N60087_003822
NAS BRUNSWICK, ME
SSIC 5000-33c

LABORATORY DATA PACKAGE, 320-34072-1, NAS BRUNSWICK ME

12/18/2017

TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

ANALYTICAL REPORT

Job Number: 320-34072-1

Job Description: TT: PFAS, Brunswick, Discharge

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

Attention: Jeff Orient



Approved for release.
David R Alltucker
Project Manager I
12/18/2017 3:12 PM

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12/18/2017

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Qualifiers

LCMS

Qualifier	Qualifier Description
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
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
320-34072-1

Receipt
The samples were received on 12/8/2017 10:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4° 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-024-TPI (320-34072-1). This analyte has been qualified; however, the peak did not saturate the instrument detector. A 10X dilution will be performed and that data will be reported as the primary data.

Method(s) 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for 13C5 PFPeA the following sample: TP-PFC-024-TPI (320-34072-1). A confirmation run of this sample confirmed the high IDA recovery. Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method(s) 537 (modified): The following sample was diluted to bring the concentration of Perfluorooctanoic acid (PFOA) within the calibration range: TP-PFC-024-TPI (320-34072-1). 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 preparation batch 320-199444.

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: 320-34072-1

Client Sample ID: TP-PFC-024-TPI — Lab Sample ID: 320-34072-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	77		2.0	0.35	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	190		2.0	0.49	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	340		4.0	0.58	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	73		2.0	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1200	M E	4.0	0.85	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	2.7		2.0	0.27	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.79	J	2.0	0.31	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	50		2.0	0.30	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	370		2.0	0.30	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	6.5		2.0	0.30	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	350	M	4.0	0.54	ng/L	1		537 (modified)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	74	D	20	3.5	ng/L	10		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	200	D	20	4.9	ng/L	10		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	350	D	40	5.8	ng/L	10		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	72	D	20	2.5	ng/L	10		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1700	D M	40	8.5	ng/L	10		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	51	D	20	3.0	ng/L	10		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	420	D	20	3.0	ng/L	10		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS) - DL	8.8	J D	20	3.0	ng/L	10		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	360	D	40	5.4	ng/L	10		537 (modified)	Total/NA

Client Sample ID: TP-PFC-024-MID-CARBON — Lab Sample ID: 320-34072-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	140	M	2.0	0.35	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	120		2.0	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	34		3.9	0.57	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.50	J M	2.0	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	4.2	M	3.9	0.84	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.59	J	2.0	0.30	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.51	J	2.0	0.30	ng/L	1		537 (modified)	Total/NA

Client Sample ID: TP-PFC-024-TPE — Lab Sample ID: 320-34072-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	140		2.0	0.35	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	72		2.0	0.49	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	13		4.0	0.58	ng/L	1		537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.80	J	2.0	0.29	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.30	J	2.0	0.30	ng/L	1		537 (modified)	Total/NA
Perfluorooctane Sulfonamide (FOSA)	0.37	J	2.0	0.35	ng/L	1		537 (modified)	Total/NA

Client Sample ID: TP-PFC-024-TPE-D — Lab Sample ID: 320-34072-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	140	M	2.0	0.34	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	76		2.0	0.48	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: TP-PFC-024-TPE-D (Continued)

Lab Sample ID: 320-34072-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	13		3.9	0.57	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.29	J	2.0	0.29	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.35	J	2.0	0.29	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: TP-PFC-024-TPI

Date Collected: 12/07/17 10:00
Date Received: 12/08/17 10:15

Lab Sample ID: 320-34072-1

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**77**		2.0	0.35	ng/L		12/12/17 08:28	12/12/17 22:06	1
Perfluoropentanoic acid (PFPeA)	**190**		2.0	0.49	ng/L		12/12/17 08:28	12/12/17 22:06	1
Perfluorohexanoic acid (PFHxA)	**340**		4.0	0.58	ng/L		12/12/17 08:28	12/12/17 22:06	1
Perfluoroheptanoic acid (PFHpA)	**73**		2.0	0.25	ng/L		12/12/17 08:28	12/12/17 22:06	1
Perfluorooctanoic acid (PFOA)	**1200**	**M E**	4.0	0.85	ng/L		12/12/17 08:28	12/12/17 22:06	1
Perfluorononanoic acid (PFNA)	**2.7**		2.0	0.27	ng/L		12/12/17 08:28	12/12/17 22:06	1
Perfluorodecanoic acid (PFDA)	**0.79**	**J**	2.0	0.31	ng/L		12/12/17 08:28	12/12/17 22:06	1
Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	1.1	ng/L		12/12/17 08:28	12/12/17 22:06	1
Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	0.55	ng/L		12/12/17 08:28	12/12/17 22:06	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	1.3	ng/L		12/12/17 08:28	12/12/17 22:06	1
Perfluorotetradecanoic acid (PFTeA)	1.0	U	2.0	0.29	ng/L		12/12/17 08:28	12/12/17 22:06	1
Perfluorobutanesulfonic acid (PFBS)	**50**		2.0	0.30	ng/L		12/12/17 08:28	12/12/17 22:06	1
Perfluorohexanesulfonic acid (PFHxS)	**370**		2.0	0.30	ng/L		12/12/17 08:28	12/12/17 22:06	1
Perfluoroheptanesulfonic Acid (PFHpS)	**6.5**		2.0	0.30	ng/L		12/12/17 08:28	12/12/17 22:06	1
Perfluorooctanesulfonic acid (PFOS)	**350**	**M**	4.0	0.54	ng/L		12/12/17 08:28	12/12/17 22:06	1
Perfluorodecanesulfonic acid (PFDS)	1.0	U	2.0	0.32	ng/L		12/12/17 08:28	12/12/17 22:06	1
Perfluorooctane Sulfonamide (FOSA)	1.0	U	2.0	0.35	ng/L		12/12/17 08:28	12/12/17 22:06	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*132*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:06*	*1*
13C4 PFBA	*135*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:06*	*1*
13C2 PFHxA	*132*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:06*	*1*
13C4 PFOA	*109*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:06*	*1*
13C5 PFNA	*136*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:06*	*1*
13C2 PFDA	*139*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:06*	*1*
13C2 PFUnA	*134*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:06*	*1*
13C2 PFDoA	*128*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:06*	*1*
18O2 PFHxS	*131*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:06*	*1*
13C4 PFOS	*137*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:06*	*1*
13C2-PFTeDA	*144*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:06*	*1*
13C4-PFHpA	*128*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:06*	*1*
13C5 PFPeA	*156*	*Q*	*25 - 150*	*12/12/17 08:28*	*12/12/17 22:06*	*1*
13C3-PFBS	*148*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:06*	*1*

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**74**	**D**	20	3.5	ng/L		12/12/17 08:28	12/13/17 15:11	10
Perfluoropentanoic acid (PFPeA)	**200**	**D**	20	4.9	ng/L		12/12/17 08:28	12/13/17 15:11	10
Perfluorohexanoic acid (PFHxA)	**350**	**D**	40	5.8	ng/L		12/12/17 08:28	12/13/17 15:11	10
Perfluoroheptanoic acid (PFHpA)	**72**	**D**	20	2.5	ng/L		12/12/17 08:28	12/13/17 15:11	10
Perfluorooctanoic acid (PFOA)	**1700**	**D M**	40	8.5	ng/L		12/12/17 08:28	12/13/17 15:11	10
Perfluorononanoic acid (PFNA)	10	U	20	2.7	ng/L		12/12/17 08:28	12/13/17 15:11	10
Perfluorodecanoic acid (PFDA)	10	U	20	3.1	ng/L		12/12/17 08:28	12/13/17 15:11	10
Perfluoroundecanoic acid (PFUnA)	30	U	40	11	ng/L		12/12/17 08:28	12/13/17 15:11	10
Perfluorododecanoic acid (PFDoA)	20	U	40	5.5	ng/L		12/12/17 08:28	12/13/17 15:11	10
Perfluorotridecanoic Acid (PFTriA)	30	U	40	13	ng/L		12/12/17 08:28	12/13/17 15:11	10
Perfluorotetradecanoic acid (PFTeA)	10	U	20	2.9	ng/L		12/12/17 08:28	12/13/17 15:11	10

Client Sample ID: TP-PFC-024-TPI — Lab Sample ID: 320-34072-1

Date Collected: 12/07/17 10:00 **Matrix: Water**
Date Received: 12/08/17 10:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**51**	**D**	20	3.0	ng/L		12/12/17 08:28	12/13/17 15:11	10
Perfluorohexanesulfonic acid (PFHxS)	**420**	**D**	20	3.0	ng/L		12/12/17 08:28	12/13/17 15:11	10
Perfluoroheptanesulfonic Acid (PFHpS)	**8.8**	**J D**	20	3.0	ng/L		12/12/17 08:28	12/13/17 15:11	10
Perfluorooctanesulfonic acid (PFOS)	**360**	**D**	40	5.4	ng/L		12/12/17 08:28	12/13/17 15:11	10
Perfluorodecanesulfonic acid (PFDS)	10	U	20	3.2	ng/L		12/12/17 08:28	12/13/17 15:11	10
Perfluorooctane Sulfonamide (FOSA)	10	U	20	3.5	ng/L		12/12/17 08:28	12/13/17 15:11	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*101*		*25 - 150*	*12/12/17 08:28*	*12/13/17 15:11*	*10*
13C4 PFBA	*114*		*25 - 150*	*12/12/17 08:28*	*12/13/17 15:11*	*10*
13C2 PFHxA	*110*		*25 - 150*	*12/12/17 08:28*	*12/13/17 15:11*	*10*
13C4 PFOA	*109*		*25 - 150*	*12/12/17 08:28*	*12/13/17 15:11*	*10*
13C5 PFNA	*105*		*25 - 150*	*12/12/17 08:28*	*12/13/17 15:11*	*10*
13C2 PFDA	*102*		*25 - 150*	*12/12/17 08:28*	*12/13/17 15:11*	*10*
13C2 PFUnA	*102*		*25 - 150*	*12/12/17 08:28*	*12/13/17 15:11*	*10*
13C2 PFDoA	*101*		*25 - 150*	*12/12/17 08:28*	*12/13/17 15:11*	*10*
18O2 PFHxS	*111*		*25 - 150*	*12/12/17 08:28*	*12/13/17 15:11*	*10*
13C4 PFOS	*104*		*25 - 150*	*12/12/17 08:28*	*12/13/17 15:11*	*10*
13C2-PFTeDA	*98*		*25 - 150*	*12/12/17 08:28*	*12/13/17 15:11*	*10*
13C4-PFHpA	*113*		*25 - 150*	*12/12/17 08:28*	*12/13/17 15:11*	*10*
13C5 PFPeA	*114*		*25 - 150*	*12/12/17 08:28*	*12/13/17 15:11*	*10*
13C3-PFBS	*110*		*25 - 150*	*12/12/17 08:28*	*12/13/17 15:11*	*10*

Client Sample ID: TP-PFC-024-MID-CARBON — Lab Sample ID: 320-34072-2

Date Collected: 12/07/17 09:40 **Matrix: Water**
Date Received: 12/08/17 10:15

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**140**	**M**	2.0	0.35	ng/L		12/12/17 08:28	12/12/17 22:14	1
Perfluoropentanoic acid (PFPeA)	**120**		2.0	0.48	ng/L		12/12/17 08:28	12/12/17 22:14	1
Perfluorohexanoic acid (PFHxA)	**34**		3.9	0.57	ng/L		12/12/17 08:28	12/12/17 22:14	1
Perfluoroheptanoic acid (PFHpA)	**0.50**	**J M**	2.0	0.25	ng/L		12/12/17 08:28	12/12/17 22:14	1
Perfluorooctanoic acid (PFOA)	**4.2**	**M**	3.9	0.84	ng/L		12/12/17 08:28	12/12/17 22:14	1
Perfluorononanoic acid (PFNA)	0.99	U	2.0	0.27	ng/L		12/12/17 08:28	12/12/17 22:14	1
Perfluorodecanoic acid (PFDA)	0.99	U	2.0	0.31	ng/L		12/12/17 08:28	12/12/17 22:14	1
Perfluoroundecanoic acid (PFUnA)	3.0	U	3.9	1.1	ng/L		12/12/17 08:28	12/12/17 22:14	1
Perfluorododecanoic acid (PFDoA)	2.0	U	3.9	0.54	ng/L		12/12/17 08:28	12/12/17 22:14	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	3.9	1.3	ng/L		12/12/17 08:28	12/12/17 22:14	1
Perfluorotetradecanoic acid (PFTeA)	0.99	U	2.0	0.29	ng/L		12/12/17 08:28	12/12/17 22:14	1
Perfluorobutanesulfonic acid (PFBS)	**0.59**	**J**	2.0	0.30	ng/L		12/12/17 08:28	12/12/17 22:14	1
Perfluorohexanesulfonic acid (PFHxS)	**0.51**	**J**	2.0	0.30	ng/L		12/12/17 08:28	12/12/17 22:14	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.99	U	2.0	0.30	ng/L		12/12/17 08:28	12/12/17 22:14	1
Perfluorooctanesulfonic acid (PFOS)	2.0	U	3.9	0.53	ng/L		12/12/17 08:28	12/12/17 22:14	1
Perfluorodecanesulfonic acid (PFDS)	0.99	U	2.0	0.32	ng/L		12/12/17 08:28	12/12/17 22:14	1

Client Sample ID: TP-PFC-024-MID-CARBON — Lab Sample ID: 320-34072-2

Date Collected: 12/07/17 09:40 **Matrix: Water**
Date Received: 12/08/17 10:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide (FOSA)	0.99	U	2.0	0.35	ng/L		12/12/17 08:28	12/12/17 22:14	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*101*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:14*	*1*
13C4 PFBA	*113*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:14*	*1*
13C2 PFHxA	*108*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:14*	*1*
13C4 PFOA	*108*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:14*	*1*
13C5 PFNA	*109*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:14*	*1*
13C2 PFDA	*106*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:14*	*1*
13C2 PFUnA	*102*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:14*	*1*
13C2 PFDoA	*100*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:14*	*1*
18O2 PFHxS	*106*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:14*	*1*
13C4 PFOS	*107*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:14*	*1*
13C2-PFTeDA	*123*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:14*	*1*
13C4-PFHpA	*110*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:14*	*1*
13C5 PFPeA	*112*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:14*	*1*
13C3-PFBS	*101*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:14*	*1*

Client Sample ID: TP-PFC-024-TPE — Lab Sample ID: 320-34072-3

Date Collected: 12/07/17 09:45 **Matrix: Water**
Date Received: 12/08/17 10:15

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**140**		2.0	0.35	ng/L		12/12/17 08:28	12/12/17 22:22	1
Perfluoropentanoic acid (PFPeA)	**72**		2.0	0.49	ng/L		12/12/17 08:28	12/12/17 22:22	1
Perfluorohexanoic acid (PFHxA)	**13**		4.0	0.58	ng/L		12/12/17 08:28	12/12/17 22:22	1
Perfluoroheptanoic acid (PFHpA)	1.0	U M	2.0	0.25	ng/L		12/12/17 08:28	12/12/17 22:22	1
Perfluorooctanoic acid (PFOA)	2.0	U M	4.0	0.85	ng/L		12/12/17 08:28	12/12/17 22:22	1
Perfluorononanoic acid (PFNA)	1.0	U	2.0	0.27	ng/L		12/12/17 08:28	12/12/17 22:22	1
Perfluorodecanoic acid (PFDA)	1.0	U	2.0	0.31	ng/L		12/12/17 08:28	12/12/17 22:22	1
Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	1.1	ng/L		12/12/17 08:28	12/12/17 22:22	1
Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	0.55	ng/L		12/12/17 08:28	12/12/17 22:22	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	1.3	ng/L		12/12/17 08:28	12/12/17 22:22	1
Perfluorotetradecanoic acid (PFTeA)	**0.80**	**J**	2.0	0.29	ng/L		12/12/17 08:28	12/12/17 22:22	1
Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	0.30	ng/L		12/12/17 08:28	12/12/17 22:22	1
Perfluorohexanesulfonic acid (PFHxS)	**0.30**	**J**	2.0	0.30	ng/L		12/12/17 08:28	12/12/17 22:22	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	0.30	ng/L		12/12/17 08:28	12/12/17 22:22	1
Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.0	0.54	ng/L		12/12/17 08:28	12/12/17 22:22	1
Perfluorodecanesulfonic acid (PFDS)	1.0	U	2.0	0.32	ng/L		12/12/17 08:28	12/12/17 22:22	1
Perfluorooctane Sulfonamide (FOSA)	**0.37**	**J**	2.0	0.35	ng/L		12/12/17 08:28	12/12/17 22:22	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*105*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:22*	*1*
13C4 PFBA	*116*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:22*	*1*
13C2 PFHxA	*107*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:22*	*1*
13C4 PFOA	*106*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:22*	*1*
13C5 PFNA	*114*		*25 - 150*	*12/12/17 08:28*	*12/12/17 22:22*	*1*

Client Sample ID: TP-PFC-024-TPE — Lab Sample ID: 320-34072-3

Date Collected: 12/07/17 09:45 **Matrix: Water**
Date Received: 12/08/17 10:15

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	109		25 - 150	12/12/17 08:28	12/12/17 22:22	1
13C2 PFUnA	107		25 - 150	12/12/17 08:28	12/12/17 22:22	1
13C2 PFDoA	103		25 - 150	12/12/17 08:28	12/12/17 22:22	1
18O2 PFHxS	108		25 - 150	12/12/17 08:28	12/12/17 22:22	1
13C4 PFOS	107		25 - 150	12/12/17 08:28	12/12/17 22:22	1
13C2-PFTeDA	132		25 - 150	12/12/17 08:28	12/12/17 22:22	1
13C4-PFHpA	112		25 - 150	12/12/17 08:28	12/12/17 22:22	1
13C5 PFPeA	111		25 - 150	12/12/17 08:28	12/12/17 22:22	1
13C3-PFBS	108		25 - 150	12/12/17 08:28	12/12/17 22:22	1

Client Sample ID: TP-PFC-024-TPE-D — Lab Sample ID: 320-34072-4

Date Collected: 12/07/17 00:00 **Matrix: Water**
Date Received: 12/08/17 10:15

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**140**	**M**	2.0	0.34	ng/L		12/12/17 08:28	12/12/17 22:29	1
Perfluoropentanoic acid (PFPeA)	**76**		2.0	0.48	ng/L		12/12/17 08:28	12/12/17 22:29	1
Perfluorohexanoic acid (PFHxA)	**13**		3.9	0.57	ng/L		12/12/17 08:28	12/12/17 22:29	1
Perfluoroheptanoic acid (PFHpA)	0.98	U M	2.0	0.25	ng/L		12/12/17 08:28	12/12/17 22:29	1
Perfluorooctanoic acid (PFOA)	2.0	U M	3.9	0.83	ng/L		12/12/17 08:28	12/12/17 22:29	1
Perfluorononanoic acid (PFNA)	0.98	U	2.0	0.27	ng/L		12/12/17 08:28	12/12/17 22:29	1
Perfluorodecanoic acid (PFDA)	0.98	U	2.0	0.30	ng/L		12/12/17 08:28	12/12/17 22:29	1
Perfluoroundecanoic acid (PFUnA)	2.9	U	3.9	1.1	ng/L		12/12/17 08:28	12/12/17 22:29	1
Perfluorododecanoic acid (PFDoA)	2.0	U	3.9	0.54	ng/L		12/12/17 08:28	12/12/17 22:29	1
Perfluorotridecanoic Acid (PFTriA)	2.9	U	3.9	1.3	ng/L		12/12/17 08:28	12/12/17 22:29	1
Perfluorotetradecanoic acid (PFTeA)	0.98	U	2.0	0.28	ng/L		12/12/17 08:28	12/12/17 22:29	1
Perfluorobutanesulfonic acid (PFBS)	**0.29**	**J**	2.0	0.29	ng/L		12/12/17 08:28	12/12/17 22:29	1
Perfluorohexanesulfonic acid (PFHxS)	**0.35**	**J**	2.0	0.29	ng/L		12/12/17 08:28	12/12/17 22:29	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.98	U	2.0	0.29	ng/L		12/12/17 08:28	12/12/17 22:29	1
Perfluorooctanesulfonic acid (PFOS)	2.0	U	3.9	0.53	ng/L		12/12/17 08:28	12/12/17 22:29	1
Perfluorodecanesulfonic acid (PFDS)	0.98	U	2.0	0.31	ng/L		12/12/17 08:28	12/12/17 22:29	1
Perfluorooctane Sulfonamide (FOSA)	0.98	U	2.0	0.34	ng/L		12/12/17 08:28	12/12/17 22:29	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	107		25 - 150	12/12/17 08:28	12/12/17 22:29	1
13C4 PFBA	114		25 - 150	12/12/17 08:28	12/12/17 22:29	1
13C2 PFHxA	113		25 - 150	12/12/17 08:28	12/12/17 22:29	1
13C4 PFOA	108		25 - 150	12/12/17 08:28	12/12/17 22:29	1
13C5 PFNA	110		25 - 150	12/12/17 08:28	12/12/17 22:29	1
13C2 PFDA	111		25 - 150	12/12/17 08:28	12/12/17 22:29	1
13C2 PFUnA	110		25 - 150	12/12/17 08:28	12/12/17 22:29	1
13C2 PFDoA	100		25 - 150	12/12/17 08:28	12/12/17 22:29	1
18O2 PFHxS	110		25 - 150	12/12/17 08:28	12/12/17 22:29	1
13C4 PFOS	105		25 - 150	12/12/17 08:28	12/12/17 22:29	1
13C2-PFTeDA	127		25 - 150	12/12/17 08:28	12/12/17 22:29	1
13C4-PFHpA	108		25 - 150	12/12/17 08:28	12/12/17 22:29	1
13C5 PFPeA	109		25 - 150	12/12/17 08:28	12/12/17 22:29	1

Client Sample ID: TP-PFC-024-TPE-D **Lab Sample ID: 320-34072-4**
Date Collected: 12/07/17 00:00 **Matrix: Water**
Date Received: 12/08/17 10:15

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3-PFBS	107		25 - 150	12/12/17 08:28	12/12/17 22:29	1

Default Detection Limits

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

TestAmerica Job ID: 320-34072-1

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: 320-34072-1

Method: 537 (modified) - Fluorinated Alkyl Substances

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFOSA (25-150)	PFBA (25-150)	PFHxA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)	PFDoA (25-150)
320-34072-1	TP-PFC-024-TPI	132	135	132	109	136	139	134	128
320-34072-1 - DL	TP-PFC-024-TPI	101	114	110	109	105	102	102	101
320-34072-2	TP-PFC-024-MID-CARBON	101	113	108	108	109	106	102	100
320-34072-3	TP-PFC-024-TPE	105	116	107	106	114	109	107	103
320-34072-4	TP-PFC-024-TPE-D	107	114	113	108	110	111	110	100
LCS 320-199444/2-A	Lab Control Sample	103	115 M	107	110	111	113	110	111
LCSD 320-199444/3-A	Lab Control Sample Dup	96	108 M	104	103	106	113	102	98
MB 320-199444/1-A	Method Blank	110	120 M	114	112	115	121	110	109

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFHxS (25-150)	PFOS (25-150)	PFTDA (25-150)	PFHpA (25-150)	PFPeA (25-150)	3C3-PFBS (25-150)		
320-34072-1	TP-PFC-024-TPI	131	137	144	128	156 Q	148		
320-34072-1 - DL	TP-PFC-024-TPI	111	104	98	113	114	110		
320-34072-2	TP-PFC-024-MID-CARBON	106	107	123	110	112	101		
320-34072-3	TP-PFC-024-TPE	108	107	132	112	111	108		
320-34072-4	TP-PFC-024-TPE-D	110	105	127	108	109	107		
LCS 320-199444/2-A	Lab Control Sample	108	105	126	108	111	106		
LCSD 320-199444/3-A	Lab Control Sample Dup	105	106	115	107	104	105		
MB 320-199444/1-A	Method Blank	118	117	126	119	115	117		

Surrogate Legend

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

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-199444/1-A
Matrix: Water
Analysis Batch: 199646

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 199444

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		12/12/17 08:28	12/12/17 21:42	1
Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	0.49	ng/L		12/12/17 08:28	12/12/17 21:42	1
Perfluorohexanoic acid (PFHxA)	2.0	U	4.0	0.58	ng/L		12/12/17 08:28	12/12/17 21:42	1
Perfluoroheptanoic acid (PFHpA)	1.0	U	2.0	0.25	ng/L		12/12/17 08:28	12/12/17 21:42	1
Perfluorooctanoic acid (PFOA)	2.0	U M	4.0	0.85	ng/L		12/12/17 08:28	12/12/17 21:42	1
Perfluorononanoic acid (PFNA)	1.0	U	2.0	0.27	ng/L		12/12/17 08:28	12/12/17 21:42	1
Perfluorodecanoic acid (PFDA)	1.0	U	2.0	0.31	ng/L		12/12/17 08:28	12/12/17 21:42	1
Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	1.1	ng/L		12/12/17 08:28	12/12/17 21:42	1
Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	0.55	ng/L		12/12/17 08:28	12/12/17 21:42	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	1.3	ng/L		12/12/17 08:28	12/12/17 21:42	1
Perfluorotetradecanoic acid (PFTeA)	1.0	U	2.0	0.29	ng/L		12/12/17 08:28	12/12/17 21:42	1
Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	0.30	ng/L		12/12/17 08:28	12/12/17 21:42	1
Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	0.30	ng/L		12/12/17 08:28	12/12/17 21:42	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	0.30	ng/L		12/12/17 08:28	12/12/17 21:42	1
Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.0	0.54	ng/L		12/12/17 08:28	12/12/17 21:42	1
Perfluorodecanesulfonic acid (PFDS)	1.0	U	2.0	0.32	ng/L		12/12/17 08:28	12/12/17 21:42	1
Perfluorooctane Sulfonamide (FOSA)	1.0	U	2.0	0.35	ng/L		12/12/17 08:28	12/12/17 21:42	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*110*		*25 - 150*	*12/12/17 08:28*	*12/12/17 21:42*	*1*
13C4 PFBA	*120*	*M*	*25 - 150*	*12/12/17 08:28*	*12/12/17 21:42*	*1*
13C2 PFHxA	*114*		*25 - 150*	*12/12/17 08:28*	*12/12/17 21:42*	*1*
13C4 PFOA	*112*		*25 - 150*	*12/12/17 08:28*	*12/12/17 21:42*	*1*
13C5 PFNA	*115*		*25 - 150*	*12/12/17 08:28*	*12/12/17 21:42*	*1*
13C2 PFDA	*121*		*25 - 150*	*12/12/17 08:28*	*12/12/17 21:42*	*1*
13C2 PFUnA	*110*		*25 - 150*	*12/12/17 08:28*	*12/12/17 21:42*	*1*
13C2 PFDoA	*109*		*25 - 150*	*12/12/17 08:28*	*12/12/17 21:42*	*1*
18O2 PFHxS	*118*		*25 - 150*	*12/12/17 08:28*	*12/12/17 21:42*	*1*
13C4 PFOS	*117*		*25 - 150*	*12/12/17 08:28*	*12/12/17 21:42*	*1*
13C2-PFTeDA	*126*		*25 - 150*	*12/12/17 08:28*	*12/12/17 21:42*	*1*
13C4-PFHpA	*119*		*25 - 150*	*12/12/17 08:28*	*12/12/17 21:42*	*1*
13C5 PFPeA	*115*		*25 - 150*	*12/12/17 08:28*	*12/12/17 21:42*	*1*
13C3-PFBS	*117*		*25 - 150*	*12/12/17 08:28*	*12/12/17 21:42*	*1*

Lab Sample ID: LCS 320-199444/2-A
Matrix: Water
Analysis Batch: 199646

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 199444

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	40.0	40.8	M	ng/L		102	89 - 128
Perfluoropentanoic acid (PFPeA)	40.0	36.7		ng/L		92	66 - 136
Perfluorohexanoic acid (PFHxA)	40.0	39.5		ng/L		99	86 - 126
Perfluoroheptanoic acid (PFHpA)	40.0	41.6		ng/L		104	89 - 127
Perfluorooctanoic acid (PFOA)	40.0	36.6		ng/L		91	80 - 120
Perfluorononanoic acid (PFNA)	40.0	38.7		ng/L		97	77 - 137
Perfluorodecanoic acid (PFDA)	40.0	39.7		ng/L		99	84 - 123
Perfluoroundecanoic acid (PFUnA)	40.0	33.2		ng/L		83	73 - 122

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

Lab Sample ID: LCS 320-199444/2-A
Matrix: Water
Analysis Batch: 199646

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 199444

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorododecanoic acid (PFDoA)	40.0	36.9		ng/L		92	82 - 122
Perfluorotridecanoic Acid (PFTriA)	40.0	42.1		ng/L		105	56 - 163
Perfluorotetradecanoic acid (PFTeA)	40.0	37.5		ng/L		94	66 - 120
Perfluorobutanesulfonic acid (PFBS)	35.4	38.2		ng/L		108	88 - 130
Perfluorohexanesulfonic acid (PFHxS)	36.4	36.1		ng/L		99	87 - 126
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	40.6		ng/L		107	92 - 135
Perfluorooctanesulfonic acid (PFOS)	37.1	38.3		ng/L		103	83 - 126
Perfluorodecanesulfonic acid (PFDS)	38.6	38.3		ng/L		99	80 - 129
Perfluorooctane Sulfonamide (FOSA)	40.0	42.3		ng/L		106	91 - 133

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*103*		*25 - 150*
13C4 PFBA	*115*	*M*	*25 - 150*
13C2 PFHxA	*107*		*25 - 150*
13C4 PFOA	*110*		*25 - 150*
13C5 PFNA	*111*		*25 - 150*
13C2 PFDA	*113*		*25 - 150*
13C2 PFUnA	*110*		*25 - 150*
13C2 PFDoA	*111*		*25 - 150*
18O2 PFHxS	*108*		*25 - 150*
13C4 PFOS	*105*		*25 - 150*
13C2-PFTeDA	*126*		*25 - 150*
13C4-PFHpA	*108*		*25 - 150*
13C5 PFPeA	*111*		*25 - 150*
13C3-PFBS	*106*		*25 - 150*

Lab Sample ID: LCSD 320-199444/3-A
Matrix: Water
Analysis Batch: 199646

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 199444

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	40.0	41.8	M	ng/L		105	89 - 128	3	30
Perfluoropentanoic acid (PFPeA)	40.0	38.4		ng/L		96	66 - 136	4	30
Perfluorohexanoic acid (PFHxA)	40.0	38.1		ng/L		95	86 - 126	3	30
Perfluoroheptanoic acid (PFHpA)	40.0	39.2		ng/L		98	89 - 127	6	30
Perfluorooctanoic acid (PFOA)	40.0	38.0		ng/L		95	80 - 120	4	30
Perfluorononanoic acid (PFNA)	40.0	39.8		ng/L		99	77 - 137	3	30
Perfluorodecanoic acid (PFDA)	40.0	39.6		ng/L		99	84 - 123	0	30
Perfluoroundecanoic acid (PFUnA)	40.0	35.9		ng/L		90	73 - 122	8	30
Perfluorododecanoic acid (PFDoA)	40.0	42.4		ng/L		106	82 - 122	14	30

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

Lab Sample ID: LCSD 320-199444/3-A
Matrix: Water
Analysis Batch: 199646

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 199444

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorotridecanoic Acid (PFTriA)			40.0	48.8		ng/L		122	56 - 163	15	30
Perfluorotetradecanoic acid (PFTeA)			40.0	39.1		ng/L		98	66 - 120	4	30
Perfluorobutanesulfonic acid (PFBS)			35.4	36.8		ng/L		104	88 - 130	4	30
Perfluorohexanesulfonic acid (PFHxS)			36.4	35.2		ng/L		97	87 - 126	2	30
Perfluoroheptanesulfonic Acid (PFHpS)			38.1	37.8		ng/L		99	92 - 135	7	30
Perfluorooctanesulfonic acid (PFOS)			37.1	36.4	M	ng/L		98	83 - 126	5	30
Perfluorodecanesulfonic acid (PFDS)			38.6	34.5		ng/L		89	80 - 129	10	30
Perfluorooctane Sulfonamide (FOSA)			40.0	42.5		ng/L		106	91 - 133	0	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C8 FOSA	*96*		*25 - 150*
13C4 PFBA	*108*	*M*	*25 - 150*
13C2 PFHxA	*104*		*25 - 150*
13C4 PFOA	*103*		*25 - 150*
13C5 PFNA	*106*		*25 - 150*
13C2 PFDA	*113*		*25 - 150*
13C2 PFUnA	*102*		*25 - 150*
13C2 PFDoA	*98*		*25 - 150*
18O2 PFHxS	*105*		*25 - 150*
13C4 PFOS	*106*		*25 - 150*
13C2-PFTeDA	*115*		*25 - 150*
13C4-PFHpA	*107*		*25 - 150*
13C5 PFPeA	*104*		*25 - 150*
13C3-PFBS	*105*		*25 - 150*

LCMS

Prep Batch: 199444

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-34072-1	TP-PFC-024-TPI	Total/NA	Water	3535	
320-34072-1 - DL	TP-PFC-024-TPI	Total/NA	Water	3535	
320-34072-2	TP-PFC-024-MID-CARBON	Total/NA	Water	3535	
320-34072-3	TP-PFC-024-TPE	Total/NA	Water	3535	
320-34072-4	TP-PFC-024-TPE-D	Total/NA	Water	3535	
MB 320-199444/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-199444/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-199444/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 199646

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-34072-1	TP-PFC-024-TPI	Total/NA	Water	537 (modified)	199444
320-34072-2	TP-PFC-024-MID-CARBON	Total/NA	Water	537 (modified)	199444
320-34072-3	TP-PFC-024-TPE	Total/NA	Water	537 (modified)	199444
320-34072-4	TP-PFC-024-TPE-D	Total/NA	Water	537 (modified)	199444
MB 320-199444/1-A	Method Blank	Total/NA	Water	537 (modified)	199444
LCS 320-199444/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	199444
LCSD 320-199444/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	199444

Analysis Batch: 199735

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-34072-1 - DL	TP-PFC-024-TPI	Total/NA	Water	537 (modified)	199444

Lab Chronicle

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

TestAmerica Job ID: 320-34072-1

Client Sample ID: TP-PFC-024-TPI
Lab Sample ID: 320-34072-1
Date Collected: 12/07/17 10:00
Matrix: Water
Date Received: 12/08/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			199444	12/12/17 08:28	CCB	TAL SAC
Total/NA	Analysis	537 (modified)		1	199646	12/12/17 22:06	ABH	TAL SAC
Total/NA	Prep	3535	DL		199444	12/12/17 08:28	CCB	TAL SAC
Total/NA	Analysis	537 (modified)	DL	10	199735	12/13/17 15:11	ABH	TAL SAC

Client Sample ID: TP-PFC-024-MID-CARBON
Lab Sample ID: 320-34072-2
Date Collected: 12/07/17 09:40
Matrix: Water
Date Received: 12/08/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			199444	12/12/17 08:28	CCB	TAL SAC
Total/NA	Analysis	537 (modified)		1	199646	12/12/17 22:14	ABH	TAL SAC

Client Sample ID: TP-PFC-024-TPE
Lab Sample ID: 320-34072-3
Date Collected: 12/07/17 09:45
Matrix: Water
Date Received: 12/08/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			199444	12/12/17 08:28	CCB	TAL SAC
Total/NA	Analysis	537 (modified)		1	199646	12/12/17 22:22	ABH	TAL SAC

Client Sample ID: TP-PFC-024-TPE-D
Lab Sample ID: 320-34072-4
Date Collected: 12/07/17 00:00
Matrix: Water
Date Received: 12/08/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			199444	12/12/17 08:28	CCB	TAL SAC
Total/NA	Analysis	537 (modified)		1	199646	12/12/17 22:29	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: 320-34072-1
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: 320-34072-1

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: 320-34072-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-34072-1	TP-PFC-024-TPI	Water	12/07/17 10:00	12/08/17 10:15
320-34072-2	TP-PFC-024-MID-CARBON	Water	12/07/17 09:40	12/08/17 10:15
320-34072-3	TP-PFC-024-TPE	Water	12/07/17 09:45	12/08/17 10:15
320-34072-4	TP-PFC-024-TPE-D	Water	12/07/17 00:00	12/08/17 10:15

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 198210

Lab Sample ID: IC 320-198210/2 Client Sample ID:

Date Analyzed: 12/04/17 15:48 Lab File ID: 2017.12.04ICAL_002.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.25	Baseline	phomsopha t	12/04/17 16:24
Perfluorooctanesulfonic acid (PFOS)	2.99	Baseline	phomsopha t	12/04/17 16:28

Lab Sample ID: IC 320-198210/3 Client Sample ID:

Date Analyzed: 12/04/17 15:56 Lab File ID: 2017.12.04ICAL_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.65	Baseline	phomsopha t	12/04/17 16:27

537 (modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 199573

Lab Sample ID: CCVL 320-199573/1 Client Sample ID:

Date Analyzed: 12/12/17 15:08 Lab File ID: 2017.12.12LLA_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanoic acid (PFHxA)	1.94	Baseline	hannigana	12/13/17 09:42

537 (modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 199646

Lab Sample ID: MB 320-199444/1-A Client Sample ID:

Date Analyzed: 12/12/17 21:42 Lab File ID: 2017.12.12LLB_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C4 PFBA	1.40	Incomplete Integration	hannigana	12/13/17 13:17
Perfluorooctanoic acid (PFOA)	2.62	Isomers	hannigana	12/13/17 13:18

Lab Sample ID: LCS 320-199444/2-A Client Sample ID:

Date Analyzed: 12/12/17 21:50 Lab File ID: 2017.12.12LLB_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C4 PFBA	1.40	Incomplete Integration	hannigana	12/13/17 13:19
Perfluorobutanoic acid (PFBA)	1.40	Incomplete Integration	hannigana	12/13/17 13:20

Lab Sample ID: LCSD 320-199444/3-A Client Sample ID:

Date Analyzed: 12/12/17 21:58 Lab File ID: 2017.12.12LLB_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C4 PFBA	1.41	Incomplete Integration	hannigana	12/13/17 13:20
Perfluorobutanoic acid (PFBA)	1.41	Incomplete Integration	hannigana	12/13/17 13:21
Perfluorooctanesulfonic acid (PFOS)	3.01	Isomers	hannigana	12/13/17 13:21

Lab Sample ID: 320-34072-1 Client Sample ID: TP-PFC-024-TPI

Date Analyzed: 12/12/17 22:06 Lab File ID: 2017.12.12LLB_006.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.63	Isomers	hannigana	12/13/17 13:28
Perfluorooctanesulfonic acid (PFOS)	3.01	Isomers	hannigana	12/13/17 13:28

537 (modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 199646

Lab Sample ID: 320-34072-2 Client Sample ID: TP-PFC-024-MID-CARBON

Date Analyzed: 12/12/17 22:14 Lab File ID: 2017.12.12LLB_007.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.40	Incomplete Integration	hannigana	12/13/17 13:30
Perfluoroheptanoic acid (PFHpA)	2.25	Wrong peak	hannigana	12/13/17 13:31
Perfluorooctanoic acid (PFOA)	2.62	Isomers	hannigana	12/13/17 12:11

Lab Sample ID: 320-34072-3 Client Sample ID: TP-PFC-024-TPE

Date Analyzed: 12/12/17 22:22 Lab File ID: 2017.12.12LLB_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.26	Split Peak	hannigana	12/13/17 13:35
Perfluorooctanoic acid (PFOA)	2.63	Isomers	hannigana	12/13/17 12:12

Lab Sample ID: 320-34072-4 Client Sample ID: TP-PFC-024-TPE-D

Date Analyzed: 12/12/17 22:29 Lab File ID: 2017.12.12LLB_009.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.40	Incomplete Integration	hannigana	12/13/17 12:12
Perfluoroheptanoic acid (PFHpA)	2.26	Split Peak	hannigana	12/13/17 13:36
Perfluorooctanoic acid (PFOA)	2.64	Isomers	hannigana	12/13/17 12:12

537 (modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 199735

Lab Sample ID: 320-34072-1 DL Client Sample ID: TP-PFC-024-TPI DL

Date Analyzed: 12/13/17 15:11 Lab File ID: 2017.12.13LLA_025.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.61	Isomers	hannigana	12/13/17 15:34

537 (modified)

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

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_00026	06/05/18	12/05/17	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_00012	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00011	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00011	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00012	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00015	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00012	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00005	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00017	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00012	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00018	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00012	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00012	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00016	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00024	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00013	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_00012	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00011	12/07/20	Wellington Laboratories, Lot M2PFTeDA0217			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM4PFHPA_00011	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00012	11/22/21	Wellington Laboratories, Lot M5PFPeA1116			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
.LCM8FOSA_00015	04/20/22	Wellington Laboratories, Lot M8FOSA0417I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00012	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFBS_00005	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
.LCMPFDA_00017	09/30/21	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00012	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00018	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00012	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00012	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00016	04/12/22	Wellington Laboratories, Lot MPFOA0417			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00024	05/19/22	Wellington Laboratories, Lot MPFOS517			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00013	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCPFC-IS_00019	06/05/18	12/05/17	Methanol, Lot 090285	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
.LCM2PFOA_00008	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.: 320-34072-1

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.: 320-34072-1

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

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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

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SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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.: 320-34072-1

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_00117	03/29/18	09/29/17	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.: 320-34072-1

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.: 320-34072-1

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

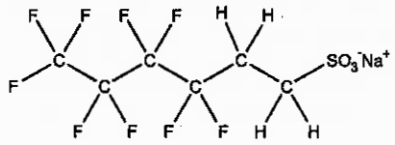
WELLINGTON LABORATORIES

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:

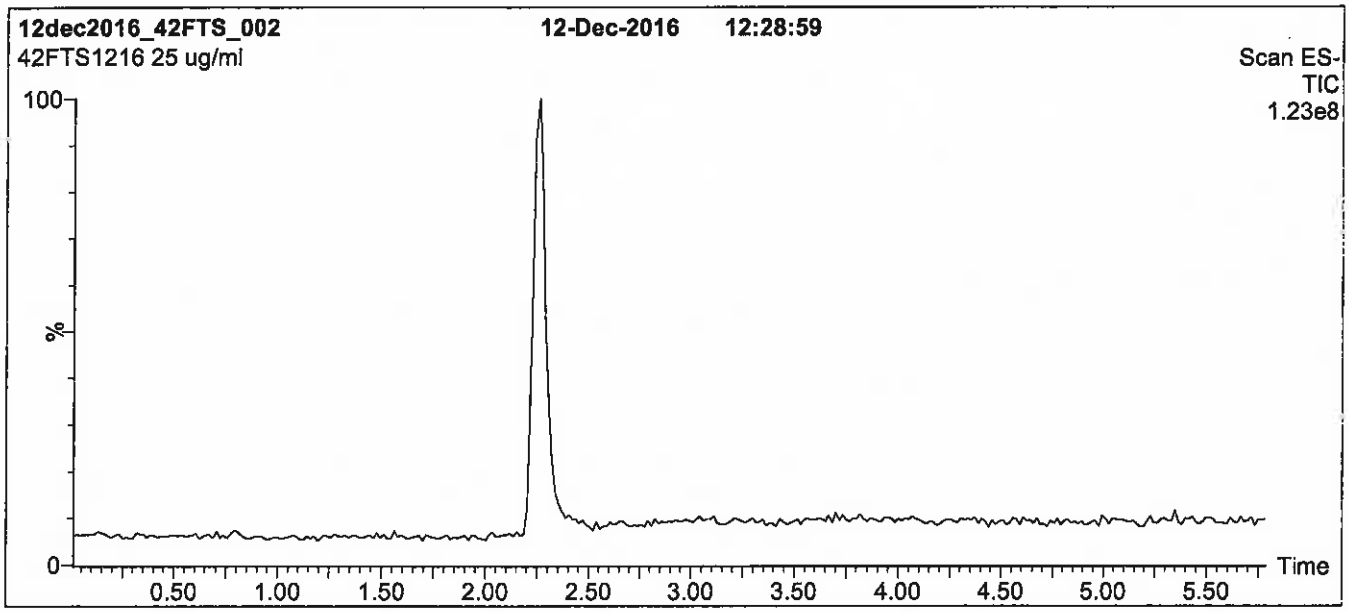
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

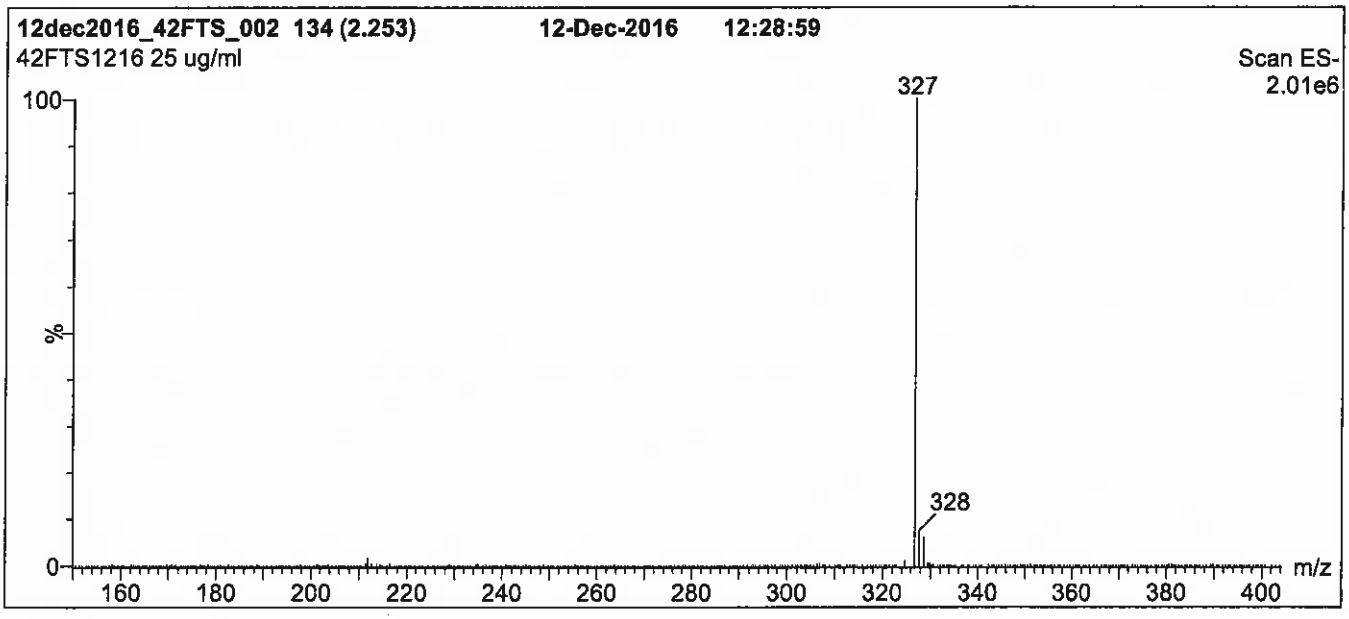
CALA Testing

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

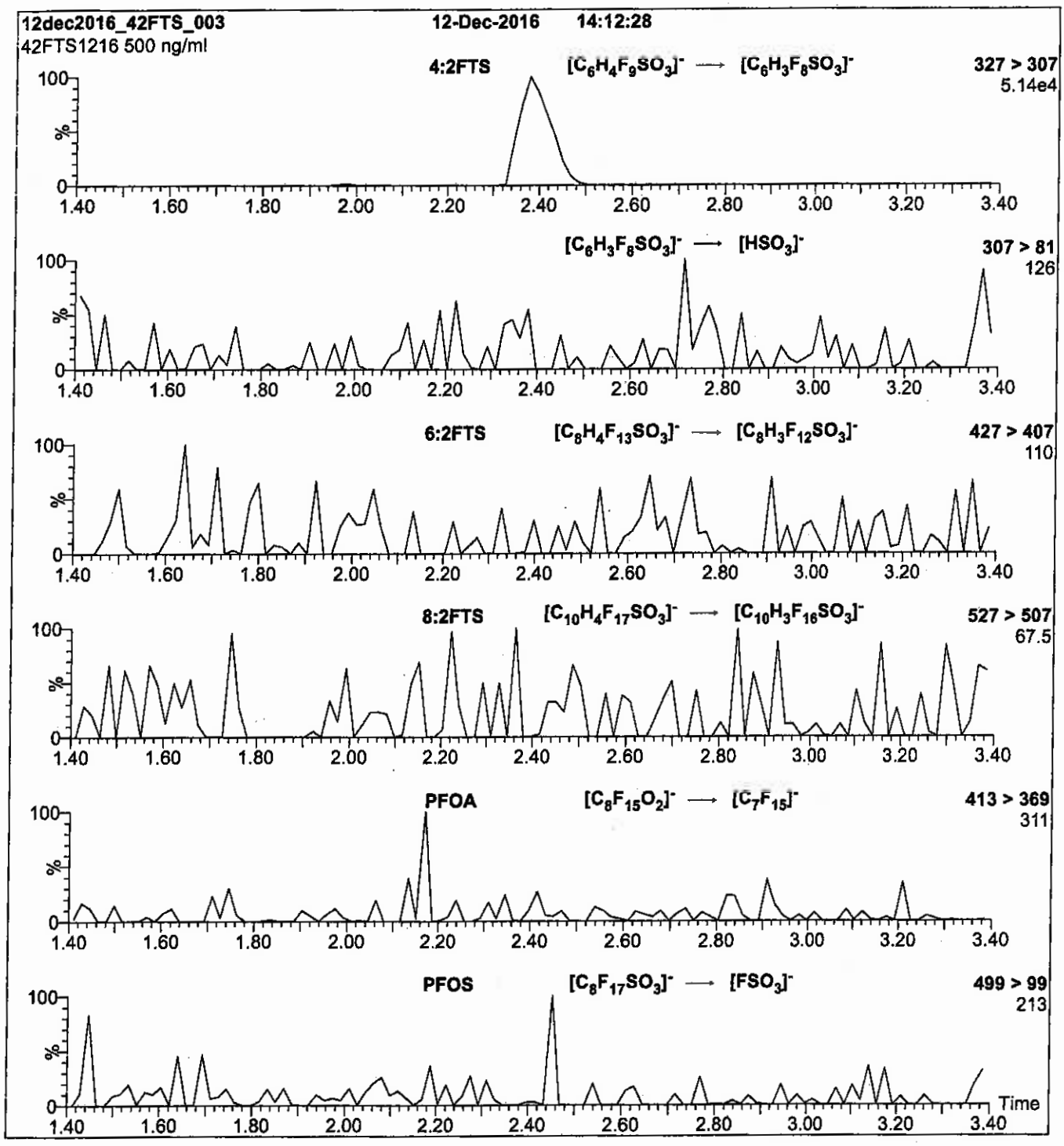
Flow: 300 µl/min

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: 7/19/17 SRV

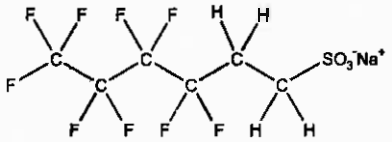
WELLINGTON LABORATORIES

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:

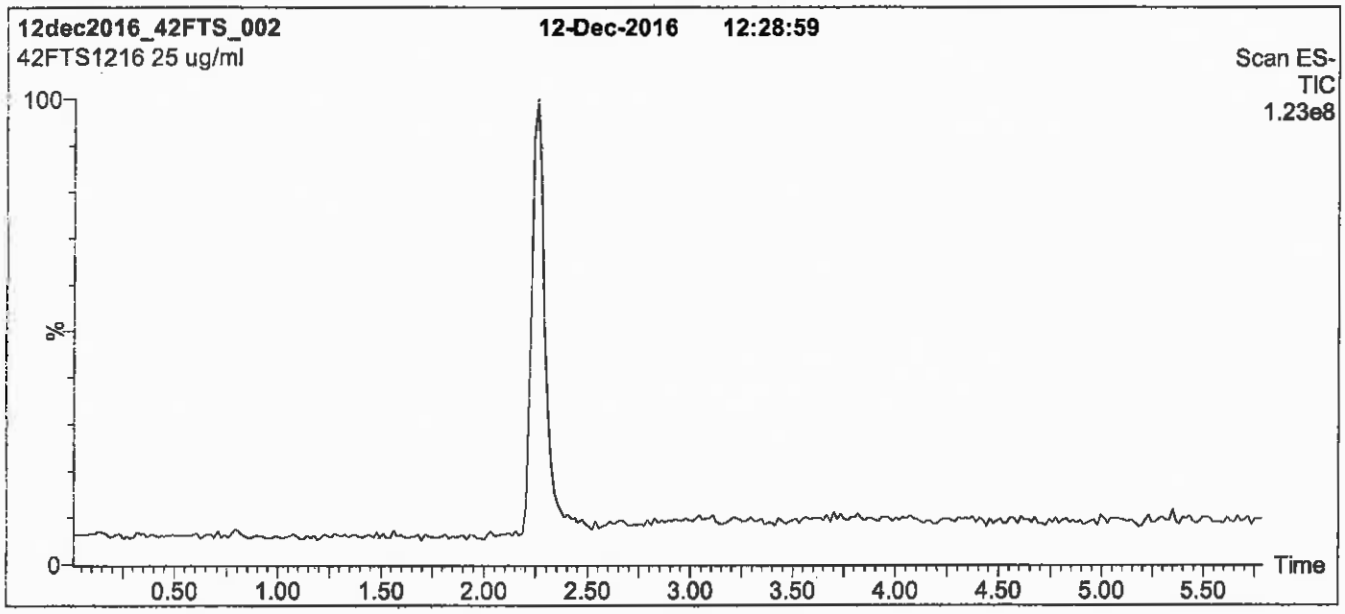
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

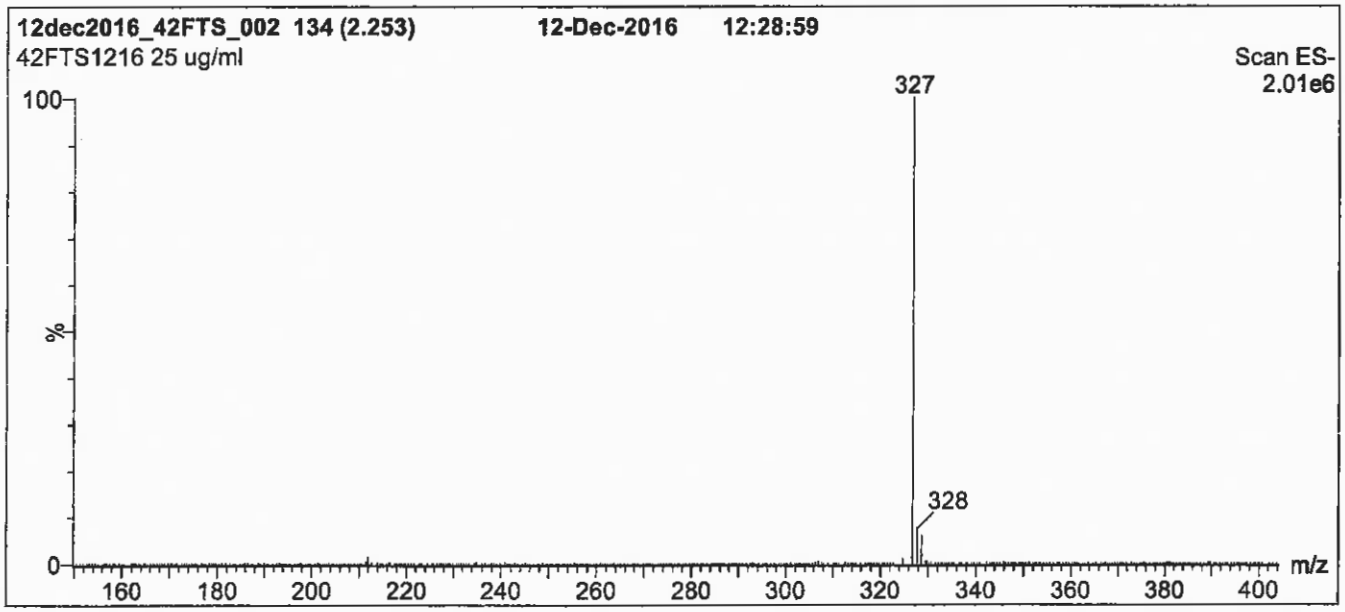
CALA

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

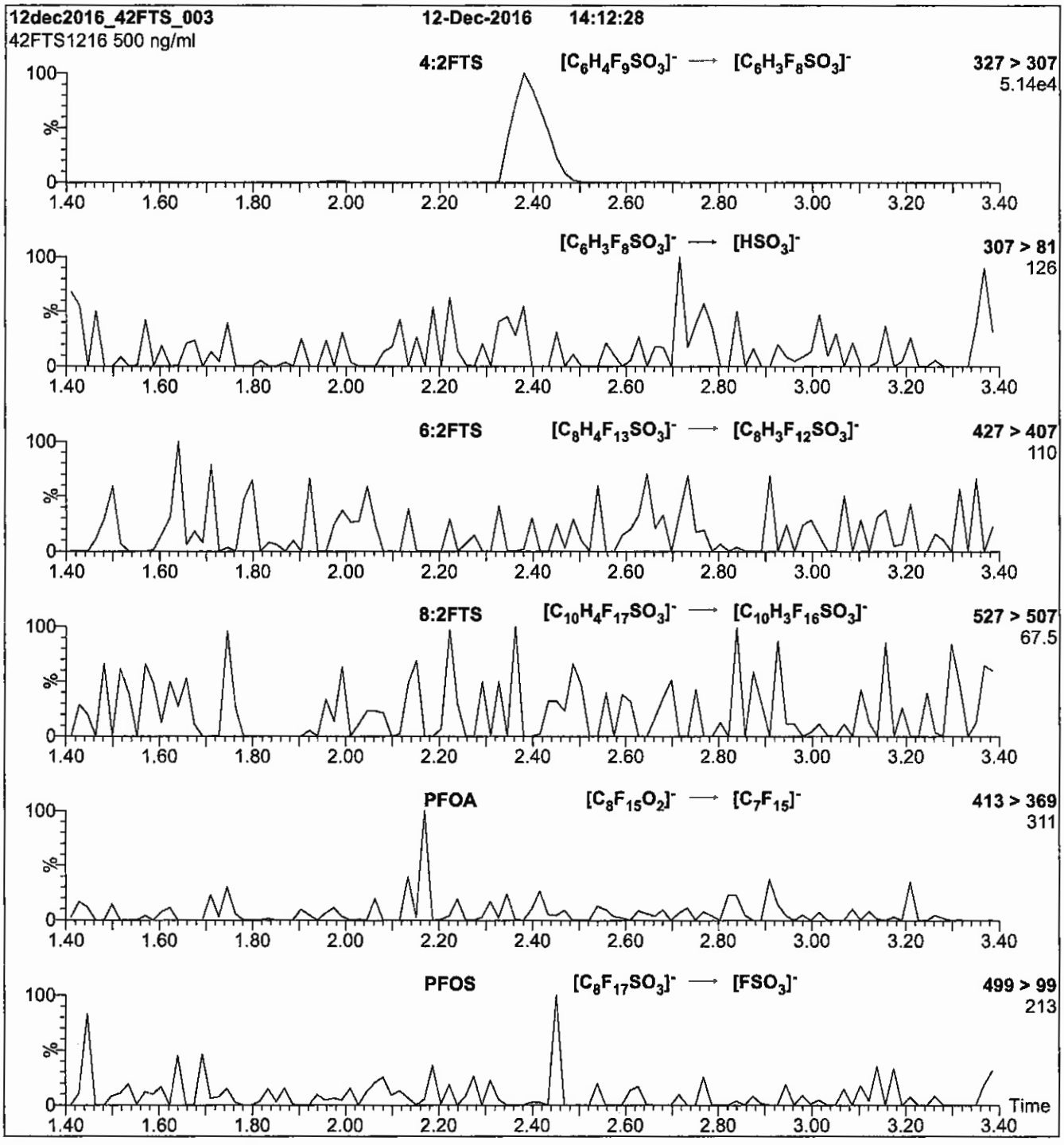
Flow: 300 µl/min

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

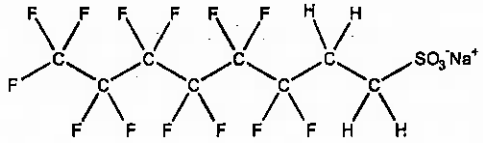
WELLINGTON LABORATORIES

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 $x_1, x_2,...x_n$ 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:

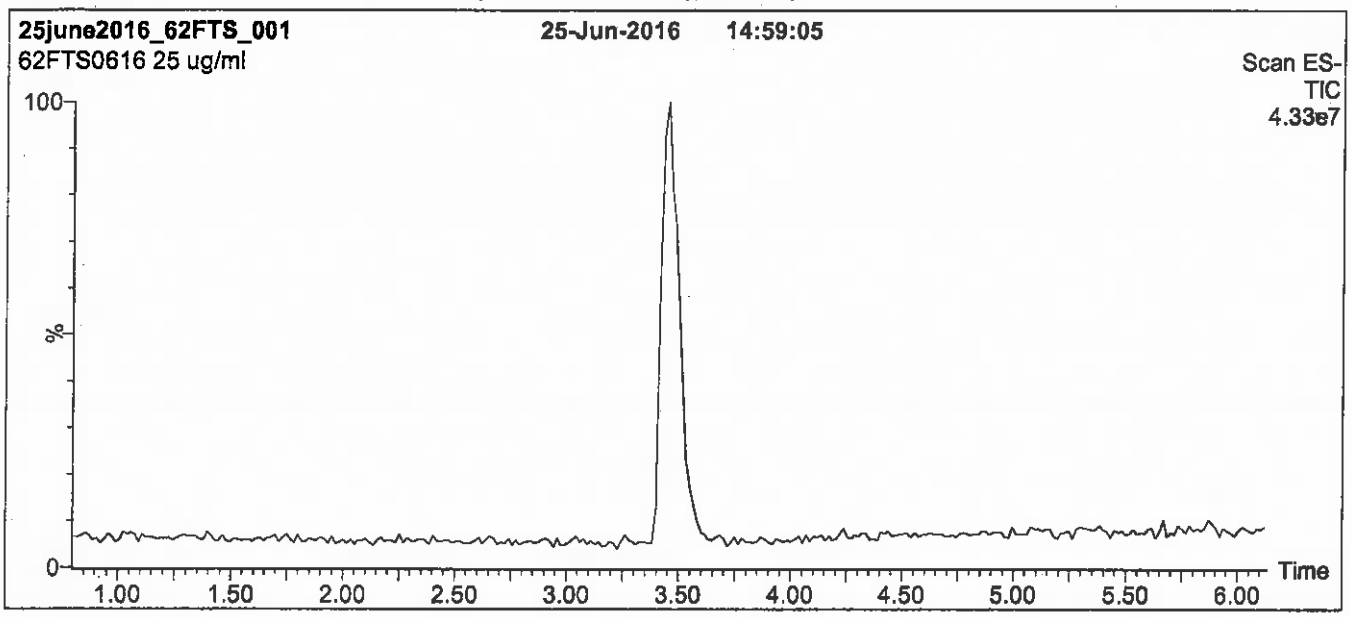
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

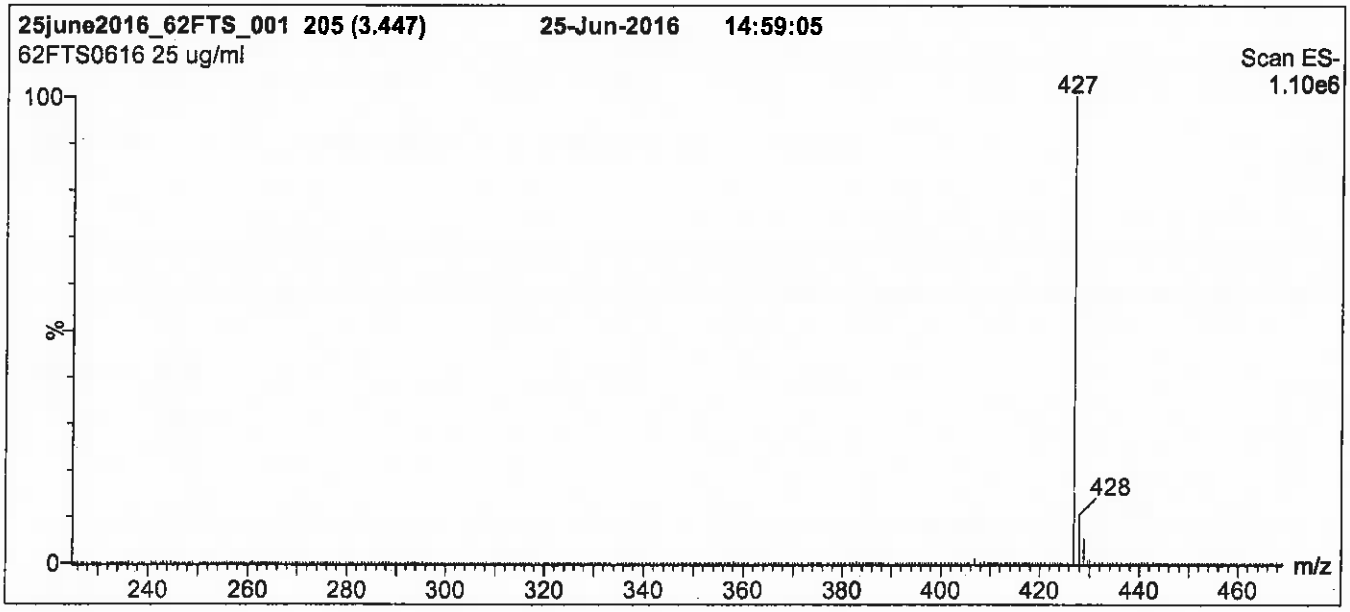
CALA

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: **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

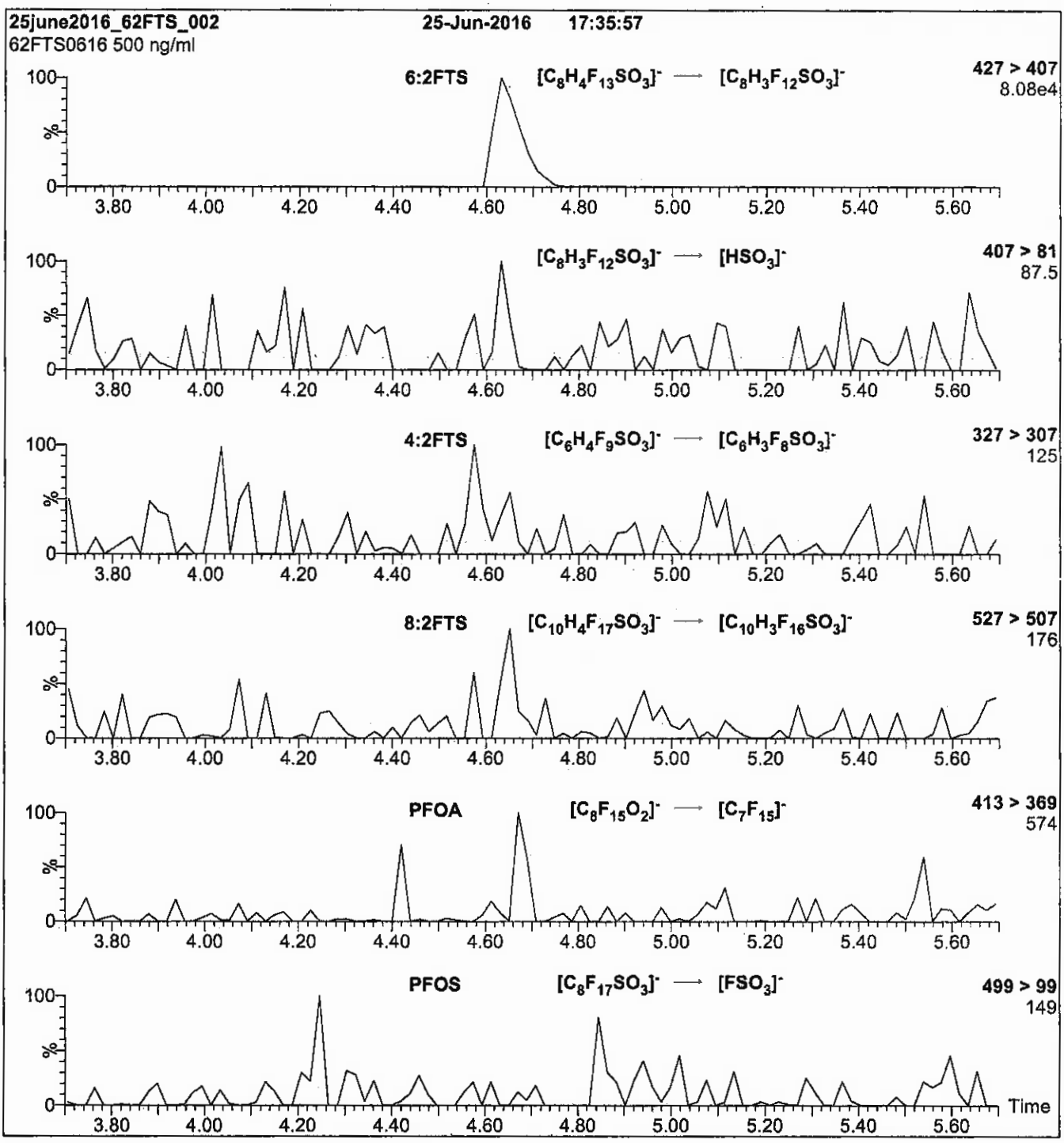
Flow: 300 µl/min

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

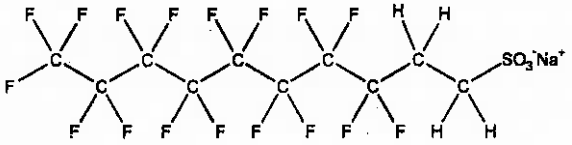
P: 12/29/16

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

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

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

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

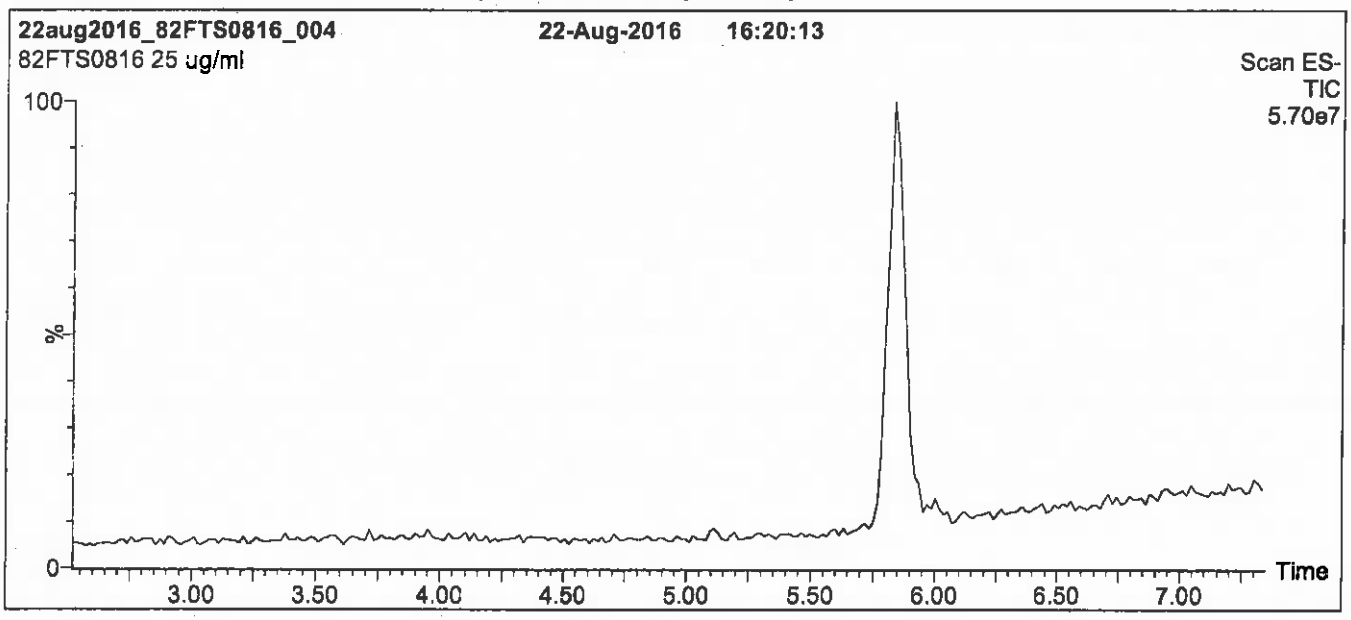
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

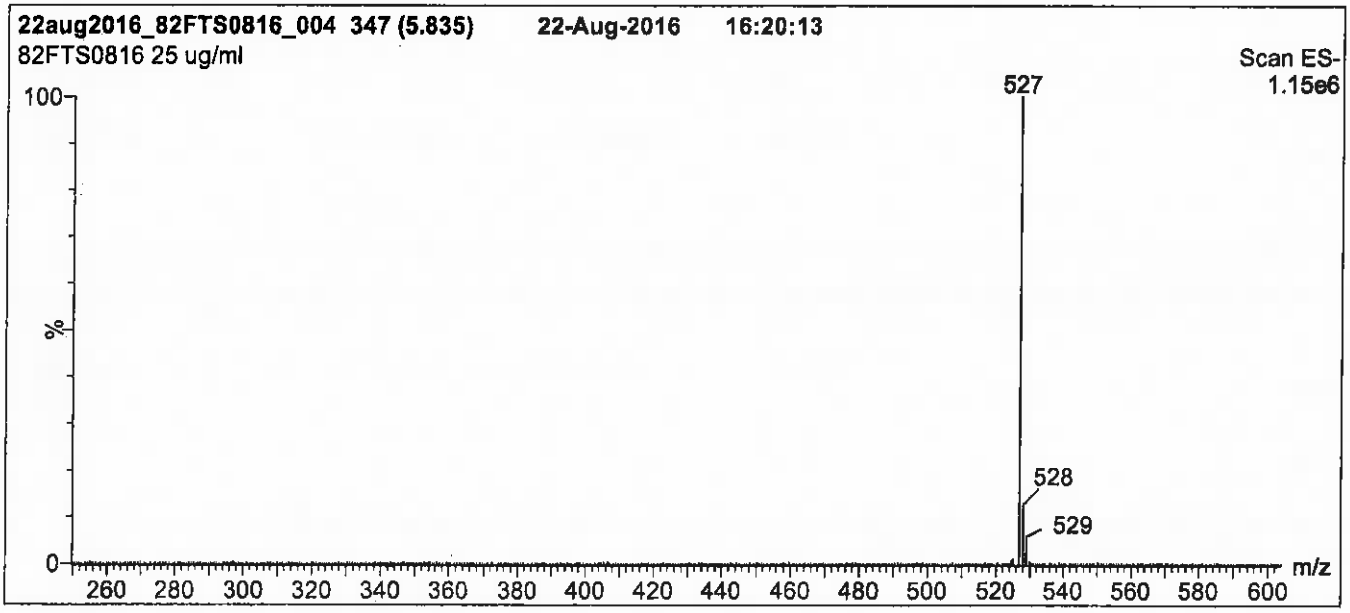
CALA

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

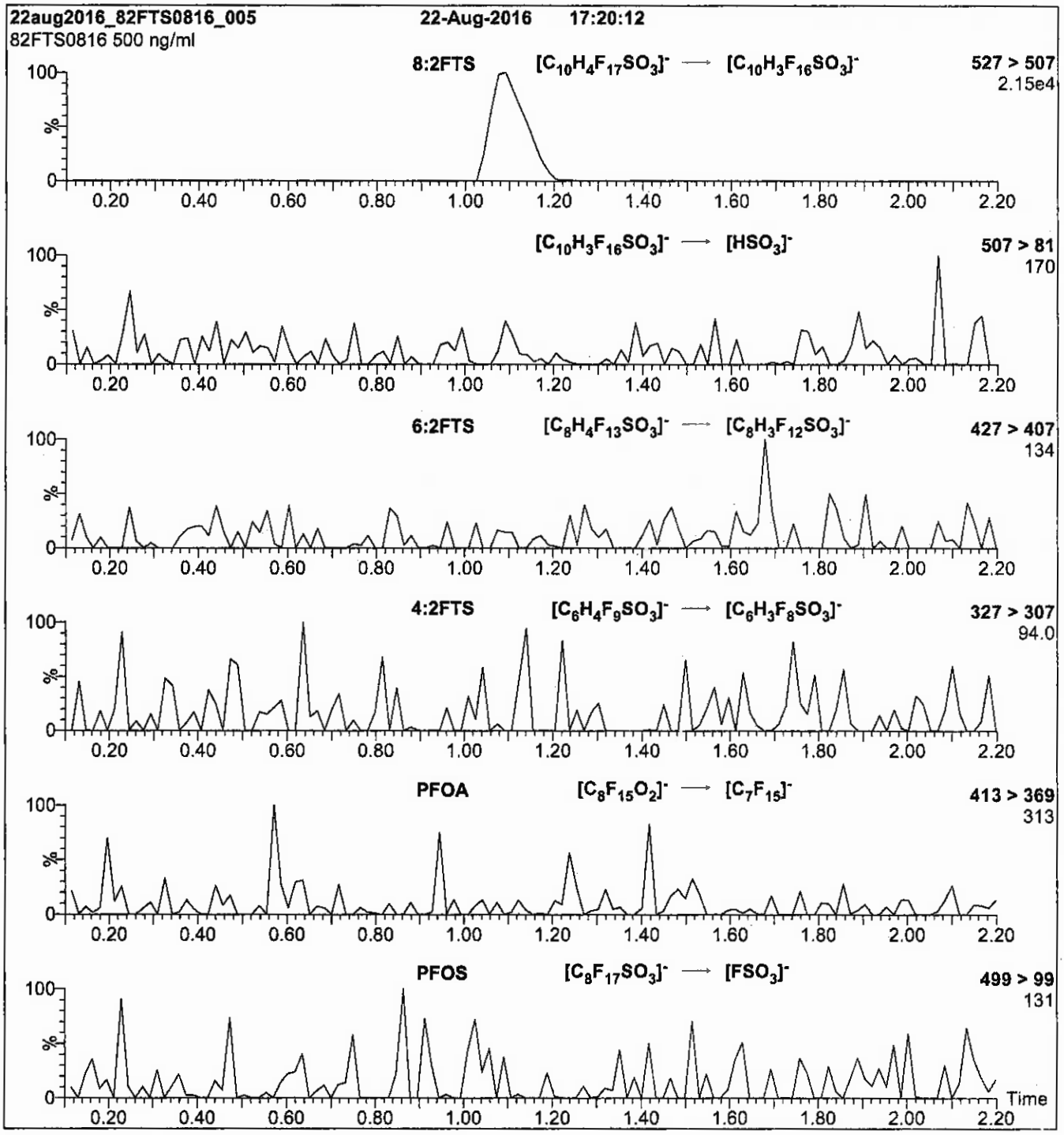
Flow: 300 µl/min

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

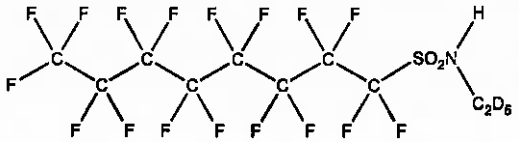
LCd-NEtFOSA-M_00005

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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CALA

ANAB ACCREDITED

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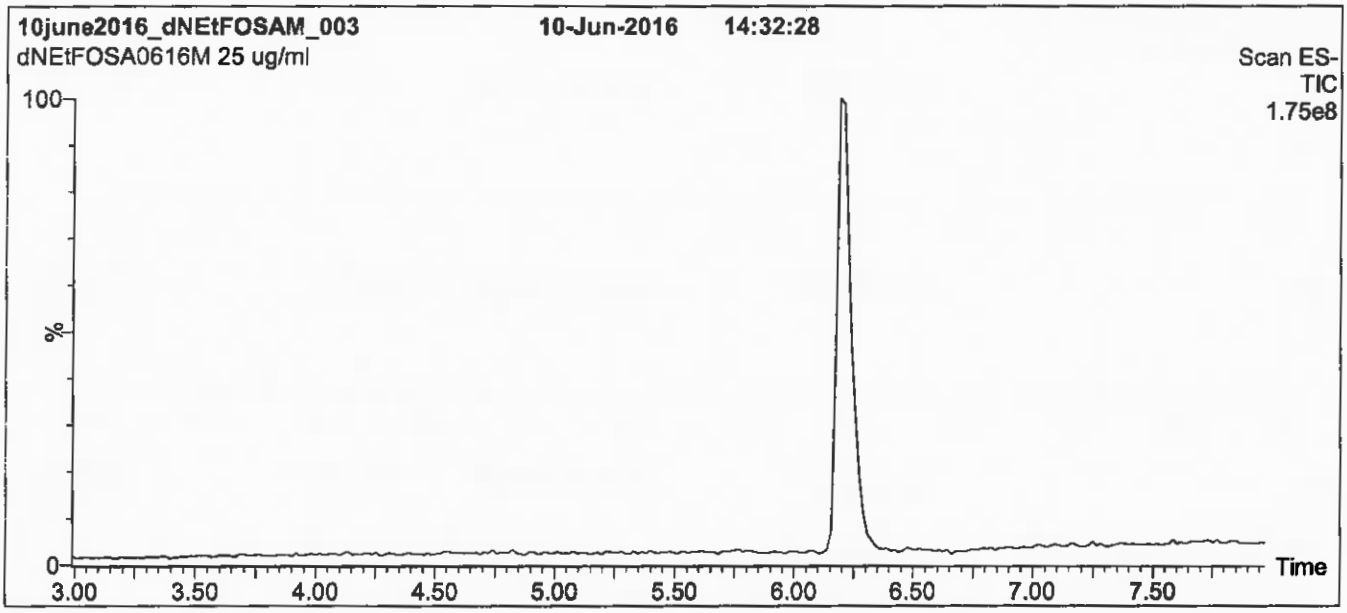
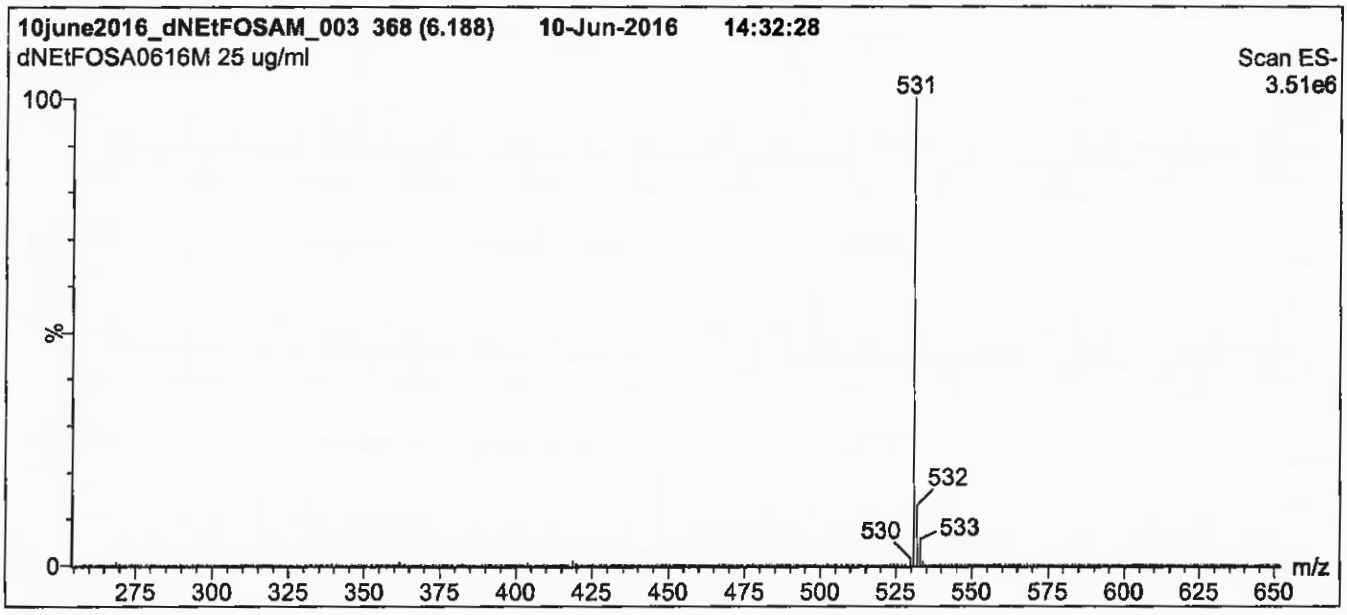
Figure 1: **d-N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





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

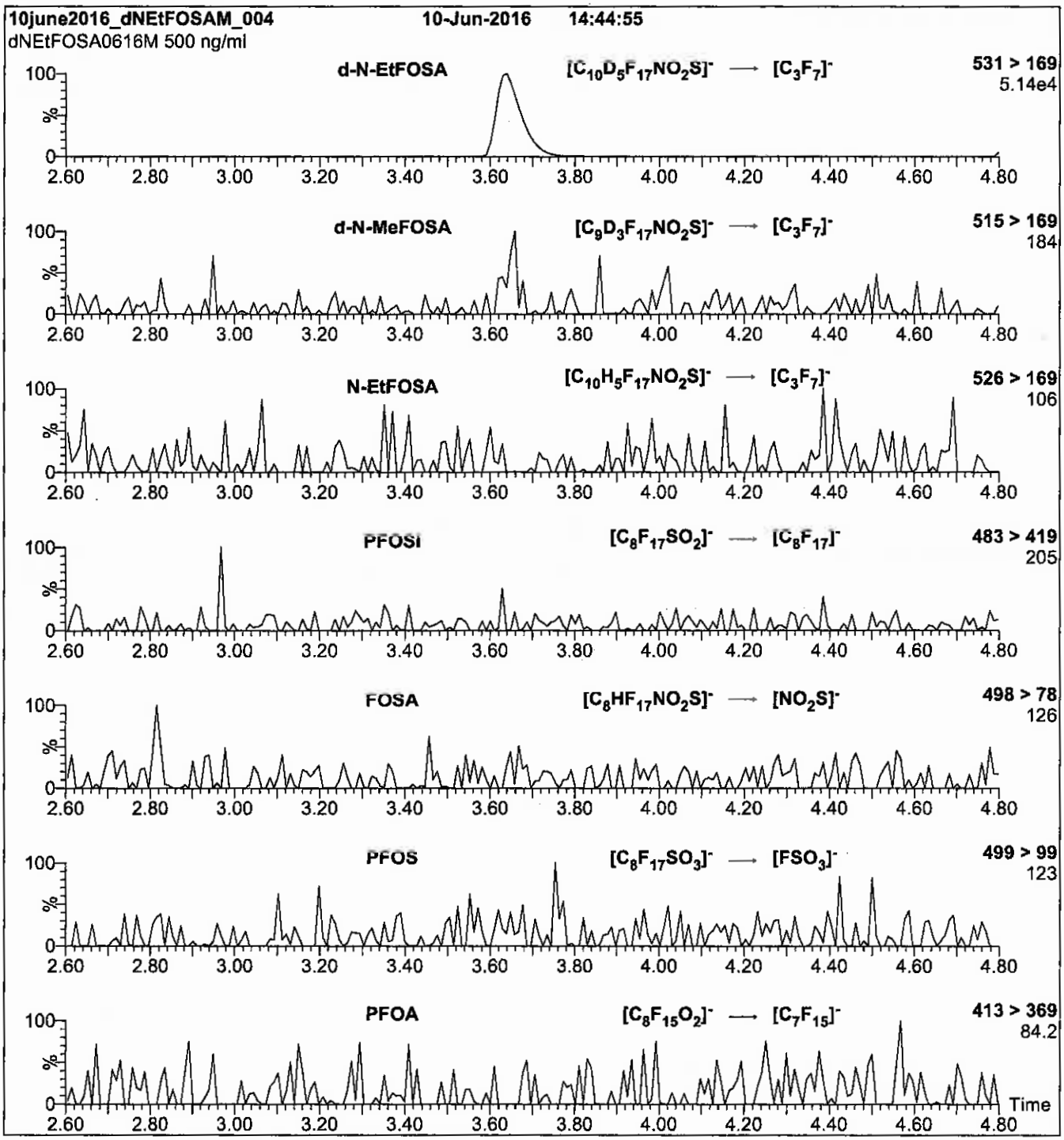
Flow: 300 µl/min

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

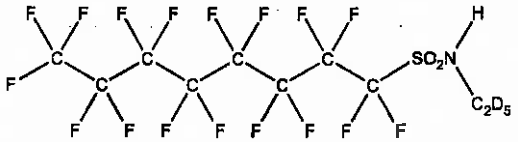
LCd-NEtFOSA-M_00006

Ps 8/30/17 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	d-N-EtFOSA-M	**LOT NUMBER:**	dNEtFOSA0417M
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)	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
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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.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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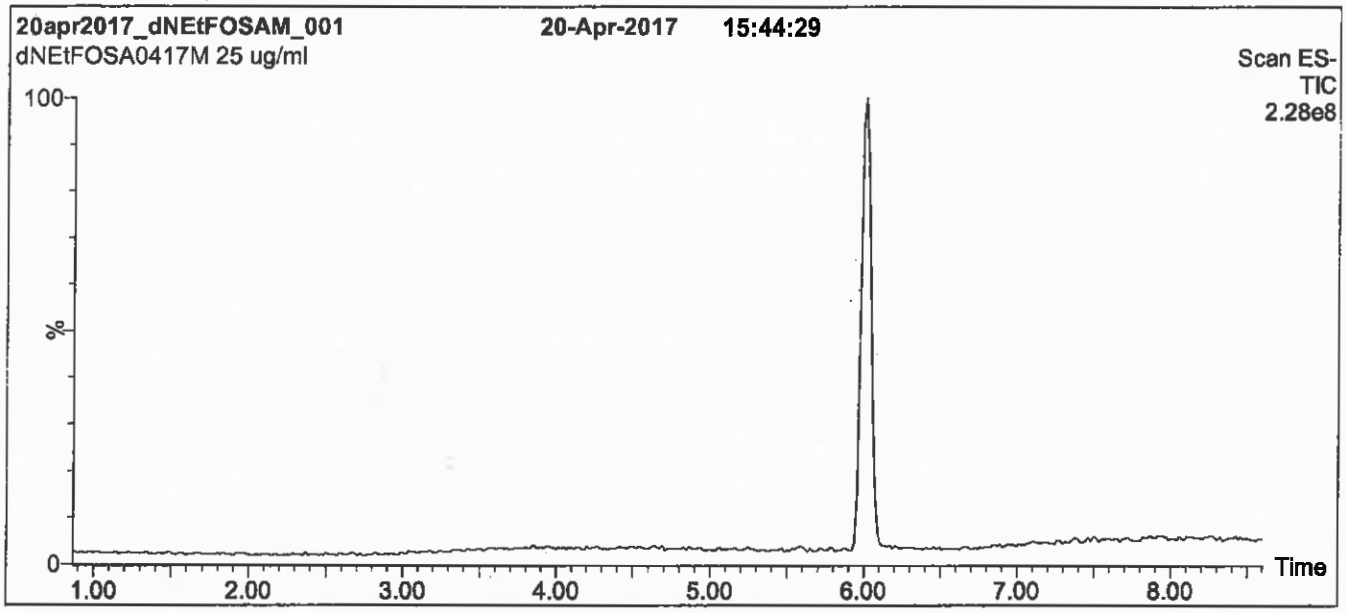
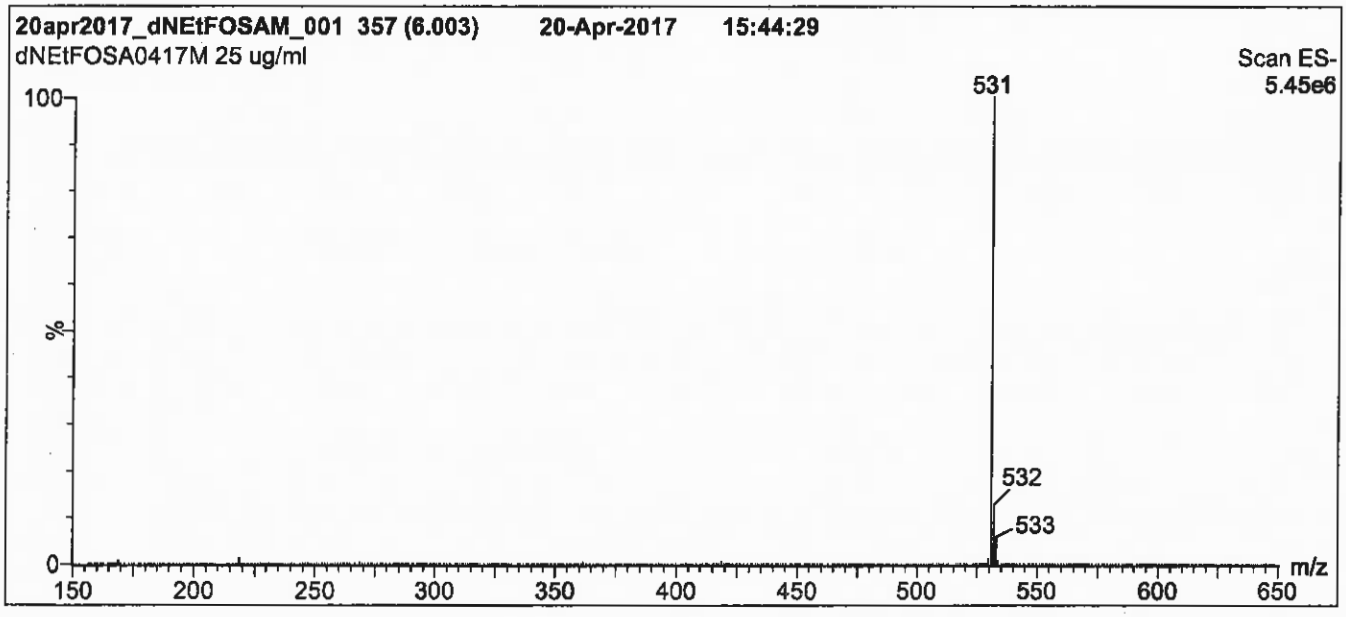
CALA

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

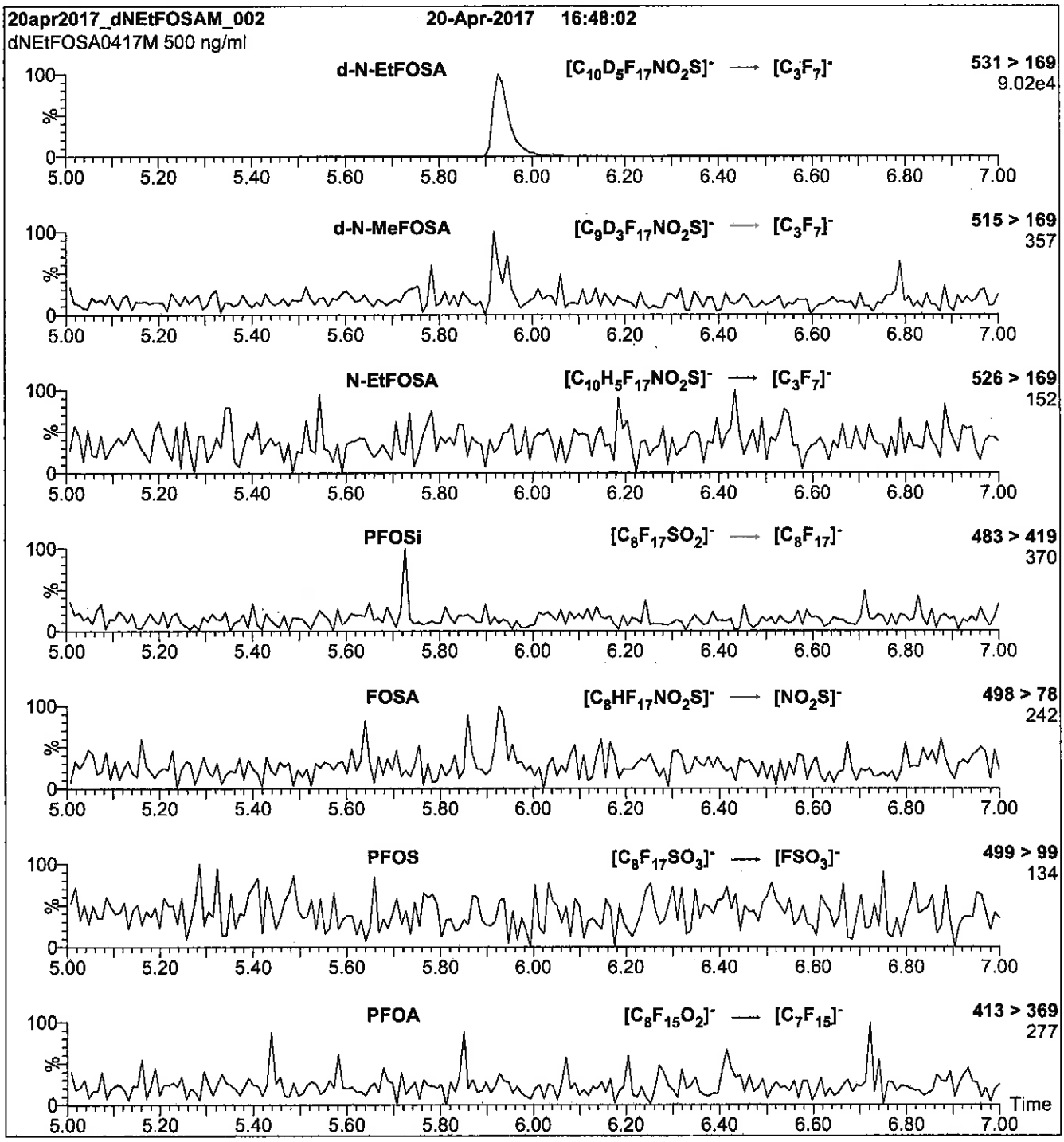
Flow: 300 µl/min

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

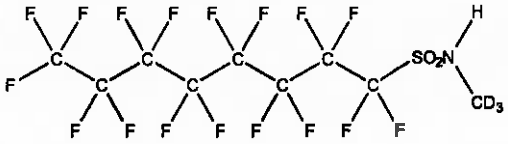
Reagent

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:

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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CALA

ANAB ACCREDITED

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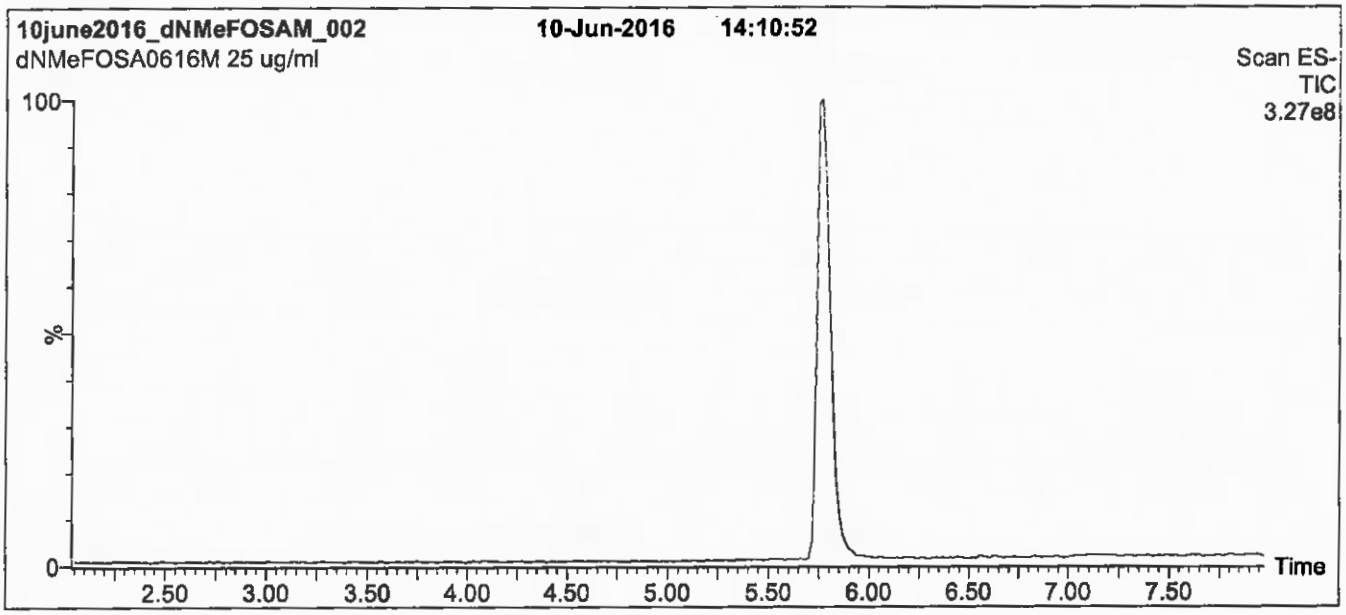
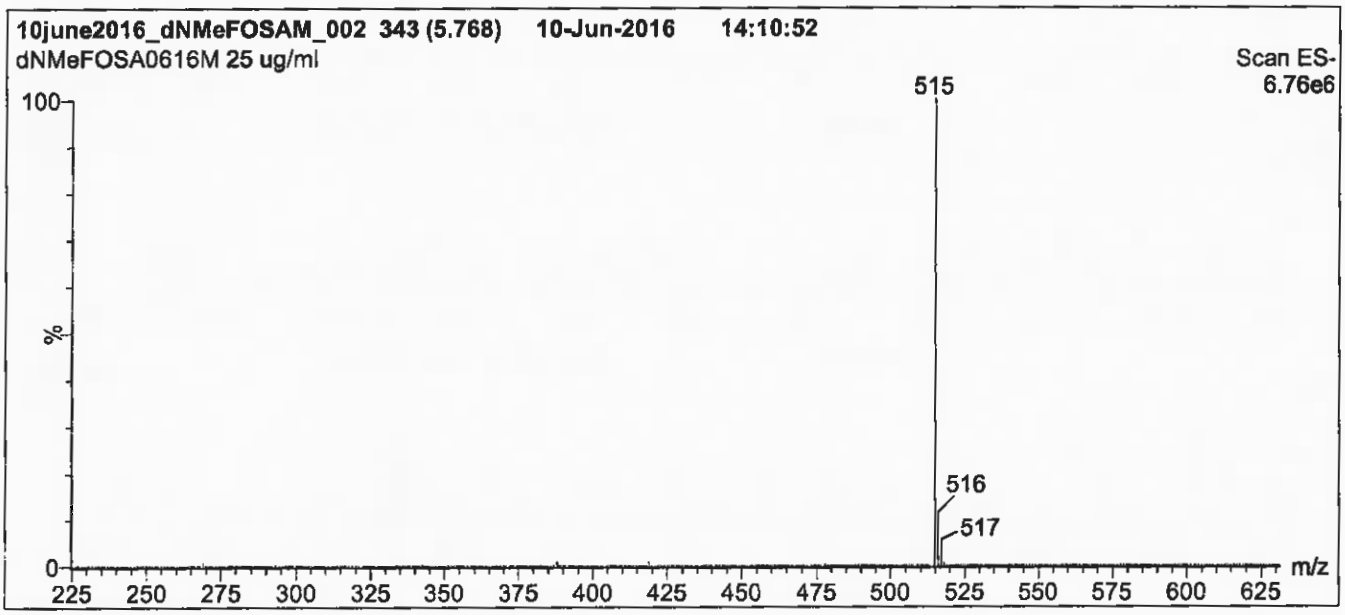
Figure 1: **d-N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





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

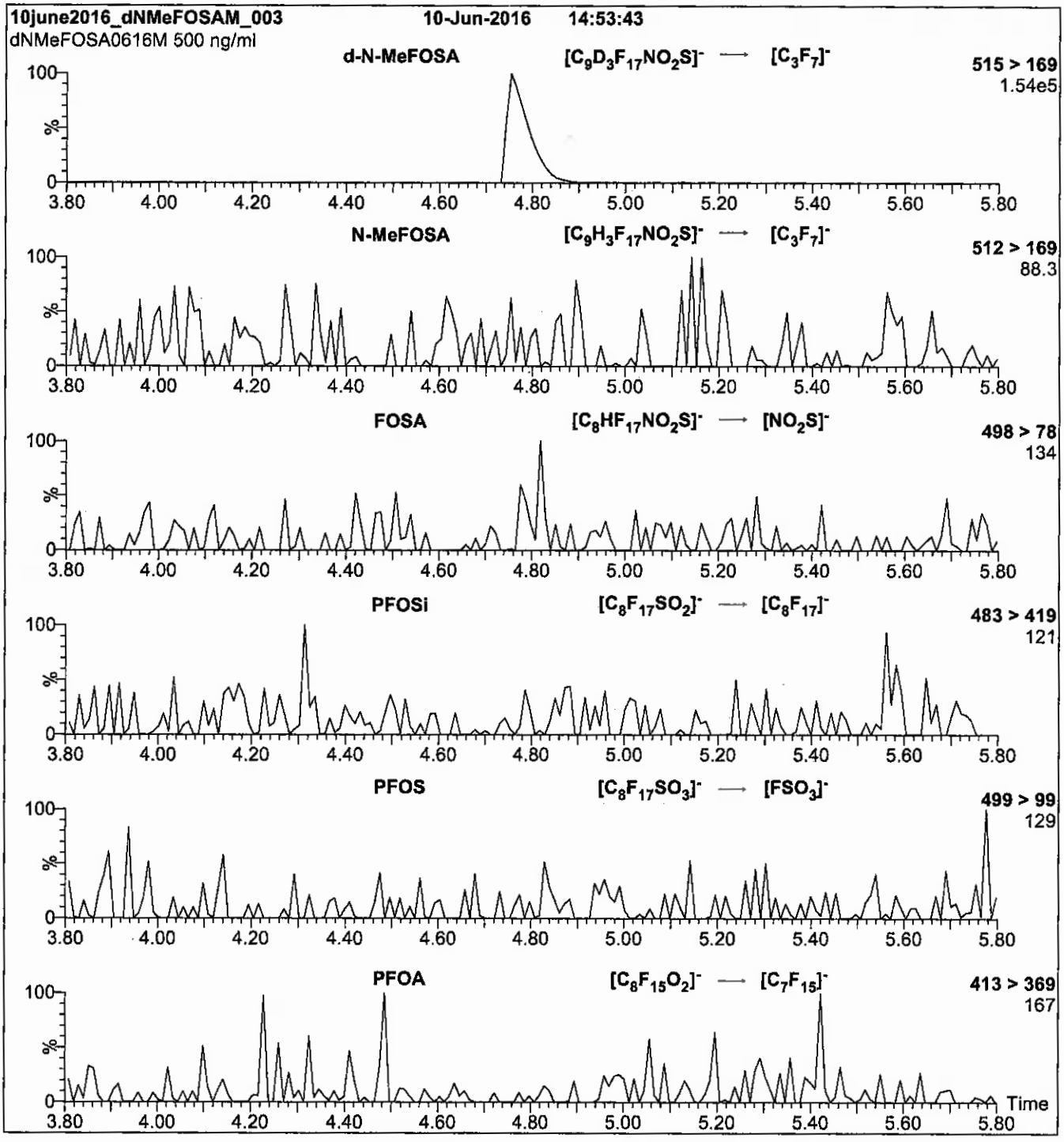
Flow: 300 µl/min

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 8/30/17 SW

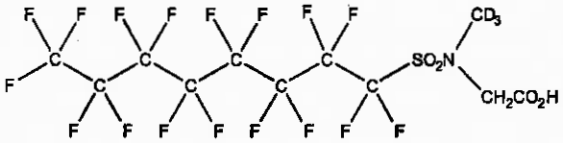
WELLINGTON LABORATORIES

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: B.G. Chittim, General Manager **Date:** 05/31/2017 (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:

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HAZARDS:

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CALA

ANAB ACCREDITED

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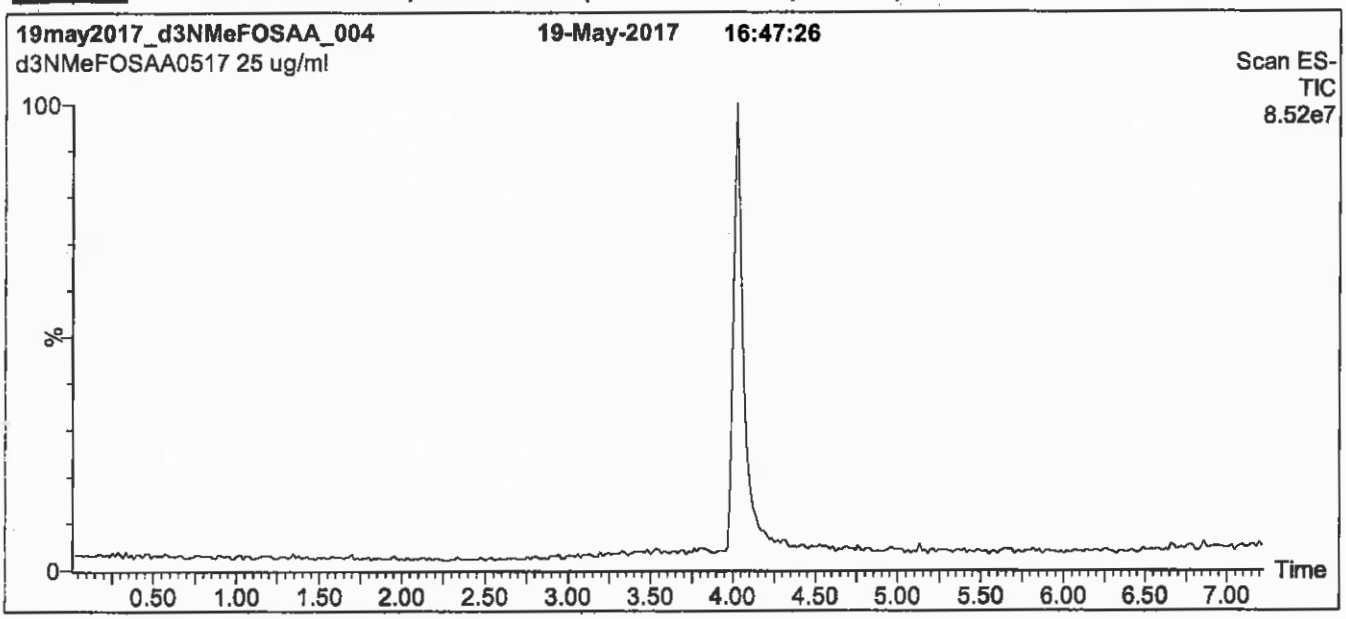
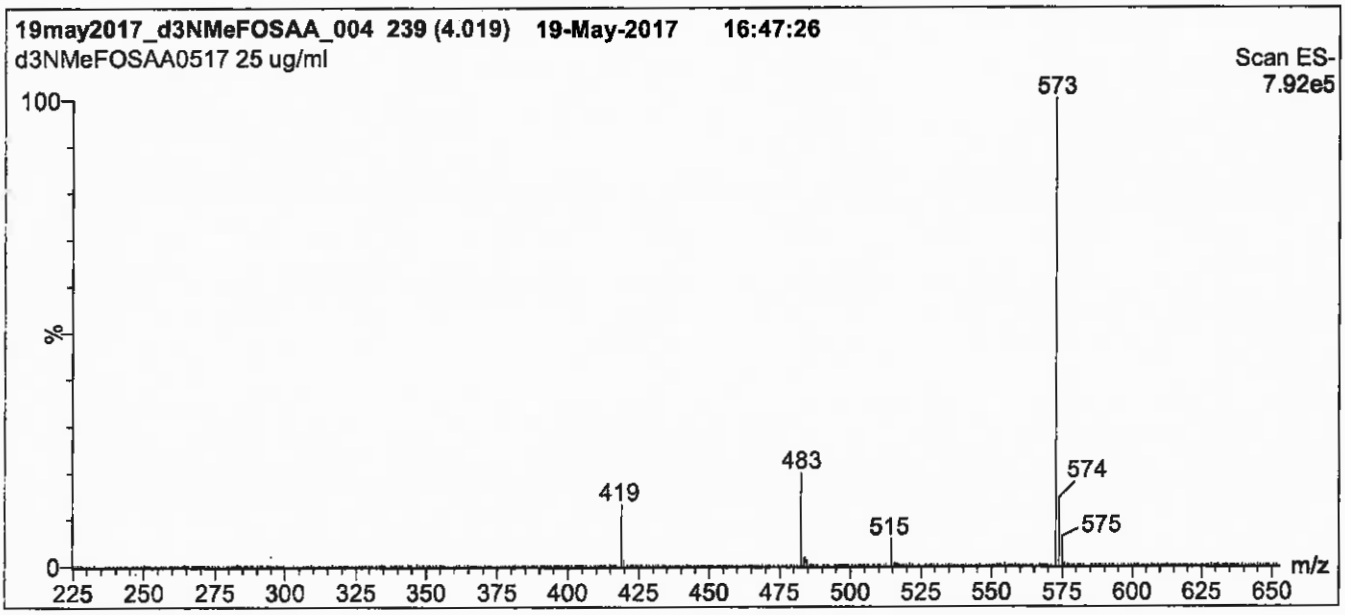
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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

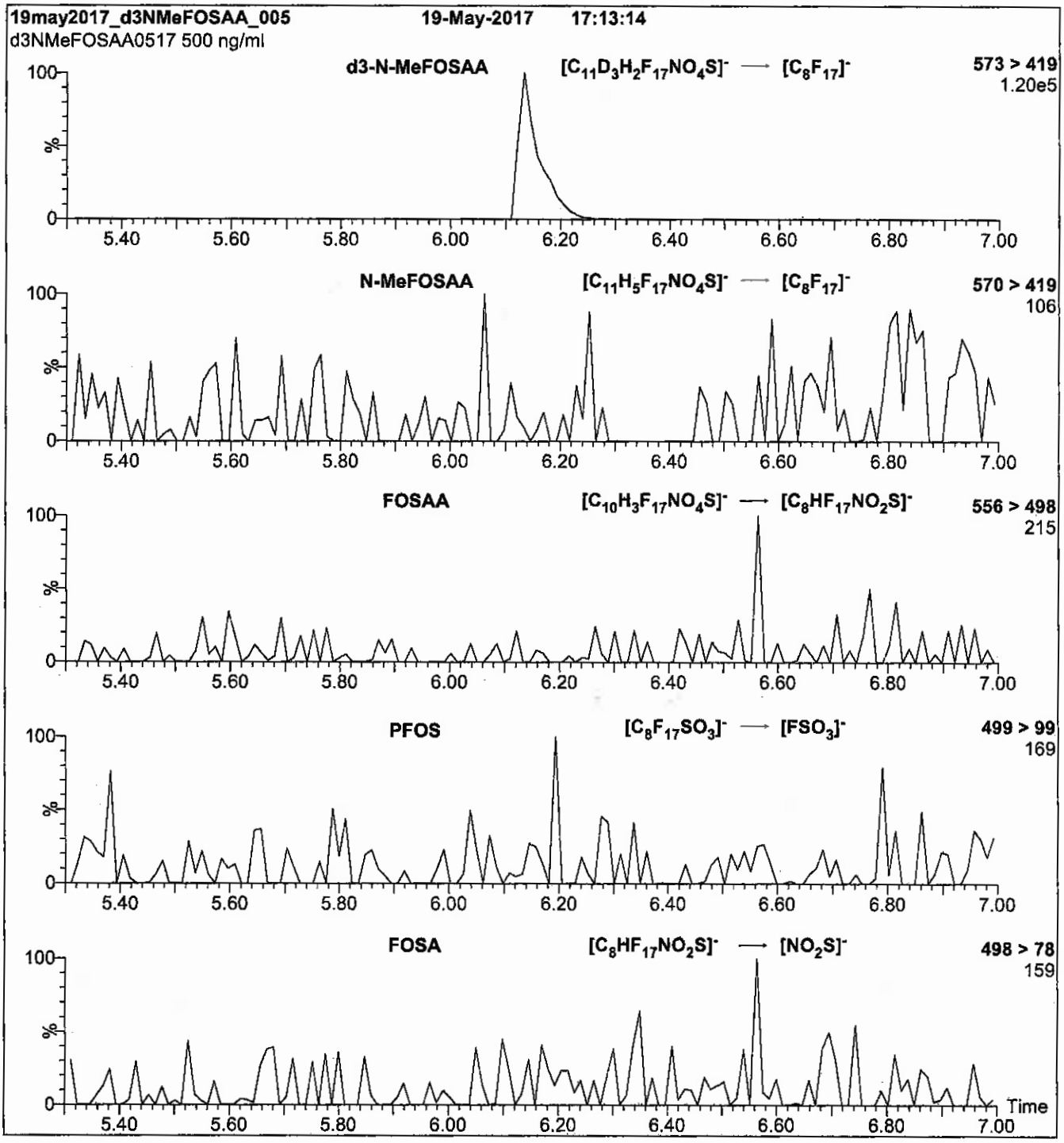
Flow: 300 µl/min

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

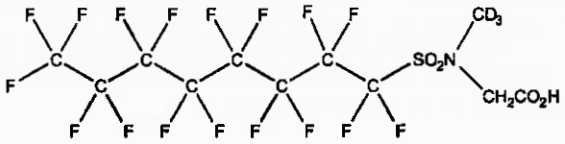
WELLINGTON LABORATORIES

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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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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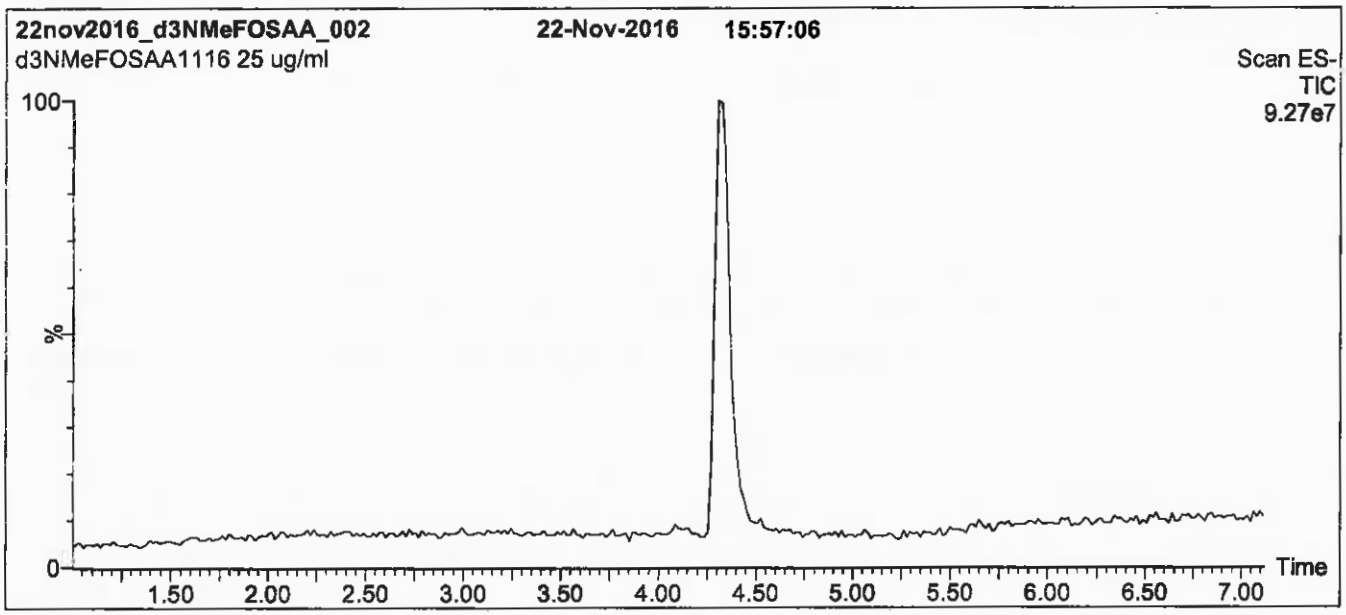
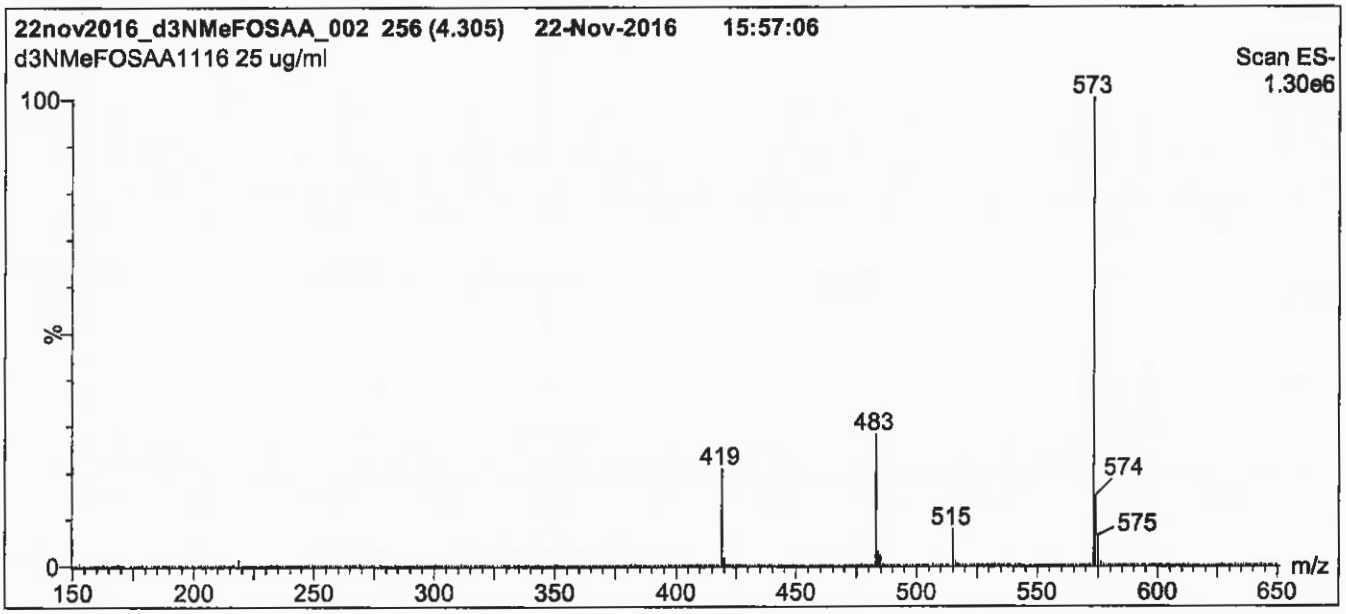
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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

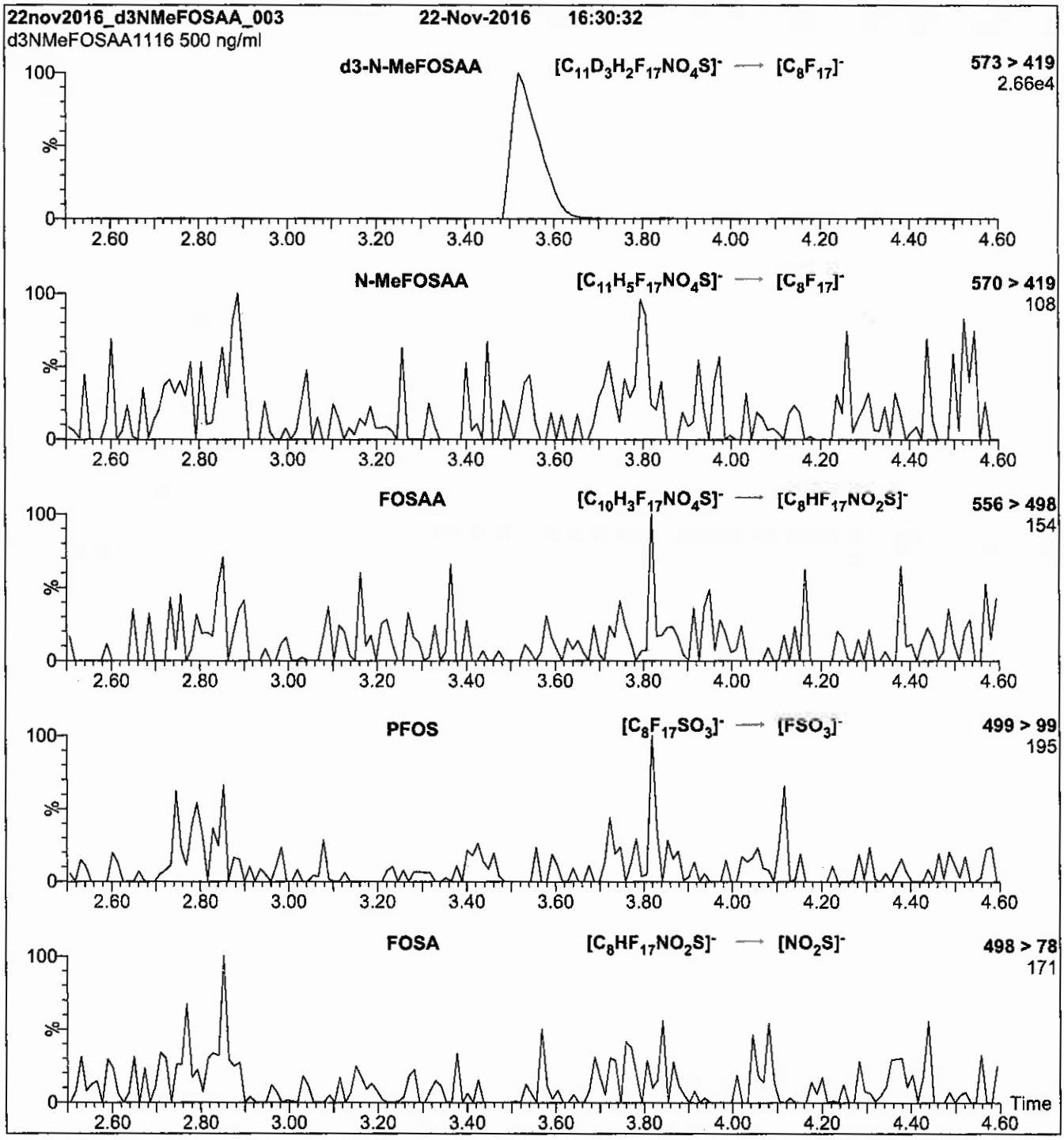
Flow: 300 µl/min

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

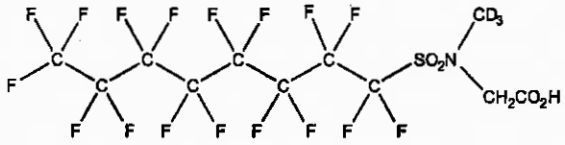
Reagent

LCd3-NMeFOSAA_00005

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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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 $x_1, x_2, \ldots x_n$ 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:

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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:

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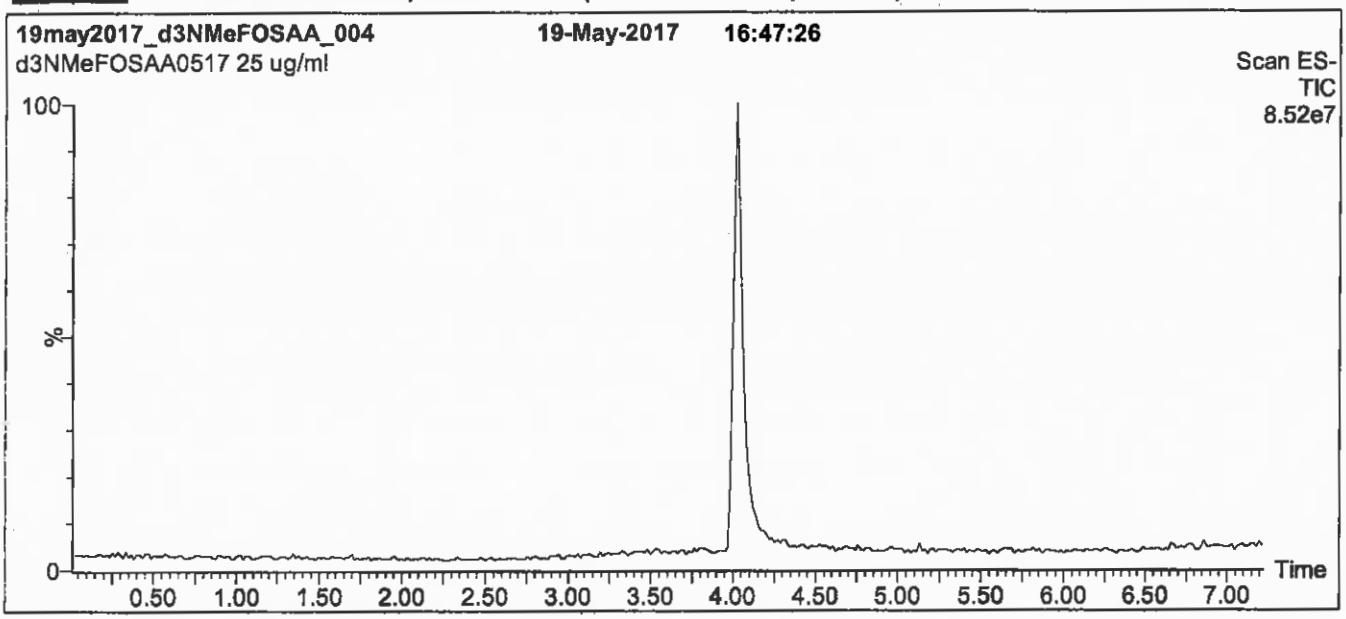

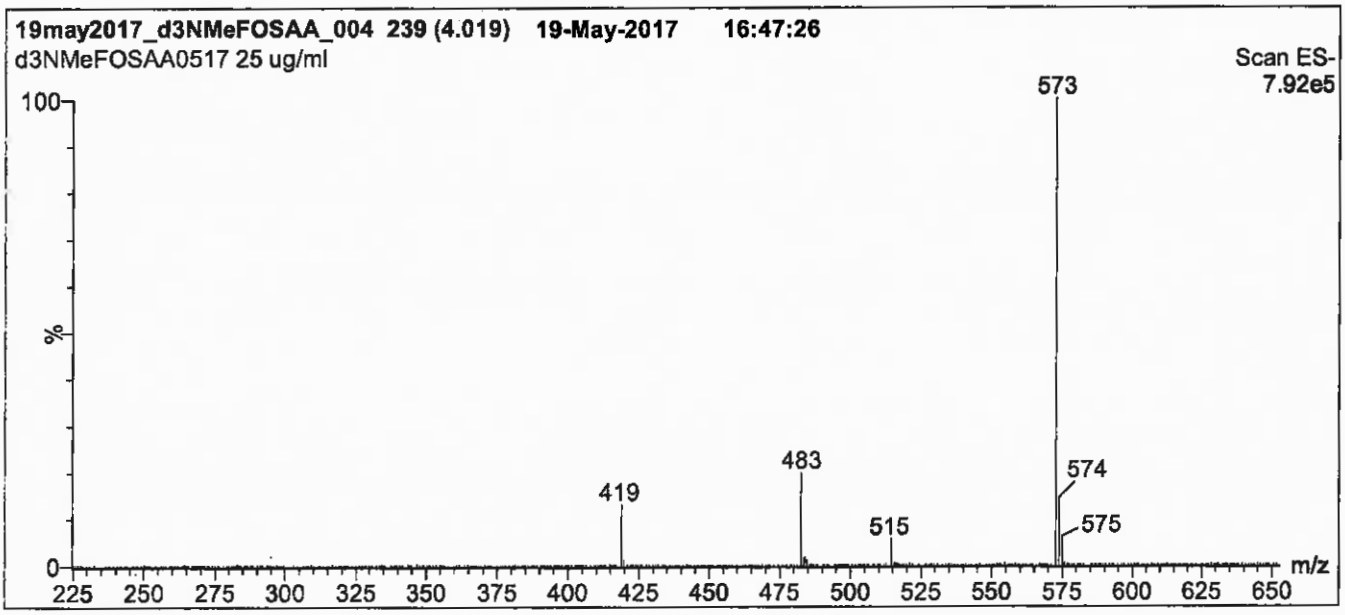

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Ramp to 90% organic over 7 min and hold for 1.5 min
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Time: 10 min

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

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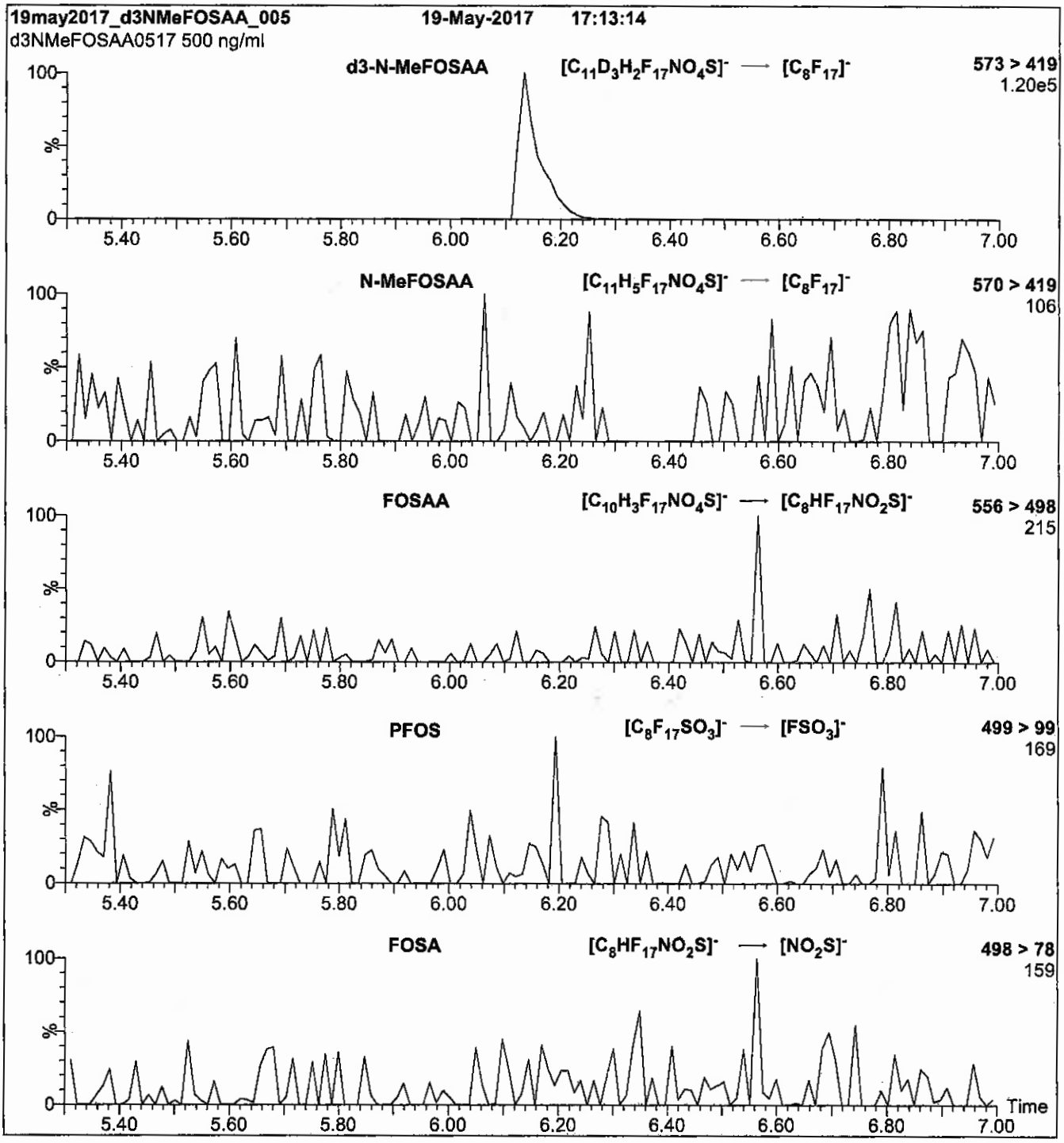


Conditions for Figure 2:

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

R: 3/20/17 SRV

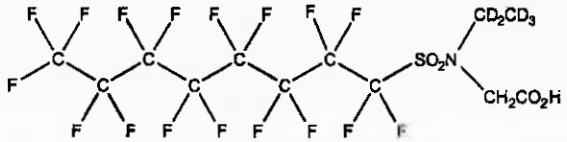
WELLINGTON LABORATORIES

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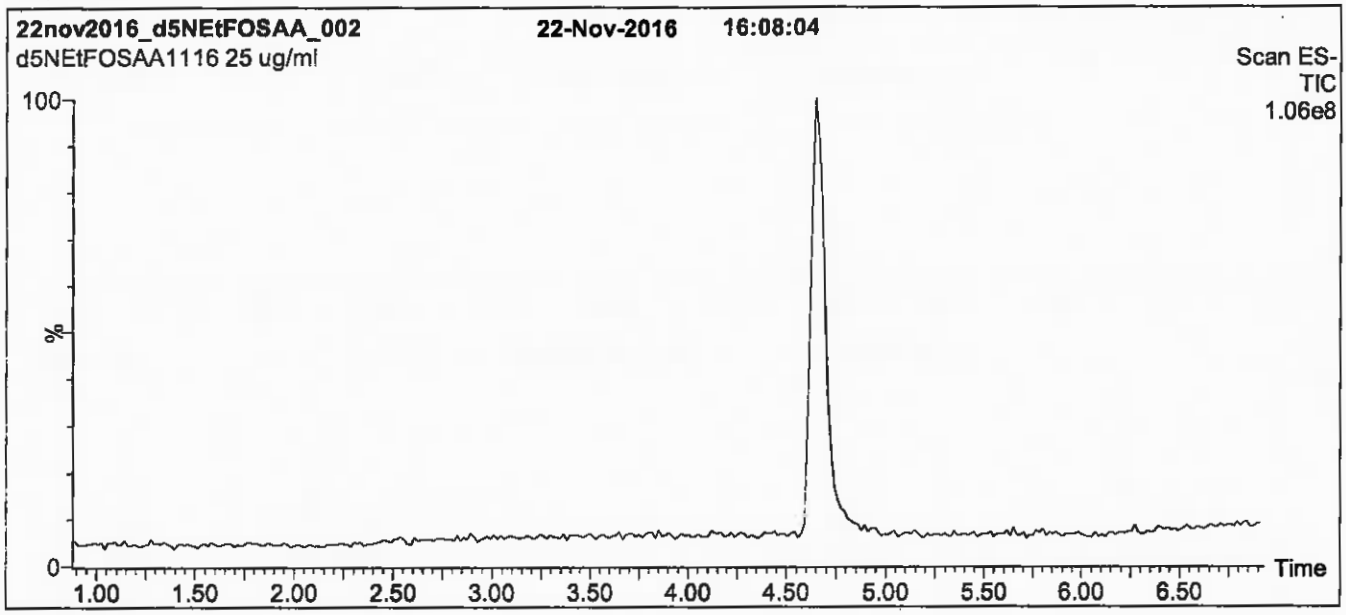
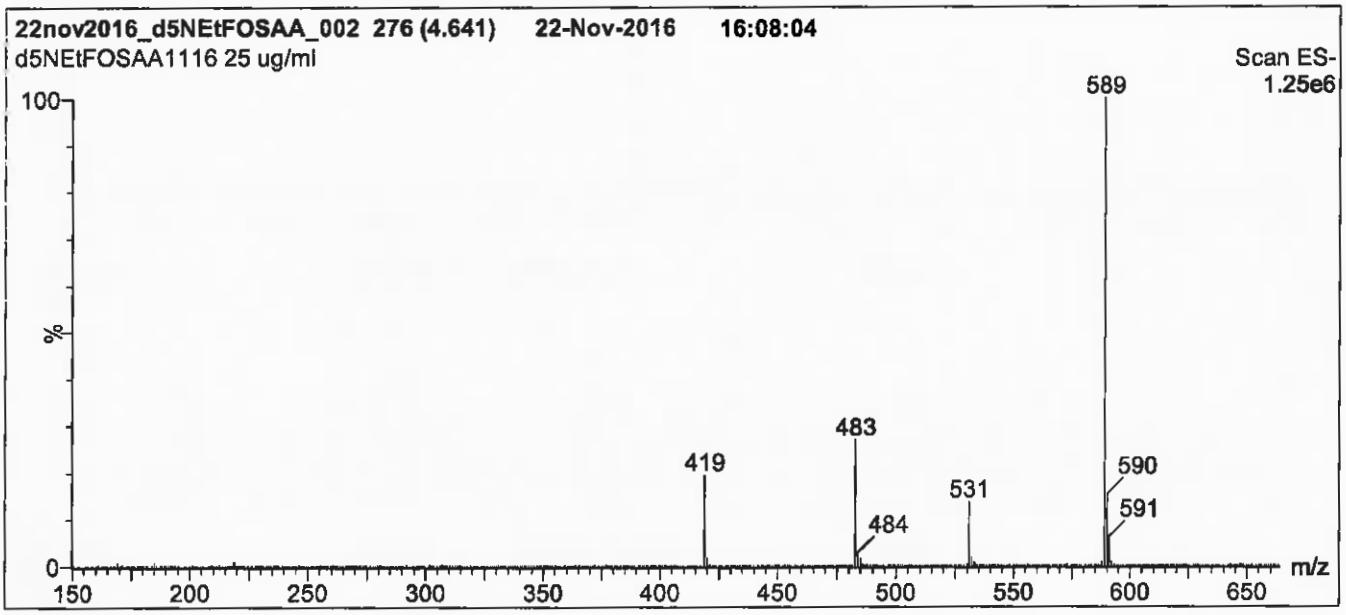
Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

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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

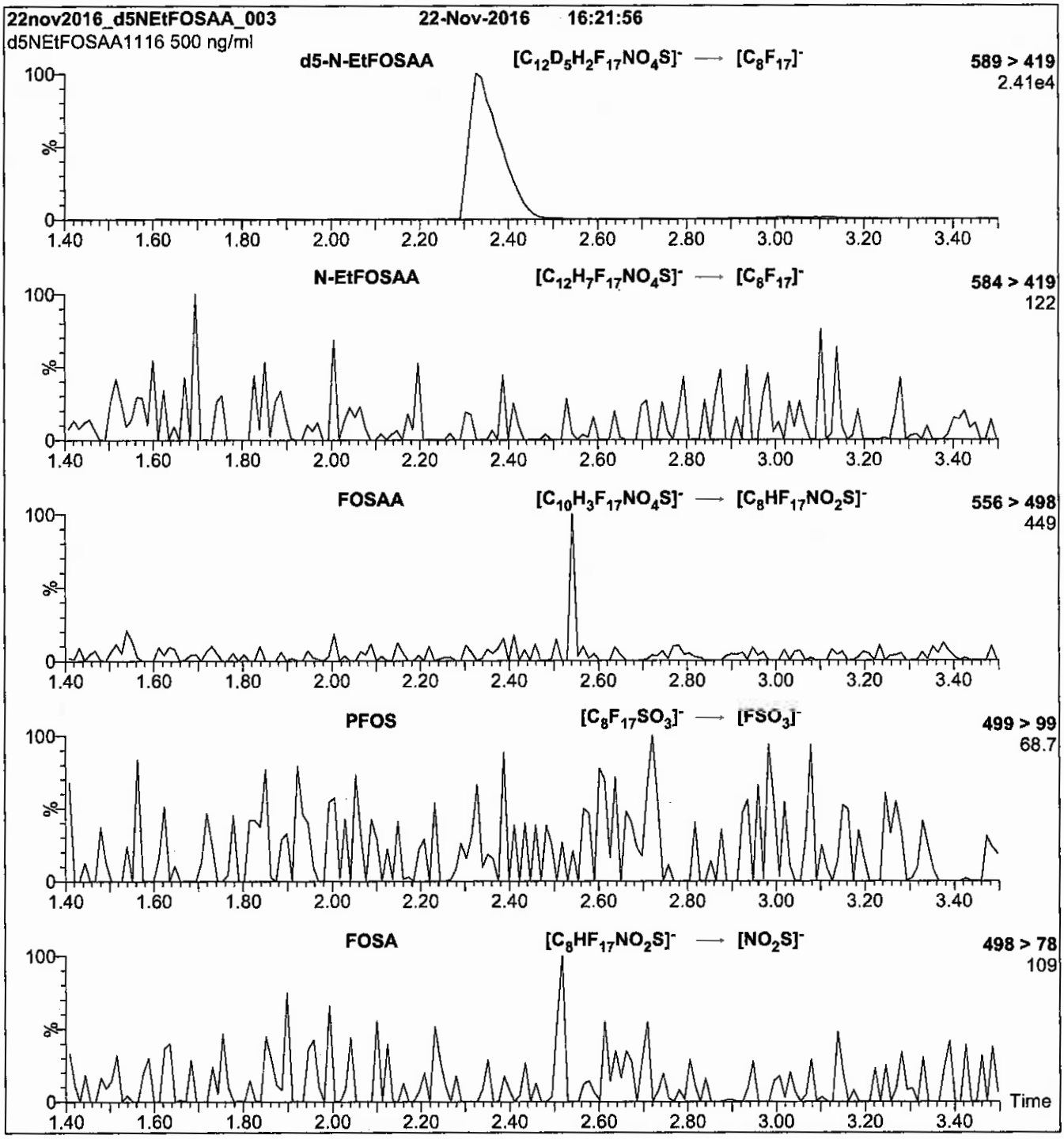
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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

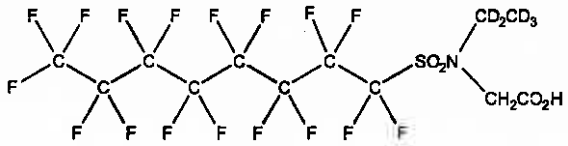
LCd5-NEtFOSAA_00005

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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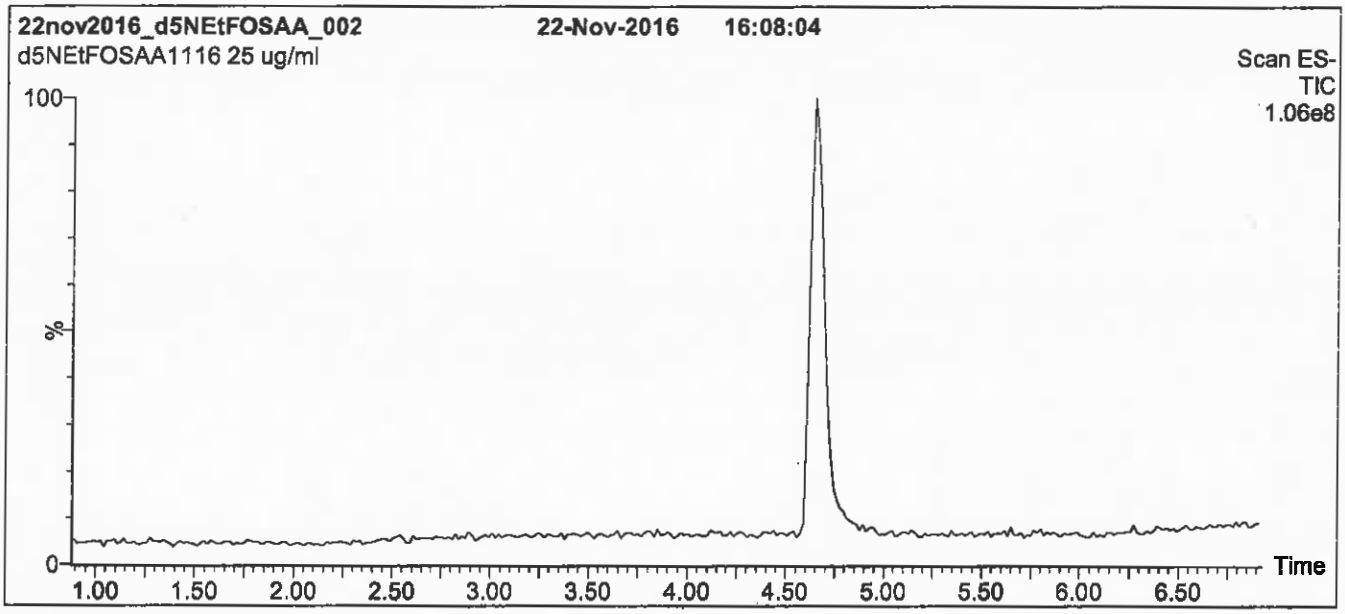

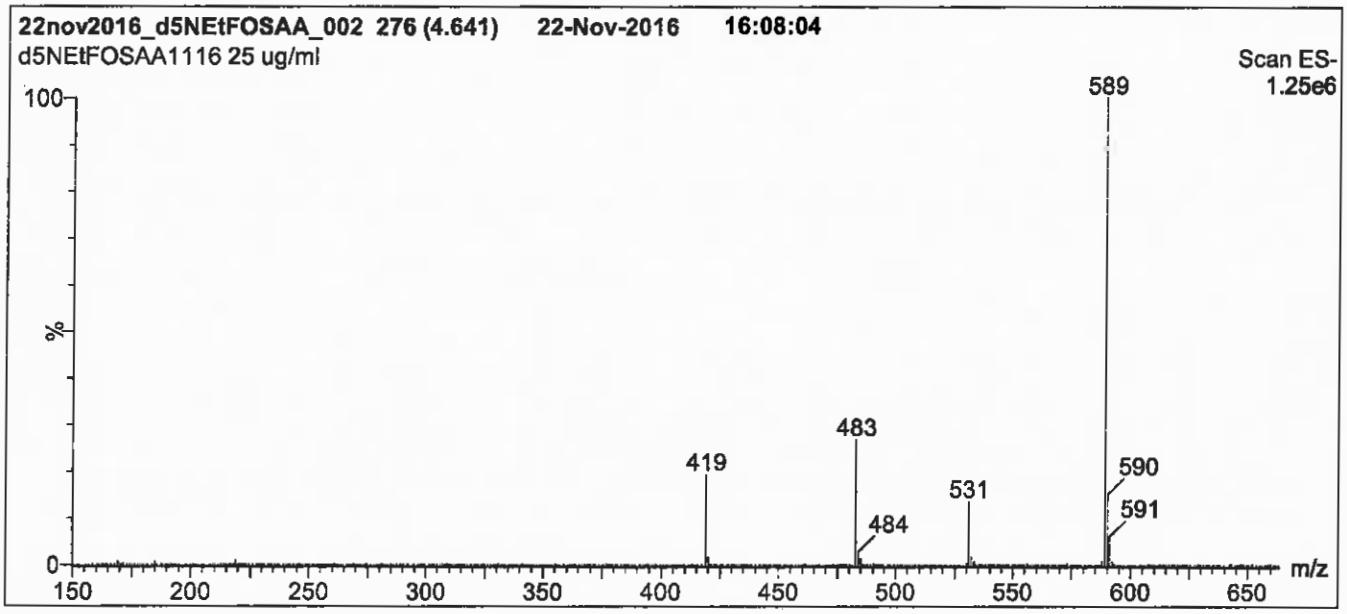

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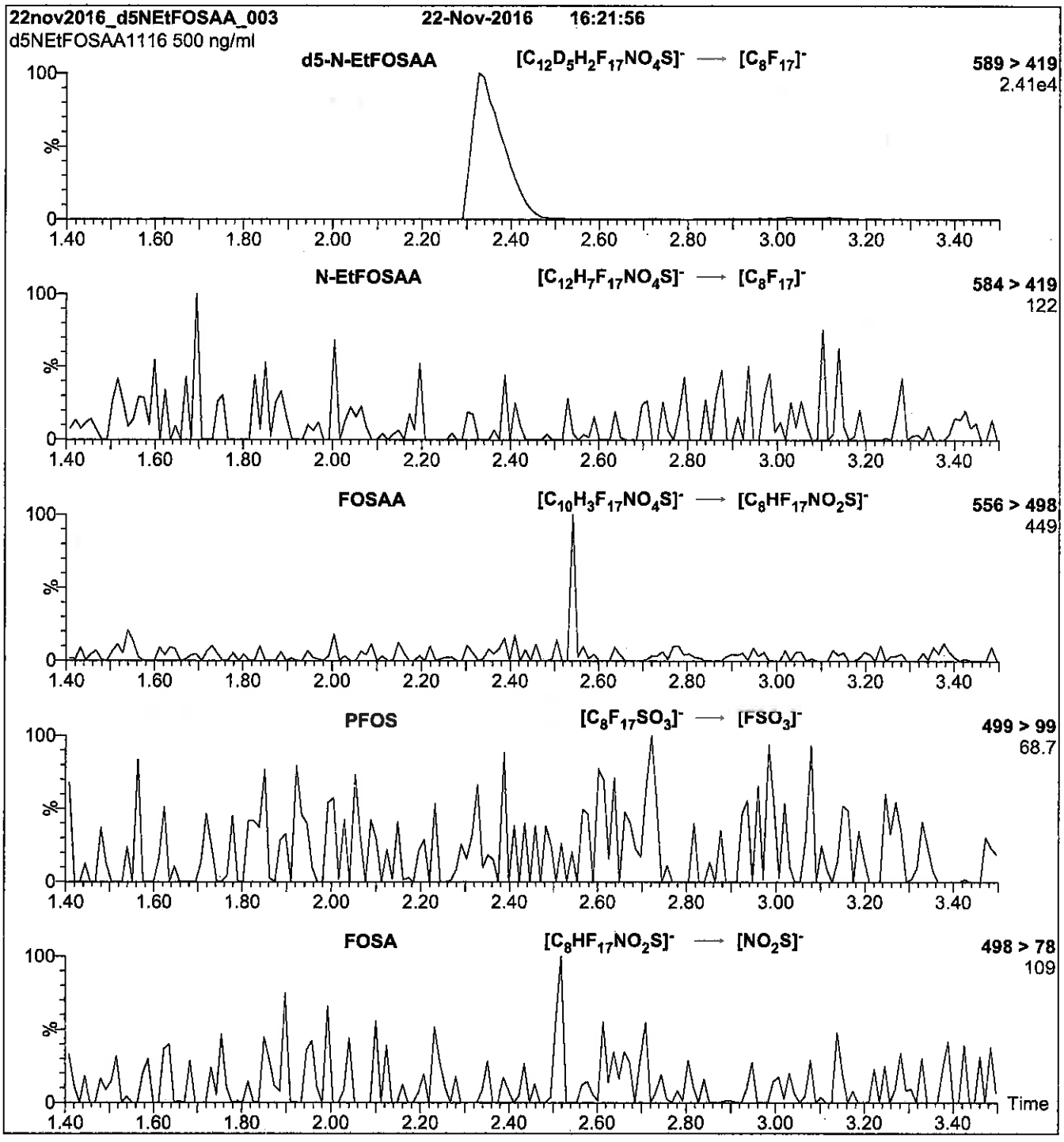


Conditions for Figure 2:

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

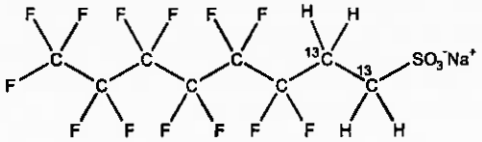
WELLINGTON LABORATORIES

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.

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

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

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

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

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

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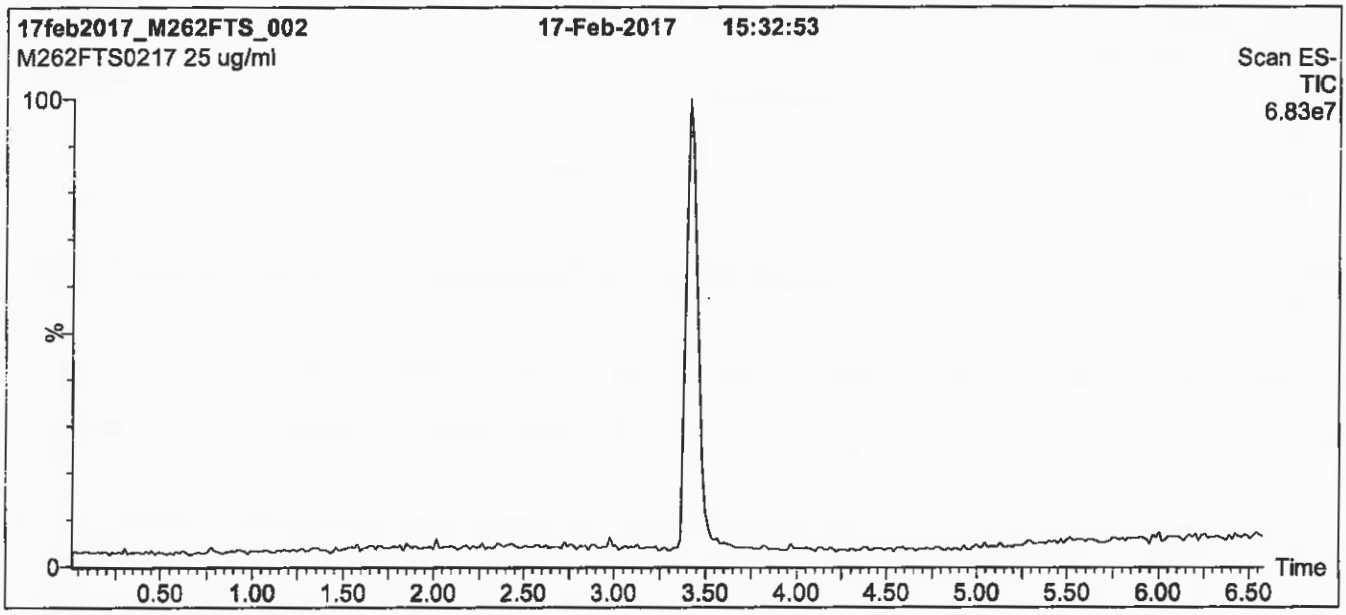
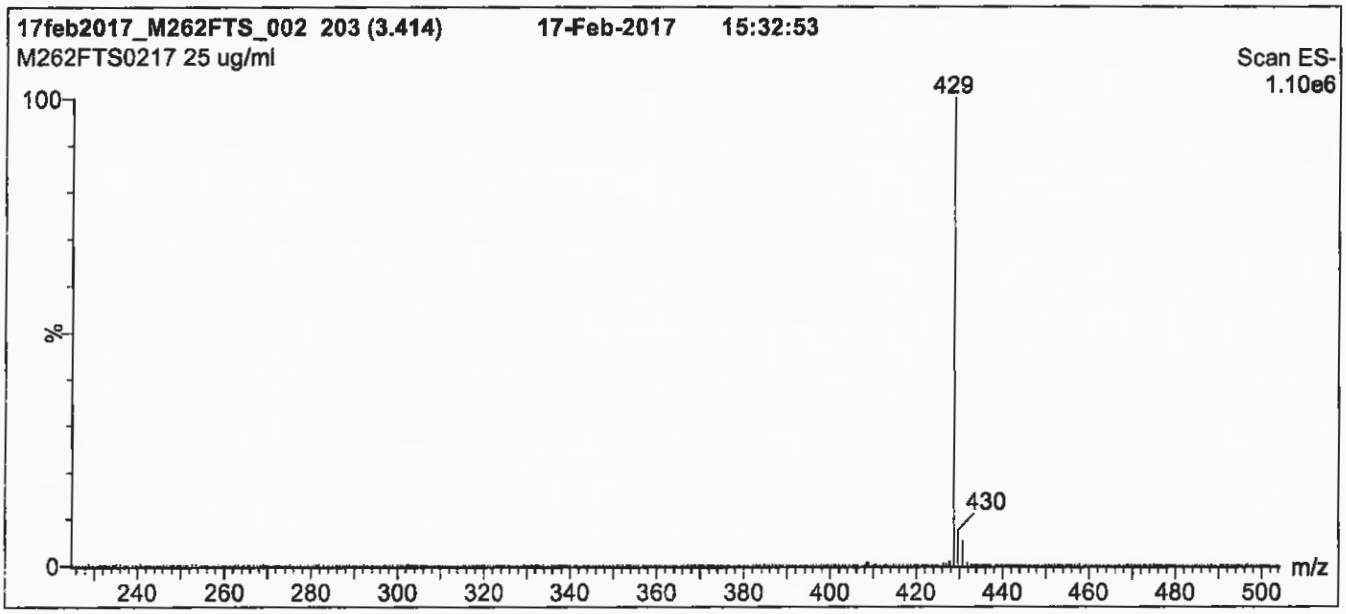
Figure 1: **M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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

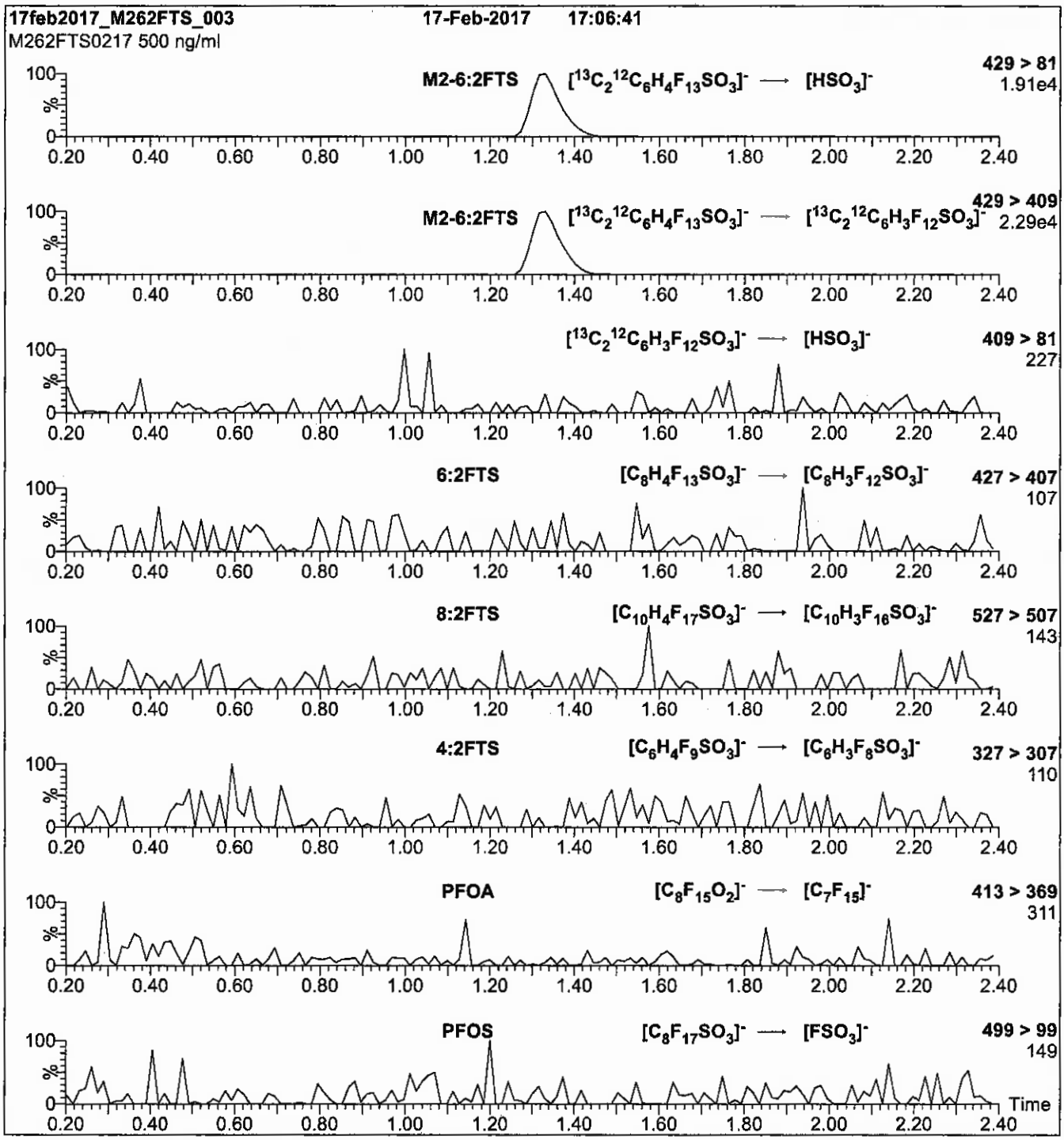
Flow: 300 µl/min

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

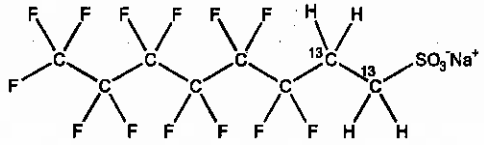
LCM2-6:FTS_00005

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) 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).

