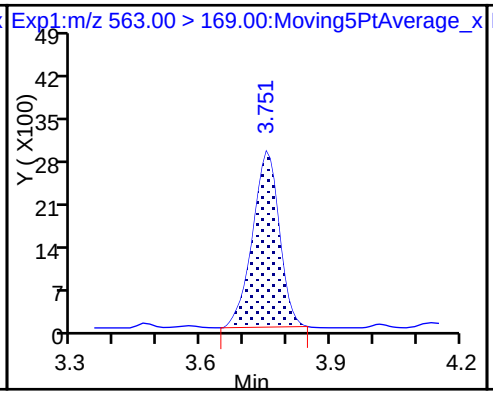
33 N-ethyl perfluorooctane sulfonamid



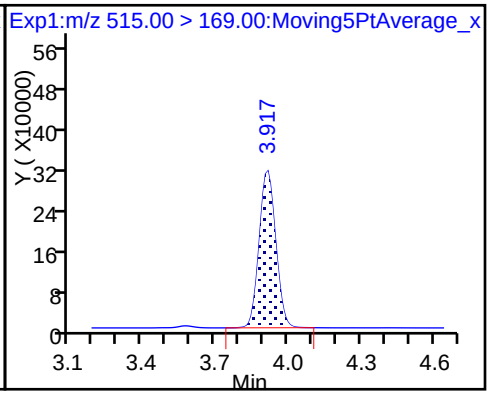
31 Perfluoroundecanoic acid



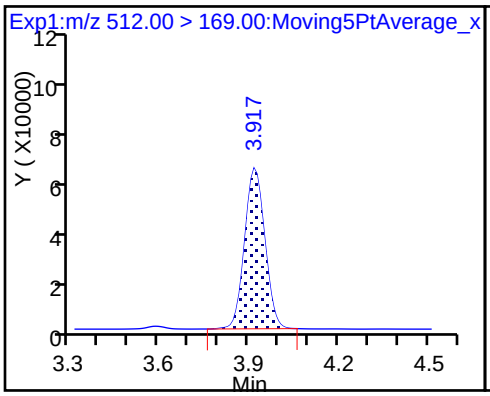
31 Perfluoroundecanoic acid



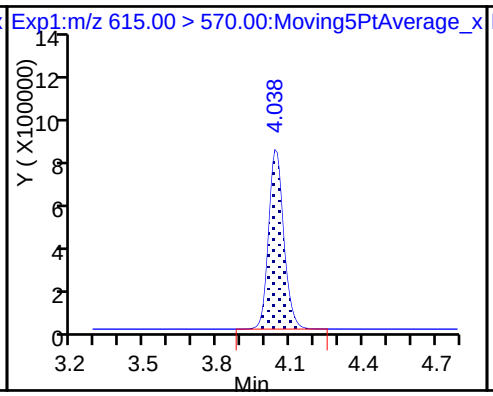
D 34 d-N-MeFOSA-M



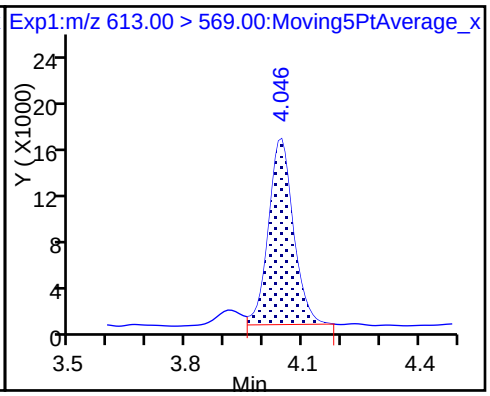
35 MeFOSA



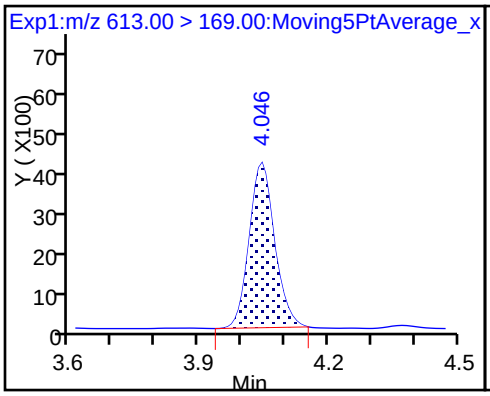
D 36 13C2 PFDoA



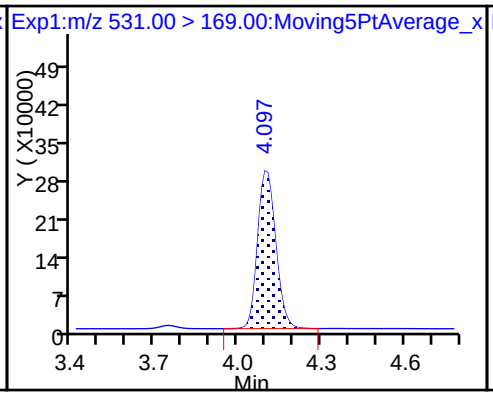
37 Perfluorododecanoic acid



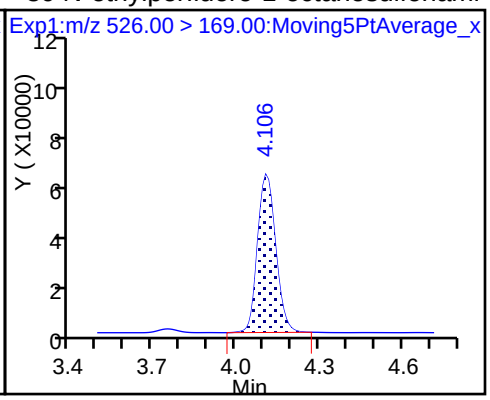
37 Perfluorododecanoic acid



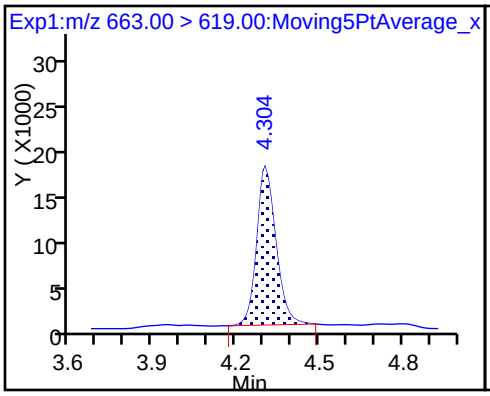
D 38 d-N-EtFOSA-M



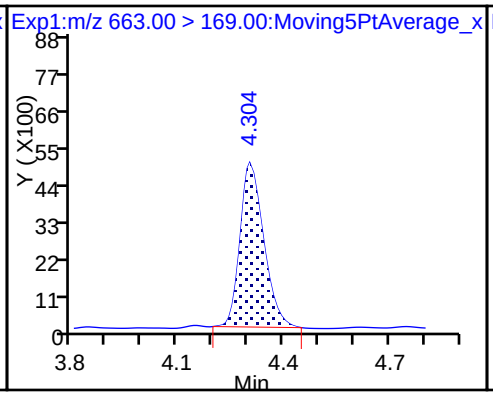
39 N-ethylperfluoro-1-octanesulfonami



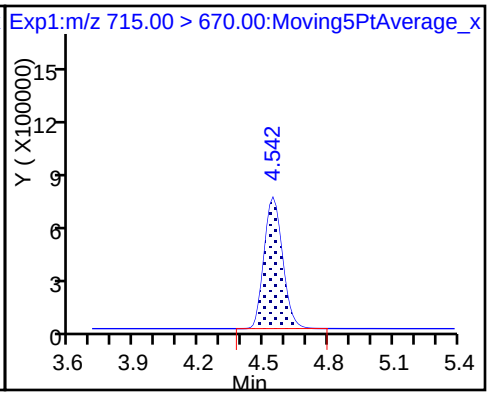
41 Perfluorotridecanoic acid



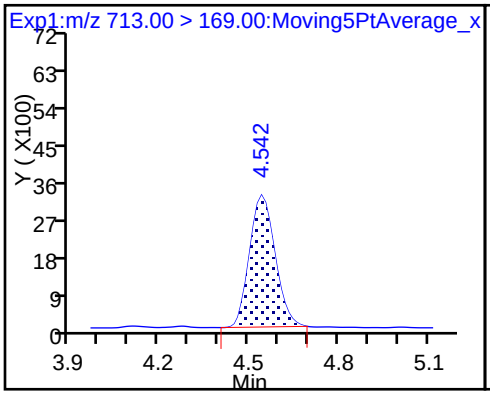
41 Perfluorotridecanoic acid



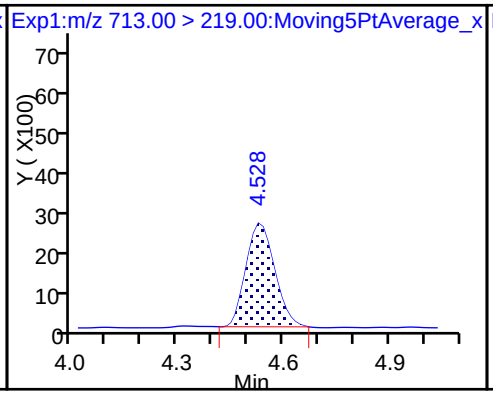
D 43 13C2-PFTeDA



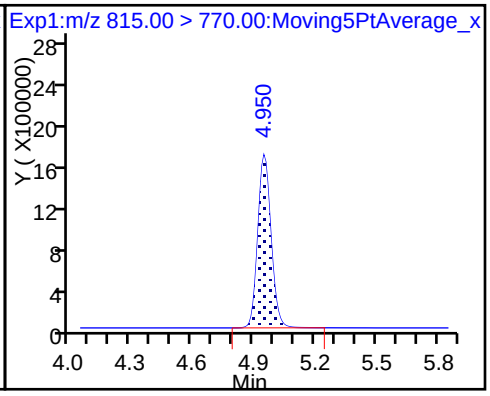
42 Perfluorotetradecanoic acid



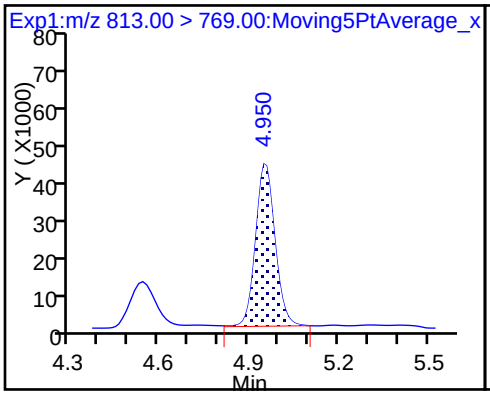
42 Perfluorotetradecanoic acid



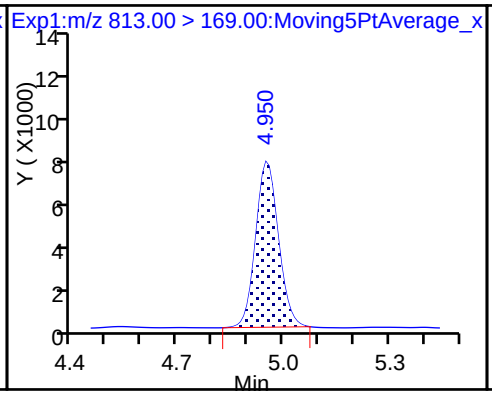
D 44 13C2-PFHxDA



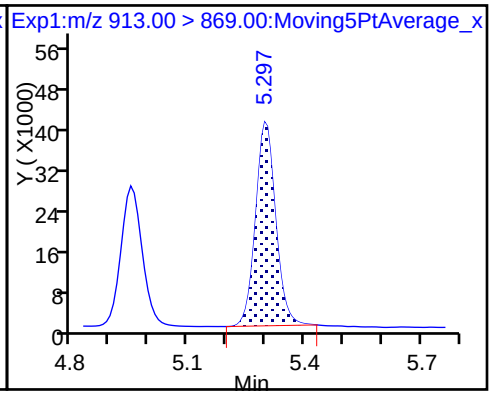
45 Perfluorohexadecanoic acid



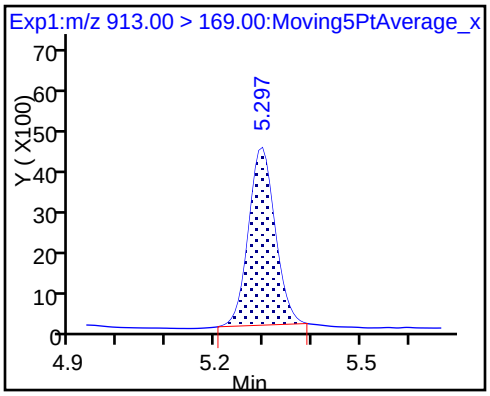
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-196712/1 Calibration Date: 11/24/2017 14:56

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.24LLA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9328		2.55	2.50	1.9	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.100		2.44	2.50	-2.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	75.74		2.25	2.21	1.9	25.0
4:2 FTS	AveID	0.7456	0.6608		2.07	2.34	-11.4	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	0.9863		2.46	2.50	-1.4	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	1.044		2.55	2.50	1.9	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	1.052		2.19	2.28	-3.9	25.0
6:2FTS	AveID	1.605	1.632		2.41	2.37	1.7	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.062		2.52	2.50	0.6	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.375		2.50	2.38	5.0	25.0
Perfluorononanoic acid (PFNA)	AveID	0.997	1.000		2.51	2.50	0.3	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.086		2.40	2.32	3.5	25.0
8:2FTS	AveID	1.214	1.198		2.36	2.40	-1.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	1.042		2.71	2.50	8.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	0.9503		2.45	2.50	-2.2	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	1.088		2.59	2.50	3.8	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.6502		2.59	2.41	7.6	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9480		2.47	2.50	-1.1	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.8873		2.45	2.50	-2.0	25.0
MeFOSA	AveID	0.9814	1.016		2.59	2.50	3.6	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	0.996		2.54	2.50	1.6	25.0
N-EtFOSA-M	AveID	1.002	1.081		2.70	2.50	7.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.093		2.23	2.50	-10.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2352		2.40	2.50	-4.1	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9081		2.54	2.50	1.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	1.053		2.65	2.50	5.8	25.0
13C4 PFBA	Ave	1.301	1.220		2.34	2.50	-6.3	50.0
13C5 PFPeA	Ave	0.8240	0.7882		2.39	2.50	-4.3	50.0
13C3-PFBS	Ave	0.0180	0.0181		2.34	2.33	0.7	50.0
13C2 PFHxA	Ave	0.9302	0.8939		2.40	2.50	-3.9	50.0
13C4-PFHpA	Ave	0.8986	0.8640		2.40	2.50	-3.8	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-196712/1 Calibration Date: 11/24/2017 14:56

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.24LLA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.066		2.38	2.37	0.5	50.0
M2-6:2FTS	Ave	0.4500	0.4686		2.47	2.38	4.1	50.0
13C4 PFOA	Ave	1.030	0.9815		2.38	2.50	-4.7	50.0
13C4 PFOS	Ave	0.7080	0.6761		2.28	2.39	-4.5	50.0
13C5 PFNA	Ave	0.7570	0.7209		2.38	2.50	-4.8	50.0
13C8 FOSA	Ave	0.9121	0.8576		2.35	2.50	-6.0	50.0
M2-8:2FTS	Ave	0.2391	0.2186		2.19	2.40	-8.6	50.0
13C2 PFDA	Ave	0.6386	0.6222		2.44	2.50	-2.6	50.0
d3-NMeFOSAA	Ave	0.3429	0.2876		2.10	2.50	-16.1	50.0
d5-NEtFOSAA	Ave	0.3296	0.3130		2.37	2.50	-5.0	50.0
13C2 PFUnA	Ave	0.5100	0.4779		2.34	2.50	-6.3	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2384		2.25	2.50	-9.9	50.0
13C2 PFDoA	Ave	0.5923	0.5582		2.36	2.50	-5.8	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2191		2.23	2.50	-10.8	50.0
13C2-PFTeDA	Ave	0.7282	0.6562		2.25	2.50	-9.9	50.0
13C2-PFHxDA	Ave	1.288	1.170		2.27	2.50	-9.2	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50938.b\2017.11.24LLA_010.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 24-Nov-2017 14:56:46 ALS Bottle#: 14 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub18

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50938.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 27-Nov-2017 15:12:18 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 27-Nov-2017 15:11:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.491	1.485	0.006	0.552	7348475	2.34		93.7	63195	
2 Perfluorobutyric acid										
212.90 > 169.00	1.491	1.485	0.006	1.000	6854964	2.55		102	1502	
D 3 13C5-PFPeA										
267.90 > 223.00	1.755	1.755	0.0	0.650	4748482	2.39		95.7	66987	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.755	0.0	1.000	5221944	2.44		97.5	3812	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.788	0.008	0.665	101591	2.34		101	2838	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.796	0.0	1.000	7313955	2.25		102	4537	
298.90 > 99.00	1.797	1.796	0.0	1.000	3016673		2.42(1.74-3.24)		4162	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.994	1.993	0.001	1.000	1742181	2.07		88.6	56159	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.035	2.035	0.0	1.005	5311004	2.46		98.6	9880	
313.00 > 119.00	2.025	2.035	-0.010	1.000	488299		10.88(7.05-13.09)		6486	
D 7 13C2 PFHxA										
315.00 > 270.00	2.025	2.035	-0.010	0.750	5384940	2.40		96.1	57514	
D 9 13C4-PFHpA										
367.00 > 322.00	2.355	2.354	0.001	0.872	5204687	2.40		96.2	44483	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.355	2.354	0.001	1.000	5434960	2.55		102	9497	
363.00 > 169.00	2.355	2.354	0.001	1.000	2120680		2.56(1.59-2.95)		10850	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.366	2.375	-0.009	1.000	6146936	2.19		96.1	13208	
399.00 > 99.00	2.366	2.375	-0.009	1.000	1962517		3.13(2.10-3.89)		7256	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.366	2.375	-0.009	0.876	6073409	2.38		100	44541	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.693	2.693	0.0	1.003	4367490	2.41		102	97395	
D 12 M2-6:2FTS										
429.00 > 81.00	2.686	2.693	-0.007	0.995	2681742	2.47		104	65206	
D 14 13C4 PFOA										
417.00 > 372.00	2.701	2.707	-0.006	1.000	5912944	2.38		95.3	40249	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.701	2.707	-0.006	1.000	6277386	2.52		101	2636	
413.00 > 169.00	2.701	2.707	-0.006	1.000	3303997		1.90(1.18-2.19)		13014	
* 62 13C2-PFOA										
415.00 > 370.00	2.701	2.707	-0.006		6024139	2.50			60649	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.708	2.714	-0.006	1.000	5331465	2.50		105	30192	
449.00 > 99.00	2.708	2.714	-0.006	1.000	1386526		3.85(2.72-5.05)		11016	
D 18 13C4 PFOS										
503.00 > 80.00	3.068	3.074	-0.006	1.136	3893779	2.28		95.5	19066	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.068	3.074	-0.006	1.000	4106156	2.40		104	815	
499.00 > 99.00	3.068	3.074	-0.006	1.000	868308		4.73(3.24-6.01)		1105	
D 19 13C5 PFNA										
468.00 > 423.00	3.068	3.074	-0.006	1.136	4342829	2.38		95.2	28959	
20 Perfluorononanoic acid										
463.00 > 419.00	3.068	3.082	-0.014	1.000	4342699	2.51		100	7404	
463.00 > 169.00	3.068	3.082	-0.014	1.000	1032223		4.21(2.65-4.93)		16214	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.421	3.411	0.010	1.000	5385201	2.71		109	35101	
D 21 13C8 FOSA										
506.00 > 78.00	3.421	3.411	0.010	1.267	5166443	2.35		94.0	31877	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.421	3.426	-0.005	1.000	1511330	2.36		98.6	23307	
D 26 M2-8:2FTS										
529.00 > 81.00	3.421	3.426	-0.005	1.267	1261631	2.19		91.4	16504	
D 23 13C2 PFDA										
515.00 > 470.00	3.429	3.434	-0.005	1.270	3748333	2.44		97.4	30047	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.429	3.441	-0.012	1.000	3562109	2.45		97.8	14109	
513.00 > 169.00	3.429	3.441	-0.012	1.000	629249		5.66(3.31-6.15)		2366	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.589	3.595	-0.006	1.329	1732572	2.10		83.9	11735	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.589	3.603	-0.014	1.000	1885213	2.59		104	7148	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.746	3.752	-0.006	1.000	2553017	2.59		108	26298	
599.00 > 99.00	3.746	3.752	-0.006	1.000	848994		3.01(1.94-3.60)		17546	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.755	3.760	-0.005	1.390	1885436	2.37		95.0	9594	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFUnA										
565.00 > 520.00	3.764	3.769	-0.005	1.394	2879188	2.34		93.7	40109	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.764	3.769	-0.005	1.002	1787333	2.47		98.9	16243	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.764	3.769	-0.005	1.000	2554687	2.45		98.0	12615	
563.00 > 169.00	3.764	3.769	-0.005	1.000	562734		4.54(0.00-0.00)		17964	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.922	3.907	0.015	1.452	1435953	2.25		90.1	3558	
35 MeFOSA										
512.00 > 169.00	3.932	3.907	0.025	1.003	1459523	2.59		104	3643	
D 36 13C2 PFDoA										
615.00 > 570.00	4.050	4.062	-0.012	1.500	3362664	2.36		94.2	51866	
37 Perfluorododecanoic acid										R
613.00 > 569.00	4.058	4.062	-0.004	1.002	3348564	2.54		102	18736	R
613.00 > 169.00	4.058	4.062	-0.004	1.002	796602		4.20(2.19-4.07)		20355	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.112	4.097	0.015	1.523	1319759	2.23		89.2	2291	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.122	4.097	0.025	1.002	1426198	2.70		108	2435	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.312	4.327	-0.015	1.000	3675789	2.23		89.3	11393	
663.00 > 169.00	4.312	4.327	-0.015	1.000	1170395		3.14(1.76-3.26)		29544	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.553	4.570	-0.017	1.686	3953050	2.25		90.1	31955	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.553	4.570	-0.017	1.000	929597	2.40		95.9	19772	
713.00 > 219.00	4.539	4.570	-0.031	0.997	685569		1.36(1.00-1.85)		16355	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.966	4.986	-0.020	1.839	7048491	2.27		90.8	21301	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.966	4.986	-0.020	1.000	6400637	2.54		101	3737	R
813.00 > 169.00	4.966	4.986	-0.020	1.000	1101611		5.81(2.50-4.65)		9501	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.309	5.347	-0.038	1.000	7420236	2.65		106	1755	
913.00 > 169.00	5.309	5.347	-0.038	1.000	888605		8.35(0.00-0.00)		2540	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Reagents:

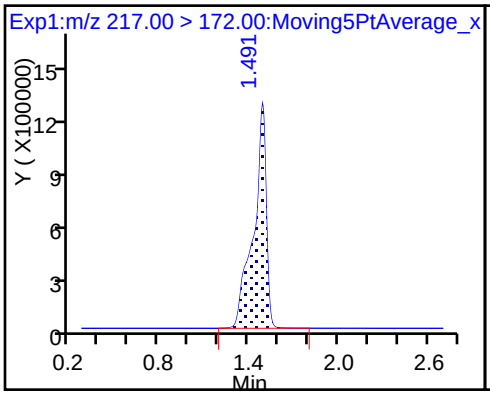
LCPFC_LL5_00002 Amount Added: 1.00 Units: mL

Report Date: 27-Nov-2017 15:12:19 Chrom Revision: 2.2 16-Aug-2017 16:24:46

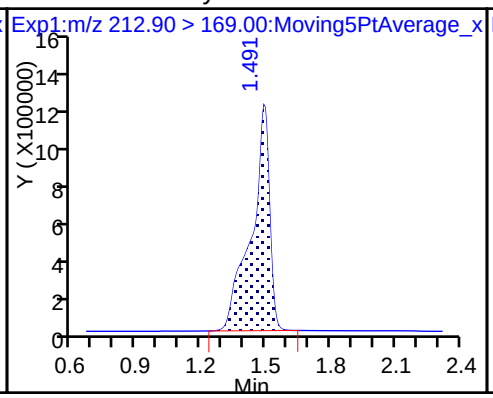
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50938.b\2017.11.24LLA_010.d
Injection Date: 24-Nov-2017 14:56:46 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL

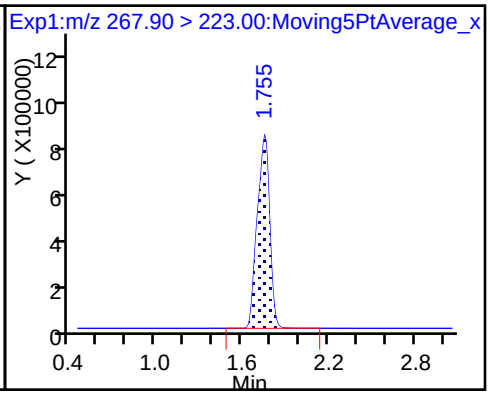
D 1 13C4 PFBA



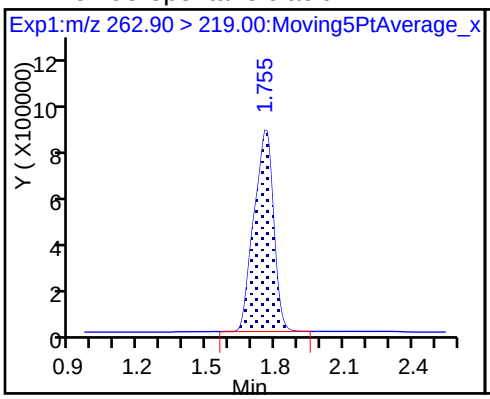
2 Perfluorobutyric acid



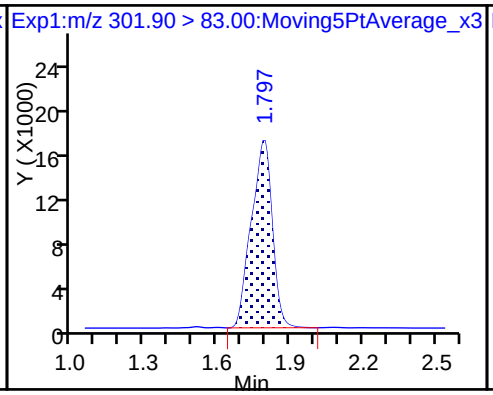
D 3 13C5-PFPeA



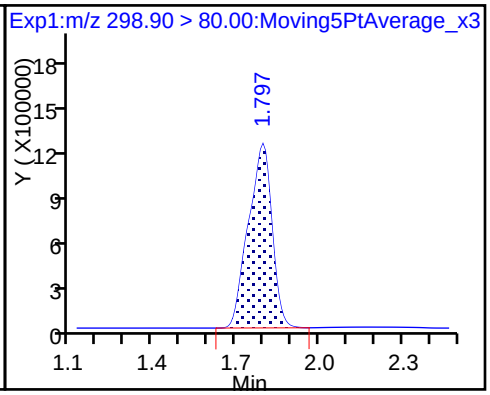
4 Perfluoropentanoic acid



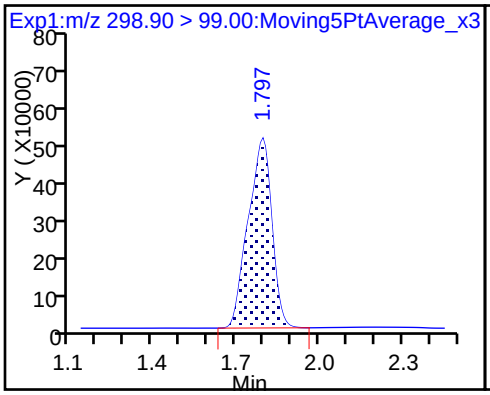
D 47 13C3-PFBS



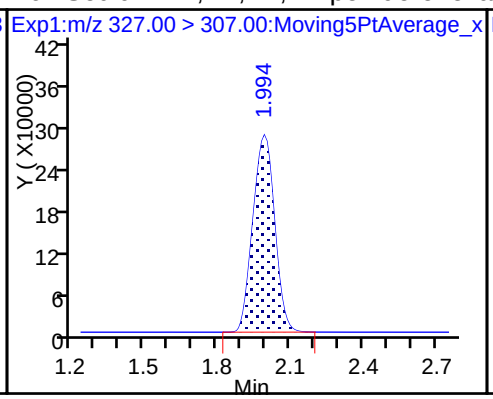
5 Perfluorobutanesulfonic acid



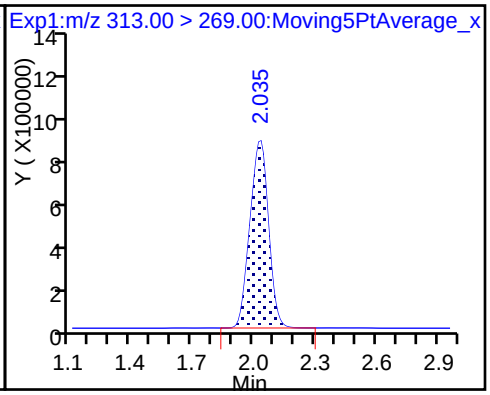
5 Perfluorobutanesulfonic acid



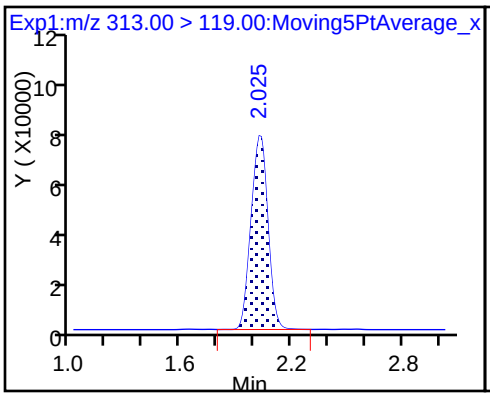
61 Sodium 1H,1H,2H,2H-perfluorohexane



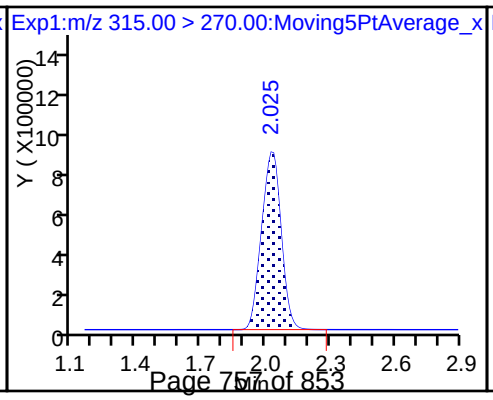
6 Perfluorohexanoic acid



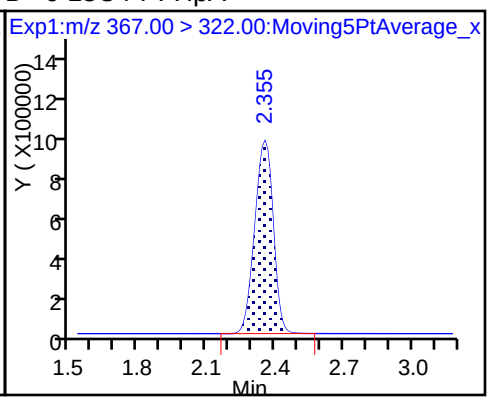
6 Perfluorohexanoic acid



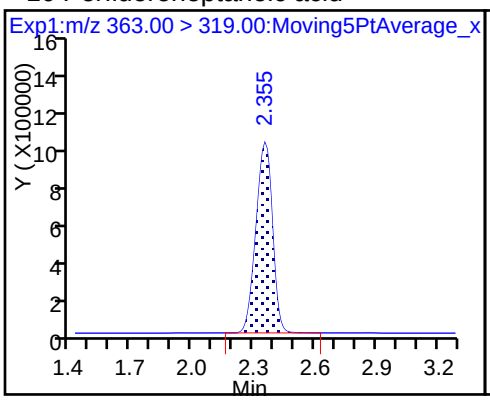
D 7 13C2 PFHxA



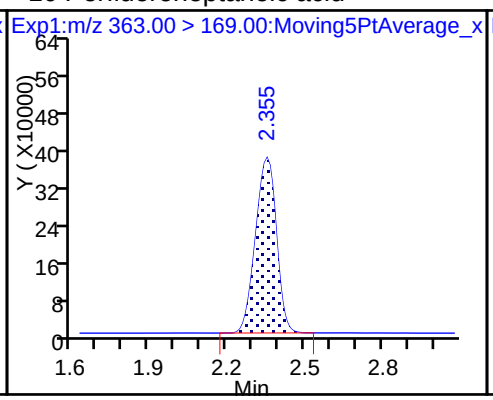
D 9 13C4-PFHpA



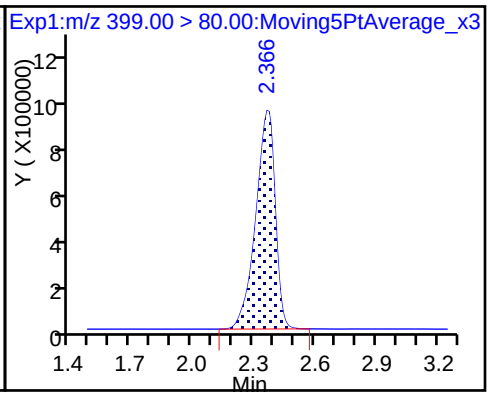
10 Perfluoroheptanoic acid



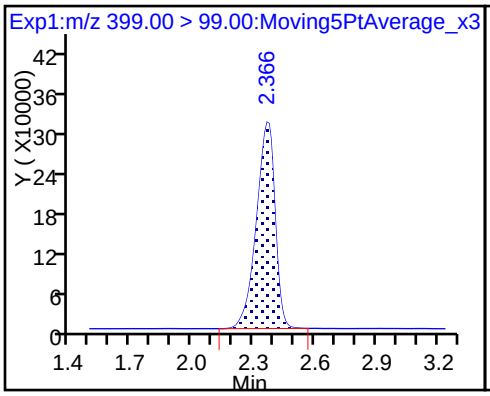
10 Perfluoroheptanoic acid



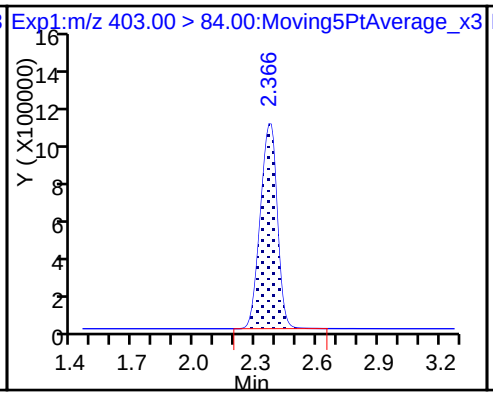
8 Perfluorohexanesulfonic acid



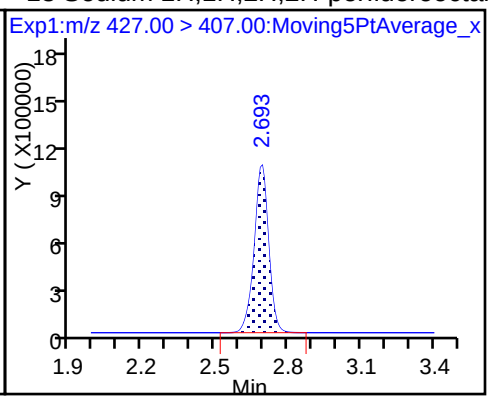
8 Perfluorohexanesulfonic acid



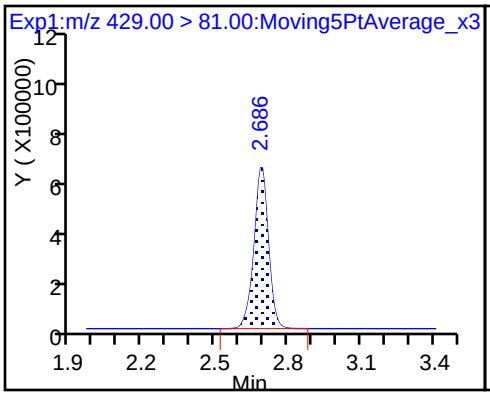
D 11 18O2 PFHxS



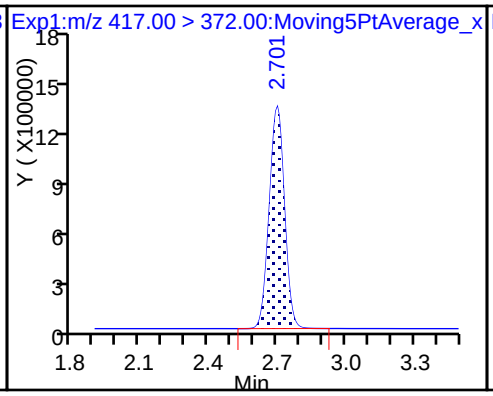
13 Sodium 1H,1H,2H,2H-perfluorooctane



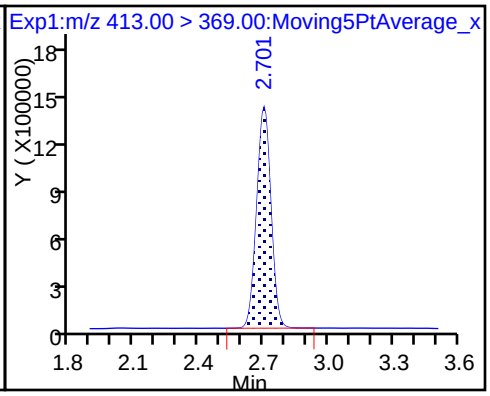
D 12 M2-6:2FTS



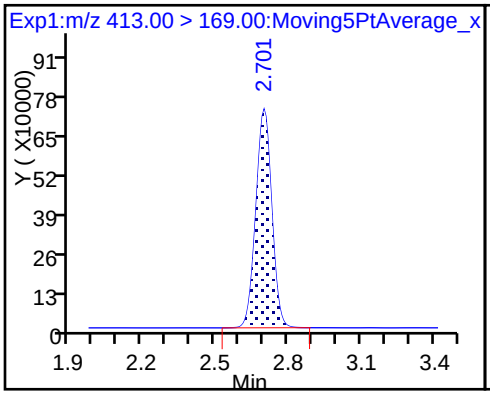
D 14 13C4 PFOA



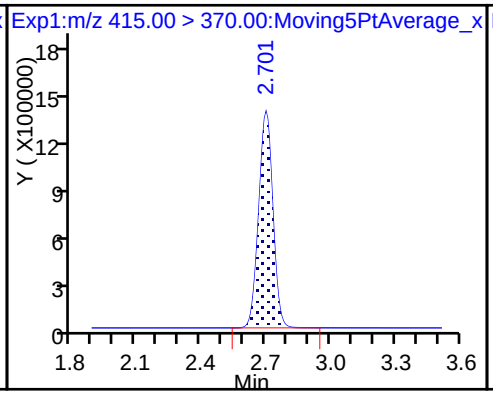
15 Perfluorooctanoic acid



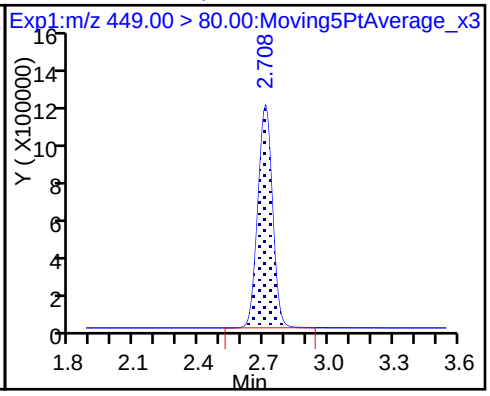
15 Perfluorooctanoic acid



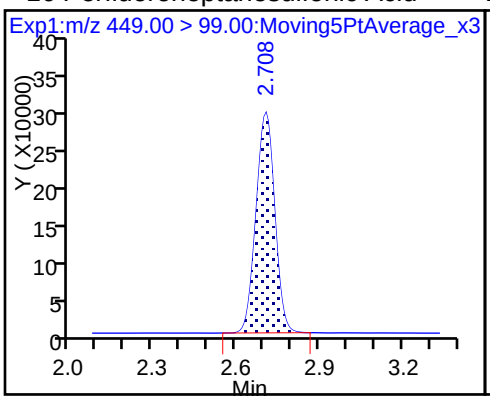
* 62 13C2-PFOA



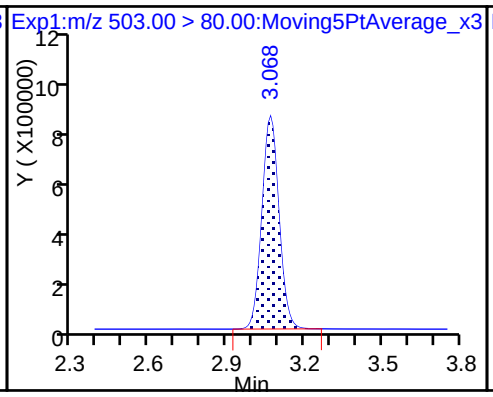
16 Perfluoroheptanesulfonic Acid



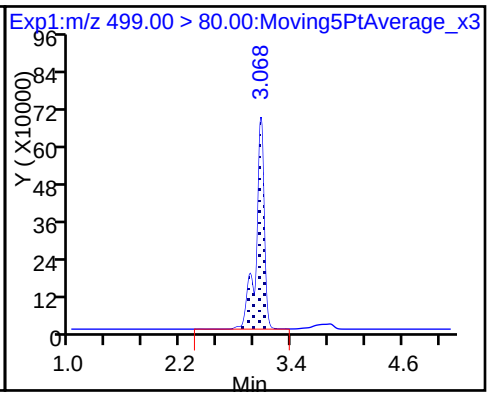
16 Perfluoroheptanesulfonic Acid



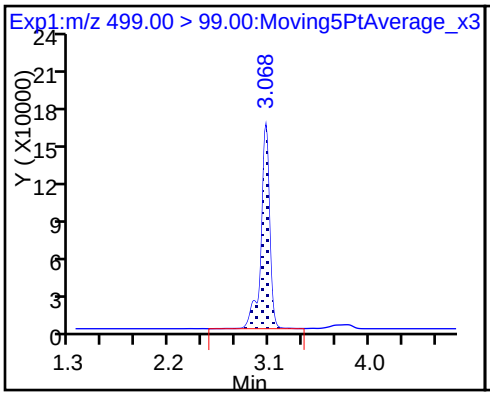
D 18 13C4 PFOS



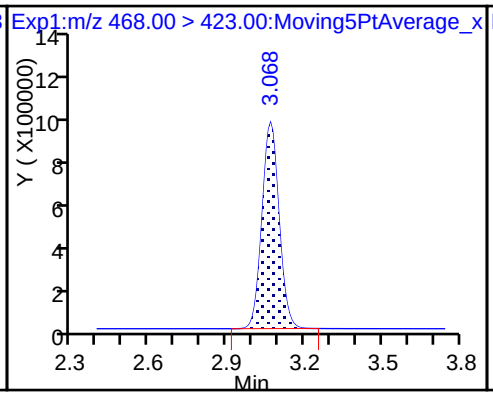
17 Perfluorooctane sulfonic acid



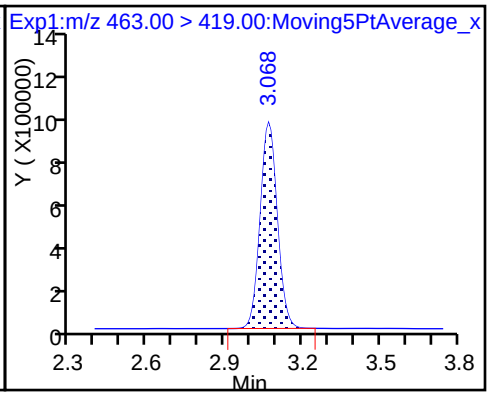
17 Perfluorooctane sulfonic acid



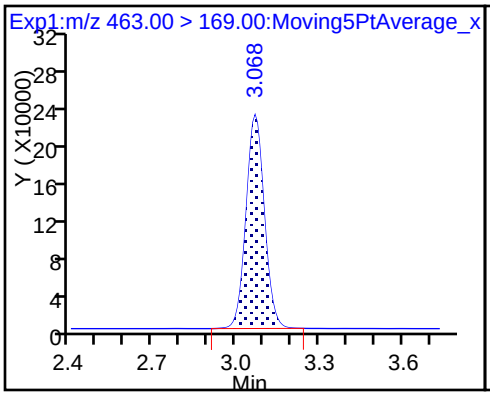
D 19 13C5 PFNA



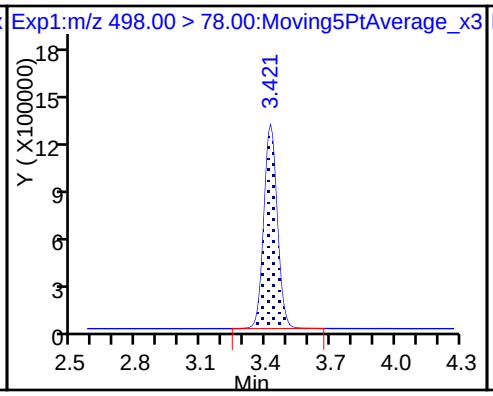
20 Perfluorononanoic acid



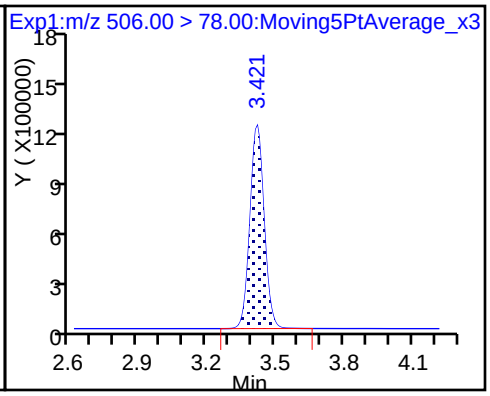
20 Perfluorononanoic acid



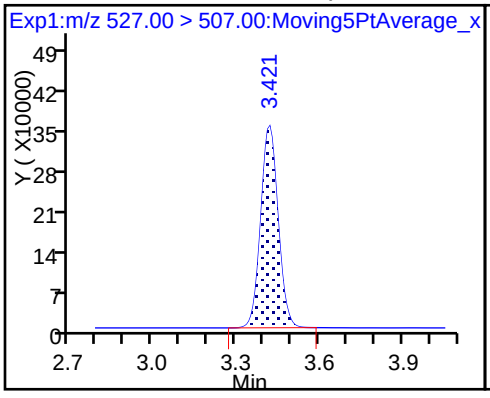
22 Perfluorooctane Sulfonamide



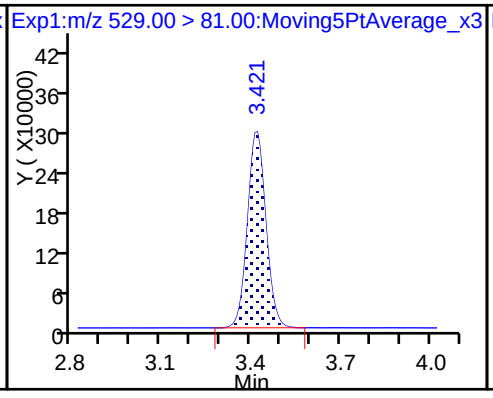
D 21 13C8 FOSA



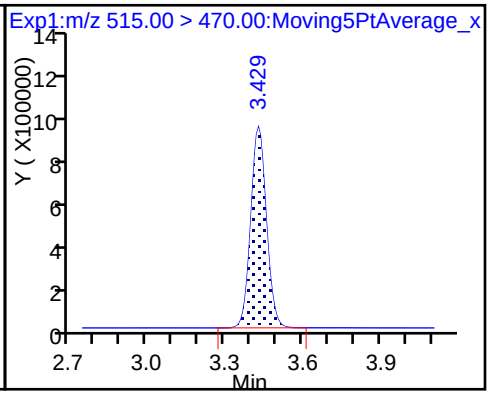
25 Sodium 1H,1H,2H,2H-perfluorodecane



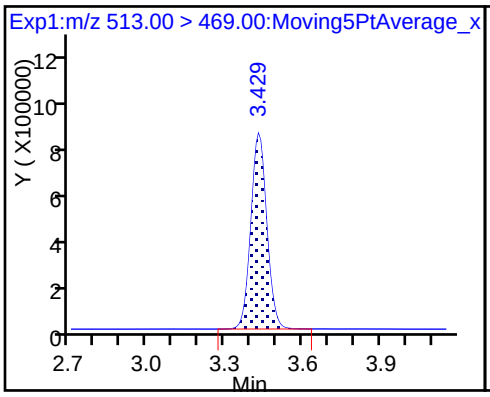
D 26 M2-8:2FTS



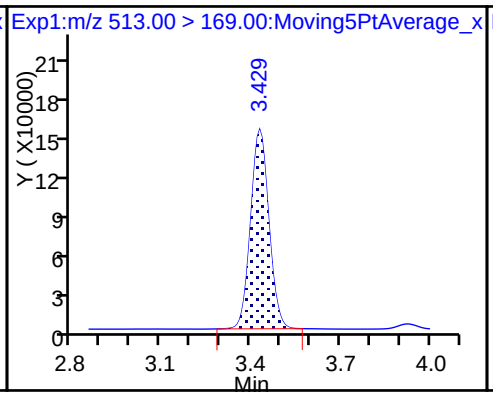
D 23 13C2 PFDA



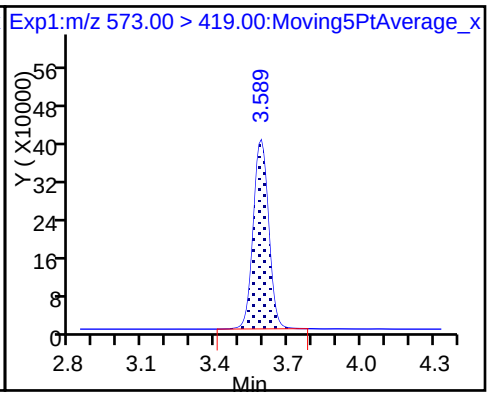
24 Perfluorodecanoic acid



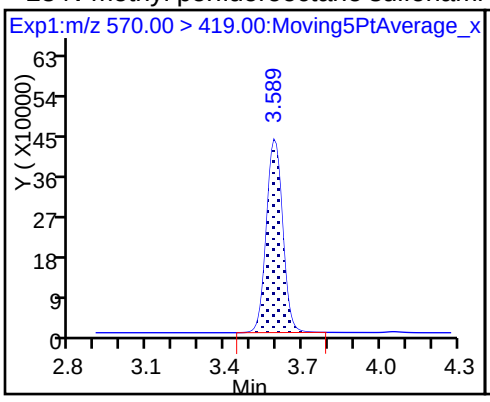
24 Perfluorodecanoic acid



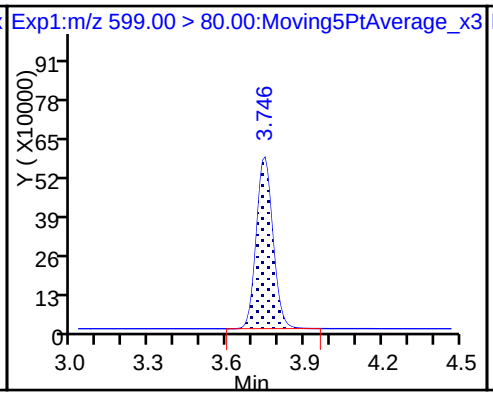
D 27 d3-NMeFOSAA



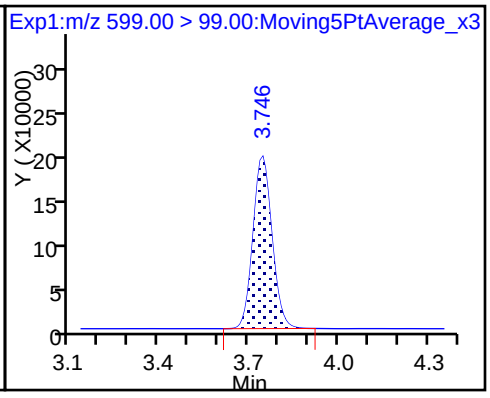
28 N-methyl perfluorooctane sulfonami



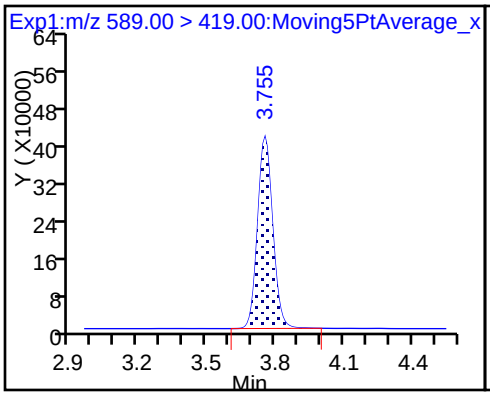
29 Perfluorodecane Sulfonic acid



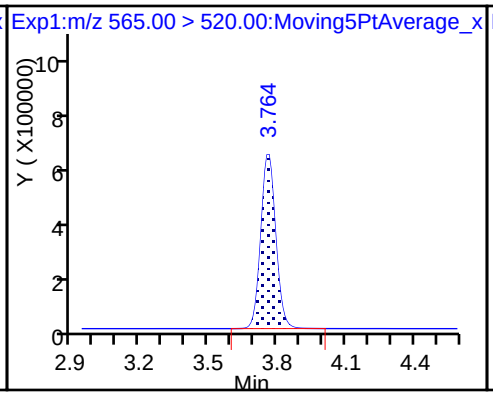
29 Perfluorodecane Sulfonic acid



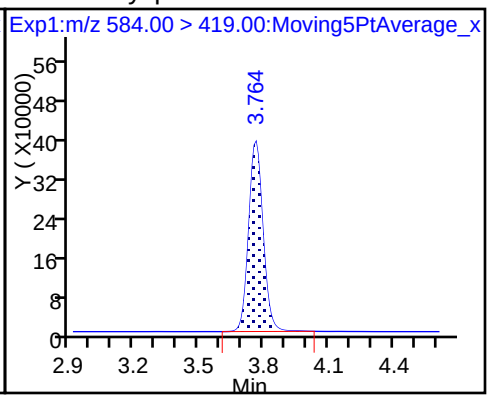
D 32 d5-NEtFOSAA



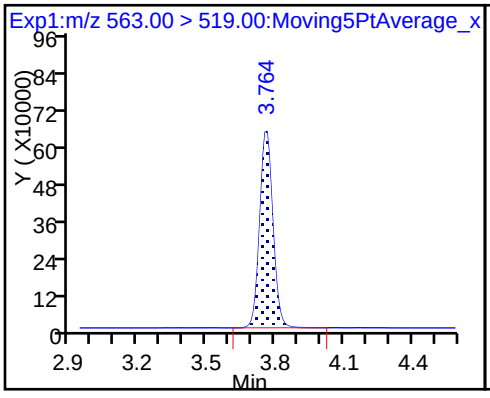
D 30 13C2 PFUnA



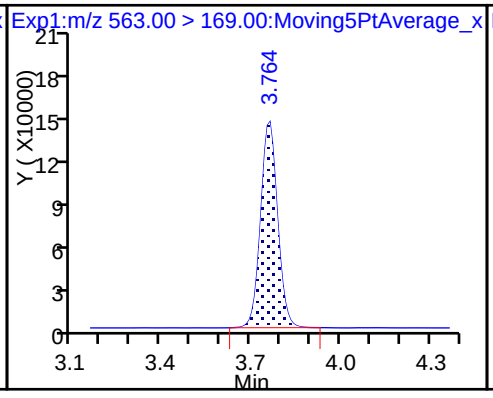
33 N-ethyl perfluorooctane sulfonamid



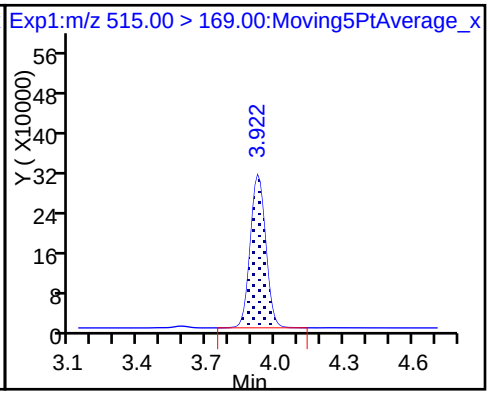
31 Perfluoroundecanoic acid



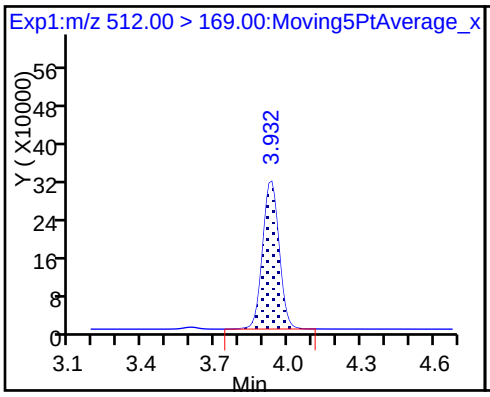
31 Perfluoroundecanoic acid



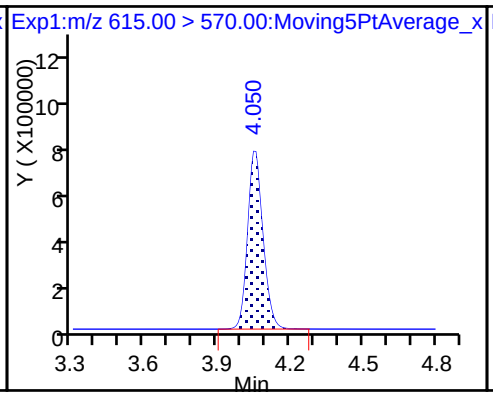
D 34 d-N-MeFOSA-M



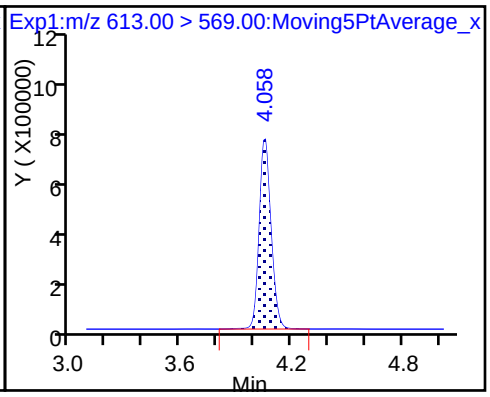
35 MeFOSA



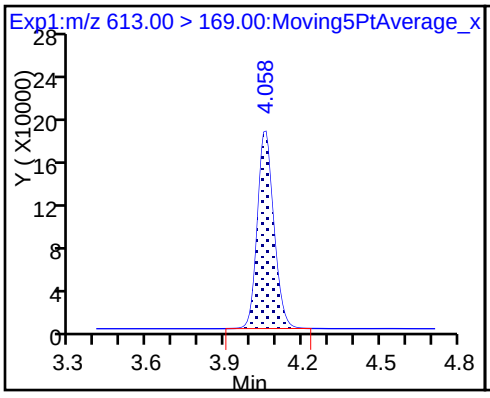
D 36 13C2 PFDoA



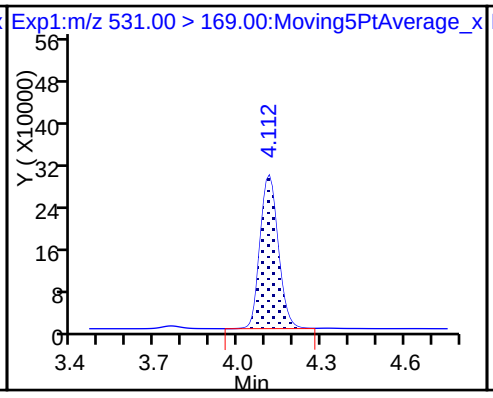
37 Perfluorododecanoic acid



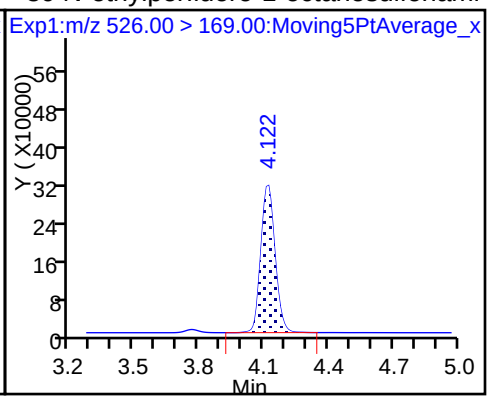
37 Perfluorododecanoic acid



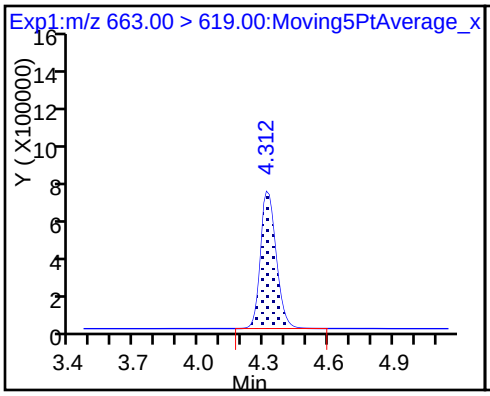
D 38 d-N-EtFOSA-M



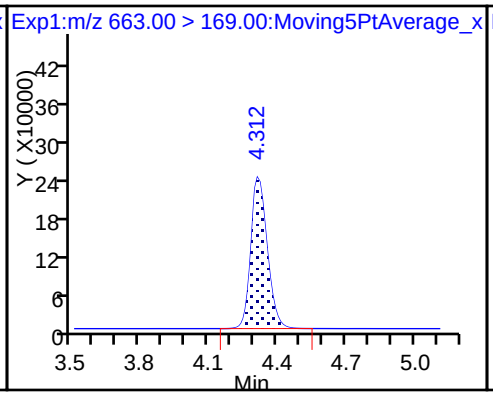
39 N-ethylperfluoro-1-octanesulfonami



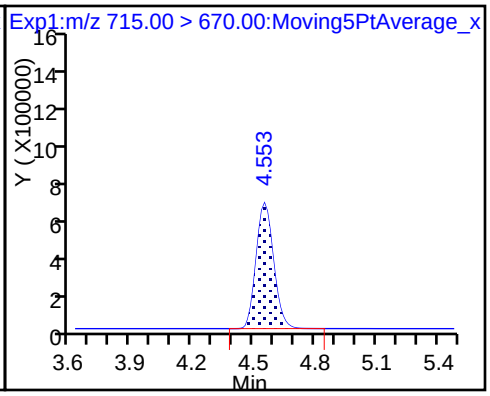
41 Perfluorotridecanoic acid



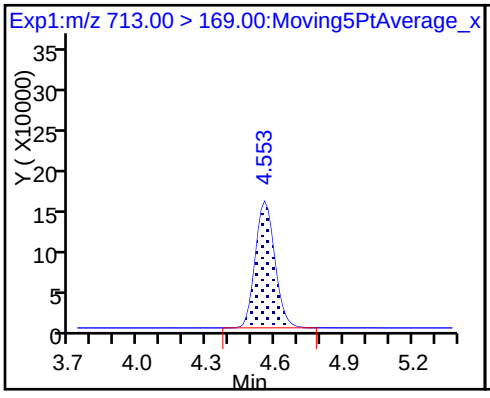
41 Perfluorotridecanoic acid



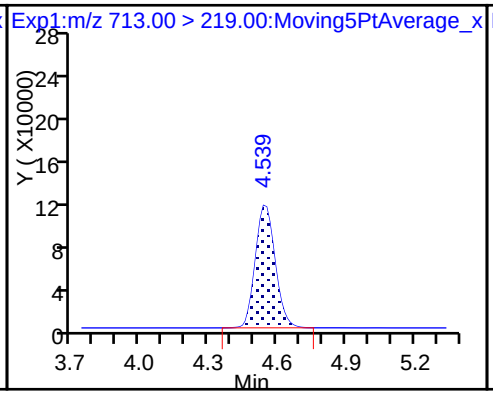
D 43 13C2-PFTeDA



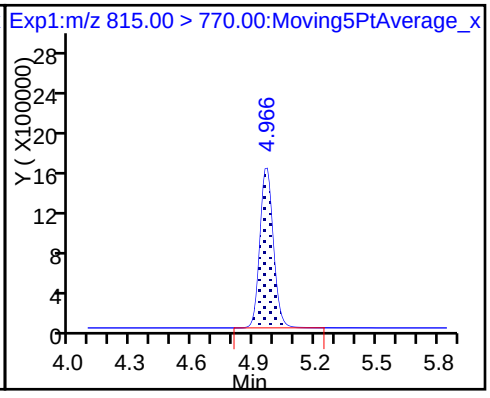
42 Perfluorotetradecanoic acid



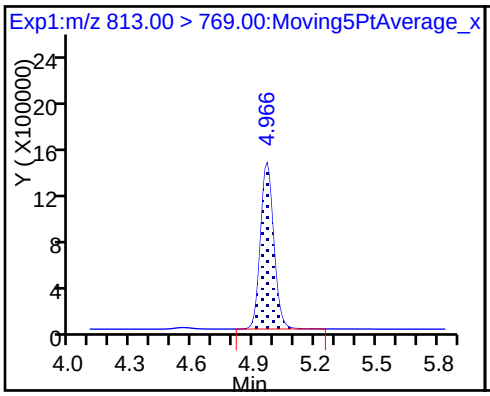
42 Perfluorotetradecanoic acid



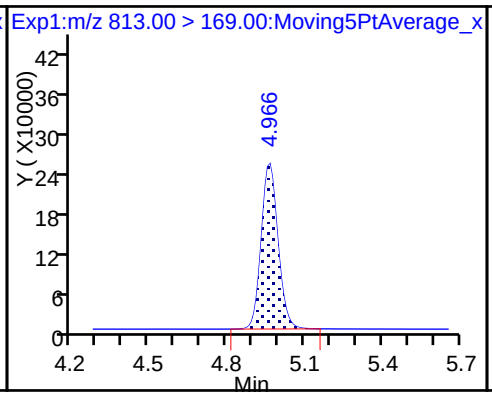
D 44 13C2-PFHxDA



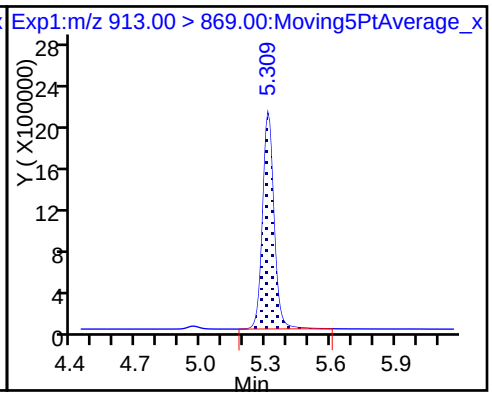
45 Perfluorohexadecanoic acid



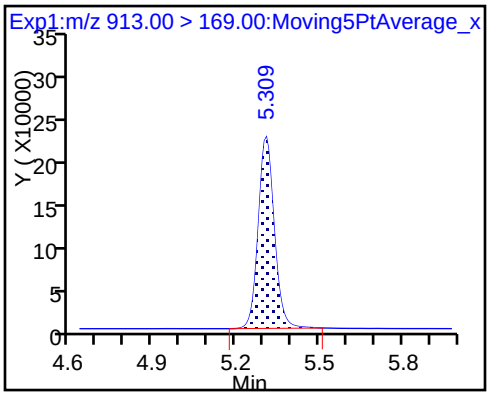
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-196712/3 Calibration Date: 11/24/2017 15:12

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.24LLA_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9323		1.02	1.00	1.8	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.150		1.02	1.00	2.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	75.13		0.894	0.884	1.1	25.0
4:2 FTS	AveID	0.7456	0.6980		0.874	0.934	-6.4	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	0.9875		0.987	1.00	-1.3	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	1.011		0.986	1.00	-1.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	1.019		0.847	0.910	-7.0	25.0
6:2FTS	AveID	1.605	1.713		1.01	0.948	6.7	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.057		1.00	1.00	0.2	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.326		0.964	0.952	1.3	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.051		0.930	0.928	0.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.997	1.001		1.00	1.00	0.4	25.0
8:2FTS	AveID	1.214	1.275		1.01	0.958	5.0	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	0.9818		1.02	1.00	2.2	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	0.9469		0.975	1.00	-2.5	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	1.053		1.00	1.00	0.5	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.6189		0.987	0.964	2.4	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9789		1.02	1.00	2.1	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.8810		0.973	1.00	-2.7	25.0
MeFOSA	AveID	0.9814	0.9632		0.981	1.00	-1.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	1.027		1.05	1.00	4.8	25.0
N-EtFOSA-M	AveID	1.002	1.068		1.07	1.00	6.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.127		0.920	1.00	-8.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2379		0.970	1.00	-3.0	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8994		0.992	1.00	-0.8	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	1.025		1.03	1.00	3.0	25.0
13C4 PFBA	Ave	1.301	1.272		2.44	2.50	-2.2	50.0
13C5 PFPeA	Ave	0.8240	0.8063		2.45	2.50	-2.2	50.0
13C3-PFBS	Ave	0.0180	0.0187		2.42	2.33	3.9	50.0
13C2 PFHxA	Ave	0.9302	0.9296		2.50	2.50	-0.0	50.0
13C4-PFHpA	Ave	0.8986	0.8948		2.49	2.50	-0.4	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-196712/3 Calibration Date: 11/24/2017 15:12

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.24LLA_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.130		2.52	2.37	6.6	50.0
M2-6:2FTS	Ave	0.4500	0.5062		2.67	2.38	12.5	50.0
13C4 PFOA	Ave	1.030	1.020		2.48	2.50	-1.0	50.0
13C4 PFOS	Ave	0.7080	0.7363		2.49	2.39	4.0	50.0
13C5 PFNA	Ave	0.7570	0.7688		2.54	2.50	1.6	50.0
13C8 FOSA	Ave	0.9121	0.9259		2.54	2.50	1.5	50.0
M2-8:2FTS	Ave	0.2391	0.2209		2.21	2.40	-7.6	50.0
13C2 PFDA	Ave	0.6386	0.6487		2.54	2.50	1.6	50.0
d3-NMeFOSAA	Ave	0.3429	0.3084		2.25	2.50	-10.1	50.0
d5-NEtFOSAA	Ave	0.3296	0.3324		2.52	2.50	0.9	50.0
13C2 PFUnA	Ave	0.5100	0.4949		2.43	2.50	-3.0	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2487		2.35	2.50	-6.0	50.0
13C2 PFDoA	Ave	0.5923	0.5797		2.45	2.50	-2.1	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2256		2.30	2.50	-8.2	50.0
13C2-PFTeDA	Ave	0.7282	0.6885		2.36	2.50	-5.4	50.0
13C2-PFHxDA	Ave	1.288	1.257		2.44	2.50	-2.5	50.0

FORM VII 537 (modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50938.b\2017.11.24LLA_012.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 24-Nov-2017 15:12:30 ALS Bottle#: 13 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub18

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50938.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 27-Nov-2017 15:13:33 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 27-Nov-2017 15:13:26

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.491	1.485	0.006	0.552	7616295	2.44		97.8	87567	
2 Perfluorobutyric acid										
212.90 > 169.00	1.491	1.485	0.006	1.000	2840137	1.02		102	524	
D 3 13C5-PFPeA										
267.90 > 223.00	1.755	1.755	0.0	0.650	4826130	2.45		97.8	54172	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.755	0.0	1.000	2220218	1.02		102	1836	
D 47 13C3-PFBS										
301.90 > 83.00	1.788	1.788	0.0	0.662	104126	2.42		104	2406	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.796	1.796	0.0	1.005	2974287	0.8936		101	1863	
298.90 > 99.00	1.796	1.796	0.0	1.005	1269925		2.34(1.74-3.24)		1716	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.993	1.993	0.0	1.000	790105	0.8744		93.6	25886	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.035	2.035	0.0	1.000	2197744	0.9870		98.7	4350	
313.00 > 119.00	2.035	2.035	0.0	1.000	208969		10.52(7.05-13.09)		2663	
D 7 13C2 PFHxA										
315.00 > 270.00	2.035	2.035	0.0	0.754	5564037	2.50		99.9	63997	
D 9 13C4-PFHpA										
367.00 > 322.00	2.355	2.354	0.001	0.872	5356302	2.49		99.6	41683	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.355	2.354	0.001	1.000	2166794	0.9865		98.6	3082	
363.00 > 169.00	2.355	2.354	0.001	1.000	873563		2.48(1.59-2.95)		5021	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.375	2.375	0.0	1.000	2508988	0.8467		93.0	7034	
399.00 > 99.00	2.375	2.375	0.0	1.000	821116		3.06(2.10-3.89)		3773	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.375	2.375	0.0	0.880	6398789	2.52		107	29068	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.693	2.693	0.0	1.000	1967475	1.01		107	48136	
D 12 M2-6:2FTS										
429.00 > 81.00	2.693	2.693	0.0	0.997	2878218	2.67		112	58677	
D 14 13C4 PFOA										
417.00 > 372.00	2.701	2.707	-0.006	1.000	6106834	2.48		99.0	51743	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.701	2.707	-0.006	1.000	2582791	1.00		100	1049	
413.00 > 169.00	2.701	2.707	-0.006	1.000	1324688		1.95(1.18-2.19)		6289	
* 62 13C2-PFOA										
415.00 > 370.00	2.701	2.707	-0.006		5985761	2.50			48408	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.708	2.714	-0.006	1.000	2225715	0.9645		101	15949	
449.00 > 99.00	2.708	2.714	-0.006	1.000	580599		3.83(2.72-5.05)		8975	
D 18 13C4 PFOS										
503.00 > 80.00	3.068	3.074	-0.006	1.136	4213487	2.49		104	25085	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.068	3.074	-0.006	1.000	1719838	0.9297		100	368	
499.00 > 99.00	3.068	3.074	-0.006	1.000	365635		4.70(3.24-6.01)		23208	M
D 19 13C5 PFNA										
468.00 > 423.00	3.068	3.074	-0.006	1.136	4601757	2.54		102	32621	
20 Perfluorononanoic acid										
463.00 > 419.00	3.076	3.082	-0.006	1.003	1842480	1.00		100	4063	
463.00 > 169.00	3.068	3.082	-0.014	1.000	433412		4.25(2.65-4.93)		10409	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.421	3.411	0.010	1.000	2176469	1.02		102	21081	
D 21 13C8 FOSA										
506.00 > 78.00	3.421	3.411	0.010	1.267	5542270	2.54		102	28270	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.421	3.426	-0.005	1.000	646140	1.01		105	19093	
D 26 M2-8:2FTS										
529.00 > 81.00	3.421	3.426	-0.005	1.267	1266461	2.21		92.4	15561	
D 23 13C2 PFDA										
515.00 > 470.00	3.429	3.434	-0.005	1.270	3883002	2.54		102	40428	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.436	3.441	-0.005	1.002	1470785	0.9750		97.5	6792	
513.00 > 169.00	3.436	3.441	-0.005	1.002	258167		5.70(3.31-6.15)		2167	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.589	3.595	-0.006	1.329	1846115	2.25		89.9	16513	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.597	3.603	-0.006	1.002	777939	1.00		100	4187	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.746	3.752	-0.006	1.000	1051777	0.9873		102	18291	
599.00 > 99.00	3.746	3.752	-0.006	1.000	361274		2.91(1.94-3.60)		8259	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.755	3.760	-0.005	1.390	1989752	2.52		101	10058	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFUnA										
565.00 > 520.00	3.763	3.769	-0.006	1.394	2962256	2.43		97.0	36990	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.763	3.769	-0.006	1.002	779135	1.02		102	7816	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.763	3.769	-0.006	1.000	1043925	0.9733		97.3	4658	
563.00 > 169.00	3.763	3.769	-0.006	1.000	237927		4.39(0.00-0.00)		7627	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.922	3.907	0.015	1.452	1488672	2.35		94.0	3229	
35 MeFOSA										
512.00 > 169.00	3.932	3.907	0.025	1.003	573547	0.9814		98.1	3158	
D 36 13C2 PFDoA										
615.00 > 570.00	4.057	4.062	-0.005	1.502	3470034	2.45		97.9	40366	
37 Perfluorododecanoic acid										R
613.00 > 569.00	4.057	4.062	-0.005	1.000	1425198	1.05		105	4122	R
613.00 > 169.00	4.057	4.062	-0.005	1.000	339395		4.20(2.19-4.07)		9867	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.112	4.097	0.015	1.523	1350296	2.30		91.8	2568	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.121	4.097	0.024	1.002	577063	1.07		107	1988	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.319	4.327	-0.008	1.000	1563606	0.9203		92.0	6332	
663.00 > 169.00	4.319	4.327	-0.008	1.000	479239		3.26(1.76-3.26)		14004	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.559	4.570	-0.011	1.688	4121392	2.36		94.6	46105	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.559	4.570	-0.011	1.000	392189	0.9700		97.0	6570	
713.00 > 219.00	4.546	4.570	-0.024	0.997	276827		1.42(1.00-1.85)		7759	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.961	4.986	-0.025	1.837	7522452	2.44		97.5	27707	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.970	4.986	-0.016	1.002	2706360	0.99		99.2	1743	R
813.00 > 169.00	4.970	4.986	-0.016	1.002	461615		5.86(2.50-4.65)		6406	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.313	5.347	-0.034	1.000	3084534	1.03		103	958	
913.00 > 169.00	5.313	5.347	-0.034	1.000	367502		8.39(0.00-0.00)		1850	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL4_00002 Amount Added: 1.00 Units: mL

Report Date: 27-Nov-2017 15:13:34 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50938.b\2017.11.24LLA_012.d

Injection Date: 24-Nov-2017 15:12:30 Instrument ID: A8_N

Lims ID: CCV L4

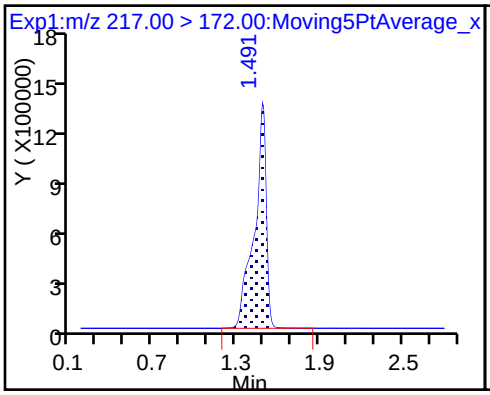
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 3

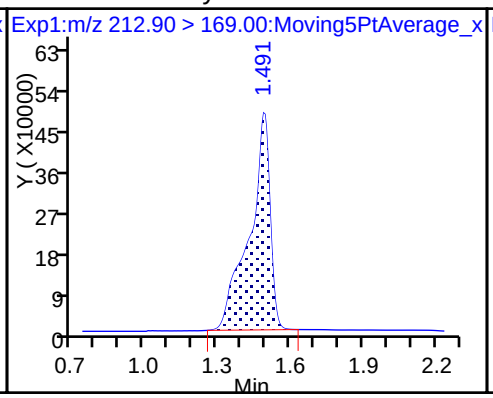
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

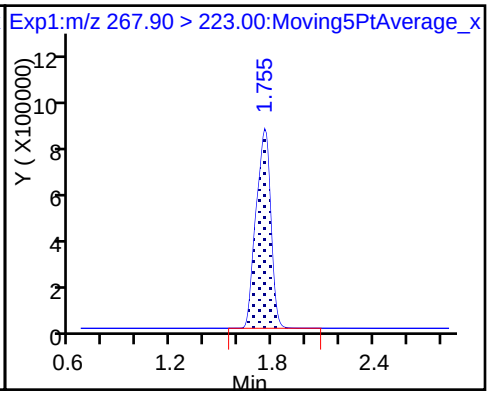
D 1 13C4 PFBA



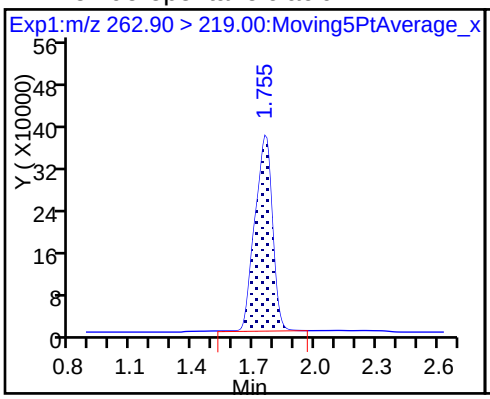
2 Perfluorobutyric acid



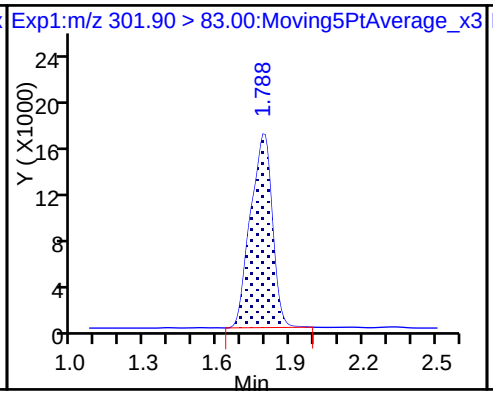
D 3 13C5-PFPeA



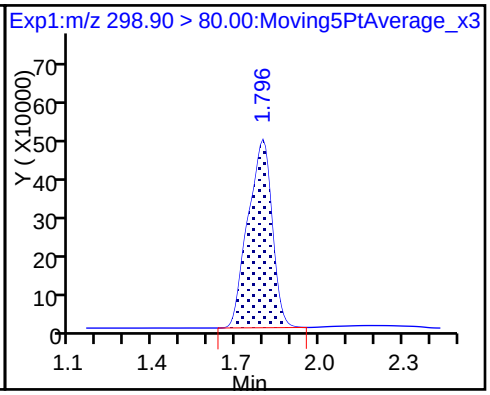
4 Perfluoropentanoic acid



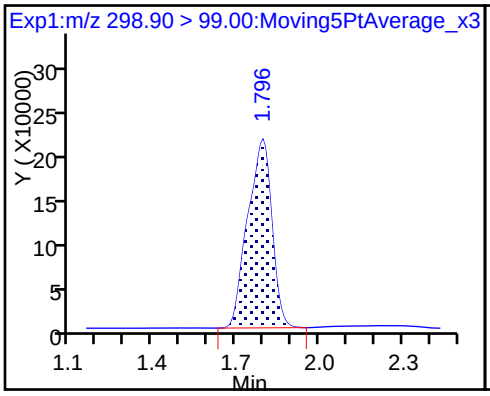
D 47 13C3-PFBS



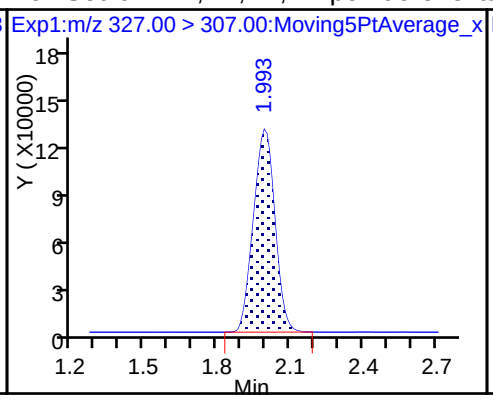
5 Perfluorobutanesulfonic acid



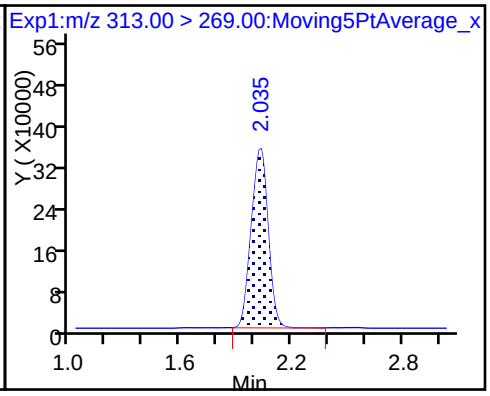
5 Perfluorobutanesulfonic acid



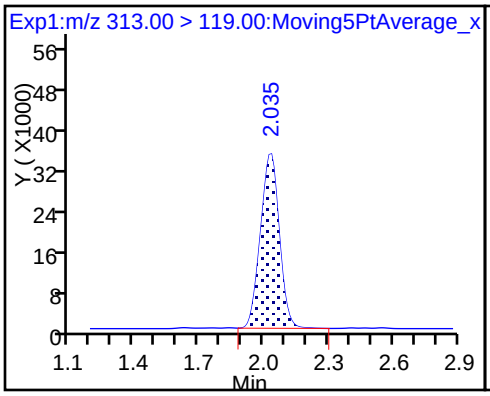
61 Sodium 1H,1H,2H,2H-perfluorohexane



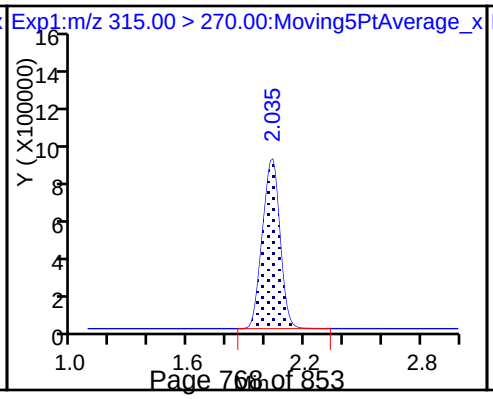
6 Perfluorohexanoic acid



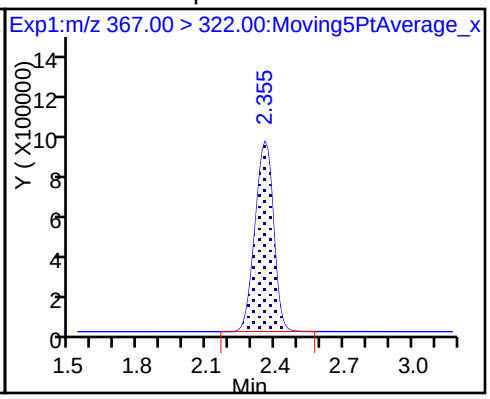
6 Perfluorohexanoic acid



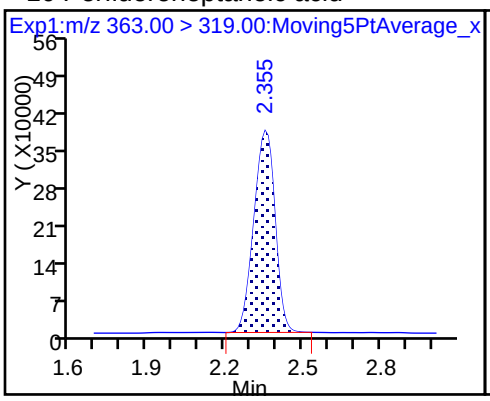
D 7 13C2 PFHxA



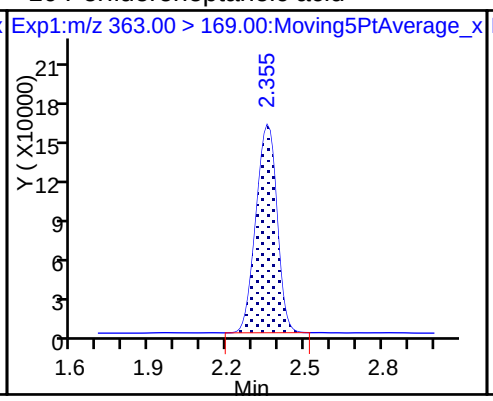
D 9 13C4-PFHpA



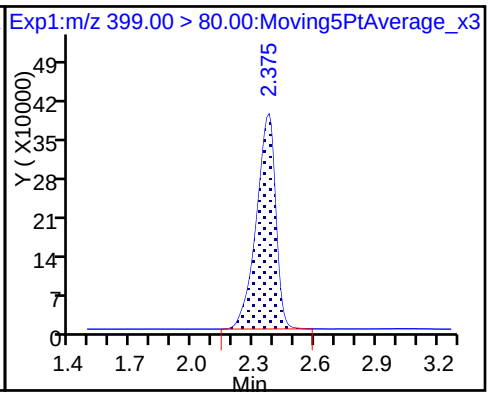
10 Perfluoroheptanoic acid



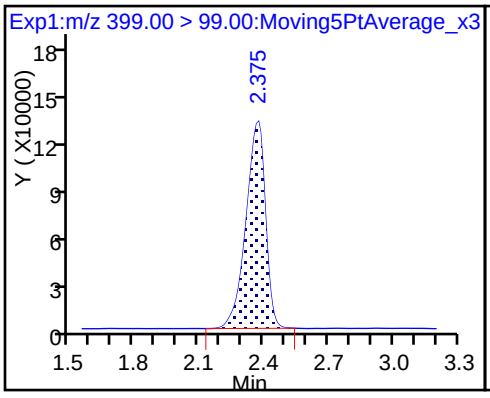
10 Perfluoroheptanoic acid



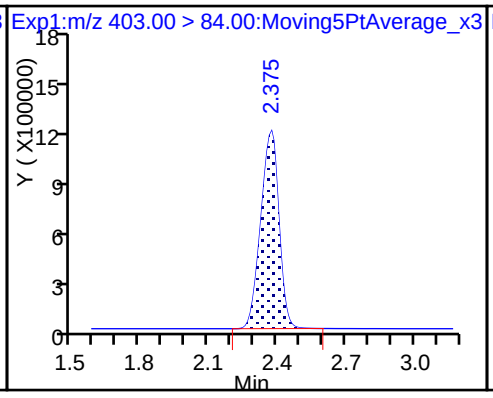
8 Perfluorohexanesulfonic acid



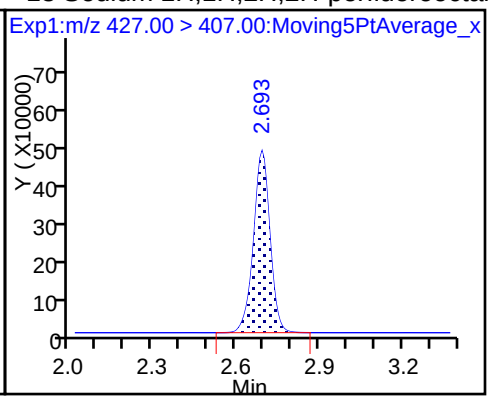
8 Perfluorohexanesulfonic acid



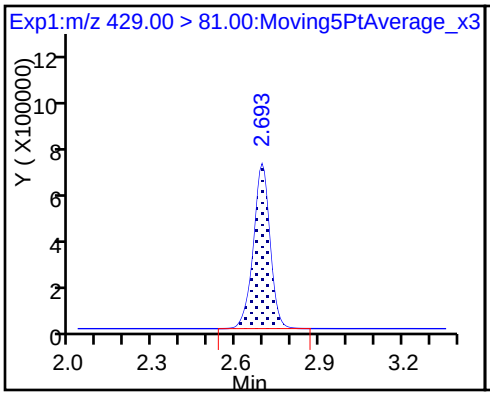
D 11 18O2 PFHxS



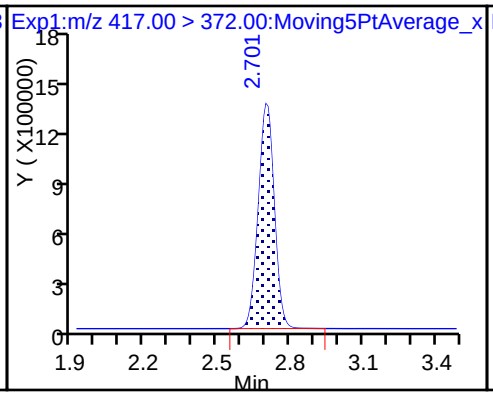
13 Sodium 1H,1H,2H,2H-perfluorooctane



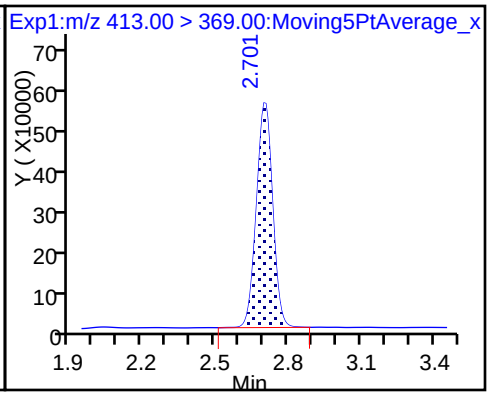
D 12 M2-6:2FTS



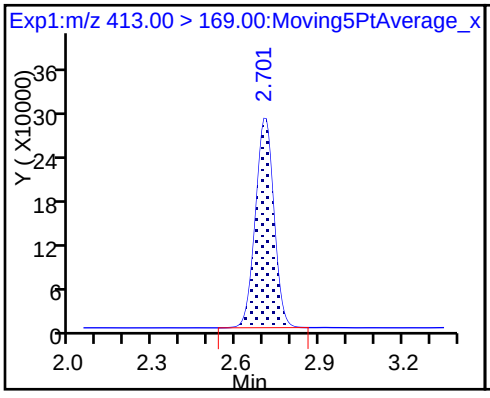
D 14 13C4 PFOA



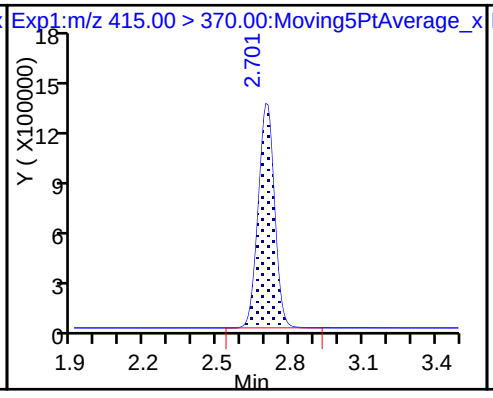
15 Perfluorooctanoic acid



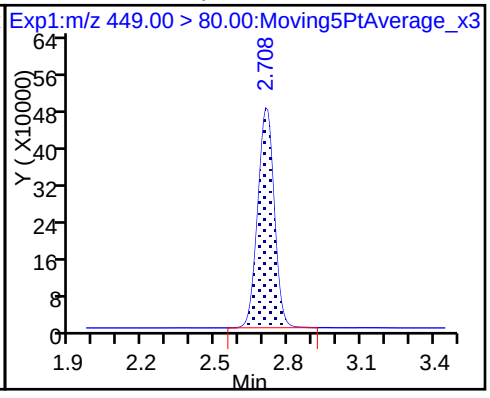
15 Perfluorooctanoic acid



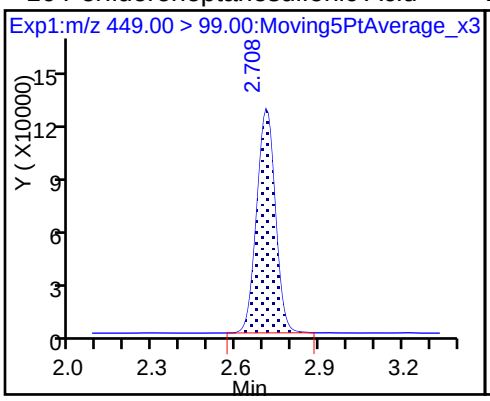
* 62 13C2-PFOA



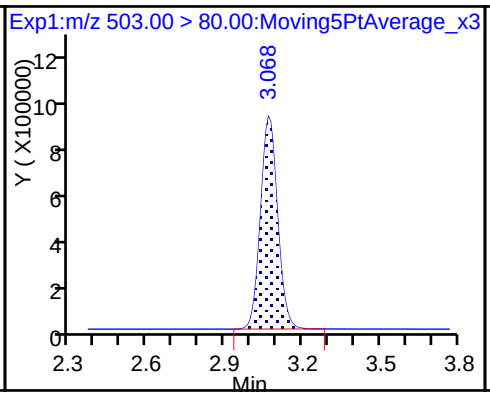
16 Perfluoroheptanesulfonic Acid



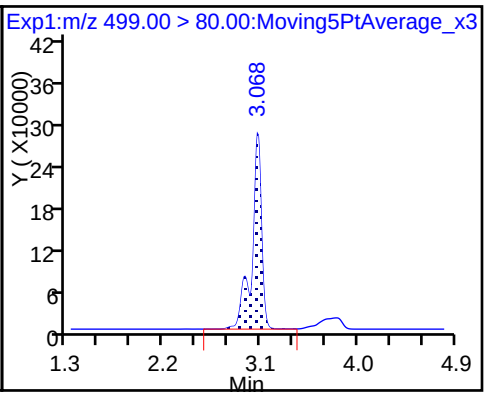
16 Perfluoroheptanesulfonic Acid



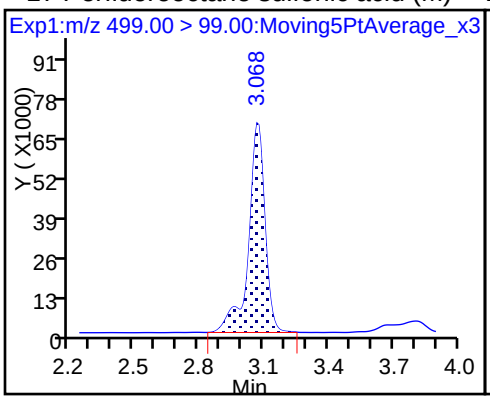
D 18 13C4 PFOS



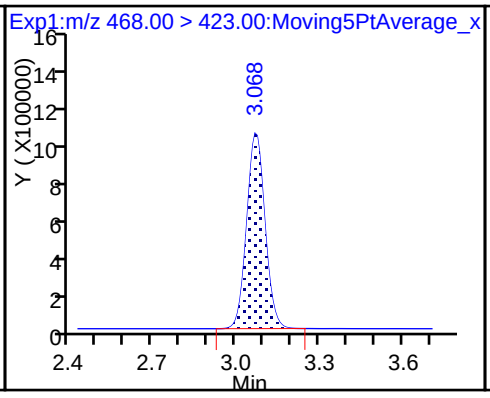
17 Perfluorooctane sulfonic acid



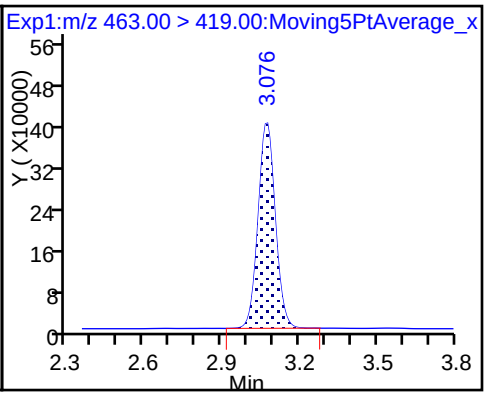
17 Perfluorooctane sulfonic acid (M)



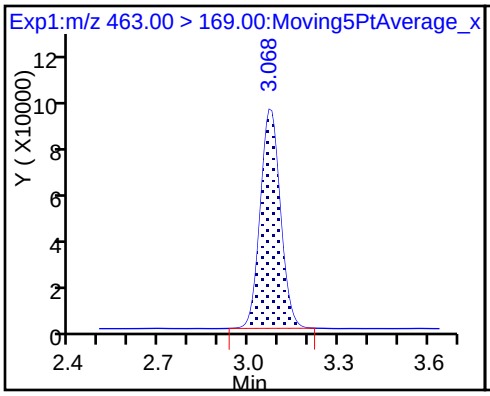
D 19 13C5 PFNA



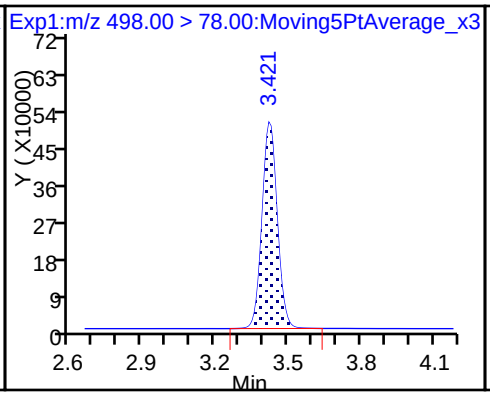
20 Perfluorononanoic acid



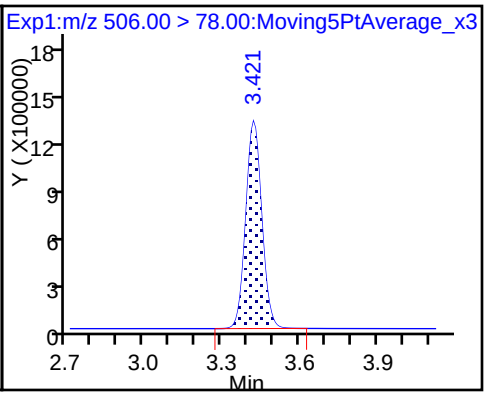
20 Perfluorononanoic acid



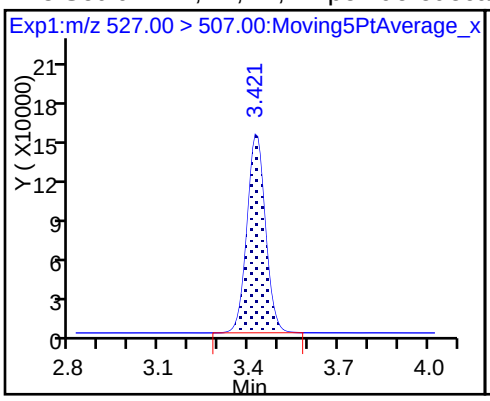
22 Perfluorooctane Sulfonamide



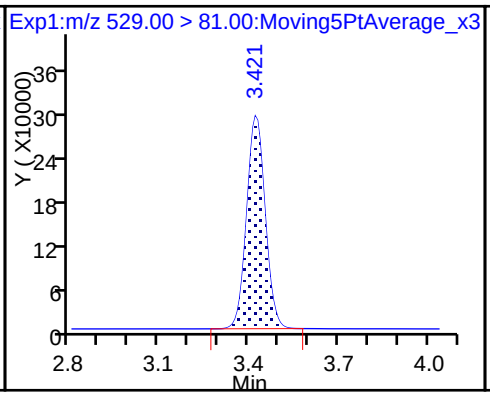
D 21 13C8 FOSA



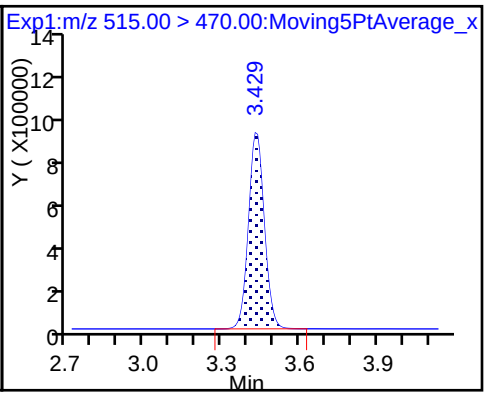
25 Sodium 1H,1H,2H,2H-perfluorodecane



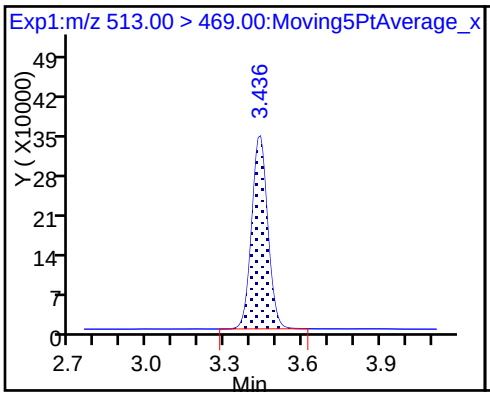
D 26 M2-8:2FTS



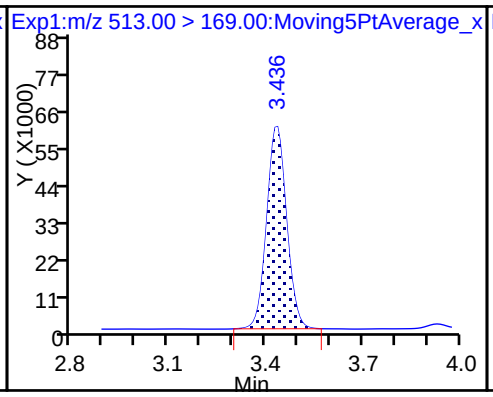
D 23 13C2 PFDA



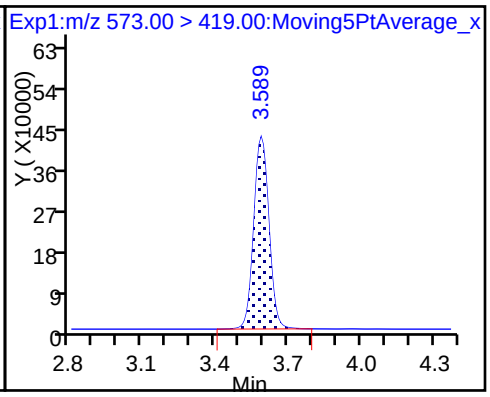
24 Perfluorodecanoic acid



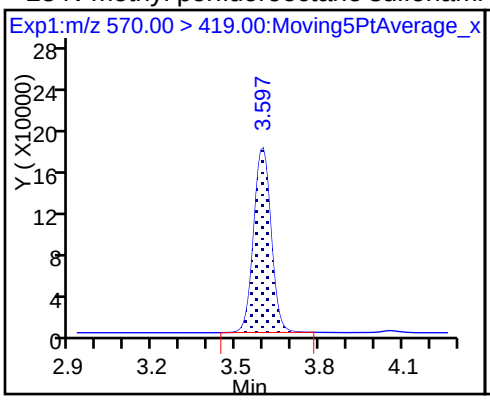
24 Perfluorodecanoic acid



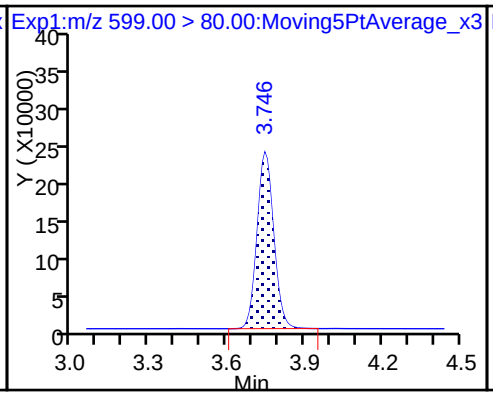
D 27 d3-NMeFOSAA



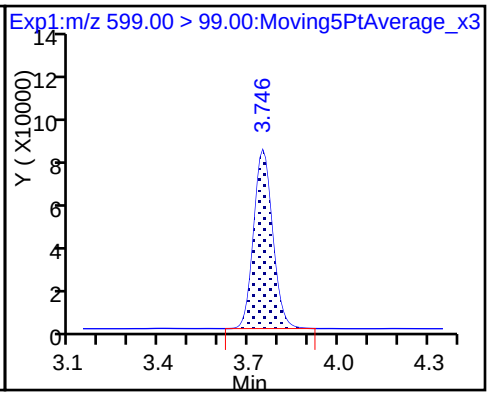
28 N-methyl perfluorooctane sulfonami



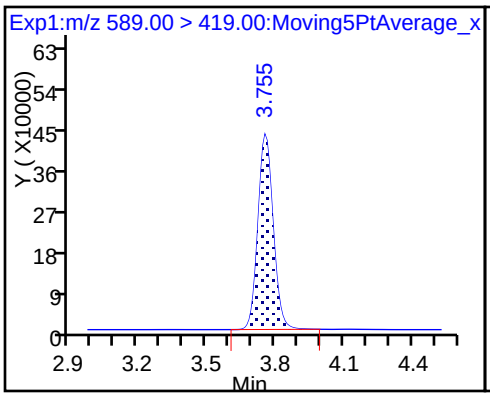
29 Perfluorodecane Sulfonic acid



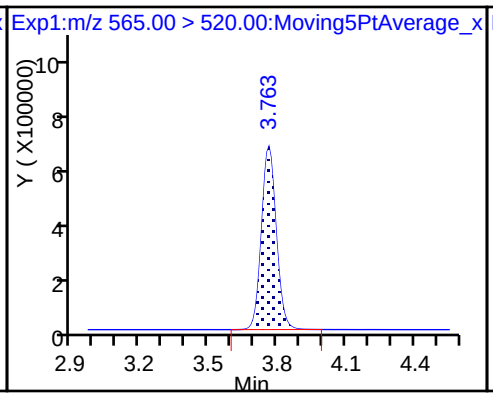
29 Perfluorodecane Sulfonic acid



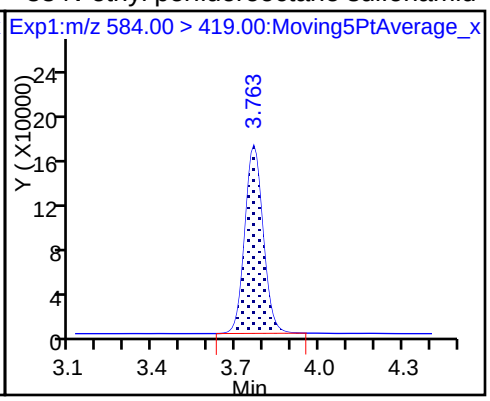
D 32 d5-NEtFOSAA



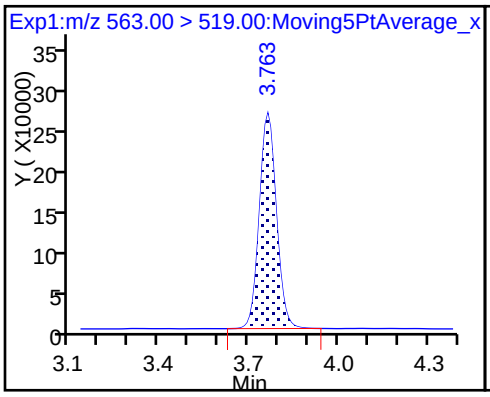
D 30 13C2 PFUnA



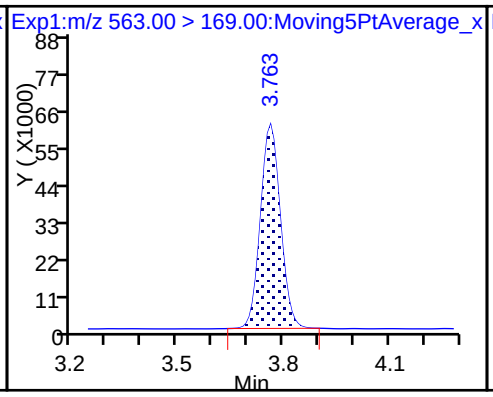
33 N-ethyl perfluorooctane sulfonamid



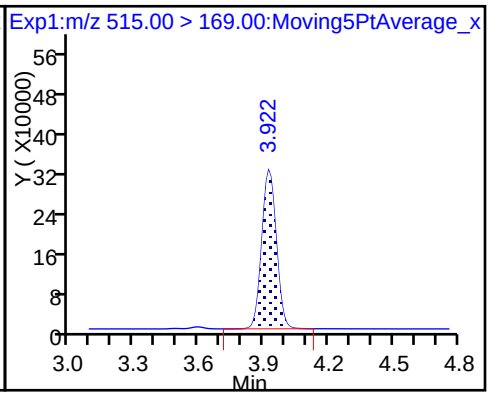
31 Perfluoroundecanoic acid



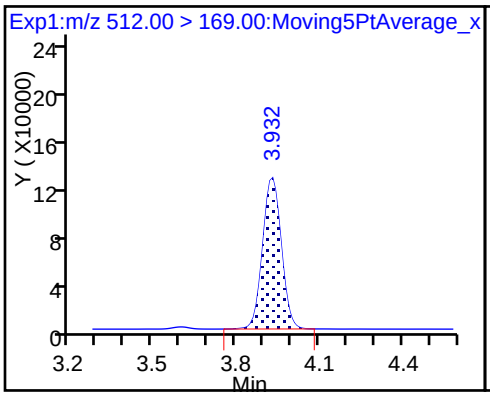
31 Perfluoroundecanoic acid



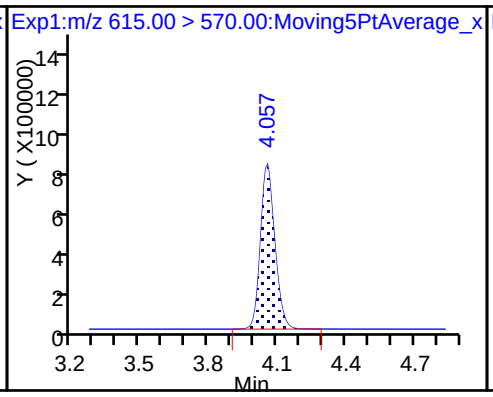
D 34 d-N-MeFOSA-M



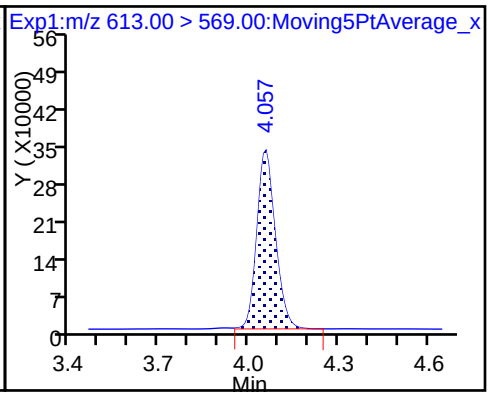
35 MeFOSA



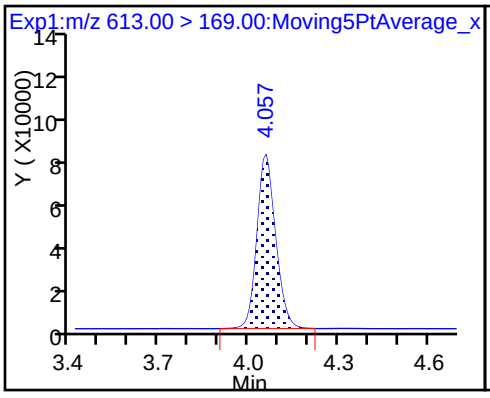
D 36 13C2 PFDoA



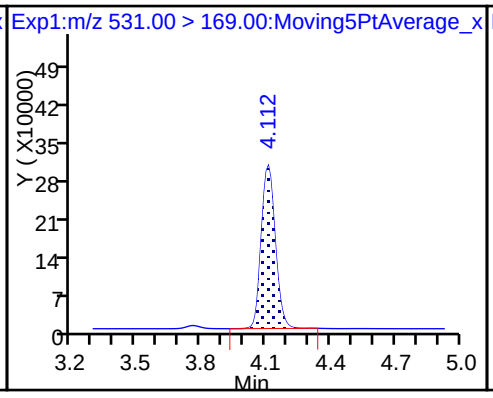
37 Perfluorododecanoic acid



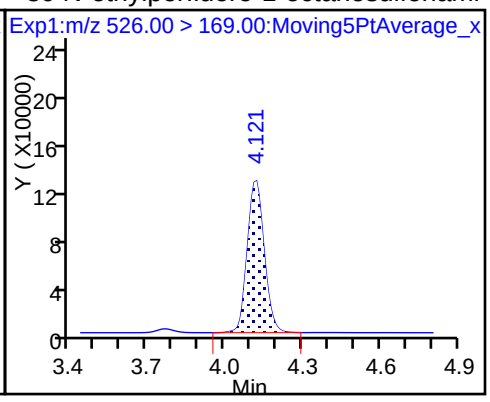
37 Perfluorododecanoic acid



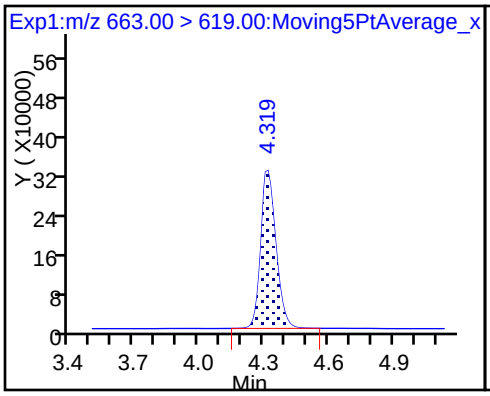
D 38 d-N-EtFOSA-M



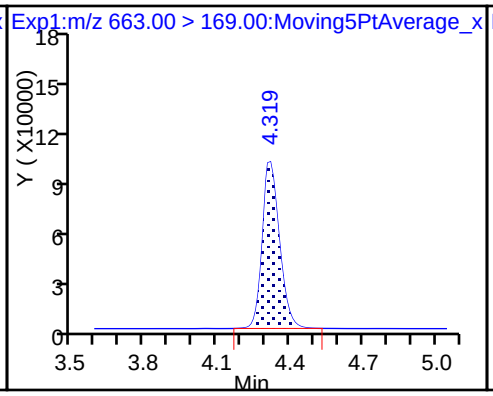
39 N-ethylperfluoro-1-octanesulfonami



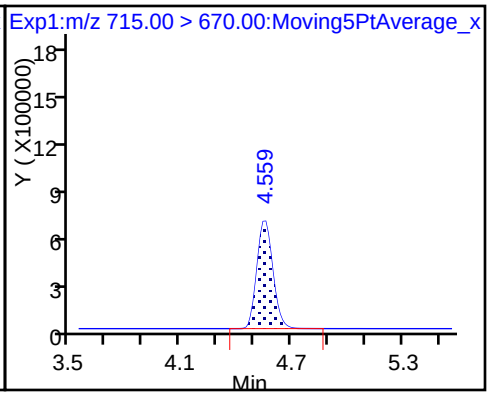
41 Perfluorotridecanoic acid



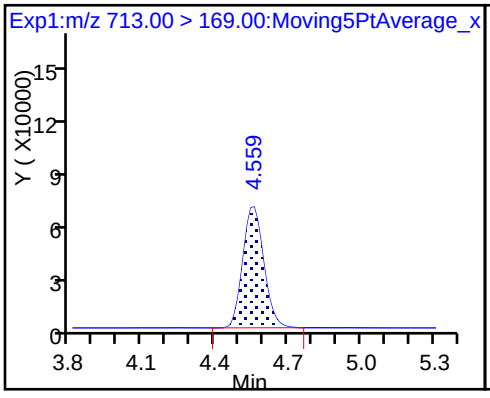
41 Perfluorotridecanoic acid



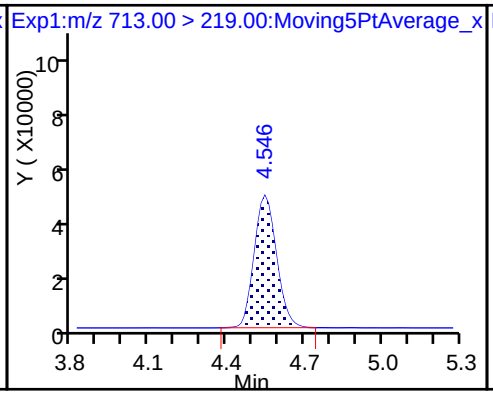
D 43 13C2-PFTeDA



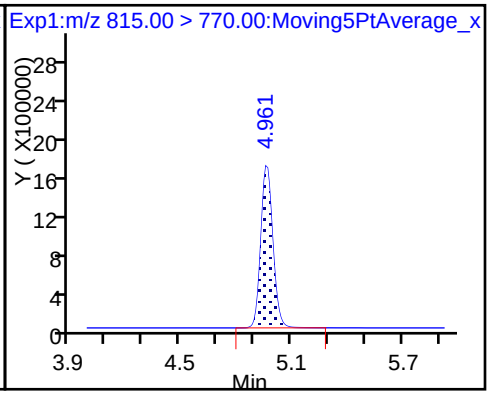
42 Perfluorotetradecanoic acid



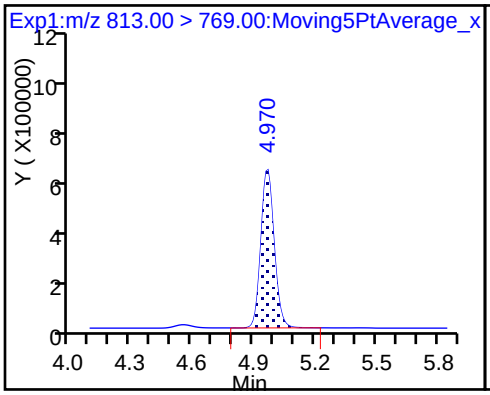
42 Perfluorotetradecanoic acid



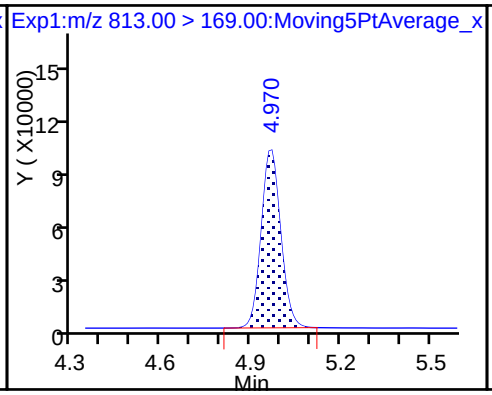
D 44 13C2-PFHxDA



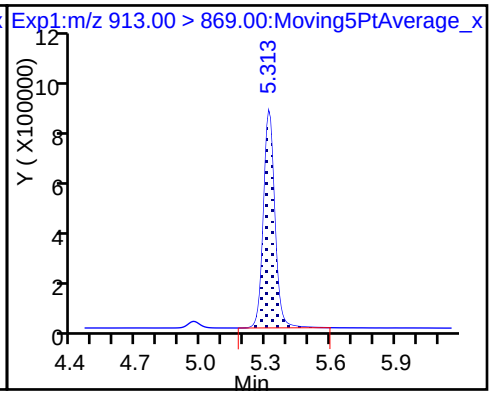
45 Perfluorohexadecanoic acid



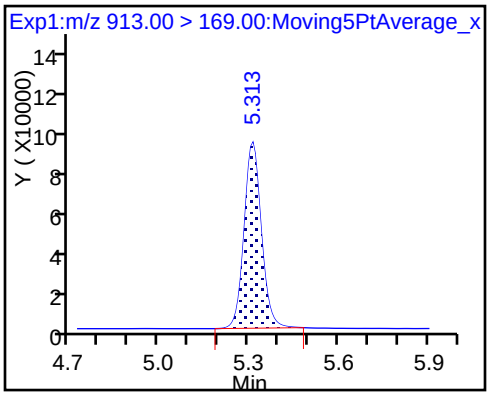
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