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

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519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

ANAB ACCREDITED

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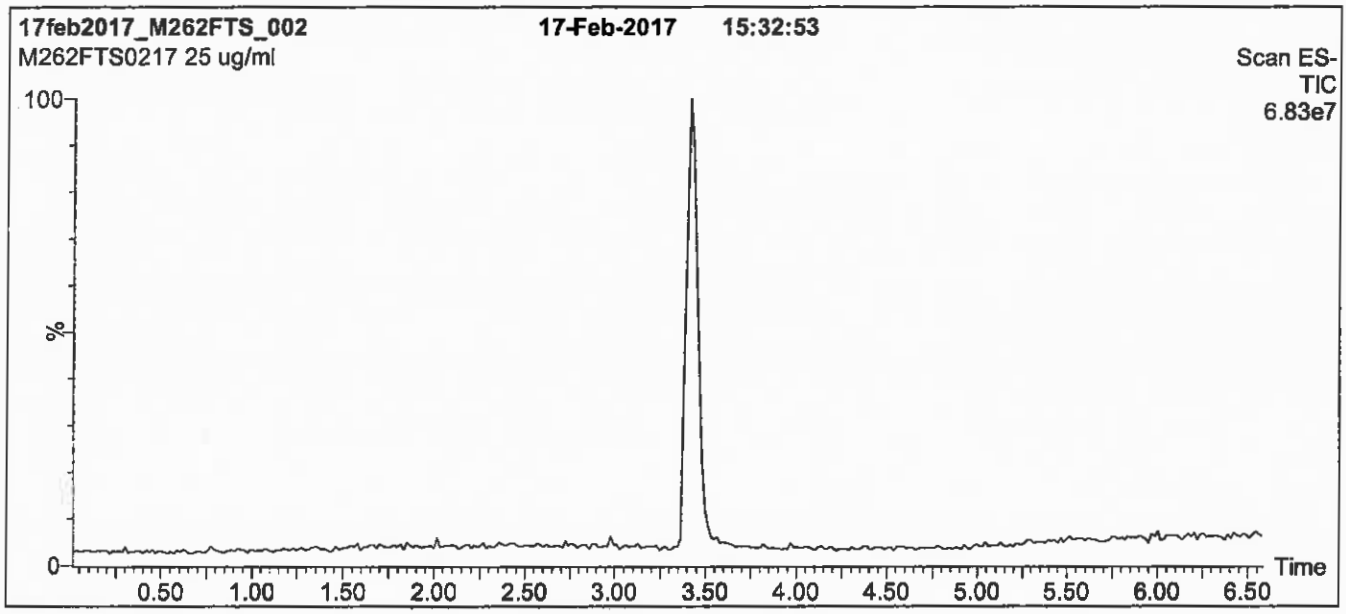
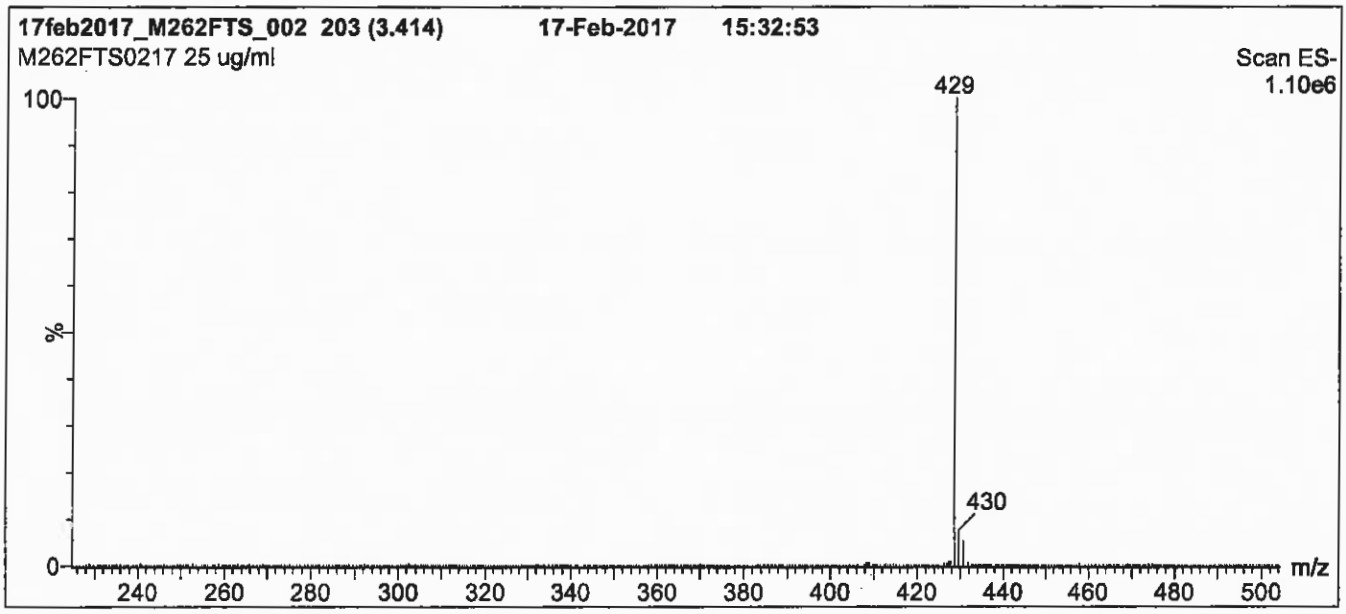
Figure 1: **M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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

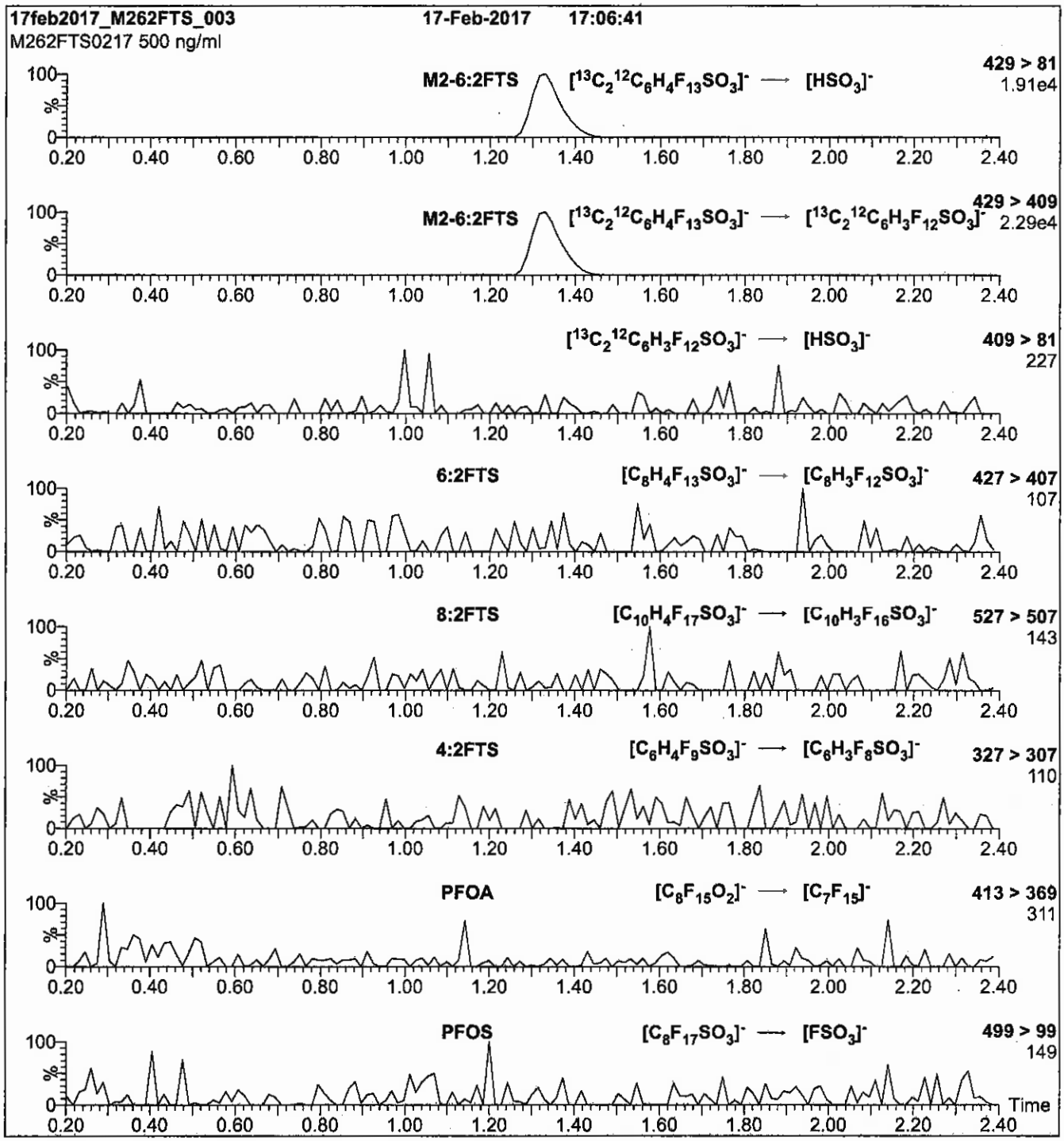
Flow: 300 µl/min

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

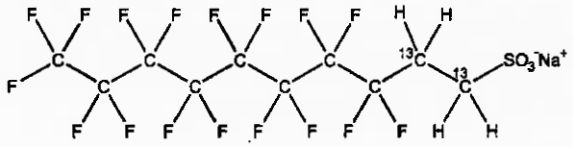
LCM2-8:2FTS_00004

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) 47.9 ± 2.4 µg/ml (M2-8:2FTS anion)	**SOLVENT(S):**	Methanol
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: _____ **Date:** 09/02/2016 (mm/dd/yyyy)
B.G. Chittim

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

ANAB ACCREDITED

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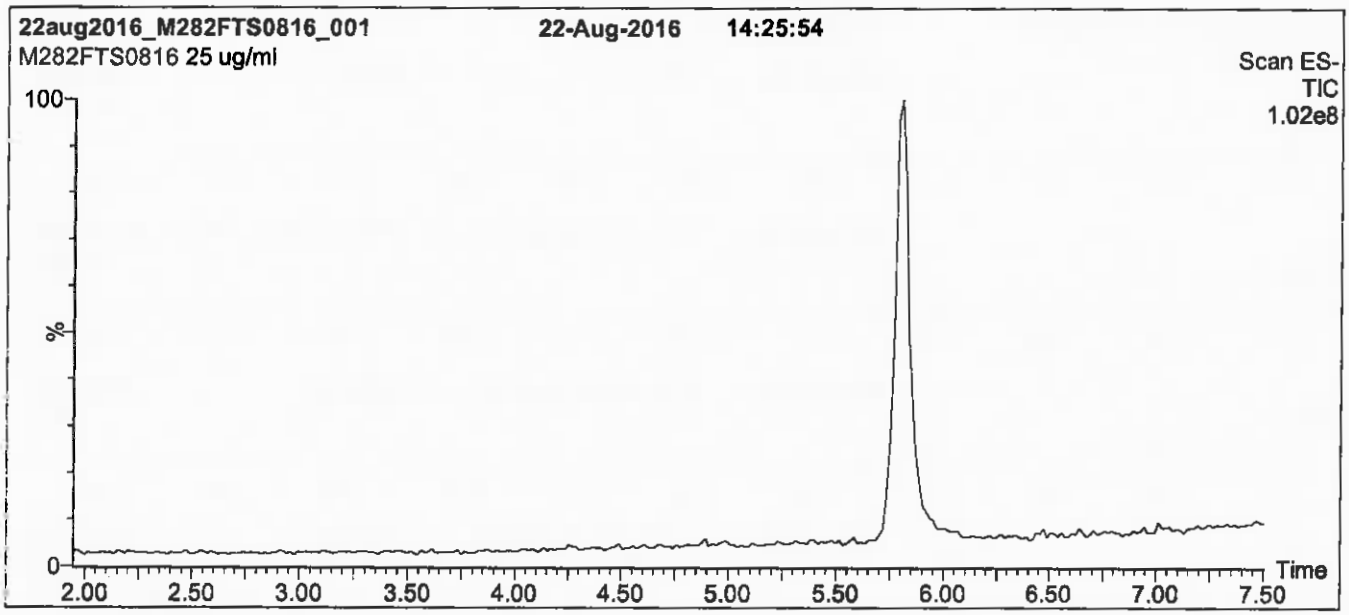
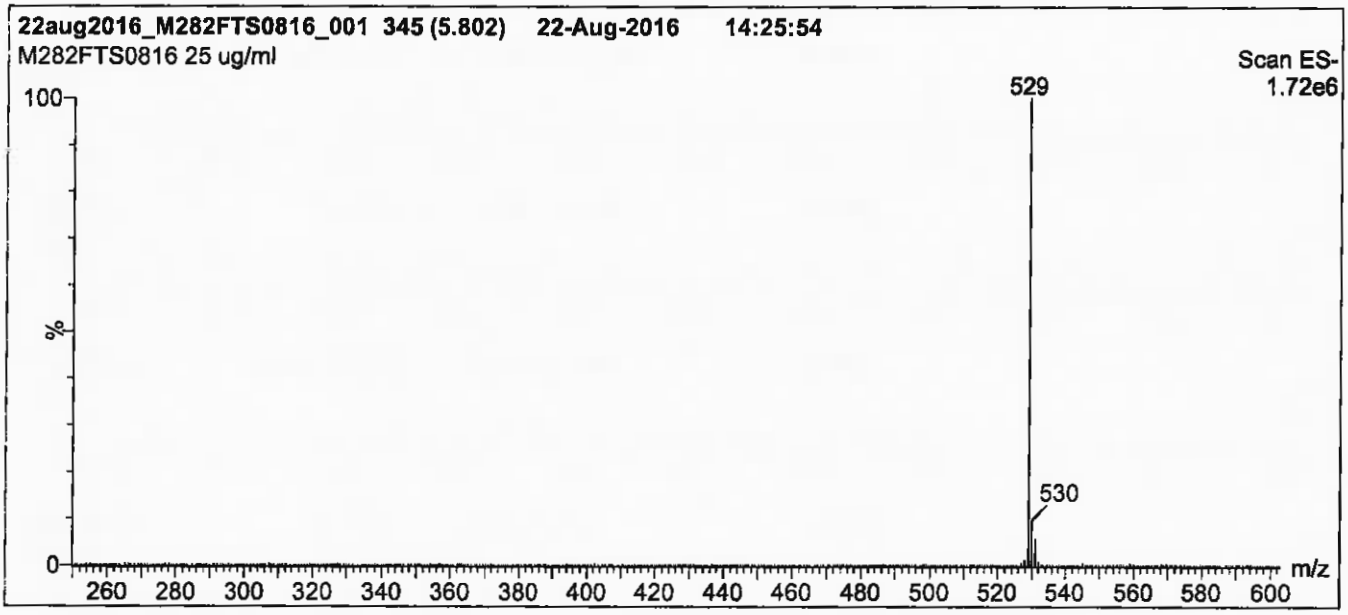
Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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

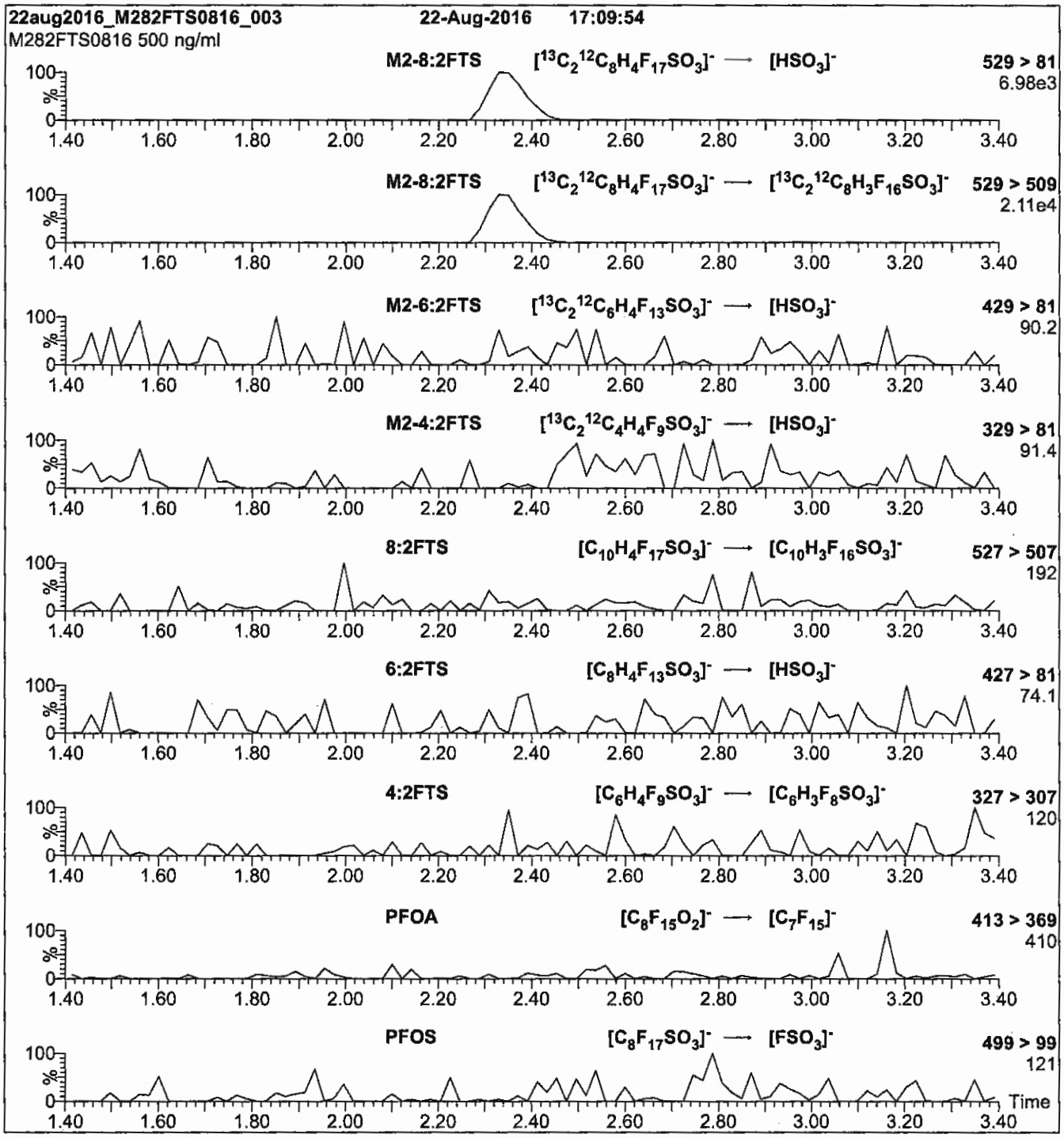
Flow: 300 µl/min

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

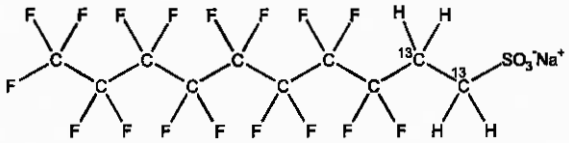
WELLINGTON LABORATORIES

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) 47.9 ± 2.4 µg/ml (M2-8:2FTS anion)	**SOLVENT(S):**	Methanol
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:

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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 $x_1, x_2, \ldots x_n$ 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:

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QUALITY MANAGEMENT:

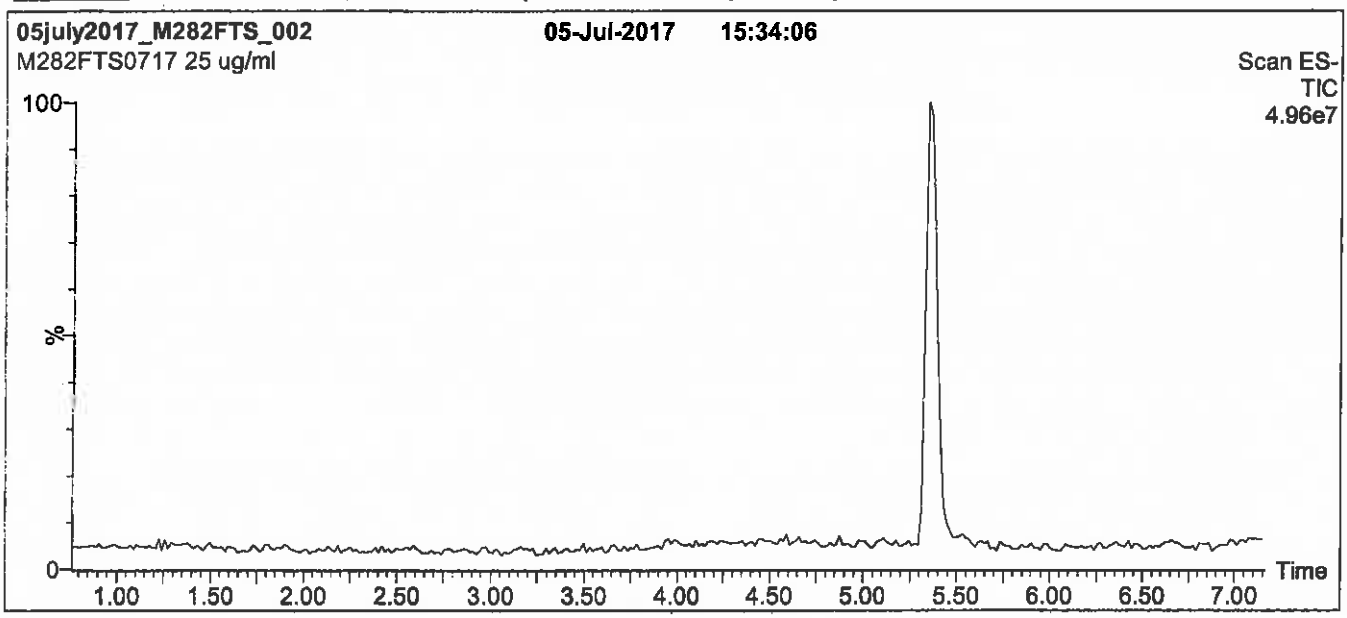
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

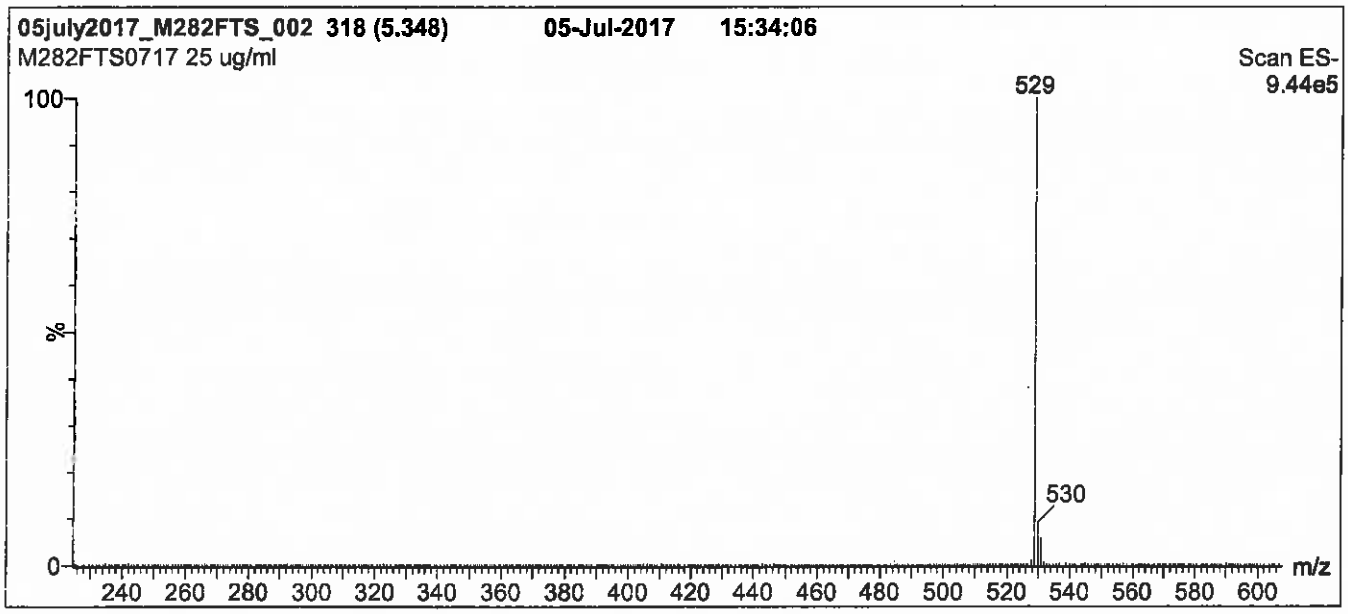
CALA

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: **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

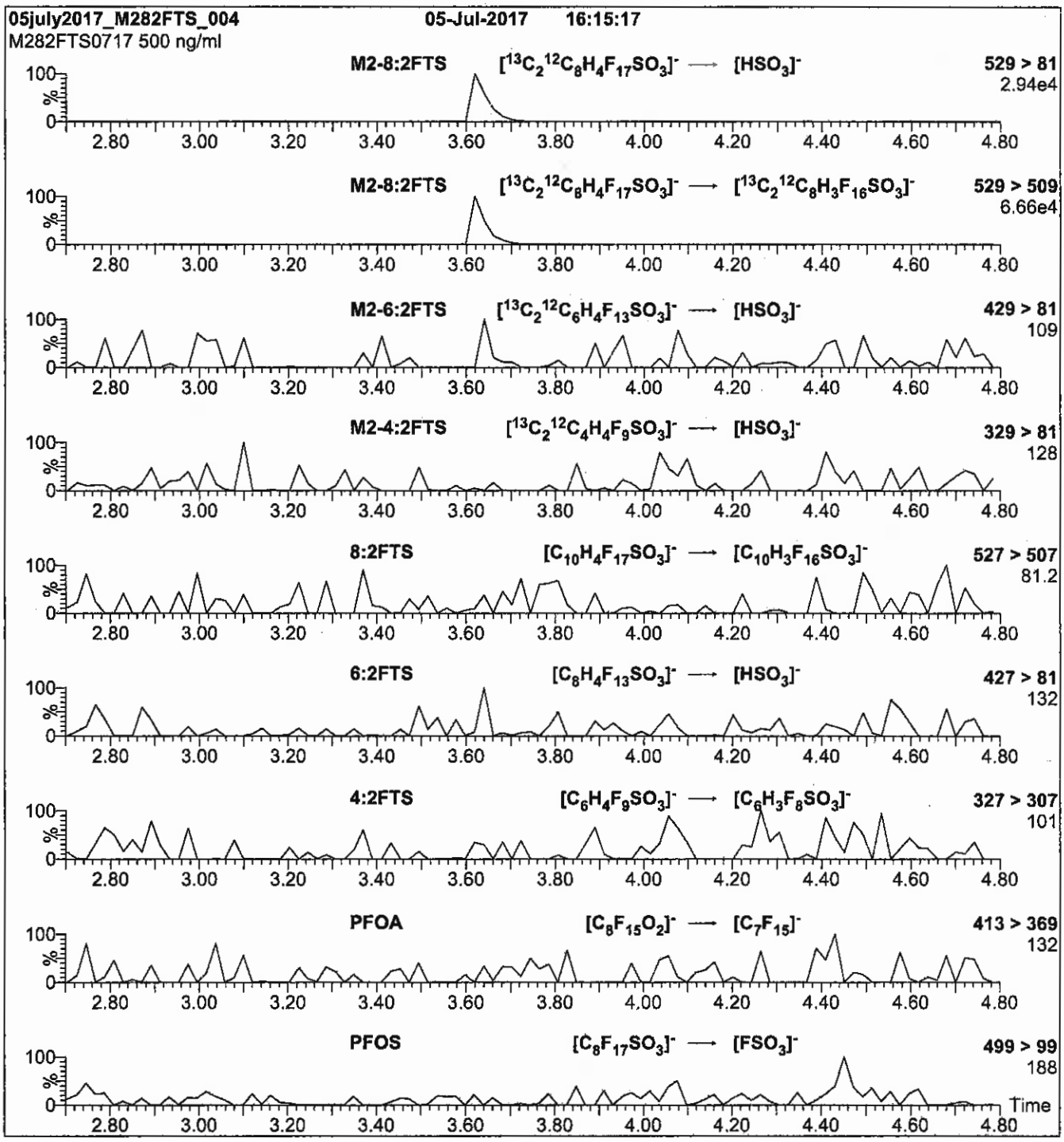
Flow: 300 µl/min

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

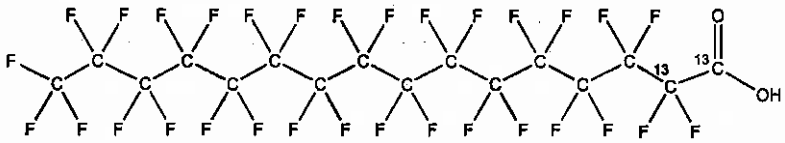
LCM2PFHxDA_00010

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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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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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:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED

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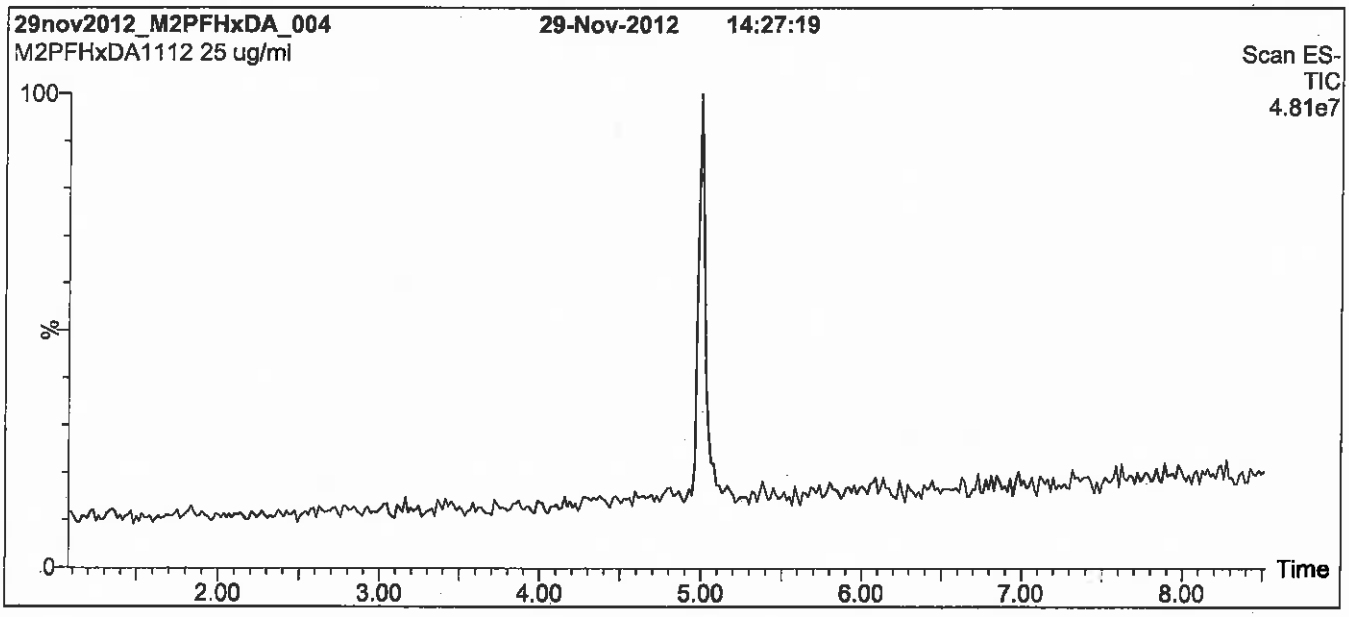
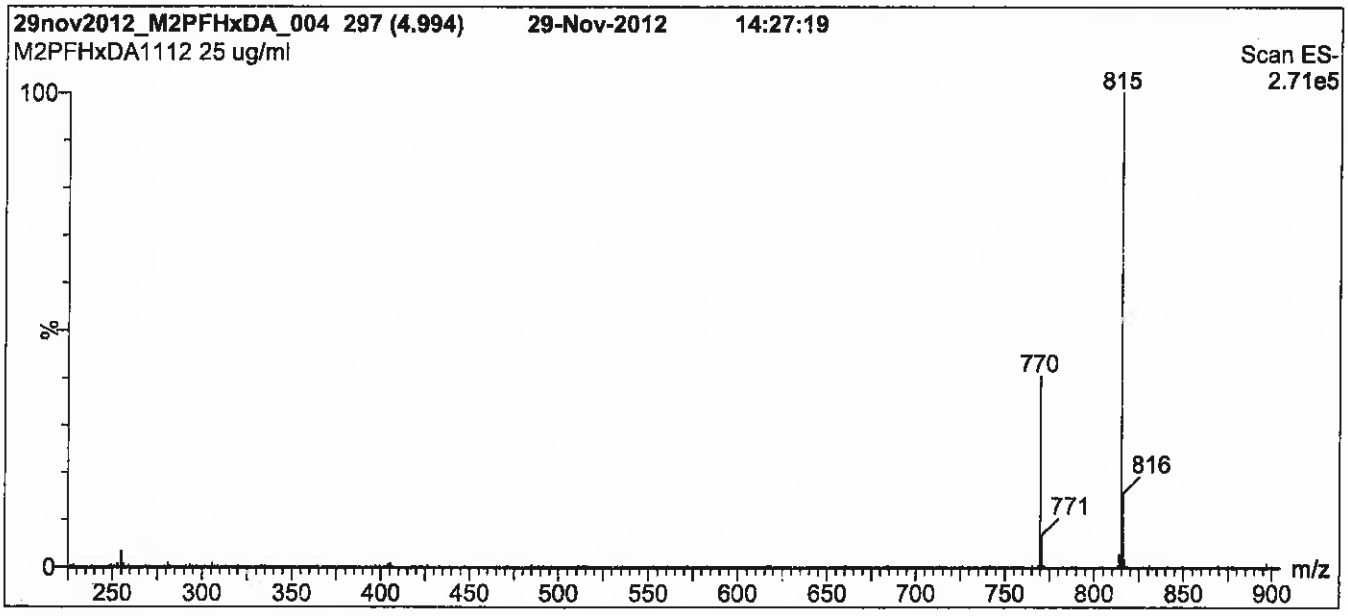
Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





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

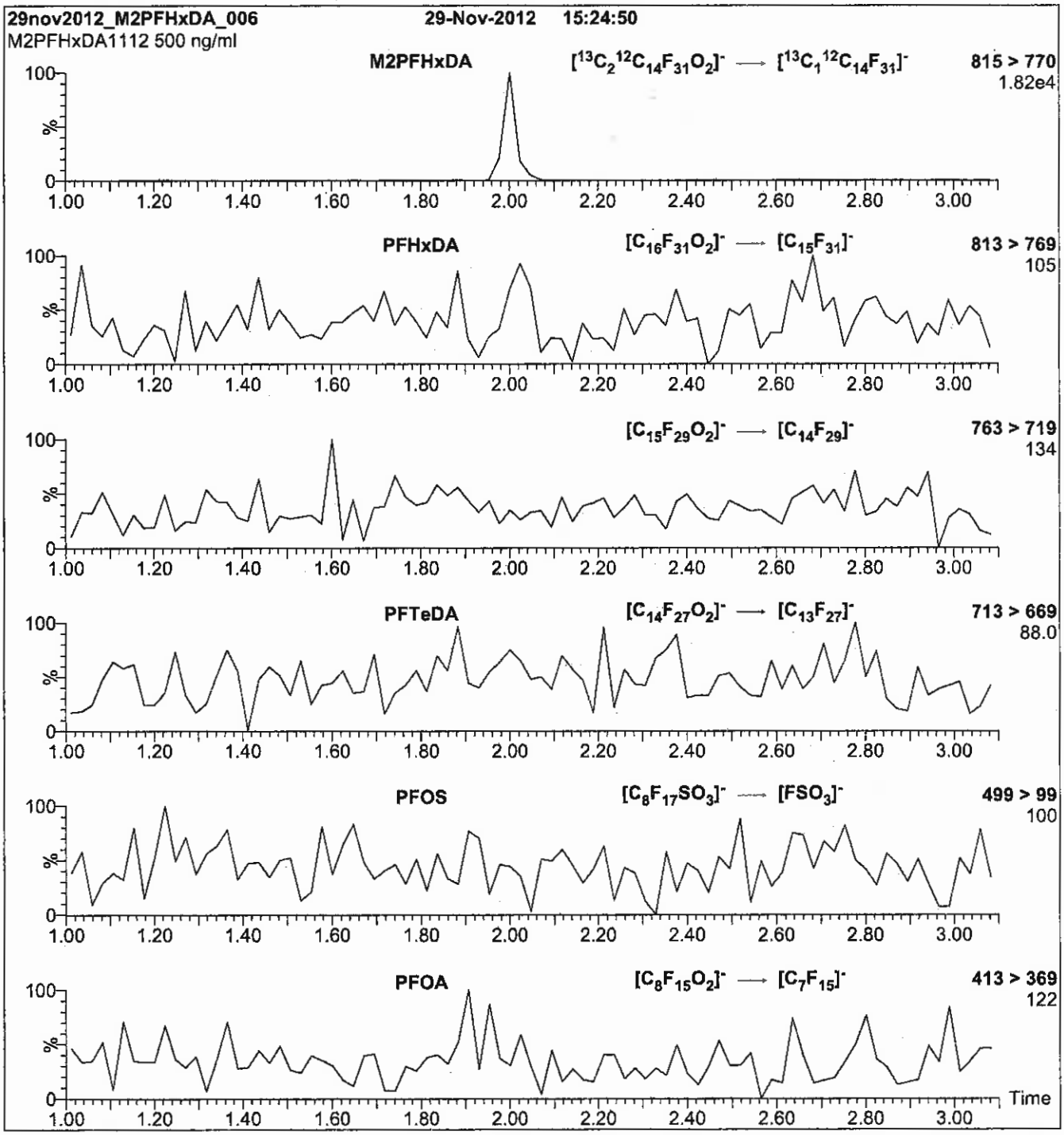
Flow: 300 µl/min

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

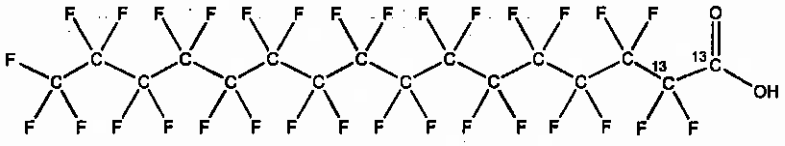
PRODUCT CODE: M2PFHxDA

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.

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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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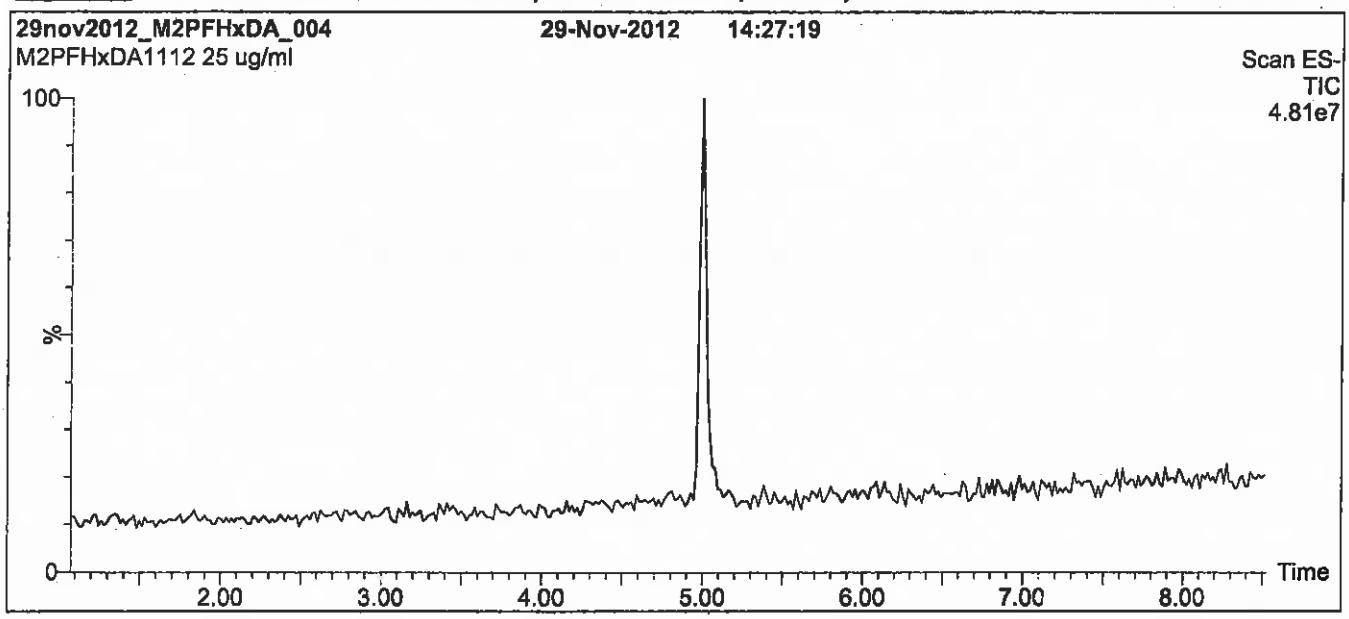
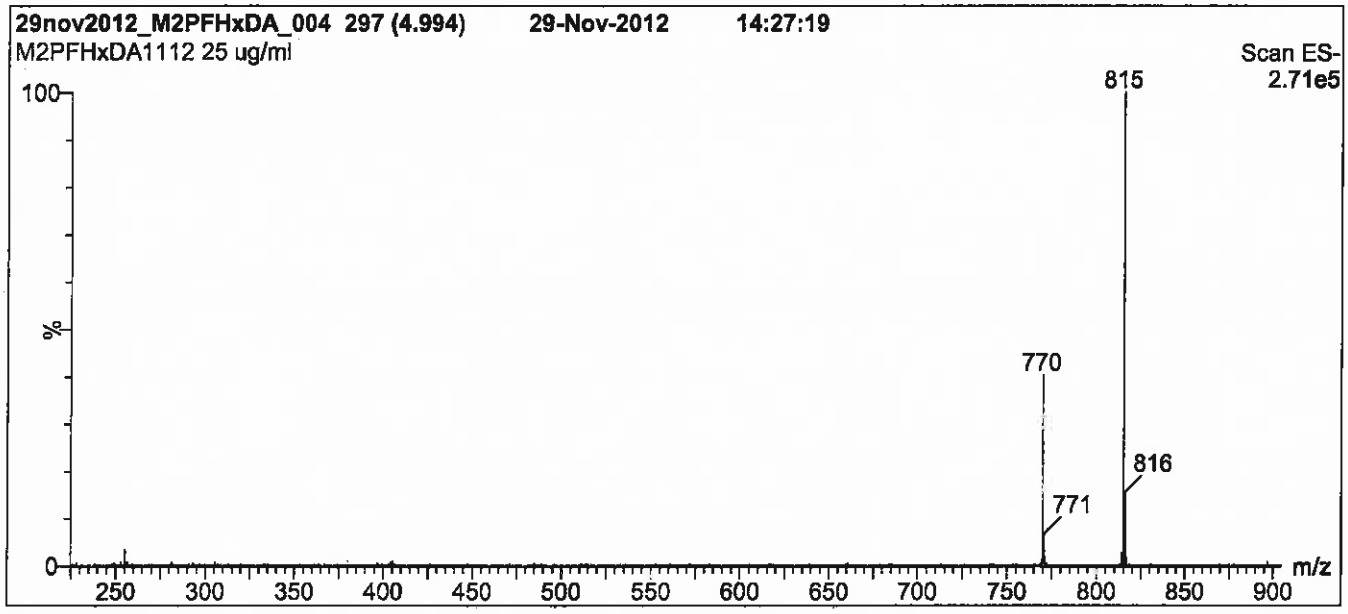




Conditions for Figure 1:

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

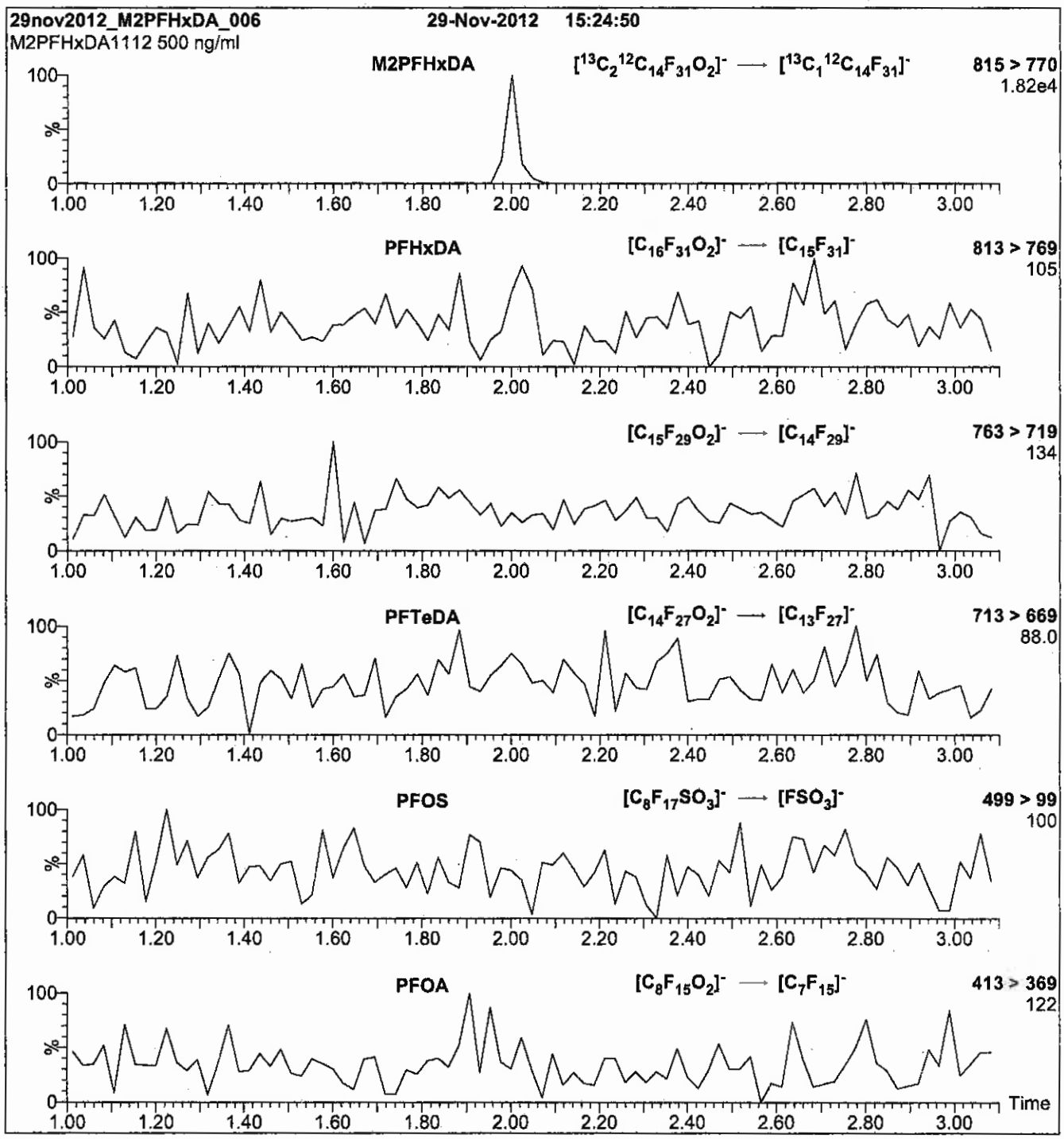
Flow: 300 µl/min

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_00012

n: 8/30/17 & 05

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

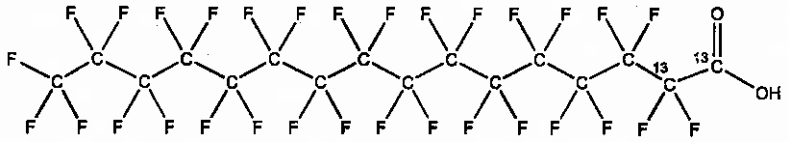
PRODUCT CODE: M2PFHxDA

LOT NUMBER: M2PFHxDA0717

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) 07/13/2017

EXPIRY DATE: (mm/dd/yyyy) 07/13/2022

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 ~ 0.3% of native perfluoro-n-hexadecanoic acid.

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Certified By: B.G. Chittim, General Manager

Date: 07/14/2017 (mm/dd/yyyy)

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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. 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:

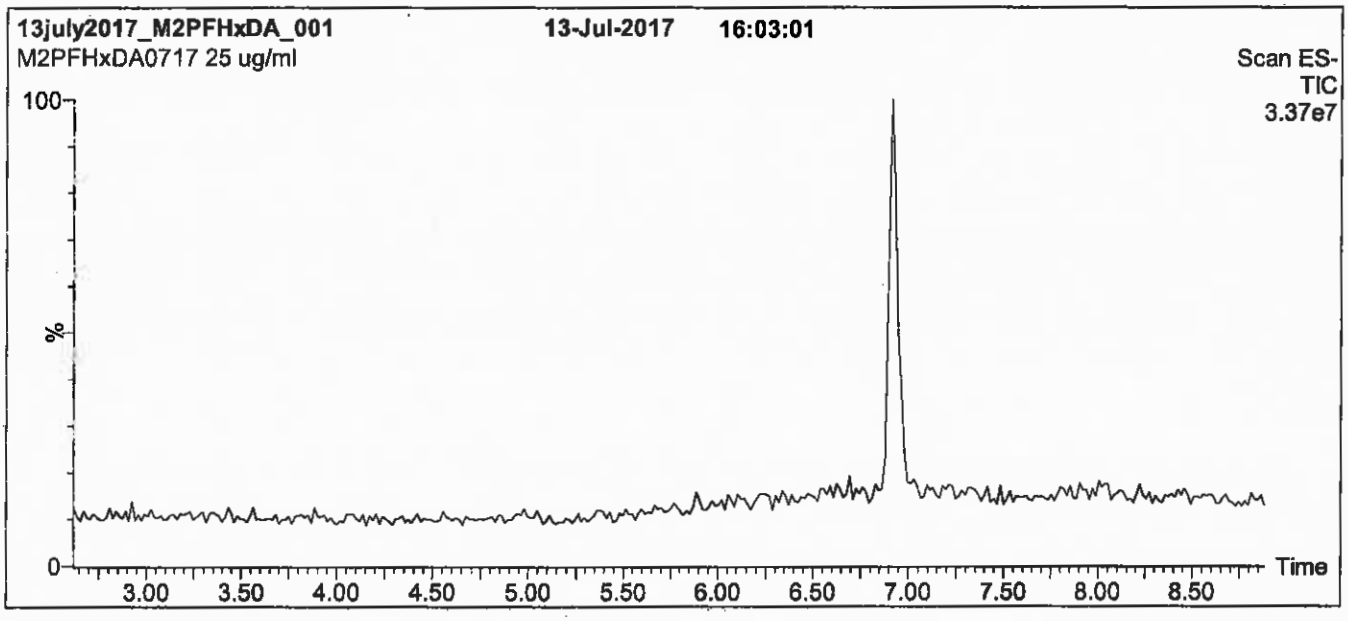
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

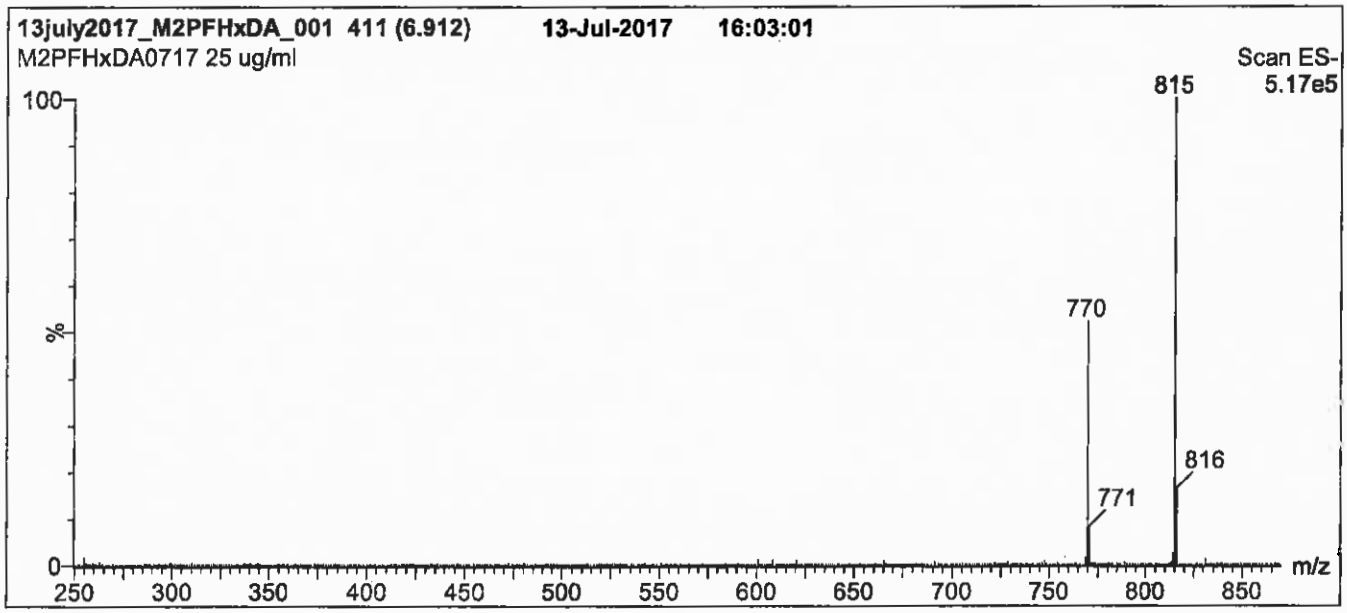
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

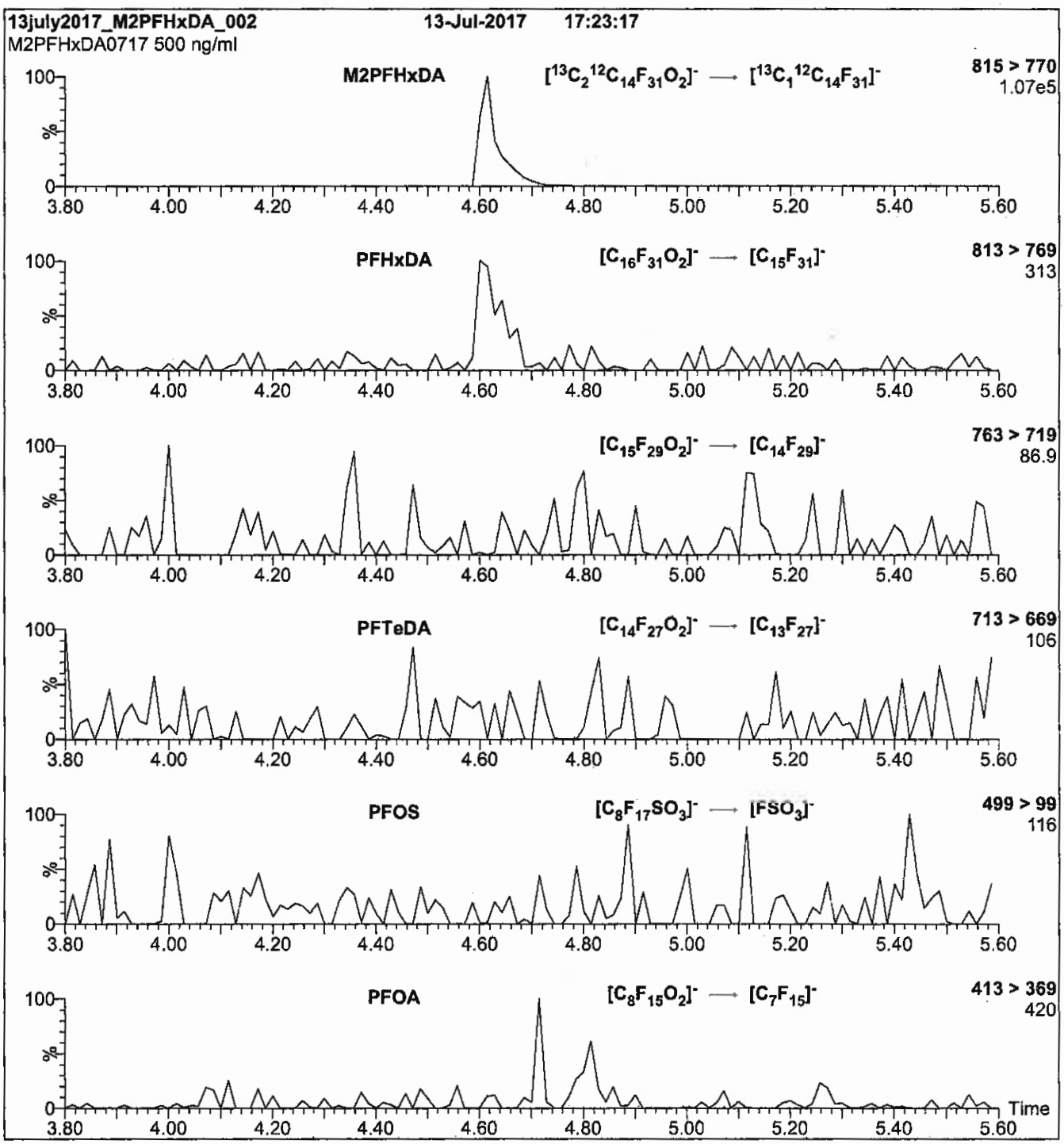
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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: **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) = 3.28e-3
Collision Energy (eV) = 15

Reagent

LCM2PFOA_00005

Rec'd. 2/10/15 SV

WELLINGTON LABORATORIES

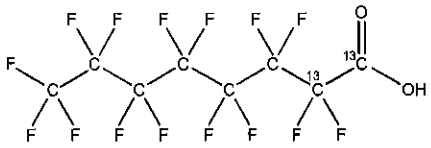
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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)

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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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

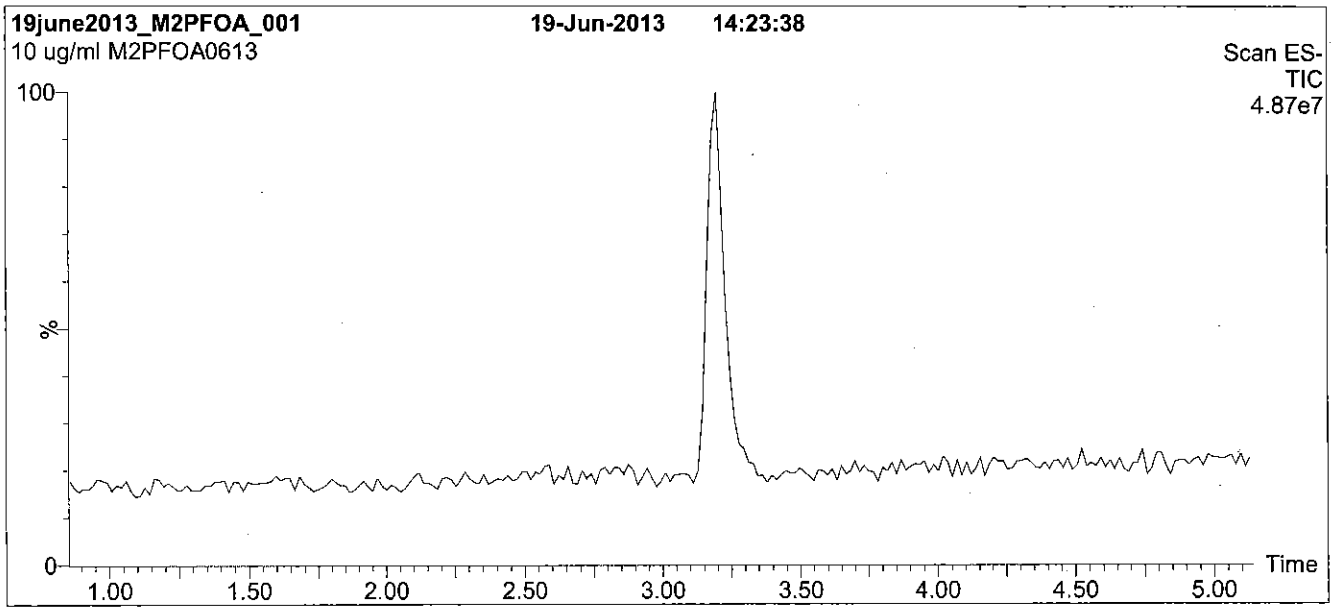
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

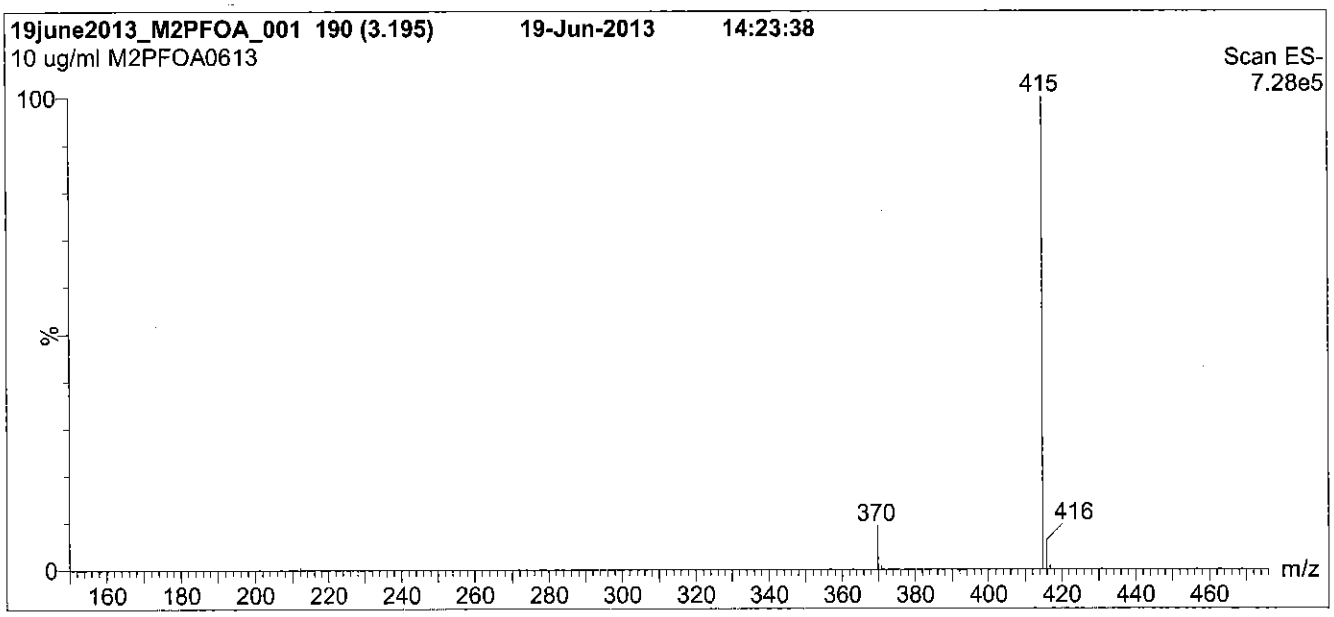
CALA Testing Accreditation No. A1226

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

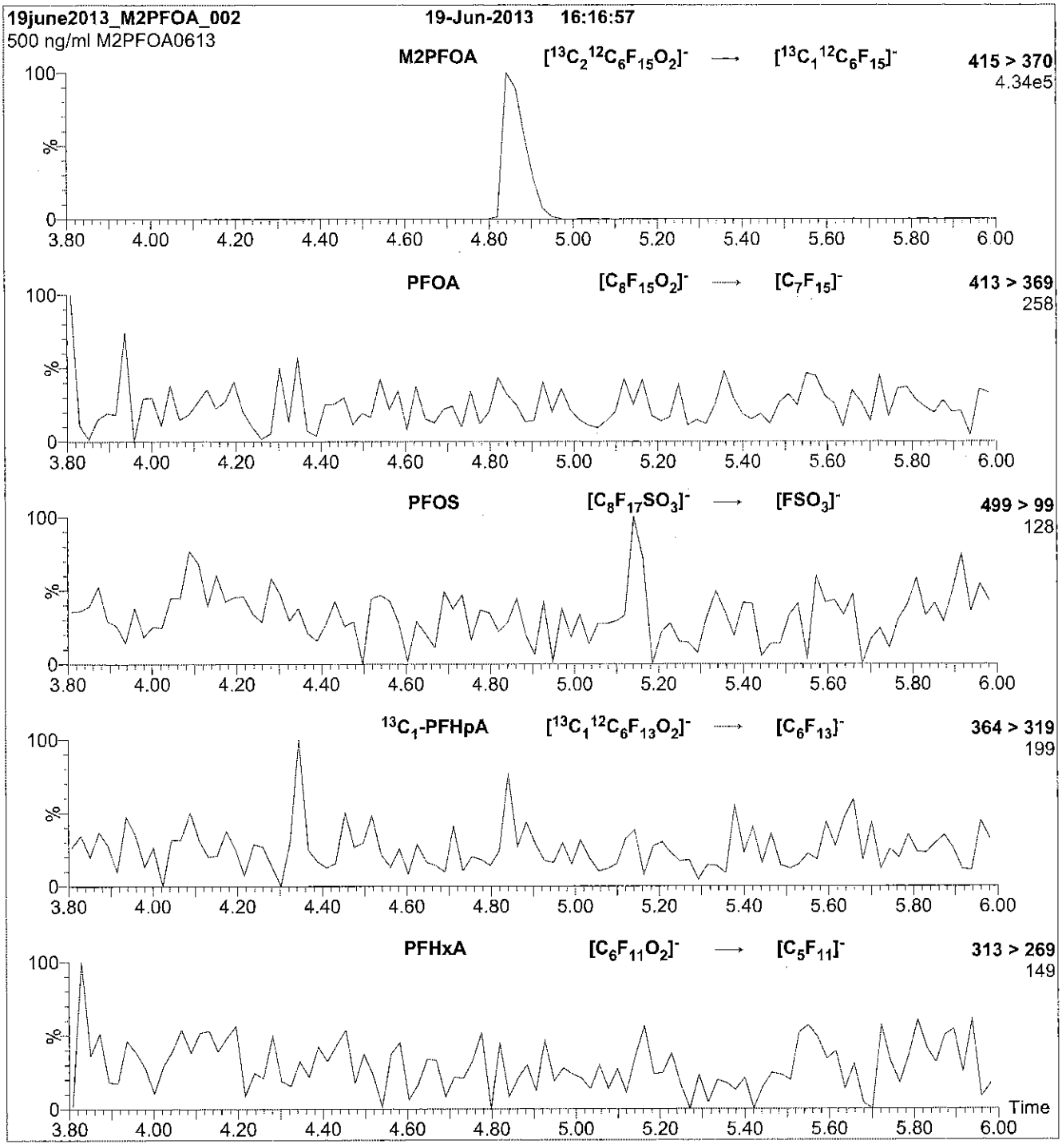
Flow: 300 µl/min

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

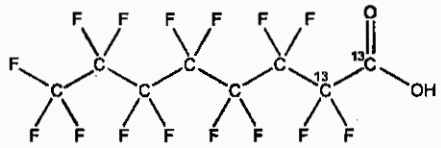
LCM2PFOA_00008

Y: 5/8/17 SM

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:	$^{13}C_2{}^{12}C_6HF_{16}O_2$	**MOLECULAR WEIGHT:**	416.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
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

INTENDED USE:

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CALA ANAB

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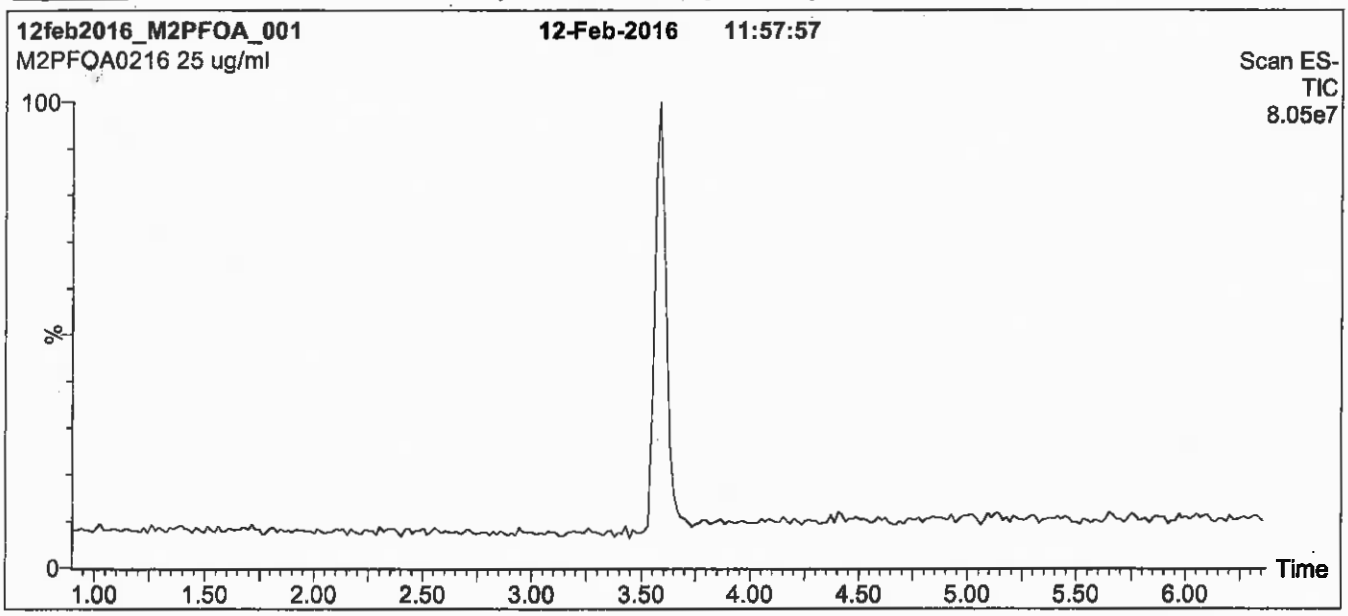
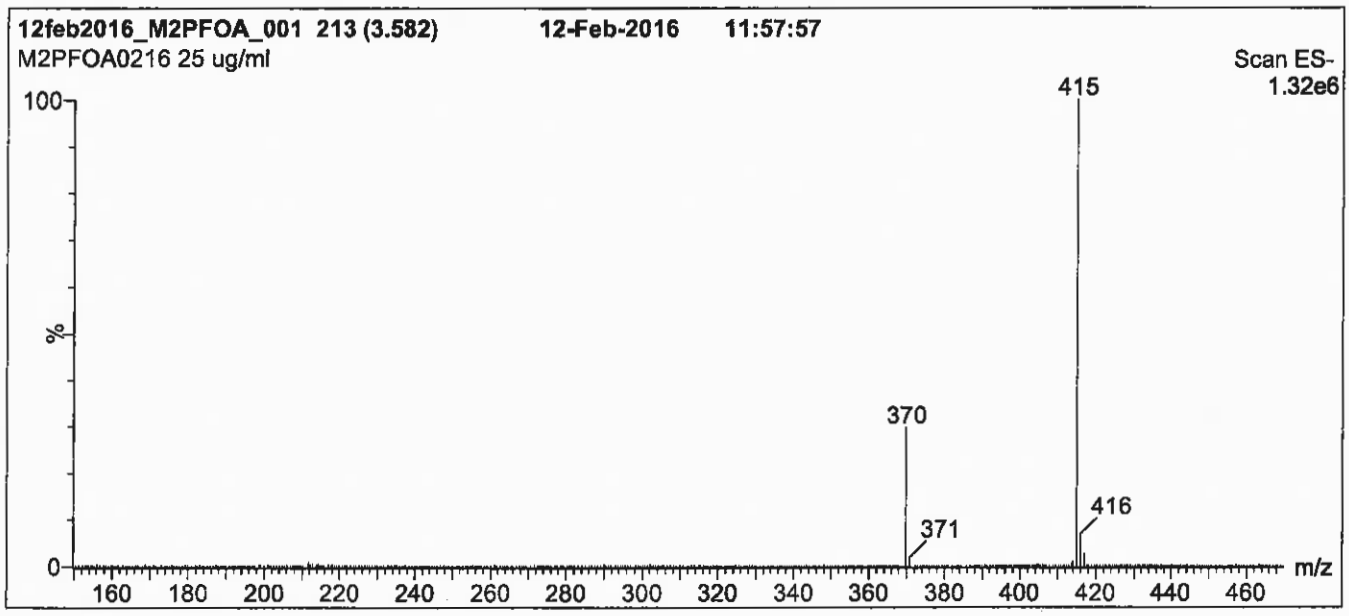




Conditions for Figure 1:

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

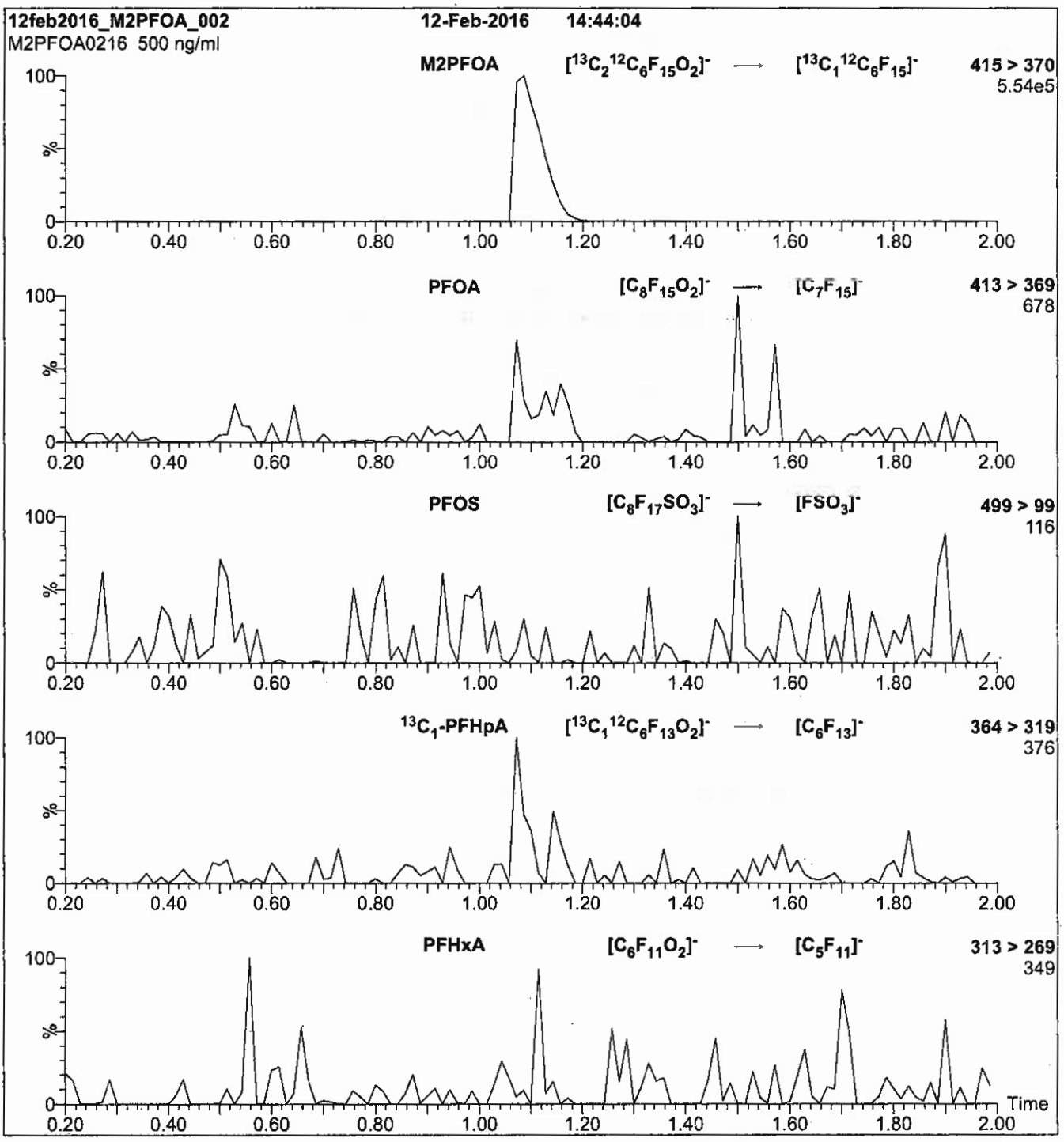
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
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% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

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

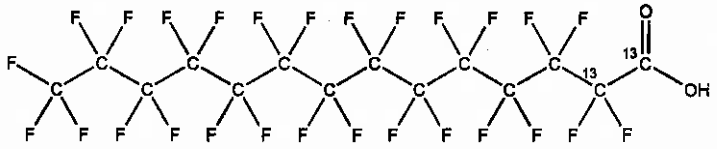
Reagent

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		

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

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CALA

ANAB ACCREDITED

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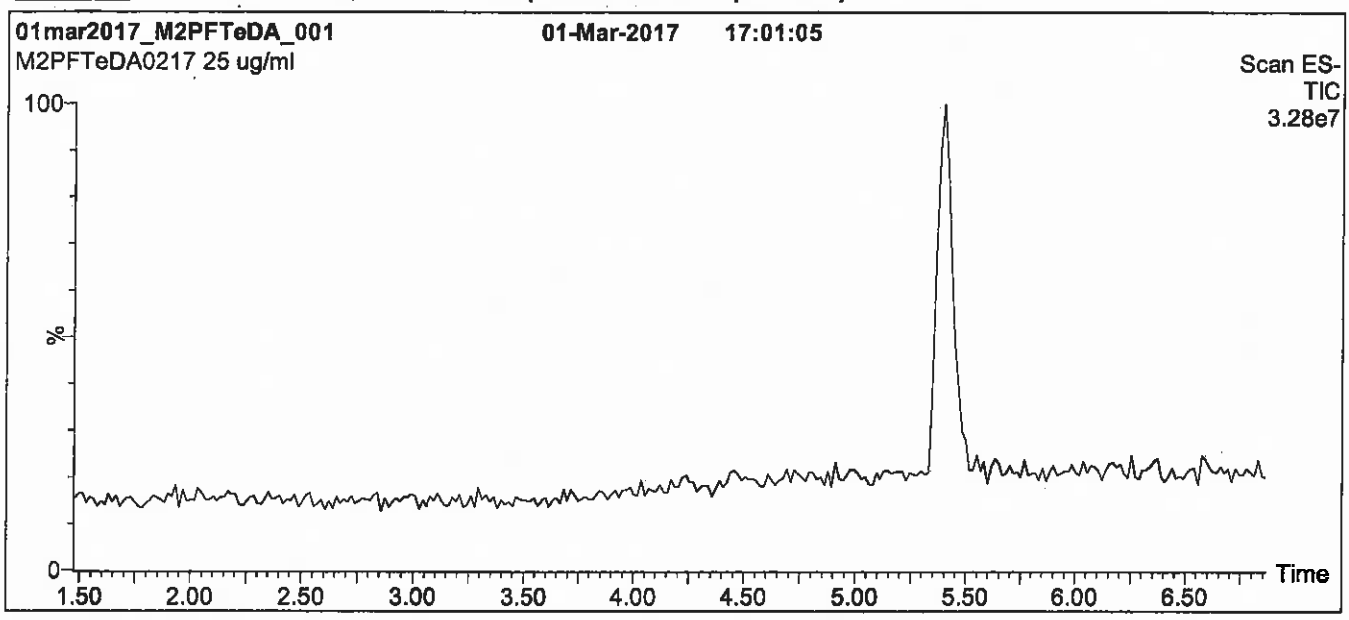
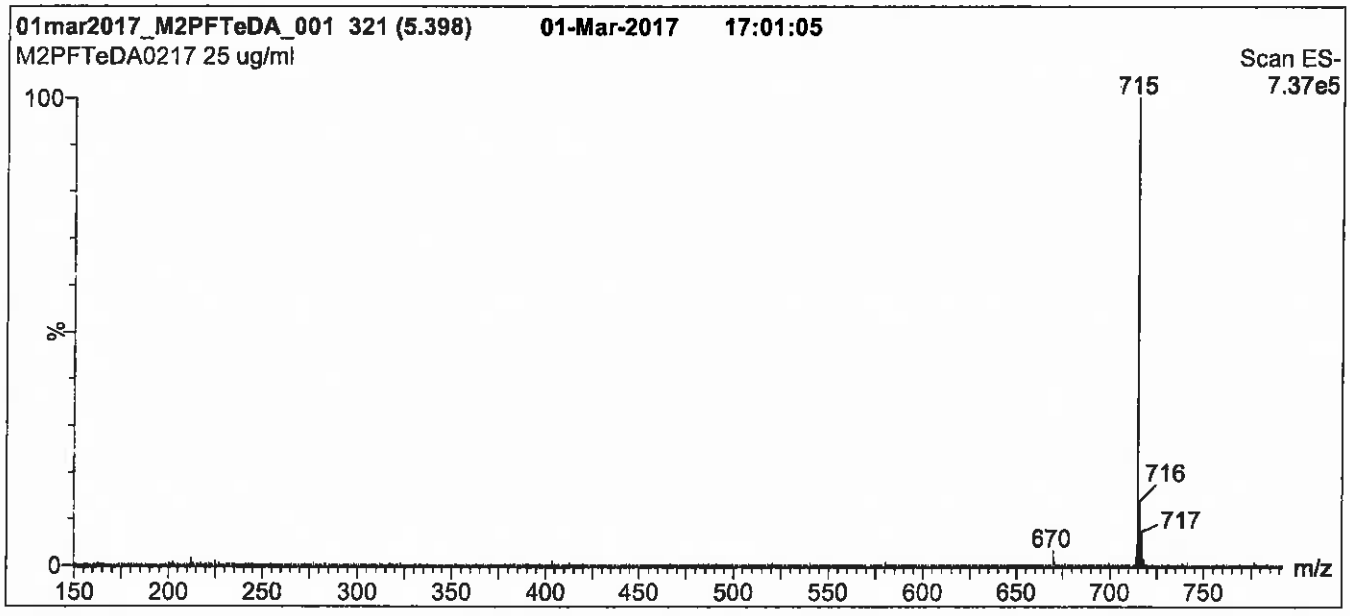
Figure 1: **M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





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

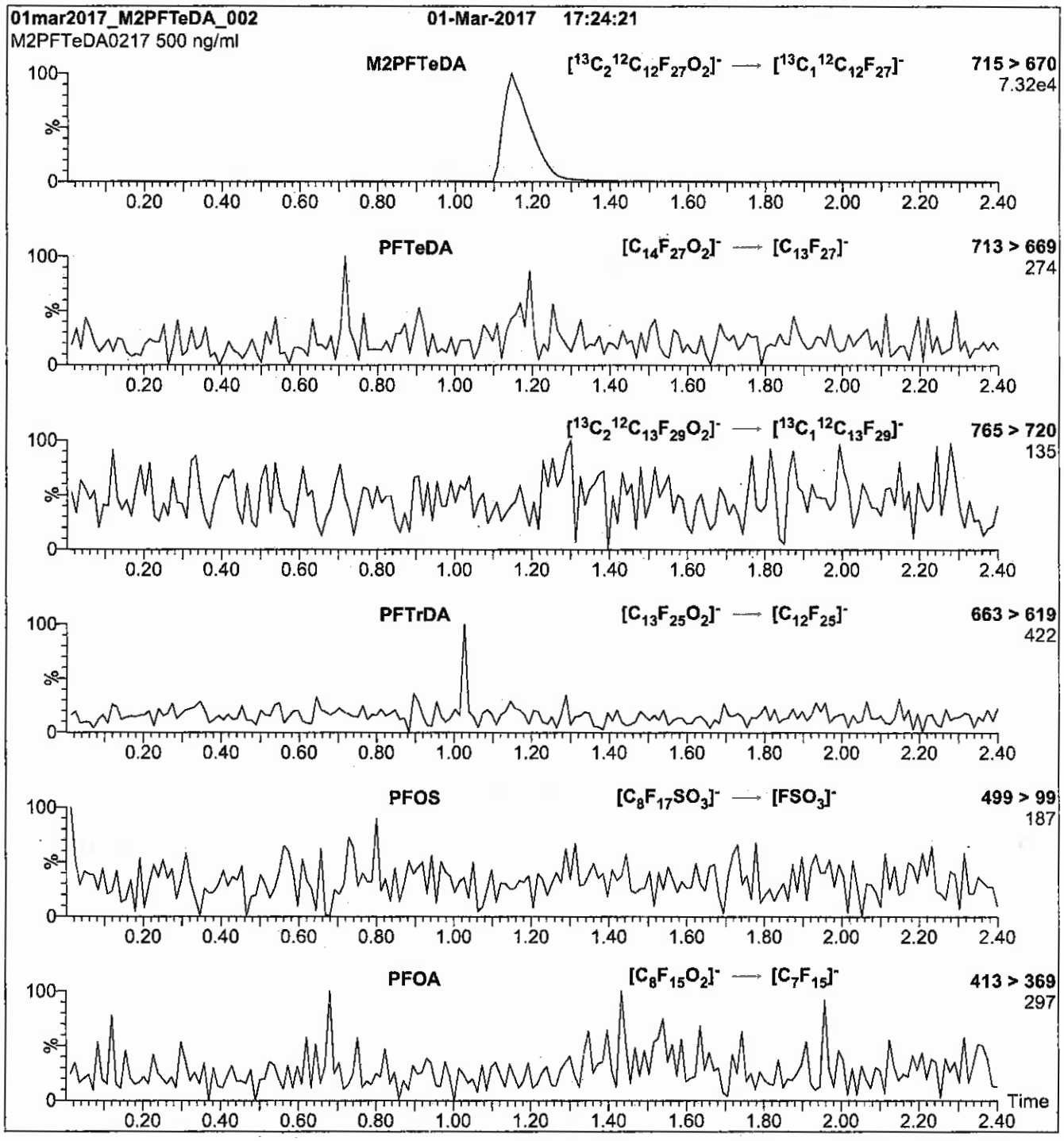
Flow: 300 µl/min

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

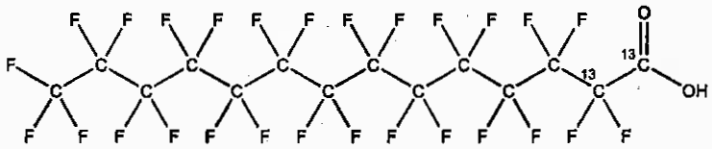
LCM2PFTeDA_00010

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



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.

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

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

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CALA

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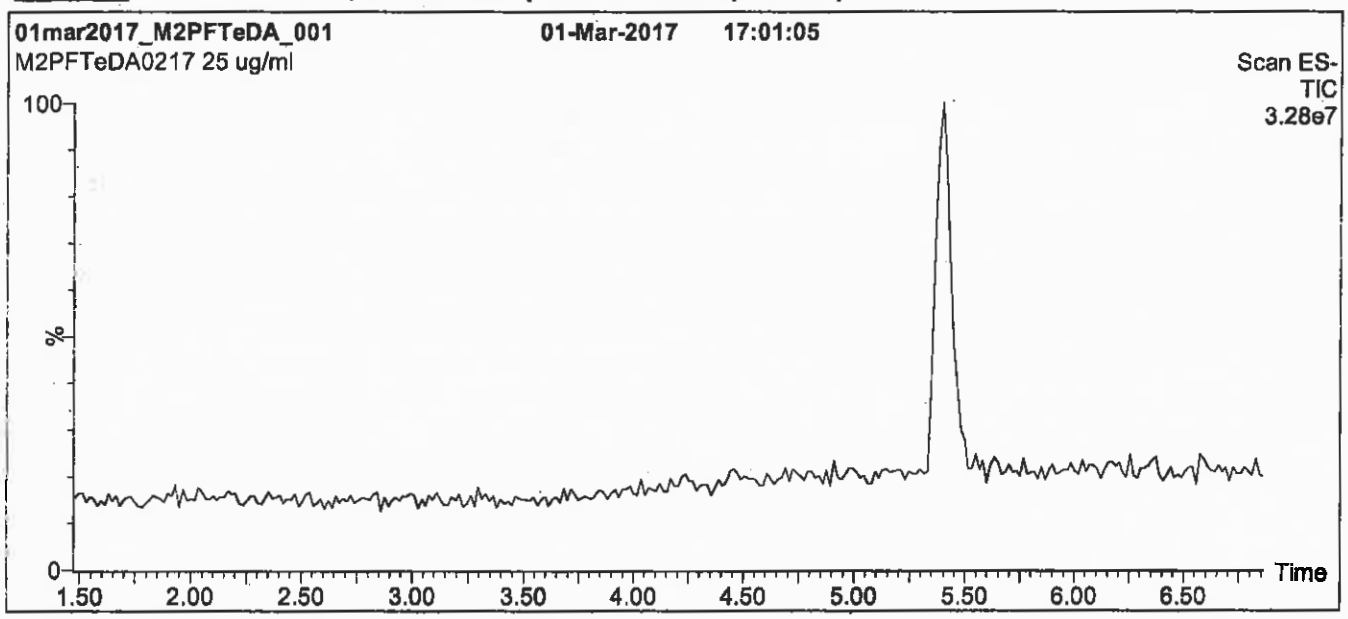

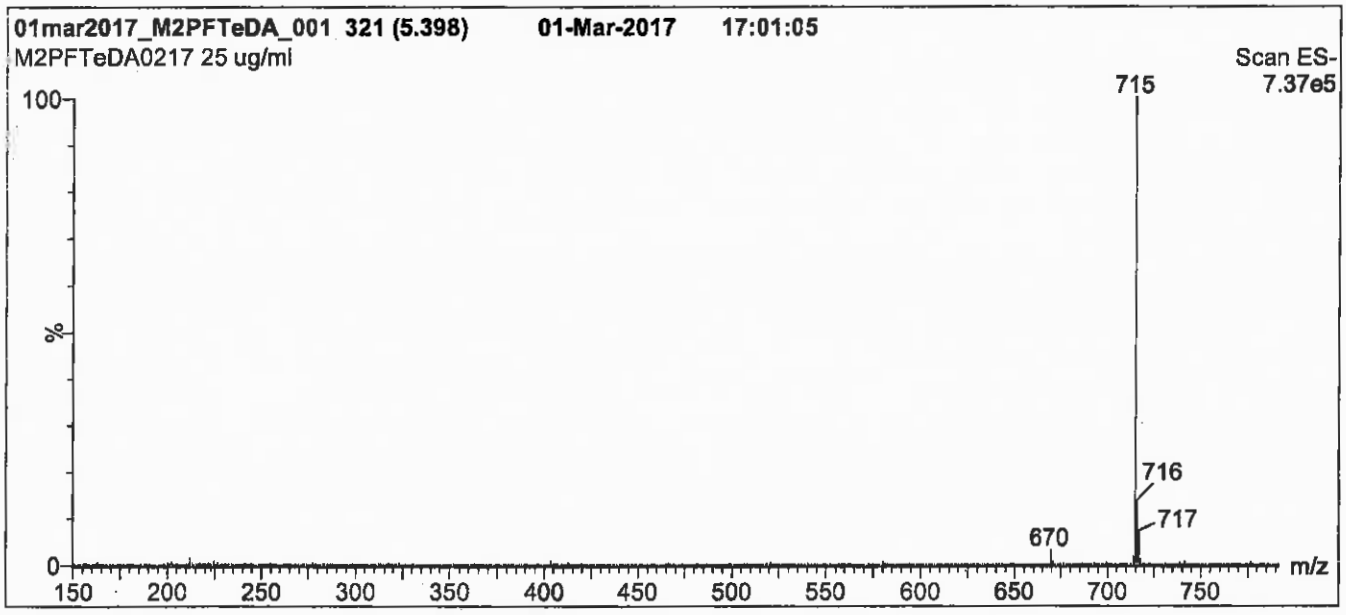

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Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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
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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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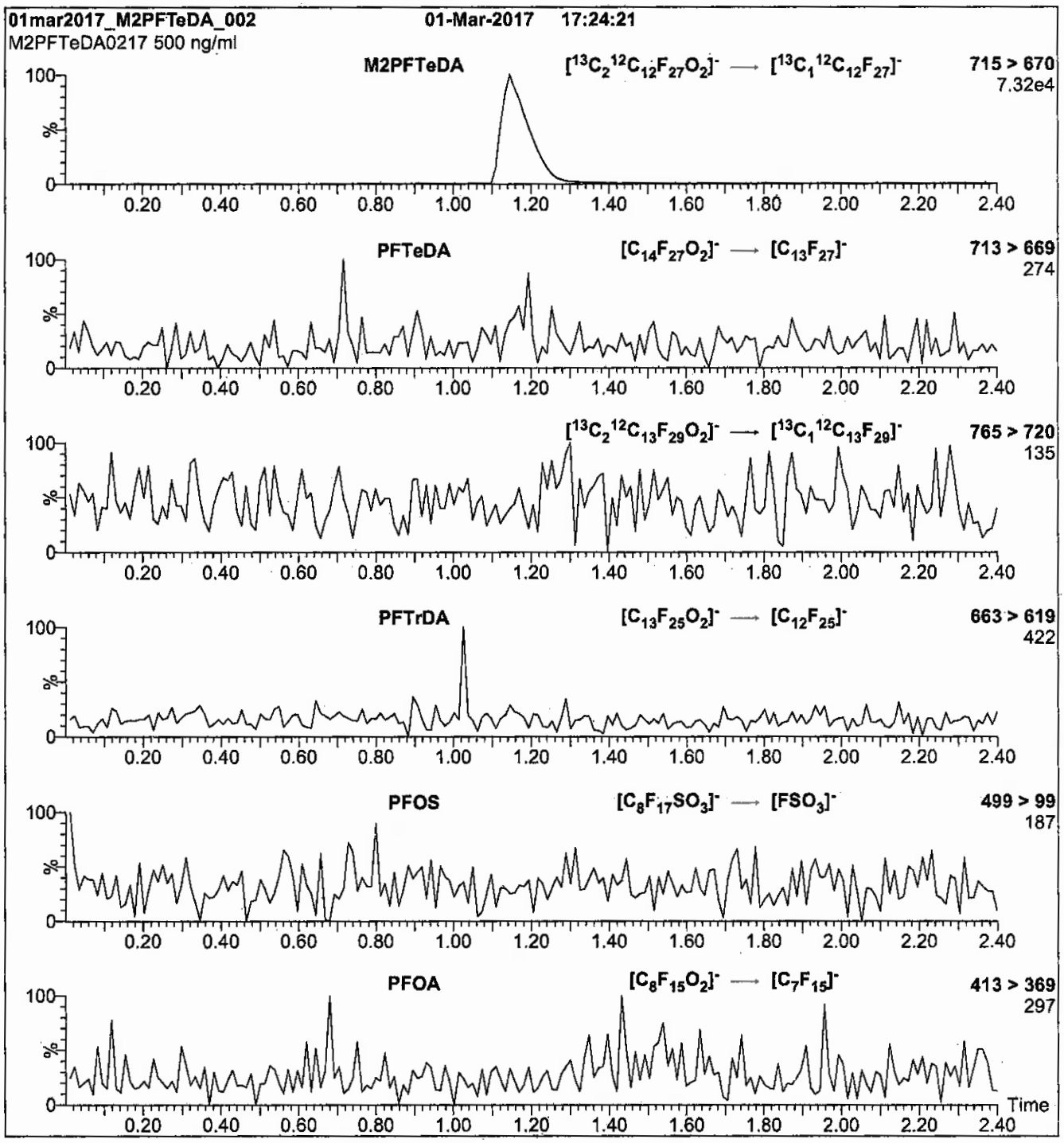

Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml 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_00011

r: 8/30/17 SDV

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-$^{13}C_2$)
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		

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

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

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

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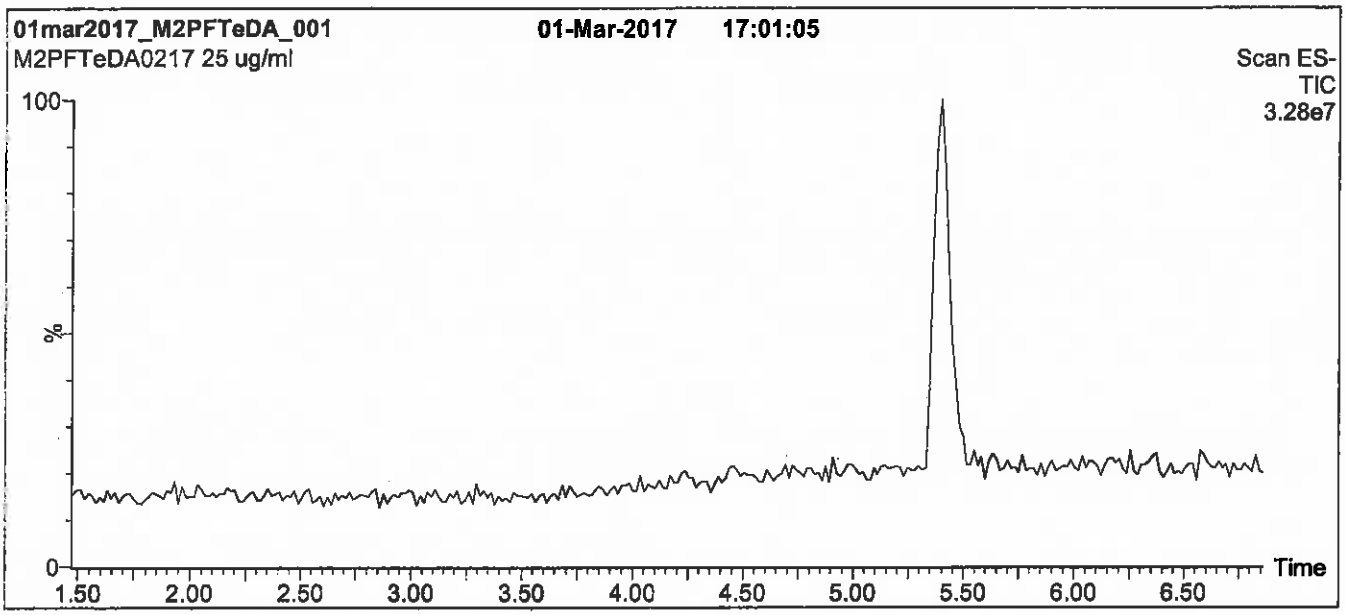
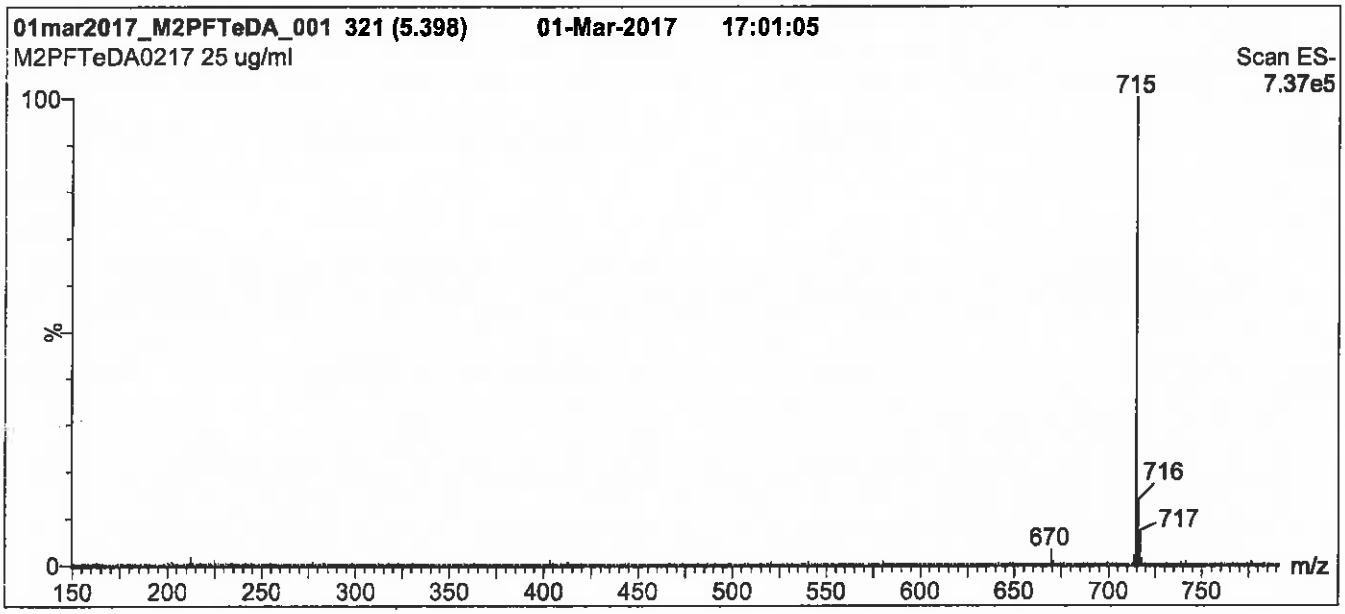




Conditions for Figure 1:

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: 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

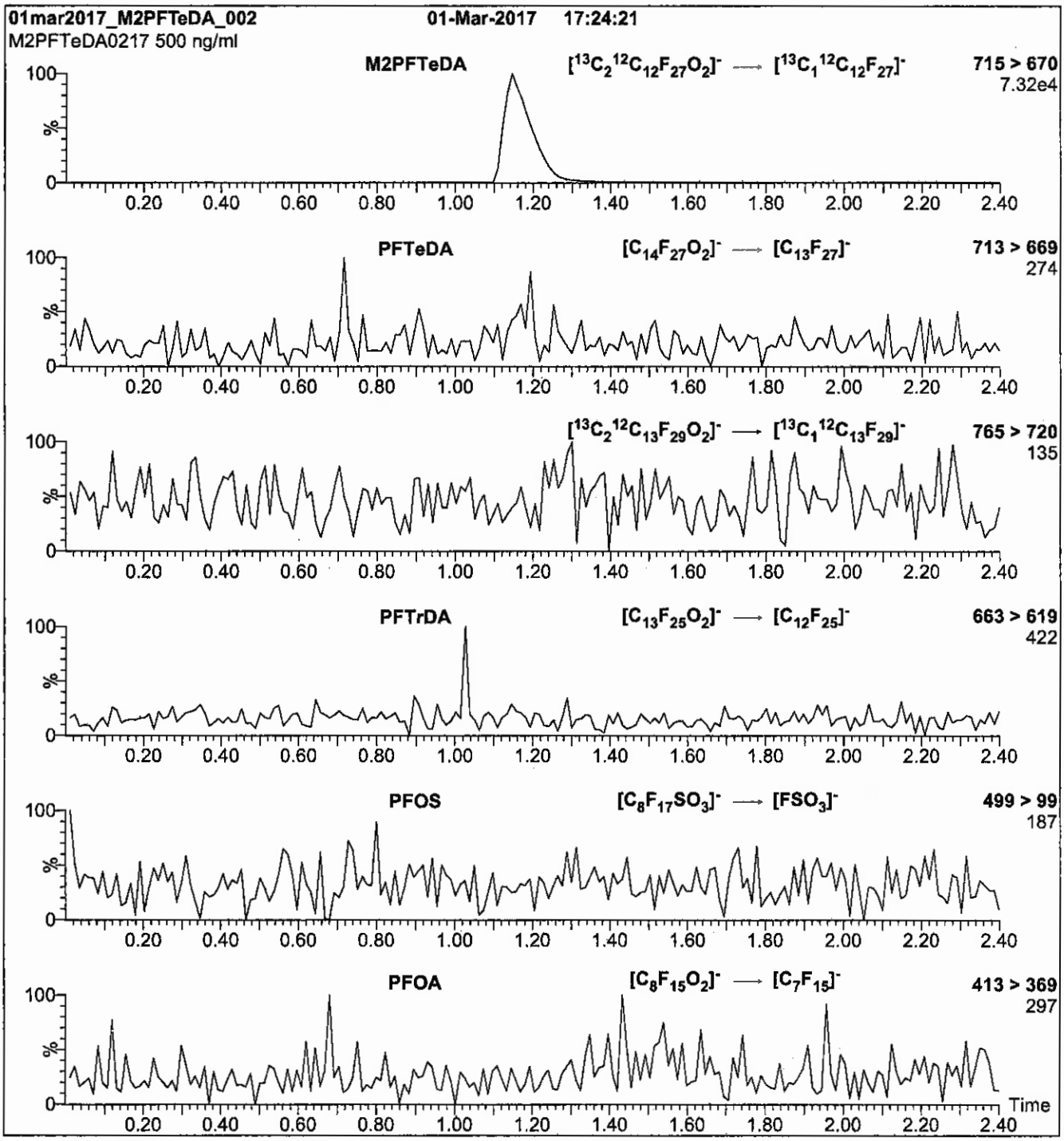
Flow: 300 µl/min

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

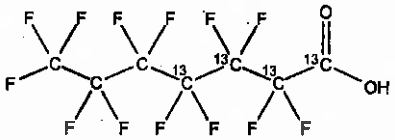
LCM4PFHPA_00009

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		

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ADDITIONAL INFORMATION:

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

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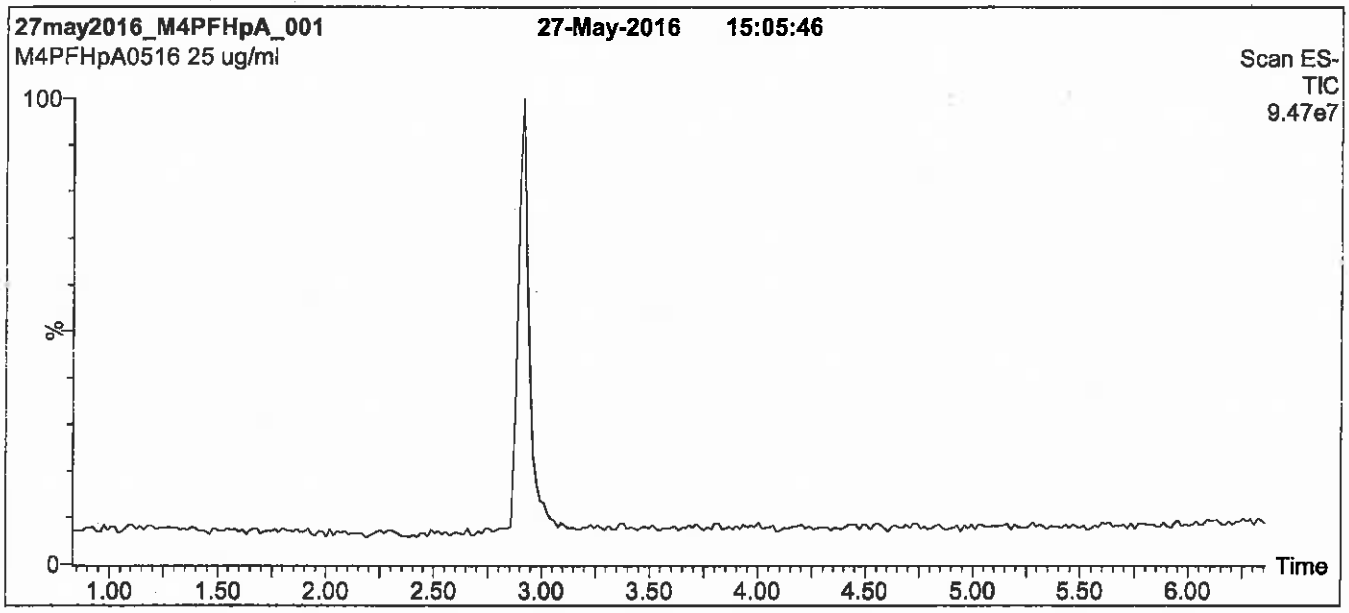

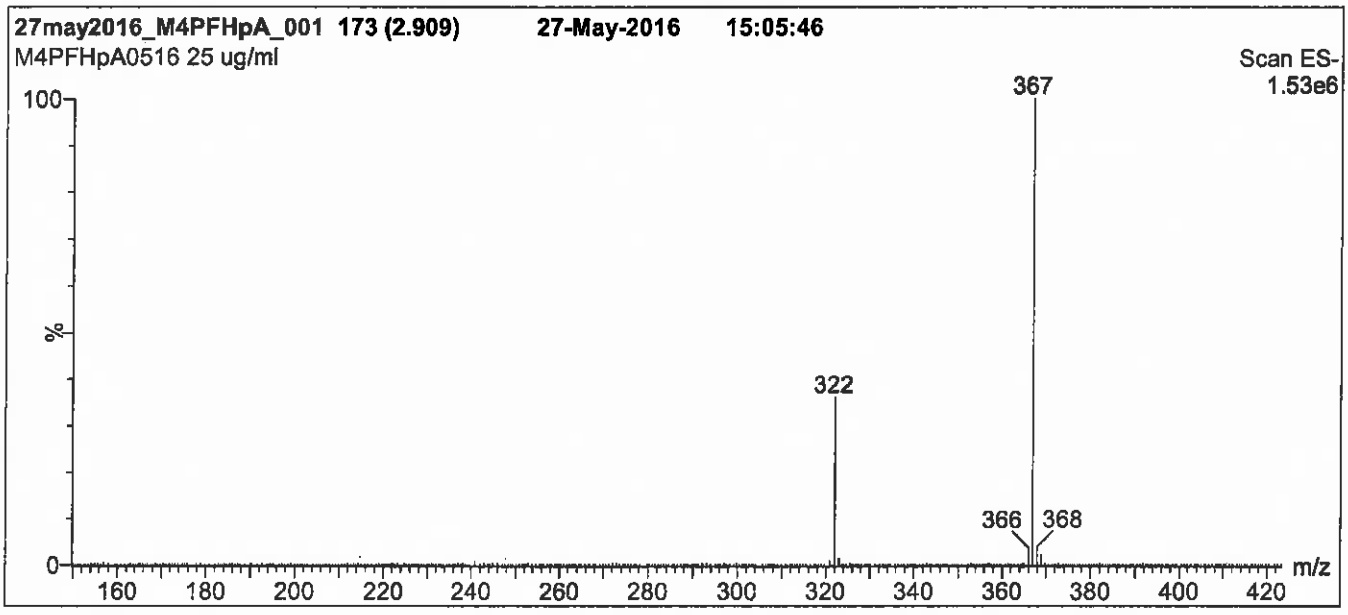

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MS: **Micromass Quattro *micro* API MS**

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1.7 µm, 2.1 x 100 mm

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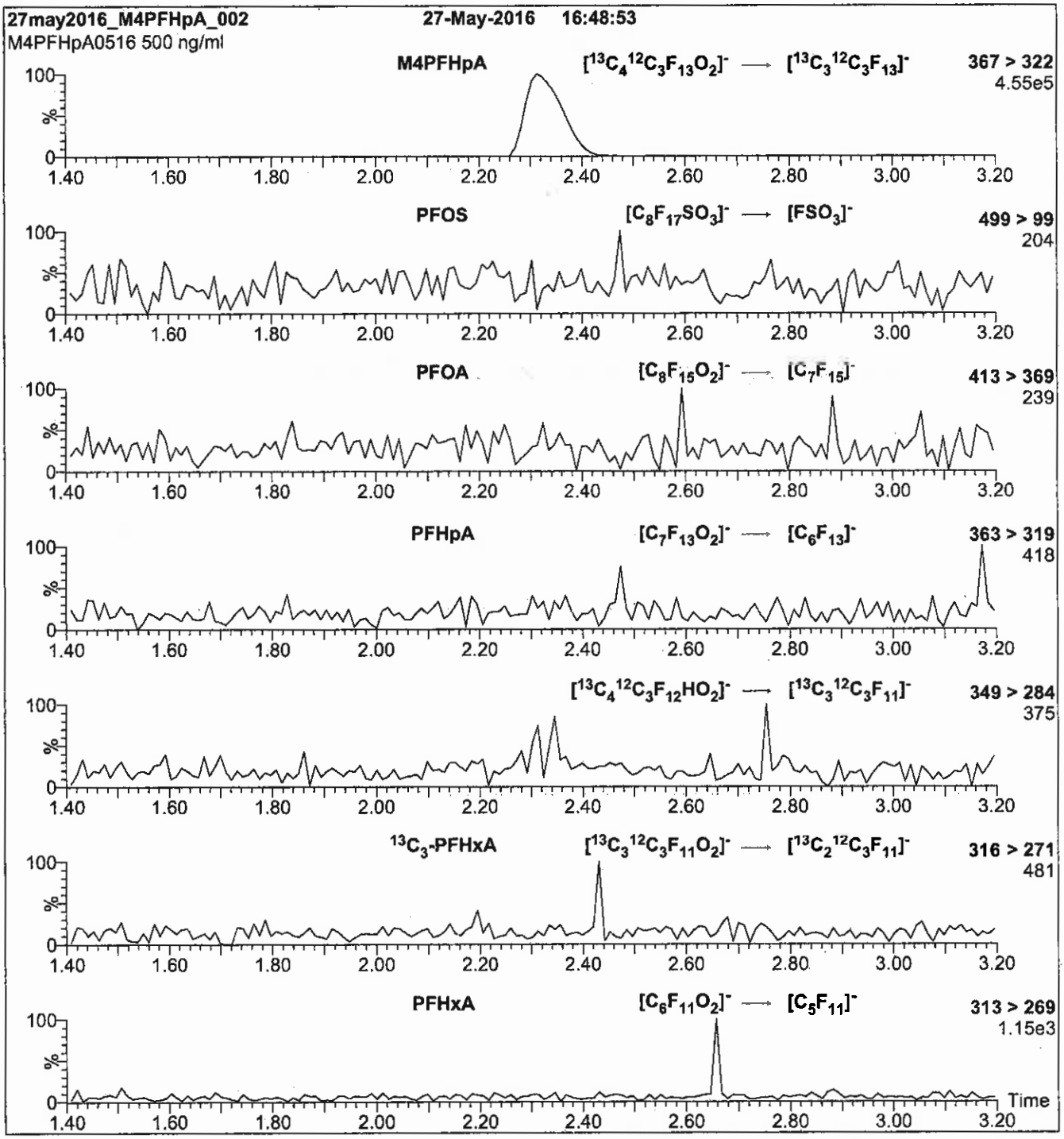
Flow: 300 µl/min

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

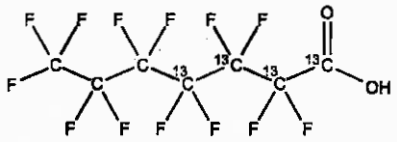
PRODUCT CODE: M4PFHpA

LOT NUMBER: M4PFHpA0517

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) 05/03/2017

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

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: 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

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:

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:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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

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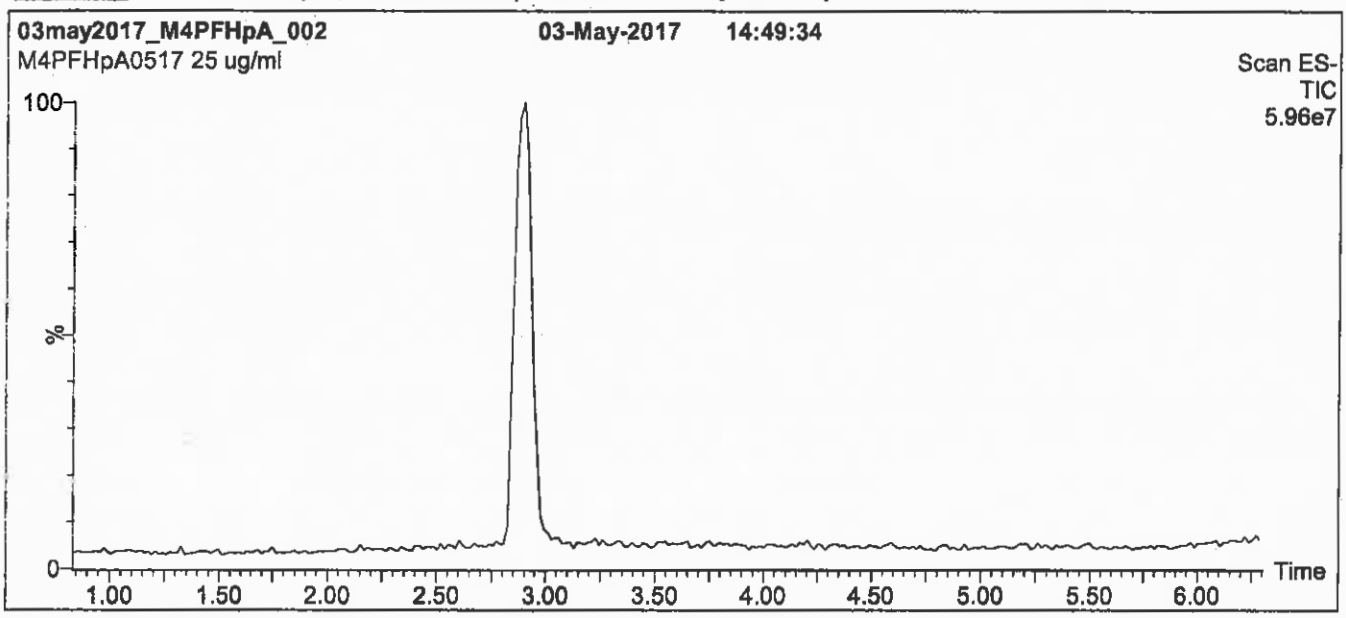
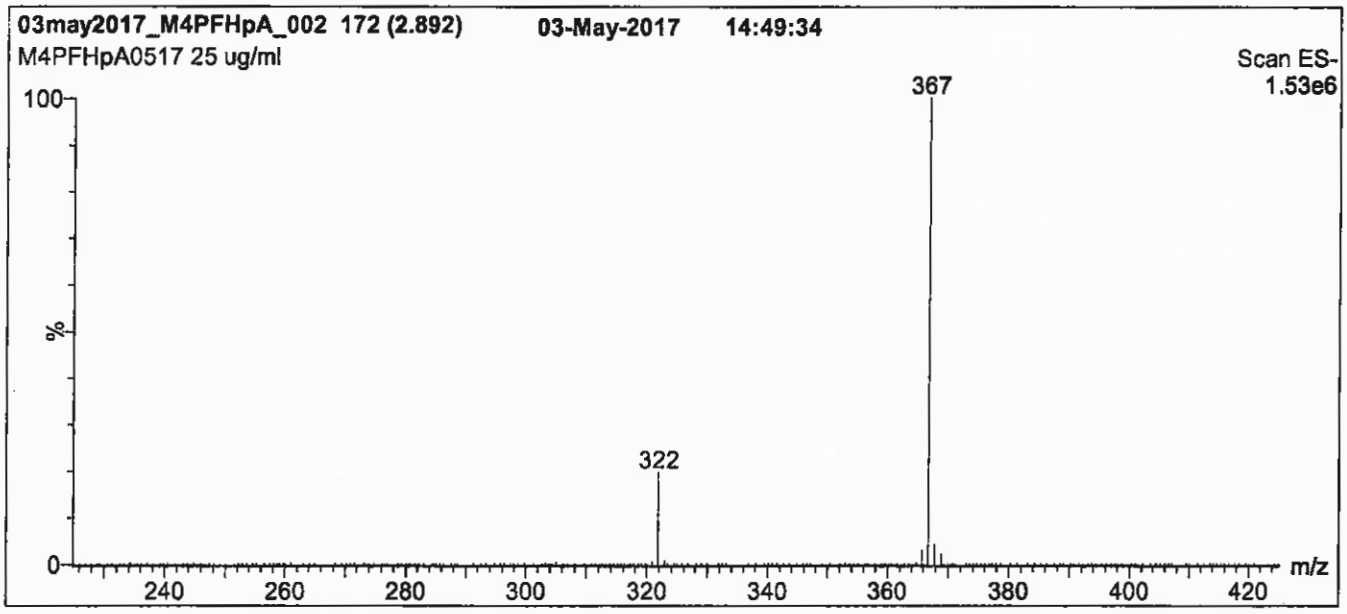
Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





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

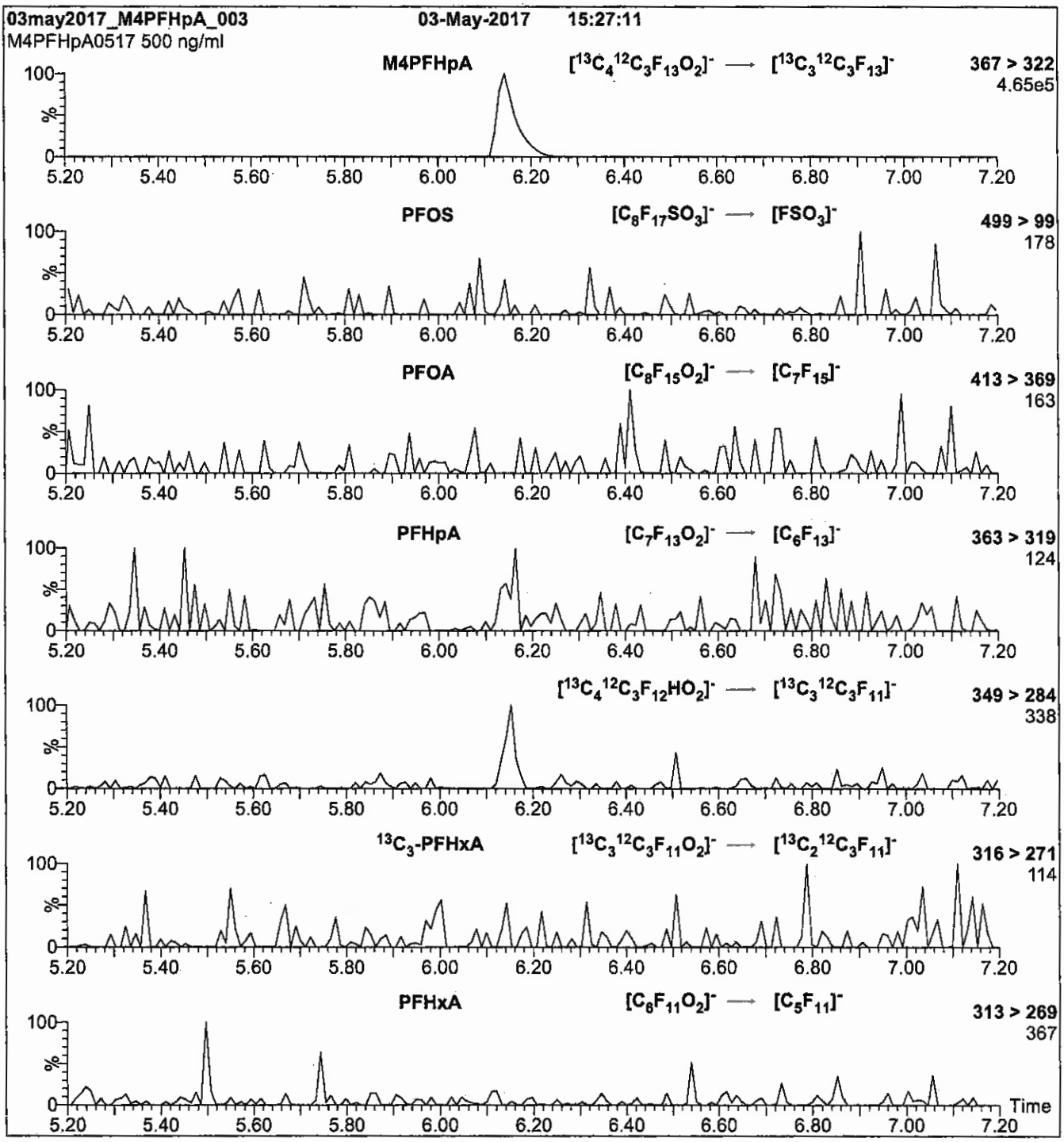
Flow: 300 µl/min

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

LCM4PFHPA_00011

P: 5/30/17 [illegible]

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

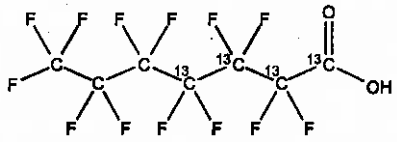
PRODUCT CODE: M4PFHpA

LOT NUMBER: M4PFHpA0517

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) 05/03/2017

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

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.

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Certified By: [signature]
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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CALA

ANAB ACCREDITED

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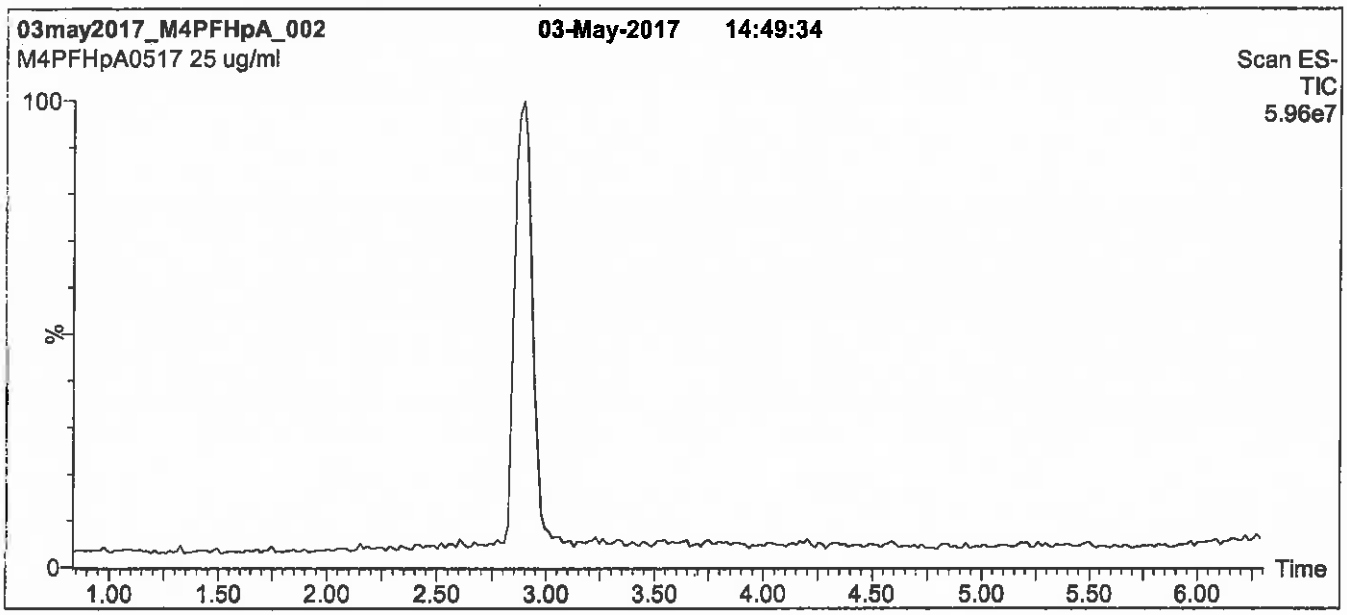
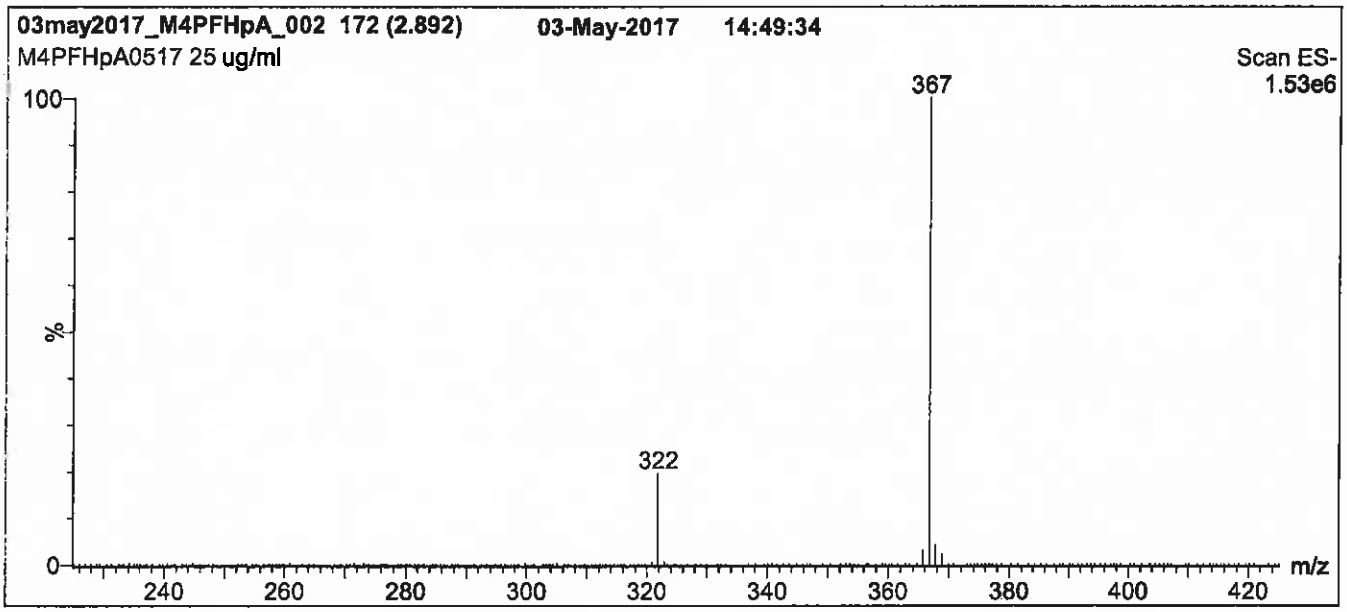




Conditions for Figure 1:

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

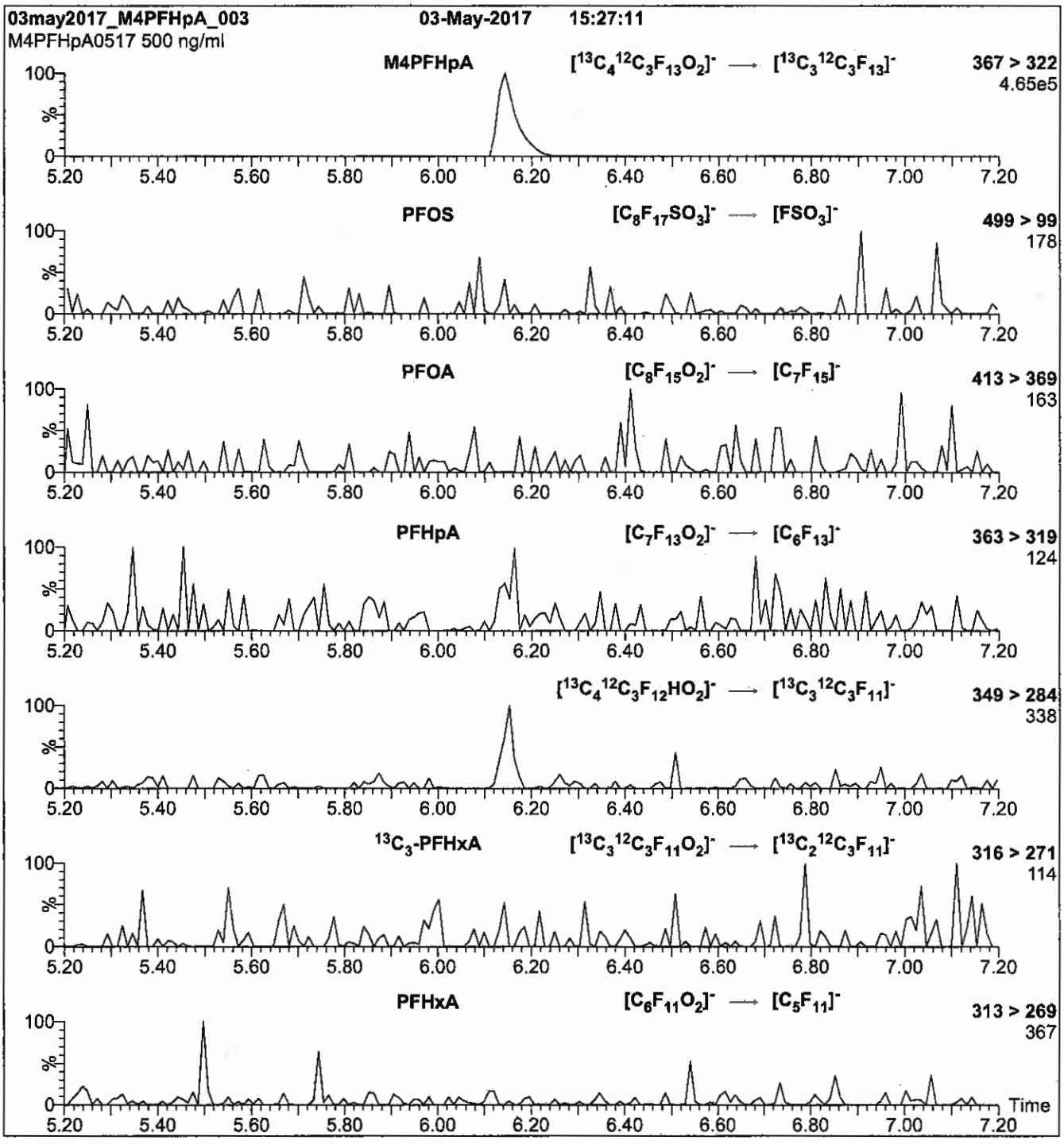
Flow: 300 µl/min

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

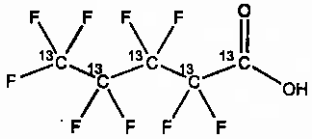
LCM5PFPEA_00010

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
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CALA

ANAB ACCREDITED

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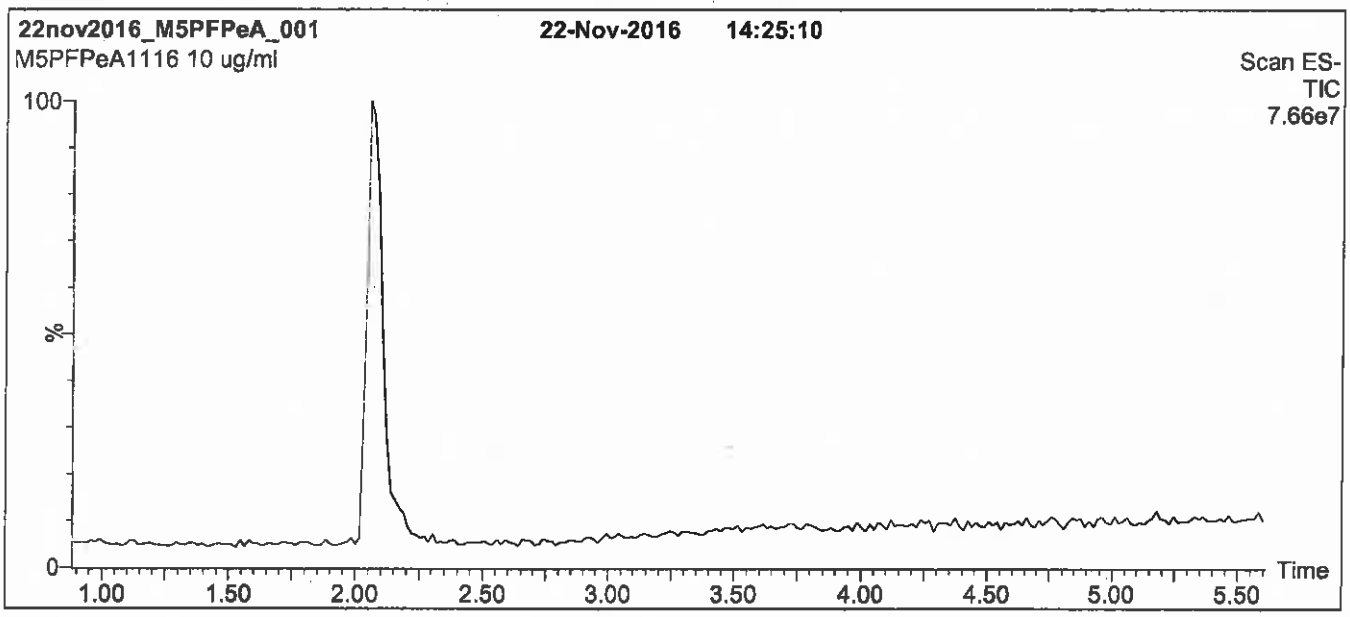

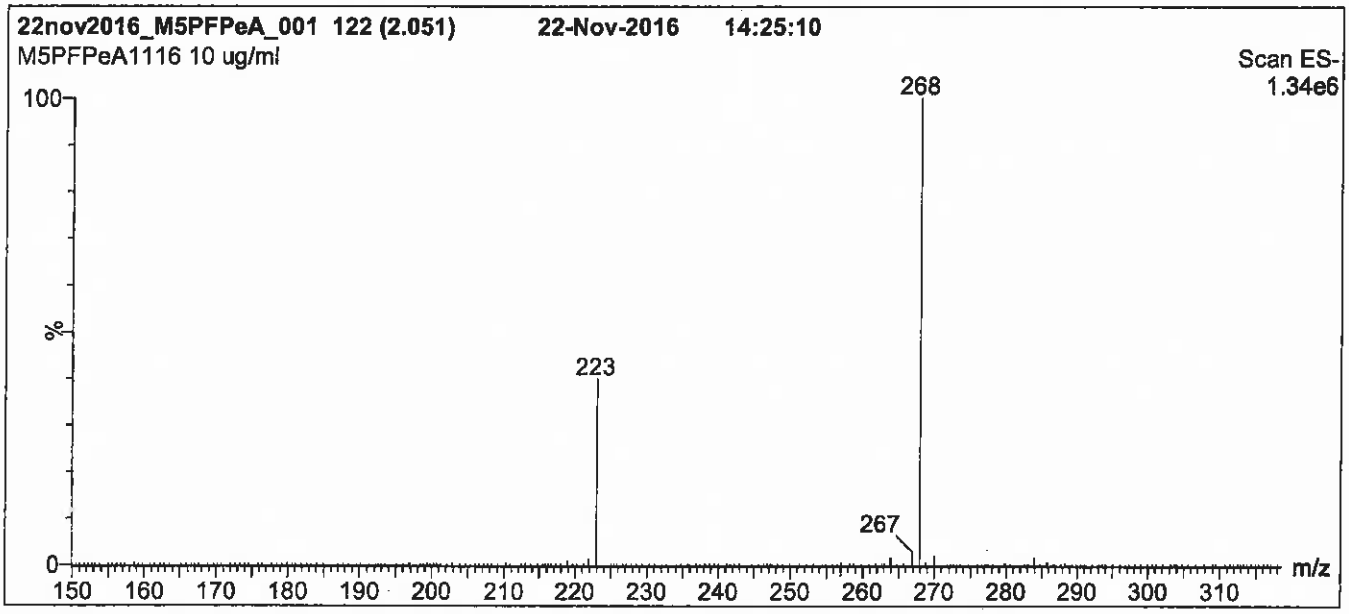

Conditions for Figure 1:

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

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

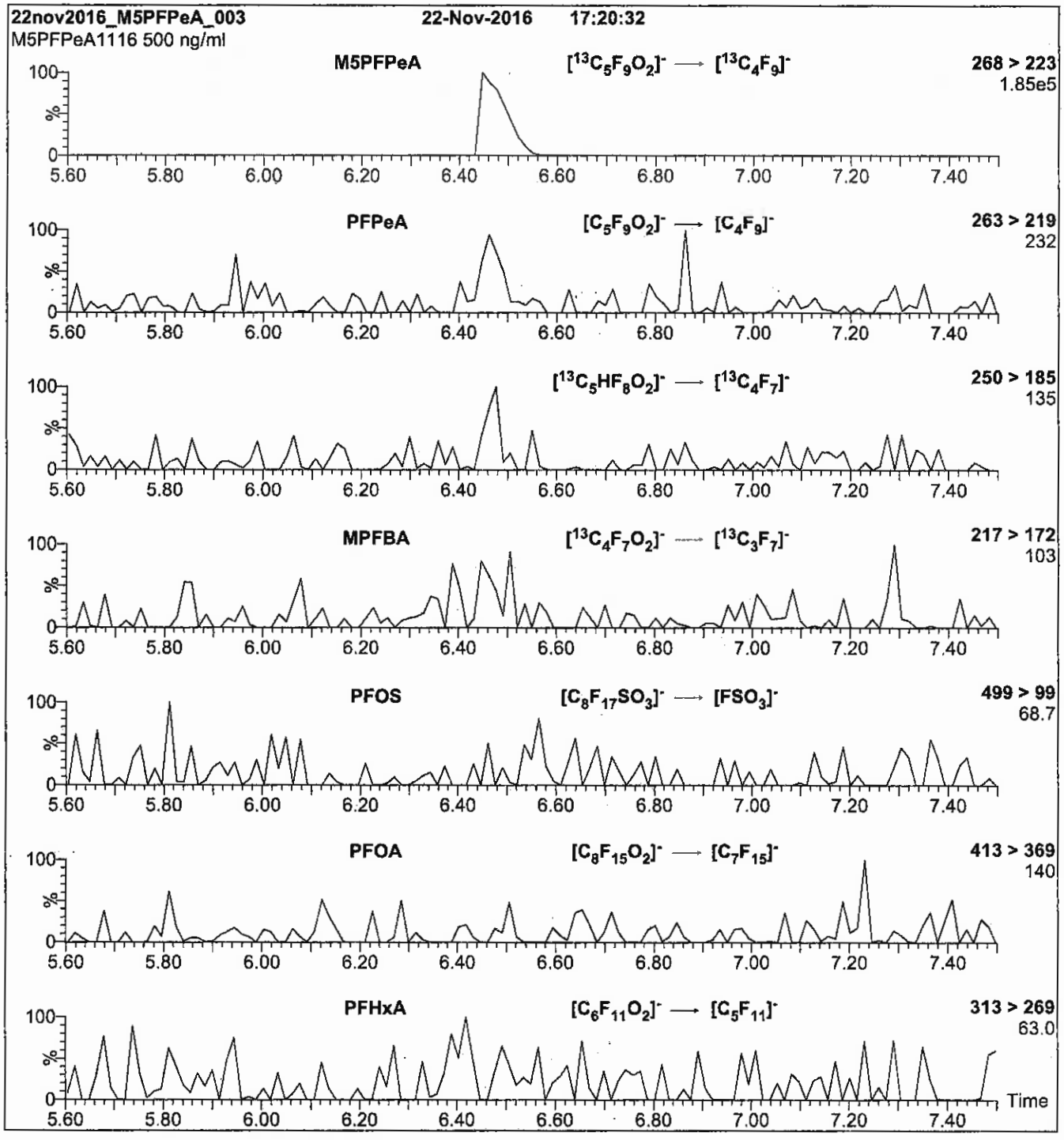
Flow: 300 µl/min

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

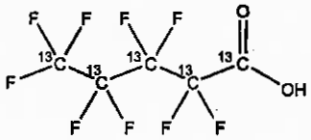
LCM5PFPEA_00011

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:	$^{13}C_5HF_9O_2$	**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

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

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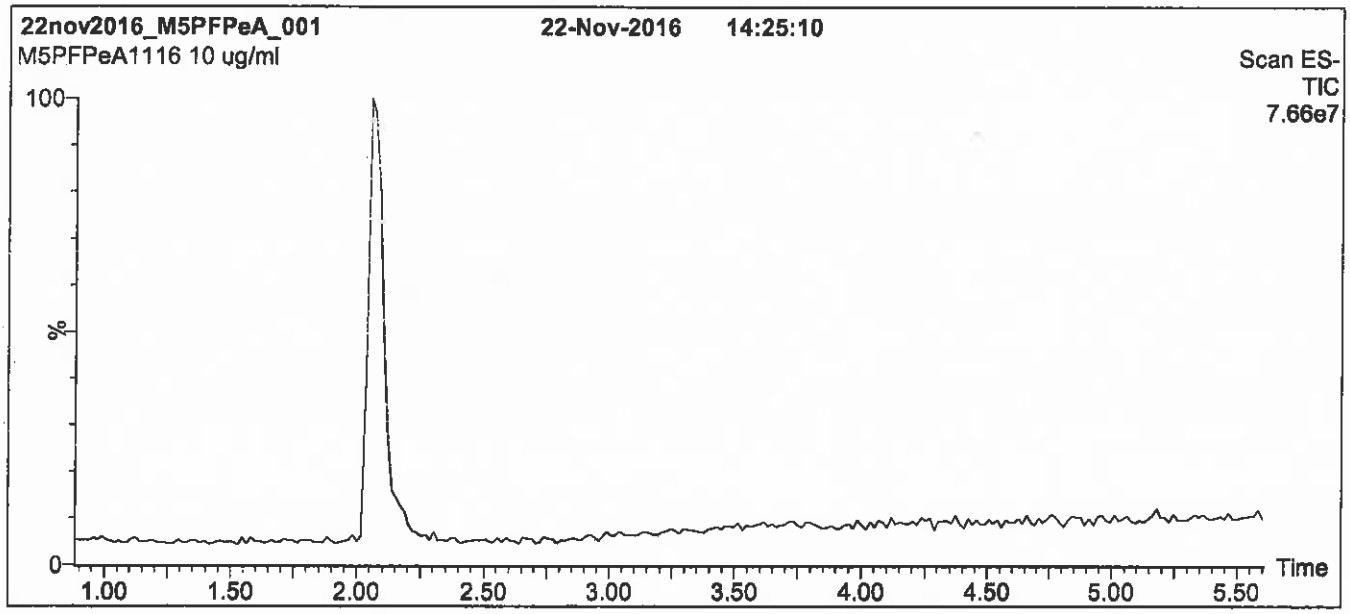
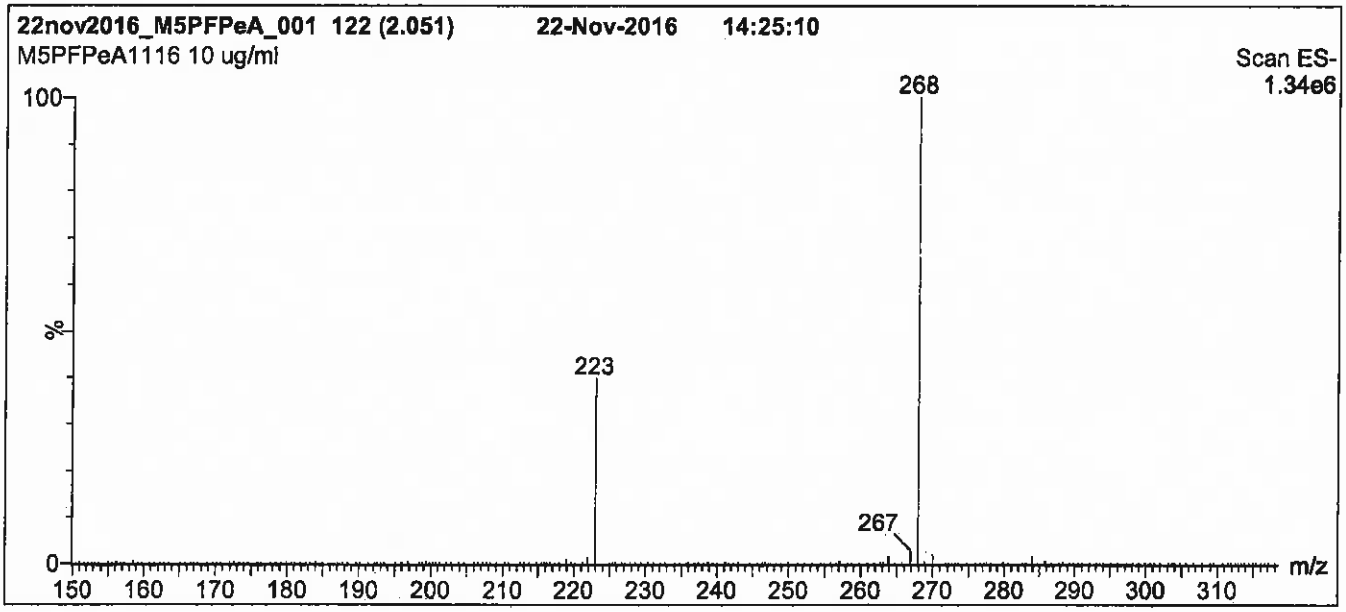
Figure 1: **M5PFPeA; LC/MS Data (TIC and Mass Spectrum)**





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

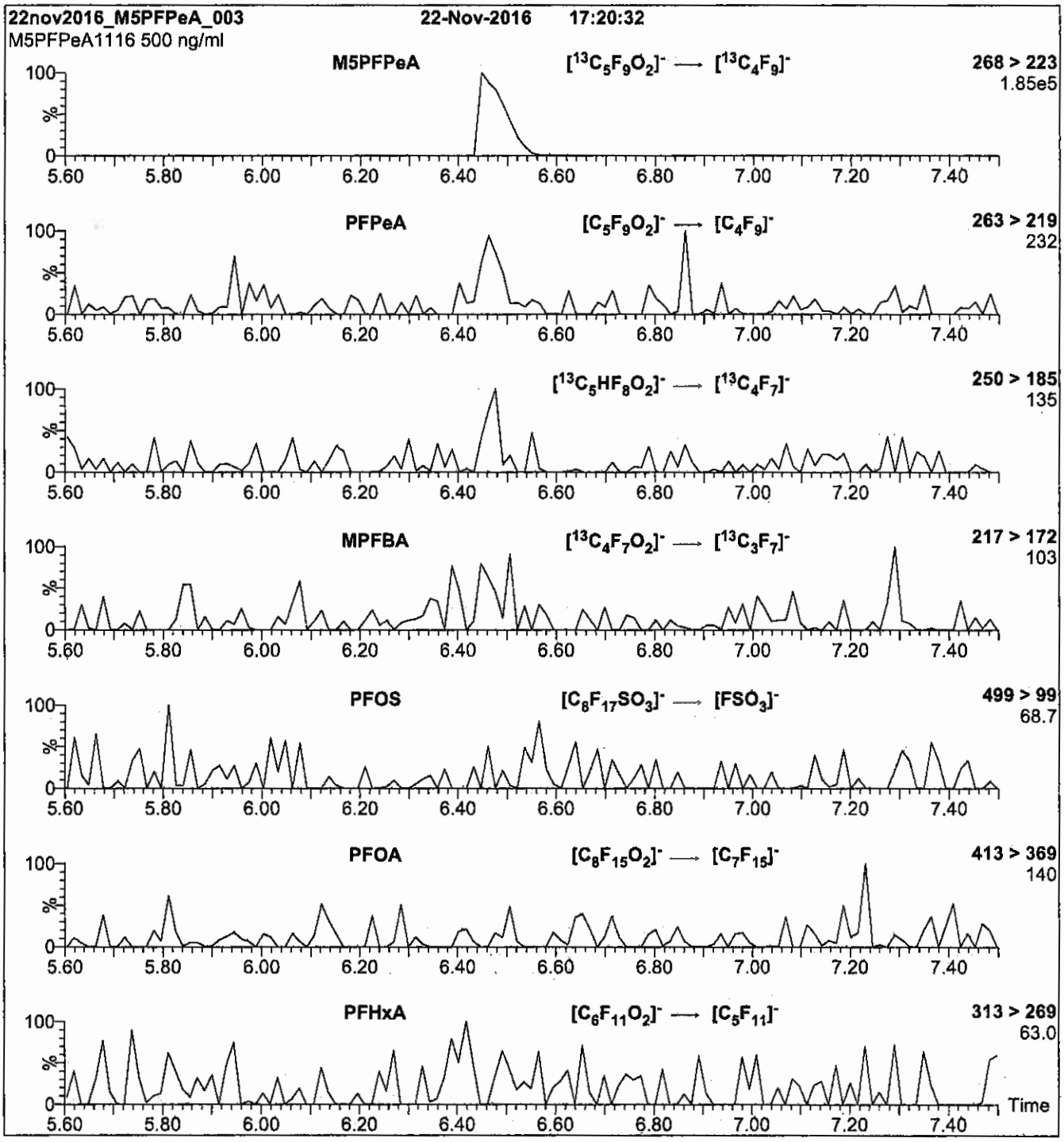
Flow: 300 µl/min

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

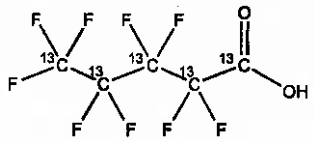
LCM5PFPEA_00012

n: 8/30/17 SRV

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.
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- Contains < 0.1% of perfluoro-n-pentanoic acid.

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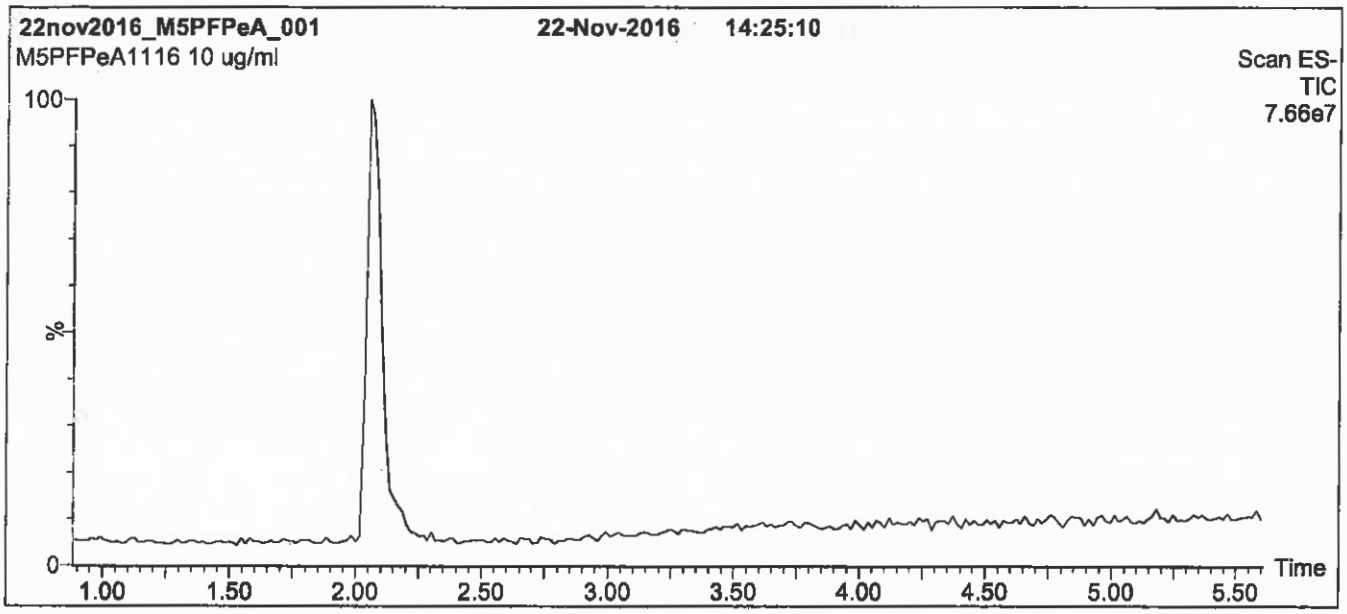
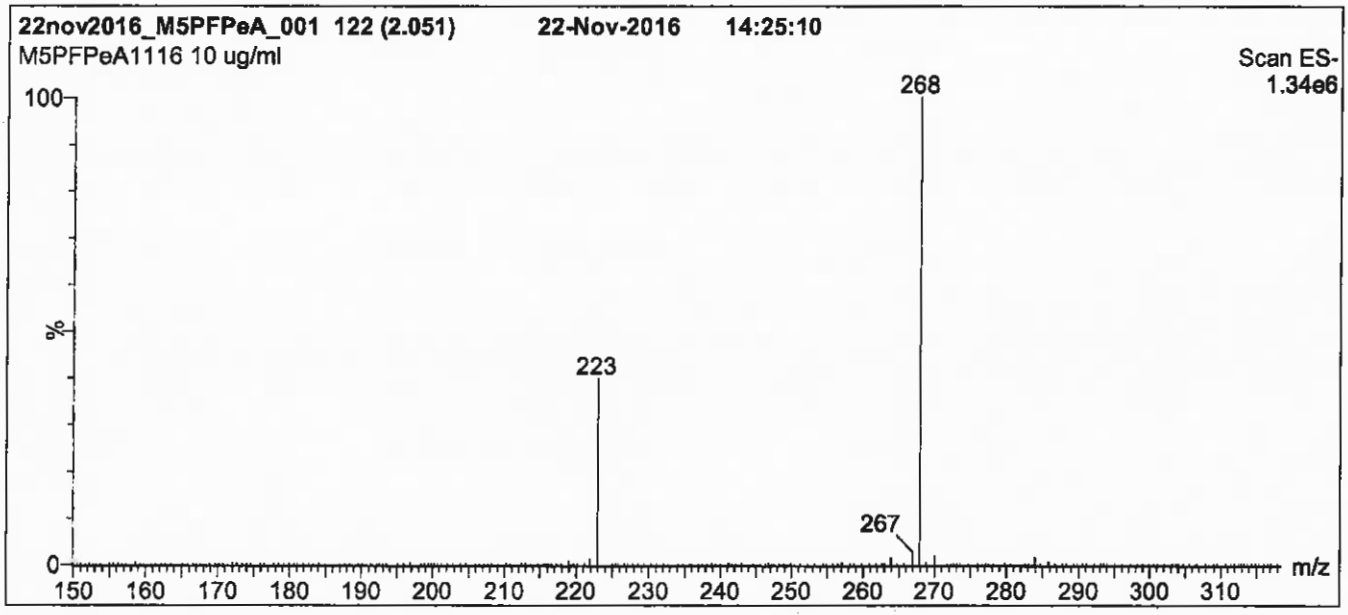
Figure 1: **M5PFPeA; LC/MS Data (TIC and Mass Spectrum)**





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

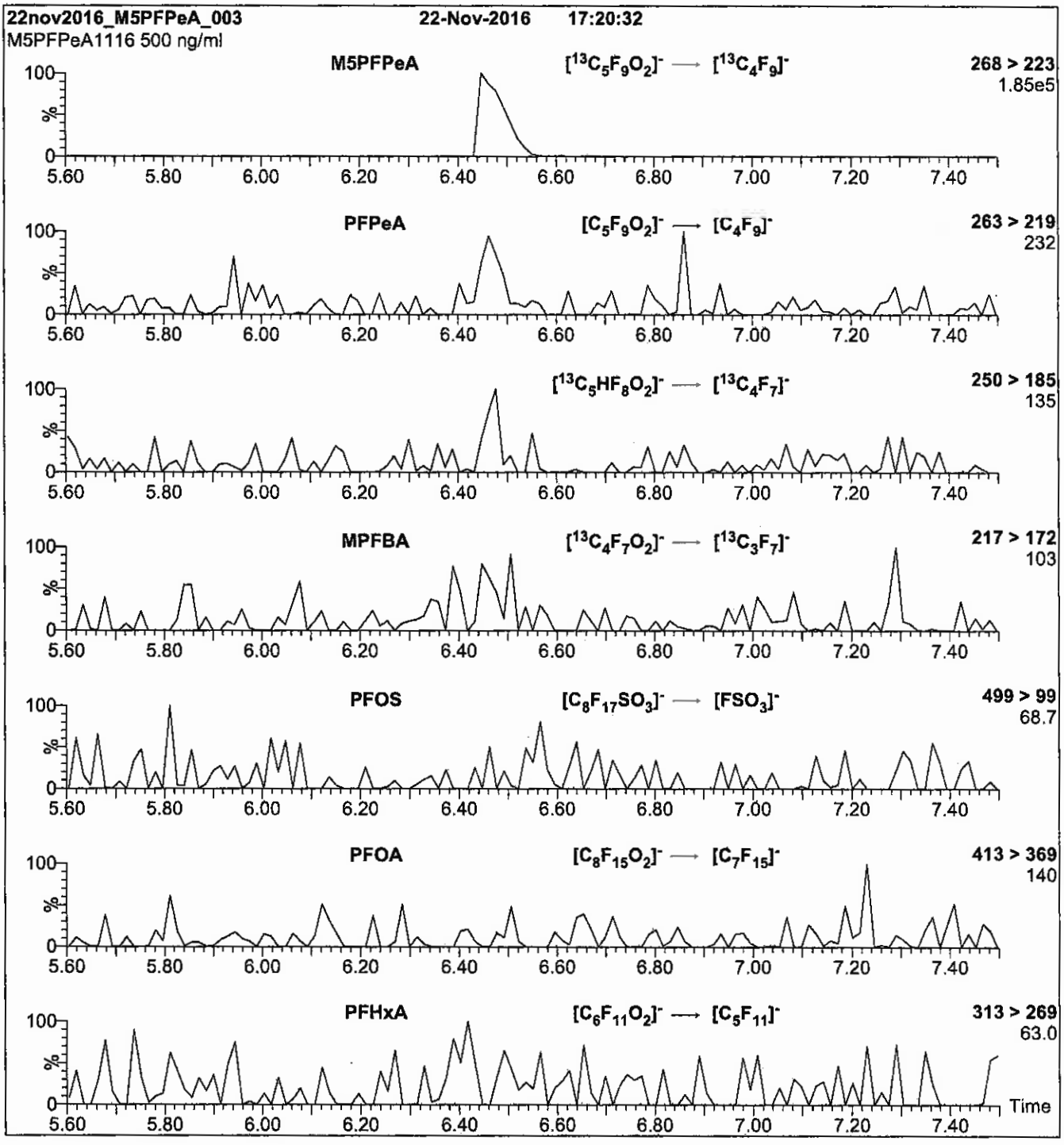
Flow: 300 µl/min

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

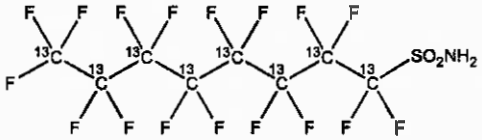
LCM8FOSA_00013

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

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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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CALA

ANAB ACCREDITED

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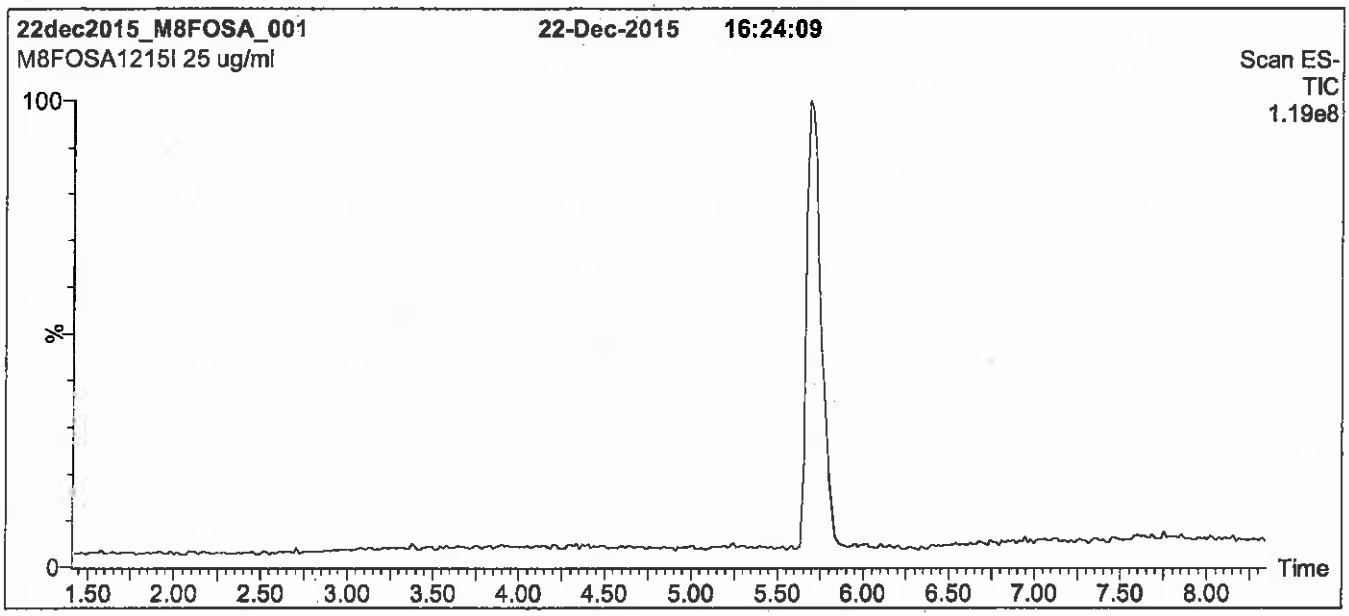
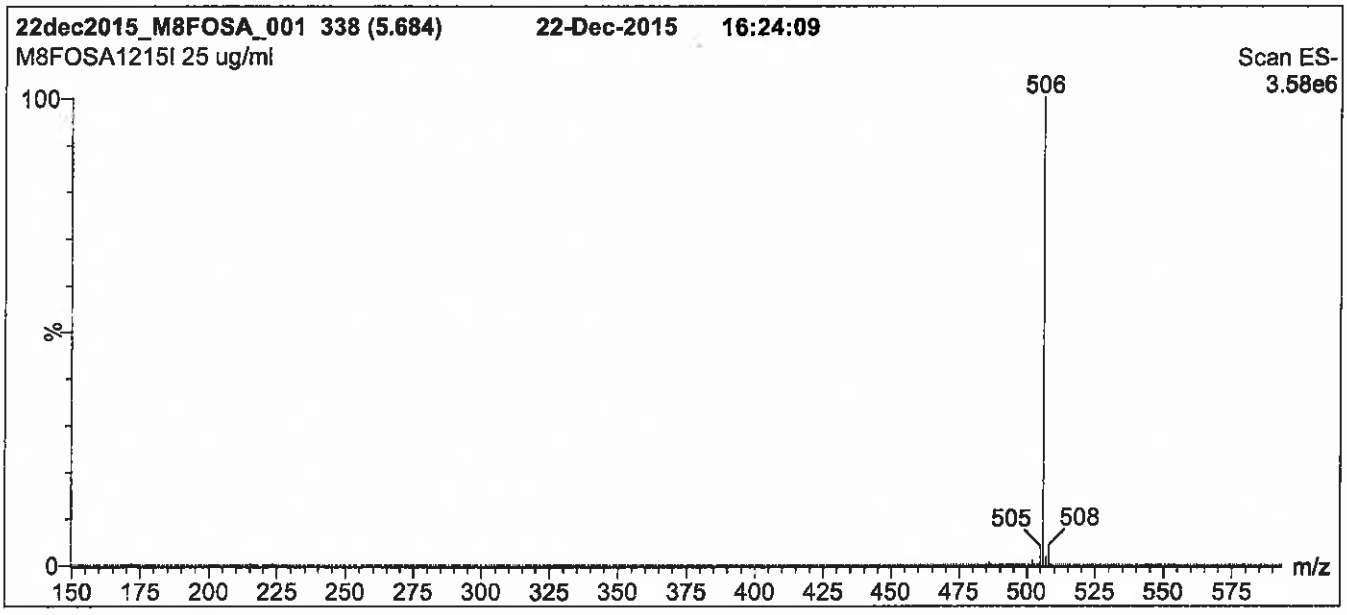
Figure 1: **M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





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

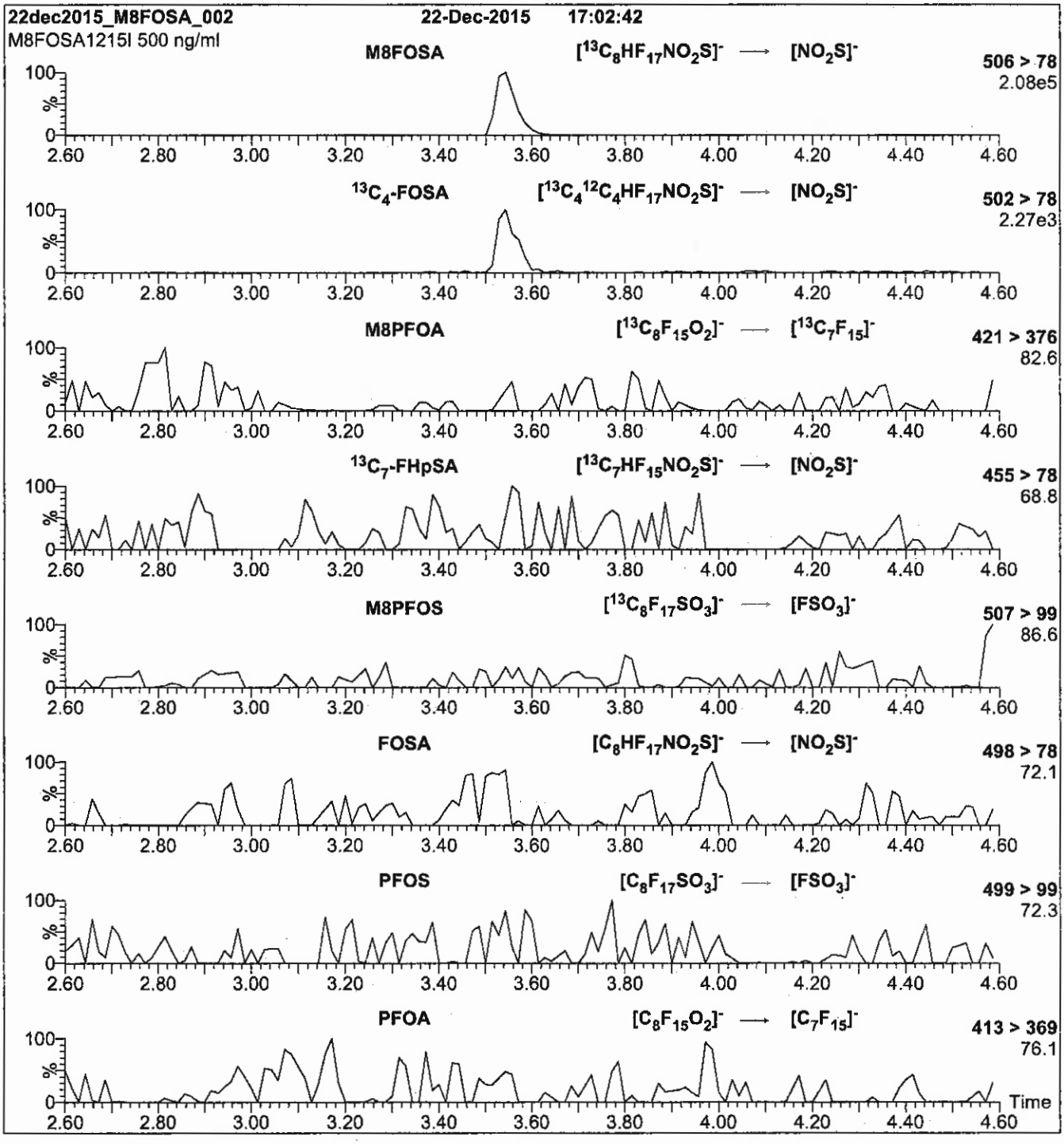
Flow: 300 µl/min

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

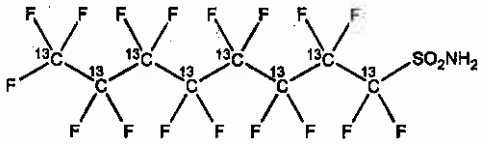
LCM8FOSA_00014

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

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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.

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EXPIRY DATE / PERIOD OF VALIDITY:

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QUALITY MANAGEMENT:

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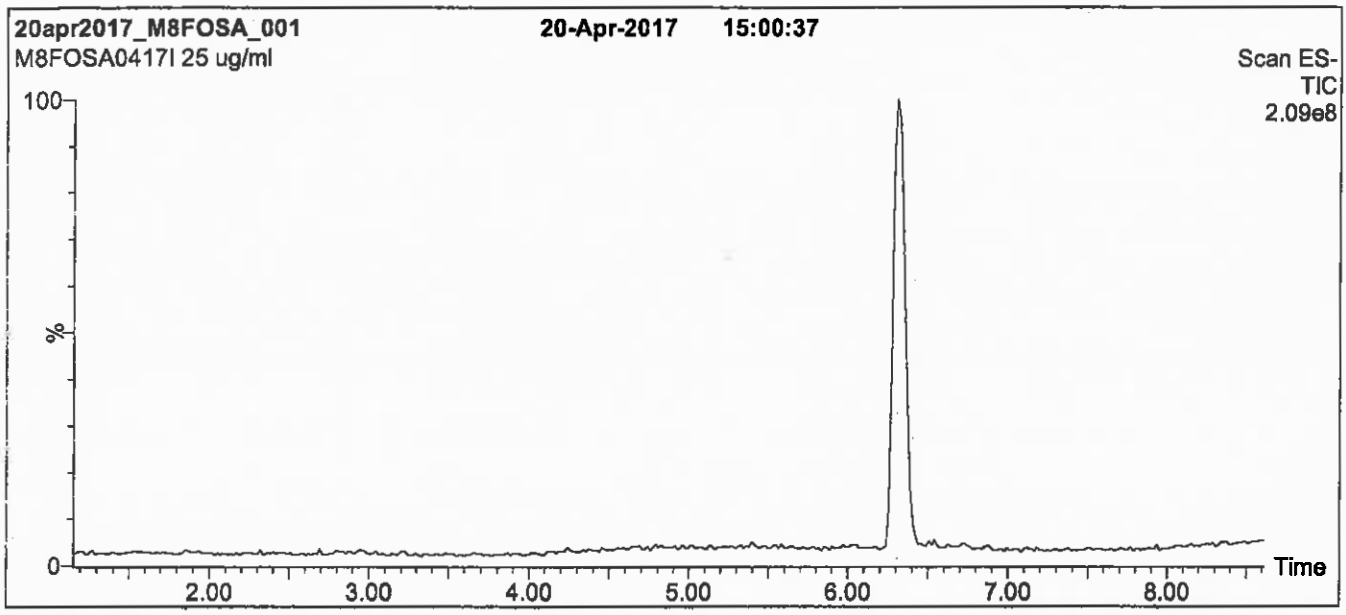
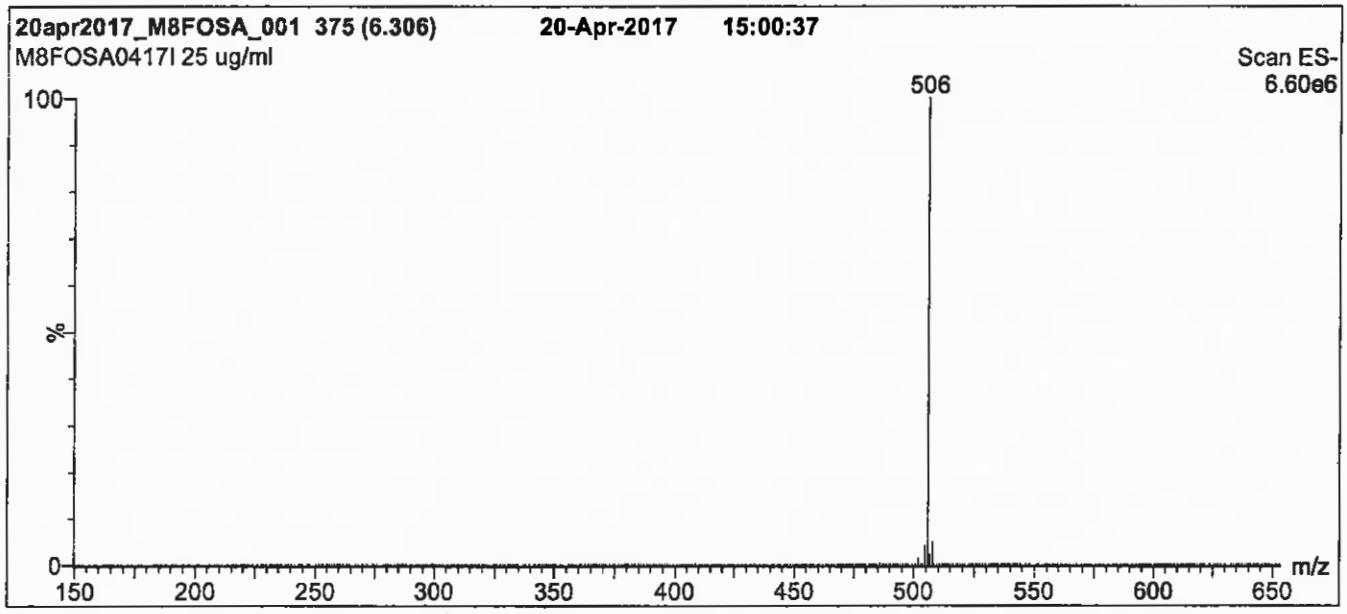
CALA

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: **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

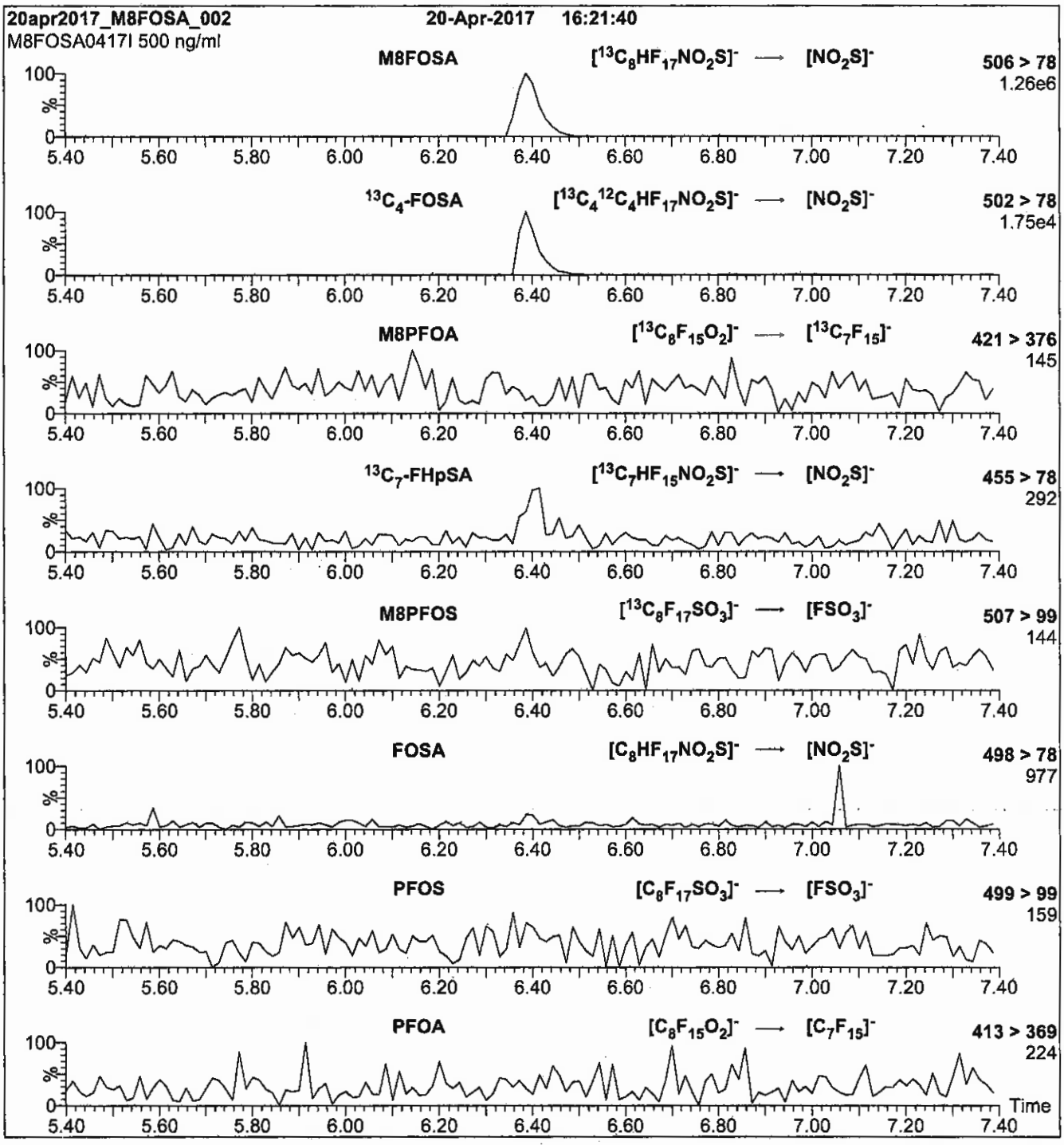
Flow: 300 µl/min

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

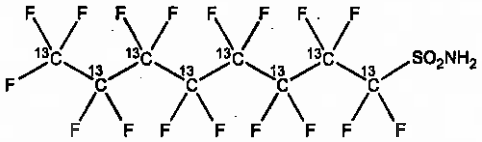
LCM8FOSA_00015

PR 8/30/17 SW

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

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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CALA

ANAB ACCREDITED

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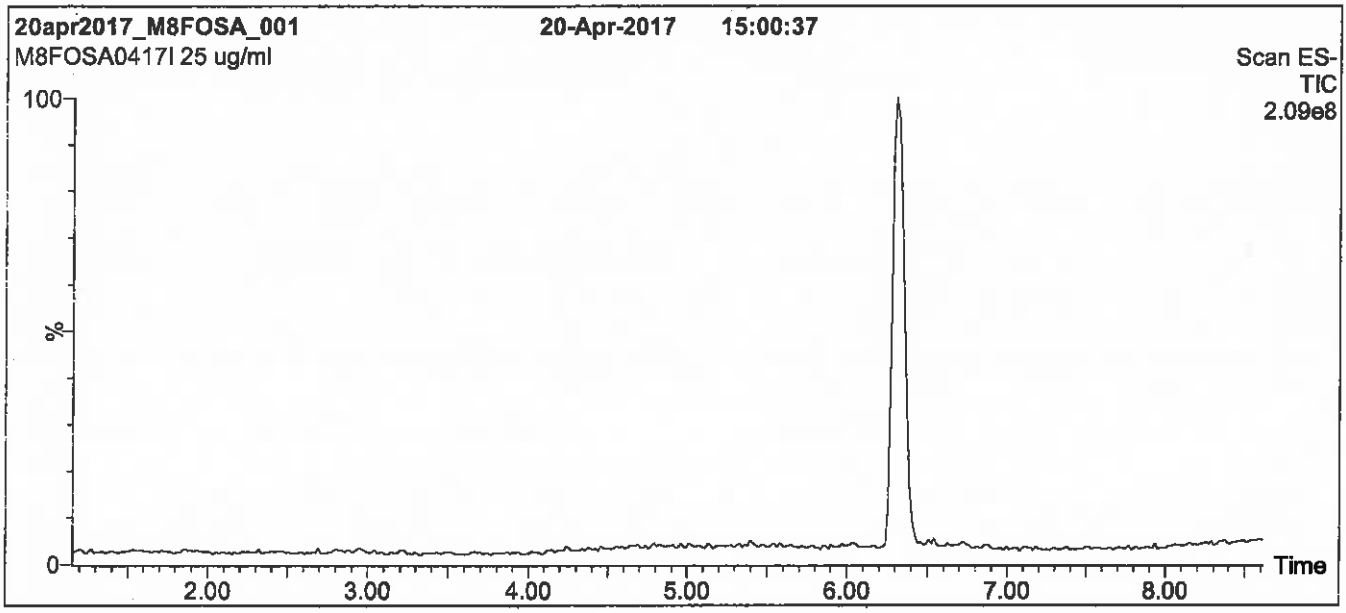

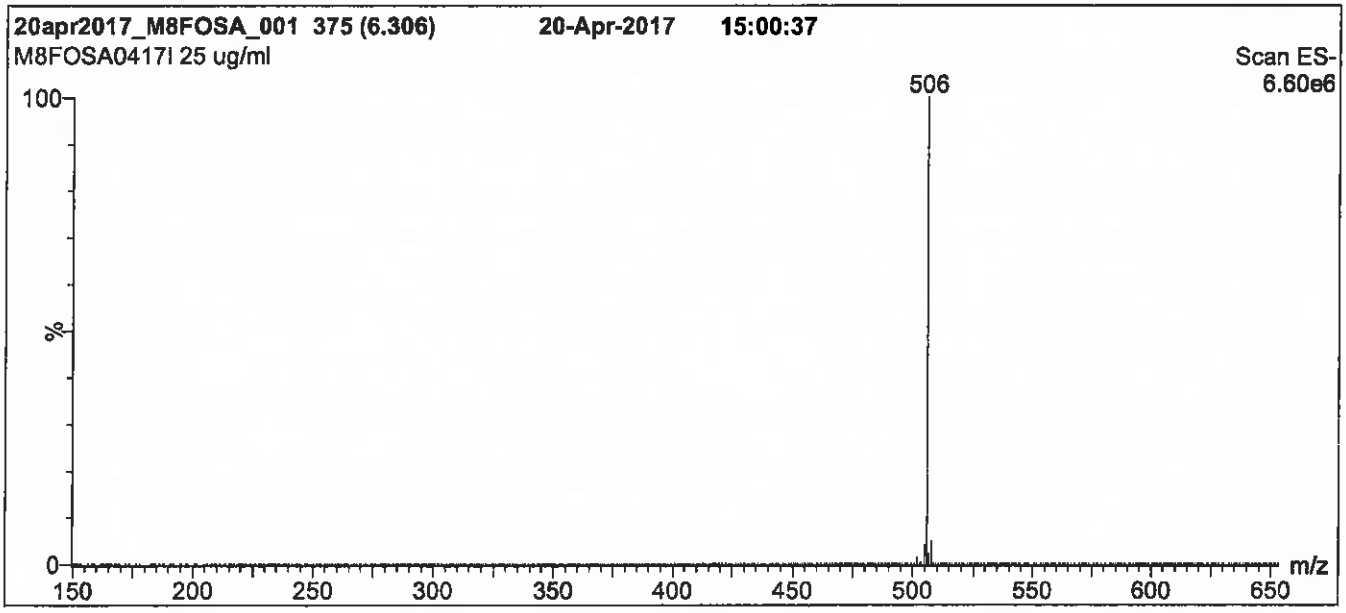

Conditions for Figure 1:

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 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
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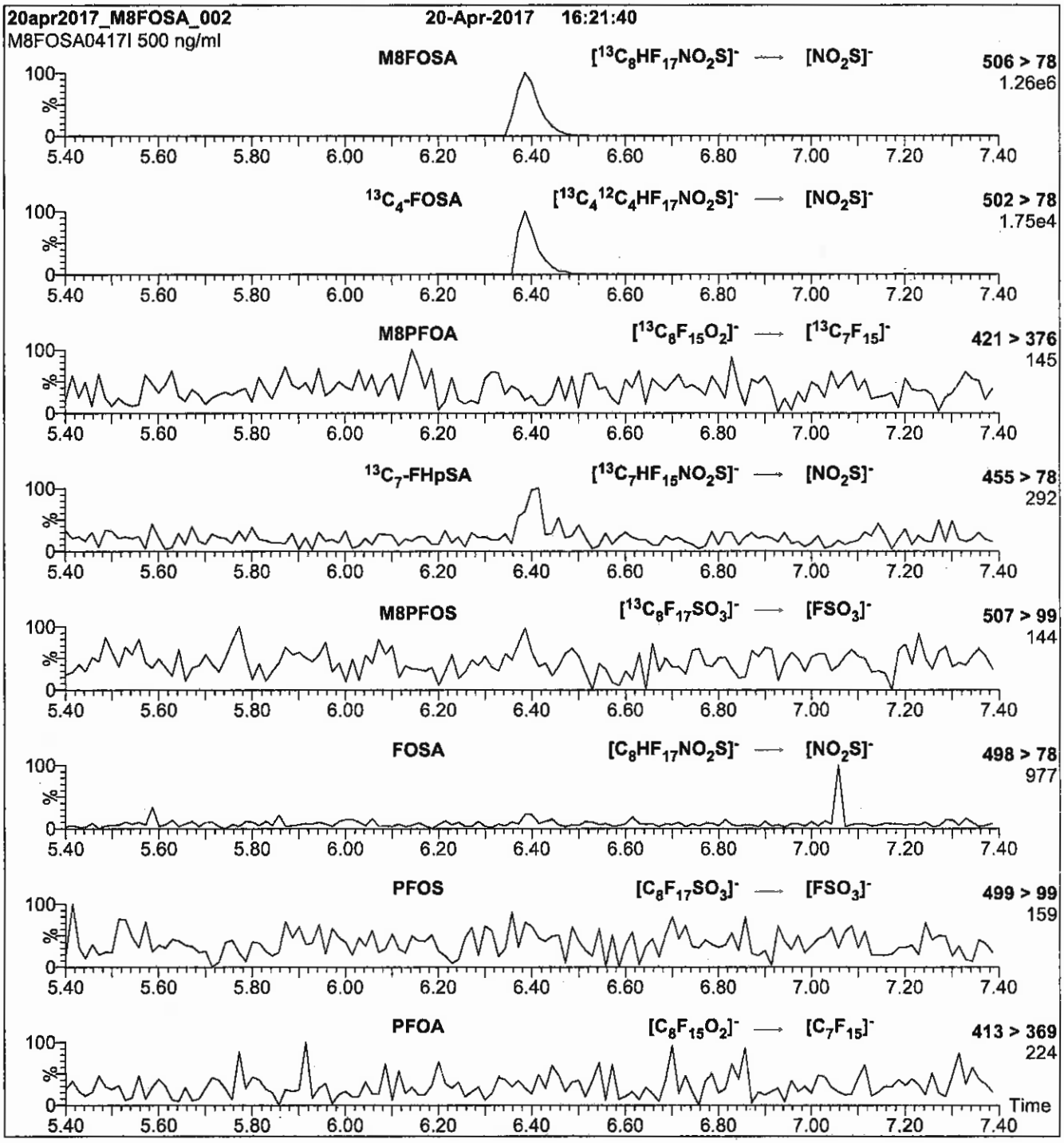


Conditions for Figure 2:

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

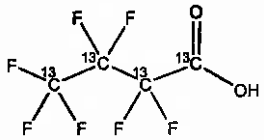
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

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CALA

ANAB ACCREDITED

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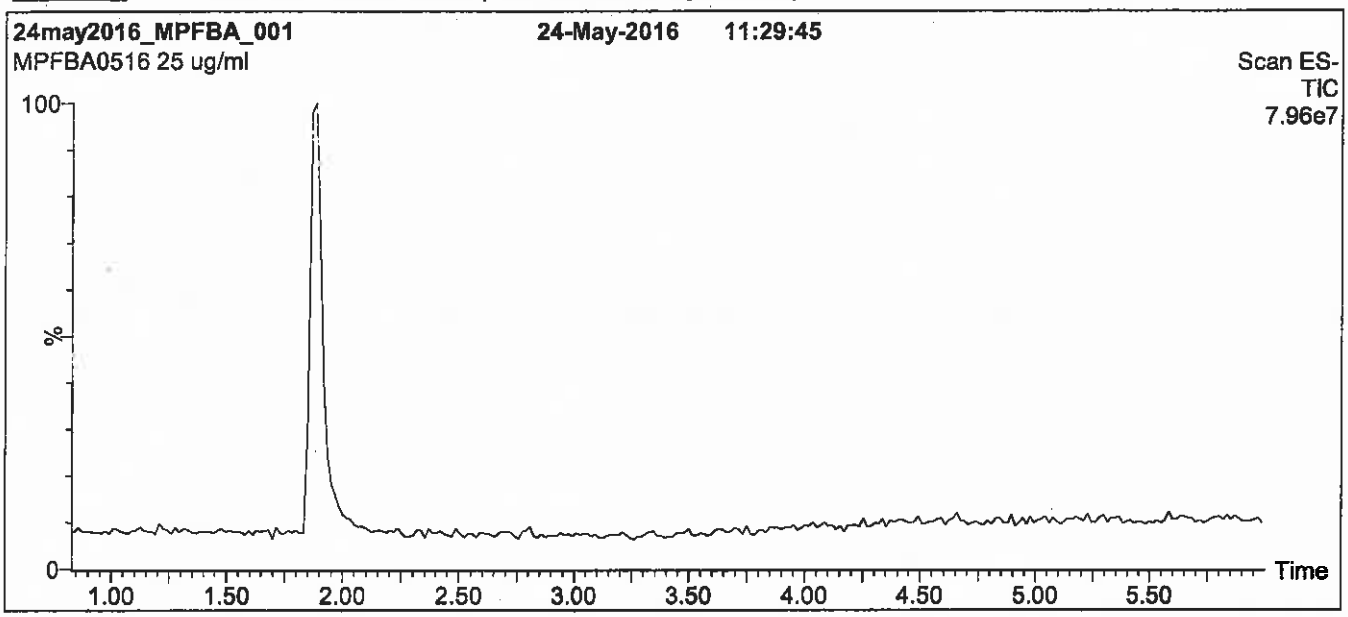
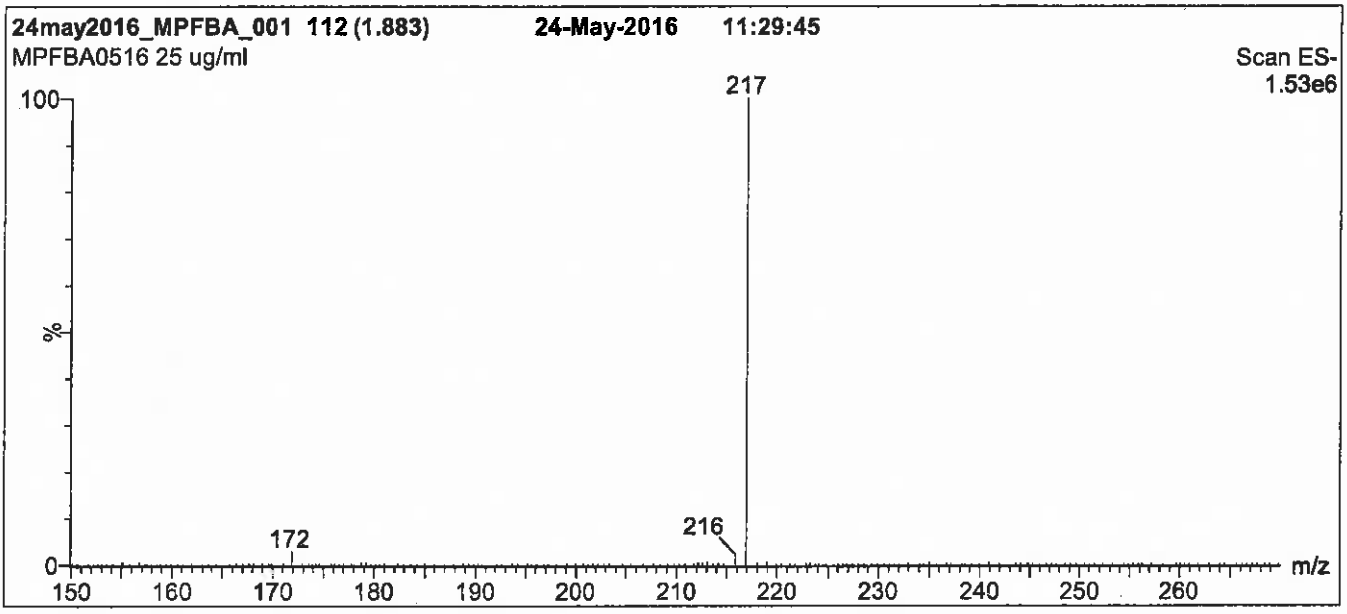




Conditions for Figure 1:

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: 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

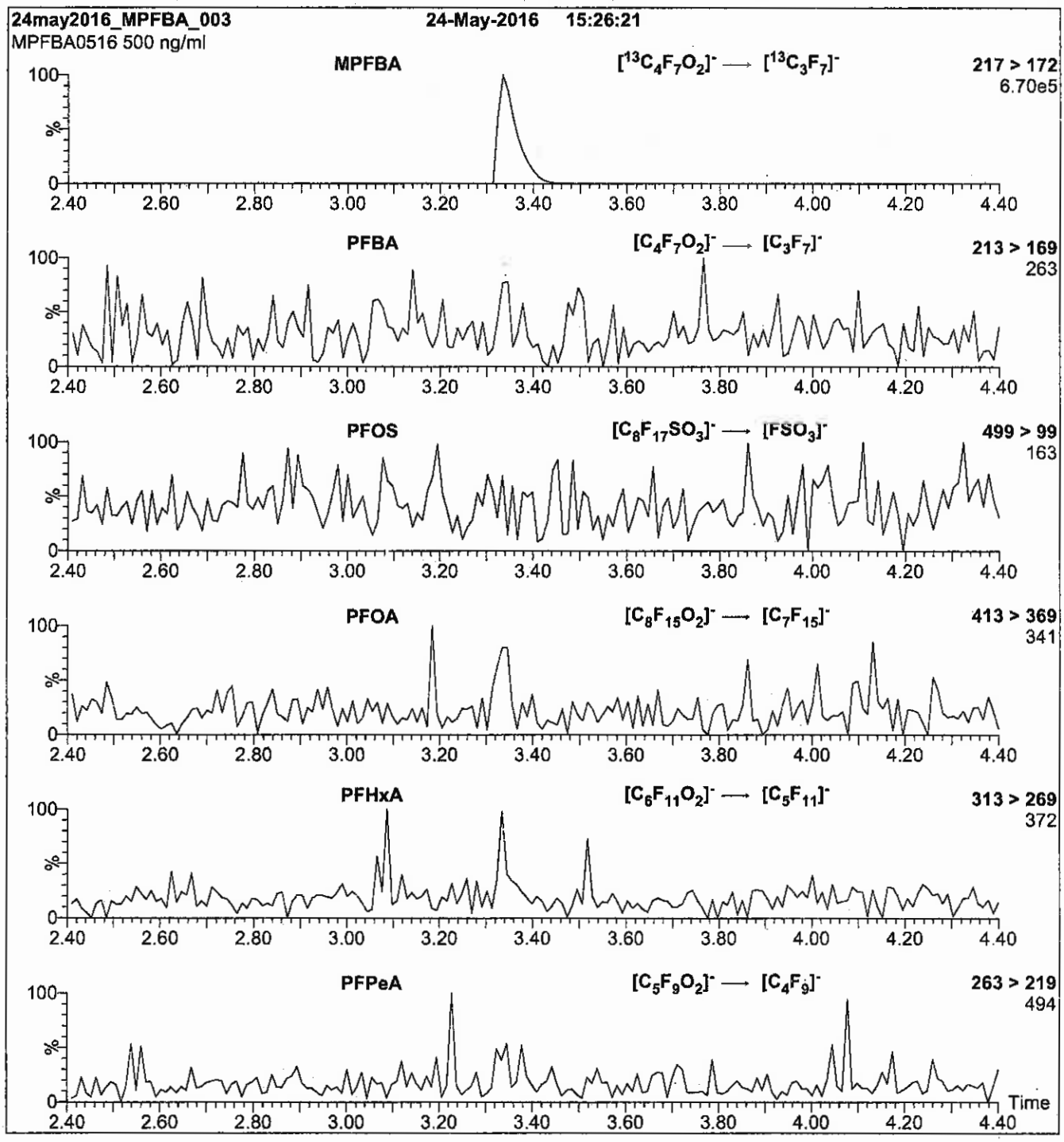
Flow: 300 µl/min

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

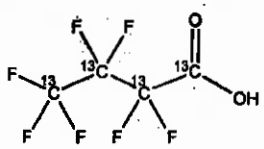
Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 10

Reagent

LCMPFBA_00011

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFBA	**LOT NUMBER:**	MPFBA0417
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)	04/12/2017		
EXPIRY DATE: (mm/dd/yyyy)	04/12/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED Reference Material Producer

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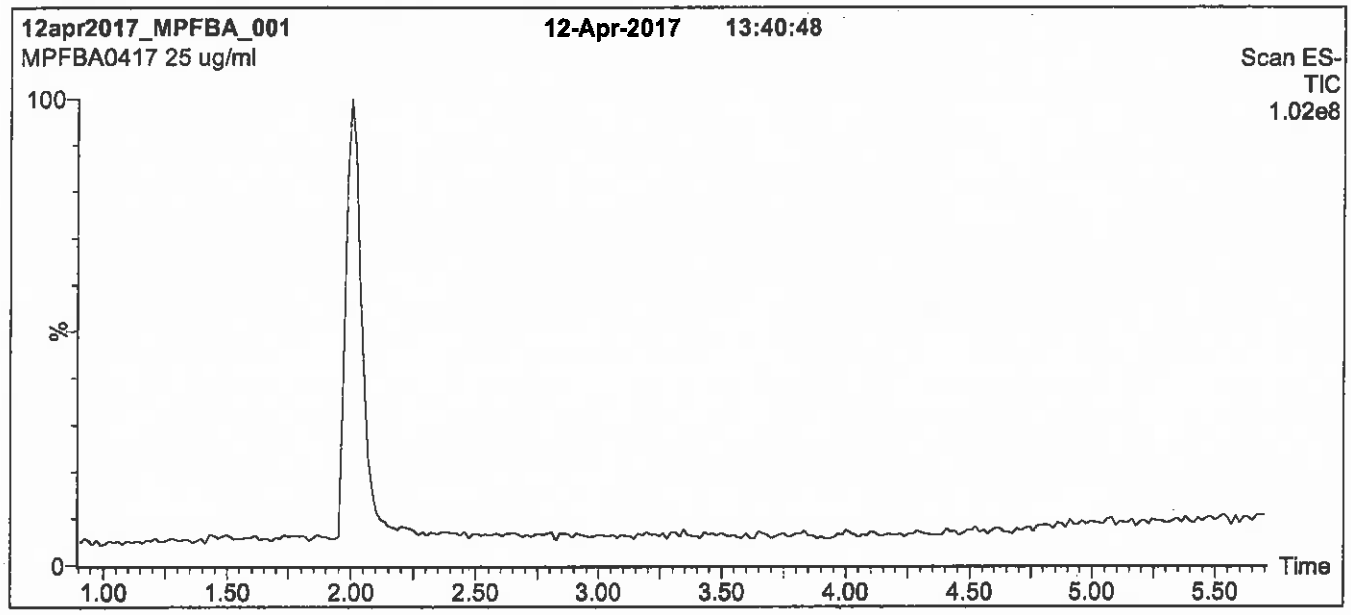
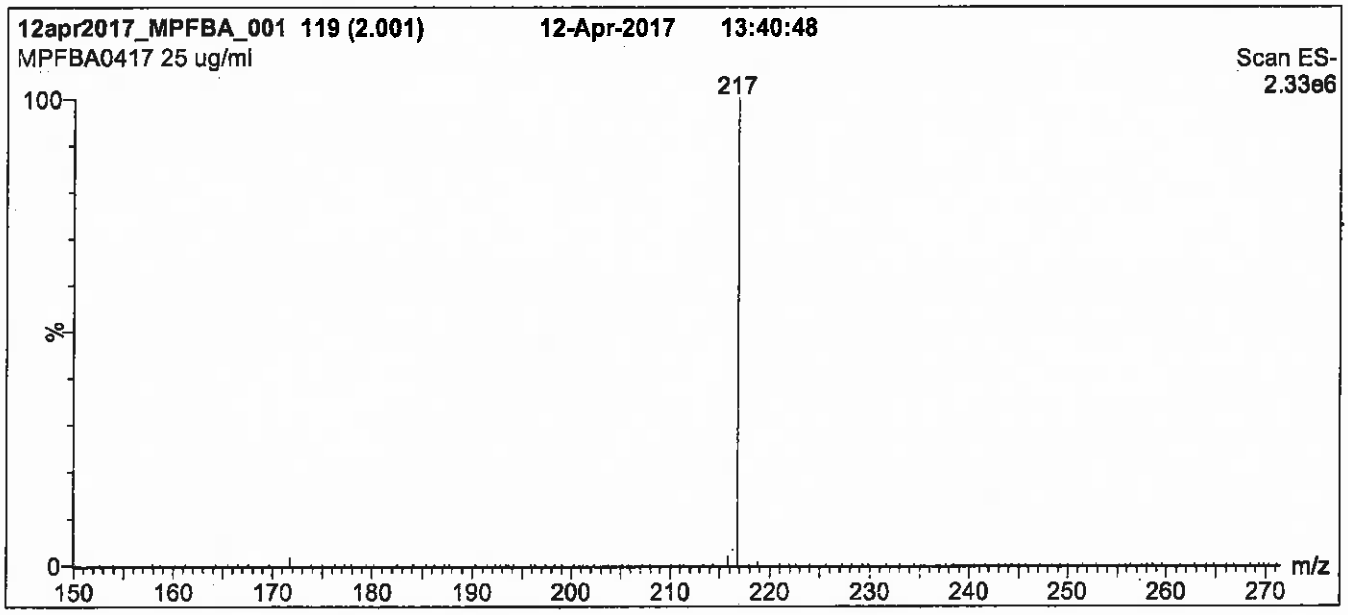




Conditions for Figure 1:

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

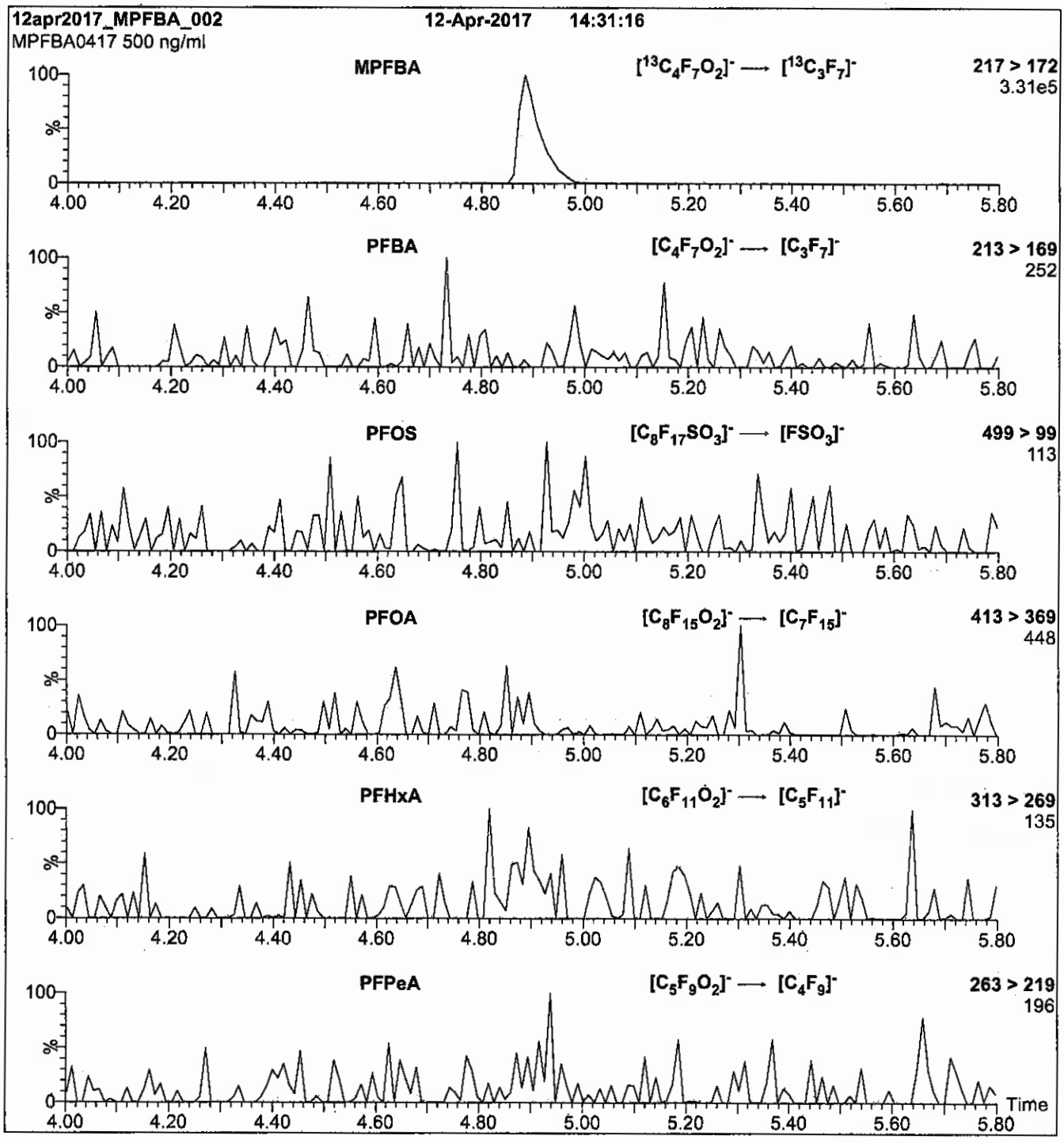
Flow: 300 µl/min

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

LCMPFBA_00012

Pr 8/30/17 SV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

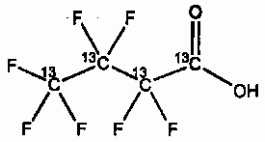
PRODUCT CODE: MPFBA

LOT NUMBER: MPFBA0417

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) 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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim, General Manager

Date: 04/20/2017 (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.