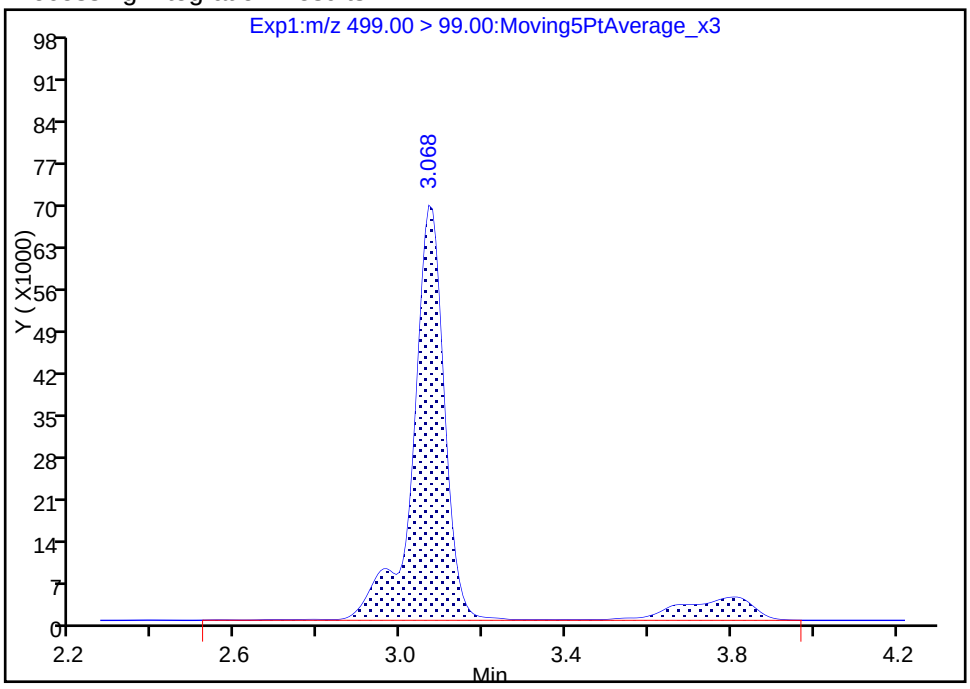
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50938.b\2017.11.24LLA_012.d
Injection Date: 24-Nov-2017 15:12:30 Instrument ID: A8_N
Lims ID: CCV L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

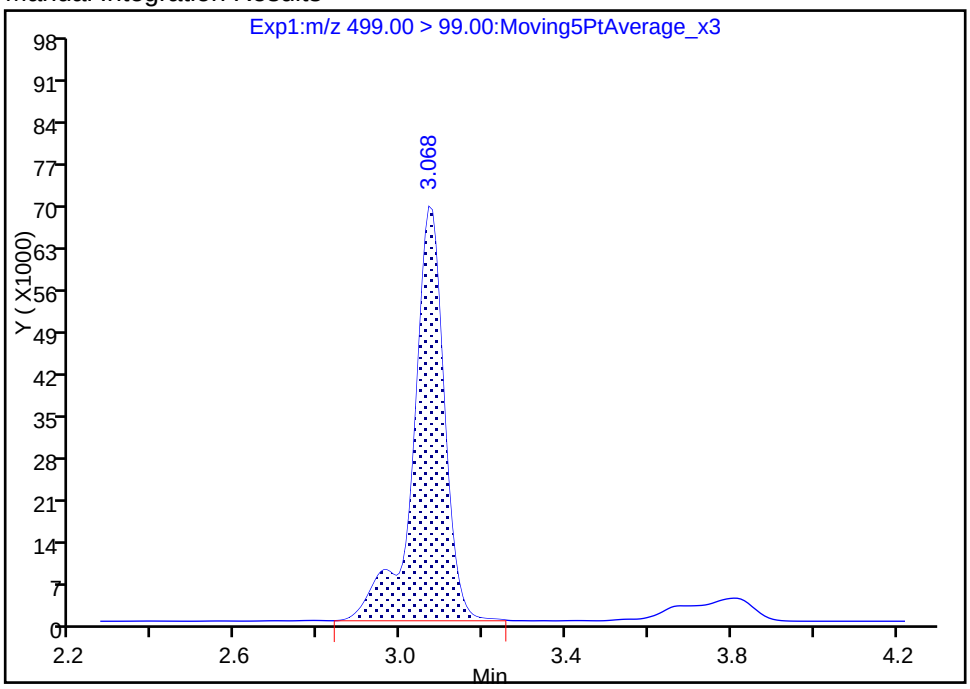
Processing Integration Results

RT: 3.07
Area: 415967
Amount: 0.929674
Amount Units: ng/ml



Manual Integration Results

RT: 3.07
Area: 365635
Amount: 0.929674
Amount Units: ng/ml



Reviewer: hannigana, 27-Nov-2017 15:12:47
Audit Action: Manually Integrated Audit Reason: Peak Tail

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-195219/1-A

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_002.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 250.00(mL) | Date Analyzed: 11/18/2017 16:55

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	1.0	U	2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	2.0	U	4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.0	U	2.0	1.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	U	4.0	2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	2.0	1.0	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	U	2.0	1.0	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	2.0	0.55
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	1.0	U	2.0	1.0	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	1.0	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	1.0	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	1.0	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.647	J M	4.0	2.0	0.54
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.0	U	2.0	1.0	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	1.0	U	2.0	1.0	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-195219/1-A

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_002.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 250.00(mL) | Date Analyzed: 11/18/2017 16:55

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	105		25-150
STL00992	13C4 PFBA	111	M	25-150
STL00993	13C2 PFHxA	107		25-150
STL00990	13C4 PFOA	104		25-150
STL00995	13C5 PFNA	112		25-150
STL00996	13C2 PFDA	115		25-150
STL00997	13C2 PFUnA	119		25-150
STL00998	13C2 PFDoA	108		25-150
STL00994	18O2 PFHxS	114		25-150
STL00991	13C4 PFOS	109		25-150
STL02116	13C2-PFTeDA	107		25-150
STL01892	13C4-PFHpA	113		25-150
STL01893	13C5 PFPeA	111		25-150
STL02337	13C3-PFBS	119		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_002.d
Lims ID: MB 320-195219/1-A
Client ID:
Sample Type: MB
Inject. Date: 18-Nov-2017 16:55:29 ALS Bottle#: 2 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-195219/1-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 24-Nov-2017 11:45:18 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK033

First Level Reviewer: hannigana Date: 24-Nov-2017 11:27:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										M
217.00 > 172.00	1.475	1.479	-0.004	0.551	7760975	2.77		111	20441	M
2 Perfluorobutyric acid										
212.90 > 169.00	1.475	1.480	-0.005	1.000	13532	0.004761			3.4	
D 3 13C5-PFPeA										
267.90 > 223.00	1.747	1.738	0.009	0.652	4930125	2.78		111	60047	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.740	0.015	1.005	10683	0.004804			6.2	
D 47 13C3-PFBS										
301.90 > 83.00	1.788	1.774	0.014	0.668	107365	2.77		119	3912	
6 Perfluorohexanoic acid										R
313.00 > 269.00	2.025	2.010	0.015	1.000	7087	0.003300			10.0	R
313.00 > 119.00	2.014	2.010	0.004	0.995	1357		5.22(7.05-13.09)		18.3	
D 7 13C2 PFHxA										
315.00 > 270.00	2.025	2.010	0.015	0.756	5367004	2.68		107	57812	
D 9 13C4-PFHpA										
367.00 > 322.00	2.344	2.332	0.012	0.875	5485157	2.83		113	68345	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.355	2.347	0.008	1.000	18710	0.006576			126	
399.00 > 99.00	2.366	2.347	0.019	1.005	8314		2.25(2.10-3.89)		77.9	
D 11 18O2 PFHxS										
403.00 > 84.00	2.355	2.347	0.008	0.879	6143347	2.69		114	69232	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.657	2.671	-0.013	1.000	137321	0.1424			221	
D 12 M2-6:2FTS										
429.00 > 81.00	2.657	2.671	-0.014	0.992	1427209	1.47		61.9	29241	
D 14 13C4 PFOA										
417.00 > 372.00	2.679	2.680	-0.001	1.000	5767326	2.60		104	65665	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.679	2.680	-0.001	1.000	13892	0.005709			4.8	
413.00 > 169.00	2.679	2.680	-0.001	1.000	8483		1.64(1.18-2.19)		60.9	
* 62 13C2-PFOA										
415.00 > 370.00	2.679	2.695	-0.016		5389361	2.50			56007	
D 18 13C4 PFOS										
503.00 > 80.00	3.043	3.042	0.001	1.136	3985636	2.61		109	24551	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.043	3.042	0.001	1.000	28307	0.0162			43.0	M
499.00 > 99.00	3.043	3.042	0.001	1.000	6990		4.05(3.24-6.01)		40.6	
D 19 13C5 PFNA										
468.00 > 423.00	3.043	3.042	0.001	1.136	4587819	2.81		112	57612	
D 26 M2-8:2FTS										
529.00 > 81.00	3.389	3.390	-0.001	1.265	1541970	2.99		125	17320	
D 21 13C8 FOSA										
506.00 > 78.00	3.397	3.393	0.004	1.268	5140852	2.61		105	42760	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.397	3.395	0.002	1.000	11301	0.005721			302	
D 23 13C2 PFDA										
515.00 > 470.00	3.397	3.400	-0.003	1.268	3946582	2.87		115	39485	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.556	3.557	-0.001	1.328	2155885	2.92		117	15896	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.564	3.561	0.003	1.002	3842	0.004250			33.3	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.719	3.725	-0.006	1.388	2112610	2.97		119	10451	
D 30 13C2 PFUnA										
565.00 > 520.00	3.728	3.730	-0.002	1.392	3276786	2.98		119	51415	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.728	3.731	-0.003	1.002	5338	0.006588			114	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.900	3.896	0.004	1.456	979731	1.72		68.7	2030	
D 36 13C2 PFDoA										
615.00 > 570.00	4.018	4.024	-0.006	1.500	3458362	2.71		108	44886	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.092	4.084	0.008	1.528	690936	1.30		52.2	1148	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.518	4.526	-0.008	1.687	4194620	2.67		107	32652	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.933	4.938	-0.005	1.842	6802801	2.45		98.0	18087	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.933	4.939	-0.006	1.000	66141	0.005999			42.0	R
813.00 > 169.00	4.933	4.939	-0.006	1.000	10859		6.09(2.50-4.65)		321	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 24-Nov-2017 11:45:25 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_002.d

Injection Date: 18-Nov-2017 16:55:29 Instrument ID: A8_N

Lims ID: MB 320-195219/1-A

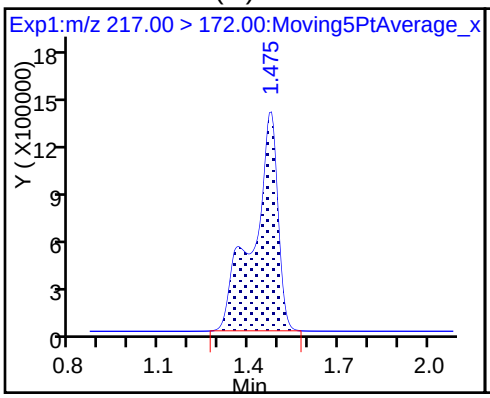
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 2

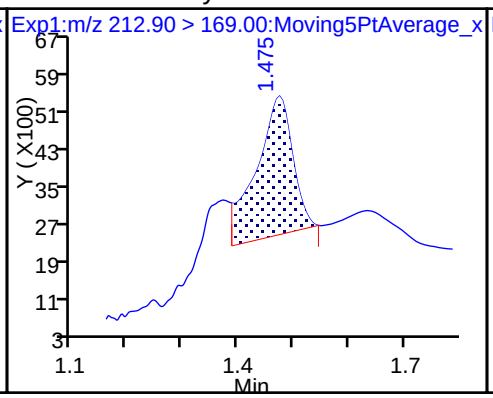
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

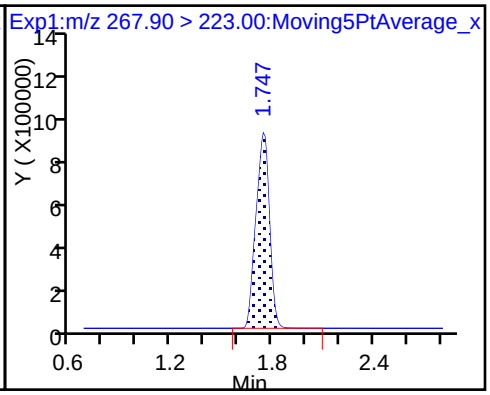
D 1 13C4 PFBA (M)



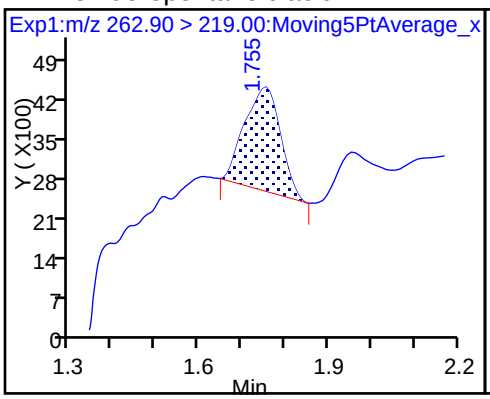
2 Perfluorobutyric acid



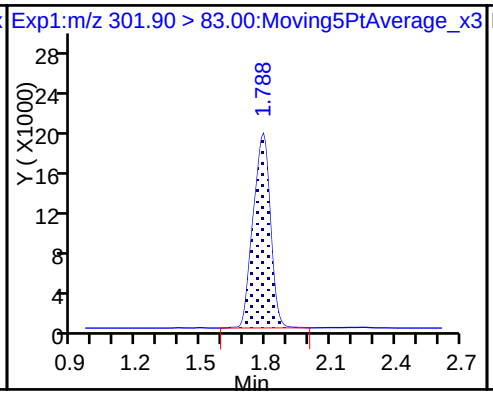
D 3 13C5-PFPeA



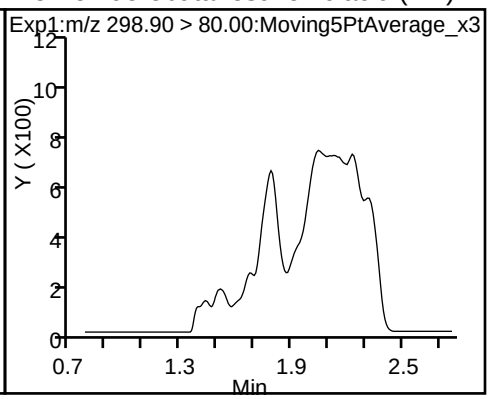
4 Perfluoropentanoic acid



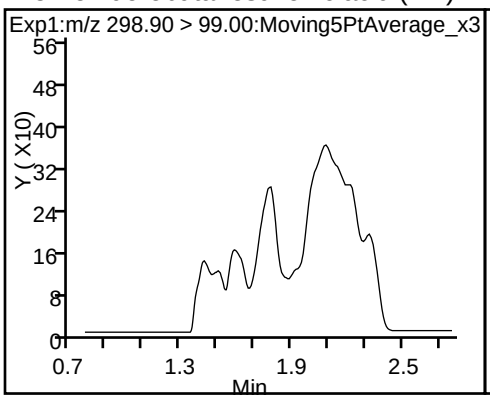
D 47 13C3-PFBS



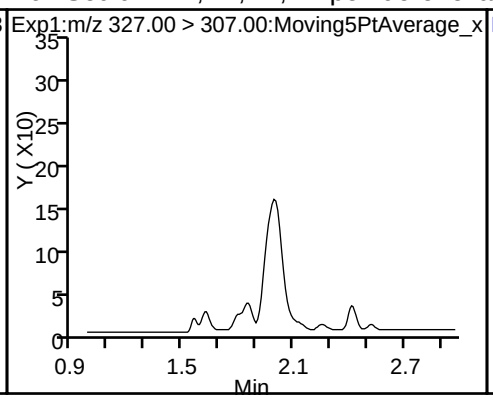
5 Perfluorobutanesulfonic acid (ND)



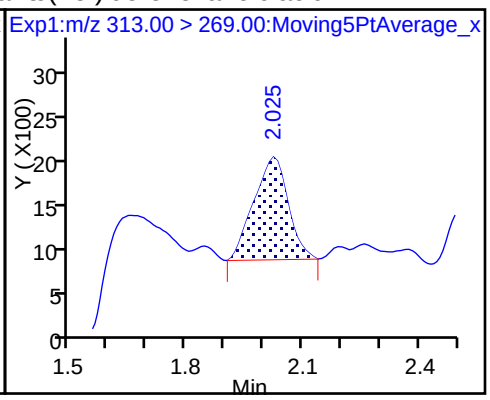
5 Perfluorobutanesulfonic acid (ND)



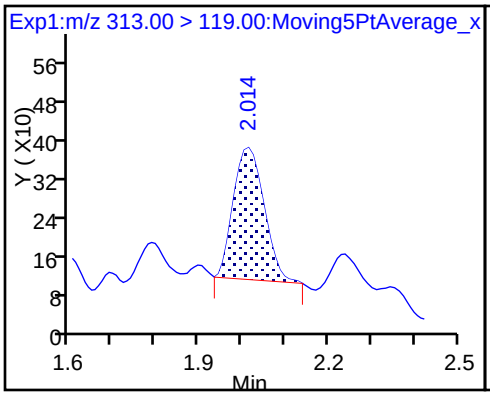
61 Sodium 1H,1H,2H,2H-perfluorohexane6(ND)



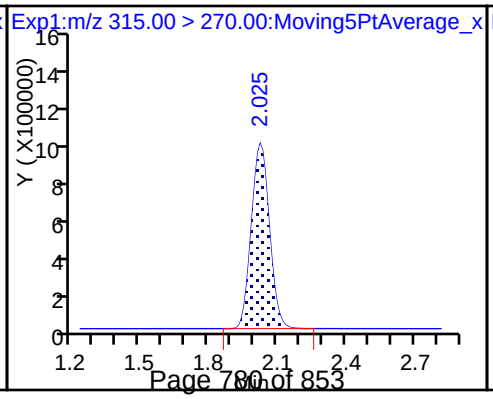
6 Perfluorohexanoic acid



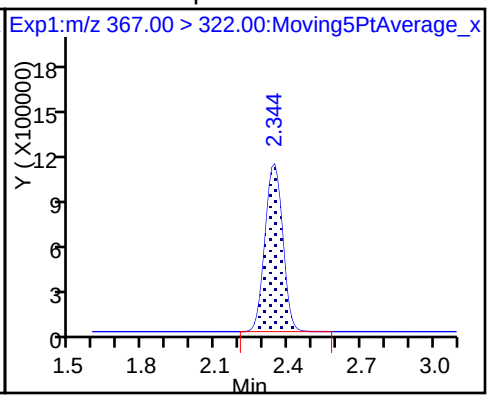
6 Perfluorohexanoic acid



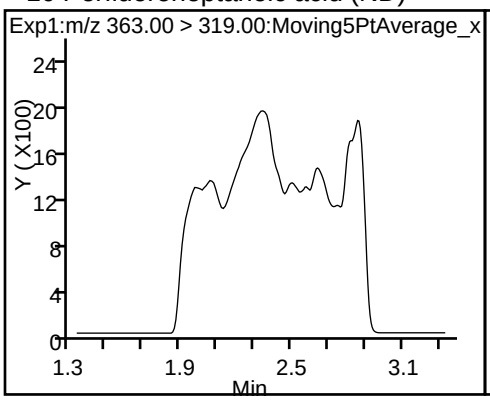
D 7 13C2 PFHxA



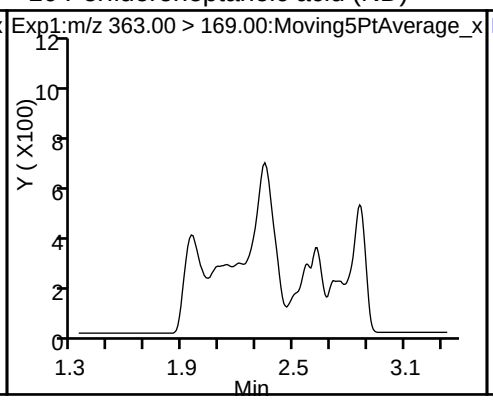
D 9 13C4-PFHpA



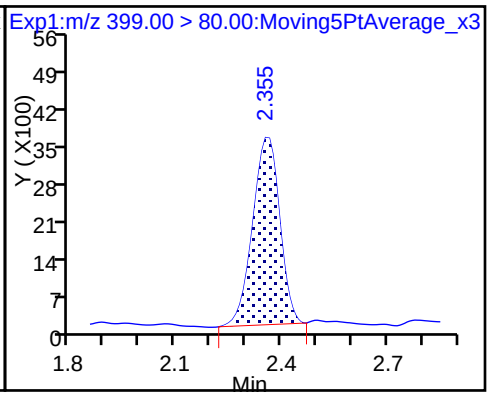
10 Perfluoroheptanoic acid (ND)



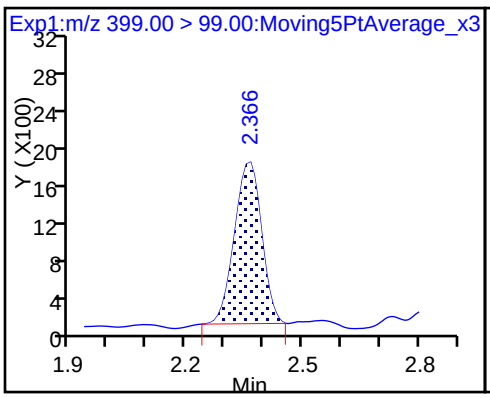
10 Perfluoroheptanoic acid (ND)



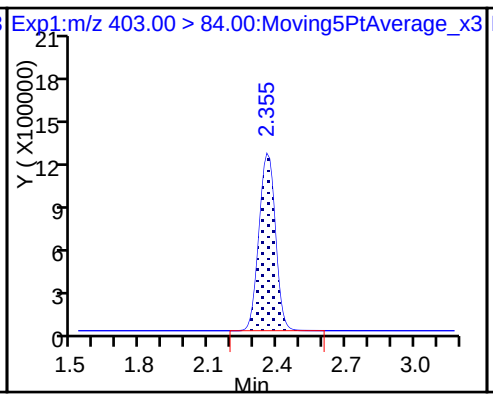
8 Perfluorohexanesulfonic acid



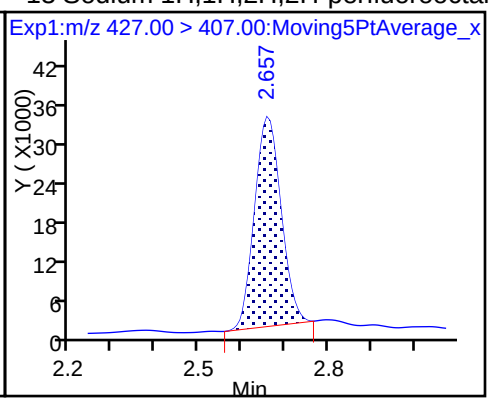
8 Perfluorohexanesulfonic acid



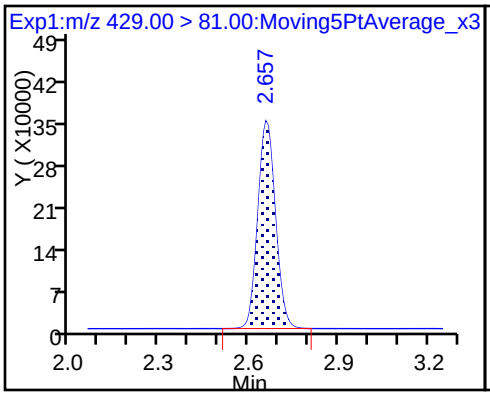
D 11 18O2 PFHxS



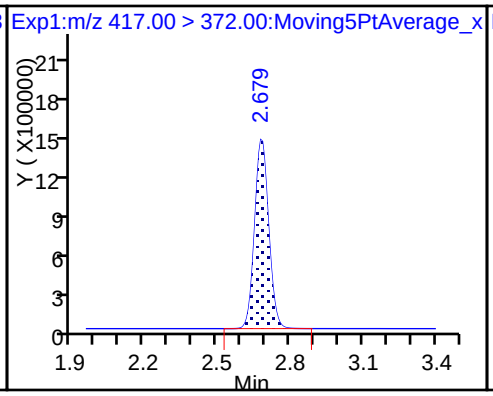
13 Sodium 1H,1H,2H,2H-perfluorooctane



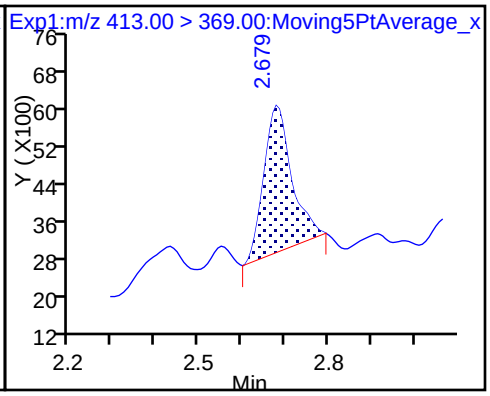
D 12 M2-6:2FTS



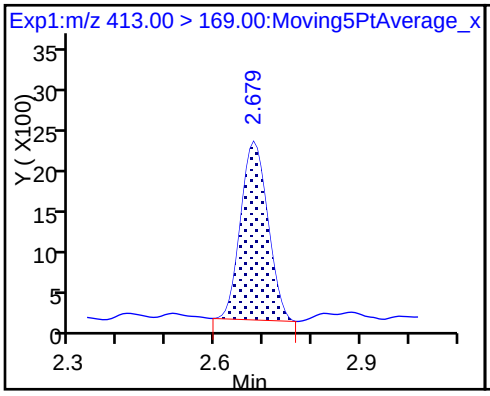
D 14 13C4 PFOA



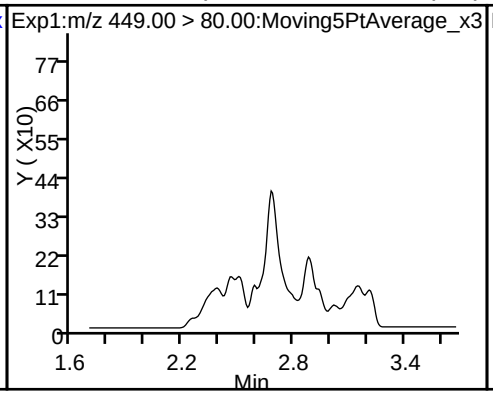
15 Perfluorooctanoic acid



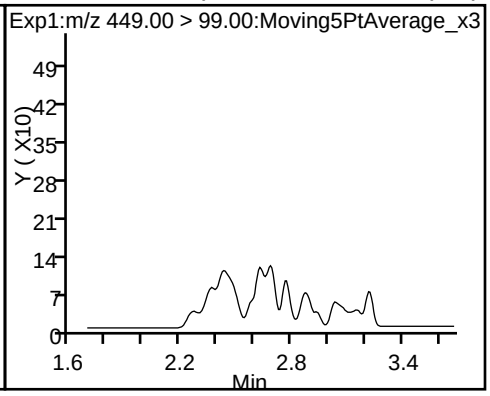
15 Perfluorooctanoic acid



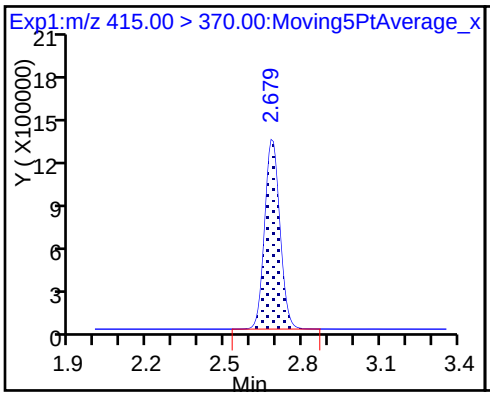
16 Perfluoroheptanesulfonic Acid (ND)



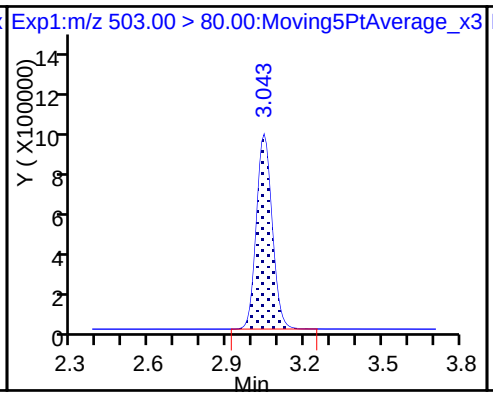
16 Perfluoroheptanesulfonic Acid (ND)



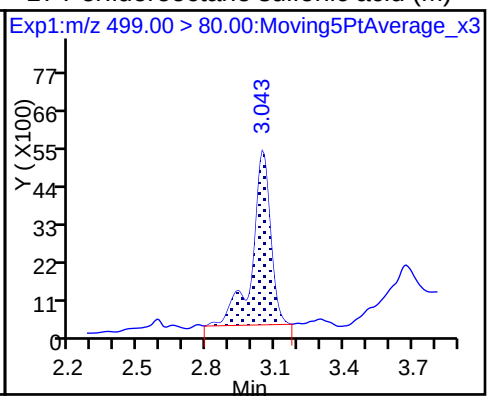
* 62 13C2-PFOA



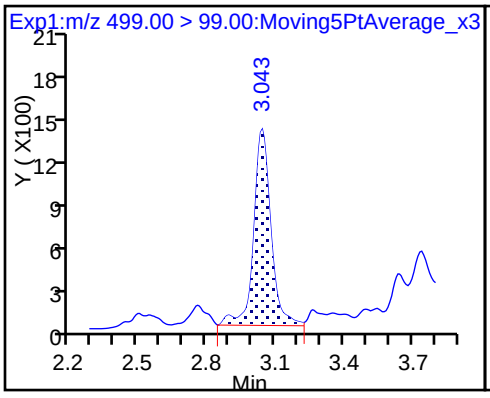
D 18 13C4 PFOS



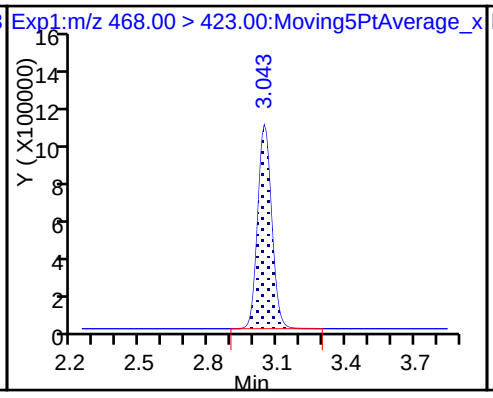
17 Perfluorooctane sulfonic acid (M)



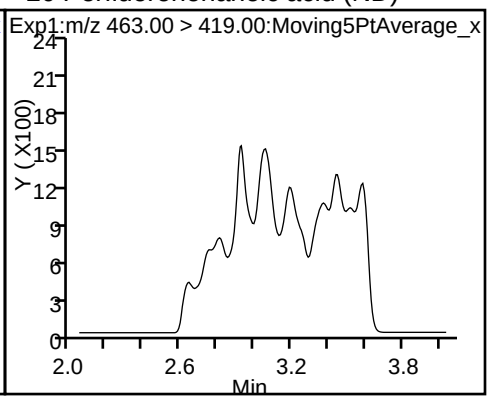
17 Perfluorooctane sulfonic acid



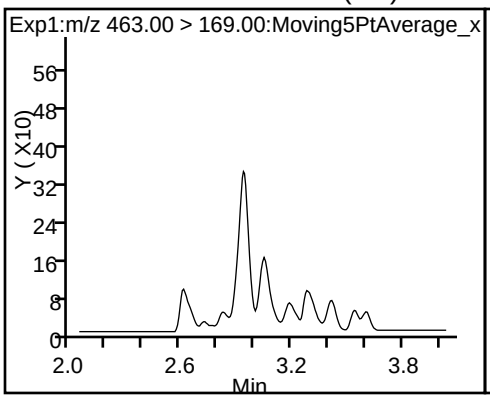
D 19 13C5 PFNA



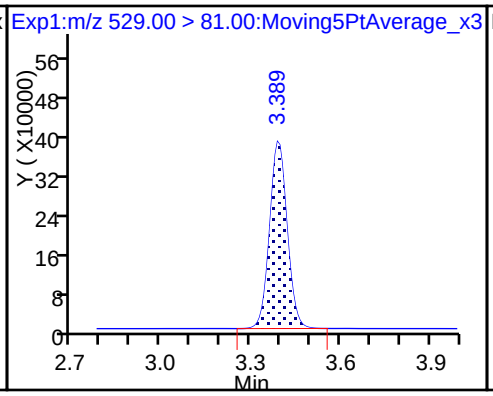
20 Perfluorononanoic acid (ND)



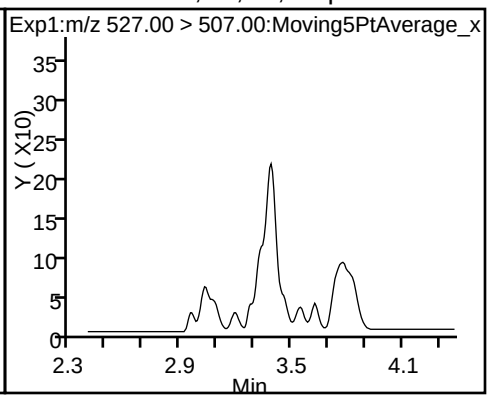
20 Perfluorononanoic acid (ND)



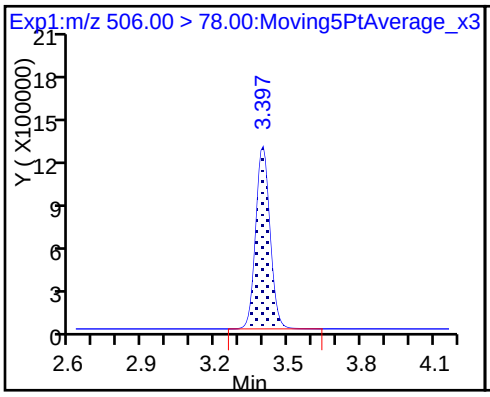
D 26 M2-8:2FTS



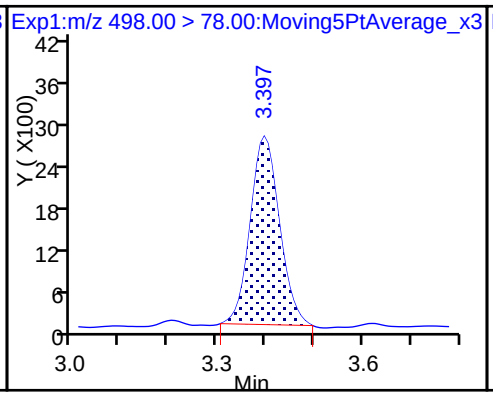
25 Sodium 1H,1H,2H,2H-perfluorodecane (ND)



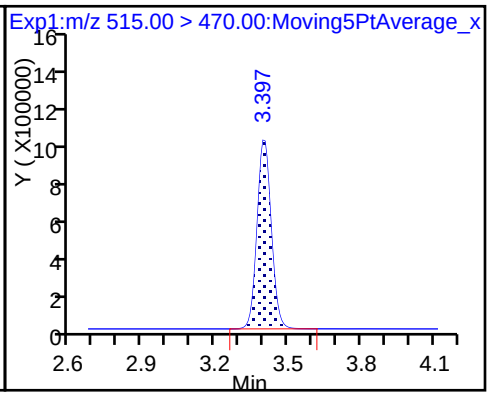
D 21 13C8 FOSA



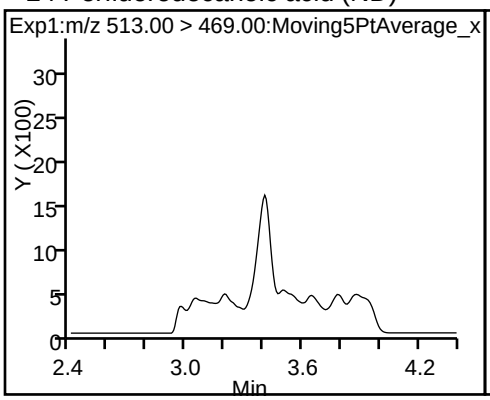
22 Perfluorooctane Sulfonamide



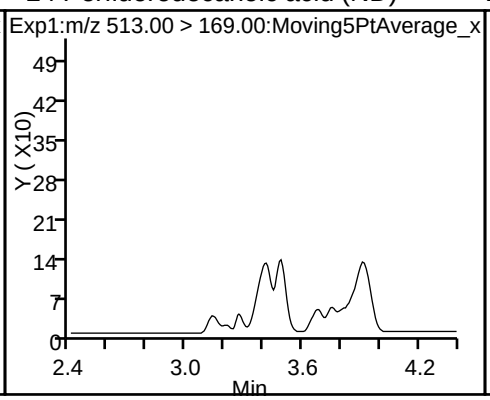
D 23 13C2 PFDA



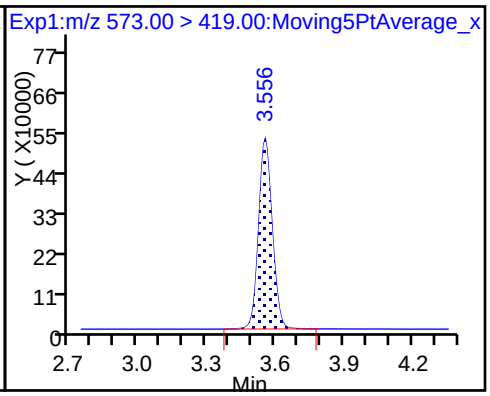
24 Perfluorodecanoic acid (ND)



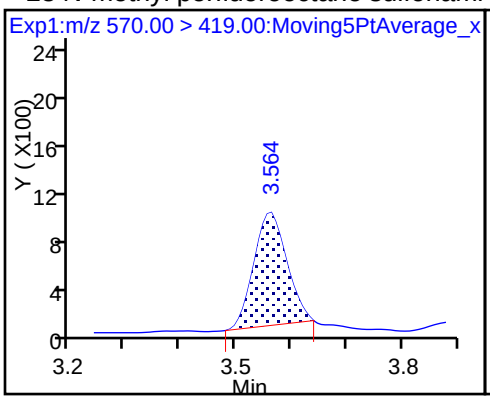
24 Perfluorodecanoic acid (ND)



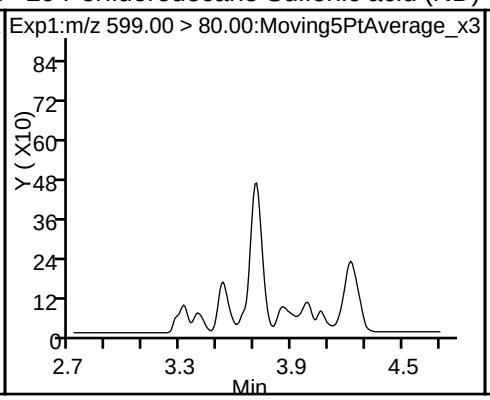
D 27 d3-NMeFOSAA



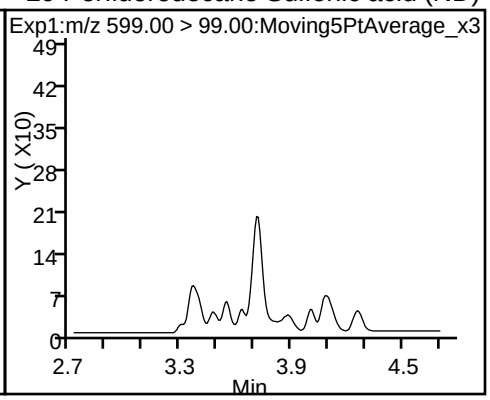
28 N-methyl perfluorooctane sulfonami



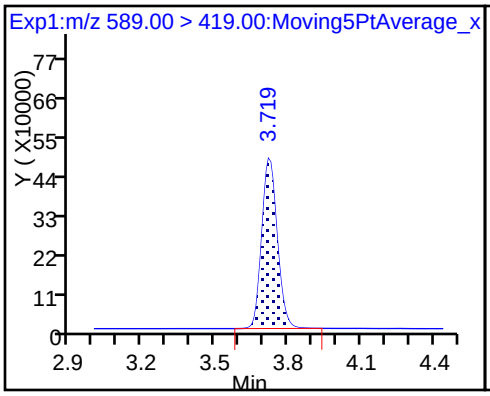
29 Perfluorodecane Sulfonic acid (ND)



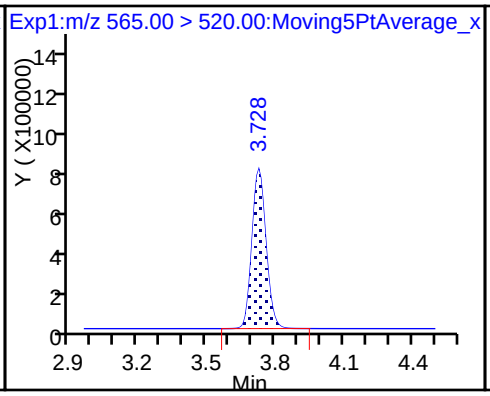
29 Perfluorodecane Sulfonic acid (ND)



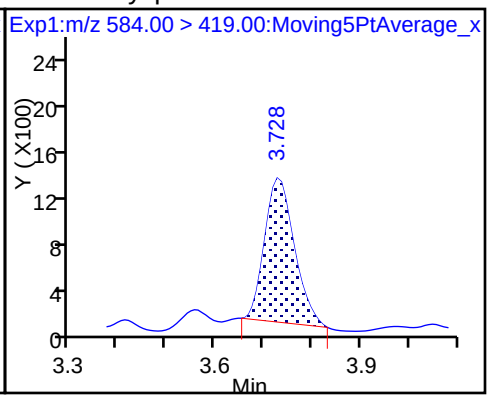
D 32 d5-NEtFOSAA



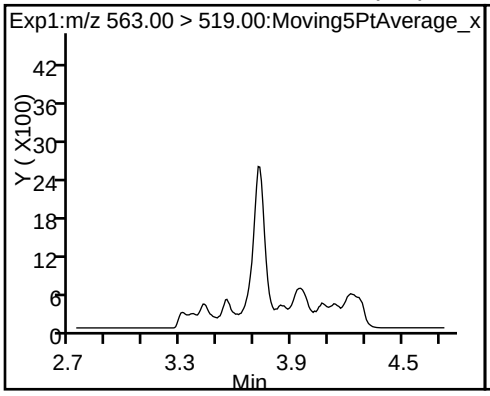
D 30 13C2 PFUnA



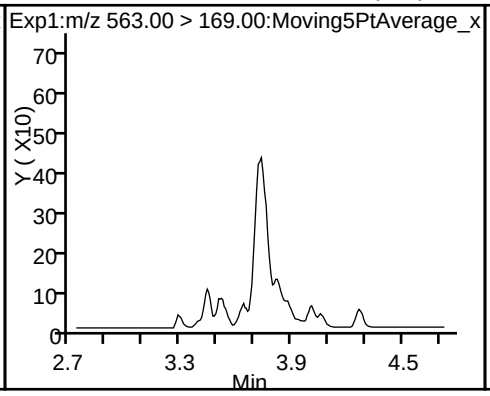
33 N-ethyl perfluorooctane sulfonamid



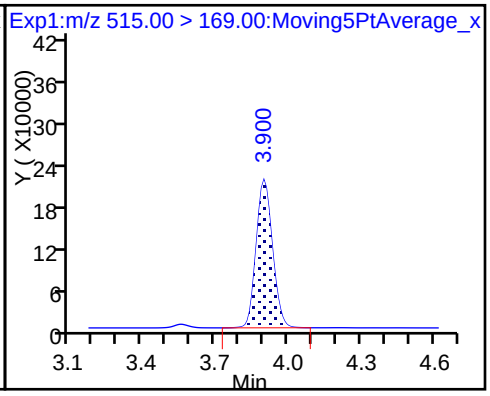
31 Perfluoroundecanoic acid (ND)



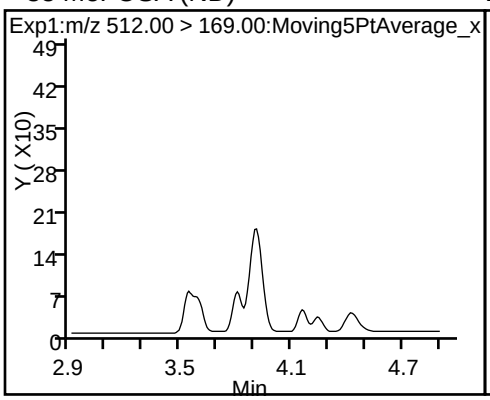
31 Perfluoroundecanoic acid (ND)



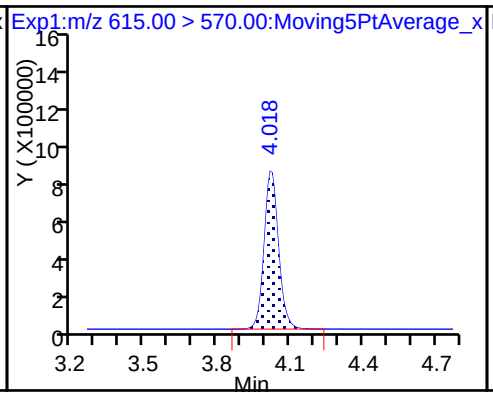
D 34 d-N-MeFOSA-M



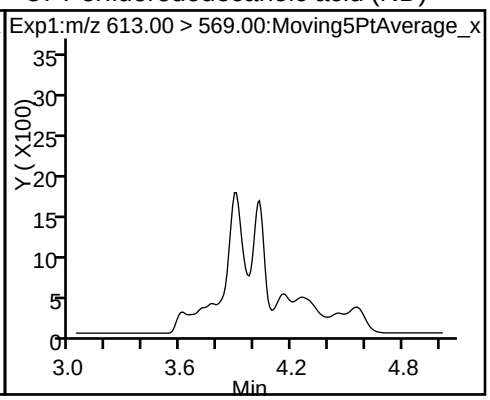
35 MeFOSA (ND)



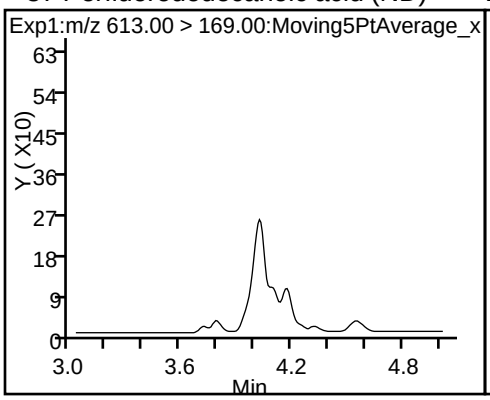
D 36 13C2 PFDoA



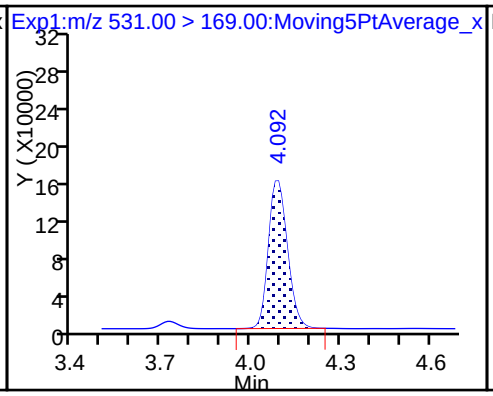
37 Perfluorododecanoic acid (ND)



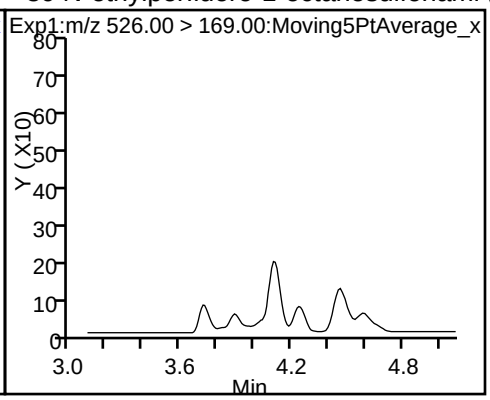
37 Perfluorododecanoic acid (ND)



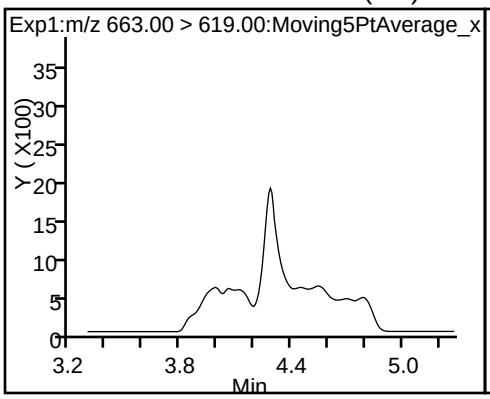
D 38 d-N-EtFOSA-M



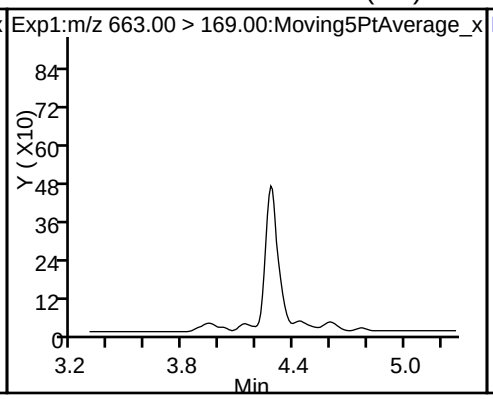
39 N-ethylperfluoro-1-octanesulfonami (ND)



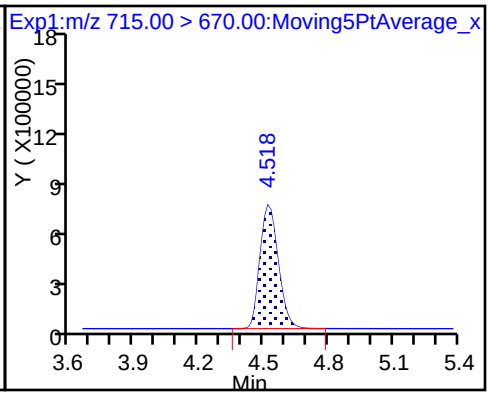
41 Perfluorotridecanoic acid (ND)



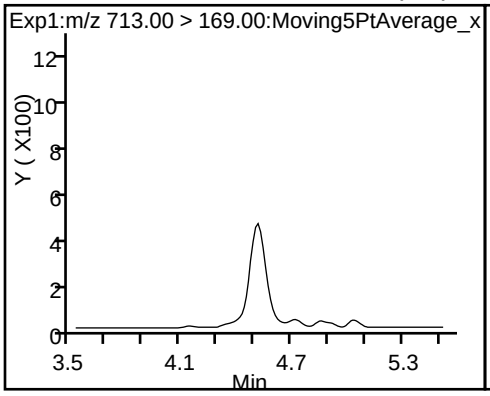
41 Perfluorotridecanoic acid (ND)



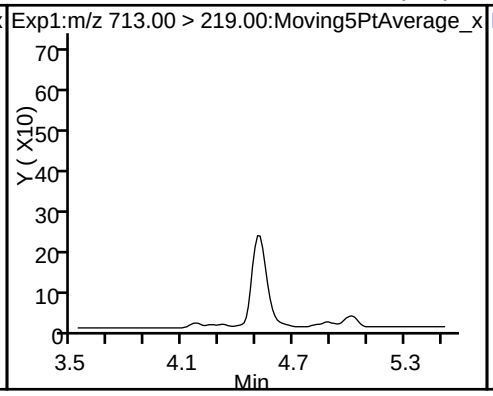
D 43 13C2-PFTeDA



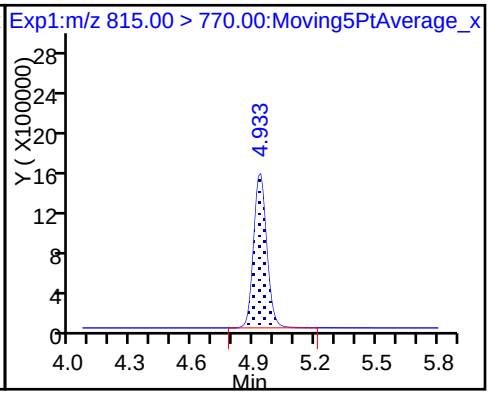
42 Perfluorotetradecanoic acid (ND)



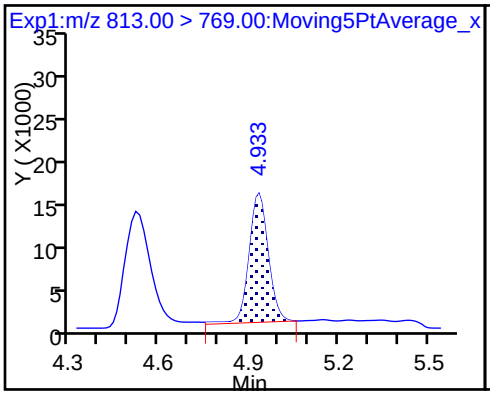
42 Perfluorotetradecanoic acid (ND)



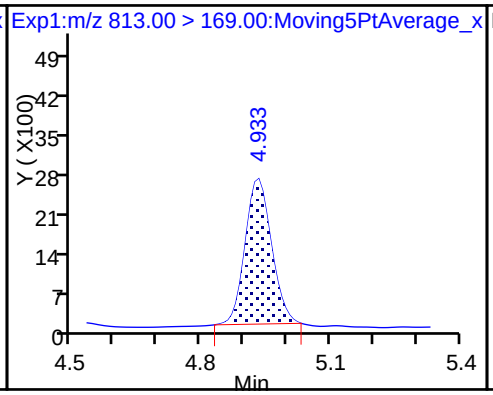
D 44 13C2-PFHxDA



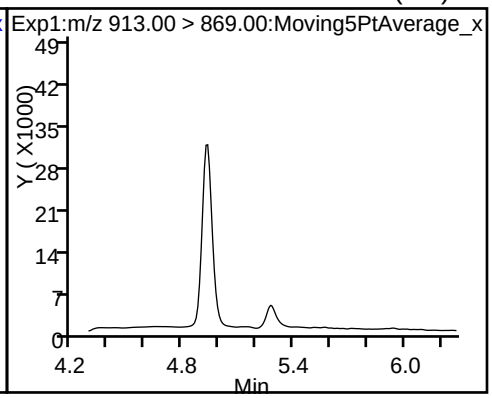
45 Perfluorohexadecanoic acid



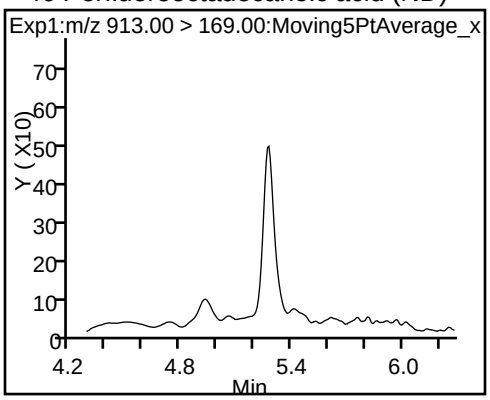
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid (ND)



46 Perfluorooctadecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

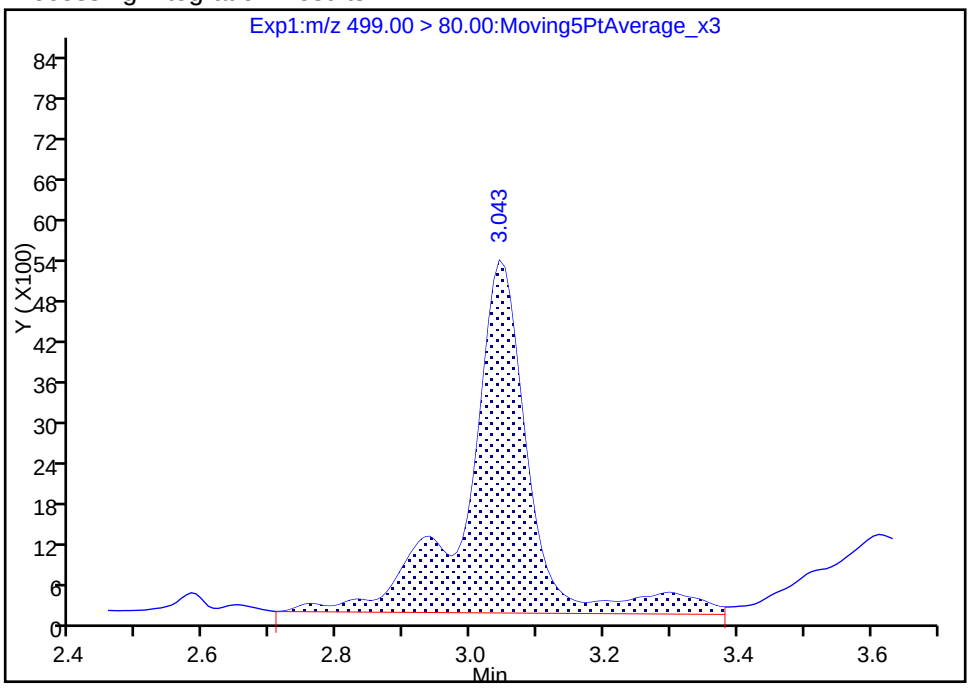
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_002.d
Injection Date: 18-Nov-2017 16:55:29 Instrument ID: A8_N
Lims ID: MB 320-195219/1-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

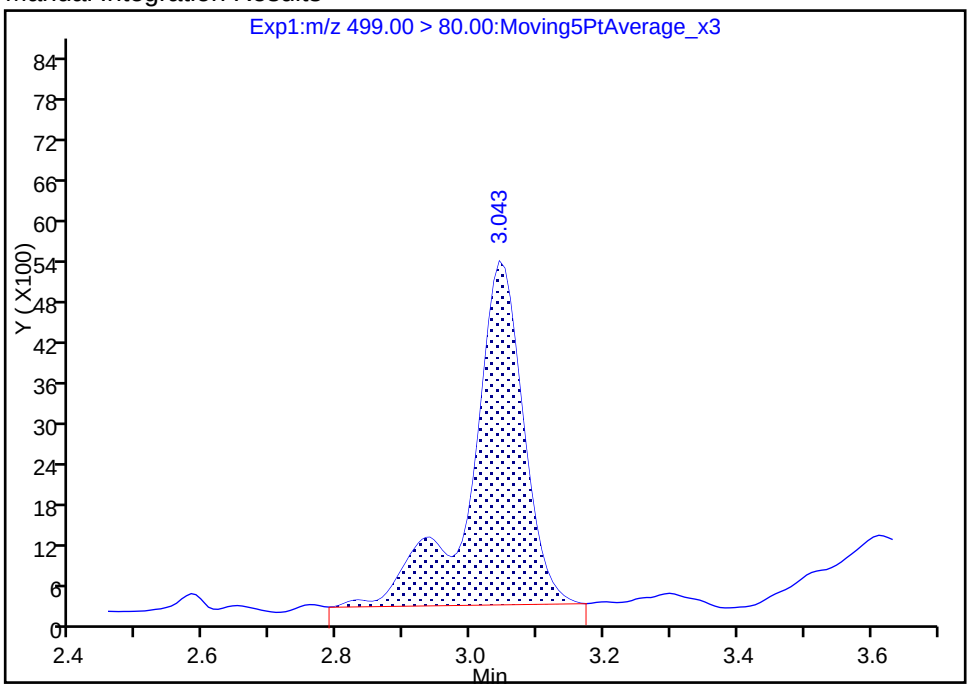
Processing Integration Results

RT: 3.04
Area: 34189
Amount: 0.019538
Amount Units: ng/ml



Manual Integration Results

RT: 3.04
Area: 28307
Amount: 0.016176
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 11:27:41
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

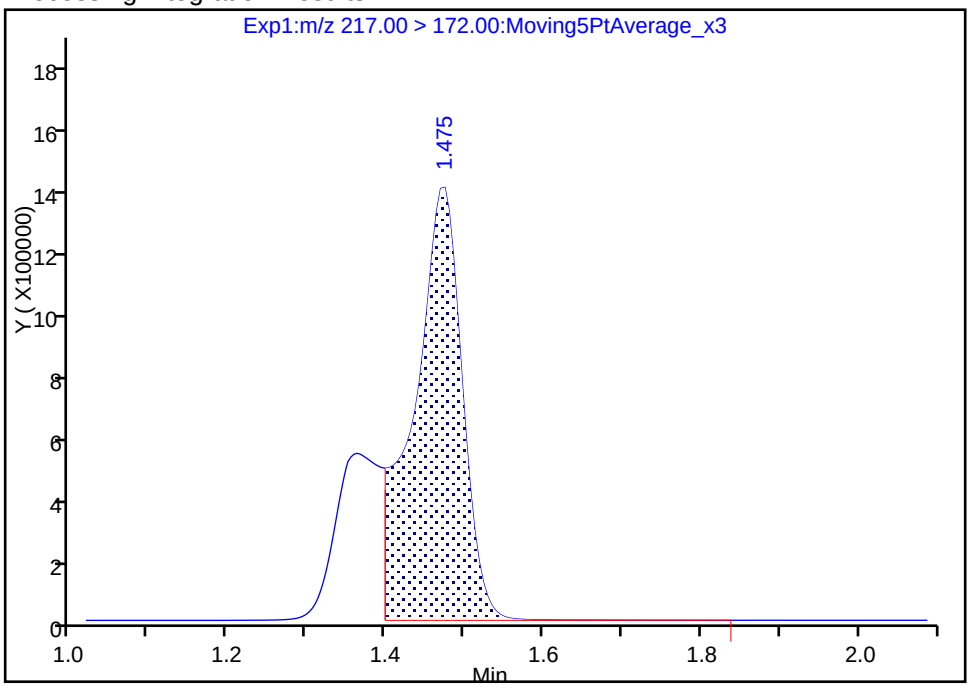
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_002.d
Injection Date: 18-Nov-2017 16:55:29 Instrument ID: A8_N
Lims ID: MB 320-195219/1-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

D 1 13C4 PFBA, CAS: STL00992

Signal: 1

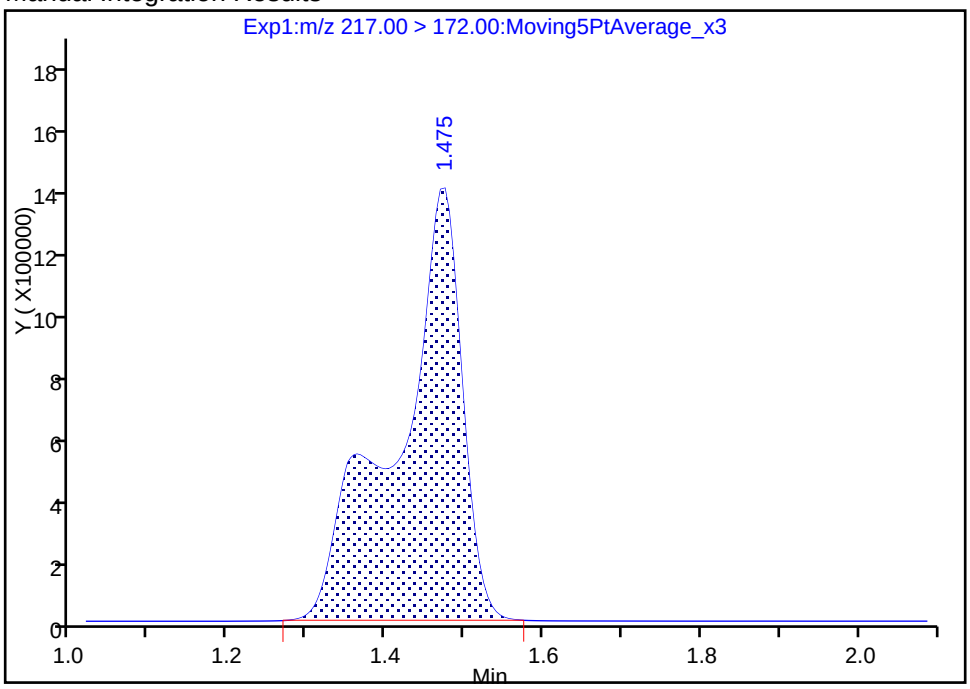
Processing Integration Results

RT: 1.47
Area: 5740124
Amount: 2.046105
Amount Units: ng/ml



Manual Integration Results

RT: 1.47
Area: 7760975
Amount: 2.766451
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 11:28:28
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-195219/2-A

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_003.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 250.00(mL) | Date Analyzed: 11/18/2017 17:03

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	41.4	M	2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	40.8		2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	42.1		4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	40.0		2.0	1.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	41.5		4.0	2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	41.6		2.0	1.0	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	41.3		2.0	1.0	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	36.0		4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	44.5		4.0	2.0	0.55
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	37.9		4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	39.4		2.0	1.0	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36.5		2.0	1.0	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	35.4		2.0	1.0	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	39.5		2.0	1.0	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	39.2		4.0	2.0	0.54
335-77-3	Perfluorodecanesulfonic acid (PFDS)	39.0		2.0	1.0	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	41.7		2.0	1.0	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-195219/2-A

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_003.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 250.00(mL) | Date Analyzed: 11/18/2017 17:03

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	106		25-150
STL00992	13C4 PFBA	112	M	25-150
STL00993	13C2 PFHxA	108		25-150
STL00990	13C4 PFOA	100		25-150
STL00995	13C5 PFNA	113		25-150
STL00996	13C2 PFDA	117		25-150
STL00997	13C2 PFUnA	121		25-150
STL00998	13C2 PFDoA	102		25-150
STL00994	18O2 PFHxS	113		25-150
STL00991	13C4 PFOS	113		25-150
STL02116	13C2-PFTeDA	102		25-150
STL01892	13C4-PFHpA	112		25-150
STL01893	13C5 PFPeA	112		25-150
STL02337	13C3-PFBS	118		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_003.d
Lims ID: LCS 320-195219/2-A
Client ID:
Sample Type: LCS
Inject. Date: 18-Nov-2017 17:03:22 ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-195219/2-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 24-Nov-2017 11:45:18 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK033

First Level Reviewer: phomsophat Date: 19-Nov-2017 12:49:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										M
217.00 > 172.00	1.469	1.479	-0.010	0.549	7358782	2.80		112	19295	M
2 Perfluorobutyric acid										M
212.90 > 169.00	1.469	1.480	-0.011	1.000	2791464	1.04		104	676	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.745	1.738	0.007	0.652	4665061	2.80		112	58708	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.745	1.740	0.005	1.000	2146380	1.02		102	1587	
D 47 13C3-PFBS										
301.90 > 83.00	1.778	1.774	0.004	0.664	100011	2.75		118	3744	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.786	1.776	0.010	1.005	2913939	0.9115		103	14276	
298.90 > 99.00	1.786	1.776	0.010	1.005	1214133		2.40(1.74-3.24)		10141	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.992	1.977	0.015	1.000	848158	2.10		225	31533	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.023	2.010	0.013	1.000	2140192	1.05		105	4397	
313.00 > 119.00	2.023	2.010	0.013	1.000	200744		10.66(7.05-13.09)		3082	
D 7 13C2 PFHxA										
315.00 > 270.00	2.023	2.010	0.013	0.756	5083312	2.70		108	59124	
D 9 13C4-PFHpA										
367.00 > 322.00	2.341	2.332	0.009	0.875	5105209	2.81		112	54150	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.341	2.333	0.008	1.000	2092549	1.00		100.0	2768	
363.00 > 169.00	2.341	2.333	0.008	1.000	836632		2.50(1.59-2.95)		4669	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.352	2.347	0.005	1.000	2346674	0.8861		97.4	13704	
399.00 > 99.00	2.352	2.347	0.005	1.000	808175		2.90(2.10-3.89)		6829	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.352	2.347	0.005	0.879	5718484	2.67		113	58695	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.654	2.671	-0.016	1.000	1003919	1.16		122	1979	
D 12 M2-6:2FTS										
429.00 > 81.00	2.654	2.671	-0.017	0.992	1284223	1.41		59.4	20089	
D 14 13C4 PFOA										
417.00 > 372.00	2.676	2.680	-0.004	1.000	5223262	2.51		100	82148	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.676	2.680	-0.004	1.000	2287852	1.04		104	972	
413.00 > 169.00	2.676	2.680	-0.004	1.000	1202590		1.90(1.18-2.19)		7488	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.683	2.687	-0.004	1.000	2095677	0.9880		104	24042	
449.00 > 99.00	2.683	2.687	-0.004	1.000	573987		3.65(2.72-5.05)		13183	
* 62 13C2-PFOA										
415.00 > 370.00	2.676	2.695	-0.019		5057864	2.50			63062	
D 18 13C4 PFOS										
503.00 > 80.00	3.040	3.042	-0.002	1.136	3872793	2.70		113	30378	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.040	3.042	-0.002	1.000	1664583	0.9790		105	2543	
499.00 > 99.00	3.040	3.042	-0.002	1.000	363546		4.58(3.24-6.01)		2559	
D 19 13C5 PFNA										
468.00 > 423.00	3.040	3.042	-0.002	1.136	4322722	2.82		113	45149	
20 Perfluorononanoic acid										
463.00 > 419.00	3.040	3.045	-0.005	1.000	1794192	1.04		104	3202	
463.00 > 169.00	3.040	3.045	-0.005	1.000	395246		4.54(2.65-4.93)		9455	
D 26 M2-8:2FTS										
529.00 > 81.00	3.387	3.390	-0.003	1.266	1513970	3.13		131	17977	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.387	3.392	-0.005	1.000	762045	0.99		104	18714	
D 21 13C8 FOSA										
506.00 > 78.00	3.387	3.393	-0.006	1.266	4877291	2.64		106	34919	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.387	3.395	-0.008	1.000	1952793	1.04		104	25574	
D 23 13C2 PFDA										
515.00 > 470.00	3.395	3.400	-0.005	1.269	3773734	2.92		117	35093	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.395	3.400	-0.005	1.000	1513336	1.03		103	6836	
513.00 > 169.00	3.395	3.400	-0.005	1.000	267948		5.65(3.31-6.15)		3745	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.546	3.557	-0.011	1.325	2088334	3.01		120	13880	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.554	3.561	-0.007	1.002	891888	1.02		102	5220	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.708	3.714	-0.006	1.000	954147	0.9744		101	15005	
599.00 > 99.00	3.708	3.714	-0.006	1.000	348302		2.74(1.94-3.60)		10342	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.716	3.725	-0.009	1.389	2019874	3.03		121	11225	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFUnA										
565.00 > 520.00	3.716	3.730	-0.014	1.389	3127458	3.03		121	48785	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.716	3.731	-0.015	1.000	764366	0.9867		98.7	7878	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.716	3.731	-0.015	1.000	1020475	0.9012		90.1	4771	
563.00 > 169.00	3.716	3.731	-0.015	1.000	228485		4.47(0.00-0.00)		8656	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.897	3.896	0.001	1.456	910915	1.70		68.0	1972	
35 MeFOSA										
512.00 > 169.00	3.897	3.903	-0.006	1.000	408290	1.14		114	1825	
D 36 13C2 PFDoA										
615.00 > 570.00	4.014	4.024	-0.010	1.500	3053987	2.55		102	43991	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.014	4.025	-0.011	1.000	1330046	1.11		111	6803	
613.00 > 169.00	4.014	4.025	-0.011	1.000	335496		3.96(2.19-4.07)		13894	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.077	4.084	-0.007	1.524	649330	1.31		52.3	1214	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.087	4.091	-0.004	1.002	301182	1.16		116	1214	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.272	4.287	-0.015	1.000	1417301	0.9478		94.8	4389	
663.00 > 169.00	4.272	4.287	-0.015	1.000	455261		3.11(1.76-3.26)		14646	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.515	4.526	-0.011	1.687	3743444	2.54		102	26776	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.515	4.526	-0.011	1.000	361762	0.9851		98.5	8858	
713.00 > 219.00	4.501	4.526	-0.025	0.997	251621		1.44(1.00-1.85)		10825	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.923	4.938	-0.015	1.840	6322452	2.43		97.0	25522	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.923	4.939	-0.016	1.000	2298054	1.00		100	1498	R
813.00 > 169.00	4.923	4.939	-0.016	1.000	410146		5.60(2.50-4.65)		5896	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.268	5.286	-0.018	1.000	2730061	1.09		109	929	
913.00 > 169.00	5.268	5.286	-0.018	1.000	343753		7.94(0.00-0.00)		2179	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 24-Nov-2017 11:45:29 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_003.d

Injection Date: 18-Nov-2017 17:03:22 Instrument ID: A8_N

Lims ID: LCS 320-195219/2-A

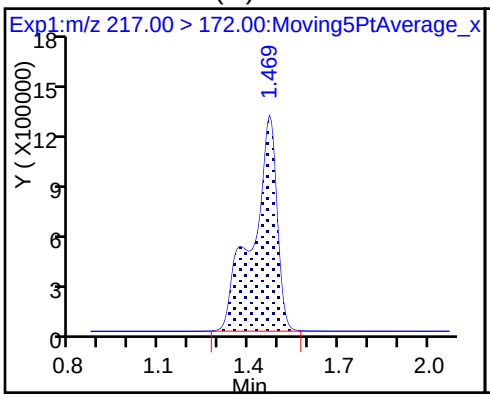
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 3

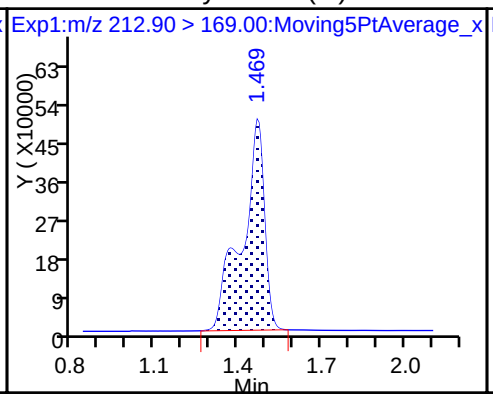
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

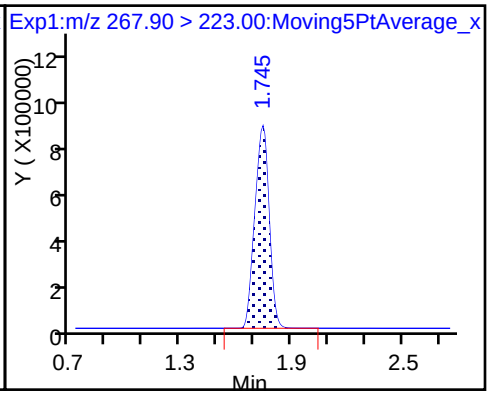
D 1 13C4 PFBA (M)



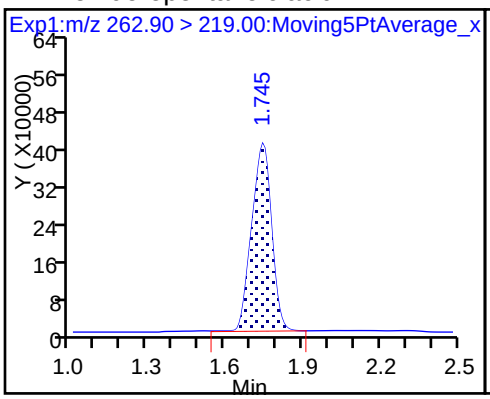
2 Perfluorobutyric acid (M)



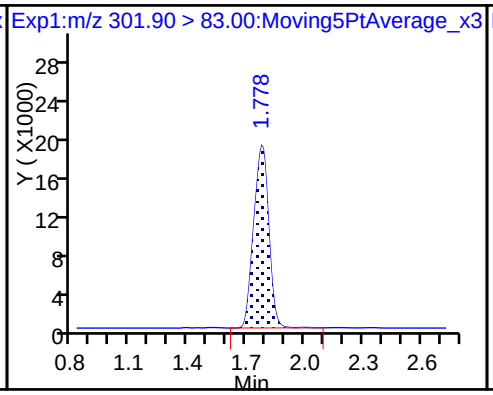
D 3 13C5-PFPeA



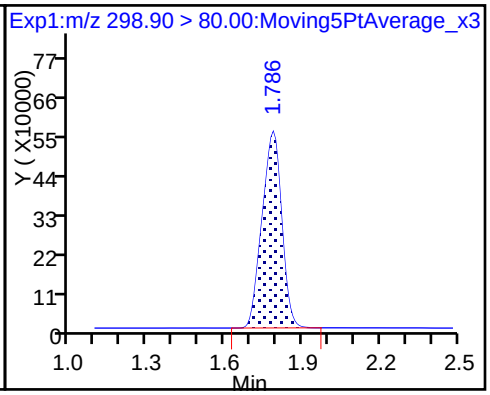
4 Perfluoropentanoic acid



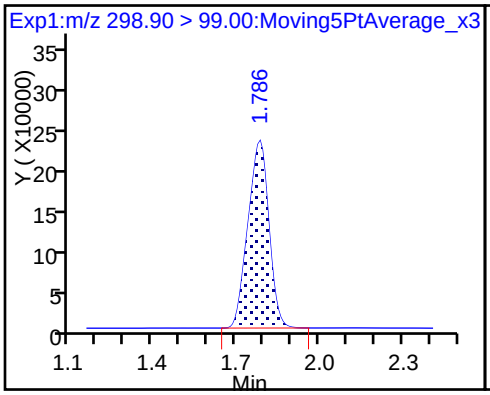
D 47 13C3-PFBS



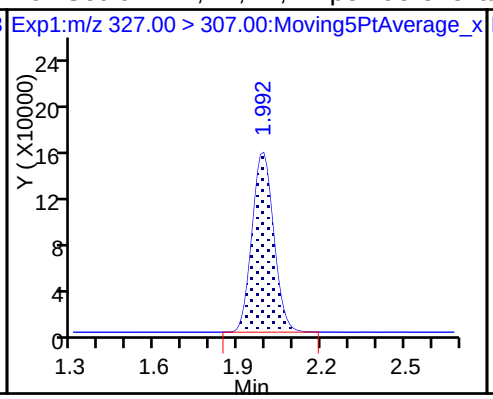
5 Perfluorobutanesulfonic acid



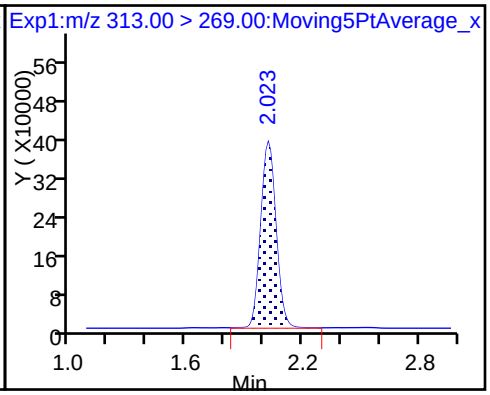
5 Perfluorobutanesulfonic acid



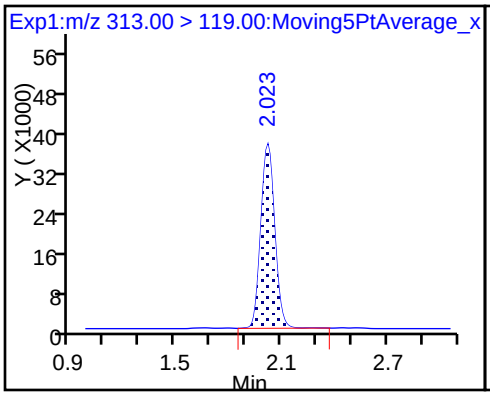
61 Sodium 1H,1H,2H,2H-perfluorohexane



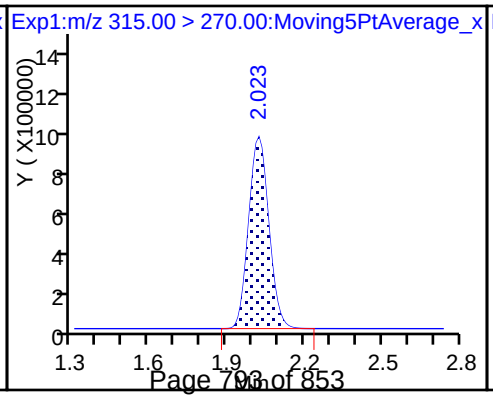
6 Perfluorohexanoic acid



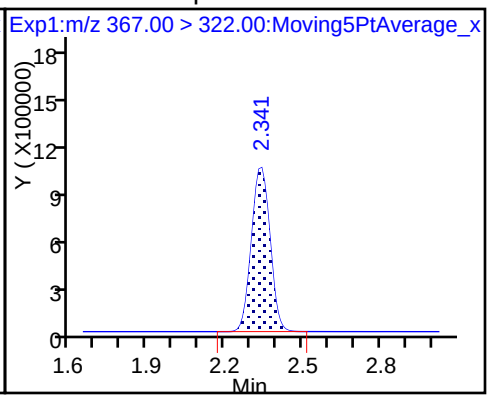
6 Perfluorohexanoic acid



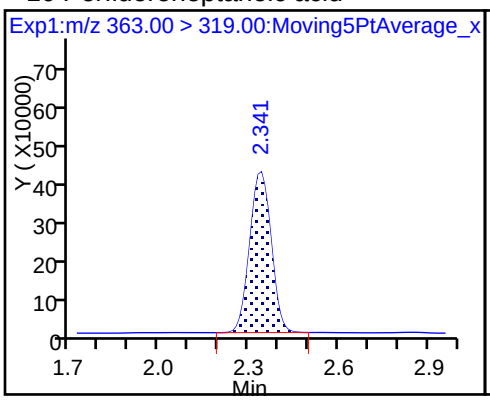
D 7 13C2 PFHxA



D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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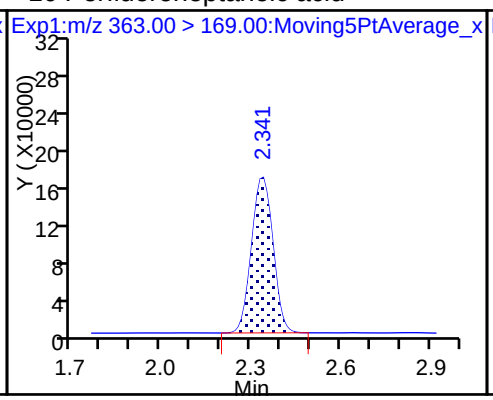
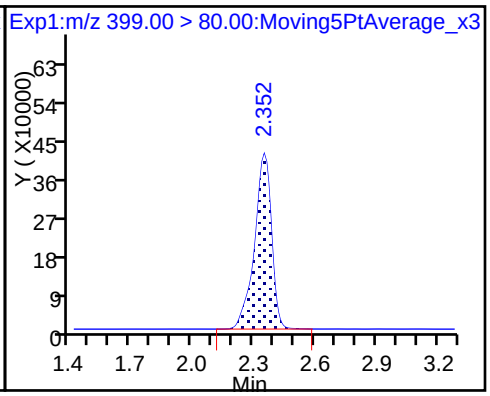
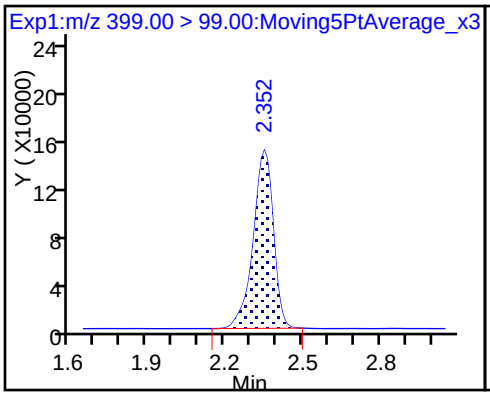


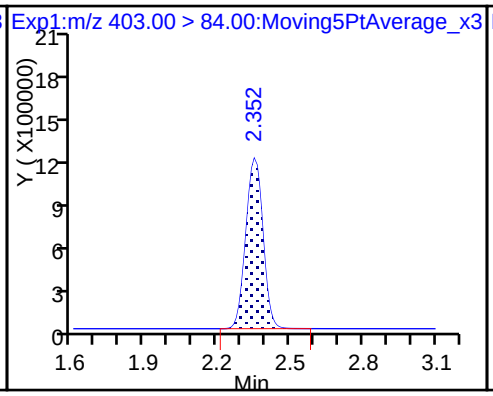
8 Perfluorohexanesulfonic acid



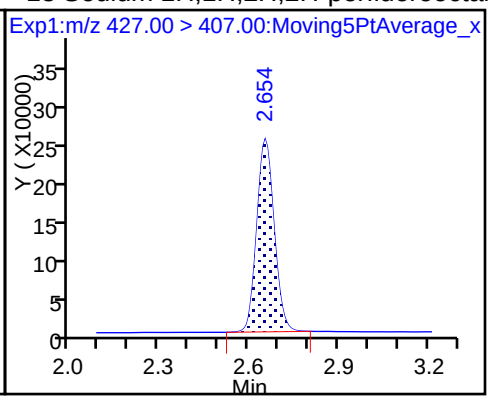
8 Perfluorohexanesulfonic acid



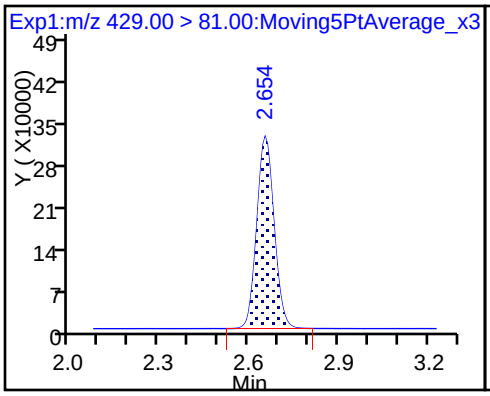
D 11 18O2 PFHxS



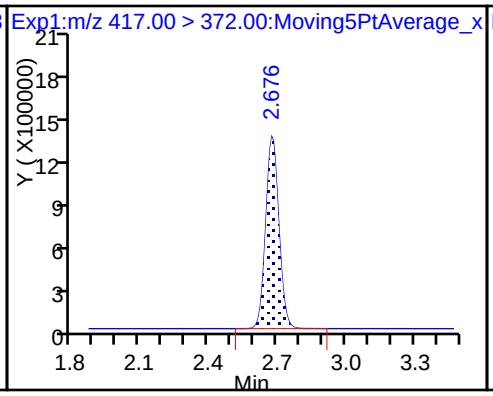
13 Sodium 1H,1H,2H,2H-perfluorooctane



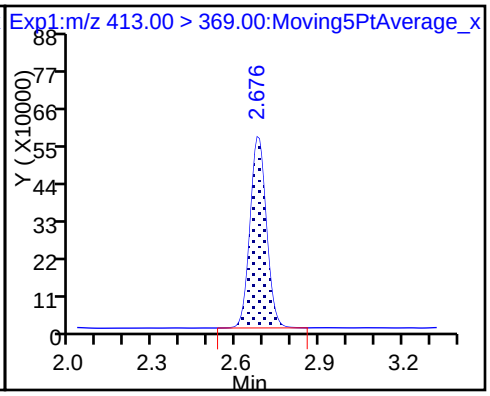
D 12 M2-6:2FTS



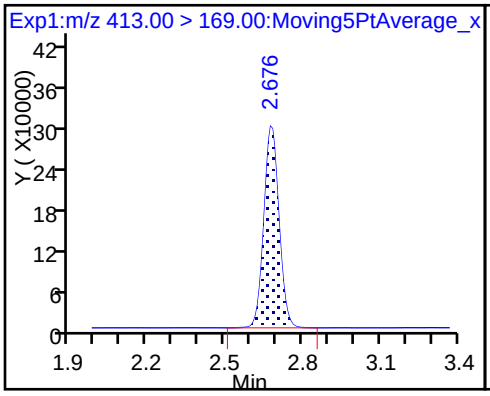
D 14 13C4 PFOA



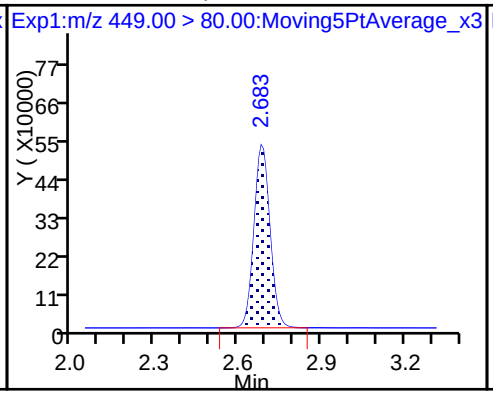
15 Perfluorooctanoic acid



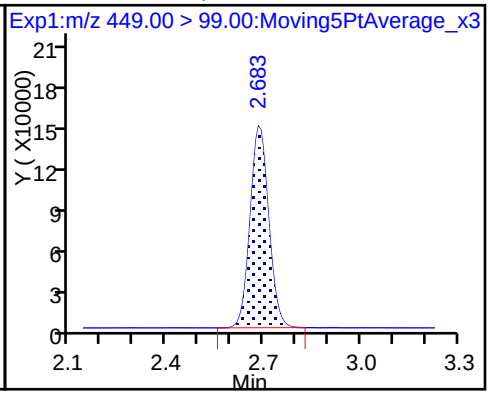
15 Perfluorooctanoic acid



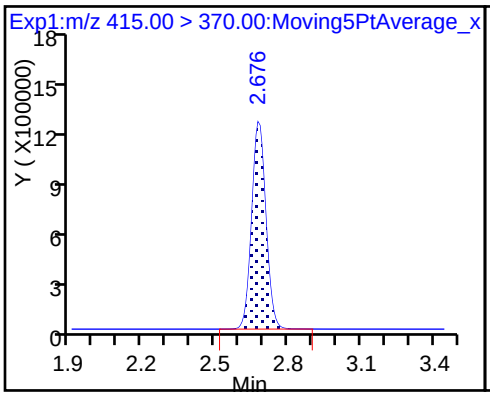
16 Perfluoroheptanesulfonic Acid



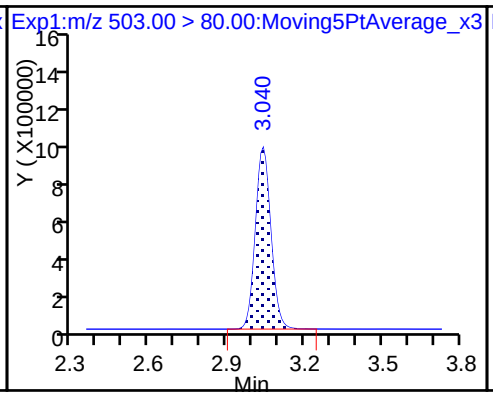
16 Perfluoroheptanesulfonic Acid



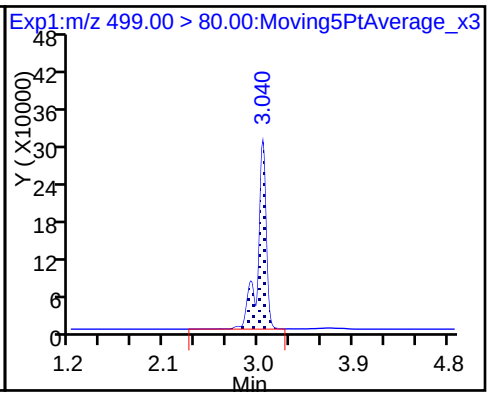
* 62 13C2-PFOA



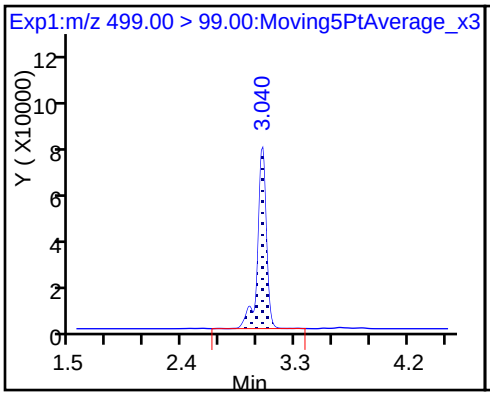
D 18 13C4 PFOS



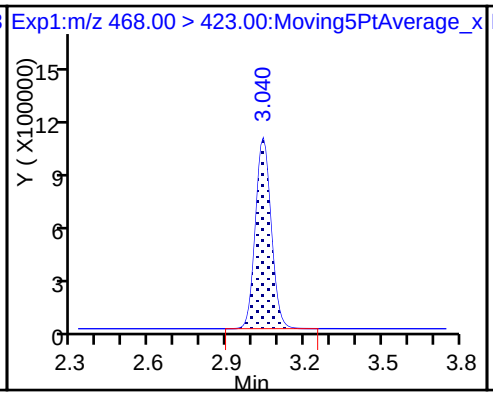
17 Perfluorooctane sulfonic acid



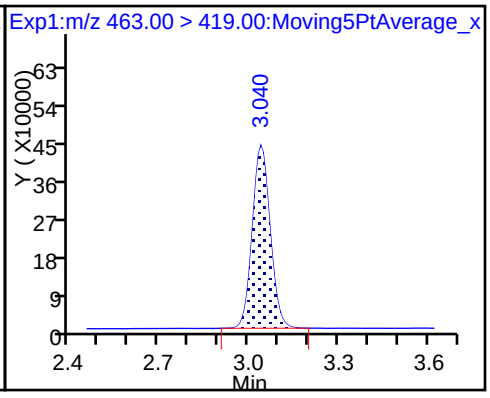
17 Perfluorooctane sulfonic acid



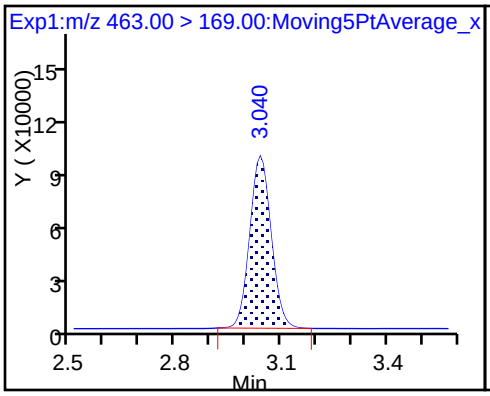
D 19 13C5 PFNA



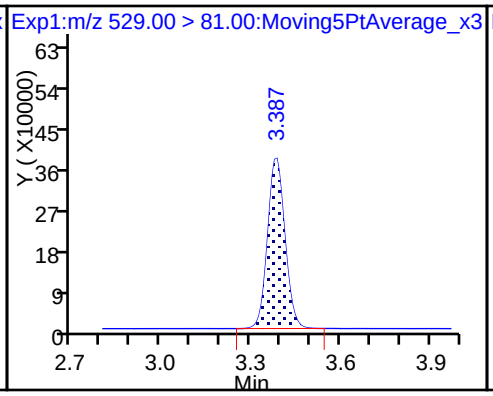
20 Perfluorononanoic acid



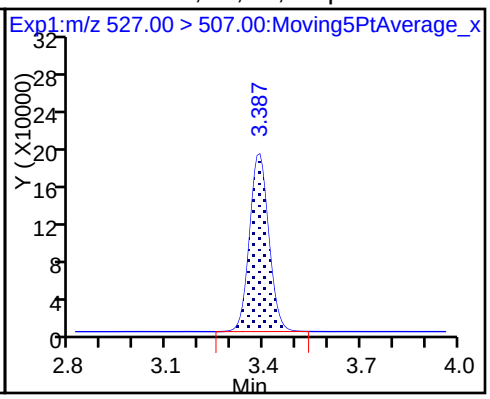
20 Perfluorononanoic acid



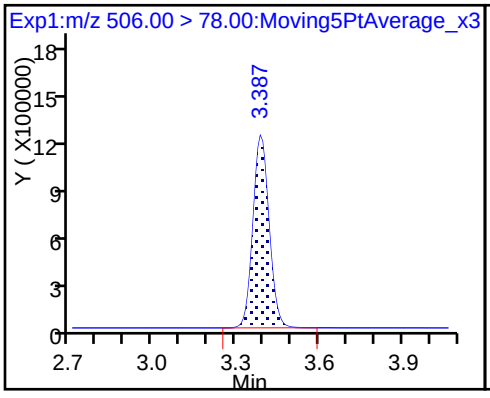
D 26 M2-8:2FTS



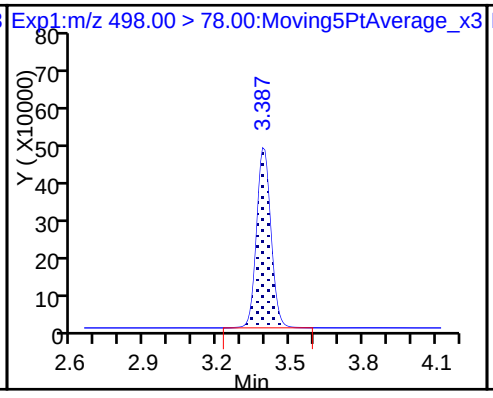
25 Sodium 1H,1H,2H,2H-perfluorodecane



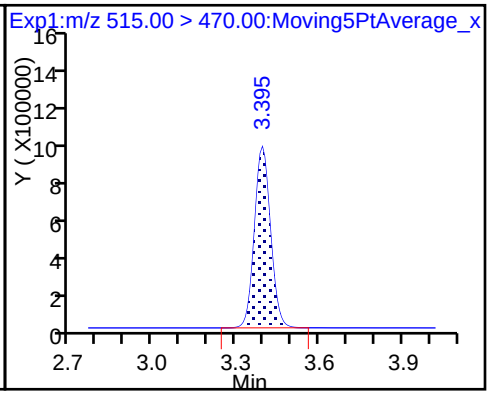
D 21 13C8 FOSA



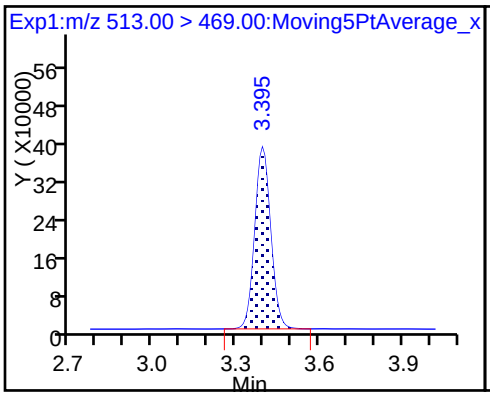
22 Perfluorooctane Sulfonamide



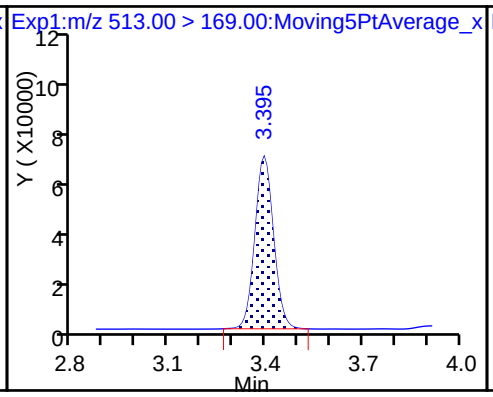
D 23 13C2 PFDA



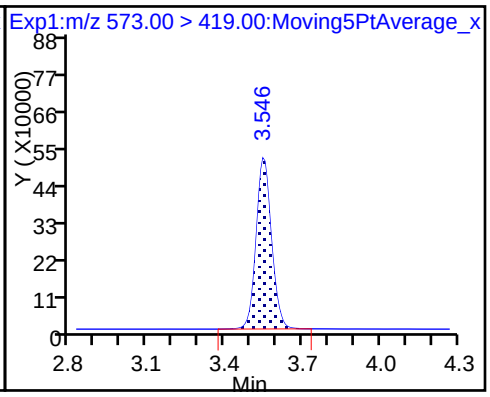
24 Perfluorodecanoic acid



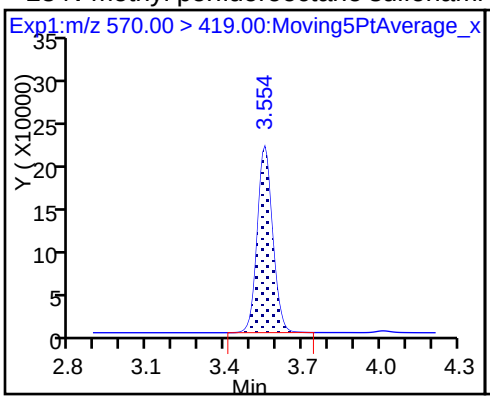
24 Perfluorodecanoic acid



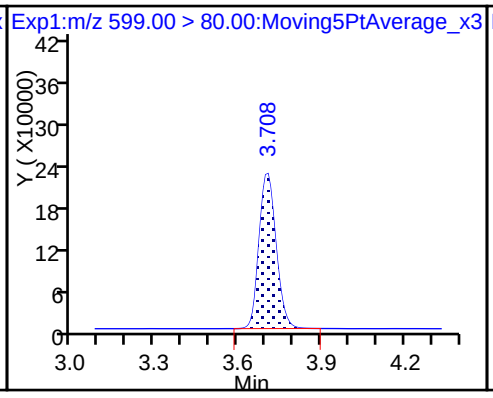
D 27 d3-NMeFOSAA



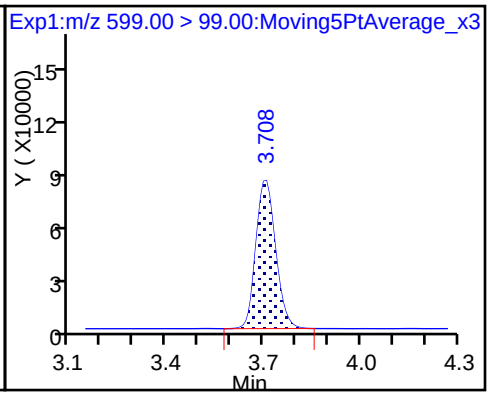
28 N-methyl perfluorooctane sulfonami



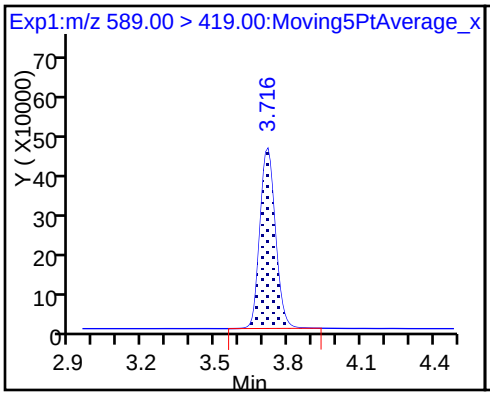
29 Perfluorodecane Sulfonic acid



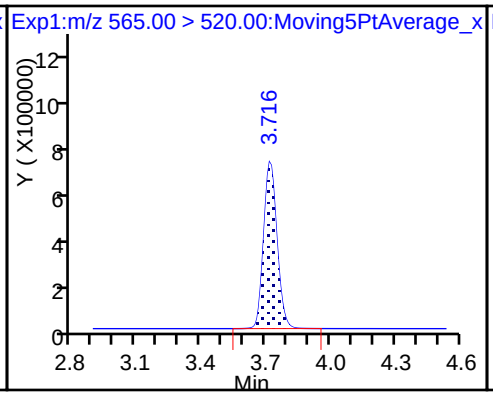
29 Perfluorodecane Sulfonic acid



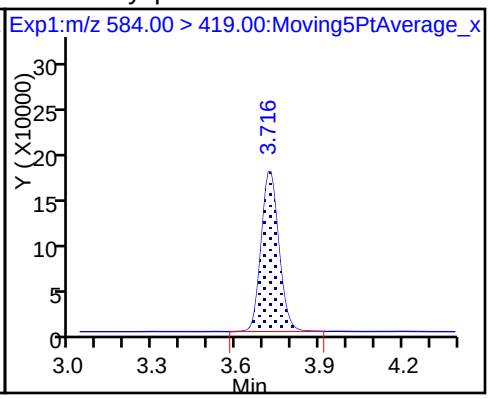
D 32 d5-NEtFOSAA



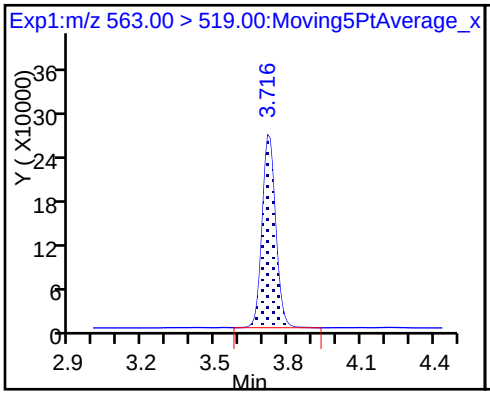
D 30 13C2 PFUnA



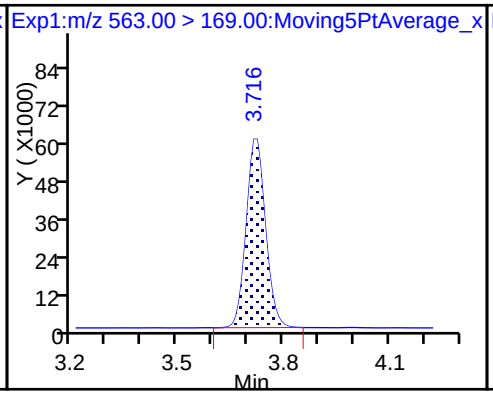
33 N-ethyl perfluorooctane sulfonamid



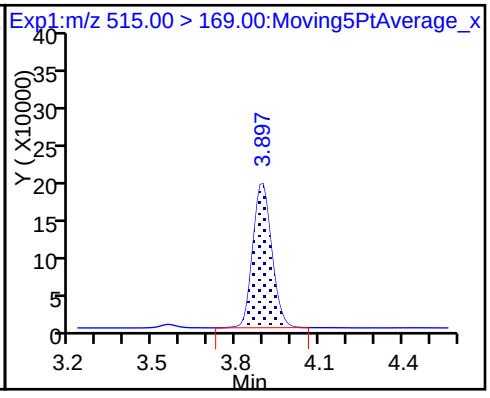
31 Perfluoroundecanoic acid



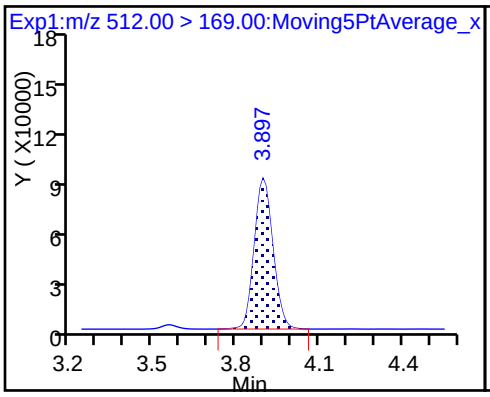
31 Perfluoroundecanoic acid



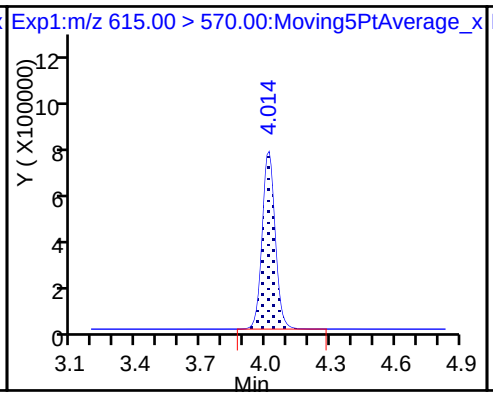
D 34 d-N-MeFOSA-M



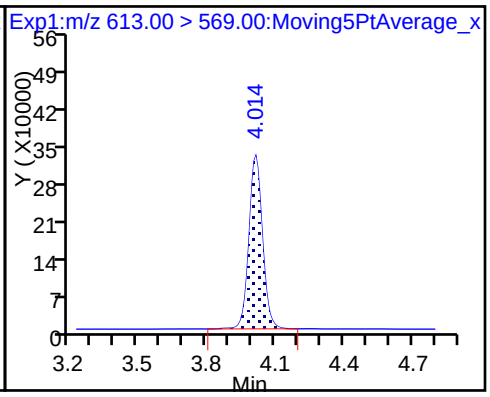
35 MeFOSA



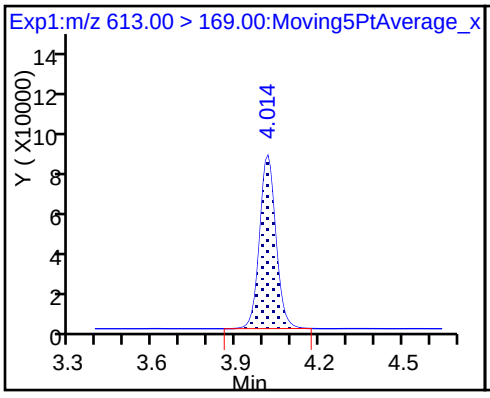
D 36 13C2 PFDoA



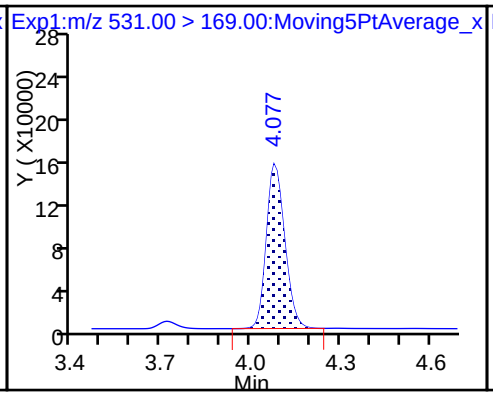
37 Perfluorododecanoic acid



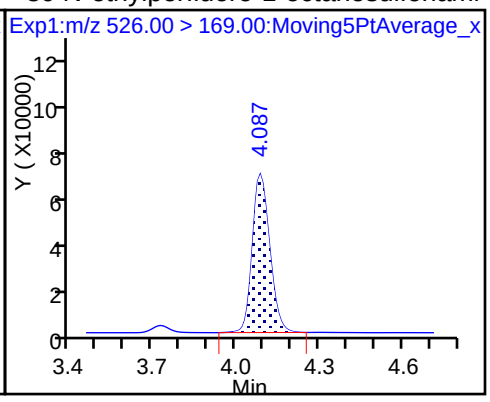
37 Perfluorododecanoic acid



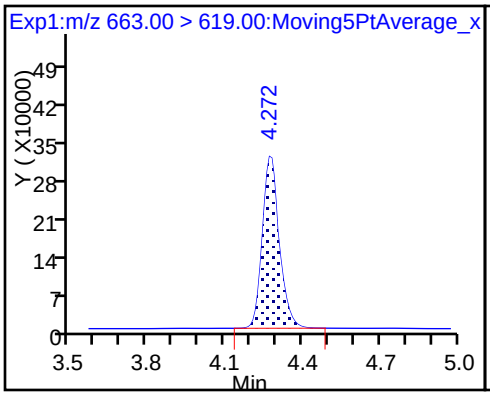
D 38 d-N-EtFOSA-M



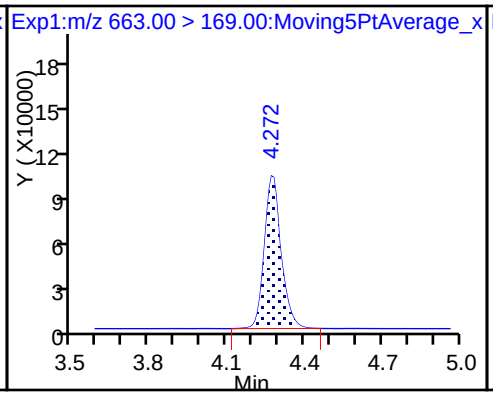
39 N-ethylperfluoro-1-octanesulfonami



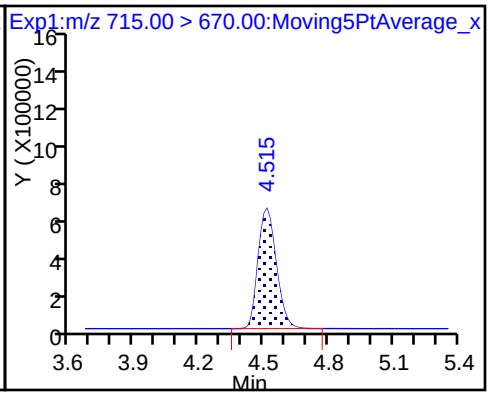
41 Perfluorotridecanoic acid



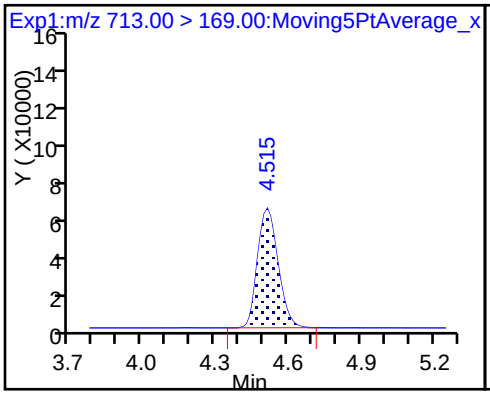
41 Perfluorotridecanoic acid



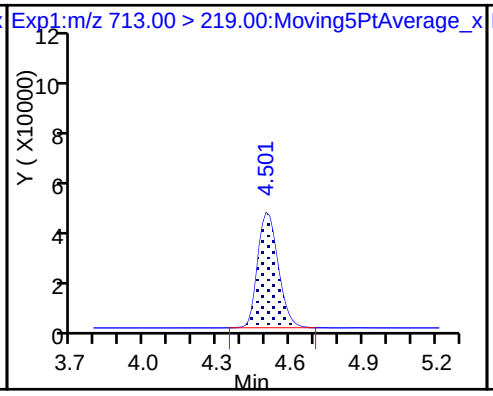
D 43 13C2-PFTeDA



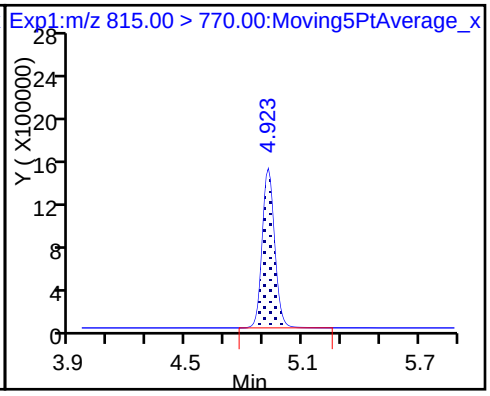
42 Perfluorotetradecanoic acid



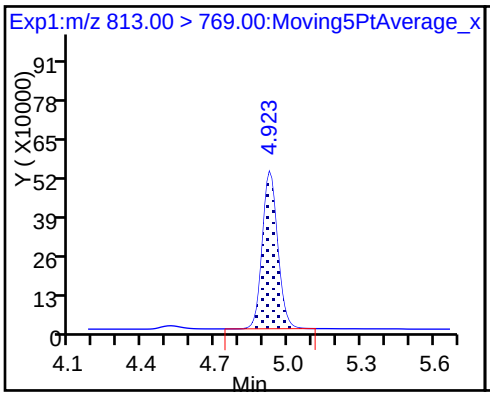
42 Perfluorotetradecanoic acid



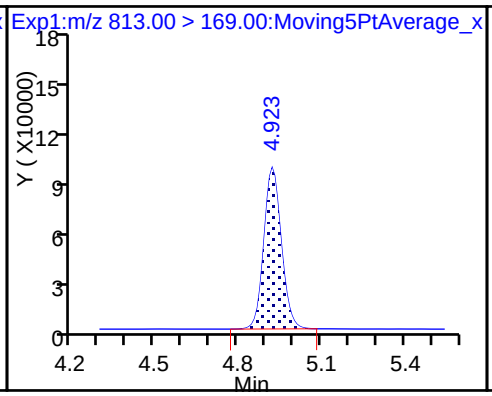
D 44 13C2-PFHxDA



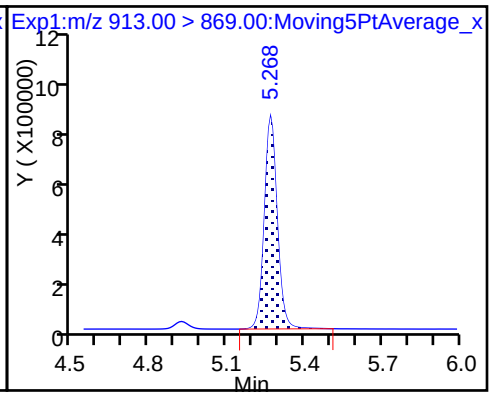
45 Perfluorohexadecanoic acid



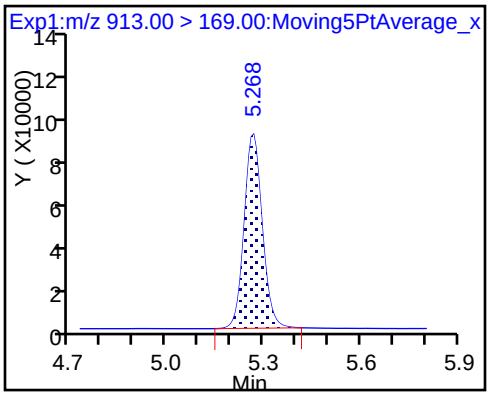
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

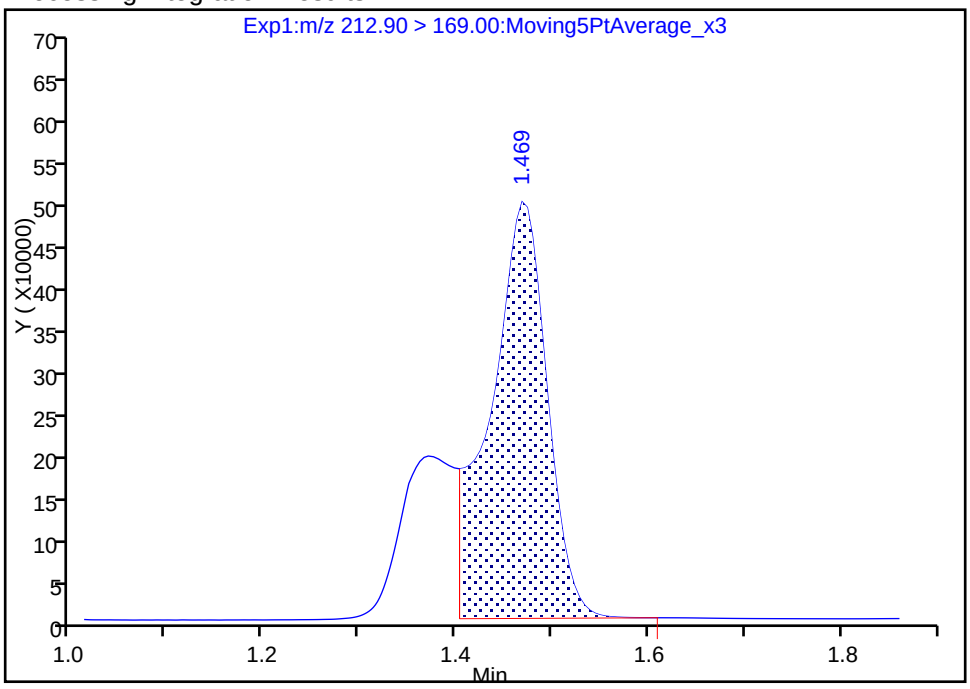
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_003.d
Injection Date: 18-Nov-2017 17:03:22 Instrument ID: A8_N
Lims ID: LCS 320-195219/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

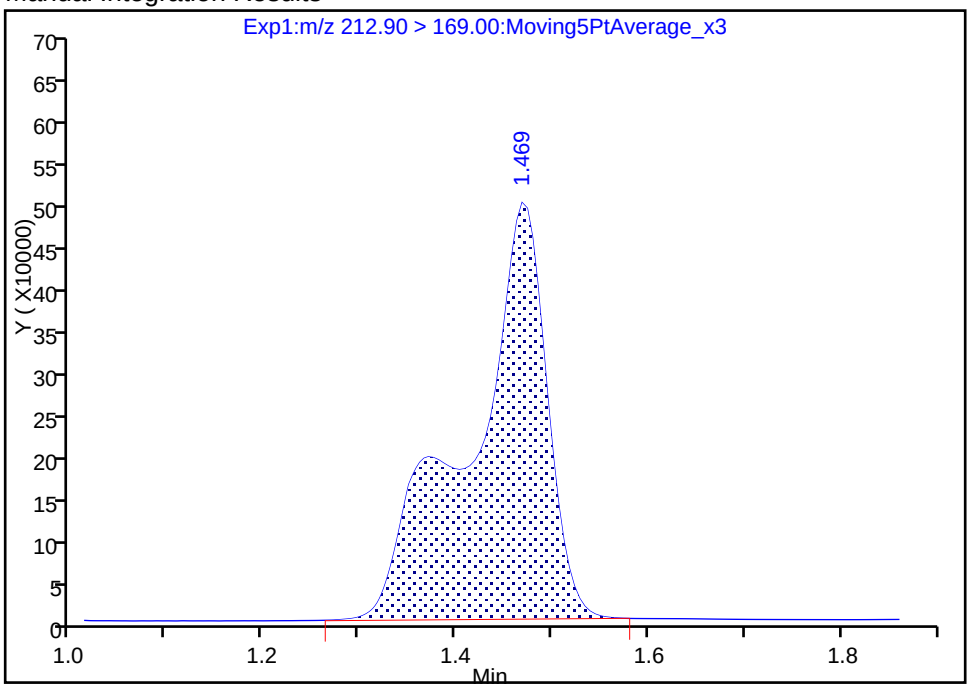
Processing Integration Results

RT: 1.47
Area: 2029254
Amount: 0.753001
Amount Units: ng/ml



Manual Integration Results

RT: 1.47
Area: 2791464
Amount: 1.035837
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 11:29:59
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

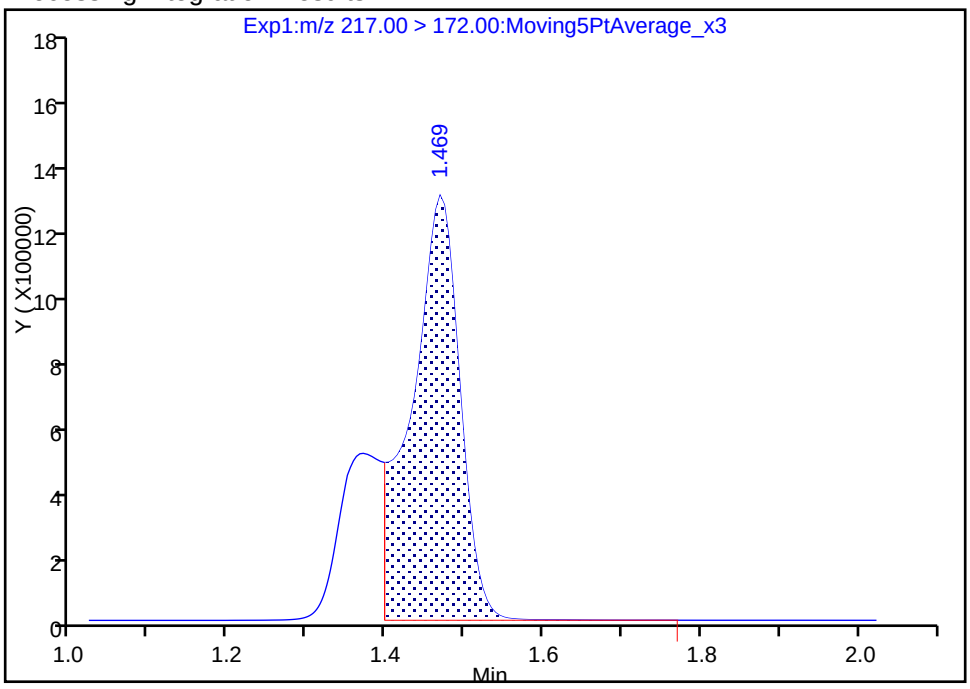
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_003.d
Injection Date: 18-Nov-2017 17:03:22 Instrument ID: A8_N
Lims ID: LCS 320-195219/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