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. 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.

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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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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

ANAB ACCREDITED

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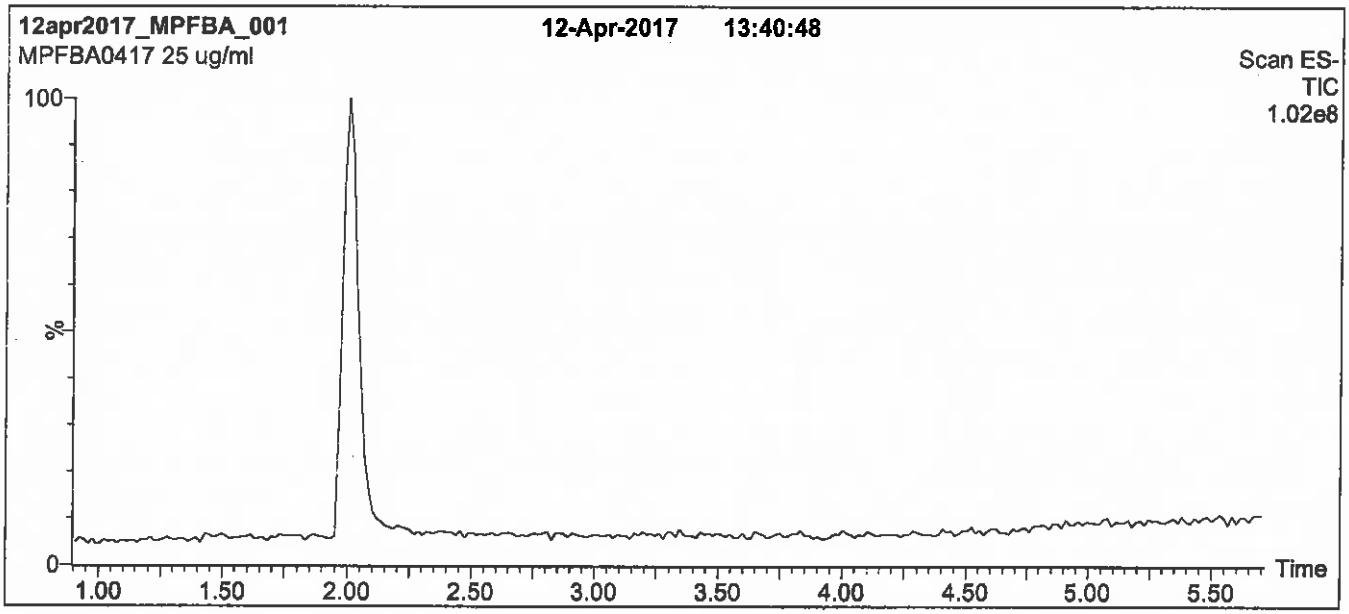

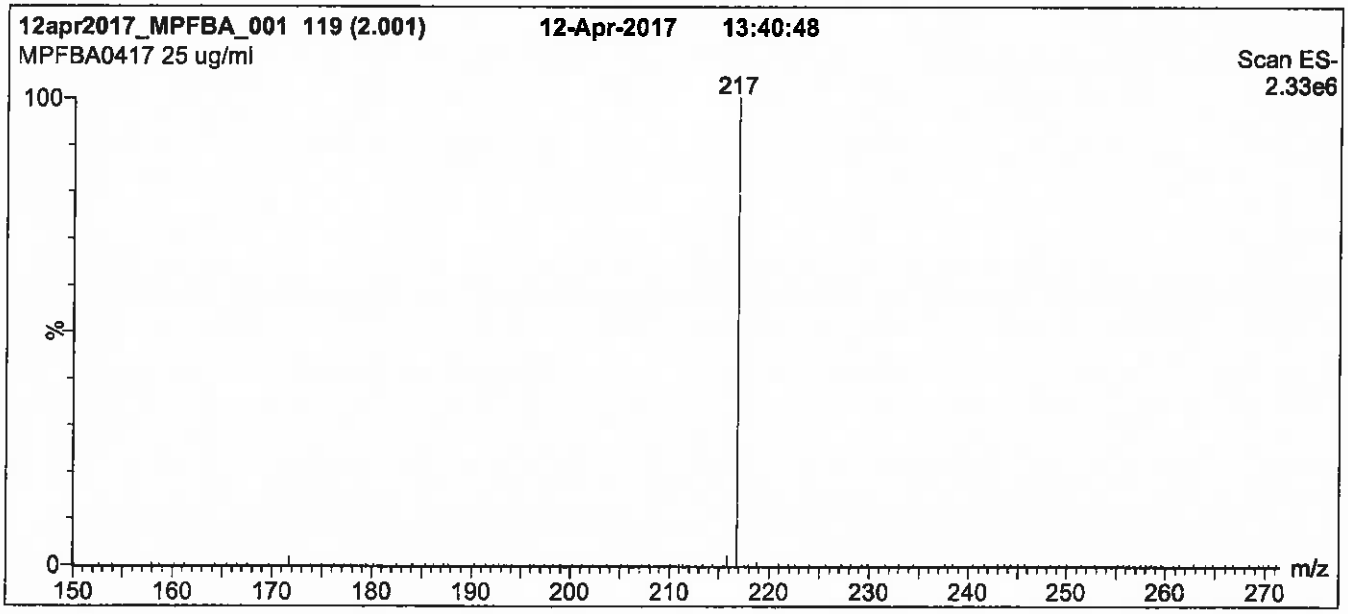

Conditions for Figure 1:

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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: 30% (80:20 MeOH:ACN) / 70% H_2O
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Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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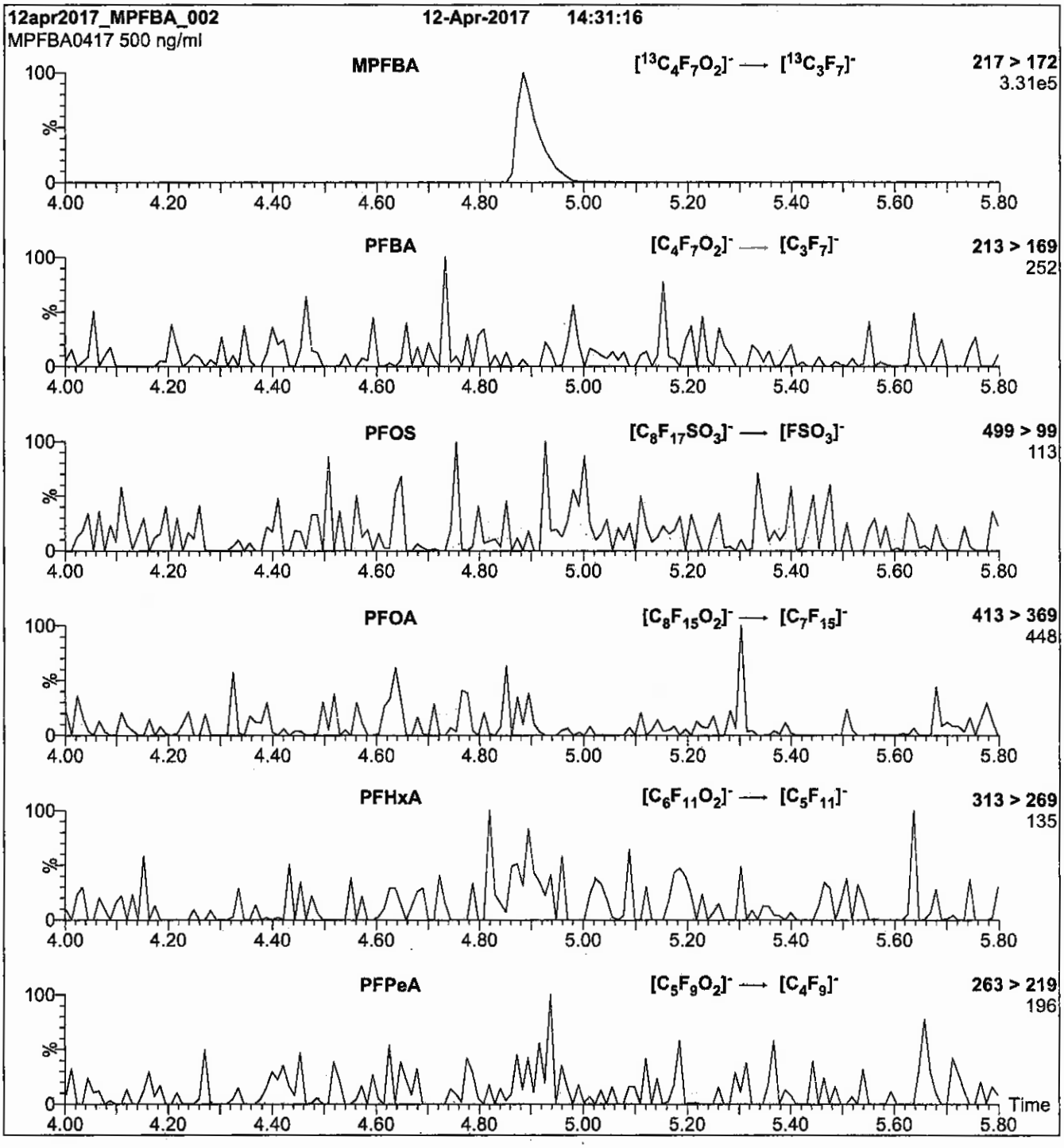
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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

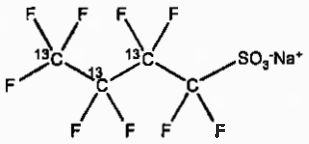
LCMPFBS_00003

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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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:

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, 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

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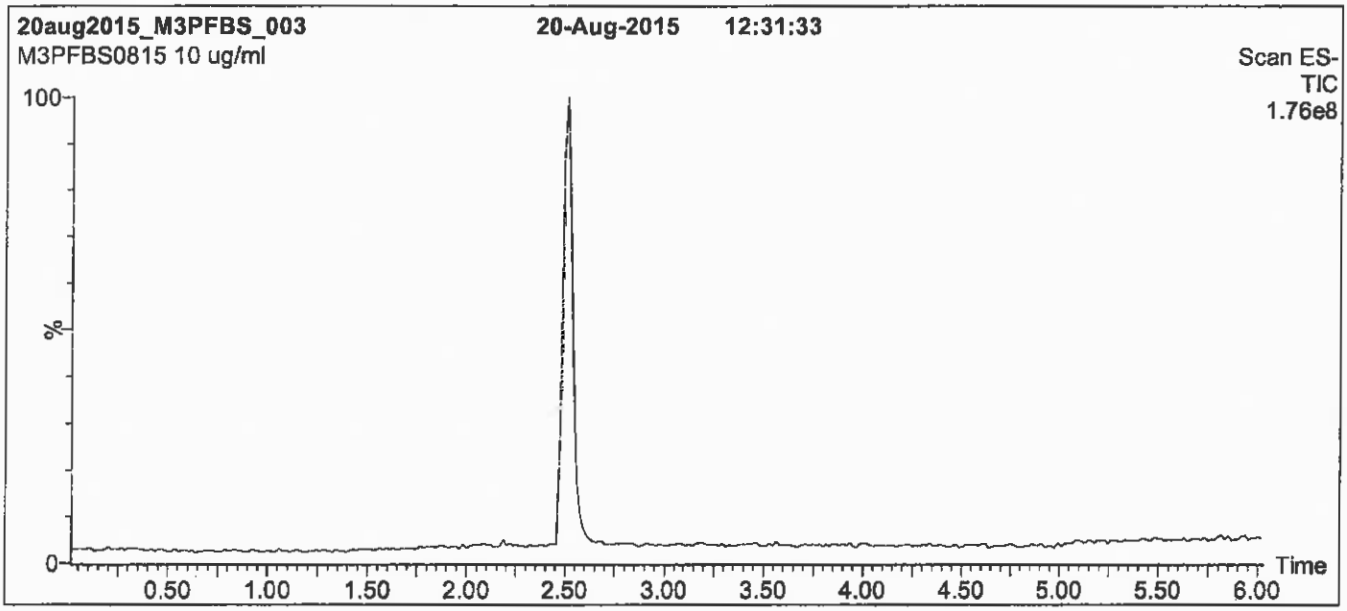
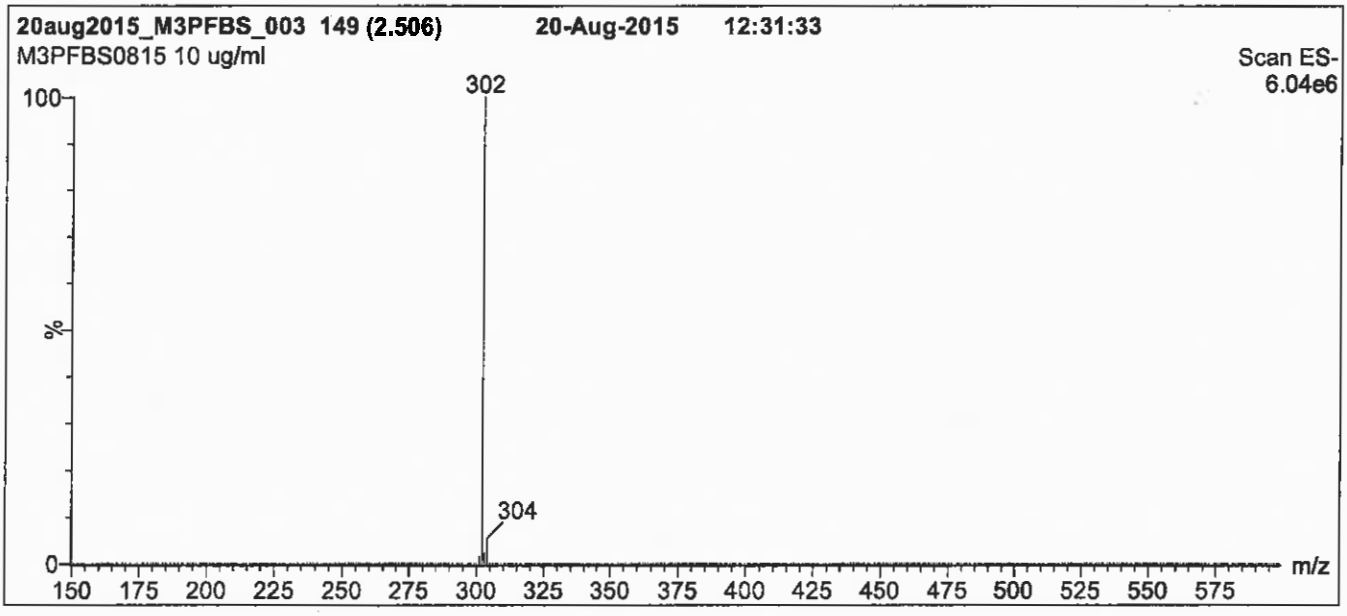
Figure 1: **M3PFBS; LC/MS Data (TIC and Mass Spectrum)**





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

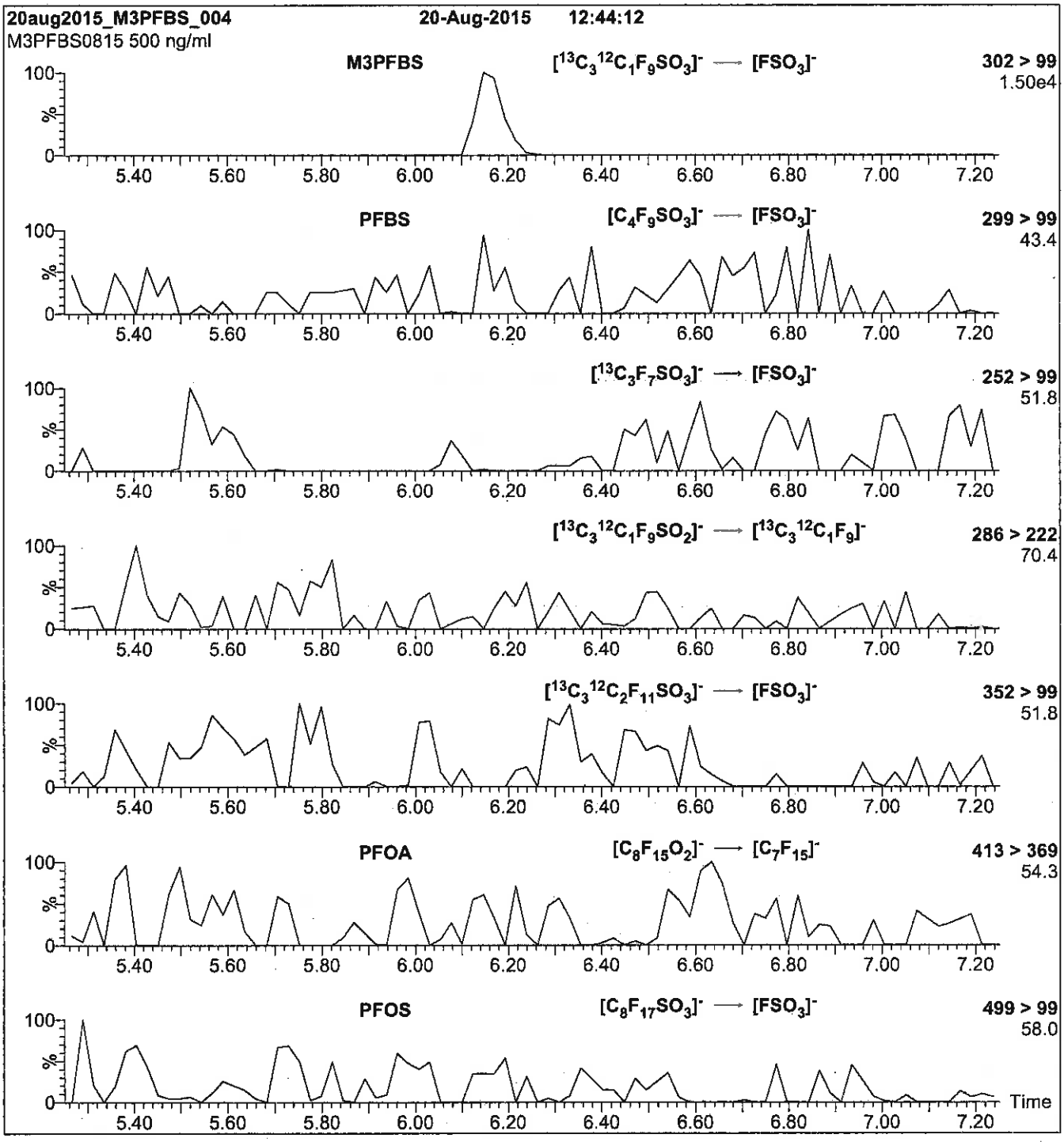
Flow: 300 µl/min

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

LCMPFBS_00004

r: 7/5/17 SA

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

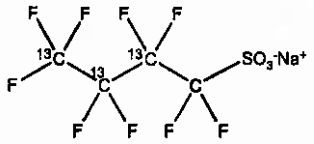
PRODUCT CODE: M3PFBS

LOT NUMBER: M3PFBS0815

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

STRUCTURE:

CAS #: Not available



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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:

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Certified By: B.G. Chittim, General Manager

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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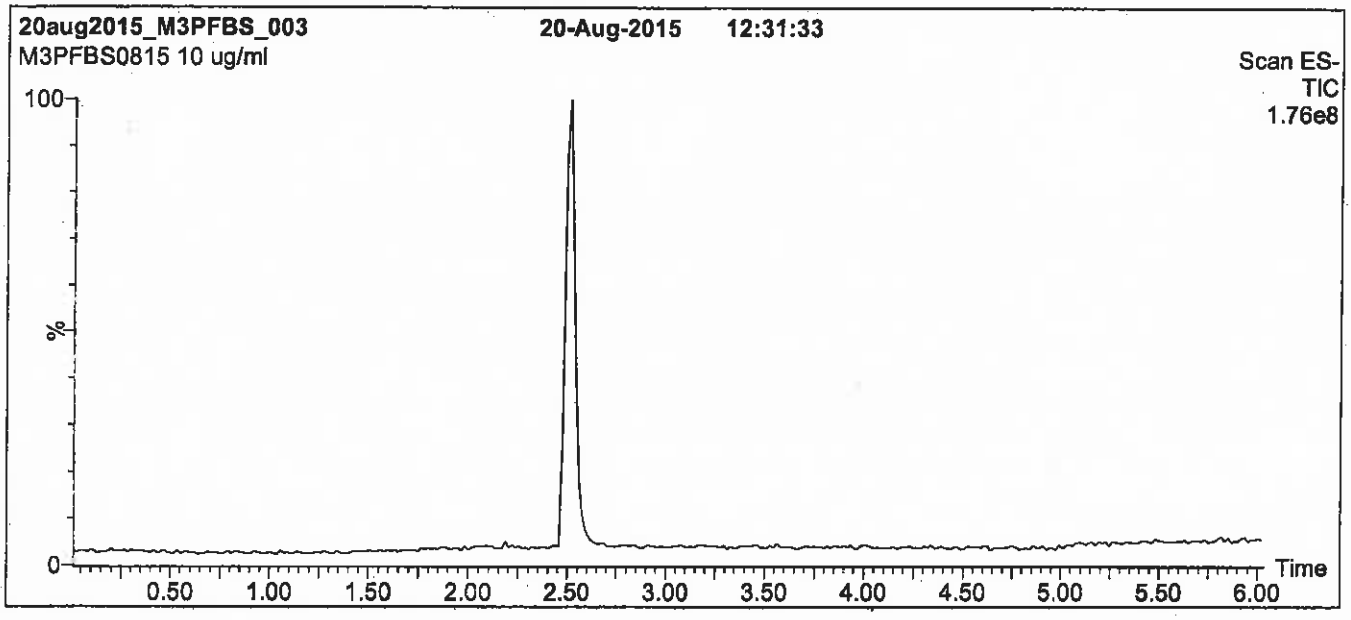

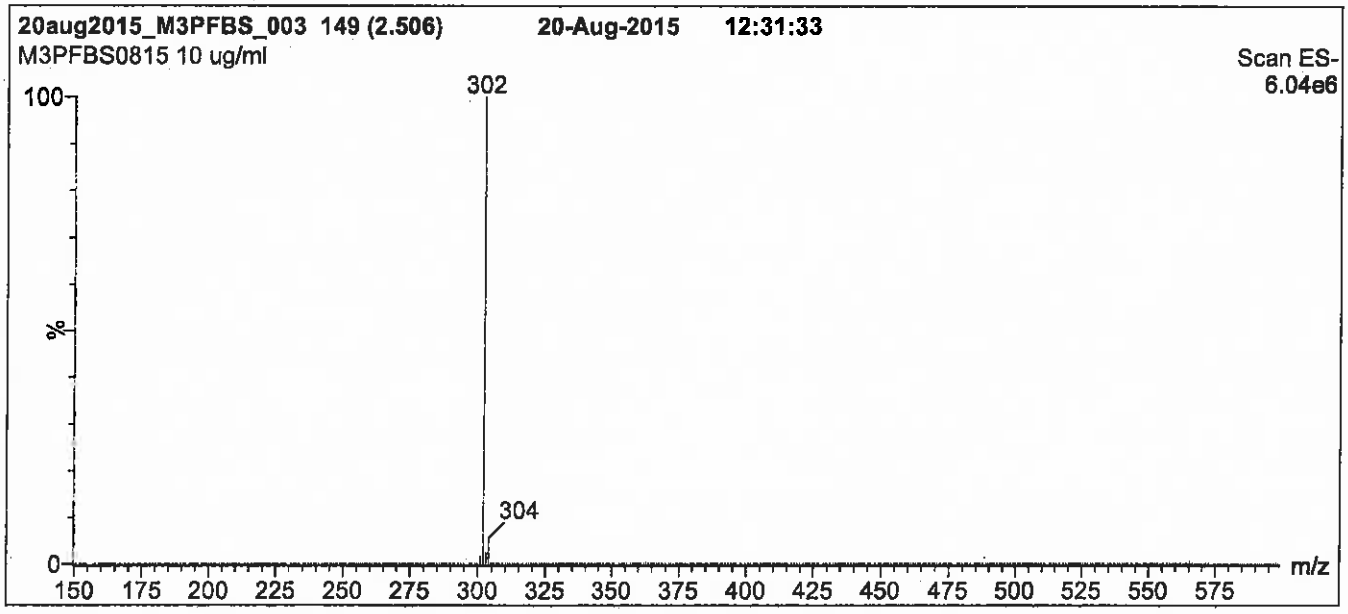

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LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

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1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
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Ramp to 90% organic over 7 min and hold for
2 min 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

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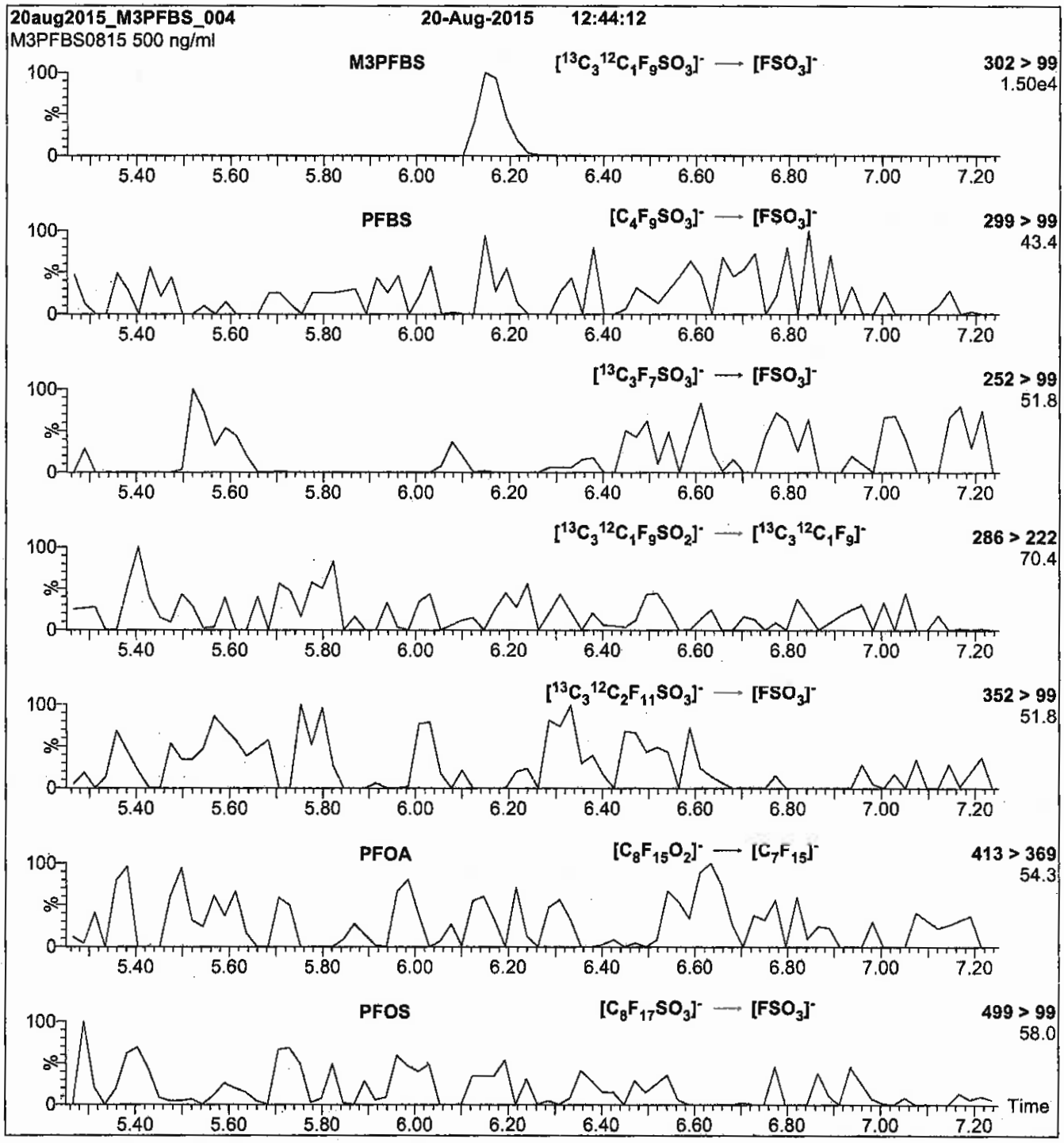

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Injection: Direct loop injection
10 µl (500 ng/ml M3PFBS)

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(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_00005

r-5 8/30/17 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

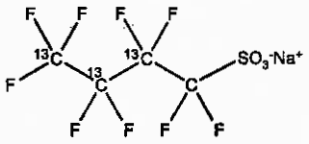
PRODUCT CODE: M3PFBS

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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
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. 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

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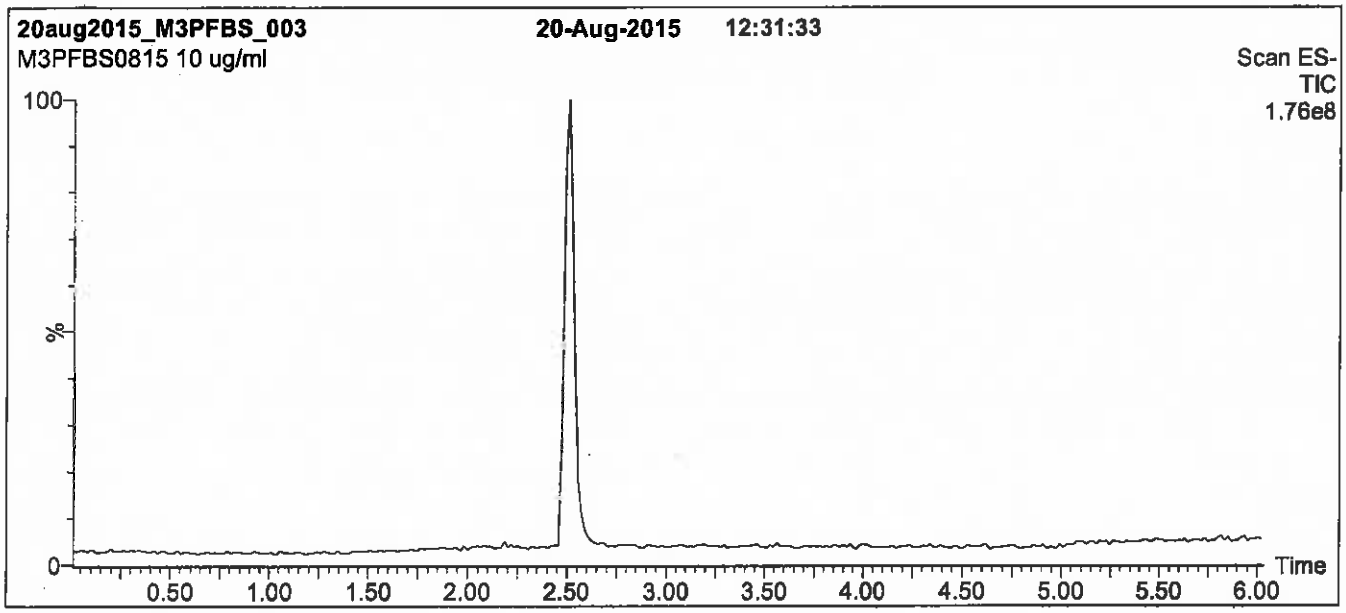
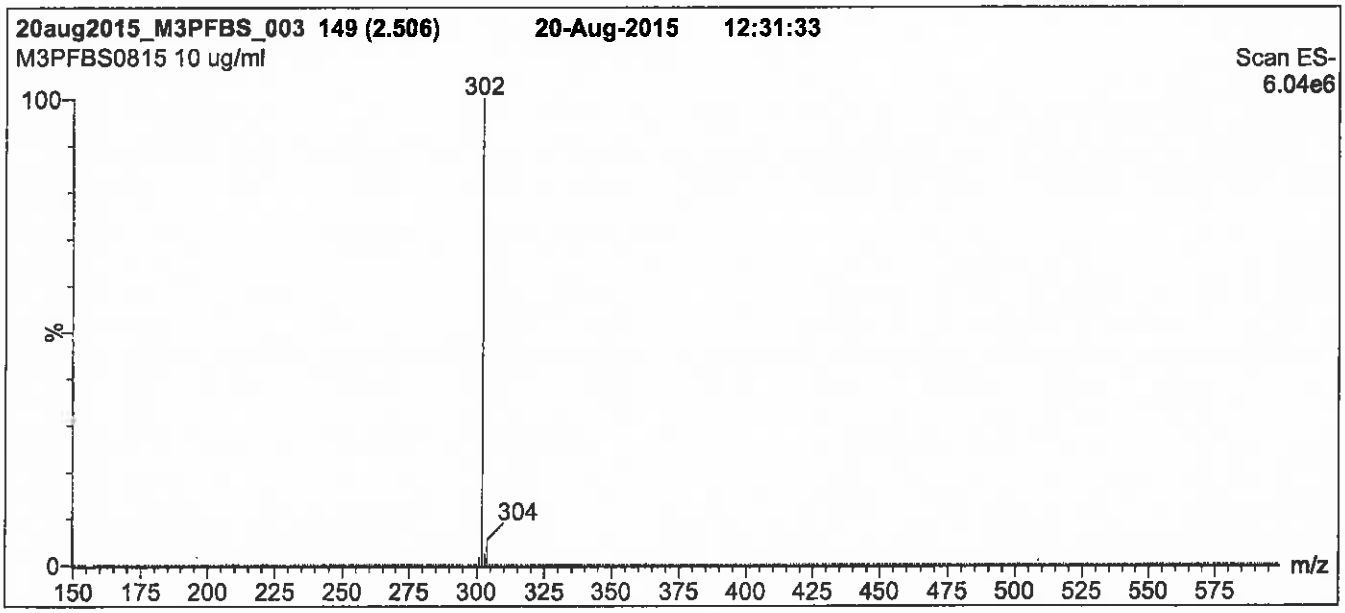
Figure 1: **M3PFBS; LC/MS Data (TIC and Mass Spectrum)**





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

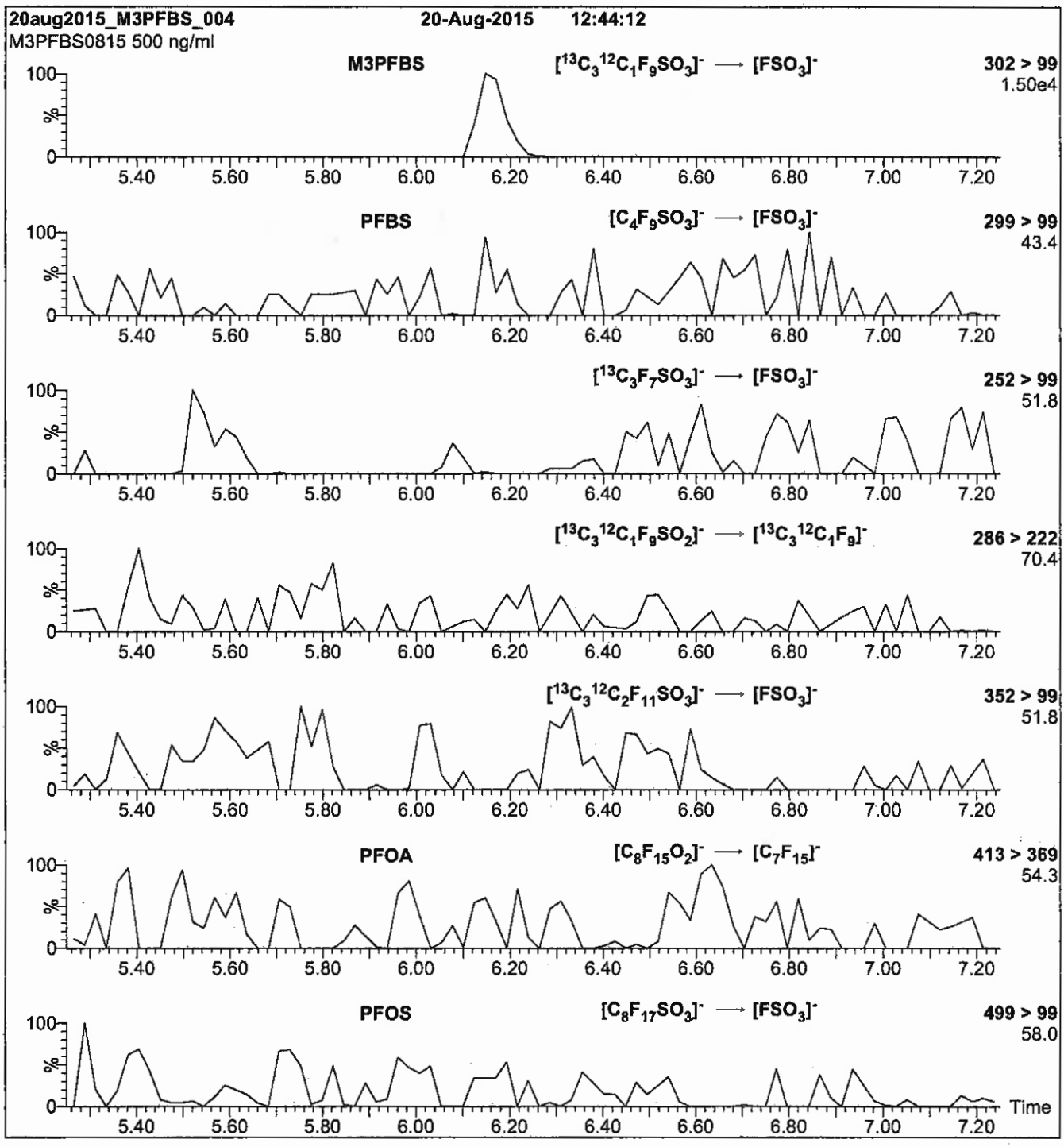
Flow: 300 µl/min

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

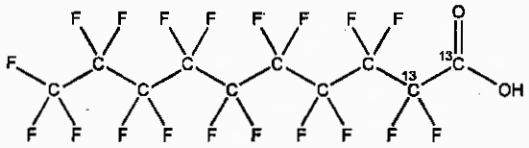
LCMPFDA_00015

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA0916
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	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

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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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:

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CALA

ANAB ACCREDITED

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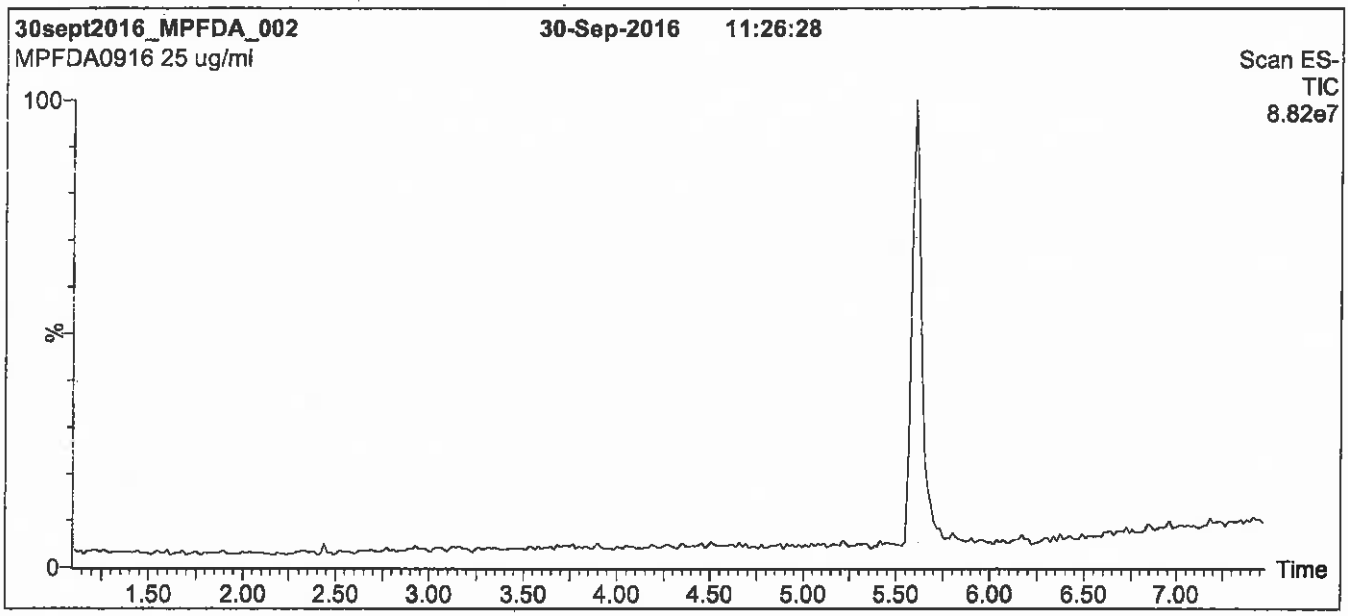
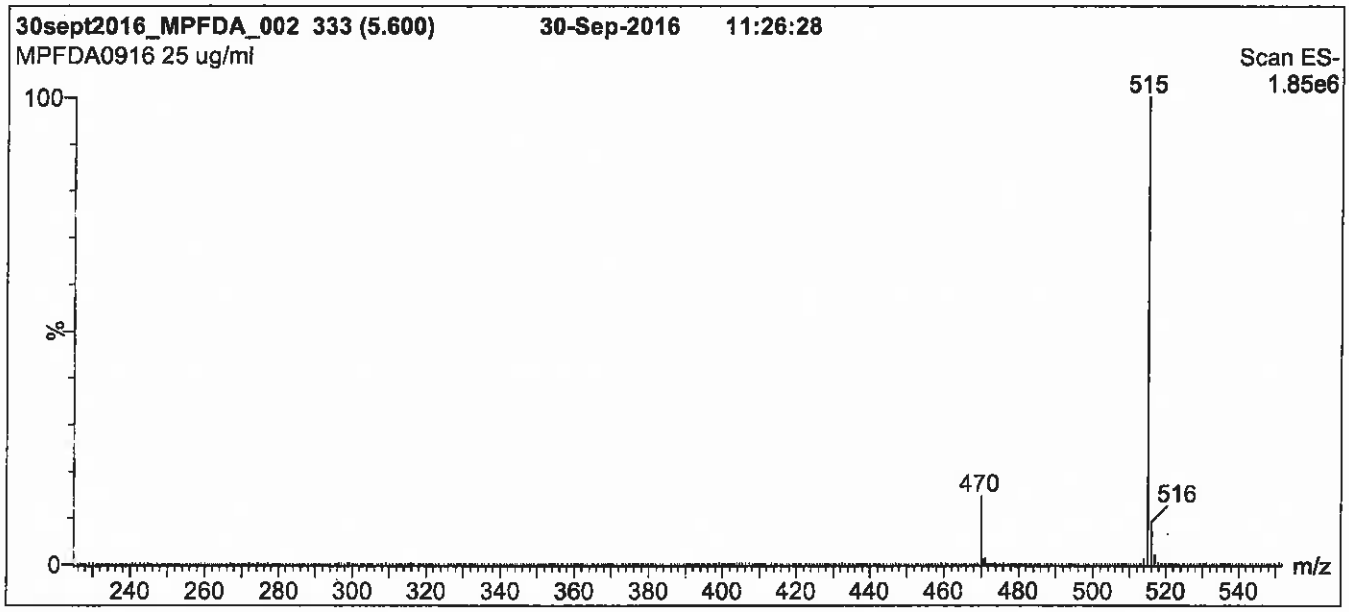




Conditions for Figure 1:

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

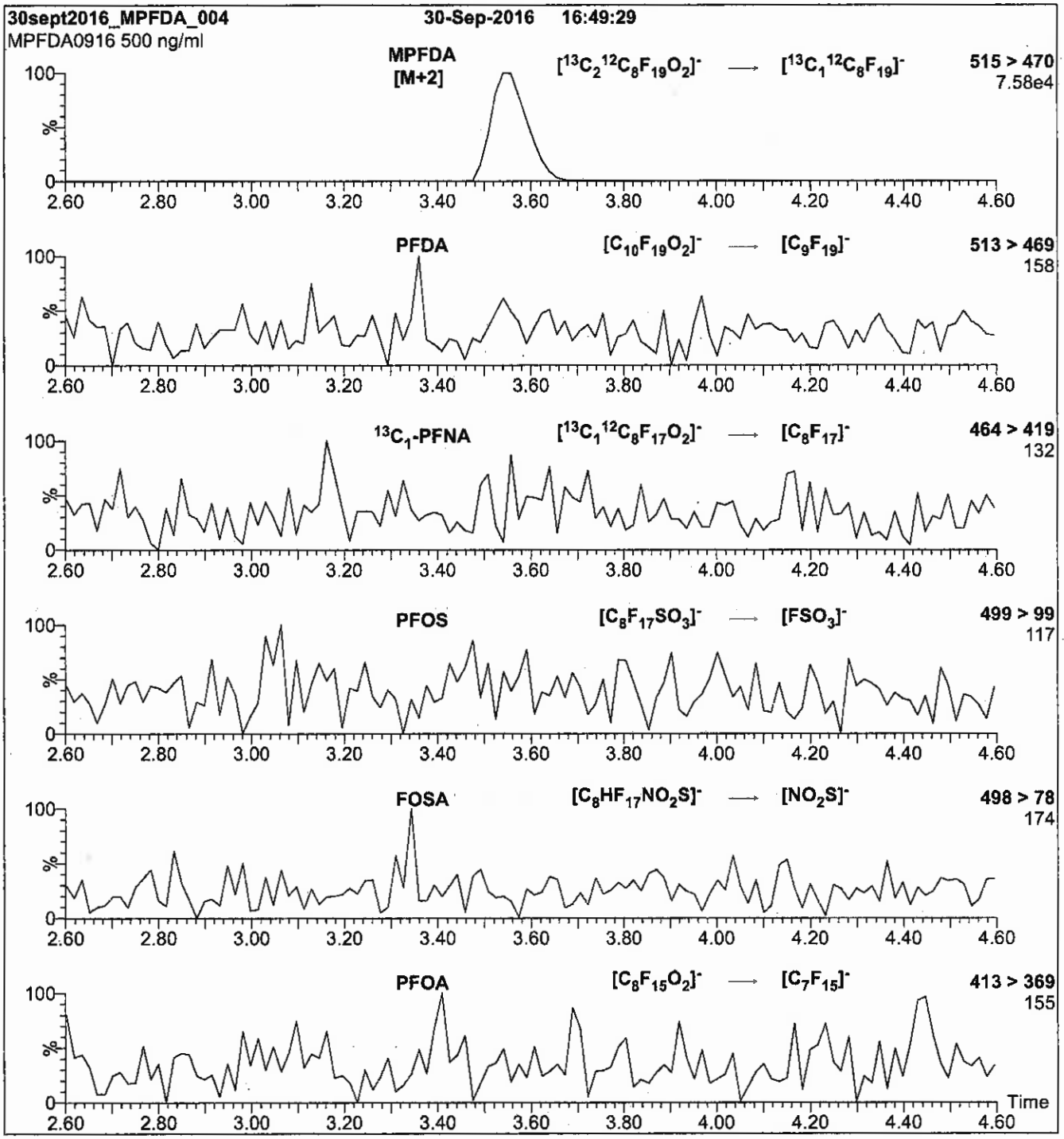
Flow: 300 µl/min

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

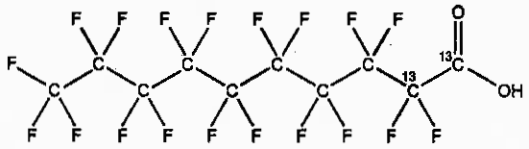
LCMPFDA_00016

r: 7/5/17 SD

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA0916
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	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)

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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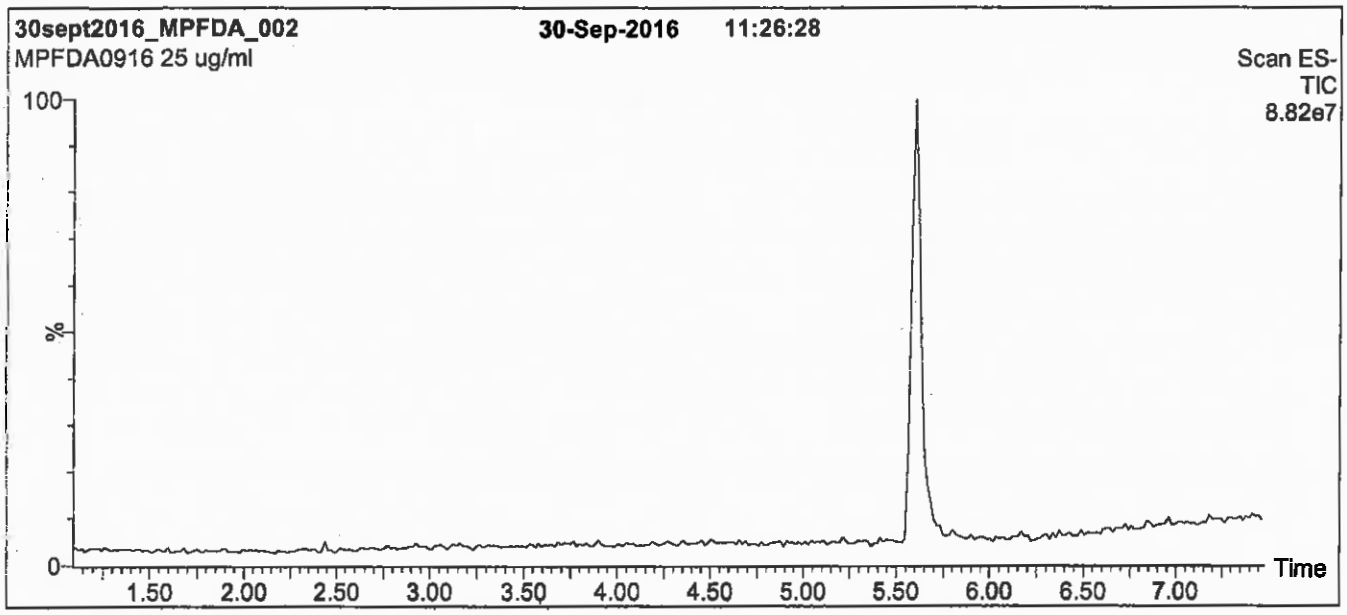
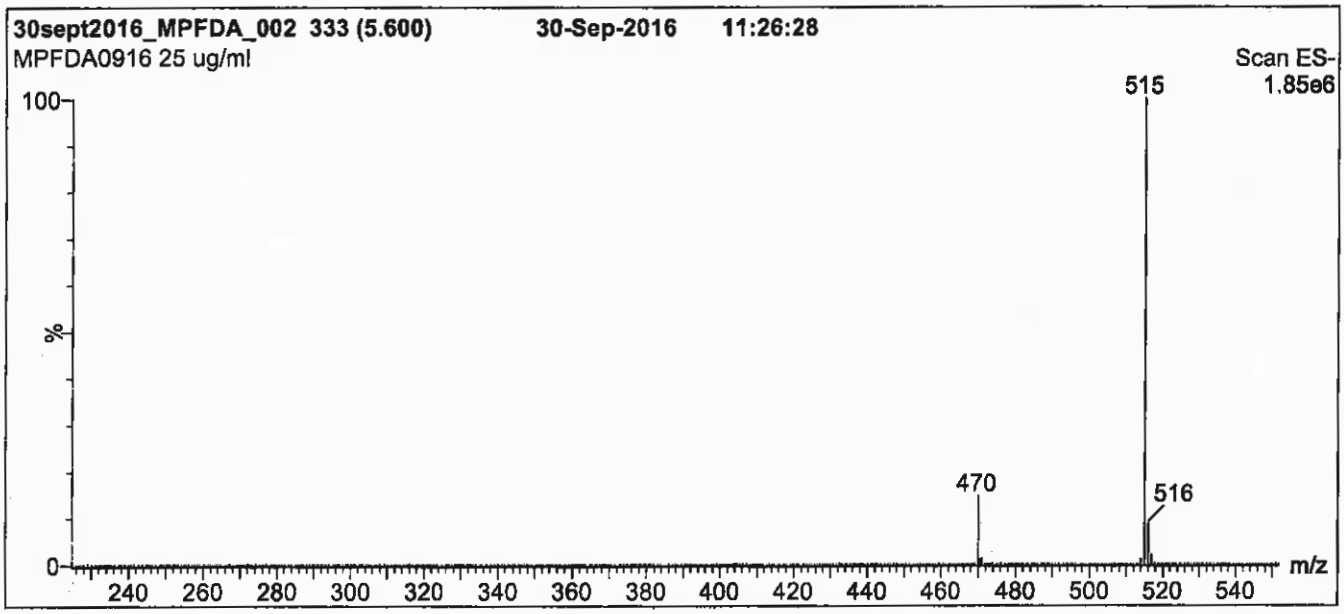




Conditions for Figure 1:

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: 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

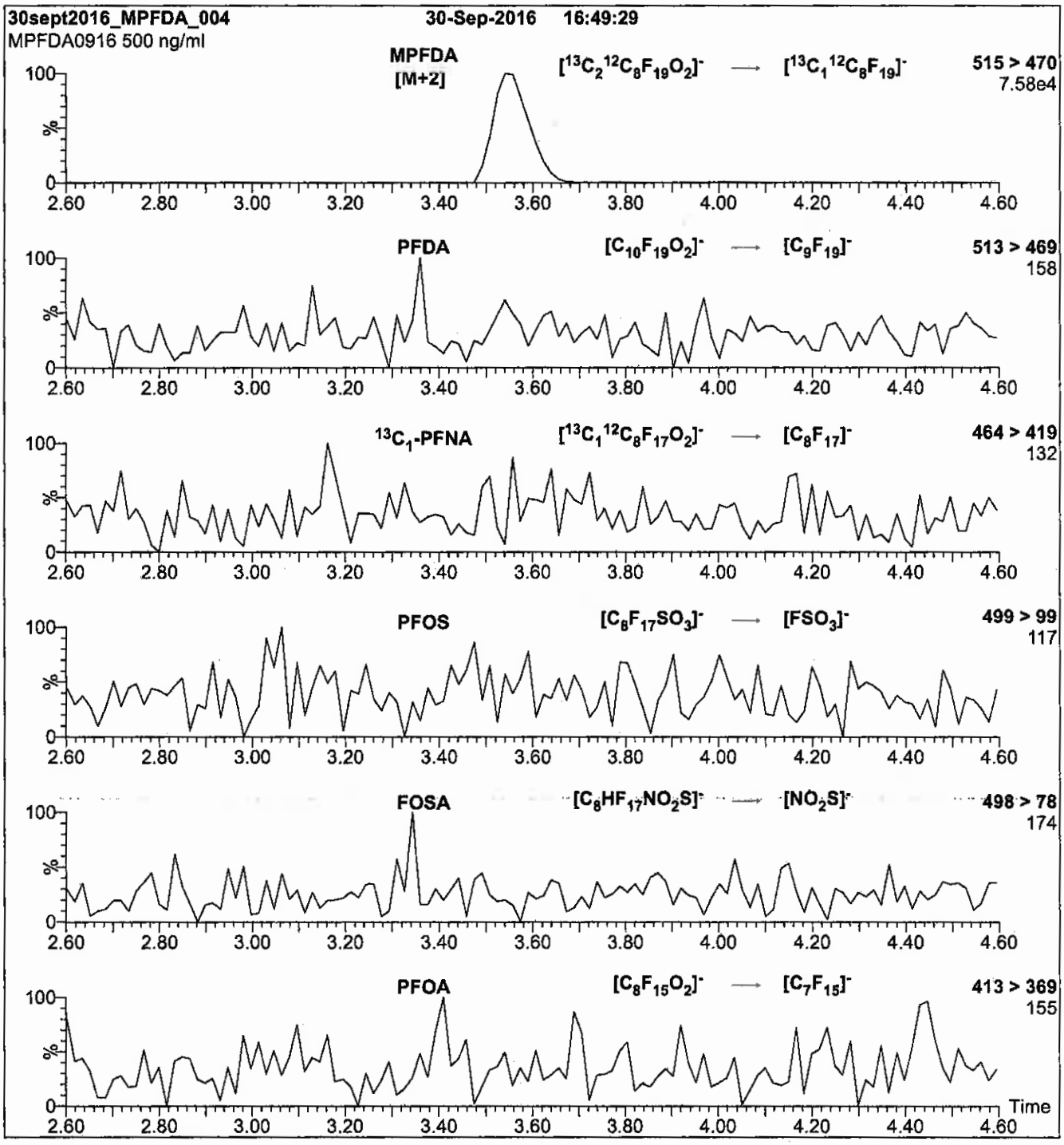
Flow: 300 µl/min

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

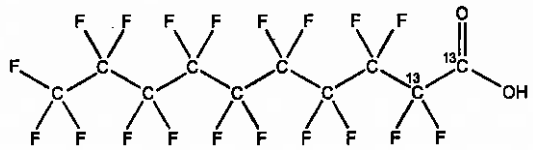
Reagent

LCMPFDA_00017

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA0717
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	07/13/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/13/2022		
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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Certified By: _____ **Date:** 07/14/2017 (mm/dd/yyyy)
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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.

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CALA

ANAB ACCREDITED

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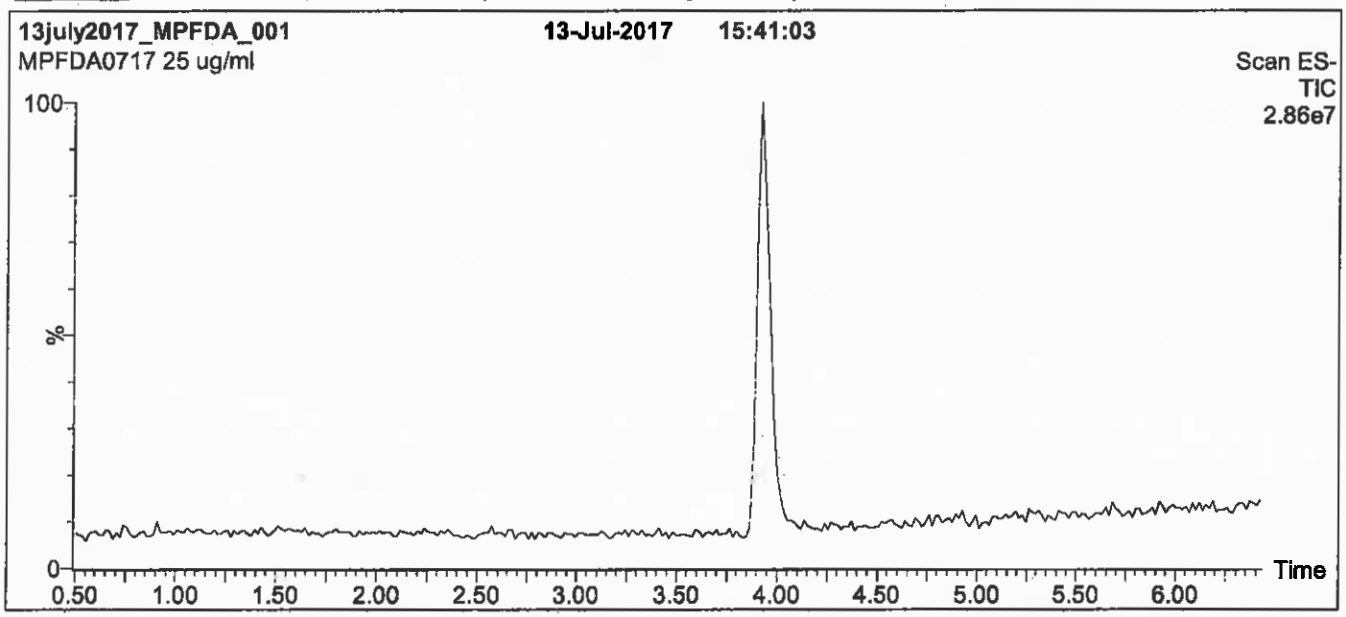
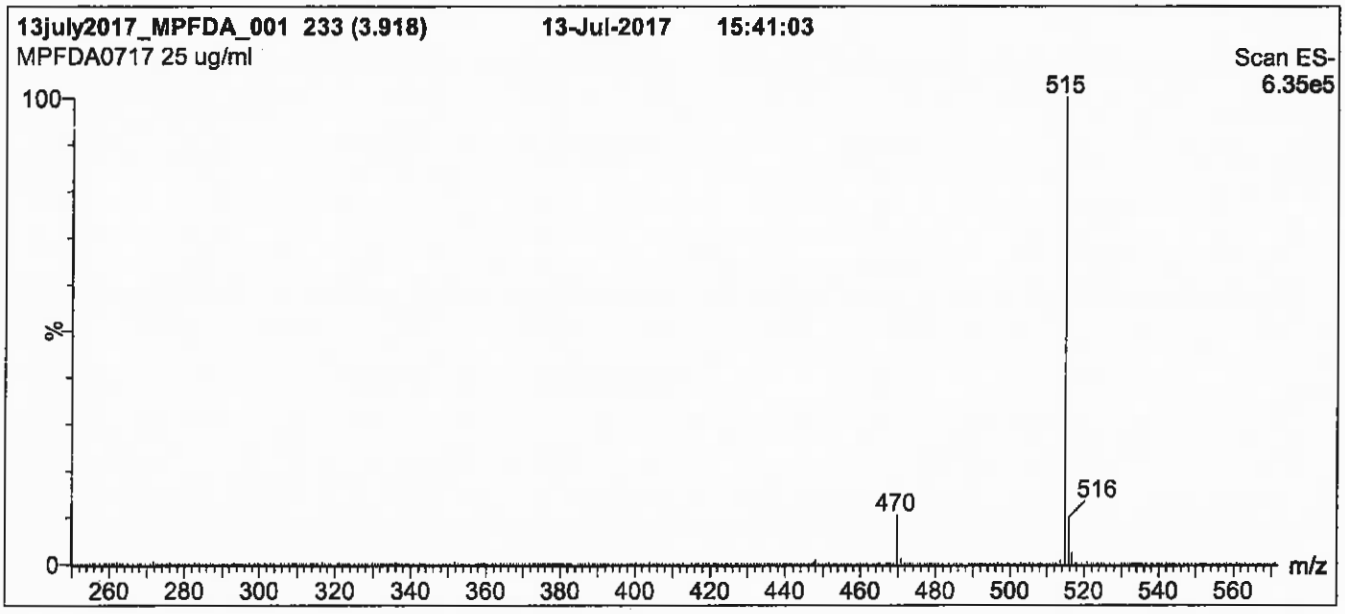
Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





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: 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

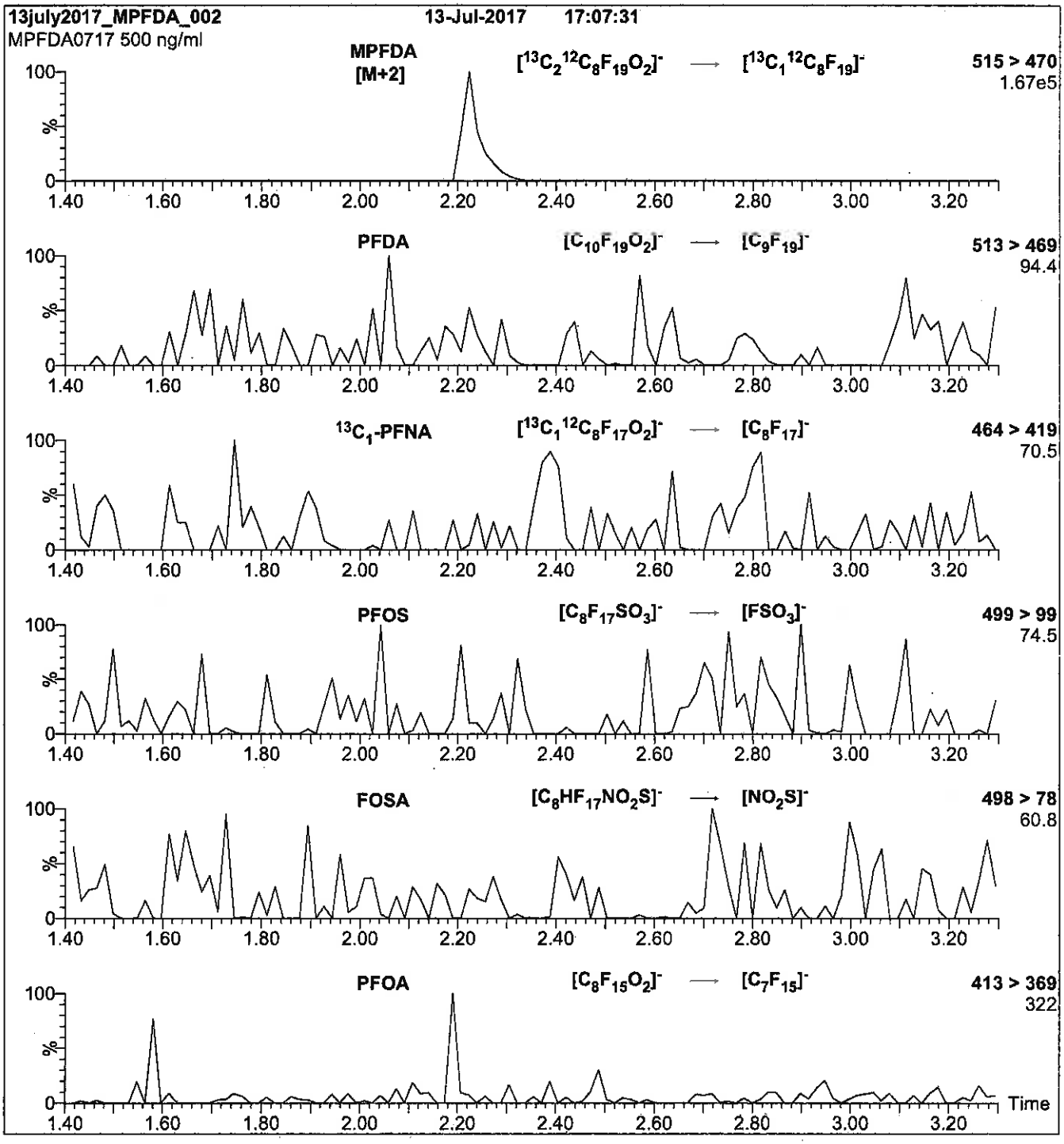
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
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) = 3.17e-3
Collision Energy (eV) = 13

Reagent

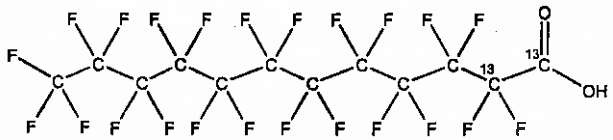
LCMPFDoA_00010

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)
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:** 04/15/2016 (mm/dd/yyyy)
B.G. Chittim

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

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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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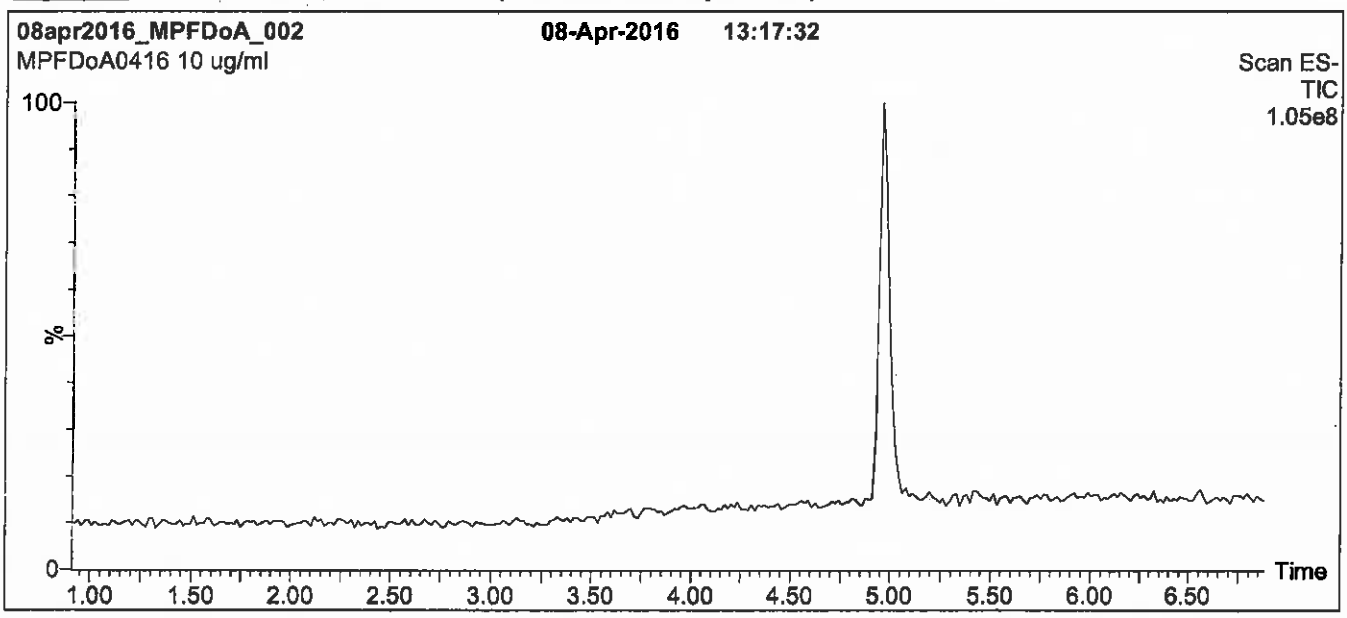

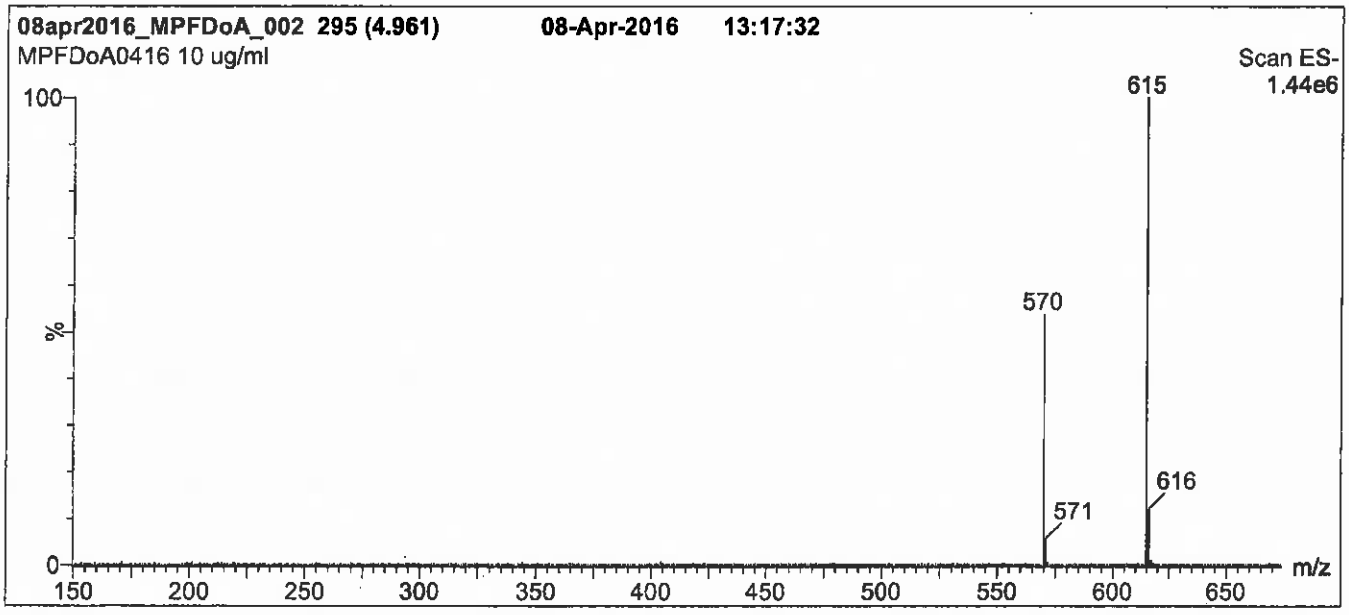

Conditions for Figure 1:

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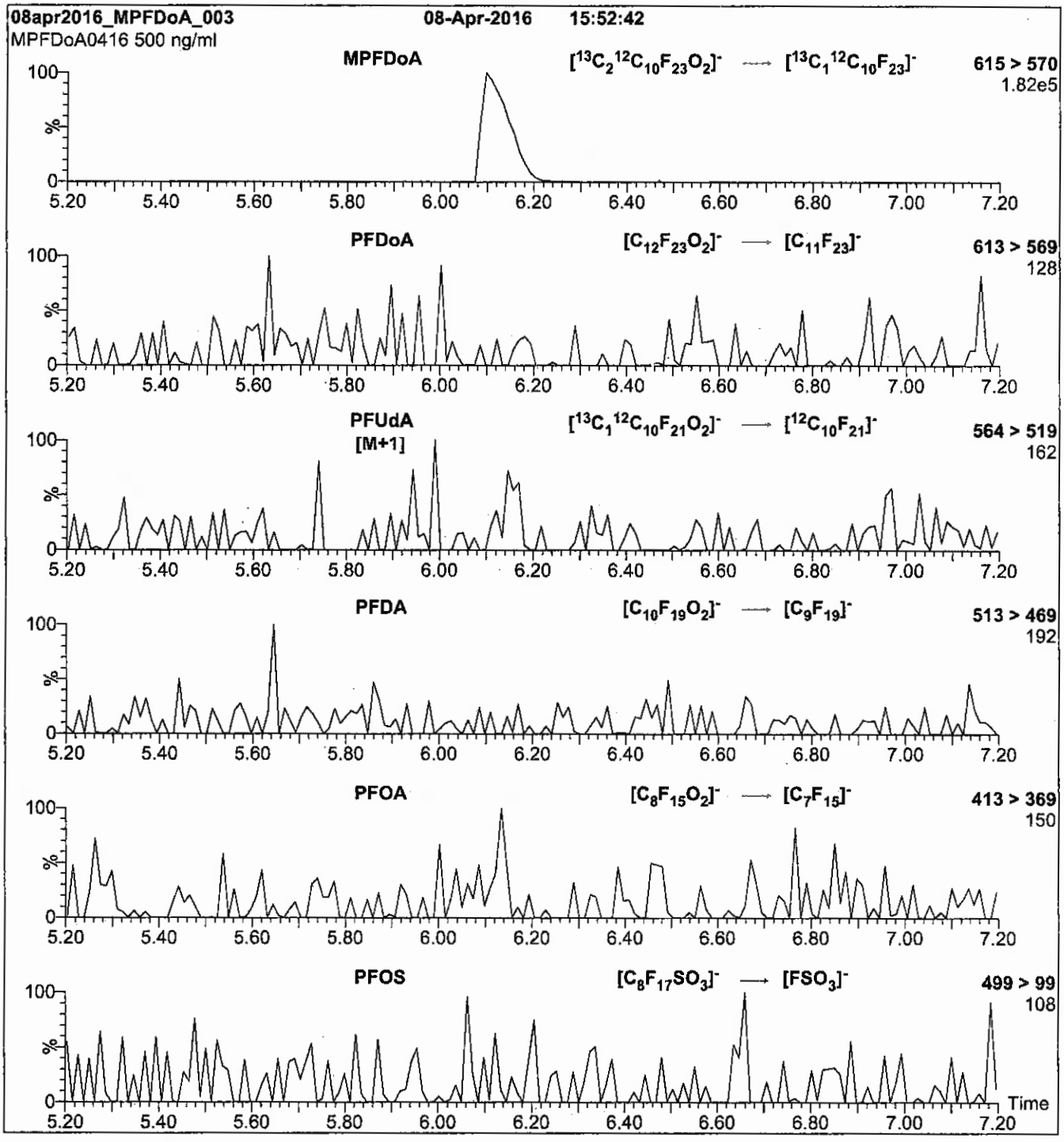
Figure 2: **MPFDoA; LC/MS/MS Data (Selected MRM Transitions)**



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

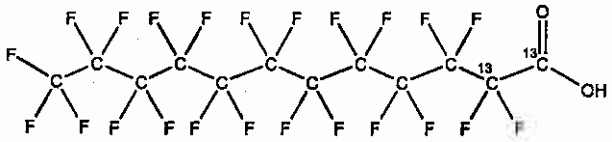
PRODUCT CODE: MPFDoA

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

LOT NUMBER: MPFDoA0517

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_{10}HF_{23}O_2$

CONCENTRATION: 50 ± 2.5 µg/ml

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 05/23/2017

EXPIRY DATE: (mm/dd/yyyy) 05/23/2022

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 616.08

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

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

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.

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Certified By: B.G. Chittim, General Manager

Date: 05/26/2017 (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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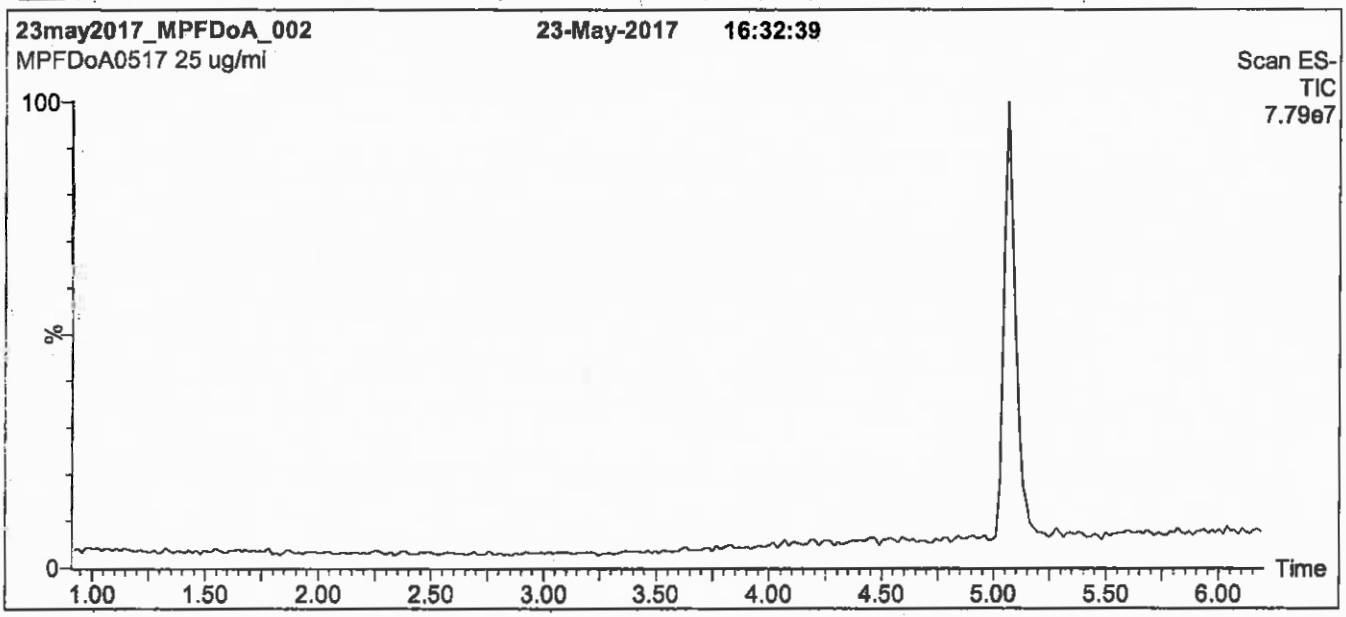

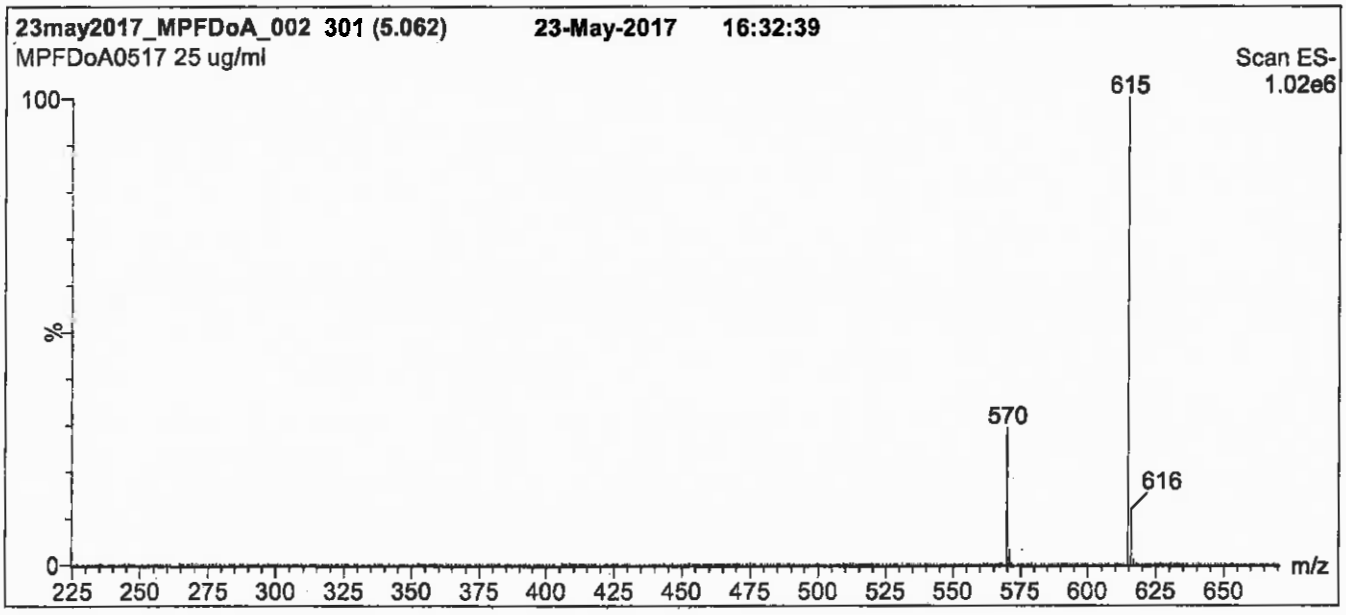

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LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

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

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

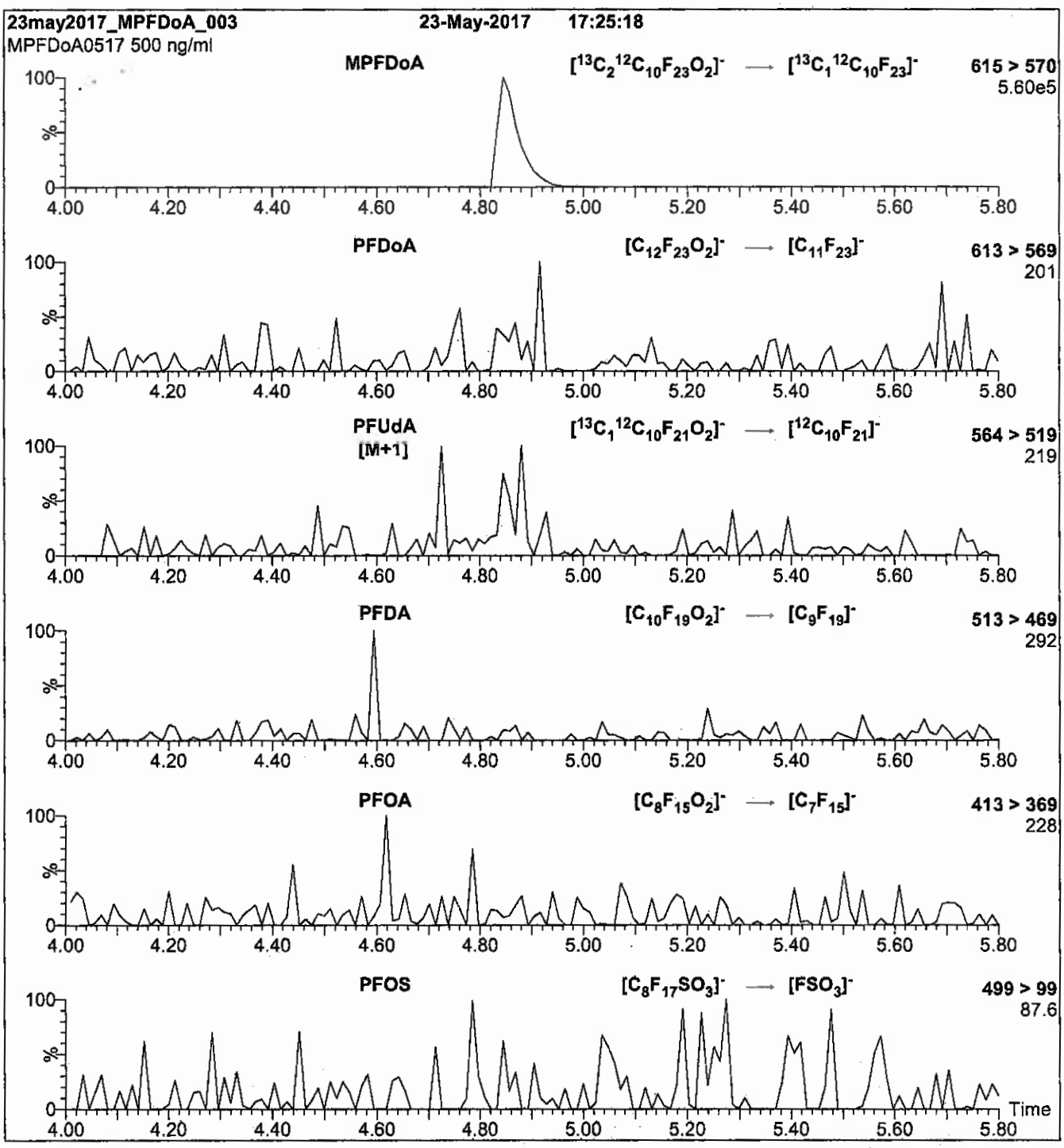
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 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

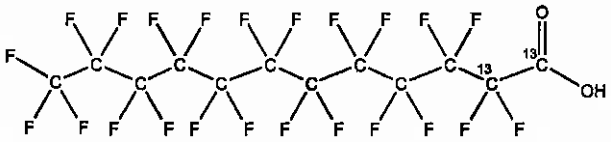
LCMPFDoA_00012

r: 8/30/17 SW

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%)
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LAST TESTED: (mm/dd/yyyy)	05/23/2017		
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QUALITY MANAGEMENT:

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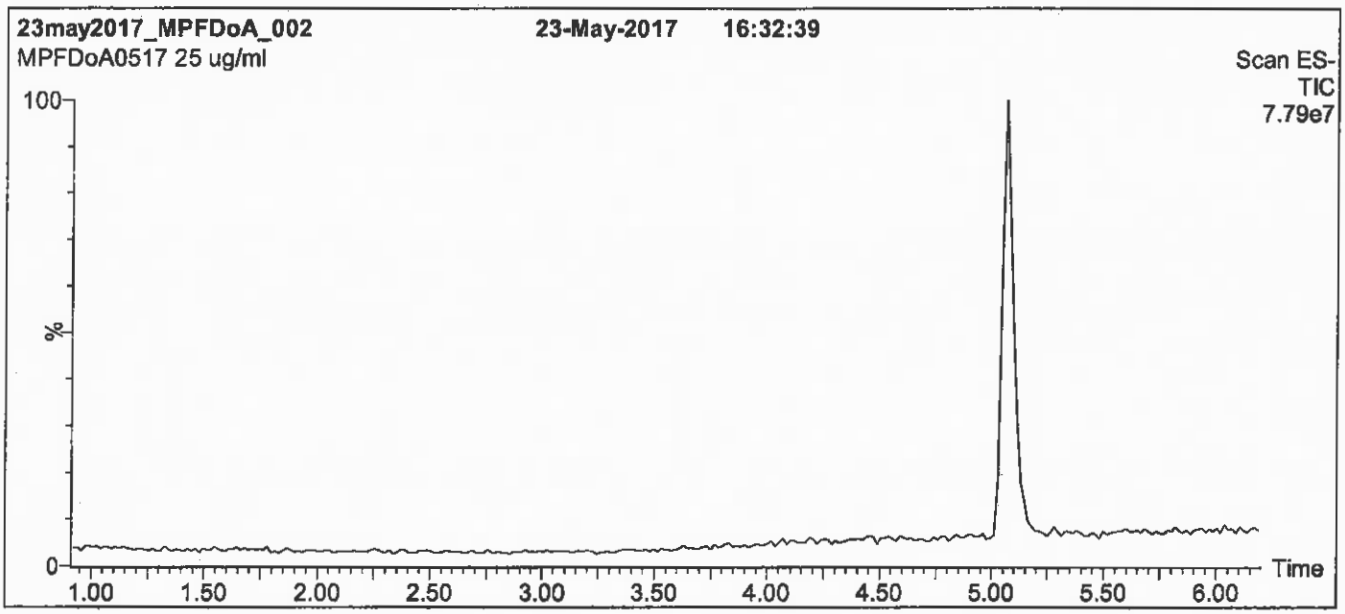
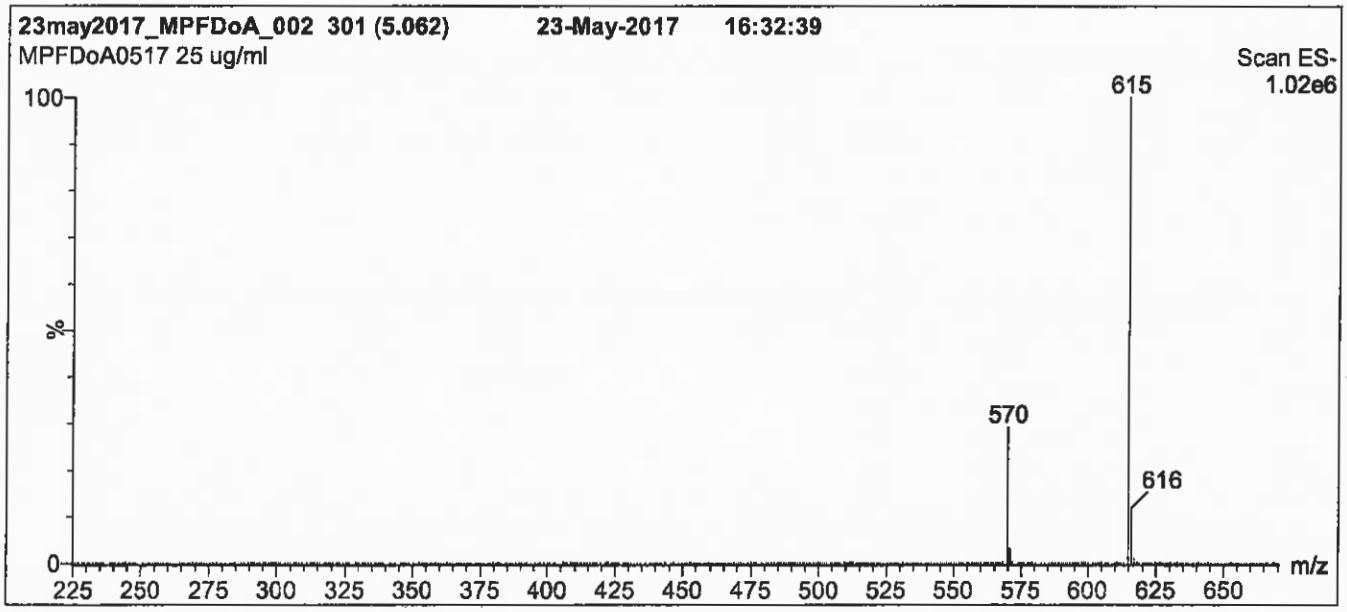
CALA

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: **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

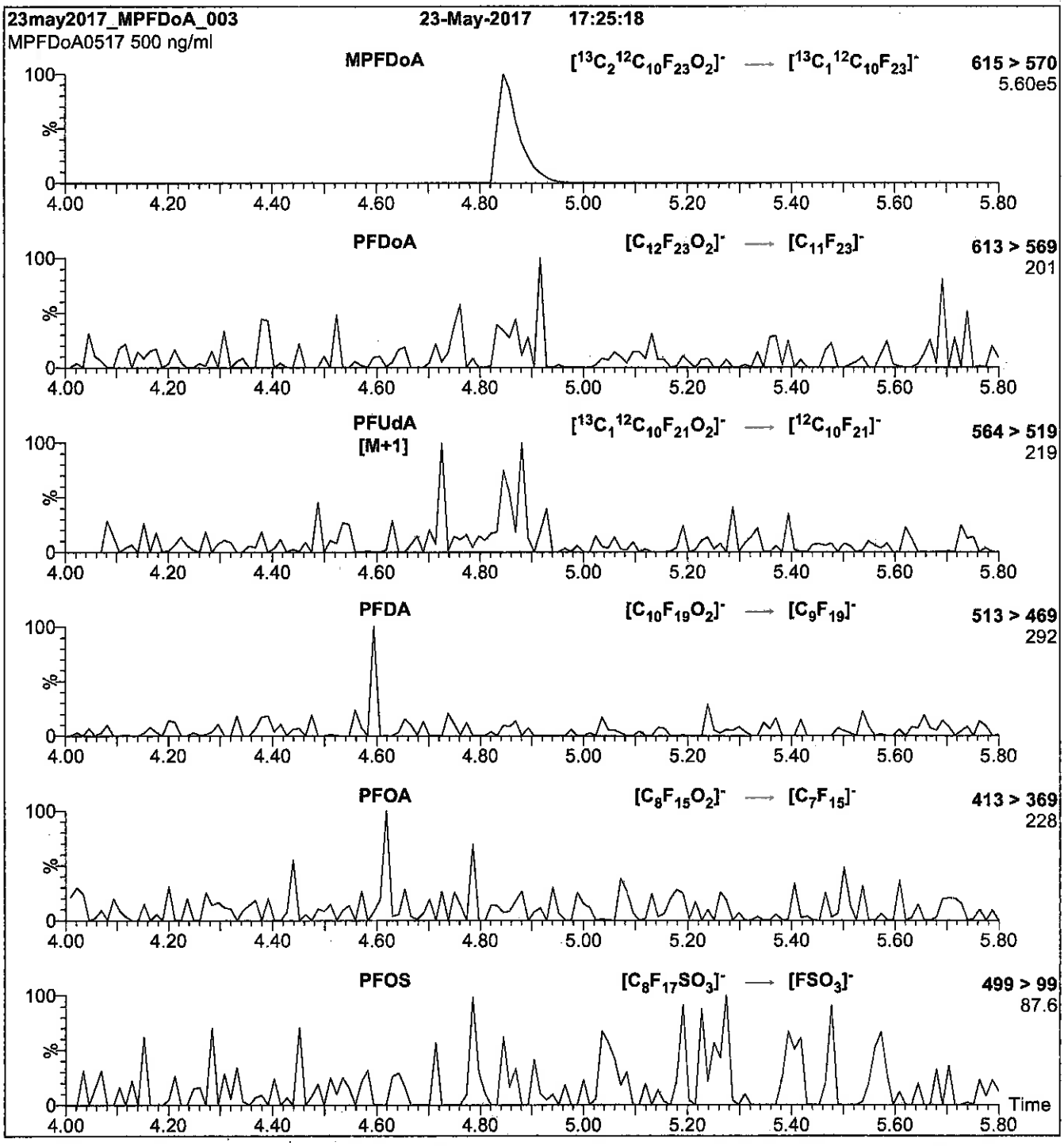
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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

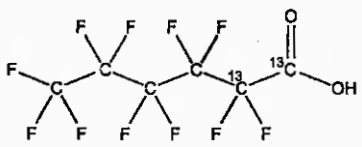
LCMPFHxA_00016

R: 5/3/17 SKN
S: 5/8/17 SKN

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 ($1,2\text{-}^{13}C_2$)
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.
- 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

INTENDED USE:

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HAZARDS:

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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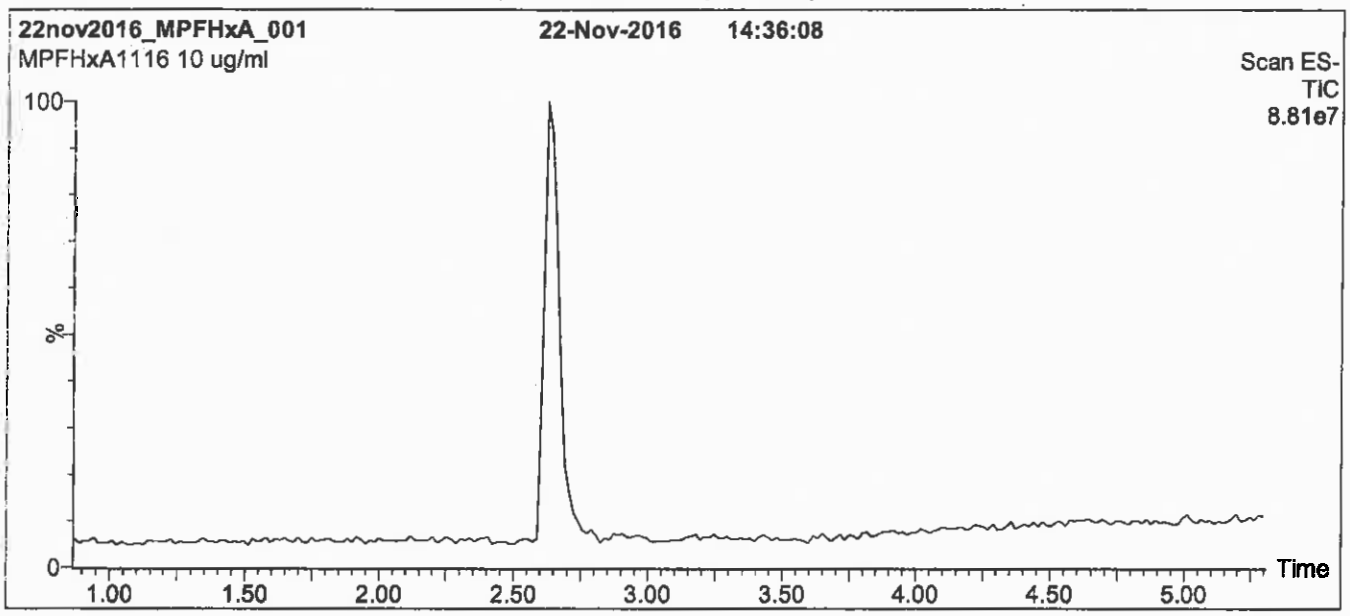
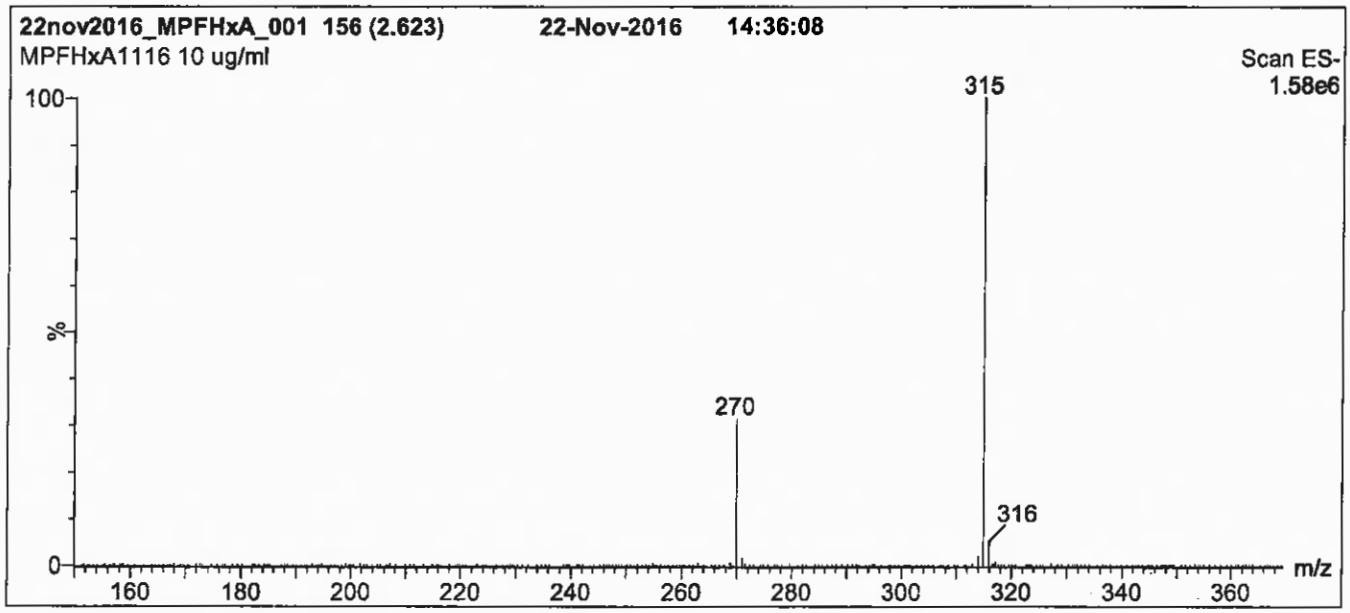
Figure 1: **MPFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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

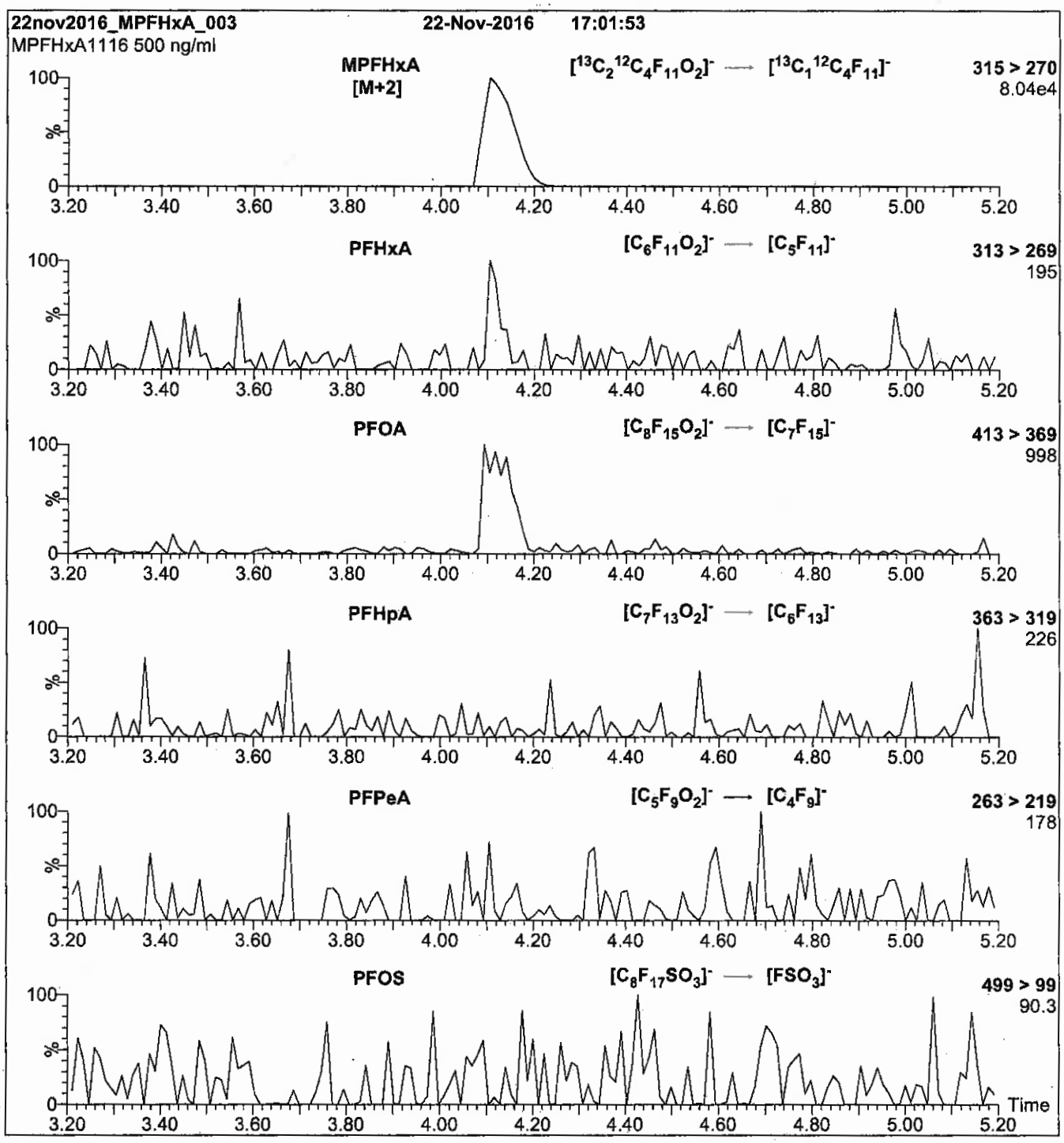
Flow: 300 µl/min

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

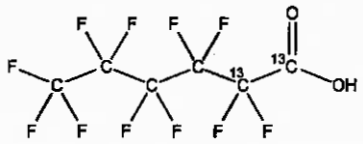
PRODUCT CODE: MPFHxA

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

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

MOLECULAR WEIGHT: 316.04

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

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

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.

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Certified By: B.G. Chittim **Date:** 12/13/2016 (mm/dd/yyyy)

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519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

ANAB ACCREDITED

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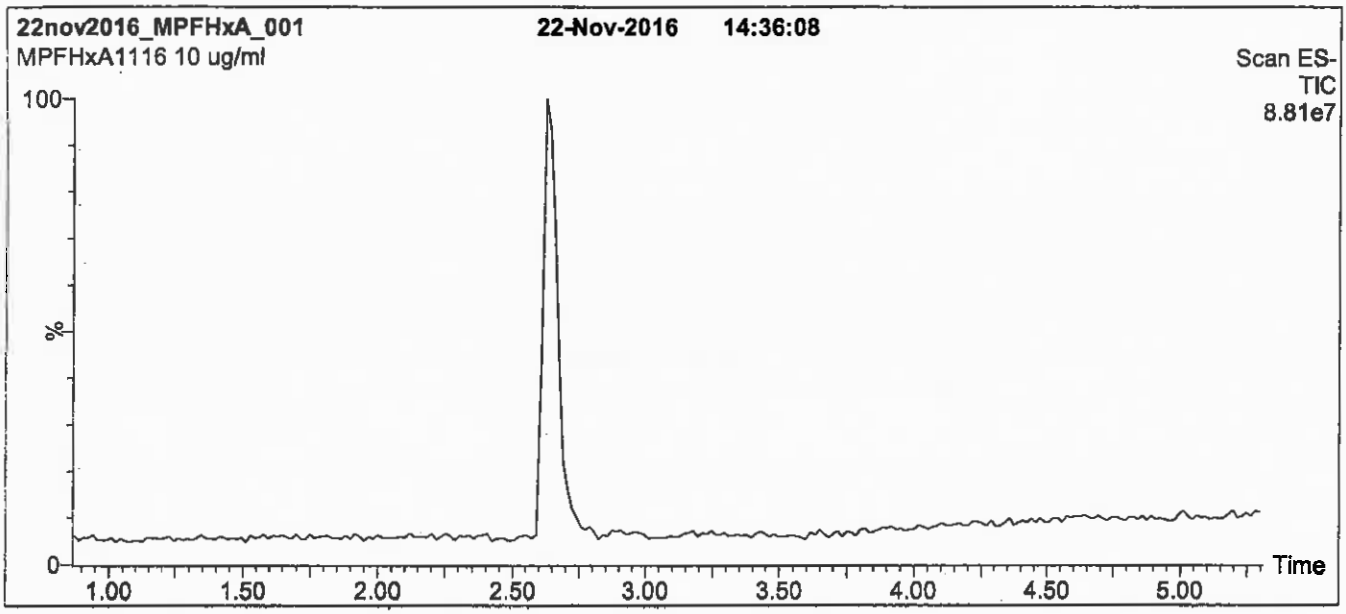
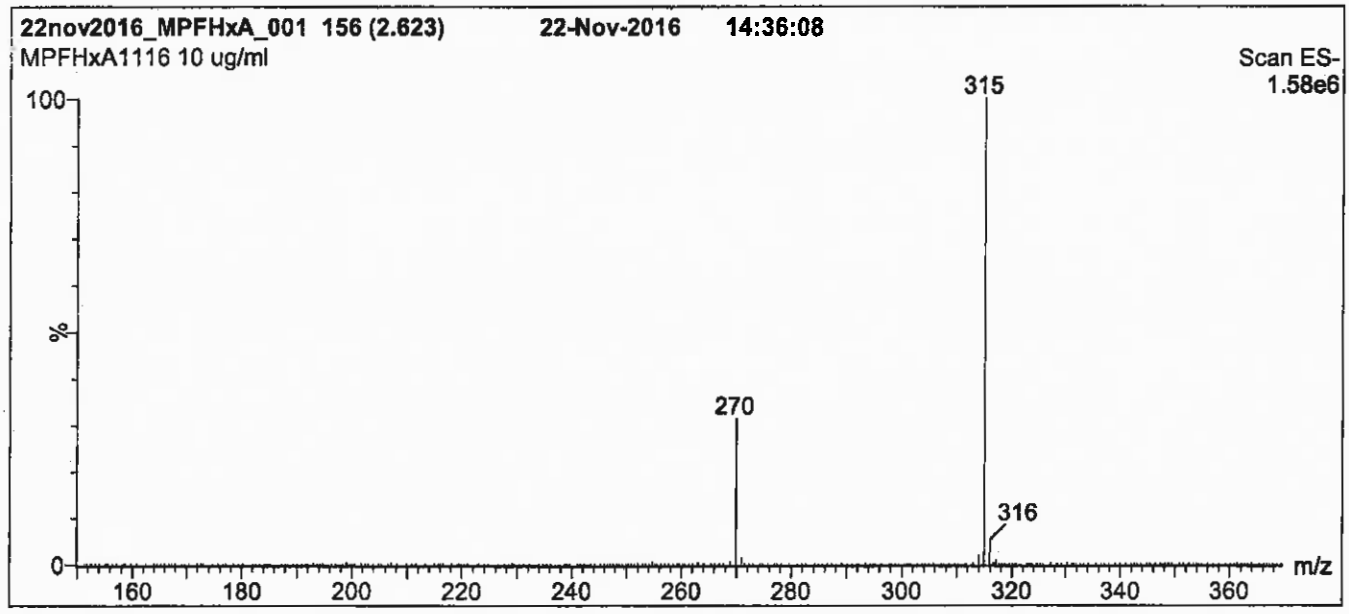




Conditions for Figure 1:

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: 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

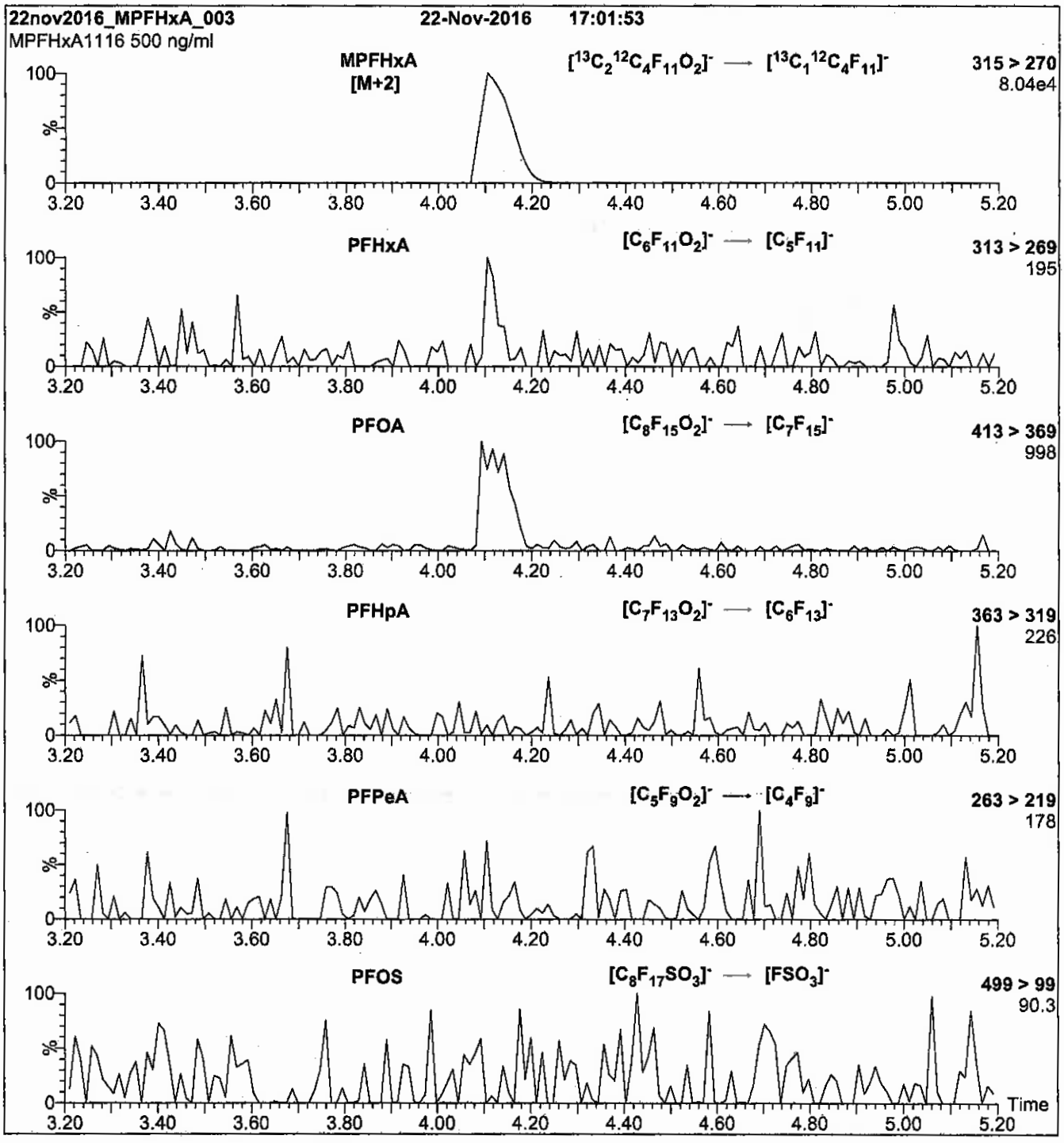
Flow: 300 µl/min

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

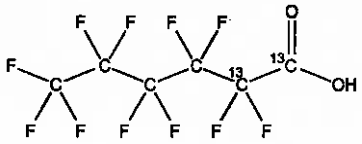
LCMPFHxA_00018

r r 5/30/17 SN

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 ($1,2\text{-}^{13}C_2$)
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:

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ANAB ACCREDITED

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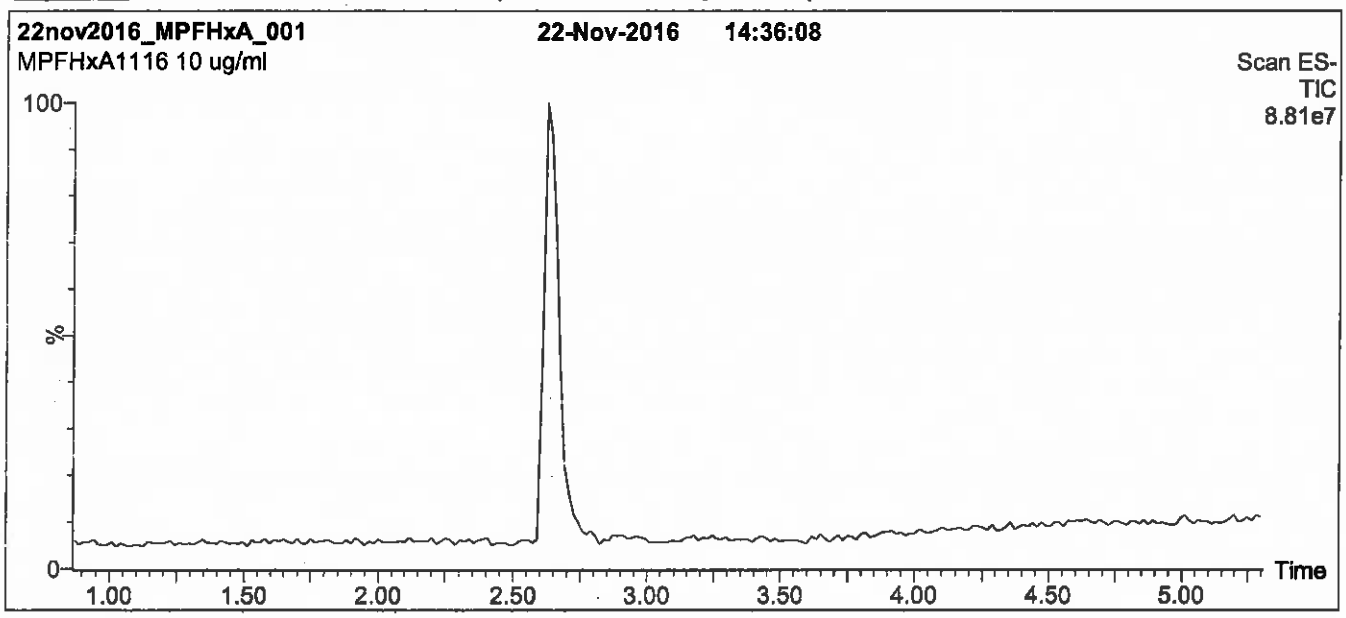
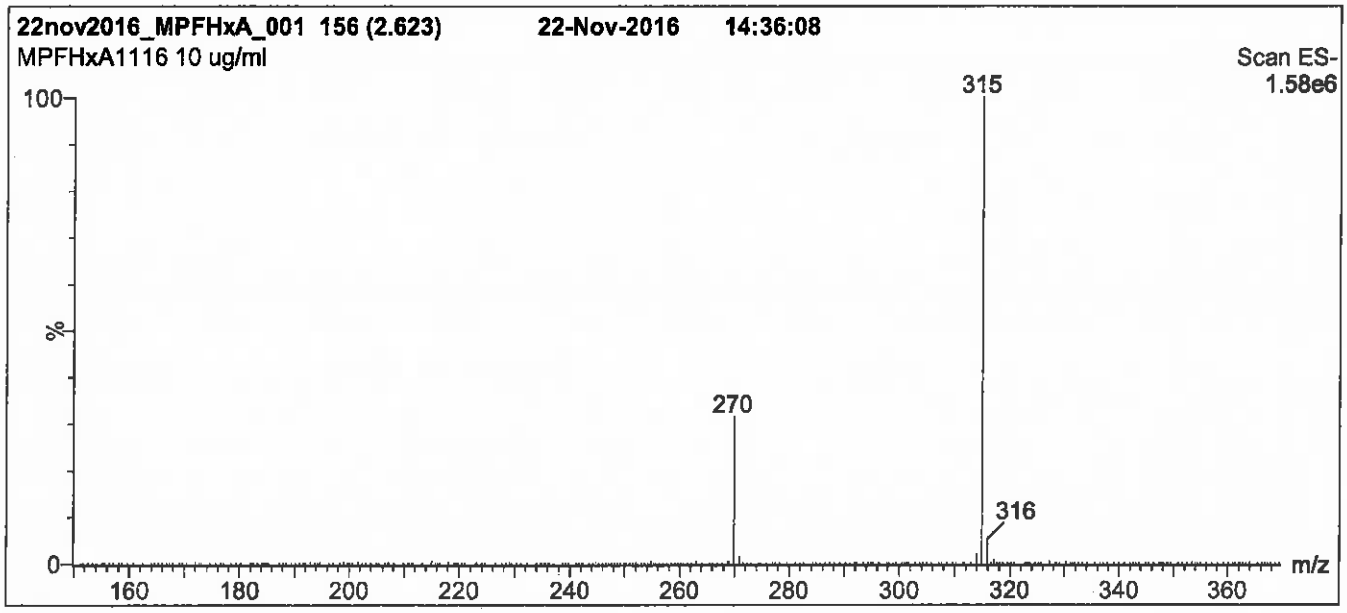




Conditions for Figure 1:

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: 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

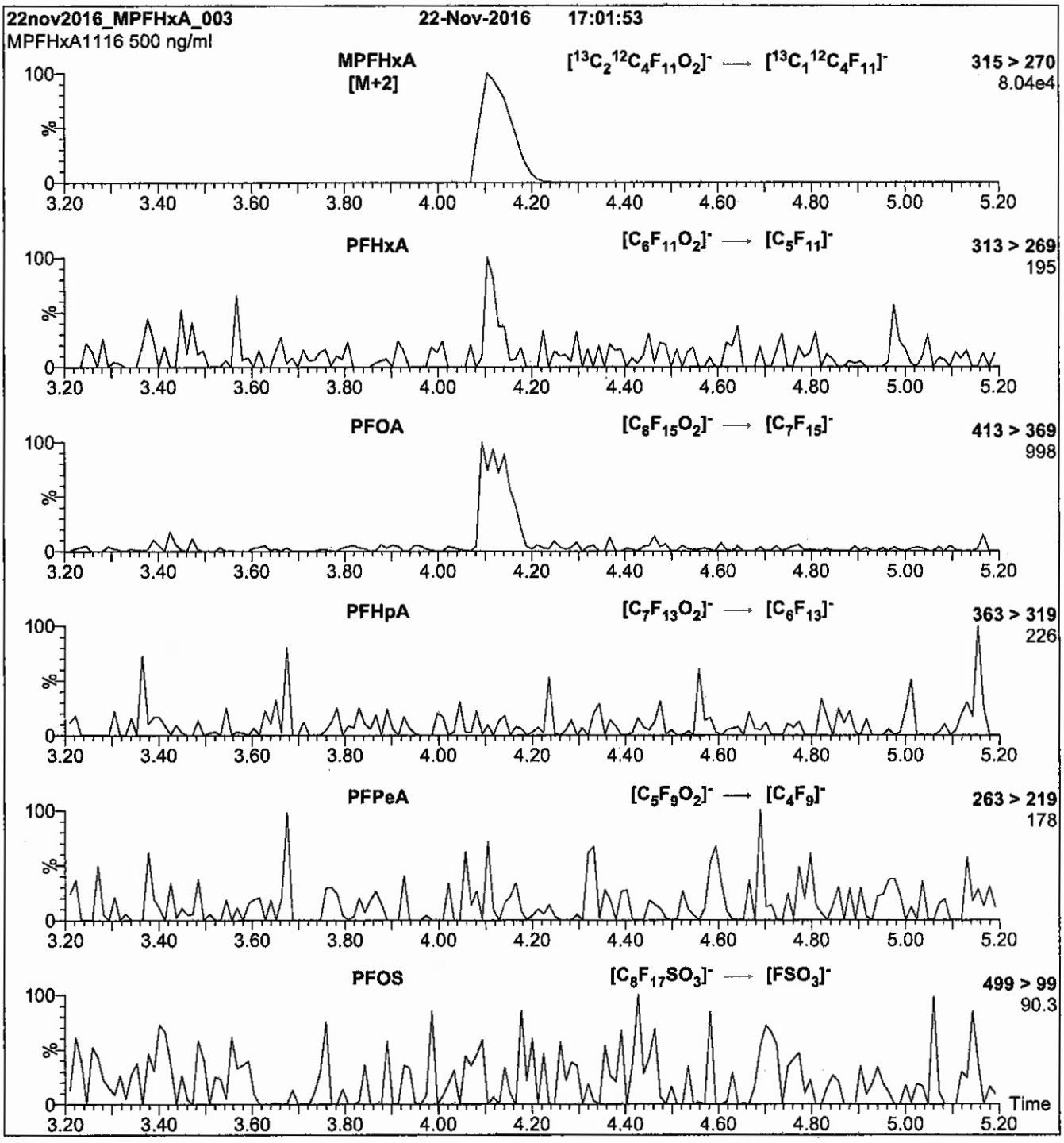
Flow: 300 µl/min

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

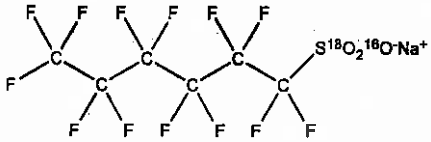
LCMPFHxS_00010

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

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HAZARDS:

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UNCERTAINTY:

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

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

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

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

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

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CALA

ANAB ACCREDITED

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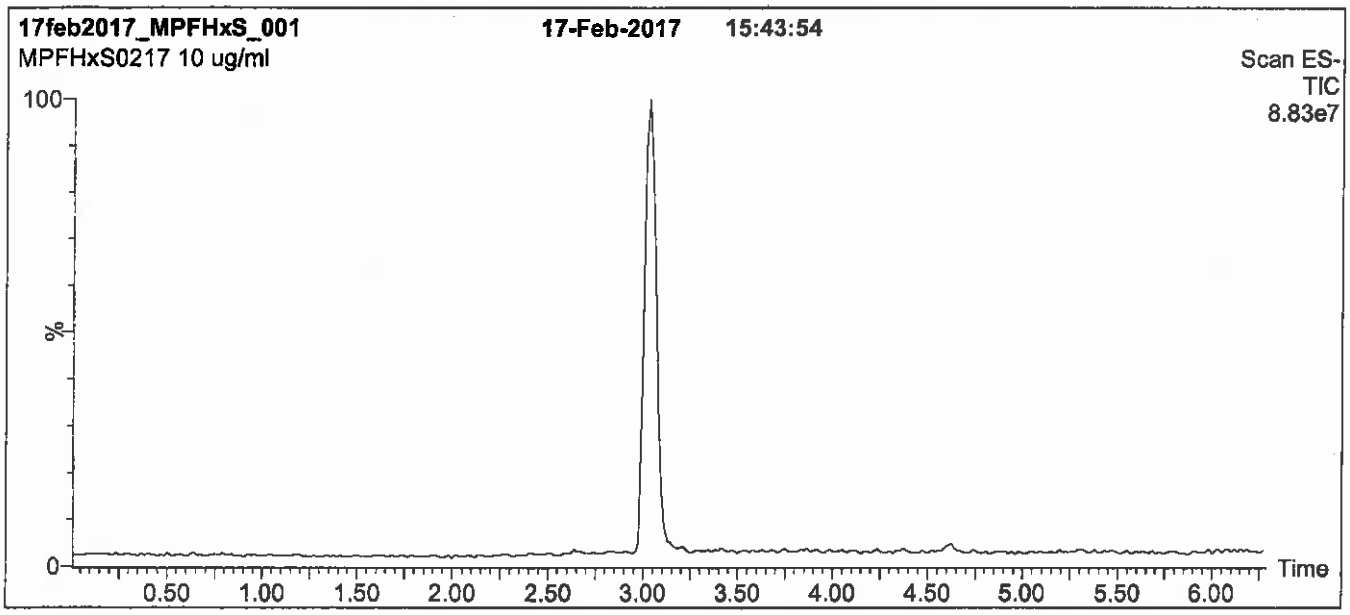

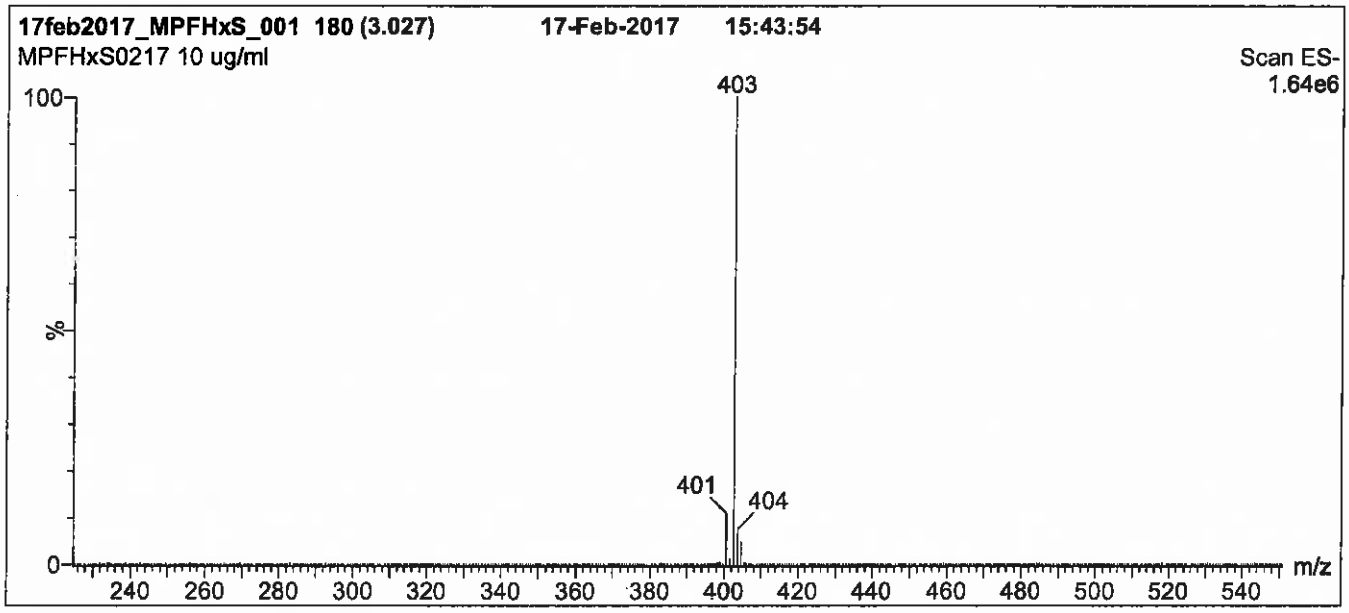

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Time: 10 min

Flow: 300 µl/min

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Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
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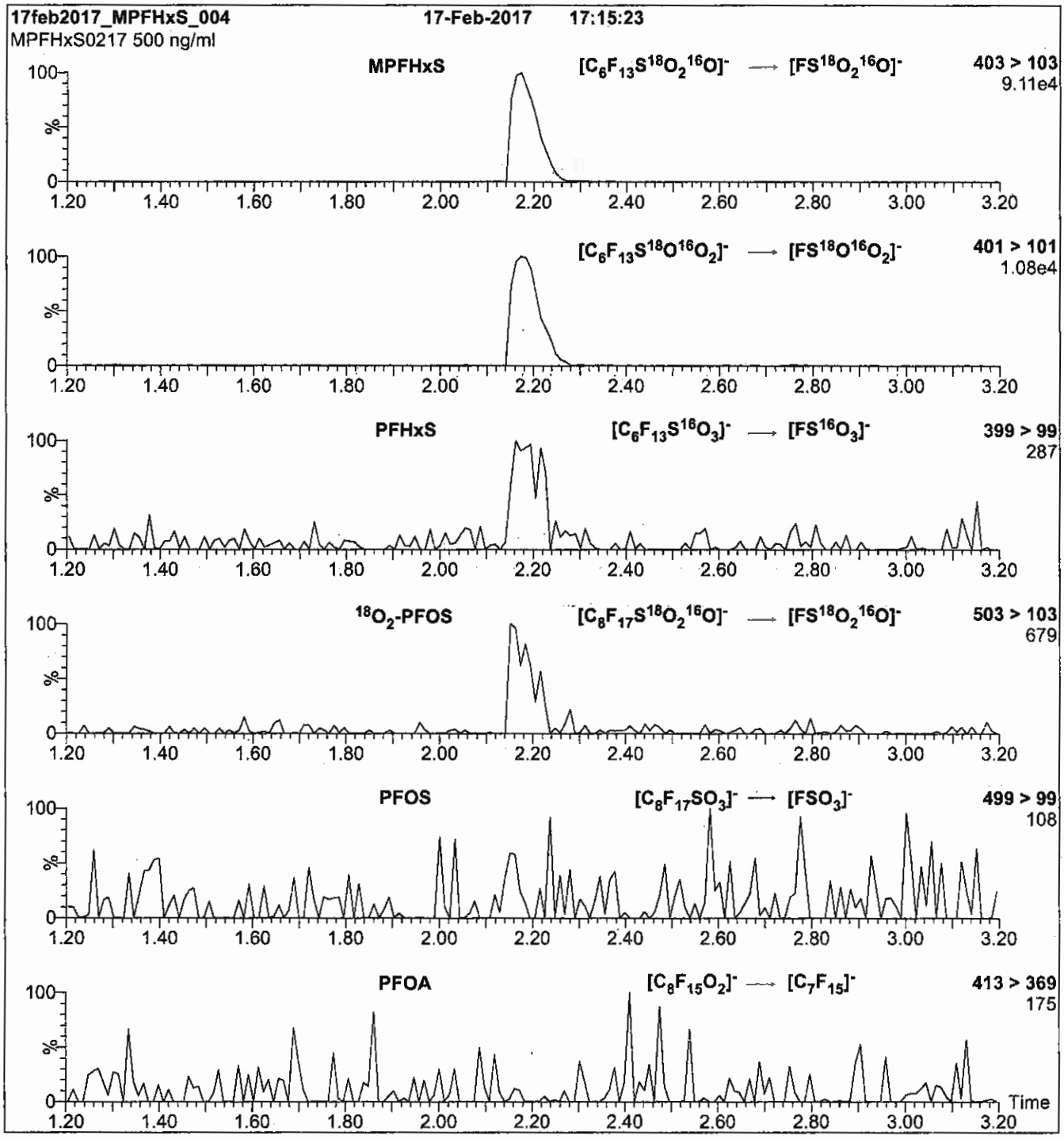

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Flow: 300 µl/min

MS Parameters

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

Reagent

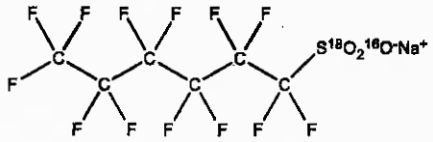
LCMPFHxS_00011

P: 7/5/17 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFHxS	**LOT NUMBER:**	MPFHxS0217
COMPOUND:	Sodium perfluoro-1-hexane[$^{18}O_2$]sulfonate		
STRUCTURE:		**CAS #:**	Not available



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EXPIRY DATE: (mm/dd/yyyy)	02/17/2022		
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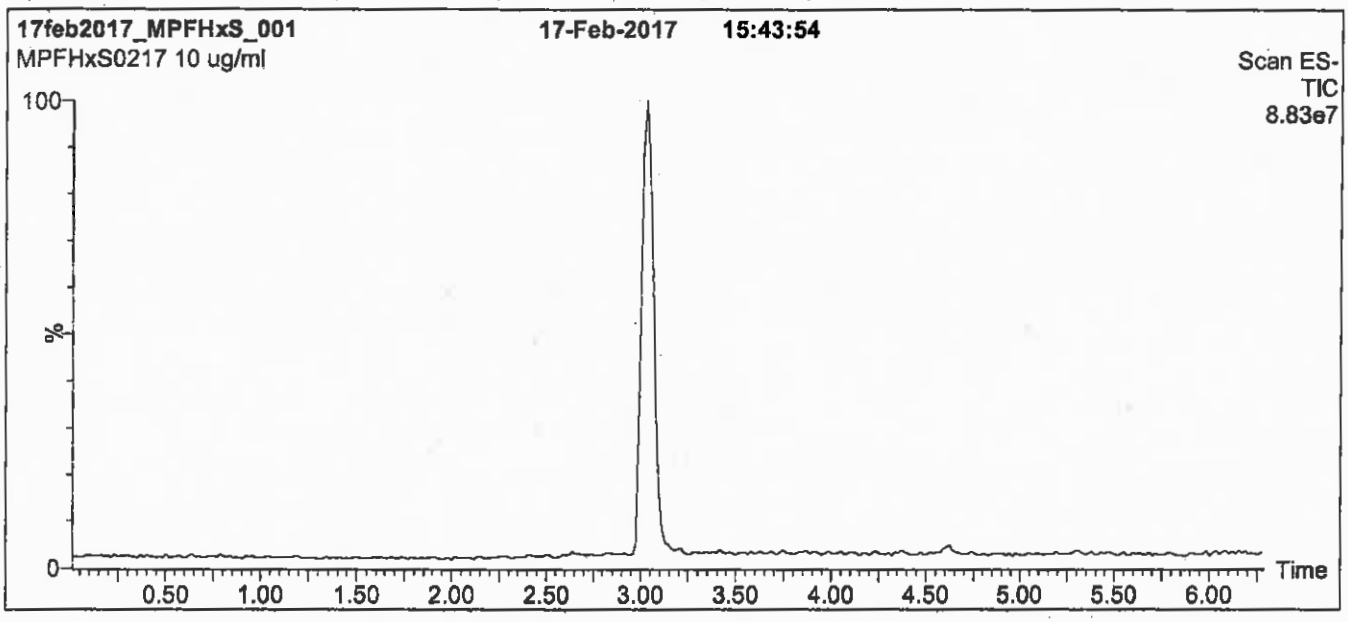

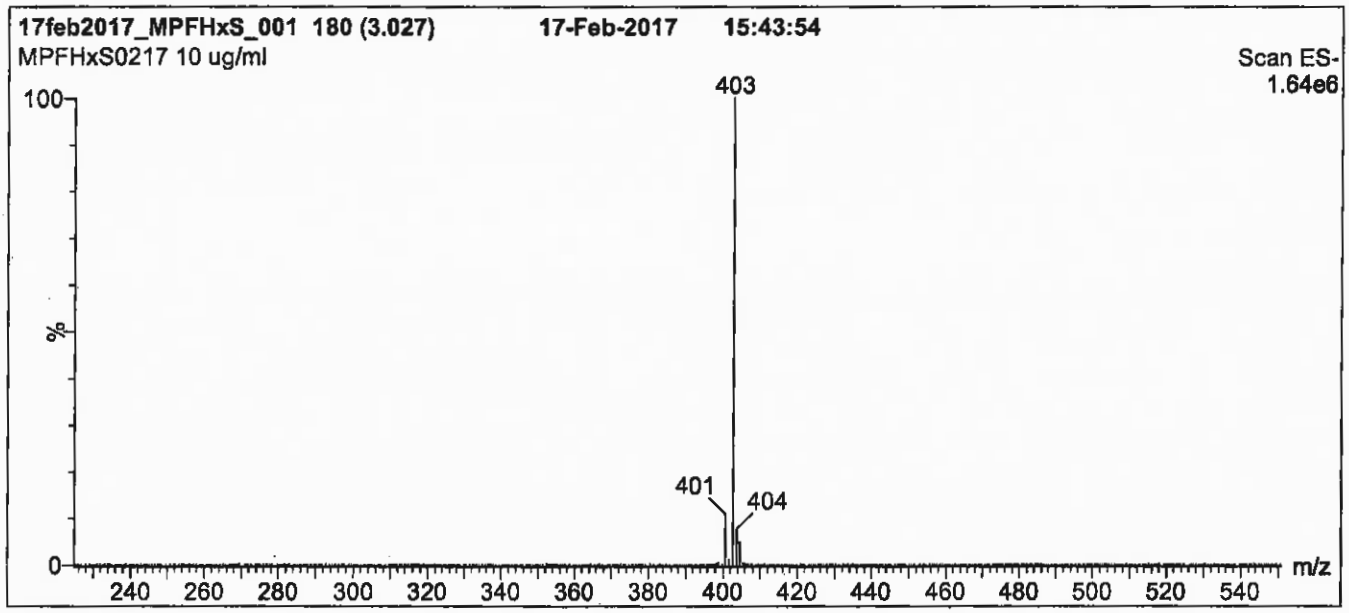

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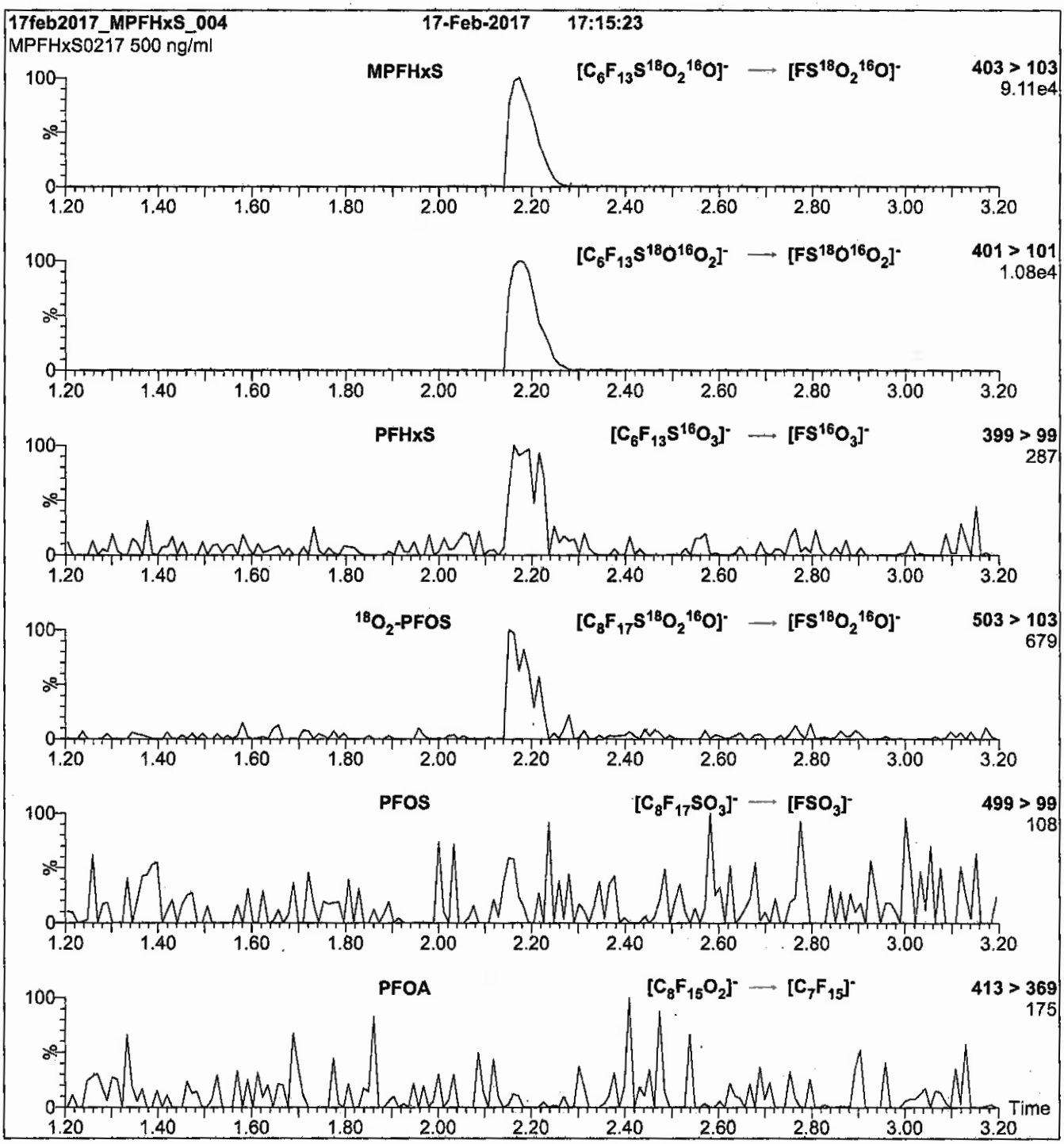

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10 µl (500 ng/ml MPFHxS)

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(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

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

Reagent

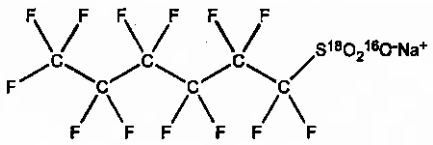
LCMPFHxS_00012

P: 8/30/17 SKN

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



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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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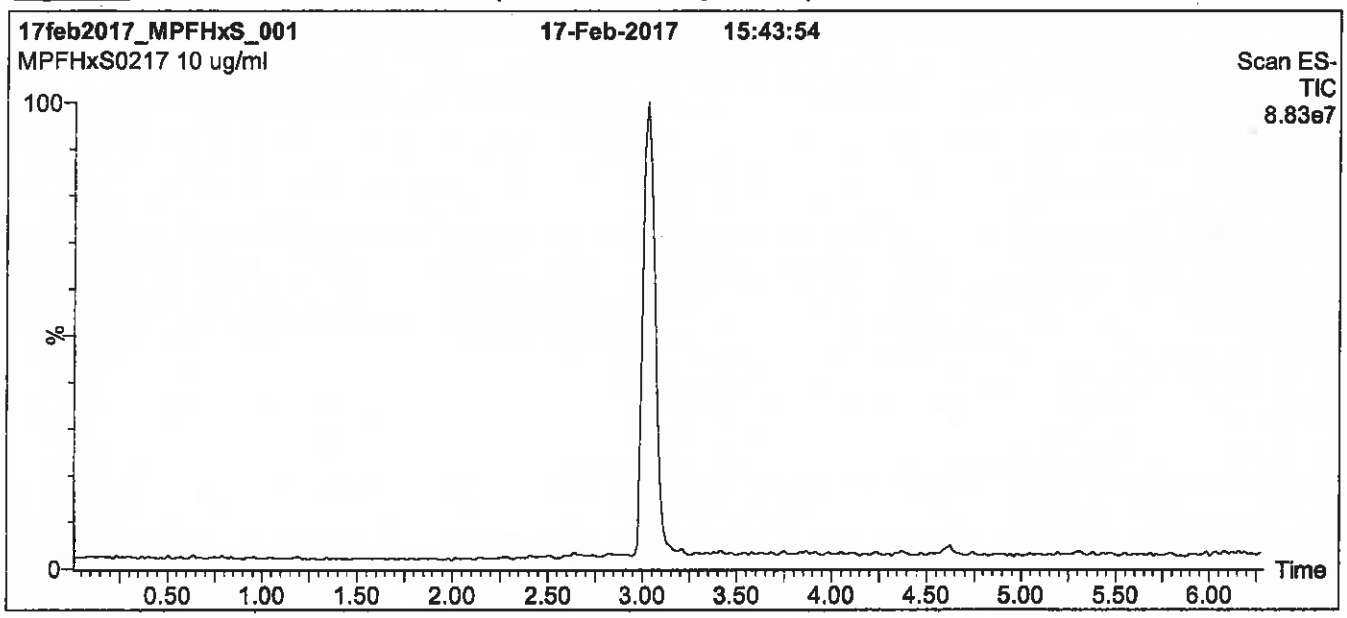

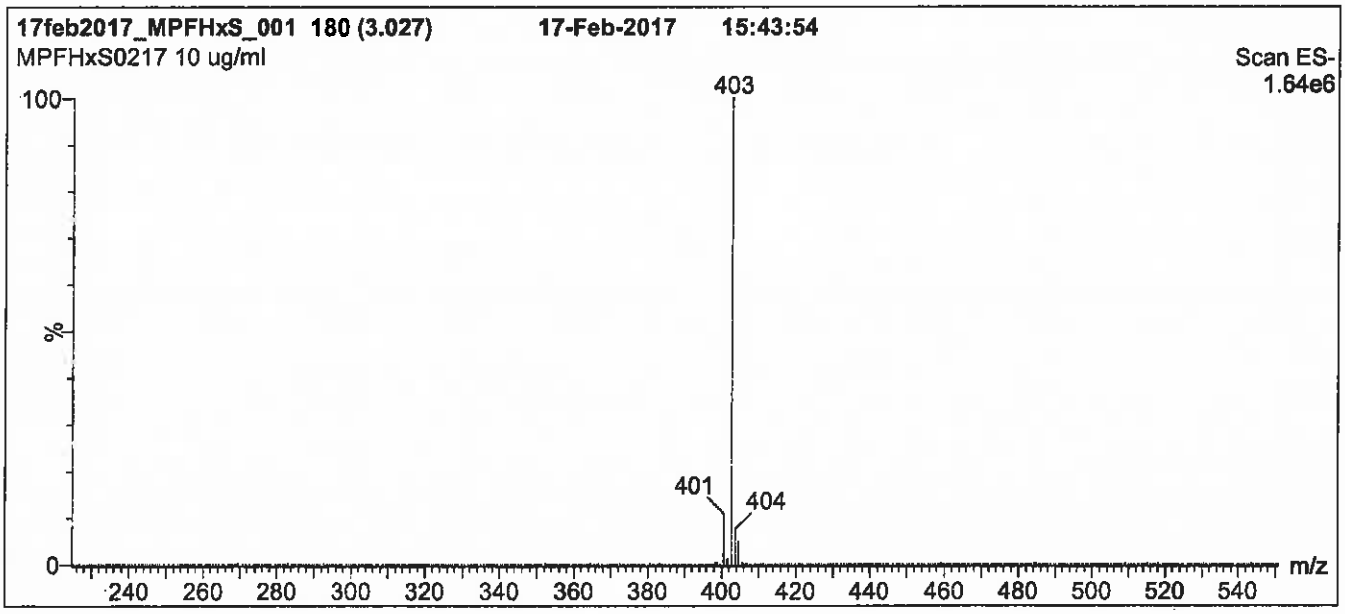

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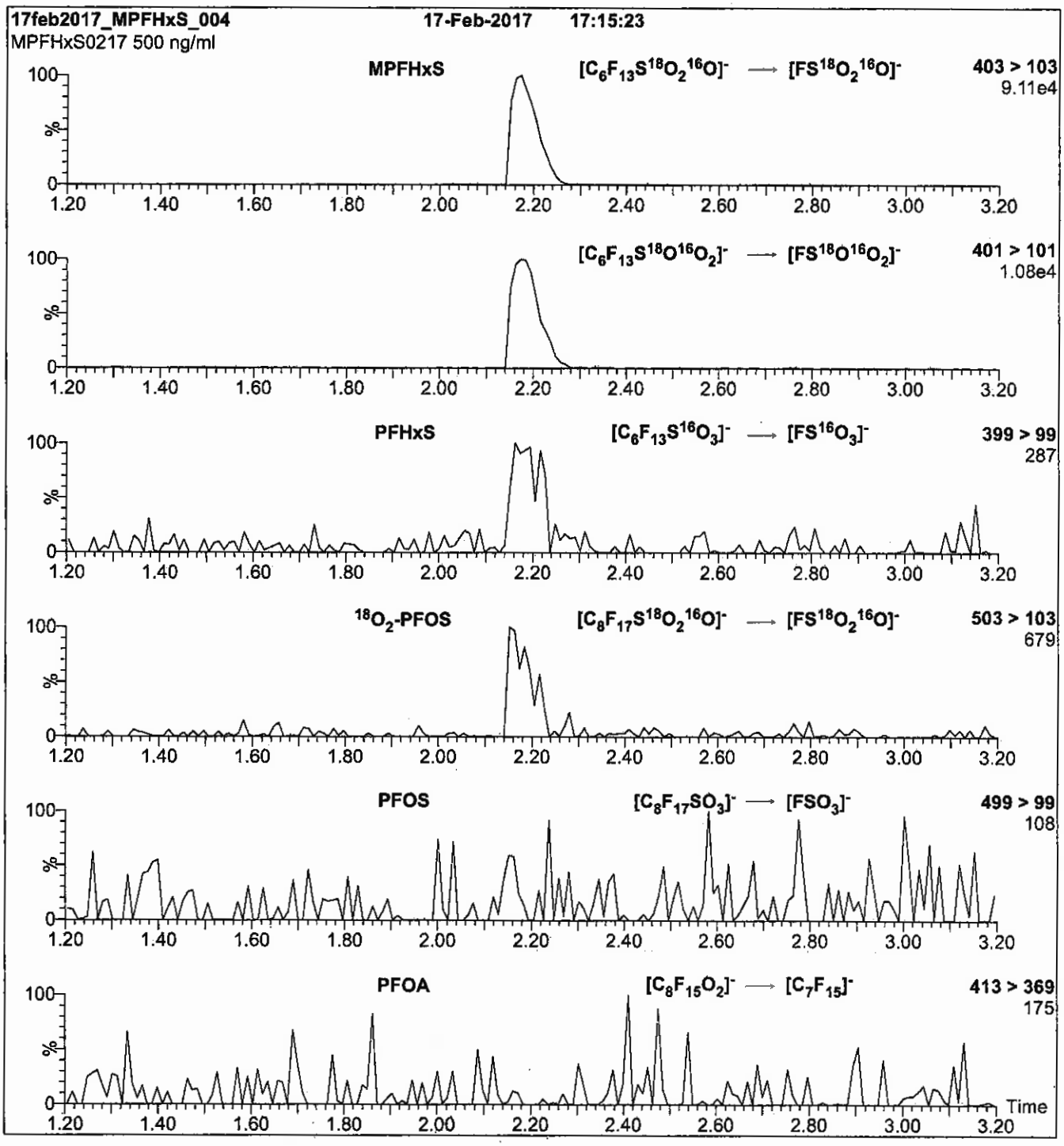
Desolvation Gas Flow (l/hr) = 750

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

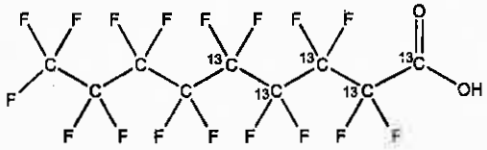
LCMPFNA_00010

r: 5/5/17 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: B.G. Chittim **Date:** 10/11/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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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:

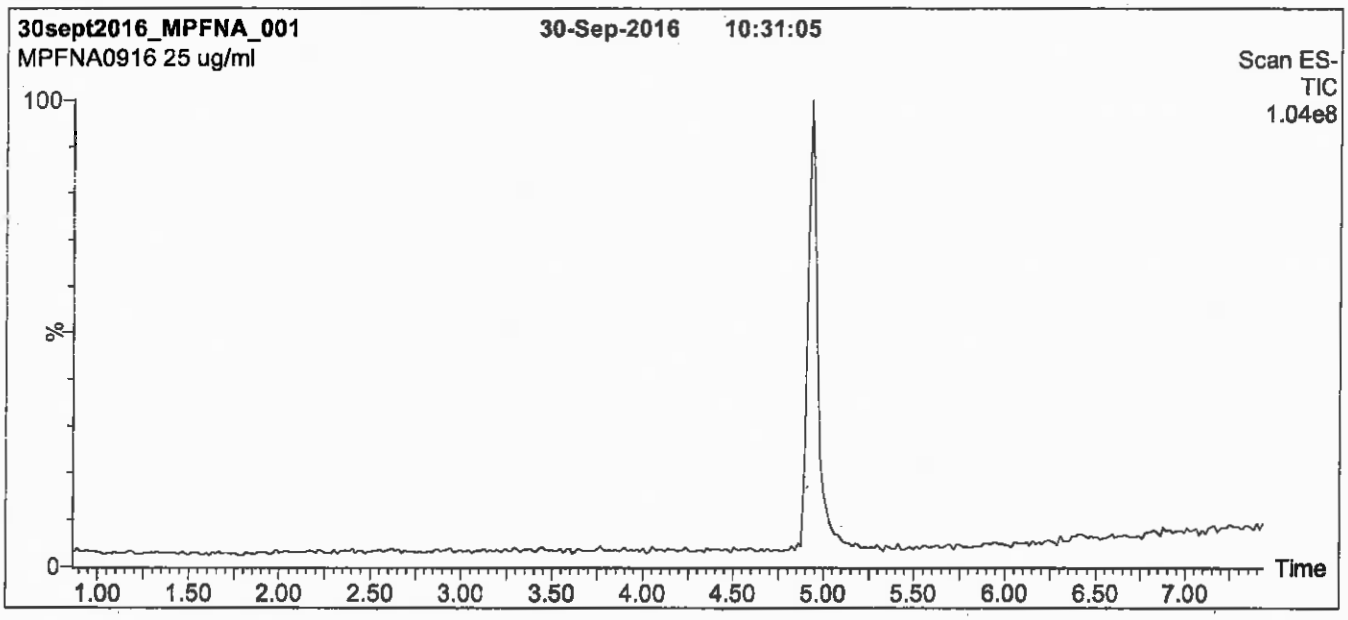
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

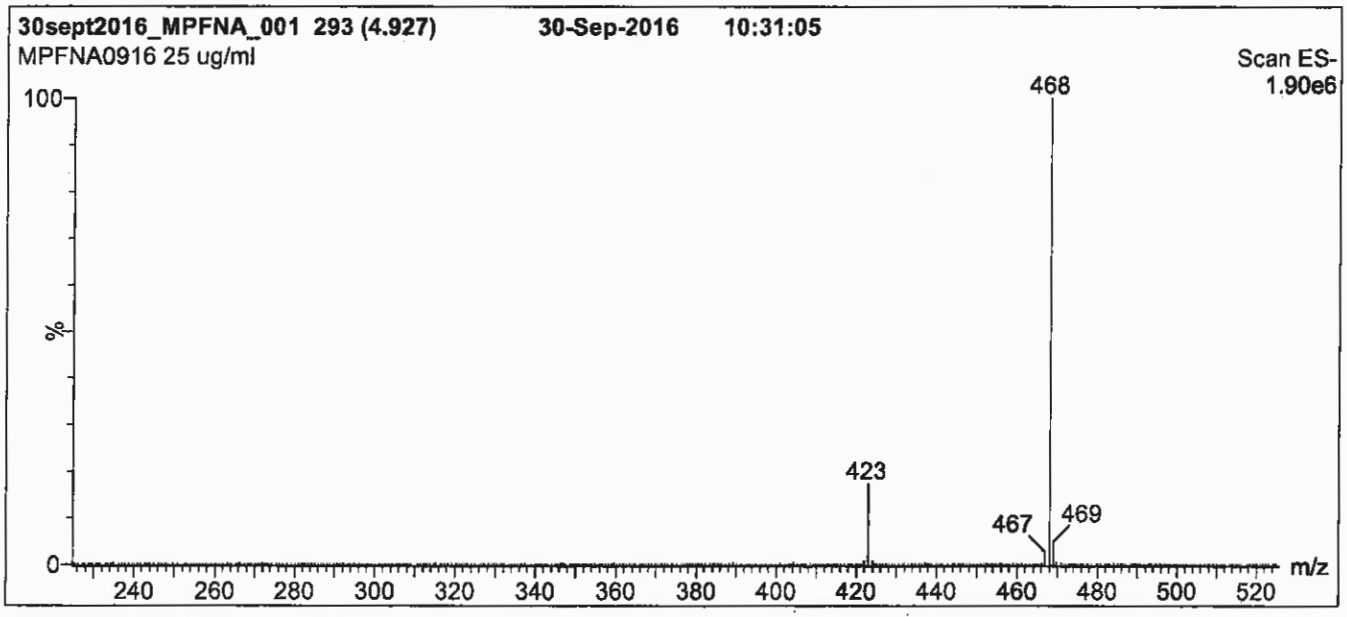
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

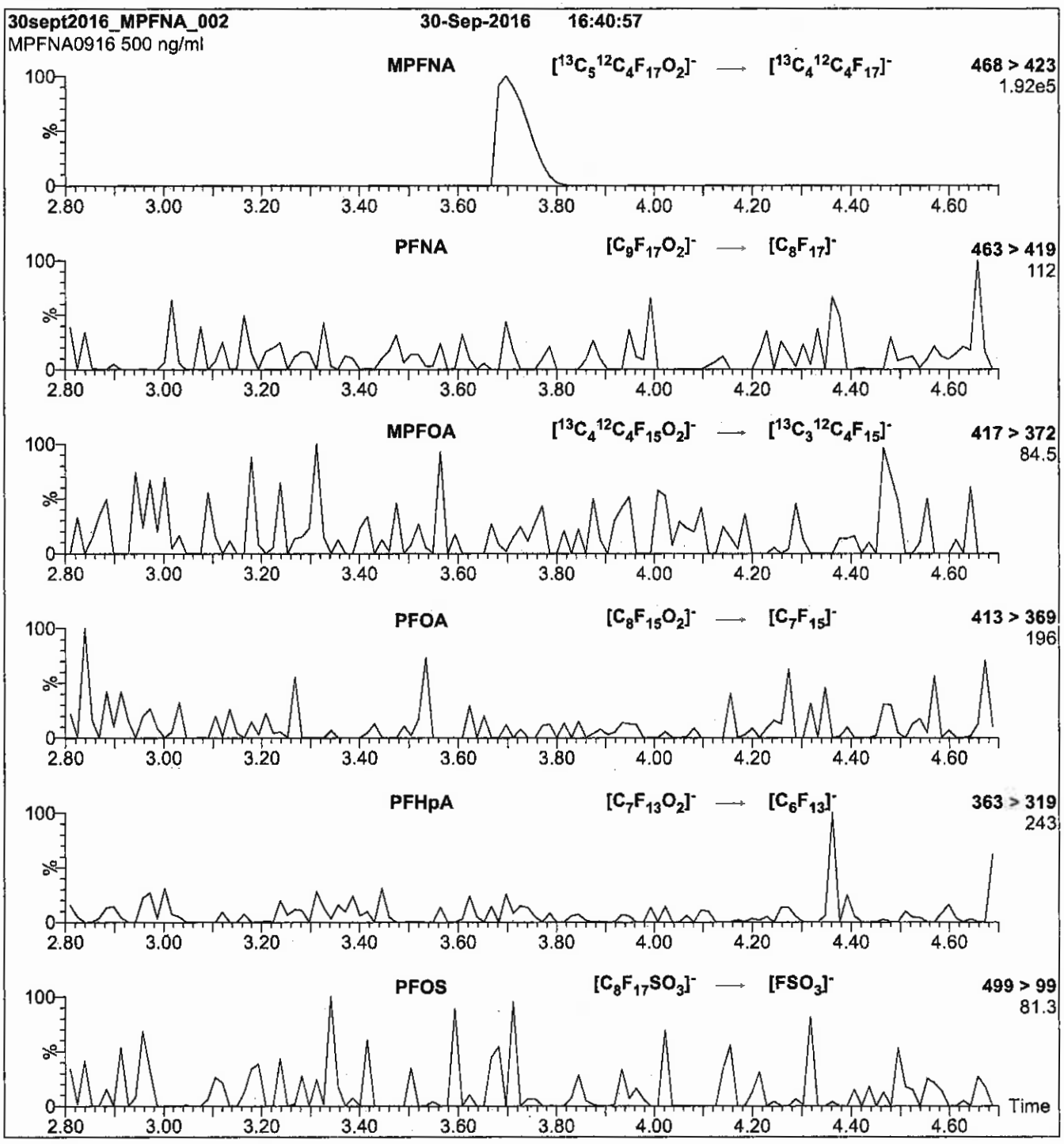
Flow: 300 µl/min

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

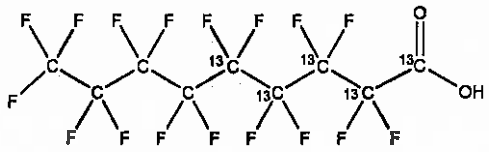
PRODUCT CODE: MPFNA

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: B.G. Chittim

Date: 10/11/2016 (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:

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

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

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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.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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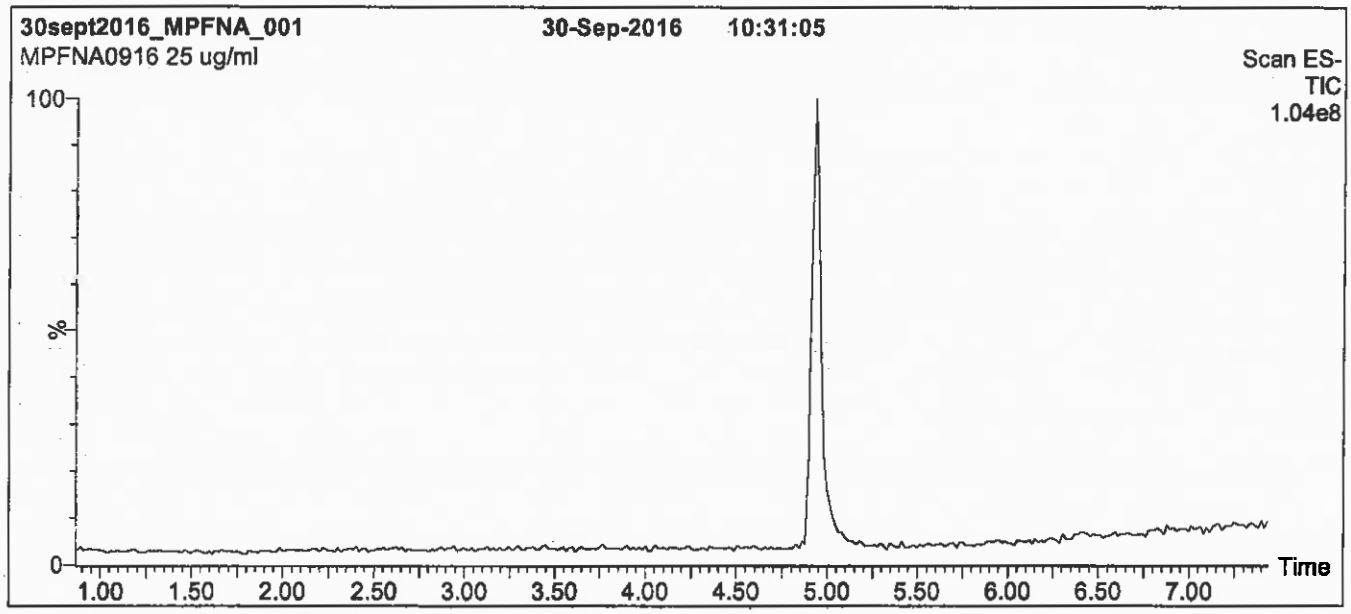
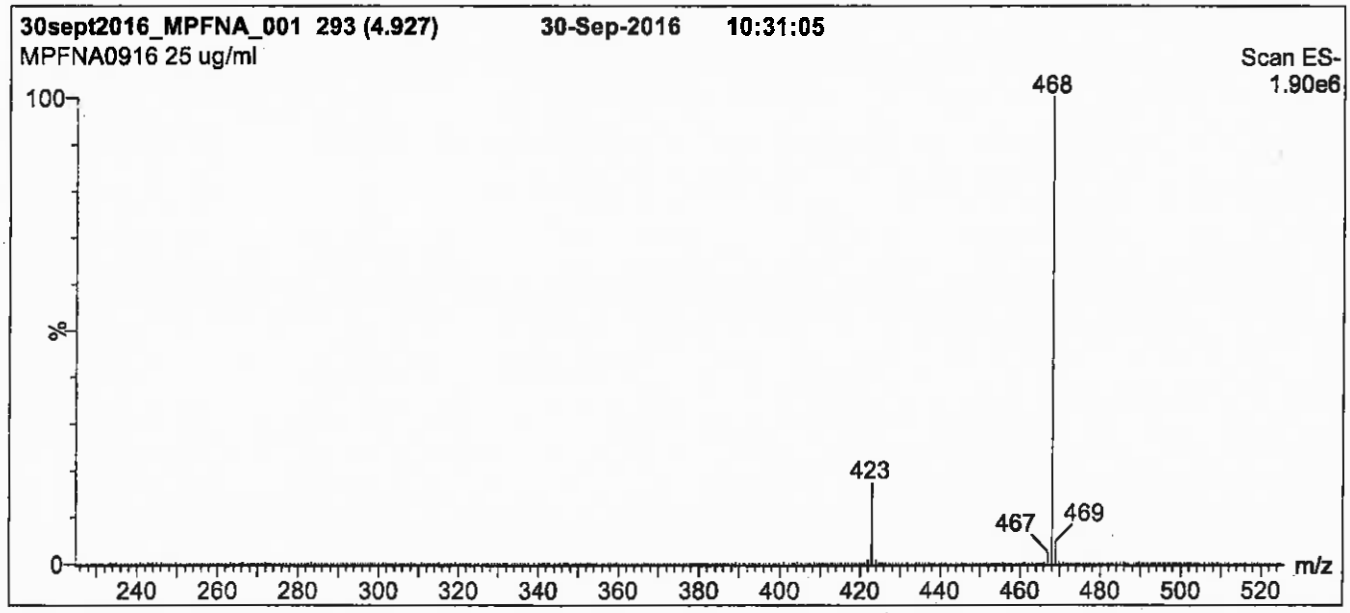
Figure 1: **MPFNA; LC/MS Data (TIC and Mass Spectrum)**





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

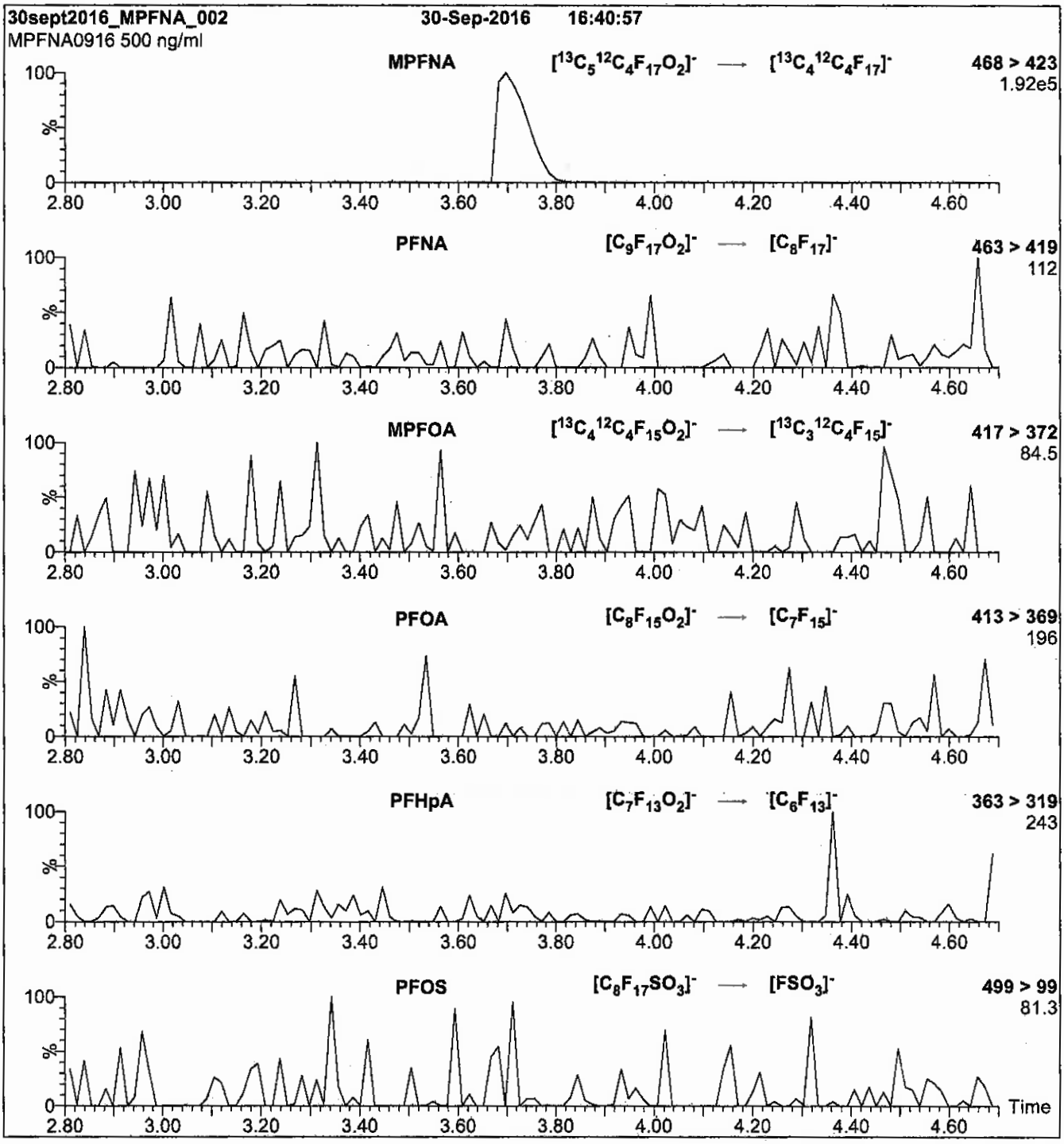
Flow: 300 µl/min

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

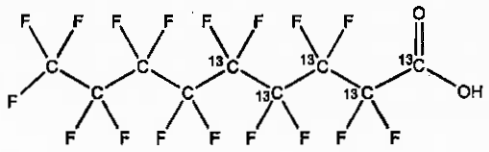
LCMPFNA_00012

r: 8/30/17 SRW

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)

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CALA

ACCREDITED

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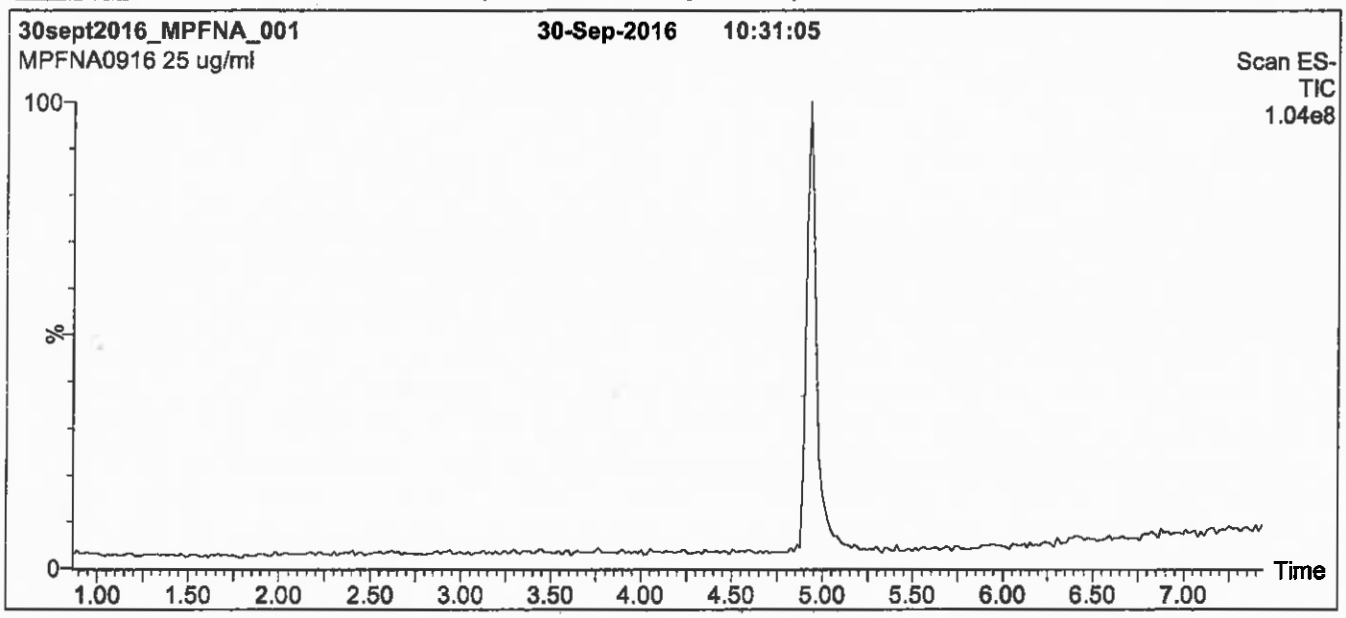
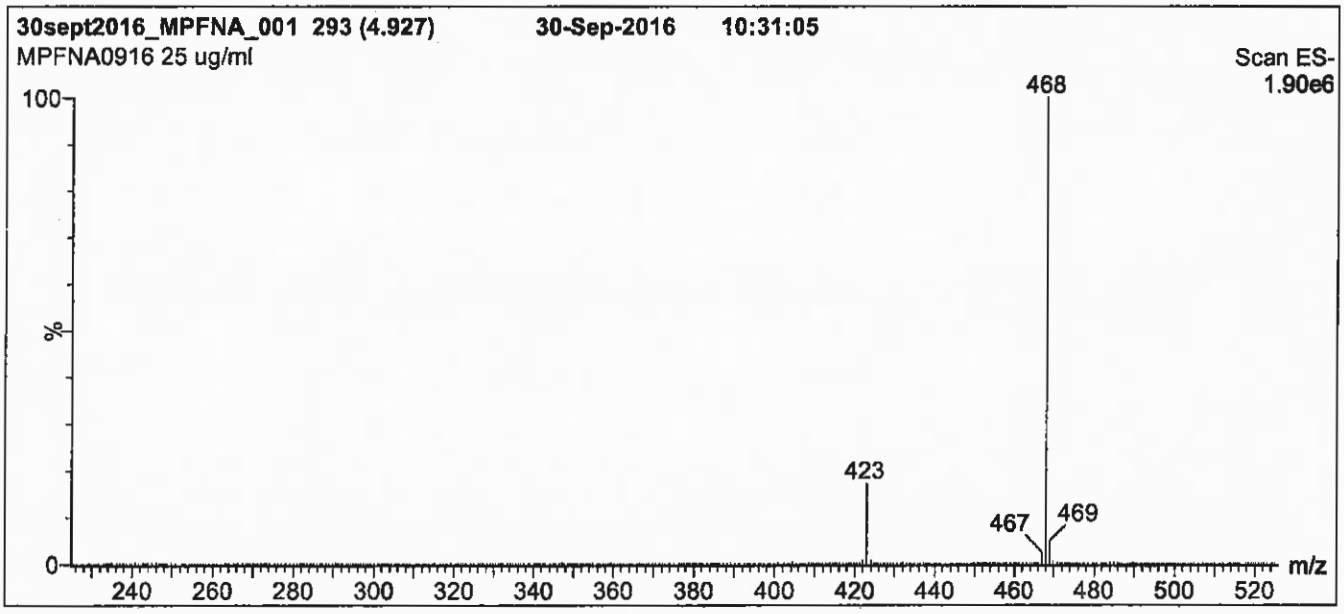