D 1 13C4 PFBA, CAS: STL00992

Signal: 1

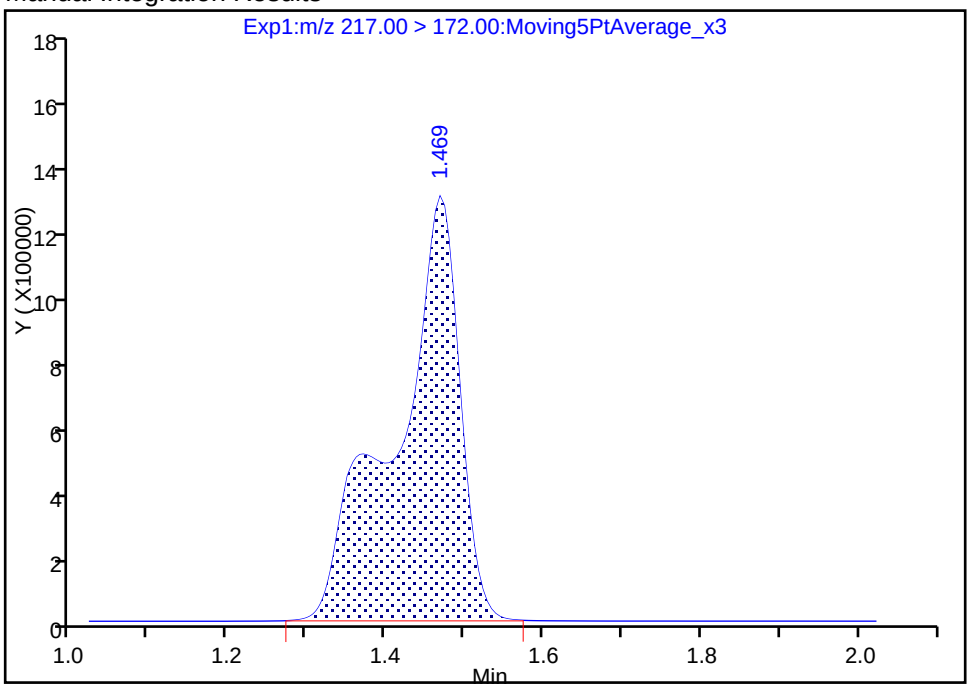
Processing Integration Results

RT: 1.47
Area: 5491240
Amount: 2.085678
Amount Units: ng/ml



Manual Integration Results

RT: 1.47
Area: 7358782
Amount: 2.795006
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 11:29:40
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCSD 320-195219/3-A

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_004.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 250.00(mL) | Date Analyzed: 11/18/2017 17:11

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	40.3	M	2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	40.3		2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	39.7		4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	40.6		2.0	1.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	39.6		4.0	2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	38.4		2.0	1.0	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	40.0		2.0	1.0	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	35.1		4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	43.0		4.0	2.0	0.55
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	38.8		4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	40.4		2.0	1.0	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34.2		2.0	1.0	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	33.9		2.0	1.0	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	38.8		2.0	1.0	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	37.1		4.0	2.0	0.54
335-77-3	Perfluorodecanesulfonic acid (PFDS)	39.0		2.0	1.0	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	40.7		2.0	1.0	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCSD 320-195219/3-A

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_004.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 250.00(mL) | Date Analyzed: 11/18/2017 17:11

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	102		25-150
STL00992	13C4 PFBA	114	M	25-150
STL00993	13C2 PFHxA	116		25-150
STL00990	13C4 PFOA	101		25-150
STL00995	13C5 PFNA	117		25-150
STL00996	13C2 PFDA	116		25-150
STL00997	13C2 PFUnA	124		25-150
STL00998	13C2 PFDoA	105		25-150
STL00994	18O2 PFHxS	120		25-150
STL00991	13C4 PFOS	118		25-150
STL02116	13C2-PFTeDA	103		25-150
STL01892	13C4-PFHpA	113		25-150
STL01893	13C5 PFPeA	115		25-150
STL02337	13C3-PFBS	125		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_004.d
Lims ID: LCSD 320-195219/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 18-Nov-2017 17:11:15 ALS Bottle#: 4 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-195219/3-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 24-Nov-2017 11:45:18 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK033

First Level Reviewer: hannigana Date: 24-Nov-2017 11:31:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										M
217.00 > 172.00	1.474	1.479	-0.005	0.549	7412428	2.85		114	22333	M
2 Perfluorobutyric acid										M
212.90 > 169.00	1.474	1.480	-0.006	1.000	2735645	1.01		101	631	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.753	1.738	0.015	0.653	4717185	2.87		115	62607	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.753	1.740	0.013	1.000	2143732	1.01		101	1562	
D 47 13C3-PFBS										
301.90 > 83.00	1.786	1.774	0.012	0.666	104725	2.91		125	3233	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.795	1.776	0.019	1.005	2861001	0.8547		96.7	15061	
298.90 > 99.00	1.795	1.776	0.019	1.005	1220946		2.34(1.74-3.24)		10701	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.992	1.977	0.015	1.000	834418	2.00		214	50754	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.033	2.010	0.023	1.000	2138801	0.99		99.2	4919	
313.00 > 119.00	2.033	2.010	0.023	1.000	200019		10.69(7.05-13.09)		2257	
D 7 13C2 PFHxA										
315.00 > 270.00	2.033	2.010	0.023	0.758	5388774	2.90		116	51851	
D 9 13C4-PFHpA										
367.00 > 322.00	2.341	2.332	0.009	0.873	5053818	2.82		113	72437	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.341	2.333	0.008	1.000	2103139	1.01		101	2813	
363.00 > 169.00	2.341	2.333	0.008	1.000	819374		2.57(1.59-2.95)		4323	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.363	2.347	0.016	1.000	2360788	0.8463		93.0	13295	
399.00 > 99.00	2.363	2.347	0.016	1.000	796150		2.97(2.10-3.89)		5446	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.363	2.347	0.016	0.881	6023393	2.84		120	58758	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.661	2.671	-0.009	1.000	946343	1.06		111	2684	
D 12 M2-6:2FTS										
429.00 > 81.00	2.661	2.671	-0.010	0.992	1327092	1.48		62.2	25017	
D 14 13C4 PFOA										
417.00 > 372.00	2.683	2.680	0.003	1.000	5211387	2.53		101	62069	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.683	2.680	0.003	1.000	2178460	0.99		99.1	908	
413.00 > 169.00	2.683	2.680	0.003	1.000	1189662		1.83(1.18-2.19)		7244	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.690	2.687	0.003	1.000	2124536	0.9710		102	25428	
449.00 > 99.00	2.690	2.687	0.003	1.000	576861		3.68(2.72-5.05)		11929	
* 62 13C2-PFOA										
415.00 > 370.00	2.683	2.695	-0.012		4992841	2.50			44073	
D 18 13C4 PFOS										
503.00 > 80.00	3.040	3.042	-0.002	1.133	3995178	2.83		118	30279	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.040	3.042	-0.002	1.000	1627475	0.9278		100.0	2666	
499.00 > 99.00	3.040	3.042	-0.002	1.000	357862		4.55(3.24-6.01)		3013	
D 19 13C5 PFNA										
468.00 > 423.00	3.040	3.042	-0.002	1.133	4438751	2.94		117	44531	
20 Perfluorononanoic acid										
463.00 > 419.00	3.040	3.045	-0.005	1.000	1698235	0.9592		95.9	3340	
463.00 > 169.00	3.040	3.045	-0.005	1.000	434248		3.91(2.65-4.93)		10353	
D 26 M2-8:2FTS										
529.00 > 81.00	3.387	3.390	-0.003	1.262	1539030	3.22		135	16734	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.387	3.392	-0.005	1.000	756766	0.9698		101	19008	
D 21 13C8 FOSA										
506.00 > 78.00	3.395	3.393	0.001	1.265	4661593	2.56		102	29478	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.395	3.395	-0.001	1.000	1823949	1.02		102	21488	
D 23 13C2 PFDA										
515.00 > 470.00	3.395	3.400	-0.006	1.265	3688089	2.89		116	40224	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.395	3.400	-0.006	1.000	1432014	1.00		99.9	5832	
513.00 > 169.00	3.395	3.400	-0.006	1.000	260798		5.49(3.31-6.15)		3643	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.553	3.557	-0.004	1.324	2093299	3.06		122	15341	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.553	3.561	-0.008	1.000	878181	1.00		100	4604	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.708	3.714	-0.006	1.000	984267	0.9744		101	16664	
599.00 > 99.00	3.708	3.714	-0.006	1.000	339313		2.90(1.94-3.60)		10151	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.716	3.725	-0.009	1.385	2046178	3.11		124	9878	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFUnA										
565.00 > 520.00	3.725	3.730	-0.005	1.388	3147170	3.09		124	40768	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.725	3.731	-0.006	1.002	758006	0.9660		96.6	8628	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.725	3.731	-0.006	1.000	998463	0.8763		87.6	5556	
563.00 > 169.00	3.725	3.731	-0.006	1.000	229353		4.35(0.00-0.00)		8584	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.897	3.896	0.001	1.452	826603	1.56		62.5	1834	
35 MeFOSA										
512.00 > 169.00	3.897	3.903	-0.006	1.000	360185	1.11		111	1819	
D 36 13C2 PFDoA										
615.00 > 570.00	4.014	4.024	-0.010	1.496	3114739	2.63		105	40262	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.014	4.025	-0.011	1.000	1312708	1.08		108	5876	
613.00 > 169.00	4.014	4.025	-0.011	1.000	329773		3.98(2.19-4.07)		11641	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.087	4.084	0.003	1.523	636338	1.30		51.9	1178	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.097	4.091	0.006	1.002	269253	1.06		106	1154	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.280	4.287	-0.007	1.000	1480754	0.9710		97.1	4651	
663.00 > 169.00	4.280	4.287	-0.007	1.000	463980		3.19(1.76-3.26)		17218	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.515	4.526	-0.011	1.683	3761057	2.59		103	23751	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.515	4.526	-0.011	1.000	372749	1.01		101	7935	
713.00 > 219.00	4.515	4.526	-0.011	1.000	254743		1.46(1.00-1.85)		7260	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.932	4.938	-0.006	1.838	6686585	2.60		104	25230	
45 Perfluorohexadecanoic acid										R
813.00 > 769.00	4.932	4.939	-0.007	1.000	2430166	1.00		100	1568	R
813.00 > 169.00	4.932	4.939	-0.007	1.000	412753		5.89(2.50-4.65)		6289	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.275	5.286	-0.011	1.000	2845176	1.07		107	908	
913.00 > 169.00	5.268	5.286	-0.018	0.999	344245		8.26(0.00-0.00)		2159	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 24-Nov-2017 11:45:32 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_004.d

Injection Date: 18-Nov-2017 17:11:15 Instrument ID: A8_N

Lims ID: LCSD 320-195219/3-A

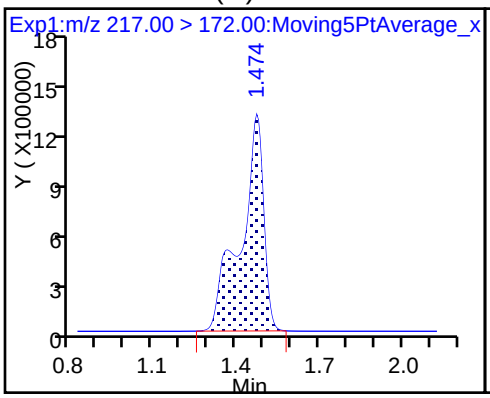
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 4

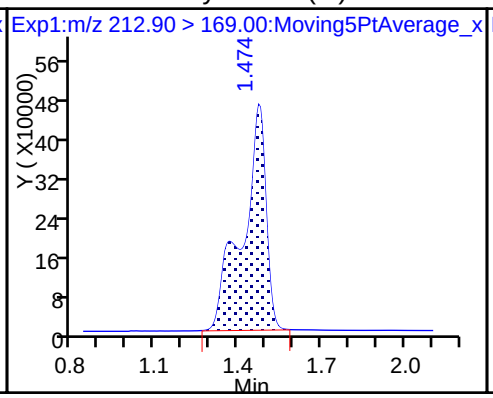
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

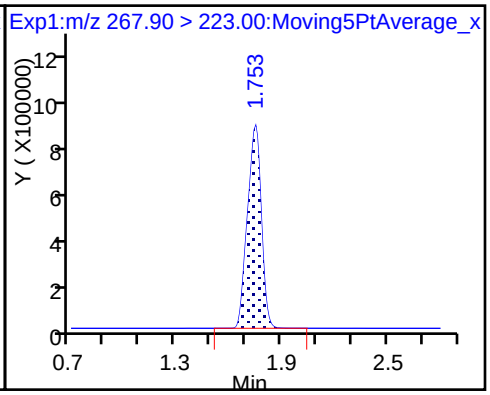
D 1 13C4 PFBA (M)



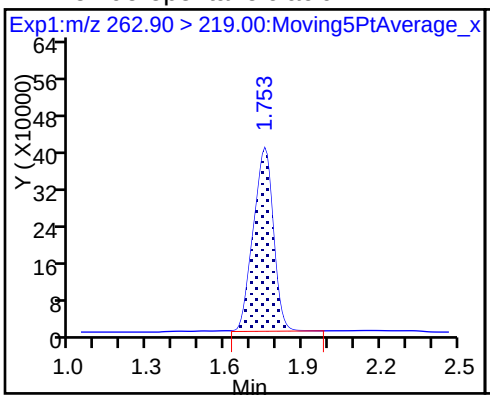
2 Perfluorobutyric acid (M)



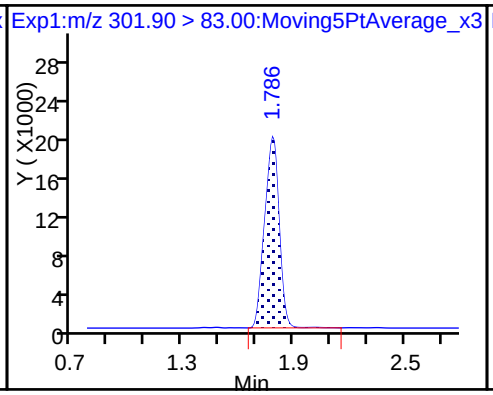
D 3 13C5-PFPeA



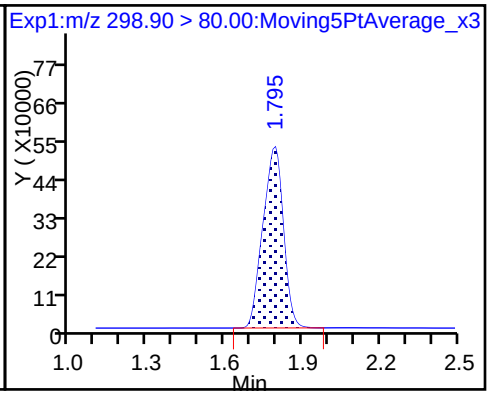
4 Perfluoropentanoic acid



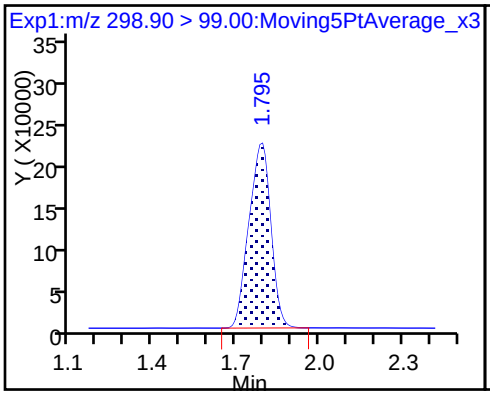
D 47 13C3-PFBS



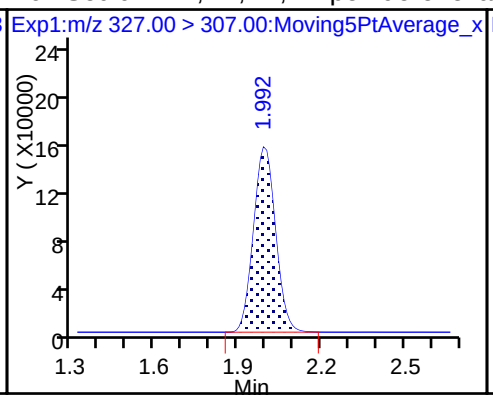
5 Perfluorobutanesulfonic acid



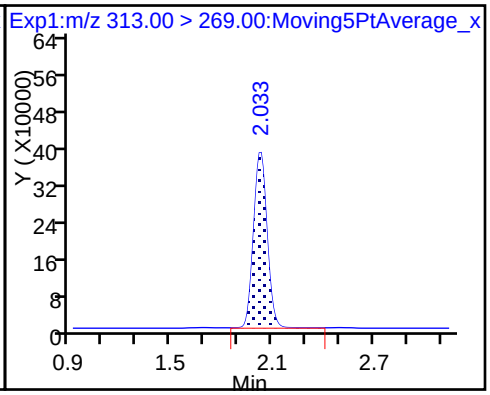
5 Perfluorobutanesulfonic acid



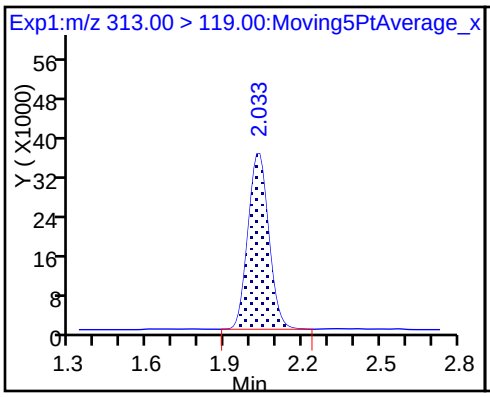
61 Sodium 1H,1H,2H,2H-perfluorohexane



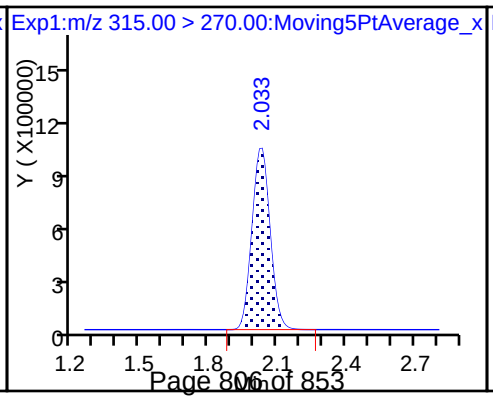
6 Perfluorohexanoic acid



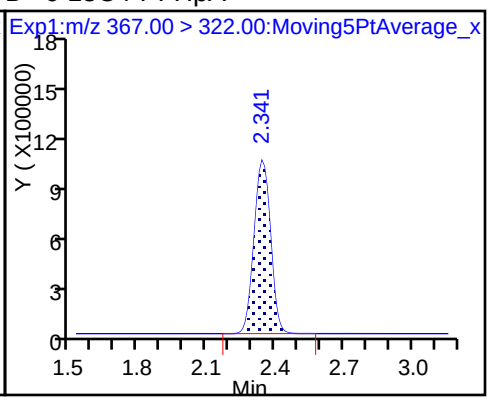
6 Perfluorohexanoic acid



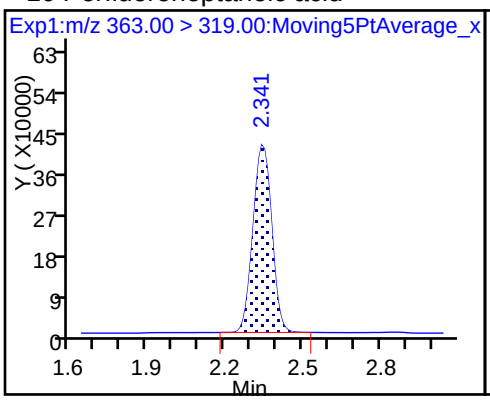
D 7 13C2 PFHxA



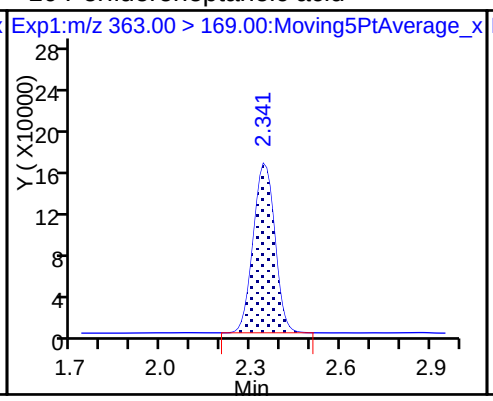
D 9 13C4-PFHpA



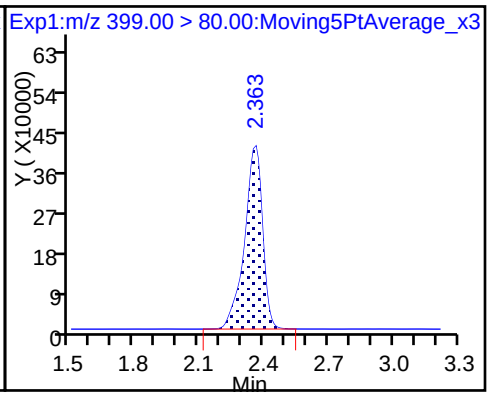
10 Perfluoroheptanoic acid



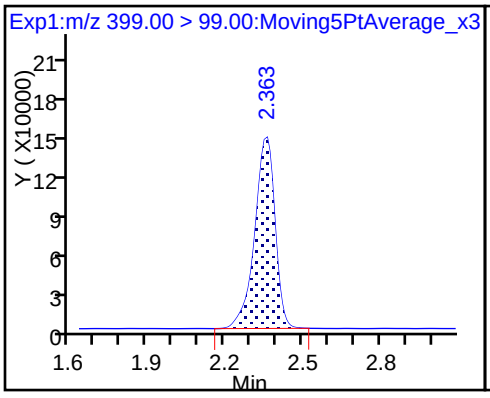
10 Perfluoroheptanoic acid



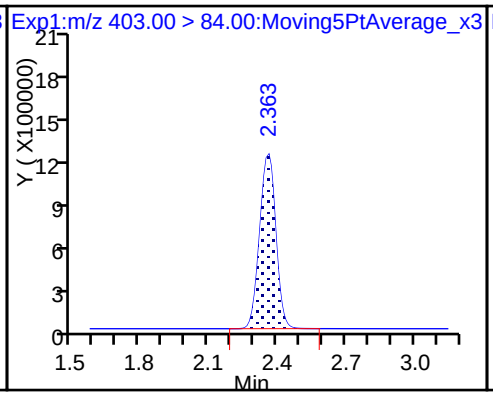
8 Perfluorohexanesulfonic acid



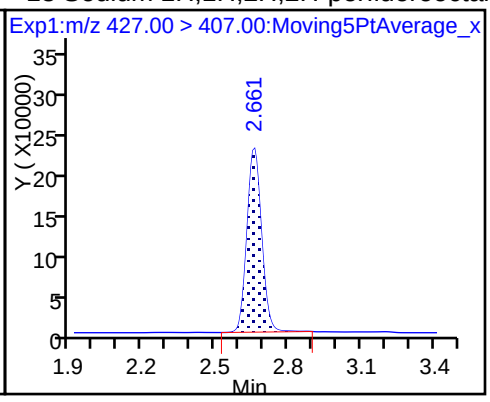
8 Perfluorohexanesulfonic acid



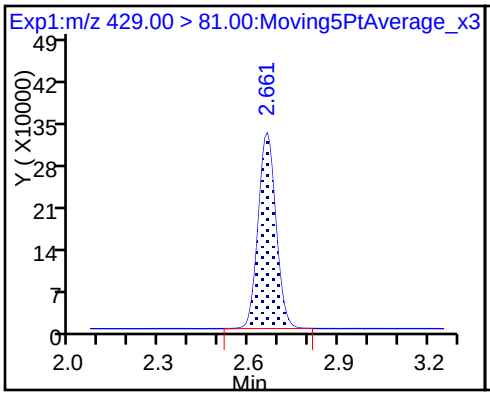
D 11 18O2 PFHxS



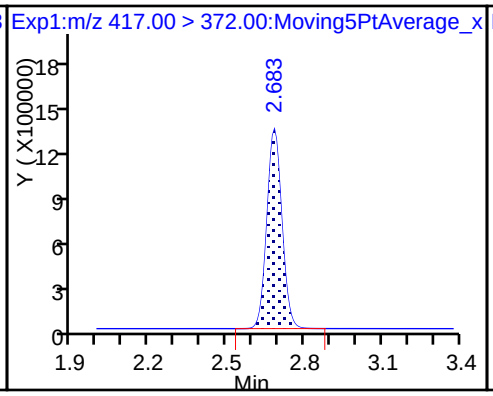
13 Sodium 1H,1H,2H,2H-perfluorooctane



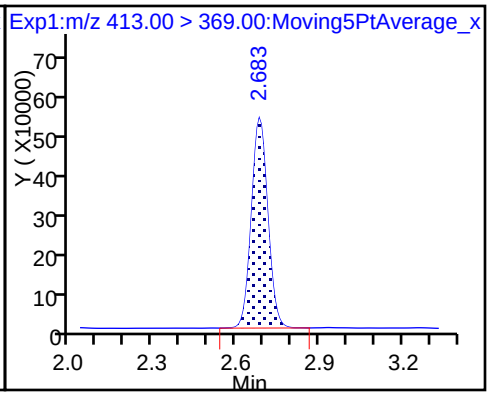
D 12 M2-6:2FTS



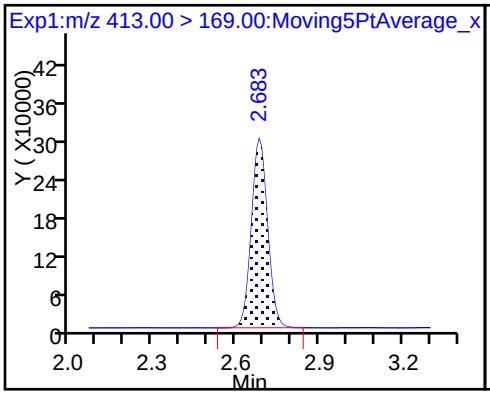
D 14 13C4 PFOA



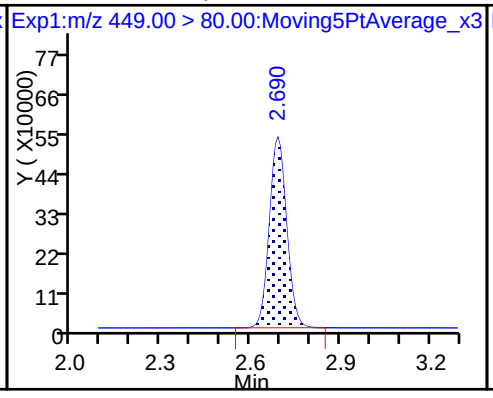
15 Perfluorooctanoic acid



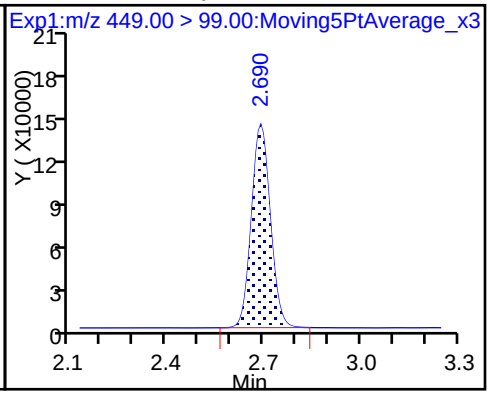
15 Perfluorooctanoic acid



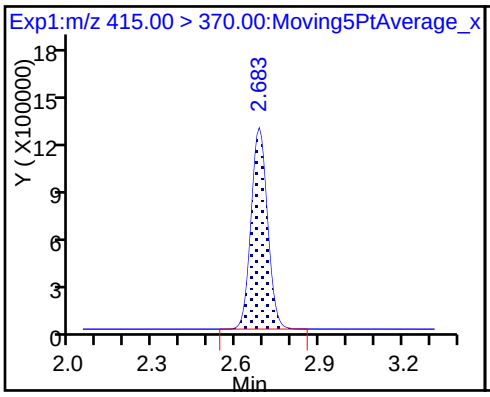
16 Perfluoroheptanesulfonic Acid



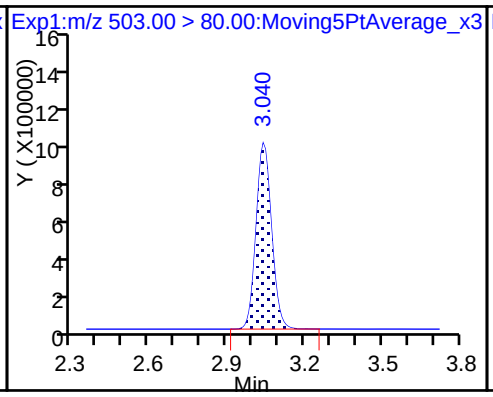
16 Perfluoroheptanesulfonic Acid



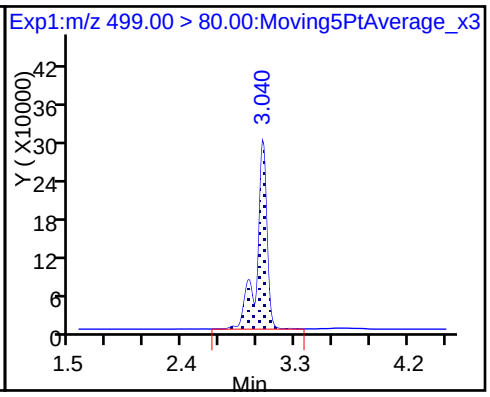
* 62 13C2-PFOA



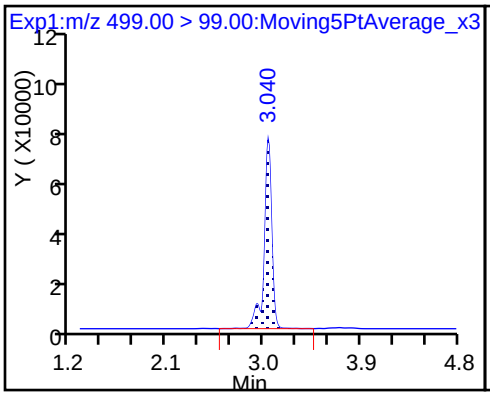
D 18 13C4 PFOS



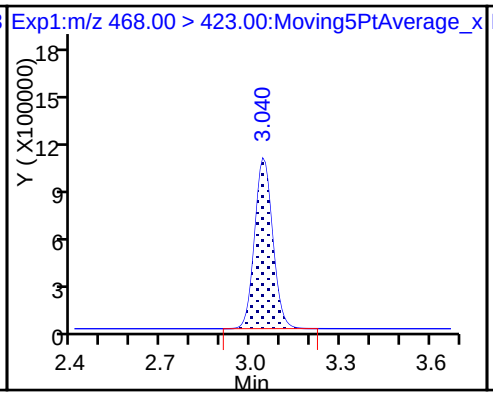
17 Perfluorooctane sulfonic acid



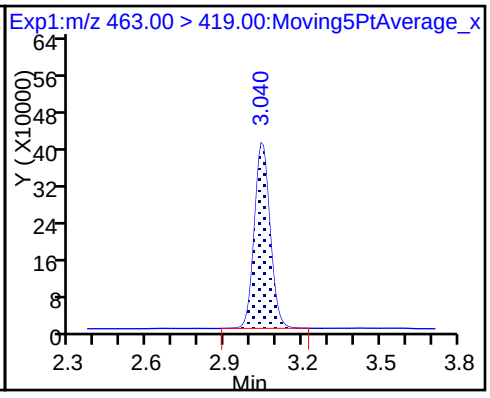
17 Perfluorooctane sulfonic acid



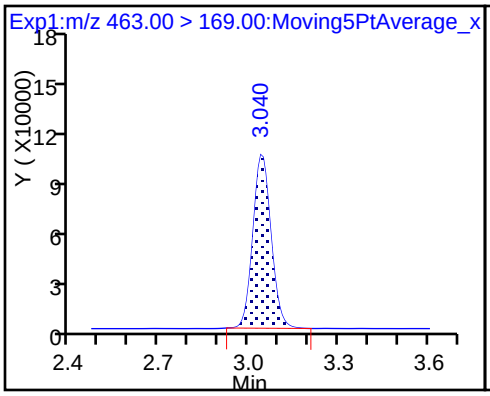
D 19 13C5 PFNA



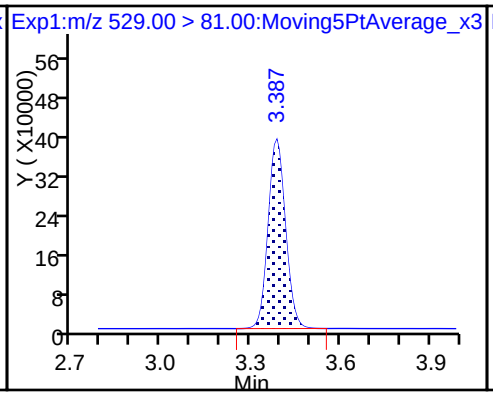
20 Perfluorononanoic acid



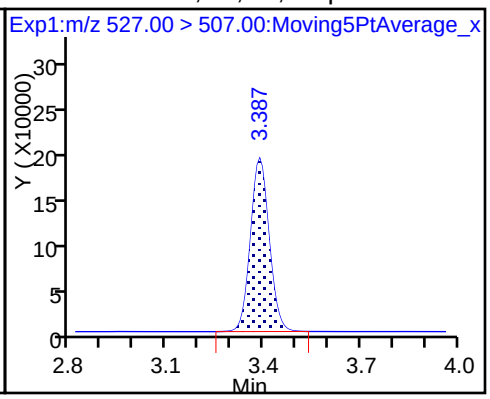
20 Perfluorononanoic acid



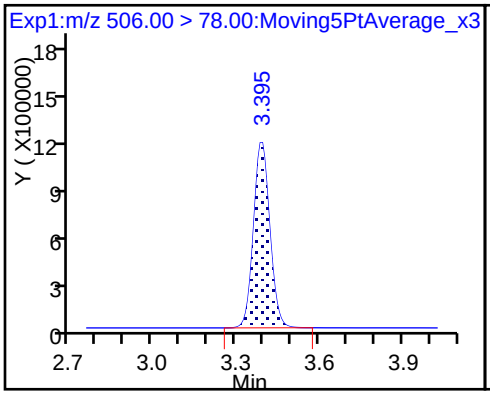
D 26 M2-8:2FTS



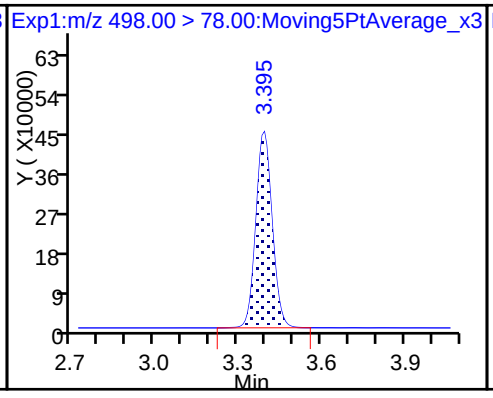
25 Sodium 1H,1H,2H,2H-perfluorodecane



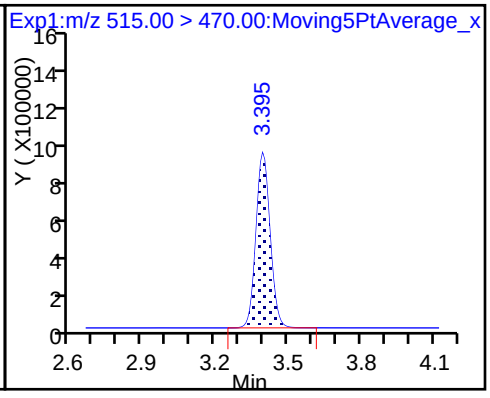
D 21 13C8 FOSA



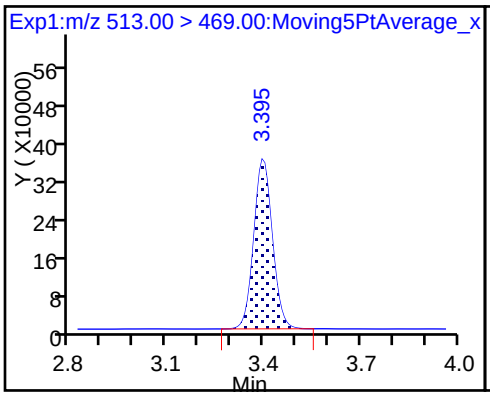
22 Perfluorooctane Sulfonamide



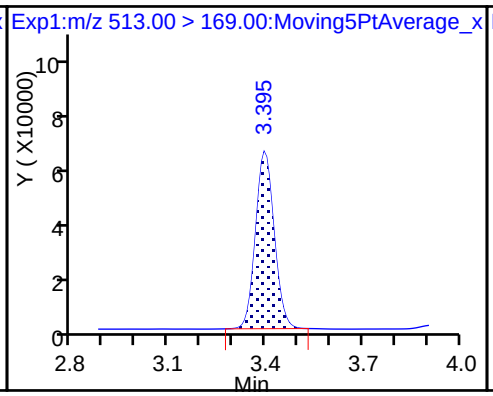
D 23 13C2 PFDA



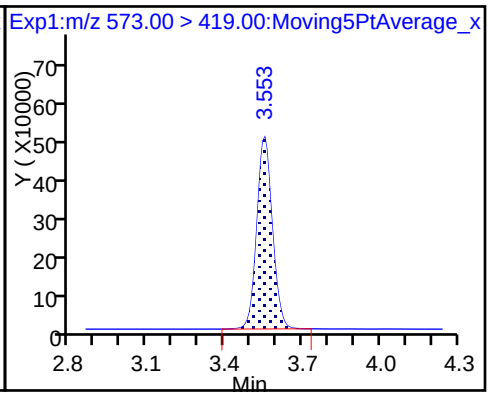
24 Perfluorodecanoic acid



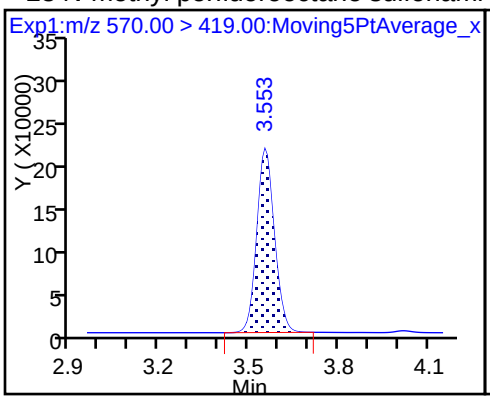
24 Perfluorodecanoic acid



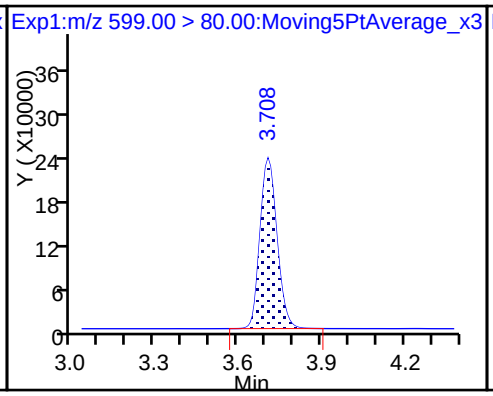
D 27 d3-NMeFOSAA



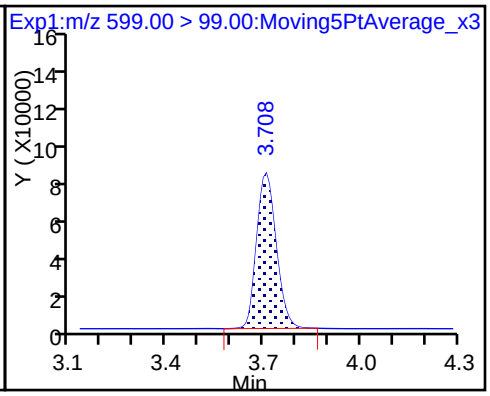
28 N-methyl perfluorooctane sulfonami



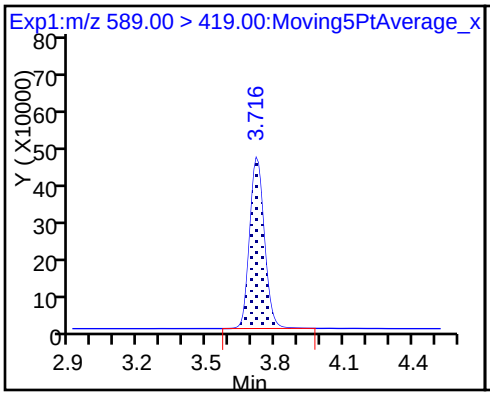
29 Perfluorodecane Sulfonic acid



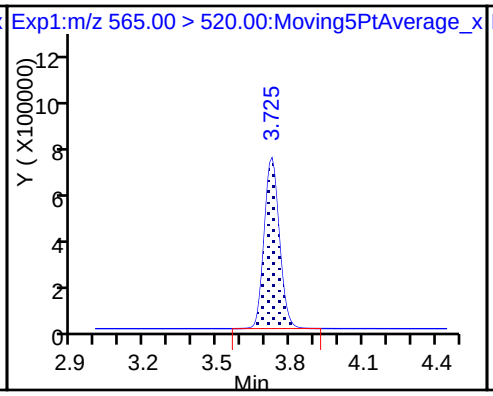
29 Perfluorodecane Sulfonic acid



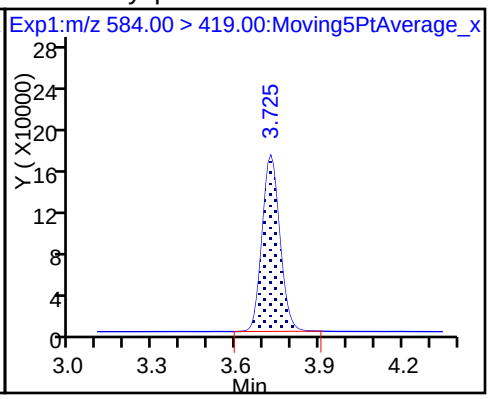
D 32 d5-NEtFOSAA



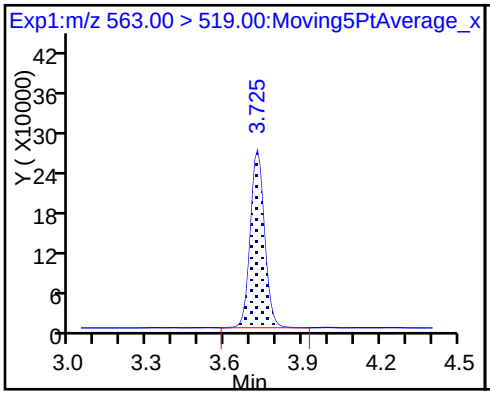
D 30 13C2 PFUnA



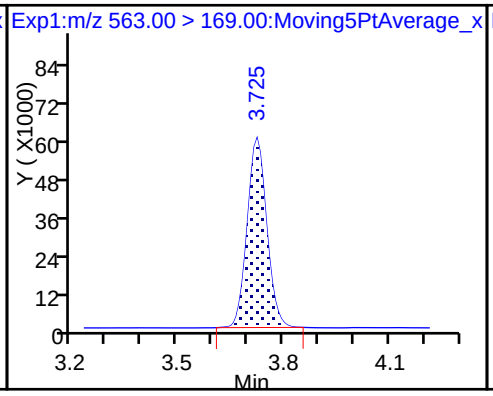
33 N-ethyl perfluorooctane sulfonamid



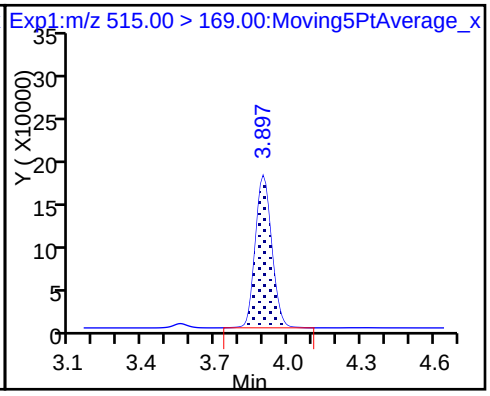
31 Perfluoroundecanoic acid



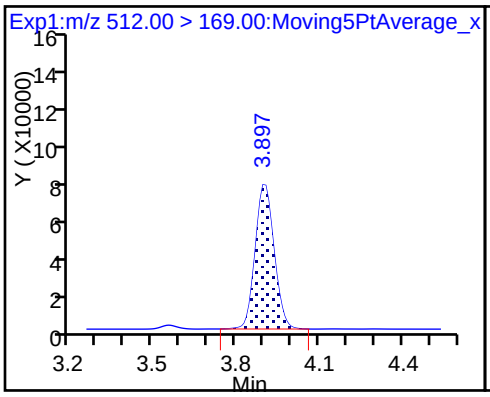
31 Perfluoroundecanoic acid



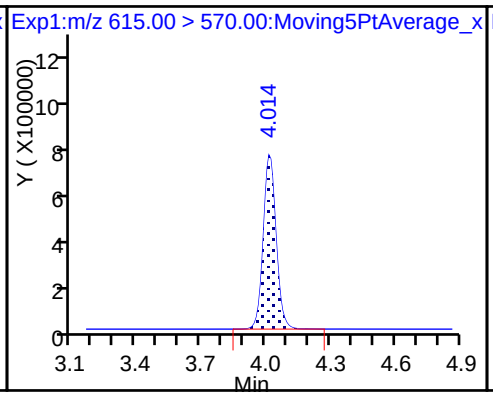
D 34 d-N-MeFOSA-M



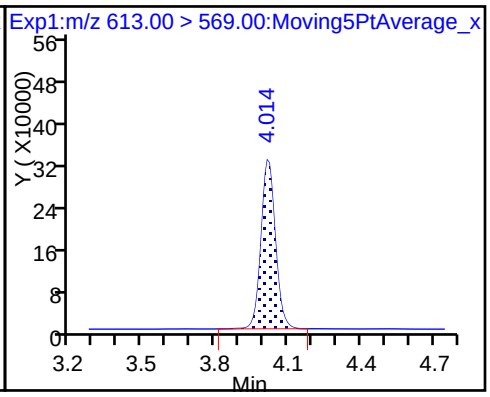
35 MeFOSA



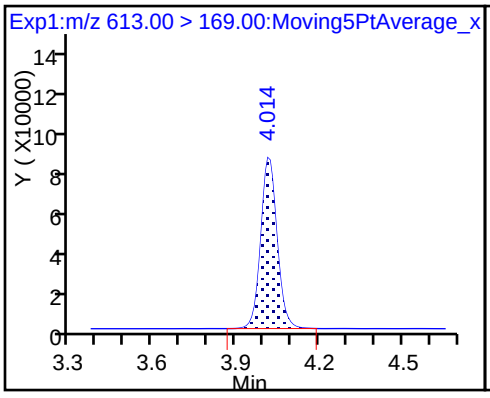
D 36 13C2 PFDoA



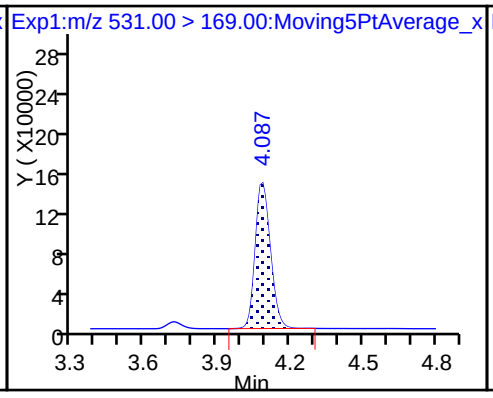
37 Perfluorododecanoic acid



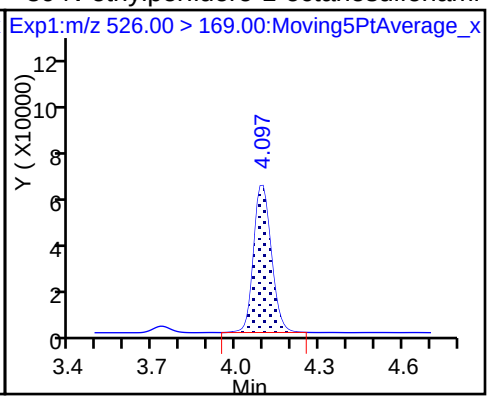
37 Perfluorododecanoic acid



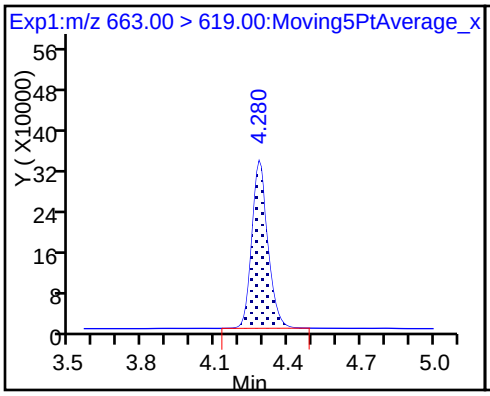
D 38 d-N-EtFOSA-M



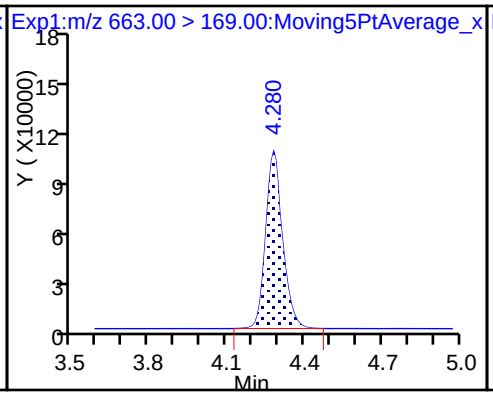
39 N-ethylperfluoro-1-octanesulfonami



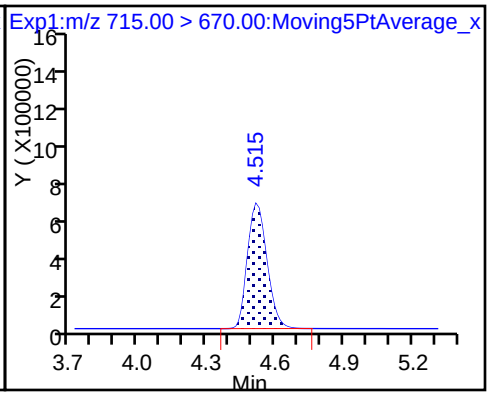
41 Perfluorotridecanoic acid



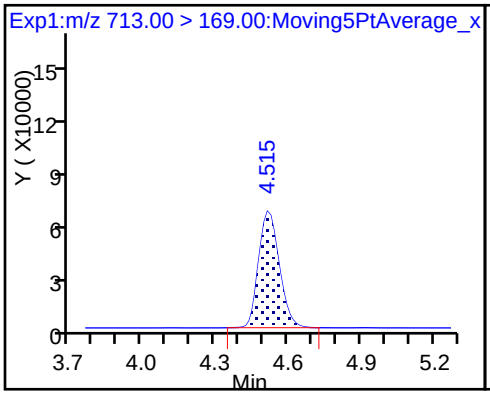
41 Perfluorotridecanoic acid



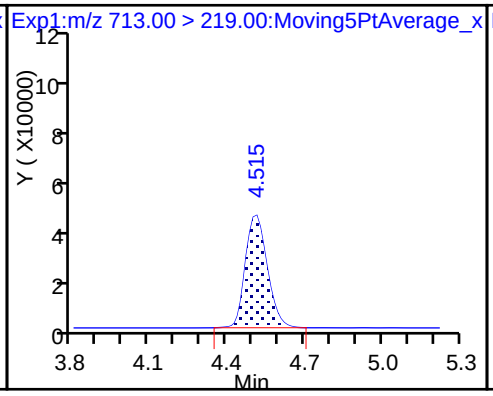
D 43 13C2-PFTeDA



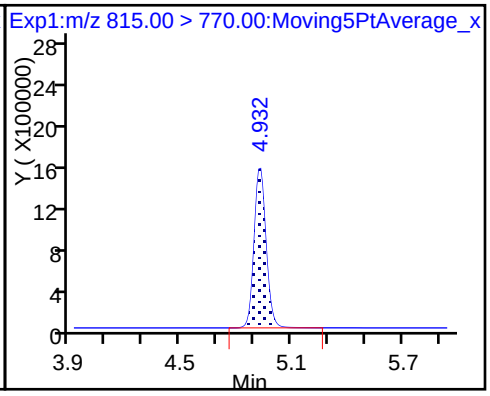
42 Perfluorotetradecanoic acid



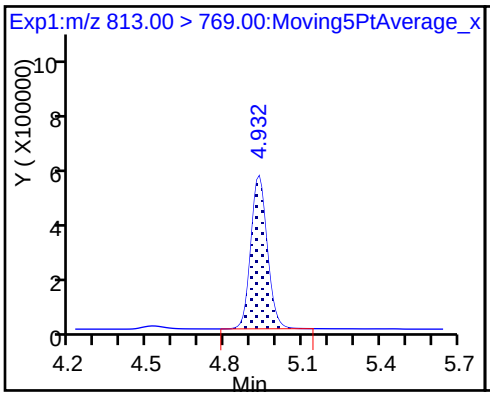
42 Perfluorotetradecanoic acid



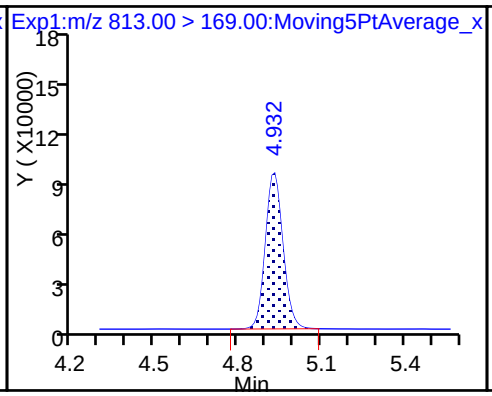
D 44 13C2-PFHxDA



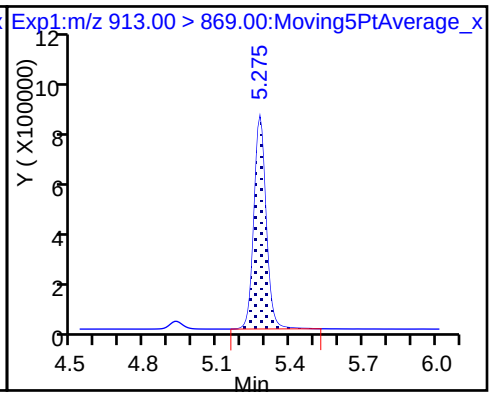
45 Perfluorohexadecanoic acid



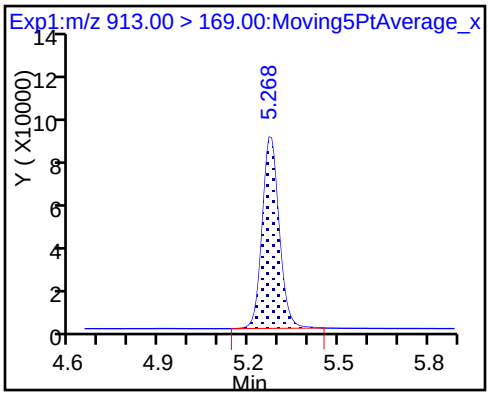
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

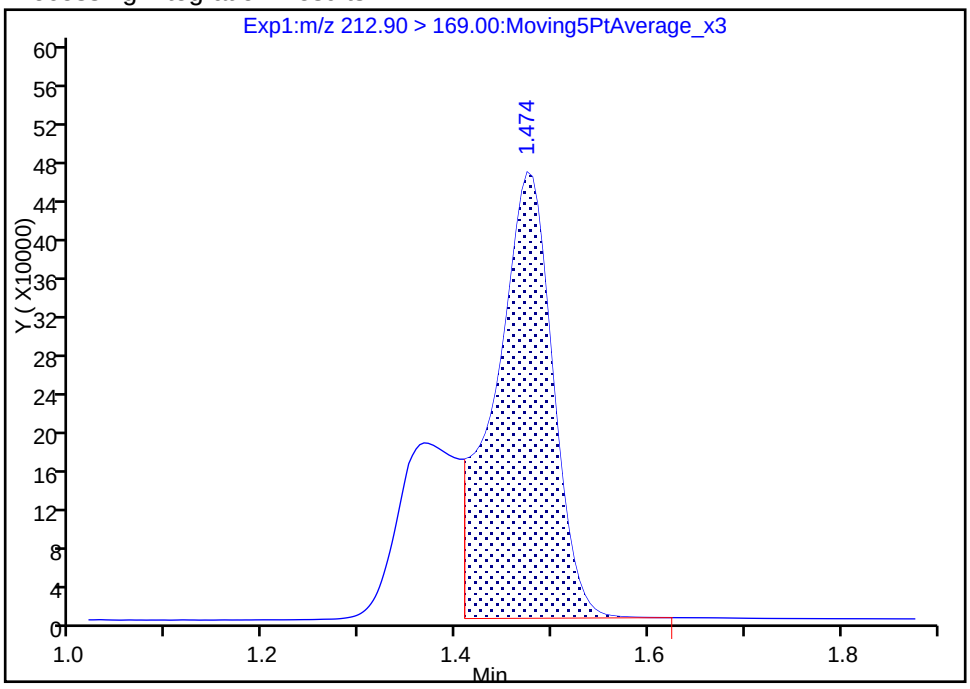
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_004.d
Injection Date: 18-Nov-2017 17:11:15 Instrument ID: A8_N
Lims ID: LCSD 320-195219/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

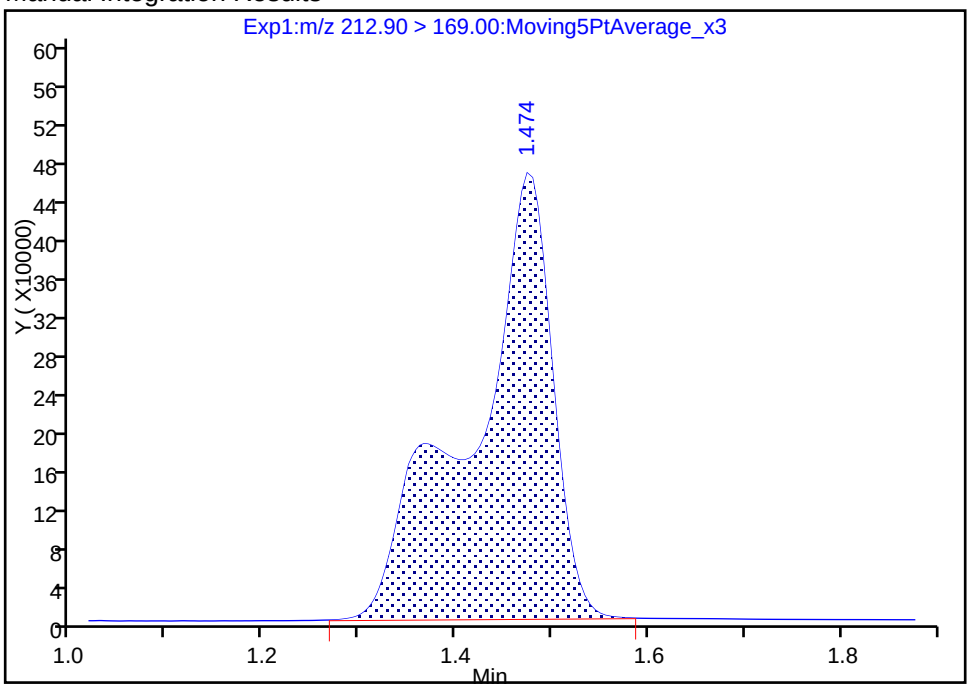
Processing Integration Results

RT: 1.47
Area: 1929353
Amount: 0.710749
Amount Units: ng/ml



Manual Integration Results

RT: 1.47
Area: 2735645
Amount: 1.007777
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 11:31:11
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

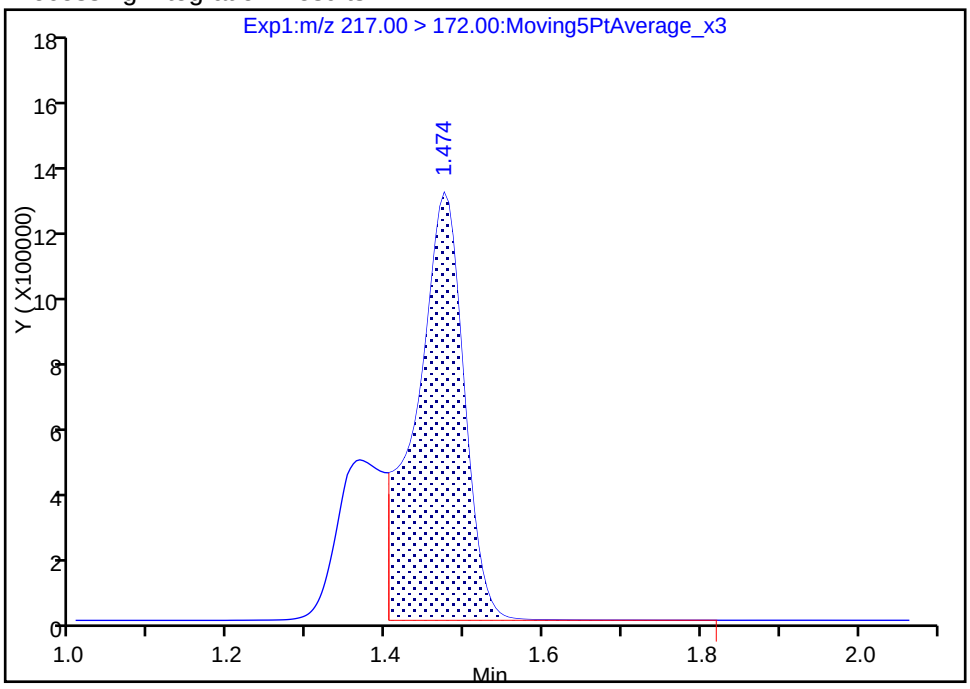
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b\2017.11.18LLAXEA_004.d
Injection Date: 18-Nov-2017 17:11:15 Instrument ID: A8_N
Lims ID: LCSD 320-195219/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

D 1 13C4 PFBA, CAS: STL00992

Signal: 1

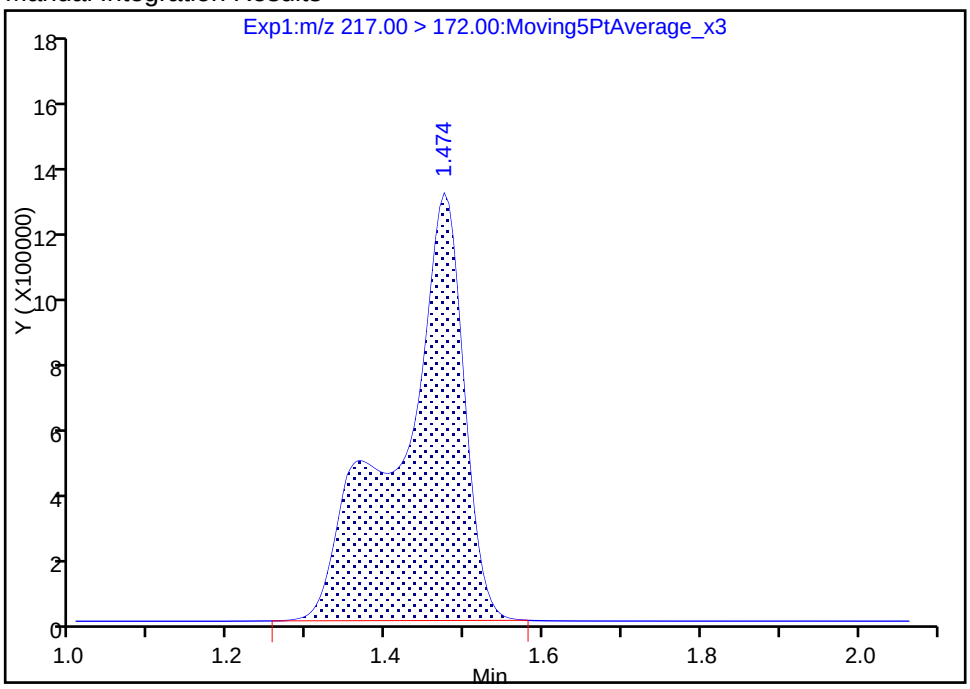
Processing Integration Results

RT: 1.47
Area: 5426320
Amount: 2.087861
Amount Units: ng/ml



Manual Integration Results

RT: 1.47
Area: 7412428
Amount: 2.852047
Amount Units: ng/ml



Reviewer: hannigana, 24-Nov-2017 11:30:55
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Instrument ID: A8_N Start Date: 11/16/2017 13:20

Analysis Batch Number: 195190 End Date: 11/16/2017 14:54

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-195190/2		11/16/2017 13:20	1	2017.11.16LLICAL 002.d	GeminiC18 3x100 3(mm)
IC 320-195190/3		11/16/2017 13:28	1	2017.11.16LLICAL 003.d	GeminiC18 3x100 3(mm)
IC 320-195190/4		11/16/2017 13:36	1	2017.11.16LLICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-195190/5		11/16/2017 13:43	1	2017.11.16LLICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-195190/6		11/16/2017 13:51	1	2017.11.16LLICAL 006.d	GeminiC18 3x100 3(mm)
IC 320-195190/7		11/16/2017 13:59	1	2017.11.16LLICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-195190/8		11/16/2017 14:07	1	2017.11.16LLICAL 008.d	GeminiC18 3x100 3(mm)
IC 320-195190/9		11/16/2017 14:15	1	2017.11.16LLICAL 009.d	GeminiC18 3x100 3(mm)
IC 320-195190/10		11/16/2017 14:23	1	2017.11.16LLICAL 010.d	GeminiC18 3x100 3(mm)
ICB 320-195190/11		11/16/2017 14:31	1		GeminiC18 3x100 3(mm)
ICV 320-195190/12		11/16/2017 14:38	1	2017.11.16LLICAL 012.d	GeminiC18 3x100 3(mm)
RINSE 320-195190/13		11/16/2017 14:46	1		GeminiC18 3x100 3(mm)
CCVL 320-195190/14		11/16/2017 14:54	1		GeminiC18 3x100 3(mm)

537 (modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Instrument ID: A8_N Start Date: 11/18/2017 14:13

Analysis Batch Number: 195558 End Date: 11/18/2017 16:39

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-195558/1		11/18/2017 14:13	1	2017.11.18LLAXE 004.d	GeminiC18 3x100 3(mm)
CCV 320-195558/2		11/18/2017 14:21	1		GeminiC18 3x100 3(mm)
ZZZZZ		11/18/2017 14:28	1		GeminiC18 3x100 3(mm)
CCV 320-195558/8		11/18/2017 15:13	1		GeminiC18 3x100 3(mm)
CCV 320-195558/19		11/18/2017 16:39	1		GeminiC18 3x100 3(mm)

537 (modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Instrument ID: A8_N Start Date: 11/18/2017 16:47

Analysis Batch Number: 195562 End Date: 11/18/2017 20:12

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-195562/1		11/18/2017 16:47	1	2017.11.18LLAXE A 001.d	GeminiC18 3x100 3(mm)
MB 320-195219/1-A		11/18/2017 16:55	1	2017.11.18LLAXE A 002.d	GeminiC18 3x100 3(mm)
LCS 320-195219/2-A		11/18/2017 17:03	1	2017.11.18LLAXE A 003.d	GeminiC18 3x100 3(mm)
LCSD 320-195219/3-A		11/18/2017 17:11	1	2017.11.18LLAXE A 004.d	GeminiC18 3x100 3(mm)
CCV 320-195562/12		11/18/2017 18:14	1	2017.11.18LLAXE A 012.d	GeminiC18 3x100 3(mm)
320-33221-1		11/18/2017 19:25	1	2017.11.18LLAXE A 021.d	GeminiC18 3x100 3(mm)
320-33221-2		11/18/2017 19:33	1	2017.11.18LLAXE A 022.d	GeminiC18 3x100 3(mm)
CCV 320-195562/23		11/18/2017 19:40	1	2017.11.18LLAXE A 023.d	GeminiC18 3x100 3(mm)
320-33221-3		11/18/2017 19:48	1	2017.11.18LLAXE A 024.d	GeminiC18 3x100 3(mm)
320-33221-4		11/18/2017 19:56	1	2017.11.18LLAXE A 025.d	GeminiC18 3x100 3(mm)
CCV 320-195562/27		11/18/2017 20:12	1	2017.11.18LLAXE A 027.d	GeminiC18 3x100 3(mm)

537 (modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Instrument ID: A8_N Start Date: 11/24/2017 14:17

Analysis Batch Number: 196679 End Date: 11/24/2017 14:48

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-196679/5		11/24/2017 14:17	1	2017.11.24LLA_005.d	GeminiC18 3x100 3(mm)
CCV 320-196679/6		11/24/2017 14:25	1		GeminiC18 3x100 3(mm)
ZZZZZ		11/24/2017 14:33	1		GeminiC18 3x100 3(mm)
ZZZZZ		11/24/2017 14:41	1		GeminiC18 3x100 3(mm)
CCV 320-196679/9		11/24/2017 14:48	1		GeminiC18 3x100 3(mm)

537 (modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Instrument ID: A8_N Start Date: 11/24/2017 14:56

Analysis Batch Number: 196712 End Date: 11/24/2017 15:12

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-196712/1		11/24/2017 14:56	1	2017.11.24LLA_010.d	GeminiC18 3x100 3(mm)
320-33221-1 DL		11/24/2017 15:04	5	2017.11.24LLA_011.d	GeminiC18 3x100 3(mm)
CCV 320-196712/3		11/24/2017 15:12	1	2017.11.24LLA_012.d	GeminiC18 3x100 3(mm)

537 (modified)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Batch Number: 195219 Batch Start Date: 11/16/17 17:39 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 11/17/17 15:14

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00018	LCPFC-IS 00012
MB 320-195219/1		3535, 537 (modified)				250.00 mL	10.00 mL	500 uL	500 uL
LCS 320-195219/2		3535, 537 (modified)				250.00 mL	10.00 mL	500 uL	500 uL
LCSD 320-195219/3		3535, 537 (modified)				250.00 mL	10.00 mL	500 uL	500 uL
320-33221-A-1	TP-PFC-023-TPI	3535, 537 (modified)	T	318.95 g	27.04 g	291.9 mL	10.00 mL	500 uL	500 uL
320-33221-A-2	TP-PFC-023-MID-CARBON	3535, 537 (modified)	T	328.76 g	26.68 g	302.1 mL	10.00 mL	500 uL	500 uL
320-33221-A-3	TP-PFC-023-TPE	3535, 537 (modified)	T	321.75 g	27.08 g	294.7 mL	10.00 mL	500 uL	500 uL
320-33221-A-4	TP-PFC-023-TPE-D	3535, 537 (modified)	T	328.23 g	27.13 g	301.1 mL	10.00 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00120					
MB 320-195219/1		3535, 537 (modified)							
LCS 320-195219/2		3535, 537 (modified)		500 uL					
LCSD 320-195219/3		3535, 537 (modified)		500 uL					
320-33221-A-1	TP-PFC-023-TPI	3535, 537 (modified)	T						
320-33221-A-2	TP-PFC-023-MID-CARBON	3535, 537 (modified)	T						
320-33221-A-3	TP-PFC-023-TPE	3535, 537 (modified)	T						
320-33221-A-4	TP-PFC-023-TPE-D	3535, 537 (modified)	T						

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Batch Number: 195219 Batch Start Date: 11/16/17 17:39 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 11/17/17 15:14

Batch Notes	
Analyst ID - Aliquot Step	JNS
Balance ID	QA-070
Analyst ID - Final Volume Step	JNS
H2O ID	11/14/17
Hexane ID	981623
Internal Standard ID#	1087029
Manifold ID	11, 16
Methanol ID	1071548
Sodium Hydroxide ID	1088697
Pipette ID	146370G
Analyst ID - Reagent Drop	JER
Analyst ID - IS Reagent Drop	CCB
Analyst ID - IS Reagent Drop Witness	JNS
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	TWL
Solvent Lot #	1092113
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003337157A

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

320-33221, 320-33133, 320-33135
480-127281, 320-33328, 680-145554
Job Number(s): 320-33103, 480-127492

Work List ID(s): 506043

Extraction Batch: 195219

Analysis Batch(es): 195562, 195563

Delivery Rank: 2, 4

Due Date: 11/29/2017

A Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# 195190, 195191	✓	✓	
2. ICAL, CCV Frequency & Criteria met.	✓	✓	
• $RF_{average}$ criteria appropriate for the method.	✓	✓	
• Linear Regression criteria appropriate if required ($r \geq 0.995$).	✓	✓	
• Quadratic fit criteria appropriate if required ($r^2 \geq 0.990$).			✓
• For Linear Regression and Quadratic fit – Does the y-intercept support ½ the reporting limit as described in CA-Q-S-005?	✓	✓	
• All curve points show calculated concentrations.	✓	✓	
3. Peaks correctly ID'd by data system.	✓	✓	
5. Tune check frequency & criteria met and Tune check report attached.	✓	✓	
B QA/QC			
1. Are all QC samples properly linked in TALS?	✓	✓	
2. Method blank, LCS/LCSD and MS/SD frequencies met.	✓	✓	
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.	✓	✓	
4. Are MS/MSD recoveries and RPD within control limits?	✓	✓	
5. Holding Times were met for prep and analytical.	✓	✓	
6. IS/Surrogate recoveries meet criteria or properly noted.	✓	✓	
C Sample Analysis			
1. Was correct analysis performed and were project instructions followed?	✓	✓	
2. If required, are compounds within RT windows?	✓	✓	
3. If required, are positive hits confirmed and >40% RPD flagged?			✓
4. Manual Integrations reviewed and appropriate.	✓	✓	
5. All analytes correctly reported. (Primary, secondary, acceptable status)	✓	✓	
6. Correct reporting limits used. (based on client request, prep factors, and dilutions)	✓	✓	
D Documentation			
1. Are all non-conformances documented/attached? NCM# 108561, 108560, 108557, 108559	✓	✓	
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): ABH Date: 11/24/2017

2nd Level Reviewer: [signature] Date: 11/24/2017

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
480-127281-A-7-A	320-0050643-026	Client	18-Nov-2017 20:04:29	2017.11.18LLAXEA_026.d	24	1.0	DUP	sv
CCV L5	320-0050643-027	CCV	18-Nov-2017 20:12:20	2017.11.18LLAXEA_027.d	14	1.0		sv

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 18NOV2017NCB_PFC Worklist Num: 50643
Instrument: A8_N Method: A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b
Anaylysis Type: SemiVOA Creator: Phomsopha, Thep
Inj Volume: 2.00 Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCV L4	320-0050643-001	CCV	18-Nov-2017 16:47:36	2017.11.18LLAXEA_001.d	13	1.0		sv
MB 320-195219/1-A	320-0050643-002	MB	18-Nov-2017 16:55:29	2017.11.18LLAXEA_002.d	2	1.0		sv
LCS 320-195219/2-A	320-0050643-003	LCS	18-Nov-2017 17:03:22	2017.11.18LLAXEA_003.d	3	1.0		sv
LCSD 320-195219/3-A	320-0050643-004	LCSD	18-Nov-2017 17:11:15	2017.11.18LLAXEA_004.d	4	1.0		sv
320-33103-A-1-A	320-0050643-005	Client	18-Nov-2017 17:19:07	2017.11.18LLAXEA_005.d	5	1.0	MINFA	sv
320-33103-A-2-A	320-0050643-006	Client	18-Nov-2017 17:26:59	2017.11.18LLAXEA_006.d	6	1.0	HB Carbon Mid #1	sv
320-33103-B-3-A	320-0050643-007	Client	18-Nov-2017 17:34:52	2017.11.18LLAXEA_007.d	7	1.0	HB Resin Mid #1	sv
320-33103-A-4-A	320-0050643-008	Client	18-Nov-2017 17:42:44	2017.11.18LLAXEA_008.d	8	1.0	M-001	sv
480-127492-A-1-A	320-0050643-009	Client	18-Nov-2017 17:50:36	2017.11.18LLAXEA_009.d	9	1.0	7-CAY-001-001-01	sv
480-127492-L-2-A	320-0050643-010	Client	18-Nov-2017 17:58:28	2017.11.18LLAXEA_010.d	10	1.0	7-CAY-001-001-02	sv
480-127492-A-3-A	320-0050643-011	Client	18-Nov-2017 18:06:20	2017.11.18LLAXEA_011.d	11	1.0	7-CAY-001-001-03	sv
CCV L5	320-0050643-012	CCV	18-Nov-2017 18:14:12	2017.11.18LLAXEA_012.d	14	1.0		sv
320-33328-A-1-A	320-0050643-013	Client	18-Nov-2017 18:22:02	2017.11.18LLAXEA_013.d	12	1.0	C84Q17-CARBON BETWEEN-111417	sv
320-33328-A-2-A	320-0050643-014	Client	18-Nov-2017 18:29:54	2017.11.18LLAXEA_014.d	13	1.0	C84Q17-AFTER CARBON-111417	sv
680-145554-A-1-A	320-0050643-015	Client	18-Nov-2017 18:37:47	2017.11.18LLAXEA_015.d	14	1.0	7111002-01	sv
320-33133-B-1-A	320-0050643-016	Client	18-Nov-2017 18:45:42	2017.11.18LLAXEA_016.d	15	1.0	C-SW-12	sv
320-33133-A-2-A	320-0050643-017	Client	18-Nov-2017 18:53:36	2017.11.18LLAXEA_017.d	16	1.0	C-CRK-1	sv
320-33133-A-3-A	320-0050643-018	Client	18-Nov-2017 19:01:30	2017.11.18LLAXEA_018.d	17	1.0	C-CRK-2	sv
320-33135-A-1-A	320-0050643-019	Client	18-Nov-2017 19:09:26	2017.11.18LLAXEA_019.d	18	1.0	M-SW-1R	sv
320-33135-A-2-A	320-0050643-020	Client	18-Nov-2017 19:17:17	2017.11.18LLAXEA_020.d	19	1.0	M-CRK-2R	sv
320-33221-A-1-A	320-0050643-021	Client	18-Nov-2017 19:25:10	2017.11.18LLAXEA_021.d	20	1.0	TP-PFC-023-TPI	sv
320-33221-A-2-A	320-0050643-022	Client	18-Nov-2017 19:33:01	2017.11.18LLAXEA_022.d	21	1.0	TP-PFC-023-MID-CARBON	sv
CCV L4	320-0050643-023	CCV	18-Nov-2017 19:40:54	2017.11.18LLAXEA_023.d	13	1.0		sv
320-33221-A-3-A	320-0050643-024	Client	18-Nov-2017 19:48:44	2017.11.18LLAXEA_024.d	22	1.0	TP-PFC-023-TPE	sv
320-33221-A-4-A	320-0050643-025	Client	18-Nov-2017 19:56:36	2017.11.18LLAXEA_025.d	23	1.0	TP-PFC-023-TPE-D	sv

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 18NOV2017NCA_PFC Worklist Num: 50642
Instrument: A8_N Method: A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50642.b
Anaylysis Type: SemiVOA Creator: Phomsopha, Thep
Inj Volume: 2.00 Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCVL	320-0050642-001	CCVL	18-Nov-2017 14:13:16	2017.11.18LLAXE_004.d	21	1.0		sv
CCV L4	320-0050642-002	CCV	18-Nov-2017 14:21:06	2017.11.18LLAXE_005.d	13	1.0		sv
RB	320-0050642-003	RB	18-Nov-2017 14:28:57	2017.11.18LLAXE_006.d	19	1.0		sv
RINSE	320-0050642-004	Client	18-Nov-2017 14:41:33	2017.11.18LLAXE_007.d	54	1.0		sv
320-33225-A-14-A	320-0050642-005	Client	18-Nov-2017 14:49:27	2017.11.17LLC_066.d	46	1.0	BLANK	sv
320-33225-A-15-A	320-0050642-006	Client	18-Nov-2017 14:57:21	2017.11.17LLC_067.d	47	1.0	EQUIPMENT BLANK	sv
RINSE	320-0050642-007	Client	18-Nov-2017 15:05:16	2017.11.17LLC_068.d	54	1.0		sv
CCV L5	320-0050642-008	CCV	18-Nov-2017 15:13:06	2017.11.17LLC_069.d	14	1.0		sv
320-33225-A-1-A	320-0050642-009	Client	18-Nov-2017 15:20:59	2017.11.17LLC_070.d	48	1.0	HI PH COMPARTMENT	sv
320-33225-A-3-A	320-0050642-010	Client	18-Nov-2017 15:28:50	2017.11.17LLC_071.d	49	1.0	CLARIFIER	sv
320-33225-A-4-A	320-0050642-011	Client	18-Nov-2017 15:36:41	2017.11.17LLC_072.d	50	1.0	MAIN HOLDING TANK	sv
320-33225-A-5-A	320-0050642-012	Client	18-Nov-2017 15:44:32	2017.11.17LLC_073.d	51	1.0	POLYMER STORAGE	sv
320-33225-A-11-A	320-0050642-013	Client	18-Nov-2017 15:52:24	2017.11.17LLC_074.d	52	1.0	MAIN DISCHARGE (EFFLUENT)	sv
320-33225-A-12-A	320-0050642-014	Client	18-Nov-2017 16:00:15	2017.11.17LLC_075.d	53	1.0	FILTER PRESS	sv
320-33225-A-13-A	320-0050642-015	Client	18-Nov-2017 16:08:06	2017.11.17LLC_076.d	54	1.0	DUPLICATE	sv
RINSE	320-0050642-016	Client	18-Nov-2017 16:16:00	2017.11.17LLC_077.d	54	1.0		sv
320-33225-A-9-A	320-0050642-017	Client	18-Nov-2017 16:23:54	2017.11.17LLC_078.d	1	1.0	CHROMIUM RECOVERY UNIT	sv
RINSE	320-0050642-018	Client	18-Nov-2017 16:31:49	2017.11.17LLC_079.d	54	1.0		sv
CCV L4	320-0050642-019	CCV	18-Nov-2017 16:39:42	2017.11.17LLC_080.d	13	1.0		sv

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 18NOV2017NCB_PFC Worklist Number: 50643
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171118-50643.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 195562	LC PFC ICAL Raw Batch: 195563	LC PFC_QSM5-1 ICAL Raw Batch: 195564
# 1 CCV L4	# 1 CCV L4	# 1 CCV L4	# 1 CCV L4
# 2 MB 320-195219/1-A	# 2 MB 320-195219/1-A	# 2 MB 320-195219/1-A	
# 3 LCS 320-195219/2-A	# 3 LCS 320-195219/2-A	# 3 LCS 320-195219/2-A	
# 4 LCSD 320-195219/3-A	# 4 LCSD 320-195219/3-A	# 4 LCSD 320-195219/3-A	
# 5 320-33103-A-1-A		# 5 320-33103-A-1-A	
# 6 320-33103-A-2-A		# 6 320-33103-A-2-A	
# 7 320-33103-B-3-A		# 7 320-33103-B-3-A	
# 8 320-33103-A-4-A		# 8 320-33103-A-4-A	
# 9 480-127492-A-1-A		# 9 480-127492-A-1-A	
#10 480-127492-L-2-A		#10 480-127492-L-2-A	
#11 480-127492-A-3-A		#11 480-127492-A-3-A	
#12 CCV L5	#12 CCV L5	#12 CCV L5	#12 CCV L5
#13 320-33328-A-1-A		#13 320-33328-A-1-A	
#14 320-33328-A-2-A		#14 320-33328-A-2-A	
#15 680-145554-A-1-A		#15 680-145554-A-1-A	
#16 320-33133-B-1-A		#16 320-33133-B-1-A	
#17 320-33133-A-2-A		#17 320-33133-A-2-A	
#18 320-33133-A-3-A		#18 320-33133-A-3-A	
#19 320-33135-A-1-A		#19 320-33135-A-1-A	
#20 320-33135-A-2-A		#20 320-33135-A-2-A	
#21 320-33221-A-1-A	#21 320-33221-A-1-A		
#22 320-33221-A-2-A	#22 320-33221-A-2-A		
#23 CCV L4	#23 CCV L4	#23 CCV L4	#23 CCV L4
#24 320-33221-A-3-A	#24 320-33221-A-3-A		
#25 320-33221-A-4-A	#25 320-33221-A-4-A		
#26 480-127281-A-7-A		#26 480-127281-A-7-A	
#27 CCV L5	#27 CCV L5	#27 CCV L5	#27 CCV L5

8813 NC Method

AS 11/17/17

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Method Code: 320-3535_PFC-320

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Batch End: 11/17/2017 3:14:00PM

Solid-Phase Extraction (SPE)

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-195219/1 N/A	N/A		250.00 mL				N/A	N/A	N/A		MB 320-195219/1-A
				10.00 mL								
2	LCS~320-195219/2 N/A	N/A		250.00 mL				N/A	N/A	N/A		LCS 320-195219/2-A
				10.00 mL								
3	LCSD~320-195219/3 N/A	N/A		250.00 mL				N/A	N/A	N/A		LCSD 320-195219/3-A
				10.00 mL								
4	320-33103-A-1 (PFC_IDA) due 11/29	N/A (320-33103-1)	281.13 g	254.1 mL				11/24/17	12_Days	2		320-33103-A-1-A
			27.07 g	10.00 mL								
5	320-33103-A-2 (PFC_IDA)	N/A (320-33103-1)	287.23 g	260.4 mL				11/24/17	12_Days	2		320-33103-A-2-A
			26.82 g	10.00 mL								
6	320-33103-B-3 (PFC_IDA)	N/A (320-33103-1)	271.74 g	245.1 mL				11/24/17	12_Days	2		320-33103-B-3-A
			26.68 g	10.00 mL								
7	320-33103-A-4 (PFC_IDA)	N/A (320-33103-1)	279.80 g	253 mL				11/24/17	12_Days	2		320-33103-A-4-A
			26.83 g	10.00 mL								
8	480-127492-A-1 (PFC_IDA)	N/A (480-127492-1)	296.89 g	269.5 mL				11/27/17	8_Day_Rush	4		480-127492-A-1-A
			27.36 g	10.00 mL								
9	480-127492-L-2 (PFC_IDA)	N/A (480-127492-1)	270.97 g	242.7 mL				11/27/17	8_Day_Rush	4		480-127492-L-2-A
			28.28 g	10.00 mL								
10	480-127492-A-3 (PFC_IDA)	N/A (480-127492-1)	289.81 g	262.5 mL				11/27/17	8_Day_Rush	4		480-127492-A-3-A
			27.28 g	10.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Method Code: 320-3535_PFC-320

Batch End: 11/17/2017 3:14:00PM

11	320-33328-A-1 (PFC_IDA)	N/A (320-33328-1)	325.39 g / 28.03 g	297.4 mL / 10.00 mL				11/28/17	8_Days	4		
12	320-33328-A-2 (PFC_IDA)	N/A (320-33328-1)	329.90 g / 29.15 g	300.8 mL / 10.00 mL				11/28/17	8_Days	4		
13	680-145554-A-1 (PFC_IDA)	N/A (680-145554-1)	274.00 g / 24.29 g	249.7 mL / 10.00 mL				11/28/17	8_Days	2		
14	320-33133-B-1 (PFC_IDA)	N/A (320-33133-1)	341.84 g / 27.54 g	314.3 mL / 10.00 mL				11/28/17	12_Days	2		
15	320-33133-A-2 (PFC_IDA)	N/A (320-33133-1)	338.22 g / 27.67 g	310.6 mL / 10.00 mL				11/28/17	12_Days	2		
16	320-33133-A-3 (PFC_IDA)	N/A (320-33133-1)	350.55 g / 28.37 g	322.2 mL / 10.00 mL				11/28/17	12_Days	2		
17	320-33135-A-1 (PFC_IDA)	N/A (320-33135-1)	269.51 g / 29.01 g	240.5 mL / 10.00 mL				11/28/17	12_Days	2		
18	320-33135-A-2 (PFC_IDA)	N/A (320-33135-1)	344.22 g / 28.32 g	315.9 mL / 10.00 mL				11/28/17	12_Days	2		
19	320-33221-A-1 (PFC_IDA_DOD5)	N/A (320-33221-1)	318.95 g / 27.04 g	291.9 mL / 10.00 mL				11/26/17	16_Days	4	5X	
20	320-33221-A-2 (PFC_IDA_DOD5)	N/A (320-33221-1)	328.76 g / 26.68 g	302.1 mL / 10.00 mL				11/26/17	16_Days	4		
21	320-33221-A-3 (PFC_IDA_DOD5)	N/A (320-33221-1)	321.75 g / 27.08 g	294.7 mL / 10.00 mL				11/26/17	16_Days	4		
22	320-33221-A-4 (PFC_IDA_DOD5)	N/A (320-33221-1)	328.23 g / 27.13 g	301.1 mL / 10.00 mL				11/26/17	16_Days	4		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Method Code: 320-3535_PFC-320

Batch End: 11/17/2017 3:14:00PM

23	480-127281-A-7 (PFC_IDA)	N/A (480-127280-1)	289.68 g 27.00 g	262.7 mL 10.00 mL				11/21/17	8_Day_Rush	4	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Method Code: 320-3535_PFC-320

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Batch End: 11/17/2017 3:14:00PM

Batch Notes

Manifold ID	11, 16
Methanol ID	1071548
Hexane ID	981623
Sodium Hydroxide ID	1088697
First Start time	NA
First End time	NA
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003337157A
Balance ID	QA-070
H2O ID	11/14/17
Pipette ID	146370G
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	1092113
Analyst ID - Reagent Drop	JER
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	TWL
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
Analyst ID - IS Reagent Drop	CCB

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Method Code: 320-3535_PFC-320

Batch End: 11/17/2017 3:14:00PM

Analyst ID - IS Reagent Drop	JNS
Witness	
Internal Standard ID#	1087029
Analyst ID - Concentration	NA
Analyst ID - Aliquot Step	JNS
Analyst ID - Final Volume Step	JNS
SOP Number	WS-LC-0025
Batch Comment	NA

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Comments

Login Comments for Job 127492: L4Reviewed(Bflo):
~Sub methods:8260C,8270D,8270D_SIM,PFC_IDA.~

320-33328-A-1
Method Comments: DuPont QAS_LCSD req

320-33328-A-2
Method Comments: DuPont QAS_LCSD req

Login Comments for Job 127280: Merge with 127280

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Method Code: 320-3535_PFC-320

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Batch End:

Batch Notes

Manifold ID	11, 16
Methanol ID	1071548
Hexane ID	981623
Sodium Hydroxide ID	1088697
First Start time	NA
First End time	NA
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003337157A
Balance ID	QA-070
H2O ID	11/14/17
Pipette ID	146370G
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	1092113
Analyst ID - Reagent Drop	JER
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	TWL
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
Analyst ID - IS Reagent Drop	CCB

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Method Code: 320-3535_PFC-320

Batch End:

Analyst ID - IS Reagent Drop Witness	JNS
Internal Standard ID#	1087029
Analyst ID - Concentration	NA
Analyst ID - Aliquot Step	JNS
Analyst ID - Final Volume Step	JNS
SOP Number	WS-LC-0025
Batch Comment	NA

Comments

Login Comments for Job 127492: L4Reviewed(Bflo):
~Sub methods:8260C,8270D,8270D_SIM,PFC_IDA.~

320-33328-A-1
Method Comments: DuPont QAS_LCSD req

320-33328-A-2
Method Comments: DuPont QAS_LCSD req

Login Comments for Job 127280: Merge with 127280

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Method Code: 320-3535_PFC-320

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-195219/1	LCMPFC_ALL_SU_00018	500 uL	10.00 mL	11/16/17	11/16/17
LCS 320-195219/2	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
LCS 320-195219/2	LCPFCSP_00120	500 uL	10.00 mL		
LCSD 320-195219/3	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
LCSD 320-195219/3	LCPFCSP_00120	500 uL	10.00 mL		
320-33103-A-1	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33103-A-2	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33103-A-3	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33103-A-4	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
480-127492-A-1	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
480-127492-L-2	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
480-127492-A-3	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33328-A-1	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33328-A-2	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
680-145554-A-1	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33133-B-1	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33133-A-2	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33133-A-3	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Method Code: 320-3535_PFC-320

Batch End:

320-33135-A-1	LCMPFC_ALL_SU_00018	500 uL	10.00 mL	11/16/17	TWR 11/16/17
320-33135-A-2	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33221-A-1	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33221-A-2	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33221-A-3	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33221-A-4	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
480-127281-A-7	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s) 195219 Test 3535_PFC

Earliest Holding Time 11/21/17

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	✓	✓
BD, FV, and AL initials are transcribed into the batch comment	✓	✓
Sample List Tab	**1st Level Reviewer**	**2nd Level Reviewer**
Samples identified to the correct method	✓	✓
Holding time violation NCM filed	NA	NA
MS/MSD or MS/DU NCM filed	✓	✓
NCM for any anomalies filed	NA	NA
All NCMs include method code, matrix, and prep batch	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Batch contains no more than 20 live samples	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check)	✓	✓
The pH is transcribed properly in TALS	NA	NA
All additional information is transcribed into TALS and is correct and raw data is attached	✓	✓
Comments/Observations are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and checked into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Internal Standard is added to the reagents	✓	✓
All units are correctly transcribed into TALS	✓	✓

1st Level Reviewer: VPM Date: 11/17/17

2nd Level Reviewer: ABH Date: 11/17/17

Comments:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 320-33221 Work List ID(s): 50938

Extraction Batch: 195219 Analysis Batch(es): 196712

Delivery Rank 4 Due Date: 12/01/2017

A Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# 195190	✓	✓	
2. ICAL, CCV Frequency & Criteria met.	✓	✓	
• $RF_{average}$ criteria appropriate for the method.	✓	✓	
• Linear Regression criteria appropriate if required ($r \geq 0.995$).	✓	✓	
• Quadratic fit criteria appropriate if required ($r^2 \geq 0.990$).			✓
• For Linear Regression and Quadratic fit – Does the y-intercept support ½ the reporting limit as described in CA-Q-S-005?	✓	✓	
• All curve points show calculated concentrations.	✓	✓	
3. Peaks correctly ID'd by data system.	✓	✓	
5. Tune check frequency & criteria met and Tune check report attached.	✓	✓	
B QA/QC			
1. Are all QC samples properly linked in TALS?	✓	✓	
2. Method blank, LCS/LCSD and MS/SD frequencies met.	✓	✓	
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.	✓	✓	
4. Are MS/MSD recoveries and RPD within control limits?	✓	✓	
5. Holding Times were met for prep and analytical.	✓	✓	
6. IS/Surrogate recoveries meet criteria or properly noted.	✓	✓	
C Sample Analysis			
1. Was correct analysis performed and were project instructions followed?	✓	✓	
2. If required, are compounds within RT windows?	✓	✓	
3. If required, are positive hits confirmed and >40% RPD flagged?			✓
4. Manual Integrations reviewed and appropriate.	✓	✓	
5. All analytes correctly reported. (Primary, secondary, acceptable status)	✓	✓	
6. Correct reporting limits used. (based on client request, prep factors, and dilutions)	✓	✓	
D Documentation			
1. Are all non-conformances documented/attached? NCM# 108783	✓	✓	
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): ABH Date: 11/27/2017

2nd Level Reviewer: MWay Date: 11/28/2017

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 24NOV2017NCB_PFC Worklist Number: 50938
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50938.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 196712	LC PFC ICAL Raw Batch: 196713	LC PFC_QSM5-1 ICAL Raw Batch: 196714
# 1 CCV L5 # 2 320-33221-A-1-A # 3 CCV L4	# 1 CCV L5 # 2 320-33221-A-1-A # 3 CCV L4	# 1 CCV L5 # 3 CCV L4	# 1 CCV L5 # 3 CCV L4

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 24NOV2017NCA_PFC Worklist Num: 50921
Instrument: A8_N Method: A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50921.b
Anaylysis Type: SemiVOA Creator: Hannigan, Alyssa B
Inj Volume: 2.00 Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
RINSE	320-0050921-001	Client	24-Nov-2017 13:45:54	2017.11.24LLA_001.d	54	1.0		sv
RINSE	320-0050921-002	Client	24-Nov-2017 13:53:47	2017.11.24LLA_002.d	54	1.0		sv
RINSE	320-0050921-003	Client	24-Nov-2017 14:01:41	2017.11.24LLA_003.d	54	1.0		sv
RINSE	320-0050921-004	Client	24-Nov-2017 14:09:32	2017.11.24LLA_004.d	54	1.0		sv
CCVL	320-0050921-005	CCVL	24-Nov-2017 14:17:25	2017.11.24LLA_005.d	21	1.0		sv
CCV L4	320-0050921-006	CCV	24-Nov-2017 14:25:19	2017.11.24LLA_006.d	13	1.0		sv
RB	320-0050921-007	RB	24-Nov-2017 14:33:11	2017.11.24LLA_007.d	20	1.0		sv
320-33070-A-18-A	320-0050921-008	Client	24-Nov-2017 14:41:03	2017.11.24LLA_008.d	1	1.0	W-TX-CAMP-002-06NOV17	sv
CCV L5	320-0050921-009	CCV	24-Nov-2017 14:48:56	2017.11.24LLA_009.d	14	1.0		sv

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 24NOV2017NCB_PFC Worklist Num: 50938
Instrument: A8_N Method: A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50938.b
Anaylysis Type: SemiVOA Creator: Royce, Amani A
Inj Volume: 2.00 Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCV L5	320-0050938-001	CCV	24-Nov-2017 14:56:46	2017.11.24LLA_010.d	14	1.0		sv
320-33221-A-1-A	320-0050938-002	Client	24-Nov-2017 15:04:38	2017.11.24LLA_011.d	2	5.0	TP-PFC-023-TPI	sv
CCV L4	320-0050938-003	CCV	24-Nov-2017 15:12:30	2017.11.24LLA_012.d	13	1.0		sv

88B NC Method

A8 11/17/17
A8 11/24/17

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Method Code: 320-3535_PFC-320

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Batch End: 11/17/2017 3:14:00PM

Solid-Phase Extraction (SPE)

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-195219/1 N/A	N/A		250.00 mL				N/A	N/A	N/A		MB 320-195219/1-A
				10.00 mL								
2	LCS~320-195219/2 N/A	N/A		250.00 mL				N/A	N/A	N/A		LCS 320-195219/2-A
				10.00 mL								
3	LCSD~320-195219/3 N/A	N/A		250.00 mL				N/A	N/A	N/A		LCSD 320-195219/3-A
				10.00 mL								
4	320-33103-A-1 (PFC_IDA) due 11/29	N/A (320-33103-1)	281.13 g	254.1 mL				11/24/17	12_Days	2		320-33103-A-1-A
			27.07 g	10.00 mL								
5	320-33103-A-2 (PFC_IDA)	N/A (320-33103-1)	287.23 g	260.4 mL				11/24/17	12_Days	2		320-33103-A-2-A
			26.82 g	10.00 mL								
6	320-33103-B-3 (PFC_IDA)	N/A (320-33103-1)	271.74 g	245.1 mL				11/24/17	12_Days	2		320-33103-B-3-A
			26.68 g	10.00 mL								
7	320-33103-A-4 (PFC_IDA)	N/A (320-33103-1)	279.80 g	253 mL				11/24/17	12_Days	2		320-33103-A-4-A
			26.83 g	10.00 mL								
8	480-127492-A-1 (PFC_IDA)	N/A (480-127492-1)	296.89 g	269.5 mL				11/27/17	8_Day_Rush	4		480-127492-A-1-A
			27.36 g	10.00 mL								
9	480-127492-L-2 (PFC_IDA)	N/A (480-127492-1)	270.97 g	242.7 mL				11/27/17	8_Day_Rush	4		480-127492-L-2-A
			28.28 g	10.00 mL								
10	480-127492-A-3 (PFC_IDA)	N/A (480-127492-1)	289.81 g	262.5 mL				11/27/17	8_Day_Rush	4		480-127492-A-3-A
			27.28 g	10.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Method Code: 320-3535_PFC-320

Batch End: 11/17/2017 3:14:00PM

11	320-33328-A-1 (PFC_IDA)	N/A (320-33328-1)	325.39 g 28.03 g	297.4 mL 10.00 mL				11/28/17	8_Days	4	RA
12	320-33328-A-2 (PFC_IDA)	N/A (320-33328-1)	329.90 g 29.15 g	300.8 mL 10.00 mL				11/28/17	8_Days	4	RA
13	680-145554-A-1 (PFC_IDA)	N/A (680-145554-1)	274.00 g 24.29 g	249.7 mL 10.00 mL				11/28/17	8_Days	2	
14	320-33133-B-1 (PFC_IDA)	N/A (320-33133-1)	341.84 g 27.54 g	314.3 mL 10.00 mL				11/28/17	12_Days	2	
15	320-33133-A-2 (PFC_IDA)	N/A (320-33133-1)	338.22 g 27.67 g	310.6 mL 10.00 mL				11/28/17	12_Days	2	
16	320-33133-A-3 (PFC_IDA)	N/A (320-33133-1)	350.55 g 28.37 g	322.2 mL 10.00 mL				11/28/17	12_Days	2	
17	320-33135-A-1 (PFC_IDA)	N/A (320-33135-1)	269.51 g 29.01 g	240.5 mL 10.00 mL				11/28/17	12_Days	2	
18	320-33135-A-2 (PFC_IDA)	N/A (320-33135-1)	344.22 g 28.32 g	315.9 mL 10.00 mL				11/28/17	12_Days	2	
19	320-33221-A-1 (PFC_IDA_DOD5)	N/A (320-33221-1)	318.95 g 27.04 g	291.9 mL 10.00 mL				11/26/17	16_Days	4	5X
20	320-33221-A-2 (PFC_IDA_DOD5)	N/A (320-33221-1)	328.76 g 26.68 g	302.1 mL 10.00 mL				11/26/17	16_Days	4	
21	320-33221-A-3 (PFC_IDA_DOD5)	N/A (320-33221-1)	321.75 g 27.08 g	294.7 mL 10.00 mL				11/26/17	16_Days	4	
22	320-33221-A-4 (PFC_IDA_DOD5)	N/A (320-33221-1)	328.23 g 27.13 g	301.1 mL 10.00 mL				11/26/17	16_Days	4	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Method Code: 320-3535_PFC-320

Batch End: 11/17/2017 3:14:00PM

23	480-127281-A-7 (PFC_IDA)	N/A (480-127280-1)	289.68 g 27.00 g	262.7 mL 10.00 mL				11/21/17	8_Day_Rush	4	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Method Code: 320-3535_PFC-320

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Batch End: 11/17/2017 3:14:00PM

Batch Notes

Manifold ID	11, 16
Methanol ID	1071548
Hexane ID	981623
Sodium Hydroxide ID	1088697
First Start time	NA
First End time	NA
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003337157A
Balance ID	QA-070
H2O ID	11/14/17
Pipette ID	146370G
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	1092113
Analyst ID - Reagent Drop	JER
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	TWL
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
Analyst ID - IS Reagent Drop	CCB

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Method Code: 320-3535_PFC-320

Batch End: 11/17/2017 3:14:00PM

Analyst ID - IS Reagent Drop	JNS
Witness	
Internal Standard ID#	1087029
Analyst ID - Concentration	NA
Analyst ID - Aliquot Step	JNS
Analyst ID - Final Volume Step	JNS
SOP Number	WS-LC-0025
Batch Comment	NA

Comments

Login Comments for Job 127492: L4Reviewed(Bflo):
~Sub methods:8260C,8270D,8270D_SIM,PFC_IDA.~

320-33328-A-1 Method Comments: DuPont QAS_LCSD req

320-33328-A-2 Method Comments: DuPont QAS_LCSD req

Login Comments for Job 127280: Merge with 127280

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Method Code: 320-3535_PFC-320

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Batch End:

Batch Notes

Manifold ID	11, 16
Methanol ID	1071548
Hexane ID	981623
Sodium Hydroxide ID	1088697
First Start time	NA
First End time	NA
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003337157A
Balance ID	QA-070
H2O ID	11/14/17
Pipette ID	146370G
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	1092113
Analyst ID - Reagent Drop	JER
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	TWL
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
Analyst ID - IS Reagent Drop	CCB

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Method Code: 320-3535_PFC-320

Batch End:

Analyst ID - IS Reagent Drop Witness	JNS
Internal Standard ID#	10087029
Analyst ID - Concentration	NL
Analyst ID - Aliquot Step	JNS
Analyst ID - Final Volume Step	JNS
SOP Number	WS-LC-0025
Batch Comment	NA

Comments

Login Comments for Job 127492: L4Reviewed(Bflo):
~Sub methods:8260C,8270D,8270D_SIM,PFC_IDA.~

320-33328-A-1 Method Comments: DuPont QAS_LCSD req

320-33328-A-2 Method Comments: DuPont QAS_LCSD req

Login Comments for Job 127280: Merge with 127280

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Method Code: 320-3535_PFC-320

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-195219/1	LCMPFC_ALL_SU_00018	500 uL	10.00 mL	11/16/17	11/16/17
LCS 320-195219/2	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
LCS 320-195219/2	LCPFCSP_00120	500 uL	10.00 mL		
LCSD 320-195219/3	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
LCSD 320-195219/3	LCPFCSP_00120	500 uL	10.00 mL		
320-33103-A-1	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33103-A-2	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33103-A-3	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33103-A-4	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
480-127492-A-1	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
480-127492-L-2	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
480-127492-A-3	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33328-A-1	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33328-A-2	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
680-145554-A-1	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33133-B-1	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33133-A-2	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33133-A-3	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Method Code: 320-3535_PFC-320

Batch End:

320-33135-A-1	LCMPFC_ALL_SU_00018	500 uL	10.00 mL	[signature] 11/16/17	TWR 11/16/17
320-33135-A-2	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33221-A-1	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33221-A-2	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33221-A-3	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
320-33221-A-4	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		
480-127281-A-7	LCMPFC_ALL_SU_00018	500 uL	10.00 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s) 195219 Test 3535_PFC

Earliest Holding Time 11/21/17

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	✓	✓
BD, FV, and AL initials are transcribed into the batch comment	✓	✓
Sample List Tab	**1st Level Reviewer**	**2nd Level Reviewer**
Samples identified to the correct method	✓	✓
Holding time violation NCM filed	NA	NA
MS/MSD or MS/DU NCM filed	✓	✓
NCM for any anomalies filed	NA	NA
All NCMs include method code, matrix, and prep batch	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Batch contains no more than 20 live samples	✓	✓
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 properly in TALS	NA	NA
All additional information is transcribed into TALS and is correct and raw data is attached	✓	✓
Comments/Observations are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and checked into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Internal Standard is added to the reagents	✓	✓
All units are correctly transcribed into TALS	✓	✓

1st Level Reviewer: VPM Date: 11/17/17

2nd Level Reviewer: ABH Date: 11/17/17

Comments:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Test America – Sacramento

Sample Dilution Record

Method ID PFC_IDA **Job #** 320-33221

Analyst (Print Name) Alyssa Hannigan **Analyst Initials** ABH

Date 11/24/2017

Sample#	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
320-33221-1	10,000	60	300	5

ABH 11/24/2017

Comments:

C:\Users\stephensk\AppData\Local\Microsoft\Windows\Temporary Internet Files\OLK1159\QA-747_SampleDilutionRecord.doc
10/20/16 RBH

Shipping and Receiving Documents

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record 241979

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.

TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Jeff Orient	Site Contact: Kevin Lemarty	Date: 11/9/17	COC No: 241979
Company Name: Tetra Tech	Tel/Fax: (412) 921-8650	Lab Contact: David Alltucker	Carrier: Fed Ex	1 of 1 COCs
Address: 661 Anderson Dr. Foster Plaza 7	Analysis Turnaround Time			Sampler:
City/State/Zip: Pittsburg, PA 015220-2700	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: (412) 921-8650	TAT if different from Below _____			Walk-in Client:
Fax:	☑ 2 weeks			Lab Sampling:
Project Name:	☐ 1 week			
Site: Former NAS Brunswick GWETS	☐ 2 days			Job / SDG No.:
PO # 117G08005-WE21	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	PFC (Full List) LC/MS/MS	Sample Specific Notes:
TP-PFC-023-TPI	11/1/17	1150	G	W	4	N	N	X	
TP-PFC-023-MID-CARBON		1155	G	W	4	N	N	X	
TP-PFC-023-TPP		1200	G	W	4	N	N	X	
TP-PFC-023-TPE-D		0000	G	W	4	N	N	X	

320-33221 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☒ Yes ☐ No | Custody Seal No.: Seal | Cooler Temp. (°C): Obs'd: 17 Corr'd: _____ | Therm ID No.: AK3

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Tetra Tech	11/1/17 1500		TAL-SAC	11/10/17 910
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-33221-1

Login Number: 33221
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?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","340","ng/L","D","2.3","DL","","TRG","","","17","LOQ","NO","-99","","291.9","10.00","8.6",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","13","ng/L","U","4.7","DL","","TRG","","","17","LOQ","NO","-99","","291.9","10.00","13",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","200","ng/L","D","2.1","DL","","TRG","","","8.6","LOQ","NO","-99","","291.9","10.00","4.3",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","370","ng/L","D","2.5","DL","","TRG","","","17","LOQ","NO","-99","","291.9","10.00","8.6",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","8.6","ng/L","U","2.4","DL","","TRG","","","17","LOQ","NO","-99","","291.9","10.00","8.6",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","1800","ng/L","D M","3.6","DL","","TRG","","","17","LOQ","YES","-99","","291.9","10.00","8.6",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","4.3","ng/L","U","1.3","DL","","TRG","","","8.6","LOQ","NO","-99","","291.9","10.00","4.3",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","4.3","ng/L","U","1.4","DL","","TRG","","","8.6","LOQ","NO","-99","","291.9","10.00","4.3",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","390","ng/L","D","1.3","DL","","TRG","","","8.6","LOQ","NO","-99","","291.9","10.00","4.3",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","75","ng/L","D","1.5","DL","","TRG","","","8.6","LOQ","NO","-99","","291.9","10.00","4.3",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","93","ng/L","D","1.3","DL","","TRG","","","8.6","LOQ","NO","-99","","291.9","10.00","4.3",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","70","ng/L","D","1.1","DL","","TRG","","","8.6","LOQ","NO","-99","","291.9","10.00","4.3",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","7.9","ng/L","J D","1.3","DL","","TRG","","","8.6","LOQ","NO","-99","","291.9","10.00","4.3",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","2.7","ng/L","J D","1.2","DL","","TRG","","","8.6","LOQ","NO","-99","","291.9","10.00","4.3",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","4.3","ng/L","U","1.2","DL","","TRG","","","8.6","LOQ","NO","-99","","291.9","10.00","4.3",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","13","ng/L","U","5.6","DL","","TRG","","","17","LOQ","NO","-99","","291.9","10.00","13",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","4.3","ng/L","U","1.5","DL","","TRG","","","8.6","LOQ","NO","-99","","291.9","10.00","4.3",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","STL00990","13C4 PFOA","76","ng/L","","-99","DL","","TRG","89","","-99","LOQ","YES","85.6","","291.9","10.00","430",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","STL00991","13C4 PFOS","87","ng/L","","-99","DL","","TRG","106","","-99","LOQ","YES","81.9","","291.9","10.00","430",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","STL00992","13C4 PFBA","92","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","85.6","","291.9","10.00","430",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","STL00993","13C2 PFHxA","87","ng/L","","-99","DL","","TRG","101","","-99","LOQ","YES","85.6","","291.9","10.00","430",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","STL00994","18O2 PFHxS","88","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","81.0","","291.9","10.00","430",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","STL00995","13C5 PFNA","87","ng/L","","-99","DL","","TRG","101","","-99","LOQ","YES","85.6","","291.9","10.00","430",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","STL00996","13C2 PFDA","87","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","85.6","","291.9","10.00","430",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","STL00997","13C2 PFUnA","85","ng/L","","-99","DL","","TRG","100","","-99","LOQ","YES","85.6","","291.9","10.00","430",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","STL00998","13C2 PFDoA","81","ng/L","","-99","DL","","TRG","95","","-99","LOQ","YES","85.6","","291.9","10.00","430",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","STL01056","13C8

FOSA","86","ng/L","","-99","DL","","TRG","101","","-99","LOQ","YES","85.6","","291.9","10.00","430",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","STL01892","13C4-
PFHpA","88","ng/L","","-99","DL","","TRG","103","","-99","LOQ","YES","85.6","","291.9","10.00","430",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","STL01893","13C5
PFPeA","90","ng/L","","-99","DL","","TRG","105","","-99","LOQ","YES","85.6","","291.9","10.00","430",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","STL02116","13C2-
PFTeDA","80","ng/L","","-99","DL","","TRG","93","","-99","LOQ","YES","85.6","","291.9","10.00","430",""
"TP-PFC-023-TPI","537 (modified)","DL","320-33221-1","TALSAC","STL02337","13C3-
PFBS","90","ng/L","","-99","DL","","TRG","113","","-99","LOQ","YES","79.7","","291.9","10.00","430",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","340","ng/L","","0.46","DL","","TRG","","","3.4","LOQ","YES","-99","","291.9","10.00","1.7",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA)","2.6","ng/L","U","0.94","DL","","TRG","","","3.4","LOQ","YES","-99","","291.9","10.00","2.6",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA)","200","ng/L","","0.42","DL","","TRG","","","1.7","LOQ","YES","-99","","291.9","10.00","0.86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","340","ng/L","","0.50","DL","","TRG","","","3.4","LOQ","YES","-99","","291.9","10.00","1.7",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDoA)","1.7","ng/L","U","0.47","DL","","TRG","","","3.4","LOQ","YES","-99","","291.9","10.00","1.7",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","1300","ng/L","M E","0.73","DL","","TRG","","","3.4","LOQ","NO","-99","","291.9","10.00","1.7",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","335-76-2","Perfluorodecanoic acid
(PFDA)","0.72","ng/L","J","0.27","DL","","TRG","","","1.7","LOQ","YES","-99","","291.9","10.00","0.86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","0.86","ng/L","U","0.27","DL","","TRG","","","1.7","LOQ","YES","-99","","291.9","10.00","0.86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","350","ng/L","","0.26","DL","","TRG","","","1.7","LOQ","YES","-99","","291.9","10.00","0.86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","75","ng/L","M","0.30","DL","","TRG","","","1.7","LOQ","YES","-99","","291.9","10.00","0.86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","52","ng/L","","0.26","DL","","TRG","","","1.7","LOQ","YES","-99","","291.9","10.00","0.86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","71","ng/L","","0.21","DL","","TRG","","","1.7","LOQ","YES","-99","","291.9","10.00","0.86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","6.8","ng/L","","0.26","DL","","TRG","","","1.7","LOQ","YES","-99","","291.9","10.00","0.86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","2.3","ng/L","","0.23","DL","","TRG","","","1.7","LOQ","YES","-99","","291.9","10.00","0.86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","0.86","ng/L","U","0.25","DL","","TRG","","","1.7","LOQ","YES","-99","","291.9","10.00","0.86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","2.6","ng/L","U","1.1","DL","","TRG","","","3.4","LOQ","YES","-99","","291.9","10.00","2.6",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA)","0.86","ng/L","U","0.30","DL","","TRG","","","1.7","LOQ","YES","-99","","291.9","10.00","0.86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","STL00990","13C4
PFOA","80","ng/L","","-99","DL","","TRG","94","","-99","LOQ","YES","85.6","","291.9","10.00","86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","STL00991","13C4
PFOS","110","ng/L","","-99","DL","","TRG","131","","-99","LOQ","YES","81.9","","291.9","10.00","86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","STL00992","13C4
PFBA","110","ng/L","M","-99","DL","","TRG","125","","-99","LOQ","YES","85.6","","291.9","10.00","86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","STL00993","13C2
PFHxA","110","ng/L","","-99","DL","","TRG","123","","-99","LOQ","YES","85.6","","291.9","10.00","86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","STL00994","18O2
PFHxS","100","ng/L","","-99","DL","","TRG","129","","-99","LOQ","YES","81.0","","291.9","10.00","86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","STL00995","13C5

PFNA","110","ng/L","","-99","DL","","TRG","130","","-99","LOQ","YES","85.6","","291.9","10.00","86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","STL00996","13C2
PFDA","120","ng/L","","-99","DL","","TRG","139","","-99","LOQ","YES","85.6","","291.9","10.00","86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","STL00997","13C2
PFUnA","110","ng/L","","-99","DL","","TRG","130","","-99","LOQ","YES","85.6","","291.9","10.00","86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","STL00998","13C2
PFDoA","110","ng/L","","-99","DL","","TRG","125","","-99","LOQ","YES","85.6","","291.9","10.00","86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","STL01056","13C8
FOSA","110","ng/L","","-99","DL","","TRG","126","","-99","LOQ","YES","85.6","","291.9","10.00","86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","STL01892","13C4-
PFHpA","110","ng/L","","-99","DL","","TRG","124","","-99","LOQ","YES","85.6","","291.9","10.00","86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","STL01893","13C5
PFPeA","110","ng/L","","-99","DL","","TRG","131","","-99","LOQ","YES","85.6","","291.9","10.00","86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","STL02116","13C2-
PFTeDA","110","ng/L","","-99","DL","","TRG","124","","-99","LOQ","YES","85.6","","291.9","10.00","86",""
"TP-PFC-023-TPI","537 (modified)","RES","320-33221-1","TALSAC","STL02337","13C3-
PFBS","100","ng/L","","-99","DL","","TRG","132","","-99","LOQ","YES","79.7","","291.9","10.00","86",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","1763-23-
1","Perfluorooctanesulfonic acid
(PFOS)","1.7","ng/L","U","0.45","DL","","TRG","","","3.3","LOQ","YES","-99","","302.1","10.00","1.7",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","2058-94-8","Perfluoroundecanoic
acid (PFUnA)","2.5","ng/L","U","0.91","DL","","TRG","","","3.3","LOQ","YES","-99","","302.1","10.00","2.5",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","2706-90-3","Perfluoropentanoic
acid (PFPeA)","79","ng/L","","0.41","DL","","TRG","","","1.7","LOQ","YES","-99","","302.1","10.00","0.83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","307-24-4","Perfluorohexanoic
acid (PFHxA)","13","ng/L","","0.48","DL","","TRG","","","3.3","LOQ","YES","-99","","302.1","10.00","1.7",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","307-55-1","Perfluorododecanoic
acid (PFDoA)","1.7","ng/L","U","0.46","DL","","TRG","","","3.3","LOQ","YES","-99","","302.1","10.00","1.7",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","335-67-1","Perfluorooctanoic
acid (PFOA)","1.2","ng/L","J M","0.70","DL","","TRG","","","3.3","LOQ","YES","-99","","302.1","10.00","1.7",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","335-76-2","Perfluorodecanoic
acid (PFDA)","0.83","ng/L","U","0.26","DL","","TRG","","","1.7","LOQ","YES","-99","","302.1","10.00","0.83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","335-77-
3","Perfluorodecanesulfonic acid
(PFDS)","0.83","ng/L","U","0.26","DL","","TRG","","","1.7","LOQ","YES","-99","","302.1","10.00","0.83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","355-46-
4","Perfluorohexanesulfonic acid
(PFHxS)","0.26","ng/L","J","0.25","DL","","TRG","","","1.7","LOQ","YES","-99","","302.1","10.00","0.83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","375-22-4","Perfluorobutanoic
acid (PFBA)","140","ng/L","M","0.29","DL","","TRG","","","1.7","LOQ","YES","-99","","302.1","10.00","0.83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","375-73-
5","Perfluorobutanesulfonic acid
(PFBS)","0.83","ng/L","U","0.25","DL","","TRG","","","1.7","LOQ","YES","-99","","302.1","10.00","0.83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","375-85-9","Perfluoroheptanoic
acid (PFHpA)","0.83","ng/L","U","0.21","DL","","TRG","","","1.7","LOQ","YES","-99","","302.1","10.00","0.83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","375-92-
8","Perfluoroheptanesulfonic Acid
(PFHpS)","0.83","ng/L","U","0.25","DL","","TRG","","","1.7","LOQ","YES","-99","","302.1","10.00","0.83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","375-95-1","Perfluorononanoic
acid (PFNA)","0.83","ng/L","U","0.22","DL","","TRG","","","1.7","LOQ","YES","-99","","302.1","10.00","0.83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","376-06-
7","Perfluorotetradecanoic acid
(PFTeA)","0.83","ng/L","U","0.24","DL","","TRG","","","1.7","LOQ","YES","-99","","302.1","10.00","0.83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","72629-94-

8","Perfluorotridecanoic Acid
(PFTriA)","2.5","ng/L","U","1.1","DL","","TRG","","","3.3","LOQ","YES","-99","","302.1","10.00","2.5",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","754-91-6","Perfluorooctane
Sulfonamide
(FOSA)","0.83","ng/L","U","0.29","DL","","TRG","","","1.7","LOQ","YES","-99","","302.1","10.00","0.83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","STL00990","13C4
PFOA","79","ng/L","","-99","DL","","TRG","95","","-99","LOQ","YES","82.8","","302.1","10.00","83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","STL00991","13C4
PFOS","88","ng/L","","-99","DL","","TRG","111","","-99","LOQ","YES","79.1","","302.1","10.00","83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","STL00992","13C4
PFBA","90","ng/L","M","-99","DL","","TRG","109","","-99","LOQ","YES","82.8","","302.1","10.00","83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","STL00993","13C2
PFHxA","92","ng/L","","-99","DL","","TRG","111","","-99","LOQ","YES","82.8","","302.1","10.00","83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","STL00994","18O2
PFHxS","90","ng/L","","-99","DL","","TRG","116","","-99","LOQ","YES","78.3","","302.1","10.00","83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","STL00995","13C5
PFNA","92","ng/L","","-99","DL","","TRG","111","","-99","LOQ","YES","82.8","","302.1","10.00","83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","STL00996","13C2
PFDA","91","ng/L","","-99","DL","","TRG","110","","-99","LOQ","YES","82.8","","302.1","10.00","83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","STL00997","13C2
PFUnA","91","ng/L","","-99","DL","","TRG","110","","-99","LOQ","YES","82.8","","302.1","10.00","83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","STL00998","13C2
PFDoA","86","ng/L","","-99","DL","","TRG","104","","-99","LOQ","YES","82.8","","302.1","10.00","83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","STL01056","13C8
FOSA","91","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","82.8","","302.1","10.00","83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","STL01892","13C4-
PFHpA","92","ng/L","","-99","DL","","TRG","112","","-99","LOQ","YES","82.8","","302.1","10.00","83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","STL01893","13C5
PFPeA","91","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","82.8","","302.1","10.00","83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","STL02116","13C2-
PFTeDA","86","ng/L","","-99","DL","","TRG","104","","-99","LOQ","YES","82.8","","302.1","10.00","83",""
"TP-PFC-023-MID-CARBON","537 (modified)","RES","320-33221-2","TALSAC","STL02337","13C3-
PFBS","88","ng/L","","-99","DL","","TRG","114","","-99","LOQ","YES","77.0","","302.1","10.00","83",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","0.59","ng/L","J M","0.46","DL","","TRG","","","3.4","LOQ","YES","-99","","294.7","10.00","1.7",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA)","2.5","ng/L","U","0.93","DL","","TRG","","","3.4","LOQ","YES","-99","","294.7","10.00","2.5",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA)","49","ng/L","","0.42","DL","","TRG","","","1.7","LOQ","YES","-99","","294.7","10.00","0.85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","8.6","ng/L","","0.49","DL","","TRG","","","3.4","LOQ","YES","-99","","294.7","10.00","1.7",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDoA)","1.7","ng/L","U","0.47","DL","","TRG","","","3.4","LOQ","YES","-99","","294.7","10.00","1.7",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","1.7","ng/L","U M","0.72","DL","","TRG","","","3.4","LOQ","YES","-99","","294.7","10.00","1.7",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","335-76-2","Perfluorodecanoic acid
(PFDA)","0.85","ng/L","U","0.26","DL","","TRG","","","1.7","LOQ","YES","-99","","294.7","10.00","0.85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","0.85","ng/L","U","0.27","DL","","TRG","","","1.7","LOQ","YES","-99","","294.7","10.00","0.85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","0.34","ng/L","J","0.25","DL","","TRG","","","1.7","LOQ","YES","-99","","294.7","10.00","0.85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","140","ng/L","M","0.30","DL","","TRG","","","1.7","LOQ","YES","-99","","294.7","10.00","0.85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid

(PFBS)","0.85","ng/L","U","0.25","DL","","TRG","","","1.7","LOQ","YES","-99","","294.7","10.00","0.85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","0.85","ng/L","U","0.21","DL","","TRG","","","1.7","LOQ","YES","-99","","294.7","10.00","0.85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","0.85","ng/L","U","0.25","DL","","TRG","","","1.7","LOQ","YES","-99","","294.7","10.00","0.85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","0.85","ng/L","U","0.23","DL","","TRG","","","1.7","LOQ","YES","-99","","294.7","10.00","0.85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","0.85","ng/L","U","0.25","DL","","TRG","","","1.7","LOQ","YES","-99","","294.7","10.00","0.85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","2.5","ng/L","U","1.1","DL","","TRG","","","3.4","LOQ","YES","-99","","294.7","10.00","2.5",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA)","0.85","ng/L","U","0.30","DL","","TRG","","","1.7","LOQ","YES","-99","","294.7","10.00","0.85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","STL00990","13C4
PFOA","87","ng/L","","-99","DL","","TRG","103","","-99","LOQ","YES","84.8","","294.7","10.00","85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","STL00991","13C4
PFOS","90","ng/L","","-99","DL","","TRG","111","","-99","LOQ","YES","81.1","","294.7","10.00","85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","STL00992","13C4
PFBA","93","ng/L","M","-99","DL","","TRG","109","","-99","LOQ","YES","84.8","","294.7","10.00","85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","STL00993","13C2
PFHxA","96","ng/L","","-99","DL","","TRG","113","","-99","LOQ","YES","84.8","","294.7","10.00","85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","STL00994","18O2
PFHxS","91","ng/L","","-99","DL","","TRG","113","","-99","LOQ","YES","80.3","","294.7","10.00","85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","STL00995","13C5
PFNA","96","ng/L","","-99","DL","","TRG","113","","-99","LOQ","YES","84.8","","294.7","10.00","85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","STL00996","13C2
PFDA","96","ng/L","","-99","DL","","TRG","113","","-99","LOQ","YES","84.8","","294.7","10.00","85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","STL00997","13C2
PFUnA","97","ng/L","","-99","DL","","TRG","114","","-99","LOQ","YES","84.8","","294.7","10.00","85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","STL00998","13C2
PFDoA","90","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","84.8","","294.7","10.00","85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","STL01056","13C8
FOSA","92","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","84.8","","294.7","10.00","85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","STL01892","13C4-
PFHpA","93","ng/L","","-99","DL","","TRG","110","","-99","LOQ","YES","84.8","","294.7","10.00","85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","STL01893","13C5
PFPeA","94","ng/L","","-99","DL","","TRG","111","","-99","LOQ","YES","84.8","","294.7","10.00","85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","STL02116","13C2-
PFTeDA","93","ng/L","","-99","DL","","TRG","110","","-99","LOQ","YES","84.8","","294.7","10.00","85",""
"TP-PFC-023-TPE","537 (modified)","RES","320-33221-3","TALSAC","STL02337","13C3-
PFBS","91","ng/L","","-99","DL","","TRG","115","","-99","LOQ","YES","78.9","","294.7","10.00","85",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","1.7","ng/L","U","0.45","DL","","TRG","","","3.3","LOQ","YES","-99","","301.1","10.00","1.7",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA)","2.5","ng/L","U","0.91","DL","","TRG","","","3.3","LOQ","YES","-99","","301.1","10.00","2.5",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA)","48","ng/L","","0.41","DL","","TRG","","","1.7","LOQ","YES","-99","","301.1","10.00","0.83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","8.9","ng/L","","0.48","DL","","TRG","","","3.3","LOQ","YES","-99","","301.1","10.00","1.7",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDoA)","1.7","ng/L","U","0.46","DL","","TRG","","","3.3","LOQ","YES","-99","","301.1","10.00","1.7",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","1.7","ng/L","U M","0.71","DL","","TRG","","","3.3","LOQ","YES","-99","","301.1","10.00","1.7",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","335-76-2","Perfluorodecanoic acid

(PFDA)","0.83","ng/L","U","0.26","DL","","TRG","","","1.7","LOQ","YES","-99","","301.1","10.00","0.83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","0.83","ng/L","U","0.27","DL","","TRG","","","1.7","LOQ","YES","-99","","301.1","10.00","0.83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","0.29","ng/L","J","0.25","DL","","TRG","","","1.7","LOQ","YES","-99","","301.1","10.00","0.83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","140","ng/L","M","0.29","DL","","TRG","","","1.7","LOQ","YES","-99","","301.1","10.00","0.83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","0.83","ng/L","U","0.25","DL","","TRG","","","1.7","LOQ","YES","-99","","301.1","10.00","0.83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","0.83","ng/L","U","0.21","DL","","TRG","","","1.7","LOQ","YES","-99","","301.1","10.00","0.83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","0.83","ng/L","U","0.25","DL","","TRG","","","1.7","LOQ","YES","-99","","301.1","10.00","0.83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","0.83","ng/L","U","0.22","DL","","TRG","","","1.7","LOQ","YES","-99","","301.1","10.00","0.83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","0.34","ng/L","J","0.24","DL","","TRG","","","1.7","LOQ","YES","-99","","301.1","10.00","0.83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","2.5","ng/L","U","1.1","DL","","TRG","","","3.3","LOQ","YES","-99","","301.1","10.00","2.5",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA)","0.83","ng/L","U","0.29","DL","","TRG","","","1.7","LOQ","YES","-99","","301.1","10.00","0.83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","STL00990","13C4
PFOA","81","ng/L","","-99","DL","","TRG","98","","-99","LOQ","YES","83.0","","301.1","10.00","83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","STL00991","13C4
PFOS","89","ng/L","","-99","DL","","TRG","113","","-99","LOQ","YES","79.4","","301.1","10.00","83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","STL00992","13C4
PFBA","90","ng/L","M","-99","DL","","TRG","108","","-99","LOQ","YES","83.0","","301.1","10.00","83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","STL00993","13C2
PFHxA","90","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","83.0","","301.1","10.00","83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","STL00994","18O2
PFHxS","88","ng/L","","-99","DL","","TRG","112","","-99","LOQ","YES","78.5","","301.1","10.00","83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","STL00995","13C5
PFNA","94","ng/L","","-99","DL","","TRG","113","","-99","LOQ","YES","83.0","","301.1","10.00","83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","STL00996","13C2
PFDA","94","ng/L","","-99","DL","","TRG","113","","-99","LOQ","YES","83.0","","301.1","10.00","83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","STL00997","13C2
PFUnA","91","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","83.0","","301.1","10.00","83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","STL00998","13C2
PFDoA","82","ng/L","","-99","DL","","TRG","99","","-99","LOQ","YES","83.0","","301.1","10.00","83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","STL01056","13C8
FOSA","90","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","83.0","","301.1","10.00","83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","STL01892","13C4-
PFHpA","93","ng/L","","-99","DL","","TRG","112","","-99","LOQ","YES","83.0","","301.1","10.00","83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","STL01893","13C5
PFPeA","91","ng/L","","-99","DL","","TRG","110","","-99","LOQ","YES","83.0","","301.1","10.00","83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","STL02116","13C2-
PFTeDA","90","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","83.0","","301.1","10.00","83",""
"TP-PFC-023-TPE-D","537 (modified)","RES","320-33221-4","TALSAC","STL02337","13C3-
PFBS","88","ng/L","","-99","DL","","TRG","114","","-99","LOQ","YES","77.2","","301.1","10.00","83",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","1763-23-
1","Perfluorooctanesulfonic acid
(PFOS)","39.2","ng/L","","0.54","DL","","SPK","105","","4.0","LOQ","YES","37.1","","250.00","10.00","2.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","2058-94-
8","Perfluoroundecanoic acid

(PFUnA)","36.0","ng/L","","1.1","DL","","SPK","90","","4.0","LOQ","YES","40.0","","250.00","10.00","3.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","40.8","ng/L","","0.49","DL","","SPK","102","","2.0","LOQ","YES","40.0","","250.00","10.00","1.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","42.1","ng/L","","0.58","DL","","SPK","105","","4.0","LOQ","YES","40.0","","250.00","10.00","2.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDoA)","44.5","ng/L","","0.55","DL","","SPK","111","","4.0","LOQ","YES","40.0","","250.00","10.00","2.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","41.5","ng/L","","0.85","DL","","SPK","104","","4.0","LOQ","YES","40.0","","250.00","10.00","2.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","41.3","ng/L","","0.31","DL","","SPK","103","","2.0","LOQ","YES","40.0","","250.00","10.00","1.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","39.0","ng/L","","0.32","DL","","SPK","101","","2.0","LOQ","YES","38.6","","250.00","10.00","1.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","35.4","ng/L","","0.30","DL","","SPK","97","","2.0","LOQ","YES","36.4","","250.00","10.00","1.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","41.4","ng/L","M","0.35","DL","","SPK","104","","2.0","LOQ","YES","40.0","","250.00","10.00","1.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36.5","ng/L","","0.30","DL","","SPK","103","","2.0","LOQ","YES","35.4","","250.00","10.00","1.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","40.0","ng/L","","0.25","DL","","SPK","100","","2.0","LOQ","YES","40.0","","250.00","10.00","1.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","39.5","ng/L","","0.30","DL","","SPK","104","","2.0","LOQ","YES","38.1","","250.00","10.00","1.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","41.6","ng/L","","0.27","DL","","SPK","104","","2.0","LOQ","YES","40.0","","250.00","10.00","1.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","39.4","ng/L","","0.29","DL","","SPK","99","","2.0","LOQ","YES","40.0","","250.00","10.00","1.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","37.9","ng/L","","1.3","DL","","SPK","95","","4.0","LOQ","YES","40.0","","250.00","10.00","3.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA)","41.7","ng/L","","0.35","DL","","SPK","104","","2.0","LOQ","YES","40.0","","250.00","10.00","1.0",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","STL00990","13C4 PFOA","100","ng/L","","-99","DL","","SPK","100","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","STL00991","13C4 PFOS","108","ng/L","","-99","DL","","SPK","113","","-99","LOQ","YES","95.6","","250.00","10.00","100",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","STL00992","13C4 PFBA","112","ng/L","M","-99","DL","","SPK","112","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","STL00993","13C2 PFHxA","108","ng/L","","-99","DL","","SPK","108","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","STL00994","18O2 PFHxS","107","ng/L","","-99","DL","","SPK","113","","-99","LOQ","YES","94.6","","250.00","10.00","100",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","STL00995","13C5 PFNA","113","ng/L","","-99","DL","","SPK","113","","-99","LOQ","YES","100","","250.00","10.00","100",""

"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","STL00996","13C2 PFDA","117","ng/L","","-99","DL","","SPK","117","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","STL00997","13C2 PFUnA","121","ng/L","","-99","DL","","SPK","121","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","STL00998","13C2 PFDoA","102","ng/L","","-99","DL","","SPK","102","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","STL01056","13C8 FOSA","106","ng/L","","-99","DL","","SPK","106","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","STL01892","13C4-PFHpA","112","ng/L","","-99","DL","","SPK","112","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","STL01893","13C5 PFPeA","112","ng/L","","-99","DL","","SPK","112","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","STL02116","13C2-PFTeDA","102","ng/L","","-99","DL","","SPK","102","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-195219/2-A","537 (modified)","RES","LCS 320-195219/2-A","TALSAC","STL02337","13C3-PFBS","110","ng/L","","-99","DL","","SPK","118","","-99","LOQ","YES","93.0","","250.00","10.00","100",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","37.1","ng/L","","0.54","DL","","SPK","100","5","4.0","LOQ","YES","37.1","LCS 320-195219/2-A","250.00","10.00","2.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","35.1","ng/L","","1.1","DL","","SPK","88","3","4.0","LOQ","YES","40.0","LCS 320-195219/2-A","250.00","10.00","3.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","40.3","ng/L","","0.49","DL","","SPK","101","1","2.0","LOQ","YES","40.0","LCS 320-195219/2-A","250.00","10.00","1.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","39.7","ng/L","","0.58","DL","","SPK","99","6","4.0","LOQ","YES","40.0","LCS 320-195219/2-A","250.00","10.00","2.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","43.0","ng/L","","0.55","DL","","SPK","108","3","4.0","LOQ","YES","40.0","LCS 320-195219/2-A","250.00","10.00","2.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","39.6","ng/L","","0.85","DL","","SPK","99","5","4.0","LOQ","YES","40.0","LCS 320-195219/2-A","250.00","10.00","2.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","40.0","ng/L","","0.31","DL","","SPK","100","3","2.0","LOQ","YES","40.0","LCS 320-195219/2-A","250.00","10.00","1.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","39.0","ng/L","","0.32","DL","","SPK","101","0","2.0","LOQ","YES","38.6","LCS 320-195219/2-A","250.00","10.00","1.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","33.9","ng/L","","0.30","DL","","SPK","93","5","2.0","LOQ","YES","36.4","LCS 320-195219/2-A","250.00","10.00","1.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","40.3","ng/L","M","0.35","DL","","SPK","101","3","2.0","LOQ","YES","40.0","LCS 320-195219/2-

A","250.00","10.00","1.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","34.2","ng/L","","0.30","DL","","SPK","97","6","2.0","LOQ","YES","35.4","LCS 320-195219/2-A","250.00","10.00","1.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","40.6","ng/L","","0.25","DL","","SPK","101","2","2.0","LOQ","YES","40.0","LCS 320-195219/2-A","250.00","10.00","1.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","38.8","ng/L","","0.30","DL","","SPK","102","2","2.0","LOQ","YES","38.1","LCS 320-195219/2-A","250.00","10.00","1.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","38.4","ng/L","","0.27","DL","","SPK","96","8","2.0","LOQ","YES","40.0","LCS 320-195219/2-A","250.00","10.00","1.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","40.4","ng/L","","0.29","DL","","SPK","101","3","2.0","LOQ","YES","40.0","LCS 320-195219/2-A","250.00","10.00","1.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","38.8","ng/L","","1.3","DL","","SPK","97","2","4.0","LOQ","YES","40.0","LCS 320-195219/2-A","250.00","10.00","3.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","40.7","ng/L","","0.35","DL","","SPK","102","2","2.0","LOQ","YES","40.0","LCS 320-195219/2-A","250.00","10.00","1.0",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","STL00990","13C4 PFOA","101","ng/L","","-99","DL","","SPK","101","","-99","LOQ","YES","100","LCS 320-195219/2-A","250.00","10.00","100",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","STL00991","13C4 PFOS","113","ng/L","","-99","DL","","SPK","118","","-99","LOQ","YES","95.6","LCS 320-195219/2-A","250.00","10.00","100",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","STL00992","13C4 PFBA","114","ng/L","M","-99","DL","","SPK","114","","-99","LOQ","YES","100","LCS 320-195219/2-A","250.00","10.00","100",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","STL00993","13C2 PFHxA","116","ng/L","","-99","DL","","SPK","116","","-99","LOQ","YES","100","LCS 320-195219/2-A","250.00","10.00","100",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","STL00994","18O2 PFHxS","114","ng/L","","-99","DL","","SPK","120","","-99","LOQ","YES","94.6","LCS 320-195219/2-A","250.00","10.00","100",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","STL00995","13C5 PFNA","117","ng/L","","-99","DL","","SPK","117","","-99","LOQ","YES","100","LCS 320-195219/2-A","250.00","10.00","100",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","STL00996","13C2 PFDA","116","ng/L","","-99","DL","","SPK","116","","-99","LOQ","YES","100","LCS 320-195219/2-A","250.00","10.00","100",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","STL00997","13C2 PFUnA","124","ng/L","","-99","DL","","SPK","124","","-99","LOQ","YES","100","LCS 320-195219/2-A","250.00","10.00","100",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","STL00998","13C2 PFDoA","105","ng/L","","-99","DL","","SPK","105","","-99","LOQ","YES","100","LCS 320-195219/2-A","250.00","10.00","100",""

"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","STL01056","13C8 FOSA","102","ng/L","","-99","DL","","SPK","102","","-99","LOQ","YES","100","LCS 320-195219/2-A","250.00","10.00","100",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","STL01892","13C4-PFHpA","113","ng/L","","-99","DL","","SPK","113","","-99","LOQ","YES","100","LCS 320-195219/2-A","250.00","10.00","100",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","STL01893","13C5 PFPeA","115","ng/L","","-99","DL","","SPK","115","","-99","LOQ","YES","100","LCS 320-195219/2-A","250.00","10.00","100",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","STL02116","13C2-PFTeDA","103","ng/L","","-99","DL","","SPK","103","","-99","LOQ","YES","100","LCS 320-195219/2-A","250.00","10.00","100",""
"LCSD 320-195219/3-A","537 (modified)","RES","LCSD 320-195219/3-A","TALSAC","STL02337","13C3-PFBS","116","ng/L","","-99","DL","","SPK","125","","-99","LOQ","YES","93.0","LCS 320-195219/2-A","250.00","10.00","100",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","0.647","ng/L","J M","0.54","DL","","TRG","","","4.0","LOQ","YES","-99","","250.00","10.00","2.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","3.0","ng/L","U","1.1","DL","","TRG","","","4.0","LOQ","YES","-99","","250.00","10.00","3.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","1.0","ng/L","U","0.49","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","2.0","ng/L","U","0.58","DL","","TRG","","","4.0","LOQ","YES","-99","","250.00","10.00","2.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","2.0","ng/L","U","0.55","DL","","TRG","","","4.0","LOQ","YES","-99","","250.00","10.00","2.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","2.0","ng/L","U","0.85","DL","","TRG","","","4.0","LOQ","YES","-99","","250.00","10.00","2.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","1.0","ng/L","U","0.31","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","1.0","ng/L","U","0.32","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","1.0","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","1.0","ng/L","U","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","1.0","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","1.0","ng/L","U","0.25","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","1.0","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","1.0","ng/L","U","0.27","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","1.0","ng/L","U","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","3.0","ng/L","U","1.3","DL","","TRG","","","4.0","LOQ","YES","-99","","250.00","10.00","3.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","754-91-6","Perfluorooctane

Sulfonamide
(FOSA)","1.0","ng/L","U","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","STL00990","13C4
PFOA","104","ng/L","","-99","DL","","TRG","104","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","STL00991","13C4
PFOS","104","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","95.6","","250.00","10.00","100",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","STL00992","13C4
PFBA","111","ng/L","M","-99","DL","","TRG","111","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","STL00993","13C2
PFHxA","107","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","STL00994","18O2
PFHxS","107","ng/L","","-99","DL","","TRG","114","","-99","LOQ","YES","94.6","","250.00","10.00","100",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","STL00995","13C5
PFNA","112","ng/L","","-99","DL","","TRG","112","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","STL00996","13C2
PFDA","115","ng/L","","-99","DL","","TRG","115","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","STL00997","13C2
PFUnA","119","ng/L","","-99","DL","","TRG","119","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","STL00998","13C2
PFDoA","108","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","STL01056","13C8
FOSA","105","ng/L","","-99","DL","","TRG","105","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","STL01892","13C4-
PFHpA","113","ng/L","","-99","DL","","TRG","113","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","STL01893","13C5
PFPeA","111","ng/L","","-99","DL","","TRG","111","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","STL02116","13C2-
PFTeDA","107","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-195219/1-A","537 (modified)","RES","MB 320-195219/1-A","TALSAC","STL02337","13C3-
PFBS","111","ng/L","","-99","DL","","TRG","119","","-99","LOQ","YES","93.0","","250.00","10.00","100",""
"Unknown","Unknown","TP-PFC-023-TPI","11/09/2017 11:50","AQ","320-33221-1","NM","","1.70","537
(modified)","3535","RES","11/16/2017 17:39","11/18/2017
19:25","TALSAC","COA","WET","NA","1","NA","NA","","100","320-195219","320-195219","NA","320-
195562","320-33221-1","11/10/2017 09:10","11/28/2017 15:26",""
"Unknown","Unknown","TP-PFC-023-TPI","11/09/2017 11:50","AQ","320-33221-1","NM","","1.70","537
(modified)","3535","DL","11/16/2017 17:39","11/24/2017
15:04","TALSAC","COA","WET","NA","5","NA","NA","","100","320-195219","320-195219","NA","320-
196712","320-33221-1","11/10/2017 09:10","11/28/2017 15:26",""
"Unknown","Unknown","TP-PFC-023-MID-CARBON","11/09/2017 11:55","AQ","320-33221-
2","NM","","1.70","537 (modified)","3535","RES","11/16/2017 17:39","11/18/2017
19:33","TALSAC","COA","WET","NA","1","NA","NA","","100","320-195219","320-195219","NA","320-
195562","320-33221-1","11/10/2017 09:10","11/28/2017 15:26",""
"Unknown","Unknown","TP-PFC-023-TPE","11/09/2017 12:00","AQ","320-33221-3","NM","","1.70","537
(modified)","3535","RES","11/16/2017 17:39","11/18/2017
19:48","TALSAC","COA","WET","NA","1","NA","NA","","100","320-195219","320-195219","NA","320-
195562","320-33221-1","11/10/2017 09:10","11/28/2017 15:26",""
"Unknown","Unknown","TP-PFC-023-TPE-D","11/09/2017 00:00","AQ","320-33221-4","FD","","1.70","537
(modified)","3535","RES","11/16/2017 17:39","11/18/2017
19:56","TALSAC","COA","WET","NA","1","NA","NA","","100","320-195219","320-195219","NA","320-
195562","320-33221-1","11/10/2017 09:10","11/28/2017 15:26",""
"Unknown","Unknown","LCS 320-195219/2-A","","AQ","LCS 320-195219/2-A","LCS","","-99","537
(modified)","3535","RES","11/16/2017 17:39","11/18/2017
17:03","TALSAC","COA","WET","NA","1","NA","NA","","100","320-195219","320-195219","NA","320-
195562","320-33221-1","11/16/2017 17:39","11/28/2017 15:26",""

"Unknown","Unknown","LCSD 320-195219/3-A","","AQ","LCSD 320-195219/3-A","LCSD","","-99","537 (modified)","3535","RES","11/16/2017 17:39","11/18/2017 17:11","TALSAC","COA","WET","NA","1","NA","NA","","100","320-195219","320-195219","NA","320-195562","320-33221-1","11/16/2017 17:39","11/28/2017 15:26",""
"Unknown","Unknown","MB 320-195219/1-A","","AQ","MB 320-195219/1-A","MB","","-99","537 (modified)","3535","RES","11/16/2017 17:39","11/18/2017 16:55","TALSAC","COA","WET","NA","1","NA","NA","","100","320-195219","320-195219","NA","320-195562","320-33221-1","11/16/2017 17:39","11/28/2017 15:26",""

TETRA TECH **INTERNAL CORRESPONDENCE**

TO: **J. ORIENT** **DATE:** **DECEMBER 7, 2017**

FROM: **MICHELLE L. WOEBER** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – POLYFLUOROALKYL SUBSTANCES (PFAS)**
FORMER NAVAL AIR STATION (NAS) BRUNSWICK, BRUNSWICK, ME
CTO WE21 PFC ASSESSMENT
SAMPLE DELIVERY GROUP (SDG) 320-33221-1

SAMPLES: 4/Aqueous/PFAS

TP-PFC-023-MID-CARBON TP-PFC-023-TPE TP-PFC-023-TPE-D
TP-PFC-023-TPI

Overview

The sample set for former NAS Brunswick, SDG 320-33221-1 consisted of four (4) aqueous environmental samples. All four (4) aqueous samples were analyzed for Polyfluoroalkyl Substances (PFAS). One field duplicate pair was included in this Sample Delivery Group (SDG): TP-PFC-023-TPE/TP-PFC-023-TPE-D.

The samples were collected by Tetra Tech, Inc. on November 9, 2017 and analyzed by Test America, Inc. The analyses were conducted using EPA Method 537 (Modified) 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
* • Laboratory Control Sample/Laboratory Control Sample Duplicate 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 this SDG. The text of this report has been formulated to address only those areas affecting data quality.

LABORATORY METHOD BLANK RESULTS

The following compound was detected in the laboratory method blank at the following maximum concentration:

Analyte	Concentration (ng/L)	Action Level Limit of Quantitation (LOQ) > or <
Perfluorooctanesulfonic acid (PFOS) (1)	0.647	<

(1) - Maximum concentration detected in the laboratory method blank, MB 320-195219/1-A, from preparation batch #320-195562 affecting all samples.

The detected result reported for this compound below the LOQ was qualified as non-detected, (U).

NOTES

Field Reagent Blanks (FRBs) were not provided with the environmental samples.

The concentration of pentadecafluorooctanoic acid (perfluorooctanoic acid (PFOA)) exceeded the instrument calibration range in sample TP-PFC-023-TPI. The sample was reanalyzed at a 5X dilution. The result for this compound from the dilution was used in the data validation.

Detected results reported below the 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: A contaminant was detected in the laboratory method blank.

Other Factors Affecting Data Quality: One sample was further diluted. 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 2017), 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.

Michelle L. Woeber

Tetra Tech, Inc.
Michelle L. Woeber
Environmental Chemist

Joseph A. Samchuck

Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:

Appendix A - Qualified Analytical Results
Appendix B - Results as reported by the Laboratory
Appendix C - Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

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
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE21	NSAMPLE	TP-PFC-023-MID-CARBON			TP-PFC-023-TPE			TP-PFC-023-TPE-D			TP-PFC-023-TPI		
SDG: 320-33221-1	LAB_ID	320-33221-2			320-33221-3			320-33221-4			320-33221-1		
FRACTION: PFAS	SAMP_DATE	11/9/2017			11/9/2017			11/9/2017			11/9/2017		
MEDIA: WATER	QC_TYPE	NM			NM			FD			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF							TP-PFC-023-TPE					
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		1.2	J	P	1.7	U		1.7	U				
PERFLUOROBUTANESULFONIC ACID		0.83	U		0.85	U		0.83	U		52		
PERFLUOROBUTANOIC ACID		140			140			140			75		
PERFLUORODECANE SULFONIC ACID		0.83	U		0.85	U		0.83	U		0.86	U	
PERFLUORODECANOIC ACID		0.83	U		0.85	U		0.83	U		0.72	J	P
PERFLUORODODECANOIC ACID		1.7	U		1.7	U		1.7	U		1.7	U	
PERFLUOROHEPTANESULFONIC ACID		0.83	U		0.85	U		0.83	U		6.8		
PERFLUOROHEPTANOIC ACID		0.83	U		0.85	U		0.83	U		71		
PERFLUOROHEXANESULFONIC ACID		0.26	J	P	0.34	J	P	0.29	J	P	350		
PERFLUOROHEXANOIC ACID		13			8.6			8.9			340		
PERFLUORONONANOIC ACID		0.83	U		0.85	U		0.83	U		2.3		
PERFLUOROOCTANE SULFONAMIDE		0.83	U		0.85	U		0.83	U		0.86	U	
PERFLUOROOCTANE SULFONIC ACID		1.7	U		0.59	U	A	1.7	U		340		
PERFLUOROPENTANOIC ACID		79			49			48			200		
PERFLUOROTETRADECANOIC ACID		0.83	U		0.85	U		0.34	J	P	0.86	U	
PERFLUOROTRIDECANOIC ACID		2.5	U		2.5	U		2.5	U		2.6	U	
PERFLUOROUNDECANOIC ACID		2.5	U		2.5	U		2.5	U		2.6	U	

PROJ_NO: 08005-WE21	NSAMPLE	TP-PFC-023-TPI-DL		
SDG: 320-33221-1	LAB_ID	320-33221-1		
FRACTION: PFAS	SAMP_DATE	11/9/2017		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		1800		
PERFLUOROBUTANESULFONIC ACID				
PERFLUOROBUTANOIC ACID				
PERFLUORODECANE SULFONIC ACID				
PERFLUORODECANOIC ACID				
PERFLUORODODECANOIC ACID				
PERFLUOROHEPTANESULFONIC ACID				
PERFLUOROHEPTANOIC ACID				
PERFLUOROHEXANESULFONIC ACID				
PERFLUOROHEXANOIC ACID				
PERFLUORONONANOIC ACID				
PERFLUOROOCTANE SULFONAMIDE				
PERFLUOROOCTANE SULFONIC ACID				
PERFLUOROPENTANOIC ACID				
PERFLUOROTETRADECANOIC ACID				
PERFLUOROTRIDECANOIC ACID				
PERFLUOROUNDECANOIC ACID				

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-TPI | Lab Sample ID: 320-33221-1

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_021.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 11:50

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 291.9(mL) | Date Analyzed: 11/18/2017 19:25

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	75	M	1.7	0.86	0.30
2706-90-3	Perfluoropentanoic acid (PFPeA)	200		1.7	0.86	0.42
307-24-4	Perfluorohexanoic acid (PFHxA)	340		3.4	1.7	0.50
375-85-9	Perfluoroheptanoic acid (PFHpA)	71		1.7	0.86	0.21
335-67-1	*Perfluorooctanoic acid (PFOA)*	*1300*	*M E*	*3.4*	1.7	*0.73*
375-95-1	Perfluorononanoic acid (PFNA)	2.3		1.7	0.86	0.23
335-76-2	Perfluorodecanoic acid (PFDA)	0.72	J	1.7	0.86	0.27
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.6	U	3.4	2.6	0.94
307-55-1	Perfluorododecanoic acid (PFDoA)	1.7	U	3.4	1.7	0.47
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	2.6	1.1
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.86	U	1.7	0.86	0.25
375-73-5	Perfluorobutanesulfonic acid (PFBS)	52		1.7	0.86	0.26
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	350		1.7	0.86	0.26
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	6.8		1.7	0.86	0.26
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	340		3.4	1.7	0.46
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.86	U	1.7	0.86	0.27
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.86	U	1.7	0.86	0.30

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-TPI | Lab Sample ID: 320-33221-1

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_021.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 11:50

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 291.9(mL) | Date Analyzed: 11/18/2017 19:25

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	126		25-150
STL00992	13C4 PFBA	125	M	25-150
STL00993	13C2 PFHxA	123		25-150
STL00990	13C4 PFOA	94		25-150
STL00995	13C5 PFNA	130		25-150
STL00996	13C2 PFDA	139		25-150
STL00997	13C2 PFUnA	130		25-150
STL00998	13C2 PFDoA	125		25-150
STL00994	18O2 PFHxS	129		25-150
STL00991	13C4 PFOS	131		25-150
STL02116	13C2-PFTeDA	124		25-150
STL01892	13C4-PFHpA	124		25-150
STL01893	13C5 PFPeA	131		25-150
STL02337	13C3-PFBS	132		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-TPI DL | Lab Sample ID: 320-33221-1 DL

Matrix: Water | Lab File ID: 2017.11.24LLA_011.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 11:50

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 291.9(mL) | Date Analyzed: 11/24/2017 15:04

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 5

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 196712 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	*Perfluorobutanoic acid (PFBA)*	*75*	*D*	*8.6*	4.3	*1.5*
2706-90-3	*Perfluoropentanoic acid (PFPeA)*	*200*	*D*	*8.6*	4.3	*2.1*
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*370*	*D*	*17*	8.6	*2.5*
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*70*	*D*	*8.6*	4.3	*1.1*
335-67-1	Perfluorooctanoic acid (PFOA)	1800	D M	17	8.6	3.6
375-95-1	*Perfluorononanoic acid (PFNA)*	*2.7*	*J D*	*8.6*	4.3	*1.2*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*4.3*	*U*	*8.6*	4.3	*1.3*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*13*	*U*	*17*	13	*4.7*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*8.6*	*U*	*17*	8.6	*2.4*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*13*	*U*	*17*	13	*5.6*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*4.3*	*U*	*8.6*	4.3	*1.2*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*93*	*D*	*8.6*	4.3	*1.3*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*390*	*D*	*8.6*	4.3	*1.3*
375-92-8	*Perfluoroheptanesulfonic Acid (PFHpS)*	*7.9*	*J D*	*8.6*	4.3	*1.3*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*340*	*D*	*17*	8.6	*2.3*
335-77-3	*Perfluorodecanesulfonic acid (PFDS)*	*4.3*	*U*	*8.6*	4.3	*1.4*
754-91-6	*Perfluorooctane Sulfonamide (FOSA)*	*4.3*	*U*	*8.6*	4.3	*1.5*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-TPI DL | Lab Sample ID: 320-33221-1 DL

Matrix: Water | Lab File ID: 2017.11.24LLA_011.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 11:50

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 291.9(mL) | Date Analyzed: 11/24/2017 15:04

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 5

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 196712 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	101		25-150
STL00992	13C4 PFBA	107		25-150
STL00993	13C2 PFHxA	101		25-150
STL00990	13C4 PFOA	89		25-150
STL00995	13C5 PFNA	101		25-150
STL00996	13C2 PFDA	102		25-150
STL00997	13C2 PFUnA	100		25-150
STL00998	13C2 PFDoA	95		25-150
STL00994	18O2 PFHxS	109		25-150
STL00991	13C4 PFOS	106		25-150
STL02116	13C2-PFTeDA	93		25-150
STL01892	13C4-PFHpA	103		25-150
STL01893	13C5 PFPeA	105		25-150
STL02337	13C3-PFBS	113		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-MID-CARBON | Lab Sample ID: 320-33221-2

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_022.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 11:55

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 302.1(mL) | Date Analyzed: 11/18/2017 19:33

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	140	M	1.7	0.83	0.29
2706-90-3	Perfluoropentanoic acid (PFPeA)	79		1.7	0.83	0.41
307-24-4	Perfluorohexanoic acid (PFHxA)	13		3.3	1.7	0.48
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.83	U	1.7	0.83	0.21
335-67-1	Perfluorooctanoic acid (PFOA)	1.2	J M	3.3	1.7	0.70
375-95-1	Perfluorononanoic acid (PFNA)	0.83	U	1.7	0.83	0.22
335-76-2	Perfluorodecanoic acid (PFDA)	0.83	U	1.7	0.83	0.26
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.5	U	3.3	2.5	0.91
307-55-1	Perfluorododecanoic acid (PFDoA)	1.7	U	3.3	1.7	0.46
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.3	2.5	1.1
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.83	U	1.7	0.83	0.24
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.83	U	1.7	0.83	0.25
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.26	J	1.7	0.83	0.25
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.83	U	1.7	0.83	0.25
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.7	U	3.3	1.7	0.45
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.83	U	1.7	0.83	0.26
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.83	U	1.7	0.83	0.29

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-MID-CARBON Lab Sample ID: 320-33221-2

Matrix: Water Lab File ID: 2017.11.18LLAXEA_022.d

Analysis Method: 537 (modified) Date Collected: 11/09/2017 11:55

Extraction Method: 3535 Date Extracted: 11/16/2017 17:39

Sample wt/vol: 302.1(mL) Date Analyzed: 11/18/2017 19:33

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	109		25-150
STL00992	13C4 PFBA	109	M	25-150
STL00993	13C2 PFHxA	111		25-150
STL00990	13C4 PFOA	95		25-150
STL00995	13C5 PFNA	111		25-150
STL00996	13C2 PFDA	110		25-150
STL00997	13C2 PFUnA	110		25-150
STL00998	13C2 PFDoA	104		25-150
STL00994	18O2 PFHxS	116		25-150
STL00991	13C4 PFOS	111		25-150
STL02116	13C2-PFTeDA	104		25-150
STL01892	13C4-PFHpA	112		25-150
STL01893	13C5 PFPeA	109		25-150
STL02337	13C3-PFBS	114		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-TPE | Lab Sample ID: 320-33221-3

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_024.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 12:00

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 294.7(mL) | Date Analyzed: 11/18/2017 19:48

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	140	M	1.7	0.85	0.30
2706-90-3	Perfluoropentanoic acid (PFPeA)	49		1.7	0.85	0.42
307-24-4	Perfluorohexanoic acid (PFHxA)	8.6		3.4	1.7	0.49
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.85	U	1.7	0.85	0.21
335-67-1	Perfluorooctanoic acid (PFOA)	1.7	U M	3.4	1.7	0.72
375-95-1	Perfluorononanoic acid (PFNA)	0.85	U	1.7	0.85	0.23
335-76-2	Perfluorodecanoic acid (PFDA)	0.85	U	1.7	0.85	0.26
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.5	U	3.4	2.5	0.93
307-55-1	Perfluorododecanoic acid (PFDoA)	1.7	U	3.4	1.7	0.47
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.4	2.5	1.1
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.85	U	1.7	0.85	0.25
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.85	U	1.7	0.85	0.25
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.34	J	1.7	0.85	0.25
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.85	U	1.7	0.85	0.25
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.59	J M	3.4	1.7	0.46
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.85	U	1.7	0.85	0.27
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.85	U	1.7	0.85	0.30

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-TPE | Lab Sample ID: 320-33221-3

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_024.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 12:00

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 294.7(mL) | Date Analyzed: 11/18/2017 19:48

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	108		25-150
STL00992	13C4 PFBA	109	M	25-150
STL00993	13C2 PFHxA	113		25-150
STL00990	13C4 PFOA	103		25-150
STL00995	13C5 PFNA	113		25-150
STL00996	13C2 PFDA	113		25-150
STL00997	13C2 PFUnA	114		25-150
STL00998	13C2 PFDoA	107		25-150
STL00994	18O2 PFHxS	113		25-150
STL00991	13C4 PFOS	111		25-150
STL02116	13C2-PFTeDA	110		25-150
STL01892	13C4-PFHpA	110		25-150
STL01893	13C5 PFPeA	111		25-150
STL02337	13C3-PFBS	115		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-TPE-D | Lab Sample ID: 320-33221-4

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_025.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 00:00

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 301.1(mL) | Date Analyzed: 11/18/2017 19:56

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	140	M	1.7	0.83	0.29
2706-90-3	Perfluoropentanoic acid (PFPeA)	48		1.7	0.83	0.41
307-24-4	Perfluorohexanoic acid (PFHxA)	8.9		3.3	1.7	0.48
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.83	U	1.7	0.83	0.21
335-67-1	Perfluorooctanoic acid (PFOA)	1.7	U M	3.3	1.7	0.71
375-95-1	Perfluorononanoic acid (PFNA)	0.83	U	1.7	0.83	0.22
335-76-2	Perfluorodecanoic acid (PFDA)	0.83	U	1.7	0.83	0.26
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.5	U	3.3	2.5	0.91
307-55-1	Perfluorododecanoic acid (PFDoA)	1.7	U	3.3	1.7	0.46
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.3	2.5	1.1
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.34	J	1.7	0.83	0.24
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.83	U	1.7	0.83	0.25
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.29	J	1.7	0.83	0.25
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.83	U	1.7	0.83	0.25
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.7	U	3.3	1.7	0.45
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.83	U	1.7	0.83	0.27
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.83	U	1.7	0.83	0.29

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: TP-PFC-023-TPE-D | Lab Sample ID: 320-33221-4

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_025.d

Analysis Method: 537 (modified) | Date Collected: 11/09/2017 00:00

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 301.1(mL) | Date Analyzed: 11/18/2017 19:56

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	108		25-150
STL00992	13C4 PFBA	108	M	25-150
STL00993	13C2 PFHxA	108		25-150
STL00990	13C4 PFOA	98		25-150
STL00995	13C5 PFNA	113		25-150
STL00996	13C2 PFDA	113		25-150
STL00997	13C2 PFUnA	109		25-150
STL00998	13C2 PFDoA	99		25-150
STL00994	18O2 PFHxS	112		25-150
STL00991	13C4 PFOS	113		25-150
STL02116	13C2-PFTeDA	108		25-150
STL01892	13C4-PFHpA	112		25-150
STL01893	13C5 PFPeA	110		25-150
STL02337	13C3-PFBS	114		25-150

APPENDIX C

SUPPORT DOCUMENTATION

NAS BRUNSWICK
SDG 320-33221-1

SAMPLE IDENTIFICATION	TP-PFC-023-TPI	
COMPOUND	PENTADECAFLUOROOCTANOIC ACID	
COMPOUND AREA	21697681	
INTERNAL STANDARD AMOUNT (ng/ml)	0.5	
DILUTION FACTOR	5	
INTERNAL STANDARD AREA	997971	
AVERAGE RRF	1.0549	
SAMPLE VOLUME (ml)	291.9	
VOLUME EXTRACT (ml)	10	
VOLUME INJECTED (µl)	1	
ml to L	1000	
CONCENTRATION =	1765.18	ng/L

21697681 x 0.5ng/ml x 1000ml x 10ml x 5/(997971 x 1.073 x 291.9ml x 1µl x 1L)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50938.b\2017.11.24LLA_011.d
Lims ID: 320-33221-A-1-A
Client ID: TP-PFC-023-TPI
Sample Type: Client
Inject. Date: 24-Nov-2017 15:04:38 ALS Bottle#: 2 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 5.0000
Sample Info: 320-33221-a-1-a 5X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171127-50938.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 27-Nov-2017 15:12:18 Calib Date: 16-Nov-2017 14:23:17
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171116-50544.b\2017.11.16LLICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK050

First Level Reviewer: hannigana Date: 27-Nov-2017 15:12:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.490	1.485	0.005	0.551	1521266	0.5364		107	9409	
2 Perfluorobutyric acid										
212.90 > 169.00	1.490	1.485	0.005	1.000	1213979	0.4358			170	
D 3 13C5-PFPeA										
267.90 > 223.00	1.754	1.755	-0.001	0.648	946464	0.5270		105	9612	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.754	1.755	-0.001	1.000	2525141	1.18			1101	
D 47 13C3-PFBS										
301.90 > 83.00	1.795	1.788	0.007	0.663	20667	0.5266		113	579	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.795	1.796	-0.001	1.000	1784081	0.5401			1021	
298.90 > 99.00	1.795	1.796	-0.001	1.000	756647		2.36(1.74-3.24)		887	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.034	2.035	-0.001	1.000	4413589	2.15			5827	
313.00 > 119.00	2.034	2.035	-0.001	1.000	347862		12.69(7.05-13.09)		3895	
D 7 13C2 PFHxA										
315.00 > 270.00	2.034	2.035	-0.001	0.752	1027744	0.5069		101	11536	
D 9 13C4-PFHpA										
367.00 > 322.00	2.352	2.354	-0.002	0.869	1007221	0.5143		103	14368	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.352	2.354	-0.002	1.000	839830	0.4067			1084	
363.00 > 169.00	2.352	2.354	-0.002	1.000	338619		2.48(1.59-2.95)		2063	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.373	2.375	-0.002	1.000	6269509	2.28			14190	
399.00 > 99.00	2.373	2.375	-0.002	1.000	1979817		3.17(2.10-3.89)		8340	
D 11 18O2 PFHxS										
403.00 > 84.00	2.373	2.375	-0.002	0.877	1187456	0.5138		109	18982	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFOA										
417.00 > 372.00	2.705	2.707	-0.002	1.000	997971	0.4444		88.9	16319	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.705	2.707	-0.002	1.000	21697681	10.3			7596	
413.00 > 169.00	2.705	2.707	-0.002	1.000	13088022		1.66(1.18-2.19)		21299	M
* 62 13C2-PFOA										
415.00 > 370.00	2.705	2.707	-0.002		1089737	0.5000			20534	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.713	2.714	-0.001	1.000	98173	0.0459			122	
449.00 > 99.00	2.705	2.714	-0.009	0.997	28748		3.41(2.72-5.05)		192	
D 18 13C4 PFOS										
503.00 > 80.00	3.072	3.074	-0.002	1.135	780927	0.5061		106	7225	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.072	3.074	-0.002	1.000	3372471	1.97			512	
499.00 > 99.00	3.072	3.074	-0.002	1.000	769489		4.38(3.24-6.01)		834	
D 19 13C5 PFNA										
468.00 > 423.00	3.072	3.074	-0.002	1.135	837199	0.5074		101	15823	
20 Perfluorononanoic acid										R
463.00 > 419.00	3.072	3.082	-0.010	1.000	26590	0.0159			43.9	R
463.00 > 169.00	3.072	3.082	-0.010	1.000	5203		5.11(2.65-4.93)		96.9	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.418	3.411	0.007	1.000	5910	0.003070			56.4	
D 21 13C8 FOSA										
506.00 > 78.00	3.418	3.411	0.007	1.263	1002087	0.5041		101	15010	
D 23 13C2 PFDA										
515.00 > 470.00	3.433	3.434	-0.001	1.269	709655	0.5099		102	14105	
D 30 13C2 PFUnA										
565.00 > 520.00	3.760	3.769	-0.009	1.390	554814	0.4991		99.8	9693	
D 36 13C2 PFDoA										
615.00 > 570.00	4.054	4.062	-0.008	1.498	613000	0.4749		95.0	11100	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.556	4.570	-0.014	1.684	738130	0.4651		93.0	7830	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

ANALYTE	ORIGINAL	DUPLICATE	RL	RPD	RPD > 30%	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2xRL
PERFLUOROBUTANOIC ACID	140	140	1.7	0.00	FALSE	TRUE	TRUE	FALSE
PERFLUOROHEXANESULFONIC ACID	0.34	0.29	1.7	15.87	FALSE	FALSE	FALSE	FALSE
PERFLUOROHEXANOIC ACID	8.6	8.9	3.3	3.43	FALSE	TRUE	TRUE	FALSE
PERFLUOROPENTANOIC ACID	49	48	1.7	2.06	FALSE	TRUE	TRUE	FALSE
PERFLUOROTETRADECANOIC ACID	0.85	0.34	1.7	85.71	TRUE	FALSE	FALSE	FALSE

SDG 320-33221-1

TP-PFC-023-TPE/TP-PFC-023-TPE-D

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record 241979

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Jeff Orient	Site Contact: Kevin Lemarie	Date: 11/9/17	COC No: 241975
Company Name: Tetra Tech	Tel/Fax: (412) 921-8650	Lab Contact: David Alltucker	Carrier: Fed Ex	1 of 1 COCs
Address: 661 Anderson Dr. Foster Plaza 7	Analysis Turnaround Time			Sampler:
City/State/Zip: Pittsburg, PA 15220-2700	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: (412) 921-8650	TAT if different from Below			Walk-in Client:
Fax:	☑ 2 weeks			Lab Sampling:
Project Name:	☐ 1 week			
Site: Former NAS Brunswick GWETS	☐ 2 days			Job / SDG No.:
PO # 117G08005-WE21	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	PFC (Full List) LC/MS/MS	Sample Specific Notes:
TP-PFC-023-TPI	11/9/17	1150	G	W	4	N	N	X	
TP-PFC-023-MID-CARBON		1155	G	W	4	N	N	X	
TP-PFC-023-TPF		1200	G	W	4	N	N	X	
TP-PFC-023-TPE-D		0000	G	W	4	N	N	X	

320-33221 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☒ Yes ☐ No | Custody Seal No.: Seal | Cooler Temp. (°C): Obs'd: 17 Corr'd: _____ | Therm ID No.: AK3

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Tetra Tech	11/9/17 1500		TAL-SAC	11/10/17 910
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-33221-1

Login Number: 33221
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?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Narrative
320-33221-1

Receipt
The samples were received on 11/10/2017 9:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.7º C.

LCMS
Method(s) 537 (modified): The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

Method(s) 537 (modified): The concentration of Perfluorooctanoic acid (PFOA) associated with the following sample exceeded the instrument calibration range: TP-PFC-023-TPI (320-33221-1). This analyte have been qualified; however, the peak did not saturate the instrument detector. The sample was analyzed at a dilution and both sets of results are reported.

Method(s) 537 (modified): The following sample was diluted to bring the concentration of Perfluorooctanoic acid (PFOA) within the calibration range: TP-PFC-023-TPI (320-33221-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 320-195219.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Qualifiers

LCMS

Qualifier	Qualifier Description
M	Manual integrated compound.
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
E	Result exceeded calibration range.
D	The reported value is from a dilution.

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	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
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 (Radiochemistry)
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)

Sample Summary

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-33221-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-33221-1	TP-PFC-023-TPI	Water	11/09/17 11:50	11/10/17 09:10
320-33221-2	TP-PFC-023-MID-CARBON	Water	11/09/17 11:55	11/10/17 09:10
320-33221-3	TP-PFC-023-TPE	Water	11/09/17 12:00	11/10/17 09:10
320-33221-4	TP-PFC-023-TPE-D	Water	11/09/17 00:00	11/10/17 09:10

Method Summary

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-33221-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBA	#	PFPeA	#	3C3-PFB	#	PFHxA	#	PFHpA	#	PFHxS	#	PFOA	#	PFNA	#
TP-PFC-023-TPI	320-33221-1	125	M	131		132		123		124		129		94		130	
TP-PFC-023-TPI DL	320-33221-1 DL	107		105		113		101		103		109		89		101	
TP-PFC-023-MID-CARBON	320-33221-2	109	M	109		114		111		112		116		95		111	
TP-PFC-023-TPE	320-33221-3	109	M	111		115		113		110		113		103		113	
TP-PFC-023-TPE-D	320-33221-4	108	M	110		114		108		112		112		98		113	
	MB 320-195219/1-A	111	M	111		119		107		113		114		104		112	
	LCS 320-195219/2-A	112	M	112		118		108		112		113		100		113	
	LCSD 320-195219/3-A	114	M	115		125		116		113		120		101		117	

	QC LIMITS
PFBA = 13C4 PFBA	25-150
PFPeA = 13C5 PFPeA	25-150
13C3-PFBS = 13C3-PFBS	25-150
PFHxA = 13C2 PFHxA	25-150
PFHpA = 13C4-PFHpA	25-150
PFHxS = 18O2 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFNA = 13C5 PFNA	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFOS #	PFDA #	PFOSA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-023-TPI	320-33221-1	131	139	126	130	125	124
TP-PFC-023-TPI DL	320-33221-1 DL	106	102	101	100	95	93
TP-PFC-023-MID-CARBON	320-33221-2	111	110	109	110	104	104
TP-PFC-023-TPE	320-33221-3	111	113	108	114	107	110
TP-PFC-023-TPE-D	320-33221-4	113	113	108	109	99	108
	MB 320-195219/1-A	109	115	105	119	108	107
	LCS 320-195219/2-A	113	117	106	121	102	102
	LCSD 320-195219/3-A	118	116	102	124	105	103

	QC LIMITS
PFOS = 13C4 PFOS	25-150
PFOSA = 13C8 FOSA	25-150
PFDA = 13C2 PFDA	25-150
PFUnA = 13C2 PFUnA	25-150
PFDoA = 13C2 PFDoA	25-150
PFTDA = 13C2-PFTeDA	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab File ID: 2017.11.18LLAXEA_002.d Lab Sample ID: MB 320-195219/1-A

Matrix: Water Date Extracted: 11/16/2017 17:39

Instrument ID: A8_N Date Analyzed: 11/18/2017 16:55

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-195219/2-A	2017.11.18LLAXEA_003.d	11/18/2017 17:03
	LCSD 320-195219/3-A	2017.11.18LLAXEA_004.d	11/18/2017 17:11
TP-PFC-023-TPI	320-33221-1	2017.11.18LLAXEA_021.d	11/18/2017 19:25
TP-PFC-023-MID-CARBON	320-33221-2	2017.11.18LLAXEA_022.d	11/18/2017 19:33
TP-PFC-023-TPE	320-33221-3	2017.11.18LLAXEA_024.d	11/18/2017 19:48
TP-PFC-023-TPE-D	320-33221-4	2017.11.18LLAXEA_025.d	11/18/2017 19:56
TP-PFC-023-TPI DL	320-33221-1 DL	2017.11.24LLA_011.d	11/24/2017 15:04

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-195219/1-A

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_002.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 250.00(mL) | Date Analyzed: 11/18/2017 16:55

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	1.0	U	2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	2.0	U	4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.0	U	2.0	1.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	U	4.0	2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	2.0	1.0	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	U	2.0	1.0	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	2.0	0.55
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	1.0	U	2.0	1.0	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	1.0	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	1.0	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	1.0	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.647	J M	4.0	2.0	0.54
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.0	U	2.0	1.0	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	1.0	U	2.0	1.0	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-33221-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-195219/1-A

Matrix: Water | Lab File ID: 2017.11.18LLAXEA_002.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 11/16/2017 17:39

Sample wt/vol: 250.00(mL) | Date Analyzed: 11/18/2017 16:55

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 195562 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	105		25-150
STL00992	13C4 PFBA	111	M	25-150
STL00993	13C2 PFHxA	107		25-150
STL00990	13C4 PFOA	104		25-150
STL00995	13C5 PFNA	112		25-150
STL00996	13C2 PFDA	115		25-150
STL00997	13C2 PFUnA	119		25-150
STL00998	13C2 PFDoA	108		25-150
STL00994	18O2 PFHxS	114		25-150
STL00991	13C4 PFOS	109		25-150
STL02116	13C2-PFTeDA	107		25-150
STL01892	13C4-PFHpA	113		25-150
STL01893	13C5 PFPeA	111		25-150
STL02337	13C3-PFBS	119		25-150

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.11.18LLAXEA_003.d

Lab ID: LCS 320-195219/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	41.4	104	89-128	M
Perfluoropentanoic acid (PFPeA)	40.0	40.8	102	66-136	
Perfluorohexanoic acid (PFHxA)	40.0	42.1	105	86-126	
Perfluoroheptanoic acid (PFHpA)	40.0	40.0	100	89-127	
Perfluorooctanoic acid (PFOA)	40.0	41.5	104	80-120	
Perfluorononanoic acid (PFNA)	40.0	41.6	104	77-137	
Perfluorodecanoic acid (PFDA)	40.0	41.3	103	84-123	
Perfluoroundecanoic acid (PFUnA)	40.0	36.0	90	73-122	
Perfluorododecanoic acid (PFDoA)	40.0	44.5	111	82-122	
Perfluorotridecanoic Acid (PFTriA)	40.0	37.9	95	56-163	
Perfluorotetradecanoic acid (PFTeA)	40.0	39.4	99	66-120	
Perfluorobutanesulfonic acid (PFBS)	35.4	36.5	103	88-130	
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.4	97	87-126	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	39.5	104	92-135	
Perfluorooctanesulfonic acid (PFOS)	37.1	39.2	105	83-126	
Perfluorodecanesulfonic acid (PFDS)	38.6	39.0	101	80-129	
Perfluorooctane Sulfonamide (FOSA)	40.0	41.7	104	91-133	
13C8 FOSA	100	106	106	25-150	
13C4 PFBA	100	112	112	25-150	M
13C2 PFHxA	100	108	108	25-150	
13C4 PFOA	100	100	100	25-150	
13C5 PFNA	100	113	113	25-150	
13C2 PFDA	100	117	117	25-150	
13C2 PFUnA	100	121	121	25-150	
13C2 PFDoA	100	102	102	25-150	
18O2 PFHxS	94.6	107	113	25-150	
13C4 PFOS	95.6	108	113	25-150	
13C2-PFTeDA	100	102	102	25-150	
13C4-PFHpA	100	112	112	25-150	
13C5 PFPeA	100	112	112	25-150	
13C3-PFBS	93.0	110	118	25-150	

Column to be used to flag recovery and RPD values

FORM III 537 (modified)

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.11.18LLAXEA_004.d

Lab ID: LCSD 320-195219/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	40.3	101	3	30	89-128	M
Perfluoropentanoic acid (PFPeA)	40.0	40.3	101	1	30	66-136	
Perfluorohexanoic acid (PFHxA)	40.0	39.7	99	6	30	86-126	
Perfluoroheptanoic acid (PFHpA)	40.0	40.6	101	2	30	89-127	
Perfluorooctanoic acid (PFOA)	40.0	39.6	99	5	30	80-120	
Perfluorononanoic acid (PFNA)	40.0	38.4	96	8	30	77-137	
Perfluorodecanoic acid (PFDA)	40.0	40.0	100	3	30	84-123	
Perfluoroundecanoic acid (PFUnA)	40.0	35.1	88	3	30	73-122	
Perfluorododecanoic acid (PFDoA)	40.0	43.0	108	3	30	82-122	
Perfluorotridecanoic Acid (PFTriA)	40.0	38.8	97	2	30	56-163	
Perfluorotetradecanoic acid (PFTeA)	40.0	40.4	101	3	30	66-120	
Perfluorobutanesulfonic acid (PFBS)	35.4	34.2	97	6	30	88-130	
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.9	93	5	30	87-126	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	38.8	102	2	30	92-135	
Perfluorooctanesulfonic acid (PFOS)	37.1	37.1	100	5	30	83-126	
Perfluorodecanesulfonic acid (PFDS)	38.6	39.0	101	0	30	80-129	
Perfluorooctane Sulfonamide (FOSA)	40.0	40.7	102	2	30	91-133	
13C8 FOSA	100	102	102			25-150	
13C4 PFBA	100	114	114			25-150	M
13C2 PFHxA	100	116	116			25-150	
13C4 PFOA	100	101	101			25-150	
13C5 PFNA	100	117	117			25-150	
13C2 PFDA	100	116	116			25-150	
13C2 PFUnA	100	124	124			25-150	
13C2 PFDoA	100	105	105			25-150	
18O2 PFHxS	94.6	114	120			25-150	
13C4 PFOS	95.6	113	118			25-150	
13C2-PFTeDA	100	103	103			25-150	
13C4-PFHpA	100	113	113			25-150	
13C5 PFPeA	100	115	115			25-150	
13C3-PFBS	93.0	116	125			25-150	

Column to be used to flag recovery and RPD values

FORM III 537 (modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Instrument ID: A8_N Start Date: 11/16/2017 13:20

Analysis Batch Number: 195190 End Date: 11/16/2017 14:54

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-195190/2		11/16/2017 13:20	1	2017.11.16LLICAL 002.d	GeminiC18 3x100 3(mm)
IC 320-195190/3		11/16/2017 13:28	1	2017.11.16LLICAL 003.d	GeminiC18 3x100 3(mm)
IC 320-195190/4		11/16/2017 13:36	1	2017.11.16LLICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-195190/5		11/16/2017 13:43	1	2017.11.16LLICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-195190/6		11/16/2017 13:51	1	2017.11.16LLICAL 006.d	GeminiC18 3x100 3(mm)
IC 320-195190/7		11/16/2017 13:59	1	2017.11.16LLICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-195190/8		11/16/2017 14:07	1	2017.11.16LLICAL 008.d	GeminiC18 3x100 3(mm)
IC 320-195190/9		11/16/2017 14:15	1	2017.11.16LLICAL 009.d	GeminiC18 3x100 3(mm)
IC 320-195190/10		11/16/2017 14:23	1	2017.11.16LLICAL 010.d	GeminiC18 3x100 3(mm)
ICB 320-195190/11		11/16/2017 14:31	1		GeminiC18 3x100 3(mm)
ICV 320-195190/12		11/16/2017 14:38	1	2017.11.16LLICAL 012.d	GeminiC18 3x100 3(mm)
RINSE 320-195190/13		11/16/2017 14:46	1		GeminiC18 3x100 3(mm)
CCVL 320-195190/14		11/16/2017 14:54	1		GeminiC18 3x100 3(mm)

537 (modified)

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1 Analy Batch No.: 195190

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/16/2017 13:20 Calibration End Date: 11/16/2017 14:23 Calibration ID: 36394

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-195190/2	2017.11.16LLICAL_002.d
Level 2	IC 320-195190/3	2017.11.16LLICAL_003.d
Level 3	IC 320-195190/4	2017.11.16LLICAL_004.d
Level 4	IC 320-195190/5	2017.11.16LLICAL_005.d
Level 5	IC 320-195190/6	2017.11.16LLICAL_006.d
Level 6	IC 320-195190/7	2017.11.16LLICAL_007.d
Level 7	IC 320-195190/8	2017.11.16LLICAL_008.d
Level 8	IC 320-195190/9	2017.11.16LLICAL_009.d