Conditions for Figure 1:

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

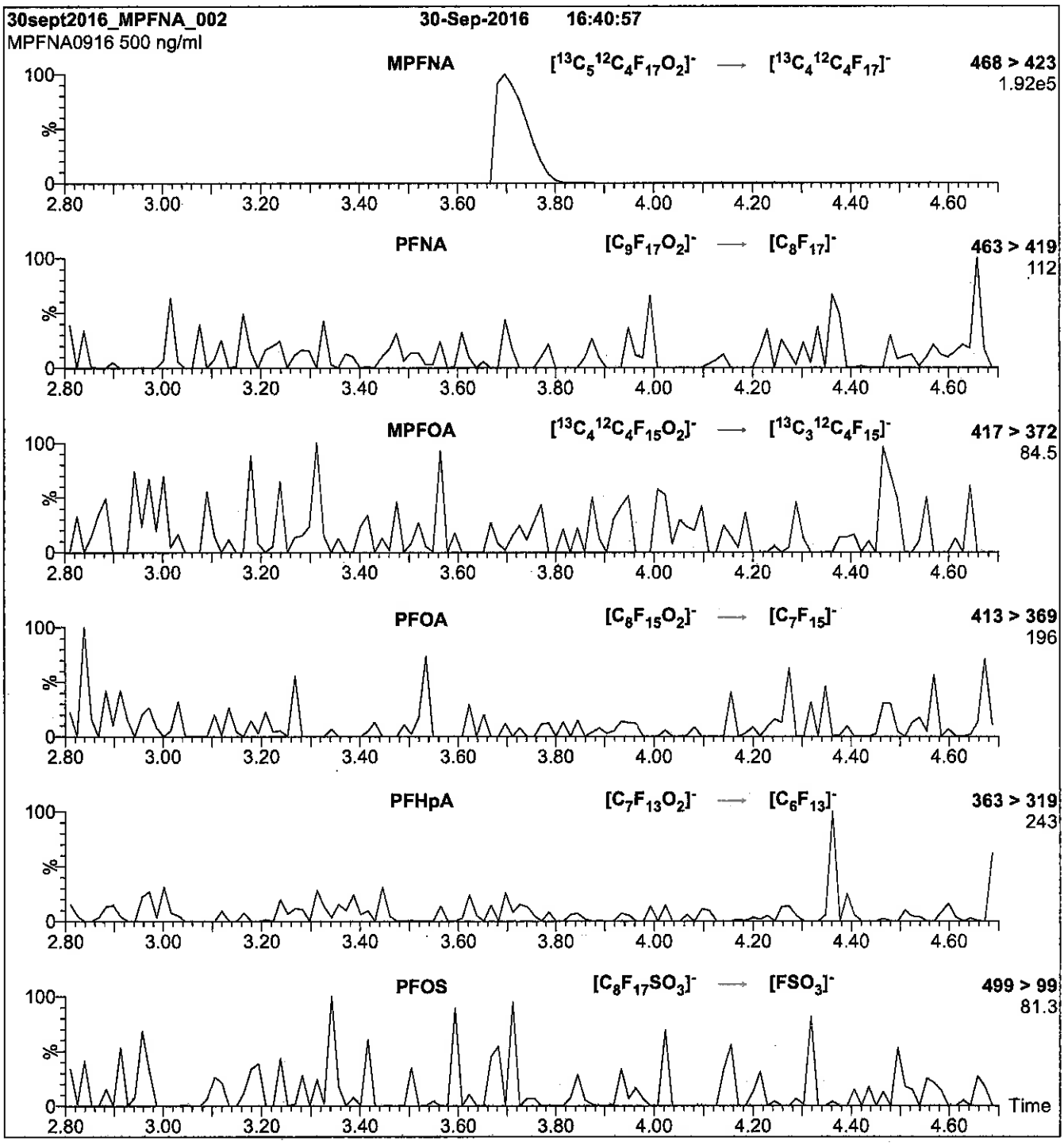
Flow: 300 µl/min

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: **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

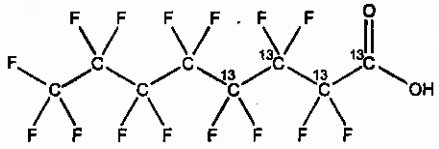
LCMPFOA_00014

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).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/28/2017 (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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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

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

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CALA

ANAB ACCREDITED

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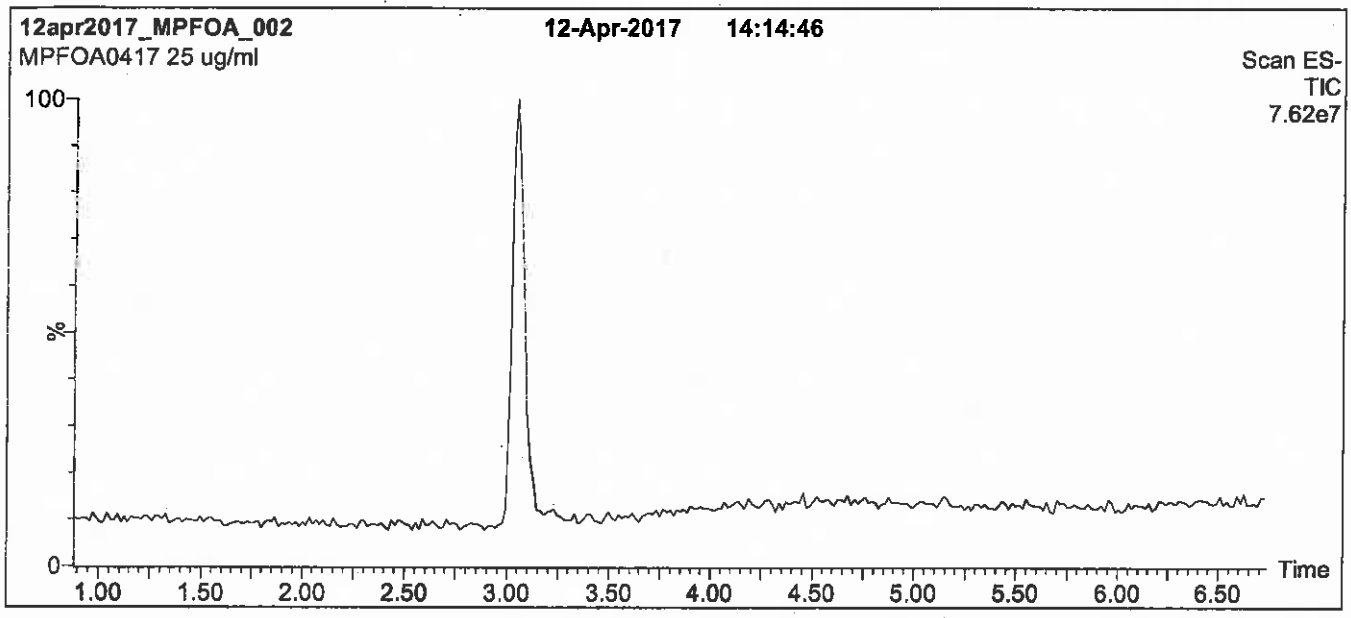
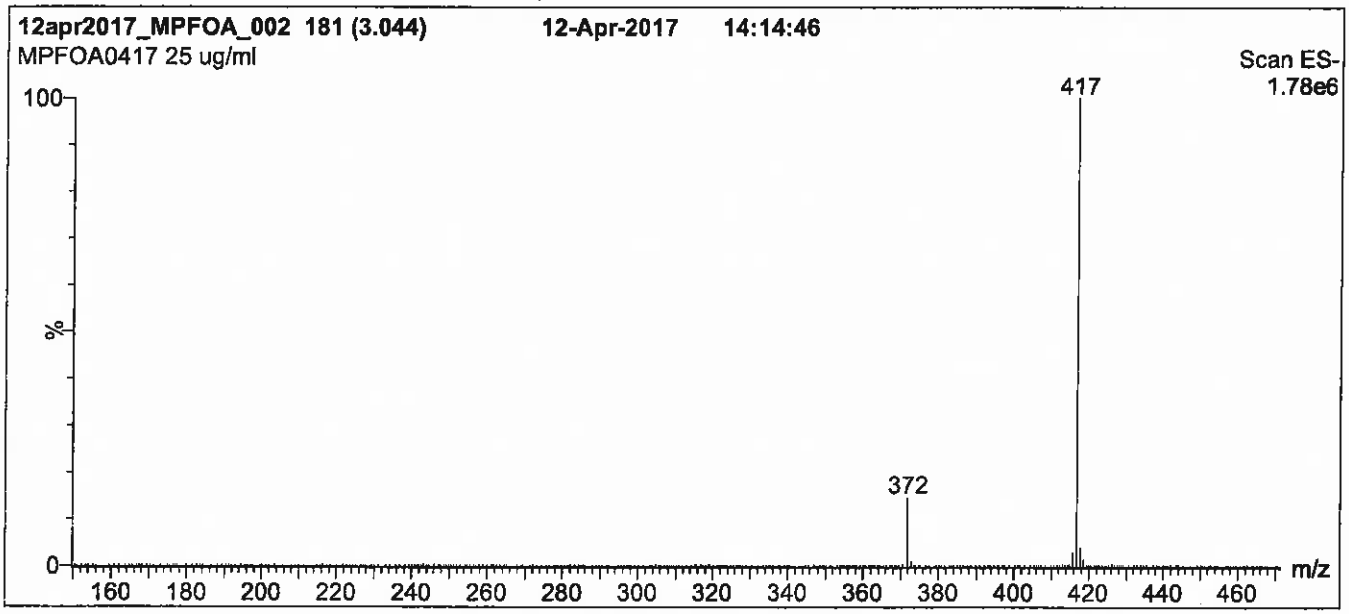
Figure 1: **MPFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

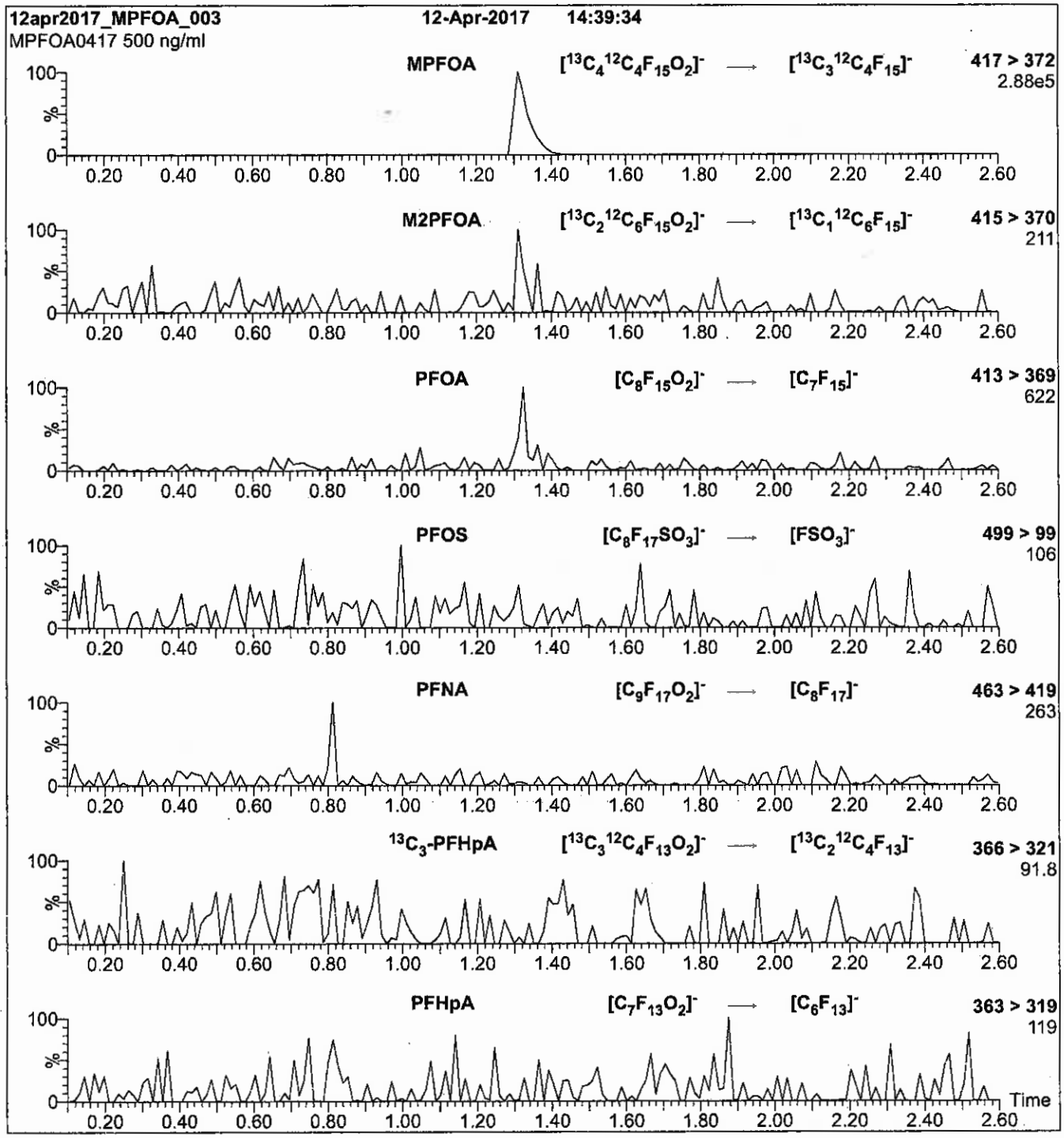
Flow: 300 µl/min

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

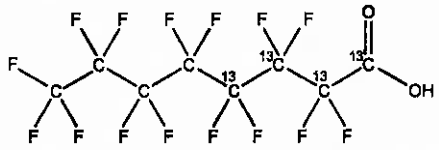
PRODUCT CODE: MPFOA

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)

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CALA

ANAB ACCREDITED

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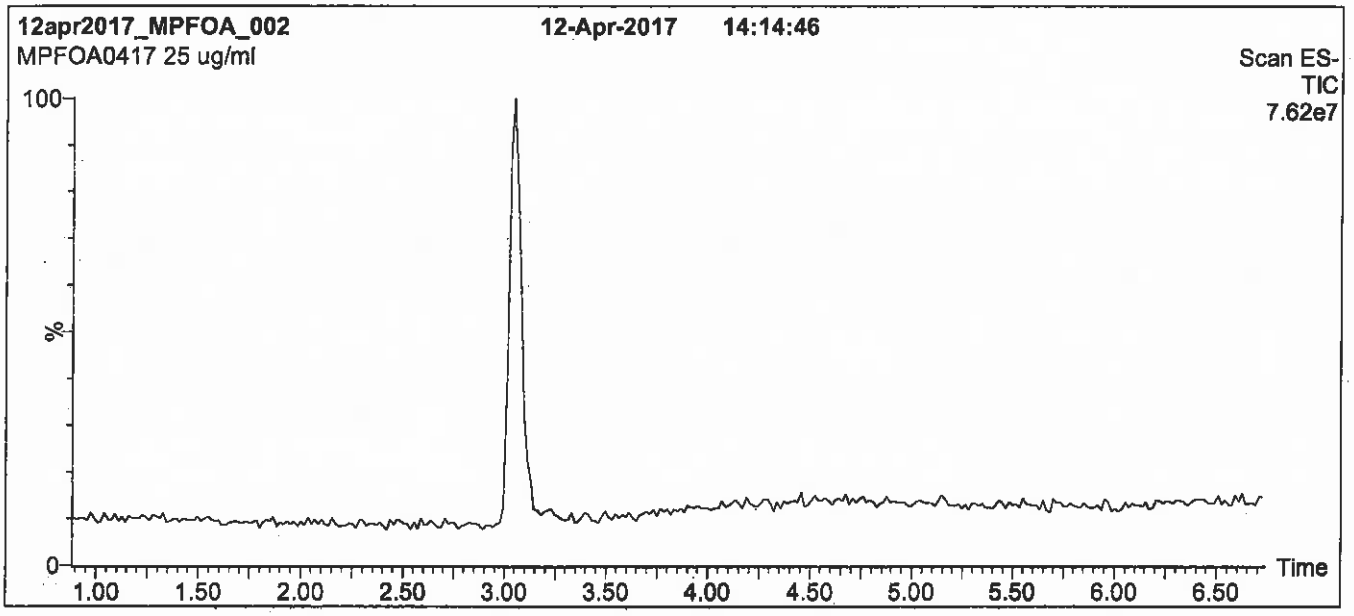

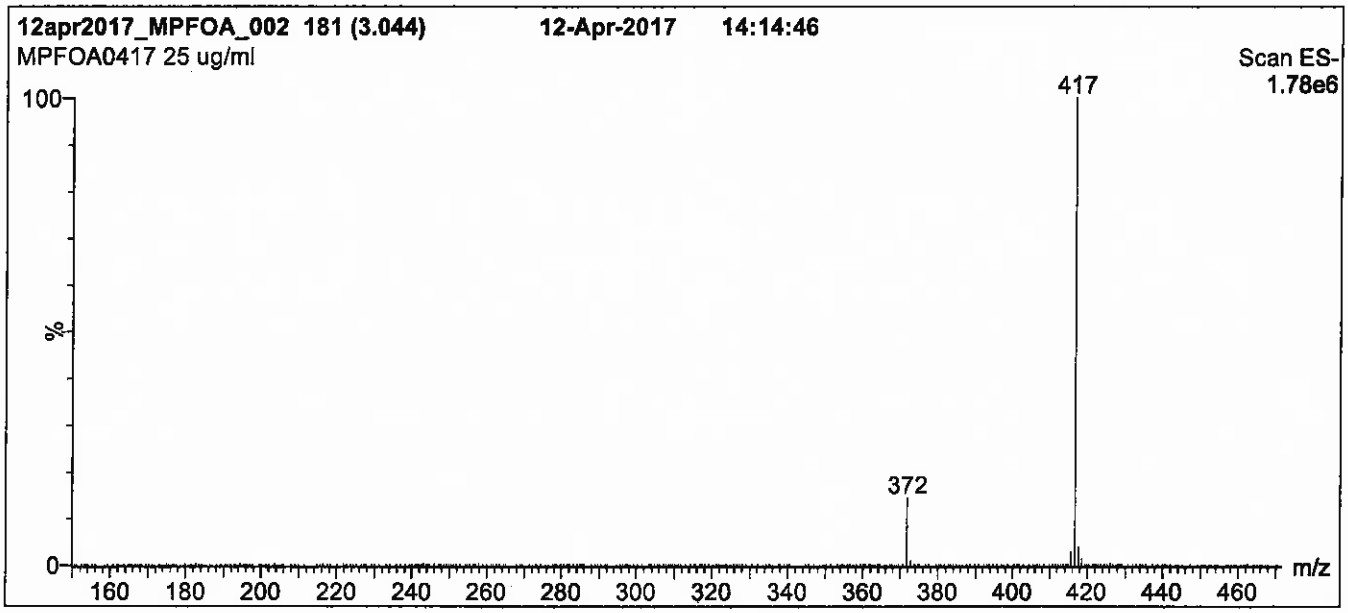

Conditions for Figure 1:

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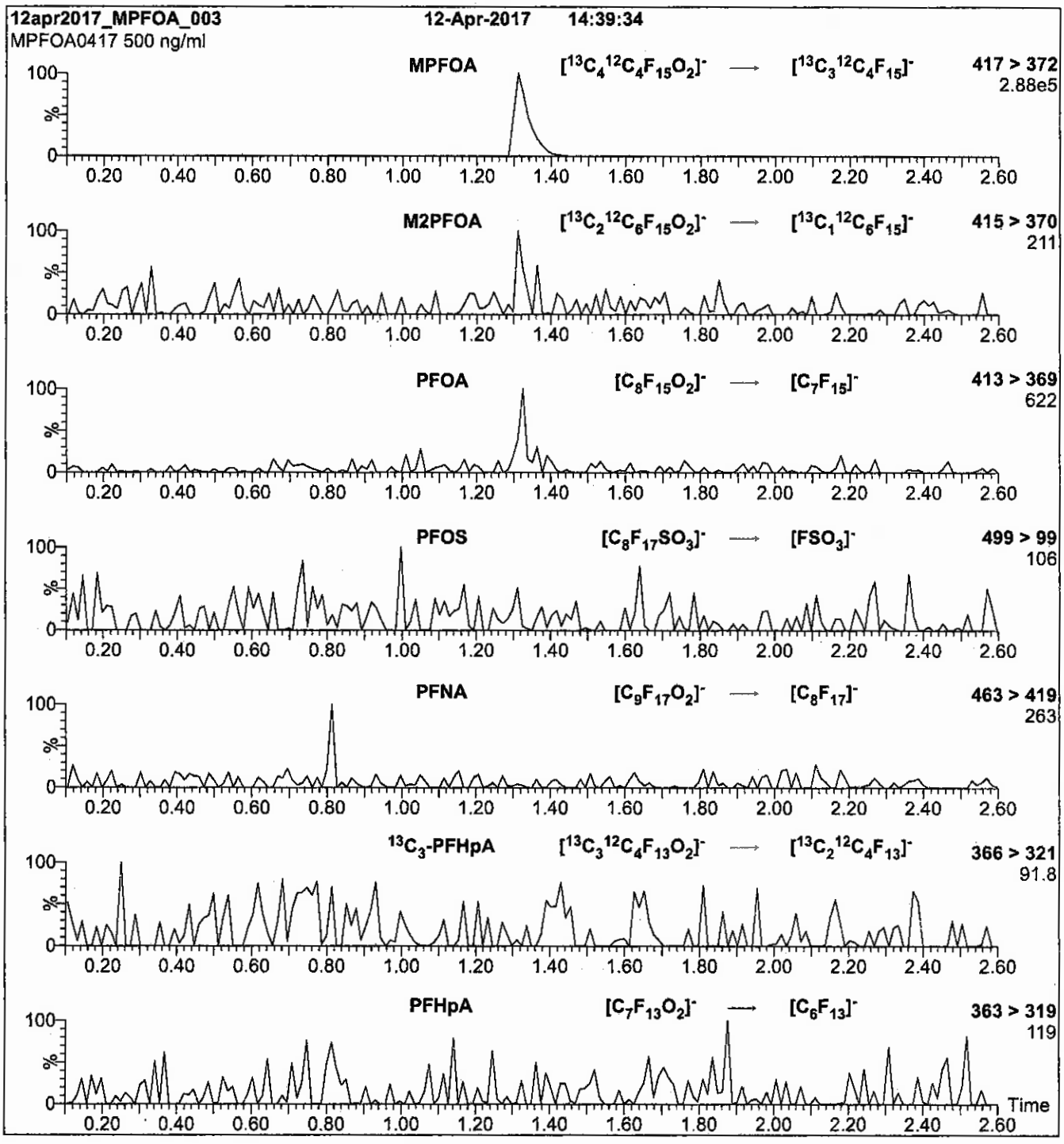
Figure 2: **MPFOA; LC/MS/MS Data (Selected MRM Transitions)**



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

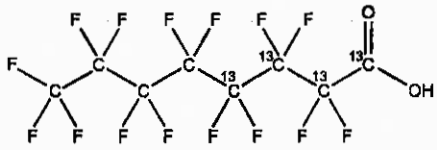
LCMPFOA_00016

nr 8/28/17-SM

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 ($1,2,3,4\text{-}^{13}C_4$)
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)
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ADDITIONAL INFORMATION:

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CALA

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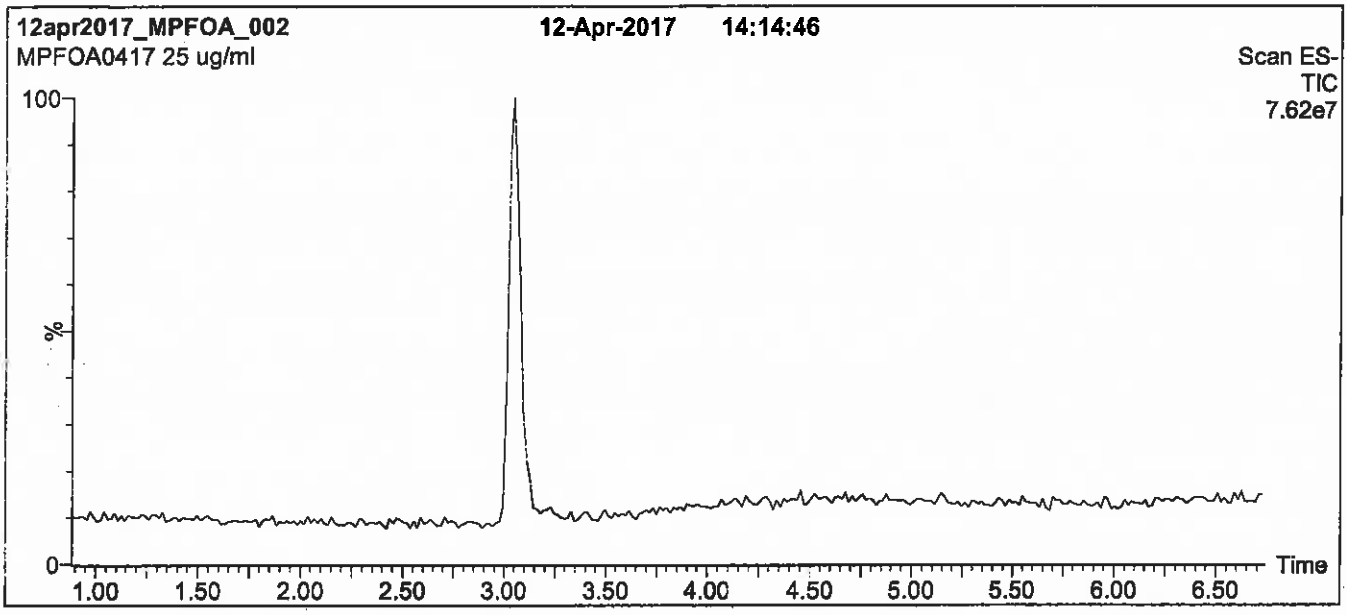

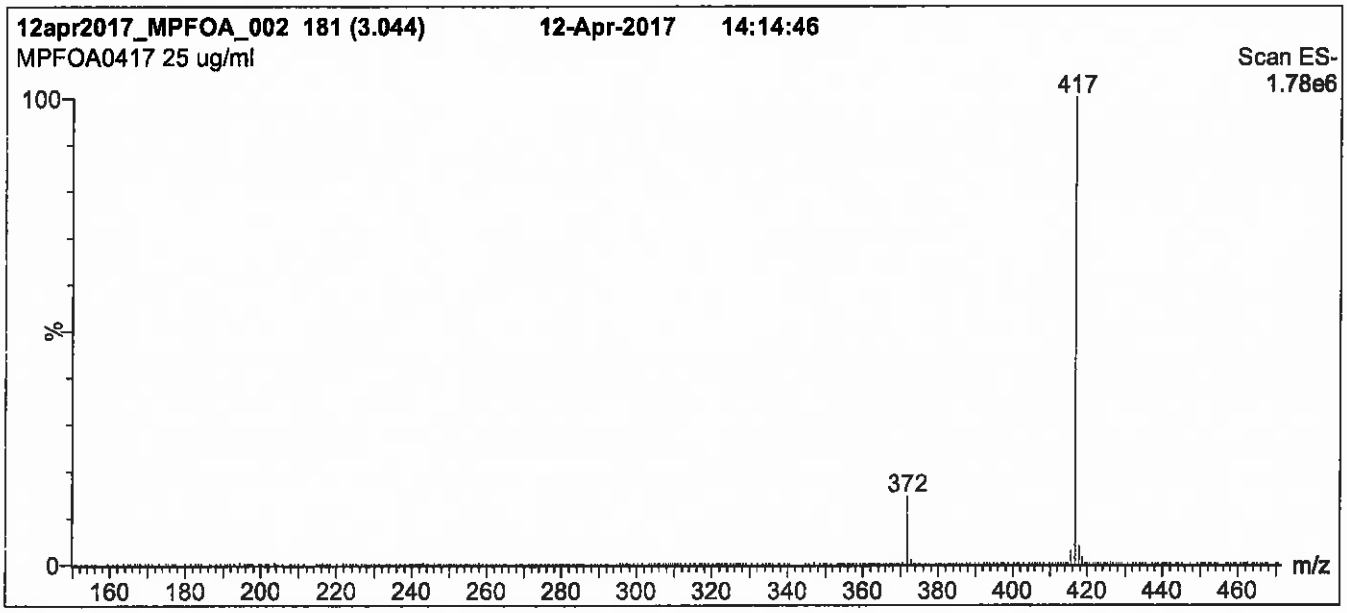

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LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

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1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 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

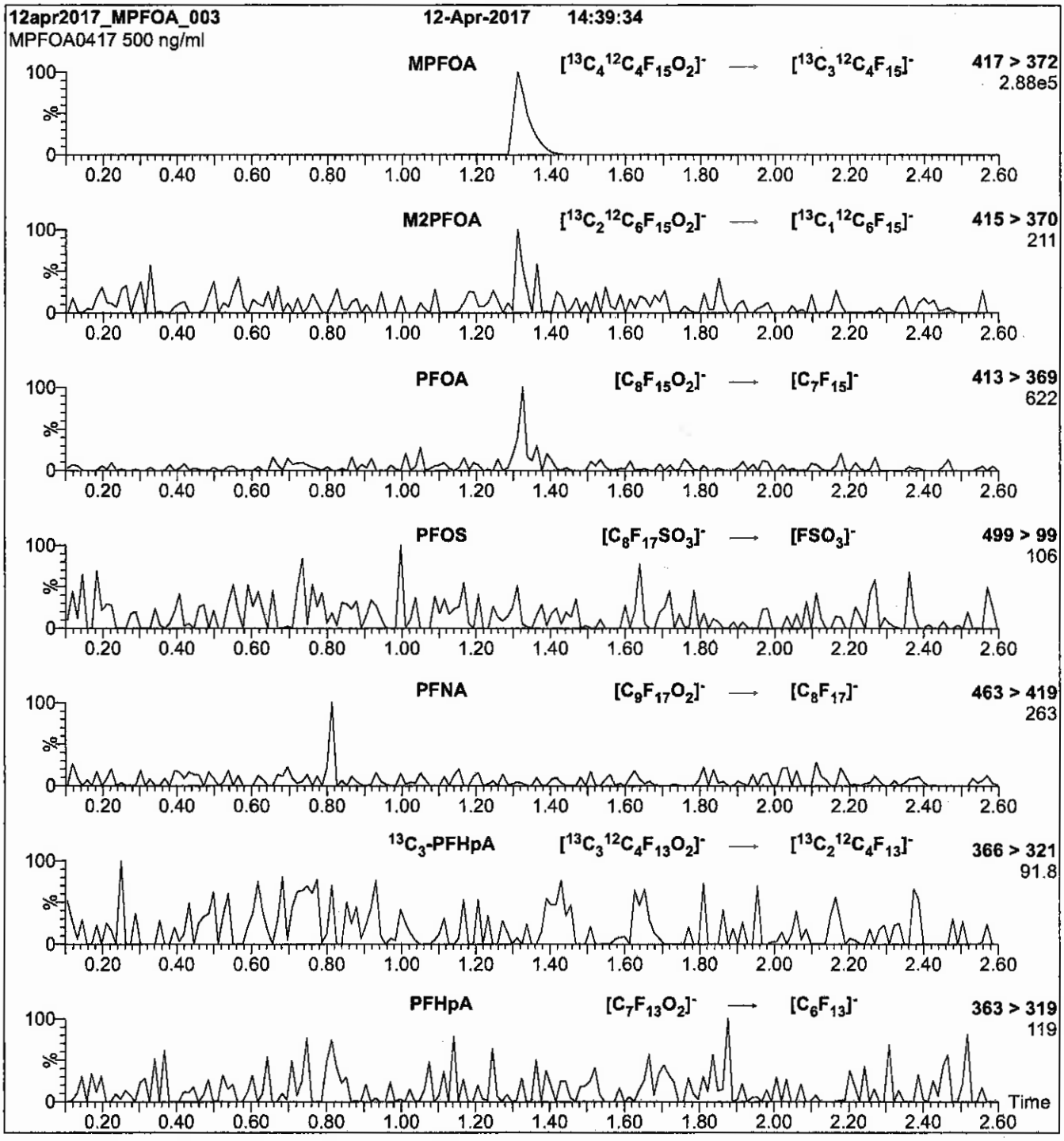
Flow: 300 µl/min

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

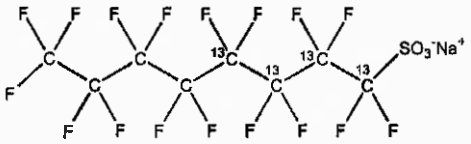
WELLINGTON LABORATORIES

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) **SOLVENT(S):** Methanol

47.8 ± 2.4 µg/ml (MPFOS anion)

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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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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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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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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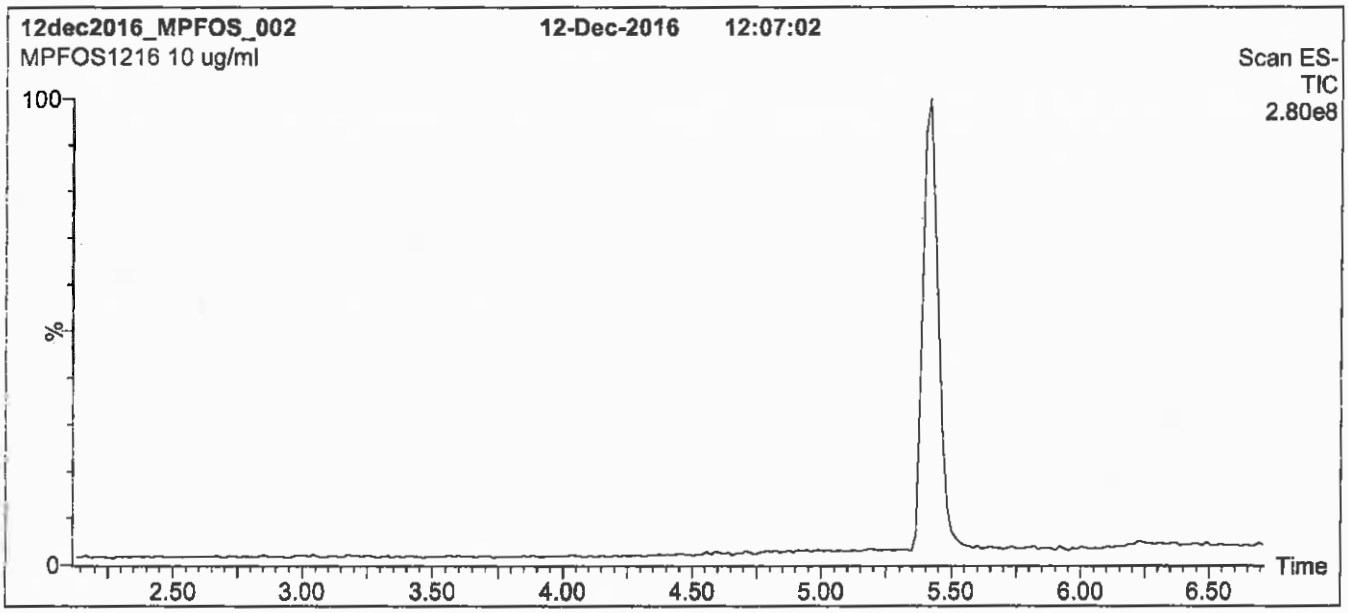
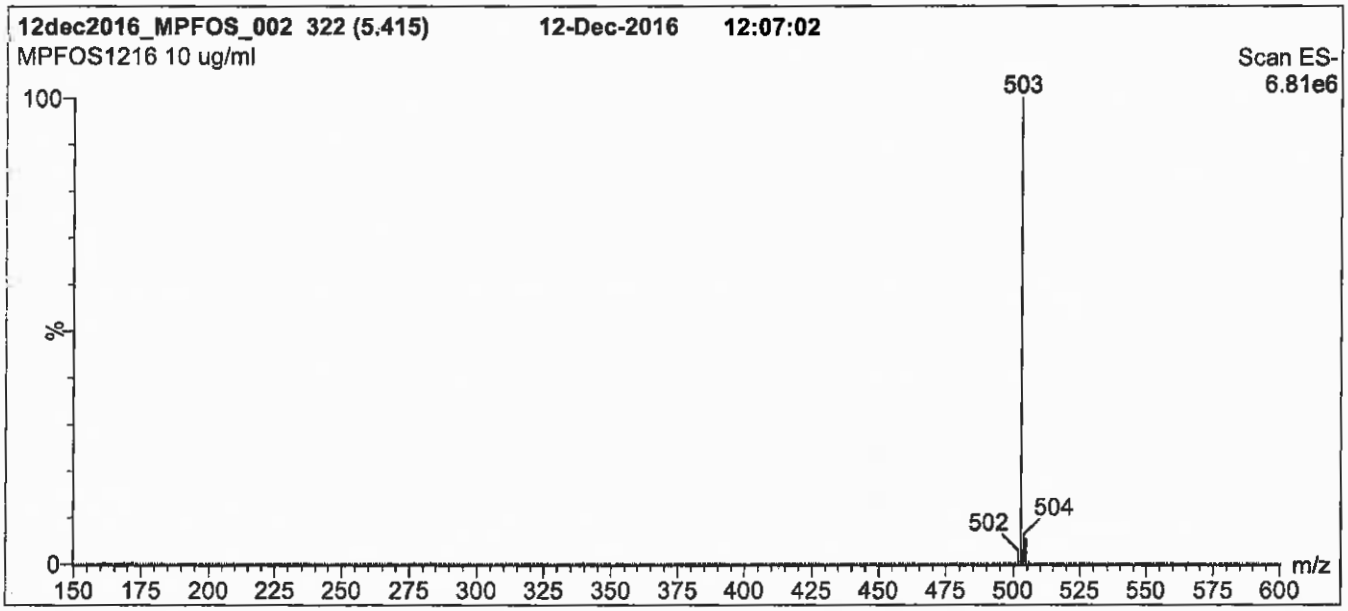
Figure 1: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





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

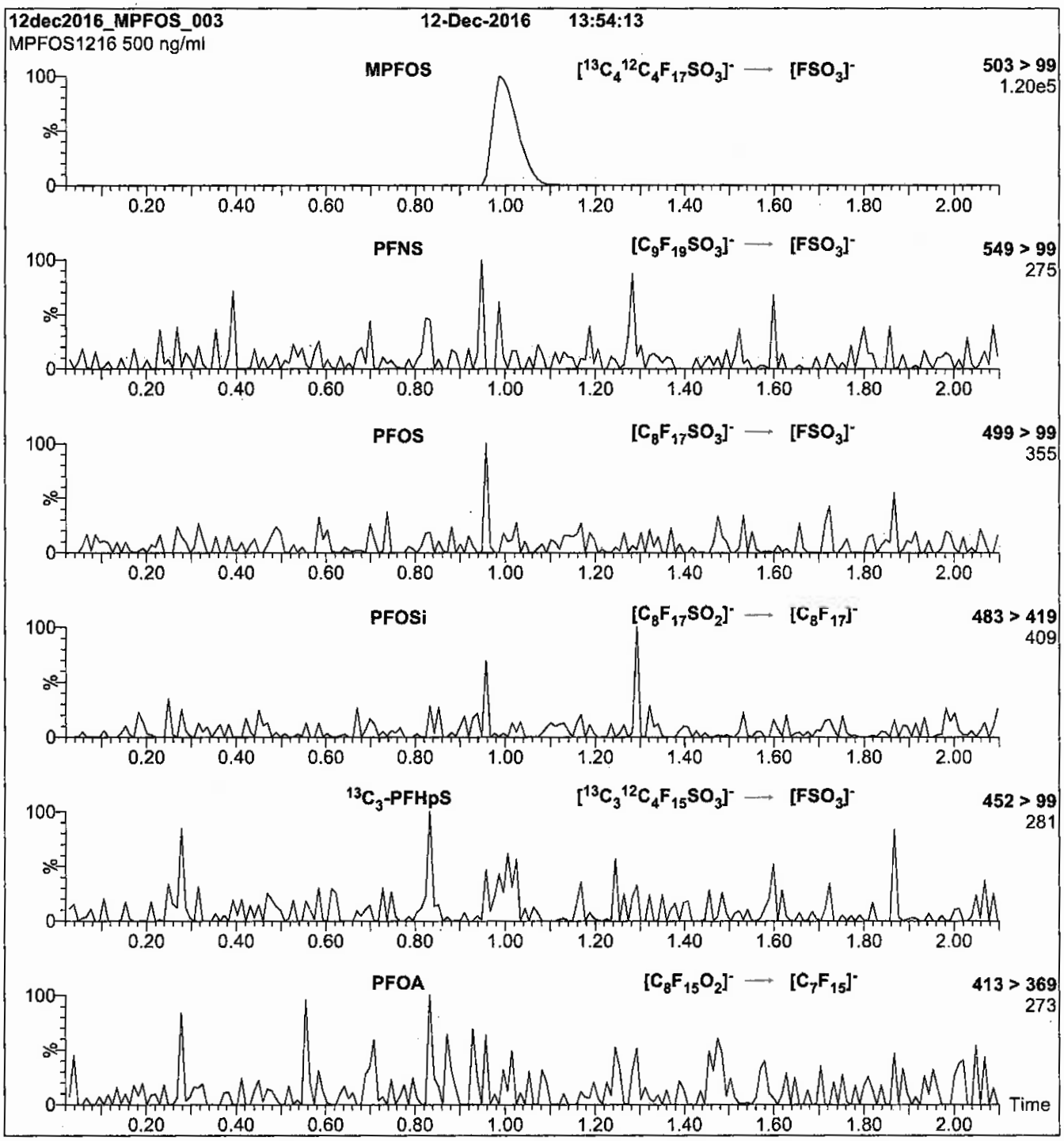
Flow: 300 µl/min

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

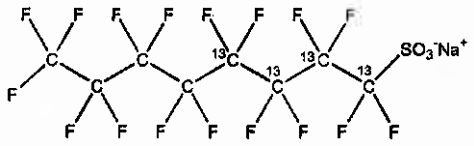
LCMPFOS_00023

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

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

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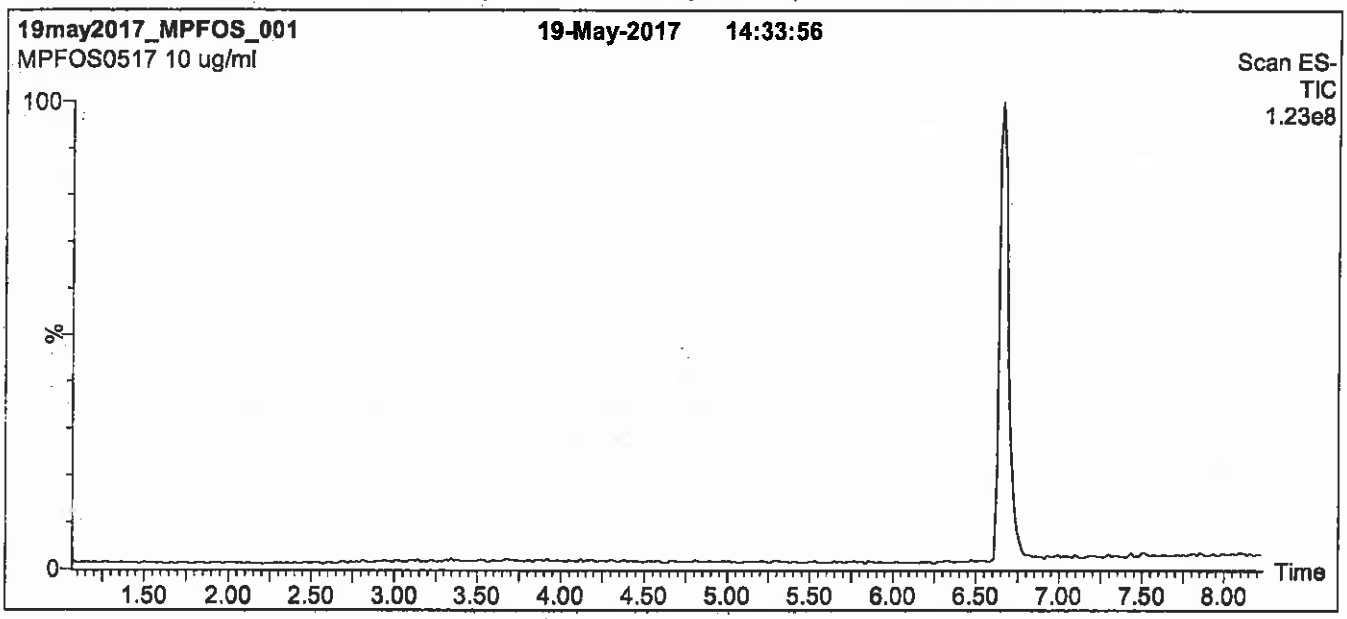
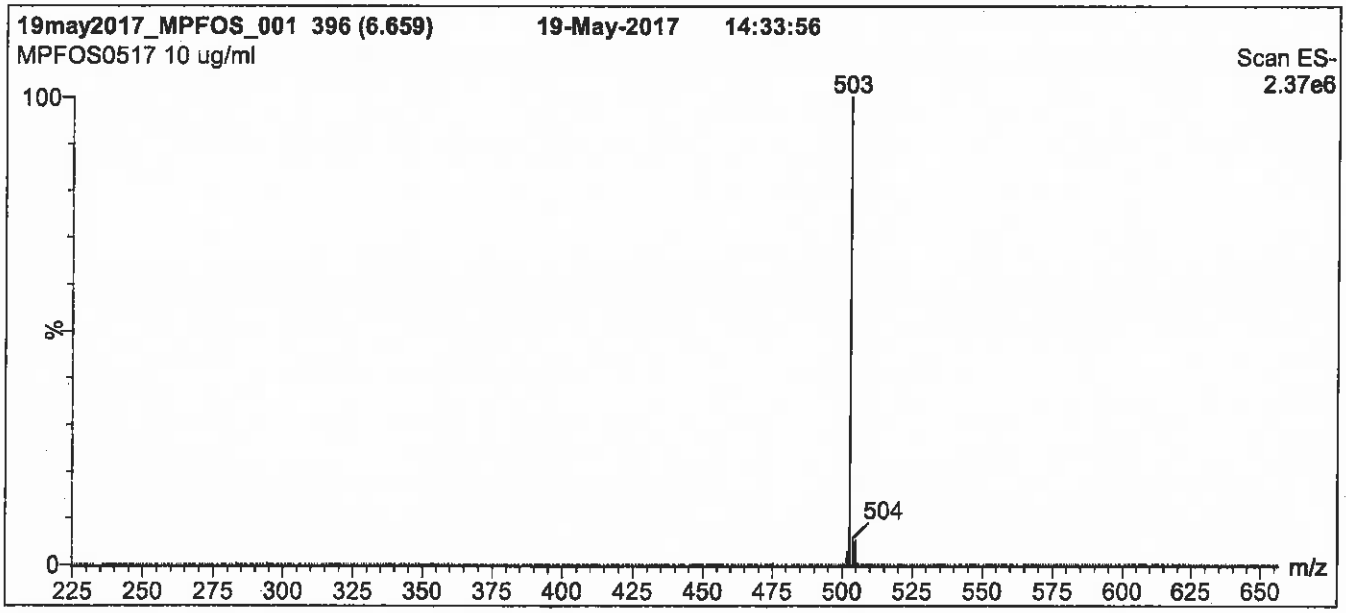




Conditions for Figure 1:

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

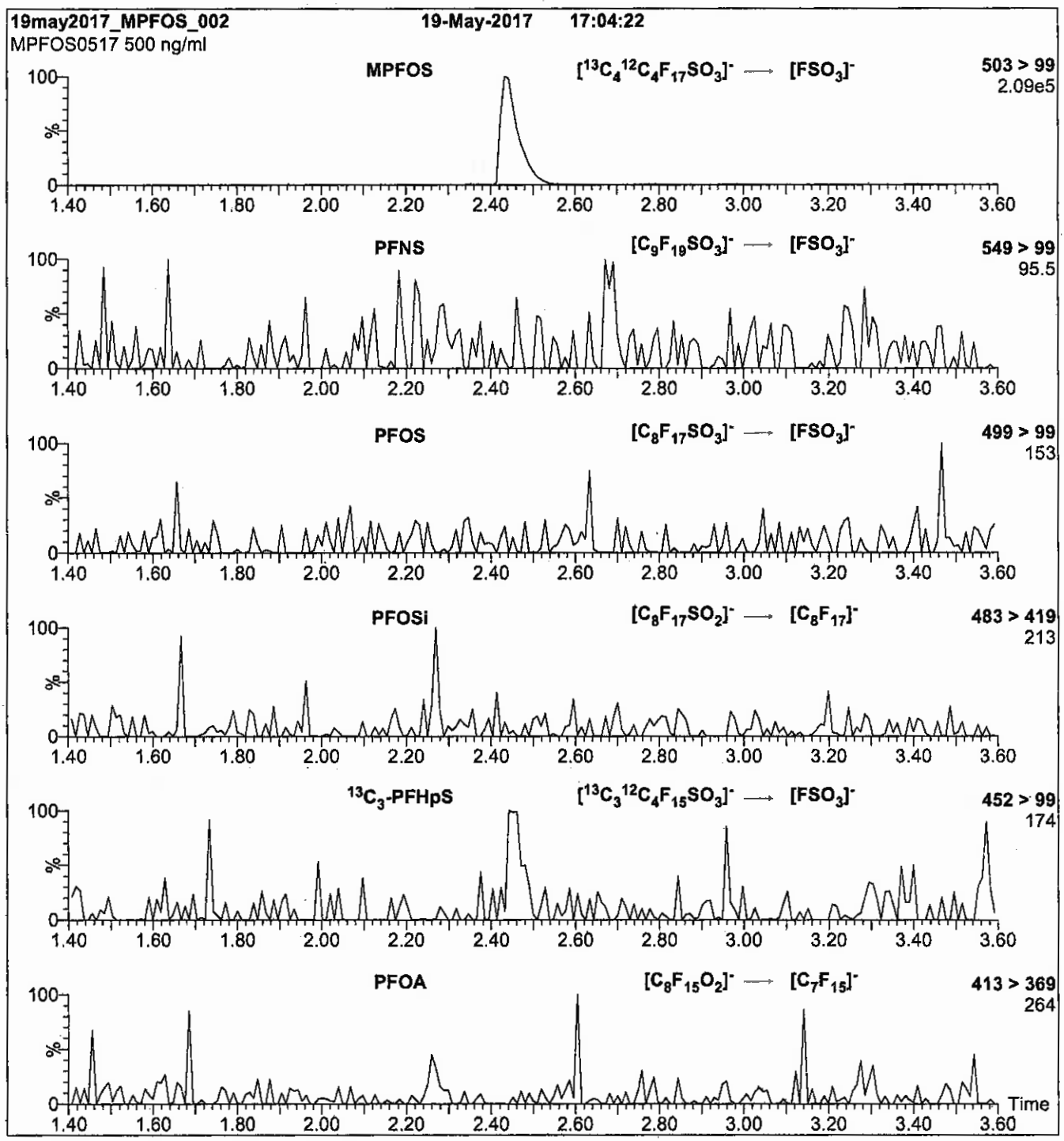
Flow: 300 µl/min

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

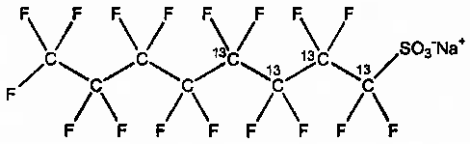
LCMPFOS_00024

r: 8/2/17 SKJ

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		

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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 ~ 0.8% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

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Certified By: _____ **Date:** 05/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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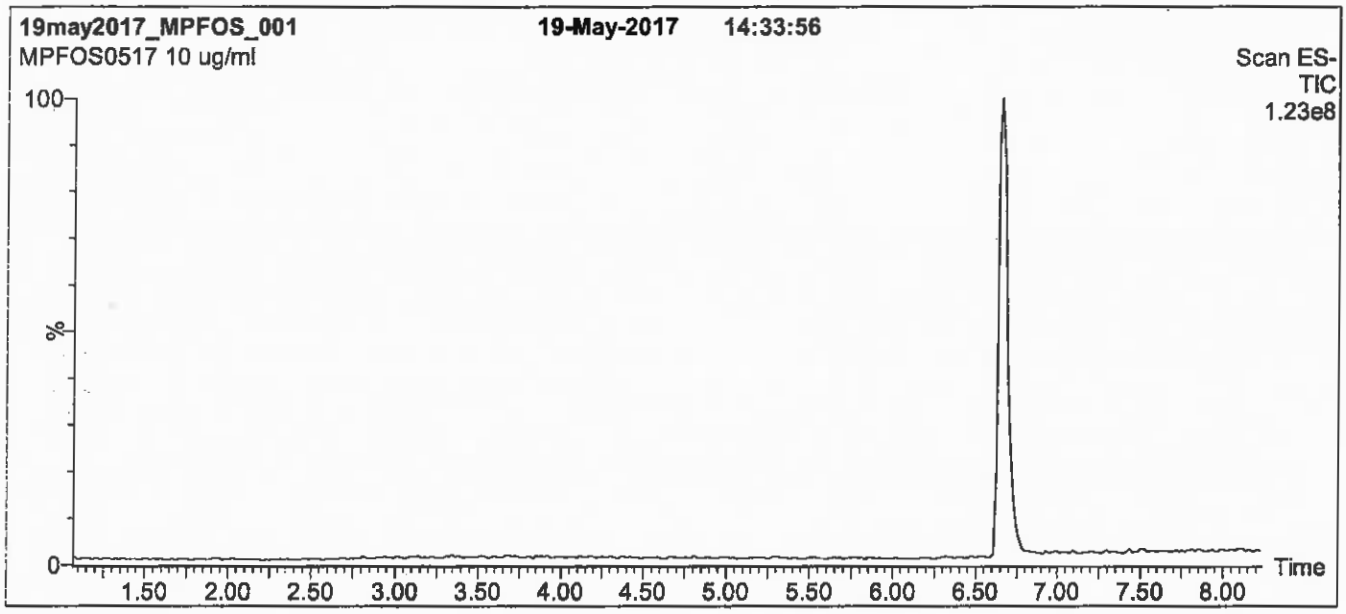
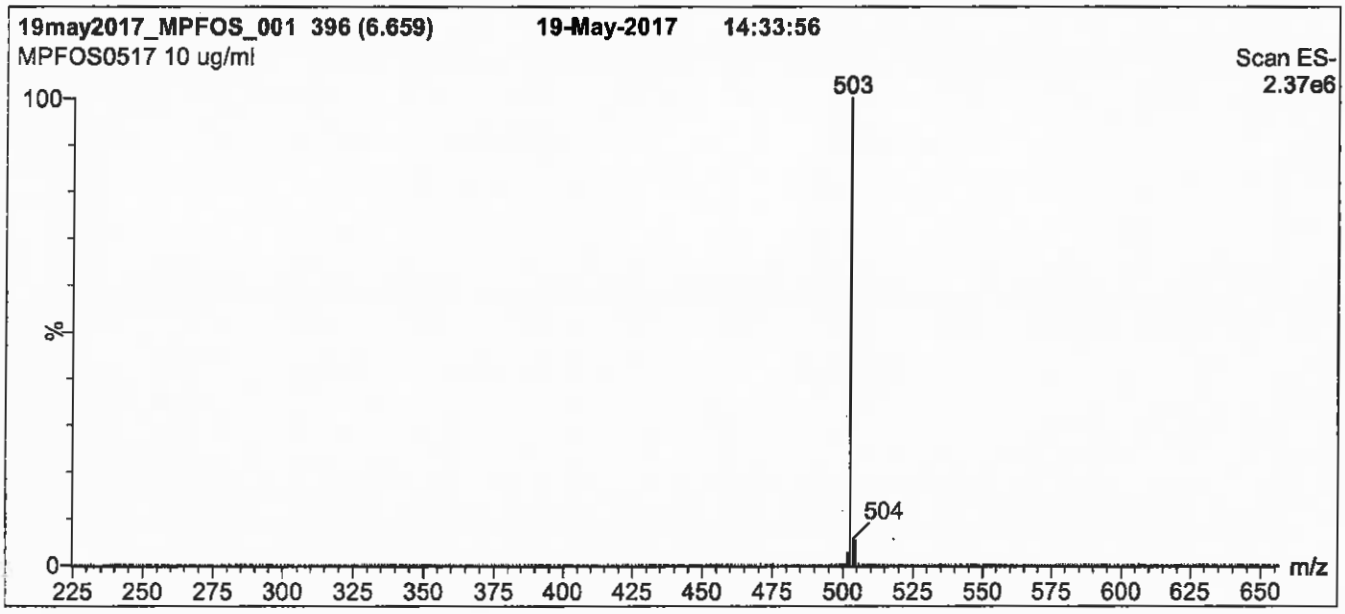




Conditions for Figure 1:

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

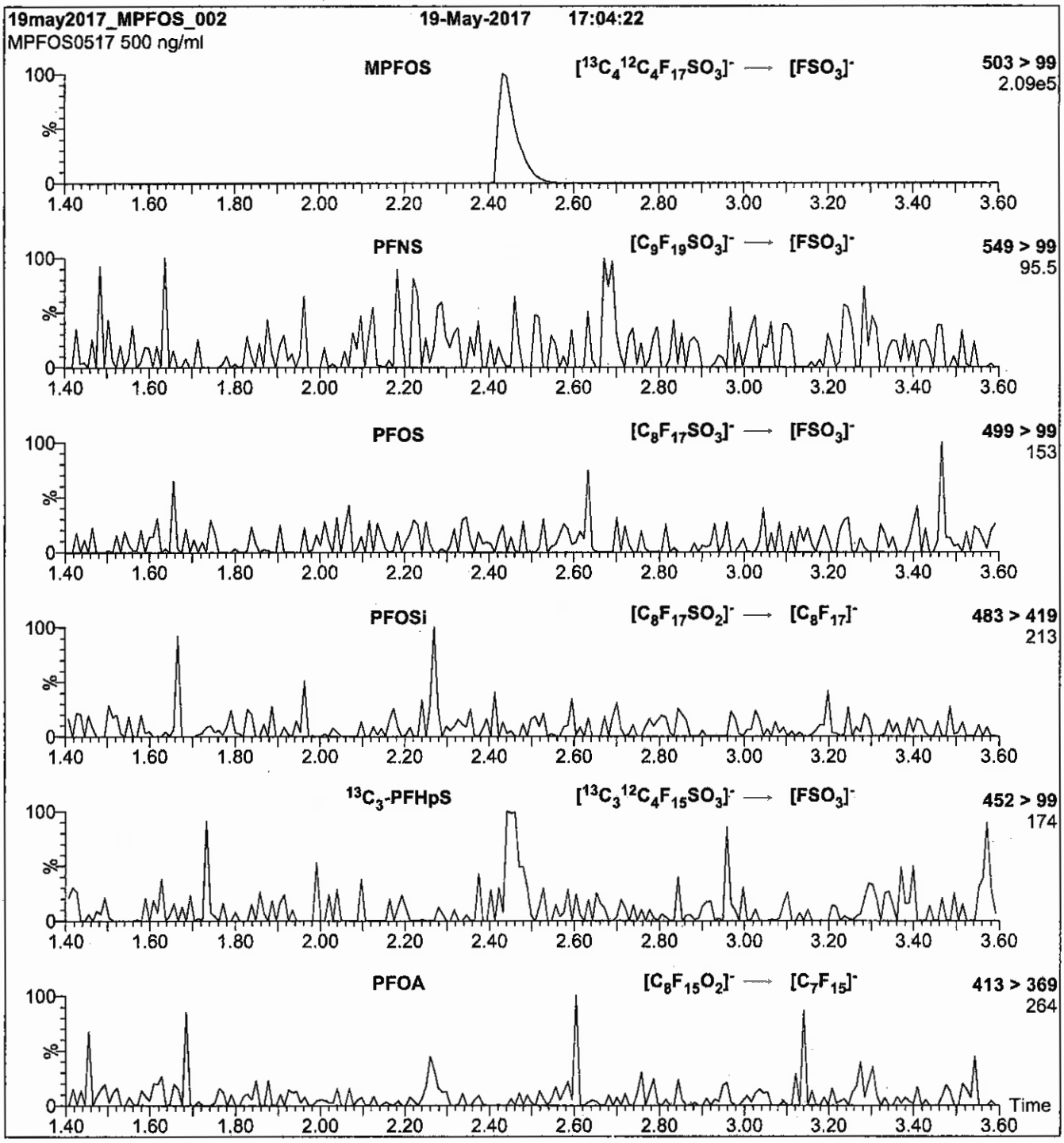
Flow: 300 µl/min

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

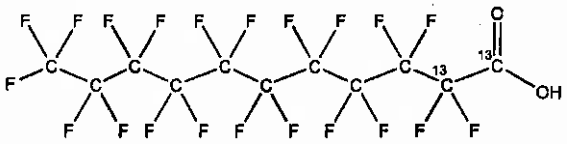
PRODUCT CODE: MPFUdA

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)

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CALA

ANAB ACCREDITED

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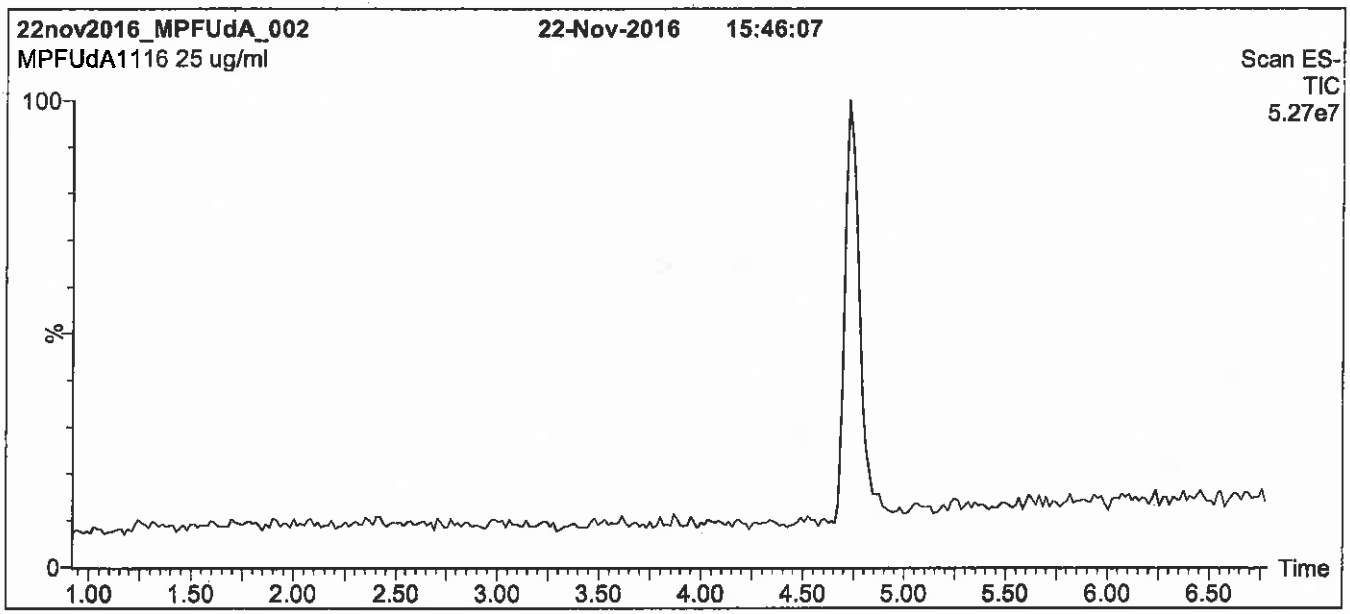
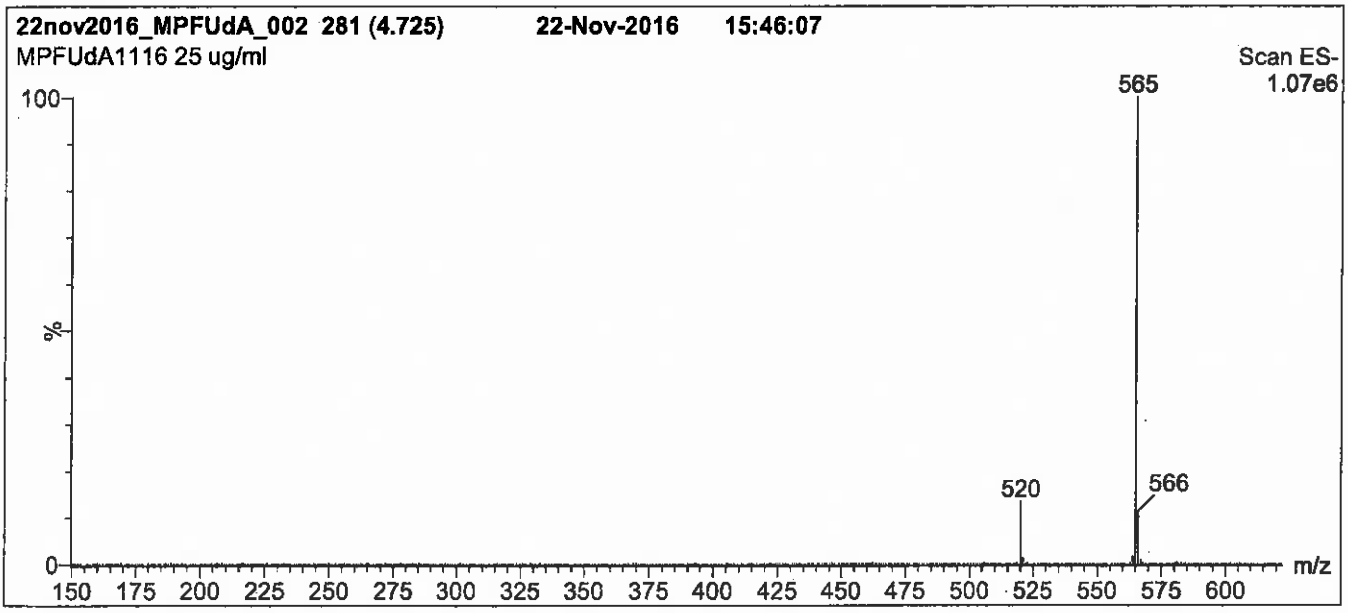
Figure 1: **MPFUdA; LC/MS Data (TIC and Mass Spectrum)**





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

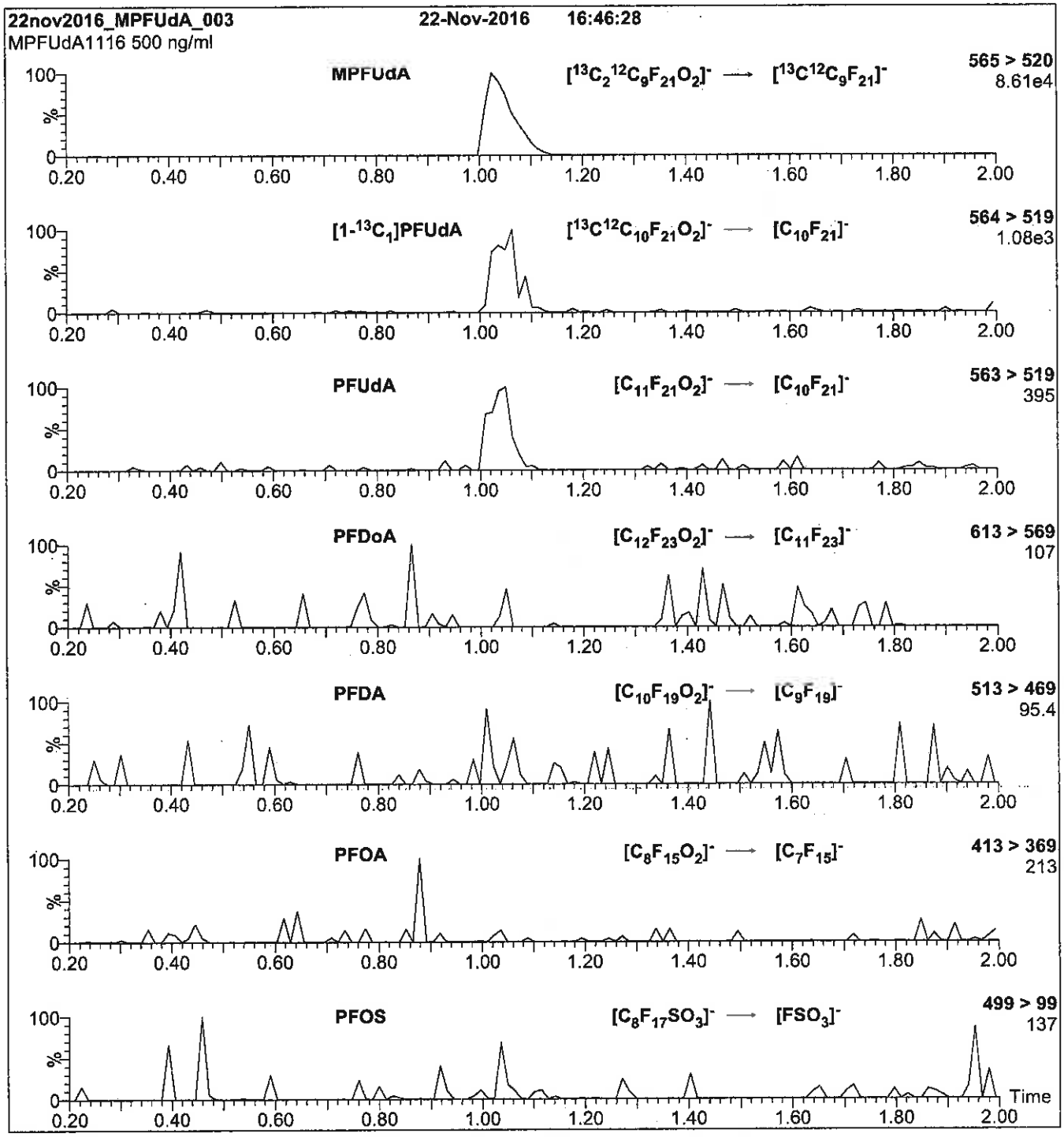
Flow: 300 µl/min

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

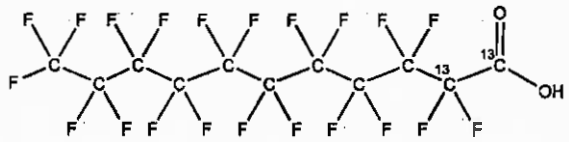
LCMPFUdA_00012

r: 7/5/17 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.

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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

INTENDED USE:

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HAZARDS:

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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.

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CALA

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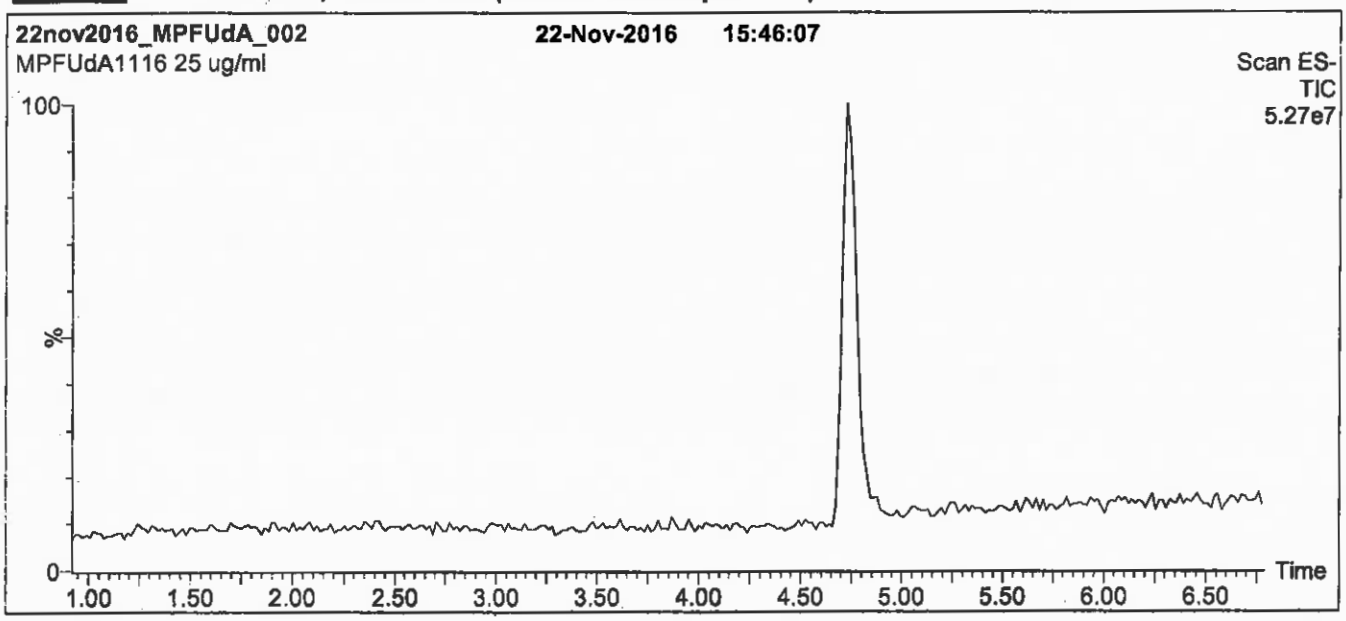

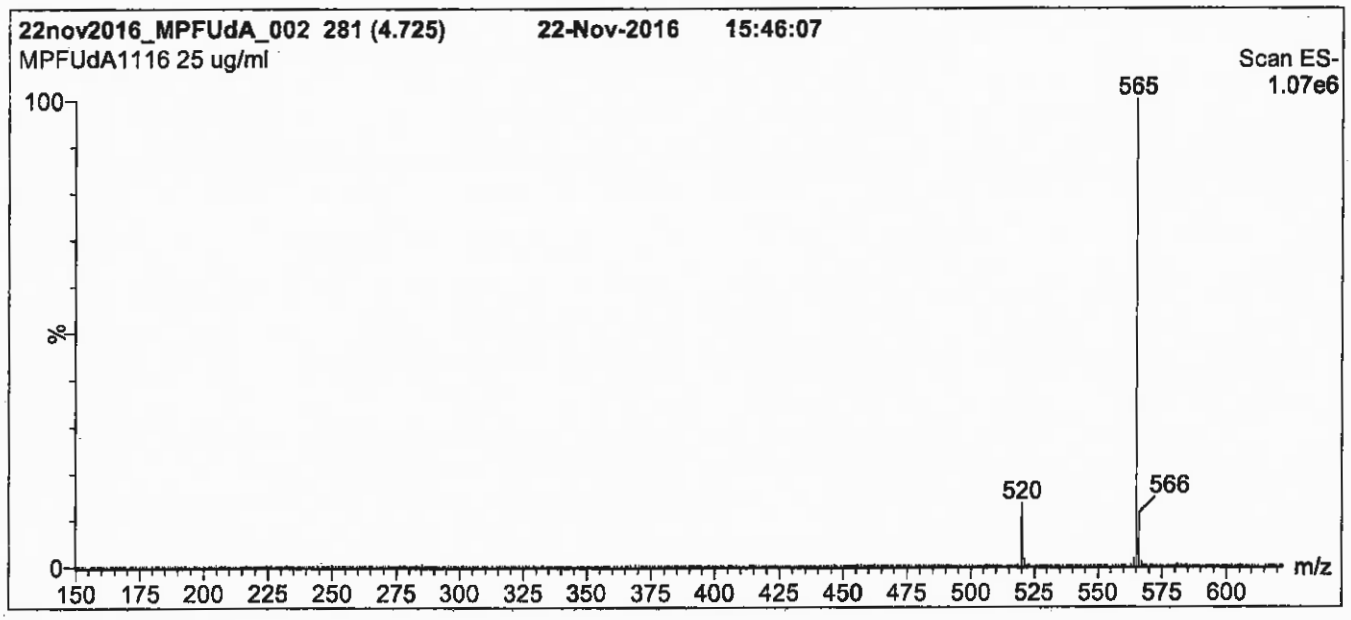

Conditions for Figure 1:

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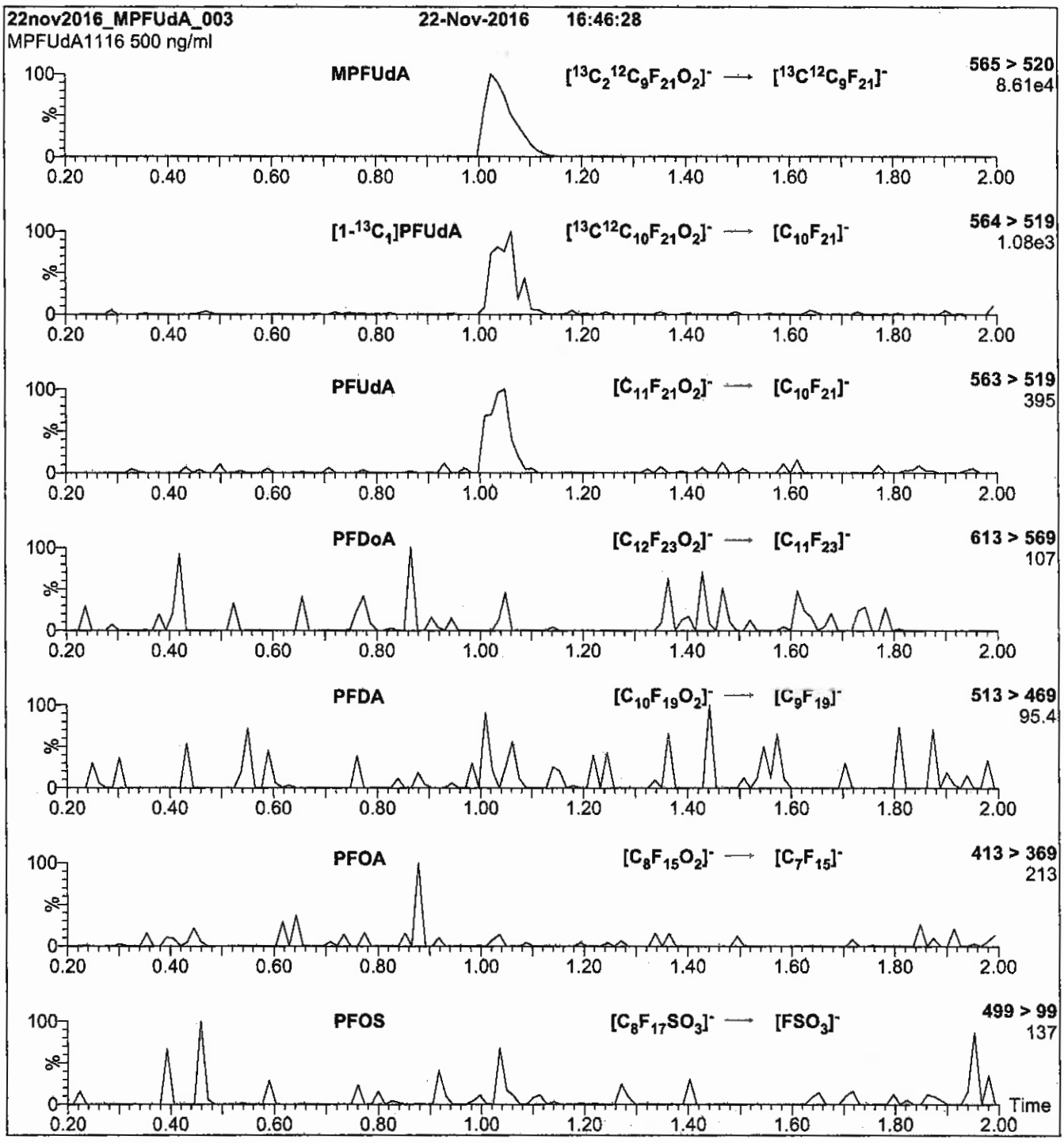
Figure 2: **MPFUdA; LC/MS/MS Data (Selected MRM Transitions)**



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_00013

r: 8/30/17 STV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

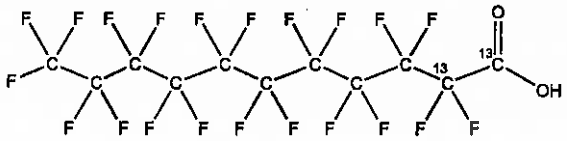
PRODUCT CODE: MPFUdA

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

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Certified By: B.G. Chittim

Date: 12/07/2016 (mm/dd/yyyy)

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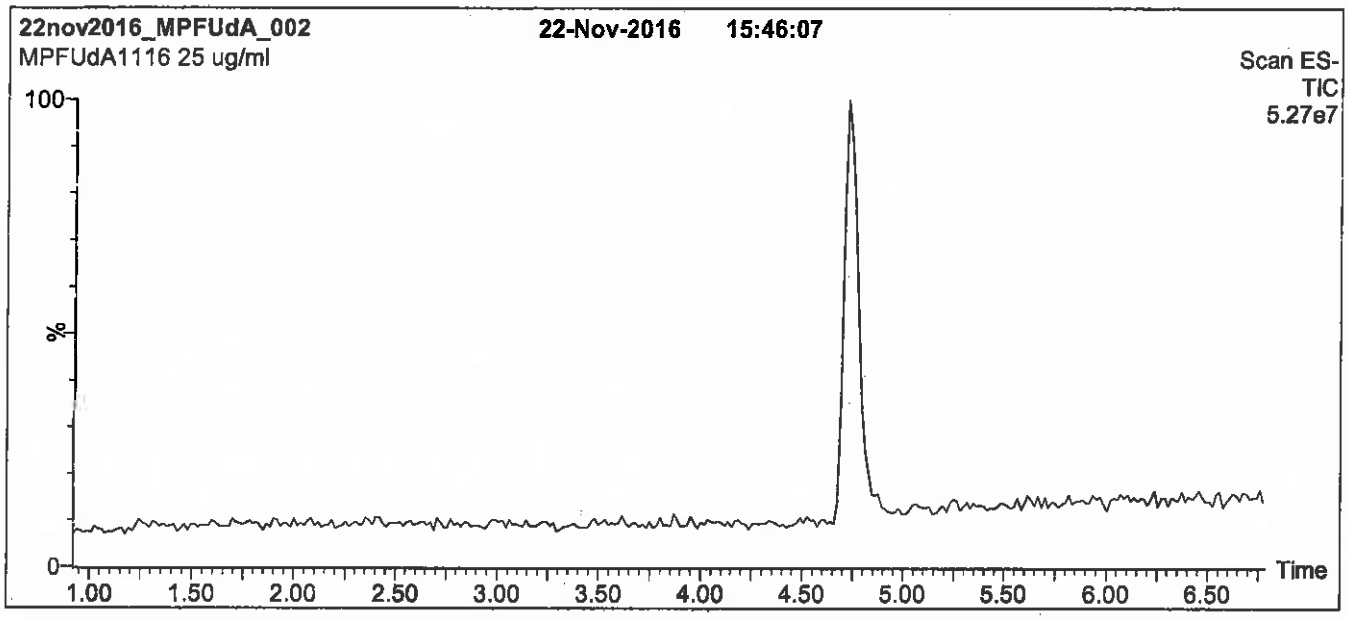
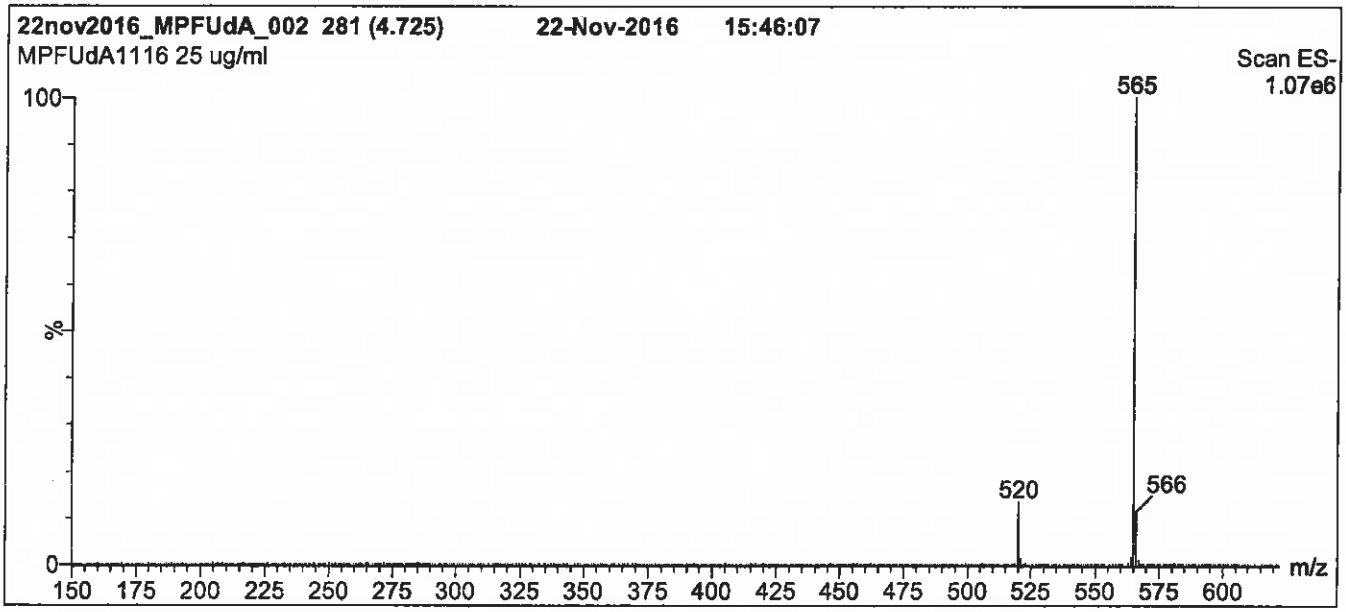




Conditions for Figure 1:

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

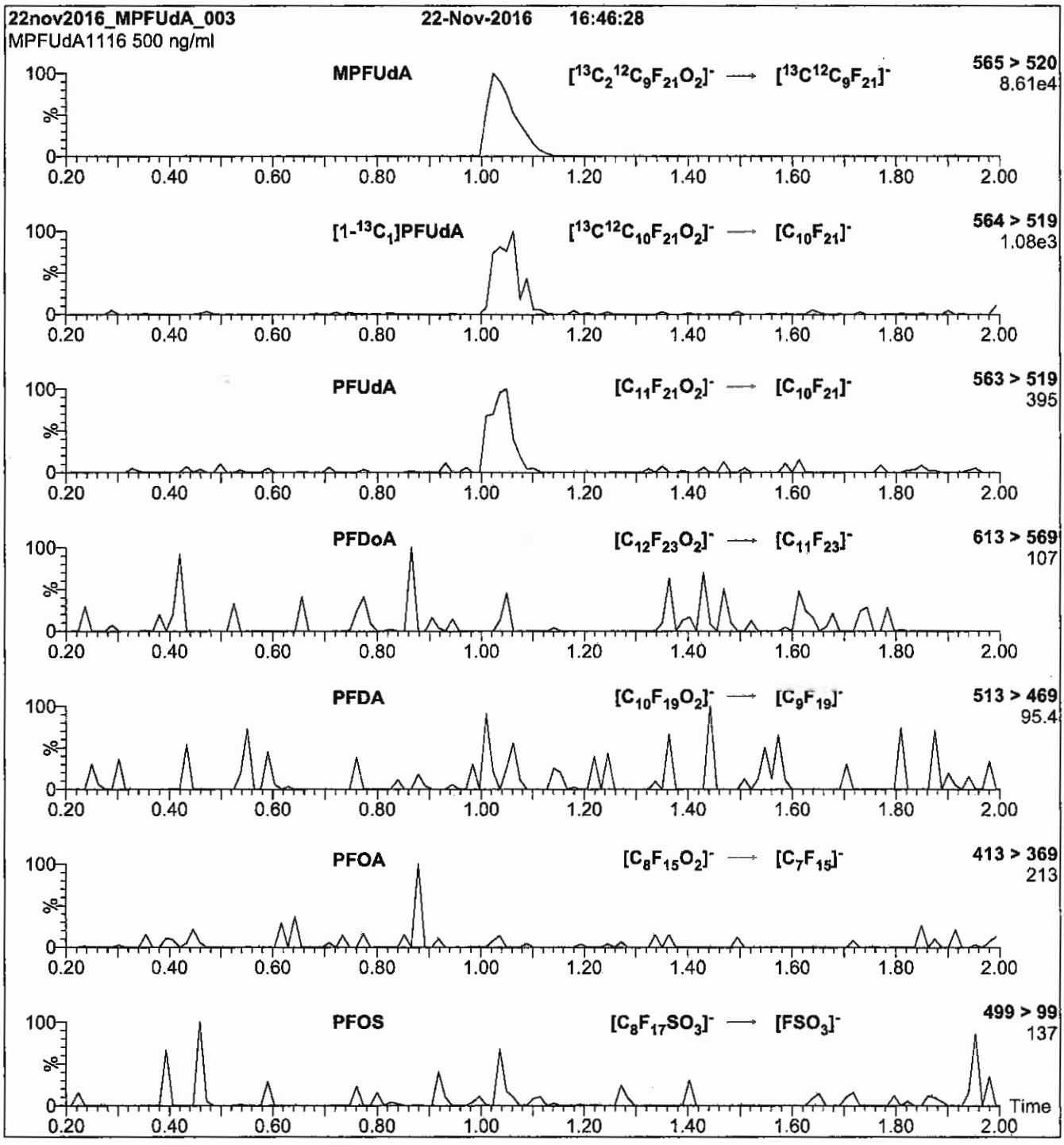
Flow: 300 µl/min

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

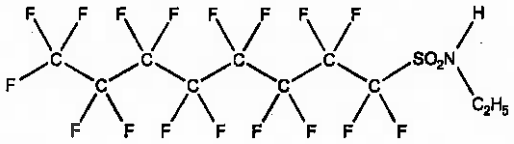
LCN-EtFOSA-M_00004

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)

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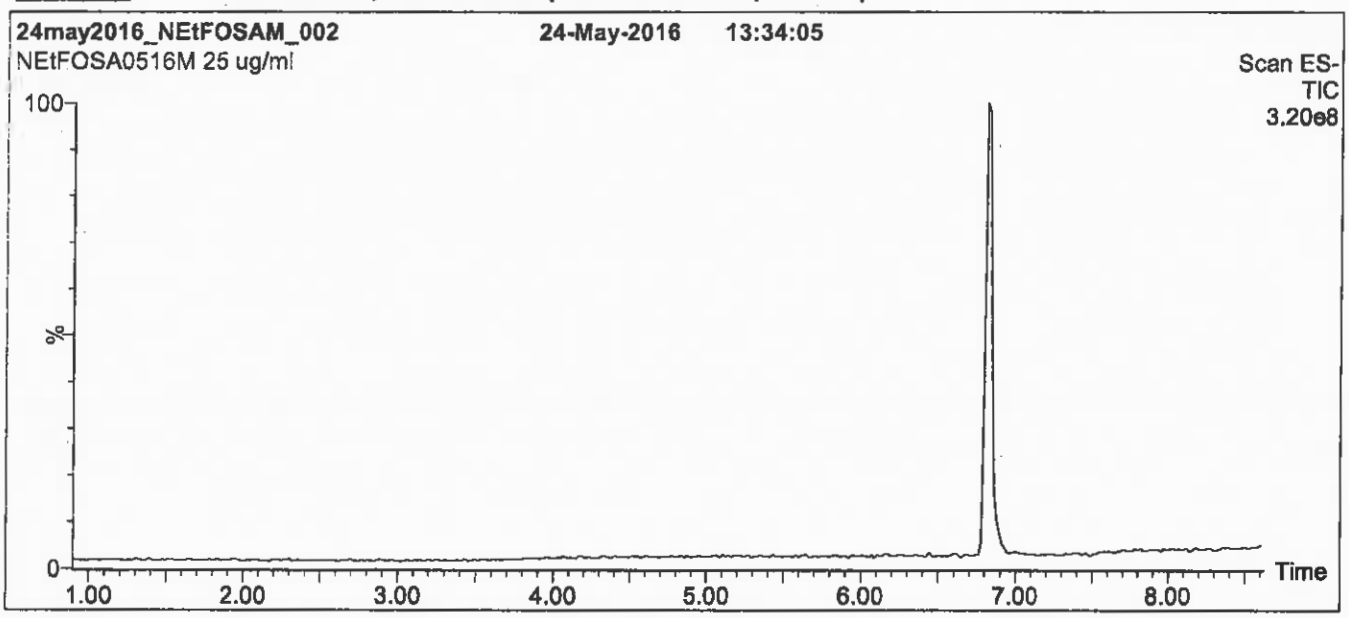
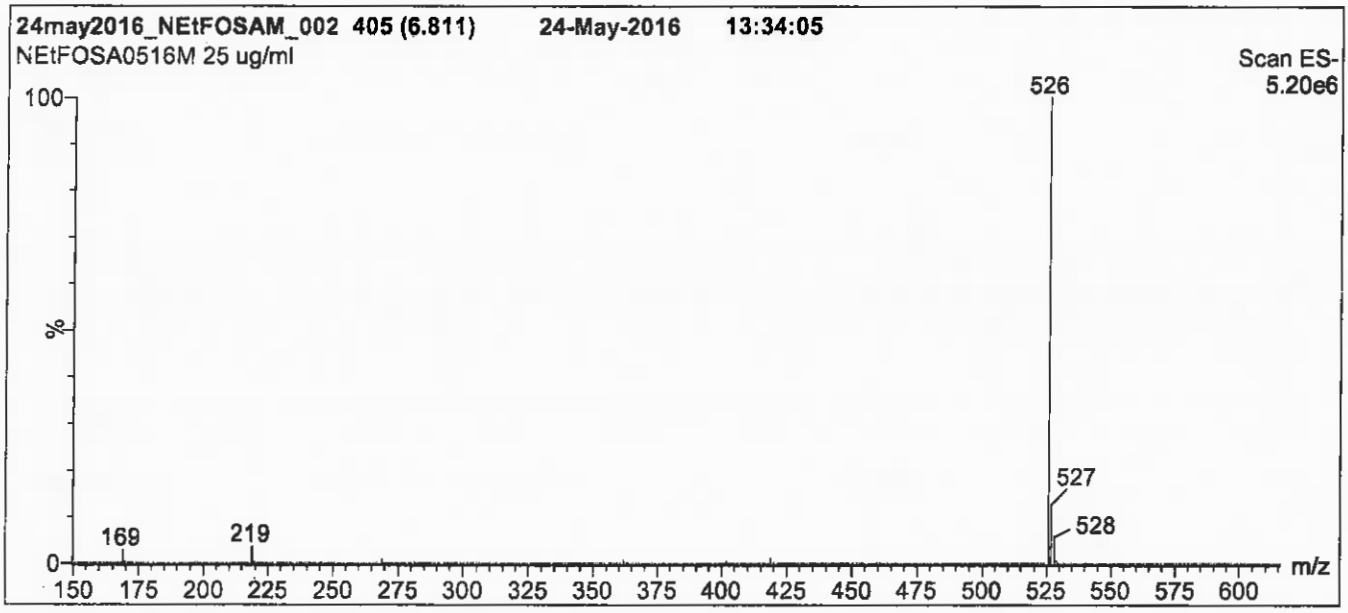
Figure 1: **N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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MS: Micromass Quattro *micro* API MS

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1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% 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

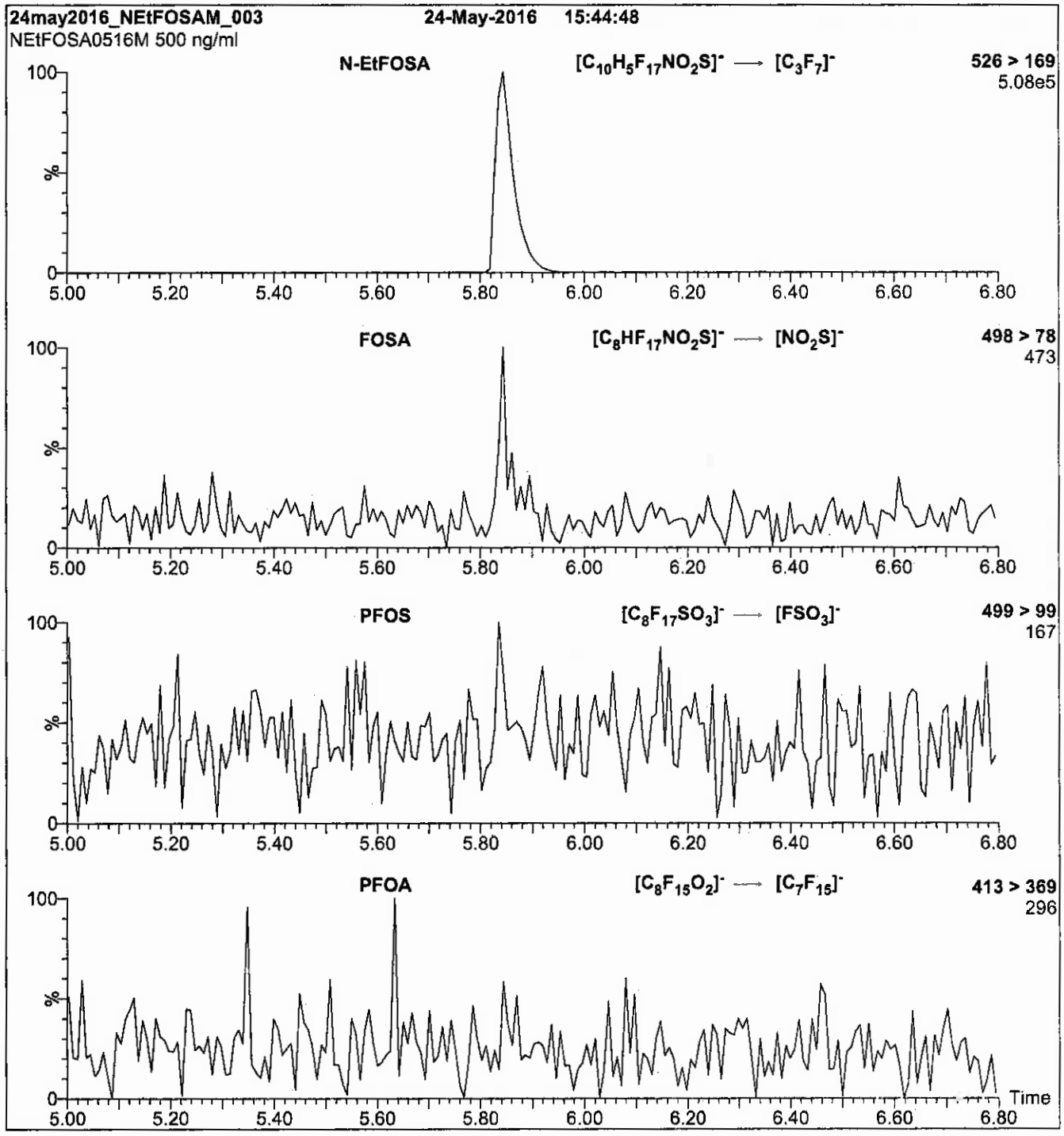
Flow: 300 µl/min

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

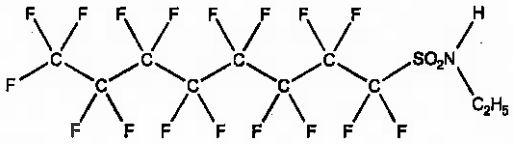
LCN-EtFOSA-M_00005

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.

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:

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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:

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

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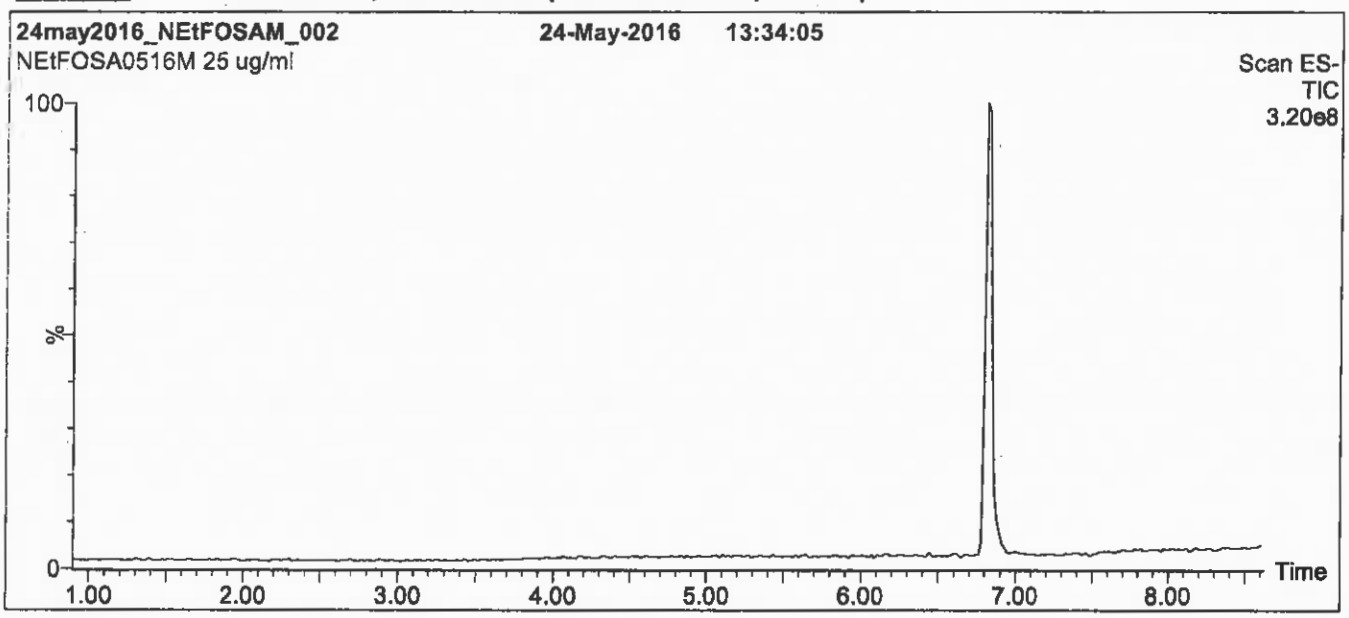
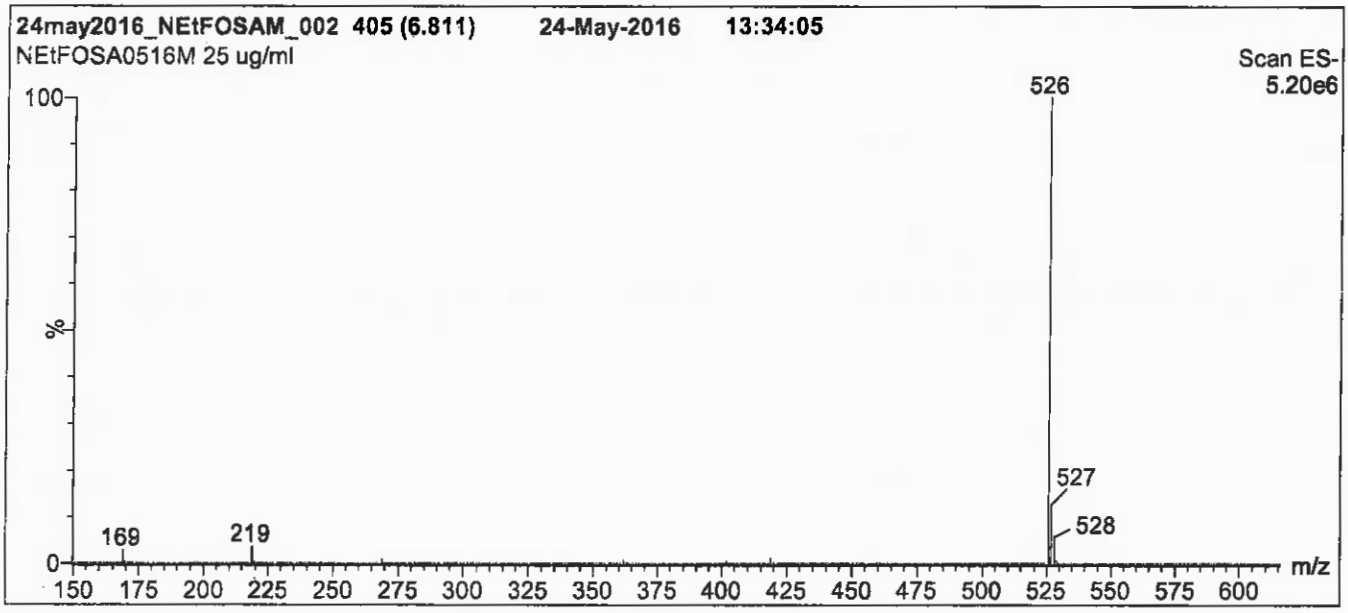
Figure 1: **N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





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

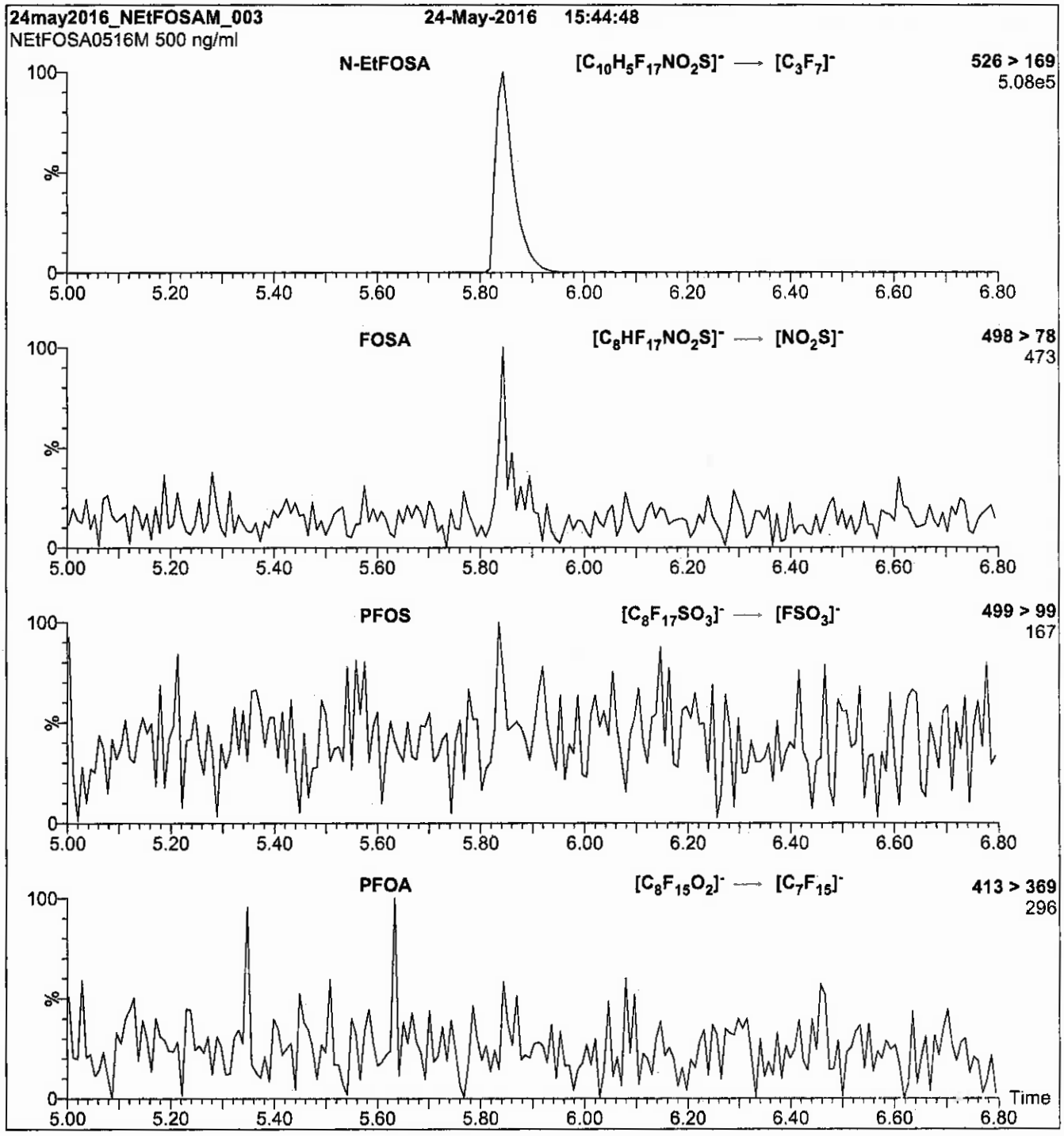
Flow: 300 µl/min

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

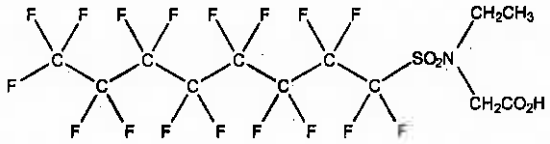
LCN-EtFOSAA_00003

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
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.

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

EXPIRY DATE / PERIOD OF VALIDITY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED

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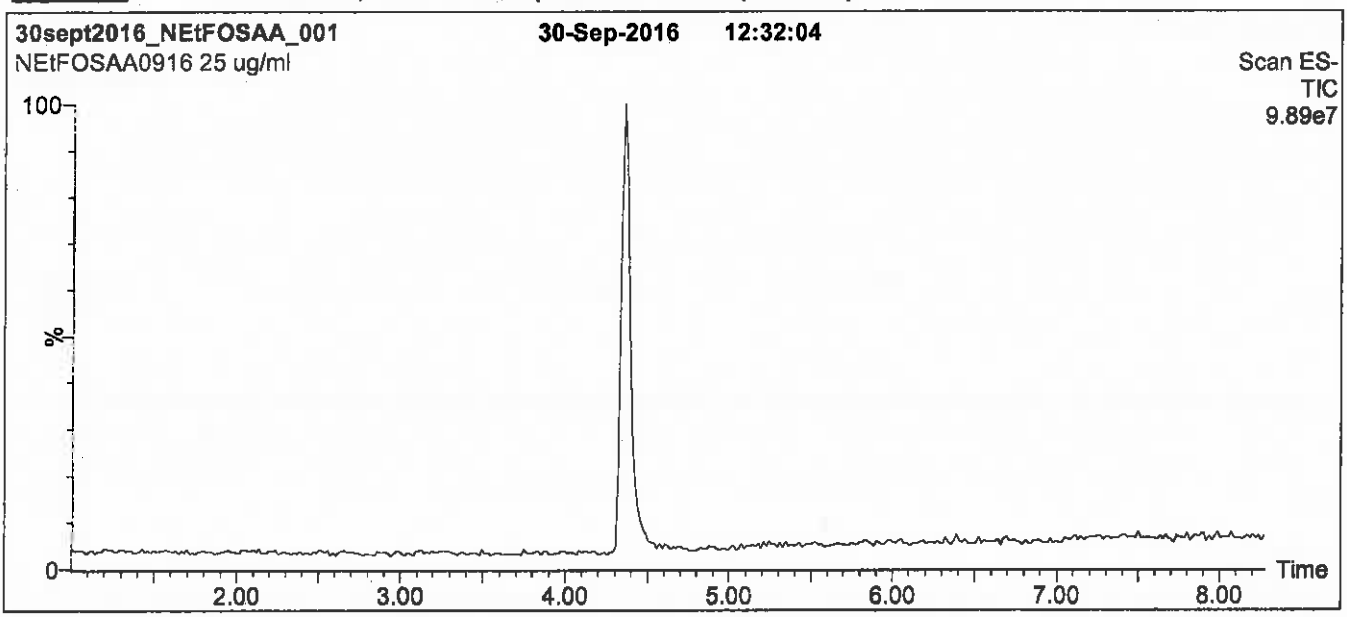
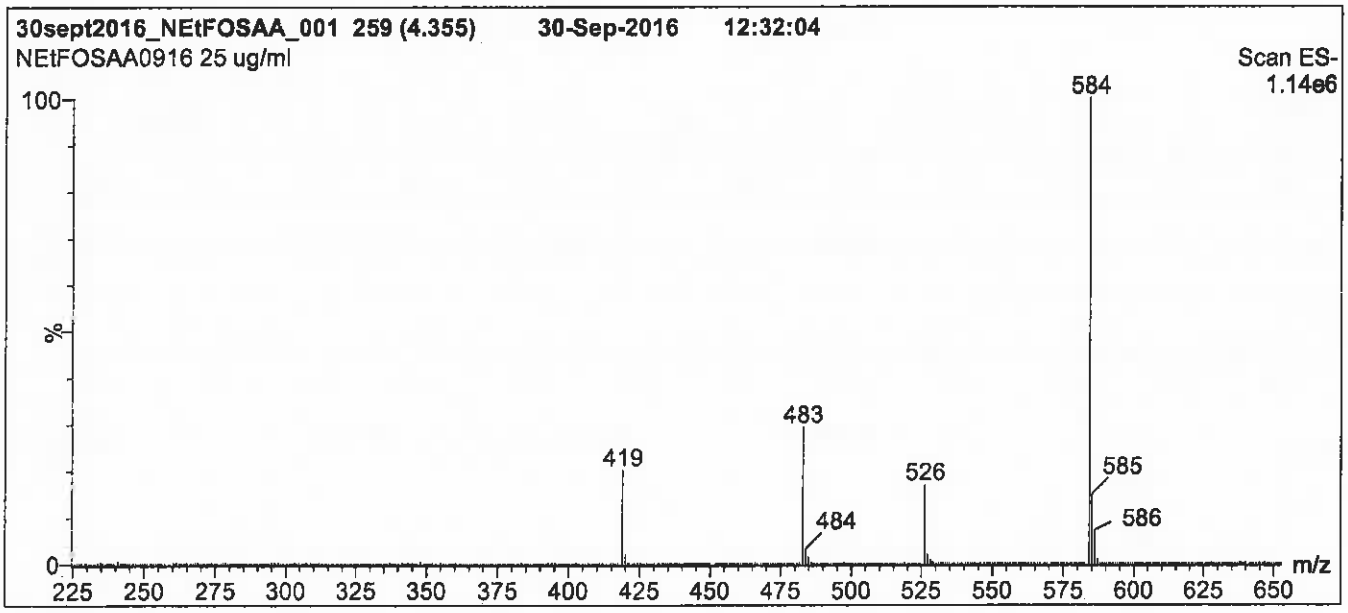
Figure 1: **N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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

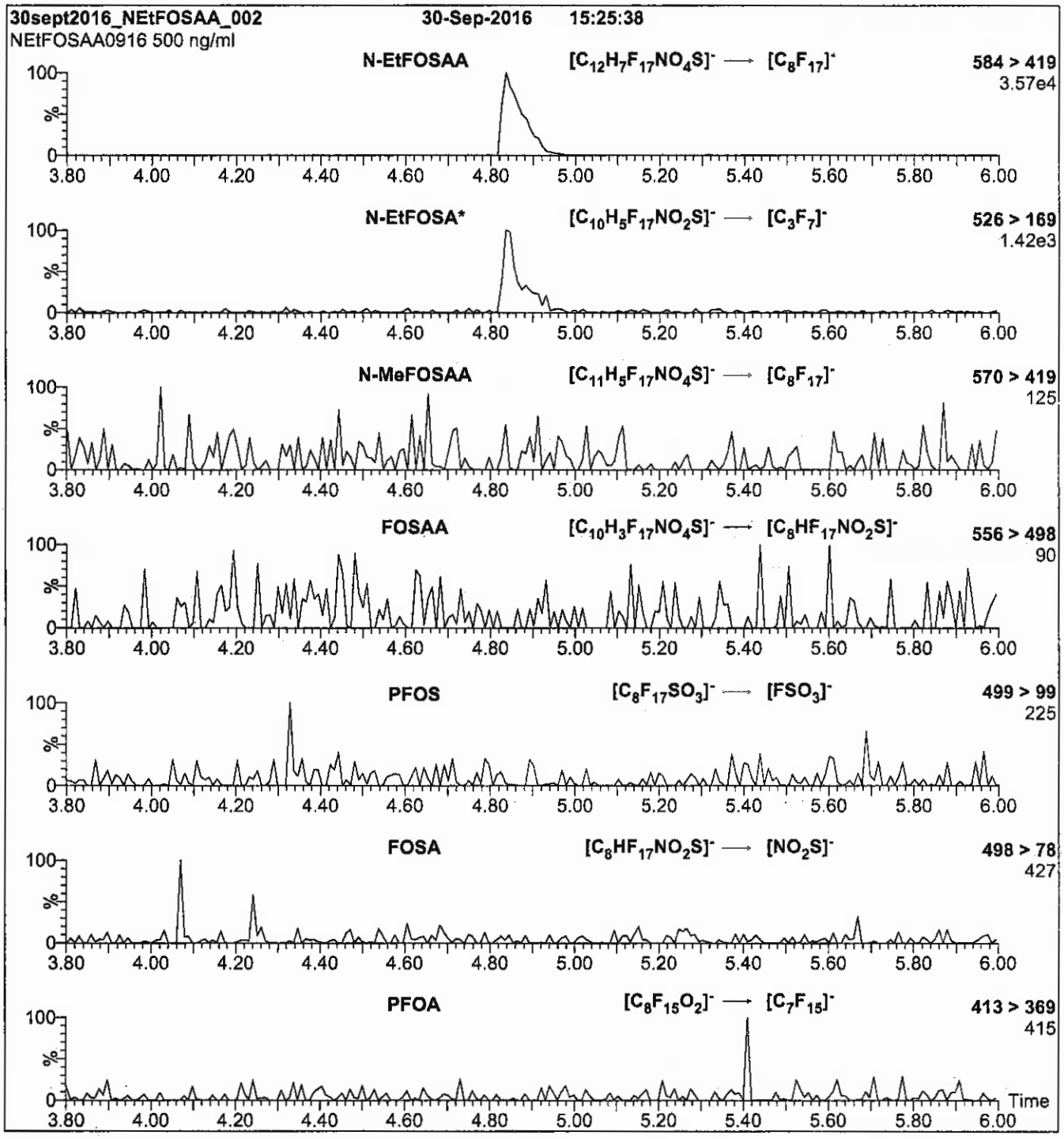
Flow: 300 µl/min

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

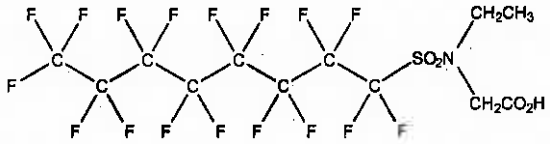
LCN-EtFOSAA_00004

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.

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CALA

ANAB ACCREDITED

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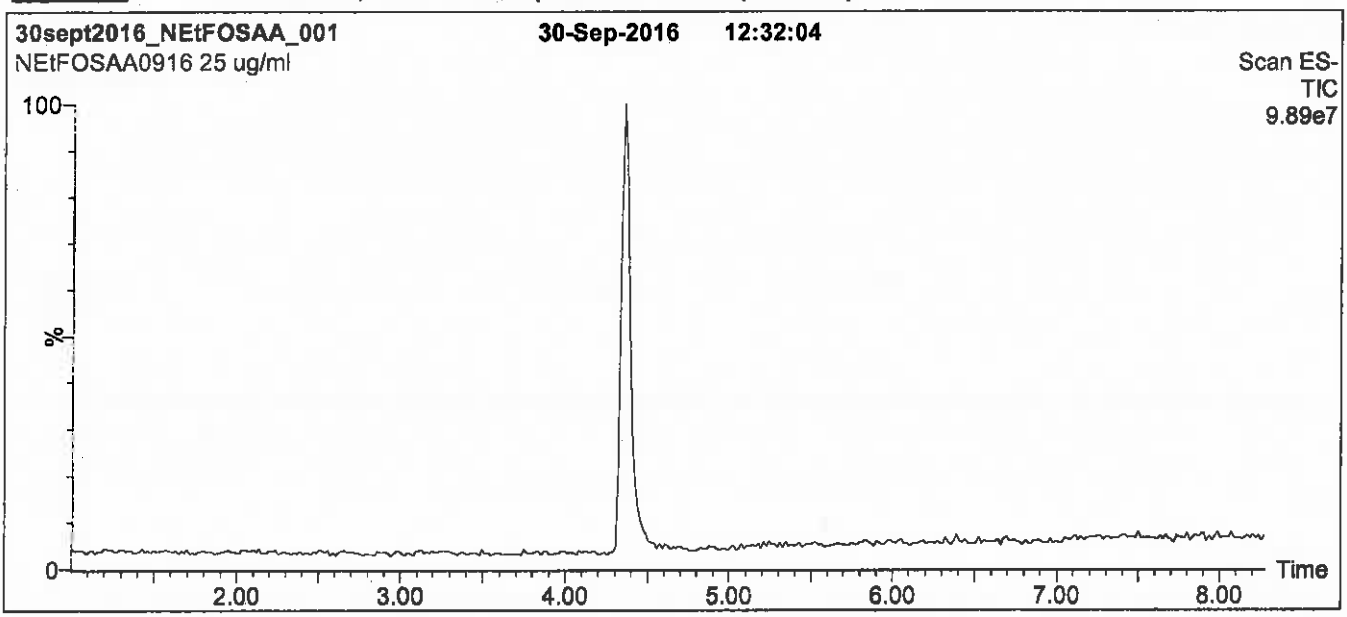
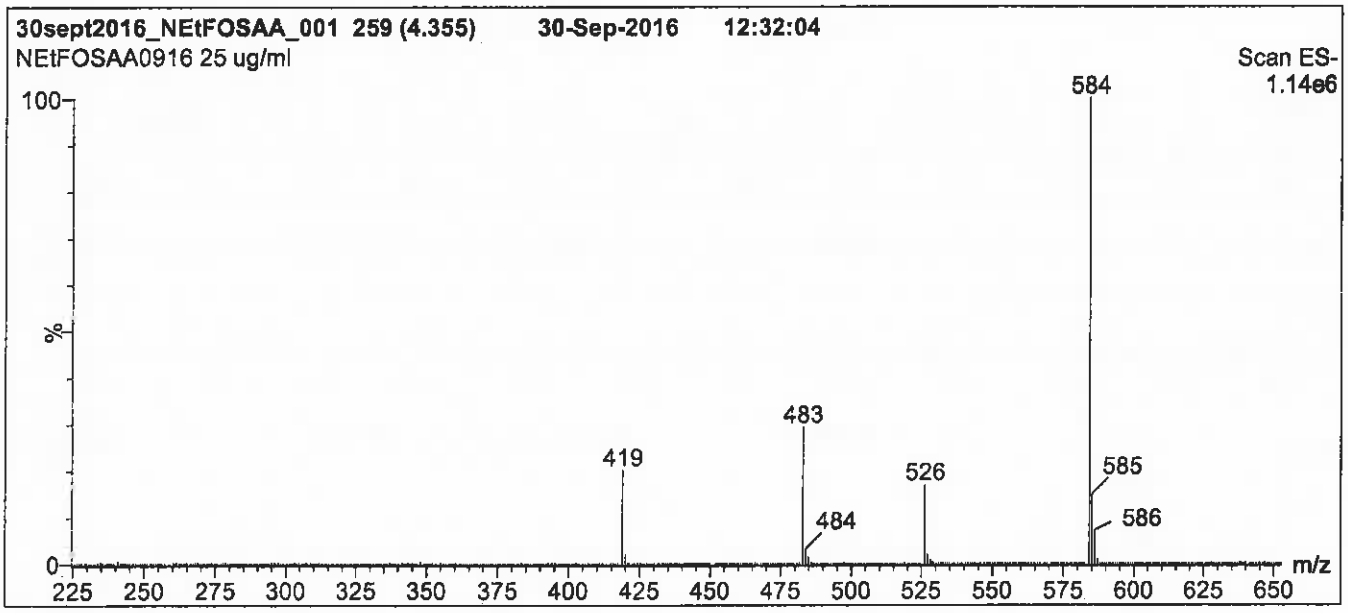




Conditions for Figure 1:

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: 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

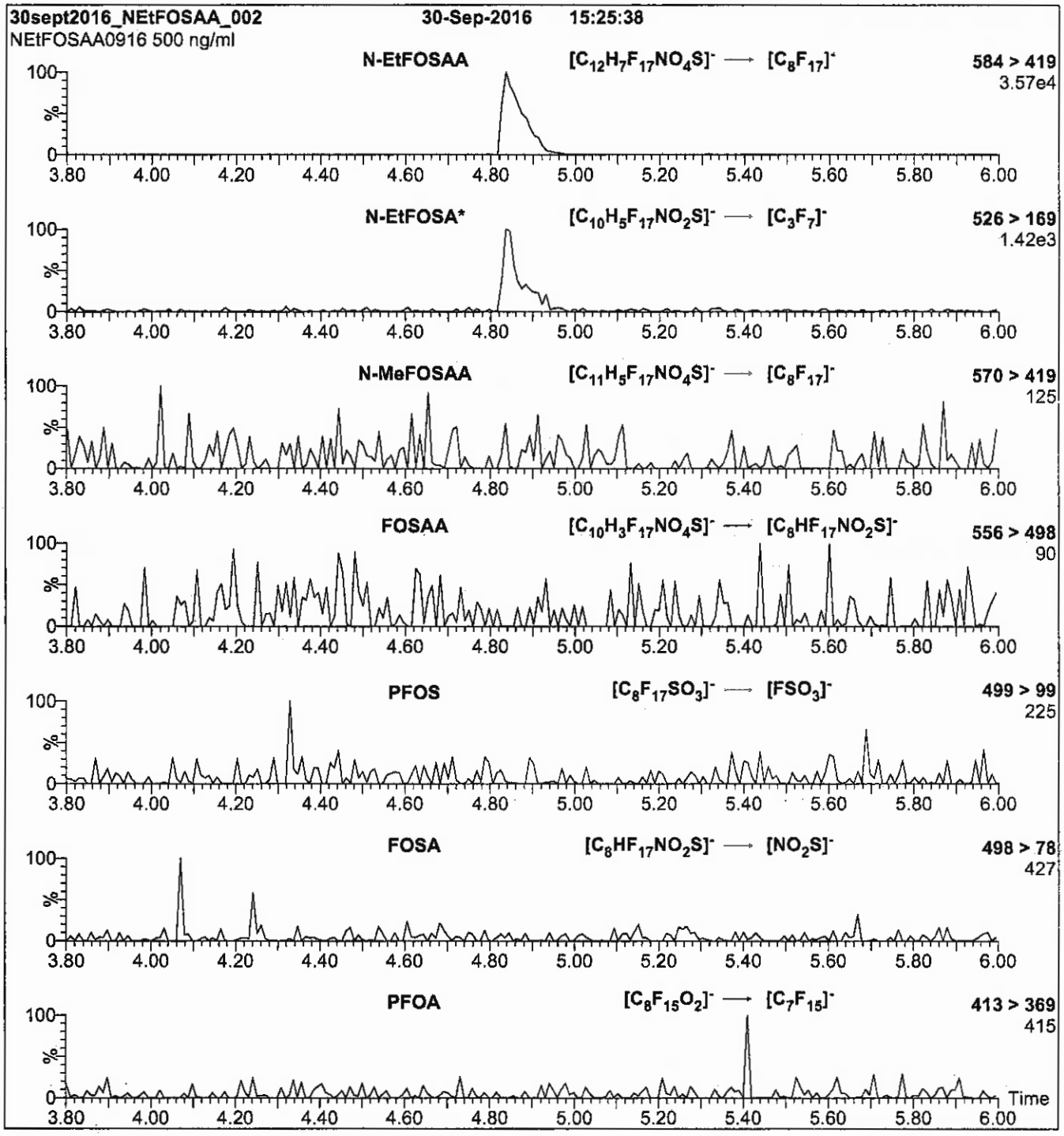
Flow: 300 µl/min

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

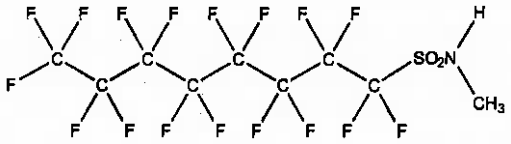
LCN-MeFOSA-M_00003

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:	$C_8H_4F_{17}NO_2S$	**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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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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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED

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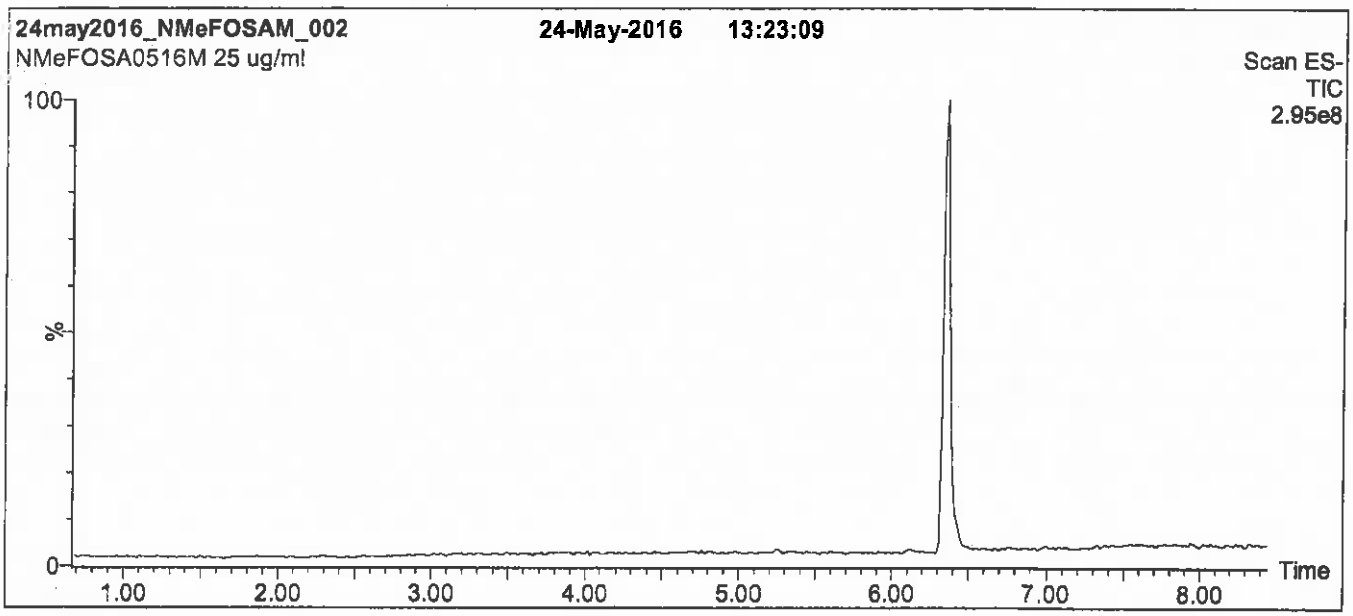
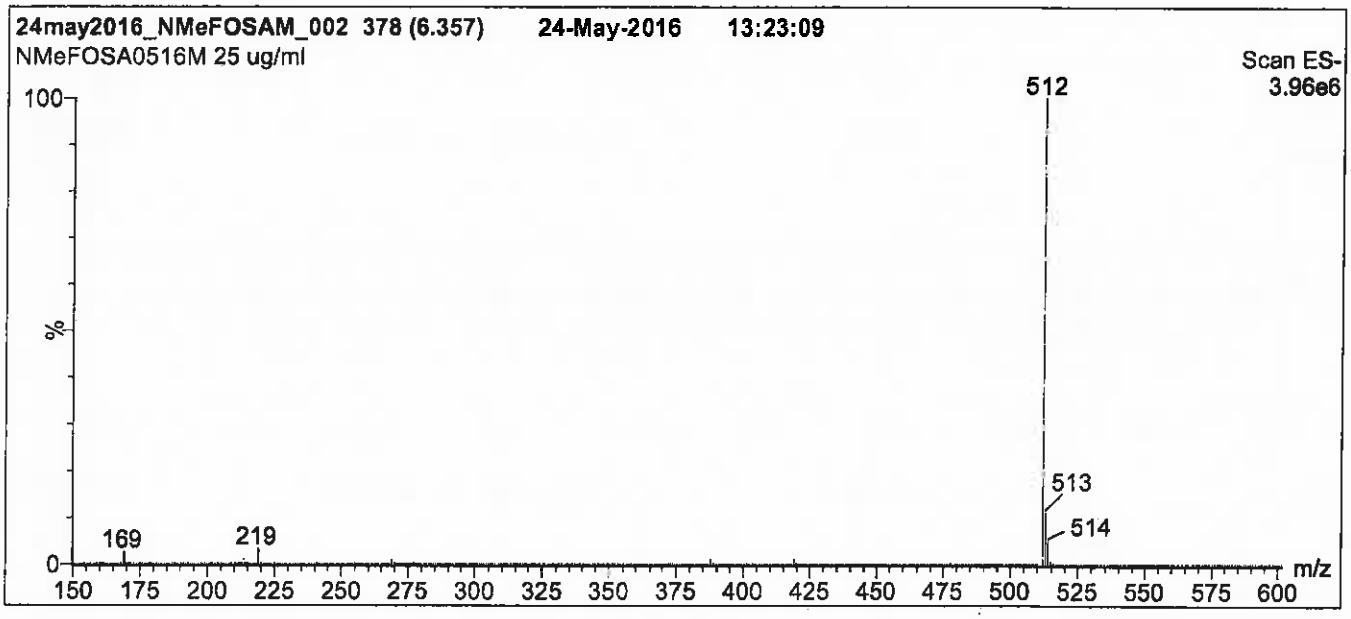
Figure 1: **N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





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

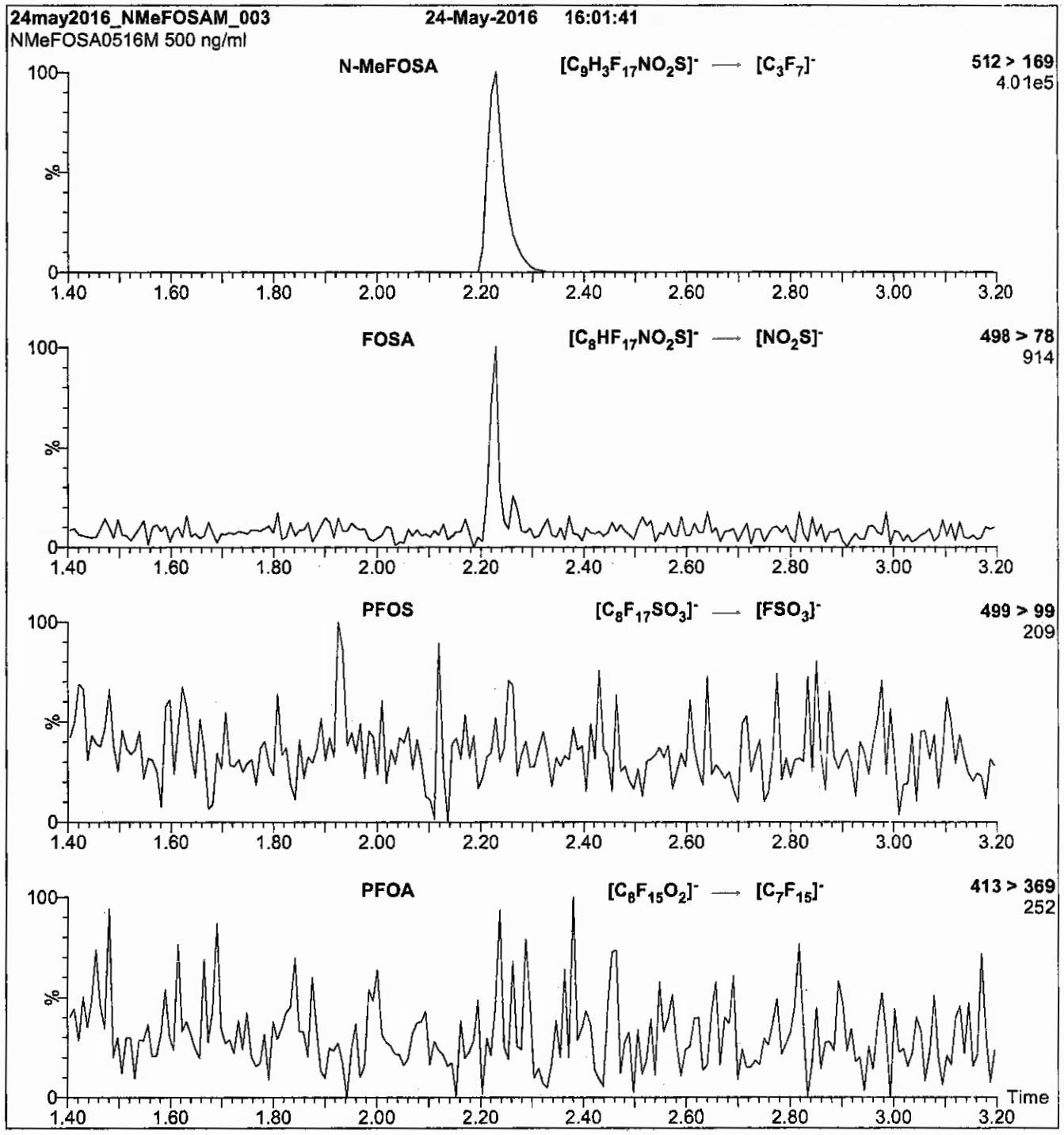
Flow: 300 µl/min

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

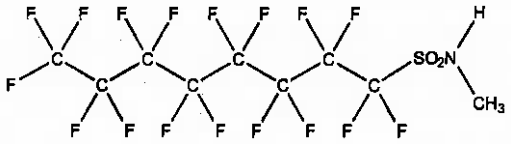
LCN-MeFOSA-M_00004

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.

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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CALA

ANAB ACCREDITED

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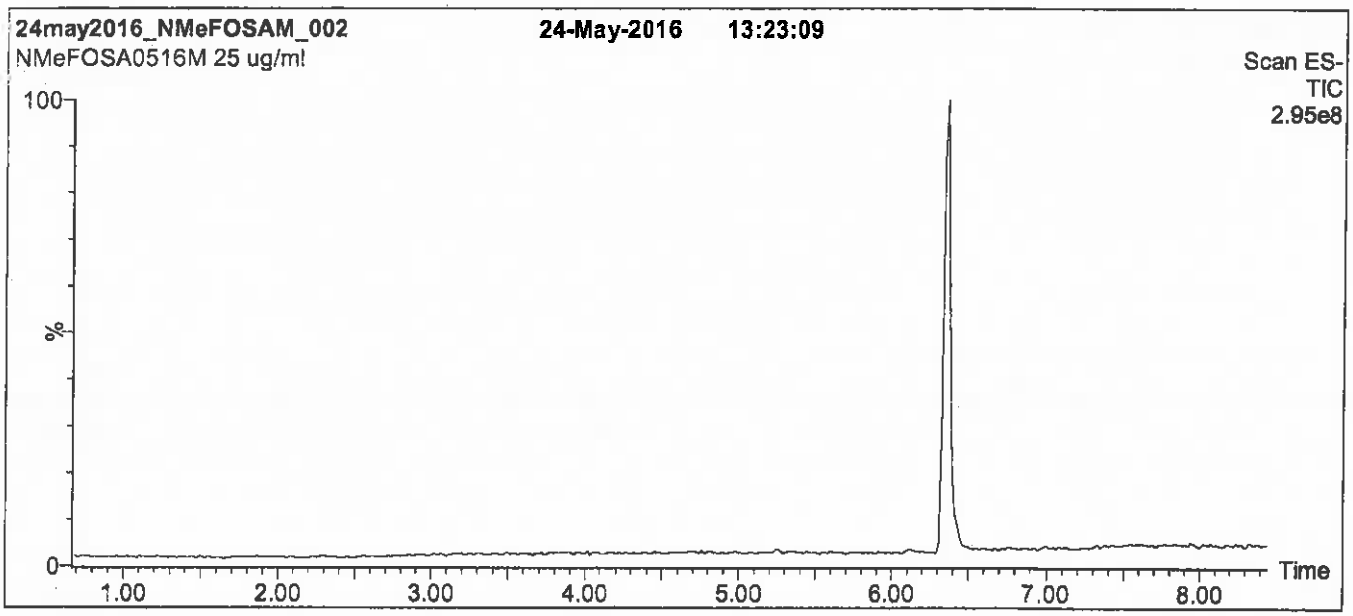
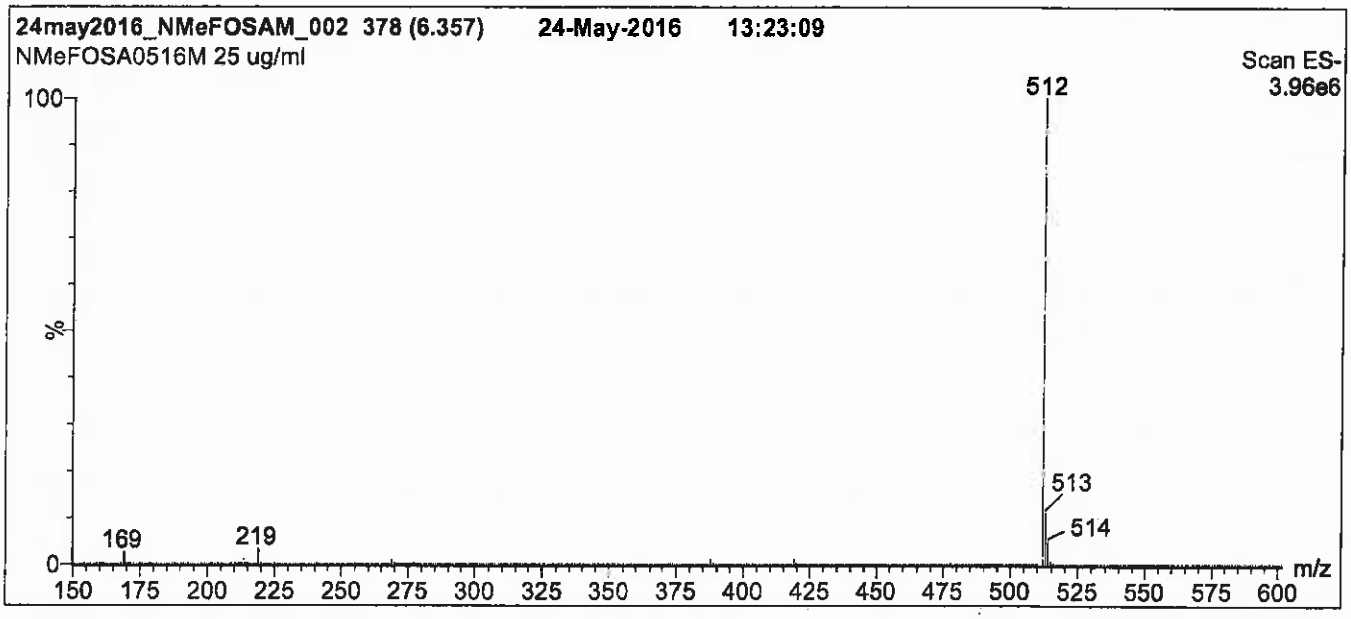
Figure 1: **N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





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

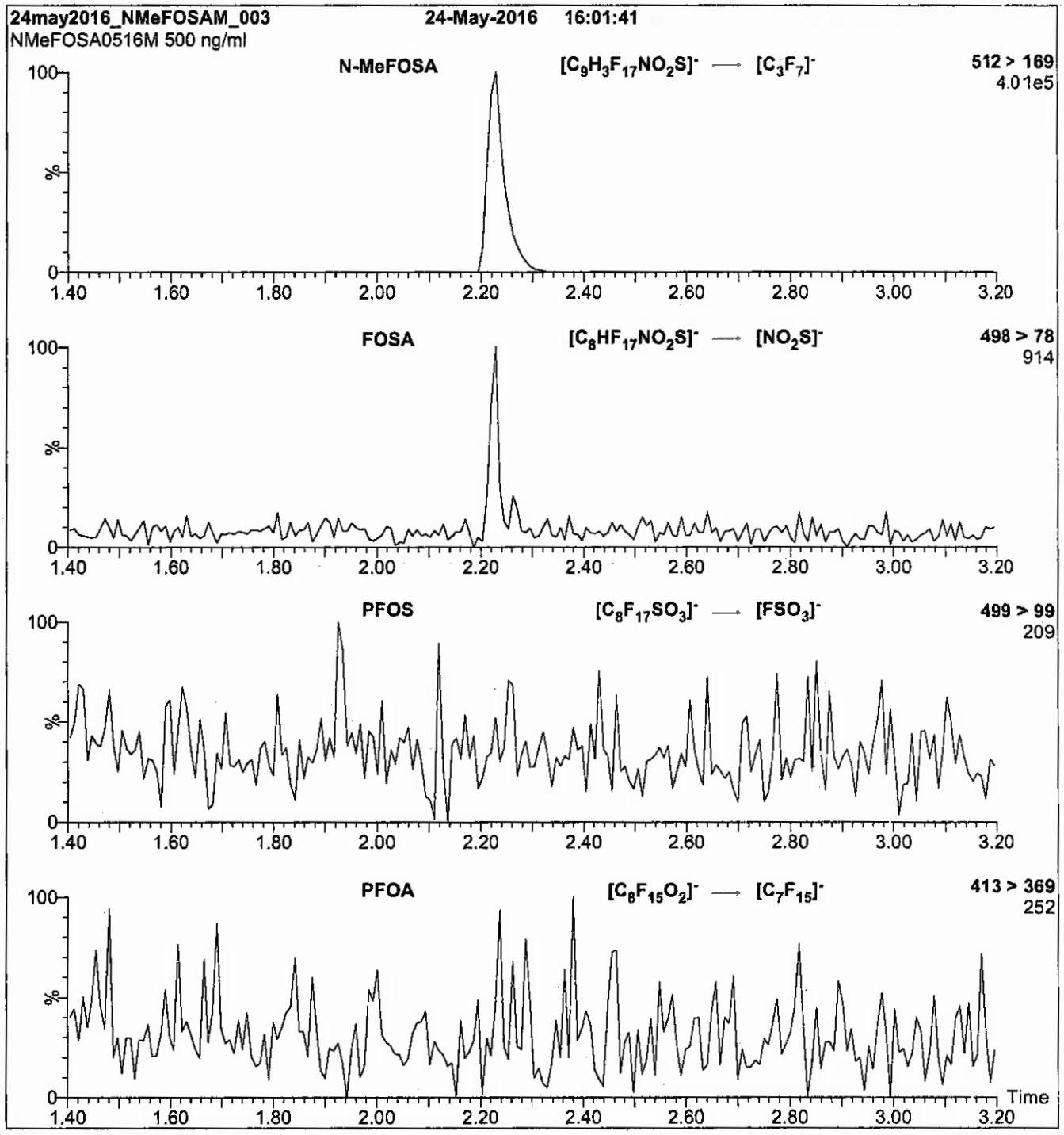
Flow: 300 µl/min

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

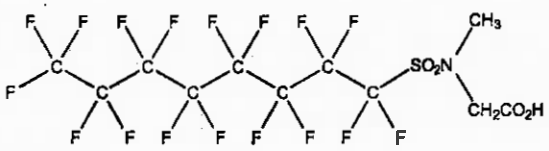
LCN-MeFOSAA_00004

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 moiety 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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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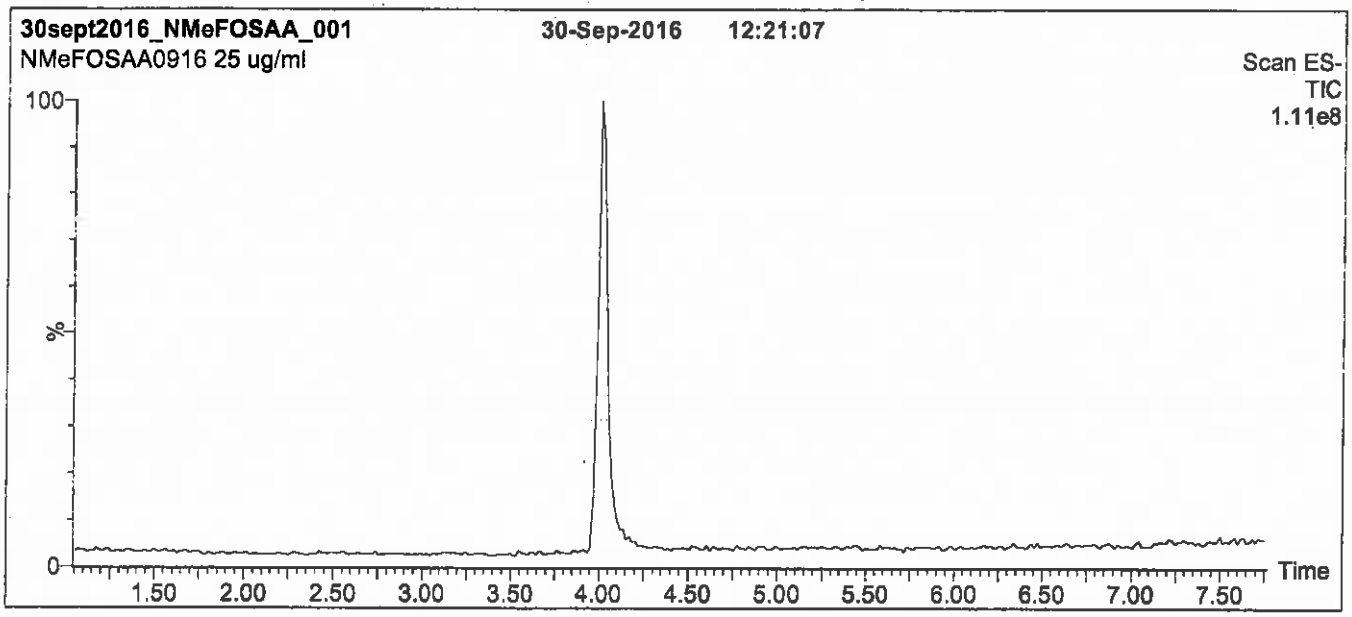
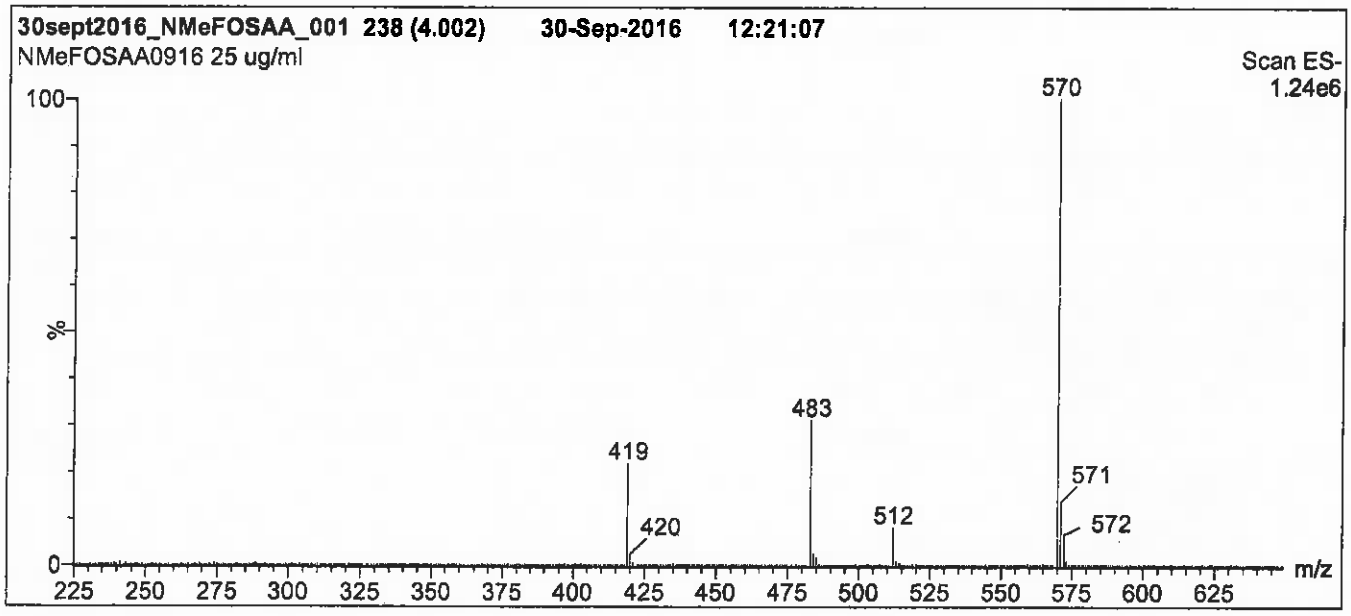
Figure 1: **N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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

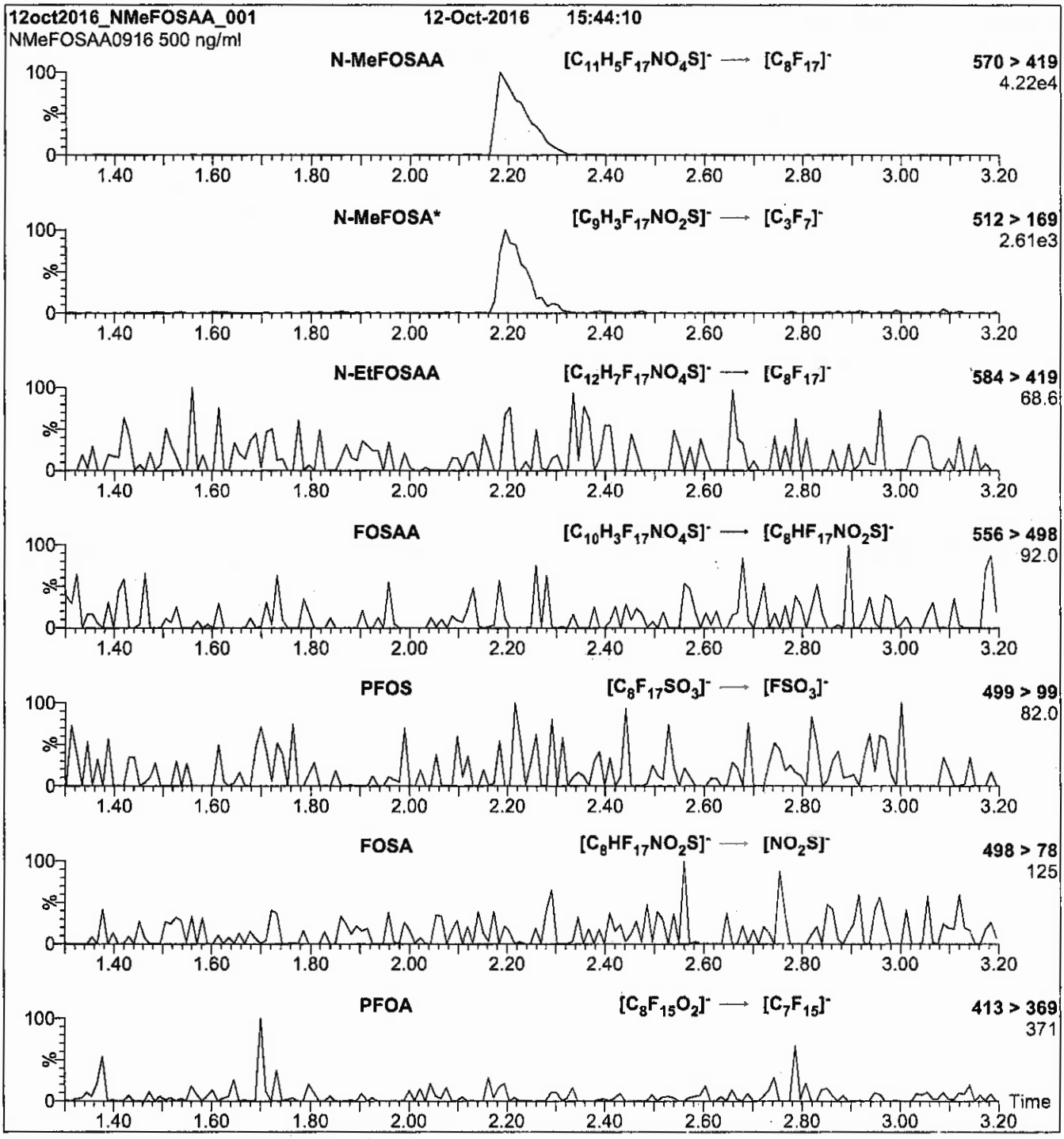
Flow: 300 µl/min

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

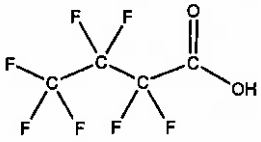
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFBA
COMPOUND: Perfluoro-n-butanoic acid

LOT NUMBER: PFBA0516

STRUCTURE:

CAS #: 375-22-4



MOLECULAR FORMULA: $C_4HF_7O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 214.04
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:

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ADDITIONAL INFORMATION:

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CALA

ANAB ACCREDITED

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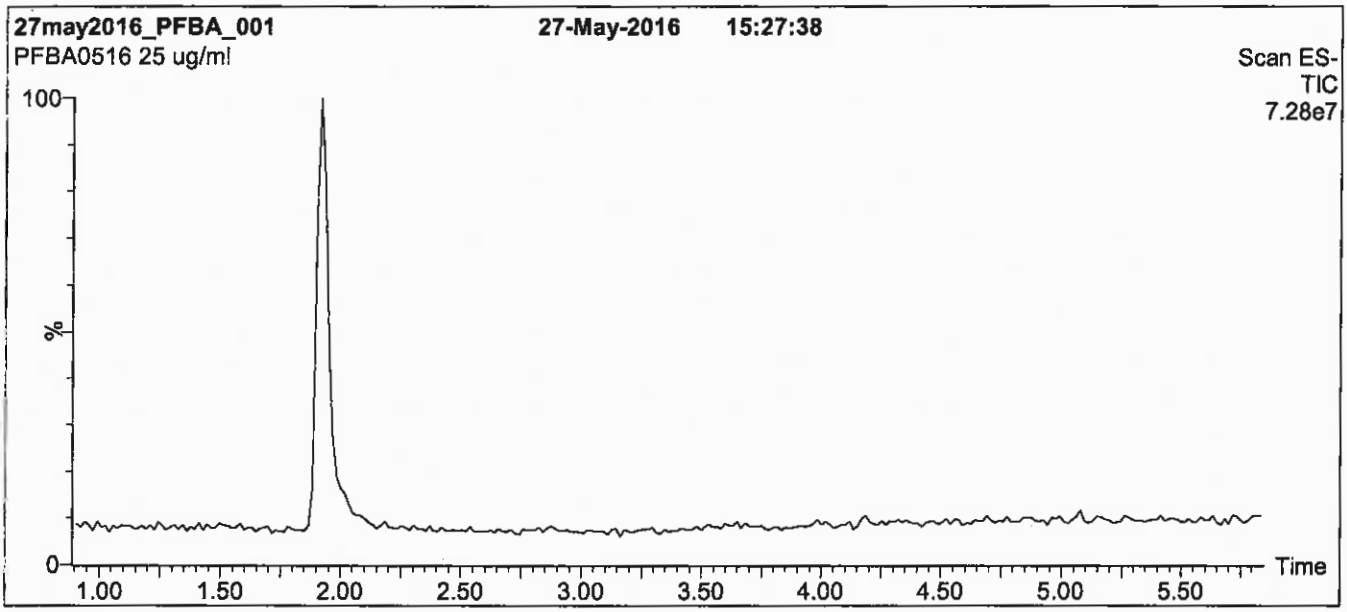
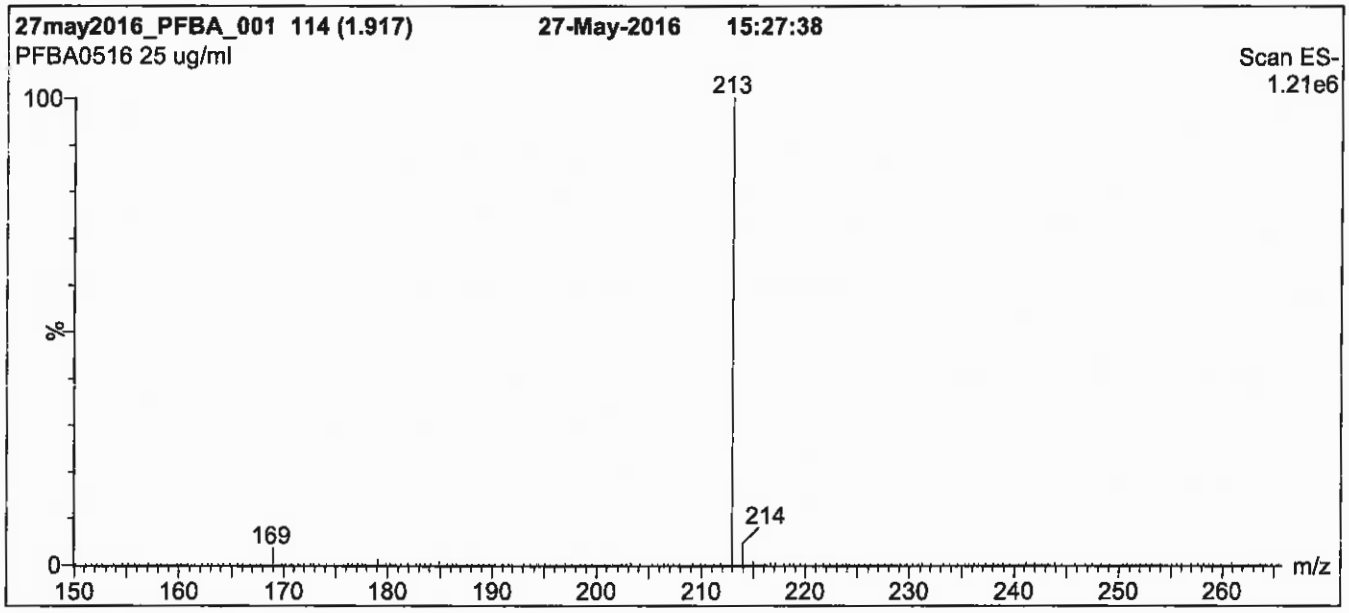
Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

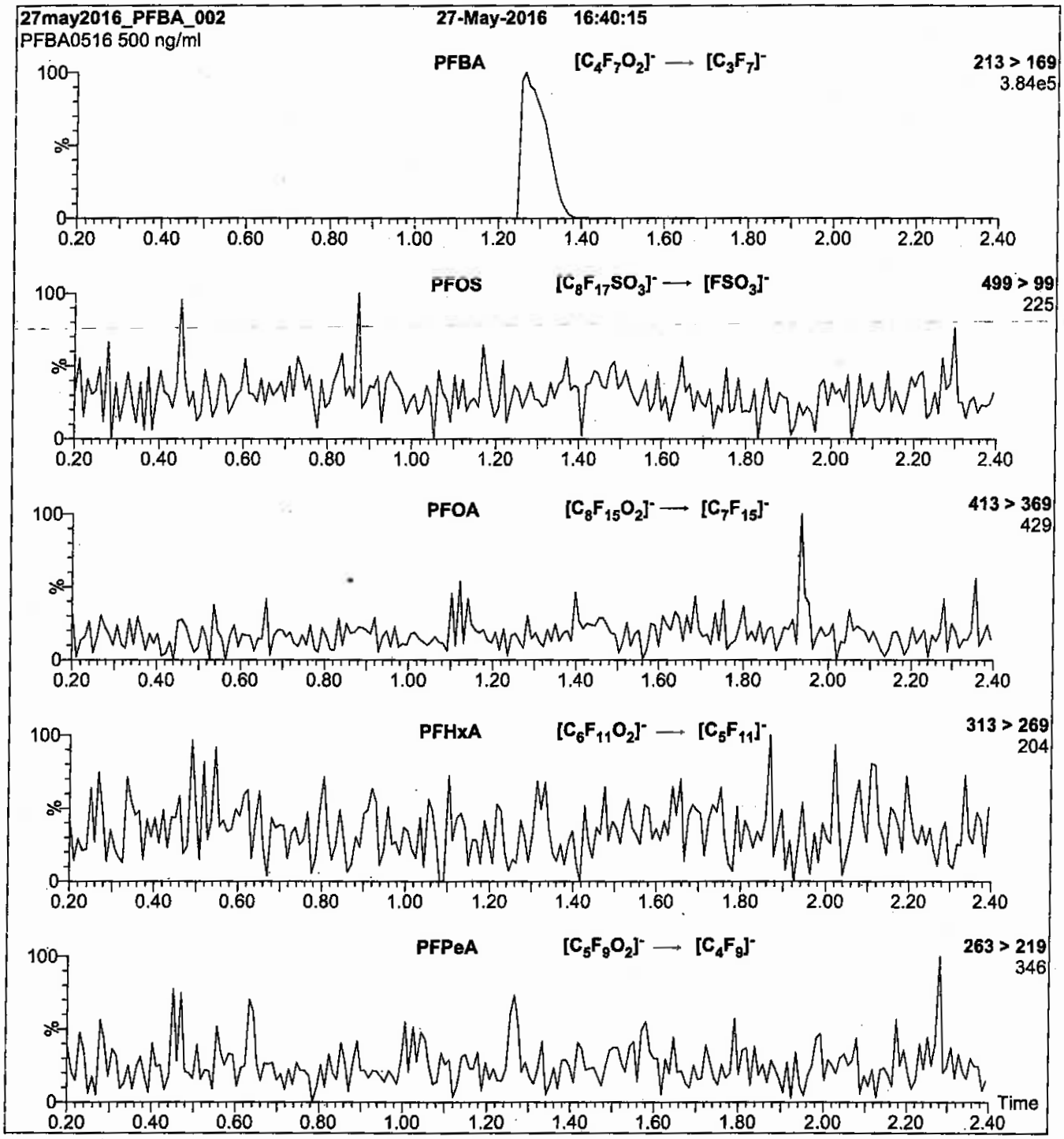
Flow: 300 µl/min

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: **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

LCPFBA_00007

r: 12/29/16 SN
S

WELLINGTON LABORATORIES

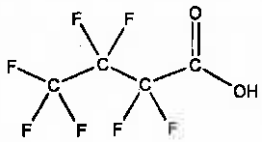
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFBA
COMPOUND: Perfluoro-n-butanoic acid

LOT NUMBER: PFBA0516

STRUCTURE:

CAS #: 375-22-4



MOLECULAR FORMULA: $C_4HF_7O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 214.04
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/31/2016 (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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CALA

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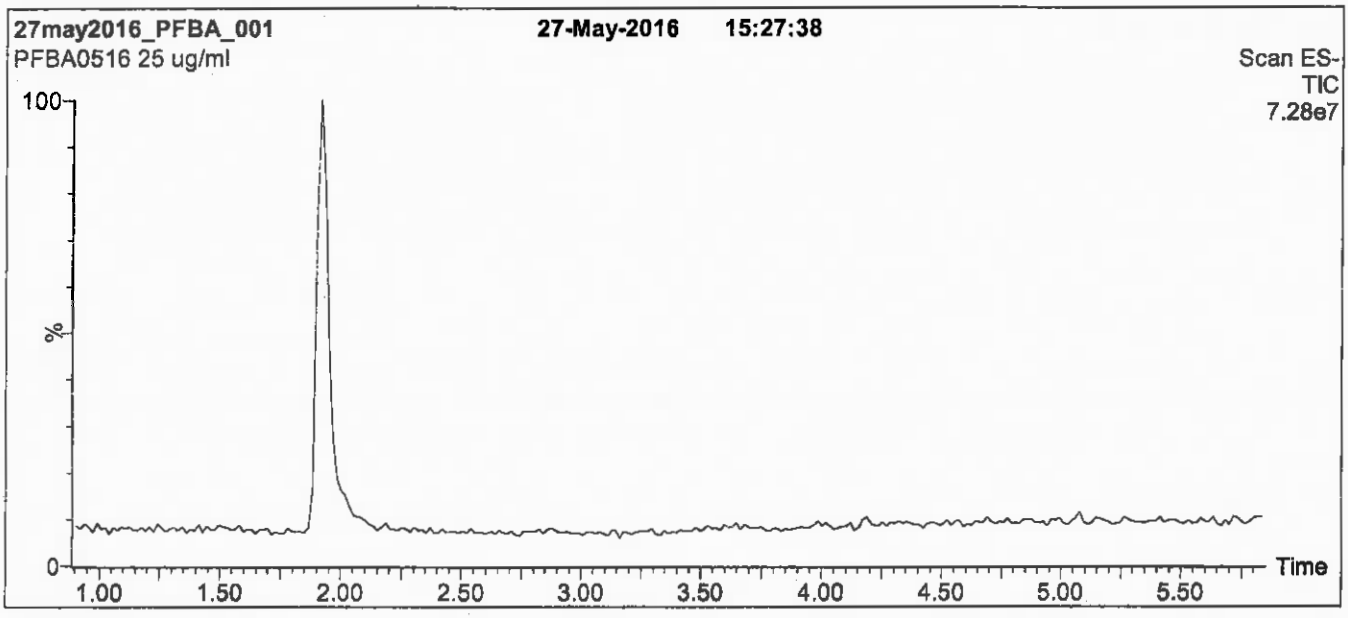

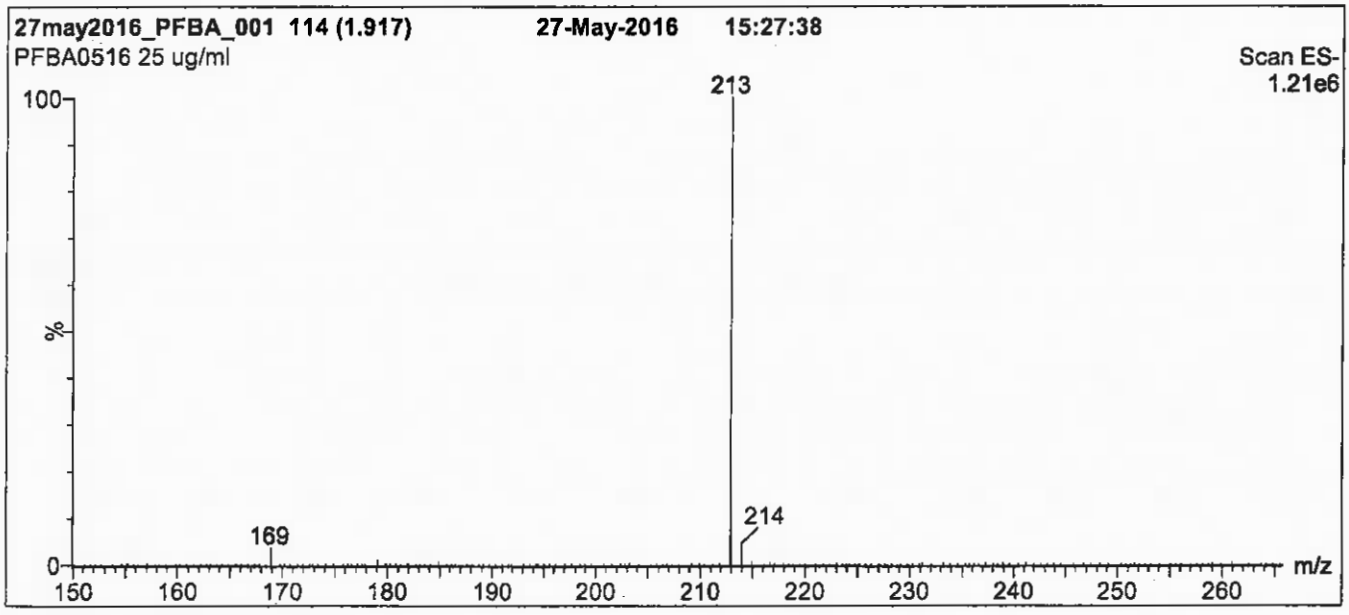

Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
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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
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Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
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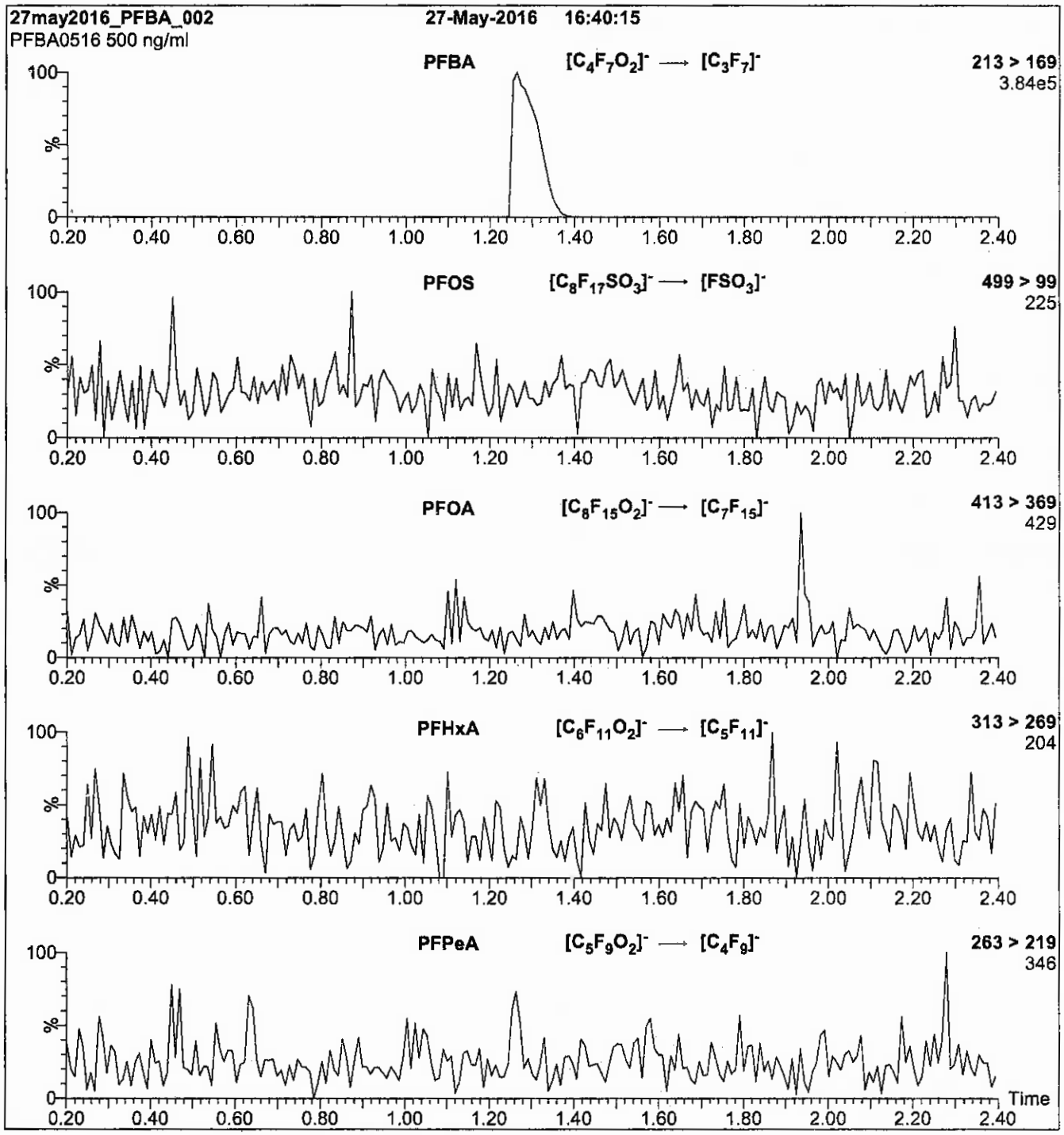


Conditions for Figure 2:

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

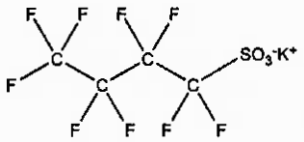
730511
ID: LCPFBS_00005
Exp: 03/15/21 Prpd: SBC
PF-1-butanesulfonate K sa

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		
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)

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CALA Testing Accredited to ISO/IEC 17025 No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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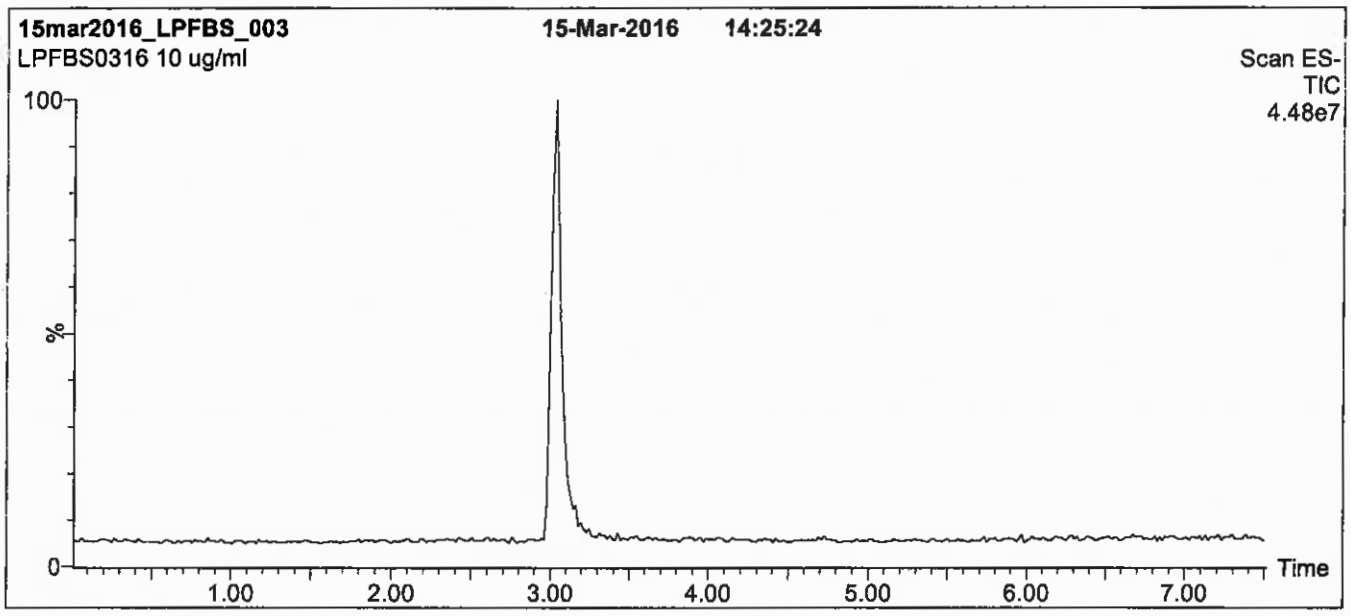
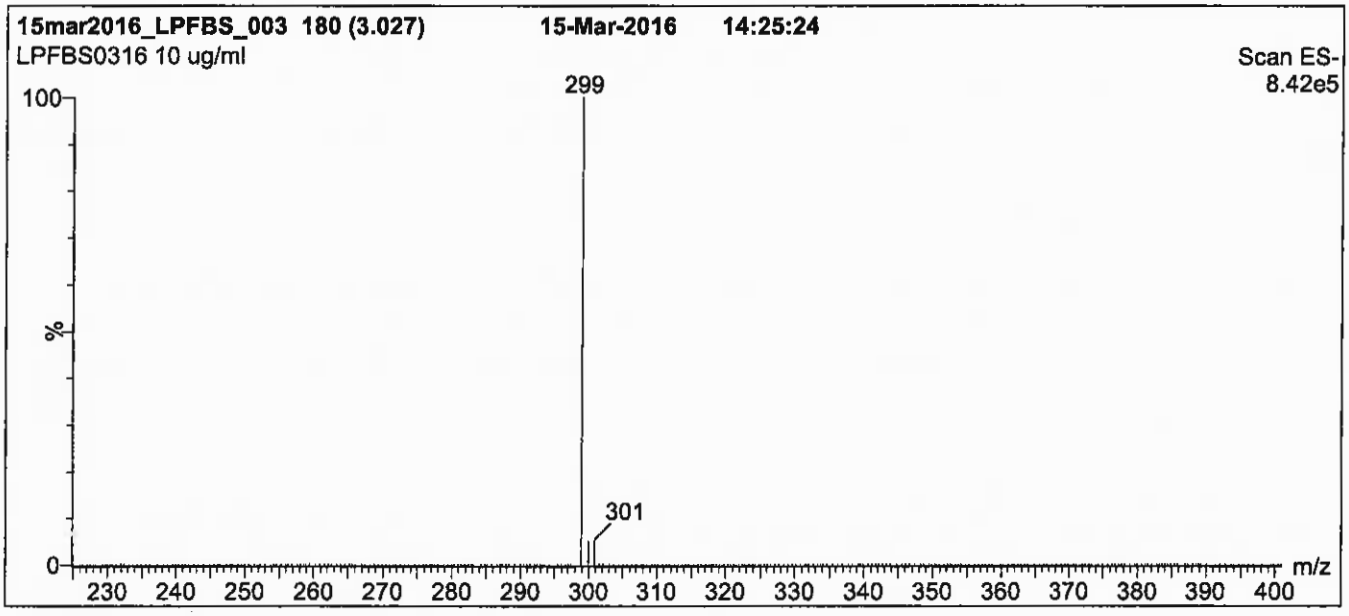