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 8	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	0.8755 0.9384	0.9058 0.9260	0.9547 0.8449	0.9333	0.9456	AveID		0.9155				4.1		35.0			
Perfluoropentanoic acid (PFPeA)	1.2113 1.1454	1.1462 1.1174	1.1463 1.0260	1.0885	1.1406	AveID		1.1277				4.8		35.0			
Perfluorobutanesulfonic acid (PFBS)	70.208 79.187	76.081 72.860	78.780 60.533	76.889	80.008	AveID		74.318				8.7		50.0			
4:2 FTS	0.5770 0.7794	0.7949 +++++	0.9154 +++++	0.6843	0.7229	AveID		0.7456				15.3		35.0			
Perfluorohexanoic acid (PFHxA)	1.0384 1.0142	1.0844 1.0023	1.0274 0.8917	0.9754	0.9700	AveID		1.0005				5.7		35.0			
Perfluoroheptanoic acid (PFHpA)	1.1490 1.0069	1.0442 0.9826	1.0564 0.9386	1.0149	1.0089	AveID		1.0252				6.0		35.0			
Perfluorohexanesulfonic acid (PFHxS)	1.3232 1.0718	1.2072 1.0137	1.0598 0.9848	1.0381	1.0634	AveID		1.0952				10.3		35.0			
6:2FTS	1.4603 1.6705	1.5615 1.6651	1.6030 +++++	1.6164	1.6556	AveID		1.6046				4.7		35.0			
Perfluorooctanoic acid (PFOA)	1.2593 1.0501	1.1053 0.9816	1.0514 0.9015	1.0546	1.0350	AveID		1.0549				9.7		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.2249 1.3588	1.3486 1.3252	1.3563 1.1624	1.3191	1.3764	AveID		1.3090				5.8		50.0			
Perfluorooctanesulfonic acid (PFOS)	0.9566 1.0709	1.0205 1.1016	1.0541 1.0380	1.0557	1.0973	AveID		1.0493				4.4		35.0			
Perfluorononanoic acid (PFNA)	0.9958 1.0268	0.9533 0.9841	1.0406 0.9198	1.0298	1.0269	AveID		0.9971				4.3		35.0			
8:2FTS	1.1276 1.2015	1.2410 1.2084	1.2362 1.1953	1.3106	1.1942	AveID		1.2143				4.3		35.0			
Perfluorooctane Sulfonamide (FOSA)	0.9816 0.9822	0.9857 0.9046	0.9997 0.8316	0.9969	1.0020	AveID		0.9605				6.3		35.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1 Analy Batch No.: 195190

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/16/2017 13:20 Calibration End Date: 11/16/2017 14:23 Calibration ID: 36394

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 8	LVL 4	LVL 5		B	M1	M2								
Perfluorodecanoic acid (PFDA)	0.9246 1.0042	0.9829 0.9756	0.9732 0.8908	1.0176	1.0010	AveID		0.9712				4.4		35.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9972 1.0580	1.0262 1.0742	1.0761 1.0400	1.0742	1.0404	AveID		1.0483				2.7		35.0			
Perfluorodecanesulfonic acid (PFDS)	0.4608 0.6372	0.6075 0.6267	0.6568 0.5763	0.6236	0.6455	AveID		0.6043				10.4		50.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.7828 0.9816	0.9504 0.9832	1.0016 1.0293	0.9620	0.9792	AveID		0.9588				7.8		35.0			
Perfluoroundecanoic acid (PFUnA)	0.9539 0.8694	0.9735 0.9093	0.8556 0.8902	0.9159	0.8734	AveID		0.9051				4.6		35.0			
MeFOSA	0.8634 0.9670	1.0875 0.9793	0.9696 0.9391	1.0391	1.0061	AveID		0.9814				6.8		35.0			
Perfluorododecanoic acid (PFDoA)	1.0105 1.0616	0.9309 0.9848	0.9736 0.9047	0.9756	0.9963	AveID		0.9797				4.9		35.0			
N-EtFOSA-M	0.7203 1.0439	1.0011 1.0521	1.0908 1.0054	1.0506	1.0497	AveID		1.0017				11.7		35.0			
Perfluorotridecanoic Acid (PFTriA)	1.1618 1.3128	1.1977 1.1806	1.2836 1.1090	1.2961	1.2509	AveID		1.2241				5.9		50.0			
Perfluorotetradecanoic acid (PFTeA)	0.2606 0.2380	0.2784 0.2361	0.2385 0.2355	0.2397	0.2352	AveID		0.2452				6.4		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 0.9214	1.2644 0.8281	0.9721 +++++	0.9158	0.9098	L2ID	0.0190	0.8873							0.9990		0.9900
Perfluoro-n-octadecanoic acid (PFODA)	0.9774 1.0207	1.0077 0.9507	1.0862 0.8092	1.0377	1.0700	AveID		0.9949				8.8		50.0			
13C4 PFBA	1.2681 1.3302	1.2688 1.3181	1.2889 1.4178	1.2651	1.2538	Ave		1.3014				4.2		50.0			
13C5 PFPeA	0.8173 0.8269	0.8118 0.8210	0.8329 0.8556	0.8221	0.8045	Ave		0.8240				1.9		50.0			
13C3-PFBS	0.0173 0.0180	0.0172 0.0180	0.0180 0.0202	0.0181	0.0173	Ave		0.0180				5.3		50.0			
13C2 PFHxA	0.9457 0.9366	0.9090 0.9190	0.9369 0.9739	0.9145	0.9060	Ave		0.9302				2.5		50.0			
13C4-PFHpA	0.8976 0.9287	0.8650 0.8896	0.9323 0.8929	0.8914	0.8910	Ave		0.8986				2.4		50.0			
18O2 PFHxS	1.0713 1.0760	1.0413 1.0602	1.0941 1.0582	1.0692	1.0133	Ave		1.0605				2.3		50.0			
M2-6:2FTS	0.5198 0.4602	0.4508 0.2949	0.4019 +++++	0.5496	0.4726	Ave		0.4500				18.5		50.0			
13C4 PFOA	1.0570 1.0262	1.0364 0.9907	1.0409 1.0220	1.0401	1.0292	Ave		1.0303				1.9		50.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1 Analy Batch No.: 195190

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/16/2017 13:20 Calibration End Date: 11/16/2017 14:23 Calibration ID: 36394

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 8	LVL 4	LVL 5		B	M1	M2								
13C4 PFOS	0.7322 0.7204	0.6934 0.6923	0.7078 0.7292	0.7043	0.6845	Ave		0.7080				2.5		50.0			
13C5 PFNA	0.7518 0.7698	0.7595 0.7486	0.7720 0.7670	0.7547	0.7325	Ave		0.7570				1.7		50.0			
M2-8:2FTS	0.2434 0.2502	0.2322 0.2294	0.2471 0.2389	0.2253	0.2466	Ave		0.2391				3.9		50.0			
13C8 FOSA	0.9078 0.9345	0.8926 0.9138	0.9314 0.9219	0.8985	0.8960	Ave		0.9121				1.8		50.0			
13C2 PFDA	0.6070 0.6649	0.6296 0.6417	0.6448 0.6745	0.6328	0.6134	Ave		0.6386				3.6		50.0			
d3-NMeFOSAA	0.3378 0.3504	0.3386 0.3446	0.3478 0.3514	0.3372	0.3354	Ave		0.3429				1.9		50.0			
d5-NEtFOSAA	0.3525 0.3185	0.3532 0.3057	0.3552 0.2920	0.3394	0.3199	Ave		0.3296				7.3		50.0			
13C2 PFUnA	0.5354 0.5079	0.5036 0.4890	0.5315 0.5000	0.5097	0.5029	Ave		0.5100				3.1		50.0			
d-N-MeFOSA-M	0.2551 0.2750	0.2449 0.2770	0.2603 0.3035	0.2482	0.2535	Ave		0.2647				7.4		50.0			
13C2 PFDoA	0.5866 0.5853	0.5964 0.5838	0.6181 0.6001	0.5922	0.5758	Ave		0.5923				2.2		50.0			
d-N-EtFOSA-M	0.2364 0.2488	0.2289 0.2541	0.2432 0.2756	0.2383	0.2399	Ave		0.2457				5.8		50.0			
13C2-PFTeDA	0.7421 0.7308	0.7228 0.7224	0.7484 0.7194	0.7322	0.7071	Ave		0.7282				1.8		50.0			
13C2-PFHxDA	1.3471 1.2658	1.3103 1.2428	1.2972 1.2873	1.3029	1.2529	Ave		1.2883				2.6		50.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1 Analy Batch No.: 195190

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/16/2017 13:20 Calibration End Date: 11/16/2017 14:23 Calibration ID: 36394

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-195190/2	2017.11.16LLICAL_002.d
Level 2	IC 320-195190/3	2017.11.16LLICAL_003.d
Level 3	IC 320-195190/4	2017.11.16LLICAL_004.d
Level 4	IC 320-195190/5	2017.11.16LLICAL_005.d
Level 5	IC 320-195190/6	2017.11.16LLICAL_006.d
Level 6	IC 320-195190/7	2017.11.16LLICAL_007.d
Level 7	IC 320-195190/8	2017.11.16LLICAL_008.d
Level 8	IC 320-195190/9	2017.11.16LLICAL_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	67714 14487072	145832 27744725	749687 48504541	2861665	7145757	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	60380 10991094	118077 20852686	581733 35544778	2168870	5530477	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	65301 14583493	147134 26327862	761950 43733553	2987210	7392943	0.0221 4.42	0.0442 8.84	0.221 17.7	0.884	2.21
4:2 FTS		AveID	17085 3887946	42466 +++++	209357 +++++	851277	1923230	0.0234 4.67	0.0467 +++++	0.234 +++++	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	59892 11023882	125071 20937572	586501 35161513	2161947	5296129	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoroheptanoic acid (PFHpA)		AveID	62896 10852203	114615 19870003	600093 33933295	2192514	5417527	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	78675 12179289	145149 22232121	642840 38397438	2448140	5909781	0.0228 4.55	0.0455 9.10	0.228 18.2	0.910	2.28
6:2FTS		AveID	43890 8458095	84669 10582688	372103 +++++	2041107	4470839	0.0237 4.74	0.0474 9.48	0.237 +++++	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	81179 12505913	145357 22105971	666805 37306505	2658602	6420325	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	52073 10815149	112954 19853443	556831 32673416	2143584	5405676	0.0238 4.76	0.0476 9.52	0.238 19.0	0.952	2.38
Perfluorooctanesulfonic acid (PFOS)		AveID	39642 8308904	83315 16088092	421851 28442036	1672296	4200814	0.0232 4.64	0.0464 9.28	0.232 18.6	0.928	2.32
Perfluorononanoic acid (PFNA)		AveID	45659 9173164	91876 16747453	489404 28564550	1883751	4533217	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
8:2FTS		AveID	16035 3341743	35025 6035706	178303 11075967	685641	1700566	0.0240 4.79	0.0479 9.58	0.240 19.2	0.958	2.40
Perfluorooctane Sulfonamide (FOSA)		AveID	54345 10652244	111648 18790588	567301 31041452	2170870	5410709	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorodecanoic acid (PFDA)		AveID	34229 7748375	78514 14230247	382352 24327508	1560625	3700623	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1 Analy Batch No.: 195190

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/16/2017 13:20 Calibration End Date: 11/16/2017 14:23 Calibration ID: 36394

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	20546 4302023	44093 8414297	228051 14796369	878031	2103253	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	19835 5135985	51522 9507505	273040 16403565	1026058	2567135	0.0241 4.82	0.0482 9.64	0.241 19.3	0.964	2.41
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	16830 3628658	42597 6831812	216779 12168812	791351	1887930	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoroundecanoic acid (PFUnA)		AveID	31146 5124927	62210 10108101	277066 18023951	1131416	2647005	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
MeFOSA		AveID	13431 3086095	33792 6166606	153755 11542463	625010	1537275	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	36153 7211647	70443 13068841	366653 21984506	1400135	3457618	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
N-EtFOSA-M		AveID	10384 3014716	29082 6076755	161649 11220168	606762	1517464	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	41563 8918159	90630 15667846	483385 26948788	1860119	4341357	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	11794 2018908	25529 3877317	108760 6859088	425441	1002364	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	+++++ 13534458	210217 23394318	768340 +++++	2891987	6870216	+++++ 5.00	0.0500 10.0	0.250 +++++	1.00	2.50
Perfluoro-n-octadecanoic acid (PFODA)		AveID	80295 14994103	167537 26858942	858466 42176267	3276971	8079511	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
13C4 PFBA	13PFOA	Ave	7734012 7718918	8049676 7490628	7852971 7175815	7665544	7556463	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C5 PFPeA	13PFOA	Ave	4984605 4798053	5150633 4665515	5074840 4330436	4981182	4848661	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C3-PFBS	13PFOA	Ave	97850 96874	101727 95038	101752 95009	102182	97211	2.33 2.33	2.33 2.33	2.33 2.33	2.33	2.33
13C2 PFHxA	13PFOA	Ave	5767539 5434859	5766713 5222423	5708542 4928948	5541300	5460202	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C4-PFHpA	13PFOA	Ave	5474075 5388818	5488149 5055553	5680339 4519230	5400977	5369819	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
18O2 PFHxS	13PFOA	Ave	6181003 5906386	6249728 5699801	6305886 5066637	6128980	5777244	2.37 2.37	2.37 2.37	2.37 2.37	2.37	2.37
M2-6:2FTS	13PFOA	Ave	3011895 2536952	2716938 1592267	2326123 +++++	3163534	2706131	2.38 2.38	2.38 2.38	2.38 +++++	2.38	2.38
13C4 PFOA	13PFOA	Ave	6446365 5954610	6575575 5630061	6341775 5172731	6302328	6202933	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C4 PFOS	13PFOA	Ave	4269043 3996454	4205377 3761176	4122883 3528339	4079597	3943985	2.39 2.39	2.39 2.39	2.39 2.39	2.39	2.39
13C5 PFNA	13PFOA	Ave	4585024 4467006	4818743 4254420	4703253 3882012	4573222	4414356	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1 Analy Batch No.: 195190

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/16/2017 13:20 Calibration End Date: 11/16/2017 14:23 Calibration ID: 36394

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4	LVL 5
M2-8:2FTS	13PF OA	Ave	1422087 1390682	1411196 1248667	1442295 1158291	1307919	1424072	2.40 2.40	2.40 2.40	2.40 2.40	2.40	2.40
13C8 FOSA	13PF OA	Ave	5536373 5422637	5663121 5192863	5674580 4665749	5444253	5400065	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C2 PFDA	13PF OA	Ave	3702160 3858028	3994110 3646507	3928765 3413649	3834115	3696857	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	2060361 2033106	2148368 1958283	2119322 1778417	2043435	2021651	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	2150007 1848391	2240958 1737053	2164393 1477824	2056463	1927943	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	3265071 2947353	3195205 2778942	3238414 2530870	3088221	3030852	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
d-N-MeFOSA-M	13PF OA	Ave	1555589 1595757	1553660 1574190	1585711 1536293	1503671	1527986	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	3577608 3396599	3783480 3317790	3765998 3037495	3588054	3470465	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
d-N-EtFOSA-M	13PF OA	Ave	1441663 1443976	1452513 1443998	1481982 1395035	1443790	1445580	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	4526109 4240619	4585582 4105559	4559867 3641191	4436784	4261836	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	8215532 7344806	8312870 7062925	7903586 6515348	7894637	7551220	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution
L2ID = Linear 1/conc^2 IsoDil

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1 Analy Batch No.: 195190

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/16/2017 13:20 Calibration End Date: 11/16/2017 14:23 Calibration ID: 36394

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-195190/2	2017.11.16LLICAL_002.d
Level 2	IC 320-195190/3	2017.11.16LLICAL_003.d
Level 3	IC 320-195190/4	2017.11.16LLICAL_004.d
Level 4	IC 320-195190/5	2017.11.16LLICAL_005.d
Level 5	IC 320-195190/6	2017.11.16LLICAL_006.d
Level 6	IC 320-195190/7	2017.11.16LLICAL_007.d
Level 7	IC 320-195190/8	2017.11.16LLICAL_008.d
Level 8	IC 320-195190/9	2017.11.16LLICAL_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 # LVL 8 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2 LVL 8	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanoic acid (PFBA)	1.1	-1.1 -7.7	4.3	1.9	3.3	2.5	25	25 25	25	25	25	25
Perfluoropentanoic acid (PFPeA)	-0.9	1.6 -9.0	1.6	-3.5	1.1	1.6	25	25 25	25	25	25	25
Perfluorobutanesulfonic acid (PFBS)	-2.0	2.4 -18.5	6.0	3.5	7.7	6.6	25	25 25	25	25	25	25
4:2 FTS	+++++	6.6 +++++	22.8	-8.2	-3.1	4.5		25	25	25	25	25
Perfluorohexanoic acid (PFHxA)	0.2	8.4 -10.9	2.7	-2.5	-3.1	1.4	25	25 25	25	25	25	25
Perfluoroheptanoic acid (PFHpA)	-4.2	1.9 -8.4	3.0	-1.0	-1.6	-1.8	25	25 25	25	25	25	25
Perfluorohexanesulfonic acid (PFHxS)	-7.4	10.2 -10.1	-3.2	-5.2	-2.9	-2.1	25	25 25	25	25	25	25
6:2FTS	3.8	-2.7 +++++	-0.1	0.7	3.2	4.1	25	25	25	25	25	25
Perfluorooctanoic acid (PFOA)	-6.9	4.8 -14.5	-0.3	0.0	-1.9	-0.5	25	25 25	25	25	25	25
Perfluoroheptanesulfonic Acid (PFHpS)	1.2	3.0 -11.2	3.6	0.8	5.2	3.8	25	25 25	25	25	25	25
Perfluorooctanesulfonic acid (PFOS)	5.0	-2.8 -1.1	0.5	0.6	4.6	2.1	25	25 25	25	25	25	25
Perfluorononanoic acid (PFNA)	-1.3	-4.4 -7.8	4.4	3.3	3.0	3.0	25	25 25	25	25	25	25
8:2FTS	-0.5	2.2 -1.6	1.8	7.9	-1.7	-1.1	25	25 25	25	25	25	25
Perfluorooctane Sulfonamide (FOSA)	-5.8	2.6 -13.4	4.1	3.8	4.3	2.3	25	25 25	25	25	25	25
Perfluorodecanoic acid (PFDA)	0.5	1.2 -8.3	0.2	4.8	3.1	3.4	25	25 25	25	25	25	25

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1 Analy Batch No.: 195190

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/16/2017 13:20 Calibration End Date: 11/16/2017 14:23 Calibration ID: 36394

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 # LVL 8 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2 LVL 8	LVL 3	LVL 4	LVL 5	LVL 6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2.5	-2.1 -0.8	2.7	2.5	-0.8	0.9	25	25 25	25	25	25	25
Perfluorodecanesulfonic acid (PFDS)	3.7	0.5 -4.6	8.7	3.2	6.8	5.5	25	25 25	25	25	25	25
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2.6	-0.9 7.4	4.5	0.3	2.1	2.4	25	25 25	25	25	25	25
Perfluoroundecanoic acid (PFUnA)	0.5	7.6 -1.7	-5.5	1.2	-3.5	-3.9	25	25 25	25	25	25	25
MeFOSA	-0.2	10.8 -4.3	-1.2	5.9	2.5	-1.5	25	25 25	25	25	25	25
Perfluorododecanoic acid (PFDoA)	0.5	-5.0 -7.7	-0.6	-0.4	1.7	8.4	25	25 25	25	25	25	25
N-EtFOSA-M	5.0	-0.1 0.4	8.9	4.9	4.8	4.2	25	25 25	25	25	25	25
Perfluorotridecanoic Acid (PFTriA)	-3.6	-2.2 -9.4	4.9	5.9	2.2	7.3	25	25 25	25	25	25	25
Perfluorotetradecanoic acid (PFTeA)	-3.7	13.5 -4.0	-2.7	-2.3	-4.1	-2.9	25	25 25	25	25	25	25
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ -6.9	+++++	1.0	1.1	1.7	3.4	25		25	25	25	25
Perfluoro-n-octadecanoic acid (PFODA)	-4.4	1.3 -18.7	9.2	4.3	7.5	2.6	25	25 25	25	25	25	25

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: ICV 320-195190/12 Calibration Date: 11/16/2017 14:38

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.16LLICAL_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9101		2.49	2.50	-0.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.122		2.49	2.50	-0.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	77.16		2.30	2.21	3.8	25.0
4:2 FTS	AveID	0.7456	0.9906		3.10	2.34	32.8*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	0.9920		2.48	2.50	-0.8	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	1.009		2.46	2.50	-1.6	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	0.9794		2.11	2.36	-10.6	25.0
6:2FTS	AveID	1.605	1.594		2.35	2.37	-0.6	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.087		2.58	2.50	3.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.341		2.44	2.38	2.5	25.0
Perfluorononanoic acid (PFNA)	AveID	0.997	1.008		2.53	2.50	1.1	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.014		2.31	2.39	-3.4	25.0
8:2FTS	AveID	1.214	1.244		2.45	2.40	2.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	0.9538		2.46	2.50	-1.8	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	0.9652		2.51	2.50	0.5	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	0.9928		2.37	2.50	-5.3	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.6322		2.52	2.41	4.6	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9253		2.41	2.50	-3.5	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.8861		2.45	2.50	-2.1	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	1.005		2.56	2.50	2.6	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.197		2.45	2.50	-2.2	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2334		2.38	2.50	-4.8	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8715		2.43	2.50	-2.6	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	0.9773		2.46	2.50	-1.8	25.0
MeFOSA	AveID	0.9814			0.500	2.50		
N-EtFOSA-M	AveID	1.002			0.500	2.50		
13C4 PFBA	Ave	1.301	1.313		2.52	2.50	0.9	50.0
13C5 PFPeA	Ave	0.8240	0.8241		2.50	2.50	0.0	50.0
13C3-PFBS	Ave	0.0180	0.0182		2.35	2.33	1.0	50.0
13C2 PFHxA	Ave	0.9302	0.9047		2.43	2.50	-2.7	50.0
13C4-PFHpA	Ave	0.8986	0.9013		2.51	2.50	0.3	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: ICV 320-195190/12 Calibration Date: 11/16/2017 14:38

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.16LLICAL_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.049		2.34	2.37	-1.1	50.0
M2-6:2FTS	Ave	0.4500	0.3449		1.82	2.38	-23.4	50.0
13C4 PFOA	Ave	1.030	0.9631		2.34	2.50	-6.5	50.0
13C4 PFOS	Ave	0.7080	0.7037		2.38	2.39	-0.6	50.0
13C5 PFNA	Ave	0.7570	0.7619		2.52	2.50	0.6	50.0
13C8 FOSA	Ave	0.9121	0.9041		2.48	2.50	-0.9	50.0
M2-8:2FTS	Ave	0.2391	0.2295		2.30	2.40	-4.0	50.0
13C2 PFDA	Ave	0.6386	0.6509		2.55	2.50	1.9	50.0
d3-NMeFOSAA	Ave	0.3429	0.3569		2.60	2.50	4.1	50.0
d5-NEtFOSAA	Ave	0.3296	0.3531		2.68	2.50	7.2	50.0
13C2 PFUnA	Ave	0.5100	0.4952		2.43	2.50	-2.9	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2589		2.45	2.50	-2.2	50.0
13C2 PFDoA	Ave	0.5923	0.5815		2.45	2.50	-1.8	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2555		2.60	2.50	4.0	50.0
13C2-PFTeDA	Ave	0.7282	0.7378		2.53	2.50	1.3	50.0
13C2-PFHxDA	Ave	1.288	1.281		2.49	2.50	-0.6	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCVL 320-195558/1 Calibration Date: 11/18/2017 14:13

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXE_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9052		0.0494	0.0500	-1.1	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.190		0.0527	0.0500	5.5	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	84.19		0.0501	0.0442	13.3	50.0
4:2 FTS	AveID	0.7456	0.8935		0.560	0.467	19.8	50.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	1.088		0.0544	0.0500	8.8	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	1.058		0.0516	0.0500	3.2	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	1.184		0.0492	0.0455	8.1	50.0
6:2FTS	AveID	1.605	1.676		0.495	0.474	4.5	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.165		0.0552	0.0500	10.4	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.392		0.0506	0.0476	6.3	50.0
Perfluorononanoic acid (PFNA)	AveID	0.997	1.026		0.0515	0.0500	2.9	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.451		0.0642	0.0464	38.3	50.0
8:2FTS	AveID	1.214	1.210		0.477	0.479	-0.3	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	0.9302		0.0484	0.0500	-3.2	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	1.055		0.0543	0.0500	8.6	50.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	1.076		0.513	0.500	2.6	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.5849		0.0467	0.0482	-3.2	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9427		0.492	0.500	-1.7	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.9685		0.0535	0.0500	7.0	50.0
MeFOSA	AveID	0.9814	1.006		0.512	0.500	2.5	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	0.9018		0.0460	0.0500	-8.0	50.0
N-EtFOSA-M	AveID	1.002	1.073		0.536	0.500	7.2	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.180		0.0482	0.0500	-3.6	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2705		0.0551	0.0500	10.3	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.360		0.0552	0.0500	10.4	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	1.144		0.0575	0.0500	15.0	50.0
13C4 PFBA	Ave	1.301	1.274		2.45	2.50	-2.1	50.0
13C5 PFPeA	Ave	0.8240	0.8362		2.54	2.50	1.5	50.0
13C3-PFBS	Ave	0.0180	0.0177		2.28	2.33	-1.8	50.0
13C2 PFHxA	Ave	0.9302	0.9491		2.55	2.50	2.0	50.0
13C4-PFHpA	Ave	0.8986	0.8985		2.50	2.50	0.0	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCVL 320-195558/1 Calibration Date: 11/18/2017 14:13

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXE_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.097		2.45	2.37	3.4	50.0
M2-6:2FTS	Ave	0.4500	0.4268		2.25	2.38	-5.2	50.0
13C4 PFOA	Ave	1.030	1.005		2.44	2.50	-2.4	50.0
13C4 PFOS	Ave	0.7080	0.7251		2.45	2.39	2.4	50.0
13C5 PFNA	Ave	0.7570	0.7817		2.58	2.50	3.3	50.0
13C8 FOSA	Ave	0.9121	0.9409		2.58	2.50	3.2	50.0
M2-8:2FTS	Ave	0.2391	0.2537		2.54	2.40	6.1	50.0
13C2 PFDA	Ave	0.6386	0.6330		2.48	2.50	-0.9	50.0
d3-NMeFOSAA	Ave	0.3429	0.3534		2.58	2.50	3.1	50.0
d5-NEtFOSAA	Ave	0.3296	0.3592		2.72	2.50	9.0	50.0
13C2 PFUnA	Ave	0.5100	0.5130		2.51	2.50	0.6	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2549		2.41	2.50	-3.7	50.0
13C2 PFDoA	Ave	0.5923	0.5863		2.47	2.50	-1.0	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2425		2.47	2.50	-1.3	50.0
13C2-PFTeDA	Ave	0.7282	0.6989		2.40	2.50	-4.0	50.0
13C2-PFHxDA	Ave	1.288	1.228		2.38	2.50	-4.7	50.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Instrument ID: A8_N Start Date: 11/18/2017 16:47

Analysis Batch Number: 195562 End Date: 11/18/2017 20:12

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-195562/1		11/18/2017 16:47	1	2017.11.18LLAXE A 001.d	GeminiC18 3x100 3(mm)
MB 320-195219/1-A		11/18/2017 16:55	1	2017.11.18LLAXE A 002.d	GeminiC18 3x100 3(mm)
LCS 320-195219/2-A		11/18/2017 17:03	1	2017.11.18LLAXE A 003.d	GeminiC18 3x100 3(mm)
LCSD 320-195219/3-A		11/18/2017 17:11	1	2017.11.18LLAXE A 004.d	GeminiC18 3x100 3(mm)
CCV 320-195562/12		11/18/2017 18:14	1	2017.11.18LLAXE A 012.d	GeminiC18 3x100 3(mm)
320-33221-1		11/18/2017 19:25	1	2017.11.18LLAXE A 021.d	GeminiC18 3x100 3(mm)
320-33221-2		11/18/2017 19:33	1	2017.11.18LLAXE A 022.d	GeminiC18 3x100 3(mm)
CCV 320-195562/23		11/18/2017 19:40	1	2017.11.18LLAXE A 023.d	GeminiC18 3x100 3(mm)
320-33221-3		11/18/2017 19:48	1	2017.11.18LLAXE A 024.d	GeminiC18 3x100 3(mm)
320-33221-4		11/18/2017 19:56	1	2017.11.18LLAXE A 025.d	GeminiC18 3x100 3(mm)
CCV 320-195562/27		11/18/2017 20:12	1	2017.11.18LLAXE A 027.d	GeminiC18 3x100 3(mm)

537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-195562/1 Calibration Date: 11/18/2017 16:47

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXEA_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9457		1.03	1.00	3.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.109		0.984	1.00	-1.6	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	77.89		0.926	0.884	4.8	25.0
4:2 FTS	AveID	0.7456	0.8565		1.07	0.934	14.9	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	0.9850		0.985	1.00	-1.5	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	0.9944		0.970	1.00	-3.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	0.998		0.829	0.910	-8.9	25.0
6:2FTS	AveID	1.605	1.843		1.09	0.948	14.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.340		0.975	0.952	2.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.101		1.04	1.00	4.4	25.0
Perfluorononanoic acid (PFNA)	AveID	0.997	1.041		1.04	1.00	4.4	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.088		0.962	0.928	3.7	25.0
8:2FTS	AveID	1.214	1.208		0.953	0.958	-0.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	0.9662		1.01	1.00	0.6	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	0.9758		1.00	1.00	0.5	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	1.073		1.02	1.00	2.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.6249		0.997	0.964	3.4	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9268		0.967	1.00	-3.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.9070		1.00	1.00	0.2	25.0
MeFOSA	AveID	0.9814	1.069		1.09	1.00	8.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	1.042		1.06	1.00	6.3	25.0
N-EtFOSA-M	AveID	1.002	1.057		1.06	1.00	5.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.145		0.935	1.00	-6.5	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2456		1.00	1.00	0.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9172		1.01	1.00	1.2	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	1.064		1.07	1.00	7.0	25.0
13C4 PFBA	Ave	1.301	1.287		2.47	2.50	-1.1	50.0
13C5 PFPeA	Ave	0.8240	0.8370		2.54	2.50	1.6	50.0
13C3-PFBS	Ave	0.0180	0.0182		2.35	2.33	1.1	50.0
13C2 PFHxA	Ave	0.9302	0.9159		2.46	2.50	-1.5	50.0
13C4-PFHpA	Ave	0.8986	0.8892		2.47	2.50	-1.0	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-195562/1 Calibration Date: 11/18/2017 16:47

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXEA_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.118		2.49	2.37	5.5	50.0
M2-6:2FTS	Ave	0.4500	0.4579		2.42	2.38	1.8	50.0
13C4 PFOA	Ave	1.030	1.003		2.43	2.50	-2.7	50.0
13C4 PFOS	Ave	0.7080	0.7214		2.44	2.39	1.9	50.0
13C5 PFNA	Ave	0.7570	0.7412		2.45	2.50	-2.1	50.0
13C8 FOSA	Ave	0.9121	0.9543		2.62	2.50	4.6	50.0
M2-8:2FTS	Ave	0.2391	0.2660		2.66	2.40	11.2	50.0
13C2 PFDA	Ave	0.6386	0.6481		2.54	2.50	1.5	50.0
d3-NMeFOSAA	Ave	0.3429	0.3653		2.66	2.50	6.5	50.0
13C2 PFUnA	Ave	0.5100	0.5323		2.61	2.50	4.4	50.0
d5-NEtFOSAA	Ave	0.3296	0.3931		2.98	2.50	19.3	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2644		2.50	2.50	-0.1	50.0
13C2 PFDoA	Ave	0.5923	0.5962		2.52	2.50	0.7	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2492		2.54	2.50	1.4	50.0
13C2-PFTeDA	Ave	0.7282	0.7179		2.46	2.50	-1.4	50.0
13C2-PFHxDA	Ave	1.288	1.221		2.37	2.50	-5.2	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-195562/12 Calibration Date: 11/18/2017 18:14

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXEA_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9462		2.58	2.50	3.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.116		2.47	2.50	-1.1	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	76.81		2.28	2.21	3.4	25.0
4:2 FTS	AveID	0.7456	0.9600		3.01	2.34	28.7*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	0.9862		2.46	2.50	-1.4	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	1.076		2.62	2.50	5.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	1.070		2.22	2.28	-2.3	25.0
6:2FTS	AveID	1.605	1.589		2.35	2.37	-1.0	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.085		2.57	2.50	2.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.339		2.44	2.38	2.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.997	1.007		2.52	2.50	1.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.067		2.36	2.32	1.7	25.0
8:2FTS	AveID	1.214	1.264		2.49	2.40	4.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	0.9796		2.52	2.50	0.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	1.014		2.64	2.50	5.5	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	1.085		2.59	2.50	3.5	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.6385		2.55	2.41	5.7	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9547		2.49	2.50	-0.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.9306		2.57	2.50	2.8	25.0
MeFOSA	AveID	0.9814	1.013		2.58	2.50	3.2	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	0.9834		2.51	2.50	0.4	25.0
N-EtFOSA-M	AveID	1.002	1.039		2.59	2.50	3.8	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.186		2.42	2.50	-3.1	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2436		2.48	2.50	-0.7	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8983		2.51	2.50	0.4	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	1.041		2.62	2.50	4.6	25.0
13C4 PFBA	Ave	1.301	1.292		2.48	2.50	-0.7	50.0
13C5 PFPeA	Ave	0.8240	0.8214		2.49	2.50	-0.3	50.0
13C3-PFBS	Ave	0.0180	0.0186		2.40	2.33	3.1	50.0
13C2 PFHxA	Ave	0.9302	0.9643		2.59	2.50	3.7	50.0
13C4-PFHpA	Ave	0.8986	0.8933		2.49	2.50	-0.6	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-195562/12 Calibration Date: 11/18/2017 18:14

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXEA_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.090		2.43	2.37	2.8	50.0
M2-6:2FTS	Ave	0.4500	0.3954		2.09	2.38	-12.1	50.0
13C4 PFOA	Ave	1.030	1.016		2.46	2.50	-1.4	50.0
13C4 PFOS	Ave	0.7080	0.7293		2.46	2.39	3.0	50.0
13C5 PFNA	Ave	0.7570	0.7715		2.55	2.50	1.9	50.0
M2-8:2FTS	Ave	0.2391	0.2612		2.62	2.40	9.2	50.0
13C2 PFDA	Ave	0.6386	0.6545		2.56	2.50	2.5	50.0
13C8 FOSA	Ave	0.9121	0.9416		2.58	2.50	3.2	50.0
d3-NMeFOSAA	Ave	0.3429	0.3622		2.64	2.50	5.6	50.0
13C2 PFUnA	Ave	0.5100	0.5447		2.67	2.50	6.8	50.0
d5-NEtFOSAA	Ave	0.3296	0.3790		2.88	2.50	15.0	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2662		2.51	2.50	0.6	50.0
13C2 PFDoA	Ave	0.5923	0.6037		2.55	2.50	1.9	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2588		2.63	2.50	5.4	50.0
13C2-PFTeDA	Ave	0.7282	0.7157		2.46	2.50	-1.7	50.0
13C2-PFHxDA	Ave	1.288	1.255		2.44	2.50	-2.6	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-195562/23 Calibration Date: 11/18/2017 19:40

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXEA_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9269		1.01	1.00	1.2	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.111		0.985	1.00	-1.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	77.28		0.919	0.884	4.0	25.0
4:2 FTS	AveID	0.7456	1.190		1.49	0.934	59.6*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	0.9429		0.942	1.00	-5.8	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	0.9949		0.970	1.00	-3.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	1.039		0.863	0.910	-5.1	25.0
6:2FTS	AveID	1.605	1.703		1.01	0.948	6.1	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.350		0.982	0.952	3.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.045		0.991	1.00	-0.9	25.0
Perfluorononanoic acid (PFNA)	AveID	0.997	1.034		1.04	1.00	3.7	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.057		0.934	0.928	0.7	25.0
8:2FTS	AveID	1.214	1.292		1.02	0.958	6.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	1.012		1.05	1.00	5.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	0.9775		1.01	1.00	0.6	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	1.082		1.03	1.00	3.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.6349		1.01	0.964	5.1	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9711		1.01	1.00	1.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.8901		0.983	1.00	-1.7	25.0
MeFOSA	AveID	0.9814	1.002		1.02	1.00	2.1	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	1.014		1.04	1.00	3.5	25.0
N-EtFOSA-M	AveID	1.002	1.039		1.04	1.00	3.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.179		0.963	1.00	-3.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2421		0.987	1.00	-1.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9356		1.03	1.00	3.3	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	1.055		1.06	1.00	6.0	25.0
13C4 PFBA	Ave	1.301	1.315		2.53	2.50	1.0	50.0
13C5 PFPeA	Ave	0.8240	0.8681		2.63	2.50	5.4	50.0
13C3-PFBS	Ave	0.0180	0.0192		2.48	2.33	6.5	50.0
13C2 PFHxA	Ave	0.9302	0.999		2.69	2.50	7.4	50.0
13C4-PFHpA	Ave	0.8986	0.9344		2.60	2.50	4.0	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-195562/23 Calibration Date: 11/18/2017 19:40

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXEA_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.119		2.49	2.37	5.5	50.0
M2-6:2FTS	Ave	0.4500	0.3375		1.78	2.38	-25.0	50.0
13C4 PFOA	Ave	1.030	1.060		2.57	2.50	2.9	50.0
13C4 PFOS	Ave	0.7080	0.7440		2.51	2.39	5.1	50.0
13C5 PFNA	Ave	0.7570	0.7767		2.57	2.50	2.6	50.0
M2-8:2FTS	Ave	0.2391	0.2630		2.63	2.40	10.0	50.0
13C2 PFDA	Ave	0.6386	0.6794		2.66	2.50	6.4	50.0
13C8 FOSA	Ave	0.9121	0.9830		2.69	2.50	7.8	50.0
d3-NMeFOSAA	Ave	0.3429	0.3557		2.59	2.50	3.7	50.0
13C2 PFUnA	Ave	0.5100	0.5445		2.67	2.50	6.8	50.0
d5-NEtFOSAA	Ave	0.3296	0.3704		2.81	2.50	12.4	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2714		2.56	2.50	2.5	50.0
13C2 PFDoA	Ave	0.5923	0.6002		2.53	2.50	1.3	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2590		2.64	2.50	5.4	50.0
13C2-PFTeDA	Ave	0.7282	0.7236		2.48	2.50	-0.6	50.0
13C2-PFHxDA	Ave	1.288	1.285		2.49	2.50	-0.3	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-195562/27 Calibration Date: 11/18/2017 20:12

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXEA_027.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9368		2.56	2.50	2.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.127		2.50	2.50	-0.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	77.52		2.31	2.21	4.3	25.0
4:2 FTS	AveID	0.7456	0.9921		3.11	2.34	33.1*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	1.000		2.50	2.50	-0.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	1.023		2.49	2.50	-0.2	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	1.023		2.12	2.28	-6.6	25.0
6:2FTS	AveID	1.605	1.633		2.41	2.37	1.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.090		2.58	2.50	3.3	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.392		2.53	2.38	6.4	25.0
Perfluorononanoic acid (PFNA)	AveID	0.997	1.010		2.53	2.50	1.3	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.069		2.36	2.32	1.9	25.0
8:2FTS	AveID	1.214	1.231		2.43	2.40	1.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	0.9876		2.54	2.50	1.7	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	1.005		2.62	2.50	4.6	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	1.052		2.51	2.50	0.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.6401		2.55	2.41	5.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.9063		2.50	2.50	0.1	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9465		2.47	2.50	-1.3	25.0
MeFOSA	AveID	0.9814	0.9879		2.52	2.50	0.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	0.995		2.54	2.50	1.6	25.0
N-EtFOSA-M	AveID	1.002	1.039		2.59	2.50	3.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.206		2.46	2.50	-1.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2357		2.40	2.50	-3.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9119		2.55	2.50	1.9	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	1.029		2.58	2.50	3.4	25.0
13C4 PFBA	Ave	1.301	1.346		2.58	2.50	3.4	50.0
13C5 PFPeA	Ave	0.8240	0.8697		2.64	2.50	5.5	50.0
13C3-PFBS	Ave	0.0180	0.0190		2.45	2.33	5.3	50.0
13C2 PFHxA	Ave	0.9302	0.9922		2.67	2.50	6.7	50.0
13C4-PFHpA	Ave	0.8986	0.9291		2.58	2.50	3.4	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-195562/27 Calibration Date: 11/18/2017 20:12

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.18LLAXEA_027.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.141		2.54	2.37	7.6	50.0
M2-6:2FTS	Ave	0.4500	0.3708		1.96	2.38	-17.6	50.0
13C4 PFOA	Ave	1.030	1.043		2.53	2.50	1.2	50.0
13C4 PFOS	Ave	0.7080	0.7498		2.53	2.39	5.9	50.0
13C5 PFNA	Ave	0.7570	0.7882		2.60	2.50	4.1	50.0
M2-8:2FTS	Ave	0.2391	0.2583		2.59	2.40	8.0	50.0
13C8 FOSA	Ave	0.9121	0.9810		2.69	2.50	7.6	50.0
13C2 PFDA	Ave	0.6386	0.6678		2.61	2.50	4.6	50.0
d3-NMeFOSAA	Ave	0.3429	0.3655		2.66	2.50	6.6	50.0
13C2 PFUnA	Ave	0.5100	0.5179		2.54	2.50	1.5	50.0
d5-NEtFOSAA	Ave	0.3296	0.3758		2.85	2.50	14.0	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2848		2.69	2.50	7.6	50.0
13C2 PFDoA	Ave	0.5923	0.6004		2.53	2.50	1.4	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2680		2.73	2.50	9.1	50.0
13C2-PFTeDA	Ave	0.7282	0.7207		2.47	2.50	-1.0	50.0
13C2-PFHxDA	Ave	1.288	1.307		2.54	2.50	1.4	50.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Instrument ID: A8_N Start Date: 11/24/2017 14:17

Analysis Batch Number: 196679 End Date: 11/24/2017 14:48

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-196679/5		11/24/2017 14:17	1	2017.11.24LLA_005.d	GeminiC18 3x100 3(mm)
CCV 320-196679/6		11/24/2017 14:25	1		GeminiC18 3x100 3(mm)
ZZZZZ		11/24/2017 14:33	1		GeminiC18 3x100 3(mm)
ZZZZZ		11/24/2017 14:41	1		GeminiC18 3x100 3(mm)
CCV 320-196679/9		11/24/2017 14:48	1		GeminiC18 3x100 3(mm)

537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCVL 320-196679/5 Calibration Date: 11/24/2017 14:17

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.24LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9458		0.0517	0.0500	3.3	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.204		0.0534	0.0500	6.8	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	84.21		0.0501	0.0442	13.3	50.0
4:2 FTS	AveID	0.7456	0.6894		0.432	0.467	-7.5	50.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	1.102		0.0551	0.0500	10.1	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	1.027		0.0501	0.0500	0.2	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	1.166		0.0484	0.0455	6.5	50.0
6:2FTS	AveID	1.605	1.708		0.505	0.474	6.5	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.153		0.0546	0.0500	9.3	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.268		0.0461	0.0476	-3.1	50.0
Perfluorononanoic acid (PFNA)	AveID	0.997	0.9648		0.0484	0.0500	-3.2	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.208		0.0534	0.0464	15.2	50.0
8:2FTS	AveID	1.214	1.240		0.489	0.479	2.1	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	0.9685		0.0504	0.0500	0.8	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	1.073		0.0552	0.0500	10.5	50.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	1.080		0.515	0.500	3.0	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.6196		0.0494	0.0482	2.5	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9739		0.508	0.500	1.6	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.9220		0.0509	0.0500	1.9	50.0
MeFOSA	AveID	0.9814	1.023		0.521	0.500	4.2	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	1.021		0.0521	0.0500	4.2	50.0
N-EtFOSA-M	AveID	1.002	1.095		0.546	0.500	9.3	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.228		0.0502	0.0500	0.3	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2235		0.0456	0.0500	-8.9	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.344		0.0544	0.0500	8.7	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	0.9874		0.0496	0.0500	-0.8	50.0
13C4 PFBA	Ave	1.301	1.242		2.39	2.50	-4.5	50.0
13C5 PFPeA	Ave	0.8240	0.7770		2.36	2.50	-5.7	50.0
13C3-PFBS	Ave	0.0180	0.0177		2.28	2.33	-1.9	50.0
13C2 PFHxA	Ave	0.9302	0.8933		2.40	2.50	-4.0	50.0
13C4-PFHpA	Ave	0.8986	0.8617		2.40	2.50	-4.1	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCVL 320-196679/5 Calibration Date: 11/24/2017 14:17

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.24LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.093		2.44	2.37	3.1	50.0
M2-6:2FTS	Ave	0.4500	0.4619		2.44	2.38	2.6	50.0
13C4 PFOA	Ave	1.030	1.004		2.44	2.50	-2.6	50.0
13C4 PFOS	Ave	0.7080	0.7058		2.38	2.39	-0.3	50.0
13C5 PFNA	Ave	0.7570	0.7723		2.55	2.50	2.0	50.0
13C8 FOSA	Ave	0.9121	0.9011		2.47	2.50	-1.2	50.0
M2-8:2FTS	Ave	0.2391	0.2080		2.08	2.40	-13.0	50.0
13C2 PFDA	Ave	0.6386	0.6059		2.37	2.50	-5.1	50.0
d3-NMeFOSAA	Ave	0.3429	0.3092		2.25	2.50	-9.8	50.0
d5-NEtFOSAA	Ave	0.3296	0.3278		2.49	2.50	-0.5	50.0
13C2 PFUnA	Ave	0.5100	0.4885		2.39	2.50	-4.2	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2400		2.27	2.50	-9.3	50.0
13C2 PFDoA	Ave	0.5923	0.5620		2.37	2.50	-5.1	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2148		2.19	2.50	-12.6	50.0
13C2-PFTeDA	Ave	0.7282	0.6960		2.39	2.50	-4.4	50.0
13C2-PFHxDA	Ave	1.288	1.200		2.33	2.50	-6.8	50.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Instrument ID: A8_N Start Date: 11/24/2017 14:56

Analysis Batch Number: 196712 End Date: 11/24/2017 15:12

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-196712/1		11/24/2017 14:56	1	2017.11.24LLA_010.d	GeminiC18 3x100 3(mm)
320-33221-1 DL		11/24/2017 15:04	5	2017.11.24LLA_011.d	GeminiC18 3x100 3(mm)
CCV 320-196712/3		11/24/2017 15:12	1	2017.11.24LLA_012.d	GeminiC18 3x100 3(mm)

537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-196712/1 Calibration Date: 11/24/2017 14:56

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.24LLA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9328		2.55	2.50	1.9	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.100		2.44	2.50	-2.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	75.74		2.25	2.21	1.9	25.0
4:2 FTS	AveID	0.7456	0.6608		2.07	2.34	-11.4	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	0.9863		2.46	2.50	-1.4	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	1.044		2.55	2.50	1.9	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	1.052		2.19	2.28	-3.9	25.0
6:2FTS	AveID	1.605	1.632		2.41	2.37	1.7	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.062		2.52	2.50	0.6	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.375		2.50	2.38	5.0	25.0
Perfluorononanoic acid (PFNA)	AveID	0.997	1.000		2.51	2.50	0.3	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.086		2.40	2.32	3.5	25.0
8:2FTS	AveID	1.214	1.198		2.36	2.40	-1.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	1.042		2.71	2.50	8.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	0.9503		2.45	2.50	-2.2	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	1.088		2.59	2.50	3.8	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.6502		2.59	2.41	7.6	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9480		2.47	2.50	-1.1	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.8873		2.45	2.50	-2.0	25.0
MeFOSA	AveID	0.9814	1.016		2.59	2.50	3.6	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	0.996		2.54	2.50	1.6	25.0
N-EtFOSA-M	AveID	1.002	1.081		2.70	2.50	7.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.093		2.23	2.50	-10.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2352		2.40	2.50	-4.1	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9081		2.54	2.50	1.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	1.053		2.65	2.50	5.8	25.0
13C4 PFBA	Ave	1.301	1.220		2.34	2.50	-6.3	50.0
13C5 PFPeA	Ave	0.8240	0.7882		2.39	2.50	-4.3	50.0
13C3-PFBS	Ave	0.0180	0.0181		2.34	2.33	0.7	50.0
13C2 PFHxA	Ave	0.9302	0.8939		2.40	2.50	-3.9	50.0
13C4-PFHpA	Ave	0.8986	0.8640		2.40	2.50	-3.8	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-196712/1 Calibration Date: 11/24/2017 14:56

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.24LLA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.066		2.38	2.37	0.5	50.0
M2-6:2FTS	Ave	0.4500	0.4686		2.47	2.38	4.1	50.0
13C4 PFOA	Ave	1.030	0.9815		2.38	2.50	-4.7	50.0
13C4 PFOS	Ave	0.7080	0.6761		2.28	2.39	-4.5	50.0
13C5 PFNA	Ave	0.7570	0.7209		2.38	2.50	-4.8	50.0
13C8 FOSA	Ave	0.9121	0.8576		2.35	2.50	-6.0	50.0
M2-8:2FTS	Ave	0.2391	0.2186		2.19	2.40	-8.6	50.0
13C2 PFDA	Ave	0.6386	0.6222		2.44	2.50	-2.6	50.0
d3-NMeFOSAA	Ave	0.3429	0.2876		2.10	2.50	-16.1	50.0
d5-NEtFOSAA	Ave	0.3296	0.3130		2.37	2.50	-5.0	50.0
13C2 PFUnA	Ave	0.5100	0.4779		2.34	2.50	-6.3	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2384		2.25	2.50	-9.9	50.0
13C2 PFDoA	Ave	0.5923	0.5582		2.36	2.50	-5.8	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2191		2.23	2.50	-10.8	50.0
13C2-PFTeDA	Ave	0.7282	0.6562		2.25	2.50	-9.9	50.0
13C2-PFHxDA	Ave	1.288	1.170		2.27	2.50	-9.2	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-196712/3 Calibration Date: 11/24/2017 15:12

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.24LLA_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9155	0.9323		1.02	1.00	1.8	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.128	1.150		1.02	1.00	2.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	74.32	75.13		0.894	0.884	1.1	25.0
4:2 FTS	AveID	0.7456	0.6980		0.874	0.934	-6.4	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.000	0.9875		0.987	1.00	-1.3	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.025	1.011		0.986	1.00	-1.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.095	1.019		0.847	0.910	-7.0	25.0
6:2FTS	AveID	1.605	1.713		1.01	0.948	6.7	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.055	1.057		1.00	1.00	0.2	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.309	1.326		0.964	0.952	1.3	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.049	1.051		0.930	0.928	0.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.997	1.001		1.00	1.00	0.4	25.0
8:2FTS	AveID	1.214	1.275		1.01	0.958	5.0	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9605	0.9818		1.02	1.00	2.2	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9712	0.9469		0.975	1.00	-2.5	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.048	1.053		1.00	1.00	0.5	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6043	0.6189		0.987	0.964	2.4	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9588	0.9789		1.02	1.00	2.1	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9051	0.8810		0.973	1.00	-2.7	25.0
MeFOSA	AveID	0.9814	0.9632		0.981	1.00	-1.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9797	1.027		1.05	1.00	4.8	25.0
N-EtFOSA-M	AveID	1.002	1.068		1.07	1.00	6.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.224	1.127		0.920	1.00	-8.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2452	0.2379		0.970	1.00	-3.0	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8994		0.992	1.00	-0.8	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9949	1.025		1.03	1.00	3.0	25.0
13C4 PFBA	Ave	1.301	1.272		2.44	2.50	-2.2	50.0
13C5 PFPeA	Ave	0.8240	0.8063		2.45	2.50	-2.2	50.0
13C3-PFBS	Ave	0.0180	0.0187		2.42	2.33	3.9	50.0
13C2 PFHxA	Ave	0.9302	0.9296		2.50	2.50	-0.0	50.0
13C4-PFHpA	Ave	0.8986	0.8948		2.49	2.50	-0.4	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Lab Sample ID: CCV 320-196712/3 Calibration Date: 11/24/2017 15:12

Instrument ID: A8_N Calib Start Date: 11/16/2017 13:20

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 11/16/2017 14:23

Lab File ID: 2017.11.24LLA_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.060	1.130		2.52	2.37	6.6	50.0
M2-6:2FTS	Ave	0.4500	0.5062		2.67	2.38	12.5	50.0
13C4 PFOA	Ave	1.030	1.020		2.48	2.50	-1.0	50.0
13C4 PFOS	Ave	0.7080	0.7363		2.49	2.39	4.0	50.0
13C5 PFNA	Ave	0.7570	0.7688		2.54	2.50	1.6	50.0
13C8 FOSA	Ave	0.9121	0.9259		2.54	2.50	1.5	50.0
M2-8:2FTS	Ave	0.2391	0.2209		2.21	2.40	-7.6	50.0
13C2 PFDA	Ave	0.6386	0.6487		2.54	2.50	1.6	50.0
d3-NMeFOSAA	Ave	0.3429	0.3084		2.25	2.50	-10.1	50.0
d5-NEtFOSAA	Ave	0.3296	0.3324		2.52	2.50	0.9	50.0
13C2 PFUnA	Ave	0.5100	0.4949		2.43	2.50	-3.0	50.0
d-N-MeFOSA-M	Ave	0.2647	0.2487		2.35	2.50	-6.0	50.0
13C2 PFDoA	Ave	0.5923	0.5797		2.45	2.50	-2.1	50.0
d-N-EtFOSA-M	Ave	0.2457	0.2256		2.30	2.50	-8.2	50.0
13C2-PFTeDA	Ave	0.7282	0.6885		2.36	2.50	-5.4	50.0
13C2-PFHxDA	Ave	1.288	1.257		2.44	2.50	-2.5	50.0

FORM VII 537 (modified)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Batch Number: 195219 Batch Start Date: 11/16/17 17:39 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 11/17/17 15:14

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00018	LCPFC-IS 00012
MB 320-195219/1		3535, 537 (modified)				250.00 mL	10.00 mL	500 uL	500 uL
LCS 320-195219/2		3535, 537 (modified)				250.00 mL	10.00 mL	500 uL	500 uL
LCSD 320-195219/3		3535, 537 (modified)				250.00 mL	10.00 mL	500 uL	500 uL
320-33221-A-1	TP-PFC-023-TPI	3535, 537 (modified)	T	318.95 g	27.04 g	291.9 mL	10.00 mL	500 uL	500 uL
320-33221-A-2	TP-PFC-023-MID-CARBON	3535, 537 (modified)	T	328.76 g	26.68 g	302.1 mL	10.00 mL	500 uL	500 uL
320-33221-A-3	TP-PFC-023-TPE	3535, 537 (modified)	T	321.75 g	27.08 g	294.7 mL	10.00 mL	500 uL	500 uL
320-33221-A-4	TP-PFC-023-TPE-D	3535, 537 (modified)	T	328.23 g	27.13 g	301.1 mL	10.00 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00120					
MB 320-195219/1		3535, 537 (modified)							
LCS 320-195219/2		3535, 537 (modified)		500 uL					
LCSD 320-195219/3		3535, 537 (modified)		500 uL					
320-33221-A-1	TP-PFC-023-TPI	3535, 537 (modified)	T						
320-33221-A-2	TP-PFC-023-MID-CARBON	3535, 537 (modified)	T						
320-33221-A-3	TP-PFC-023-TPE	3535, 537 (modified)	T						
320-33221-A-4	TP-PFC-023-TPE-D	3535, 537 (modified)	T						

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33221-1

SDG No.:

Batch Number: 195219 Batch Start Date: 11/16/17 17:39 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 11/17/17 15:14

Batch Notes	
Analyst ID - Aliquot Step	JNS
Balance ID	QA-070
Analyst ID - Final Volume Step	JNS
H2O ID	11/14/17
Hexane ID	981623
Internal Standard ID#	1087029
Manifold ID	11, 16
Methanol ID	1071548
Sodium Hydroxide ID	1088697
Pipette ID	146370G
Analyst ID - Reagent Drop	JER
Analyst ID - IS Reagent Drop	CCB
Analyst ID - IS Reagent Drop Witness	JNS
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	TWL
Solvent Lot #	1092113
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003337157A

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.

8813 NC Method

AS 11/17/17

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Method Code: 320-3535_PFC-320

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Batch End: 11/17/2017 3:14:00PM

Solid-Phase Extraction (SPE)

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-195219/1 N/A	N/A		250.00 mL				N/A	N/A	N/A		MB 320-195219/1-A
				10.00 mL								
2	LCS~320-195219/2 N/A	N/A		250.00 mL				N/A	N/A	N/A		LCS 320-195219/2-A
				10.00 mL								
3	LCSD~320-195219/3 N/A	N/A		250.00 mL				N/A	N/A	N/A		LCSD 320-195219/3-A
				10.00 mL								
4	320-33103-A-1 (PFC_IDA) due 11/29	N/A (320-33103-1)	281.13 g	254.1 mL				11/24/17	12_Days	2		320-33103-A-1-A
			27.07 g	10.00 mL								
5	320-33103-A-2 (PFC_IDA)	N/A (320-33103-1)	287.23 g	260.4 mL				11/24/17	12_Days	2		320-33103-A-2-A
			26.82 g	10.00 mL								
6	320-33103-B-3 (PFC_IDA)	N/A (320-33103-1)	271.74 g	245.1 mL				11/24/17	12_Days	2		320-33103-B-3-A
			26.68 g	10.00 mL								
7	320-33103-A-4 (PFC_IDA)	N/A (320-33103-1)	279.80 g	253 mL				11/24/17	12_Days	2		320-33103-A-4-A
			26.83 g	10.00 mL								
8	480-127492-A-1 (PFC_IDA)	N/A (480-127492-1)	296.89 g	269.5 mL				11/27/17	8_Day_Rush	4		480-127492-A-1-A
			27.36 g	10.00 mL								
9	480-127492-L-2 (PFC_IDA)	N/A (480-127492-1)	270.97 g	242.7 mL				11/27/17	8_Day_Rush	4		480-127492-L-2-A
			28.28 g	10.00 mL								
10	480-127492-A-3 (PFC_IDA)	N/A (480-127492-1)	289.81 g	262.5 mL				11/27/17	8_Day_Rush	4		480-127492-A-3-A
			27.28 g	10.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Method Code: 320-3535_PFC-320

Batch End: 11/17/2017 3:14:00PM

11	320-33328-A-1 (PFC_IDA)	N/A (320-33328-1)	325.39 g / 28.03 g	297.4 mL / 10.00 mL				11/28/17	8_Days	4		
12	320-33328-A-2 (PFC_IDA)	N/A (320-33328-1)	329.90 g / 29.15 g	300.8 mL / 10.00 mL				11/28/17	8_Days	4		
13	680-145554-A-1 (PFC_IDA)	N/A (680-145554-1)	274.00 g / 24.29 g	249.7 mL / 10.00 mL				11/28/17	8_Days	2		
14	320-33133-B-1 (PFC_IDA)	N/A (320-33133-1)	341.84 g / 27.54 g	314.3 mL / 10.00 mL				11/28/17	12_Days	2		
15	320-33133-A-2 (PFC_IDA)	N/A (320-33133-1)	338.22 g / 27.67 g	310.6 mL / 10.00 mL				11/28/17	12_Days	2		
16	320-33133-A-3 (PFC_IDA)	N/A (320-33133-1)	350.55 g / 28.37 g	322.2 mL / 10.00 mL				11/28/17	12_Days	2		
17	320-33135-A-1 (PFC_IDA)	N/A (320-33135-1)	269.51 g / 29.01 g	240.5 mL / 10.00 mL				11/28/17	12_Days	2		
18	320-33135-A-2 (PFC_IDA)	N/A (320-33135-1)	344.22 g / 28.32 g	315.9 mL / 10.00 mL				11/28/17	12_Days	2		
19	320-33221-A-1 (PFC_IDA_DOD5)	N/A (320-33221-1)	318.95 g / 27.04 g	291.9 mL / 10.00 mL				11/26/17	16_Days	4	5X	
20	320-33221-A-2 (PFC_IDA_DOD5)	N/A (320-33221-1)	328.76 g / 26.68 g	302.1 mL / 10.00 mL				11/26/17	16_Days	4		
21	320-33221-A-3 (PFC_IDA_DOD5)	N/A (320-33221-1)	321.75 g / 27.08 g	294.7 mL / 10.00 mL				11/26/17	16_Days	4		
22	320-33221-A-4 (PFC_IDA_DOD5)	N/A (320-33221-1)	328.23 g / 27.13 g	301.1 mL / 10.00 mL				11/26/17	16_Days	4		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-195219

Analyst: Reed, Jonathan E

Batch Open: 11/16/2017 5:39:00PM

Method Code: 320-3535_PFC-320

Batch End: 11/17/2017 3:14:00PM

23	480-127281-A-7 (PFC_IDA)	N/A (480-127280-1)	289.68 g 27.00 g	262.7 mL 10.00 mL				11/21/17	8_Day_Rush	4	

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	320-33221-1	SITE 00011	SITE 00011	TP-PFC-MIDPOINT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-023-MID-CARBON	Ground water	Normal (Regular)	9-Nov-17	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-33221-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-023-TPE	Ground water	Normal (Regular)	9-Nov-17	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-33221-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-023-TPE-D	Ground water	Field duplicate	9-Nov-17	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-33221-1	SITE 00011	SITE 00011	TP-PFC-INFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-023-TPI	Ground water	Normal (Regular)	9-Nov-17	537	Perfluoroalkyl Compounds