Conditions for Figure 1:

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: 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

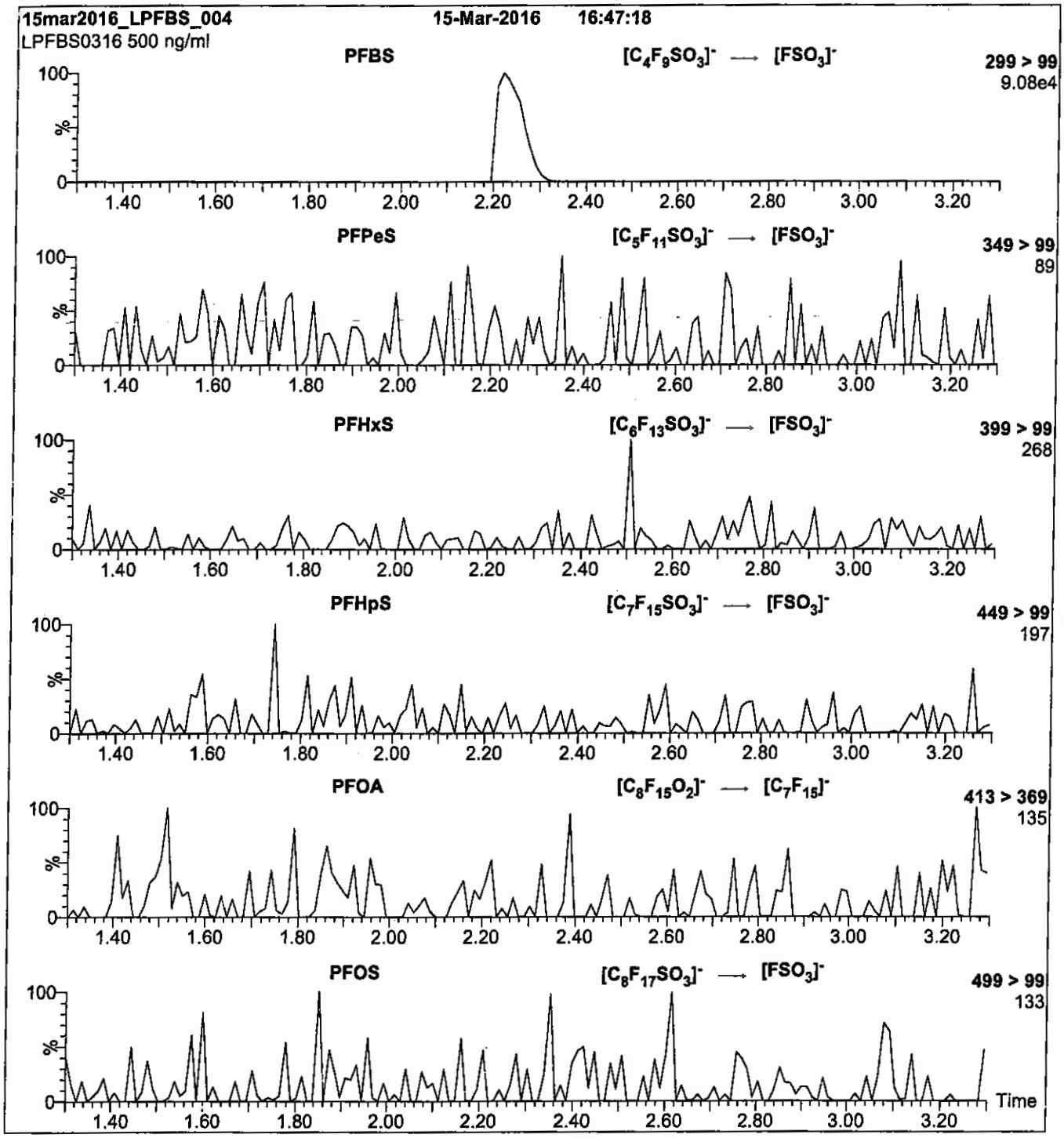
Flow: 300 µl/min

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

WELLINGTON LABORATORIES

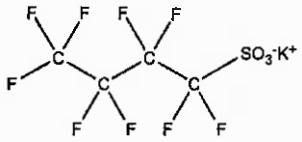
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: LPFBS0316

STRUCTURE:

CAS #: 29420-49-3



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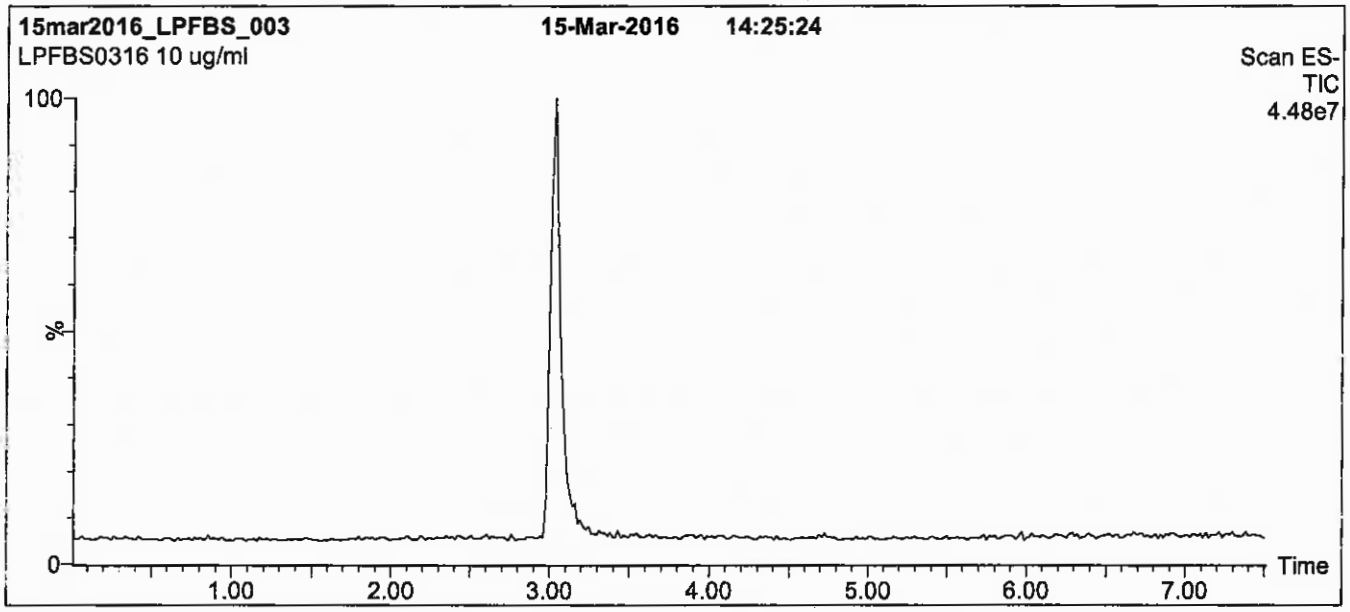

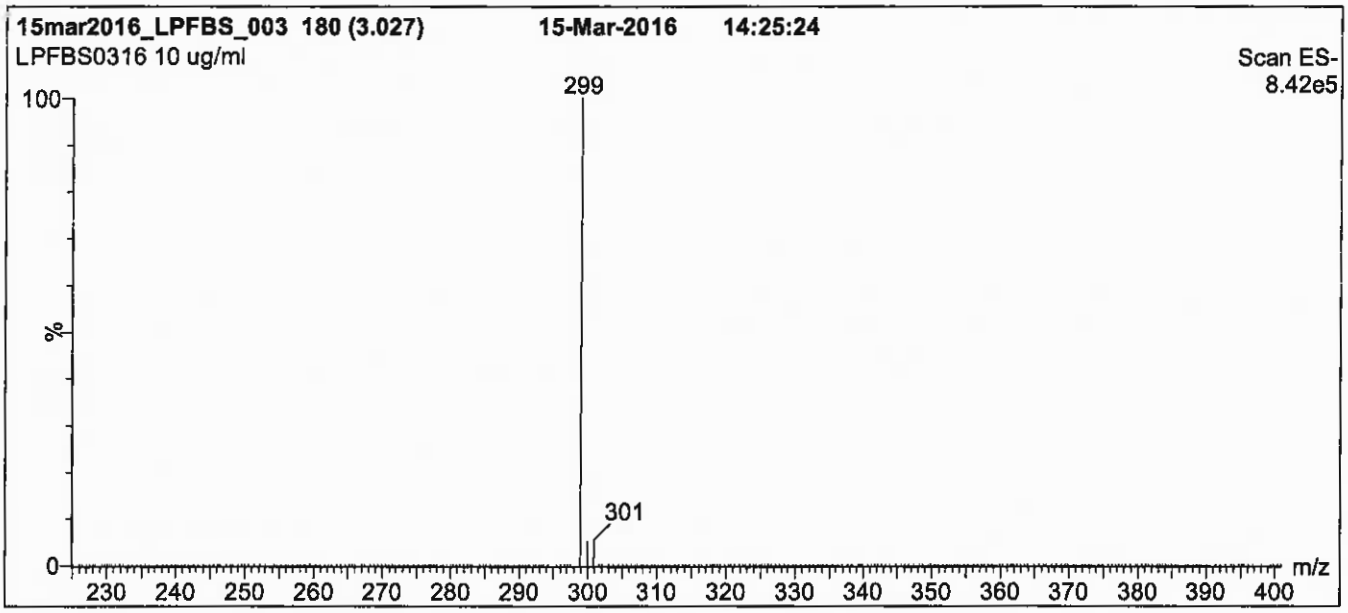

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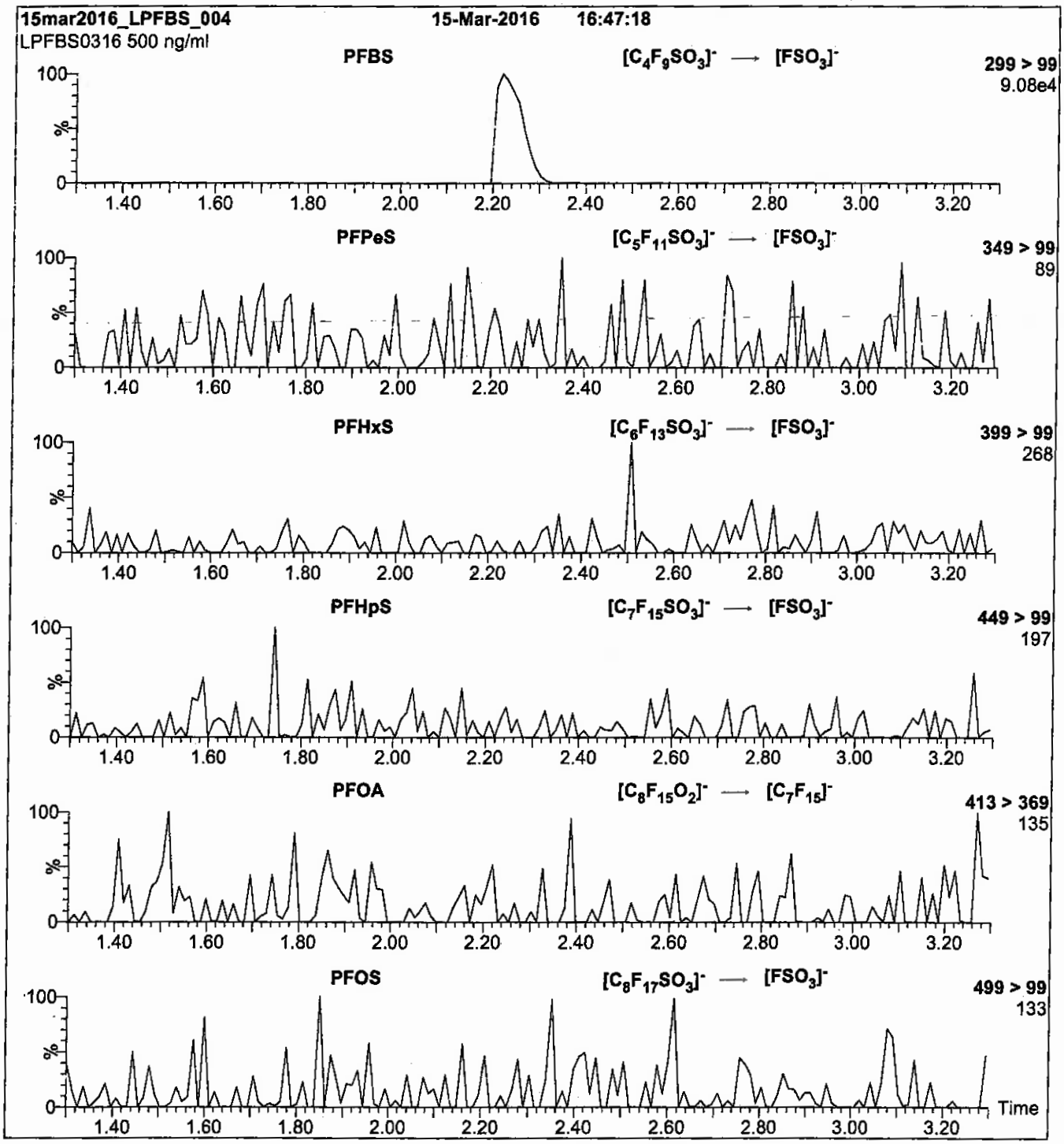
Desolvation Gas Flow (l/hr) = 750

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 10/14/16 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

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:

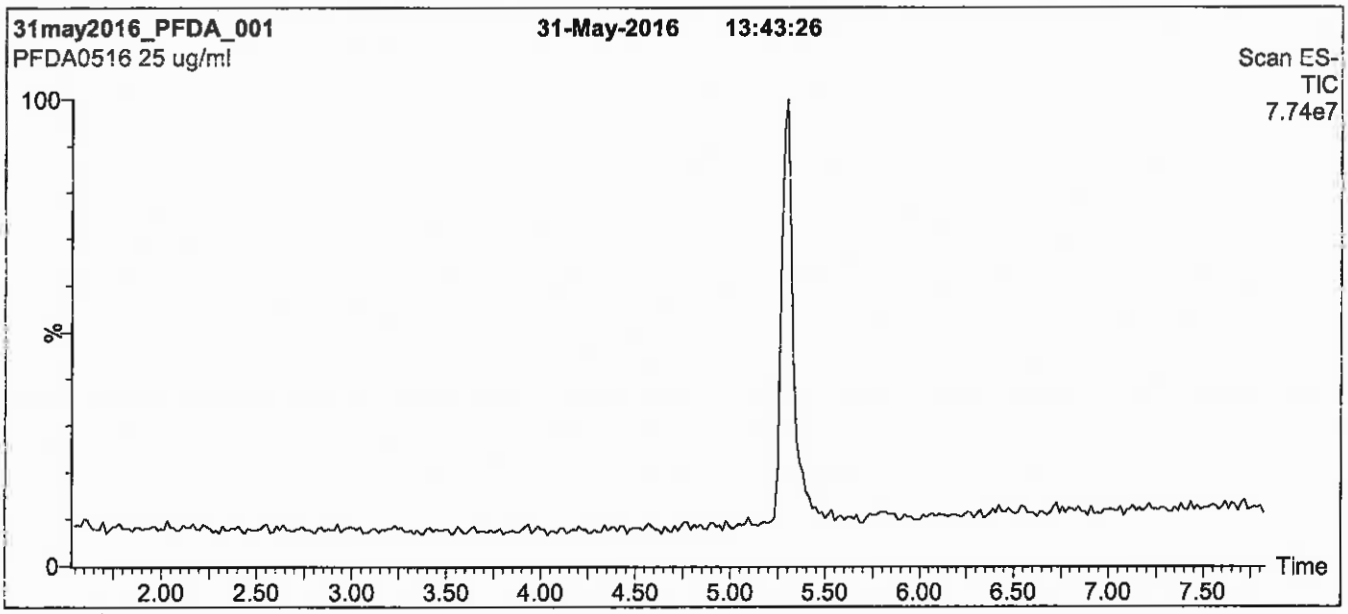
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

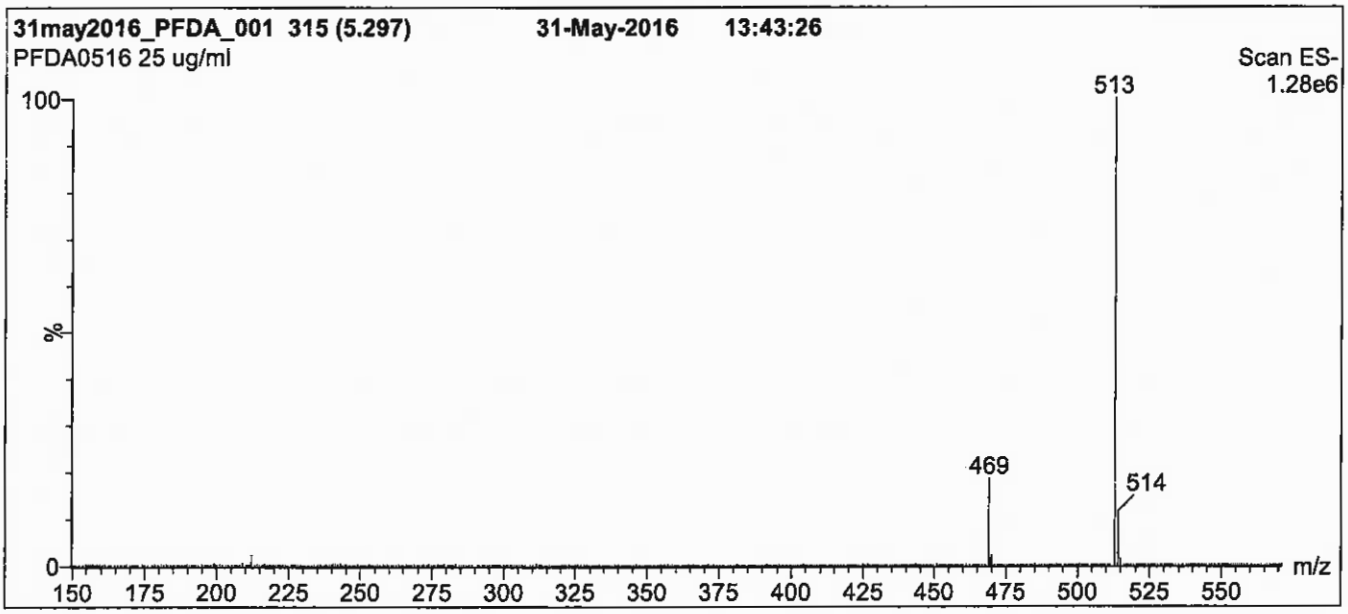
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

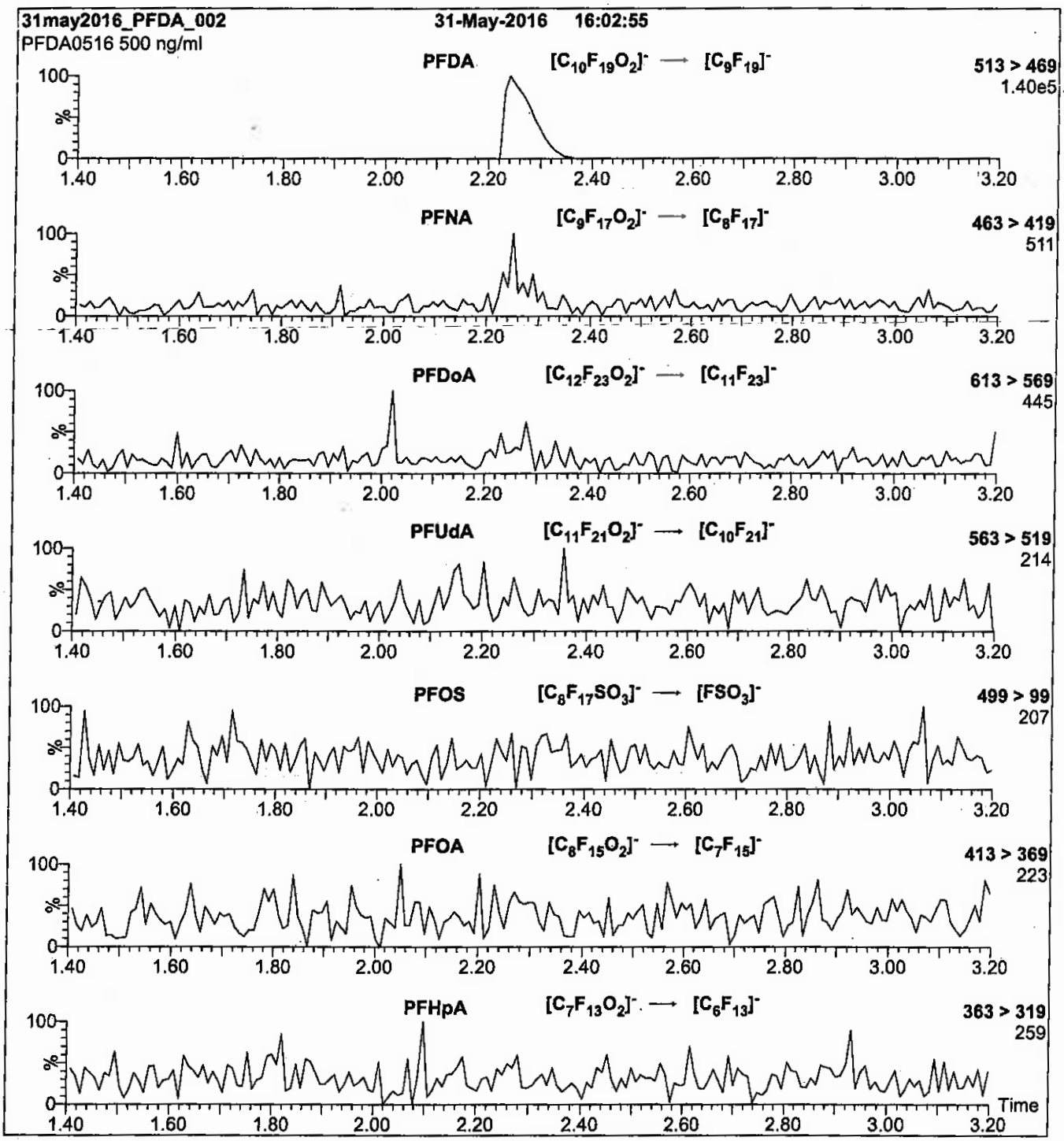
Flow: 300 µl/min

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

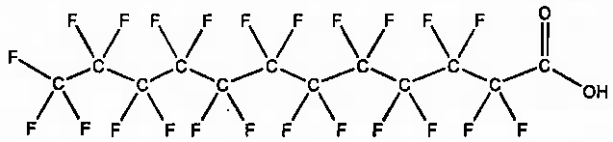
LCPFDoA_00007

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		

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:** 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:

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 $x_1, x_2,...x_n$ 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:

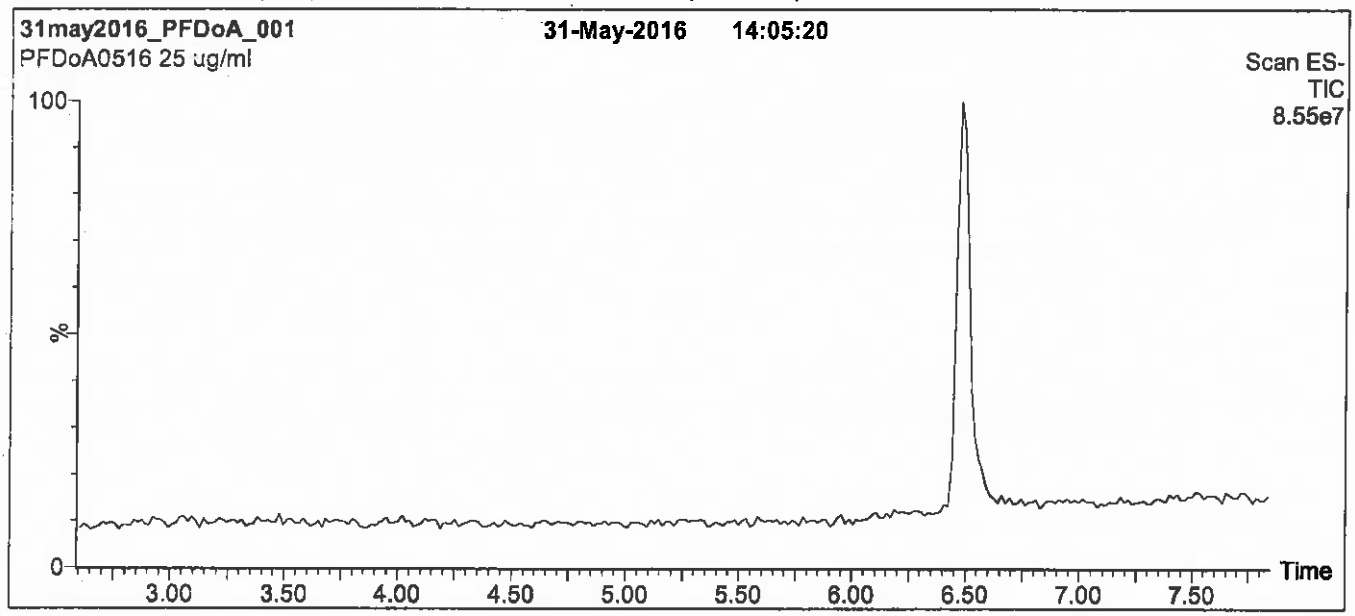
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

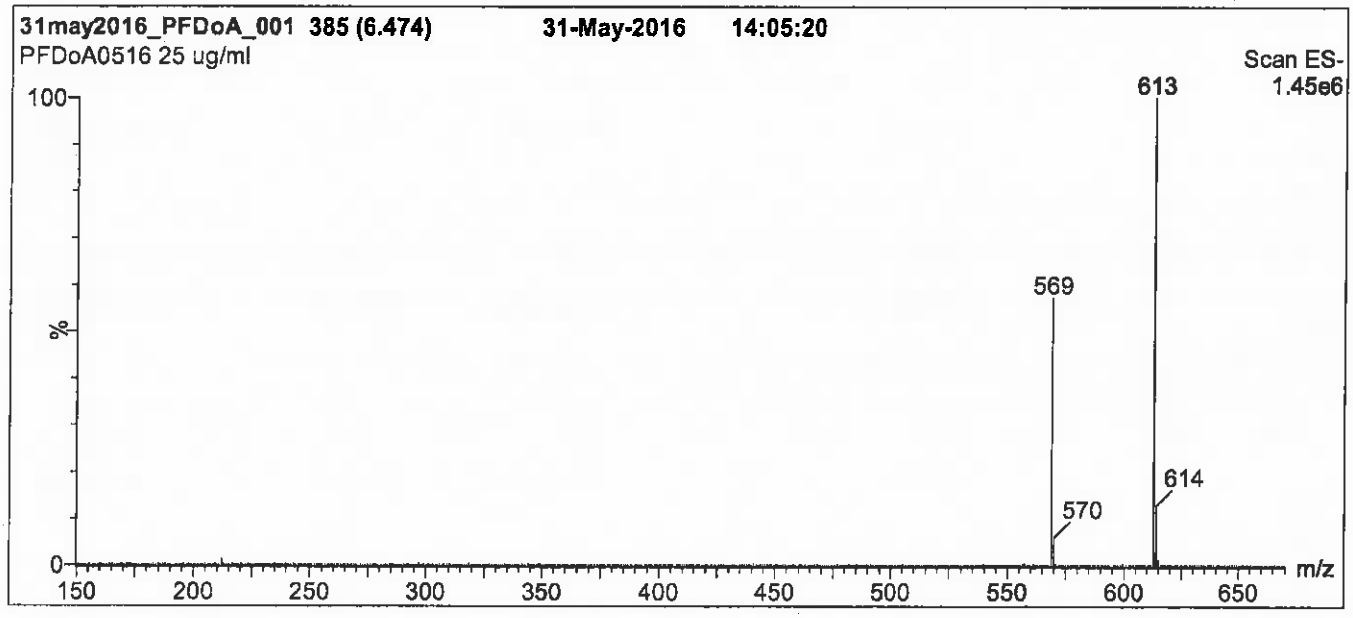
CALA

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

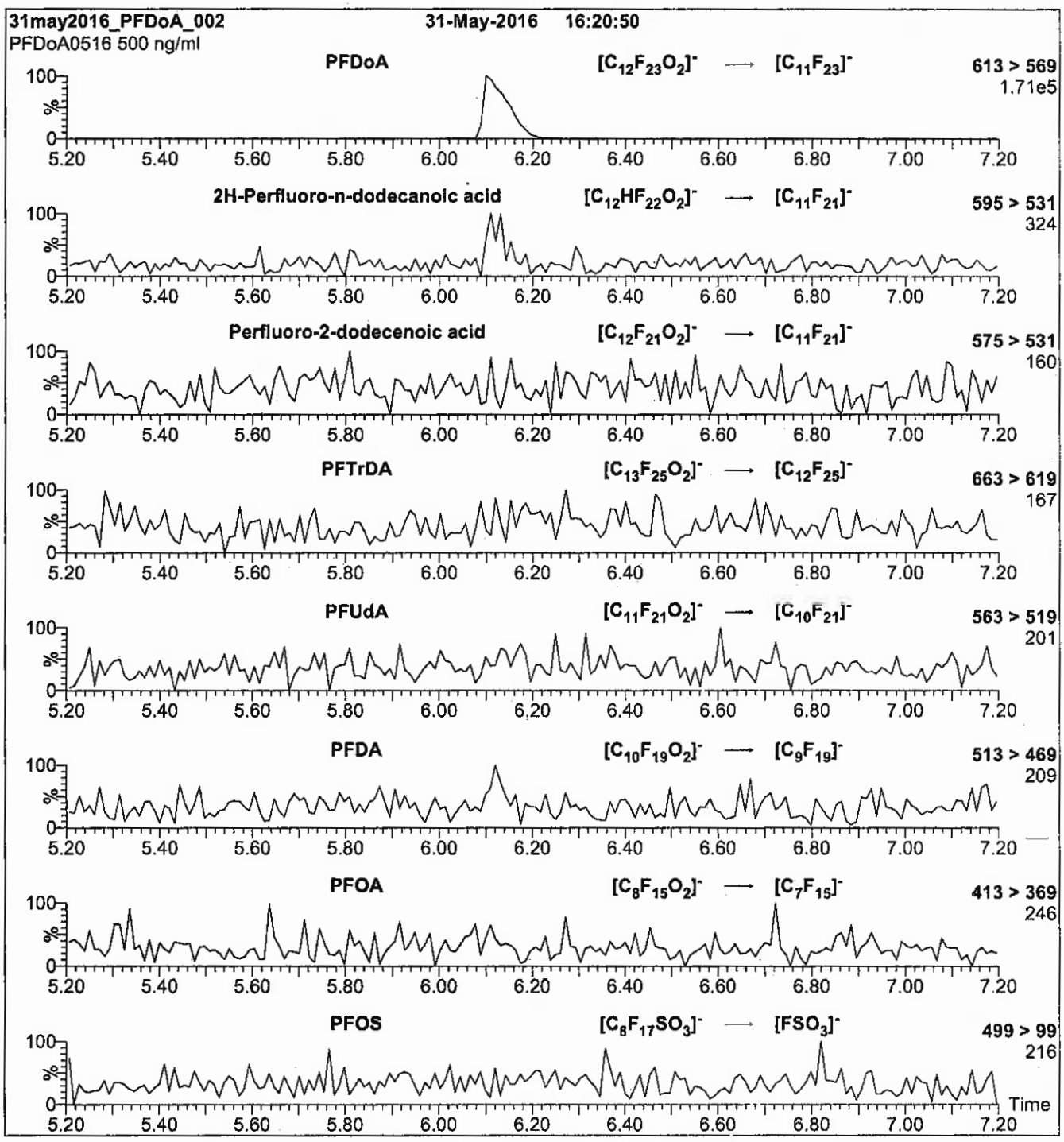
Flow: 300 µl/min

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

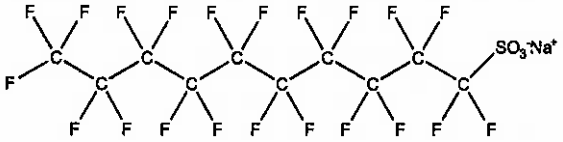
730550
ID: LCPFDS_00007
Exp: 05/24/21 Prpd: SBC
PF-1-decanesulfonate sodi

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

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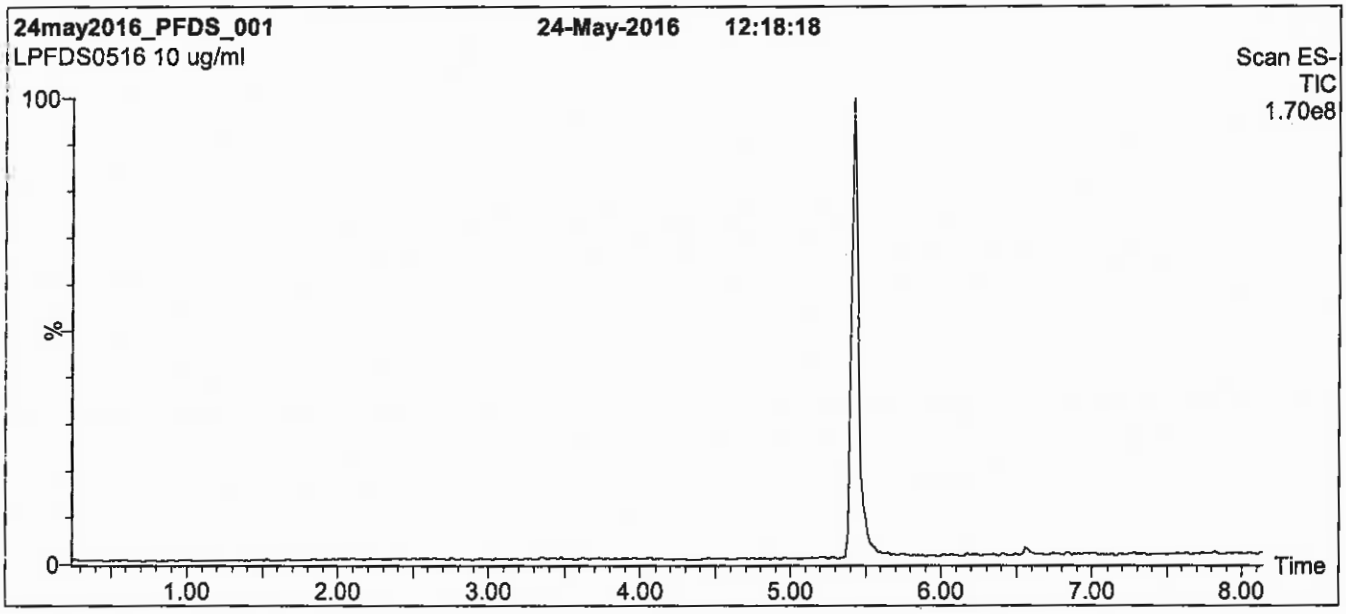
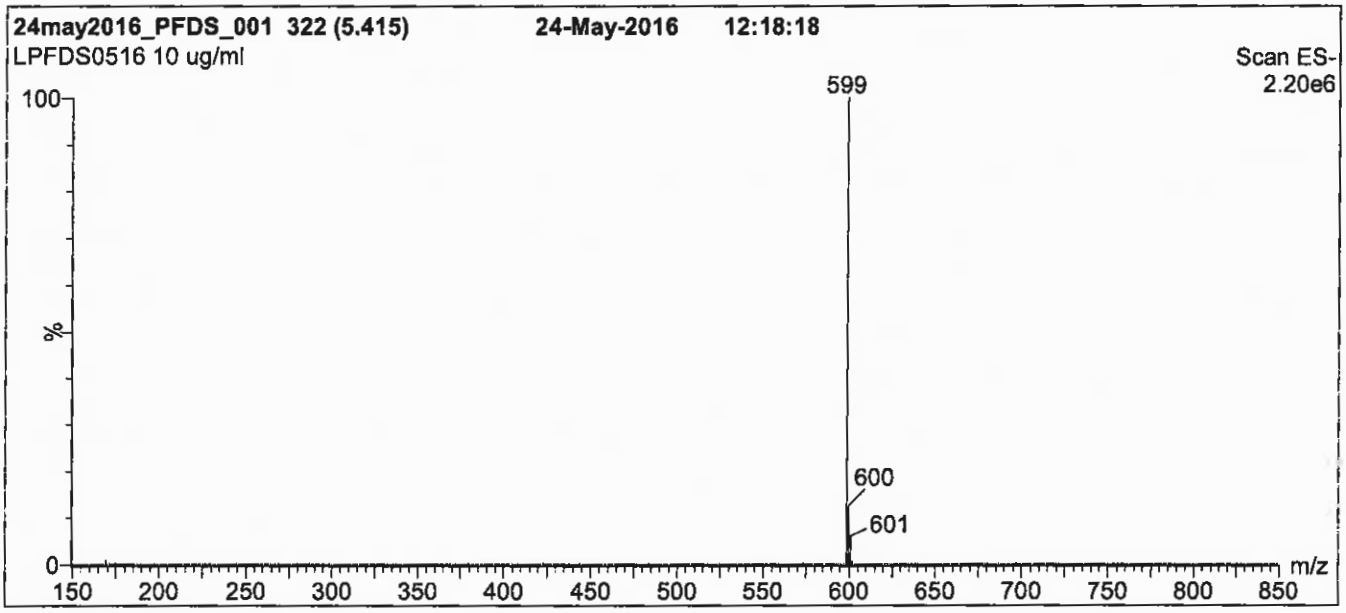
CALA

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: **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

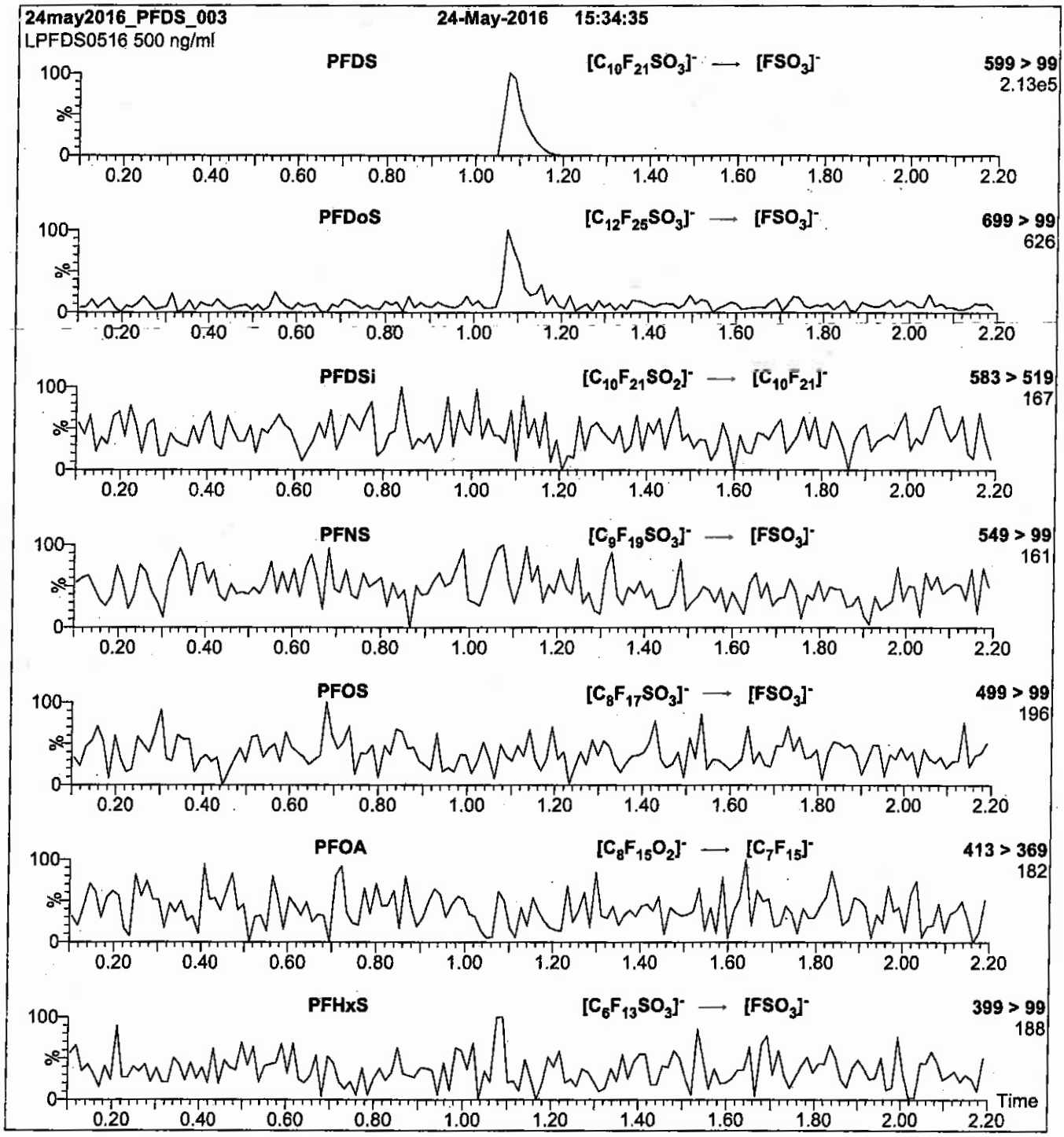
Flow: 300 µl/min

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

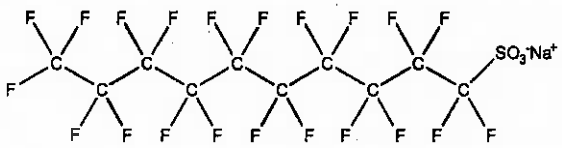
LCPFDSA_00002

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

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 $x_1, x_2, \ldots x_n$ 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

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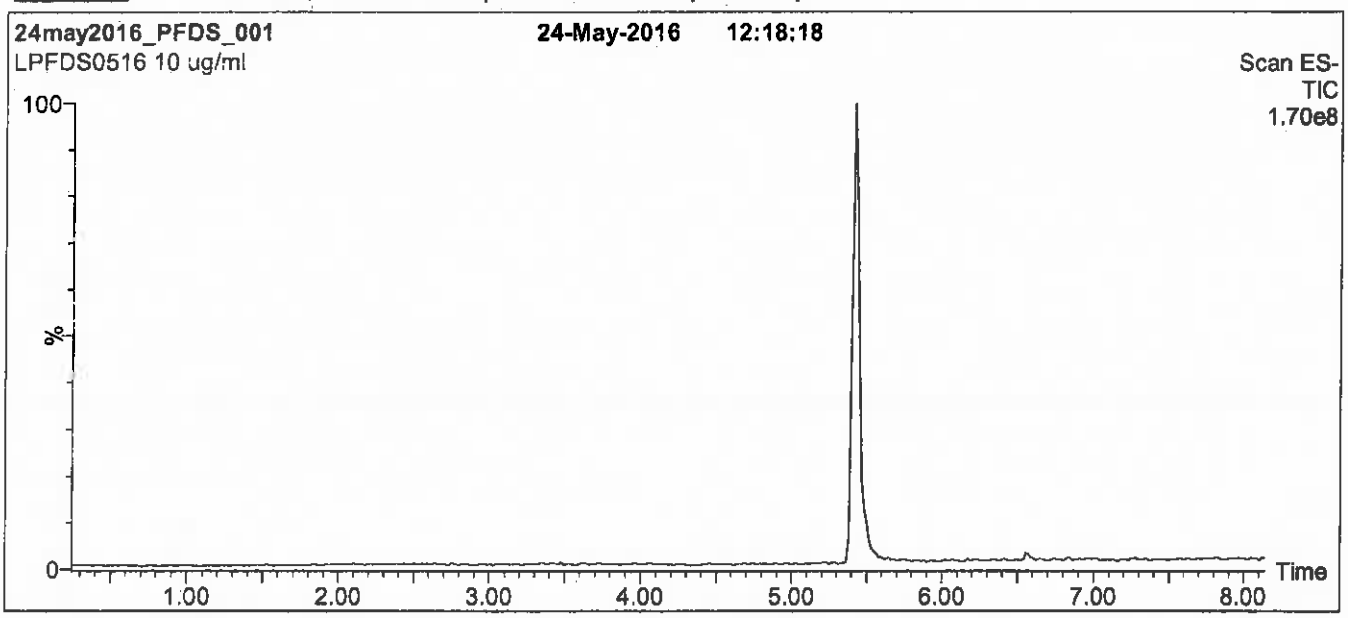
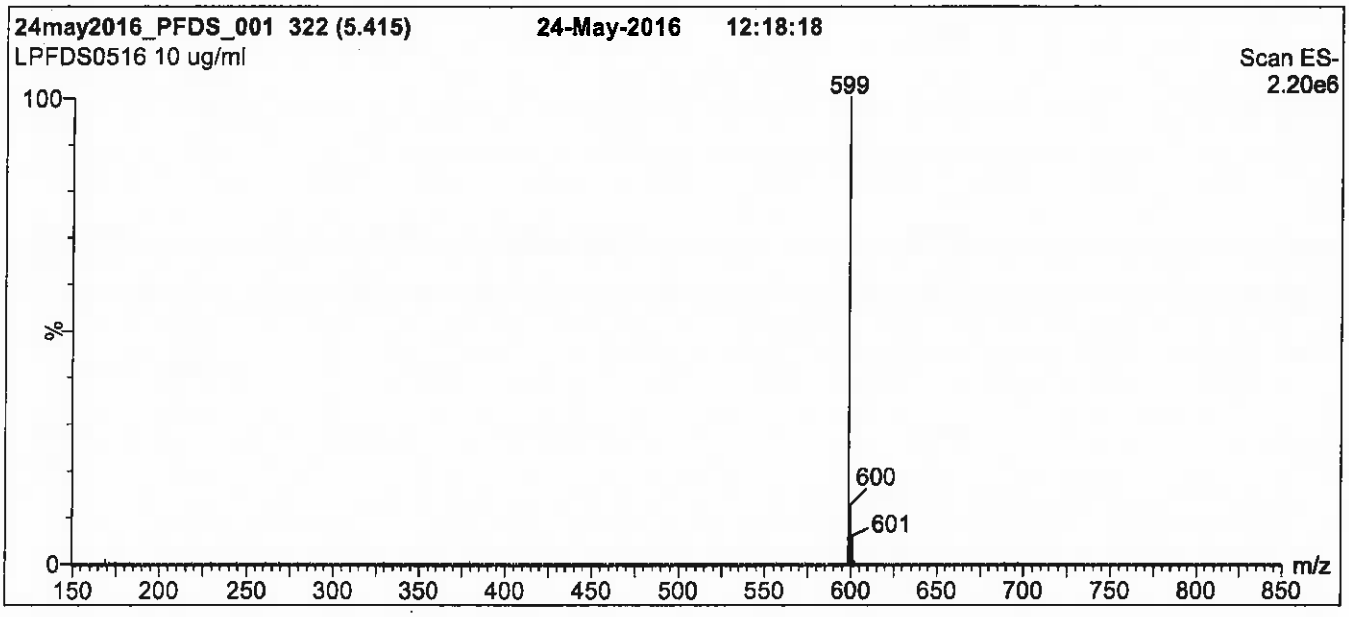
Figure 1: **L-PFDS; LC/MS Data (TIC and Mass Spectrum)**





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

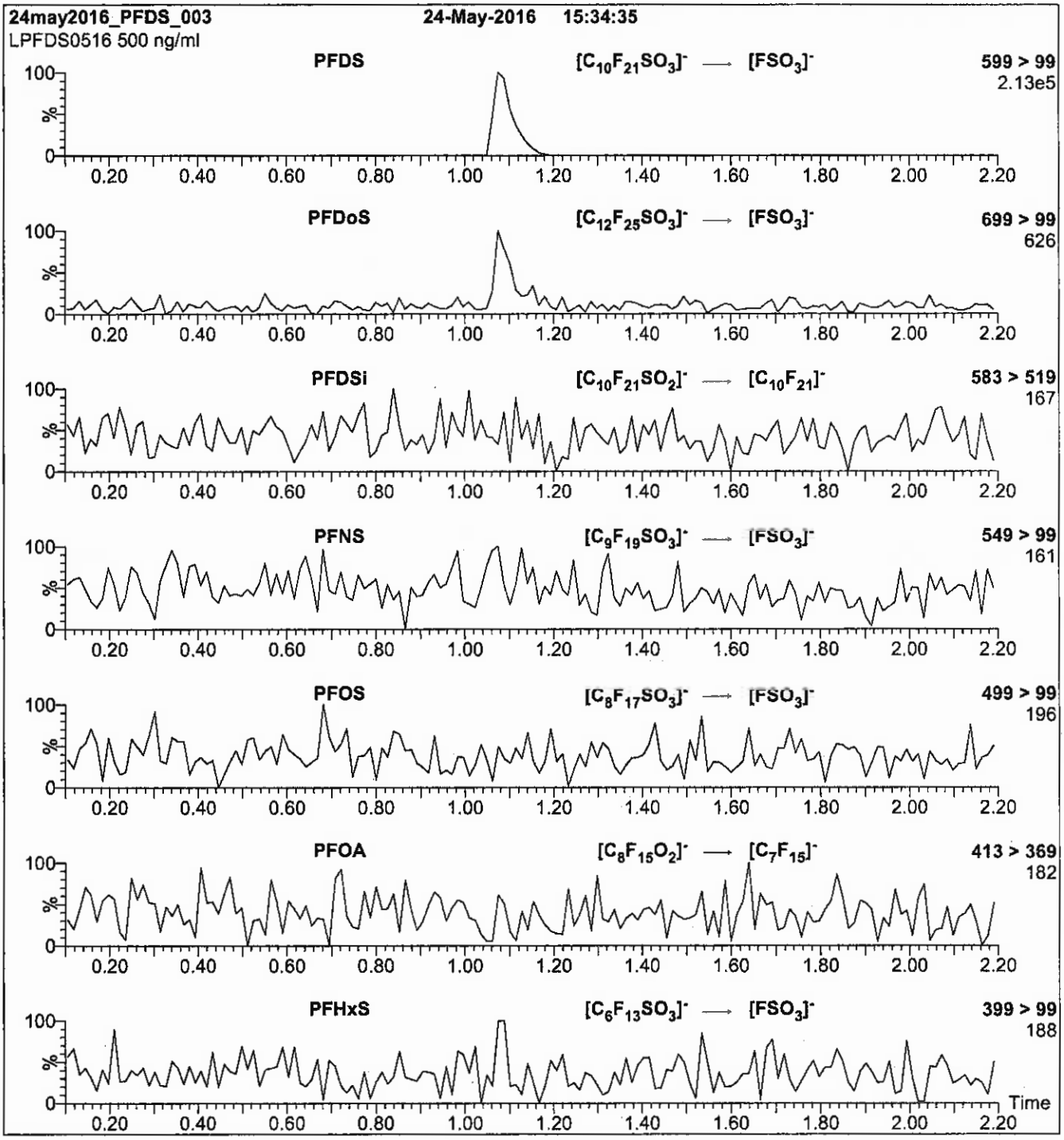
Flow: 300 µl/min

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

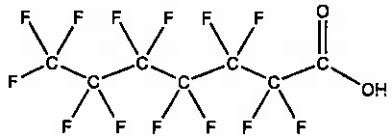
730517
ID: LCPFHpA_00006
Exp: 01/22/21 Prpd: SBC
PF-n-heptanoic acid

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)

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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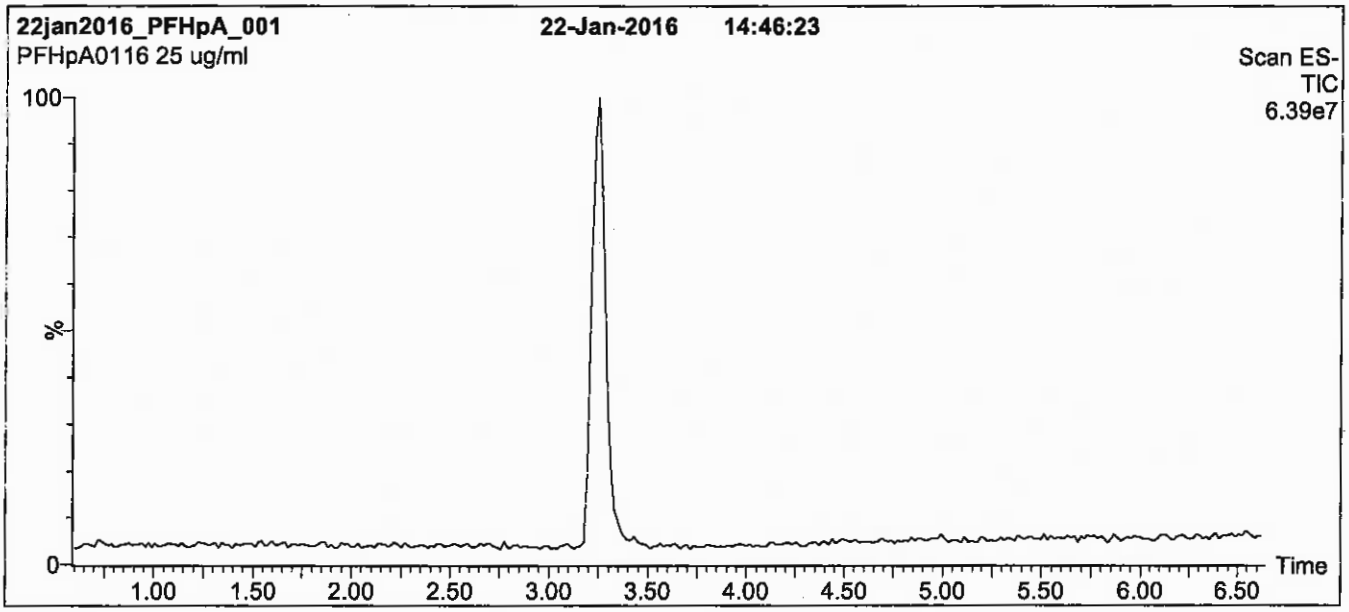
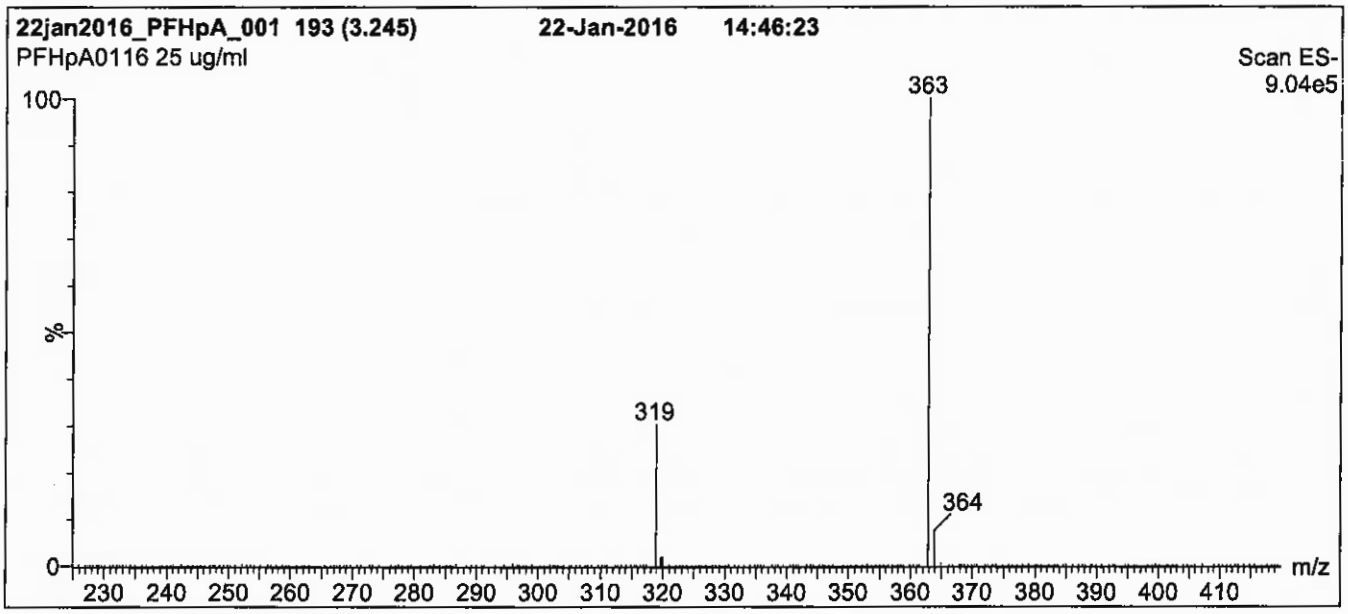
Figure 1: **PFHpA; LC/MS Data (TIC and Mass Spectrum)**





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

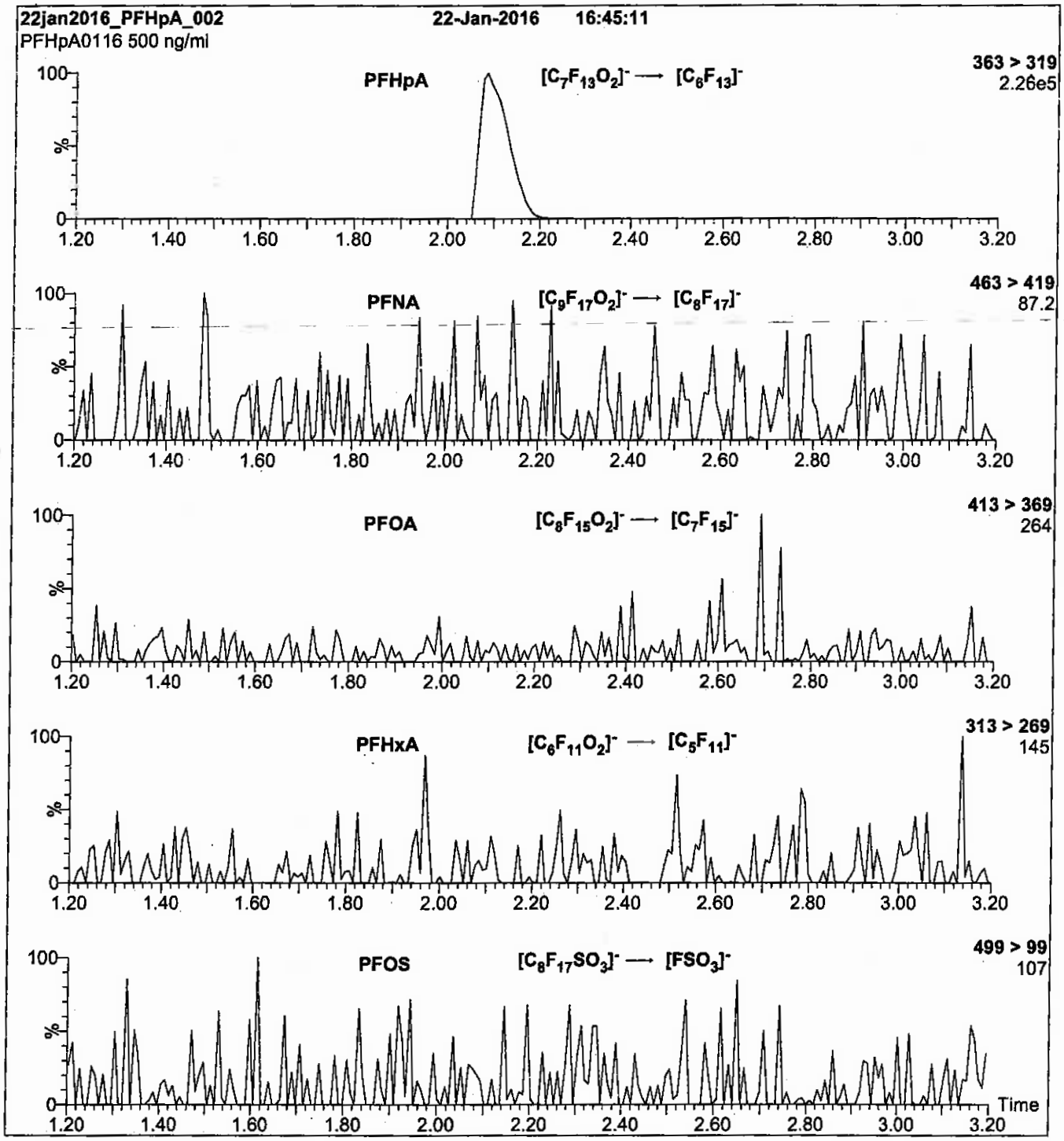
Flow: 300 µl/min

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

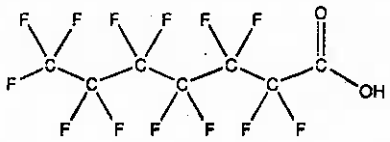
LCPFHpA_00008

R: 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
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CALA

ANAB ACCREDITED REFERENCE MATERIAL

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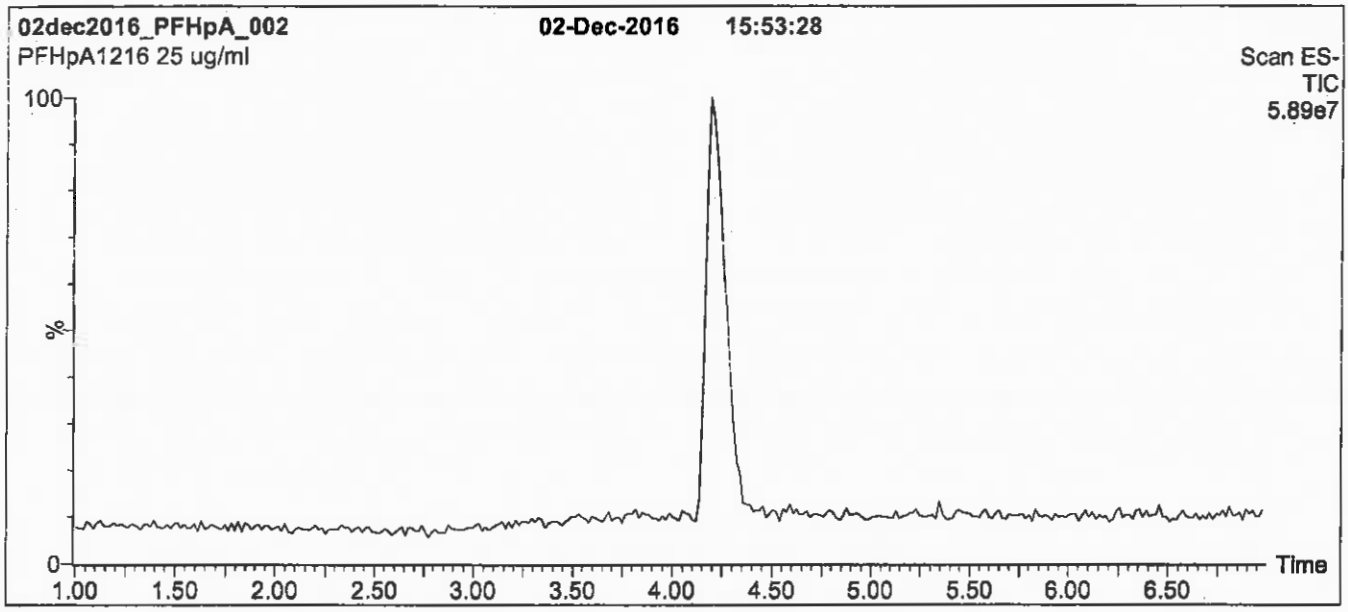
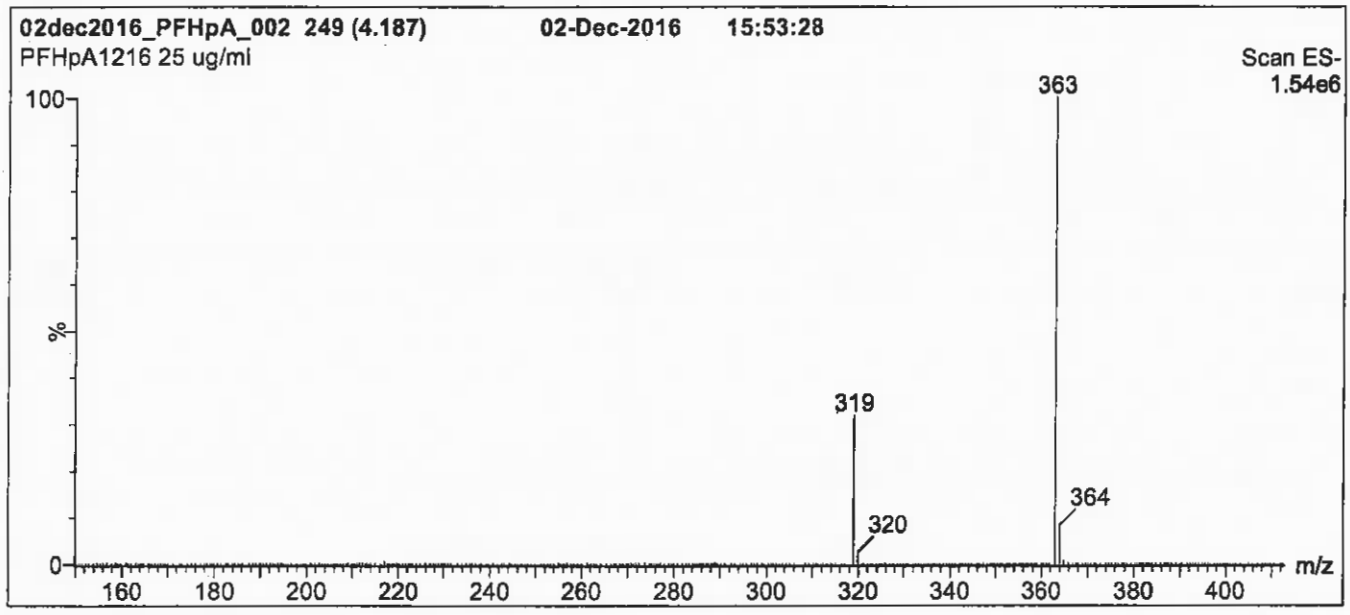




Conditions for Figure 1:

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

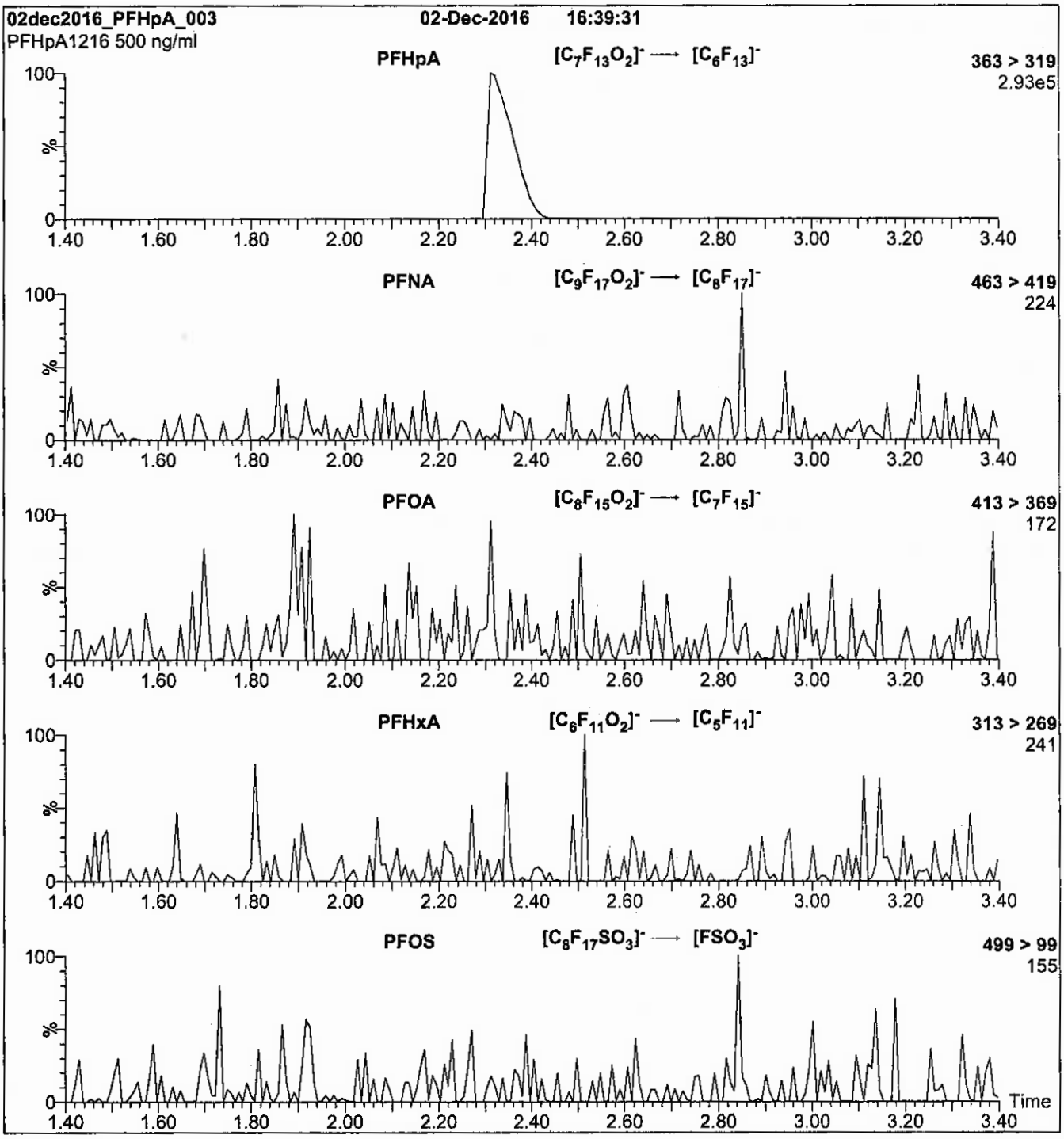
Flow: 300 µl/min

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: **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 SR 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

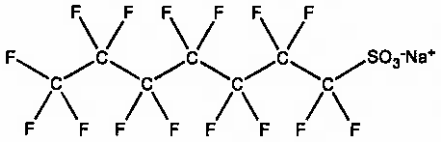
WELLINGTON LABORATORIES

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 ($C_8F_{17}SO_3Na$).

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Certified By: B.G. Chittim **Date:** 11/09/2015 (mm/dd/yyyy)

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

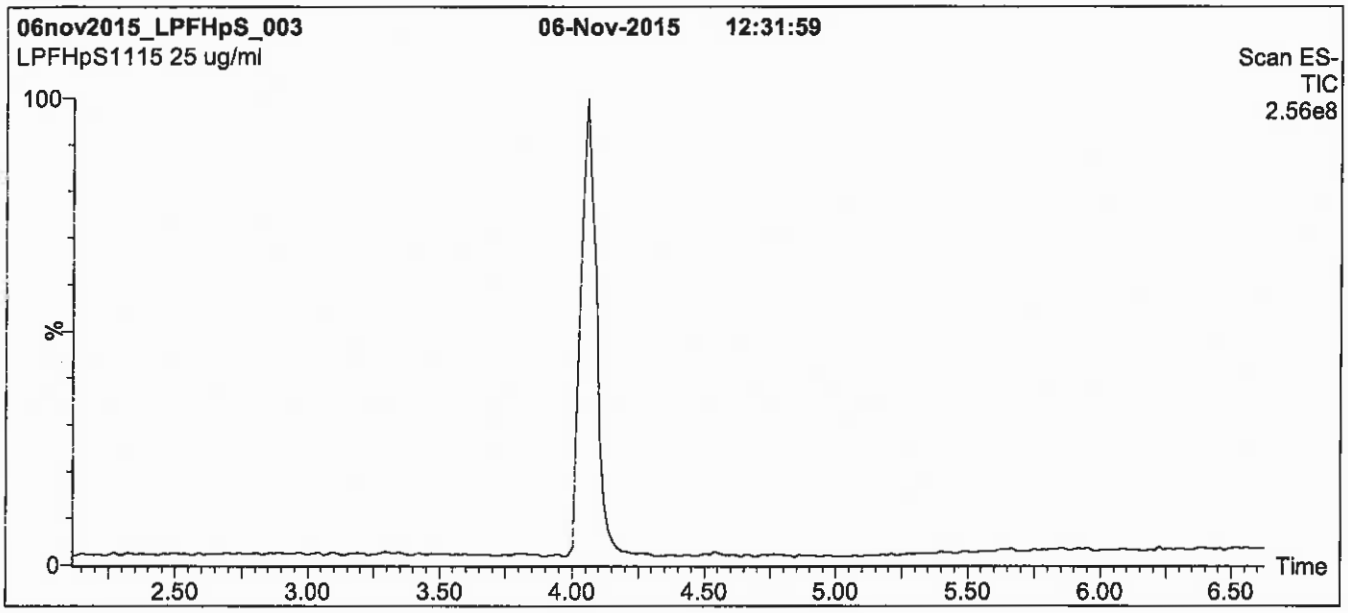
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

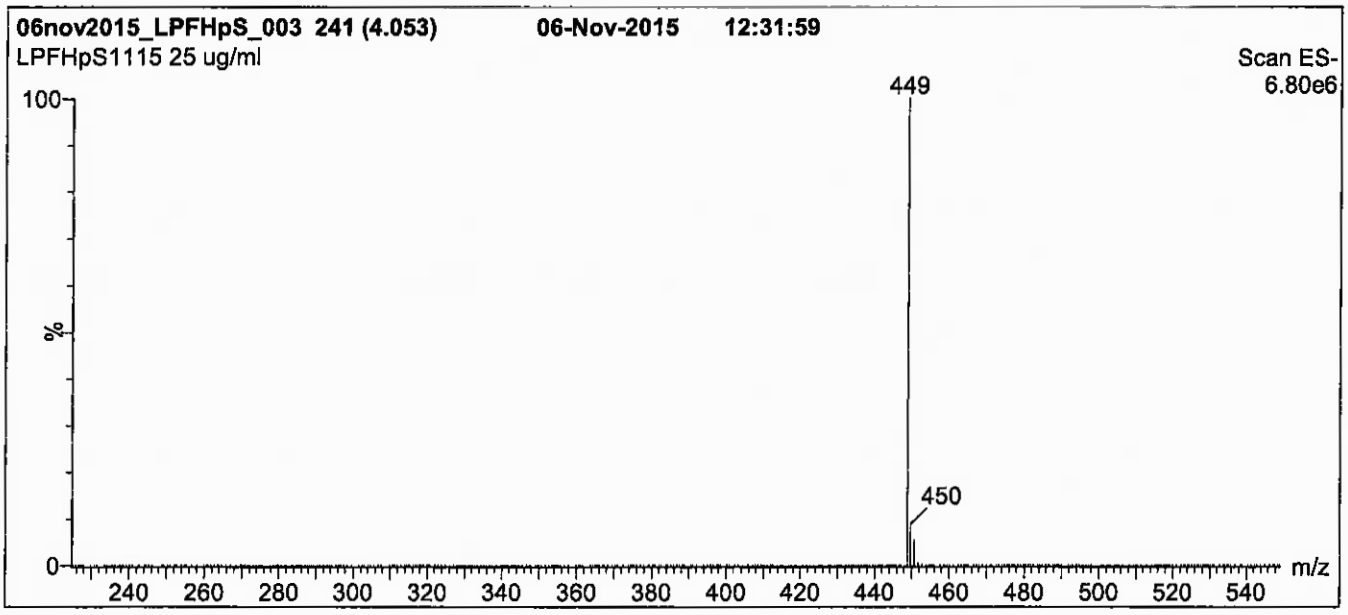
CALA

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: **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

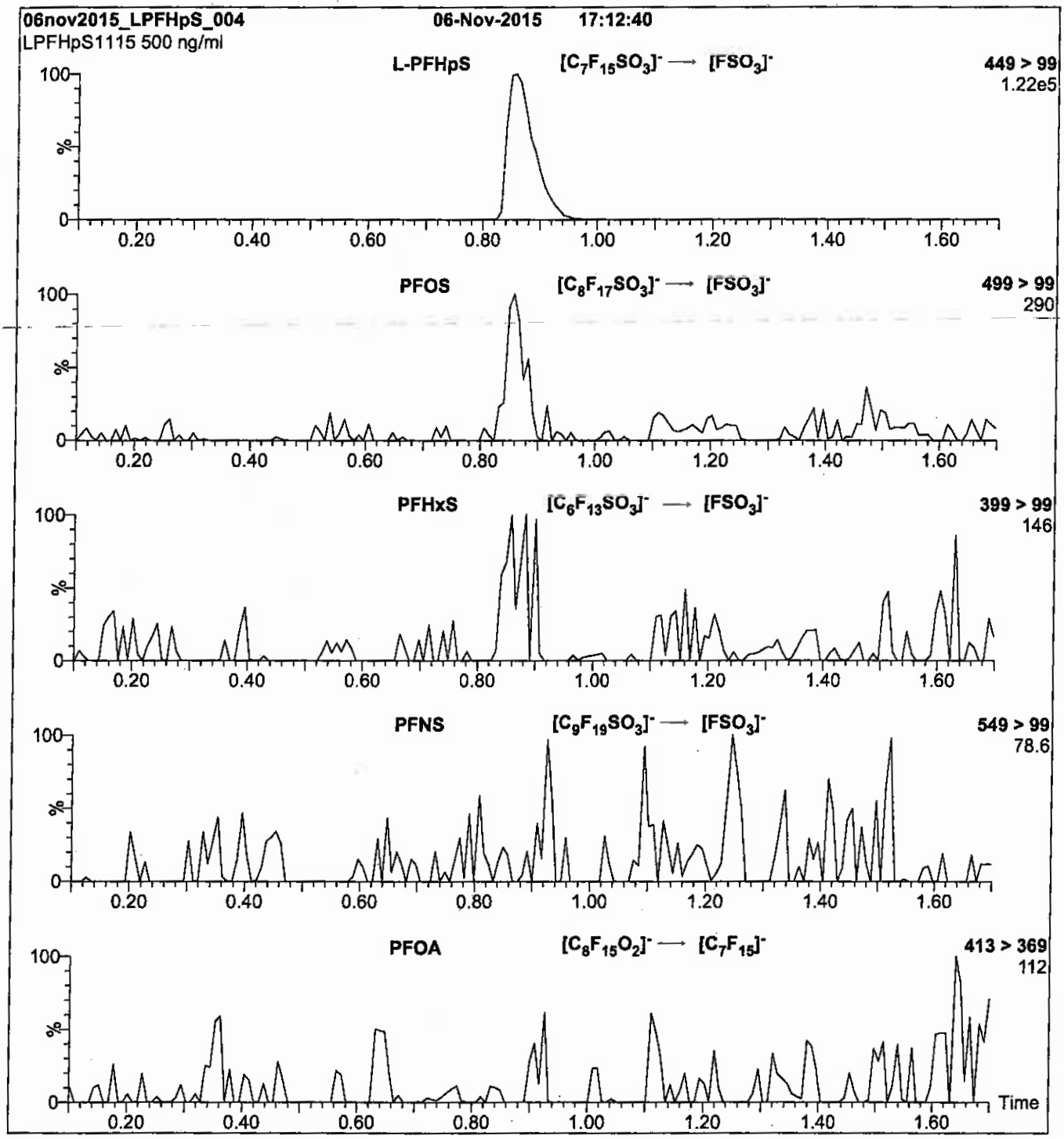
Flow: 300 µl/min

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

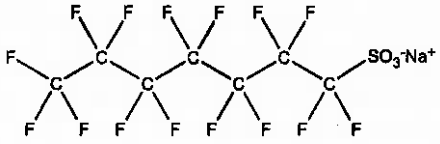
LCPFHpSA_00002

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

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:

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

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

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

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CALA

ANAB

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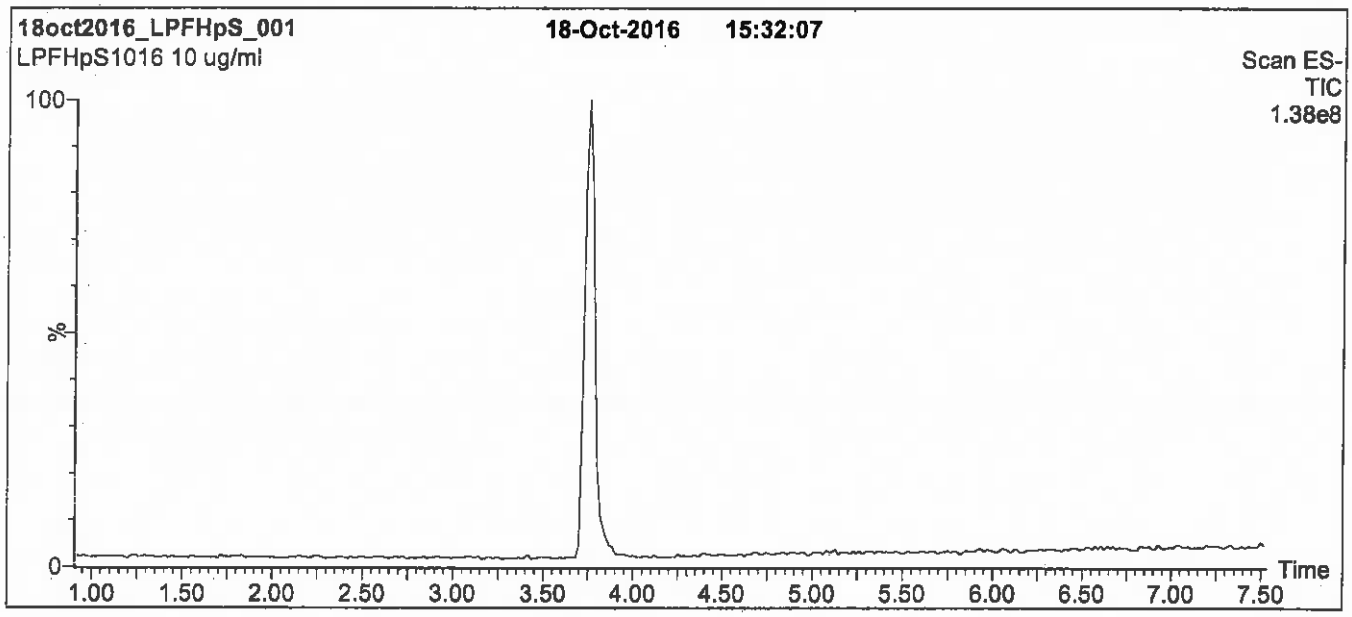
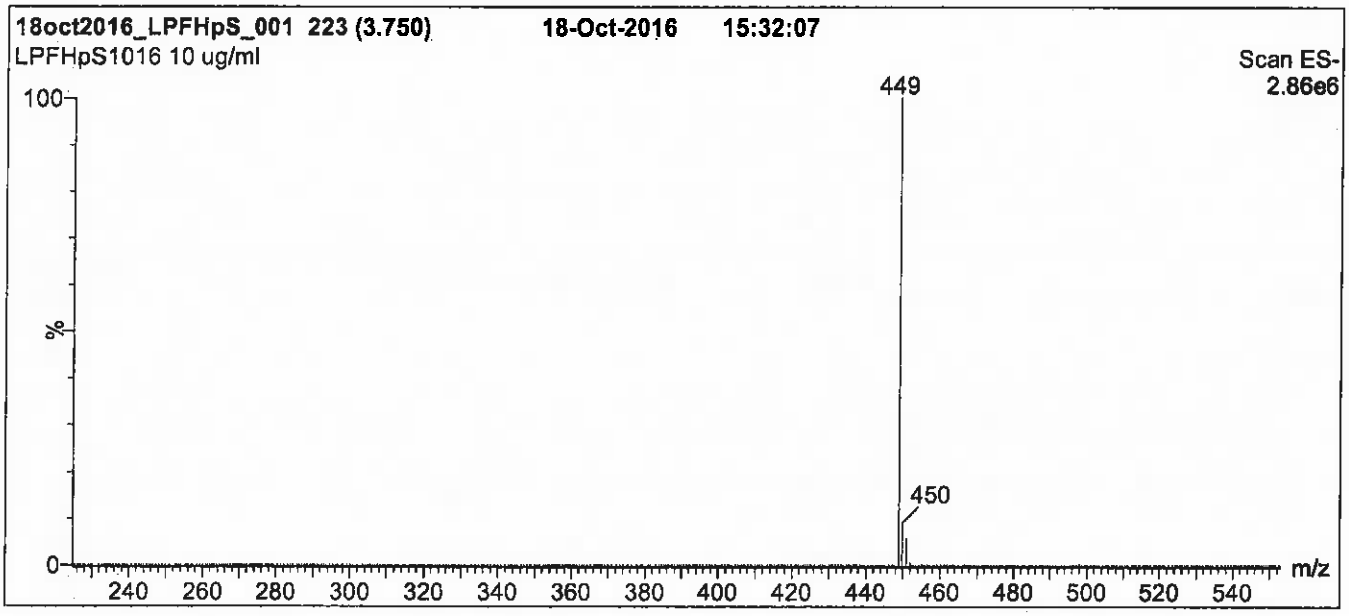




Conditions for Figure 1:

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

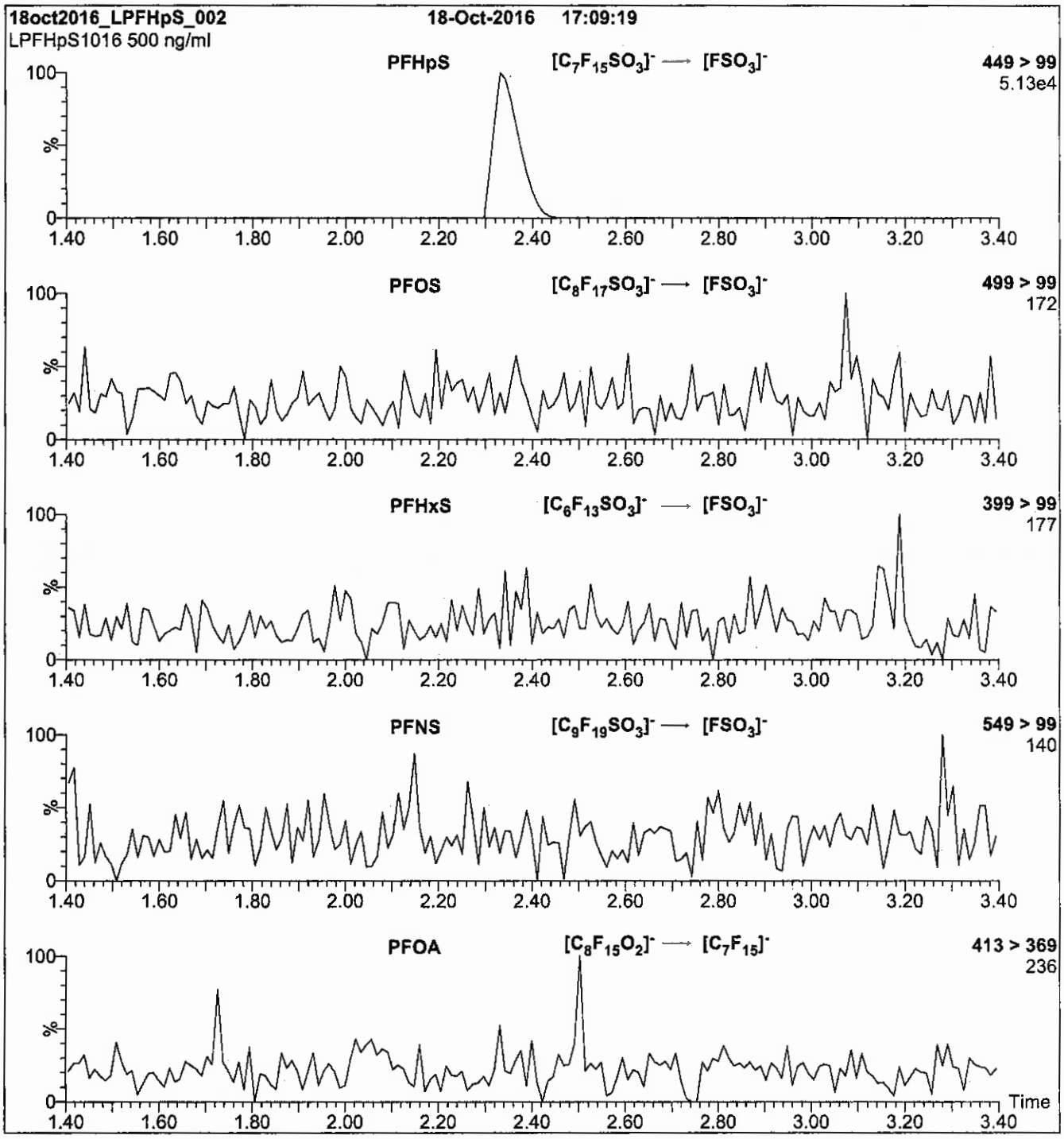
Flow: 300 µl/min

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

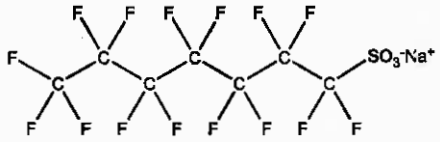
LCPFHpSA_00003

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
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.

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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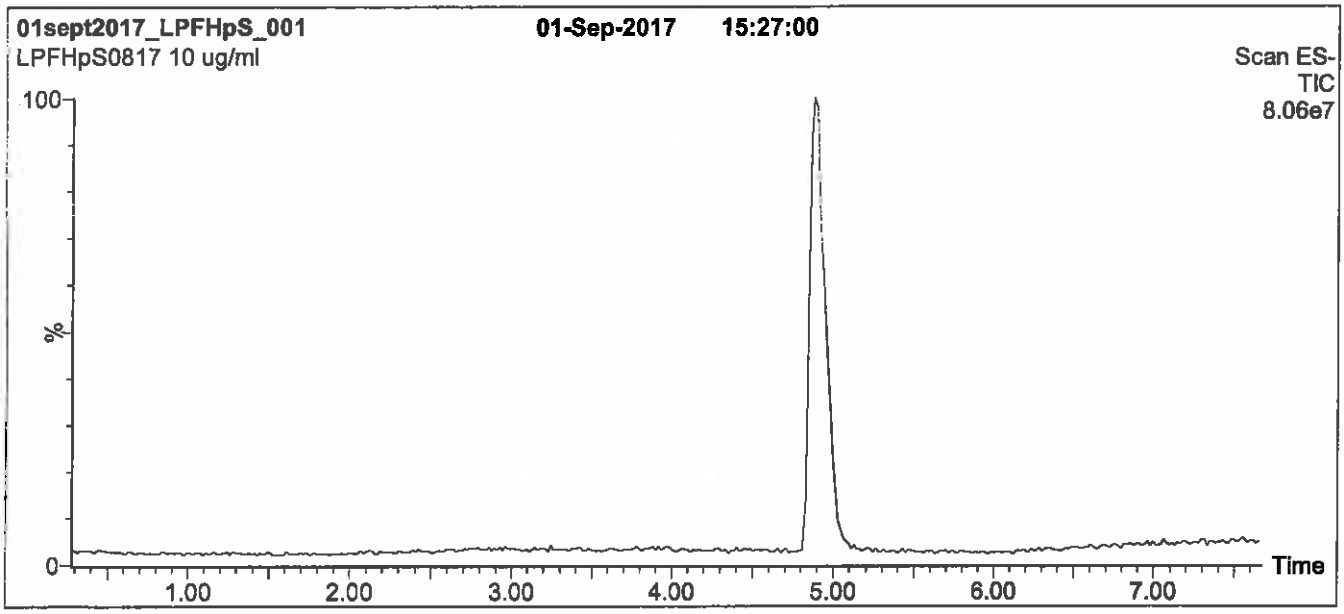
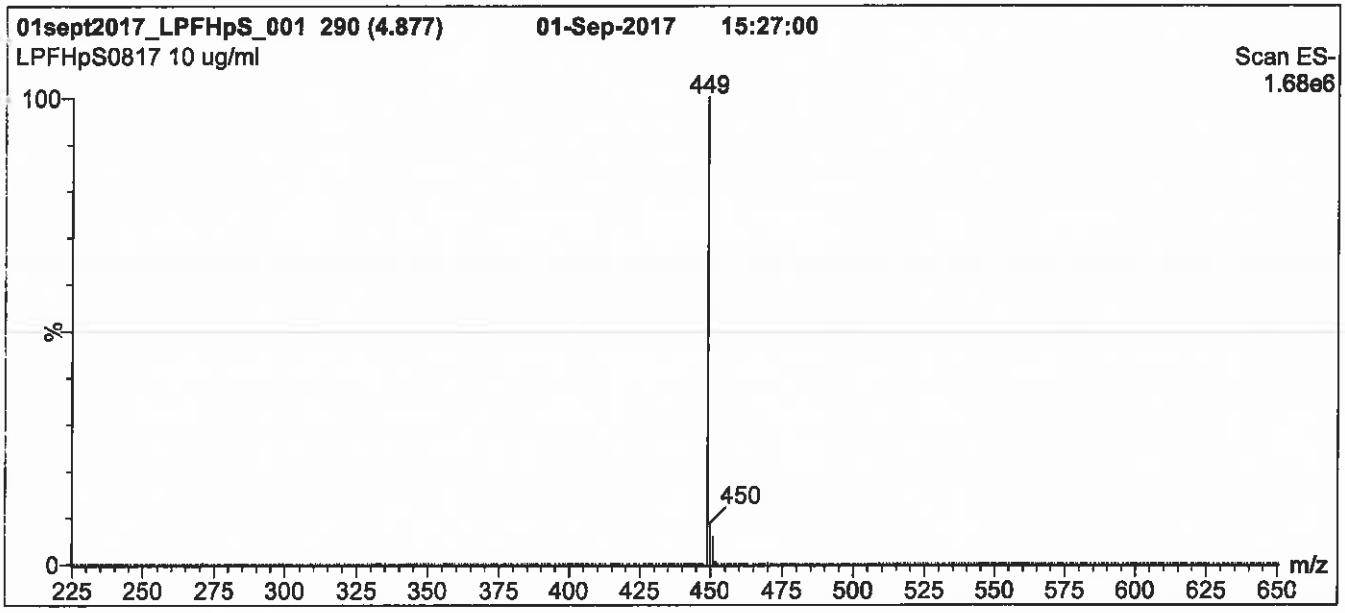
Figure 1: **L-PFHpS; LC/MS Data (TIC and Mass Spectrum)**





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: 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

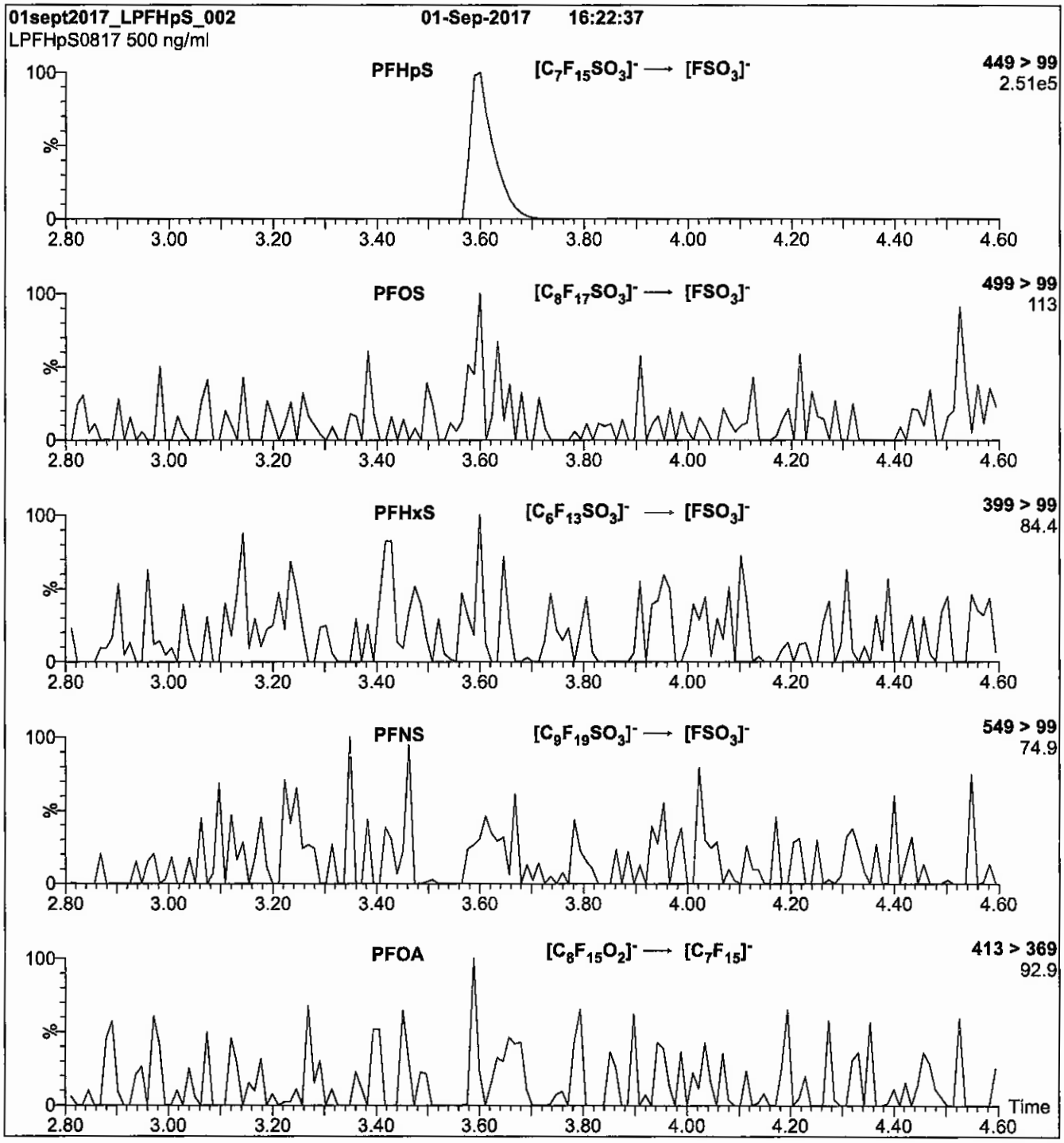
Flow: 300 µl/min

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

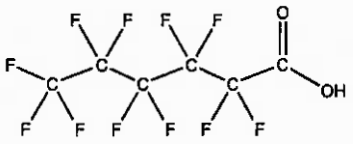
730551
ID: LCPFHxA_00005
Exp: 12/22/20 Prpd: SBC
PF-n-hexanoic acid

730552
ID: LCPFHxA_00006
Exp: 12/22/20 Prpd: SBC
PF-n-hexanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFHxA	**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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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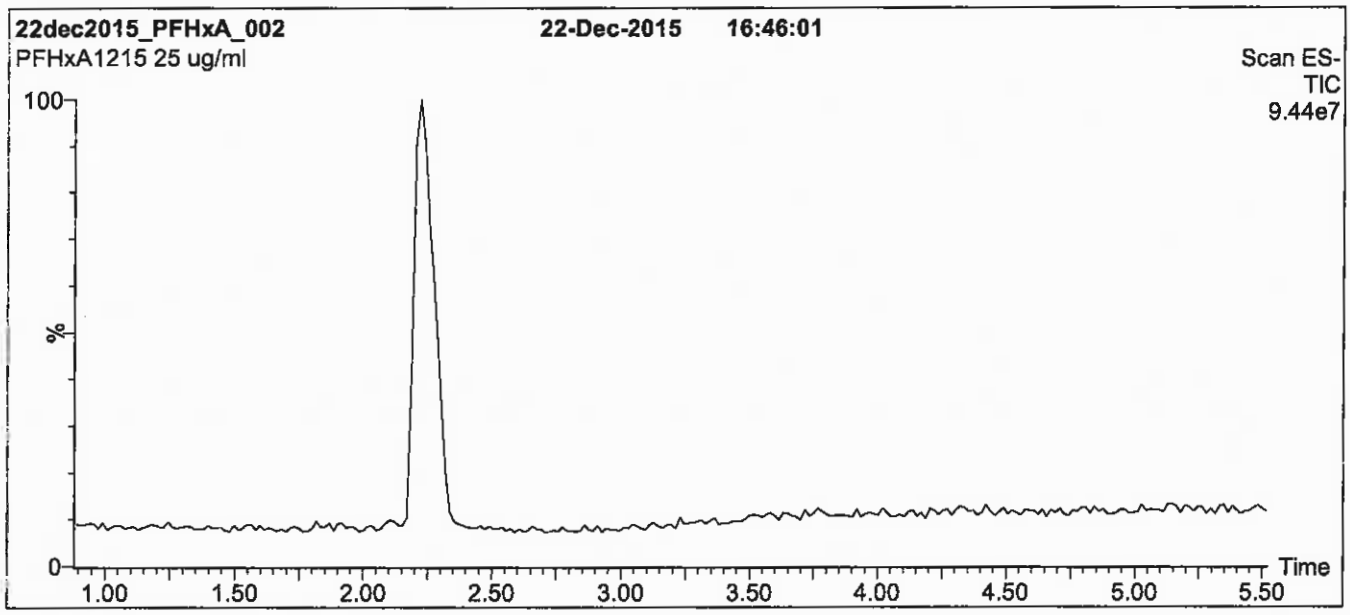
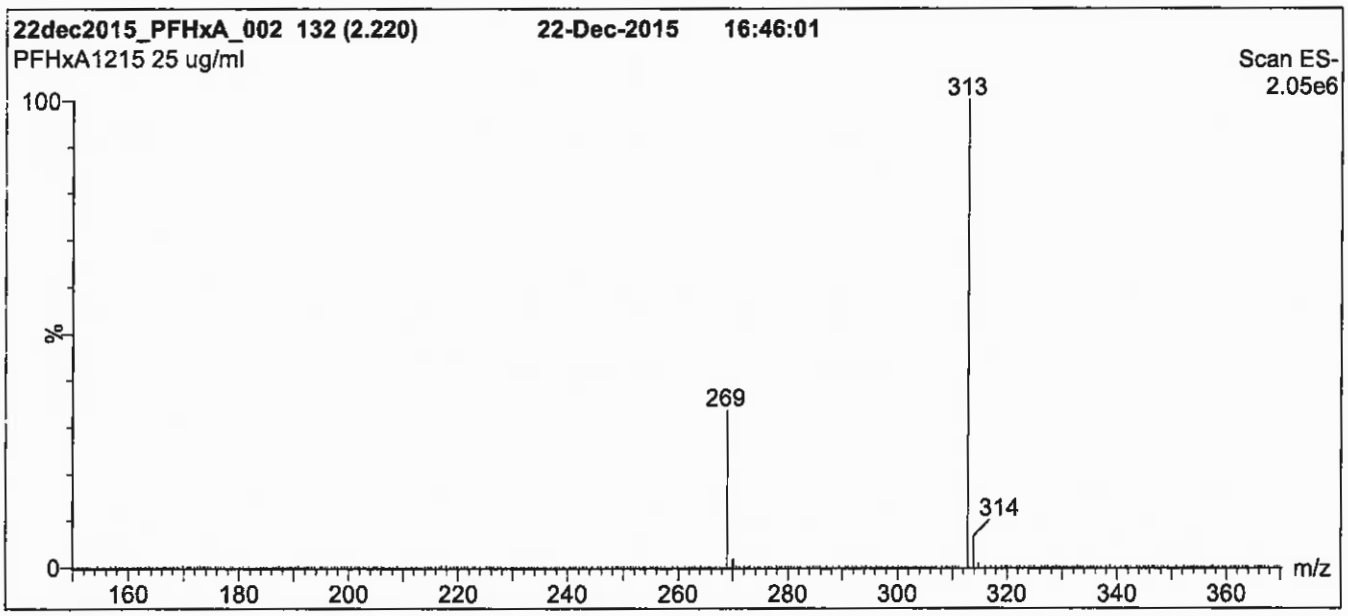
Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





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

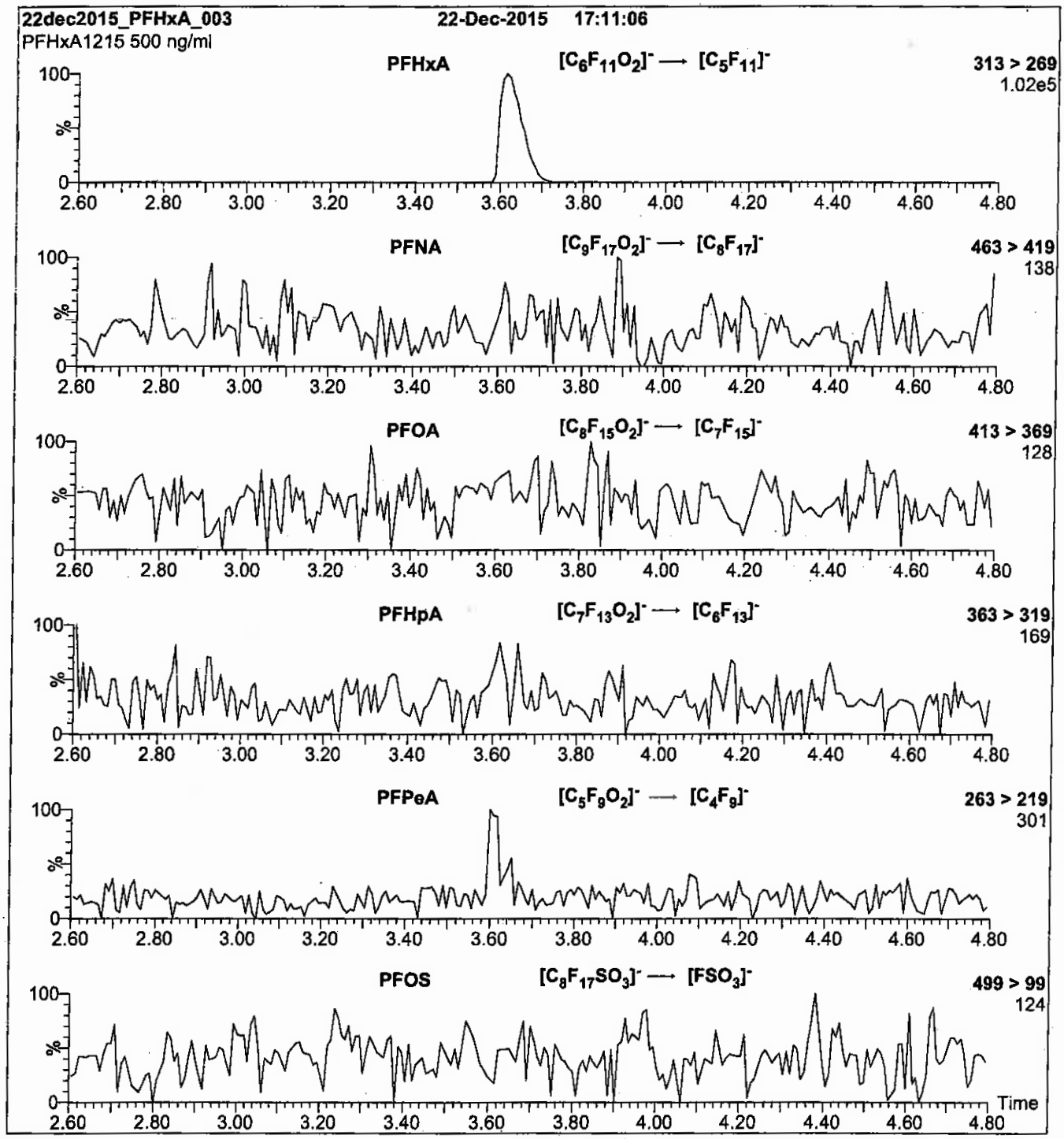
Flow: 300 µl/min

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

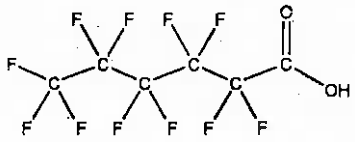
LCPFHxA_00007

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:

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.

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

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QUALITY MANAGEMENT:

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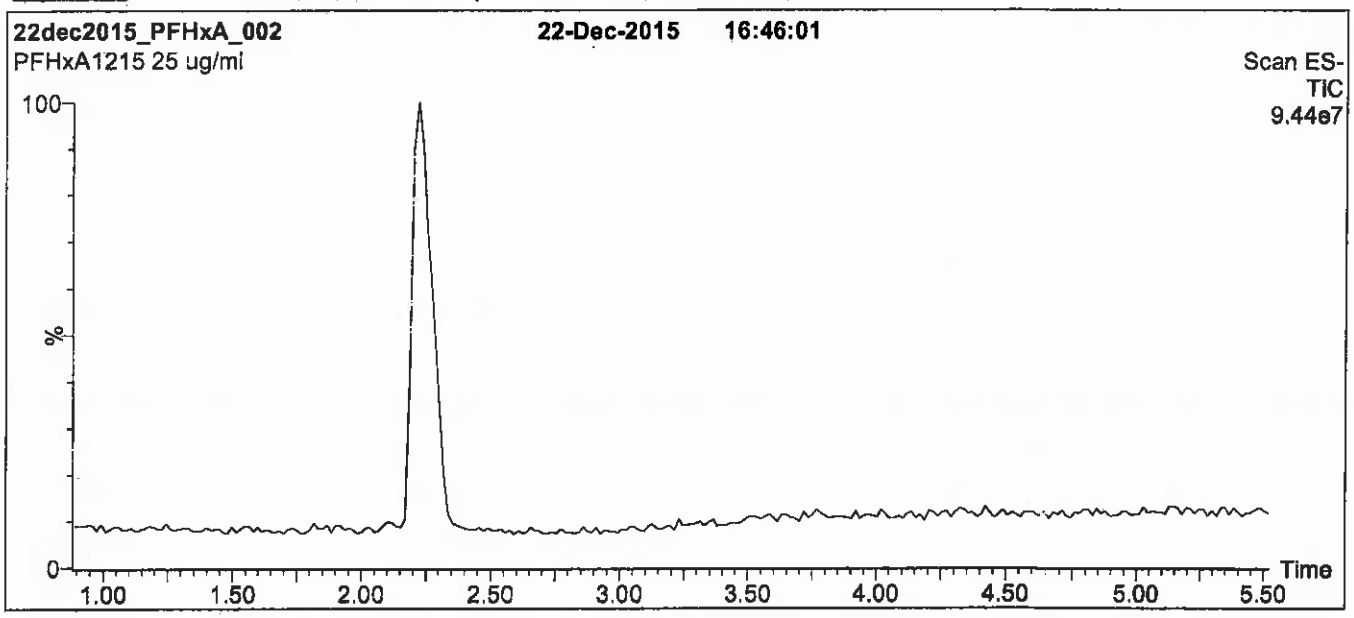
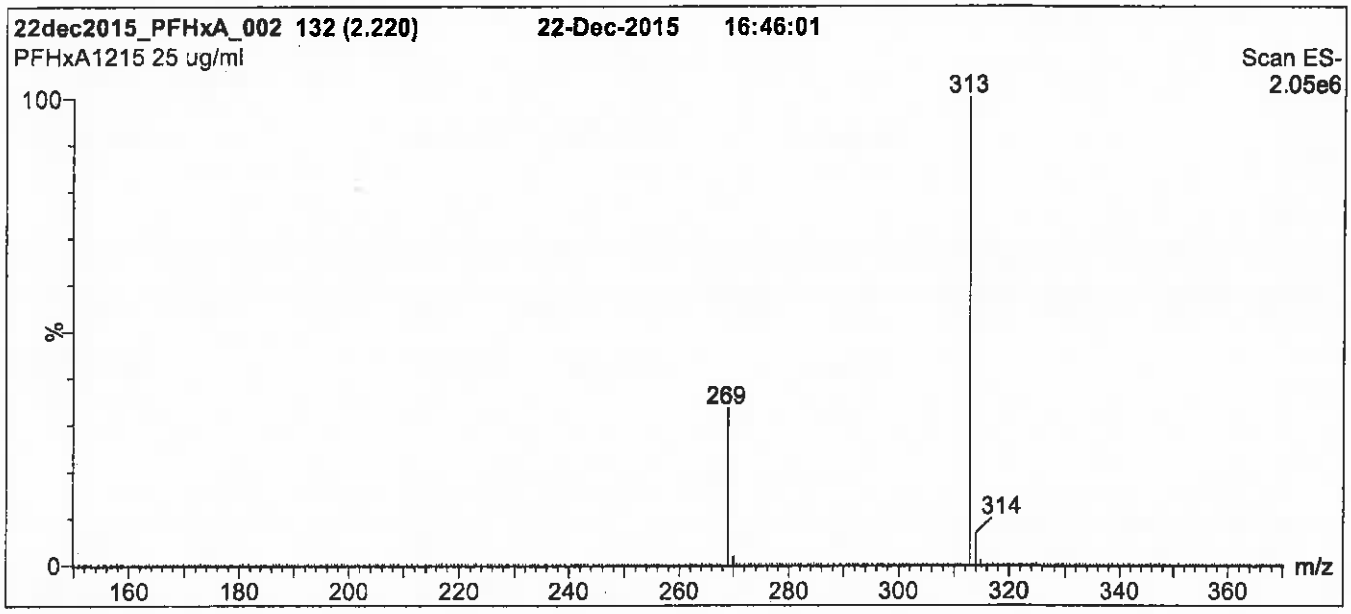
Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH 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

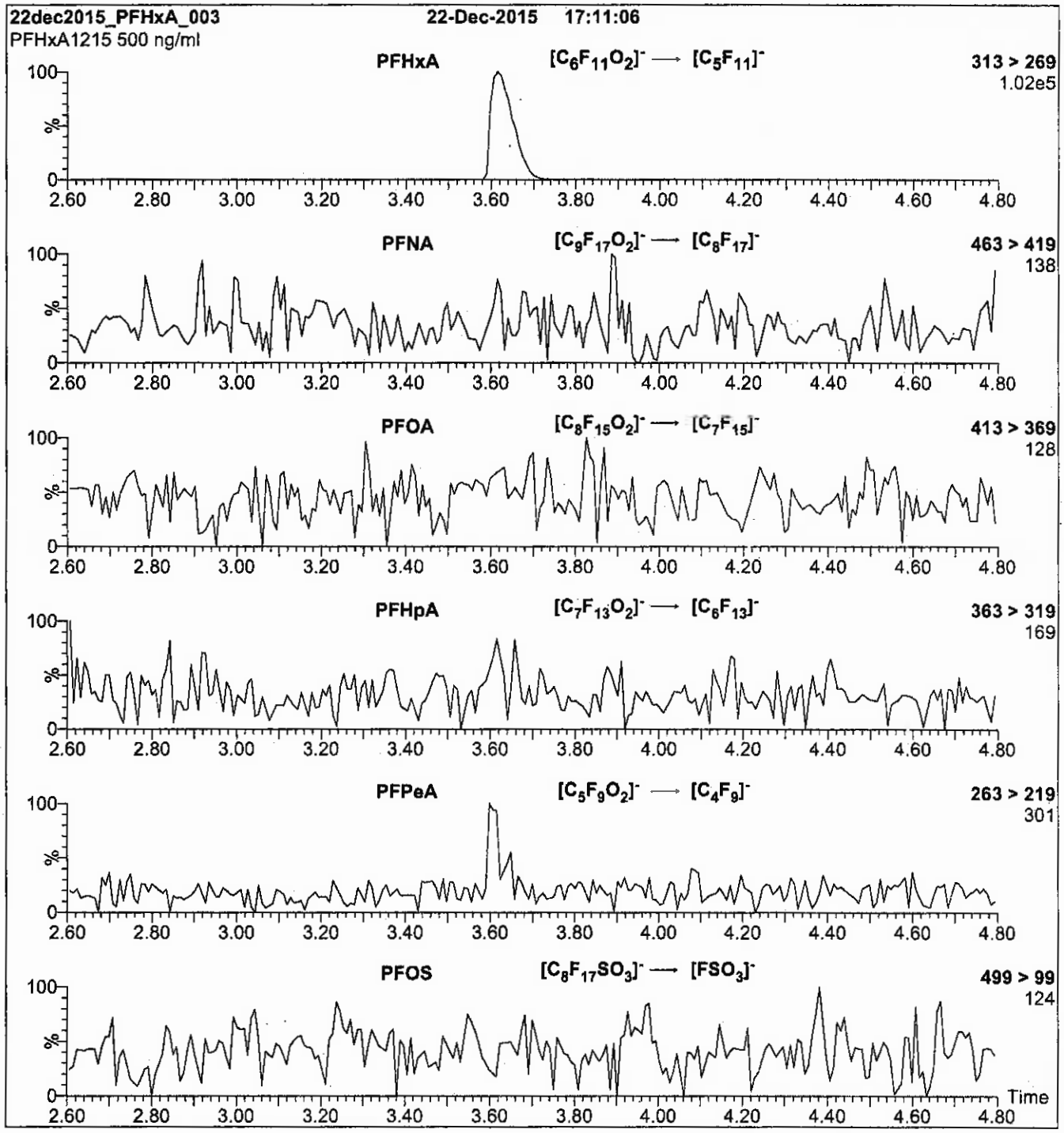
Flow: 300 µl/min

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 SBC

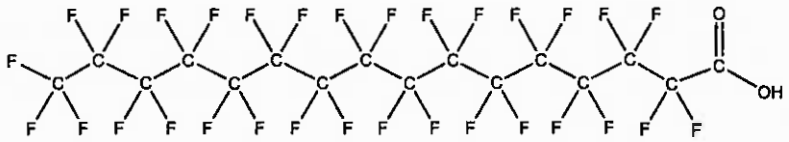
730630
ID: LCPFHxDA_00006
Exp: 05/25/21 Prpd: SBC
PFHxDA stock 50ug/mL

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.

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:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, 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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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 REFERENCE MATERIAL PRODUCER

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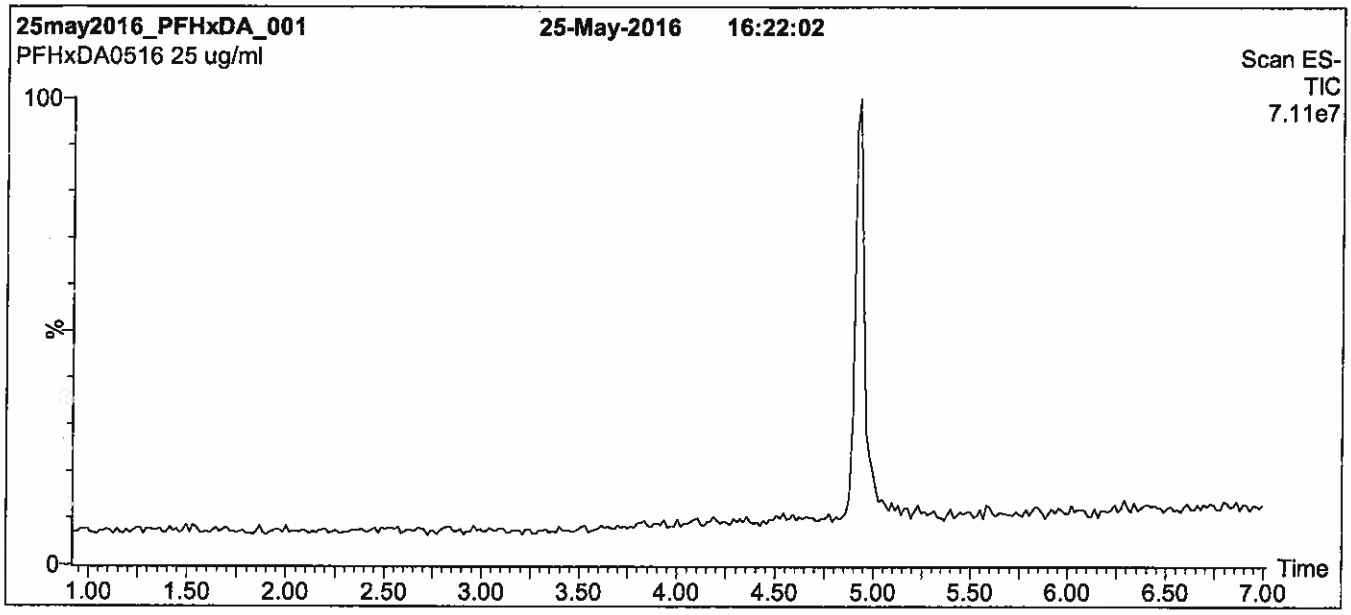
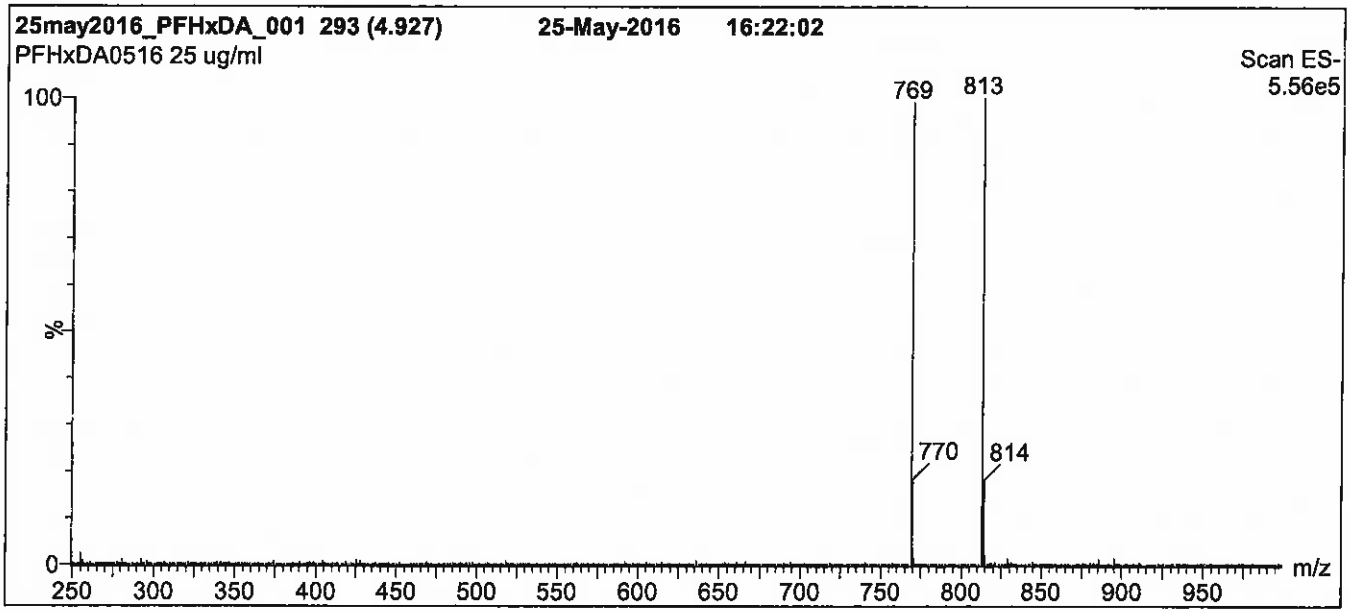
Figure 1: **PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





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

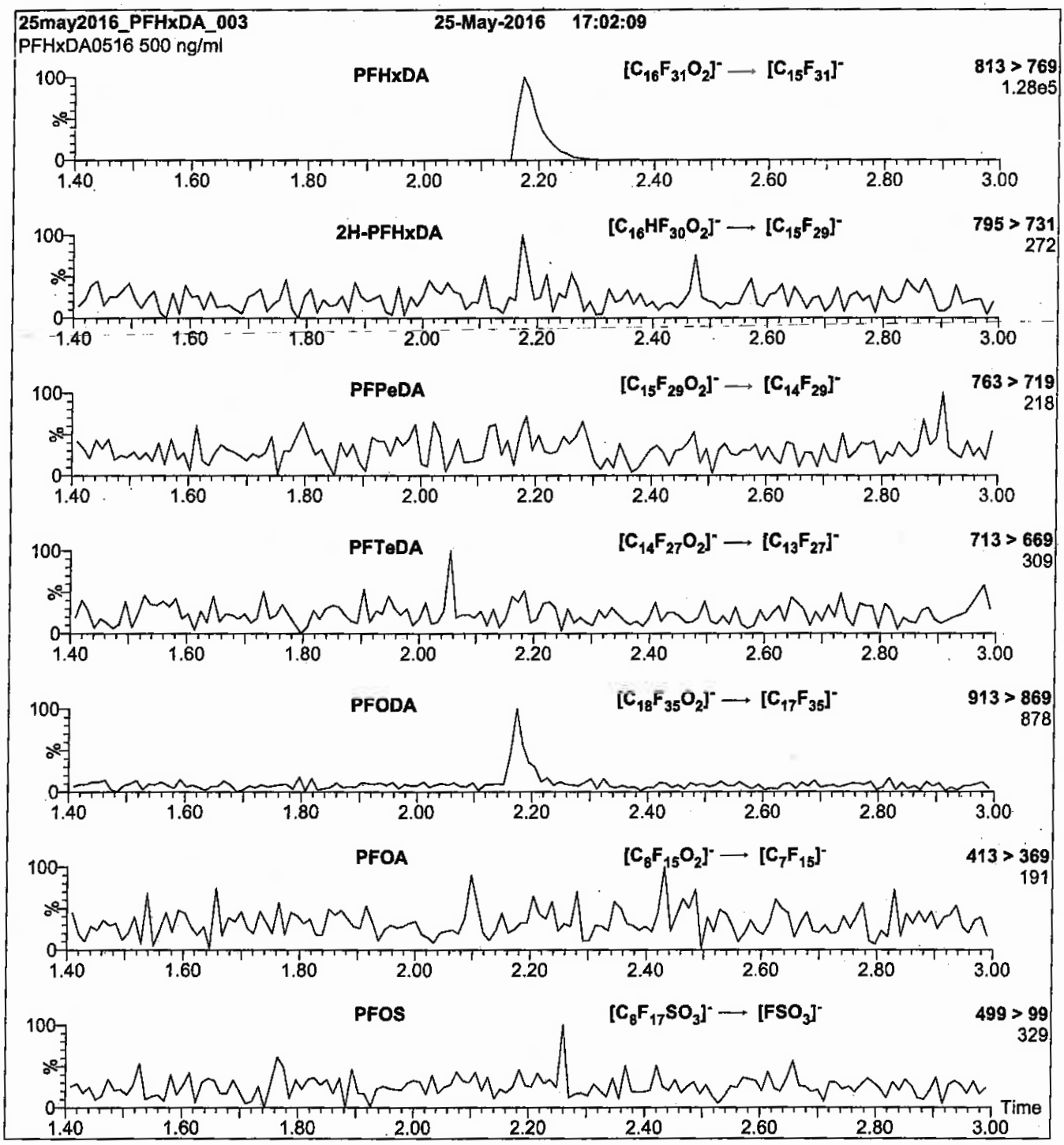
Flow: 300 µl/min

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

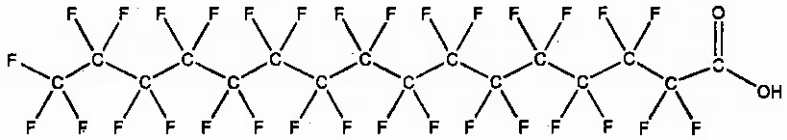
LCPFHxDA_00008

T: 12/29/16 SEV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFHxDA	**LOT NUMBER:**	PFHxDA0516
COMPOUND:	Perfluoro-n-hexadecanoic acid		
STRUCTURE:		**CAS #:**	67905-19-5



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CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/25/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/25/2021		
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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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CALA

ANAB ACCREDITED

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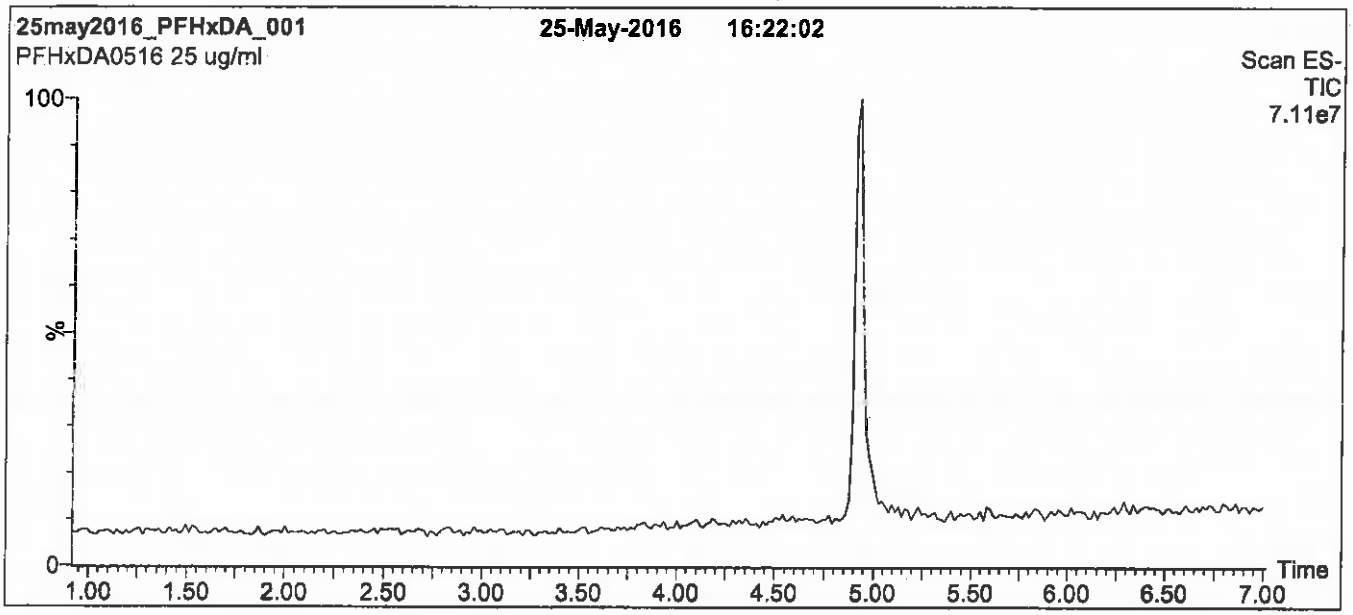
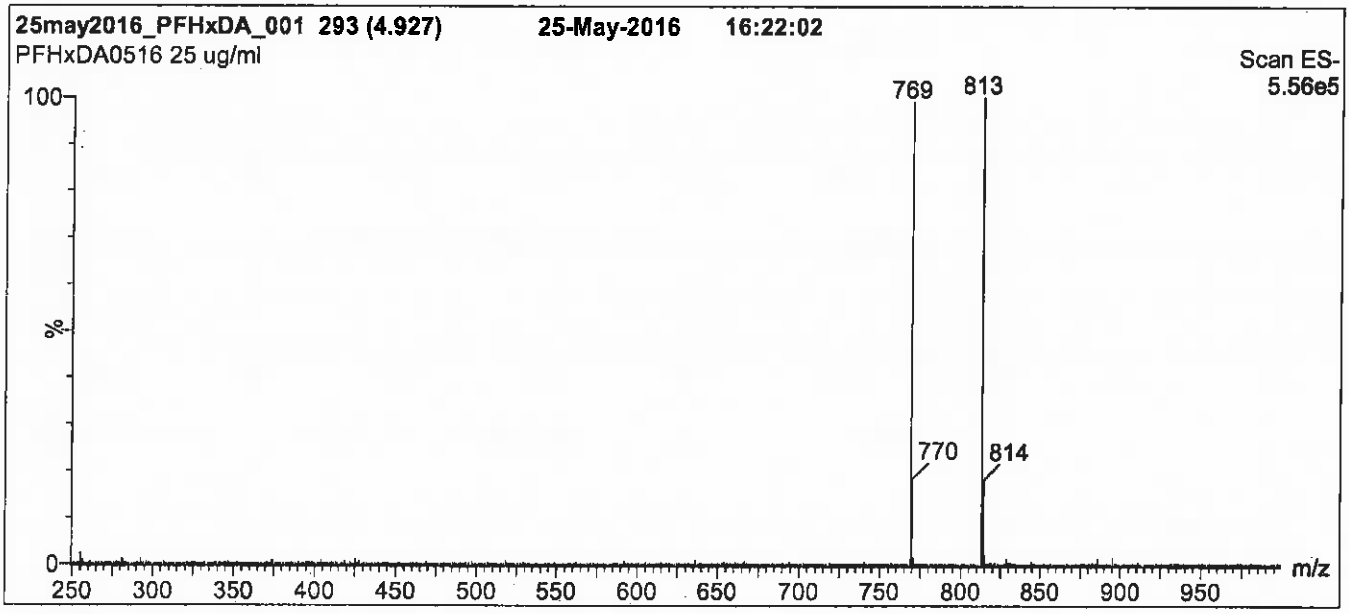




Conditions for Figure 1:

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

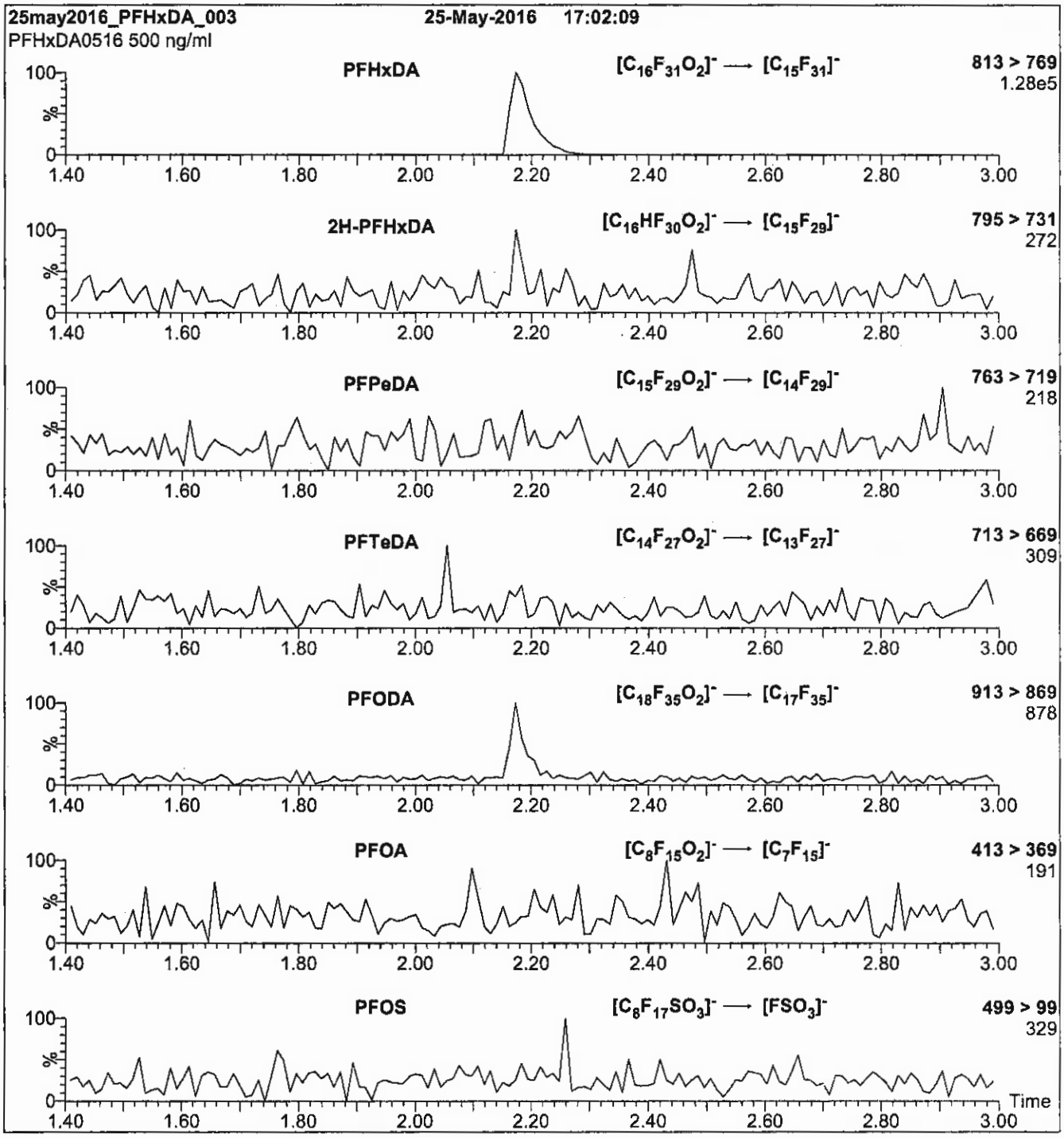
Flow: 300 µl/min

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
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

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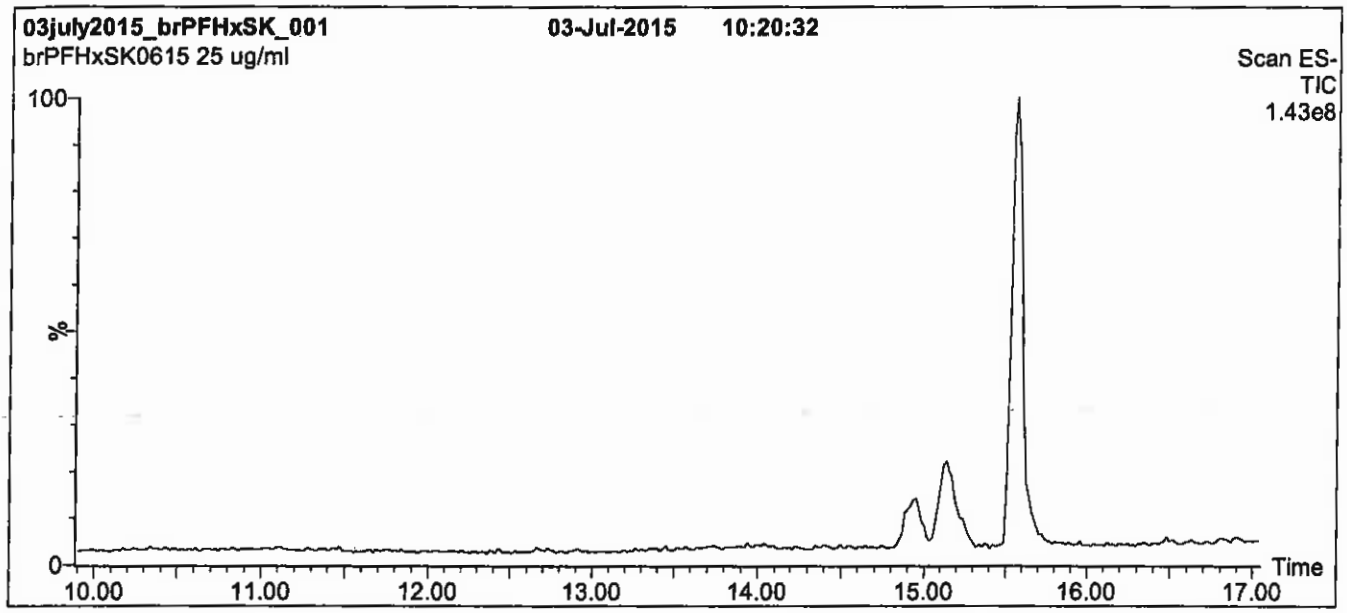
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

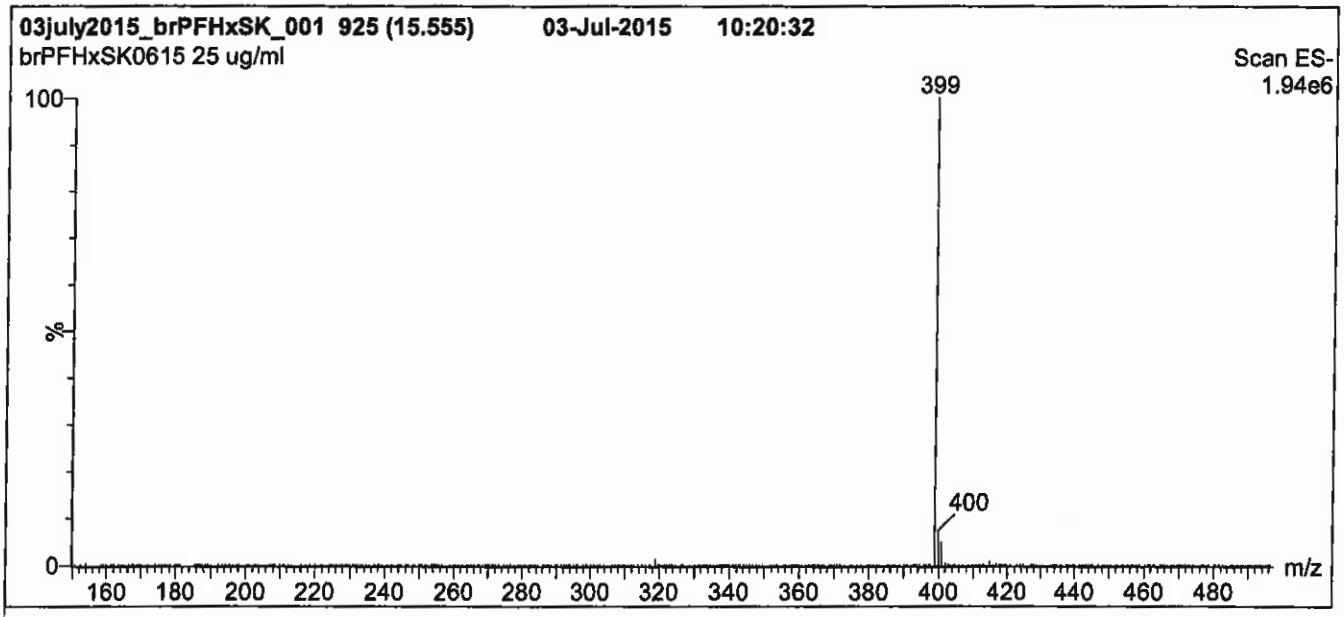
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	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

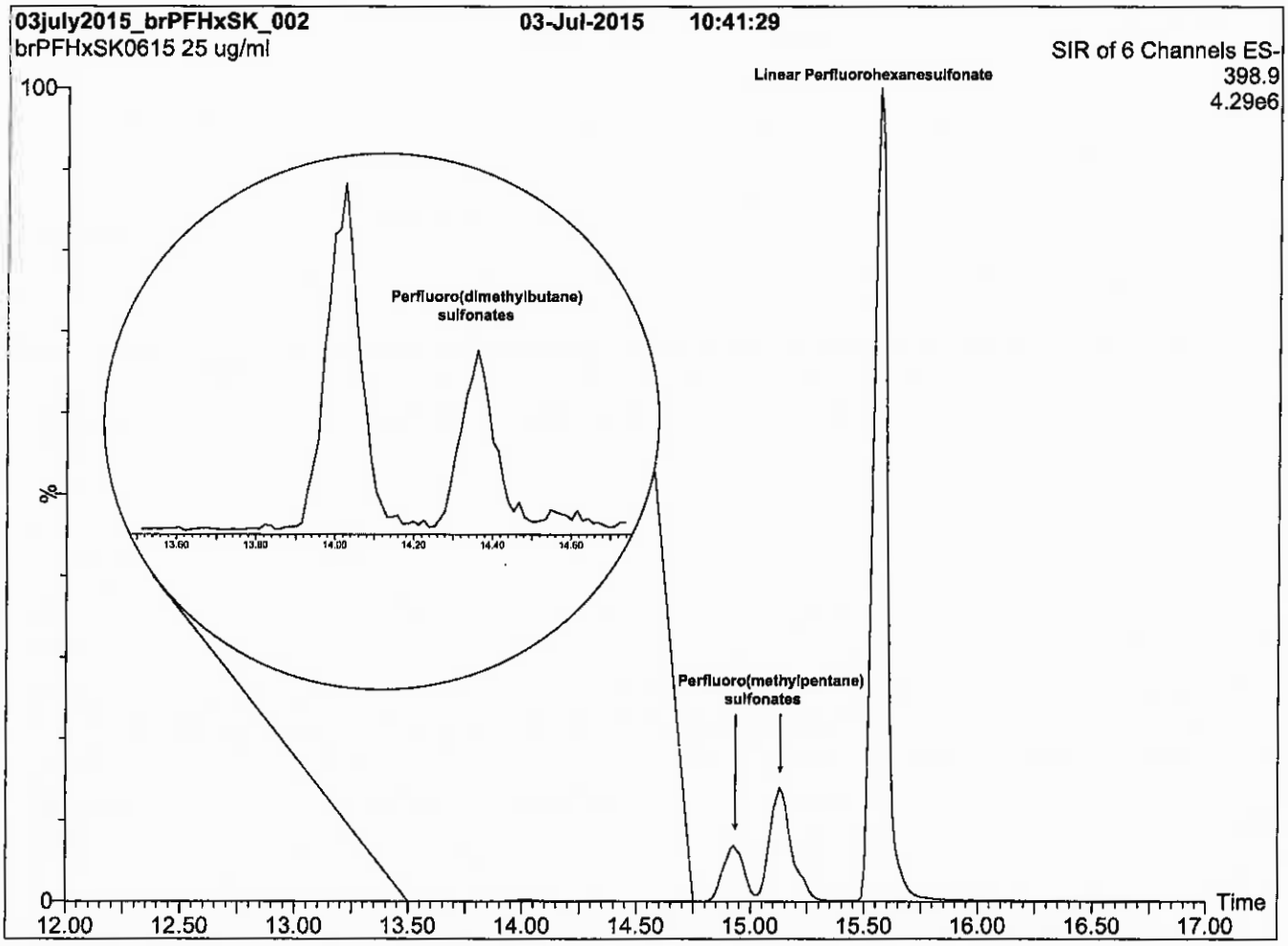
Flow: 300 µl/min

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

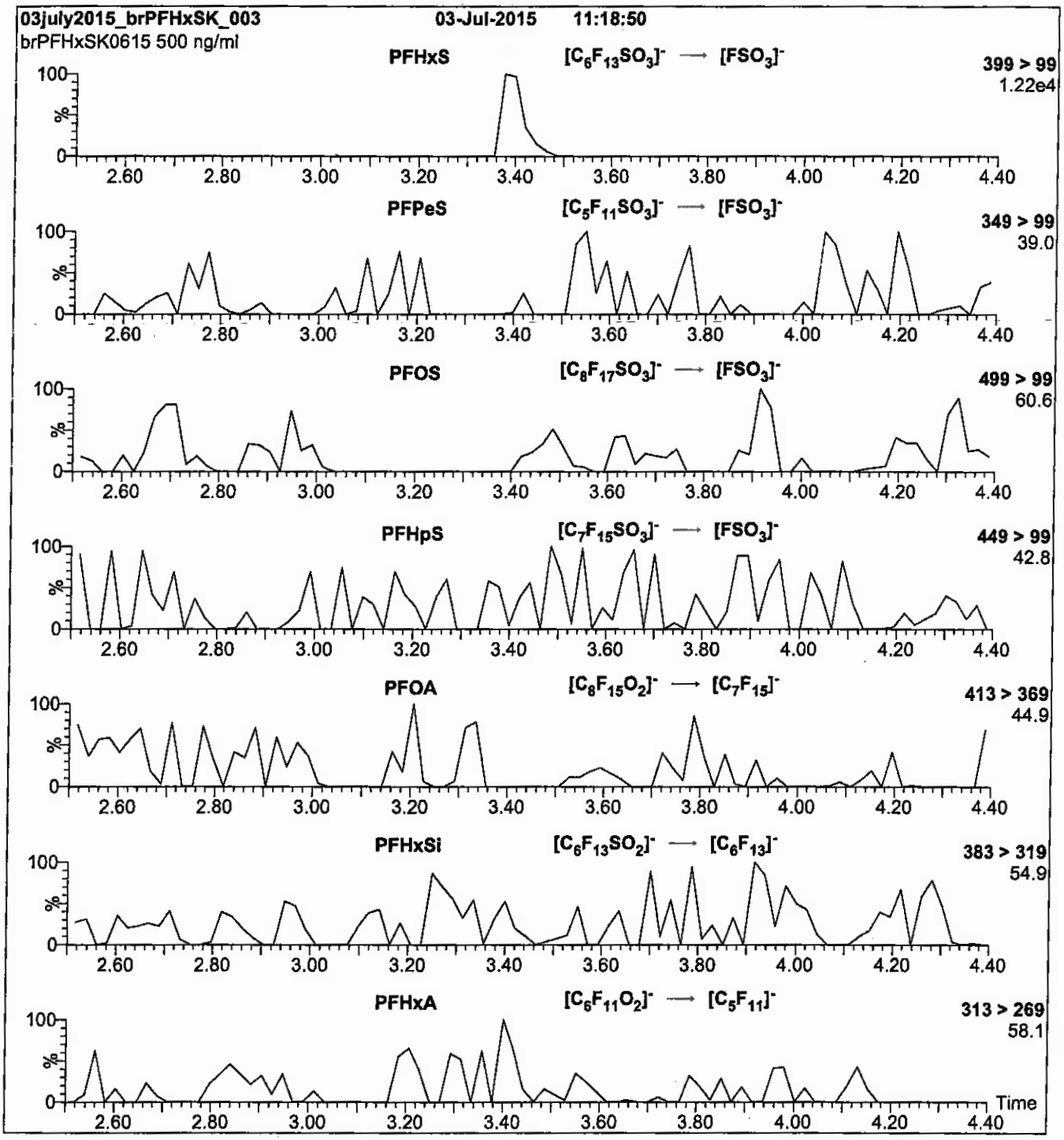
Flow: 300 µl/min

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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CALA

ANAB ACCREDITED

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

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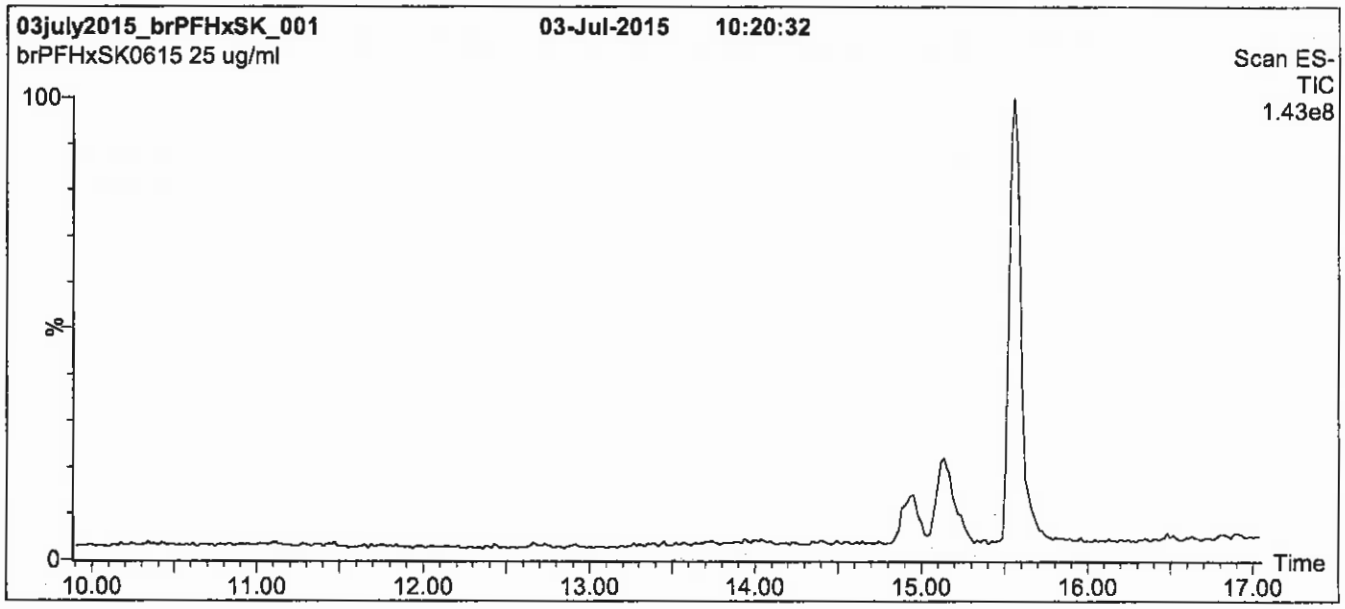
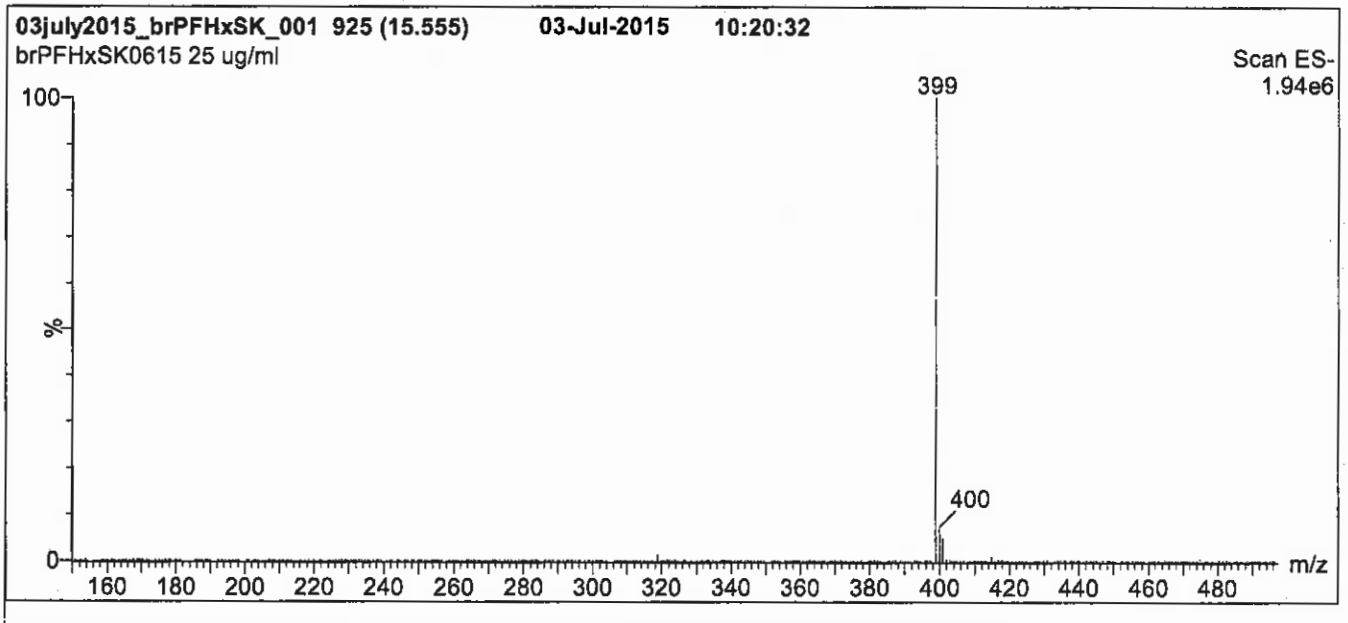
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2\underset{\displaystyle CF_3}{\underset{\vert}{C}}FSO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2\underset{\displaystyle CF_3}{\underset{\vert}{C}}FCF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2\underset{\displaystyle CF_3}{\underset{\vert}{C}}FCF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3\underset{\displaystyle CF_3}{\underset{\vert}{C}}FCF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3\underset{\displaystyle CF_3}{\underset{\vert}{\overset{\displaystyle CF_3}{\overset{\vert}{C}}}}CF_2CF_2SO_3^-K^+$	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

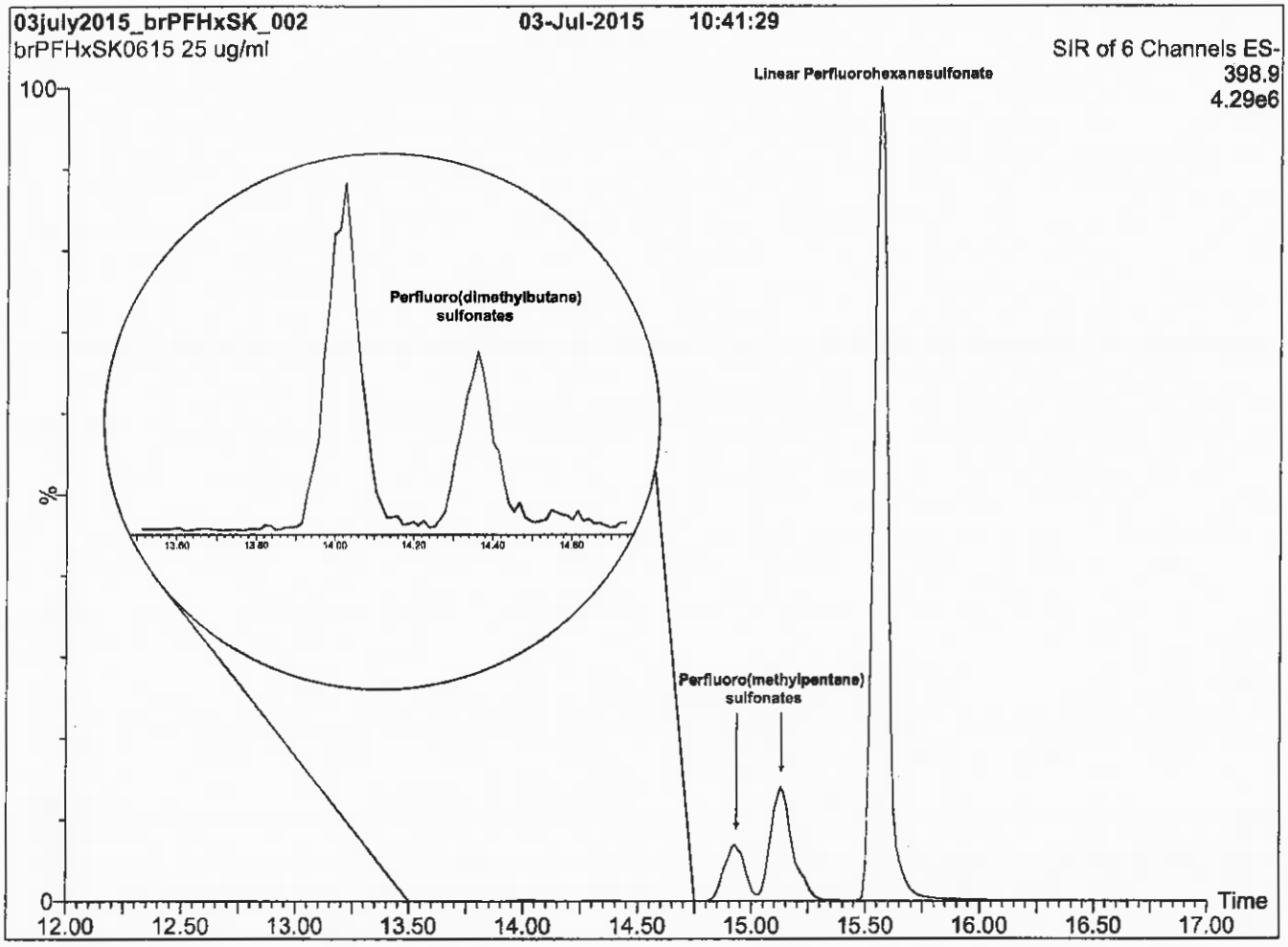
Flow: 300 µl/min

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

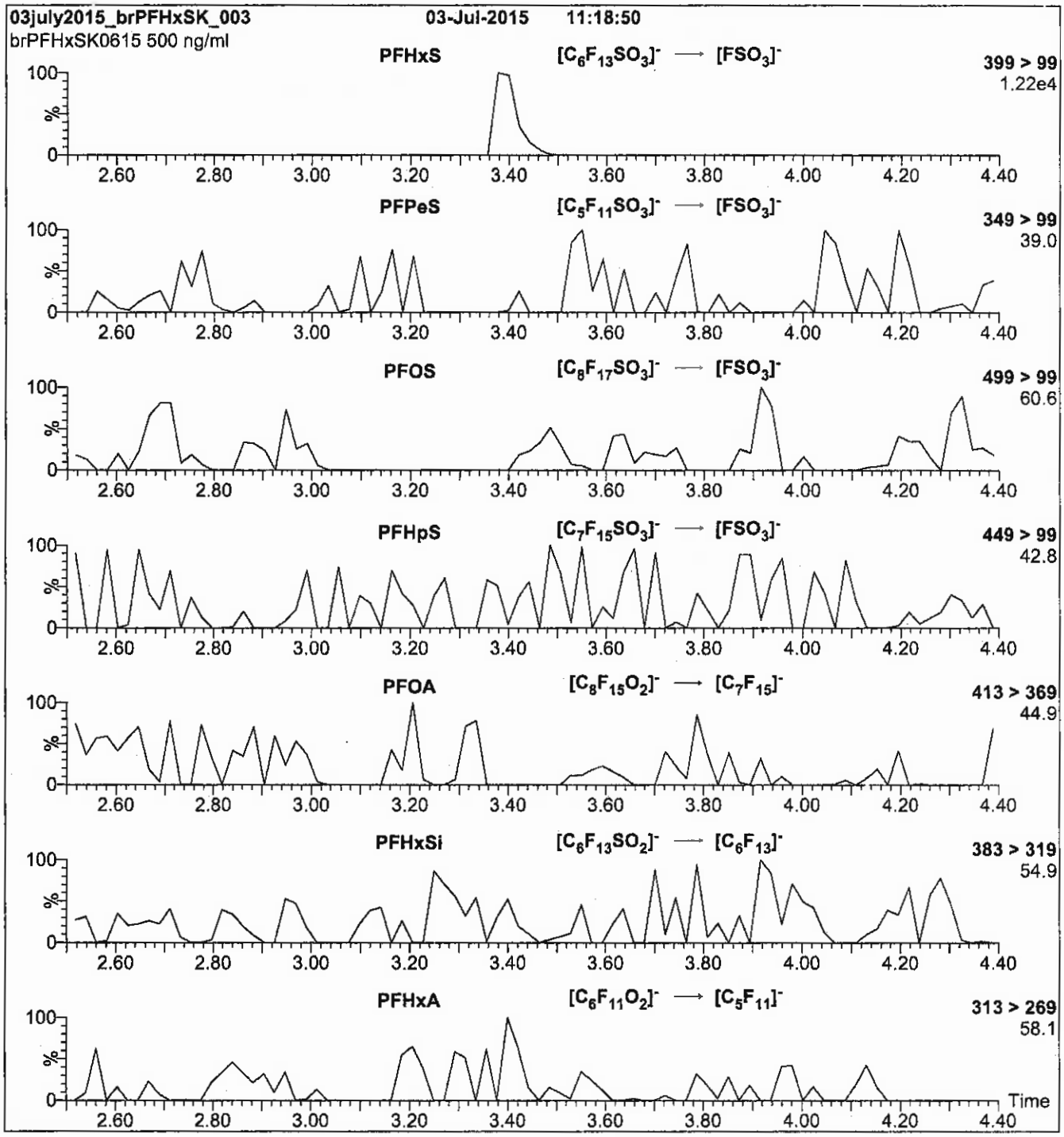
Flow: 300 µl/min

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
Scanned 10/14/16

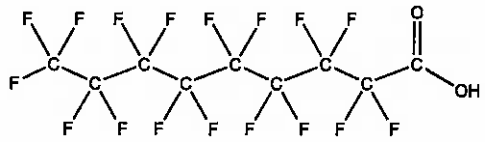
730559
ID: LCPFNA_00006
Exp: 10/23/20 Prpd: SBC
PF-n-nonanoic acid

730560
ID: LCPFNA_00007
Exp: 10/23/20 Prpd: SBC
PF-n-nonanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFNA	**LOT NUMBER:**	PFNA1015
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)	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

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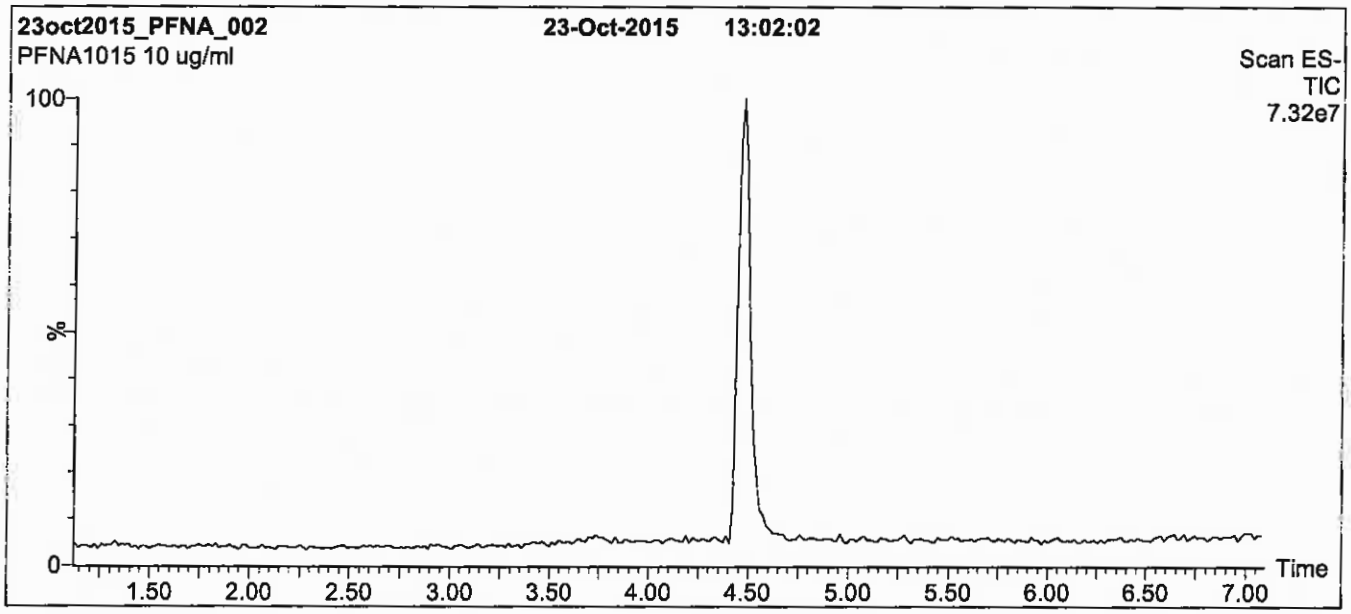
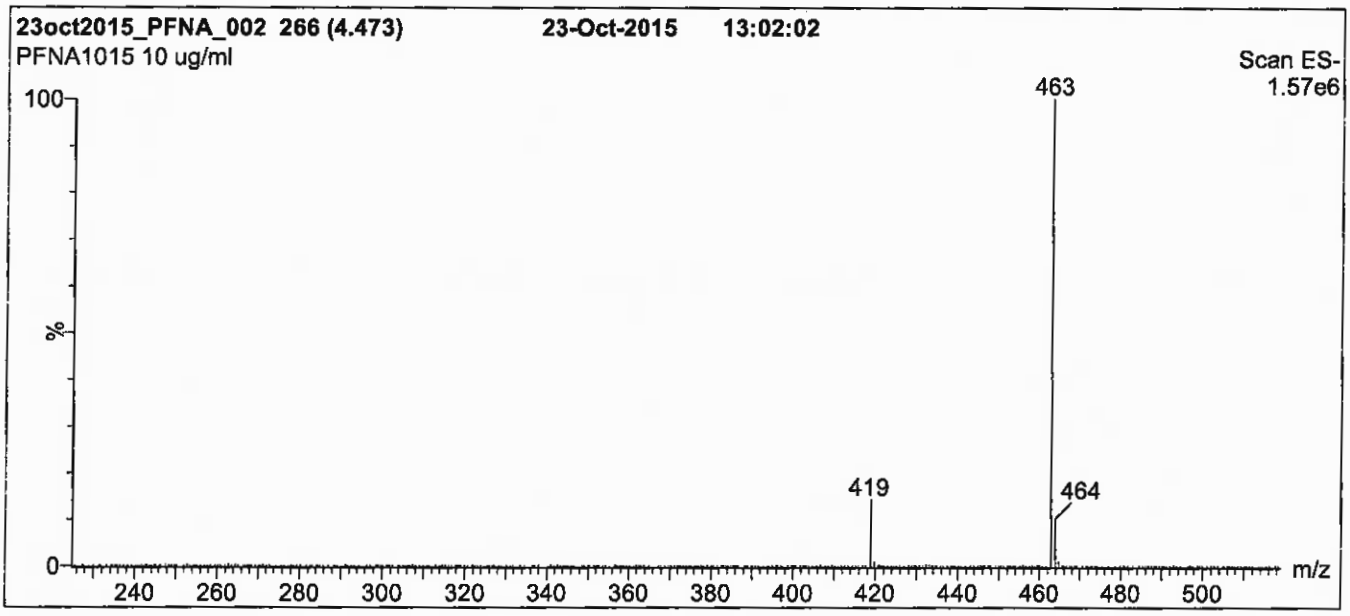
Figure 1: **PFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

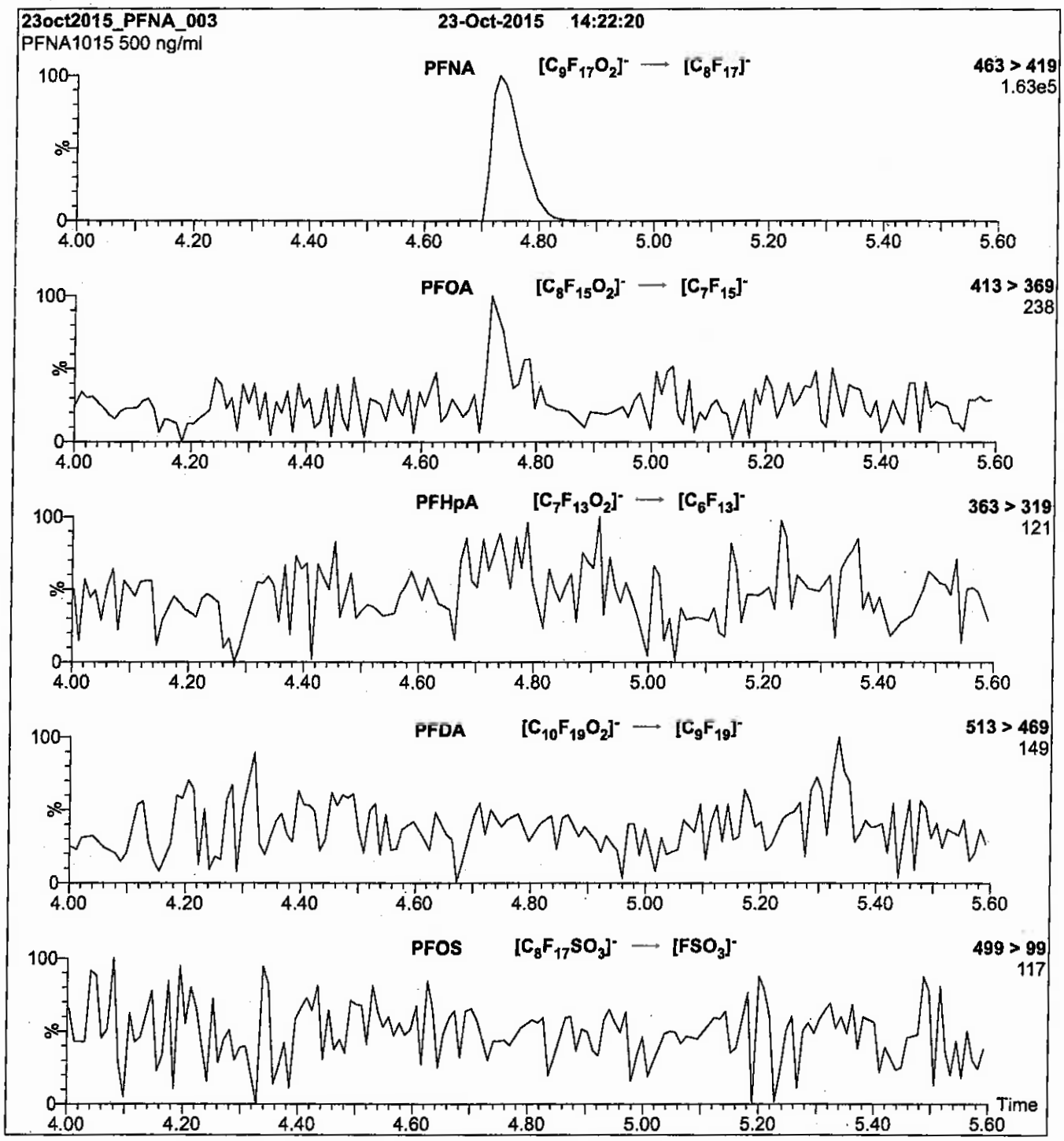
Flow: 300 µl/min

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

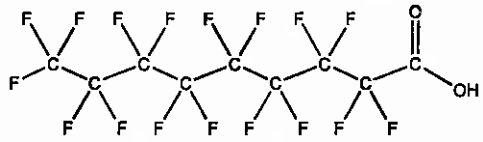
LCPFNA_00009

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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HAZARDS:

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UNCERTAINTY:

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

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

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CALA

ANAB ACCREDITED

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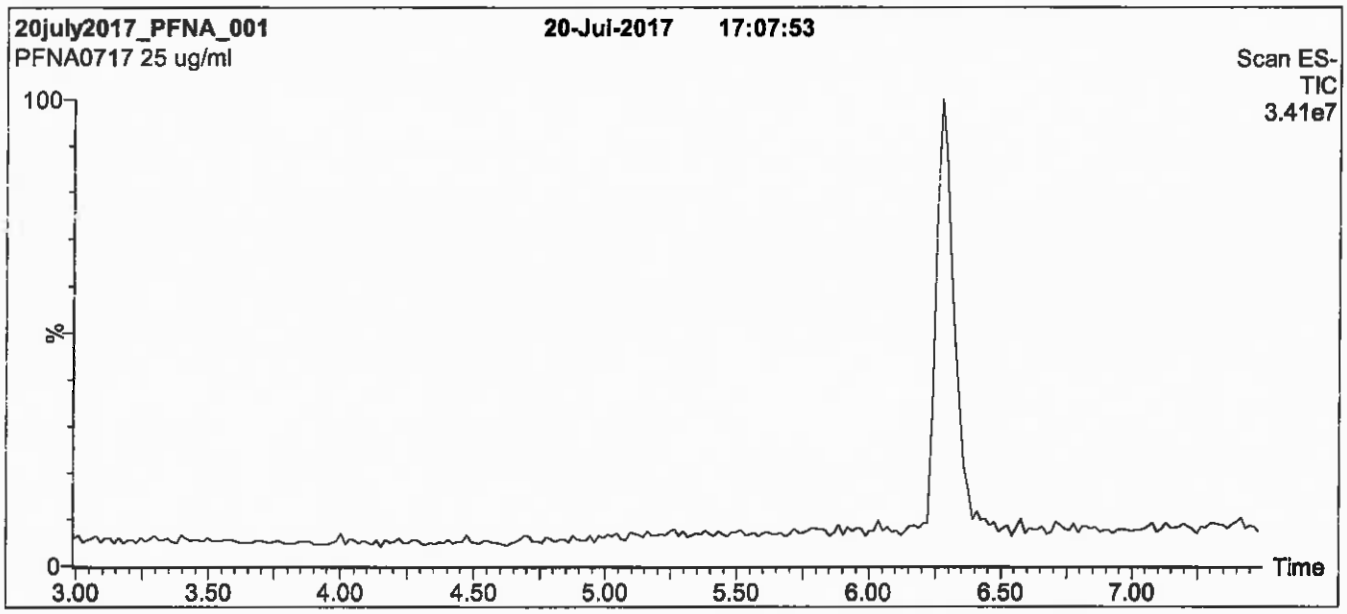

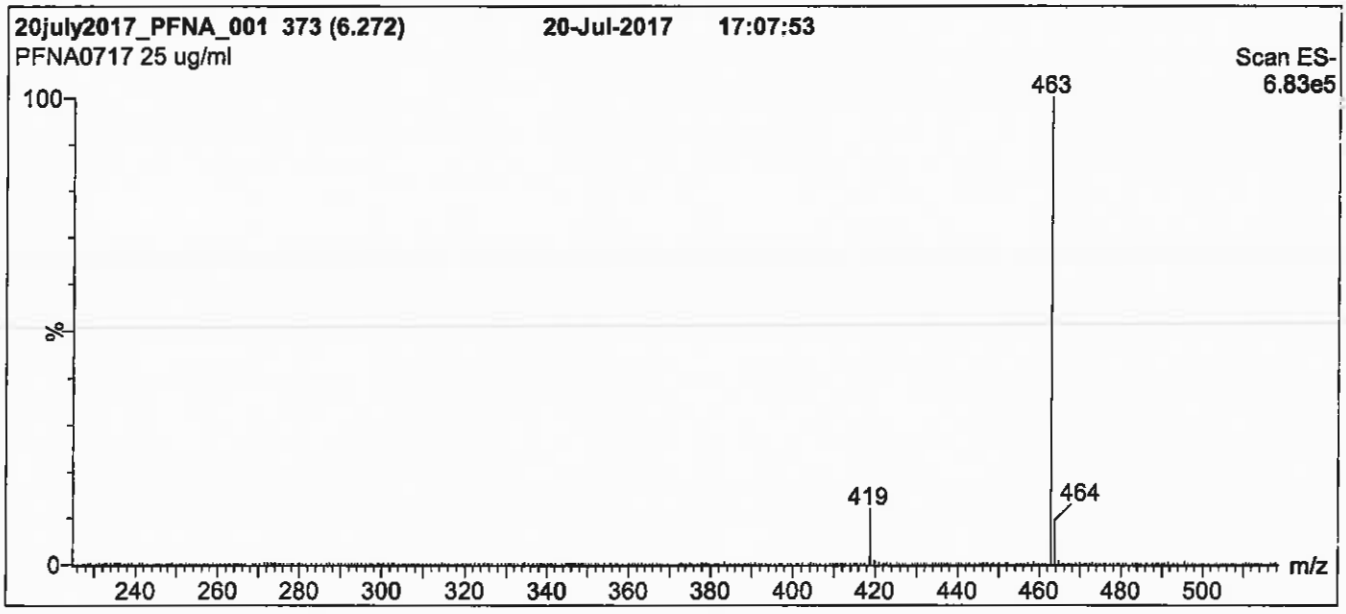

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Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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
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Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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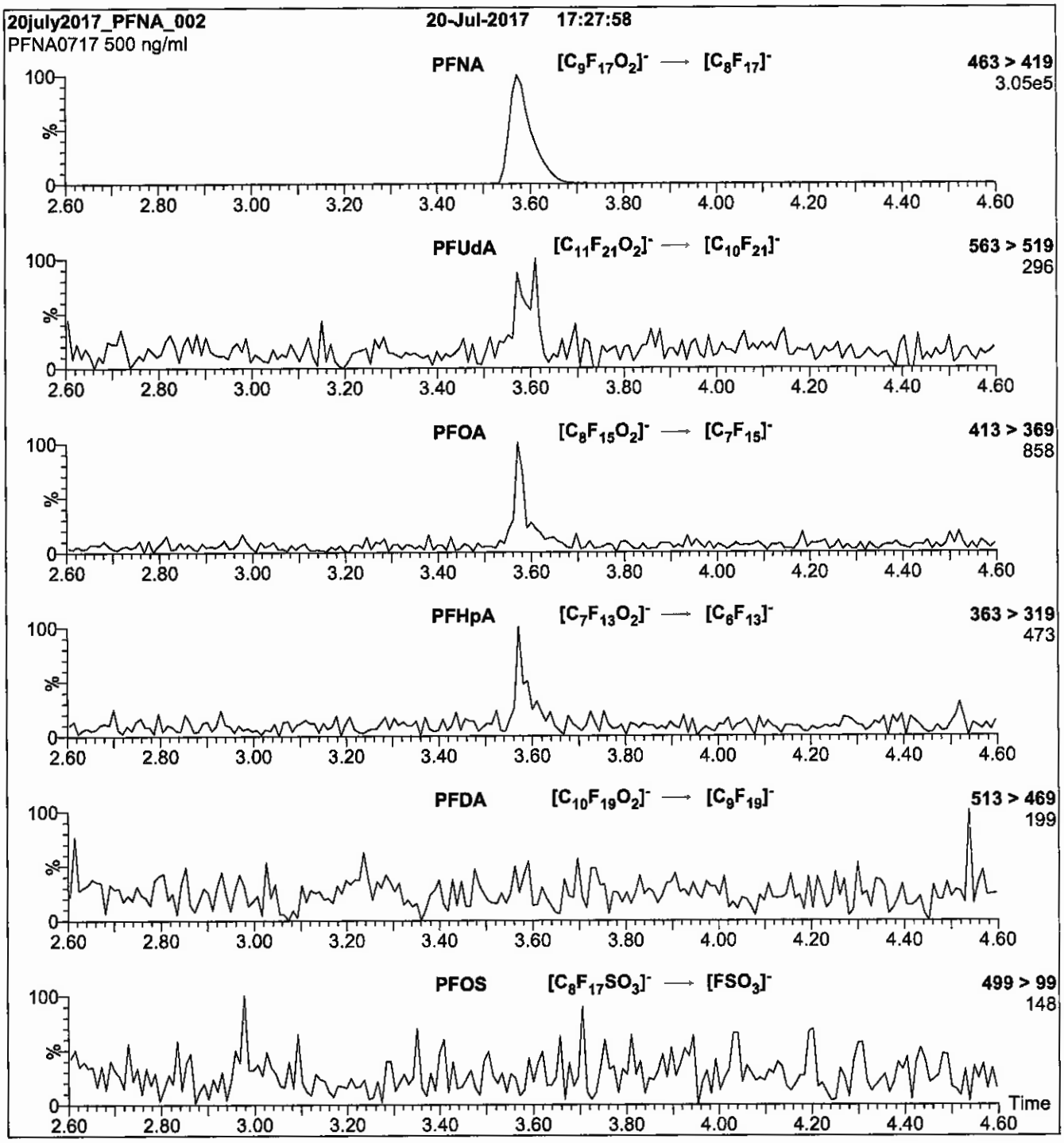


Conditions for Figure 2:

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

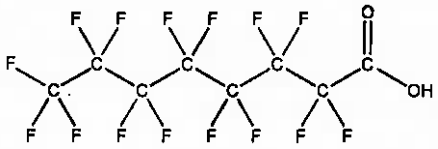
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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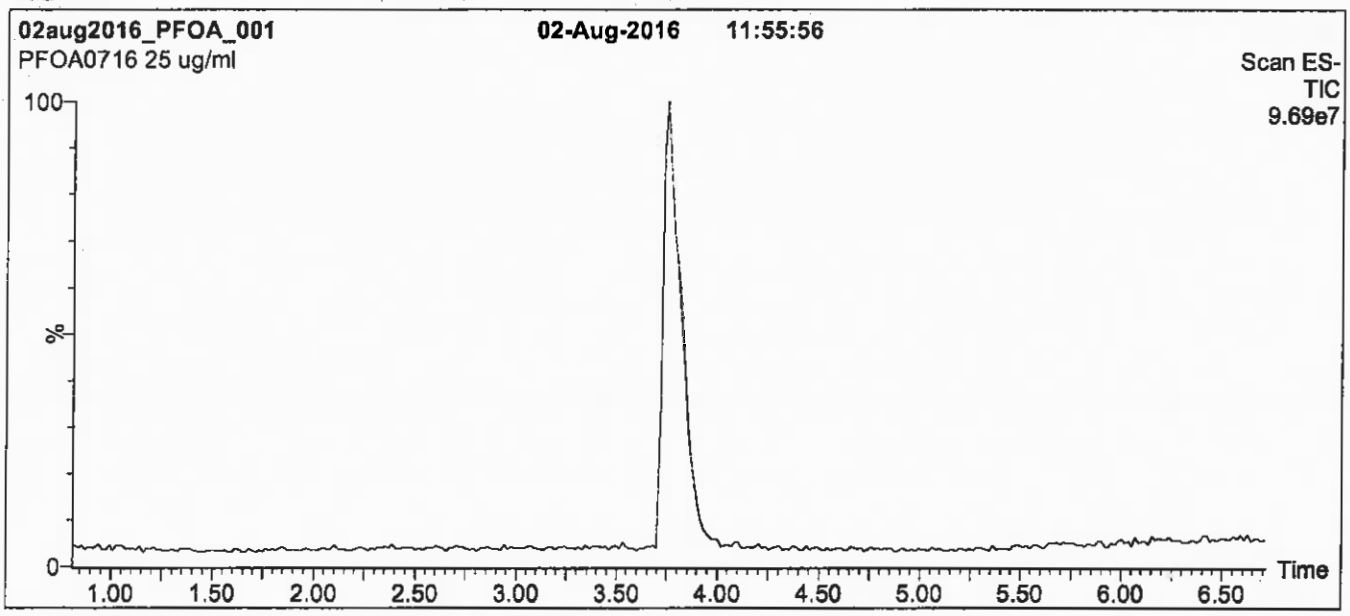
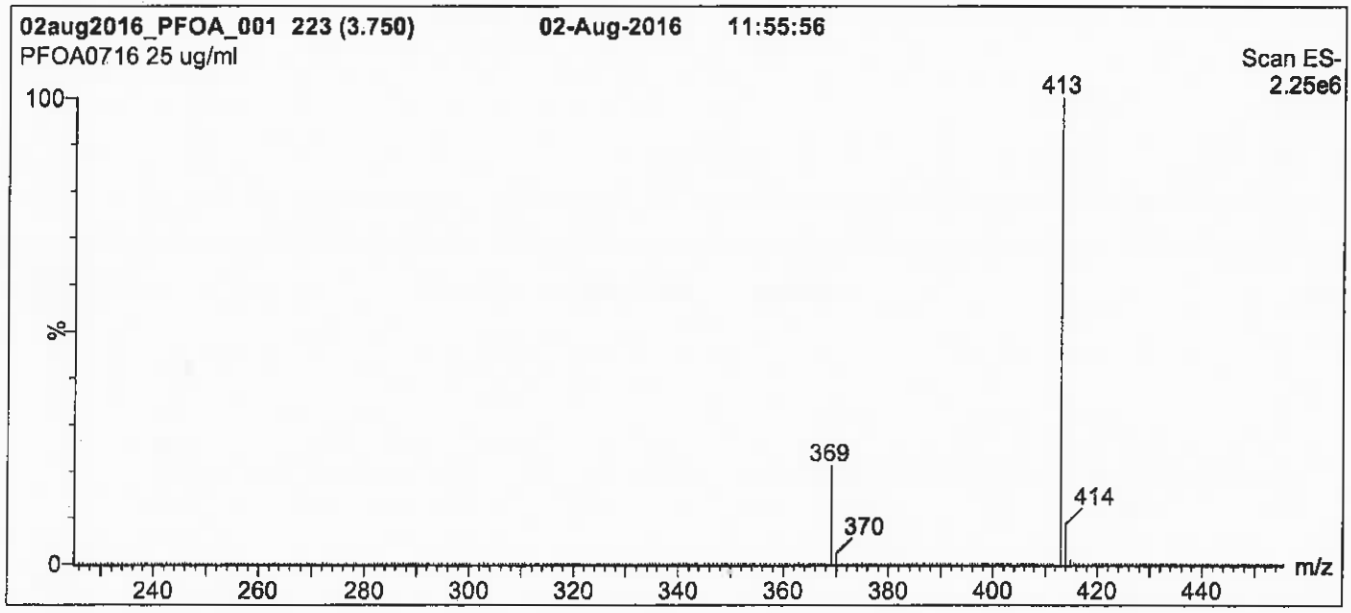
Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





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 m:M 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

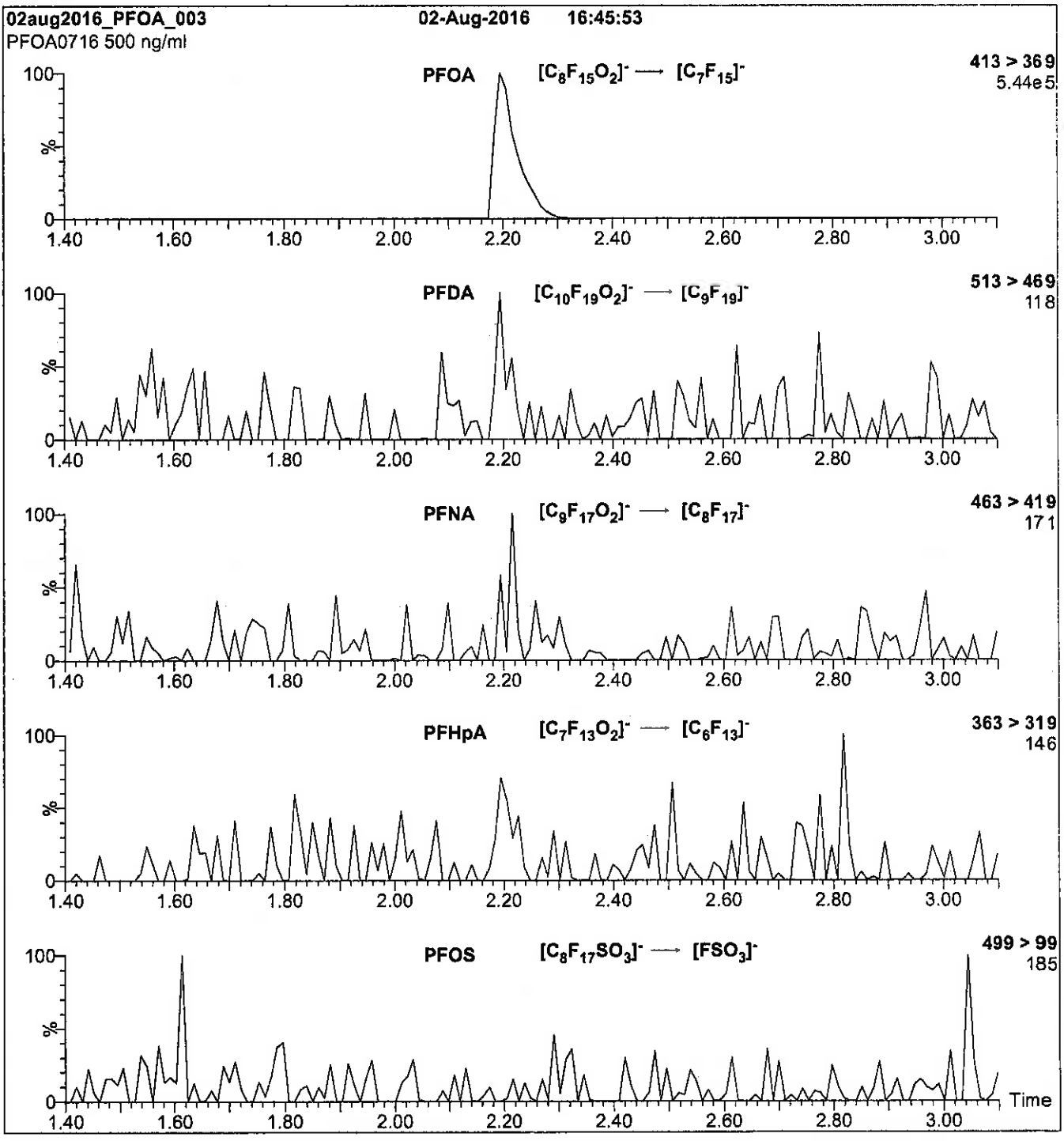
Flow: 300 µl/min

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

LCPFOA_00008

n: 12/29/16 SKW

WELLINGTON LABORATORIES

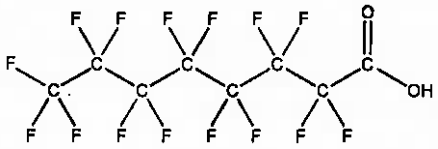
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFOA
COMPOUND: Perfluoro-n-octanoic acid

LOT NUMBER: PFOA0716

STRUCTURE:

CAS #: 335-67-1



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CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 414.07
SOLVENT(S): Methanol
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CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/02/2016
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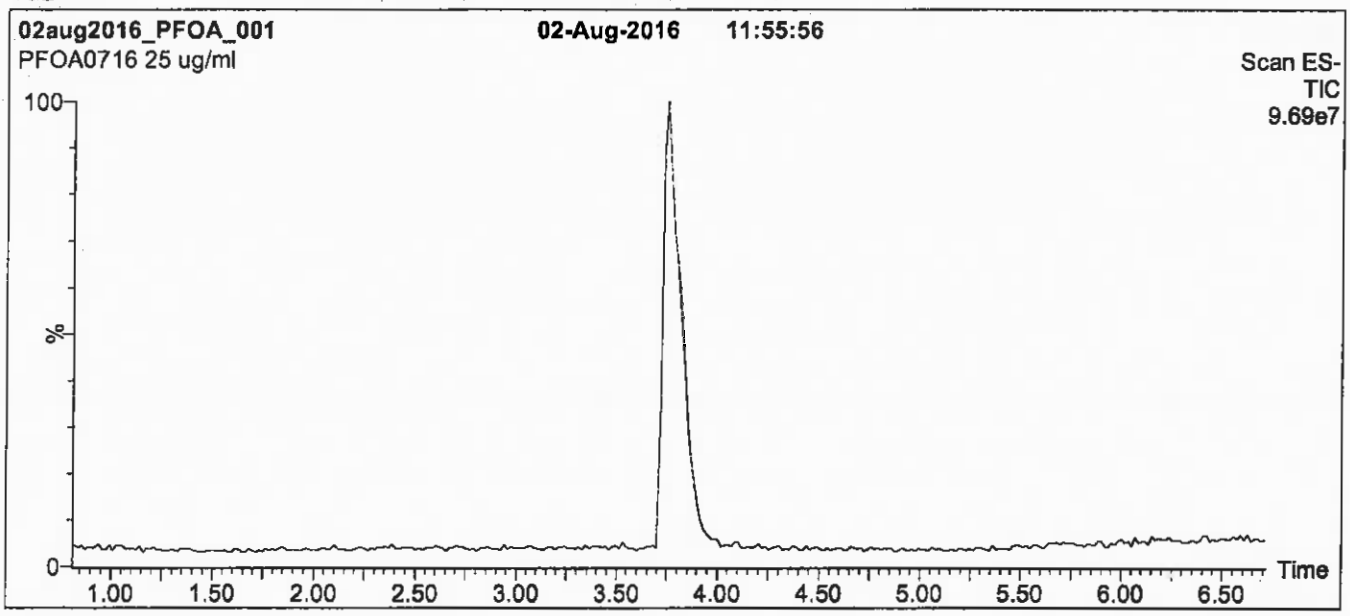

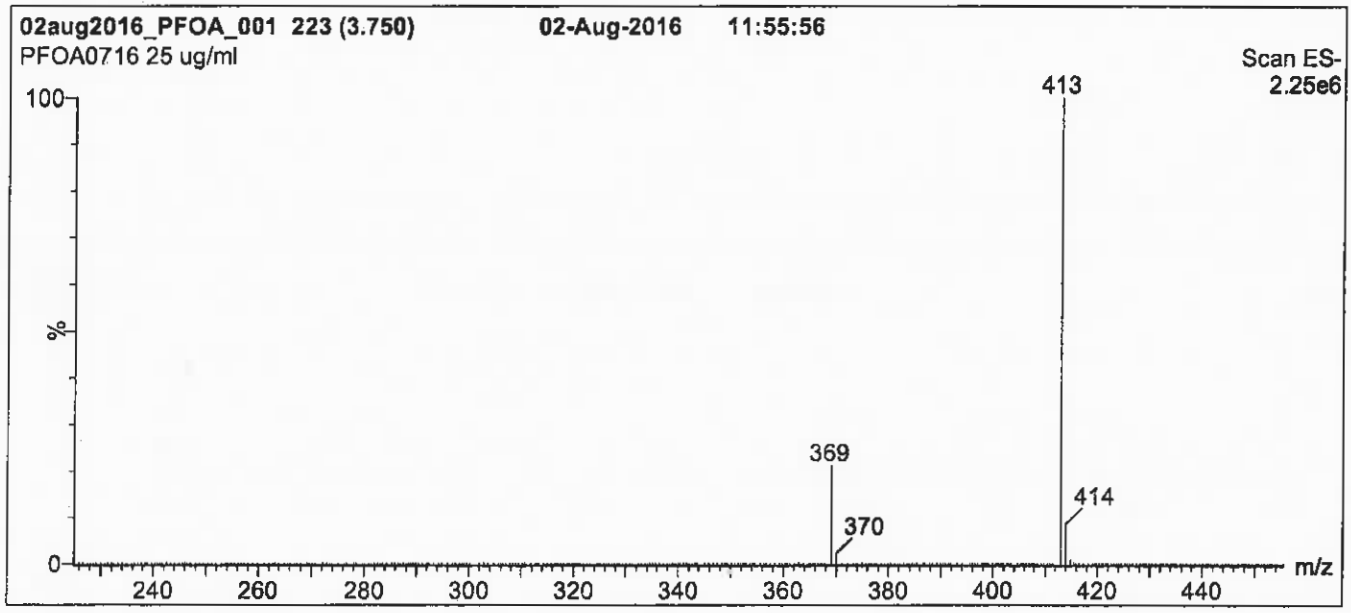

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LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

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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 m:M 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

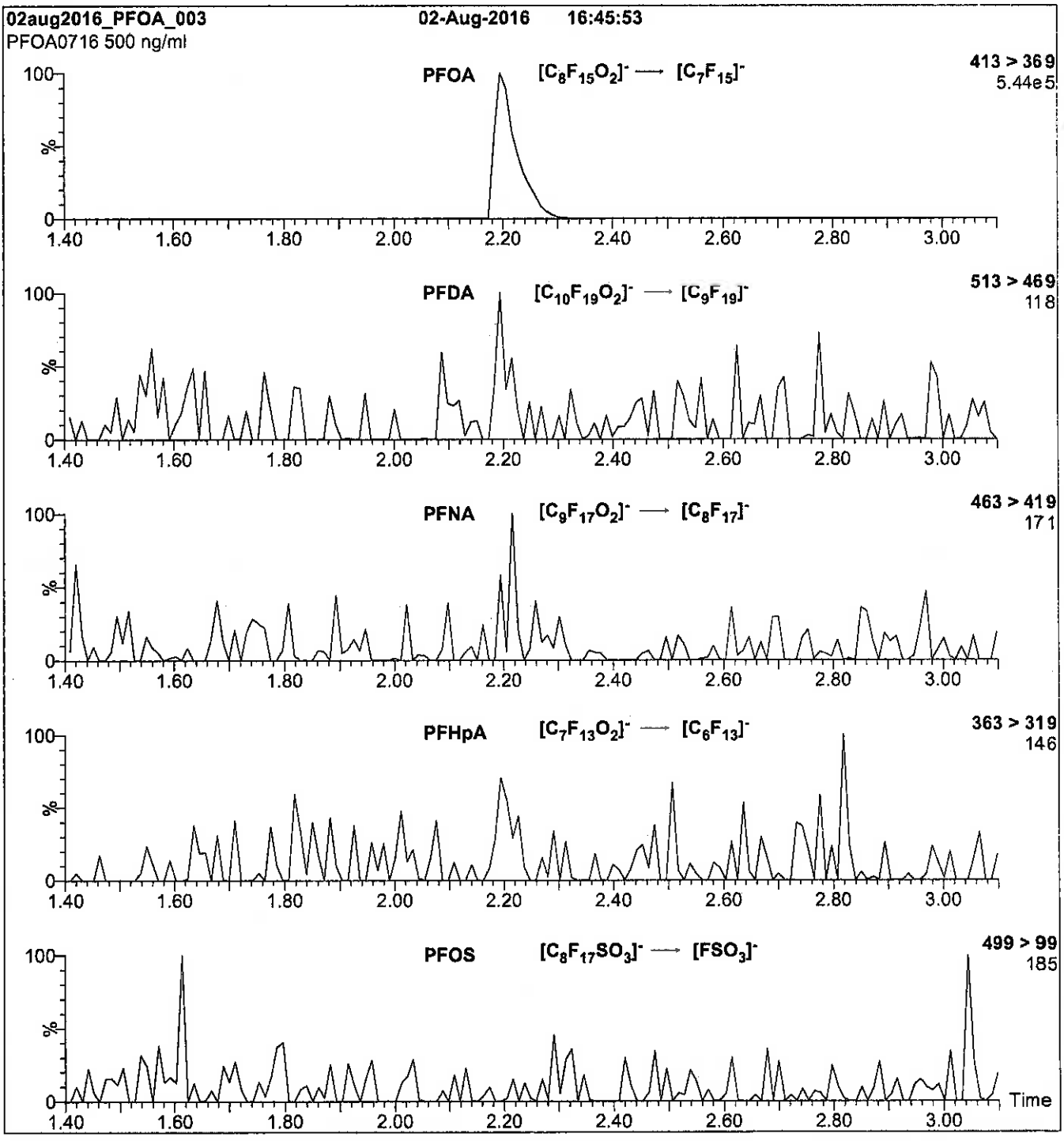
Flow: 300 µl/min

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 09/14/16

R: SBC 9/13/16

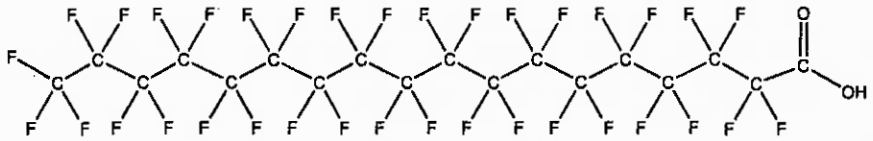
730632
ID: LCPFODA_00006
Exp: 04/29/21 Prpd: SBC
PFODA stock 50ug/mL

730633
ID: LCPFODA_00007
Exp: 04/29/21 Prpd: SBC
PFODA stock 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFODA	**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		
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:** 05/20/2016 (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

INTENDED USE:

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HAZARDS:

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

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

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QUALITY MANAGEMENT:

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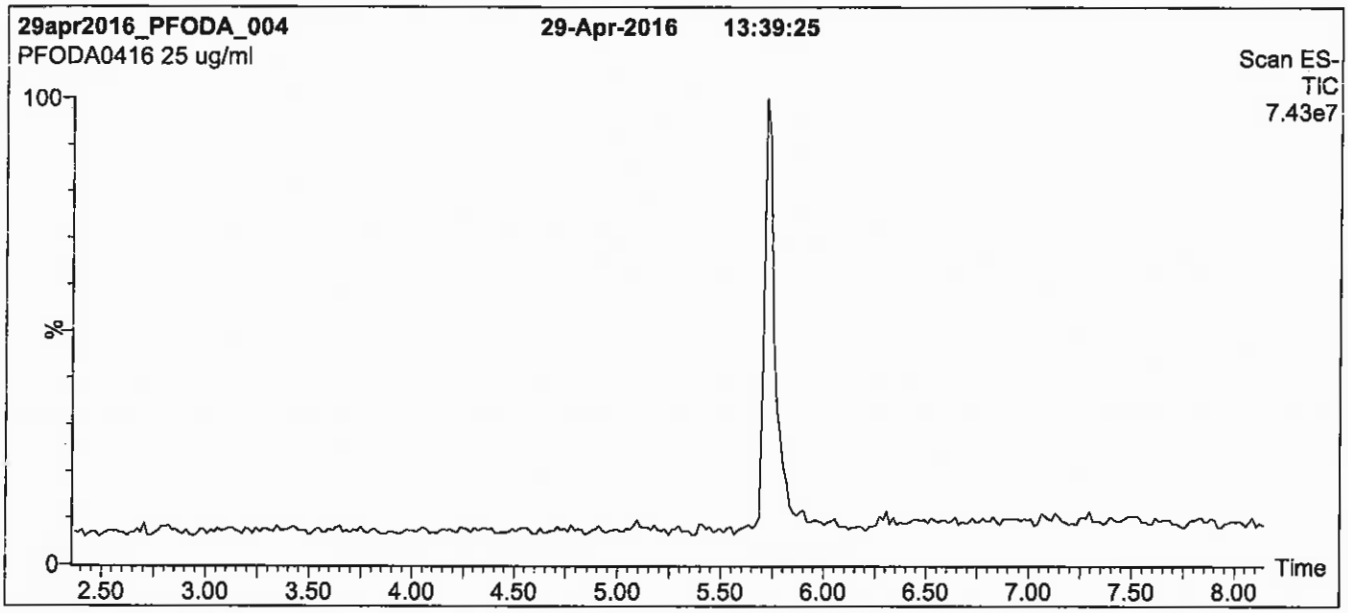
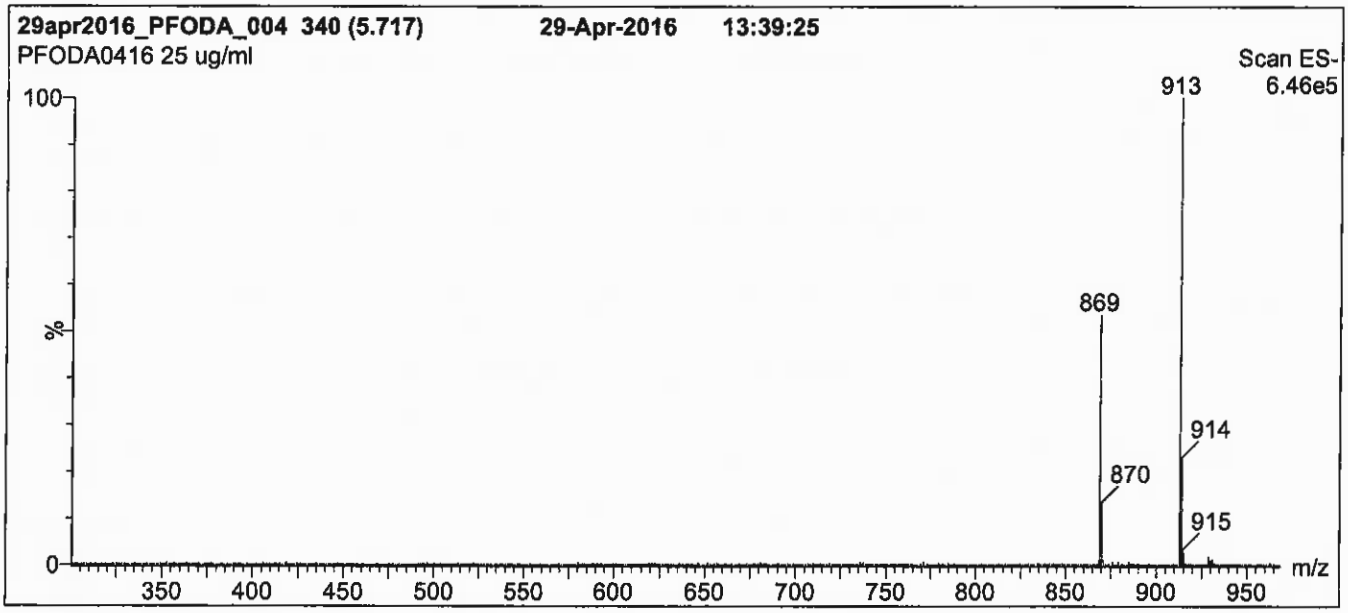
Figure 1: **PFODA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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

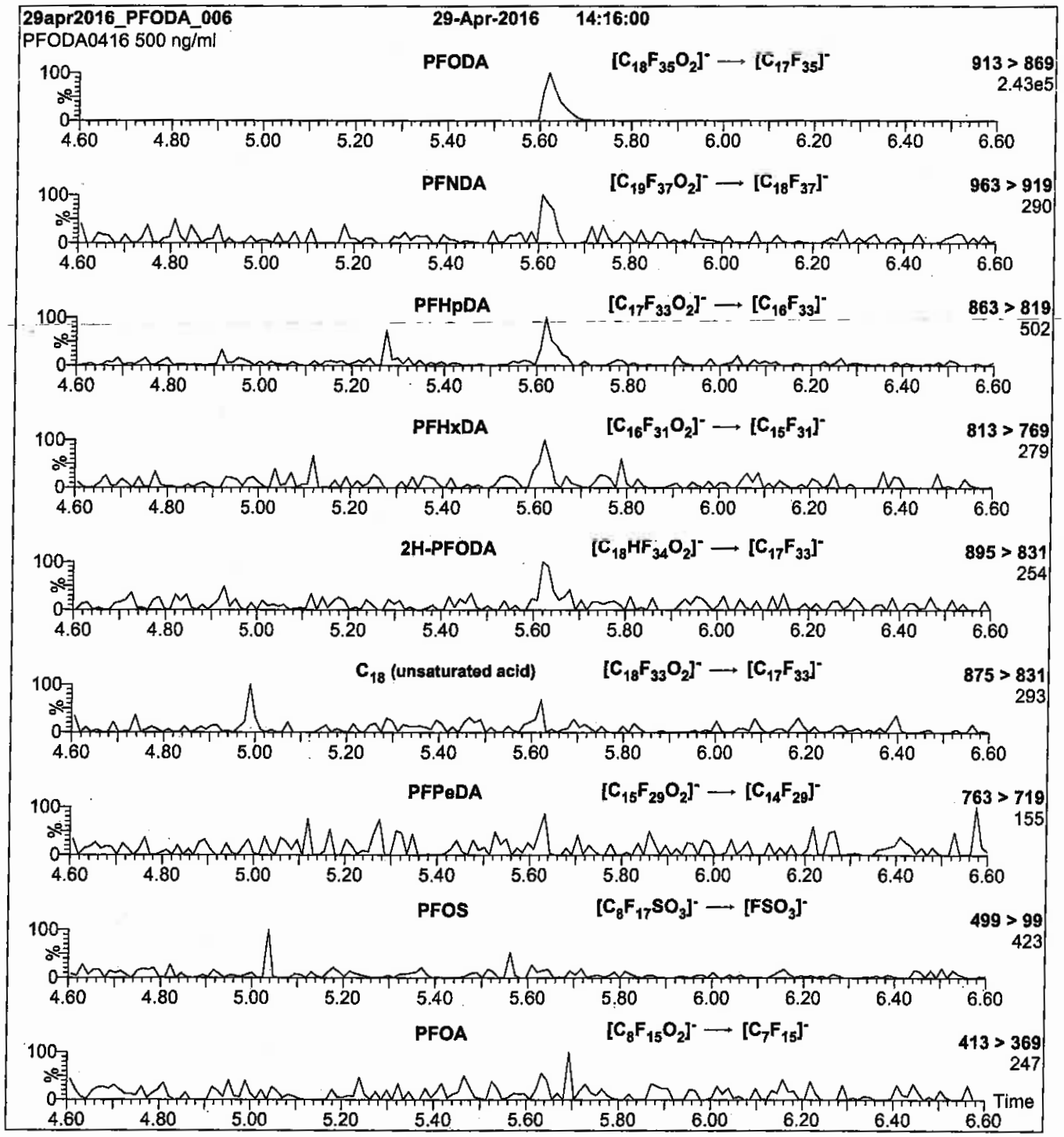
Flow: 300 µl/min

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
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

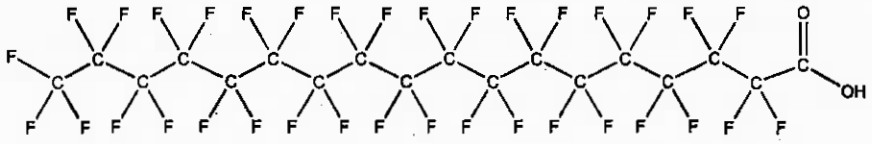
LCPFODA_00008

R: 12/22/16 SFN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFODA	**LOT NUMBER:**	PFODA0416
COMPOUND:	Perfluoro-n-octadecanoic acid		
STRUCTURE:		**CAS #:**	16517-11-6



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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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ADDITIONAL INFORMATION:

- See page 2 for further details.
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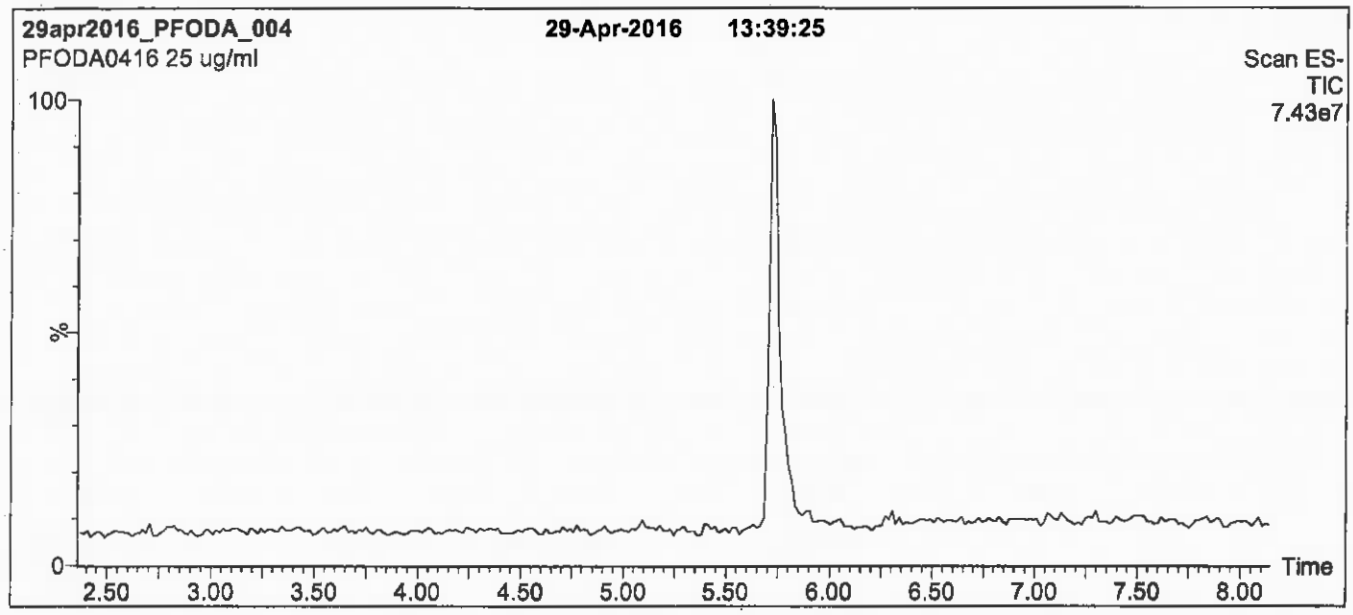
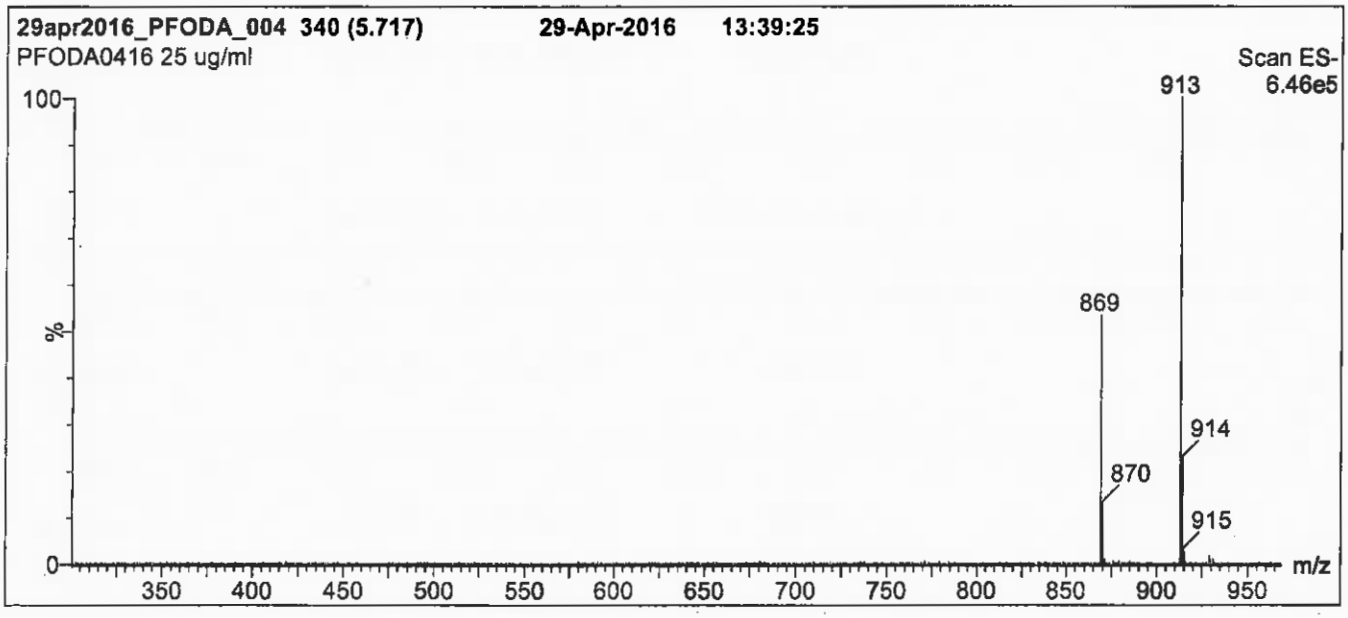




Conditions for Figure 1:

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

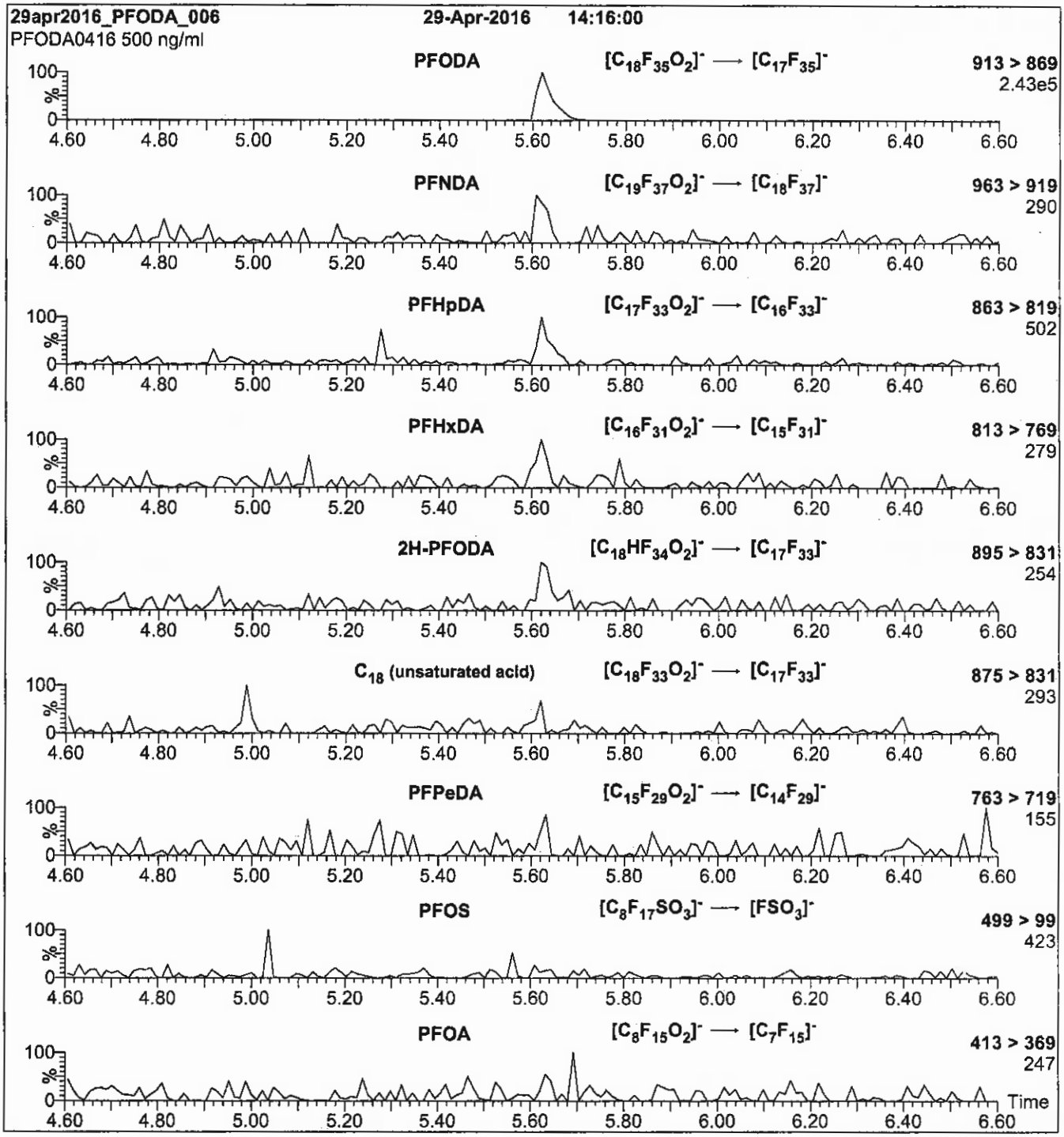
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 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 S.R

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).

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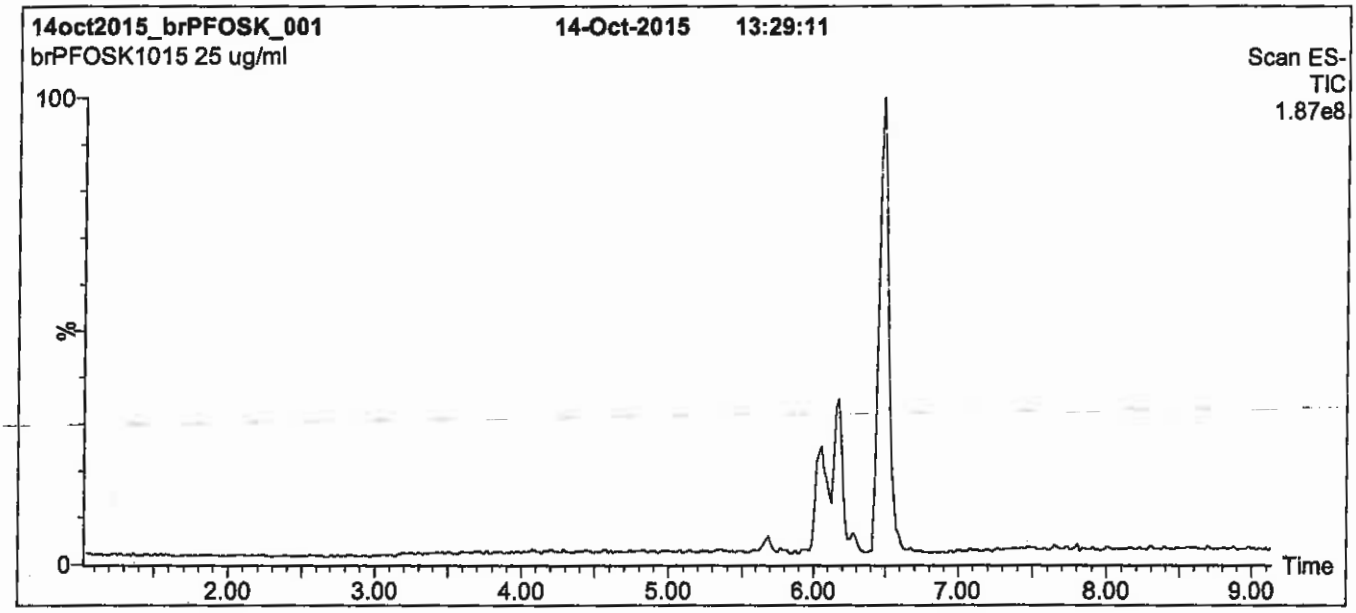
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

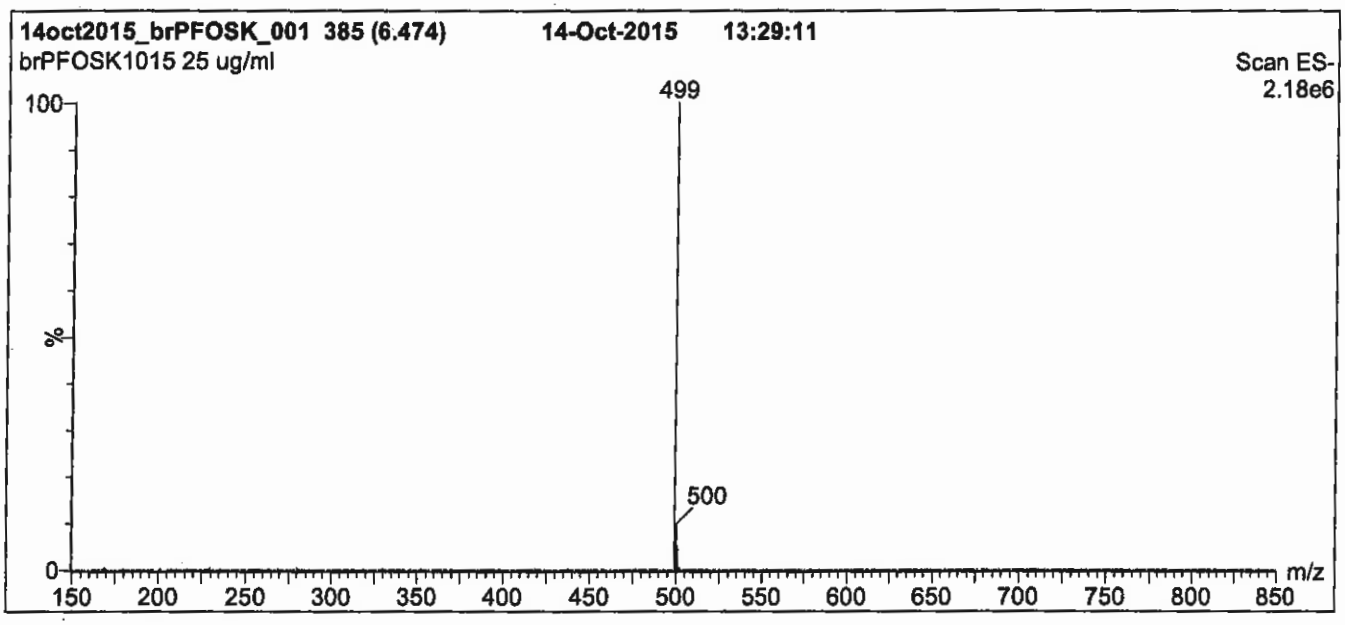
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CFSO_3^-K^+$ (CF$_3$ branch)	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CFCF_2SO_3^-K^+$ (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

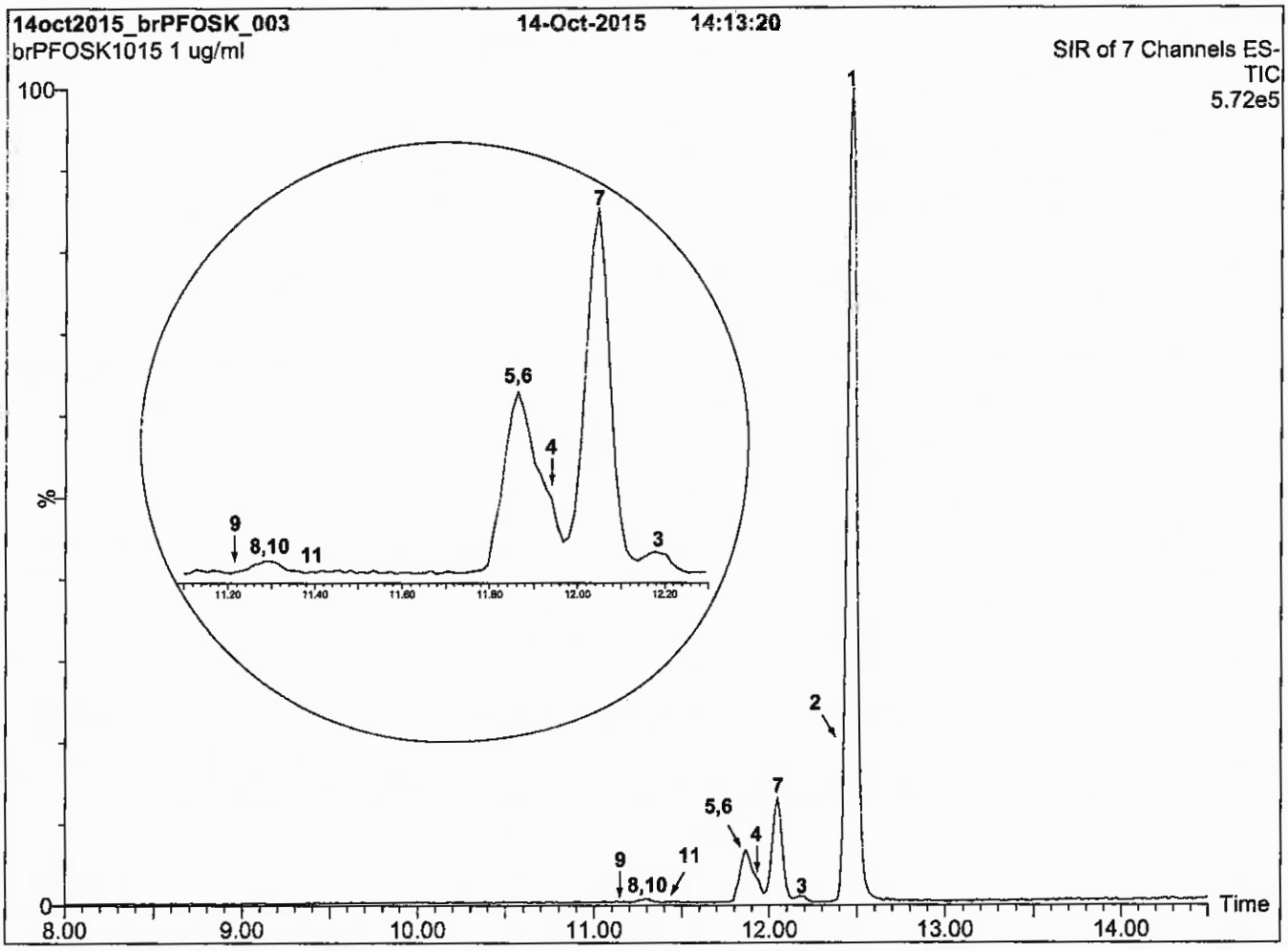
Flow: 300 µl/min

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

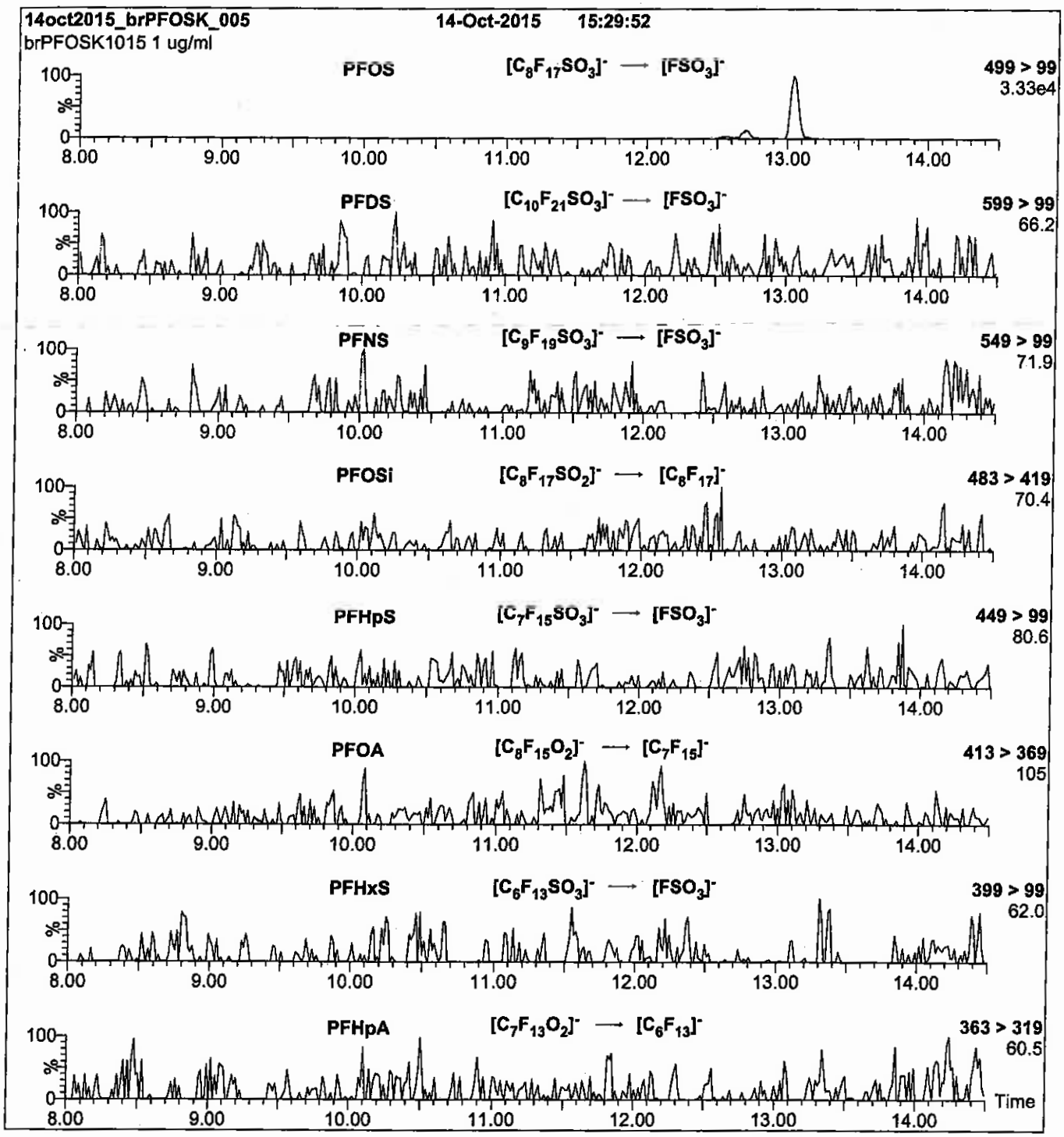
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

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

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:

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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.

TRACEABILITY:

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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

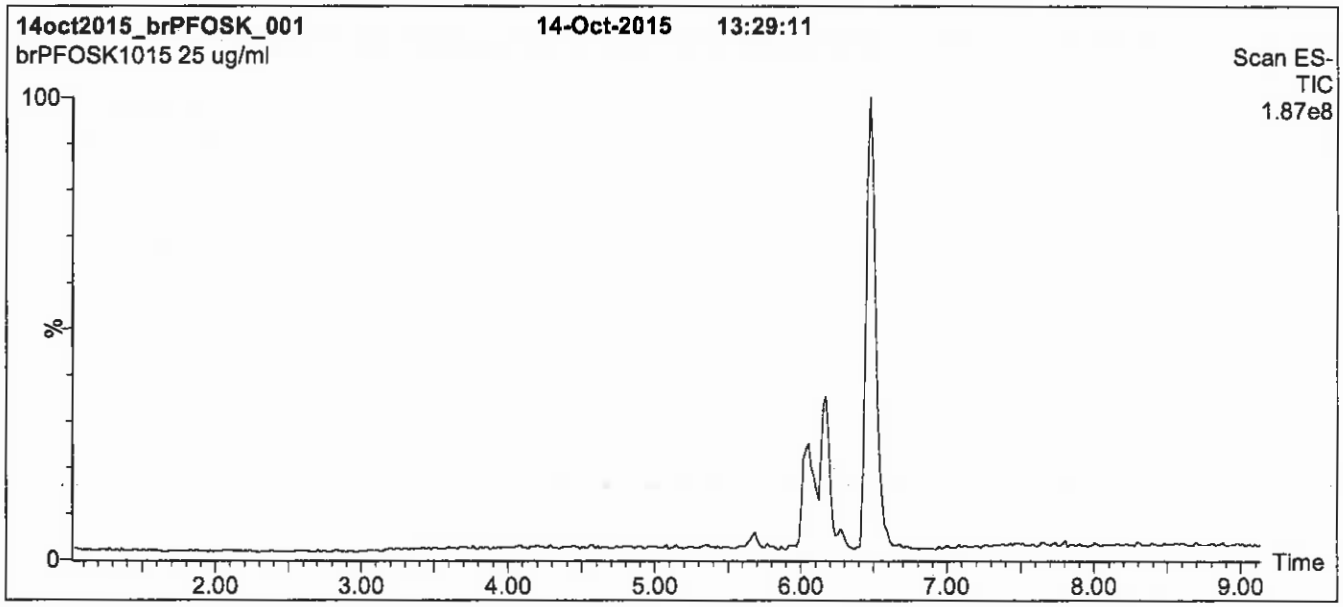
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

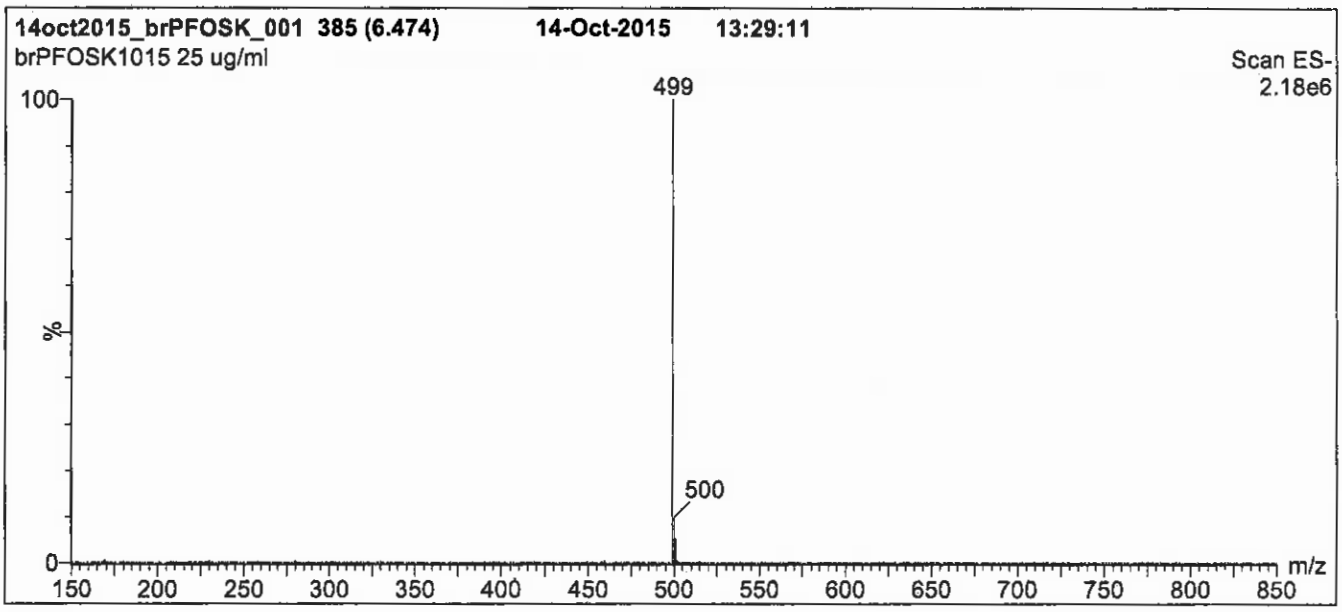
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	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	$CF_3-C(CF_3)_2CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2-C(CF_3)_2-CF_2CF_2CF_2SO_3^-K^+$	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

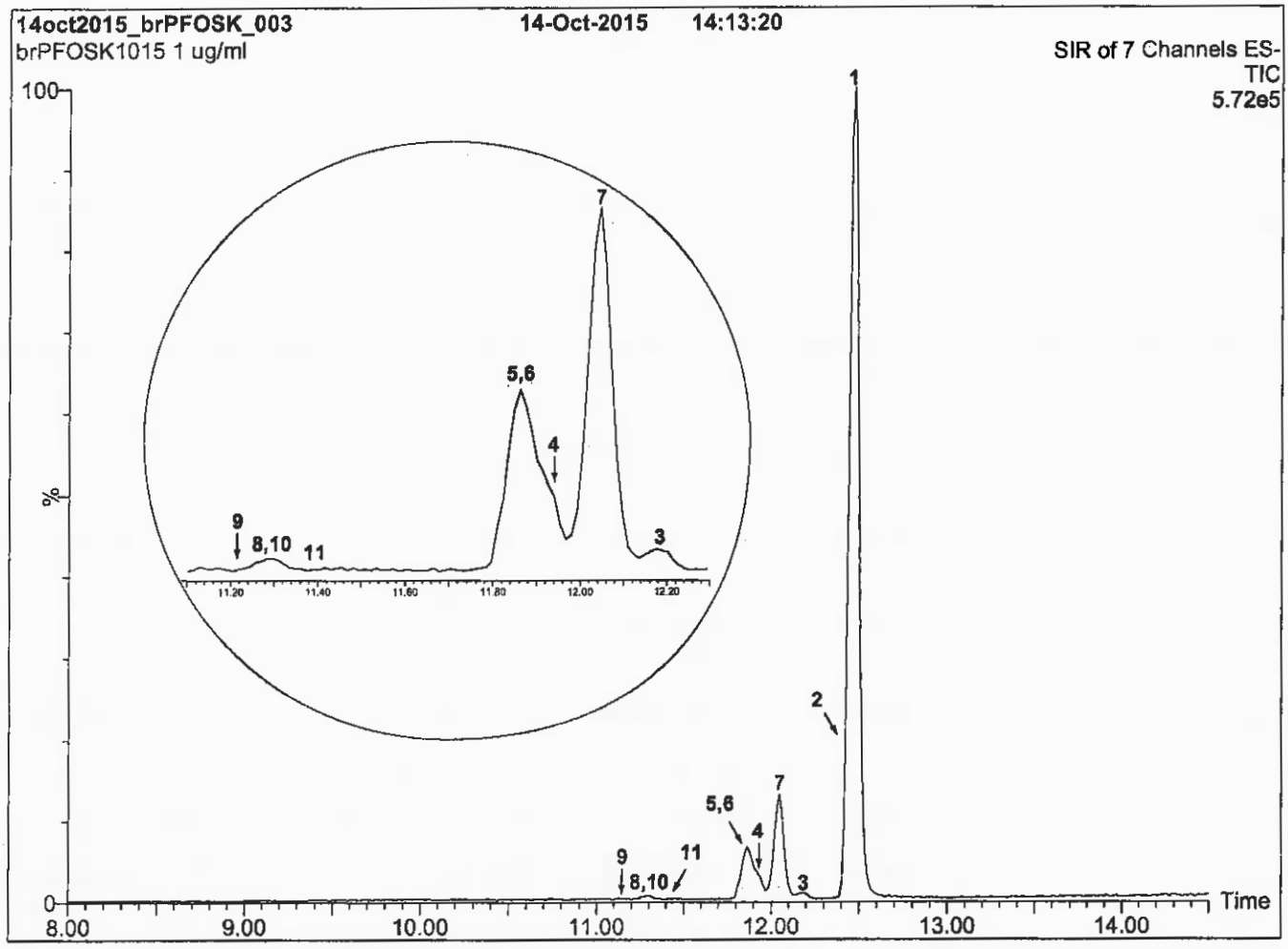
Flow: 300 µl/min

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

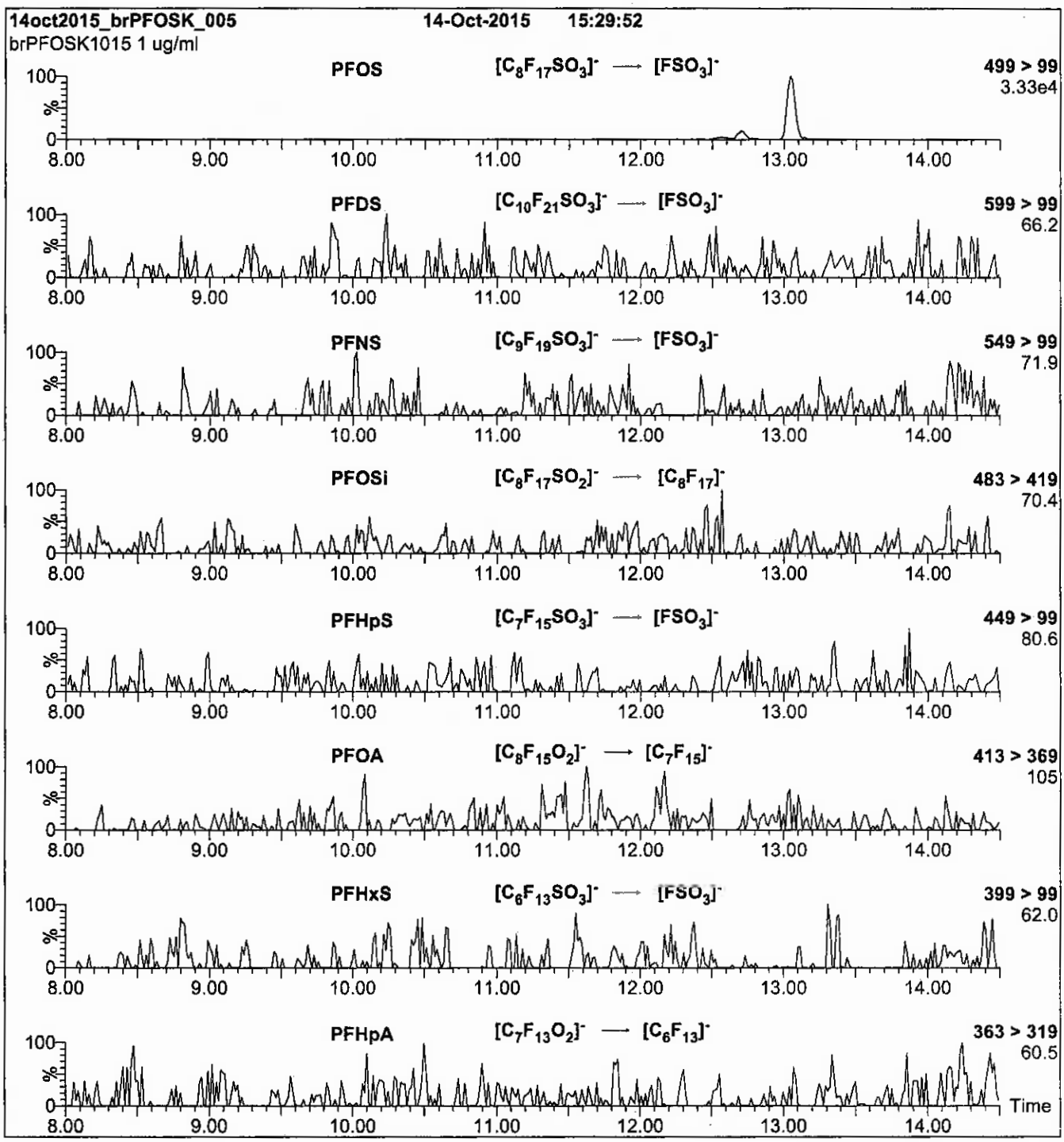
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

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

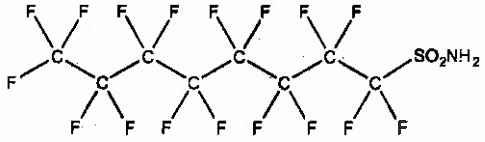
LCPFOSA_00010

12/20/16 SKI

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.

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

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

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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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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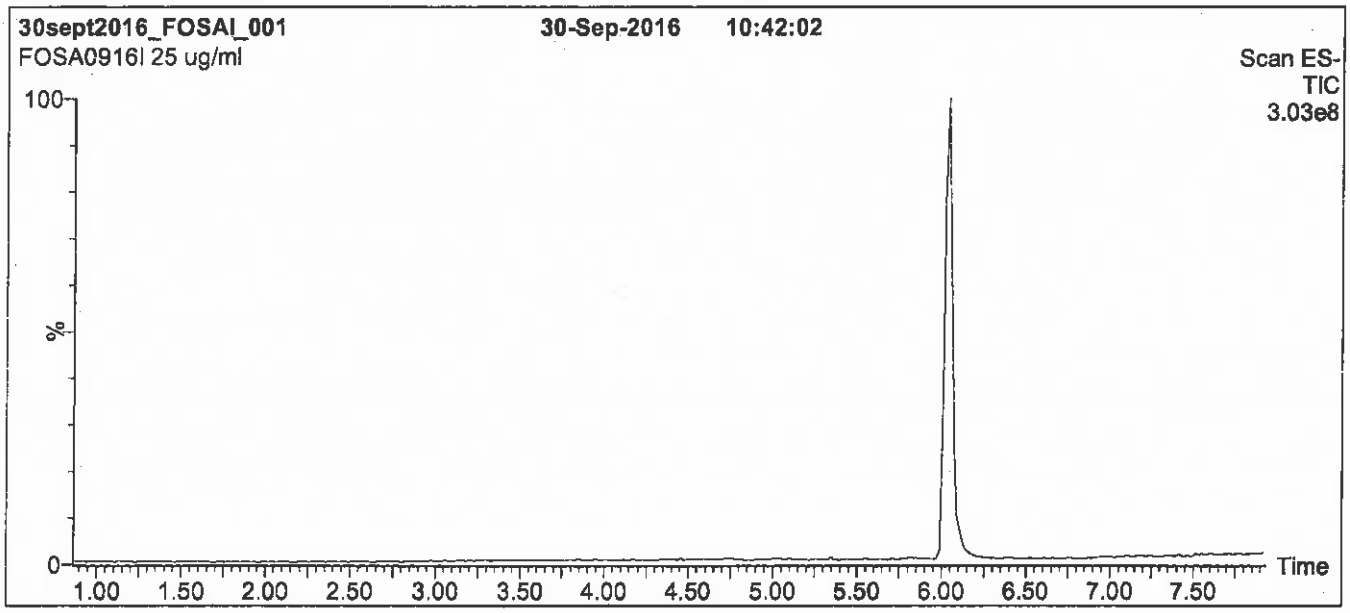
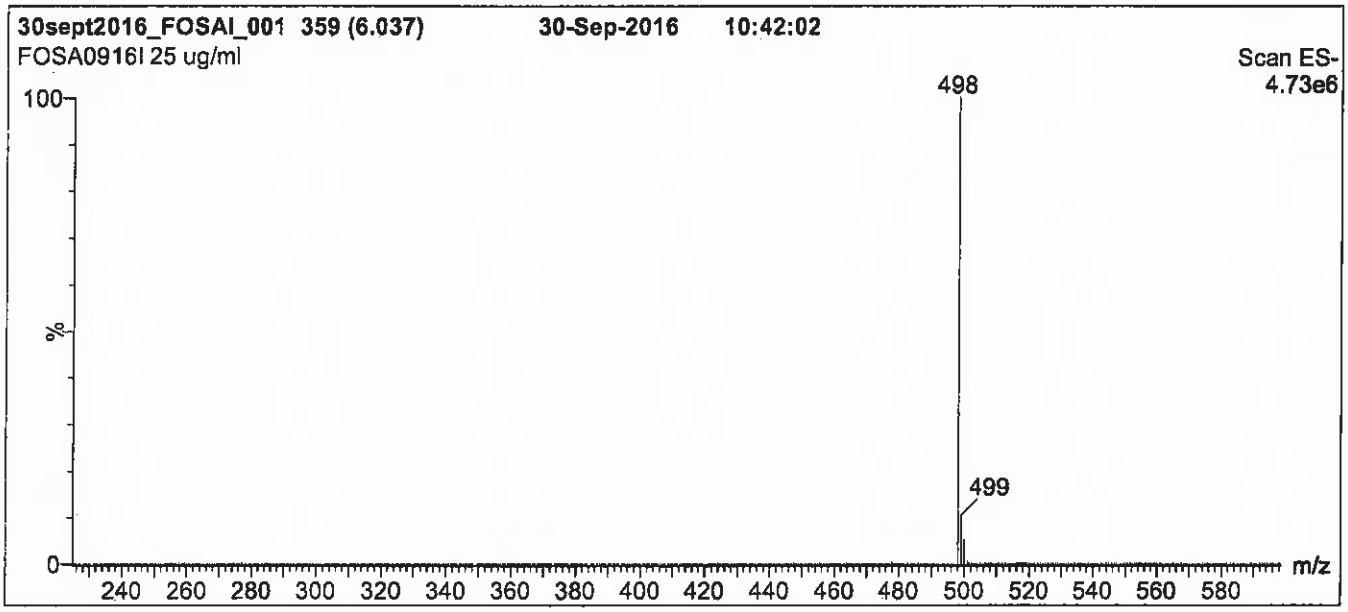
Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH 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

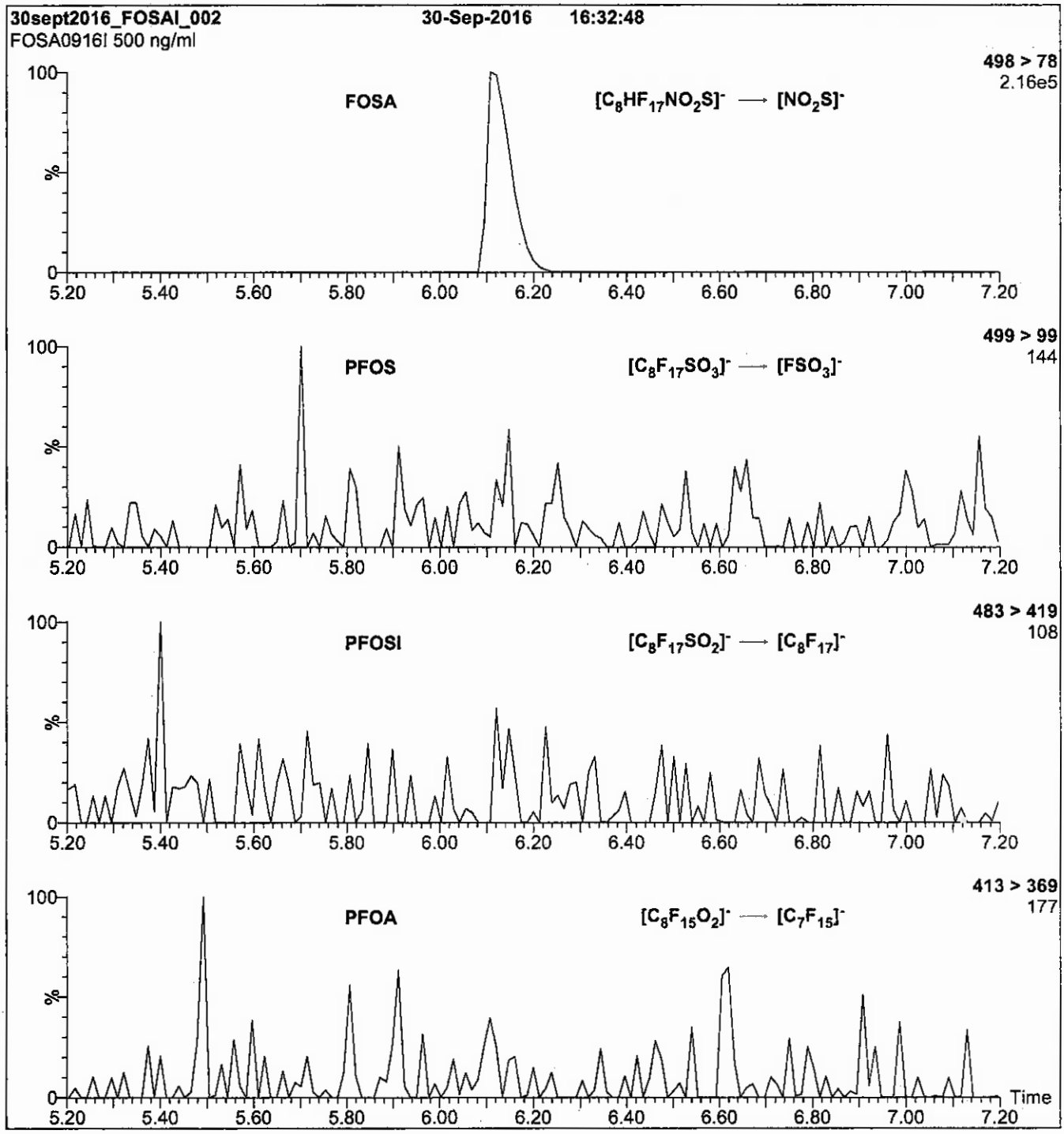
Flow: 300 µl/min

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

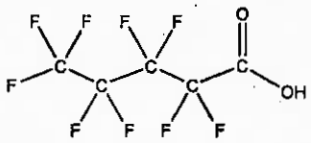
LCPFPeA_00006

r: 12/29/16 SRV
s: 1/6/17 SRV

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

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ANAB ACCREDITED

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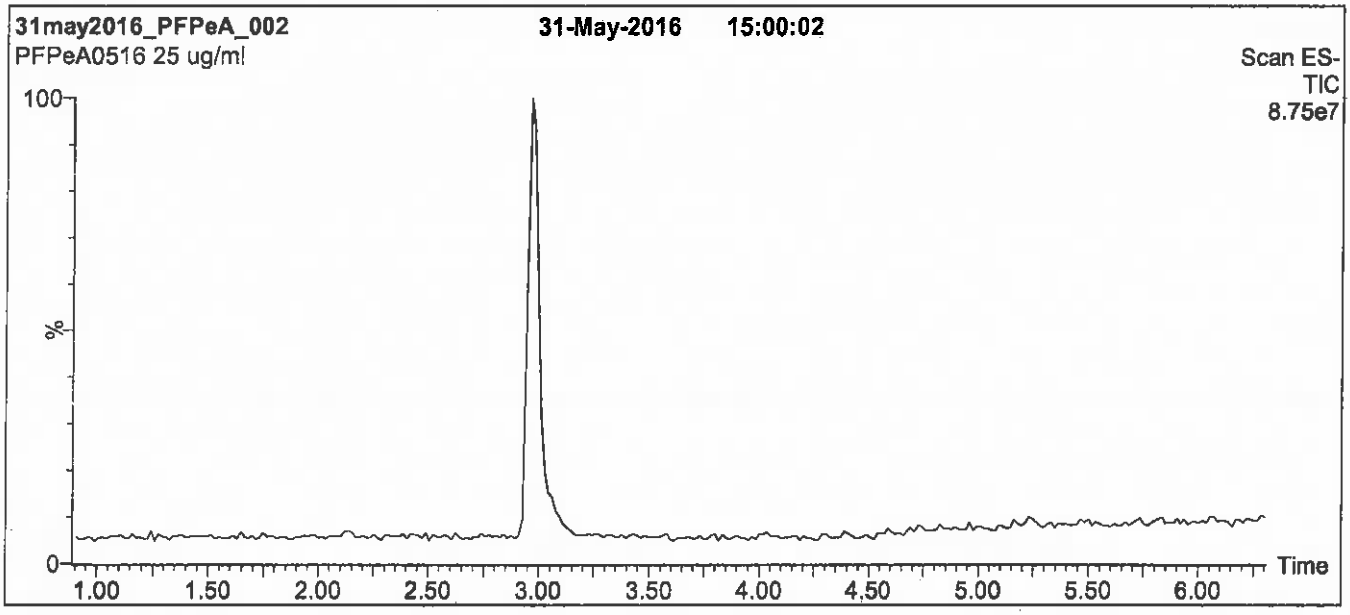
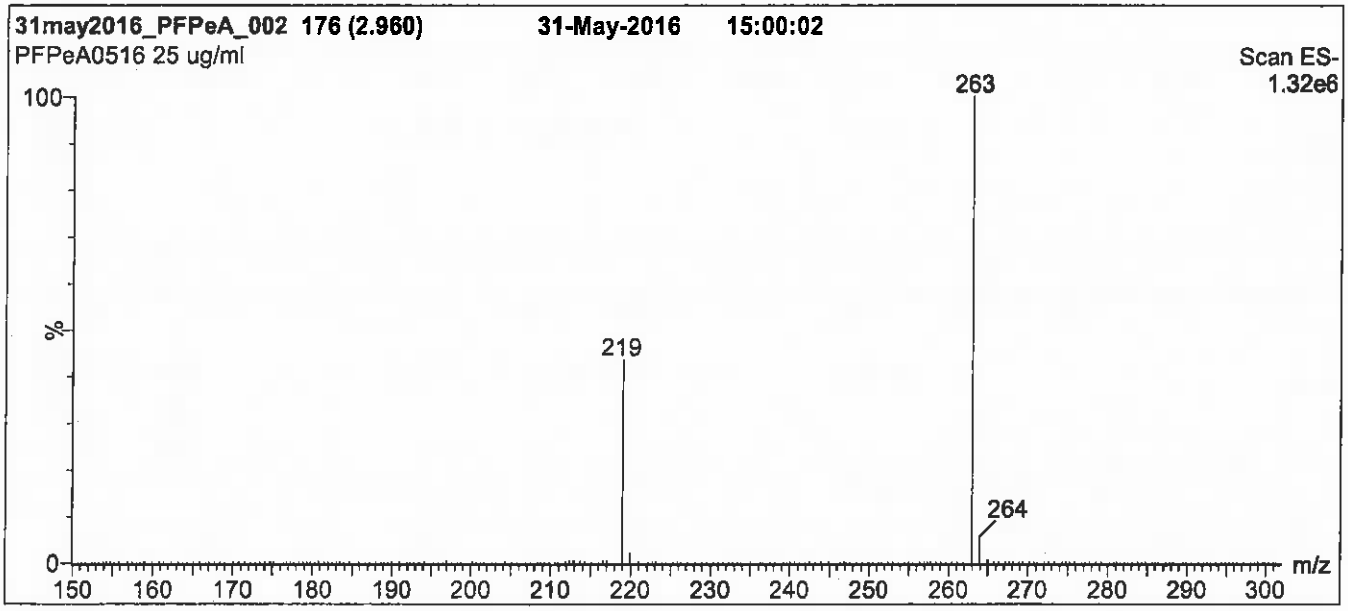
Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





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: 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

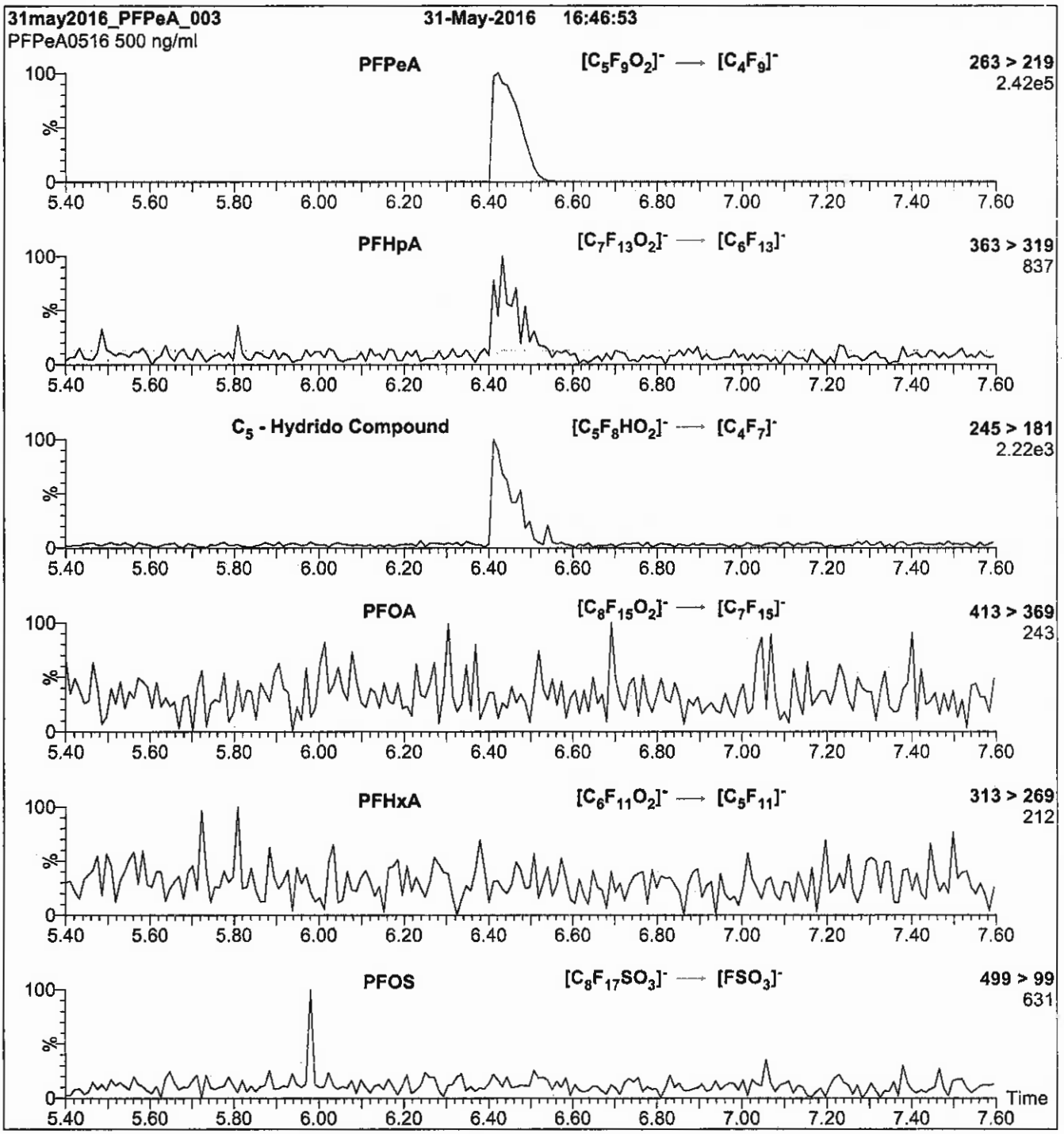
Flow: 300 µl/min

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

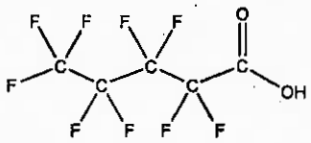
LCPFPeA_00007

r: 12/29/16 SRV
s: 1/6/17 SRV

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:

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:

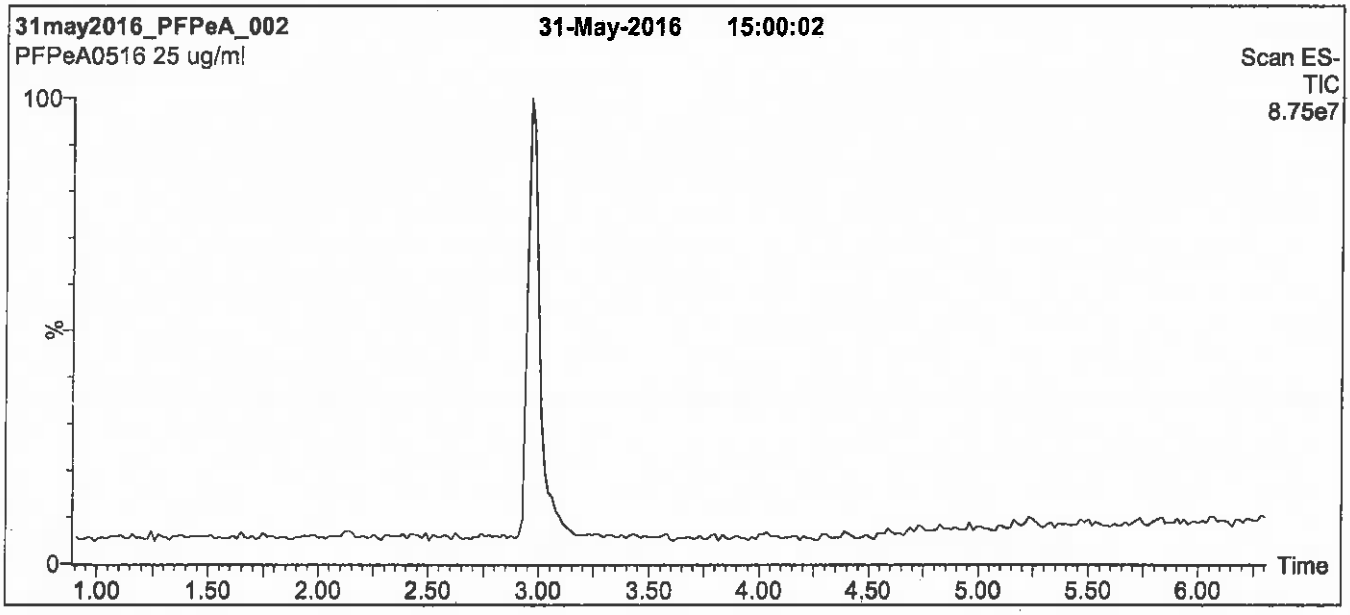
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

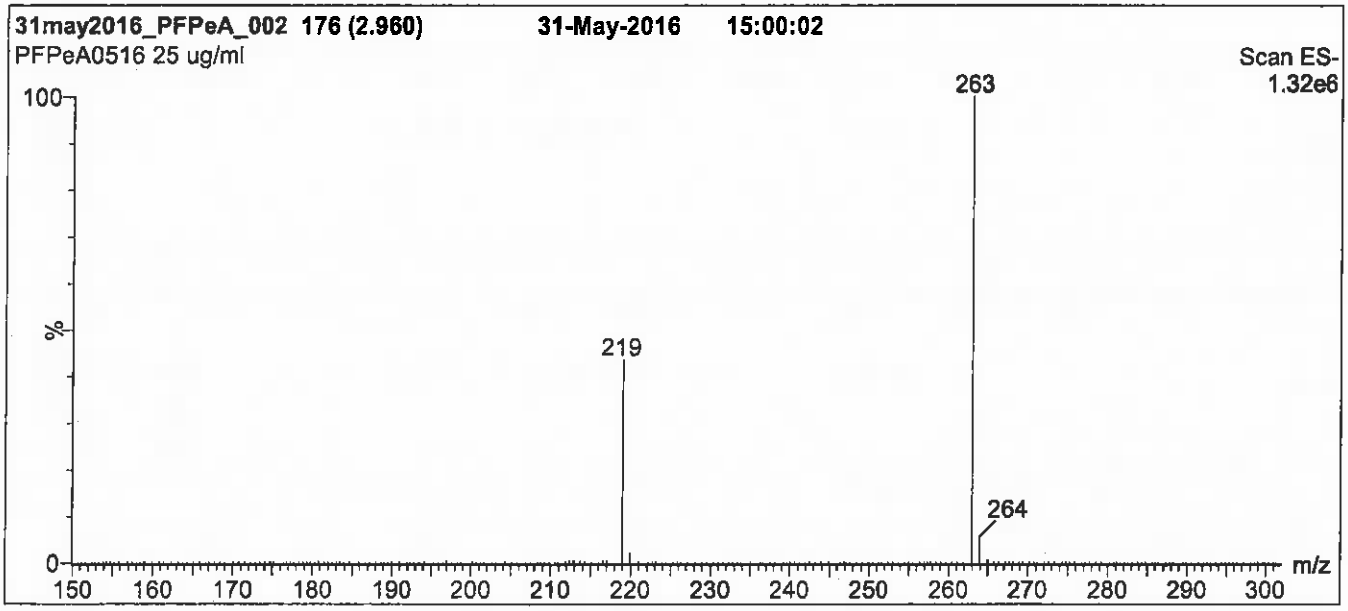
CALA

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: **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

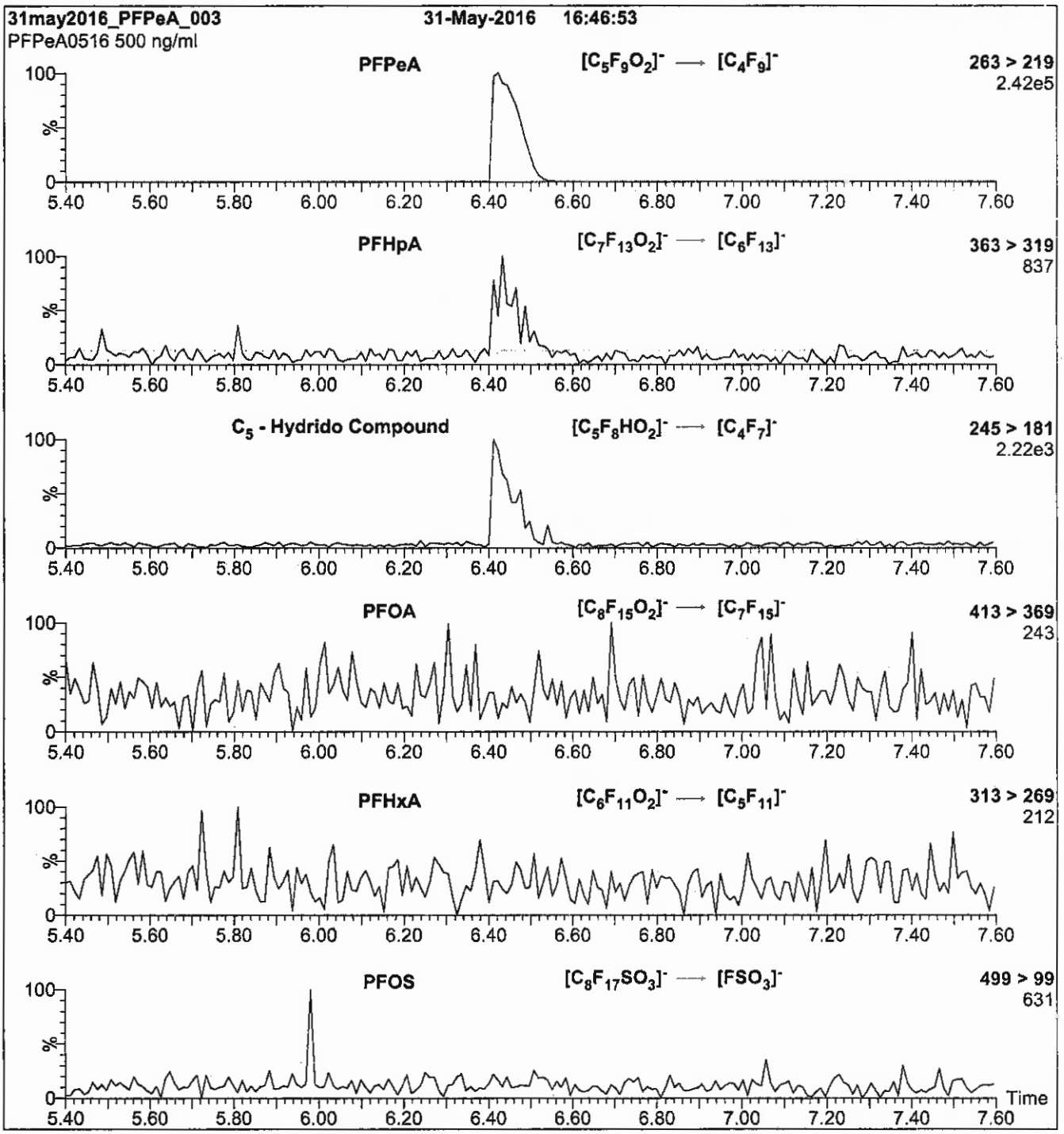
Flow: 300 µl/min

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

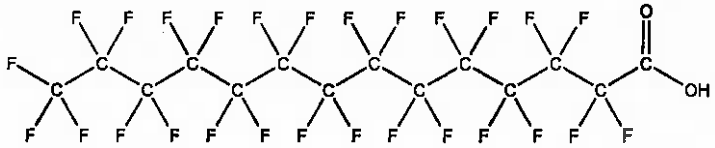
LCPFTeDA_00007

D: 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		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/05/2016 (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.

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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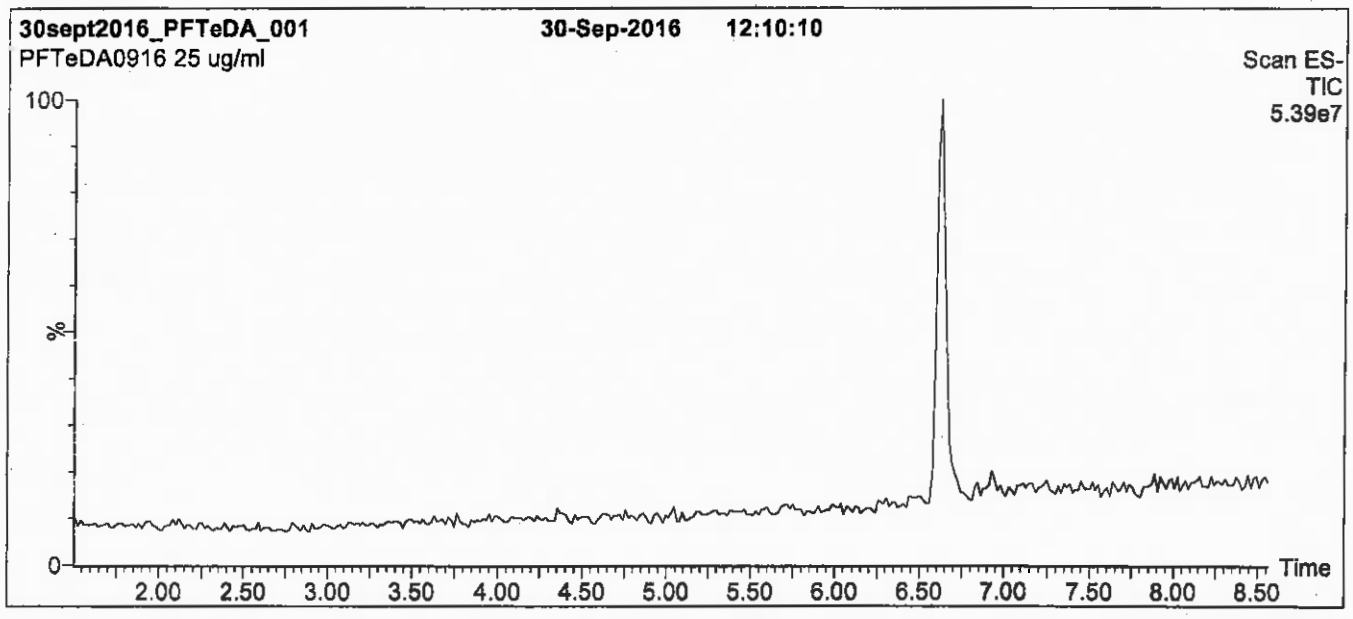
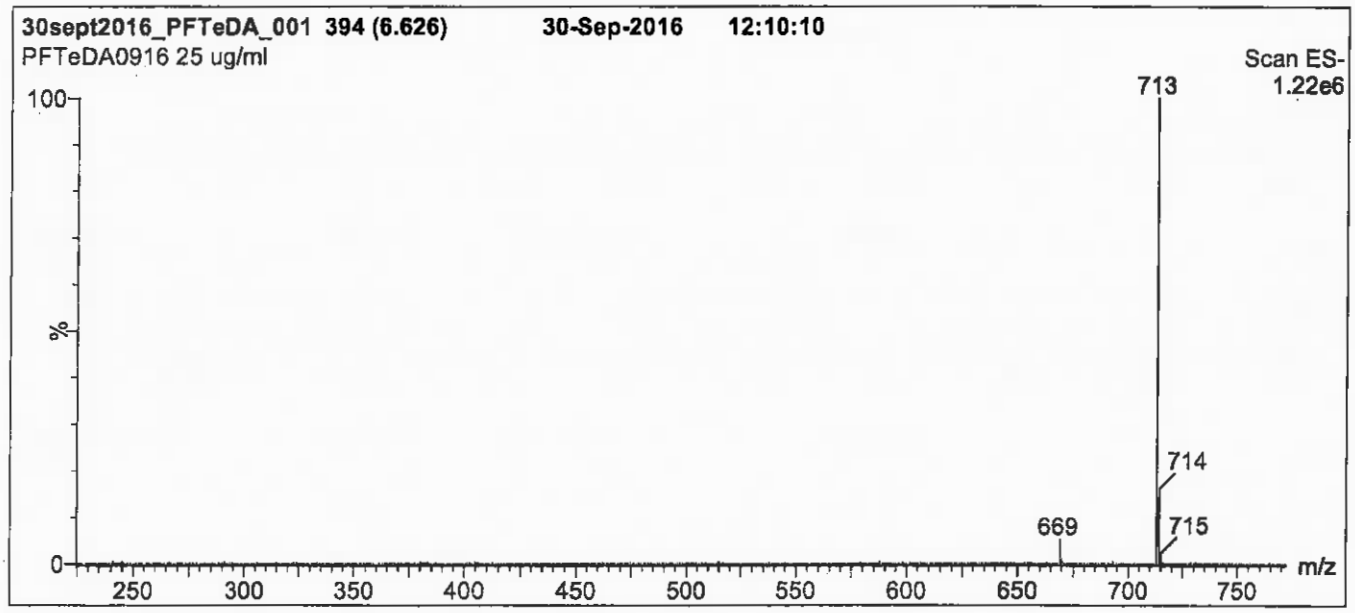
ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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: **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

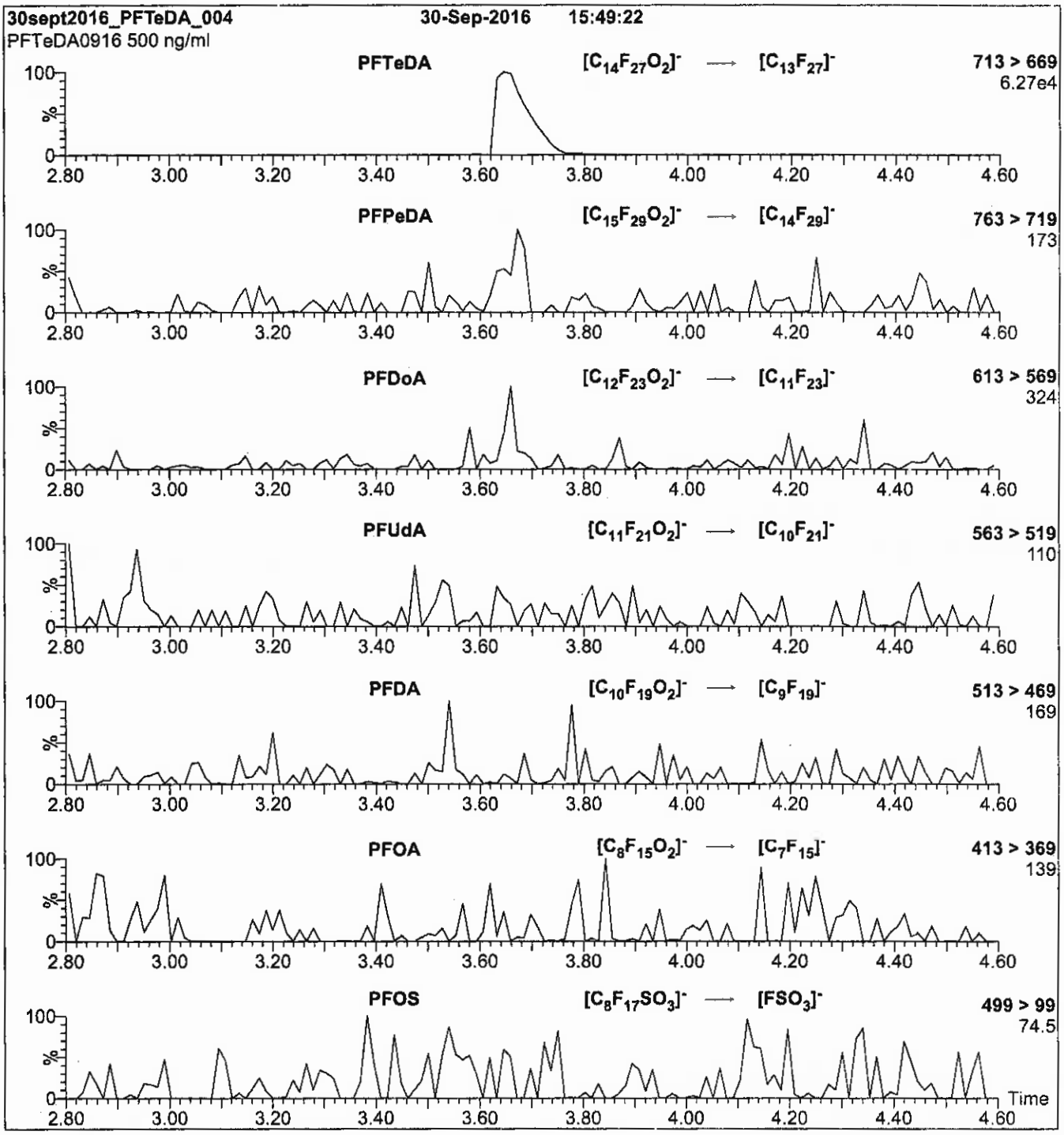
Flow: 300 µl/min

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

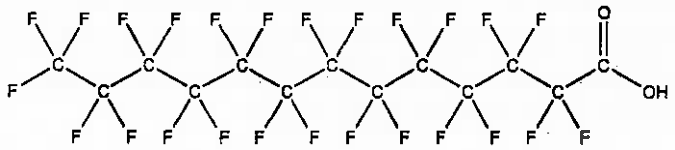
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

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CALA

ANAB ACCREDITED

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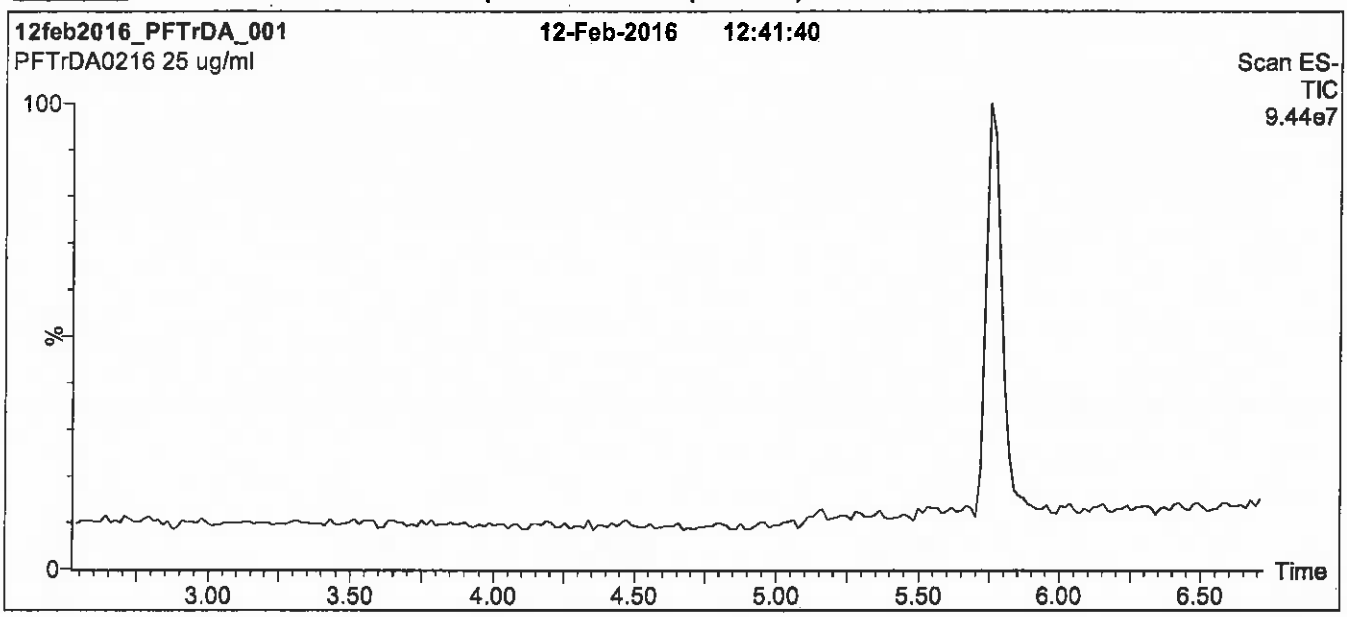
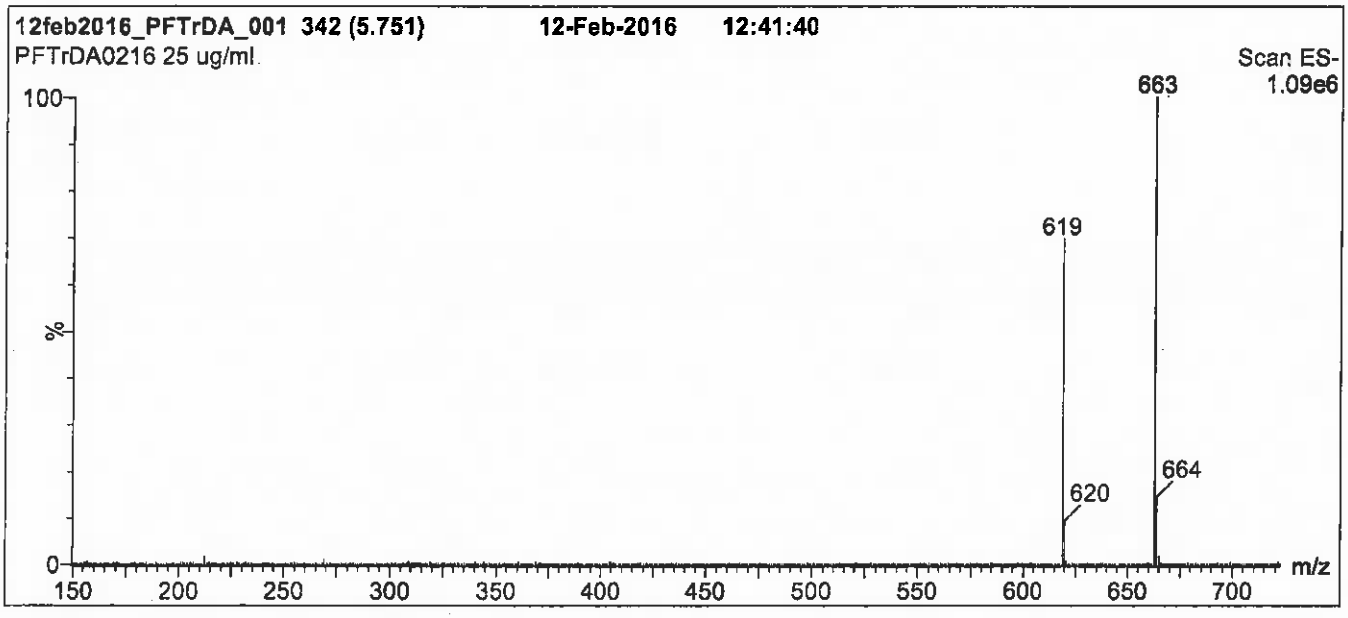
Figure 1: **PFTrDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

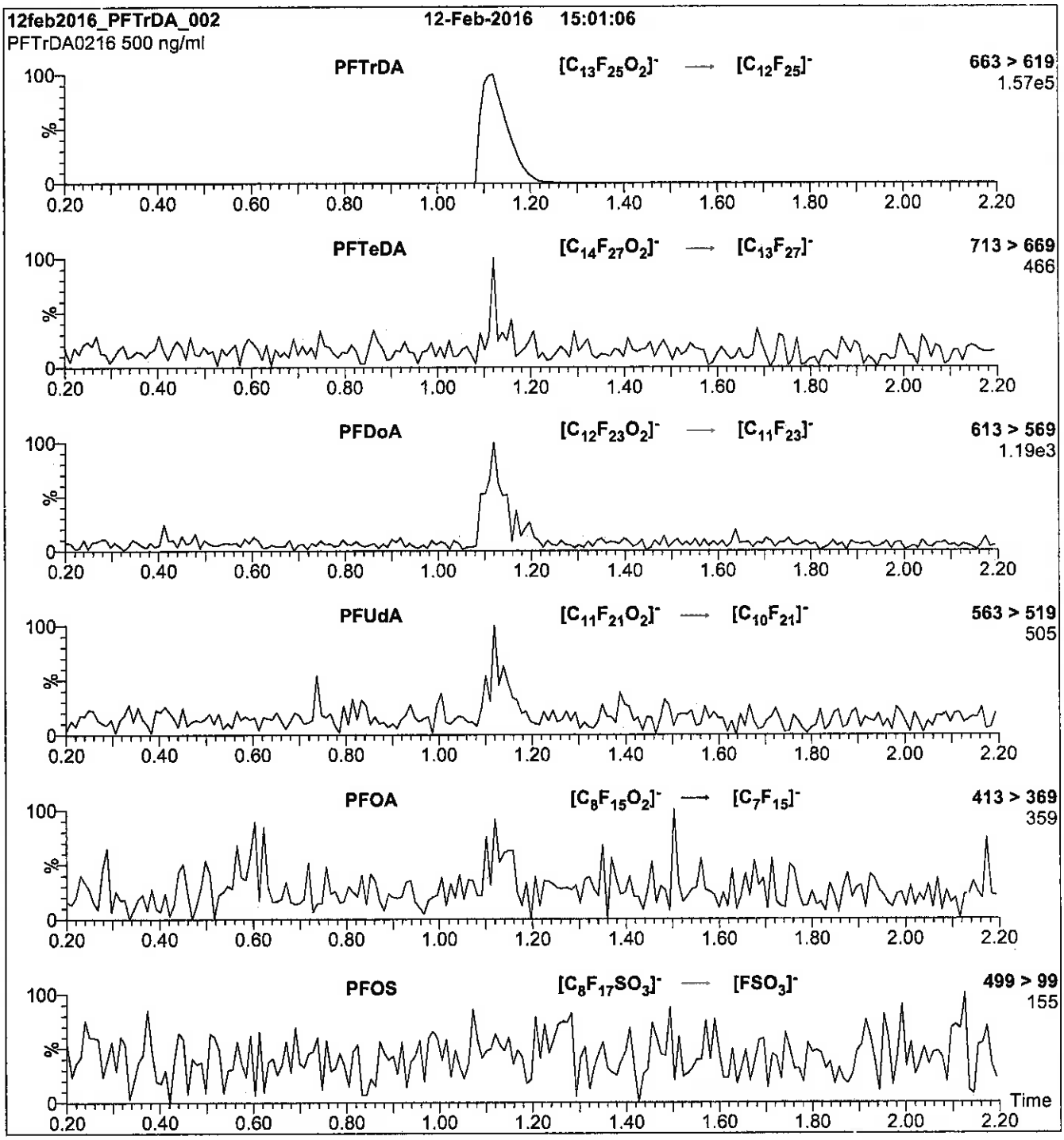
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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

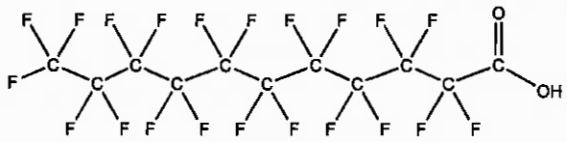
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFUdA
COMPOUND: Perfluoro-n-undecanoic acid

LOT NUMBER: PFUdA0815

STRUCTURE:

CAS #: 2058-94-8



MOLECULAR FORMULA: $C_{11}HF_{21}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 564.09
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

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:

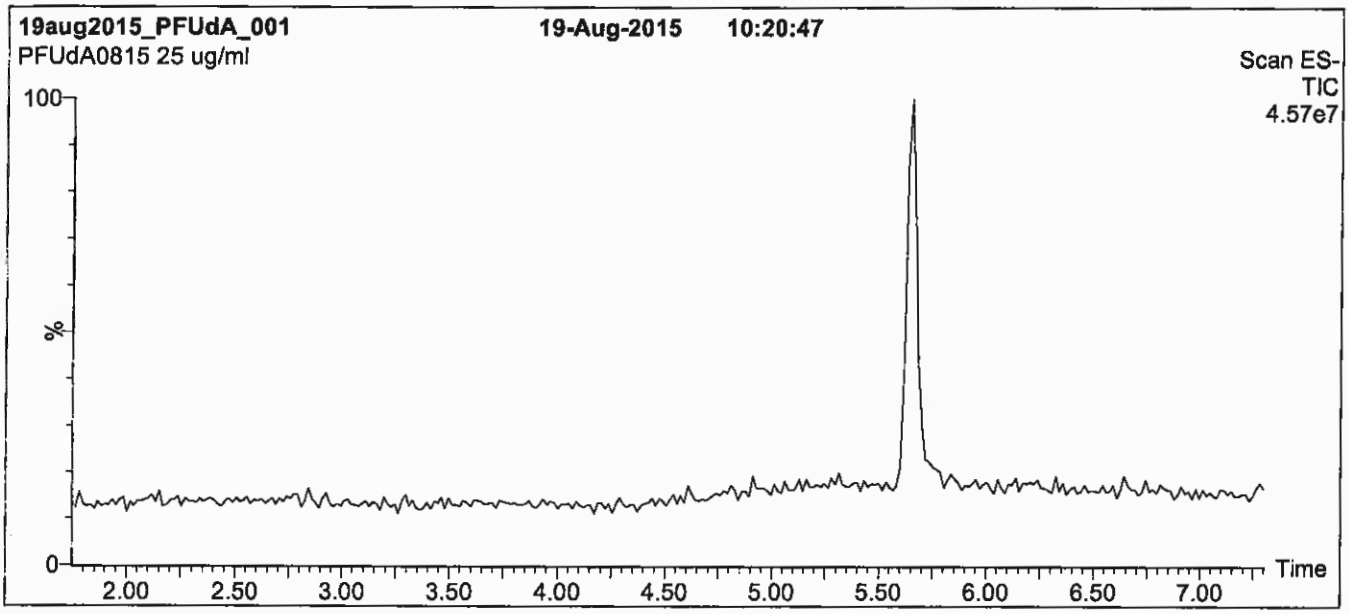
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

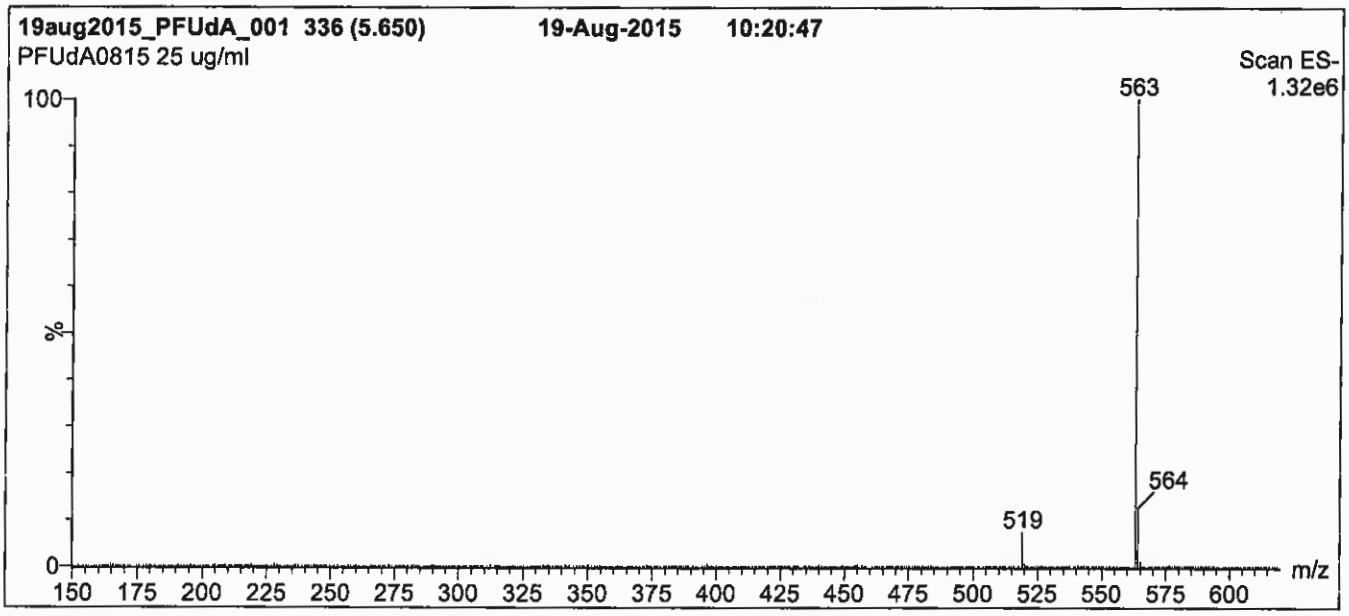
CALA

ANAB ACCREDITED 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: **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

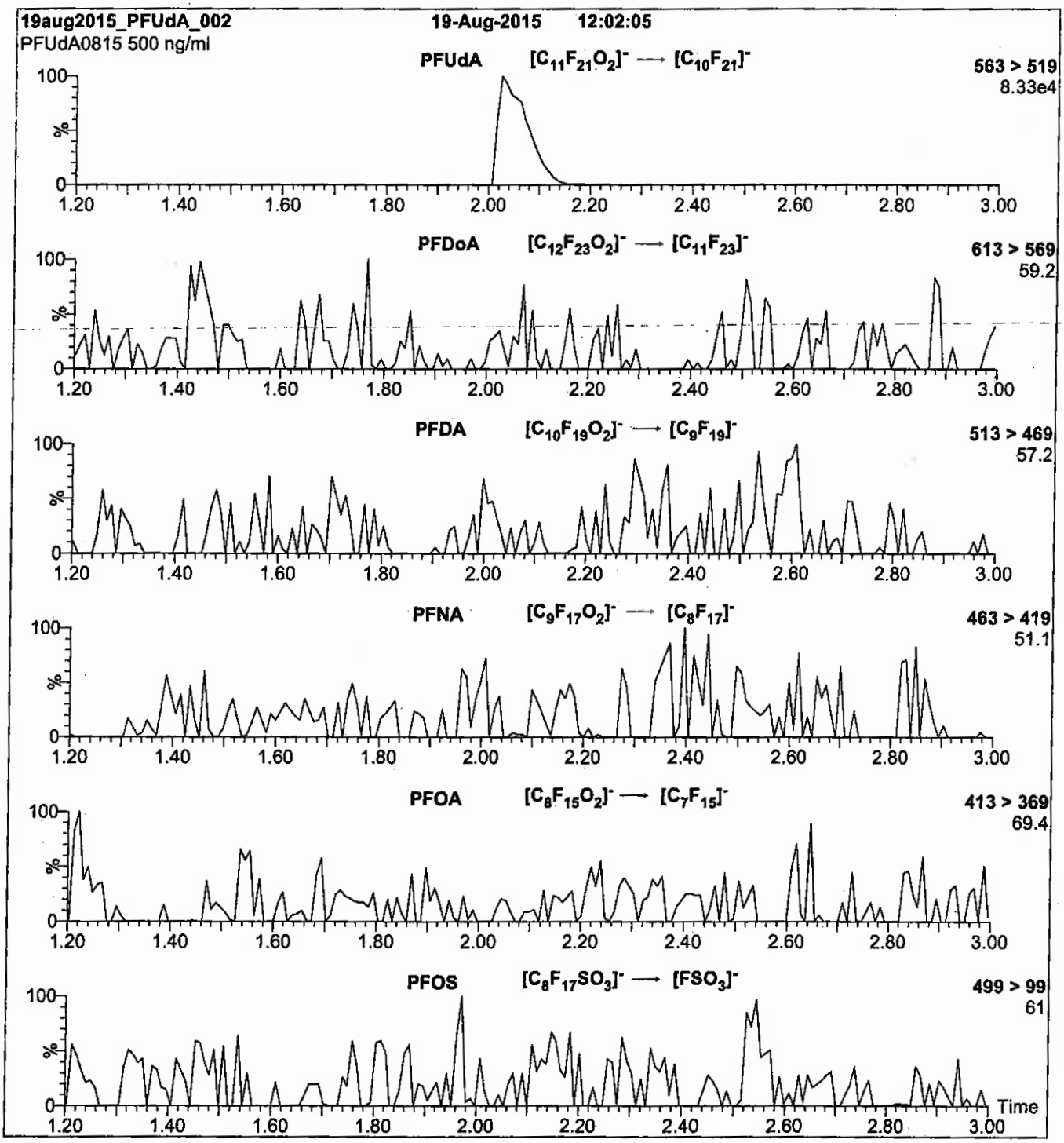
Flow: 300 µl/min

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

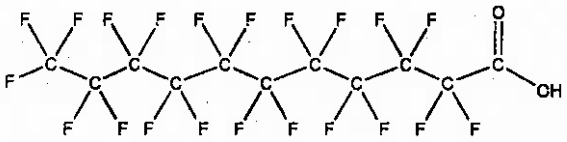
LCPFUdA_00007

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		

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:** 10/19/2016 (mm/dd/yyyy)

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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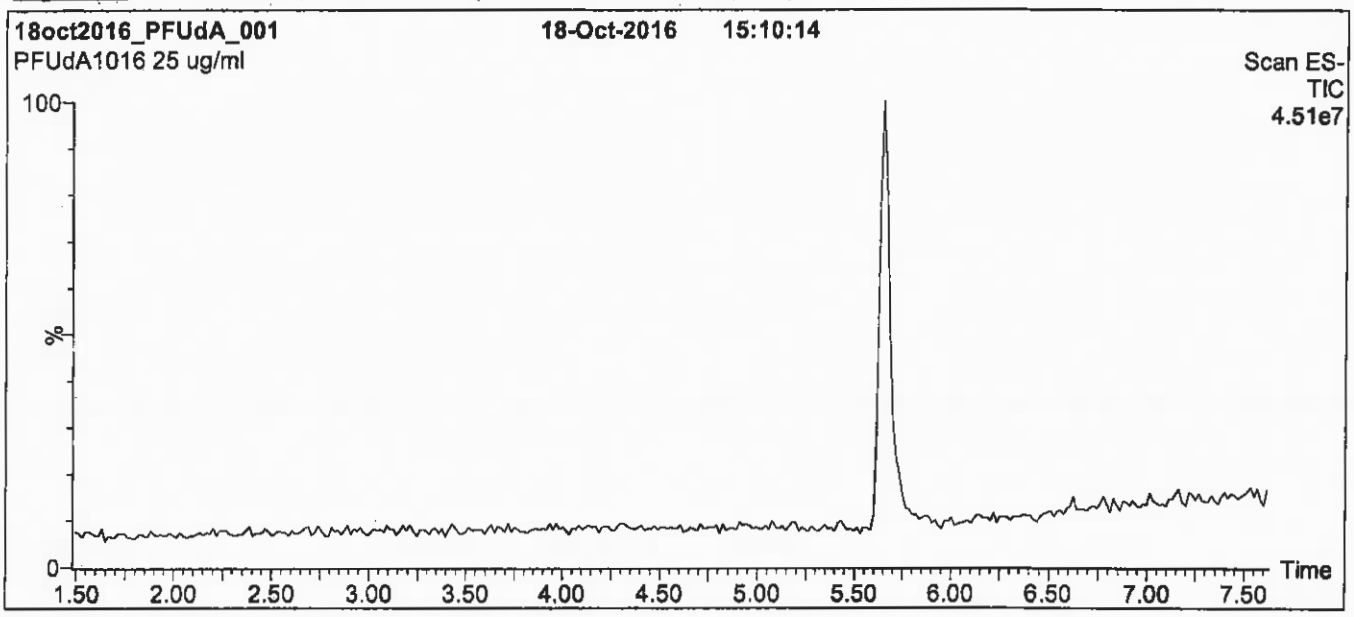
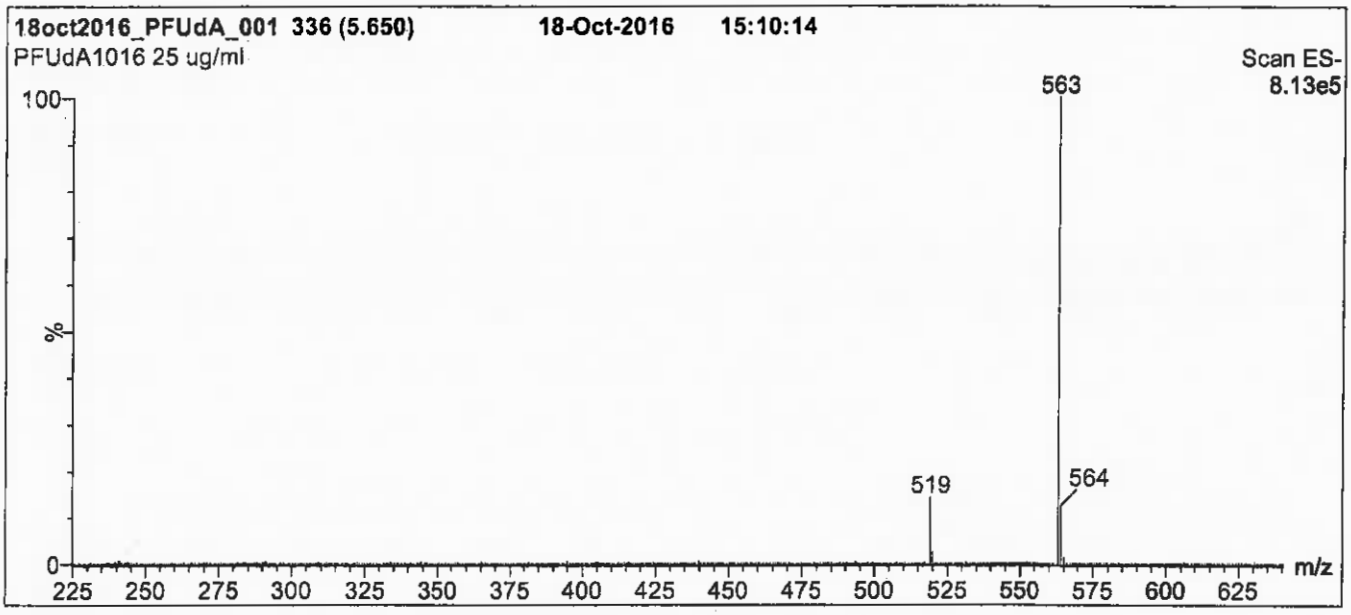




Conditions for Figure 1:

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: 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

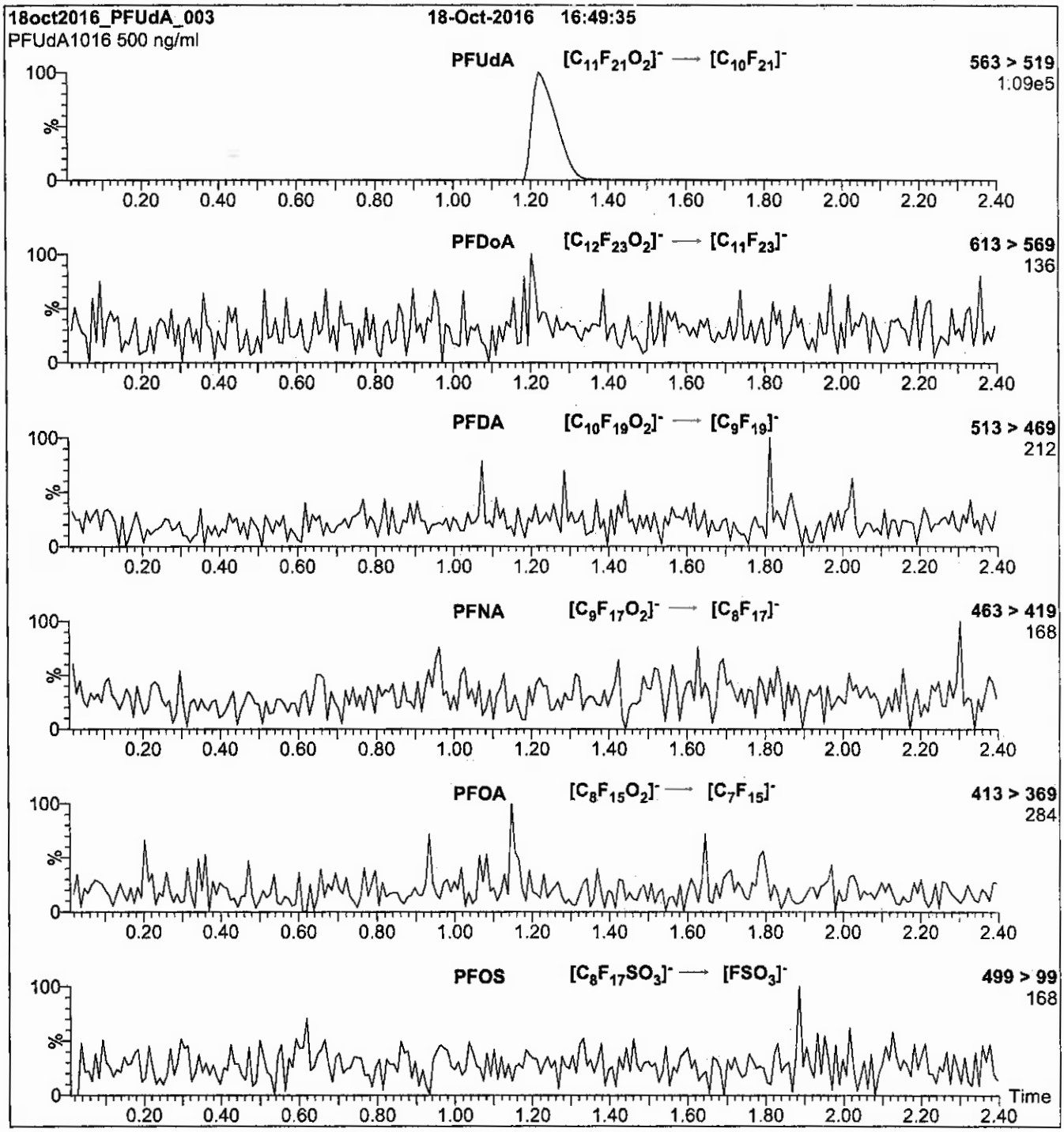
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 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.: 320-34072-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	PFBS #	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #
TP-PFC-024-TPI	320-34072-1	135	156 Q	148	132	128	131	109	136
TP-PFC-024-TPI DL	320-34072-1 DL	114	114	110	110	113	111	109	105
TP-PFC-024-MID-CARBON	320-34072-2	113	112	101	108	110	106	108	109
TP-PFC-024-TPE	320-34072-3	116	111	108	107	112	108	106	114
TP-PFC-024-TPE-D	320-34072-4	114	109	107	113	108	110	108	110
	MB 320-199444/1-A	120 M	115	117	114	119	118	112	115
	LCS 320-199444/2-A	115 M	111	106	107	108	108	110	111
	LCSD 320-199444/3-A	108 M	104	105	104	107	105	103	106

	QC LIMITS
PFBA = 13C4 PFBA	25-150
PFPeA = 13C5 PFPeA	25-150
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.: 320-34072-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFOS #	PFOSA #	PFDA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-024-TPI	320-34072-1	137	132	139	134	128	144
TP-PFC-024-TPI DL	320-34072-1 DL	104	101	102	102	101	98
TP-PFC-024-MID-CARBON	320-34072-2	107	101	106	102	100	123
TP-PFC-024-TPE	320-34072-3	107	105	109	107	103	132
TP-PFC-024-TPE-D	320-34072-4	105	107	111	110	100	127
	MB 320-199444/1-A	117	110	121	110	109	126
	LCS 320-199444/2-A	105	103	113	110	111	126
	LCSD 320-199444/3-A	106	96	113	102	98	115

	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.: 320-34072-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.12.12LLB_004.d

Lab ID: LCS 320-199444/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	40.8	102	89-128	M
Perfluoropentanoic acid (PFPeA)	40.0	36.7	92	66-136	
Perfluorohexanoic acid (PFHxA)	40.0	39.5	99	86-126	
Perfluoroheptanoic acid (PFHpA)	40.0	41.6	104	89-127	
Perfluorooctanoic acid (PFOA)	40.0	36.6	91	80-120	
Perfluorononanoic acid (PFNA)	40.0	38.7	97	77-137	
Perfluorodecanoic acid (PFDA)	40.0	39.7	99	84-123	
Perfluoroundecanoic acid (PFUnA)	40.0	33.2	83	73-122	
Perfluorododecanoic acid (PFDoA)	40.0	36.9	92	82-122	
Perfluorotridecanoic Acid (PFTriA)	40.0	42.1	105	56-163	
Perfluorotetradecanoic acid (PFTeA)	40.0	37.5	94	66-120	
Perfluorobutanesulfonic acid (PFBS)	35.4	38.2	108	88-130	
Perfluorohexanesulfonic acid (PFHxS)	36.4	36.1	99	87-126	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	40.6	107	92-135	
Perfluorooctanesulfonic acid (PFOS)	37.1	38.3	103	83-126	
Perfluorodecanesulfonic acid (PFDS)	38.6	38.3	99	80-129	
Perfluorooctane Sulfonamide (FOSA)	40.0	42.3	106	91-133	
13C8 FOSA	100	103	103	25-150	
13C4 PFBA	100	115	115	25-150	M
13C2 PFHxA	100	107	107	25-150	
13C4 PFOA	100	110	110	25-150	
13C5 PFNA	100	111	111	25-150	
13C2 PFDA	100	113	113	25-150	
13C2 PFUnA	100	110	110	25-150	
13C2 PFDoA	100	111	111	25-150	
18O2 PFHxS	94.6	102	108	25-150	
13C4 PFOS	95.6	101	105	25-150	
13C2-PFTeDA	100	126	126	25-150	
13C4-PFHpA	100	108	108	25-150	
13C5 PFPeA	100	111	111	25-150	
13C3-PFBS	93.0	98.8	106	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.: 320-34072-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.12.12LLB_005.d

Lab ID: LCSD 320-199444/3-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	41.8	105	3	30	89-128	M
Perfluoropentanoic acid (PFPeA)	40.0	38.4	96	4	30	66-136	
Perfluorohexanoic acid (PFHxA)	40.0	38.1	95	3	30	86-126	
Perfluoroheptanoic acid (PFHpA)	40.0	39.2	98	6	30	89-127	
Perfluorooctanoic acid (PFOA)	40.0	38.0	95	4	30	80-120	
Perfluorononanoic acid (PFNA)	40.0	39.8	99	3	30	77-137	
Perfluorodecanoic acid (PFDA)	40.0	39.6	99	0	30	84-123	
Perfluoroundecanoic acid (PFUnA)	40.0	35.9	90	8	30	73-122	
Perfluorododecanoic acid (PFDoA)	40.0	42.4	106	14	30	82-122	
Perfluorotridecanoic Acid (PFTriA)	40.0	48.8	122	15	30	56-163	
Perfluorotetradecanoic acid (PFTeA)	40.0	39.1	98	4	30	66-120	
Perfluorobutanesulfonic acid (PFBS)	35.4	36.8	104	4	30	88-130	
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.2	97	2	30	87-126	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	37.8	99	7	30	92-135	
Perfluorooctanesulfonic acid (PFOS)	37.1	36.4	98	5	30	83-126	M
Perfluorodecanesulfonic acid (PFDS)	38.6	34.5	89	10	30	80-129	
Perfluorooctane Sulfonamide (FOSA)	40.0	42.5	106	0	30	91-133	
13C8 FOSA	100	96.1	96			25-150	
13C4 PFBA	100	108	108			25-150	M
13C2 PFHxA	100	104	104			25-150	
13C4 PFOA	100	103	103			25-150	
13C5 PFNA	100	106	106			25-150	
13C2 PFDA	100	113	113			25-150	
13C2 PFUnA	100	102	102			25-150	
13C2 PFDoA	100	98.1	98			25-150	
18O2 PFHxS	94.6	99.0	105			25-150	
13C4 PFOS	95.6	101	106			25-150	
13C2-PFTeDA	100	115	115			25-150	
13C4-PFHpA	100	107	107			25-150	
13C5 PFPeA	100	104	104			25-150	
13C3-PFBS	93.0	97.8	105			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.: 320-34072-1

SDG No.:

Lab File ID: 2017.12.12LLB_003.d Lab Sample ID: MB 320-199444/1-A

Matrix: Water Date Extracted: 12/12/2017 08:28

Instrument ID: A8_N Date Analyzed: 12/12/2017 21:42

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-199444/2-A	2017.12.12LLB_004.d	12/12/2017 21:50
	LCSD 320-199444/3-A	2017.12.12LLB_005.d	12/12/2017 21:58
TP-PFC-024-TPI	320-34072-1	2017.12.12LLB_006.d	12/12/2017 22:06
TP-PFC-024-MID-CARBON	320-34072-2	2017.12.12LLB_007.d	12/12/2017 22:14
TP-PFC-024-TPE	320-34072-3	2017.12.12LLB_008.d	12/12/2017 22:22
TP-PFC-024-TPE-D	320-34072-4	2017.12.12LLB_009.d	12/12/2017 22:29
TP-PFC-024-TPI DL	320-34072-1 DL	2017.12.13LLA_025.d	12/13/2017 15:11

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-TPI | Lab Sample ID: 320-34072-1

Matrix: Water | Lab File ID: 2017.12.12LLB_006.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 10:00

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 248.8(mL) | Date Analyzed: 12/12/2017 22:06

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	77		2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	190		2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	340		4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	73		2.0	1.0	0.25
335-67-1	*Perfluorooctanoic acid (PFOA)*	*1200*	*M E*	*4.0*	2.0	*0.85*
375-95-1	Perfluorononanoic acid (PFNA)	2.7		2.0	1.0	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	0.79	J	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)	50		2.0	1.0	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	370		2.0	1.0	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	6.5		2.0	1.0	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	350	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.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-TPI | Lab Sample ID: 320-34072-1

Matrix: Water | Lab File ID: 2017.12.12LLB_006.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 10:00

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 248.8(mL) | Date Analyzed: 12/12/2017 22:06

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	132		25-150
STL00992	13C4 PFBA	135		25-150
STL00993	13C2 PFHxA	132		25-150
STL00990	13C4 PFOA	109		25-150
STL00995	13C5 PFNA	136		25-150
STL00996	13C2 PFDA	139		25-150
STL00997	13C2 PFUnA	134		25-150
STL00998	13C2 PFDoA	128		25-150
STL00994	18O2 PFHxS	131		25-150
STL00991	13C4 PFOS	137		25-150
STL02116	13C2-PFTeDA	144		25-150
STL01892	13C4-PFHpA	128		25-150
STL01893	13C5 PFPeA	156	Q	25-150
STL02337	13C3-PFBS	148		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_006.d
Lims ID: 320-34072-A-1-A
Client ID: TP-PFC-024-TPI
Sample Type: Client
Inject. Date: 12-Dec-2017 22:06:17 ALS Bottle#: 4 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-34072-a-1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 13-Dec-2017 13:39:08 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK047

First Level Reviewer: hannigana Date: 13-Dec-2017 13:29:44

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	1.404	1.401	0.003	0.533	8364655	3.36		135	40396	
2 Perfluorobutyric acid										
212.90 > 169.00	1.404	1.402	0.002	1.000	5805016	1.91			1492	
D 3 13C5-PFPeA										
267.90 > 223.00	1.647	1.646	0.001	0.626	6031618	3.89		156	45937	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.647	1.648	-0.001	1.000	13134610	4.68			3762	
D 47 13C3-PFBS										
301.90 > 83.00	1.679	1.681	-0.002	0.638	110856	3.44		148	2882	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.687	1.682	0.005	1.005	4504703	1.24			5015	
298.90 > 99.00	1.687	1.682	0.005	1.005	1881595		2.39(1.25-3.74)		4318	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.933	1.923	0.009	1.000	18409183	8.54			15210	
313.00 > 119.00	1.933	1.923	0.009	1.000	1491455		12.34(5.03-15.10)		23050	
D 7 13C2 PFHxA										
315.00 > 270.00	1.933	1.924	0.008	0.734	5277567	3.31		132	50487	
D 9 13C4-PFHpA										
367.00 > 322.00	2.268	2.254	0.014	0.862	4958484	3.20		128	50419	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.268	2.255	0.013	1.000	3738830	1.81			5048	
363.00 > 169.00	2.268	2.255	0.013	1.000	1471517		2.54(1.13-3.40)		11743	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.279	2.269	0.010	1.000	25038948	9.26			33669	
399.00 > 99.00	2.279	2.269	0.010	1.000	8712200		2.87(1.50-4.49)		12809	
D 11 18O2 PFHxS										
403.00 > 84.00	2.279	2.271	0.008	0.866	6012549	3.10		131	60874	

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	2.633	2.618	0.015	1.000	4662267	2.72		109	50359	
* 62 13C2-PFOA										
415.00 > 370.00	2.633	2.619	0.014		4175236	2.50			38168	
15 Perfluorooctanoic acid										EM
413.00 > 369.00	2.633	2.621	0.012	1.000	60269414	30.3			13796	EM
413.00 > 169.00	2.633	2.621	0.012	1.000	42181989		1.43(0.84-2.52)		15552	M
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.640	2.626	0.014	1.000	366525	0.1626			122	
449.00 > 99.00	2.640	2.626	0.014	1.000	124844		2.94(1.94-5.82)		286	
D 18 13C4 PFOS										
503.00 > 80.00	3.008	2.993	0.015	1.143	4139436	3.28		137	35773	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.008	2.994	0.014	1.000	15439428	8.60			14246	M
499.00 > 99.00	3.008	2.994	0.014	1.000	3420717		4.51(2.31-6.93)		7037	M
D 19 13C5 PFNA										
468.00 > 423.00	3.008	2.994	0.014	1.143	4210826	3.40		136	54925	
20 Perfluorononanoic acid										
463.00 > 419.00	3.008	2.994	0.014	1.000	108488	0.0661			132	
463.00 > 169.00	3.008	2.994	0.014	1.000	25564		4.24(1.90-5.69)		94.4	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.371	3.356	0.015	1.000	28209	0.0197			79.3	
513.00 > 169.00	3.371	3.356	0.015	1.000	4137		6.82(2.36-7.09)		42.6	
D 23 13C2 PFDA										
515.00 > 470.00	3.371	3.356	0.015	1.280	3642975	3.47		139	45363	
D 21 13C8 FOSA										
506.00 > 78.00	3.355	3.359	-0.004	1.275	5615025	3.31		132	31114	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.355	3.359	-0.004	1.000	12930	0.006145			37.7	
D 30 13C2 PFUnA										
565.00 > 520.00	3.698	3.685	0.013	1.405	2702172	3.34		134	41050	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.698	3.685	0.013	1.000	6154	0.005790			28.8	
563.00 > 169.00	3.698	3.685	0.013	1.000	1472		4.18(0.00-0.00)		57.8	
D 36 13C2 PFDoA										
615.00 > 570.00	3.997	3.979	0.018	1.518	2872817	3.19		128	39020	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.500	4.481	0.019	1.709	3769019	3.59		144	27466	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 13-Dec-2017 13:39:16 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_006.d

Injection Date: 12-Dec-2017 22:06:17 Instrument ID: A8_N

Lims ID: 320-34072-A-1-A Lab Sample ID: 320-34072-1

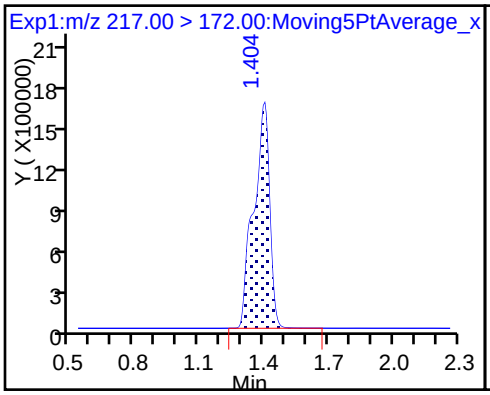
Client ID: TP-PFC-024-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 5

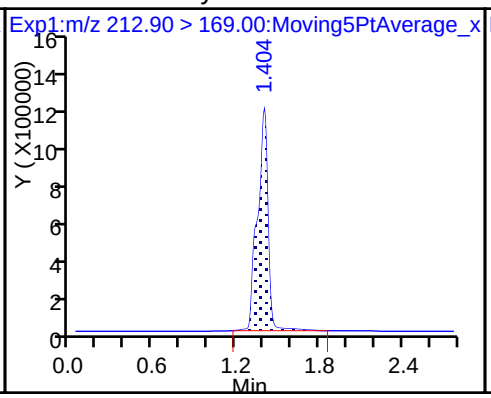
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

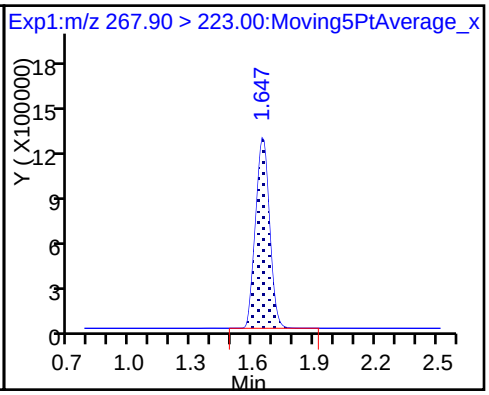
D 1 13C4 PFBA



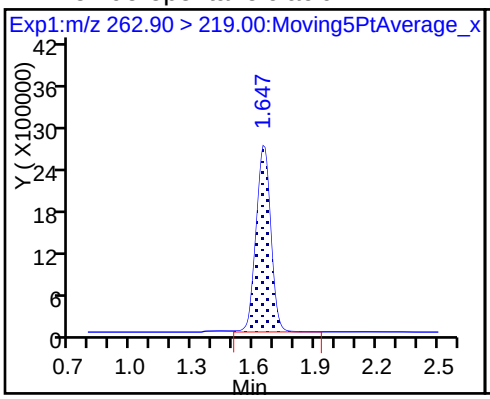
2 Perfluorobutyric acid



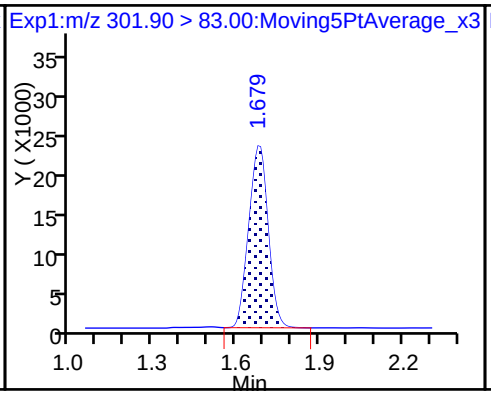
D 3 13C5-PFPeA



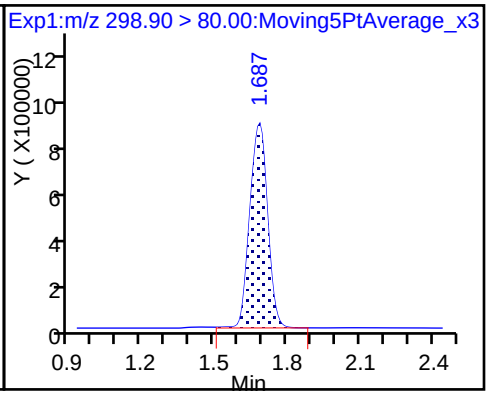
4 Perfluoropentanoic acid



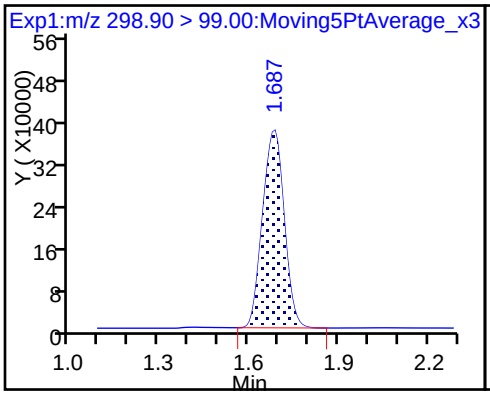
D 47 13C3-PFBS



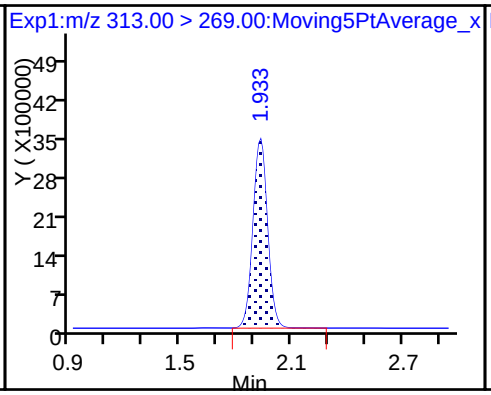
5 Perfluorobutanesulfonic acid



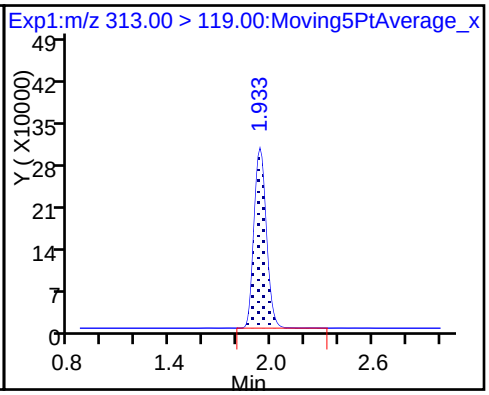
5 Perfluorobutanesulfonic acid



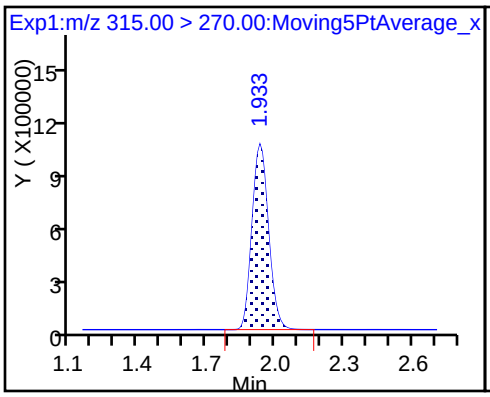
6 Perfluorohexanoic acid



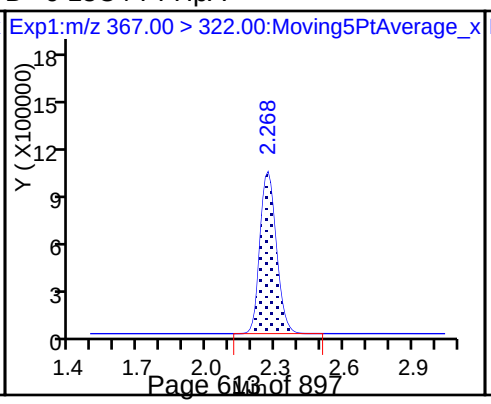
6 Perfluorohexanoic acid



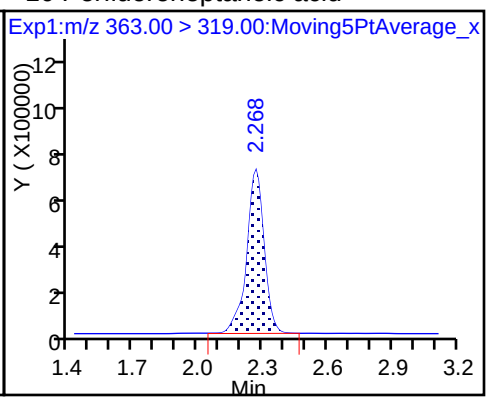
D 7 13C2 PFHxA



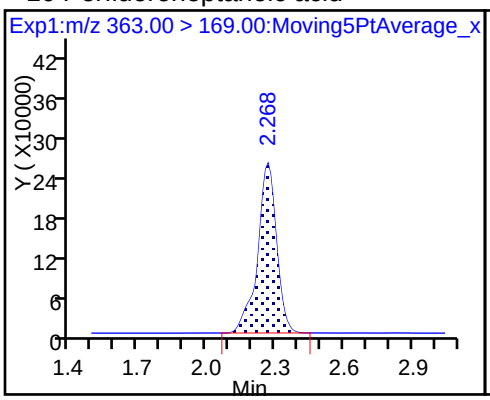
D 9 13C4-PFHpA



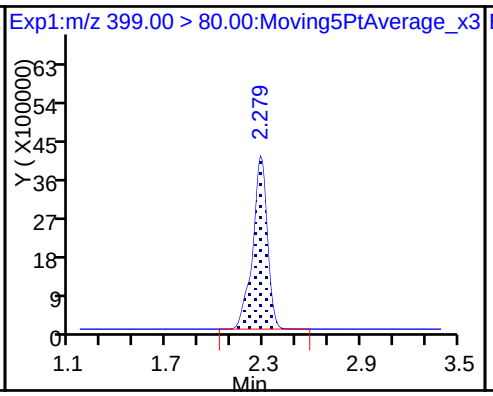
10 Perfluoroheptanoic acid



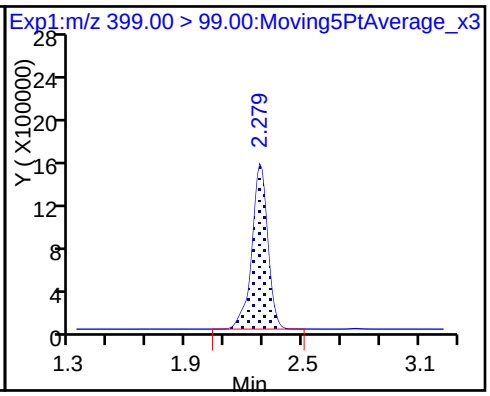
10 Perfluoroheptanoic acid



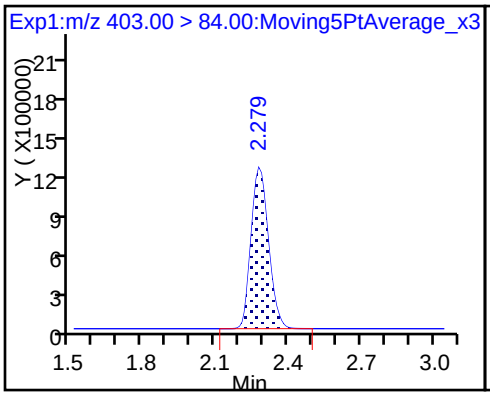
8 Perfluorohexanesulfonic acid



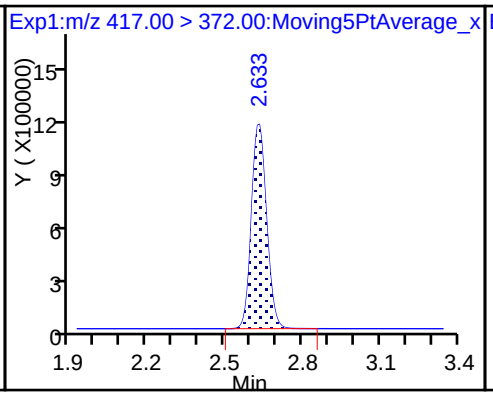
8 Perfluorohexanesulfonic acid



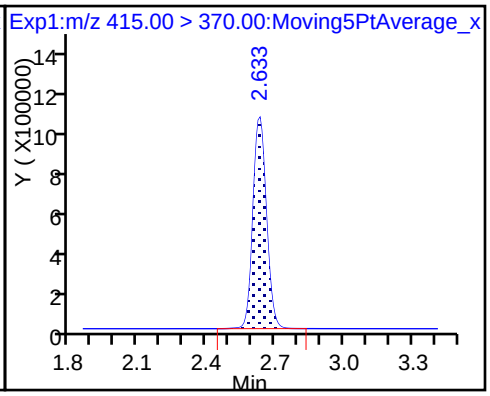
D 11 18O2 PFHxS



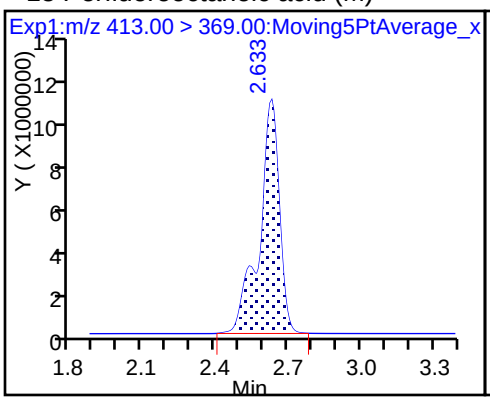
D 14 13C4 PFOA



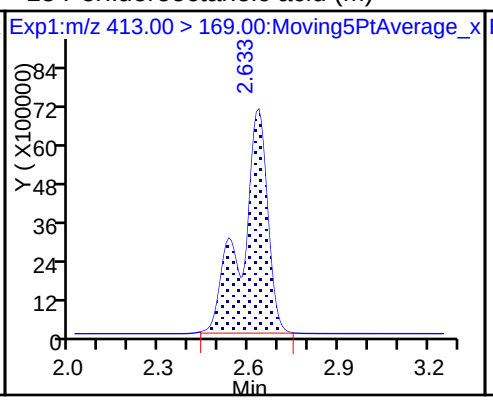
* 62 13C2-PFOA



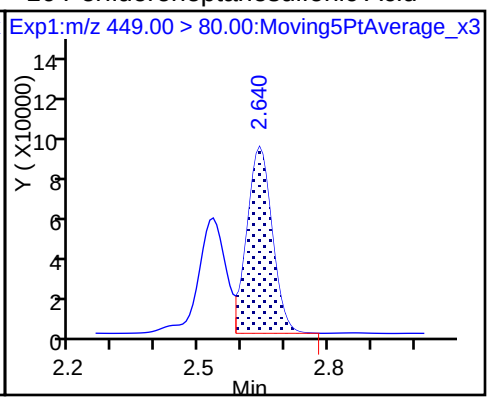
15 Perfluorooctanoic acid (M)



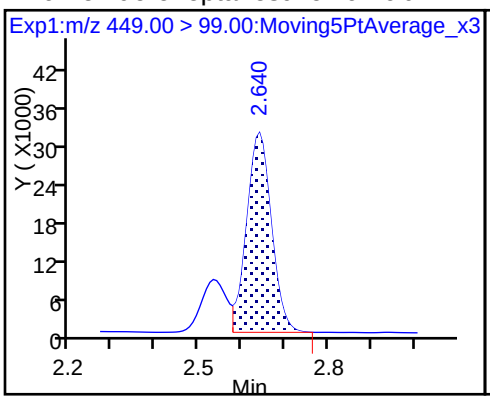
15 Perfluorooctanoic acid (M)



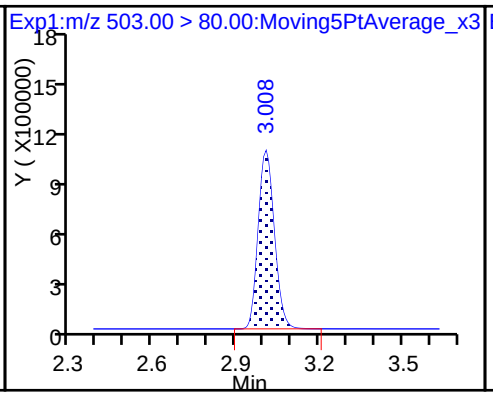
16 Perfluoroheptanesulfonic Acid



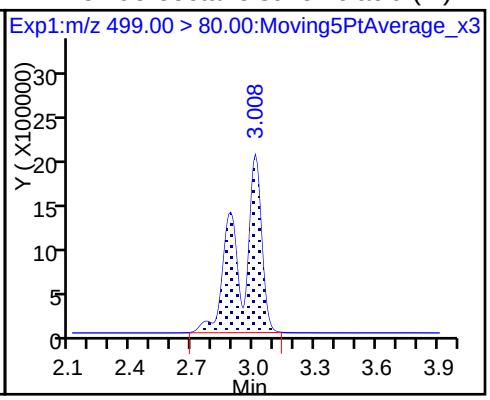
16 Perfluoroheptanesulfonic Acid



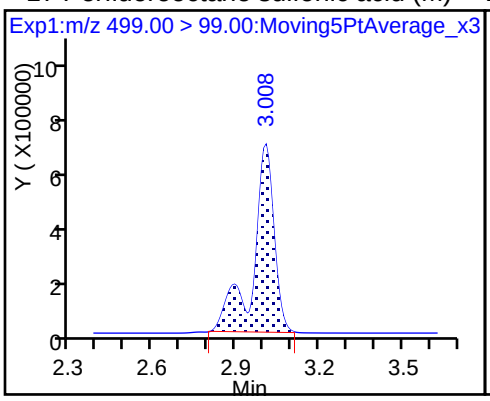
D 18 13C4 PFOS



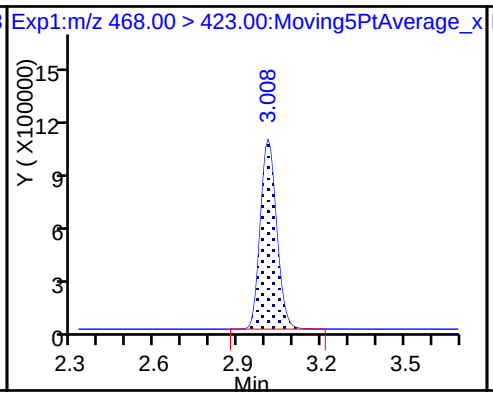
17 Perfluorooctane sulfonic acid (M)



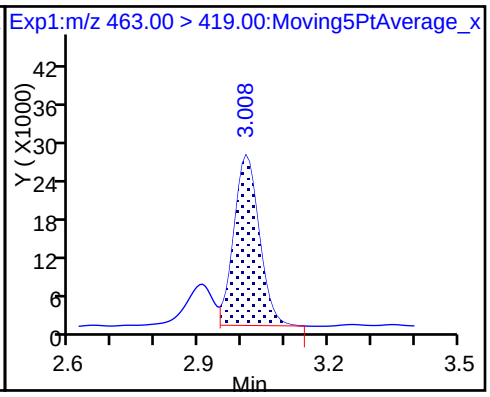
17 Perfluorooctane sulfonic acid (M)



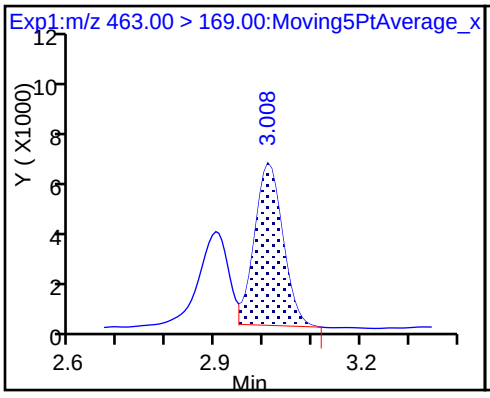
D 19 13C5 PFNA



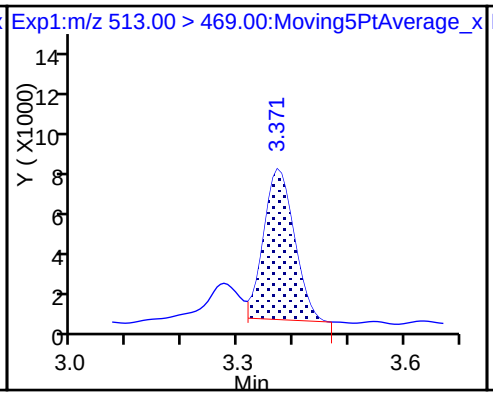
20 Perfluorononanoic acid



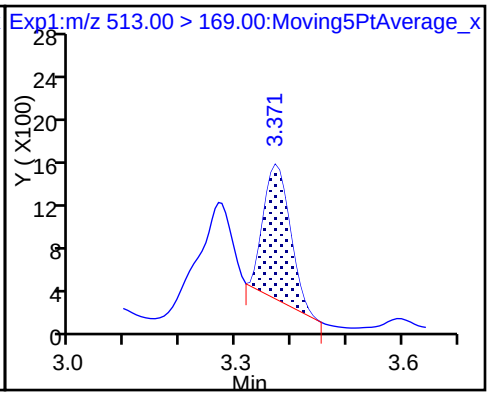
20 Perfluorononanoic acid



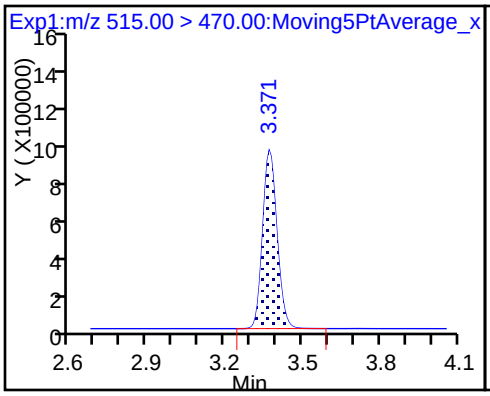
24 Perfluorodecanoic acid



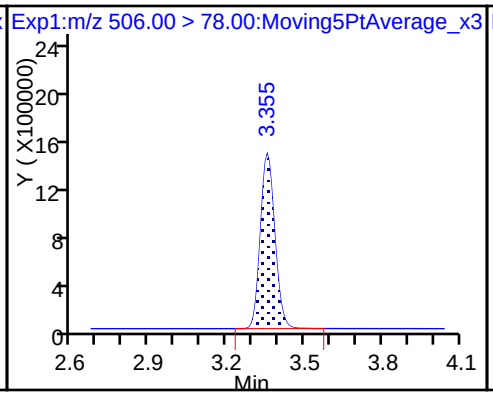
24 Perfluorodecanoic acid



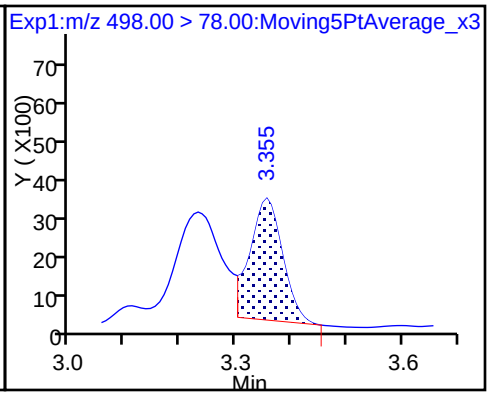
D 23 13C2 PFDA



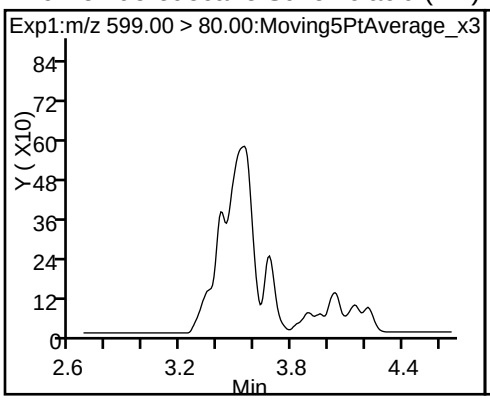
D 21 13C8 FOSA



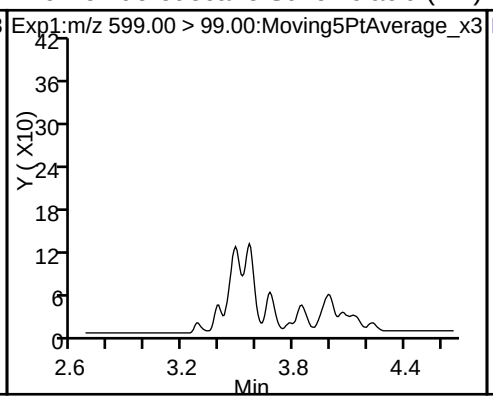
22 Perfluorooctane Sulfonamide



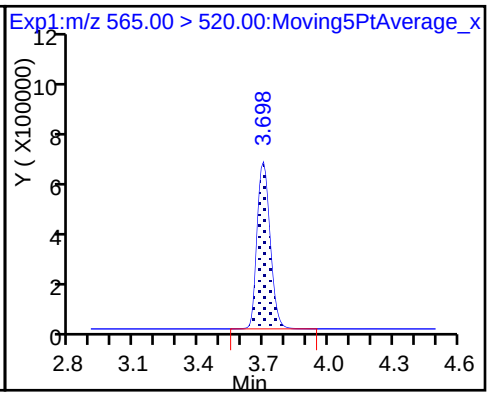
29 Perfluorodecane Sulfonic acid (ND)



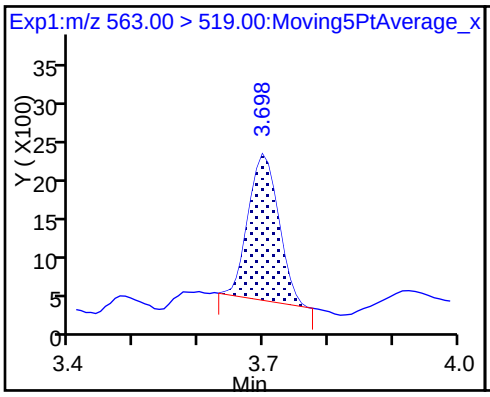
29 Perfluorodecane Sulfonic acid (ND)



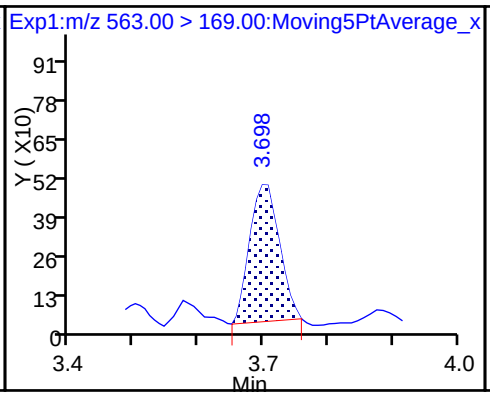
D 30 13C2 PFUnA



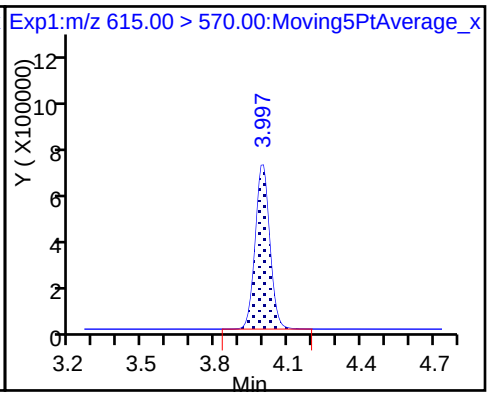
31 Perfluoroundecanoic acid



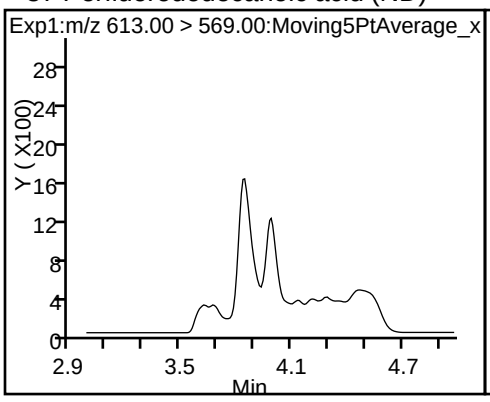
31 Perfluoroundecanoic acid



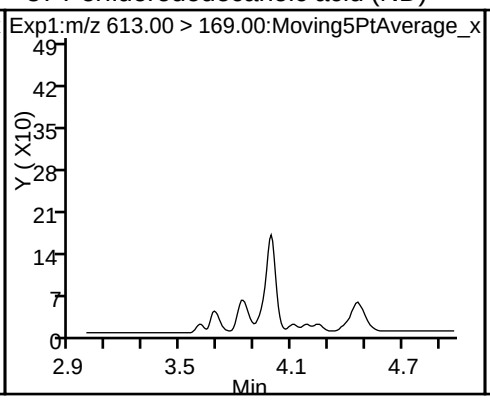
D 36 13C2 PFDoA



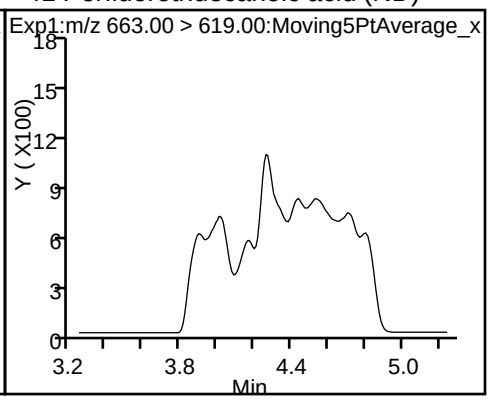
37 Perfluorododecanoic acid (ND)



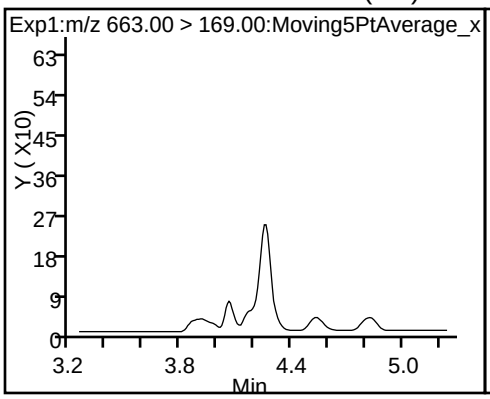
37 Perfluorododecanoic acid (ND)



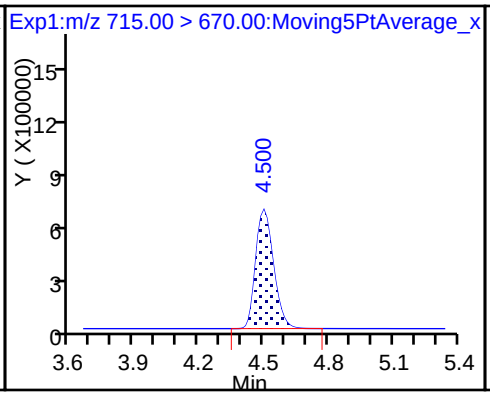
41 Perfluorotridecanoic acid (ND)



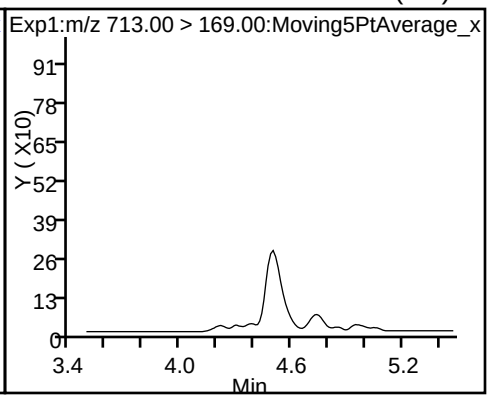
41 Perfluorotridecanoic acid (ND)



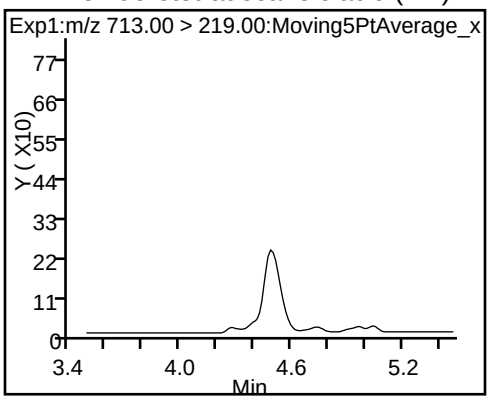
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

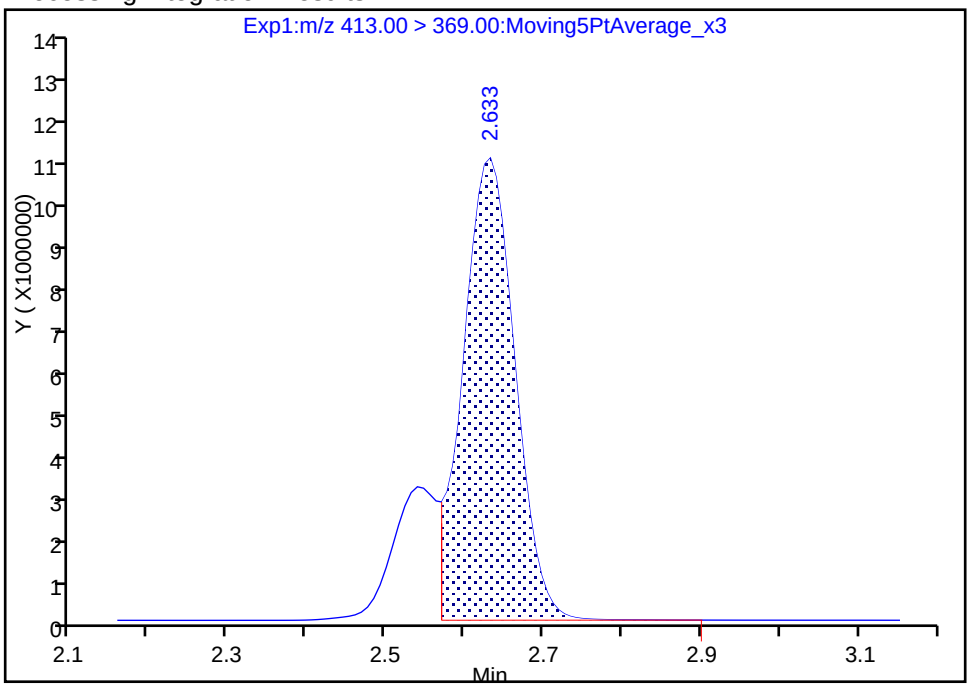
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_006.d				
Injection Date:	12-Dec-2017 22:06:17	Instrument ID:	A8_N		
Lims ID:	320-34072-A-1-A	Lab Sample ID:	320-34072-1		
Client ID:	TP-PFC-024-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	5
Injection Vol:	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

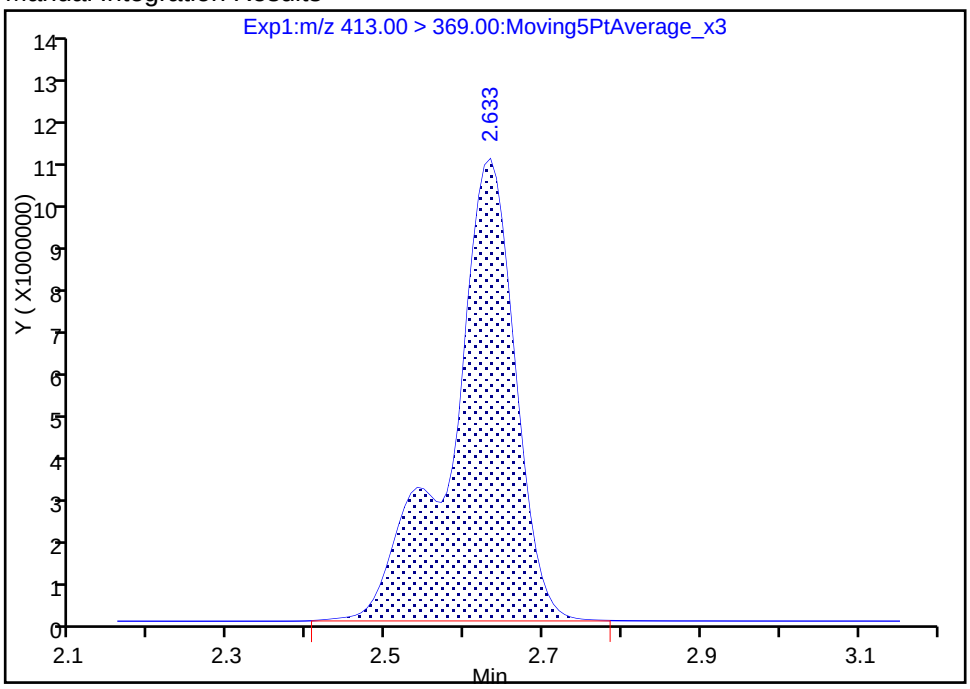
Processing Integration Results

RT: 2.63
Area: 48209940
Amount: 24.237649
Amount Units: ng/ml



Manual Integration Results

RT: 2.63
Area: 60269414
Amount: 30.300575
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:28:34

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

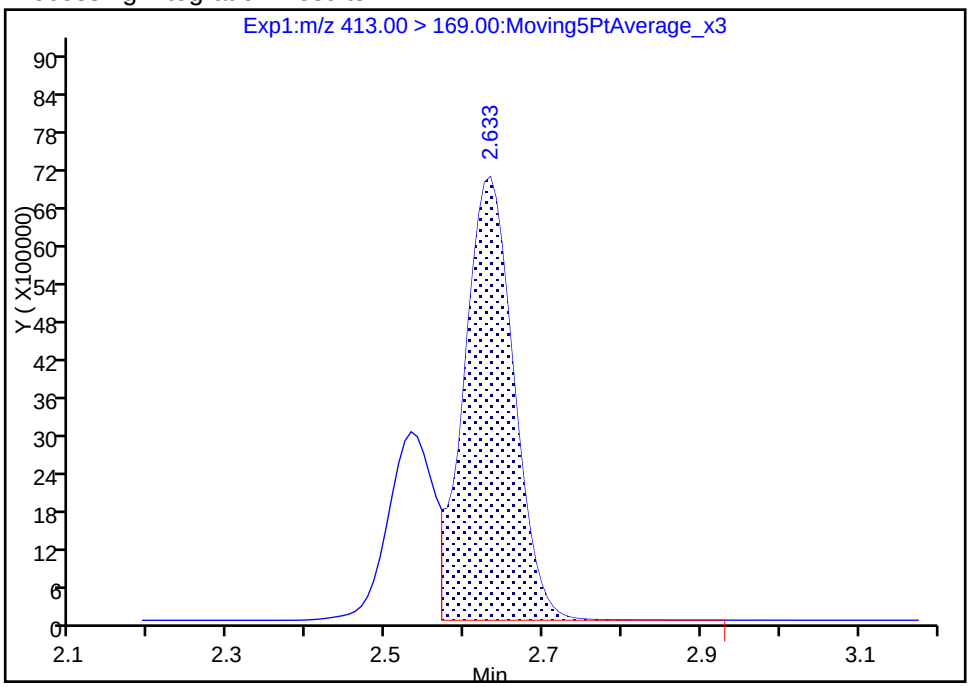
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_006.d				
Injection Date:	12-Dec-2017 22:06:17	Instrument ID:	A8_N		
Lims ID:	320-34072-A-1-A	Lab Sample ID:	320-34072-1		
Client ID:	TP-PFC-024-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	5
Injection Vol:	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

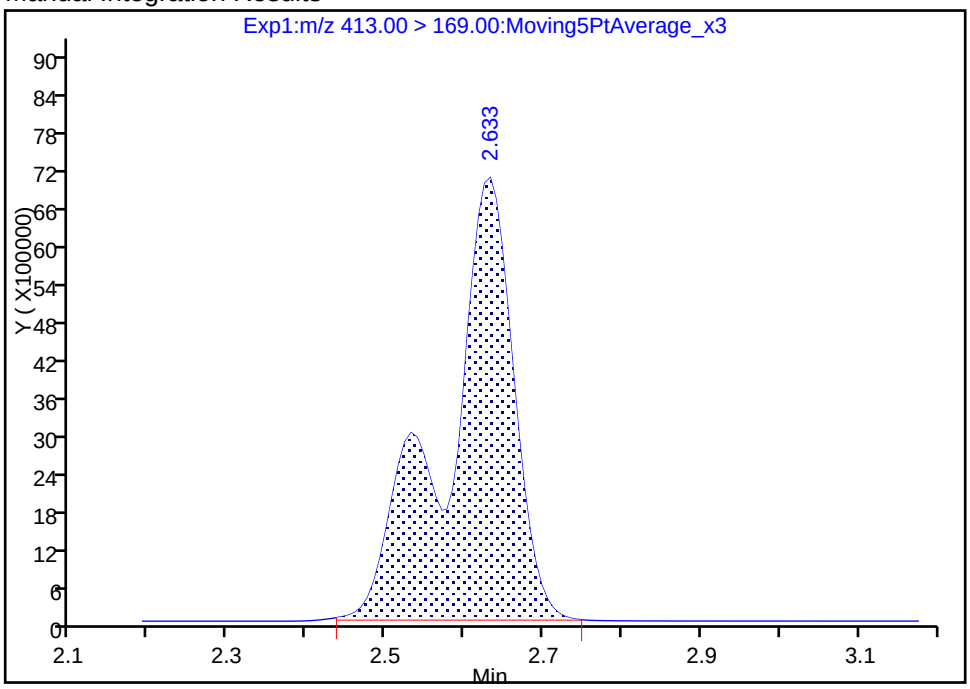
Processing Integration Results

RT: 2.63
Area: 30725822
Amount: 24.237649
Amount Units: ng/ml



Manual Integration Results

RT: 2.63
Area: 42181989
Amount: 30.300575
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:28:40
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

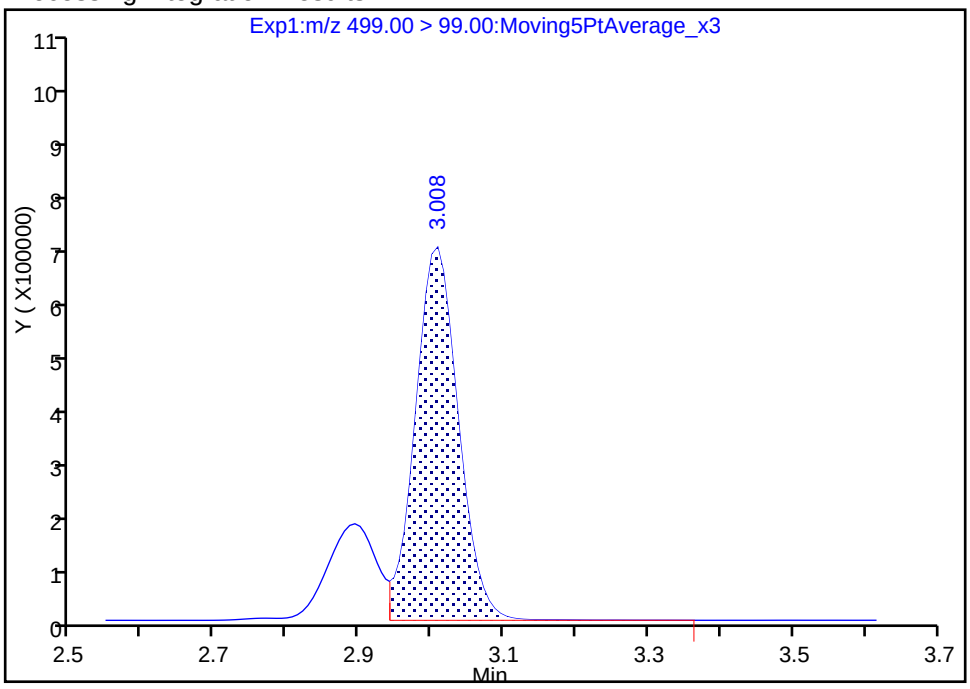
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_006.d				
Injection Date:	12-Dec-2017 22:06:17	Instrument ID:	A8_N		
Lims ID:	320-34072-A-1-A	Lab Sample ID:	320-34072-1		
Client ID:	TP-PFC-024-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	5
Injection Vol:	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

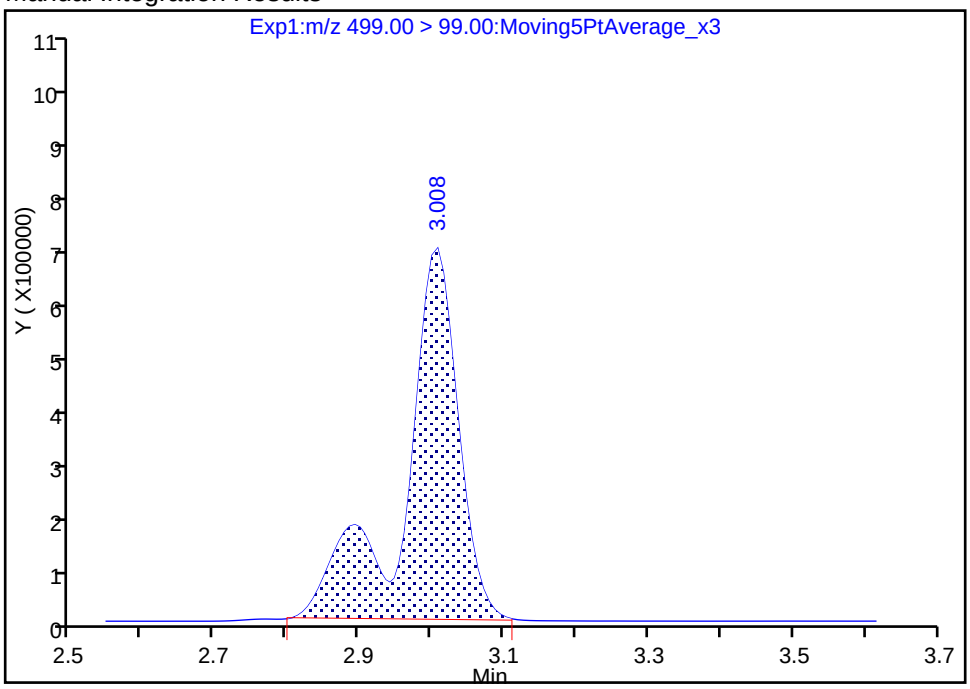
Processing Integration Results

RT: 3.01
Area: 2712460
Amount: 4.686305
Amount Units: ng/ml



Manual Integration Results

RT: 3.01
Area: 3420717
Amount: 8.601031
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:28:53

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

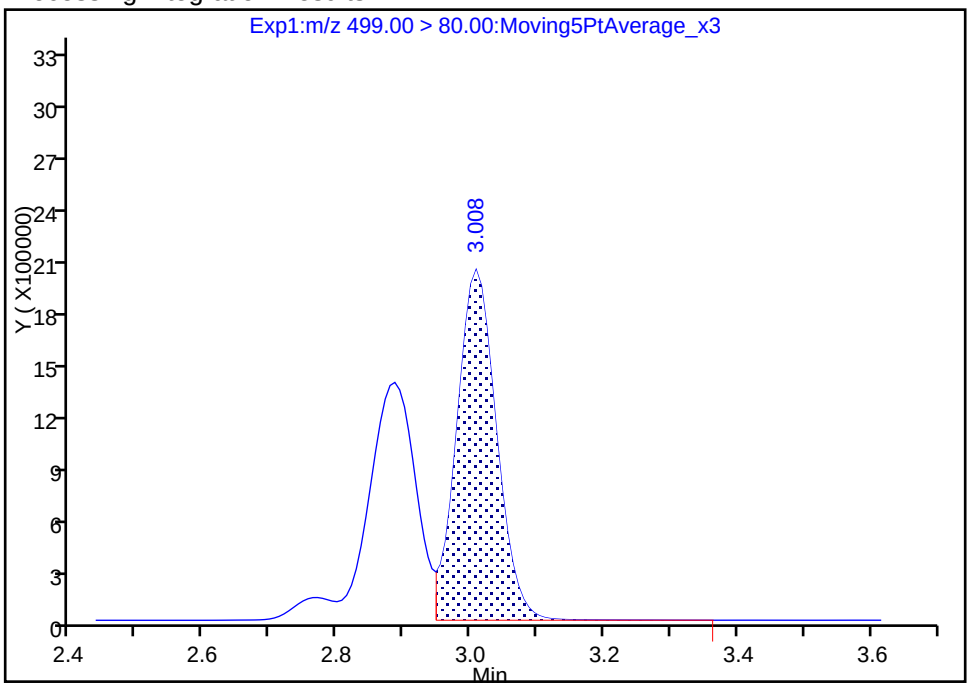
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_006.d				
Injection Date:	12-Dec-2017 22:06:17	Instrument ID:	A8_N		
Lims ID:	320-34072-A-1-A	Lab Sample ID:	320-34072-1		
Client ID:	TP-PFC-024-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	5
Injection Vol:	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

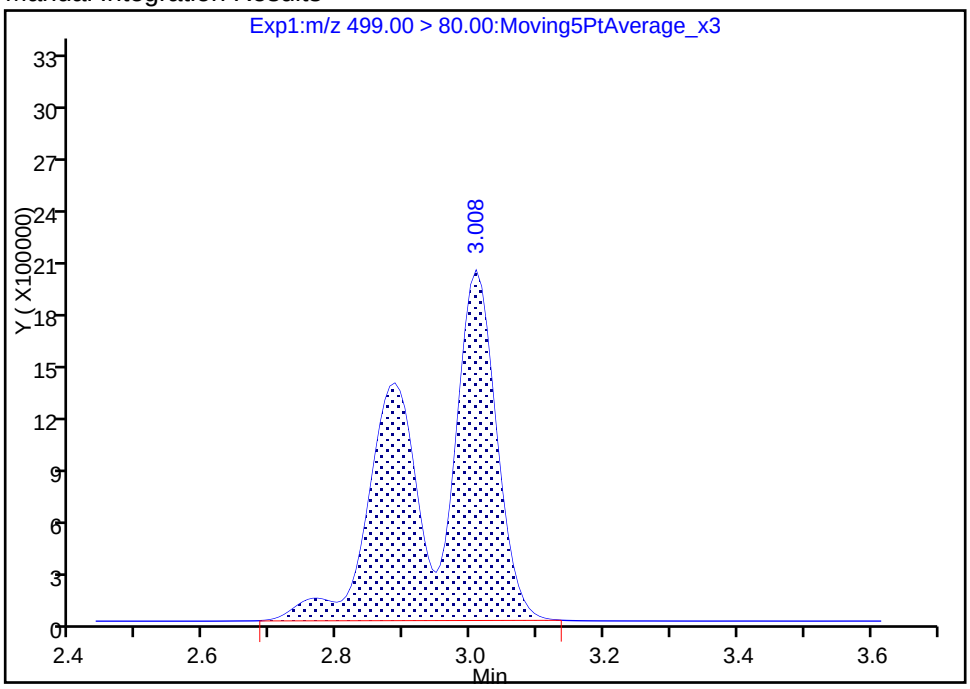
Processing Integration Results

RT: 3.01
Area: 8412232
Amount: 4.686305
Amount Units: ng/ml



Manual Integration Results

RT: 3.01
Area: 15439428
Amount: 8.601031
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:28:58

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-TPI DL | Lab Sample ID: 320-34072-1 DL

Matrix: Water | Lab File ID: 2017.12.13LLA_025.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 10:00

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 248.8(mL) | Date Analyzed: 12/13/2017 15:11

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199735 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	*Perfluorobutanoic acid (PFBA)*	*74*	*D*	*20*	10	*3.5*
2706-90-3	*Perfluoropentanoic acid (PFPeA)*	*200*	*D*	*20*	10	*4.9*
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*350*	*D*	*40*	20	*5.8*
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*72*	*D*	*20*	10	*2.5*
335-67-1	Perfluorooctanoic acid (PFOA)	1700	D M	40	20	8.5
375-95-1	*Perfluorononanoic acid (PFNA)*	*10*	*U*	*20*	10	*2.7*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*10*	*U*	*20*	10	*3.1*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*30*	*U*	*40*	30	*11*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*20*	*U*	*40*	20	*5.5*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*30*	*U*	*40*	30	*13*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*10*	*U*	*20*	10	*2.9*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*51*	*D*	*20*	10	*3.0*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*420*	*D*	*20*	10	*3.0*
375-92-8	*Perfluoroheptanesulfonic Acid (PFHpS)*	*8.8*	*J D*	*20*	10	*3.0*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*360*	*D*	*40*	20	*5.4*
335-77-3	*Perfluorodecanesulfonic acid (PFDS)*	*10*	*U*	*20*	10	*3.2*
754-91-6	*Perfluorooctane Sulfonamide (FOSA)*	*10*	*U*	*20*	10	*3.5*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-TPI DL | Lab Sample ID: 320-34072-1 DL

Matrix: Water | Lab File ID: 2017.12.13LLA_025.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 10:00

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 248.8(mL) | Date Analyzed: 12/13/2017 15:11

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199735 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	101		25-150
STL00992	13C4 PFBA	114		25-150
STL00993	13C2 PFHxA	110		25-150
STL00990	13C4 PFOA	109		25-150
STL00995	13C5 PFNA	105		25-150
STL00996	13C2 PFDA	102		25-150
STL00997	13C2 PFUnA	102		25-150
STL00998	13C2 PFDoA	101		25-150
STL00994	18O2 PFHxS	111		25-150
STL00991	13C4 PFOS	104		25-150
STL02116	13C2-PFTeDA	98		25-150
STL01892	13C4-PFHpA	113		25-150
STL01893	13C5 PFPeA	114		25-150
STL02337	13C3-PFBS	110		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51718.b\2017.12.13LLA_025.d
Lims ID: 320-34072-A-1-A
Client ID: TP-PFC-024-TPI
Sample Type: Client
Inject. Date: 13-Dec-2017 15:11:02 ALS Bottle#: 18 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-34072-a-1-a 10X
Misc. Info.: Plate: 1 Rack: 4
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51718.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 13-Dec-2017 15:35:12 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK047

First Level Reviewer: hannigana Date: 13-Dec-2017 15:35:12

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	1.399	1.401	-0.002	0.535	868477	0.2845		114	5812	
2 Perfluorobutyric acid										
212.90 > 169.00	1.404	1.402	0.002	1.004	583974	0.1850			135	
D 3 13C5-PFPeA										
267.90 > 223.00	1.648	1.646	0.002	0.631	543107	0.2852		114	5563	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.648	1.648	0.0	1.000	1237747	0.4896			774	
D 47 13C3-PFBS										
301.90 > 83.00	1.681	1.681	0.0	0.643	10167	0.2568		110	323	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.681	1.682	-0.001	1.000	418951	0.1259			1386	
298.90 > 99.00	1.681	1.682	-0.001	1.000	184450		2.27(1.25-3.74)		1022	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.924	1.923	0.001	1.000	1914738	0.8755			3855	
313.00 > 119.00	1.924	1.923	0.001	1.000	162376		11.79(5.03-15.10)		2688	
D 7 13C2 PFHxA										
315.00 > 270.00	1.924	1.924	0.0	0.736	535577	0.2738		110	6078	
D 9 13C4-PFHpA										
367.00 > 322.00	2.260	2.254	0.006	0.865	538540	0.2831		113	7667	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.249	2.255	-0.006	0.995	400387	0.1789			644	
363.00 > 169.00	2.249	2.255	-0.006	0.995	154497		2.59(1.13-3.40)		1250	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.270	2.269	0.001	1.000	2912750	1.04			14658	
399.00 > 99.00	2.270	2.269	0.001	1.000	919269		3.17(1.50-4.49)		4322	
D 11 18O2 PFHxS										
403.00 > 84.00	2.270	2.271	-0.001	0.869	623319	0.2617		111	16645	

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	2.613	2.618	-0.005	1.000	573739	0.2725		109	11437	
* 62 13C2-PFOA										
415.00 > 370.00	2.613	2.619	-0.006		512542	0.2500			8174	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.613	2.621	-0.008	1.000	10083421	4.12			4979	
413.00 > 169.00	2.613	2.621	-0.008	1.000	6000991		1.68(0.84-2.52)		17733	M
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.628	2.626	0.002	1.000	46050	0.0219			147	
449.00 > 99.00	2.620	2.626	-0.006	0.997	16875		2.73(1.94-5.82)		216	
D 18 13C4 PFOS										
503.00 > 80.00	2.987	2.993	-0.006	1.143	385973	0.2492		104	8602	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.987	2.994	-0.007	1.000	1497465	0.8947			4200	
499.00 > 99.00	2.987	2.994	-0.007	1.000	334372		4.48(2.31-6.93)		3842	
D 19 13C5 PFNA										
468.00 > 423.00	2.987	2.994	-0.007	1.143	400394	0.2631		105	8059	
D 23 13C2 PFDA										
515.00 > 470.00	3.351	3.356	-0.005	1.282	328371	0.2546		102	6370	
D 21 13C8 FOSA										
506.00 > 78.00	3.351	3.359	-0.008	1.282	526725	0.2526		101	7761	
D 30 13C2 PFUnA										
565.00 > 520.00	3.674	3.685	-0.011	1.406	252485	0.2542		102	5672	
D 36 13C2 PFDoA										
615.00 > 570.00	3.975	3.979	-0.004	1.521	279984	0.2532		101	6105	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.474	4.481	-0.007	1.712	317123	0.2461		98.5	3792	

QC Flag Legend

Review Flags

M - Manually Integrated

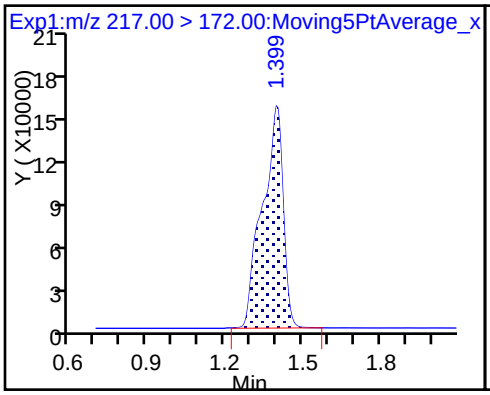
Report Date: 13-Dec-2017 15:35:12 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

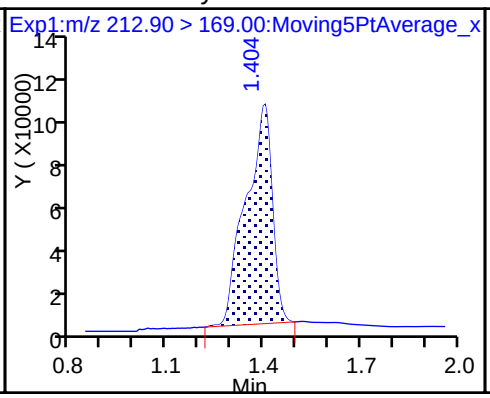
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51718.b\2017.12.13LLA_025.d

Injection Date:	13-Dec-2017 15:11:02	Instrument ID:	A8_N		
Lims ID:	320-34072-A-1-A	Lab Sample ID:	320-34072-1		
Client ID:	TP-PFC-024-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	18	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

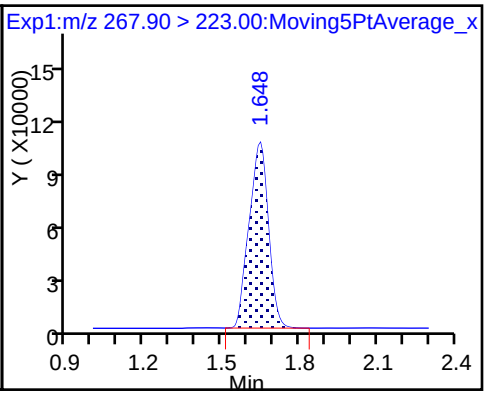
D 1 13C4 PFBA



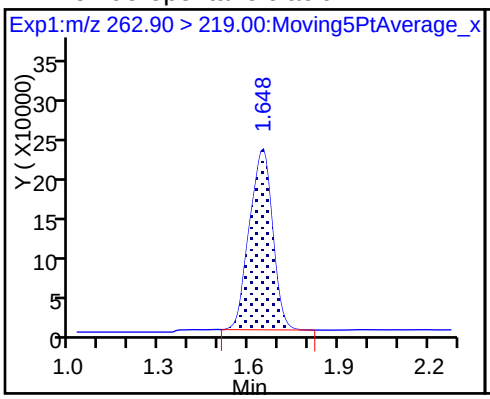
2 Perfluorobutyric acid



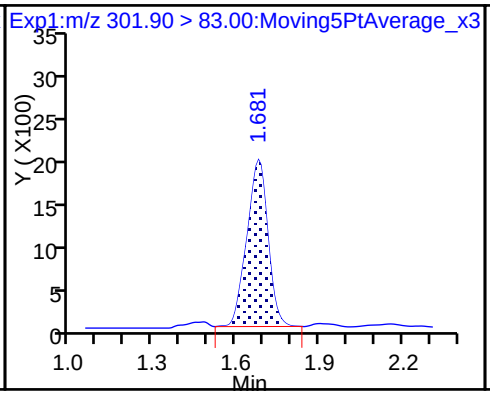
D 3 13C5-PFPeA



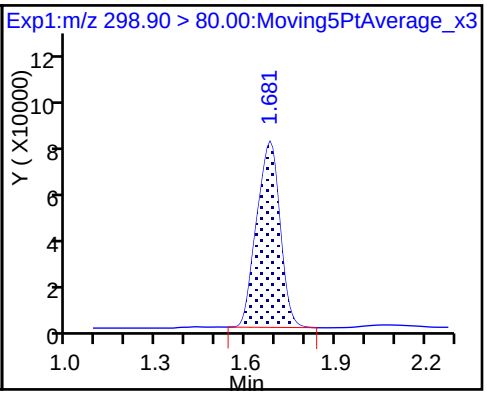
4 Perfluoropentanoic acid



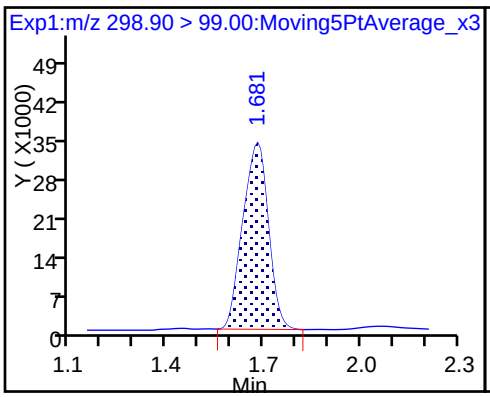
D 47 13C3-PFBS



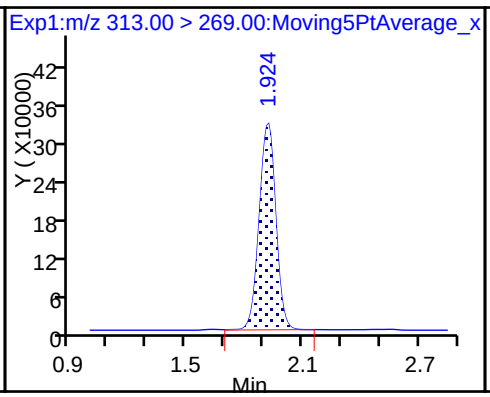
5 Perfluorobutanesulfonic acid



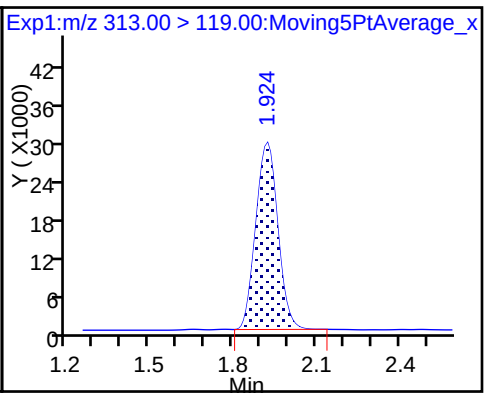
5 Perfluorobutanesulfonic acid



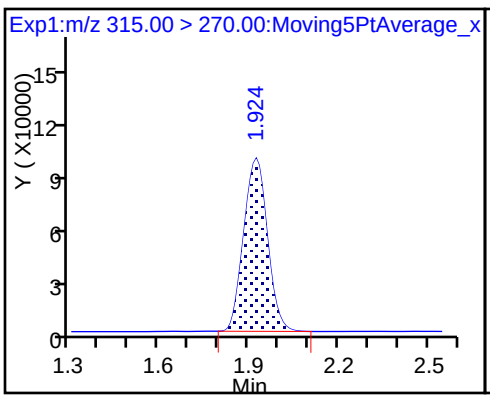
6 Perfluorohexanoic acid



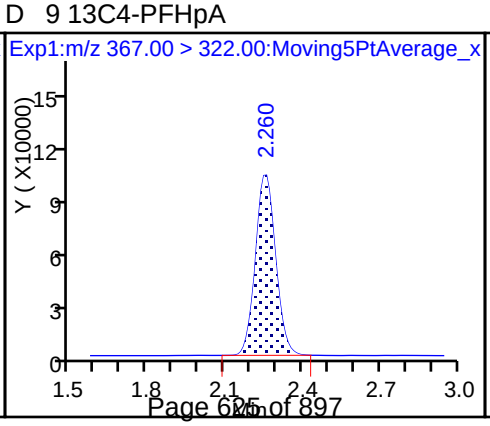
6 Perfluorohexanoic acid



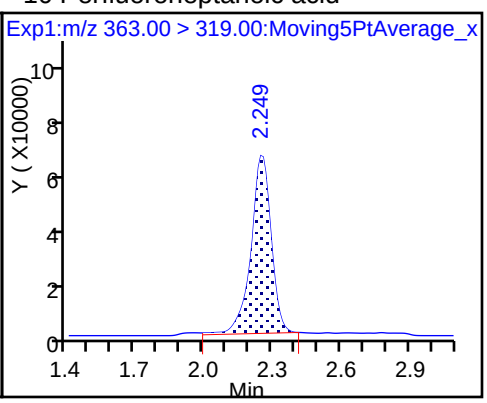
D 7 13C2 PFHxA



D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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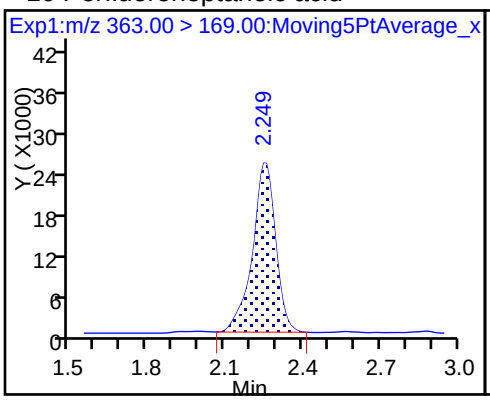
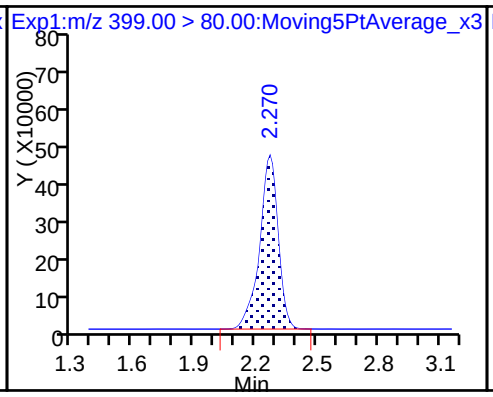
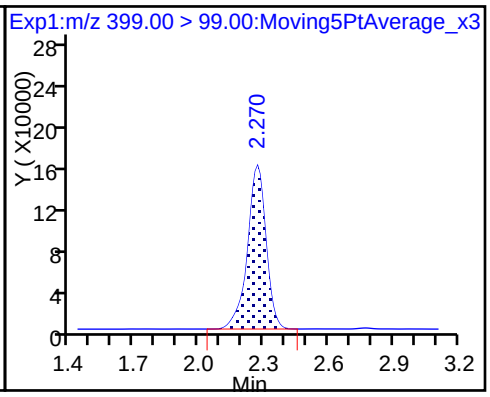


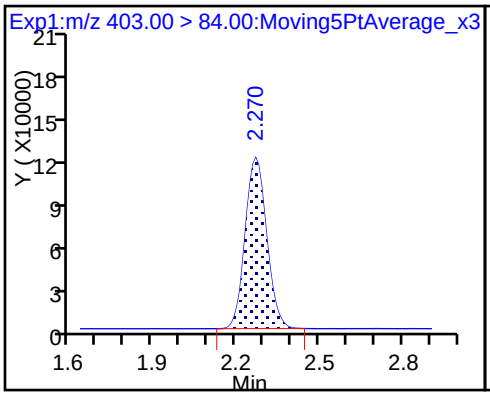
8 Perfluorohexanesulfonic acid



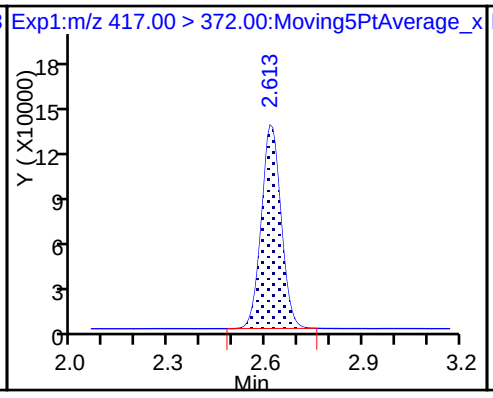
8 Perfluorohexanesulfonic acid



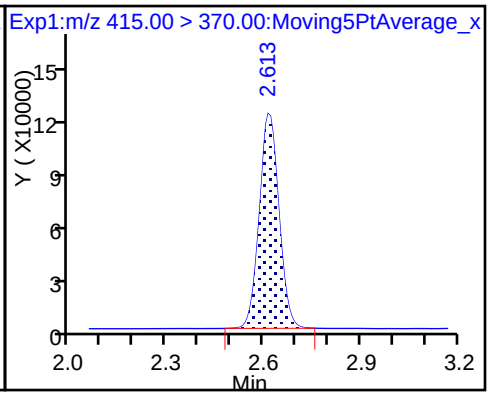
D 11 18O2 PFHxS



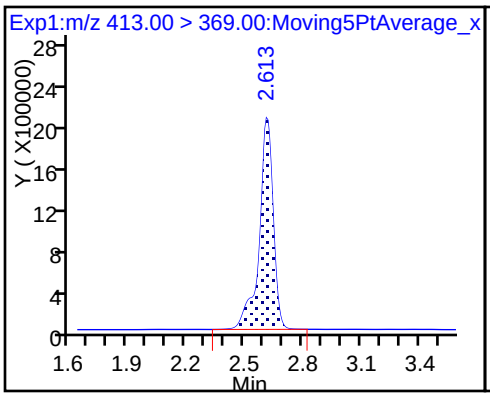
D 14 13C4 PFOA



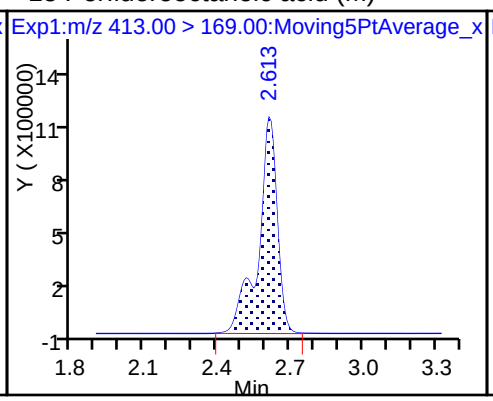
* 62 13C2-PFOA



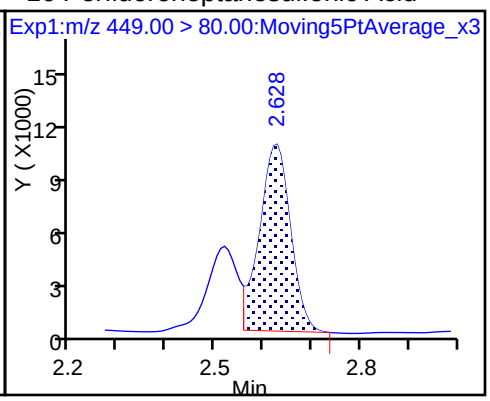
15 Perfluorooctanoic acid



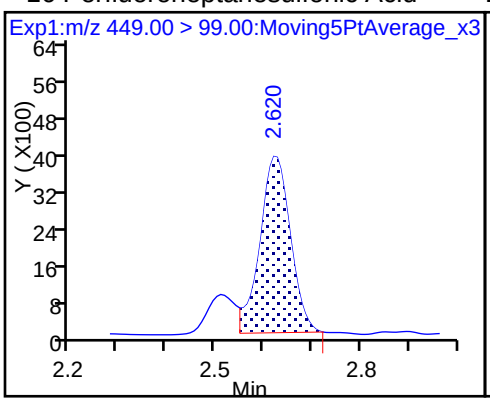
15 Perfluorooctanoic acid (M)



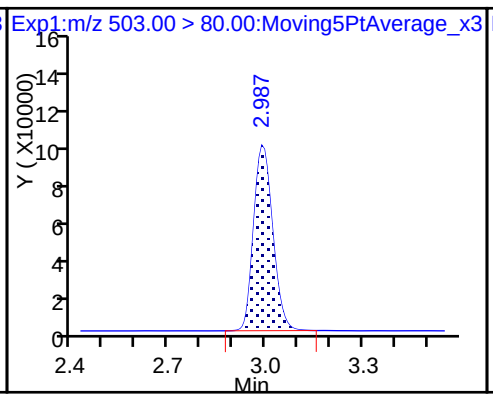
16 Perfluoroheptanesulfonic Acid



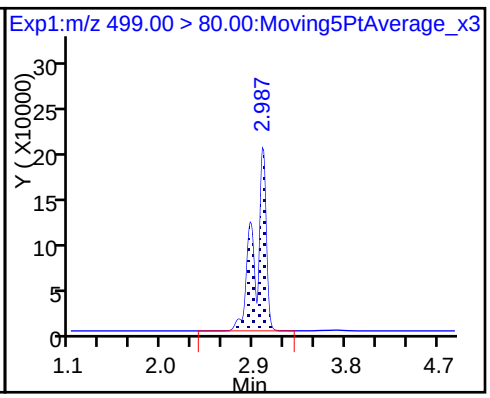
16 Perfluoroheptanesulfonic Acid



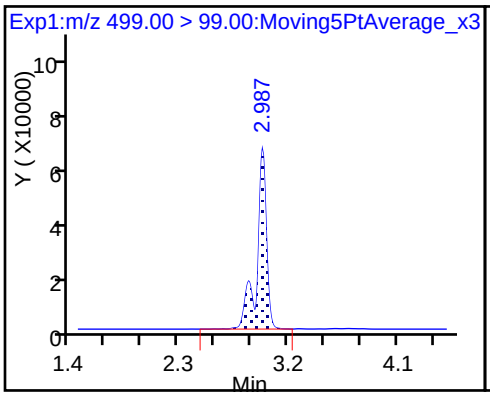
D 18 13C4 PFOS



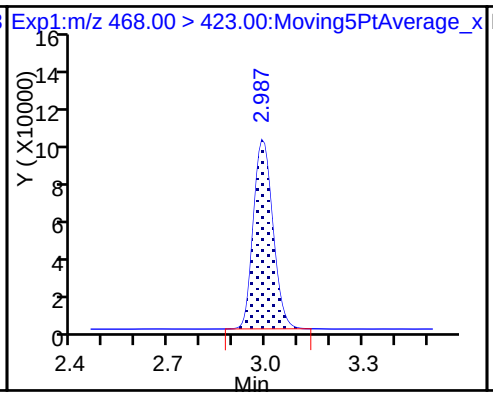
17 Perfluorooctane sulfonic acid



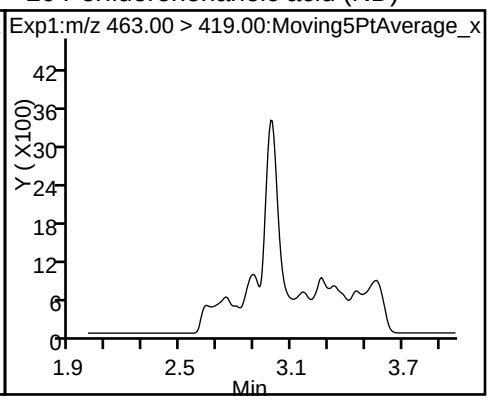
17 Perfluorooctane sulfonic acid



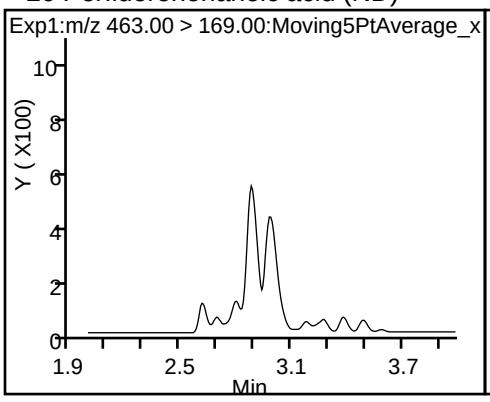
D 19 13C5 PFNA



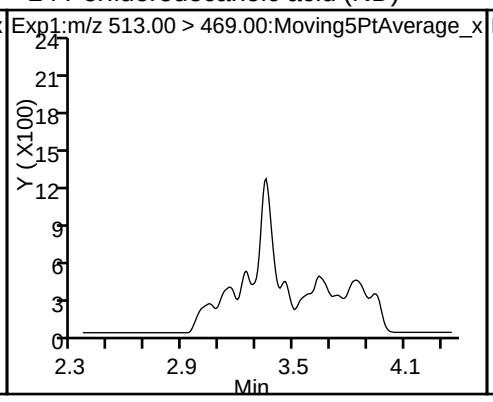
20 Perfluorononanoic acid (ND)



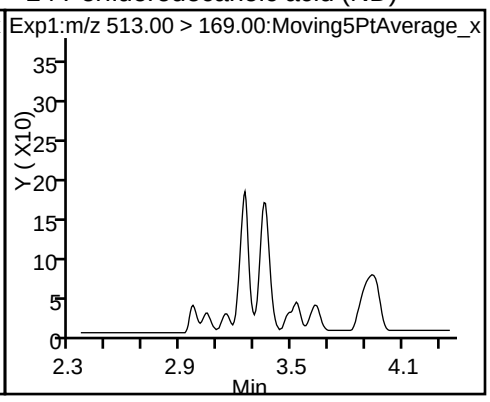
20 Perfluorononanoic acid (ND)



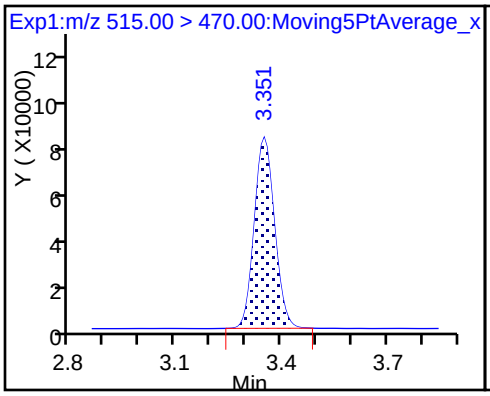
24 Perfluorodecanoic acid (ND)



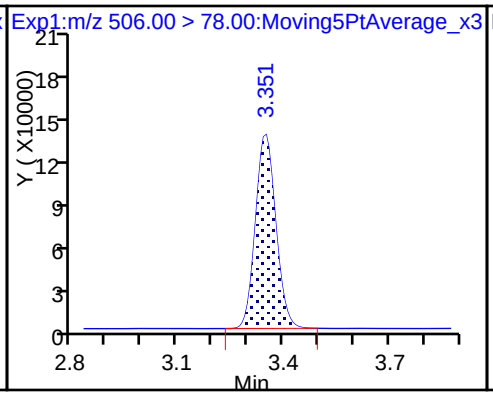
24 Perfluorodecanoic acid (ND)



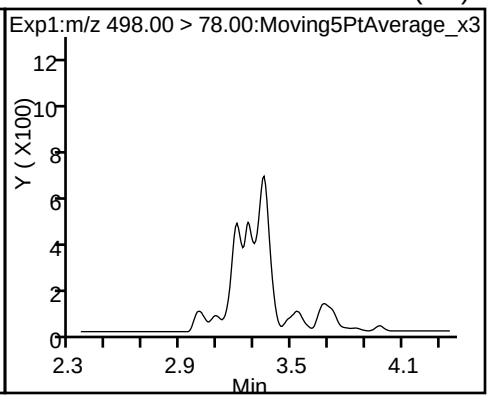
D 23 13C2 PFDA



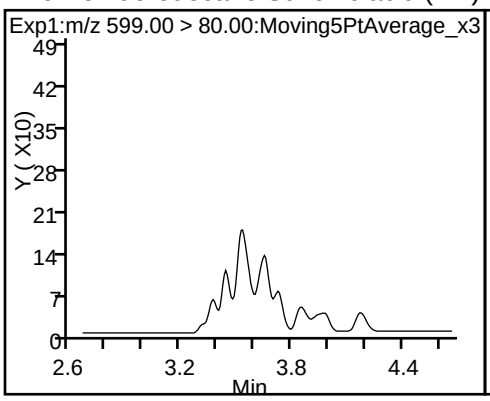
D 21 13C8 FOSA



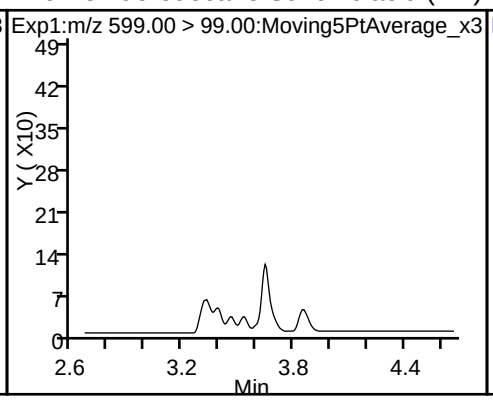
22 Perfluorooctane Sulfonamide (ND)



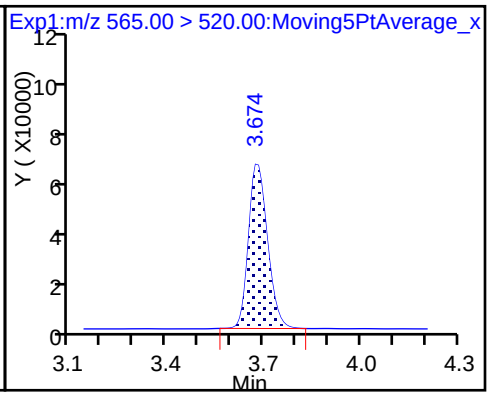
29 Perfluorodecane Sulfonic acid (ND)



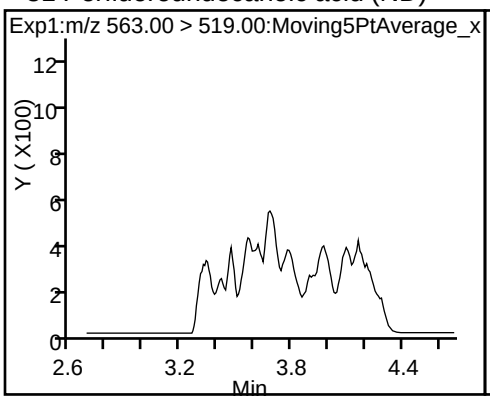
29 Perfluorodecane Sulfonic acid (ND)



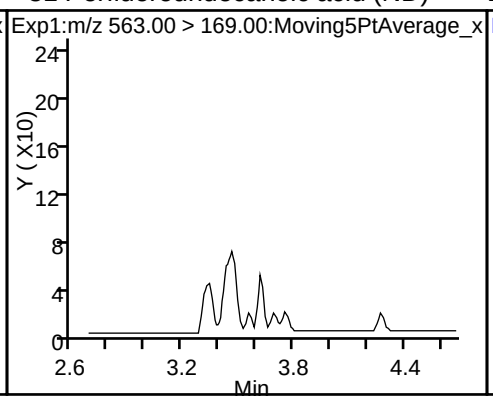
D 30 13C2 PFUnA



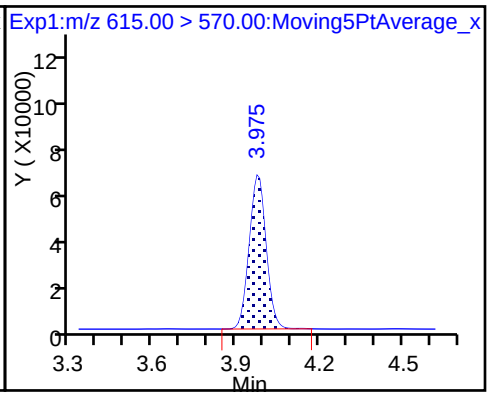
31 Perfluoroundecanoic acid (ND)



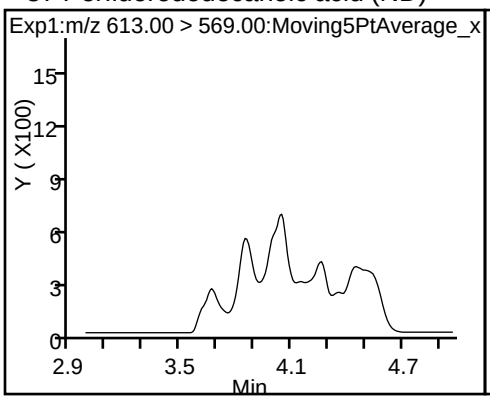
31 Perfluoroundecanoic acid (ND)



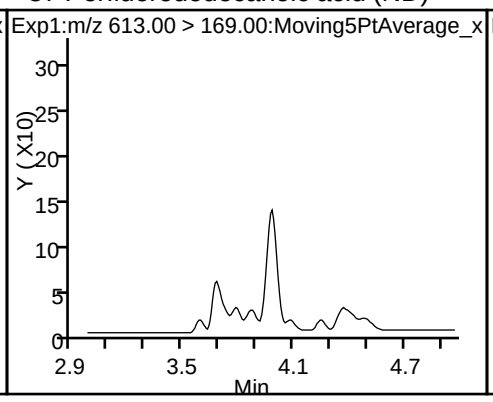
D 36 13C2 PFDoA



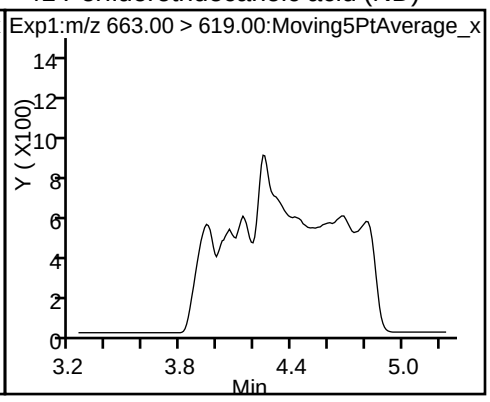
37 Perfluorododecanoic acid (ND)



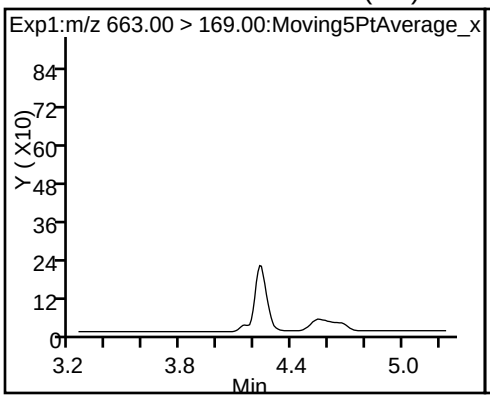
37 Perfluorododecanoic acid (ND)



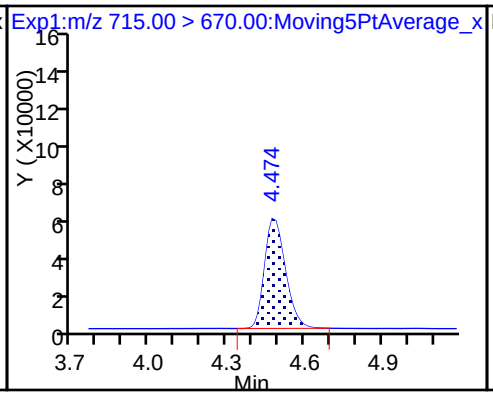
41 Perfluorotridecanoic acid (ND)



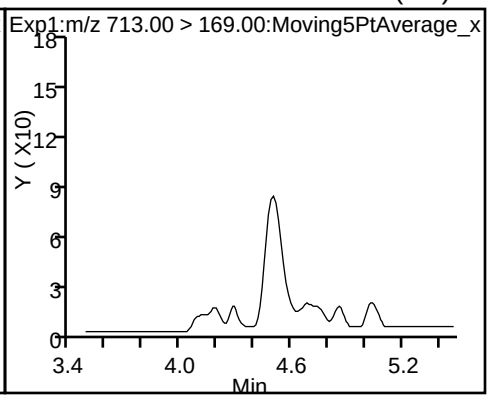
41 Perfluorotridecanoic acid (ND)



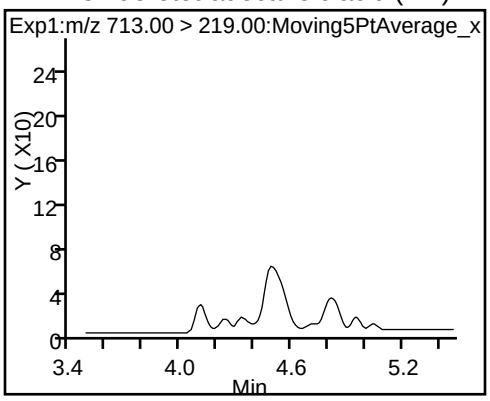
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

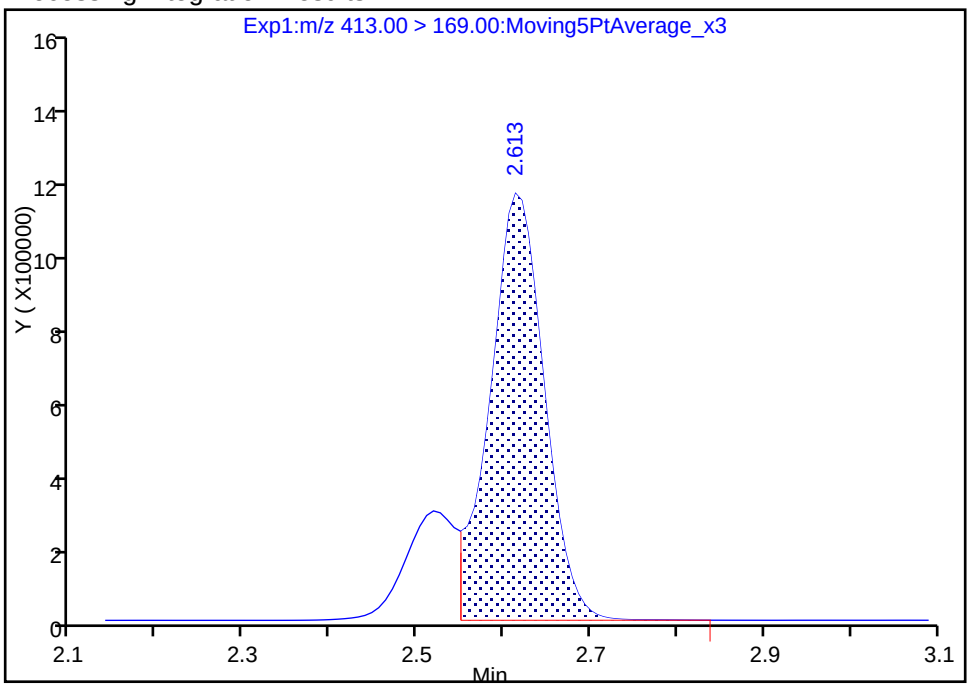
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51718.b\2017.12.13LLA_025.d				
Injection Date:	13-Dec-2017 15:11:02	Instrument ID:	A8_N		
Lims ID:	320-34072-A-1-A	Lab Sample ID:	320-34072-1		
Client ID:	TP-PFC-024-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	18	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
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: 2.61
Area: 4845231
Amount: 4.119501
Amount Units: ng/ml



Manual Integration Results

RT: 2.61
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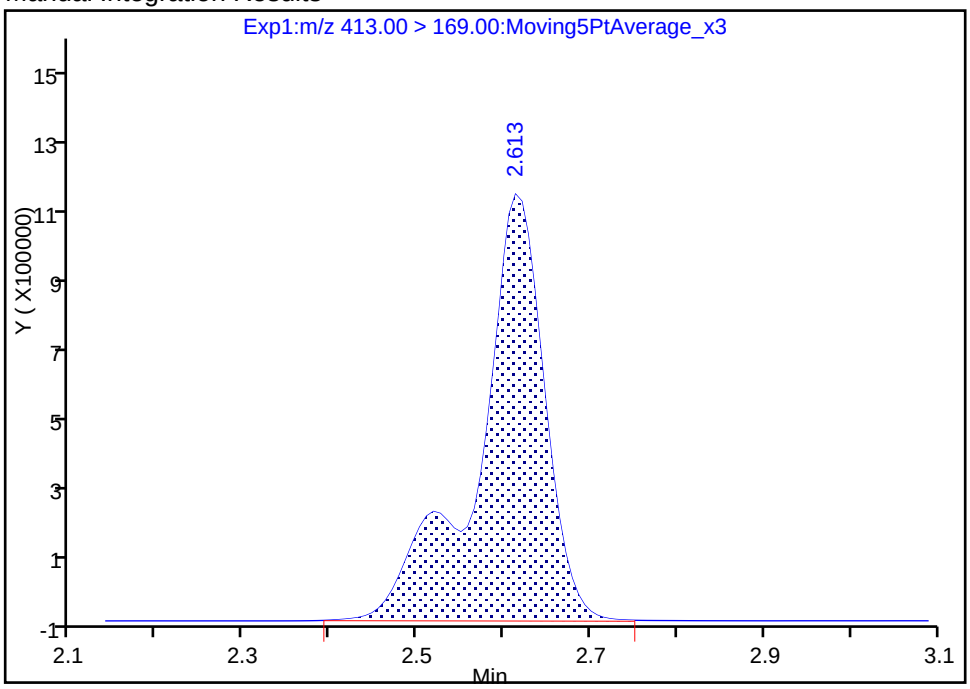
Amount: 4.119501
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 15:34:49

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-MID-CARBON | Lab Sample ID: 320-34072-2

Matrix: Water | Lab File ID: 2017.12.12LLB_007.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 09:40

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 253.6(mL) | Date Analyzed: 12/12/2017 22:14

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	140	M	2.0	0.99	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	120		2.0	0.99	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	34		3.9	2.0	0.57
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.50	J M	2.0	0.99	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	4.2	M	3.9	2.0	0.84
375-95-1	Perfluorononanoic acid (PFNA)	0.99	U	2.0	0.99	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	0.99	U	2.0	0.99	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	3.0	U	3.9	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	3.9	2.0	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	3.9	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.99	U	2.0	0.99	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.59	J	2.0	0.99	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.51	J	2.0	0.99	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.99	U	2.0	0.99	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	3.9	2.0	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.99	U	2.0	0.99	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.99	U	2.0	0.99	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-MID-CARBON | Lab Sample ID: 320-34072-2

Matrix: Water | Lab File ID: 2017.12.12LLB_007.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 09:40

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 253.6(mL) | Date Analyzed: 12/12/2017 22:14

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	101		25-150
STL00992	13C4 PFBA	113		25-150
STL00993	13C2 PFHxA	108		25-150
STL00990	13C4 PFOA	108		25-150
STL00995	13C5 PFNA	109		25-150
STL00996	13C2 PFDA	106		25-150
STL00997	13C2 PFUnA	102		25-150
STL00998	13C2 PFDoA	100		25-150
STL00994	18O2 PFHxS	106		25-150
STL00991	13C4 PFOS	107		25-150
STL02116	13C2-PFTeDA	123		25-150
STL01892	13C4-PFHpA	110		25-150
STL01893	13C5 PFPeA	112		25-150
STL02337	13C3-PFBS	101		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_007.d
Lims ID: 320-34072-A-2-A
Client ID: TP-PFC-024-MID-CARBON
Sample Type: Client
Inject. Date: 12-Dec-2017 22:14:11 ALS Bottle#: 5 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-34072-a-2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 13-Dec-2017 13:39:08 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK047

First Level Reviewer: hannigana Date: 13-Dec-2017 12:11:42

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	1.399	1.401	-0.002	0.533	8945754	2.83		113	57539	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.399	1.402	-0.003	1.000	11424016	3.51			2269	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.649	1.646	0.003	0.629	5516614	2.79		112	82516	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.642	1.648	-0.006	0.995	7606241	2.96			5523	
D 47 13C3-PFBS										
301.90 > 83.00	1.682	1.681	0.001	0.641	96818	2.36		101	4042	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.682	1.682	0.0	1.000	47048	0.0148			221	
298.90 > 99.00	1.674	1.682	-0.008	0.995	25935		1.81(1.25-3.74)		184	
6 Perfluorohexanoic acid										R
313.00 > 269.00	1.916	1.923	-0.007	0.995	1954202	0.8748			3888	R
313.00 > 119.00	1.925	1.923	0.002	1.000	95084		20.55(5.03-15.10)		2335	
D 7 13C2 PFHxA										
315.00 > 270.00	1.925	1.924	0.001	0.734	5470490	2.70		108	54850	
D 9 13C4-PFHpA										
367.00 > 322.00	2.263	2.254	0.009	0.862	5440090	2.76		110	47769	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.252	2.255	-0.003	0.995	28633	0.0127			37.9	M
363.00 > 169.00	2.263	2.255	0.008	1.000	11968		2.39(1.13-3.40)		60.8	M
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.273	2.269	0.004	1.000	36256	0.0130			299	
399.00 > 99.00	2.273	2.269	0.004	1.000	12974		2.79(1.50-4.49)		96.5	
D 11 18O2 PFHxS										
403.00 > 84.00	2.273	2.271	0.002	0.866	6195151	2.51		106	103798	

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	2.624	2.618	0.006	1.000	5890946	2.70		108	68686	
* 62 13C2-PFOA										
415.00 > 370.00	2.624	2.619	0.005		5314133	2.50			71892	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.624	2.621	0.003	1.000	265773	0.1057			102	M
413.00 > 169.00	2.624	2.621	0.003	1.000	182721		1.45(0.84-2.52)		613	M
D 18 13C4 PFOS										
503.00 > 80.00	2.999	2.993	0.006	1.143	4102002	2.55		107	44946	
D 19 13C5 PFNA										
468.00 > 423.00	2.999	2.994	0.005	1.143	4304077	2.73		109	51071	
D 23 13C2 PFDA										
515.00 > 470.00	3.362	3.356	0.006	1.282	3535762	2.64		106	45137	
D 21 13C8 FOSA										
506.00 > 78.00	3.347	3.359	-0.012	1.276	5436098	2.51		101	26214	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.347	3.359	-0.012	1.000	5422	0.002662			162	
D 30 13C2 PFUnA										
565.00 > 520.00	3.697	3.685	0.012	1.409	2622516	2.55		102	35358	
D 36 13C2 PFDoA										
615.00 > 570.00	3.989	3.979	0.010	1.520	2870683	2.50		100	33634	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.500	4.481	0.019	1.715	4104730	3.07		123	32510	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 13-Dec-2017 13:39:18 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_007.d

Injection Date: 12-Dec-2017 22:14:11 Instrument ID: A8_N

Lims ID: 320-34072-A-2-A Lab Sample ID: 320-34072-2

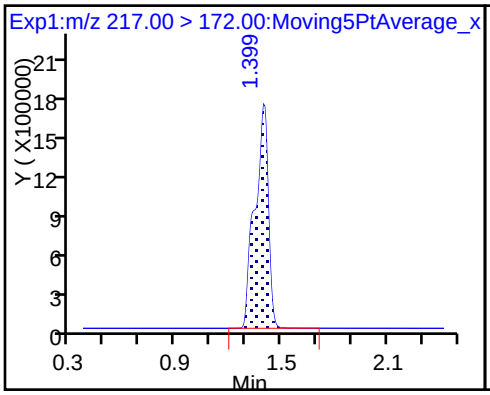
Client ID: TP-PFC-024-MID-CARBON

Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 6

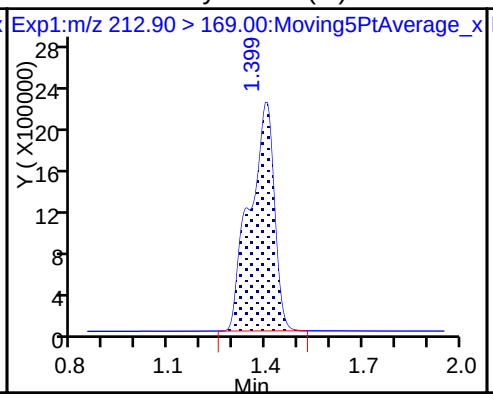
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

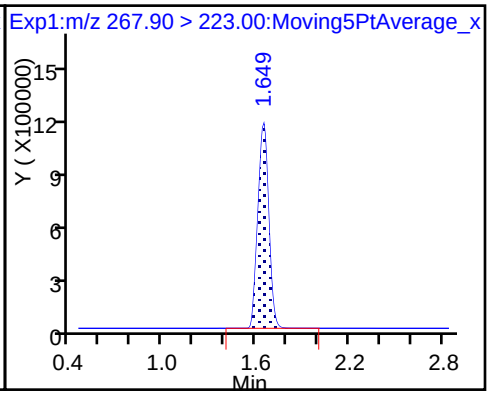
D 1 13C4 PFBA



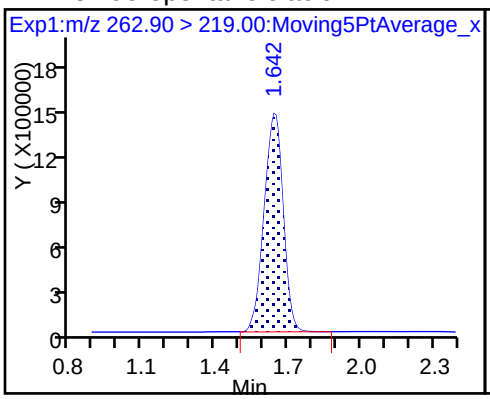
2 Perfluorobutyric acid (M)



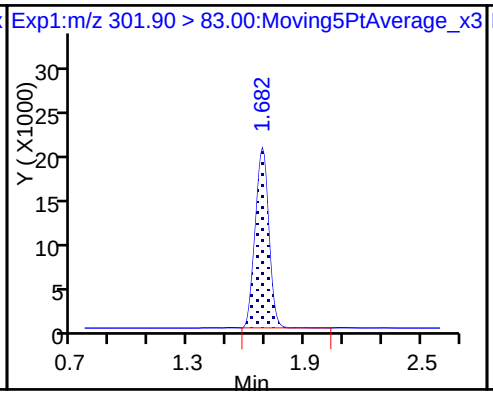
D 3 13C5-PFPeA



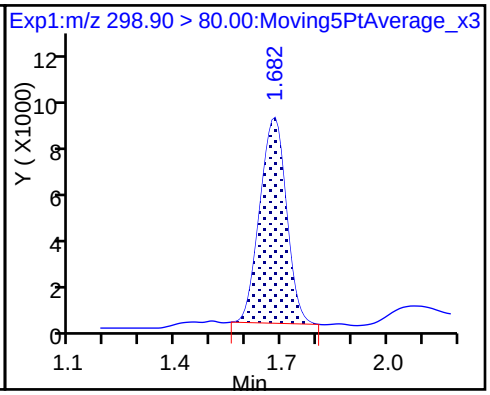
4 Perfluoropentanoic acid



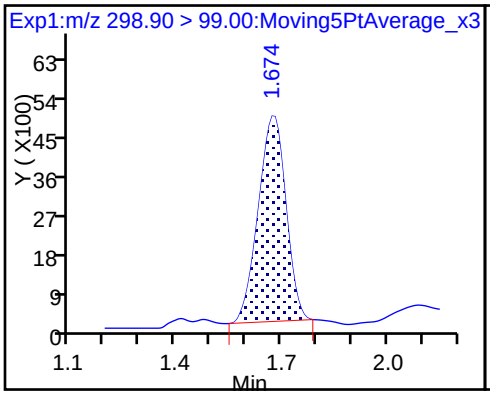
D 47 13C3-PFBS



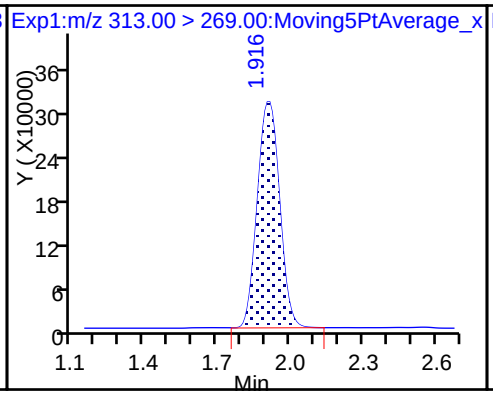
5 Perfluorobutanesulfonic acid



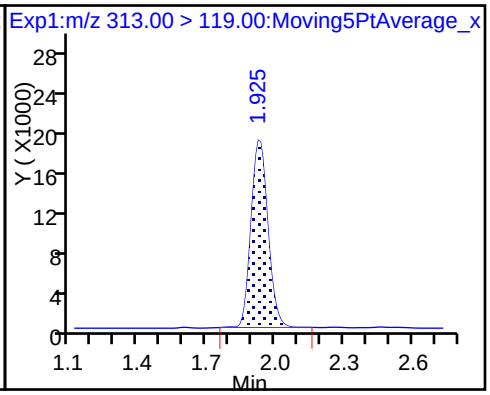
5 Perfluorobutanesulfonic acid



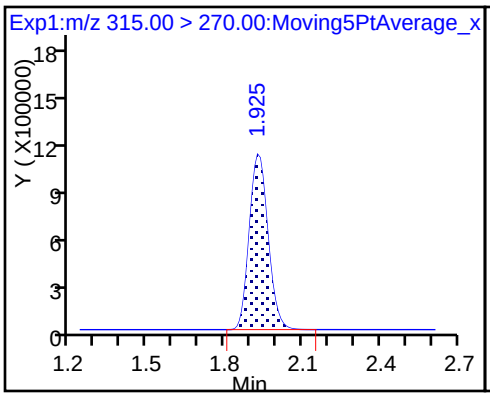
6 Perfluorohexanoic acid



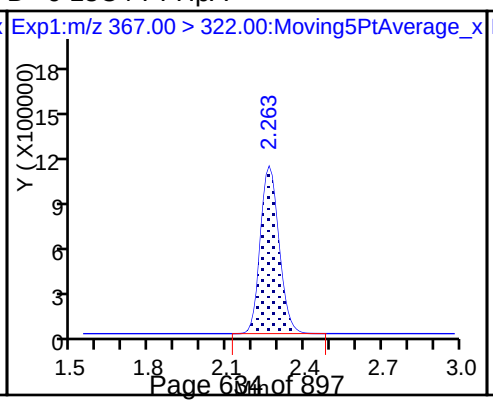
6 Perfluorohexanoic acid



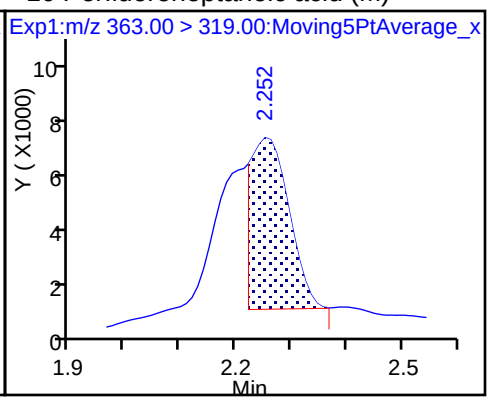
D 7 13C2 PFHxA



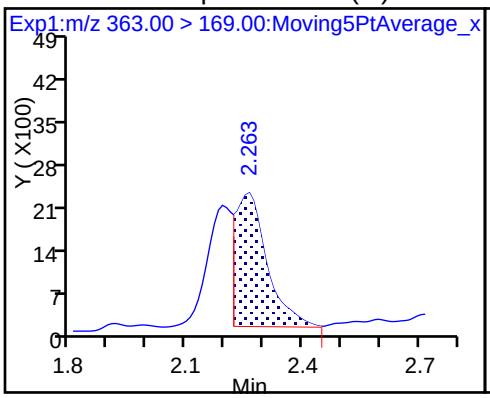
D 9 13C4-PFHpA



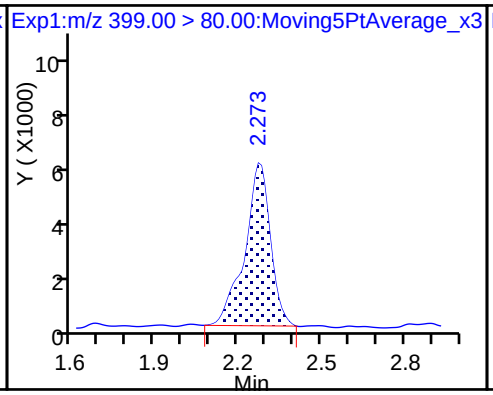
10 Perfluoroheptanoic acid (M)



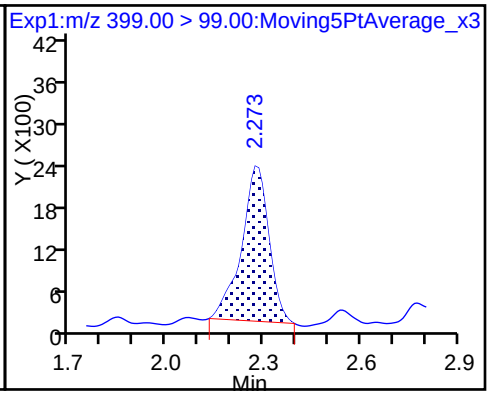
10 Perfluoroheptanoic acid (M)



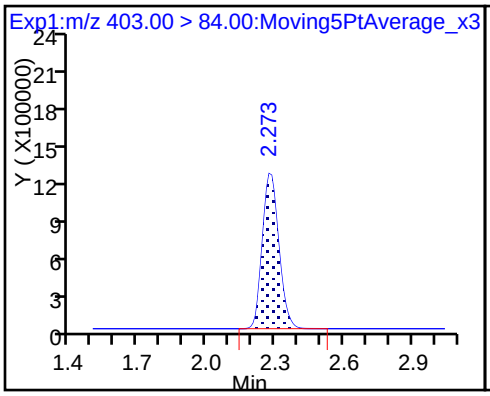
8 Perfluorohexanesulfonic acid



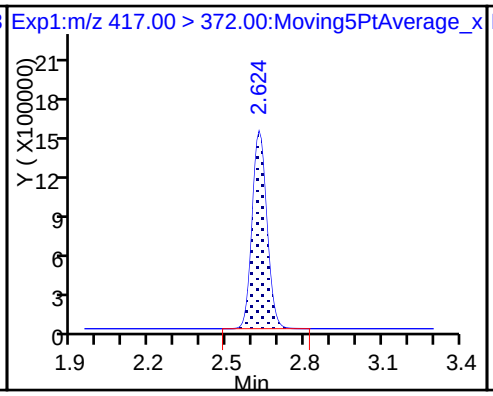
8 Perfluorohexanesulfonic acid



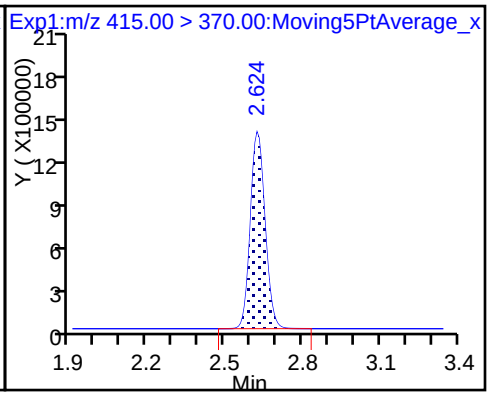
D 11 18O2 PFHxS



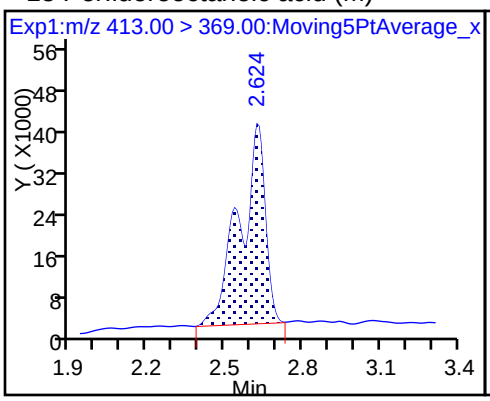
D 14 13C4 PFOA



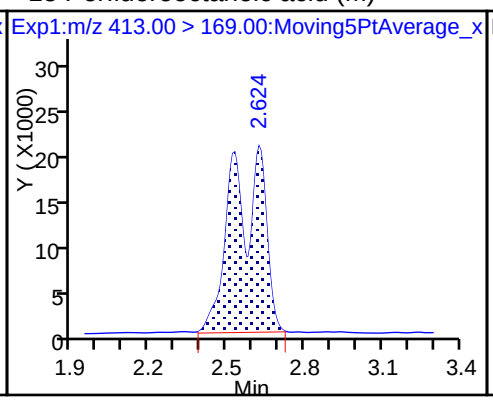
* 62 13C2-PFOA



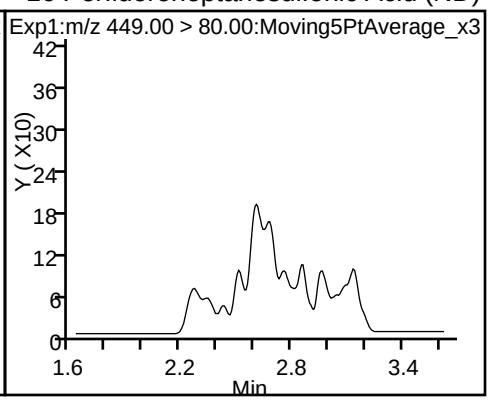
15 Perfluorooctanoic acid (M)



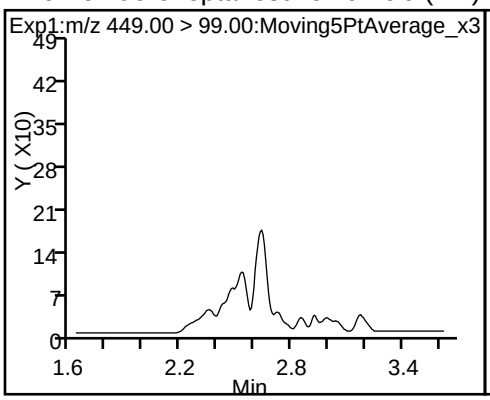
15 Perfluorooctanoic acid (M)



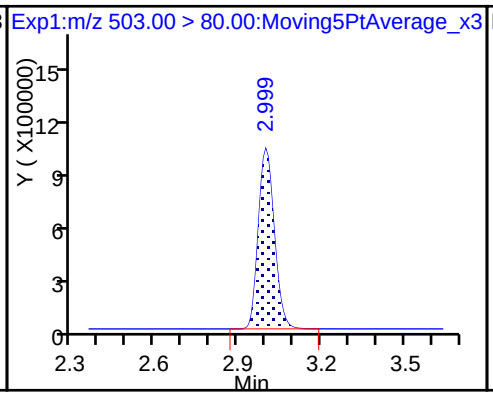
16 Perfluoroheptanesulfonic Acid (ND)



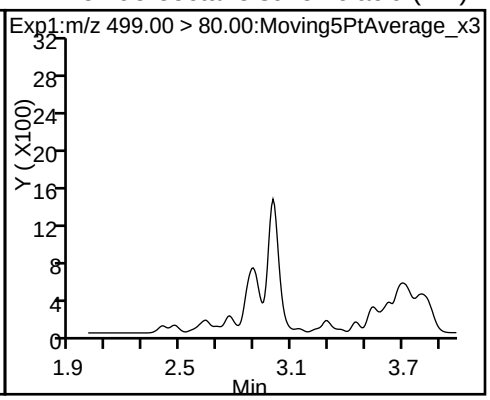
16 Perfluoroheptanesulfonic Acid (ND)



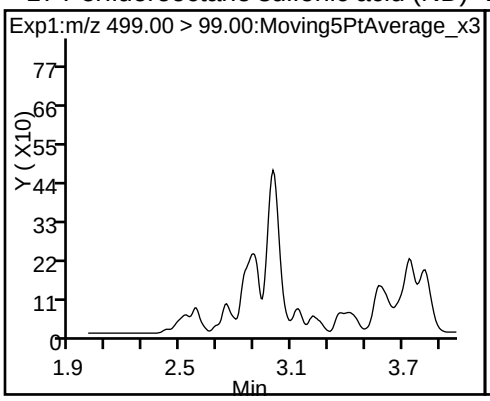
D 18 13C4 PFOS



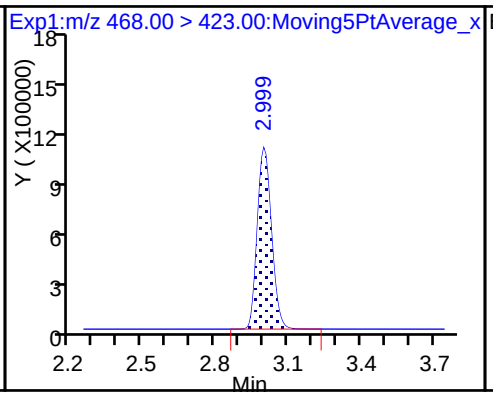
17 Perfluorooctane sulfonic acid (ND)



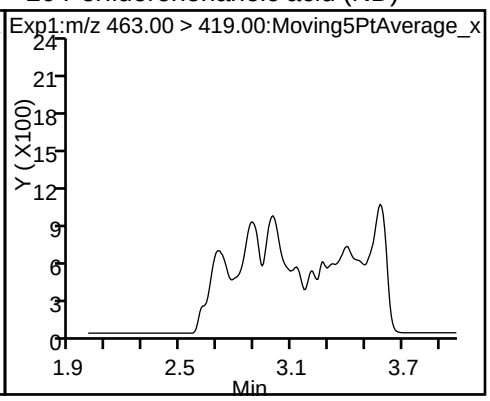
17 Perfluorooctane sulfonic acid (ND)



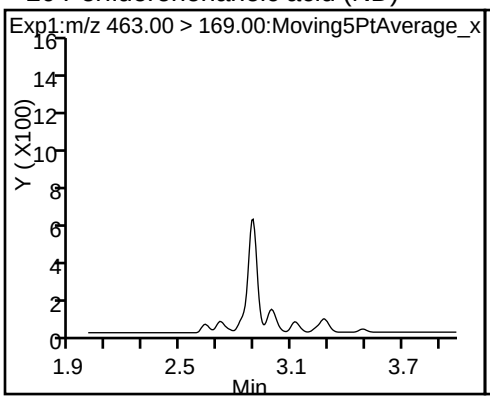
D 19 13C5 PFNA



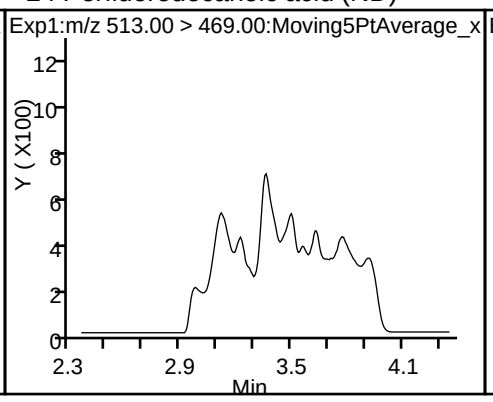
20 Perfluorononanoic acid (ND)



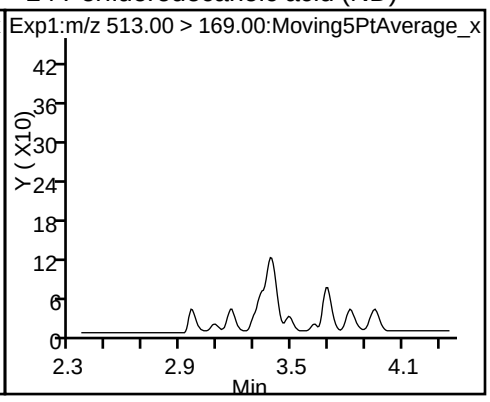
20 Perfluorononanoic acid (ND)



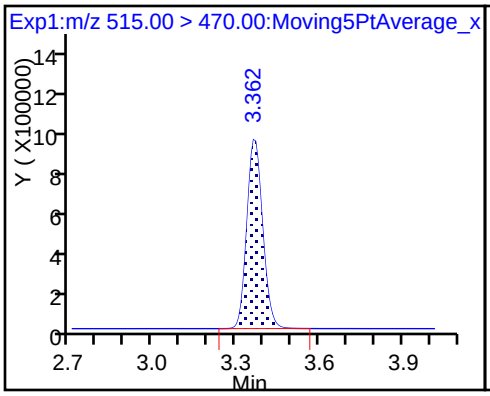
24 Perfluorodecanoic acid (ND)



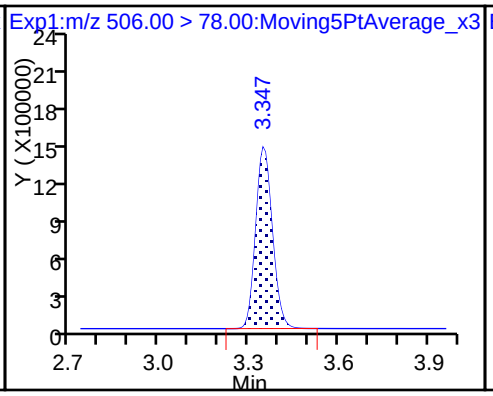
24 Perfluorodecanoic acid (ND)



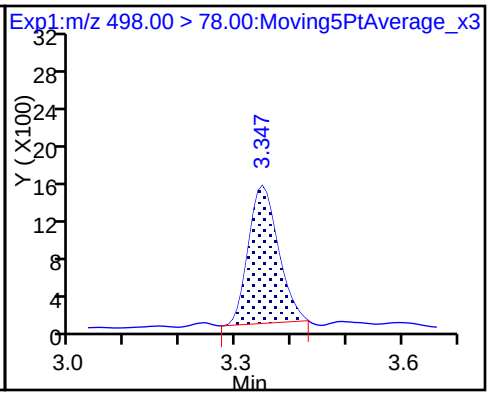
D 23 13C2 PFDA



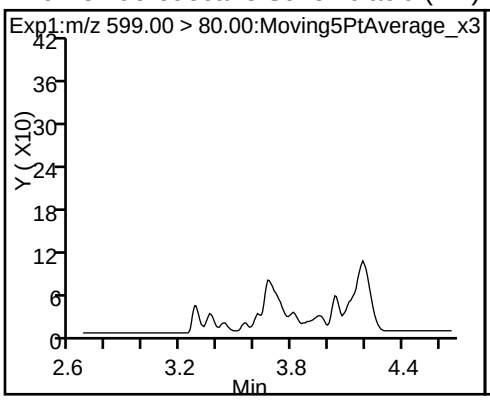
D 21 13C8 FOSA



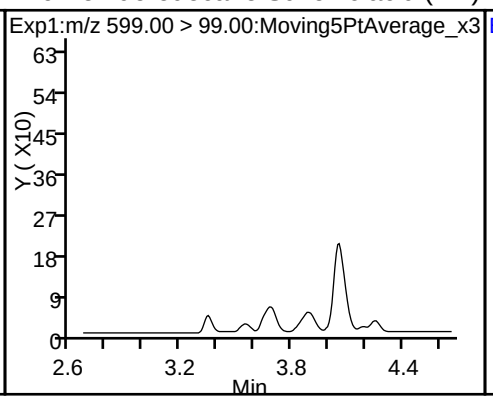
22 Perfluorooctane Sulfonamide



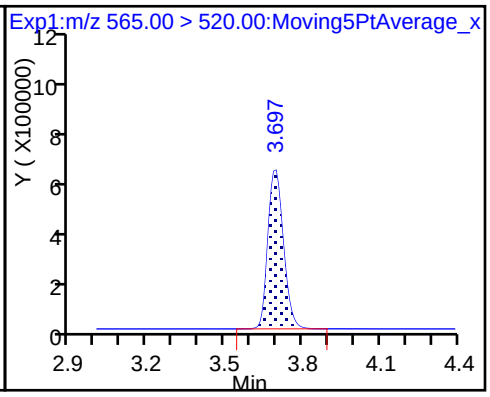
29 Perfluorodecane Sulfonic acid (ND)



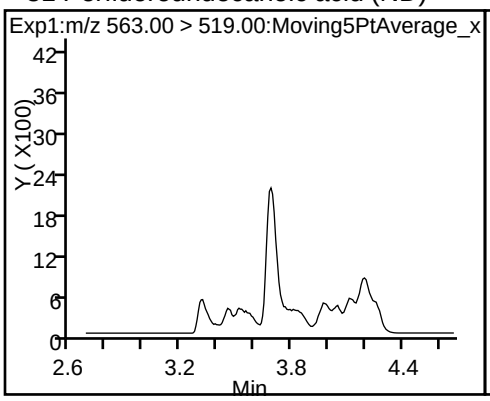
29 Perfluorodecane Sulfonic acid (ND)



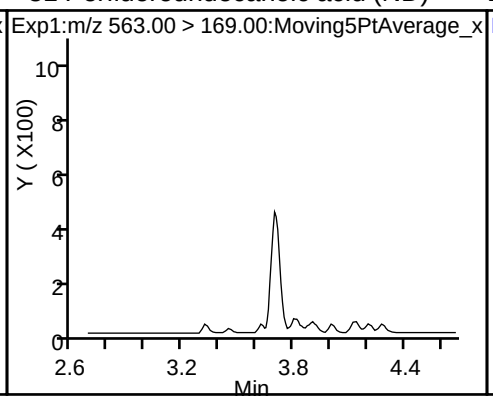
D 30 13C2 PFUnA



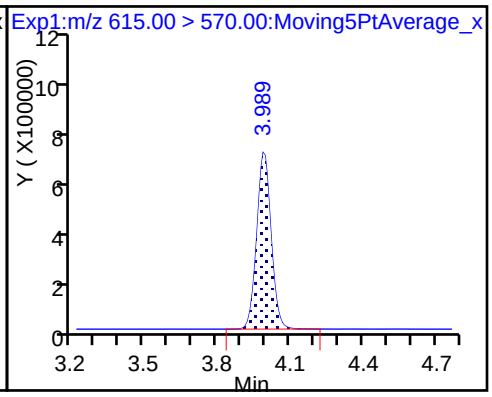
31 Perfluoroundecanoic acid (ND)



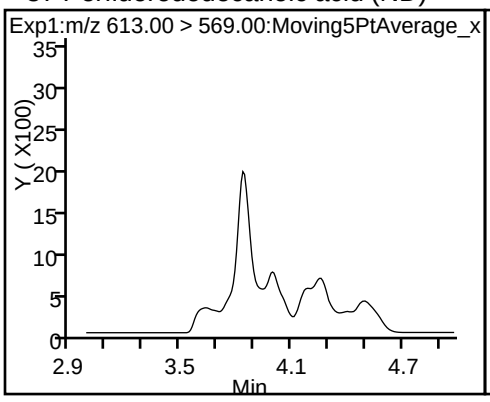
31 Perfluoroundecanoic acid (ND)



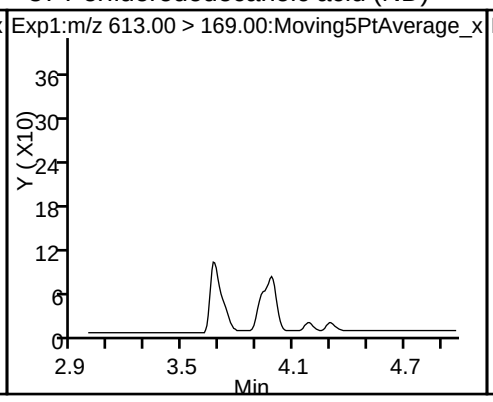
D 36 13C2 PFDoA



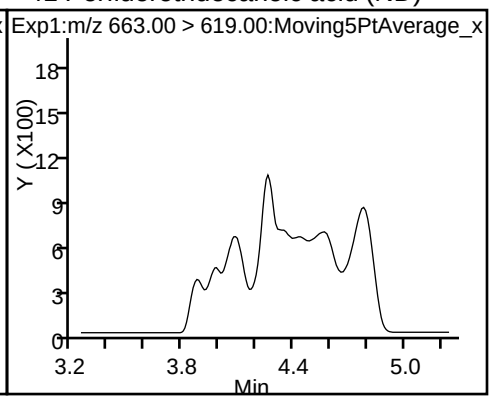
37 Perfluorododecanoic acid (ND)



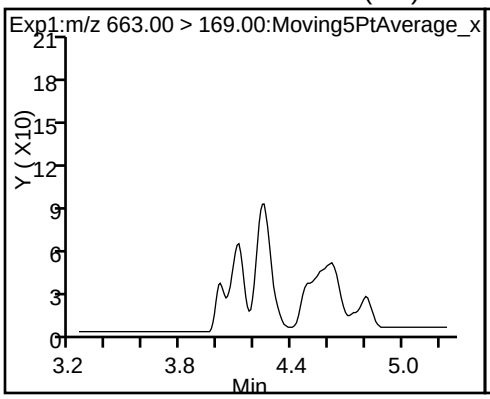
37 Perfluorododecanoic acid (ND)



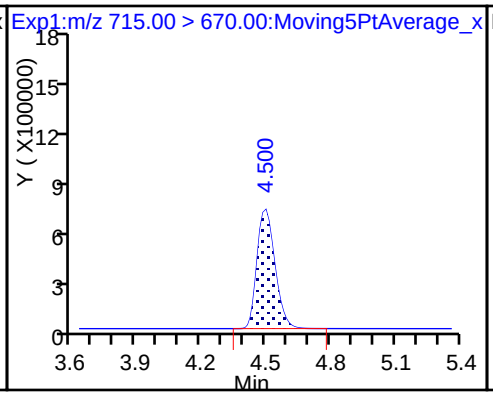
41 Perfluorotridecanoic acid (ND)



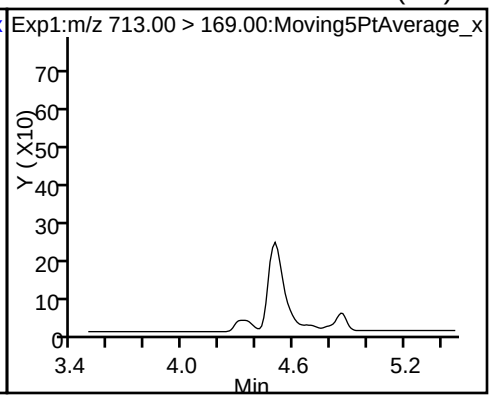
41 Perfluorotridecanoic acid (ND)



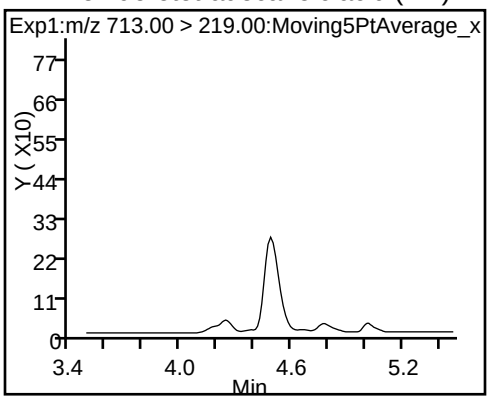
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

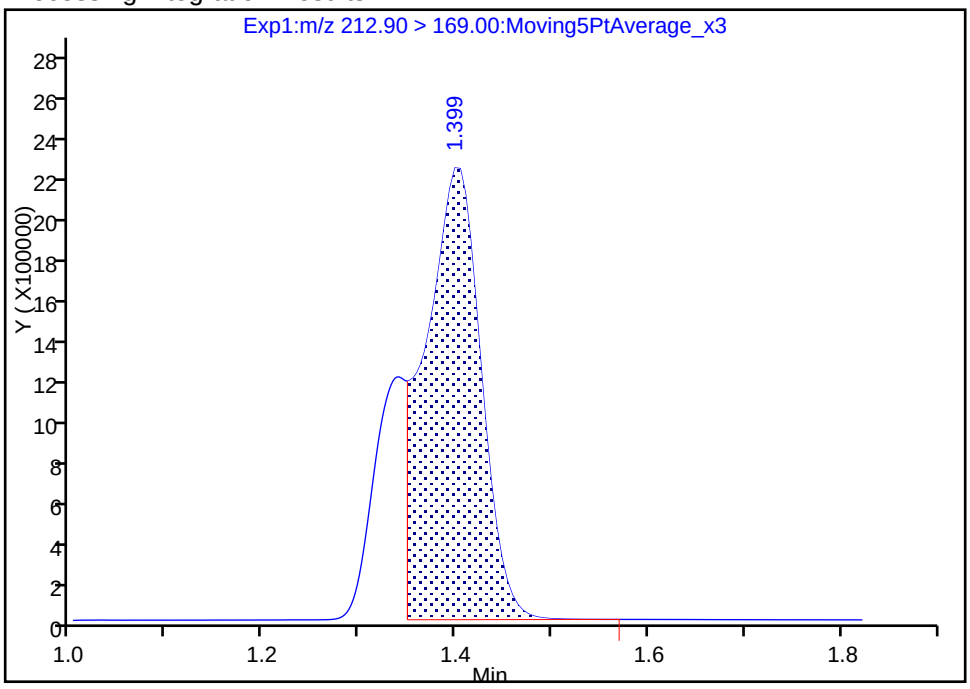
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_007.d				
Injection Date:	12-Dec-2017 22:14:11	Instrument ID:	A8_N		
Lims ID:	320-34072-A-2-A	Lab Sample ID:	320-34072-2		
Client ID:	TP-PFC-024-MID-CARBON				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	5	Worklist Smp#:	6
Injection 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

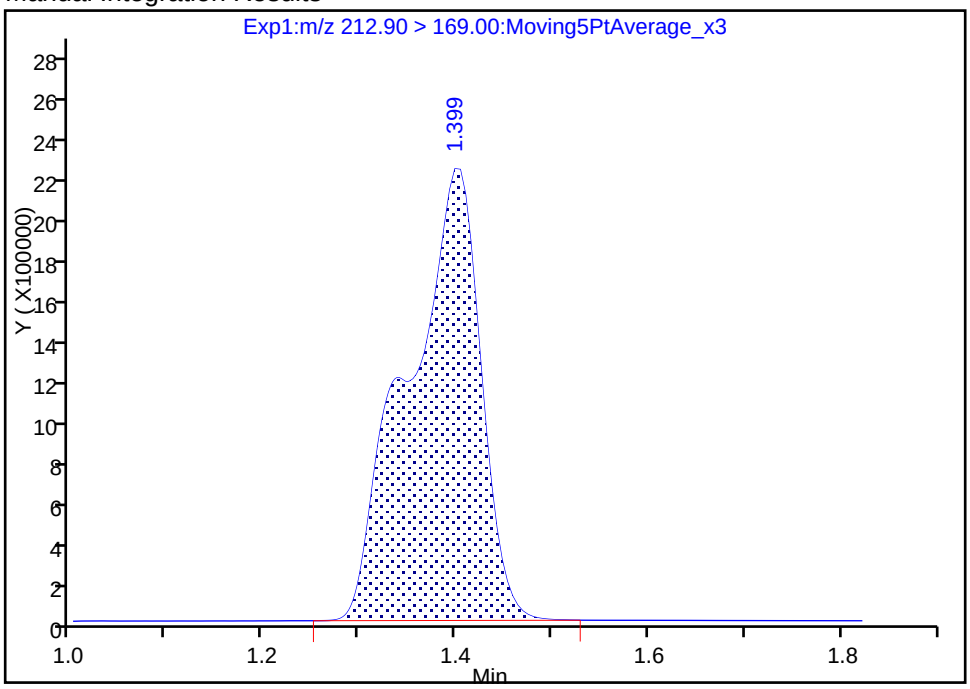
Processing Integration Results

RT: 1.40
Area: 8725317
Amount: 2.684192
Amount Units: ng/ml



Manual Integration Results

RT: 1.40
Area: 11424016
Amount: 3.514400
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:30:10

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

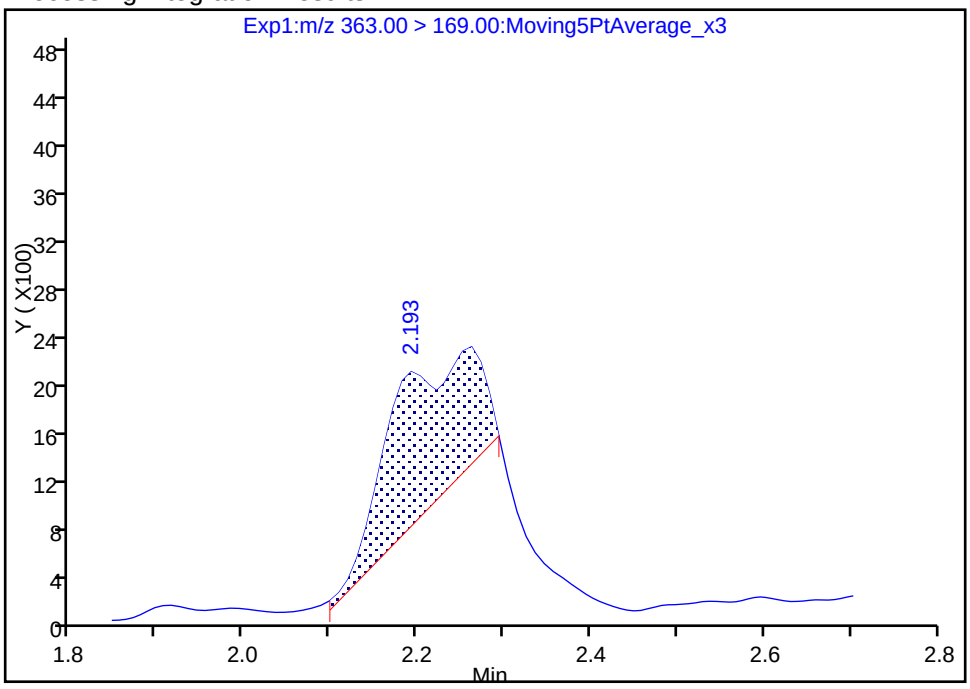
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_007.d				
Injection Date:	12-Dec-2017 22:14:11	Instrument ID:	A8_N		
Lims ID:	320-34072-A-2-A	Lab Sample ID:	320-34072-2		
Client ID:	TP-PFC-024-MID-CARBON				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	5	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 2

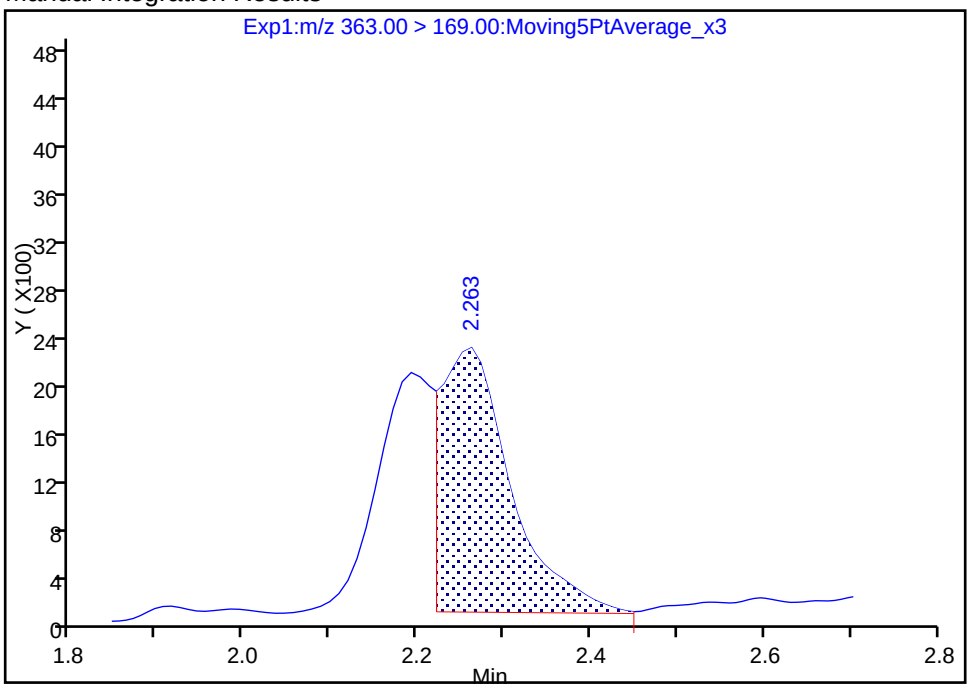
Processing Integration Results

RT: 2.19
Area: 8661
Amount: 0.022714
Amount Units: ng/ml



Manual Integration Results

RT: 2.26
Area: 11968
Amount: 0.012664
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:31:03

Audit Action: Manually Integrated Audit Reason: Wrong peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

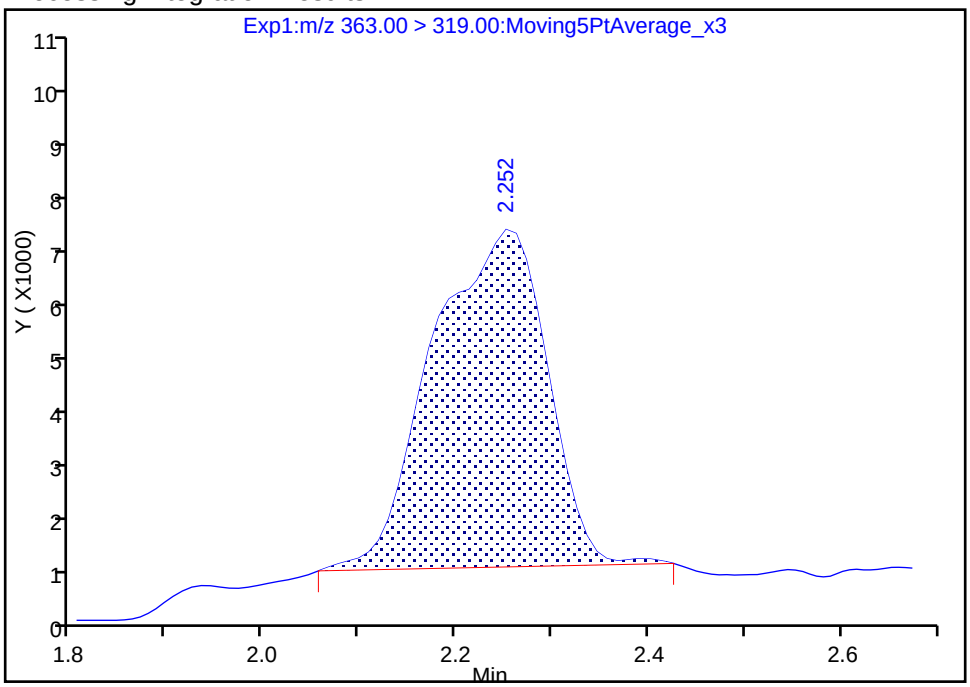
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_007.d				
Injection Date:	12-Dec-2017 22:14:11	Instrument ID:	A8_N		
Lims ID:	320-34072-A-2-A	Lab Sample ID:	320-34072-2		
Client ID:	TP-PFC-024-MID-CARBON				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	5	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

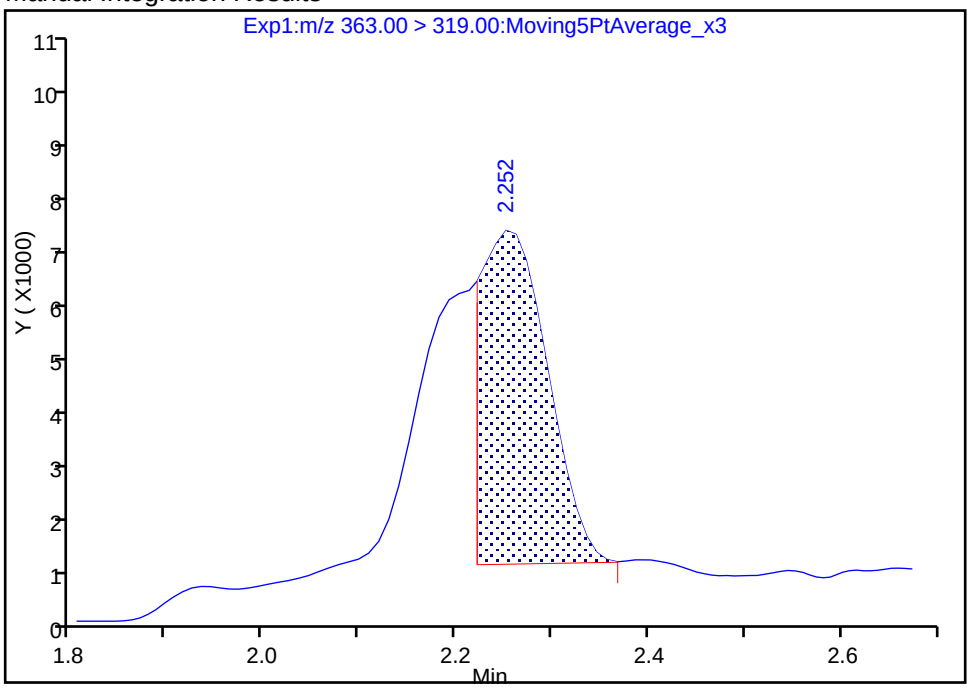
Processing Integration Results

RT: 2.25
Area: 51356
Amount: 0.022714
Amount Units: ng/ml



Manual Integration Results

RT: 2.25
Area: 28633
Amount: 0.012664
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:31:03

Audit Action: Manually Integrated Audit Reason: Wrong peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

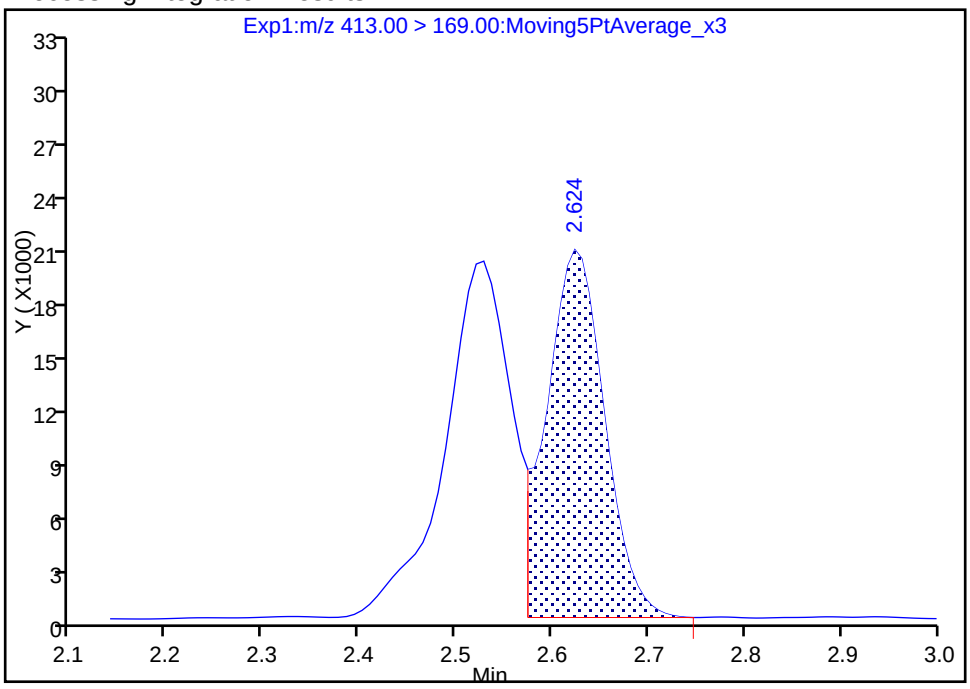
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_007.d				
Injection Date:	12-Dec-2017 22:14:11	Instrument ID:	A8_N		
Lims ID:	320-34072-A-2-A	Lab Sample ID:	320-34072-2		
Client ID:	TP-PFC-024-MID-CARBON				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	5	Worklist Smp#:	6
Injection 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

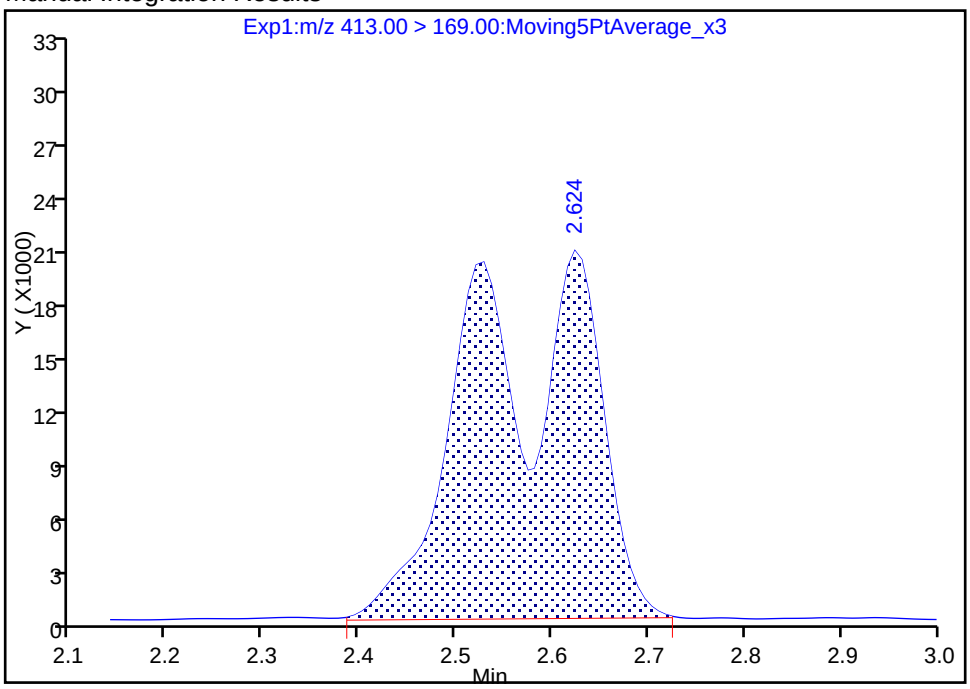
Processing Integration Results

RT: 2.62
Area: 86246
Amount: 0.063821
Amount Units: ng/ml



Manual Integration Results

RT: 2.62
Area: 182721
Amount: 0.105749
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 12:11:33

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

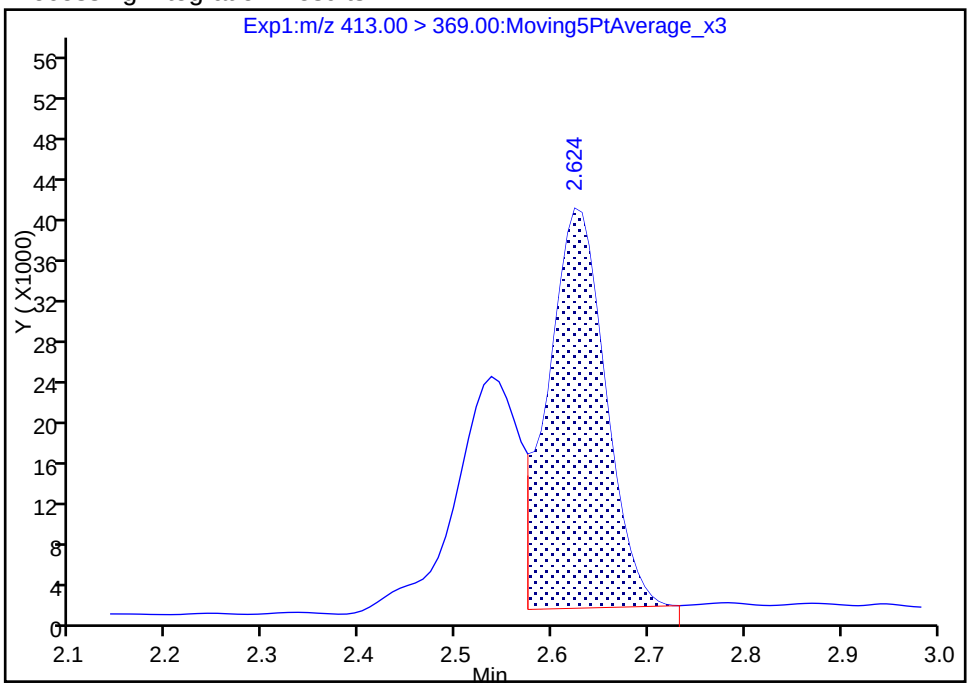
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_007.d				
Injection Date:	12-Dec-2017 22:14:11	Instrument ID:	A8_N		
Lims ID:	320-34072-A-2-A	Lab Sample ID:	320-34072-2		
Client ID:	TP-PFC-024-MID-CARBON				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	5	Worklist Smp#:	6
Injection 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

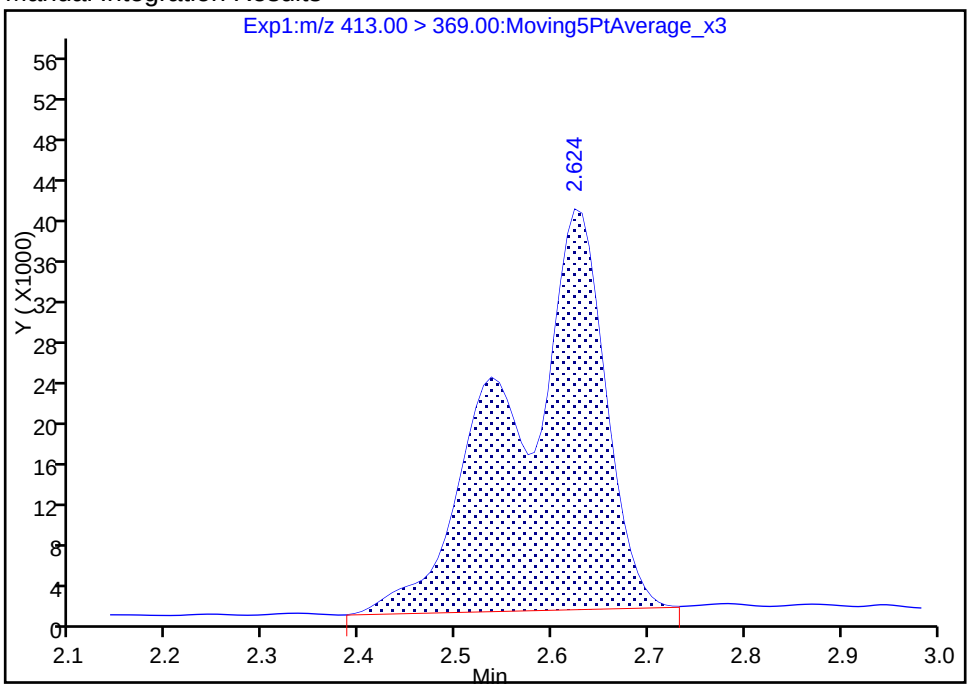
Processing Integration Results

RT: 2.62
Area: 160398
Amount: 0.063821
Amount Units: ng/ml



Manual Integration Results

RT: 2.62
Area: 265773
Amount: 0.105749
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 12:11:37

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-TPE | Lab Sample ID: 320-34072-3

Matrix: Water | Lab File ID: 2017.12.12LLB_008.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 09:45

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 250(mL) | Date Analyzed: 12/12/2017 22:22

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	140		2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	72		2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	13		4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.0	U M	2.0	1.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	U M	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)	0.80	J	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)	0.30	J	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)	2.0	U	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)	0.37	J	2.0	1.0	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-TPE | Lab Sample ID: 320-34072-3

Matrix: Water | Lab File ID: 2017.12.12LLB_008.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 09:45

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 250(mL) | Date Analyzed: 12/12/2017 22:22

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	105		25-150
STL00992	13C4 PFBA	116		25-150
STL00993	13C2 PFHxA	107		25-150
STL00990	13C4 PFOA	106		25-150
STL00995	13C5 PFNA	114		25-150
STL00996	13C2 PFDA	109		25-150
STL00997	13C2 PFUnA	107		25-150
STL00998	13C2 PFDoA	103		25-150
STL00994	18O2 PFHxS	108		25-150
STL00991	13C4 PFOS	107		25-150
STL02116	13C2-PFTeDA	132		25-150
STL01892	13C4-PFHpA	112		25-150
STL01893	13C5 PFPeA	111		25-150
STL02337	13C3-PFBS	108		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_008.d
Lims ID: 320-34072-A-3-A
Client ID: TP-PFC-024-TPE
Sample Type: Client
Inject. Date: 12-Dec-2017 22:22:05 ALS Bottle#: 6 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-34072-a-3-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 13-Dec-2017 13:39:08 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK047

First Level Reviewer: hannigana Date: 13-Dec-2017 12:12:10

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	1.405	1.401	0.003	0.534	8890458	2.91		116	47181	
2 Perfluorobutyric acid										
212.90 > 169.00	1.405	1.402	0.002	1.000	11126868	3.44			2897	
D 3 13C5-PFPeA										
267.90 > 223.00	1.649	1.646	0.003	0.627	5265765	2.76		111	50244	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.641	1.648	-0.007	0.995	4431068	1.81			3360	
D 47 13C3-PFBS										
301.90 > 83.00	1.681	1.681	0.0	0.640	99473	2.51		108	4191	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.681	1.682	-0.001	1.000	20659	0.006344			93.0	
298.90 > 99.00	1.681	1.682	-0.001	1.000	11604		1.78(1.25-3.74)		72.6	
6 Perfluorohexanoic acid										R
313.00 > 269.00	1.905	1.923	-0.018	0.985	696772	0.3258			1674	R
313.00 > 119.00	1.935	1.923	0.012	1.000	30464		22.87(5.03-15.10)		568	
D 7 13C2 PFHxA										
315.00 > 270.00	1.935	1.924	0.011	0.736	5236746	2.68		107	56796	
D 9 13C4-PFHpA										
367.00 > 322.00	2.271	2.254	0.017	0.864	5305338	2.79		112	45313	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.260	2.255	0.005	0.995	8694	0.003943			12.0	M
363.00 > 169.00	2.271	2.255	0.016	1.000	3079		2.82(1.13-3.40)		22.2	M
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.281	2.269	0.012	1.000	20304	0.007427			223	
399.00 > 99.00	2.281	2.269	0.012	1.000	7430		2.73(1.50-4.49)		47.8	
D 11 18O2 PFHxS										
403.00 > 84.00	2.281	2.271	0.010	0.868	6080042	2.55		108	77597	

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	2.628	2.618	0.010	1.000	5571894	2.65		106	53817	
* 62 13C2-PFOA										
415.00 > 370.00	2.628	2.619	0.009		5127169	2.50			47679	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.628	2.621	0.007	1.000	48662	0.0205			21.9	M
413.00 > 169.00	2.628	2.621	0.007	1.000	27078		1.80(0.84-2.52)		110	M
D 18 13C4 PFOS										
503.00 > 80.00	3.003	2.993	0.010	1.143	3950538	2.55		107	43453	
D 19 13C5 PFNA										
468.00 > 423.00	3.003	2.994	0.009	1.143	4356619	2.86		114	49647	
D 23 13C2 PFDA										
515.00 > 470.00	3.366	3.356	0.010	1.281	3525083	2.73		109	50743	
D 21 13C8 FOSA										
506.00 > 78.00	3.351	3.359	-0.008	1.275	5489152	2.63		105	29929	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.351	3.359	-0.008	1.000	18806	0.009143			317	
D 30 13C2 PFUnA										
565.00 > 520.00	3.693	3.685	0.008	1.405	2669954	2.69		107	50328	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.693	3.685	0.008	1.000	9642	0.009181			44.6	
563.00 > 169.00	3.693	3.685	0.008	1.000	2836		3.40(0.00-0.00)		149	
D 36 13C2 PFDoA										
615.00 > 570.00	3.994	3.979	0.015	1.520	2847679	2.57		103	27241	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.986	3.982	0.004	0.998	13157	0.0117			39.1	
613.00 > 169.00	3.994	3.982	0.012	1.000	2974		4.42(2.13-6.40)		158	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.258	4.243	0.015	1.000	27394	0.0230			82.4	
663.00 > 169.00	4.258	4.243	0.015	1.000	8546		3.21(1.25-3.76)		414	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.491	4.481	0.010	1.709	4267385	3.31		132	33968	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.491	4.481	0.010	1.000	8666	0.0200			380	
713.00 > 219.00	4.491	4.481	0.010	1.000	6075		1.43(0.71-2.13)		278	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 13-Dec-2017 13:39:19 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_008.d

Injection Date: 12-Dec-2017 22:22:05 Instrument ID: A8_N

Lims ID: 320-34072-A-3-A Lab Sample ID: 320-34072-3

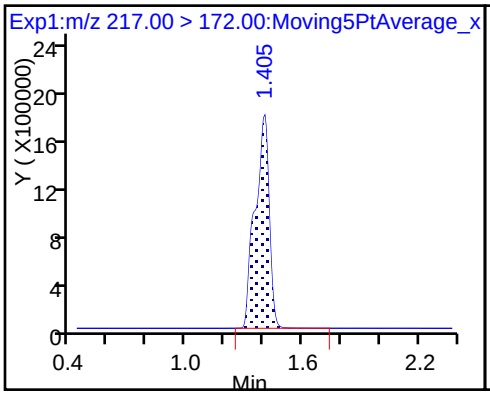
Client ID: TP-PFC-024-TPE

Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 7

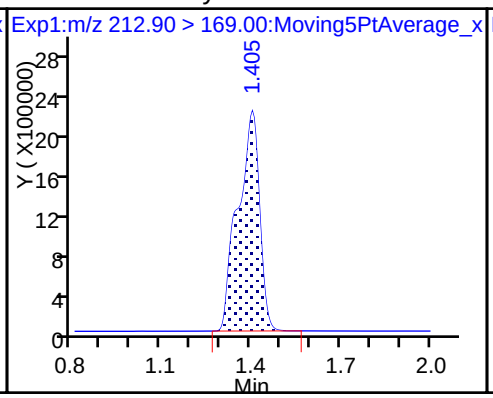
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

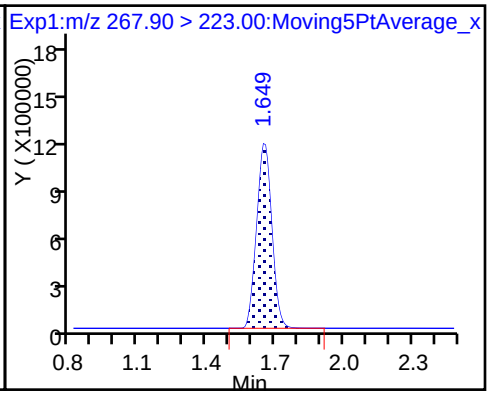
D 1 13C4 PFBA



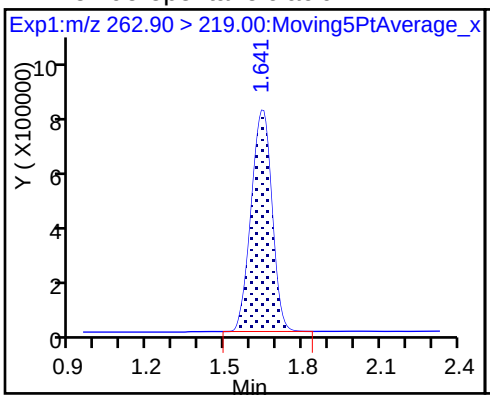
2 Perfluorobutyric acid



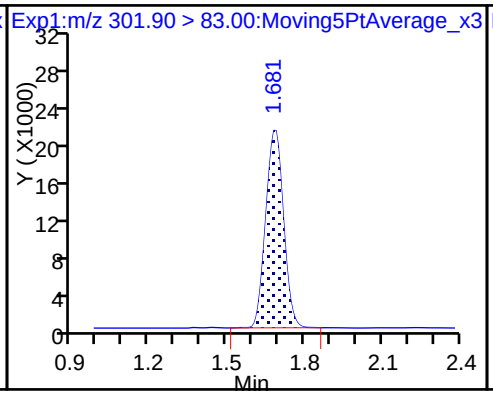
D 3 13C5-PFPeA



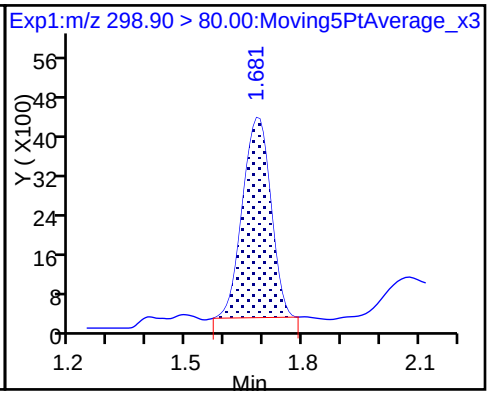
4 Perfluoropentanoic acid



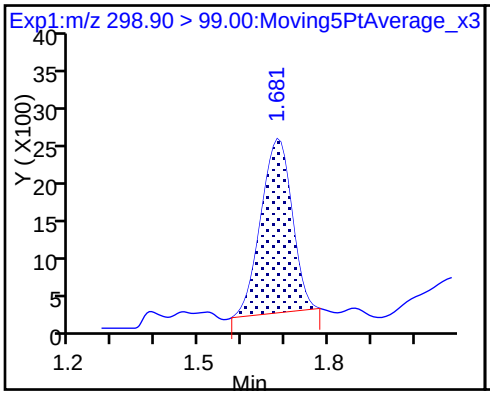
D 47 13C3-PFBS



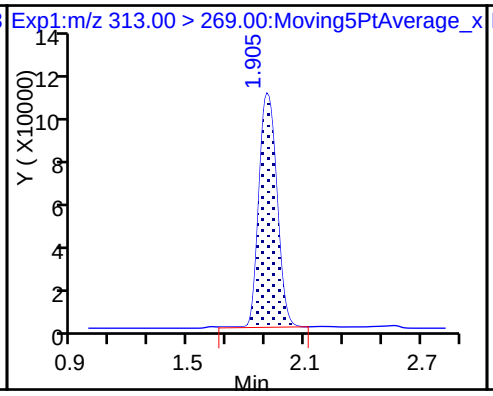
5 Perfluorobutanesulfonic acid



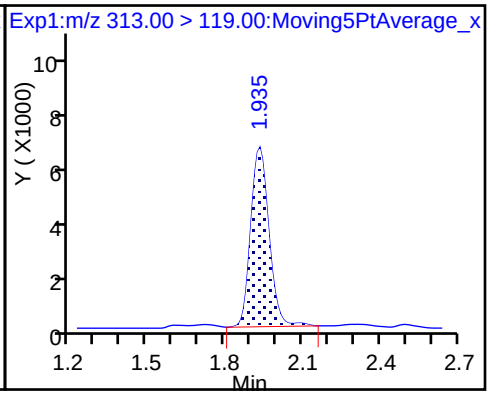
5 Perfluorobutanesulfonic acid



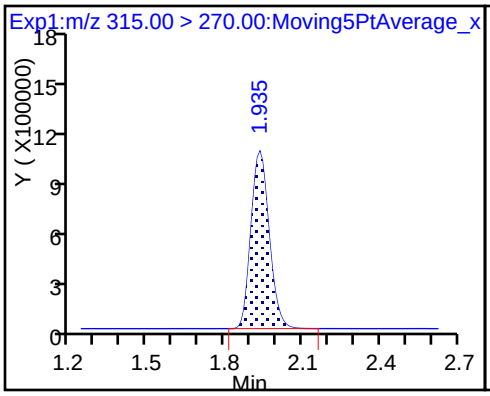
6 Perfluorohexanoic acid



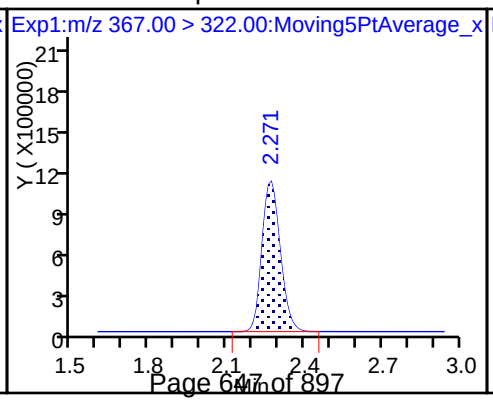
6 Perfluorohexanoic acid



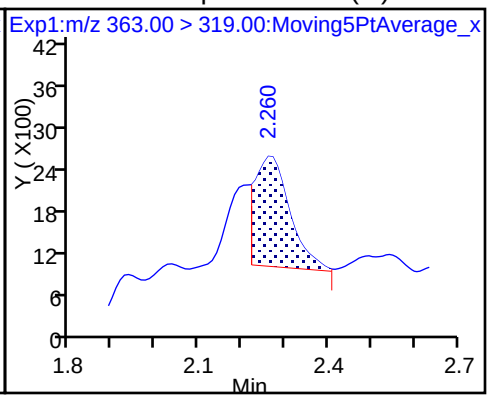
D 7 13C2 PFHxA



D 9 13C4-PFHpA



10 Perfluoroheptanoic acid (M)



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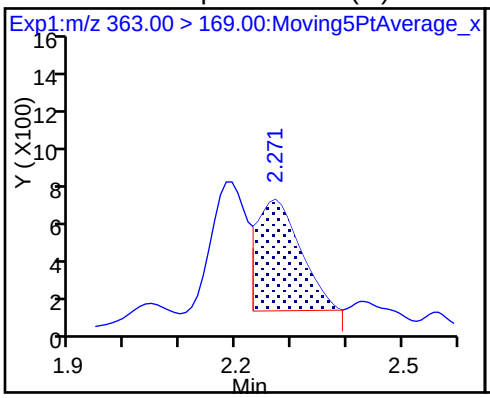
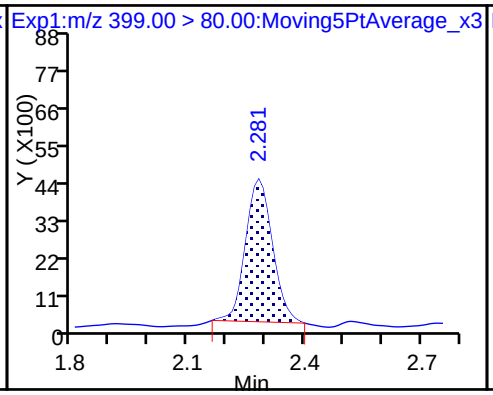
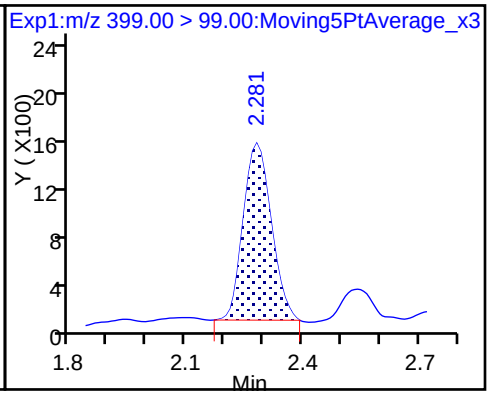


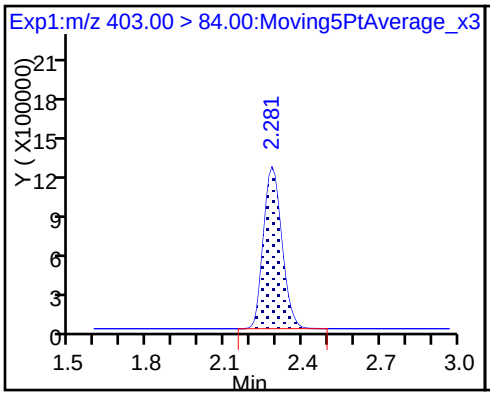
8 Perfluorohexanesulfonic acid



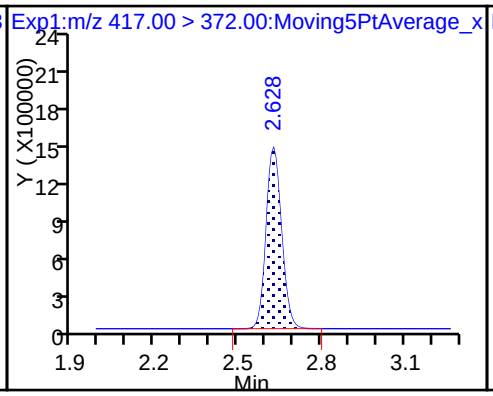
8 Perfluorohexanesulfonic acid



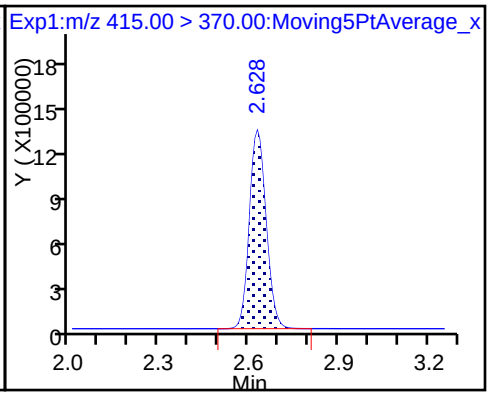
D 11 18O2 PFHxS



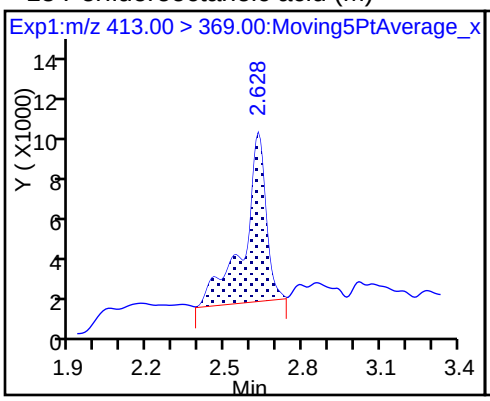
D 14 13C4 PFOA



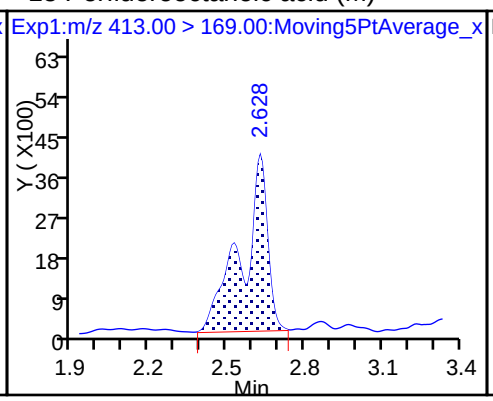
* 62 13C2-PFOA



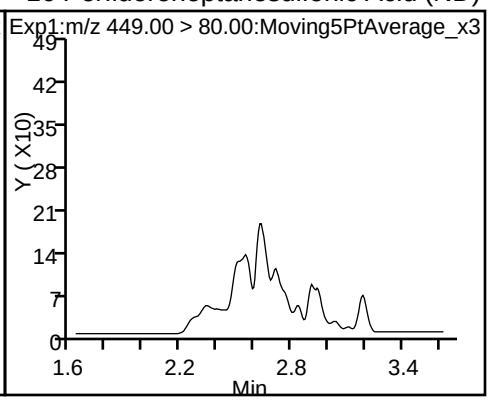
15 Perfluorooctanoic acid (M)



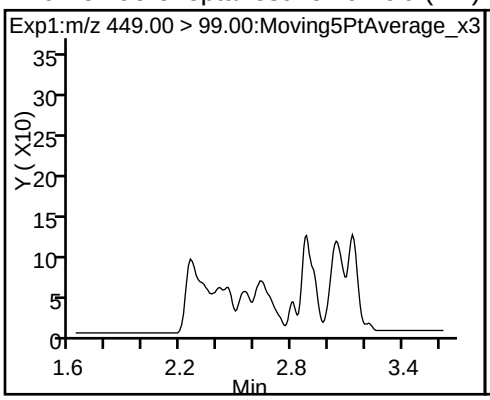
15 Perfluorooctanoic acid (M)



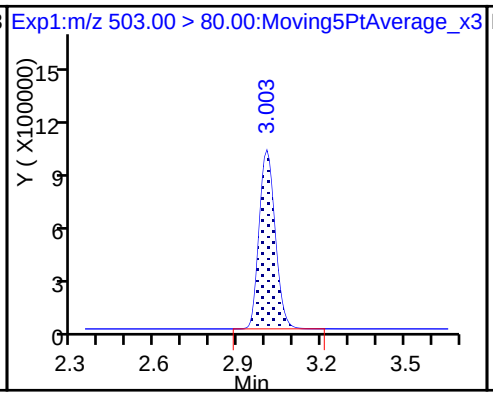
16 Perfluoroheptanesulfonic Acid (ND)



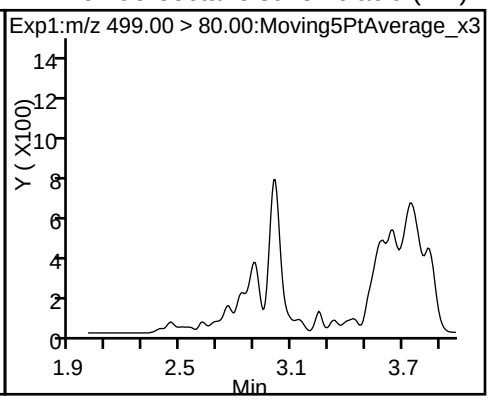
16 Perfluoroheptanesulfonic Acid (ND)



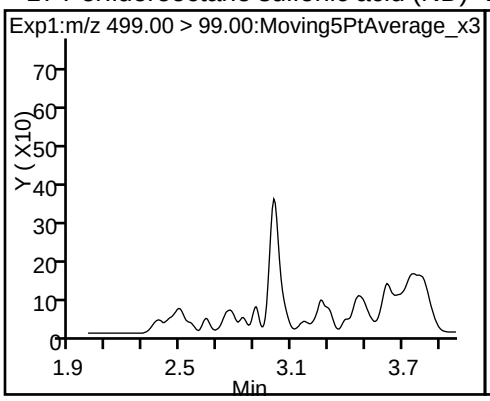
D 18 13C4 PFOS



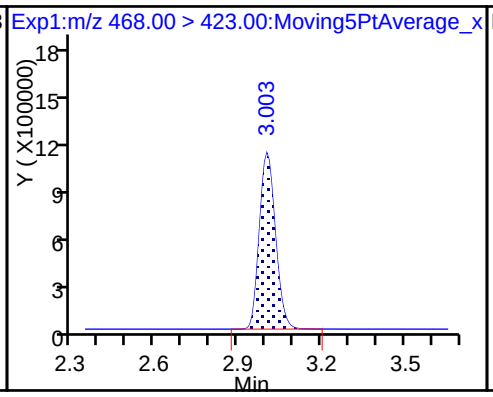
17 Perfluorooctane sulfonic acid (ND)



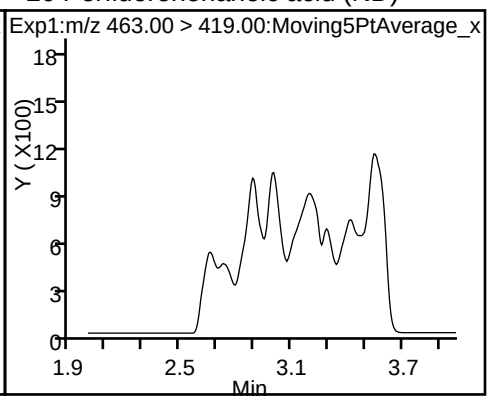
17 Perfluorooctane sulfonic acid (ND)



D 19 13C5 PFNA



20 Perfluorononanoic acid (ND)



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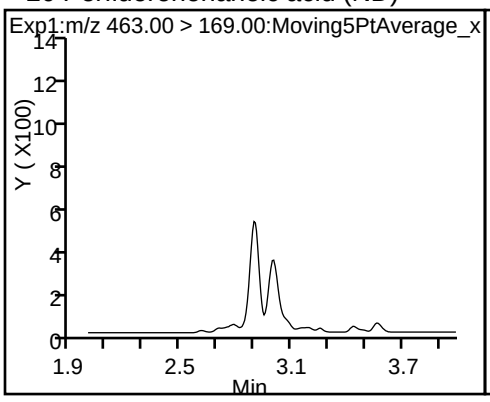
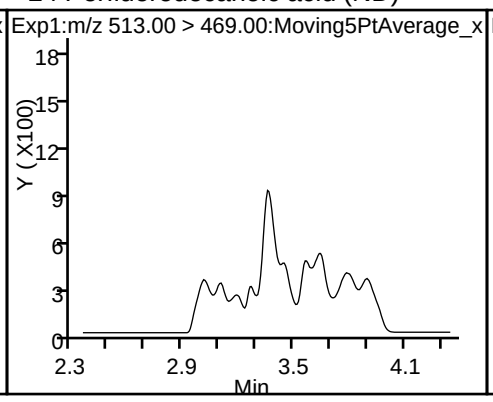
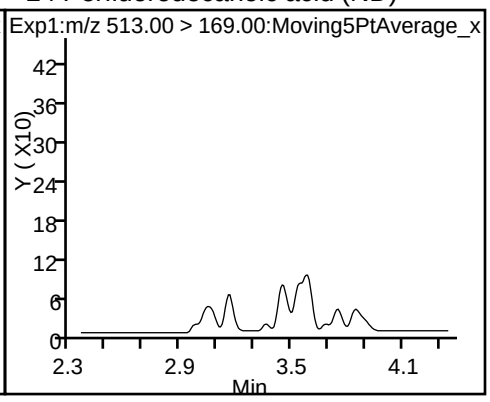


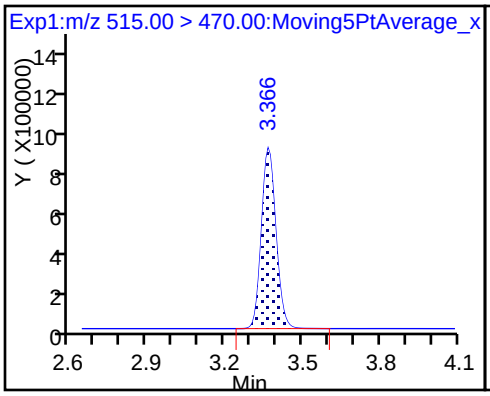
24 Perfluorodecanoic acid (ND)



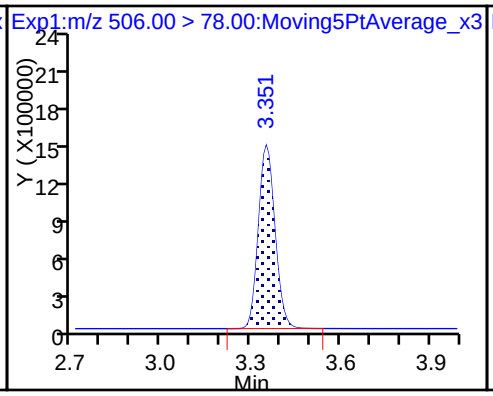
24 Perfluorodecanoic acid (ND)



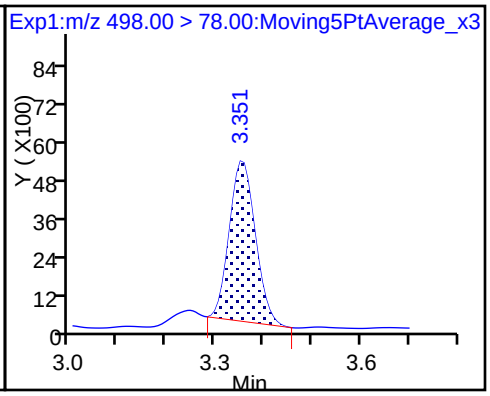
D 23 13C2 PFDA



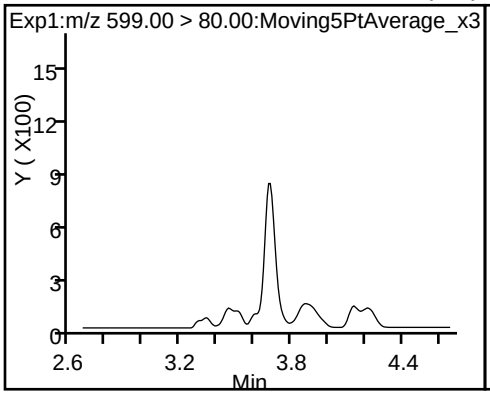
D 21 13C8 FOSA



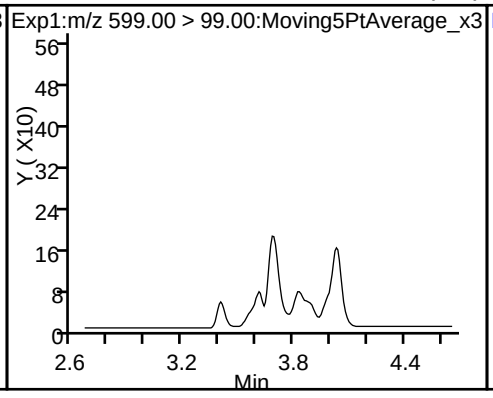
22 Perfluorooctane Sulfonamide



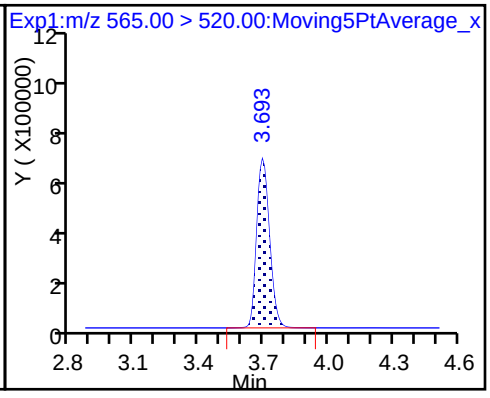
29 Perfluorodecane Sulfonic acid (ND)



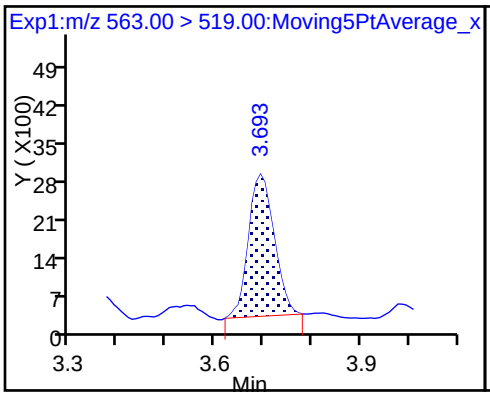
29 Perfluorodecane Sulfonic acid (ND)



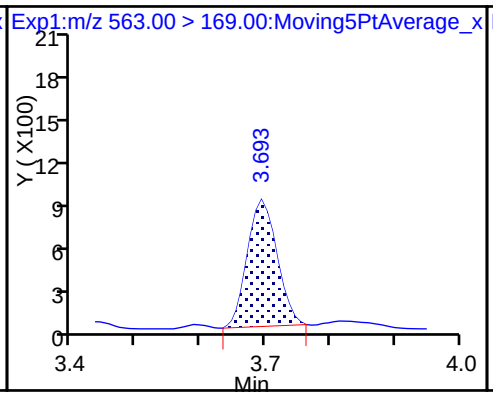
D 30 13C2 PFUnA



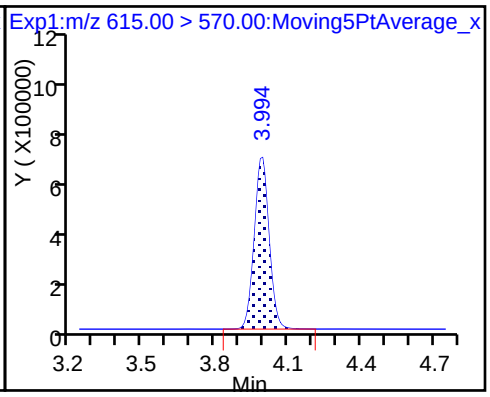
31 Perfluoroundecanoic acid



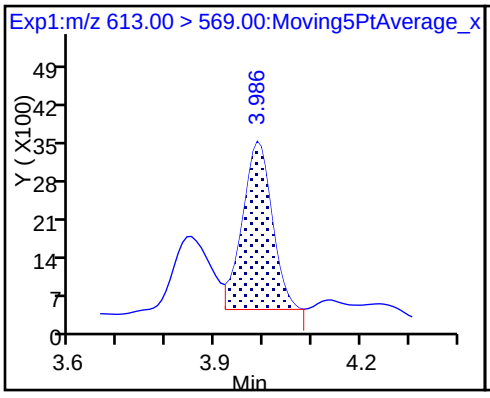
31 Perfluoroundecanoic acid



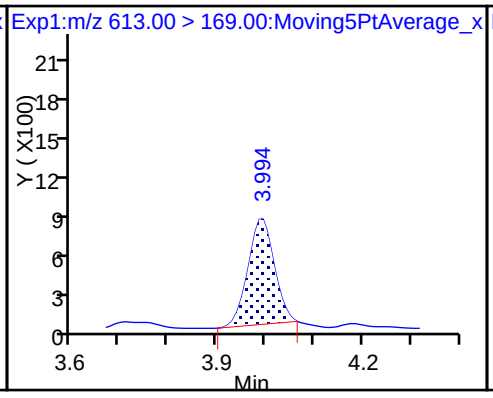
D 36 13C2 PFDoA



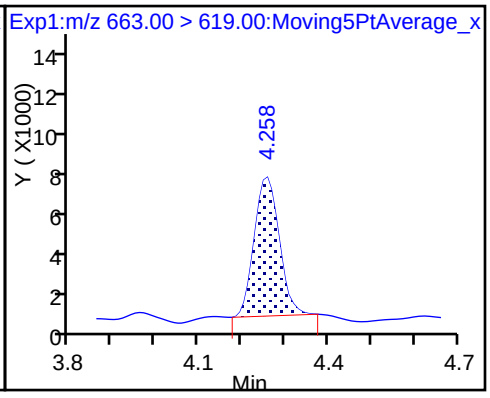
37 Perfluorododecanoic acid



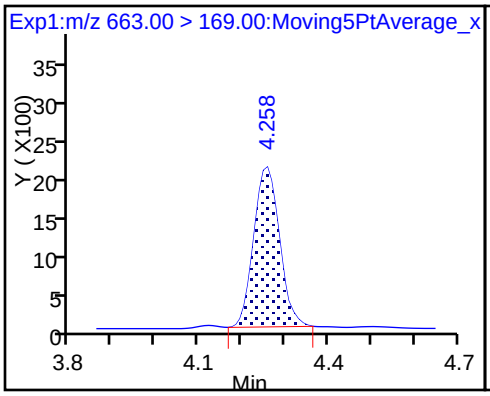
37 Perfluorododecanoic acid



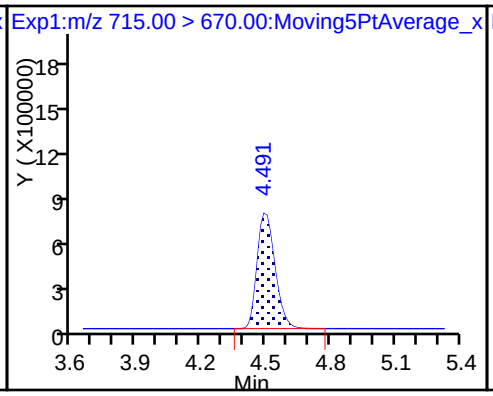
41 Perfluorotridecanoic acid



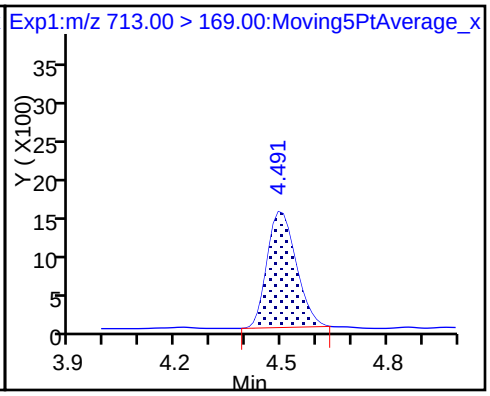
41 Perfluorotridecanoic acid



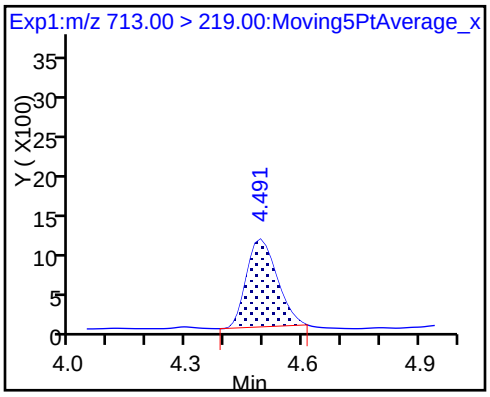
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

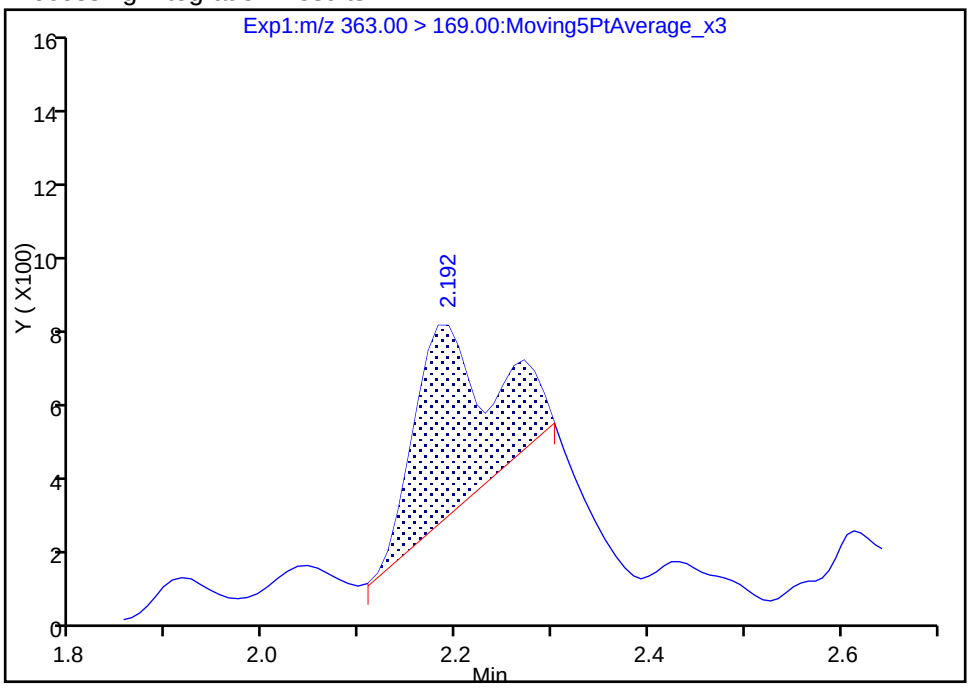
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_008.d				
Injection Date:	12-Dec-2017 22:22:05	Instrument ID:	A8_N		
Lims ID:	320-34072-A-3-A	Lab Sample ID:	320-34072-3		
Client ID:	TP-PFC-024-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 2

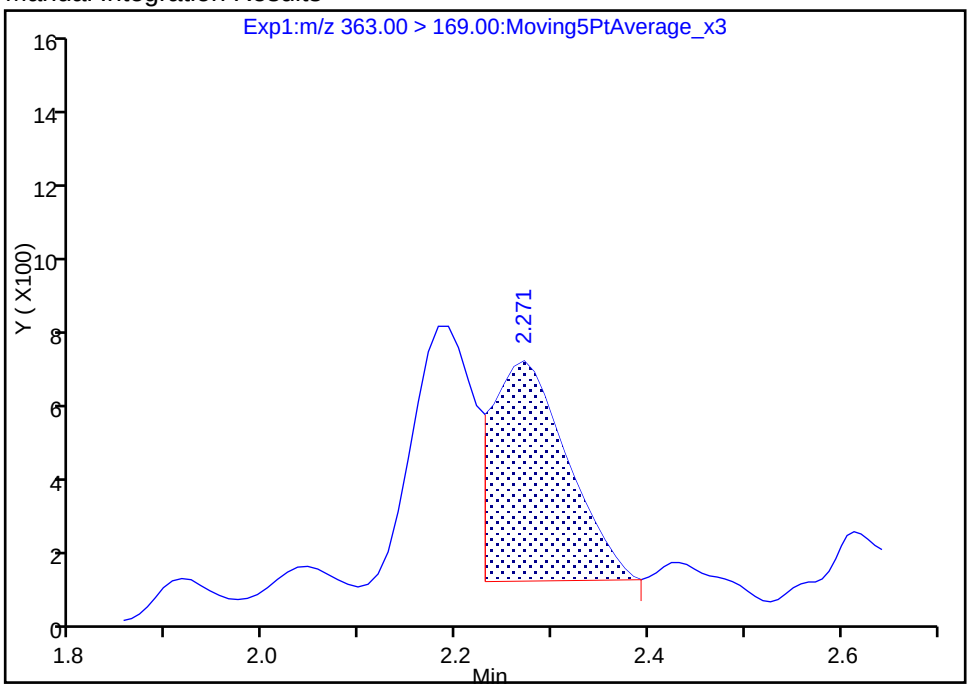
Processing Integration Results

RT: 2.19
Area: 2824
Amount: 0.005751
Amount Units: ng/ml



Manual Integration Results

RT: 2.27
Area: 3079
Amount: 0.003943
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:35:37

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

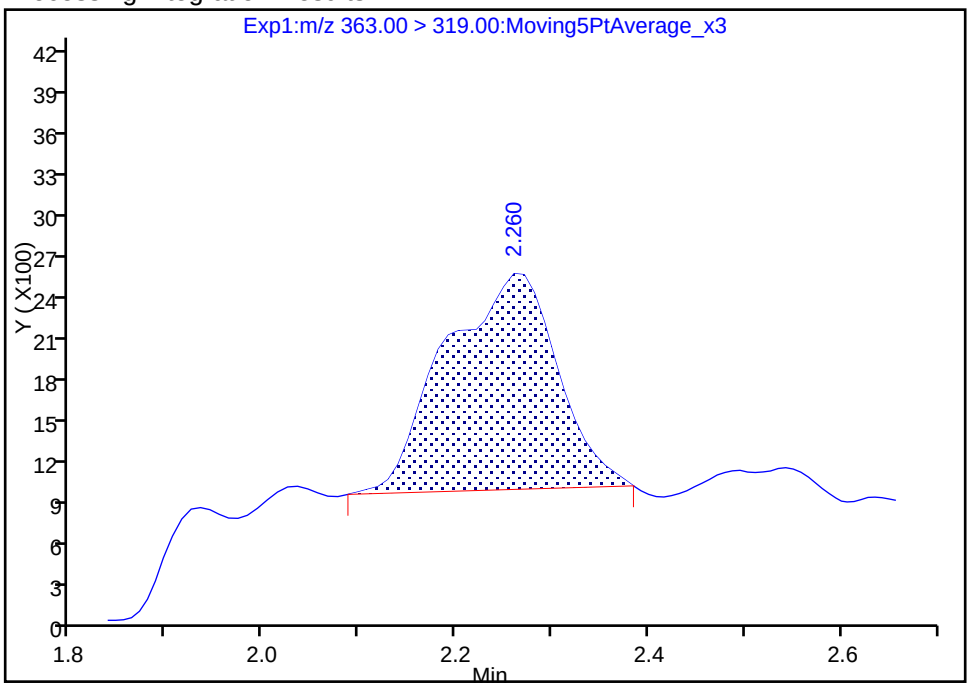
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_008.d				
Injection Date:	12-Dec-2017 22:22:05	Instrument ID:	A8_N		
Lims ID:	320-34072-A-3-A	Lab Sample ID:	320-34072-3		
Client ID:	TP-PFC-024-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

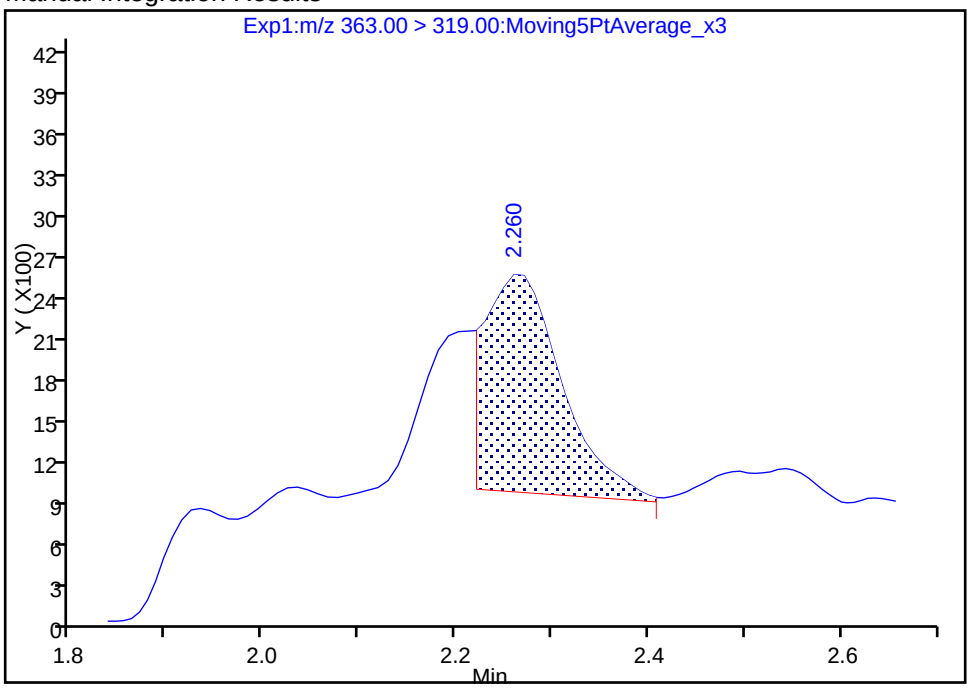
Processing Integration Results

RT: 2.26
Area: 12680
Amount: 0.005751
Amount Units: ng/ml



Manual Integration Results

RT: 2.26
Area: 8694
Amount: 0.003943
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:35:37

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

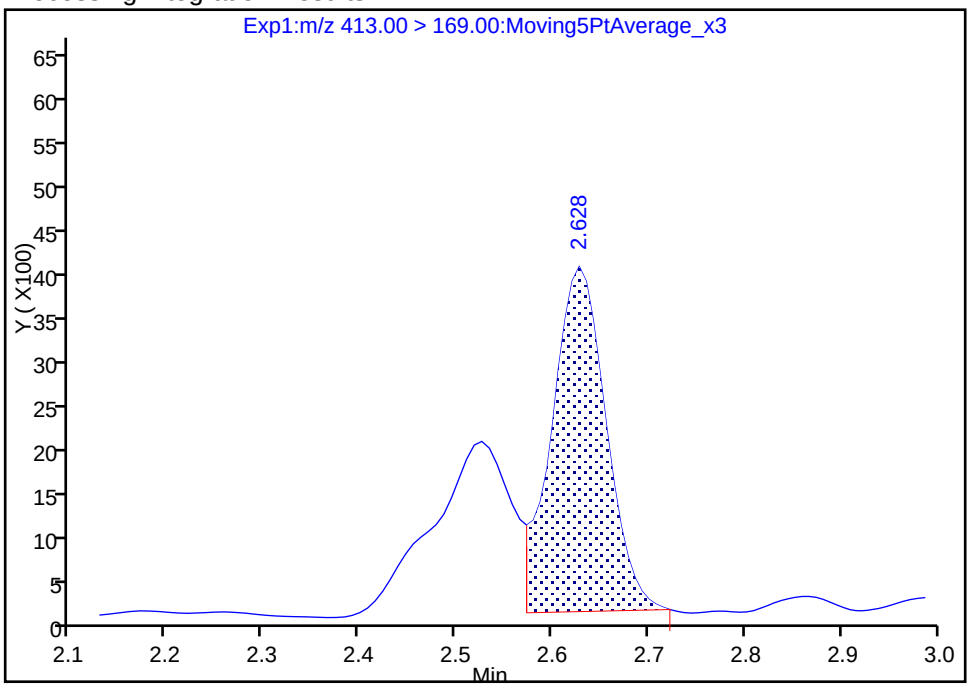
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_008.d				
Injection Date:	12-Dec-2017 22:22:05	Instrument ID:	A8_N		
Lims ID:	320-34072-A-3-A	Lab Sample ID:	320-34072-3		
Client ID:	TP-PFC-024-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	7
Injection Vol:	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

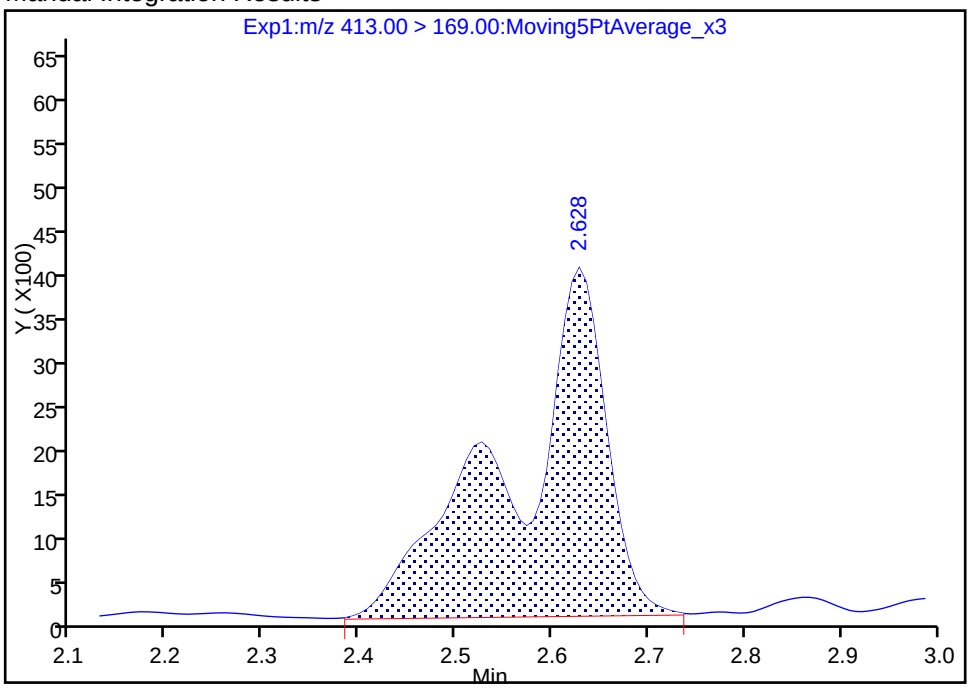
Processing Integration Results

RT: 2.63
Area: 15252
Amount: 0.013685
Amount Units: ng/ml



Manual Integration Results

RT: 2.63
Area: 27078
Amount: 0.020471
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 12:11:59

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

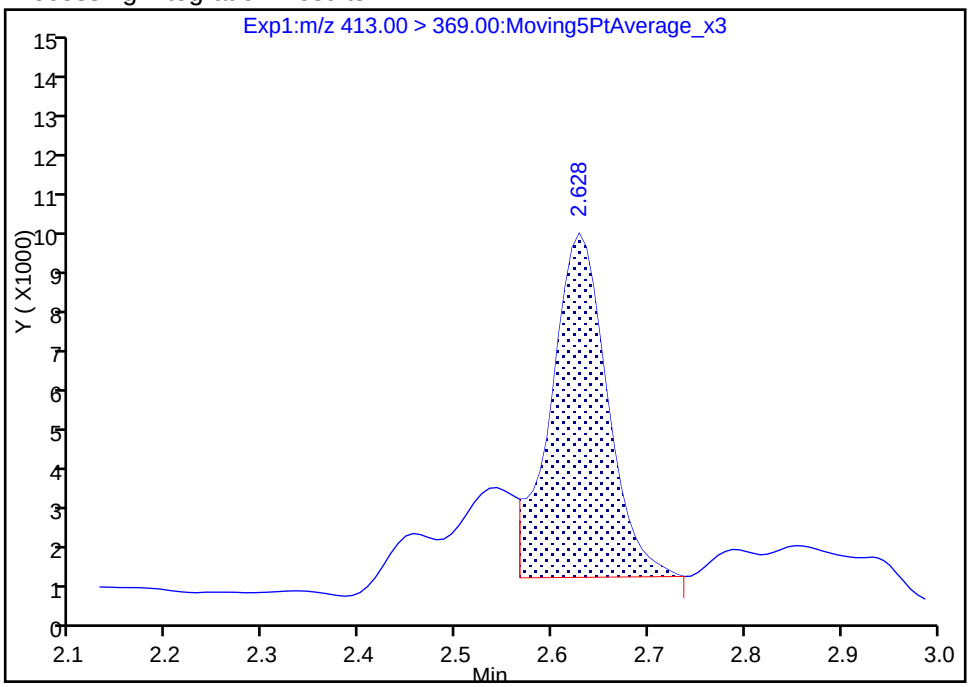
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_008.d				
Injection Date:	12-Dec-2017 22:22:05	Instrument ID:	A8_N		
Lims ID:	320-34072-A-3-A	Lab Sample ID:	320-34072-3		
Client ID:	TP-PFC-024-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	7
Injection Vol:	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

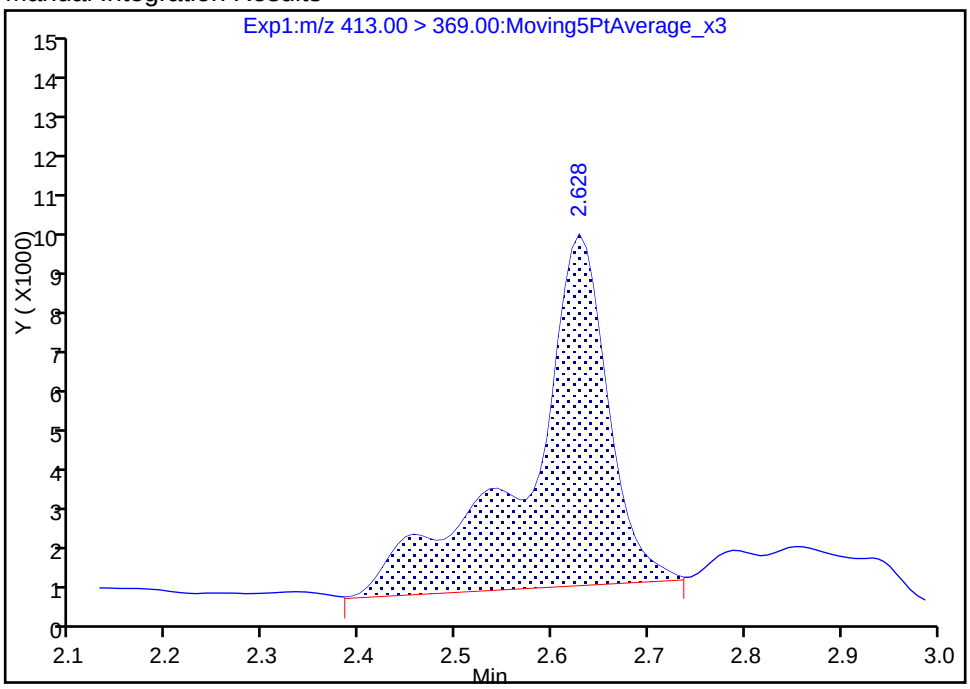
Processing Integration Results

RT: 2.63
Area: 32531
Amount: 0.013685
Amount Units: ng/ml



Manual Integration Results

RT: 2.63
Area: 48662
Amount: 0.020471
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 12:12:05
Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-TPE-D | Lab Sample ID: 320-34072-4

Matrix: Water | Lab File ID: 2017.12.12LLB_009.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 00:00

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 254.5(mL) | Date Analyzed: 12/12/2017 22:29

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	140	M	2.0	0.98	0.34
2706-90-3	Perfluoropentanoic acid (PFPeA)	76		2.0	0.98	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	13		3.9	2.0	0.57
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.98	U M	2.0	0.98	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	U M	3.9	2.0	0.83
375-95-1	Perfluorononanoic acid (PFNA)	0.98	U	2.0	0.98	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	0.98	U	2.0	0.98	0.30
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.9	U	3.9	2.9	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	3.9	2.0	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.9	U	3.9	2.9	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.98	U	2.0	0.98	0.28
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.29	J	2.0	0.98	0.29
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.35	J	2.0	0.98	0.29
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.98	U	2.0	0.98	0.29
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	3.9	2.0	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.98	U	2.0	0.98	0.31
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.98	U	2.0	0.98	0.34

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-TPE-D | Lab Sample ID: 320-34072-4

Matrix: Water | Lab File ID: 2017.12.12LLB_009.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 00:00

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 254.5(mL) | Date Analyzed: 12/12/2017 22:29

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	107		25-150
STL00992	13C4 PFBA	114		25-150
STL00993	13C2 PFHxA	113		25-150
STL00990	13C4 PFOA	108		25-150
STL00995	13C5 PFNA	110		25-150
STL00996	13C2 PFDA	111		25-150
STL00997	13C2 PFUnA	110		25-150
STL00998	13C2 PFDoA	100		25-150
STL00994	18O2 PFHxS	110		25-150
STL00991	13C4 PFOS	105		25-150
STL02116	13C2-PFTeDA	127		25-150
STL01892	13C4-PFHpA	108		25-150
STL01893	13C5 PFPeA	109		25-150
STL02337	13C3-PFBS	107		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_009.d
Lims ID: 320-34072-A-4-A
Client ID: TP-PFC-024-TPE-D
Sample Type: Client
Inject. Date: 12-Dec-2017 22:29:59 ALS Bottle#: 7 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-34072-a-4-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 13-Dec-2017 13:39:08 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK047

First Level Reviewer: hannigana Date: 13-Dec-2017 12:13:00

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	1.404	1.401	0.003	0.533	8880656	2.86		114	58586	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.404	1.402	0.002	1.000	11196896	3.47			2533	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.656	1.646	0.010	0.628	5288351	2.73		109	71442	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.649	1.648	0.0	0.995	4776569	1.94			3492	
D 47 13C3-PFBS										
301.90 > 83.00	1.689	1.681	0.008	0.641	100403	2.49		107	4011	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.681	1.682	-0.001	0.995	24539	0.007466			125	
298.90 > 99.00	1.681	1.682	-0.001	0.995	12056		2.04(1.25-3.74)		78.4	
6 Perfluorohexanoic acid										R
313.00 > 269.00	1.905	1.923	-0.018	0.985	782647	0.3411			1667	R
313.00 > 119.00	1.934	1.923	0.011	1.000	36778		21.28(5.03-15.10)		567	
D 7 13C2 PFHxA										
315.00 > 270.00	1.934	1.924	0.010	0.734	5618142	2.82		113	50629	
D 9 13C4-PFHpA										
367.00 > 322.00	2.271	2.254	0.017	0.862	5210952	2.69		108	49471	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.260	2.255	0.005	0.995	8981	0.004147			14.4	M
363.00 > 169.00	2.250	2.255	-0.005	0.991	4583		1.96(1.13-3.40)		31.4	M
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.281	2.269	0.012	1.000	24954	0.008815			261	
399.00 > 99.00	2.281	2.269	0.012	1.000	7229		3.45(1.50-4.49)		72.4	
D 11 18O2 PFHxS										
403.00 > 84.00	2.281	2.271	0.010	0.866	6295263	2.60		110	90343	

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	2.635	2.618	0.017	1.000	5803873	2.71		108	47219	
* 62 13C2-PFOA										
415.00 > 370.00	2.635	2.619	0.016		5219013	2.50			49507	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.635	2.621	0.014	1.000	45977	0.0186			20.5	M
413.00 > 169.00	2.635	2.621	0.014	1.000	33246		1.38(0.84-2.52)		167	M
D 18 13C4 PFOS										
503.00 > 80.00	3.012	2.993	0.019	1.143	3968213	2.52		105	38880	
D 19 13C5 PFNA										
468.00 > 423.00	3.012	2.994	0.018	1.143	4242083	2.74		110	49599	
D 23 13C2 PFDA										
515.00 > 470.00	3.375	3.356	0.019	1.281	3650969	2.78		111	45029	
D 21 13C8 FOSA										
506.00 > 78.00	3.360	3.359	0.001	1.275	5692226	2.68		107	32345	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.360	3.359	0.001	1.000	8964	0.004203			344	
D 30 13C2 PFUnA										
565.00 > 520.00	3.694	3.685	0.009	1.402	2769545	2.74		110	37507	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.694	3.685	0.009	1.000	7977	0.007323			34.8	
563.00 > 169.00	3.702	3.685	0.017	1.002	2158		3.70(0.00-0.00)		74.4	
D 36 13C2 PFDoA										
615.00 > 570.00	3.994	3.979	0.015	1.516	2806289	2.49		99.7	38703	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.505	4.481	0.024	1.709	4151093	3.16		127	30182	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 13-Dec-2017 13:39:20 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_009.d

Injection Date: 12-Dec-2017 22:29:59 Instrument ID: A8_N

Lims ID: 320-34072-A-4-A Lab Sample ID: 320-34072-4

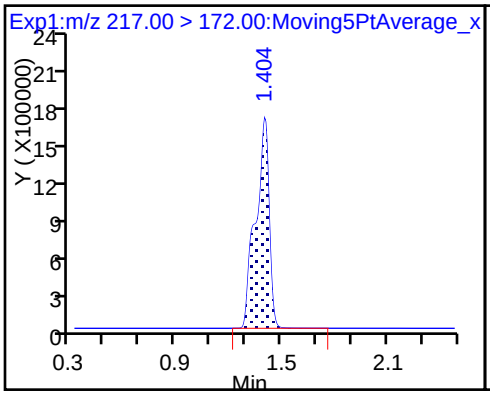
Client ID: TP-PFC-024-TPE-D

Operator ID: SACINSTLCMS01 ALS Bottle#: 7 Worklist Smp#: 8

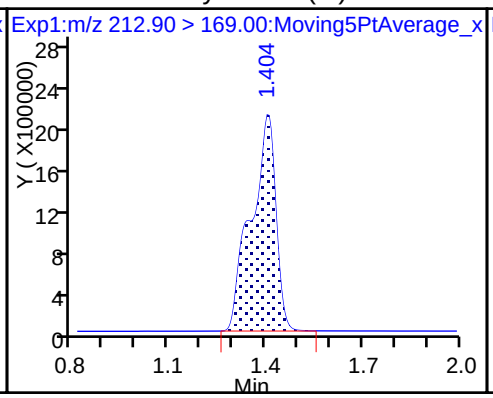
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

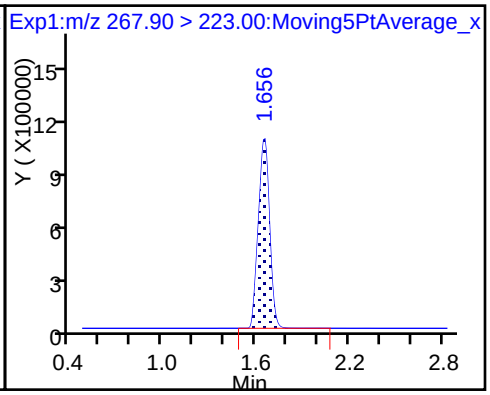
D 1 13C4 PFBA



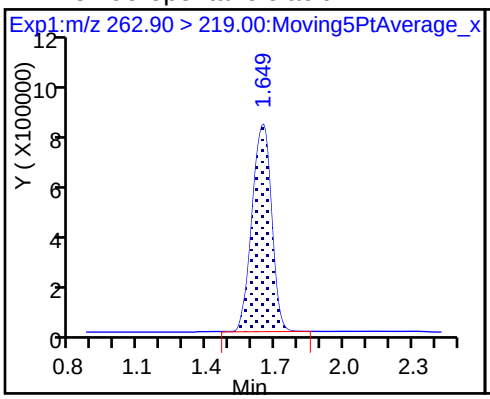
2 Perfluorobutyric acid (M)



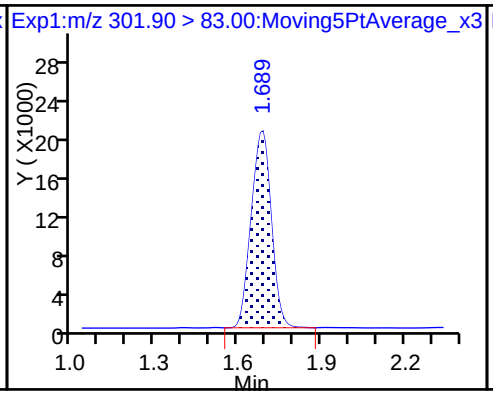
D 3 13C5-PFPeA



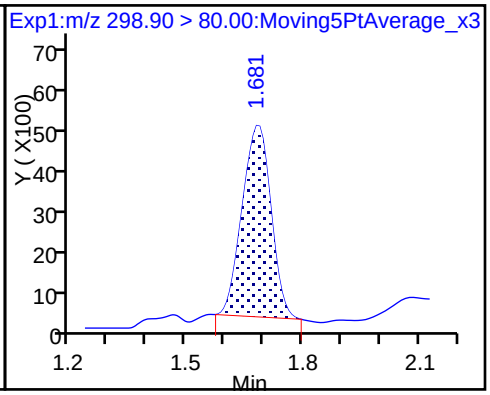
4 Perfluoropentanoic acid



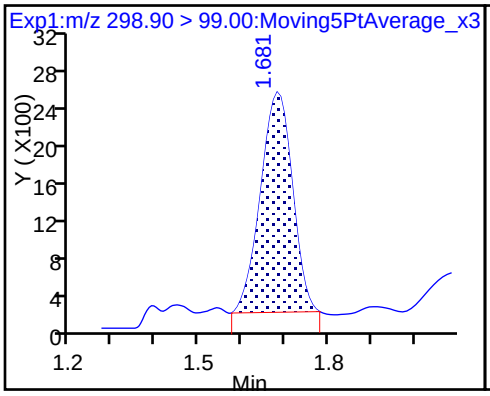
D 47 13C3-PFBS



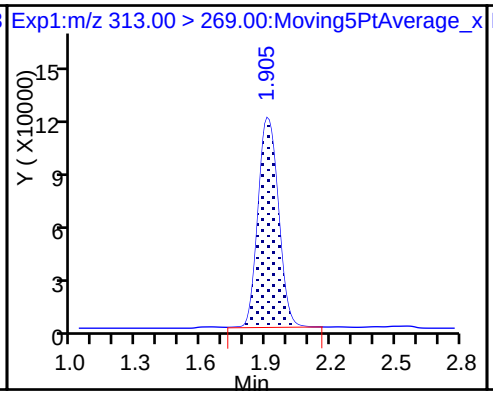
5 Perfluorobutanesulfonic acid



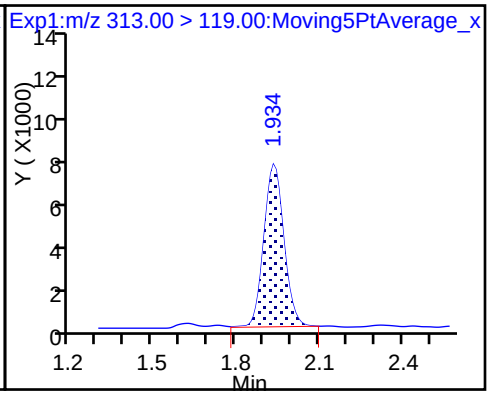
5 Perfluorobutanesulfonic acid



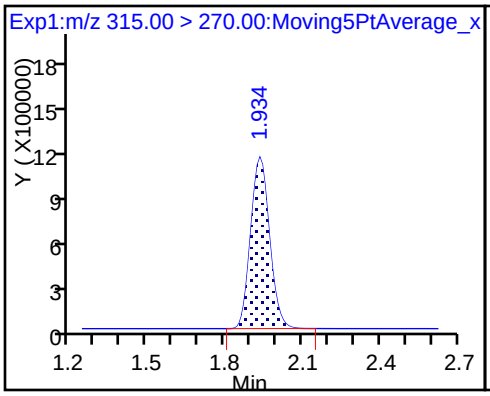
6 Perfluorohexanoic acid



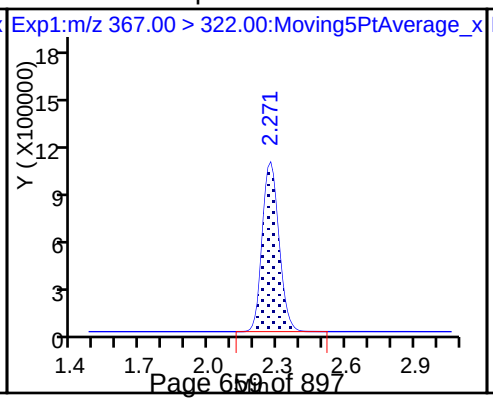
6 Perfluorohexanoic acid



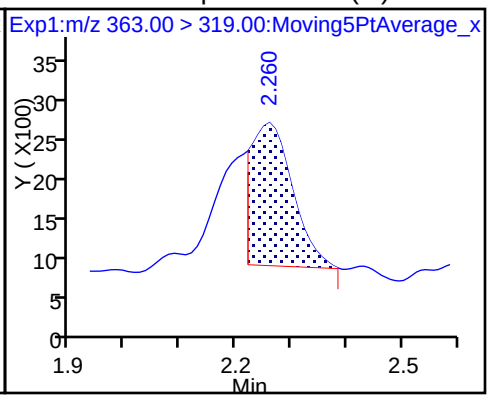
D 7 13C2 PFHxA



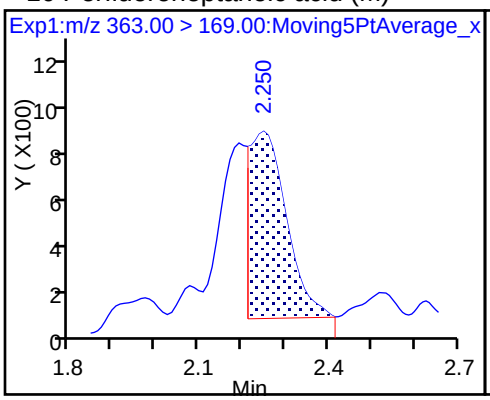
D 9 13C4-PFHpA



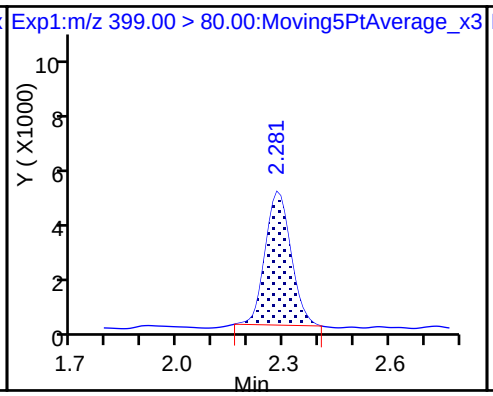
10 Perfluoroheptanoic acid (M)



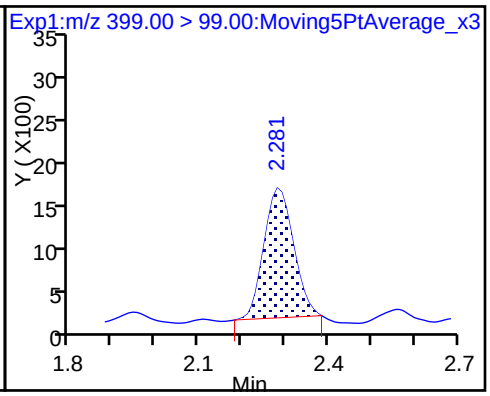
10 Perfluoroheptanoic acid (M)



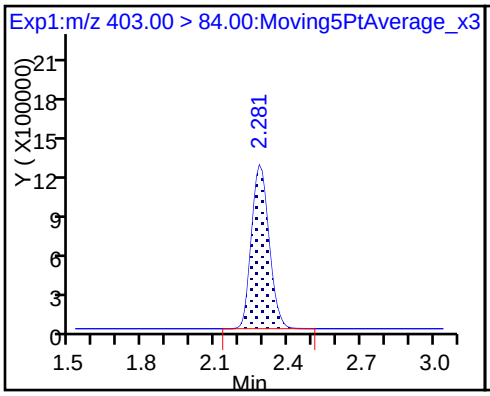
8 Perfluorohexanesulfonic acid



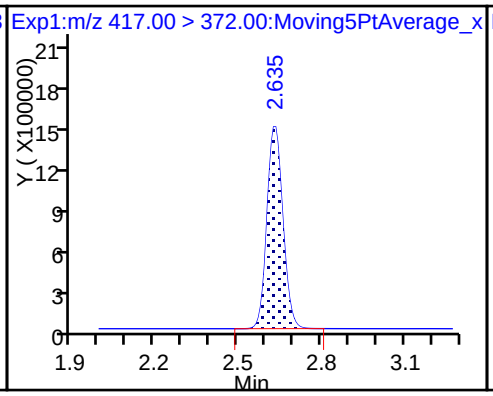
8 Perfluorohexanesulfonic acid



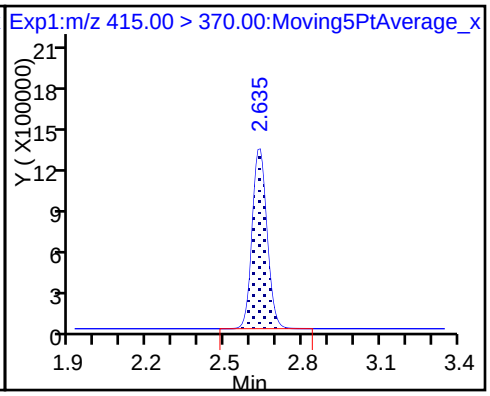
D 11 18O2 PFHxS



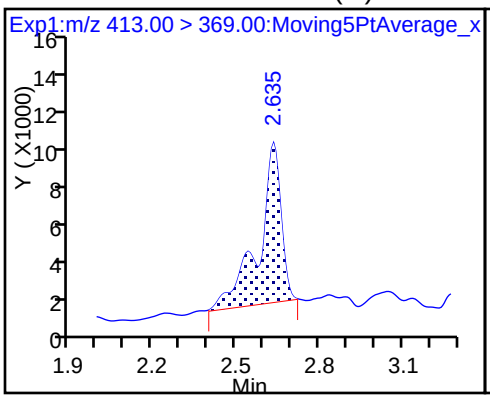
D 14 13C4 PFOA



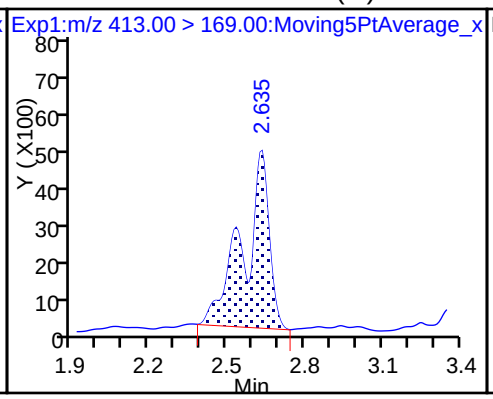
* 62 13C2-PFOA



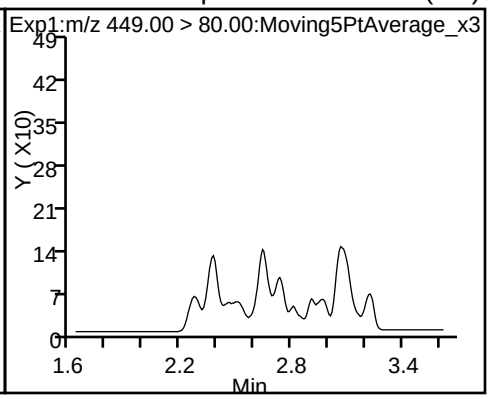
15 Perfluorooctanoic acid (M)



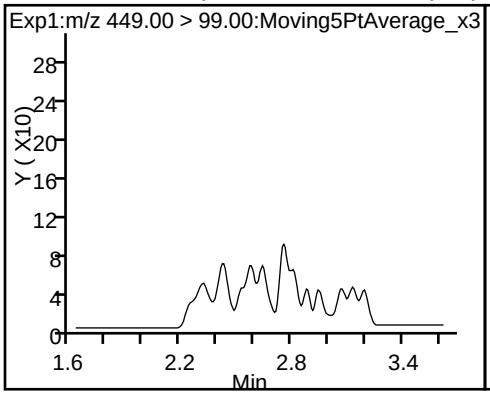
15 Perfluorooctanoic acid (M)



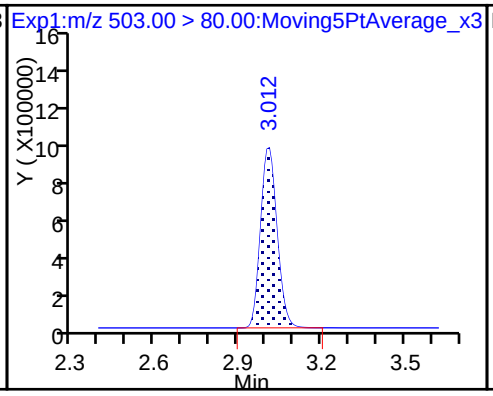
16 Perfluoroheptanesulfonic Acid (ND)



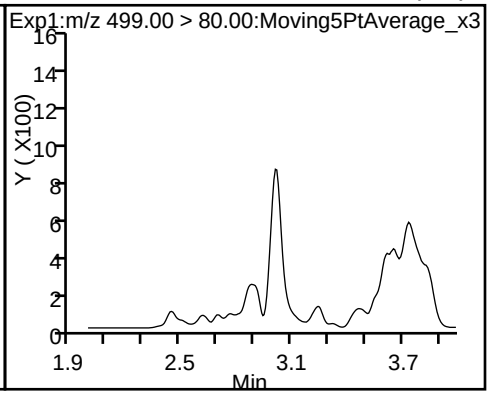
16 Perfluoroheptanesulfonic Acid (ND)



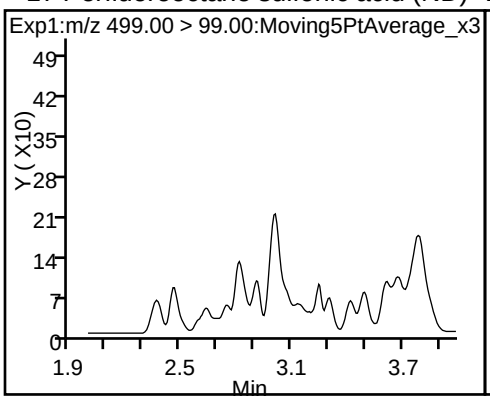
D 18 13C4 PFOS



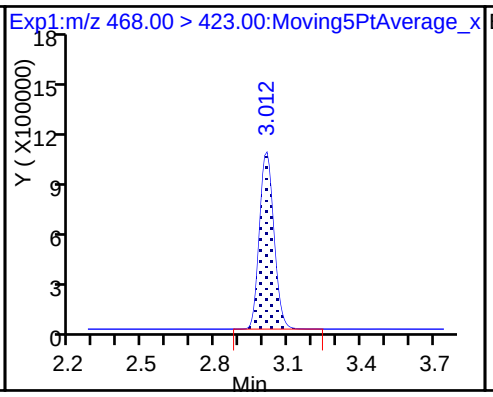
17 Perfluorooctane sulfonic acid (ND)



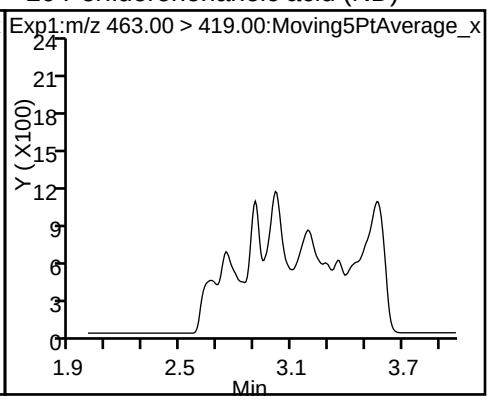
17 Perfluorooctane sulfonic acid (ND)



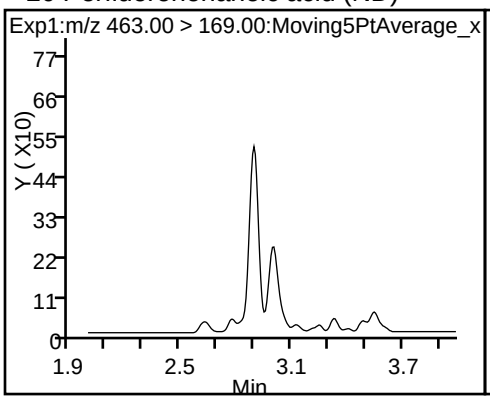
D 19 13C5 PFNA



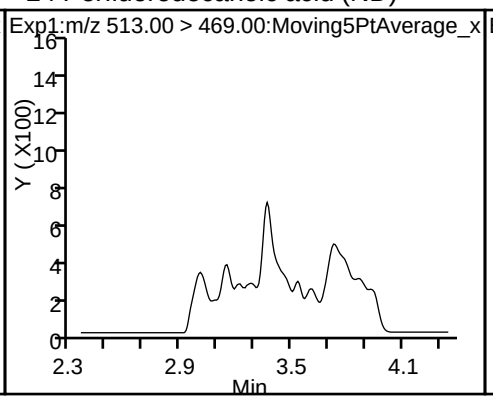
20 Perfluorononanoic acid (ND)



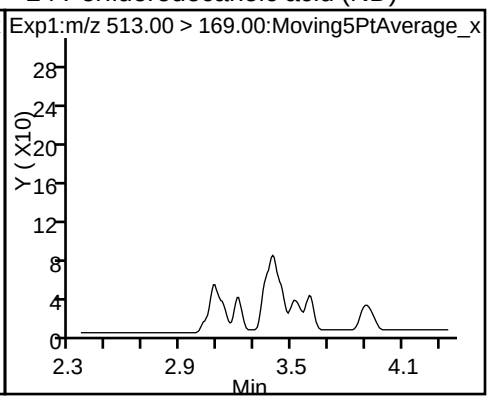
20 Perfluorononanoic acid (ND)



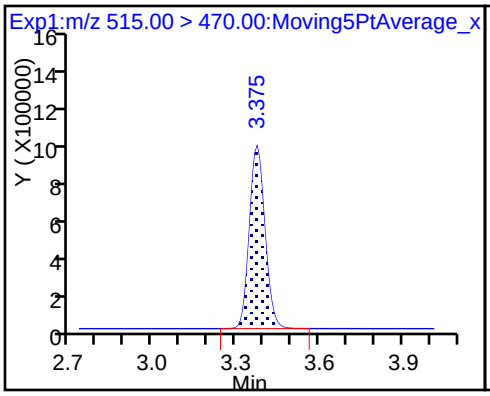
24 Perfluorodecanoic acid (ND)



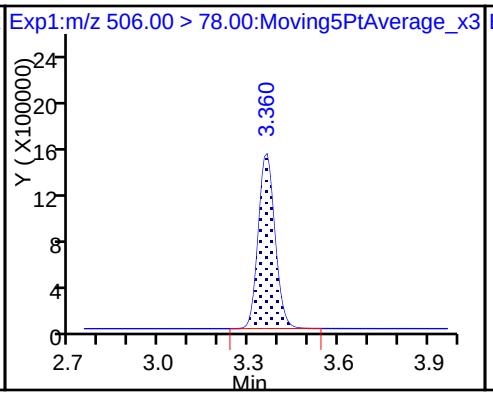
24 Perfluorodecanoic acid (ND)



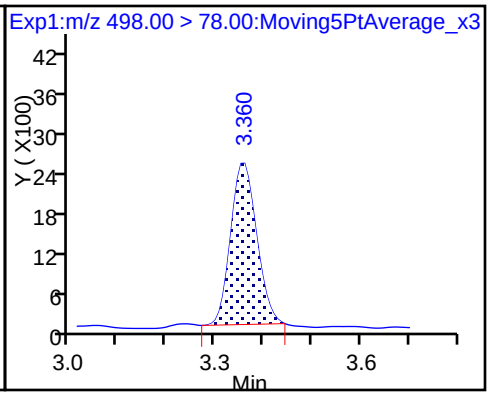
D 23 13C2 PFDA



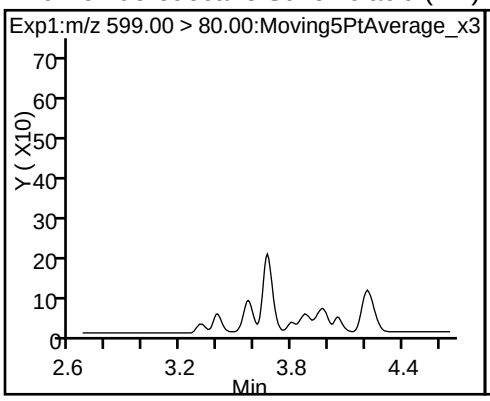
D 21 13C8 FOSA



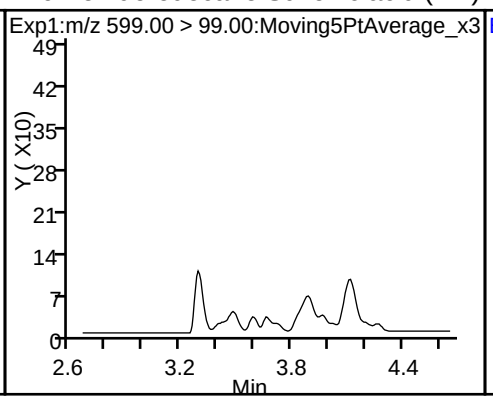
22 Perfluorooctane Sulfonamide



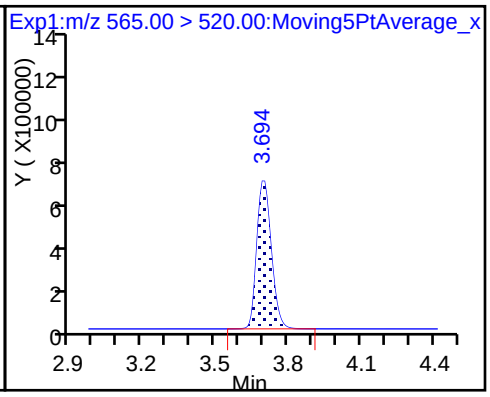
29 Perfluorodecane Sulfonic acid (ND)



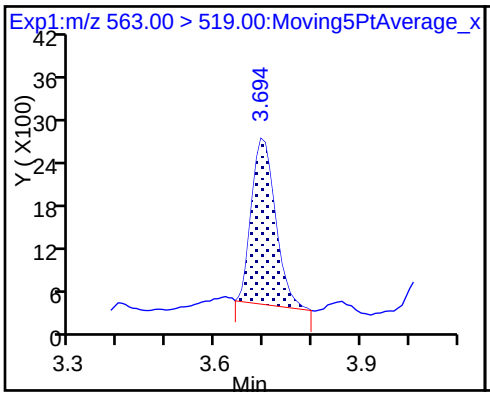
29 Perfluorodecane Sulfonic acid (ND)



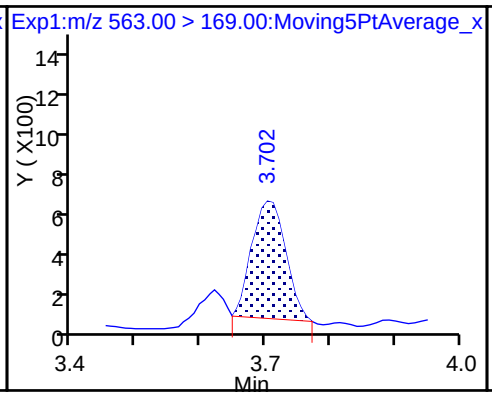
D 30 13C2 PFUnA



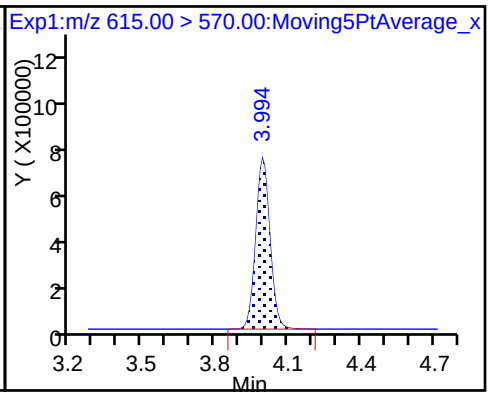
31 Perfluoroundecanoic acid



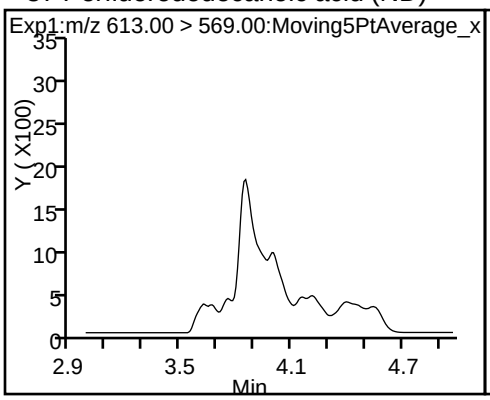
31 Perfluoroundecanoic acid



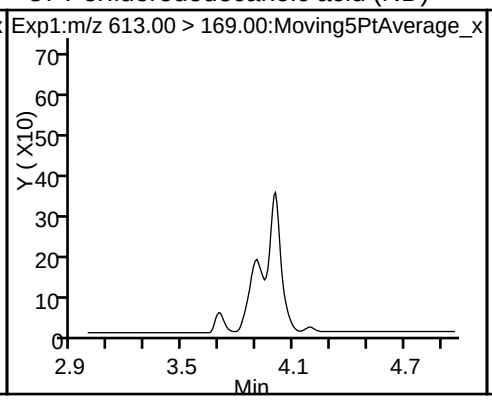
D 36 13C2 PFDoA



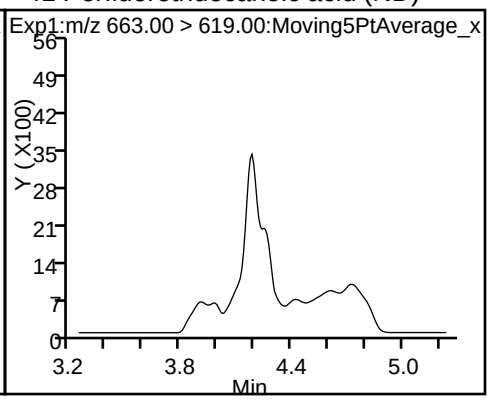
37 Perfluorododecanoic acid (ND)



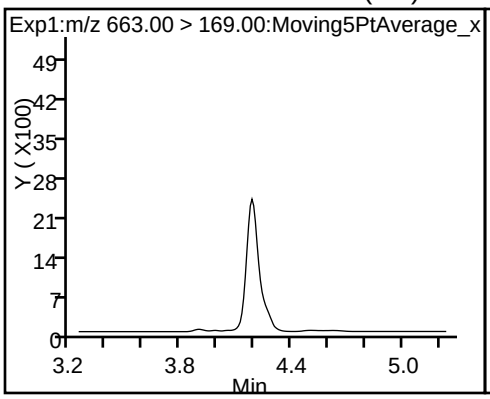
37 Perfluorododecanoic acid (ND)



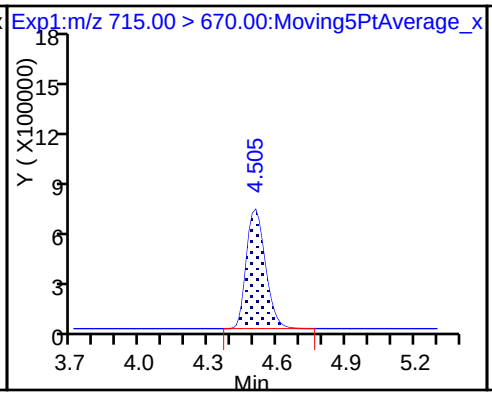
41 Perfluorotridecanoic acid (ND)



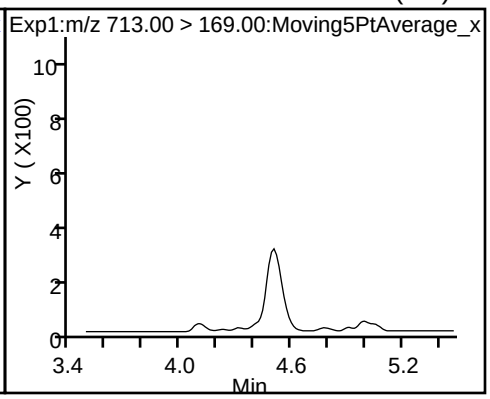
41 Perfluorotridecanoic acid (ND)



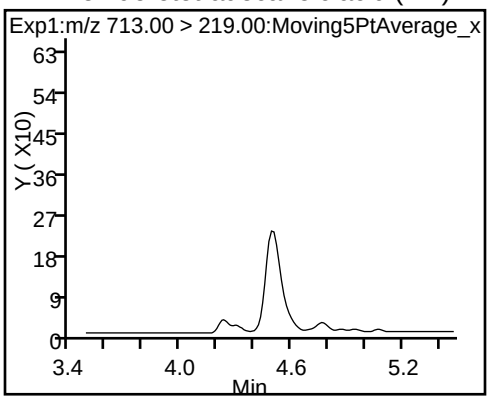
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

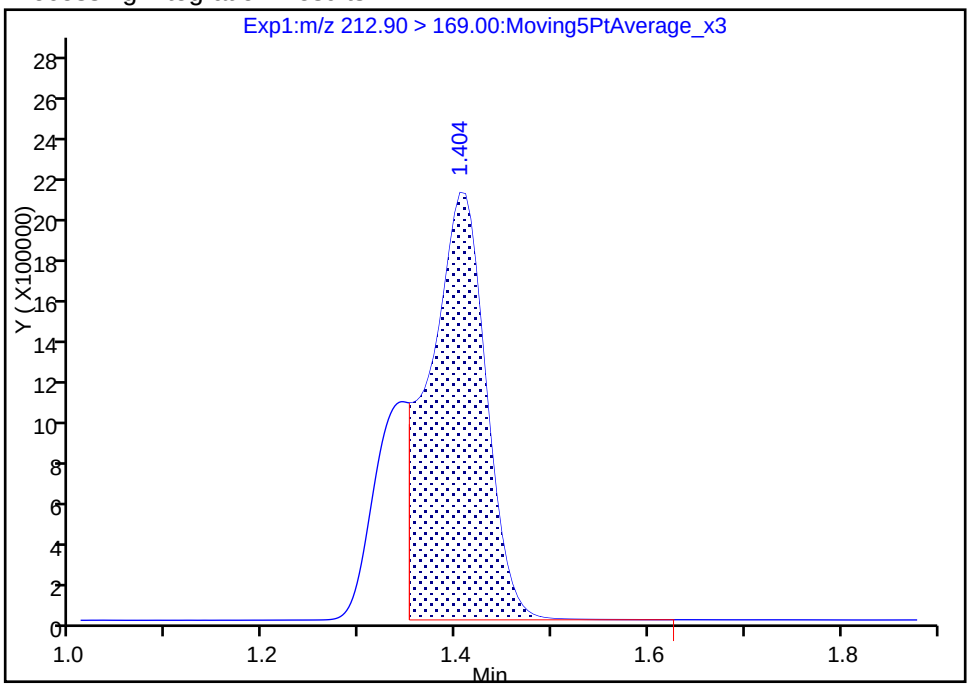
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_009.d				
Injection Date:	12-Dec-2017 22:29:59	Instrument ID:	A8_N		
Lims ID:	320-34072-A-4-A	Lab Sample ID:	320-34072-4		
Client ID:	TP-PFC-024-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	7	Worklist Smp#:	8
Injection 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

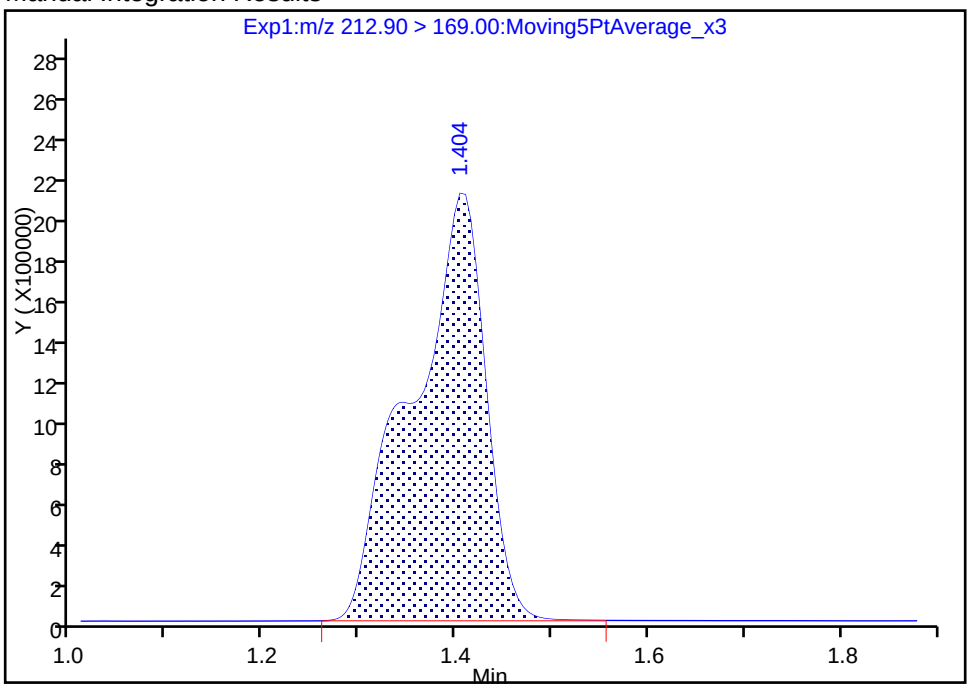
Processing Integration Results

RT: 1.40
Area: 8515991
Amount: 2.639001
Amount Units: ng/ml



Manual Integration Results

RT: 1.40
Area: 11196896
Amount: 3.469780
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 12:12:47

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

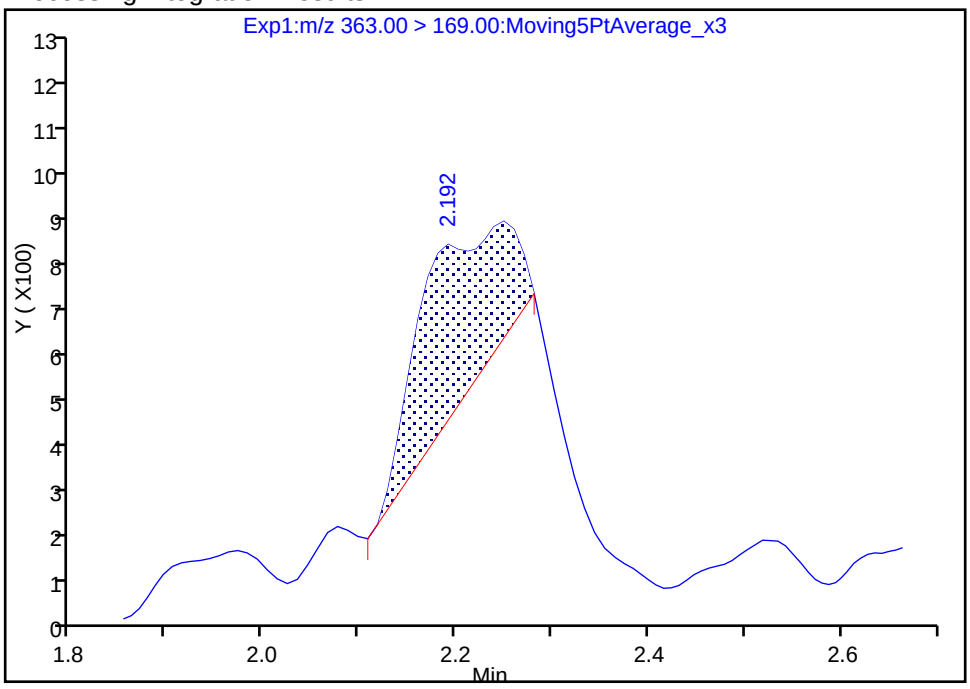
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_009.d				
Injection Date:	12-Dec-2017 22:29:59	Instrument ID:	A8_N		
Lims ID:	320-34072-A-4-A	Lab Sample ID:	320-34072-4		
Client ID:	TP-PFC-024-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	7	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 2

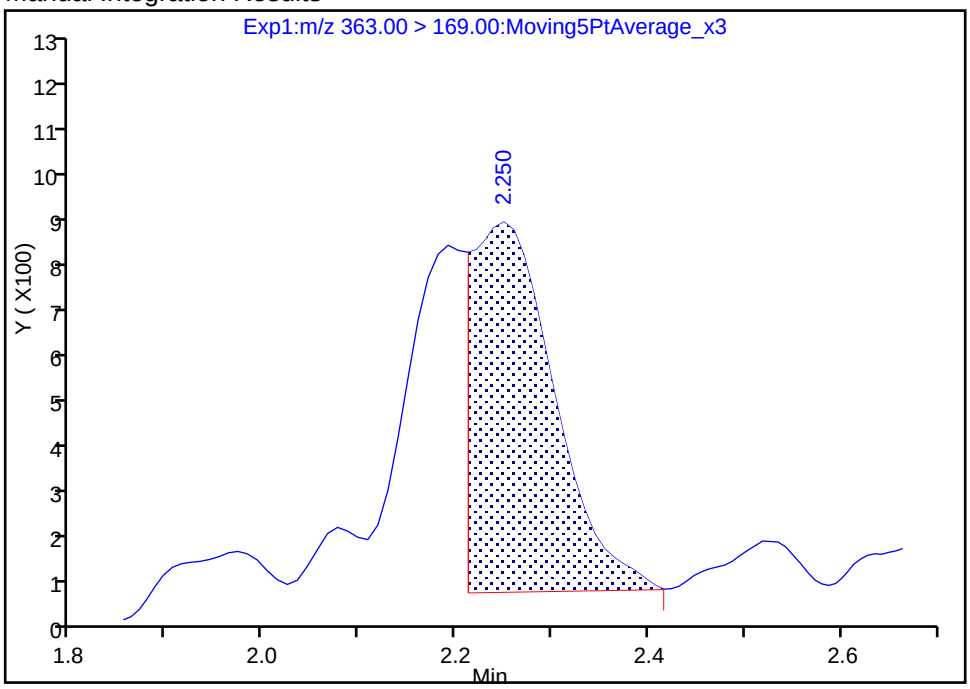
Processing Integration Results

RT: 2.19
Area: 2305
Amount: 0.006231
Amount Units: ng/ml



Manual Integration Results

RT: 2.25
Area: 4583
Amount: 0.004147
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:36:57

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

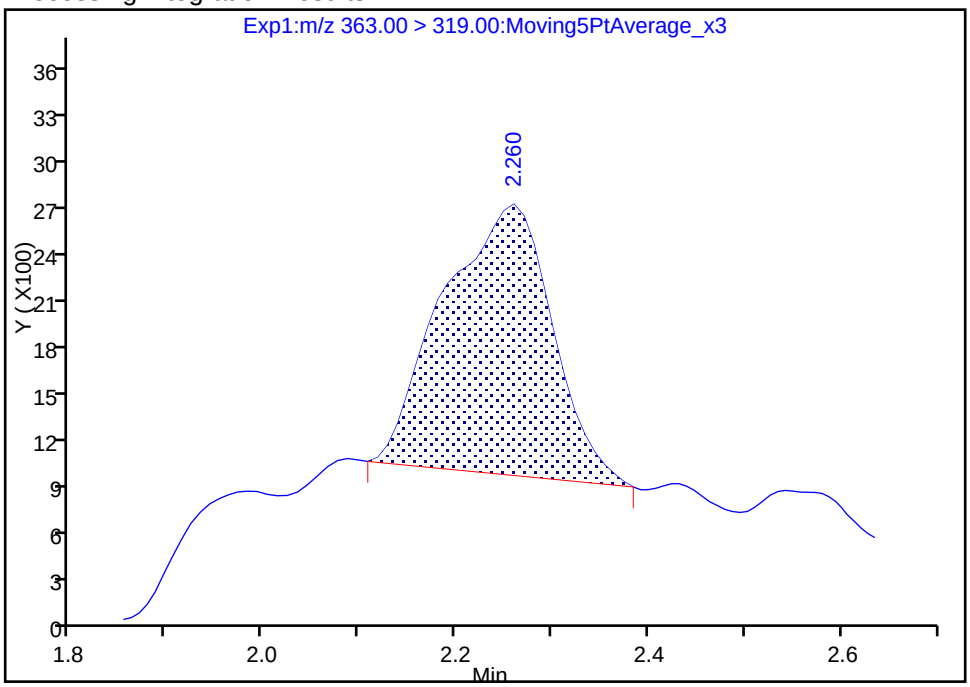
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_009.d				
Injection Date:	12-Dec-2017 22:29:59	Instrument ID:	A8_N		
Lims ID:	320-34072-A-4-A	Lab Sample ID:	320-34072-4		
Client ID:	TP-PFC-024-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	7	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

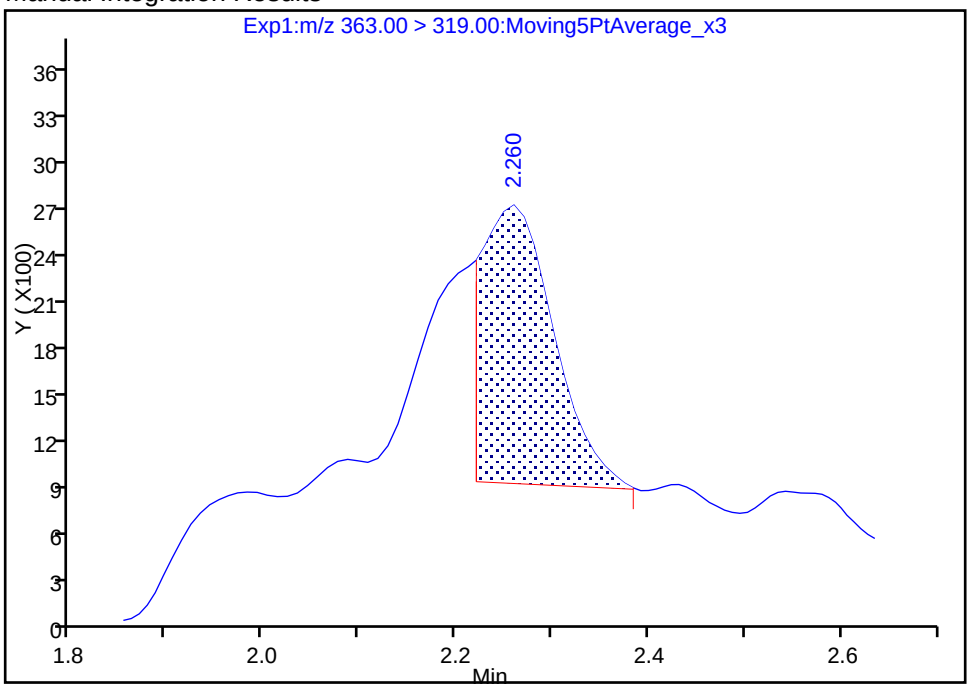
Processing Integration Results

RT: 2.26
Area: 13494
Amount: 0.006231
Amount Units: ng/ml



Manual Integration Results

RT: 2.26
Area: 8981
Amount: 0.004147
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:36:57

Audit Action: Manually Integrated Audit Reason: Split Peak

TestAmerica Sacramento

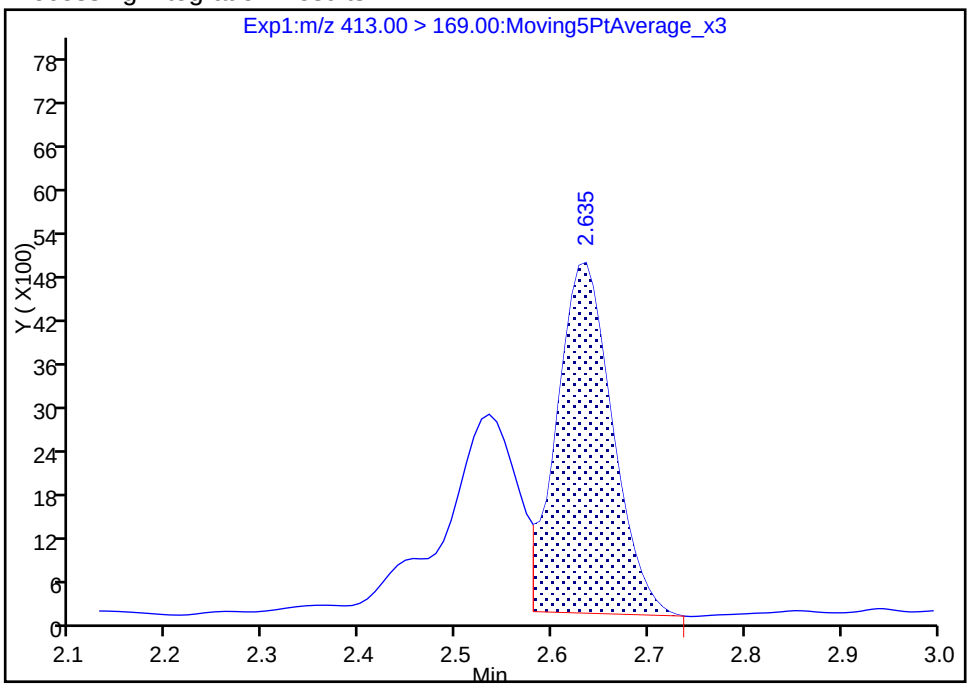
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_009.d				
Injection Date:	12-Dec-2017 22:29:59	Instrument ID:	A8_N		
Lims ID:	320-34072-A-4-A	Lab Sample ID:	320-34072-4		
Client ID:	TP-PFC-024-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	7	Worklist Smp#:	8
Injection 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

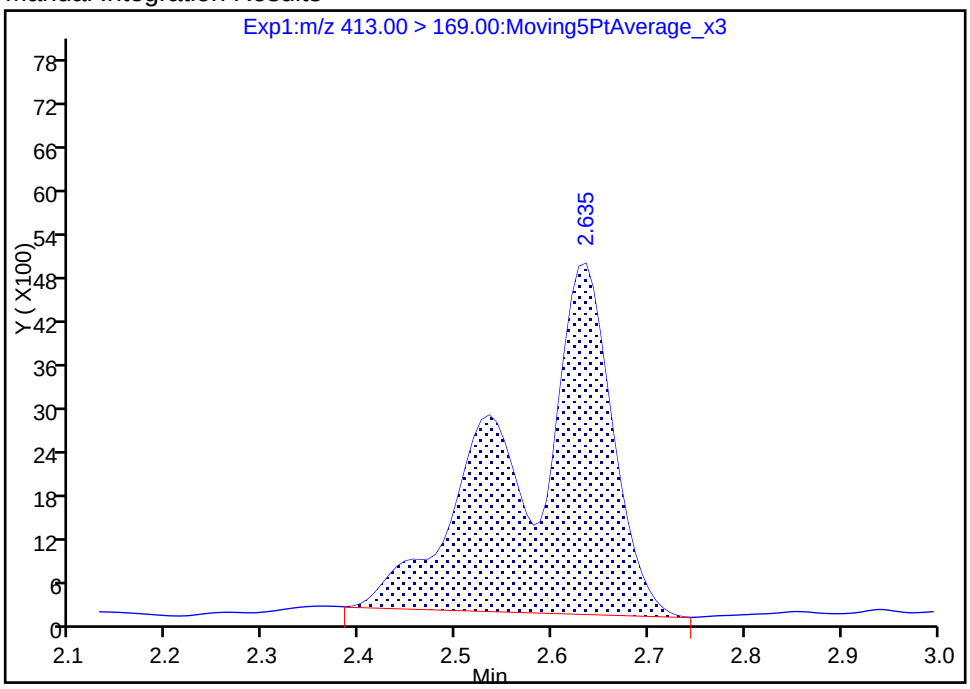
Processing Integration Results

RT: 2.64
Area: 19353
Amount: 0.012653
Amount Units: ng/ml



Manual Integration Results

RT: 2.64
Area: 33246
Amount: 0.018568
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 12:12:28
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_009.d

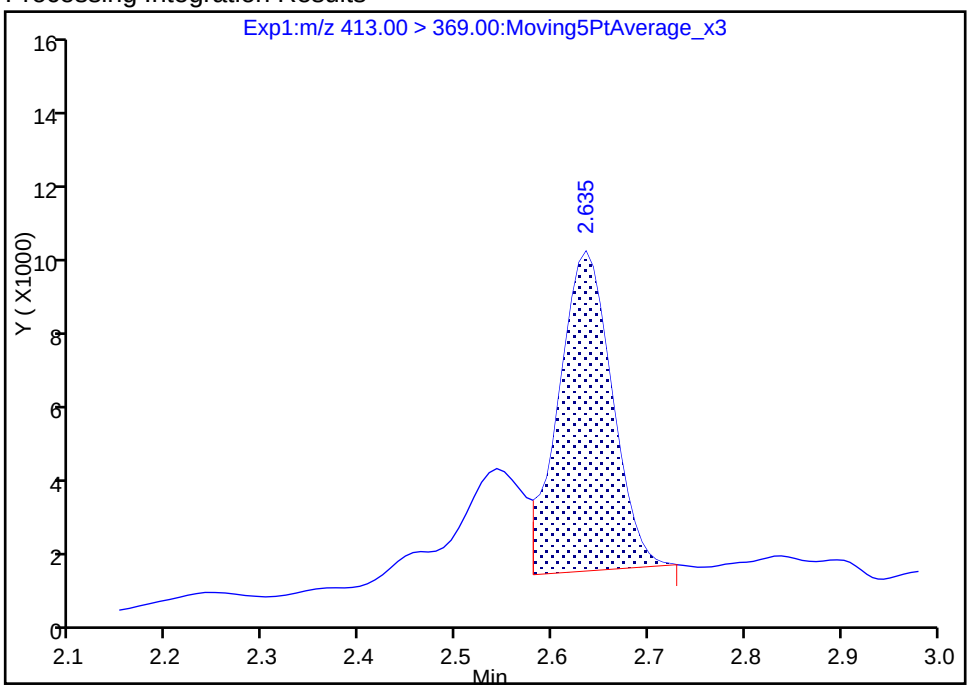
Injection Date:	12-Dec-2017 22:29:59	Instrument ID:	A8_N		
Lims ID:	320-34072-A-4-A	Lab Sample ID:	320-34072-4		
Client ID:	TP-PFC-024-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	7	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

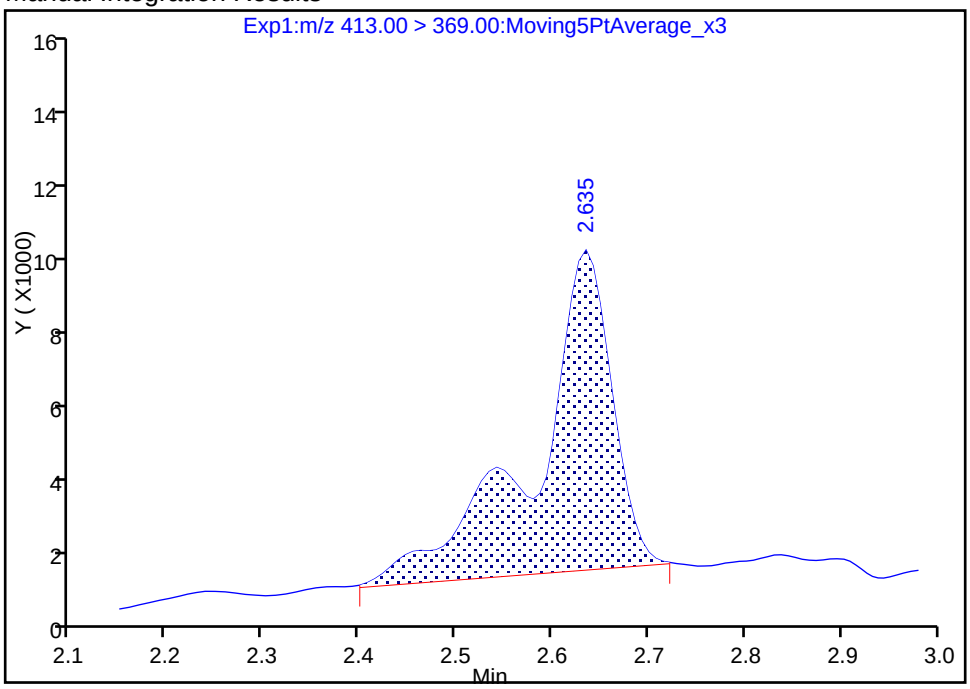
Processing Integration Results

RT: 2.64
Area: 31331
Amount: 0.012653
Amount Units: ng/ml



Manual Integration Results

RT: 2.64
Area: 45977
Amount: 0.018568
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 12:12:32

Audit Action: Manually Integrated Audit Reason: Isomers

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1 Analy Batch No.: 198210

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/04/2017 15:48 Calibration End Date: 12/04/2017 16:51 Calibration ID: 36632

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-198210/2	2017.12.04ICAL_002.d
Level 2	IC 320-198210/3	2017.12.04ICAL_003.d
Level 3	IC 320-198210/4	2017.12.04ICAL_004.d
Level 4	IC 320-198210/5	2017.12.04ICAL_005.d
Level 5	IC 320-198210/6	2017.12.04ICAL_006.d
Level 6	IC 320-198210/7	2017.12.04ICAL_007.d
Level 7	IC 320-198210/8	2017.12.04ICAL_008.d
Level 8	IC 320-198210/9	2017.12.04ICAL_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)	0.8841 0.9276	0.9455 0.9073	0.9275 0.8052	0.9346	0.9357	AveID		0.9084				5.1		35.0			
Perfluoropentanoic acid (PFPeA)	1.4289 1.1512	1.2088 1.0630	1.1950 0.9698	1.1491	1.1439	AveID		1.1637				11.3		35.0			
Perfluorobutanesulfonic acid (PFBS)	74.228 78.653	80.262 72.597	78.694 61.120	82.789	80.567	AveID		76.114				9.1		50.0			
4:2 FTS	0.8812 1.0832	1.0722 1.1511	1.0938 1.2555	1.1582	1.0061	AveID		1.0877				10.2		35.0			
Perfluorohexanoic acid (PFHxA)	1.0760 1.0159	1.0950 0.9900	1.0536 0.9061	0.9803	1.0506	AveID		1.0209				6.0		35.0			
Perfluoroheptanoic acid (PFHpA)	1.0431 1.0611	1.0939 1.0354	1.0416 0.9269	1.0459	1.0643	AveID		1.0390				4.7		35.0			
Perfluorohexanesulfonic acid (PFHxS)	1.3084 1.0320	1.1183 0.9894	1.0537 0.9675	1.0099	1.0284	AveID		1.0634				10.2		35.0			
6:2FTS	1.9784 1.5778	1.9597 1.5938	1.7391 1.5347	1.5891	1.5157	AveID		1.6860				11.1		35.0			
Perfluorooctanoic acid (PFOA)	1.2798 1.0742	1.1066 0.9776	1.0867 0.8957	1.0651	1.0470	AveID		1.0666				10.3		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.3368 1.3703	1.3225 1.2515	1.3221 1.1139	1.3242	1.3692	AveID		1.3013				6.5		50.0			
Perfluorononanoic acid (PFNA)	0.9234 1.0141	1.0147 0.9737	0.9759 0.9098	0.9962	0.9911	AveID		0.9749				4.0		35.0			
Perfluorooctanesulfonic acid (PFOS)	1.0419 1.0417	1.0160 1.0270	1.0737 0.9869	1.0303	1.0739	AveID		1.0364				2.8		35.0			
8:2FTS	1.1412 1.2549	1.2311 1.1999	1.3279 1.1983	1.2346	1.2882	AveID		1.2345				4.7		35.0			
Perfluorodecanoic acid (PFDA)	0.9607 0.9863	1.0729 1.0008	1.0214 0.8734	0.9640	0.9680	AveID		0.9809				5.8		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.: 320-34072-1 Analy Batch No.: 198210

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/04/2017 15:48 Calibration End Date: 12/04/2017 16:51 Calibration ID: 36632

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								
Perfluorooctane Sulfonamide (FOSA)	0.9196 0.9278	0.9860 0.9055	0.9910 0.7715	1.0050	0.9879	AveID		0.9368				8.2		35.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9369 1.0688	1.0997 1.0802	1.0484 1.0365	1.0328	1.0745	AveID		1.0472				4.8		35.0			
Perfluorodecanesulfonic acid (PFDS)	0.6542 0.6256	0.6438 0.6285	0.6521 0.5675	0.6257	0.6613	AveID		0.6323				4.7		50.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.7909 0.9864	0.9156 0.9738	0.9907 0.9988	0.9501	0.9274	AveID		0.9417				7.2		35.0			
Perfluoroundecanoic acid (PFUnA)	1.1660 0.9884	0.9804 0.9582	0.9606 0.8937	0.9195	0.9998	AveID		0.9833				8.3		35.0			
MeFOSA	0.8430 1.0027	0.8063 0.9900	1.0447 0.9219	1.0122	1.0150	AveID		0.9545				9.2		35.0			
Perfluorododecanoic acid (PFDoA)	0.9674 1.0287	1.0550 0.9361	0.9862 0.9290	0.9984	0.9967	AveID		0.9872				4.4		35.0			
N-EtFOSA-M	0.8921 1.0695	1.1482 1.0709	1.1094 1.0058	1.0419	1.0622	AveID		1.0500				7.3		35.0			
Perfluorotridecanoic Acid (PFTriA)	0.9958 1.0846	1.0834 0.9810	1.1273 0.9299	1.0839	1.0731	AveID		1.0449				6.5		50.0			
Perfluorotetradecanoic acid (PFTeA)	0.2790 0.2513	0.2544 0.2531	0.2325 0.2686	0.2355	0.2554	AveID		0.2537				6.1		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	1.6258 0.8438	1.3649 0.8243	0.9762 0.7547	0.8703	0.9040	L2ID	0.0208	0.8499							0.9940		0.9900
Perfluoro-n-octadecanoic acid (PFODA)	0.8991 0.9363	1.0451 0.9147	1.0038 0.8387	0.9858	1.0216	AveID		0.9556				7.3		50.0			
13C4 PFBA	1.4764 1.5014	1.4537 1.4919	1.4314 1.6365	1.5001	1.4212	Ave		1.4891				4.5		50.0			
13C5 PFPeA	0.8920 0.9391	0.9020 0.9570	0.8810 1.0201	0.9466	0.8925	Ave		0.9288				5.0		50.0			
13C3-PFBS	0.0192 0.0193	0.0182 0.0198	0.0190 0.0218	0.0190	0.0182	Ave		0.0193				5.9		50.0			
13C2 PFHxA	0.9664 0.9489	0.9490 0.9559	0.9280 1.0207	0.9770	0.8879	Ave		0.9542				4.0		50.0			
13C4-PFHpA	0.9314 0.9297	0.9237 0.9121	0.9207 0.9534	0.9627	0.8894	Ave		0.9279				2.5		50.0			
18O2 PFHxS	1.1797 1.1530	1.1707 1.1720	1.1122 1.1848	1.2088	1.1118	Ave		1.1616				3.0		50.0			
M2-6:2FTS	0.3734 0.3145	0.2986 0.2909	0.3102 0.2863	0.2989	0.3176	Ave		0.3113				8.8		50.0			
13C4 PFOA	1.0473 1.0088	1.0187 1.0128	1.0217 1.0395	1.0494	1.0167	Ave		1.0268				1.6		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
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1 Analy Batch No.: 198210

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/04/2017 15:48 Calibration End Date: 12/04/2017 16:51 Calibration ID: 36632

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	0.7522 0.7566	0.7307 0.7605	0.7334 0.8004	0.7803	0.7293	Ave		0.7554				3.3		50.0			
13C5 PFNA	0.7405 0.7483	0.7403 0.7396	0.7362 0.7570	0.7595	0.7169	Ave		0.7423				1.8		50.0			
M2-8:2FTS	0.2463 0.2413	0.2485 0.2561	0.2346 0.2499	0.2470	0.2364	Ave		0.2450				2.9		50.0			
13C2 PFDA	0.6225 0.6392	0.6078 0.6051	0.6108 0.6826	0.6570	0.6070	Ave		0.6290				4.5		50.0			
13C8 FOSA	1.0208 1.0410	1.0030 0.9871	0.9921 1.0732	1.0397	0.9804	Ave		1.0171				3.2		50.0			
d3-NMeFOSAA	0.3430 0.3307	0.3318 0.3385	0.3199 0.3594	0.3400	0.3212	Ave		0.3356				3.8		50.0			
d5-NEtFOSAA	0.3323 0.3204	0.3401 0.3068	0.3257 0.3046	0.3463	0.3329	Ave		0.3261				4.6		50.0			
13C2 PFUnA	0.4994 0.4665	0.4948 0.4664	0.4853 0.4975	0.5004	0.4662	Ave		0.4846				3.3		50.0			
d-N-MeFOSA-M	0.2788 0.2977	0.2830 0.3125	0.2669 0.3537	0.2857	0.2724	Ave		0.2938				9.6		50.0			
13C2 PFDoA	0.5439 0.5317	0.5435 0.5467	0.5302 0.5623	0.5486	0.5083	Ave		0.5394				3.0		50.0			
d-N-EtFOSA-M	0.2535 0.2727	0.2608 0.2835	0.2566 0.3301	0.2739	0.2581	Ave		0.2737				9.2		50.0			
13C2-PFTeDA	0.6481 0.6033	0.6263 0.6038	0.6770 0.6059	0.6495	0.6136	Ave		0.6284				4.3		50.0			
13C2-PFHxDA	1.0894 1.0596	1.0004 1.0121	1.0073 1.0460	1.0976	1.0042	Ave		1.0396				3.8		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.: 320-34072-1 Analy Batch No.: 198210

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/04/2017 15:48 Calibration End Date: 12/04/2017 16:51 Calibration ID: 36632

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-198210/2	2017.12.04ICAL_002.d
Level 2	IC 320-198210/3	2017.12.04ICAL_003.d
Level 3	IC 320-198210/4	2017.12.04ICAL_004.d
Level 4	IC 320-198210/5	2017.12.04ICAL_005.d
Level 5	IC 320-198210/6	2017.12.04ICAL_006.d
Level 6	IC 320-198210/7	2017.12.04ICAL_007.d
Level 7	IC 320-198210/8	2017.12.04ICAL_008.d
Level 8	IC 320-198210/9	2017.12.04ICAL_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	78224 16017345	170852 30325086	829578 51311116	3250007	8103624	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	76382 12434175	135542 22789920	657858 38522728	2521773	6221422	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	75308 15445497	160661 28463816	825020 45840995	3225845	7915154	0.0221 4.42	0.0442 8.84	0.221 17.7	0.884	2.21
4:2 FTS		AveID	18416 3659841	37173 7005464	198045 13073743	749506	1818901	0.0234 4.67	0.0467 9.34	0.234 18.7	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	62320 11087289	129172 21198747	610997 36014620	2220279	5684235	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoroheptanoic acid (PFHpA)		AveID	58223 11345726	125602 21155159	599255 34413663	2334058	5768119	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	84174 12453435	148090 23639232	666375 40621142	2575397	6340167	0.0228 4.55	0.0455 9.10	0.228 18.2	0.910	2.28
6:2FTS		AveID	41964 5410631	68964 9844898	319592 16219600	1043721	2781378	0.0237 4.74	0.0474 9.48	0.237 19.0	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	80320 12462909	140133 22179047	693749 36256854	2591017	6486499	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	57367 11352397	114362 20298371	576767 33050481	2280426	5792972	0.0238 4.76	0.0476 9.52	0.238 19.0	0.952	2.38
Perfluorononanoic acid (PFNA)		AveID	40979 8727865	93375 16132833	448913 26819393	1753950	4329674	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)		AveID	43586 8412511	85637 16236576	456586 28542678	1729608	4429145	0.0232 4.64	0.0464 9.28	0.232 18.6	0.928	2.32
8:2FTS		AveID	16136 3335732	36430 6593874	186494 11171284	677314	1777969	0.0240 4.79	0.0479 9.58	0.240 19.2	0.958	2.40
Perfluorodecanoic acid (PFDA)		AveID	35837 7250393	81056 13565320	389843 23214862	1468220	3580422	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorooctane Sulfonamide (FOSA)		AveID	56258 11108013	122931 20023558	614374 32240646	2422346	5901786	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.: 320-34072-1 Analy Batch No.: 198210

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/04/2017 15:48 Calibration End Date: 12/04/2017 16:51 Calibration ID: 36632

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	19259 4064917	45355 8192092	209556 14505483	813999	2103368	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	28427 5247839	56374 10321356	288079 17049700	1091162	2833055	0.0241 4.82	0.0482 9.64	0.241 19.3	0.964	2.41
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	15751 3634581	38708 6693367	201644 11844723	762806	1881492	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoroundecanoic acid (PFUnA)		AveID	34900 5303373	60297 10011006	291297 17311402	1066672	2840384	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
MeFOSA		AveID	14087 3433227	28360 6931131	174245 12698938	670337	1684839	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	31534 6290779	71281 11465899	326739 20341082	1269740	3087281	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
N-EtFOSA-M		AveID	13553 3354313	37225 6801725	177846 12929404	661598	1670598	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	32459 6632282	73202 12015798	373509 20360336	1378400	3323761	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	10836 1743731	19806 3423281	98348 6336454	354521	955034	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	106142 10283347	169723 18690044	614444 30740196	2214468	5531905	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoro-n-octadecanoic acid (PFODA)		AveID	58698 11410437	129959 20739410	631858 34162529	2508373	6251649	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
13C4 PFBA	13PFOA	Ave	8847788 8633918	9035119 8355556	8944246 7965653	8693983	8660817	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C5 PFPeA	13PFOA	Ave	5345531 5400463	5606439 5359848	5505317 4965540	5486176	5438586	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C3-PFBS	13PFOA	Ave	106734 103297	105293 103121	110295 98631	102481	103355	2.33 2.33	2.33 2.33	2.33 2.33	2.33	2.33
13C2 PFHxA	13PFOA	Ave	5791822 5457006	5898473 5353254	5799143 4968232	5662531	5410683	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C4-PFHpA	13PFOA	Ave	5581950 5346111	5741019 5108146	5753355 4640871	5579165	5419539	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
18O2 PFHxS	13PFOA	Ave	6688035 6272276	6883037 6209580	6574606 5455632	6627522	6409168	2.37 2.37	2.37 2.37	2.37 2.37	2.37	2.37
M2-6:2FTS	13PFOA	Ave	2125634 1718247	1763243 1547518	1841567 1323901	1645515	1838871	2.38 2.38	2.38 2.38	2.38 2.38	2.38	2.38
13C4 PFOA	13PFOA	Ave	6276186 5801176	6331644 5672017	6384245 5059591	6081734	6195524	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C4 PFOS	13PFOA	Ave	4309488 4159568	4341775 4071767	4380920 3724410	4323332	4248600	2.39 2.39	2.39 2.39	2.39 2.39	2.39	2.39
13C5 PFNA	13PFOA	Ave	4437613 4303391	4601234 4142344	4600032 3684676	4401513	4368620	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.: 320-34072-1 Analy Batch No.: 198210

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/04/2017 15:48 Calibration End Date: 12/04/2017 16:51 Calibration ID: 36632

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	Ave	1413990	1479516	1404384	1371577	1380175	2.40	2.40	2.40	2.40	2.40
	OA		1329091	1373886	1165374			2.40	2.40	2.40		
13C2 PFDA	13PF	Ave	3730433	3777541	3816836	3807504	3698804	2.50	2.50	2.50	2.50	2.50
	OA		3675640	3388613	3322458			2.50	2.50	2.50		
13C8 FOSA	13PF	Ave	6117373	6234029	6199614	6025486	5974226	2.50	2.50	2.50	2.50	2.50
	OA		5986273	5528057	5223719			2.50	2.50	2.50		
d3-NMeFOSAA	13PF	Ave	2055648	2062096	1998907	1970435	1957557	2.50	2.50	2.50	2.50	2.50
	OA		1901694	1895903	1749381			2.50	2.50	2.50		
d5-NEtFOSAA	13PF	Ave	1991458	2113821	2035321	2007076	2028871	2.50	2.50	2.50	2.50	2.50
	OA		1842284	1718330	1482404			2.50	2.50	2.50		
13C2 PFUnA	13PF	Ave	2993069	3075279	3032542	2900047	2840864	2.50	2.50	2.50	2.50	2.50
	OA		2682738	2611948	2421439			2.50	2.50	2.50		
d-N-MeFOSA-M	13PF	Ave	1670992	1758684	1667869	1655616	1659925	2.50	2.50	2.50	2.50	2.50
	OA		1711960	1750368	1721873			2.50	2.50	2.50		
13C2 PFDoA	13PF	Ave	3259539	3378244	3313277	3179371	3097457	2.50	2.50	2.50	2.50	2.50
	OA		3057546	3062001	2736968			2.50	2.50	2.50		
d-N-EtFOSA-M	13PF	Ave	1519293	1620984	1603127	1587546	1572774	2.50	2.50	2.50	2.50	2.50
	OA		1568109	1587890	1606922			2.50	2.50	2.50		
13C2-PFTeDA	13PF	Ave	3883886	3892459	4230459	3764283	3739126	2.50	2.50	2.50	2.50	2.50
	OA		3469556	3381530	2949102			2.50	2.50	2.50		
13C2-PFHxDA	13PF	Ave	6528514	6217463	6294517	6361239	6119574	2.50	2.50	2.50	2.50	2.50
	OA		6093216	5668173	5091489			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.: 320-34072-1 Analy Batch No.: 198210

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/04/2017 15:48 Calibration End Date: 12/04/2017 16:51 Calibration ID: 36632

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-198210/2	2017.12.04ICAL_002.d
Level 2	IC 320-198210/3	2017.12.04ICAL_003.d
Level 3	IC 320-198210/4	2017.12.04ICAL_004.d
Level 4	IC 320-198210/5	2017.12.04ICAL_005.d
Level 5	IC 320-198210/6	2017.12.04ICAL_006.d
Level 6	IC 320-198210/7	2017.12.04ICAL_007.d
Level 7	IC 320-198210/8	2017.12.04ICAL_008.d
Level 8	IC 320-198210/9	2017.12.04ICAL_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)	-0.1	4.1 -11.4	2.1	2.9	3.0	2.1	25	25 25	25	25	25	25
Perfluoropentanoic acid (PFPeA)	-8.7	3.9 -16.7	2.7	-1.3	-1.7	-1.1	25	25 25	25	25	25	25
Perfluorobutanesulfonic acid (PFBS)	-4.6	5.5 -19.7	3.4	8.8	5.9	3.3	25	25 25	25	25	25	25
4:2 FTS	5.8	-1.4 15.4	0.6	6.5	-7.5	-0.4	25	25 25	25	25	25	25
Perfluorohexanoic acid (PFHxA)	-3.0	7.3 -11.2	3.2	-4.0	2.9	-0.5	25	25 25	25	25	25	25
Perfluoroheptanoic acid (PFHpA)	-0.4	5.3 -10.8	0.2	0.7	2.4	2.1	25	25 25	25	25	25	25
Perfluorohexanesulfonic acid (PFHxS)	-7.0	5.2 -9.0	-0.9	-5.0	-3.3	-3.0	25	25 25	25	25	25	25
6:2FTS	-5.5	16.2 -9.0	3.1	-5.8	-10.1	-6.4	25	25 25	25	25	25	25
Perfluorooctanoic acid (PFOA)	-8.3	3.8 -16.0	1.9	-0.1	-1.8	0.7	25	25 25	25	25	25	25
Perfluoroheptanesulfonic Acid (PFHpS)	-3.8	1.6 -14.4	1.6	1.8	5.2	5.3	25	25 25	25	25	25	25
Perfluorononanoic acid (PFNA)	-0.1	4.1 -6.7	0.1	2.2	1.7	4.0	25	25 25	25	25	25	25
Perfluorooctanesulfonic acid (PFOS)	-0.9	-2.0 -4.8	3.6	-0.6	3.6	0.5	25	25 25	25	25	25	25
8:2FTS	-2.8	-0.3 -2.9	7.6	0.0	4.4	1.7	25	25 25	25	25	25	25
Perfluorodecanoic acid (PFDA)	2.0	9.4 -11.0	4.1	-1.7	-1.3	0.5	25	25 25	25	25	25	25
Perfluorooctane Sulfonamide (FOSA)	-3.3	5.2 -17.6	5.8	7.3	5.5	-1.0	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.: 320-34072-1 Analy Batch No.: 198210

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/04/2017 15:48 Calibration End Date: 12/04/2017 16:51 Calibration ID: 36632

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)	3.2	5.0 -1.0	0.1	-1.4	2.6	2.1	25	25 25	25	25	25	25
Perfluorodecanesulfonic acid (PFDS)	-0.6	1.8 -10.3	3.1	-1.0	4.6	-1.1	25	25 25	25	25	25	25
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.4	-2.8 6.1	5.2	0.9	-1.5	4.7	25	25 25	25	25	25	25
Perfluoroundecanoic acid (PFUnA)	-2.6	-0.3 -9.1	-2.3	-6.5	1.7	0.5	25	25 25	25	25	25	25
MeFOSA	3.7	-15.5 -3.4	9.5	6.0	6.3	5.1	25	25 25	25	25	25	25
Perfluorododecanoic acid (PFDoA)	-5.2	6.9 -5.9	-0.1	1.1	1.0	4.2	25	25 25	25	25	25	25
N-EtFOSA-M	2.0	9.4 -4.2	5.7	-0.8	1.2	1.9	25	25 25	25	25	25	25
Perfluorotridecanoic Acid (PFTriA)	-6.1	3.7 -11.0	7.9	3.7	2.7	3.8	25	25 25	25	25	25	25
Perfluorotetradecanoic acid (PFTeA)	-0.2	0.3 5.9	-8.4	-7.2	0.7	-1.0	25	25 25	25	25	25	25
Perfluoro-n-hexadecanoic acid (PFHxDA)	-3.2	11.7 -11.3	5.1	0.0	5.4	-1.2	25	25 25	25	25	25	25
Perfluoro-n-octadecanoic acid (PFODA)	-4.3	9.4 -12.2	5.0	3.2	6.9	-2.0	25	25 25	25	25	25	25

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_002.d
Lims ID: IC L1 Full
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 04-Dec-2017 15:48:59 ALS Bottle#: 10 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\20171204-51297.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 04-Dec-2017 19:07:14 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: phomsophat Date: 04-Dec-2017 16:19:49

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	1.399	1.401	-0.002	0.536	8847788	2.48		99.1	75619	
2 Perfluorobutyric acid										
212.90 > 169.00	1.399	1.402	-0.003	1.000	78224	0.0243		97.3	20.7	
D 3 13C5-PFPeA										
267.90 > 223.00	1.647	1.646	0.001	0.631	5345531	2.40		96.0	66703	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.647	1.648	-0.001	1.000	76382	0.0307		123	35.5	
D 47 13C3-PFBS										
301.90 > 83.00	1.679	1.681	-0.002	0.643	106734	2.31		99.2	3270	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.679	1.682	-0.003	1.000	75308	0.0216		97.5	371	
298.90 > 99.00	1.679	1.682	-0.003	1.000	32055		2.35(1.25-3.74)	97.5	275	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.886	1.887	-0.001	1.000	18416	0.0189		81.0	870	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.913	1.923	-0.010	0.995	62320	0.0263		105	118	
313.00 > 119.00	1.923	1.923	0.0	1.000	5732		10.87(5.03-15.10)	105	103	
D 7 13C2 PFHxA										
315.00 > 270.00	1.923	1.924	-0.001	0.736	5791822	2.53		101	63578	
D 9 13C4-PFHpA										
367.00 > 322.00	2.248	2.254	-0.006	0.861	5581950	2.51		100	45103	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.248	2.255	-0.007	1.000	58223	0.0251		100	68.8	M
363.00 > 169.00	2.248	2.255	-0.007	1.000	22789		2.55(1.13-3.40)	100	226	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.269	2.269	0.0	1.000	84174	0.0280		123	198	
399.00 > 99.00	2.269	2.269	0.0	1.000	25610		3.29(1.50-4.49)	123	136	

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	2.269	2.271	-0.002	0.869	6688035	2.40		102	62499	
D 12 M2-6:2FTS										
429.00 > 81.00	2.604	2.605	-0.001	0.997	2125634	2.85		120	40564	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.604	2.605	-0.001	1.000	41964	0.0278		117	1064	
D 14 13C4 PFOA										
417.00 > 372.00	2.611	2.618	-0.007	1.000	6276186	2.55		102	62999	
* 62 13C2-PFOA										
415.00 > 370.00	2.611	2.619	-0.008		5993004	2.50			54359	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.619	2.621	-0.002	1.003	80320	0.0300		120	39.7	
413.00 > 169.00	2.611	2.621	-0.010	1.000	41019		1.96(0.84-2.52)	120	299	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.619	2.626	-0.007	1.000	57367	0.0244		103	1637	
449.00 > 99.00	2.619	2.626	-0.007	1.000	14602		3.93(1.94-5.82)	103	430	
D 18 13C4 PFOS										
503.00 > 80.00	2.985	2.993	-0.008	1.143	4309488	2.38		99.6	46368	
20 Perfluorononanoic acid										
463.00 > 419.00	2.985	2.994	-0.009	1.000	40979	0.0237		94.7	116	
463.00 > 169.00	2.993	2.994	-0.001	1.003	9900		4.14(1.90-5.69)	94.7	264	
D 19 13C5 PFNA										
468.00 > 423.00	2.985	2.994	-0.009	1.143	4437613	2.49		99.8	46977	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.985	2.994	-0.009	1.000	43586	0.0233		101	207	
499.00 > 99.00	2.993	2.994	-0.001	1.003	9648		4.52(2.31-6.93)	101	120	M
D 26 M2-8:2FTS										
529.00 > 81.00	3.342	3.343	-0.001	1.280	1413990	2.41		101	20852	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.342	3.344	-0.002	1.000	16136	0.0221		92.4	585	
D 23 13C2 PFDA										
515.00 > 470.00	3.350	3.356	-0.006	1.283	3730433	2.47		99.0	44485	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.350	3.356	-0.006	1.000	35837	0.0245		97.9	147	
513.00 > 169.00	3.357	3.356	0.001	1.002	5648		6.35(2.36-7.09)	97.9	245	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.357	3.359	-0.002	1.000	56258	0.0245		98.2	1514	
D 21 13C8 FOSA										
506.00 > 78.00	3.357	3.359	-0.002	1.286	6117373	2.51		100	30244	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.510	3.511	-0.001	1.344	2055648	2.56		102	20325	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.510	3.515	-0.005	1.000	19259	0.0224		89.5	154	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.665	3.667	-0.002	1.000	28427	0.0249		103	1457	
599.00 > 99.00	3.665	3.667	-0.002	1.000	7743		3.67(1.39-4.16)	103	392	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.673	3.677	-0.004	1.407	1991458	2.55		102	10829	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.682	3.685	-0.003	1.000	34900	0.0296		119	157	
563.00 > 169.00	3.682	3.685	-0.003	1.000	6920		5.04(0.00-0.00)	119	690	
D 30 13C2 PFUnA										
565.00 > 520.00	3.682	3.685	-0.003	1.410	2993069	2.58		103	29275	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.682	3.685	-0.003	1.002	15751	0.0210		84.0	261	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.856	3.856	0.0	1.477	1670992	2.37		94.9	3791	
35 MeFOSA										
512.00 > 169.00	3.867	3.865	0.002	1.003	14087	0.0221		88.3	525	
D 36 13C2 PFDoA										
615.00 > 570.00	3.974	3.979	-0.005	1.522	3259539	2.52		101	30848	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.983	3.982	0.001	1.002	31534	0.0245		98.0	64.5	
613.00 > 169.00	3.974	3.982	-0.008	1.000	7102		4.44(2.13-6.40)	98.0	351	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.046	4.048	-0.002	1.549	1519293	2.32		92.6	4418	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.053	4.056	-0.003	1.002	13553	0.0212		85.0	663	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.244	4.243	0.001	1.000	32459	0.0238		95.3	68.1	
663.00 > 169.00	4.235	4.243	-0.008	0.998	8805		3.69(1.25-3.76)	95.3	430	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.473	4.481	-0.008	1.000	10836	0.0275		110	486	
713.00 > 219.00	4.473	4.481	-0.008	1.000	7431		1.46(0.71-2.13)	110	337	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.473	4.481	-0.008	1.713	3883886	2.58		103	29011	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.887	4.892	-0.005	1.871	6528514	2.62		105	24185	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.896	4.894	0.002	1.002	106142	0.0234		93.6	66.1	
813.00 > 169.00	4.887	4.894	-0.007	1.000	19751		5.37(2.86-8.58)	93.6	560	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.240	5.242	-0.002	1.000	58698	0.0235		94.1	13.5	
913.00 > 169.00	5.240	5.242	-0.002	1.000	8199		7.16(0.00-0.00)	94.1	117	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL1_00002 Amount Added: 1.00 Units: mL

Report Date: 04-Dec-2017 19:07:14 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_002.d

Injection Date: 04-Dec-2017 15:48:59 Instrument ID: A8_N

Lims ID: IC L1 Full

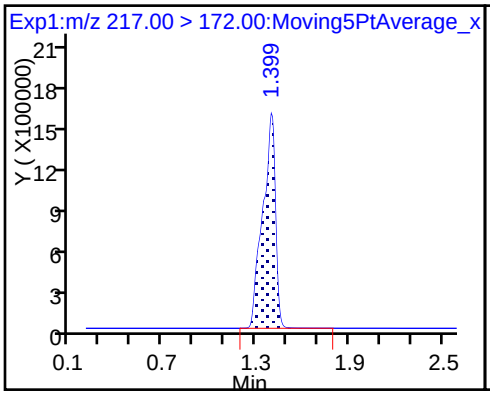
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2

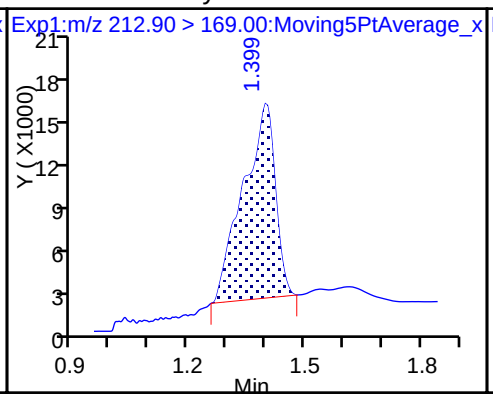
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

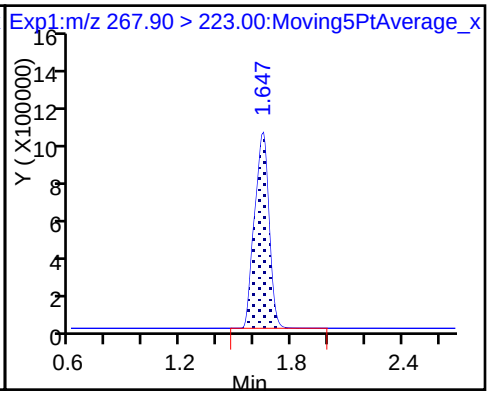
D 1 13C4 PFBA



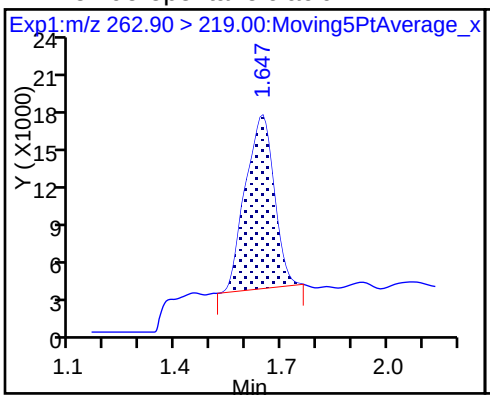
2 Perfluorobutyric acid



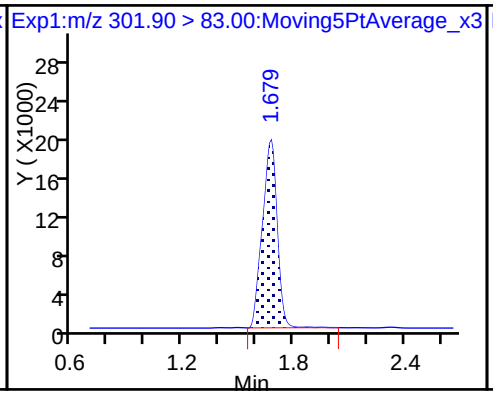
D 3 13C5-PFPeA



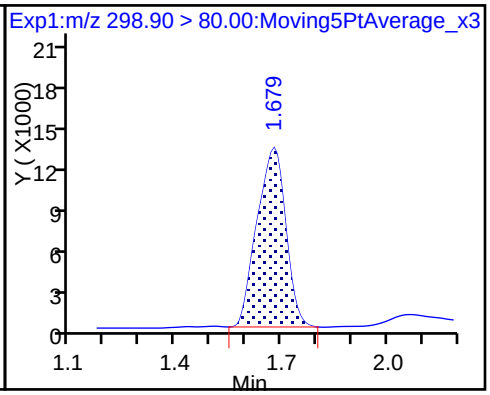
4 Perfluoropentanoic acid



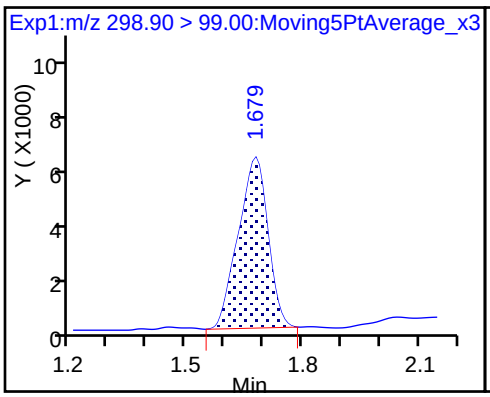
D 47 13C3-PFBS



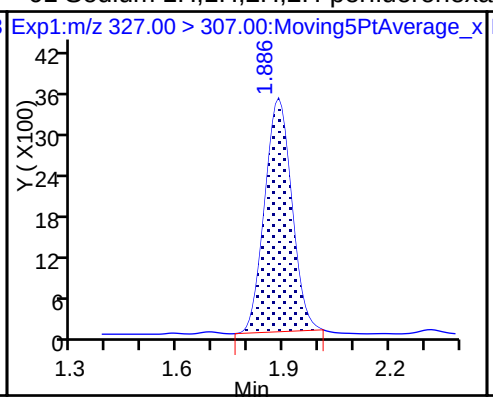
5 Perfluorobutanesulfonic acid



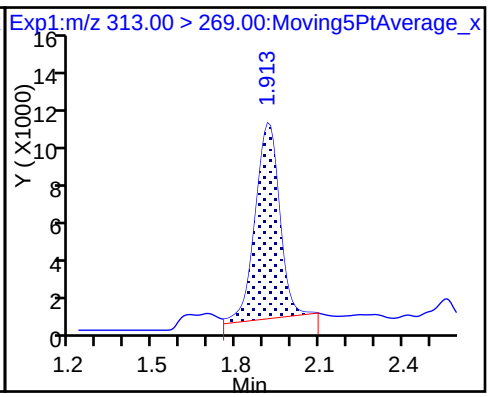
5 Perfluorobutanesulfonic acid



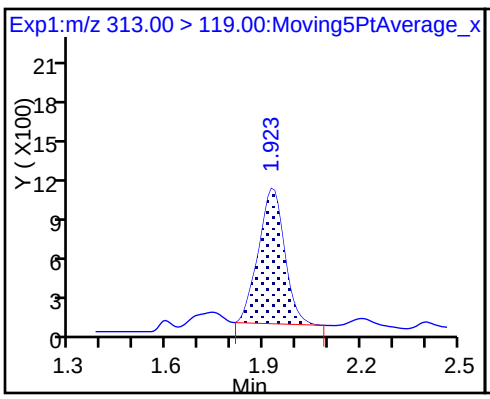
61 Sodium 1H,1H,2H,2H-perfluorohexane



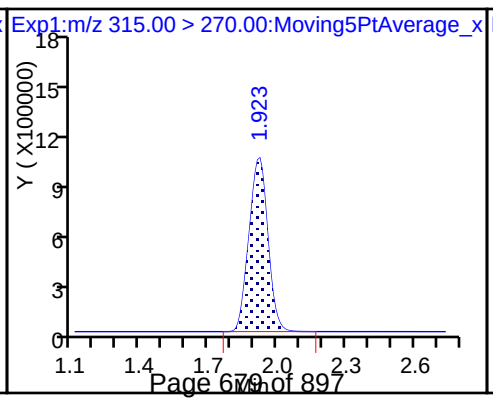
6 Perfluorohexanoic acid



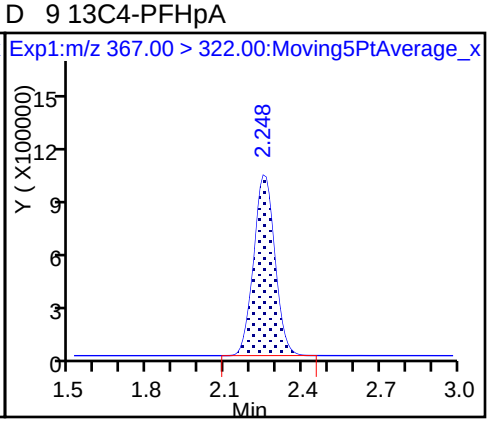
6 Perfluorohexanoic acid



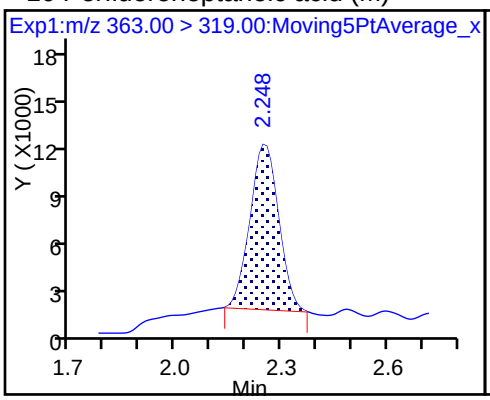
D 7 13C2 PFHxA



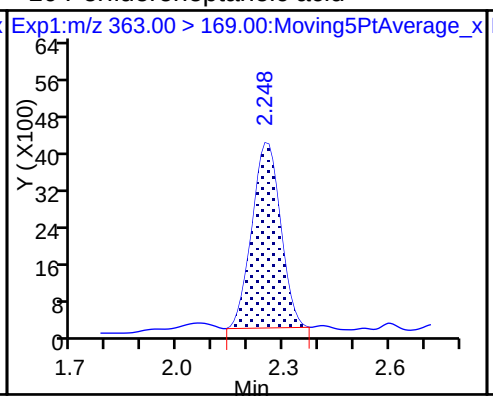
D 9 13C4-PFHpA



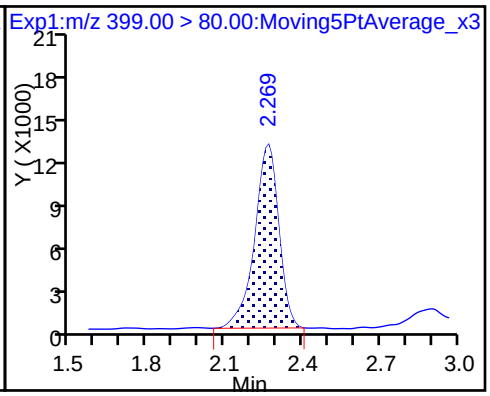
10 Perfluoroheptanoic acid (M)



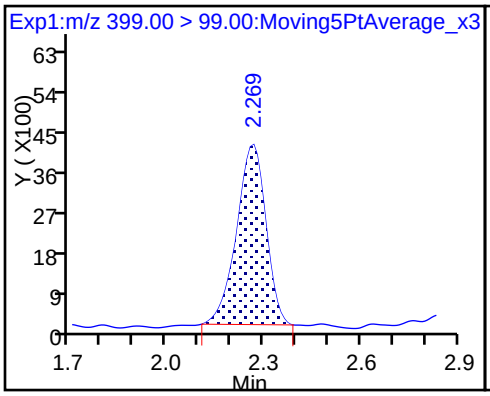
10 Perfluoroheptanoic acid



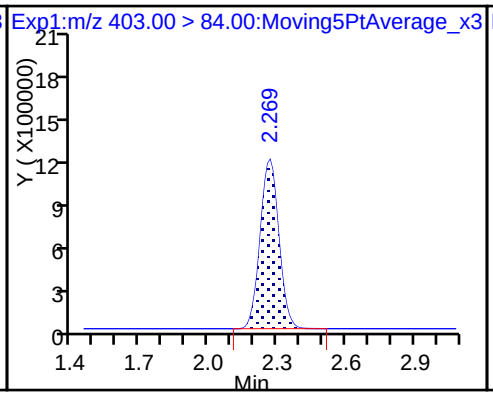
8 Perfluorohexanesulfonic acid



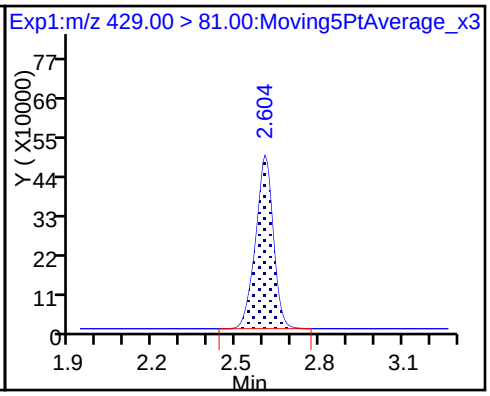
8 Perfluorohexanesulfonic acid



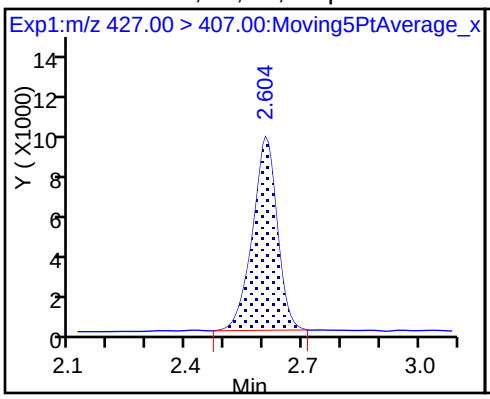
D 11 18O2 PFHxS



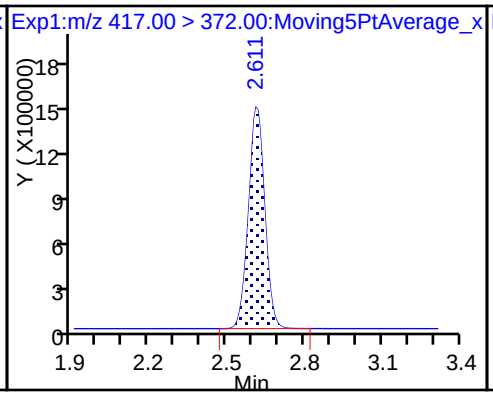
D 12 M2-6:2FTS



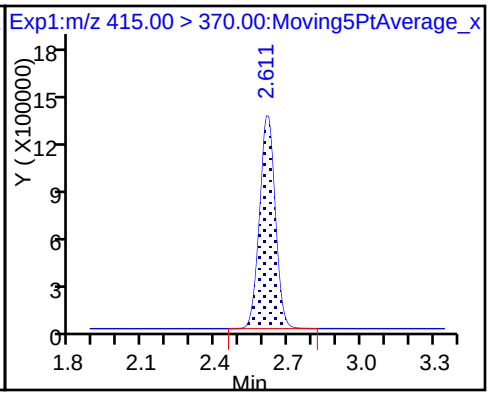
13 Sodium 1H,1H,2H,2H-perfluorooctane



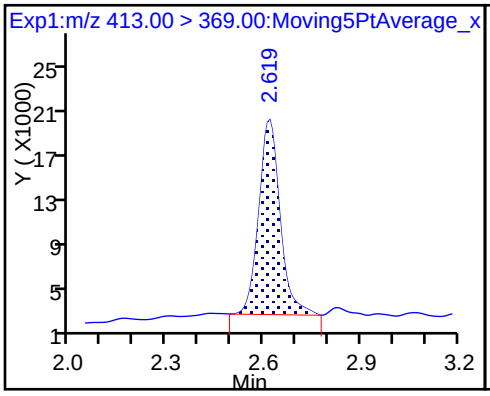
D 14 13C4 PFOA



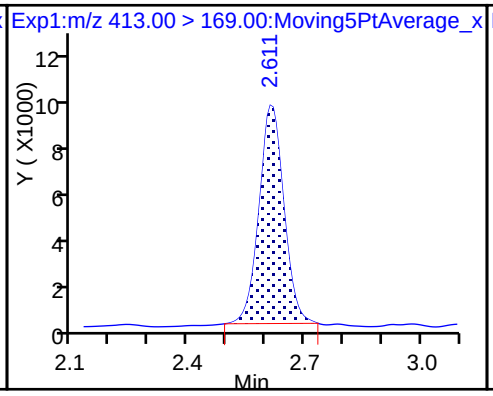
* 62 13C2-PFOA



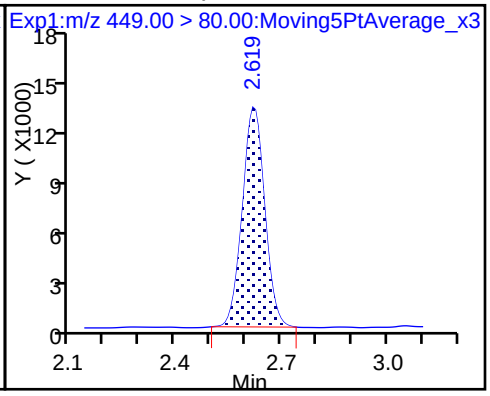
15 Perfluorooctanoic acid



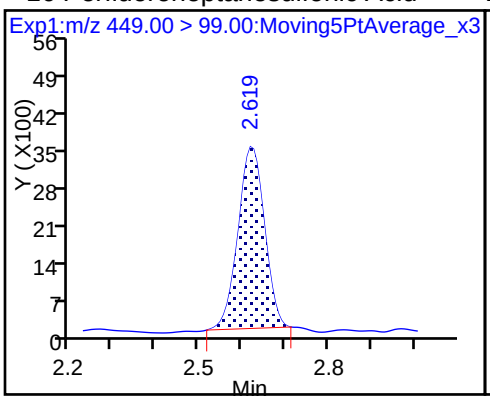
15 Perfluorooctanoic acid



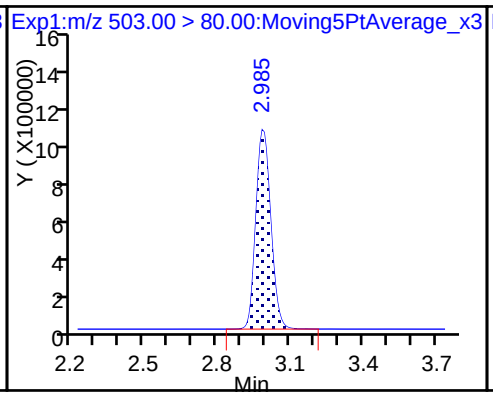
16 Perfluoroheptanesulfonic Acid



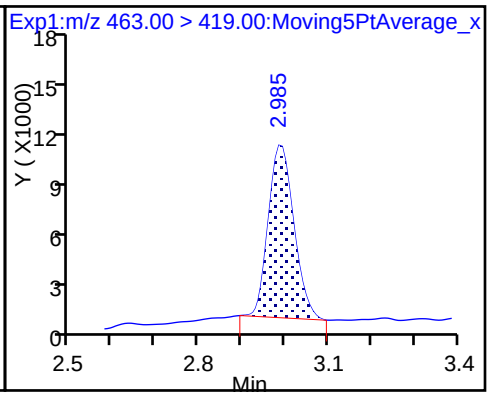
16 Perfluoroheptanesulfonic Acid



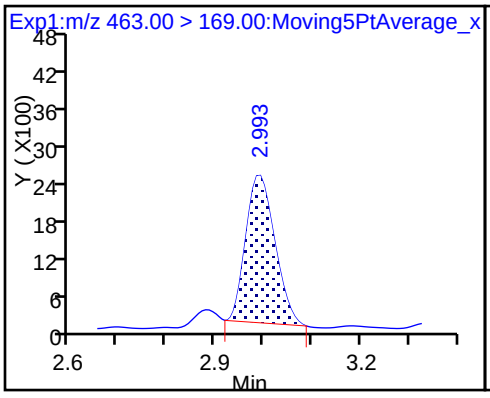
D 18 13C4 PFOS



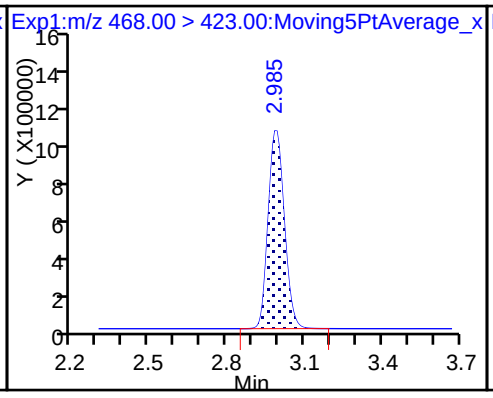
20 Perfluorononanoic acid



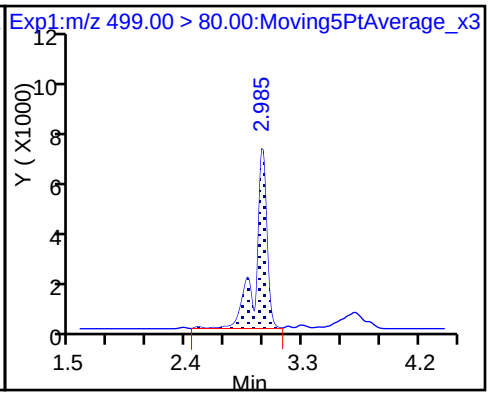
20 Perfluorononanoic acid



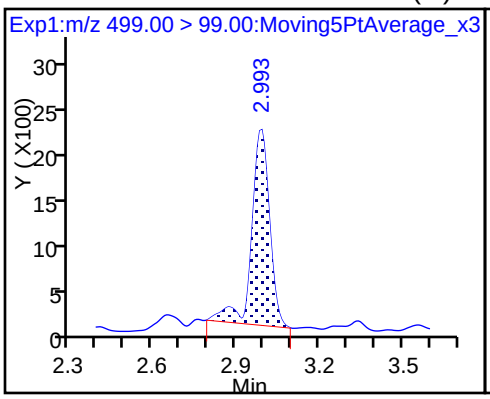
D 19 13C5 PFNA



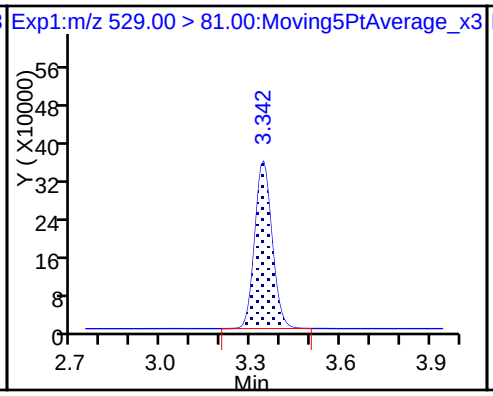
17 Perfluorooctane sulfonic acid



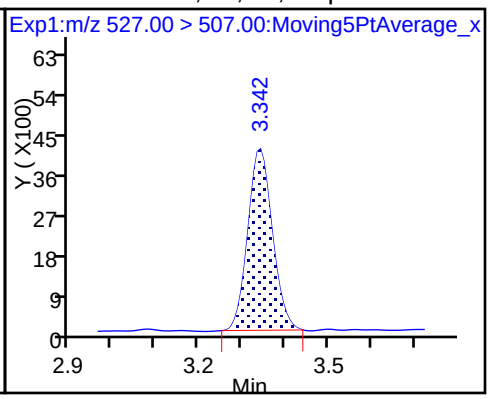
17 Perfluorooctane sulfonic acid (M)



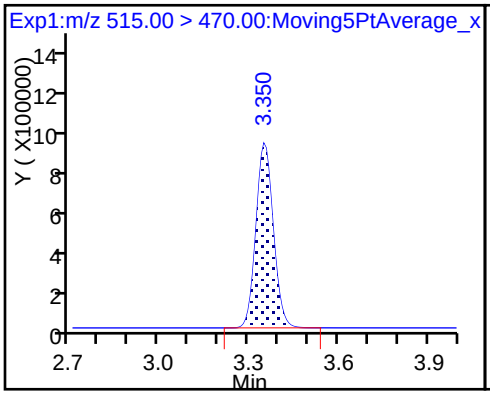
D 26 M2-8:2FTS



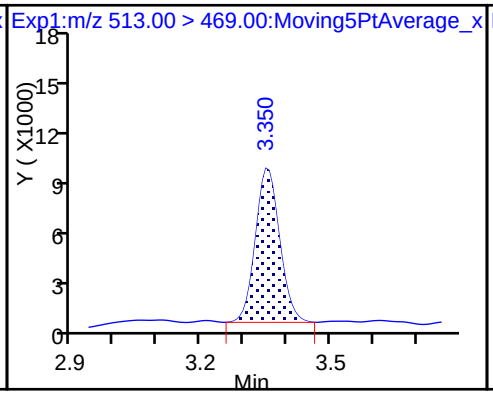
25 Sodium 1H,1H,2H,2H-perfluorodecane



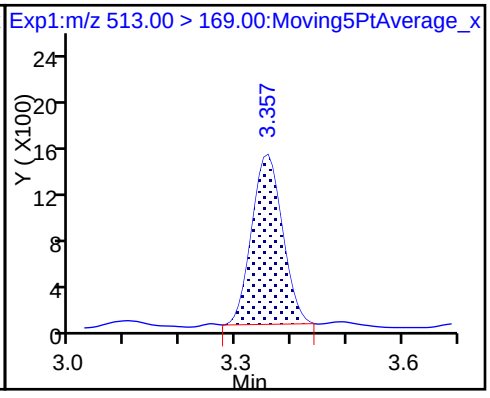
D 23 13C2 PFDA



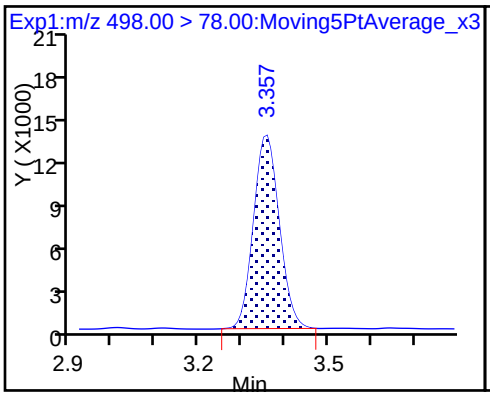
24 Perfluorodecanoic acid



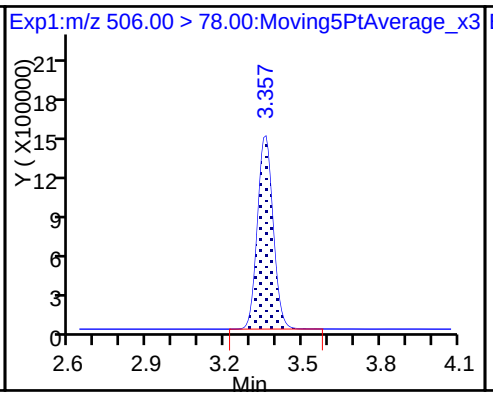
24 Perfluorodecanoic acid



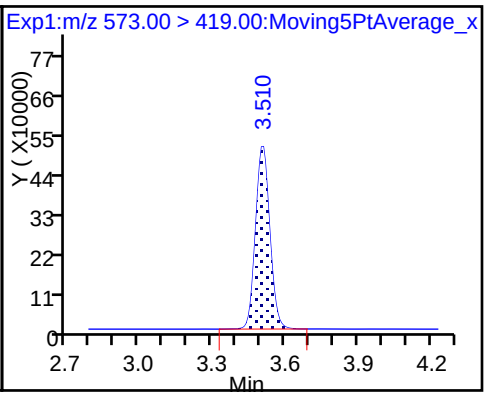
22 Perfluorooctane Sulfonamide



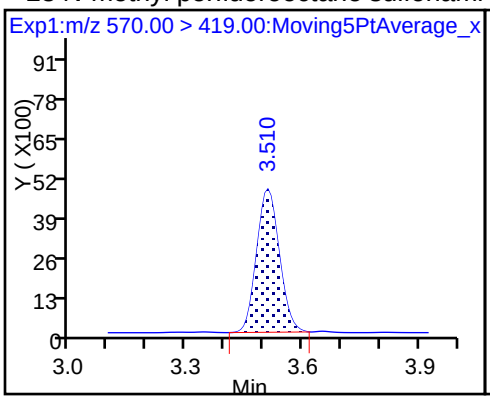
D 21 13C8 FOSA



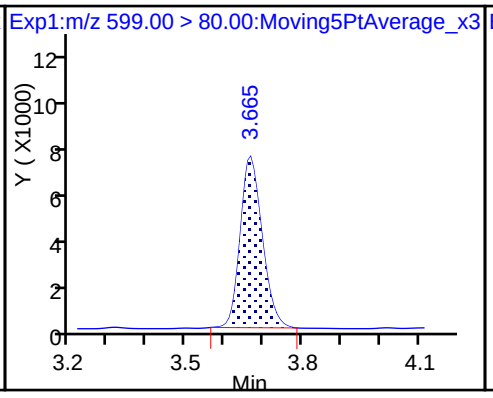
D 27 d3-NMeFOSAA



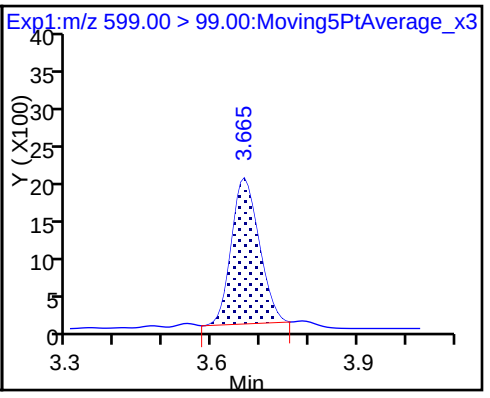
28 N-methyl perfluorooctane sulfonami



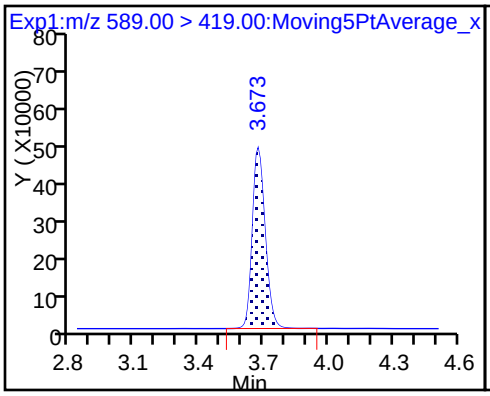
29 Perfluorodecane Sulfonic acid



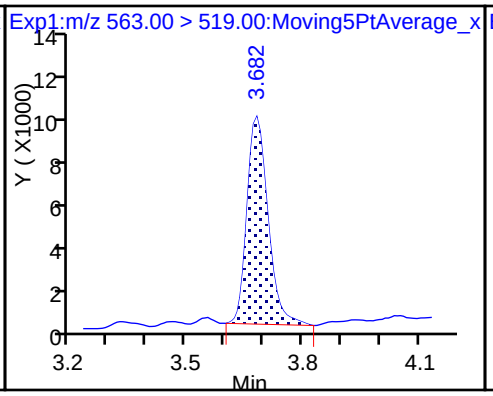
29 Perfluorodecane Sulfonic acid



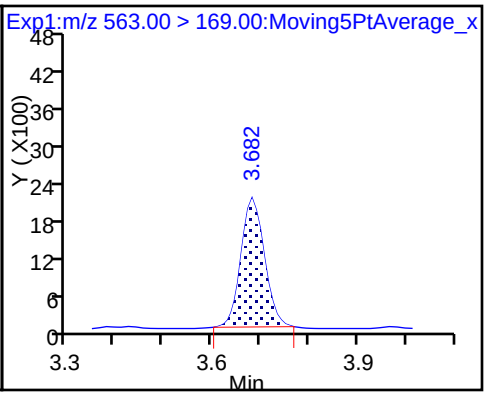
D 32 d5-NEtFOSAA



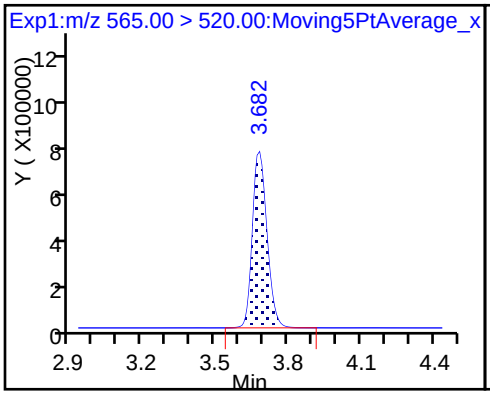
31 Perfluoroundecanoic acid



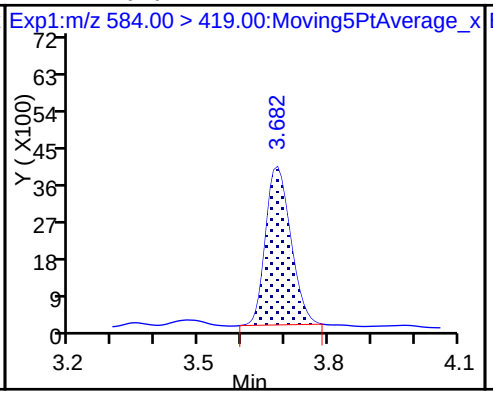
31 Perfluoroundecanoic acid



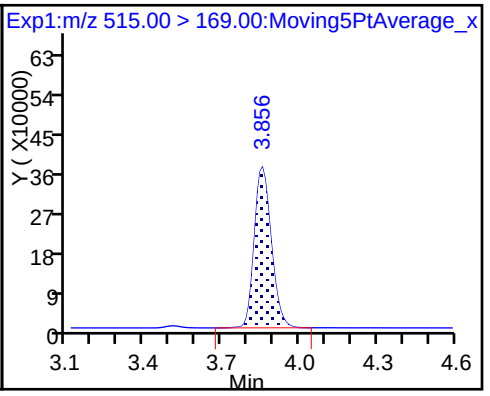
D 30 13C2 PFUnA



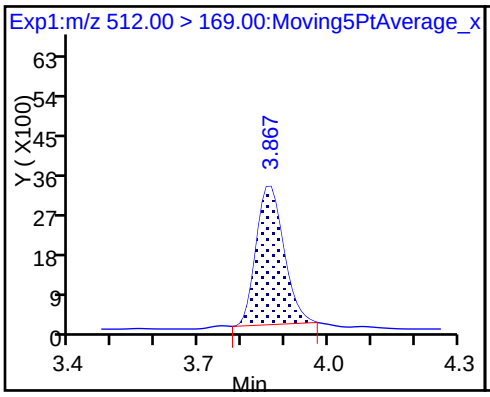
33 N-ethyl perfluorooctane sulfonamid



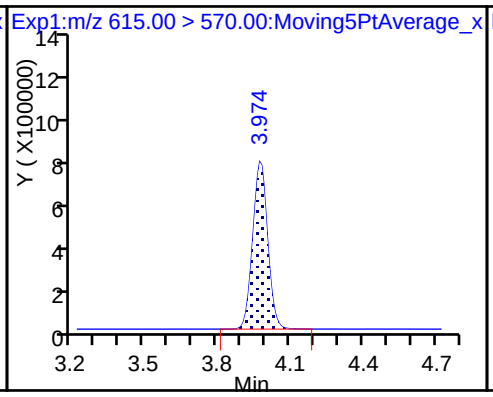
D 34 d-N-MeFOSA-M



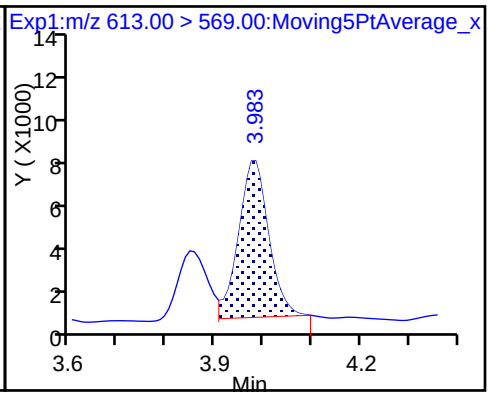
35 MeFOSA



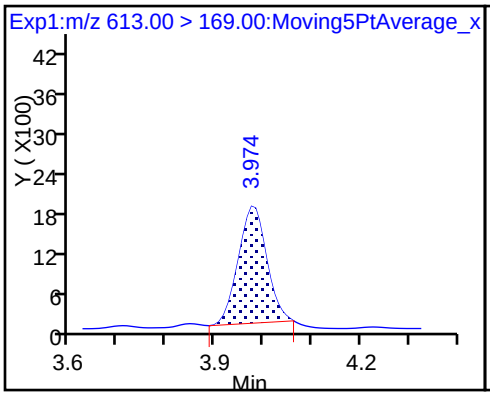
D 36 13C2 PFDoA



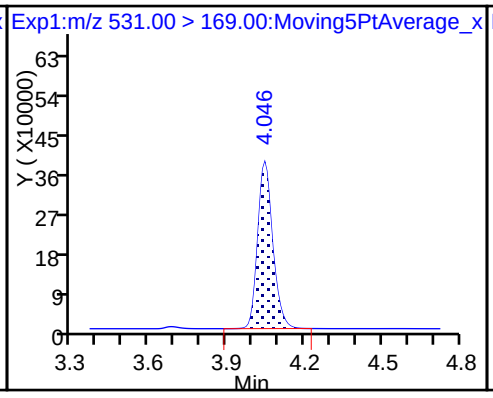
37 Perfluorododecanoic acid



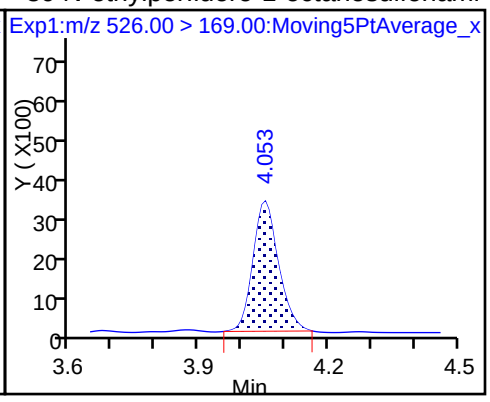
37 Perfluorododecanoic acid



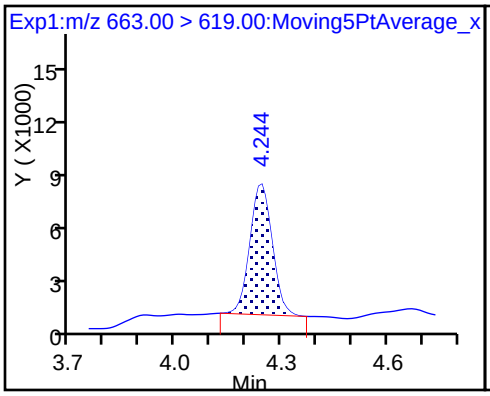
D 38 d-N-EtFOSA-M



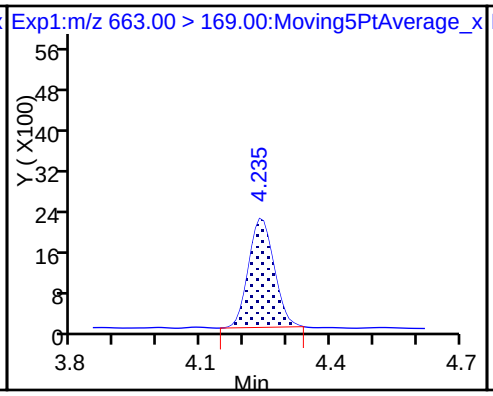
39 N-ethylperfluoro-1-octanesulfonami



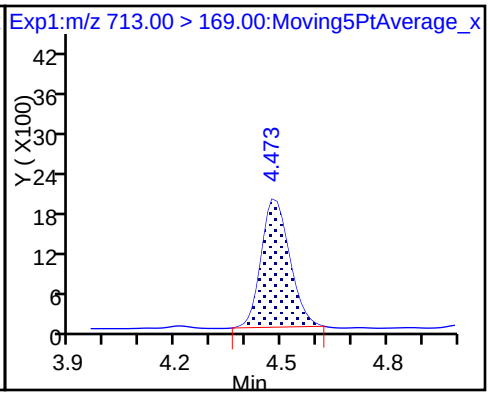
41 Perfluorotridecanoic acid



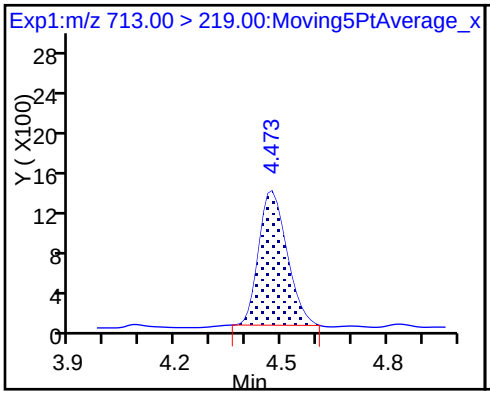
41 Perfluorotridecanoic acid



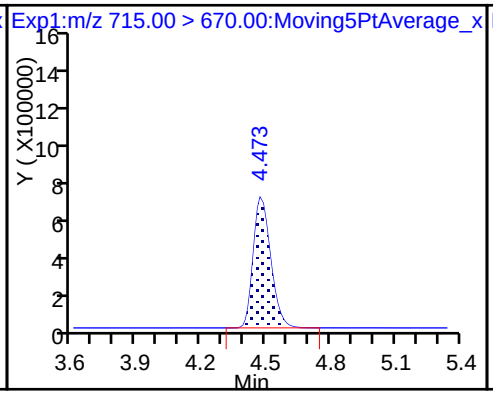
42 Perfluorotetradecanoic acid



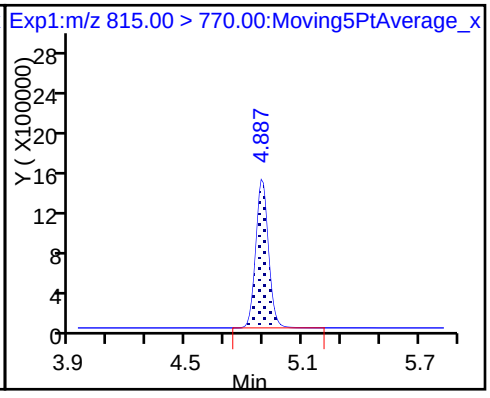
42 Perfluorotetradecanoic acid



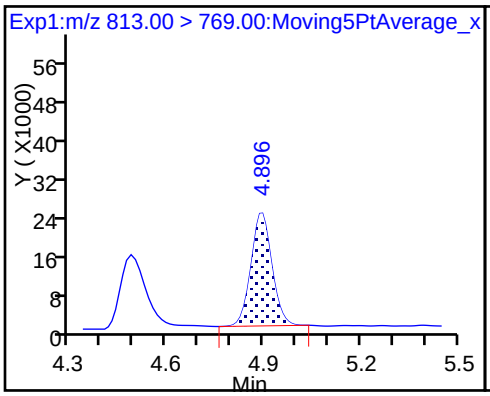
D 43 13C2-PFTeDA



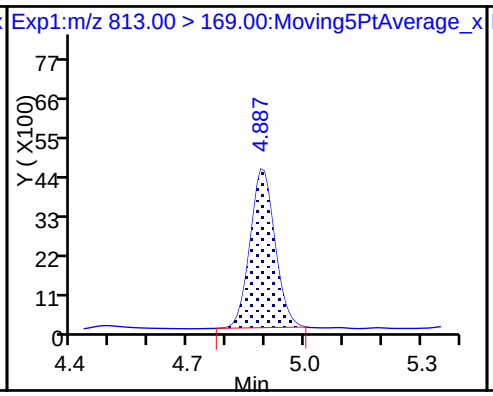
D 44 13C2-PFHxDA



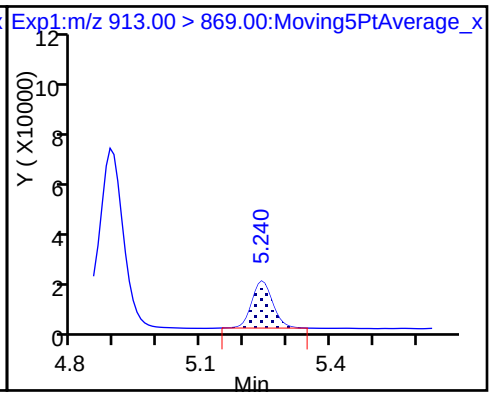
45 Perfluorohexadecanoic acid



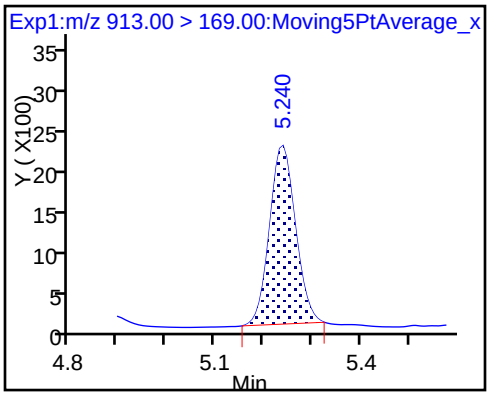
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

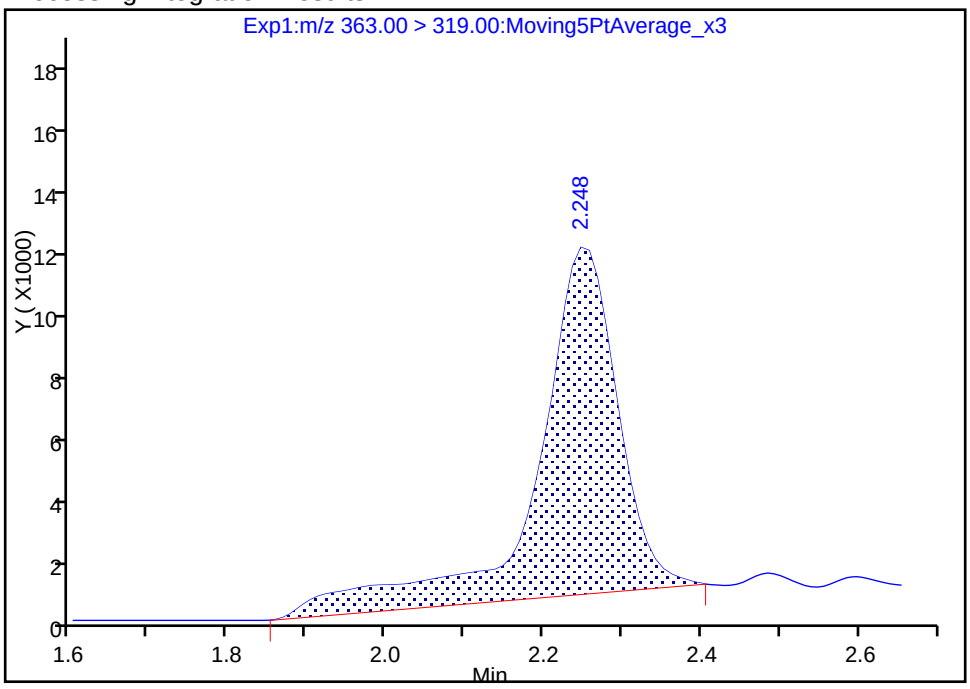
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_002.d
Injection Date: 04-Dec-2017 15:48:59 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

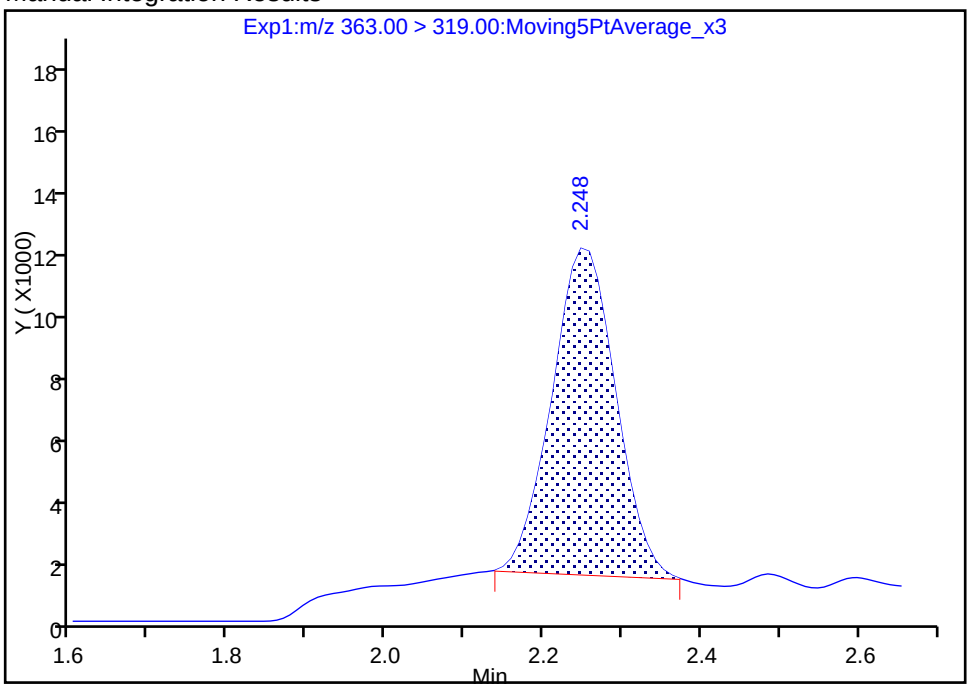
Processing Integration Results

RT: 2.25
Area: 79525
Amount: 0.030931
Amount Units: ng/ml



Manual Integration Results

RT: 2.25
Area: 58223
Amount: 0.025097
Amount Units: ng/ml



Reviewer: phomsophat, 04-Dec-2017 16:24:09
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

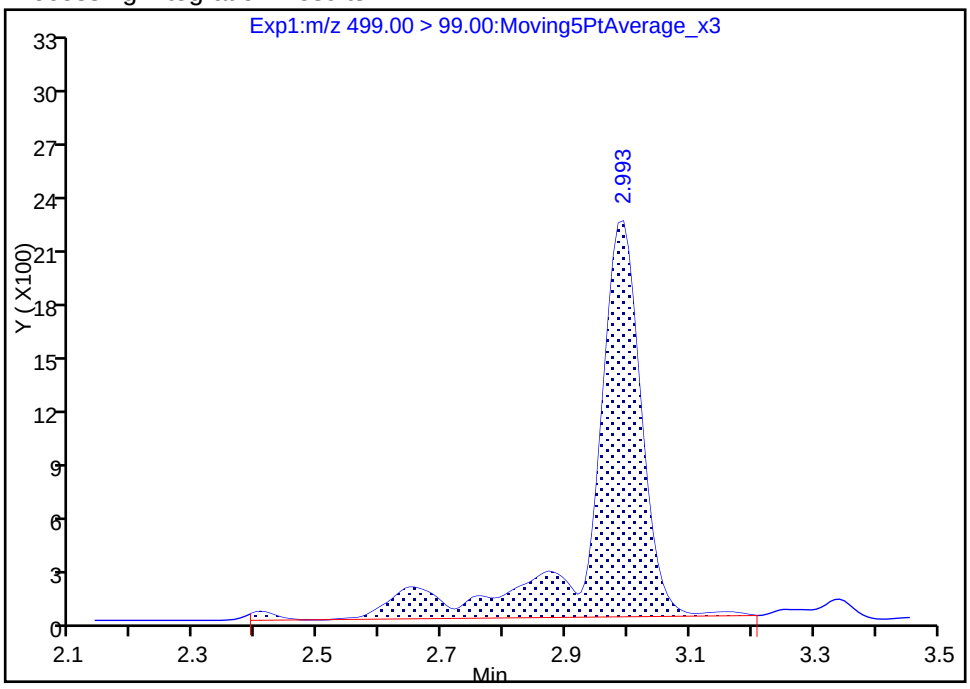
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_002.d				
Injection Date:	04-Dec-2017 15:48:59	Instrument ID:	A8_N		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

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

Signal: 2

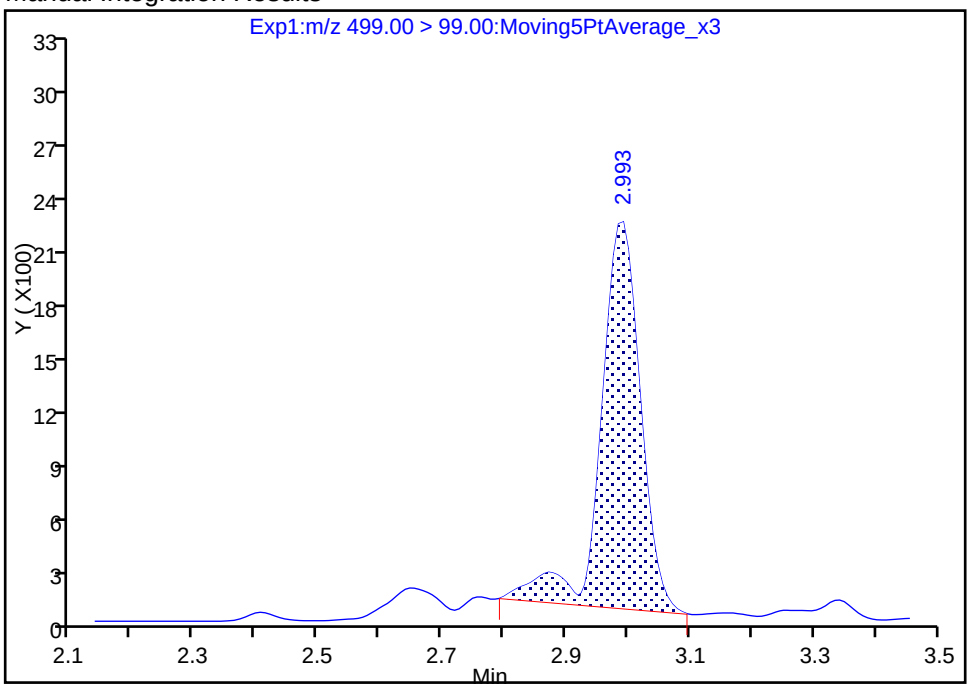
Processing Integration Results

RT: 2.99
Area: 12476
Amount: 0.023232
Amount Units: ng/ml



Manual Integration Results

RT: 2.99
Area: 9648
Amount: 0.023323
Amount Units: ng/ml



Reviewer: phomsophat, 04-Dec-2017 16:28:06

Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_003.d
Lims ID: IC L2 Full
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 04-Dec-2017 15:56:51 ALS Bottle#: 11 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\20171204-51297.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 04-Dec-2017 19:07:17 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: phomsophat Date: 04-Dec-2017 16:20:07

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	1.399	1.401	-0.002	0.535	9035119	2.44		97.6	62952	
2 Perfluorobutyric acid										
212.90 > 169.00	1.404	1.402	0.002	1.004	170852	0.0520		104	49.2	
D 3 13C5-PFPeA										
267.90 > 223.00	1.649	1.646	0.003	0.631	5606439	2.43		97.1	66862	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.649	1.648	0.001	1.000	135542	0.0519		104	66.8	M
D 47 13C3-PFBS										
301.90 > 83.00	1.681	1.681	0.0	0.643	105293	2.19		94.3	2762	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.681	1.682	-0.001	1.000	160661	0.0466		105	879	
298.90 > 99.00	1.681	1.682	-0.001	1.000	66235		2.43(1.25-3.74)	105	637	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.888	1.887	0.001	1.000	37173	0.0460		98.6	1652	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.925	1.923	0.002	1.000	129172	0.0536		107	262	
313.00 > 119.00	1.925	1.923	0.002	1.000	12113		10.66(5.03-15.10)	107	206	
D 7 13C2 PFHxA										
315.00 > 270.00	1.925	1.924	0.001	0.736	5898473	2.49		99.5	58568	
D 9 13C4-PFHpA										
367.00 > 322.00	2.250	2.254	-0.004	0.861	5741019	2.49		99.5	52619	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.250	2.255	-0.005	1.000	125602	0.0526		105	155	
363.00 > 169.00	2.250	2.255	-0.005	1.000	47232		2.66(1.13-3.40)	105	487	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.271	2.269	0.002	1.000	148090	0.0478		105	360	
399.00 > 99.00	2.271	2.269	0.002	1.000	47127		3.14(1.50-4.49)	105	231	

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	2.271	2.271	0.0	0.869	6883037	2.38		101	57137	
D 12 M2-6:2FTS										
429.00 > 81.00	2.606	2.605	0.001	0.997	1763243	2.28		95.9	36723	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.606	2.605	0.001	1.000	68964	0.0551		116	1867	
D 14 13C4 PFOA										
417.00 > 372.00	2.613	2.618	-0.005	1.000	6331644	2.48		99.2	73788	
* 62 13C2-PFOA										
415.00 > 370.00	2.613	2.619	-0.006		6215248	2.50			51506	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.621	2.621	0.0	1.003	140133	0.0519		104	71.4	
413.00 > 169.00	2.621	2.621	0.0	1.003	76385		1.83(0.84-2.52)	104	590	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.628	2.626	0.002	1.000	114362	0.0484		102	3007	
449.00 > 99.00	2.621	2.626	-0.005	0.997	33689		3.39(1.94-5.82)	102	982	
D 18 13C4 PFOS										
503.00 > 80.00	2.988	2.993	-0.005	1.143	4341775	2.31		96.7	43304	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.995	2.994	0.001	1.003	85637	0.0455		98.0	437	
499.00 > 99.00	2.995	2.994	0.001	1.003	20498		4.18(2.31-6.93)	98.0	259	
D 19 13C5 PFNA										
468.00 > 423.00	2.995	2.994	0.001	1.146	4601234	2.49		99.7	43297	
20 Perfluorononanoic acid										
463.00 > 419.00	2.995	2.994	0.001	1.000	93375	0.0520		104	265	
463.00 > 169.00	2.988	2.994	-0.006	0.997	21633		4.32(1.90-5.69)	104	578	
D 26 M2-8:2FTS										
529.00 > 81.00	3.344	3.343	0.001	1.279	1479516	2.43		101	28546	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.344	3.344	0.0	1.000	36430	0.0478		99.7	1122	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.351	3.356	-0.005	1.000	81056	0.0547		109	298	
513.00 > 169.00	3.351	3.356	-0.005	1.000	11637		6.97(2.36-7.09)	109	379	
D 23 13C2 PFDA										
515.00 > 470.00	3.351	3.356	-0.005	1.282	3777541	2.42		96.6	33907	
D 21 13C8 FOSA										
506.00 > 78.00	3.359	3.359	0.0	1.285	6234029	2.47		98.6	27836	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.359	3.359	0.0	1.000	122931	0.0526		105	4345	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.512	3.511	0.001	1.344	2062096	2.47		98.9	28194	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.512	3.515	-0.003	1.000	45355	0.0525		105	354	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.668	3.667	0.001	1.000	56374	0.0491		102	2501	
599.00 > 99.00	3.668	3.667	0.001	1.000	17909		3.15(1.39-4.16)	102	763	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.675	3.677	-0.002	1.406	2113821	2.61		104	9755	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.684	3.685	-0.001	1.002	38708	0.0486		97.2	539	
D 30 13C2 PFUnA										
565.00 > 520.00	3.684	3.685	-0.001	1.410	3075279	2.55		102	32967	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.684	3.685	-0.001	1.000	60297	0.0498		99.7	300	
563.00 > 169.00	3.684	3.685	-0.001	1.000	12524		4.81(0.00-0.00)	99.7	886	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.859	3.856	0.003	1.477	1758684	2.41		96.3	4615	
35 MeFOSA										
512.00 > 169.00	3.870	3.865	0.005	1.003	28360	0.0422		84.5	898	
D 36 13C2 PFDoA										
615.00 > 570.00	3.977	3.979	-0.002	1.522	3378244	2.52		101	29777	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.977	3.982	-0.005	1.000	71281	0.0534		107	126	
613.00 > 169.00	3.977	3.982	-0.005	1.000	17531		4.07(2.13-6.40)	107	1079	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.049	4.048	0.001	1.549	1620984	2.38		95.3	3879	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.056	4.056	0.0	1.002	37225	0.0547		109	1140	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.239	4.243	-0.004	1.000	73202	0.0518		104	172	
663.00 > 169.00	4.239	4.243	-0.004	1.000	22165		3.30(1.25-3.76)	104	836	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.476	4.481	-0.005	1.713	3892459	2.49		99.7	26803	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.476	4.481	-0.005	1.000	19806	0.0501		100	591	
713.00 > 219.00	4.476	4.481	-0.005	1.000	14424		1.37(0.71-2.13)	100	875	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.888	4.892	-0.004	1.870	6217463	2.41		96.2	19873	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.888	4.894	-0.006	1.000	169723	0.0559		112	110	
813.00 > 169.00	4.888	4.894	-0.006	1.000	29186		5.82(2.86-8.58)	112	854	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.241	5.242	-0.001	1.000	129959	0.0547		109	29.2	
913.00 > 169.00	5.241	5.242	-0.001	1.000	15417		8.43(0.00-0.00)	109	208	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00002 Amount Added: 1.00 Units: mL

Report Date: 04-Dec-2017 19:07:18 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_003.d

Injection Date: 04-Dec-2017 15:56:51 Instrument ID: A8_N

Lims ID: IC L2 Full

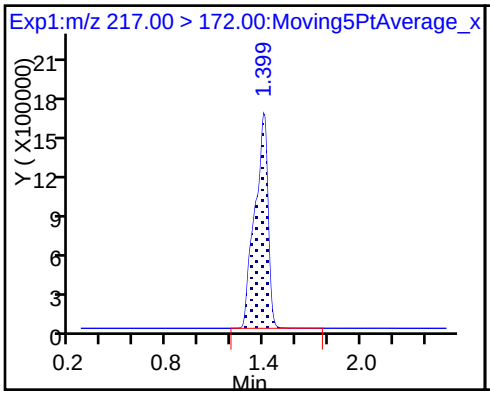
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3

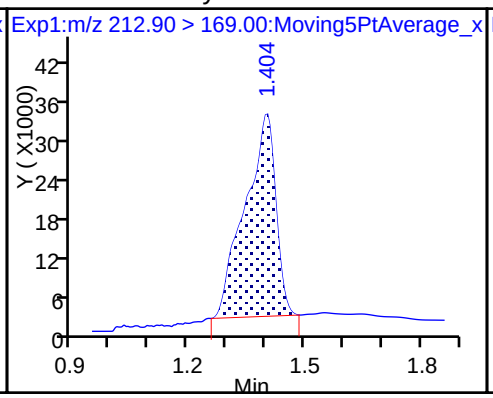
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

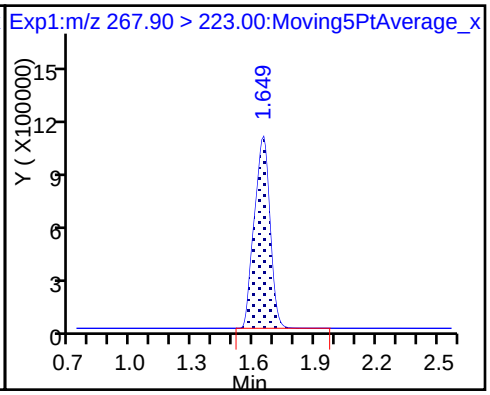
D 1 13C4 PFBA



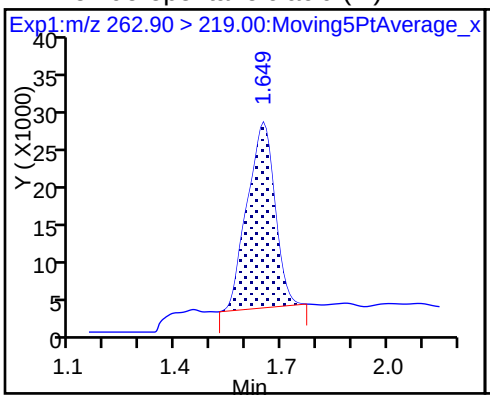
2 Perfluorobutyric acid



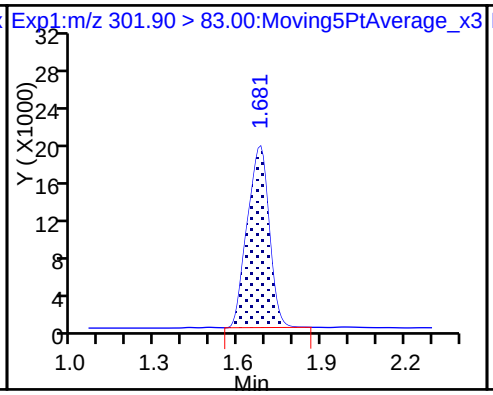
D 3 13C5-PFPeA



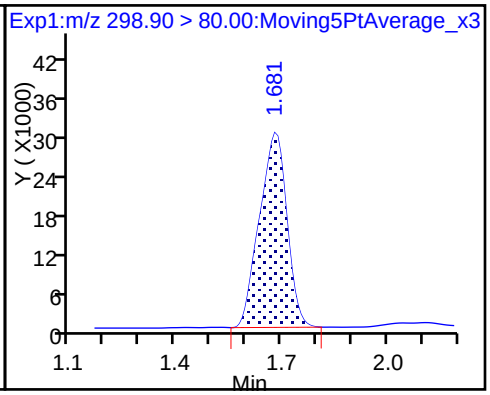
4 Perfluoropentanoic acid (M)



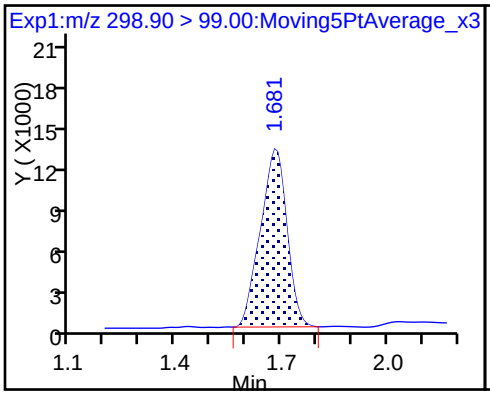
D 47 13C3-PFBS



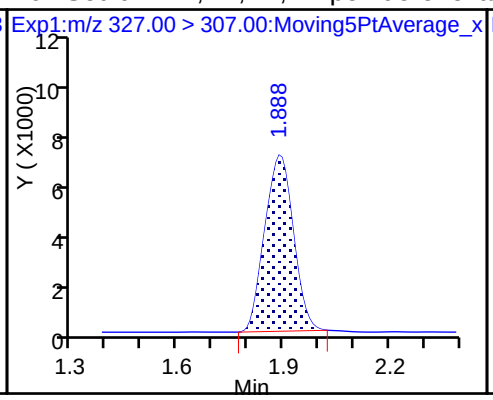
5 Perfluorobutanesulfonic acid



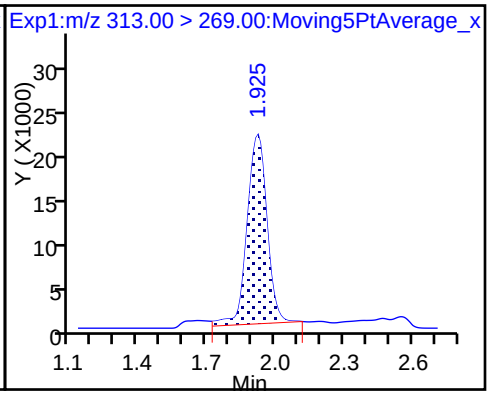
5 Perfluorobutanesulfonic acid



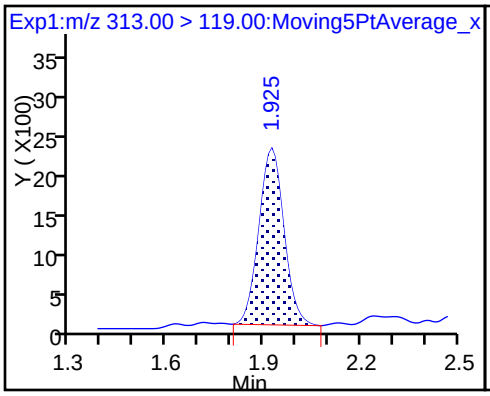
61 Sodium 1H,1H,2H,2H-perfluorohexane



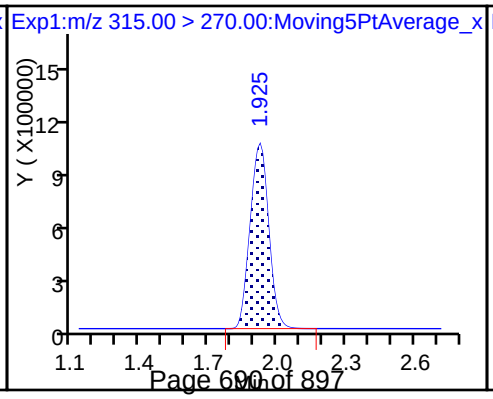
6 Perfluorohexanoic acid



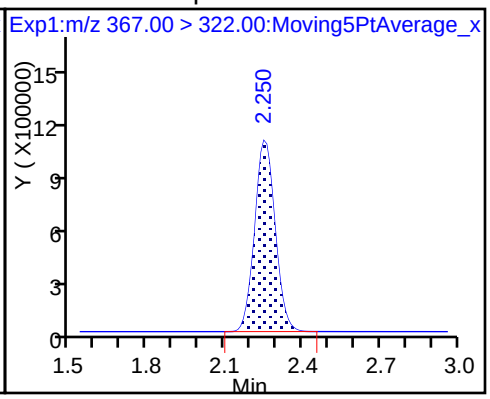
6 Perfluorohexanoic acid



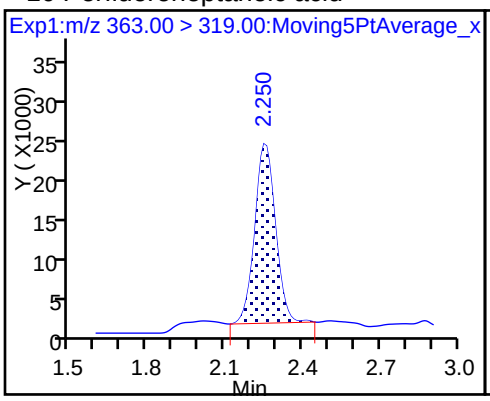
D 7 13C2 PFHxA



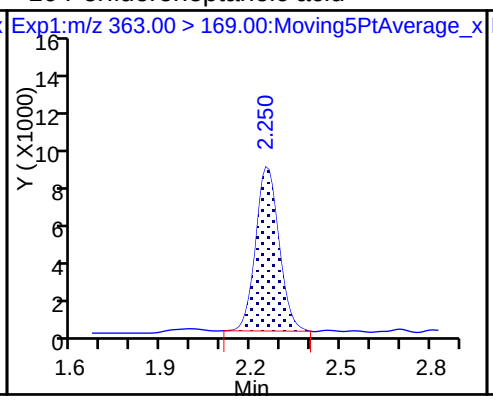
D 9 13C4-PFHpA



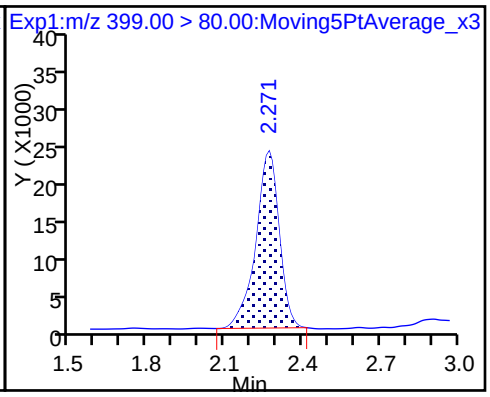
10 Perfluoroheptanoic acid



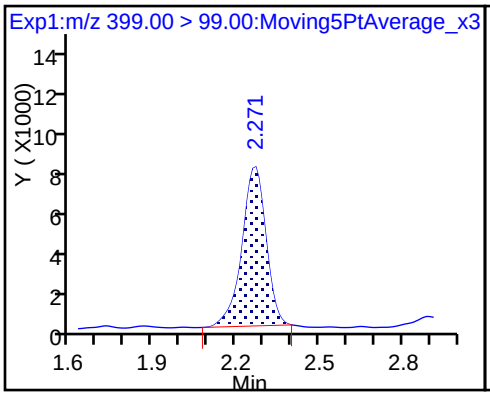
10 Perfluoroheptanoic acid



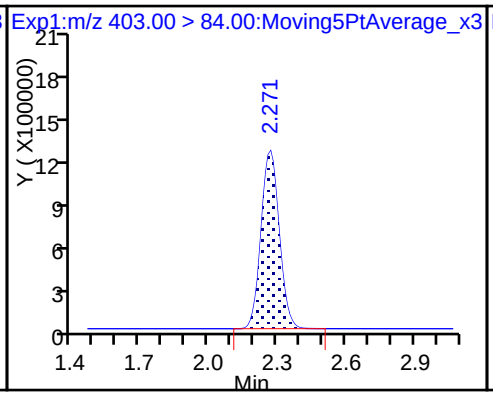
8 Perfluorohexanesulfonic acid



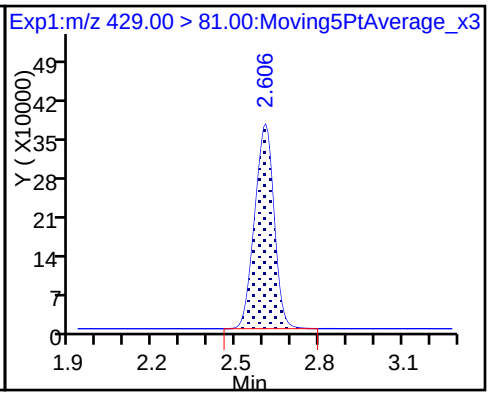
8 Perfluorohexanesulfonic acid



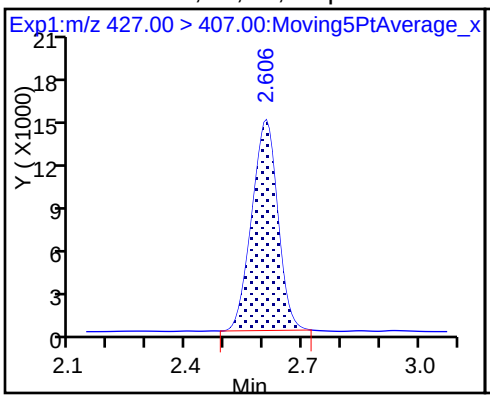
D 11 18O2 PFHxS



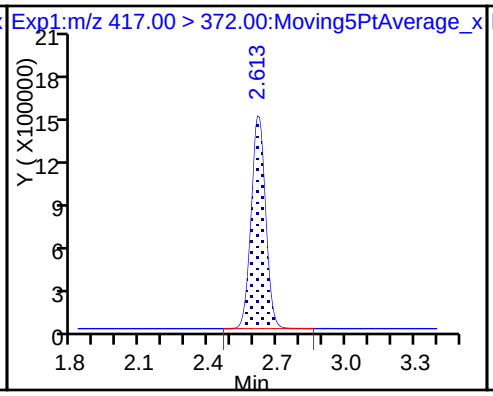
D 12 M2-6:2FTS



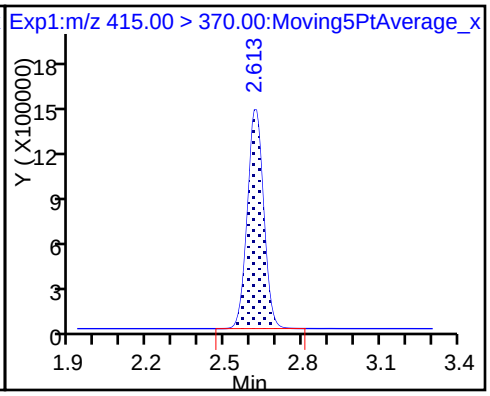
13 Sodium 1H,1H,2H,2H-perfluorooctane



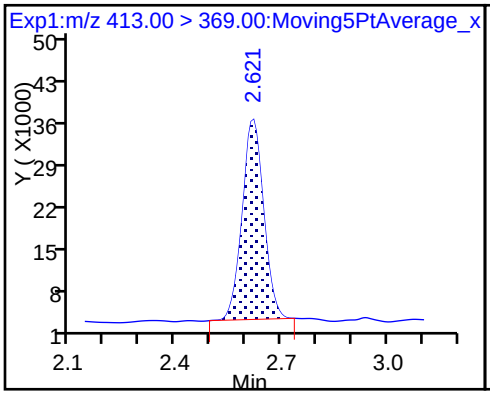
D 14 13C4 PFOA



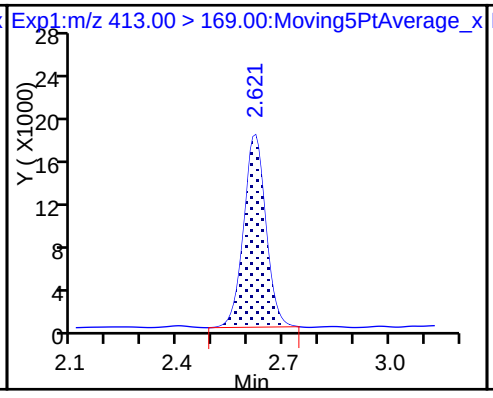
* 62 13C2-PFOA



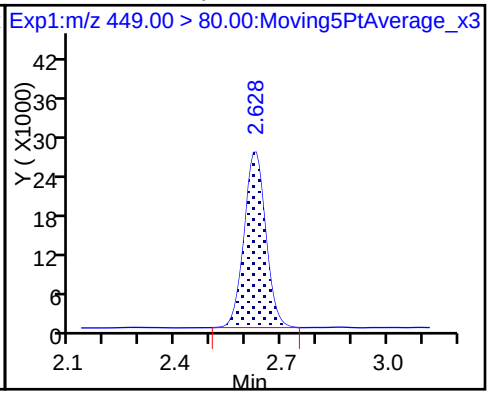
15 Perfluorooctanoic acid



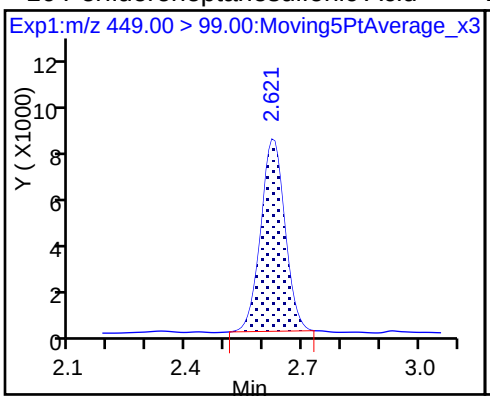
15 Perfluorooctanoic acid



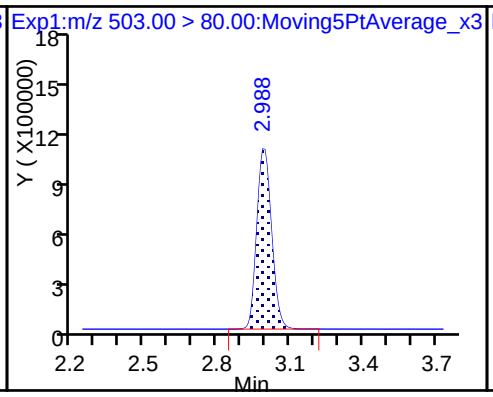
16 Perfluoroheptanesulfonic Acid



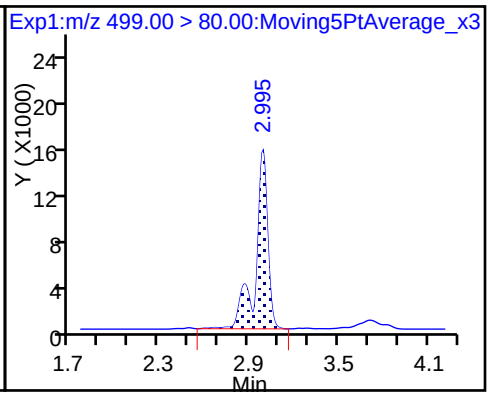
16 Perfluoroheptanesulfonic Acid



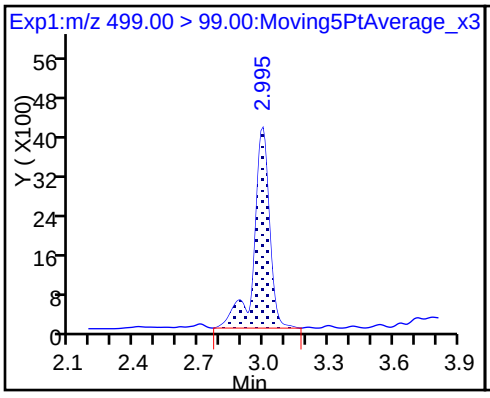
D 18 13C4 PFOS



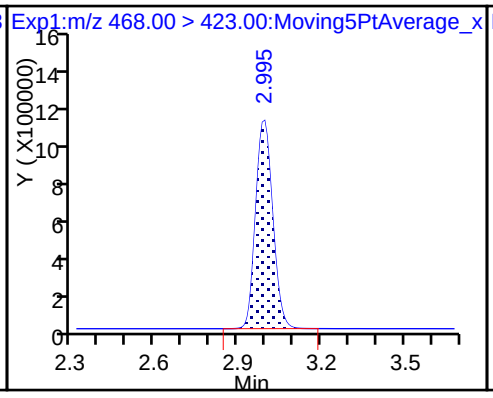
17 Perfluorooctane sulfonic acid



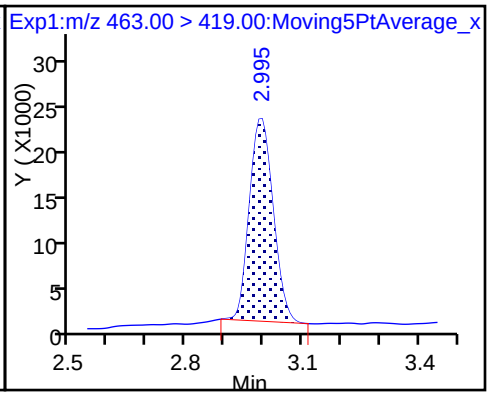
17 Perfluorooctane sulfonic acid



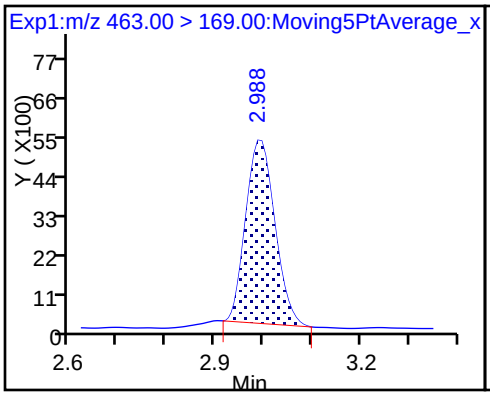
D 19 13C5 PFNA



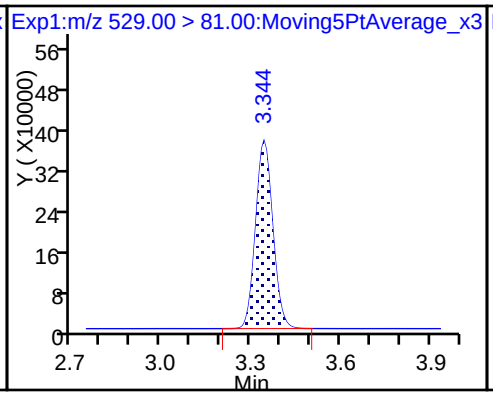
20 Perfluorononanoic acid



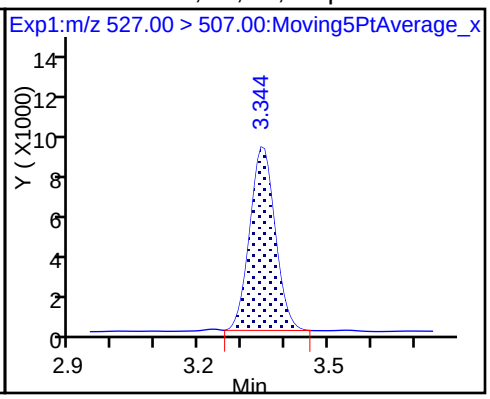
20 Perfluorononanoic acid



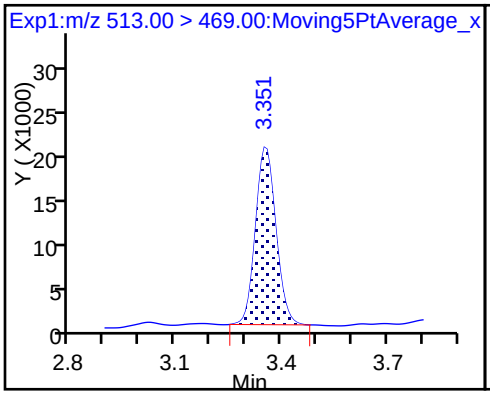
D 26 M2-8:2FTS



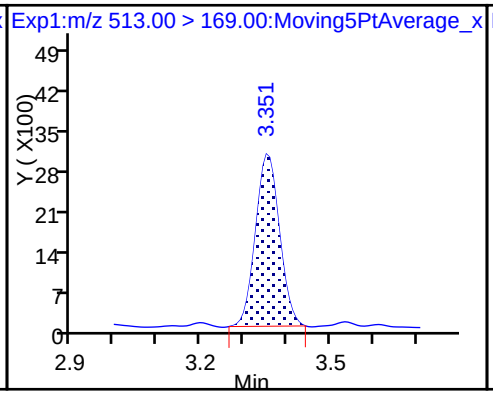
25 Sodium 1H,1H,2H,2H-perfluorodecane



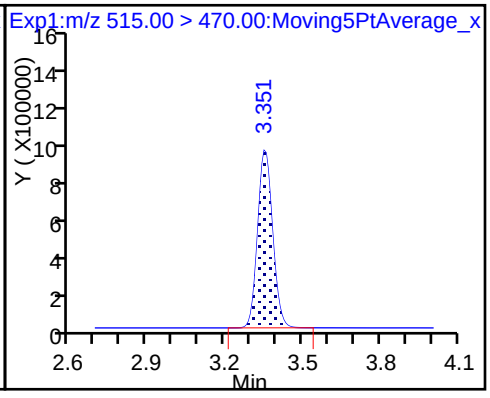
24 Perfluorodecanoic acid



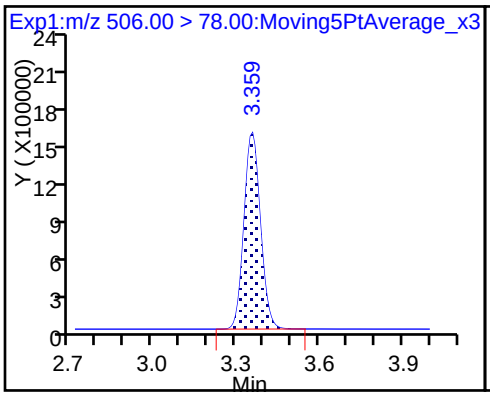
24 Perfluorodecanoic acid



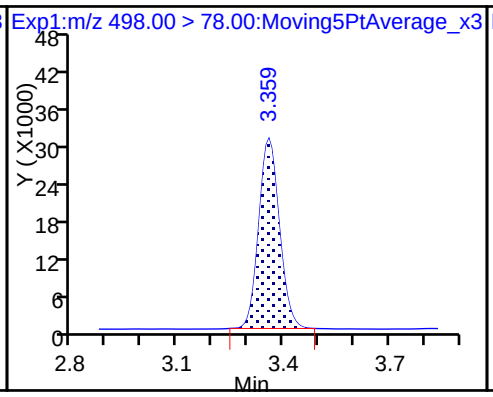
D 23 13C2 PFDA



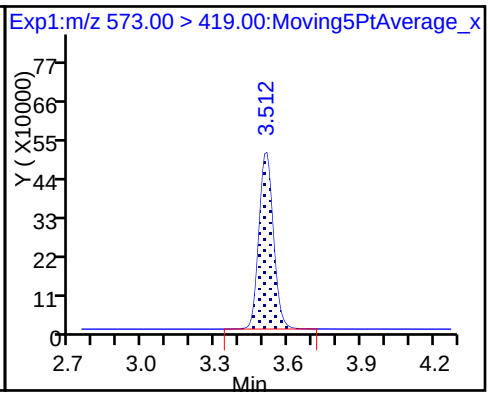
D 21 13C8 FOSA



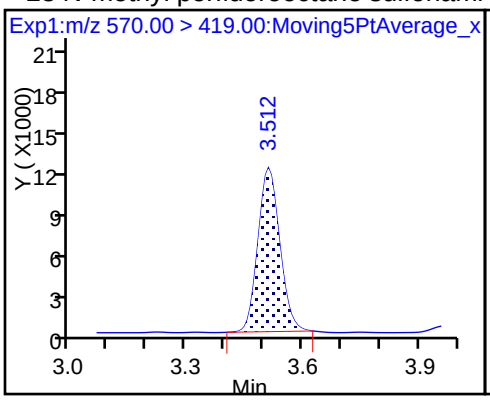
22 Perfluorooctane Sulfonamide



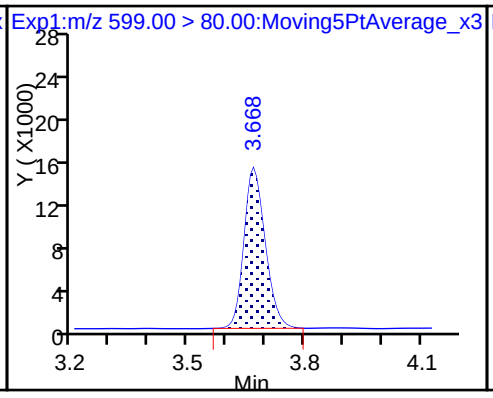
D 27 d3-NMeFOSAA



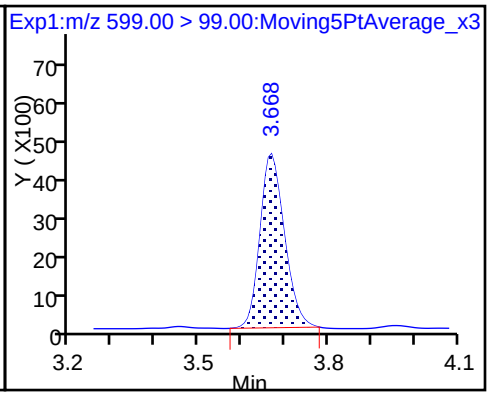
28 N-methyl perfluorooctane sulfonami



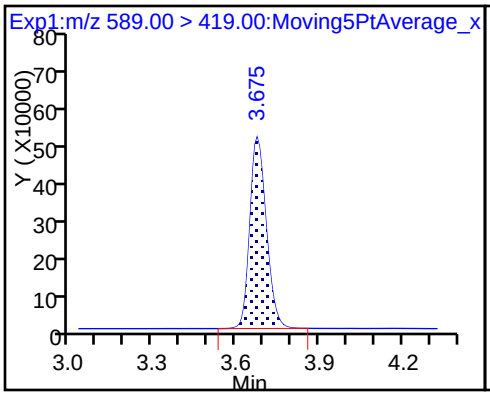
29 Perfluorodecane Sulfonic acid



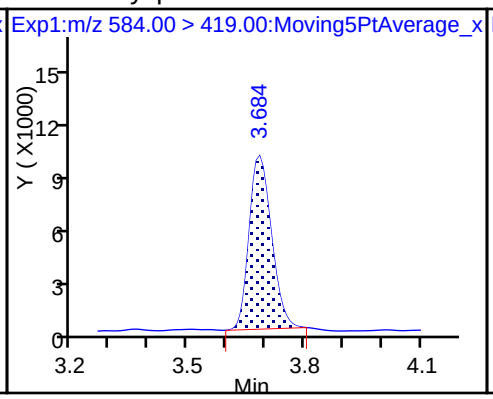
29 Perfluorodecane Sulfonic acid



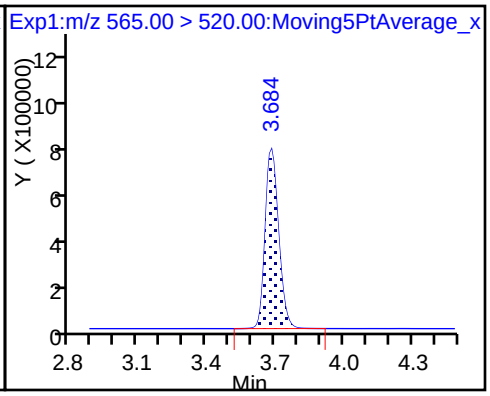
D 32 d5-NEtFOSAA



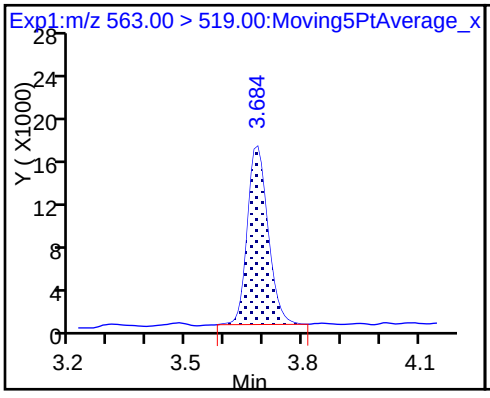
33 N-ethyl perfluorooctane sulfonamid



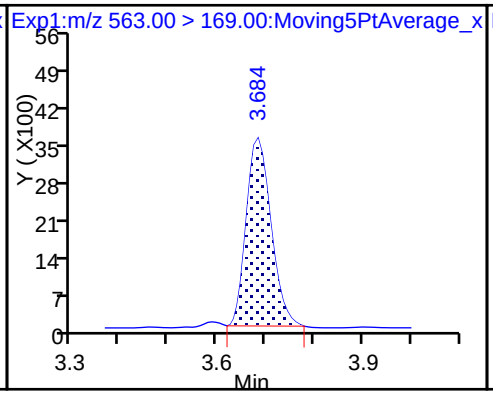
D 30 13C2 PFUnA



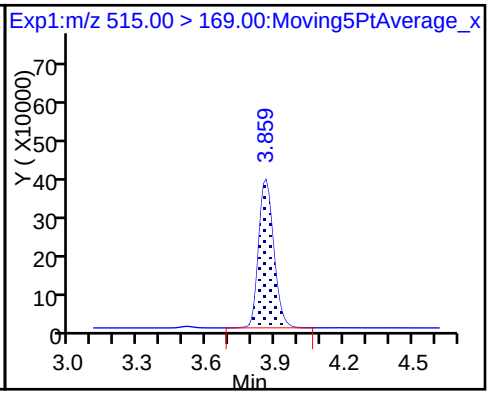
31 Perfluoroundecanoic acid



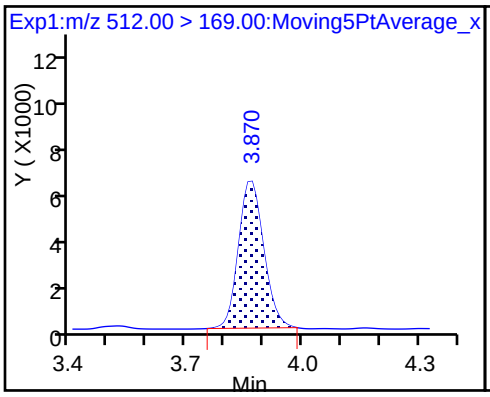
31 Perfluoroundecanoic acid



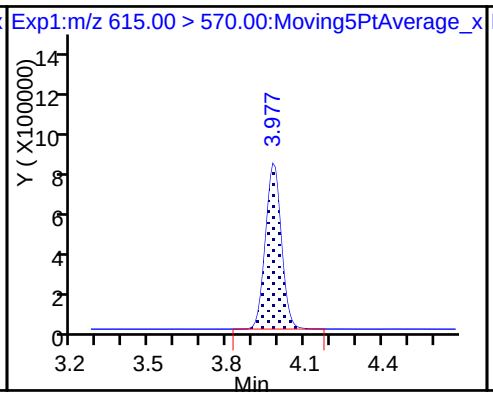
D 34 d-N-MeFOSA-M



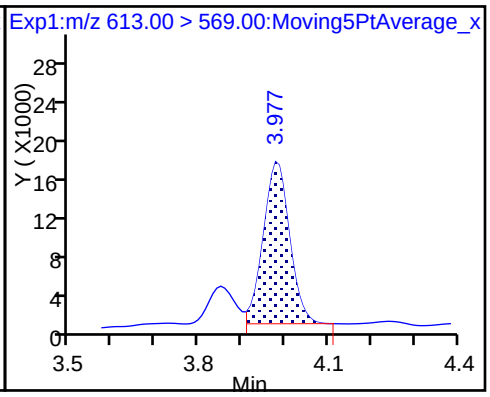
35 MeFOSA



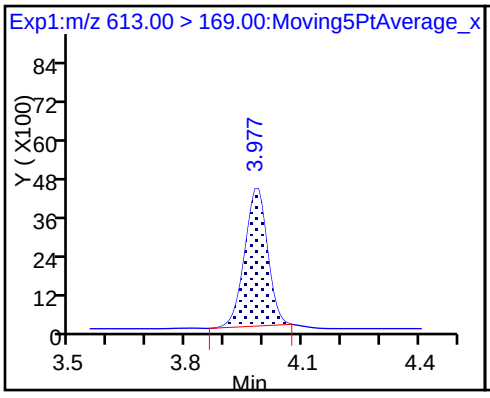
D 36 13C2 PFDoA



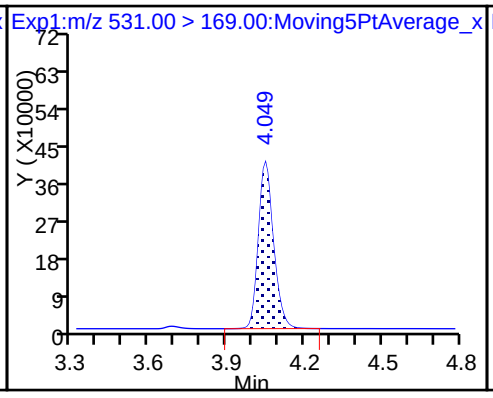
37 Perfluorododecanoic acid



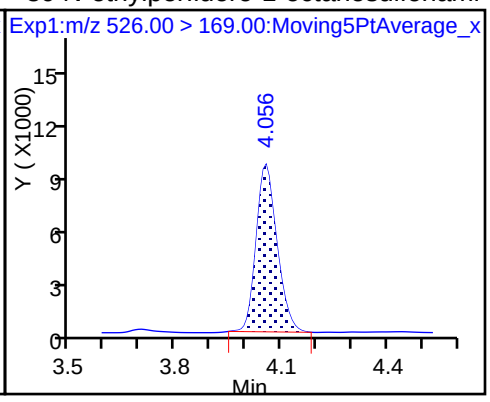
37 Perfluorododecanoic acid



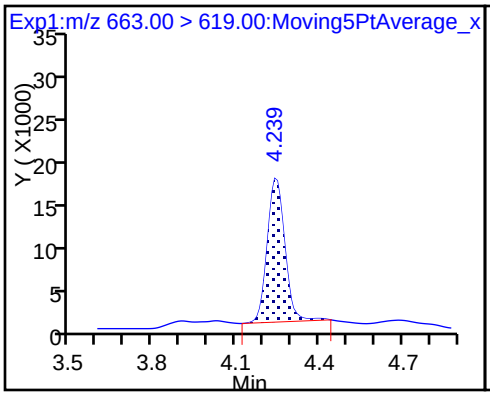
D 38 d-N-EtFOSA-M



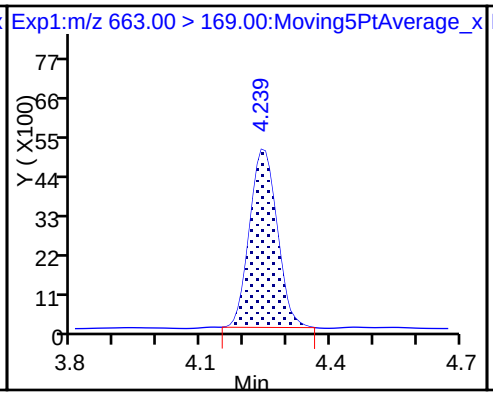
39 N-ethylperfluoro-1-octanesulfonami



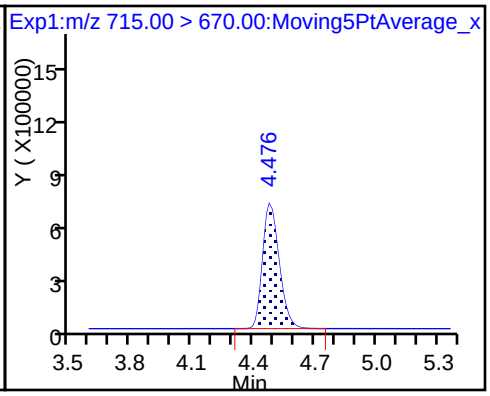
41 Perfluorotridecanoic acid



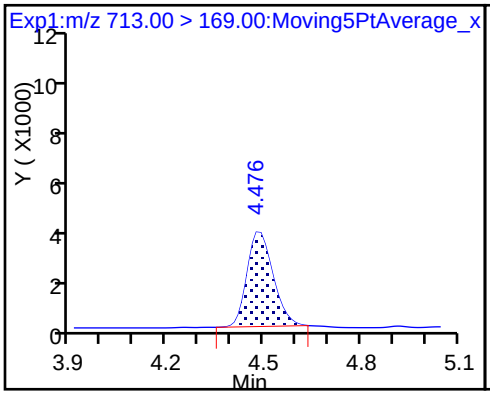
41 Perfluorotridecanoic acid



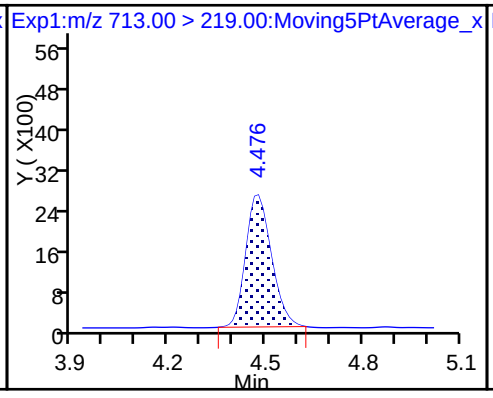
D 43 13C2-PFTeDA



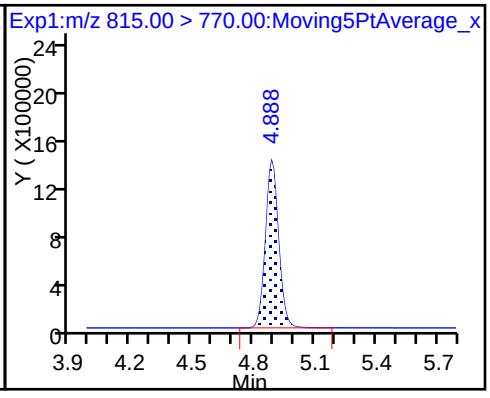
42 Perfluorotetradecanoic acid



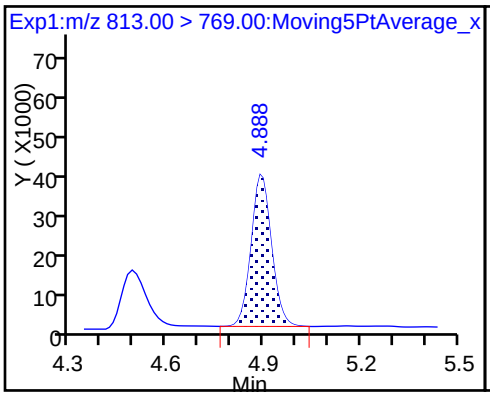
42 Perfluorotetradecanoic acid



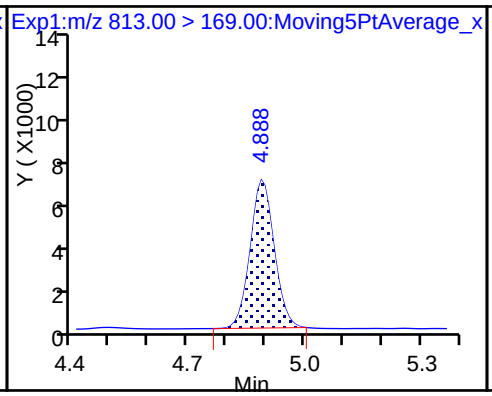
D 44 13C2-PFHxDA



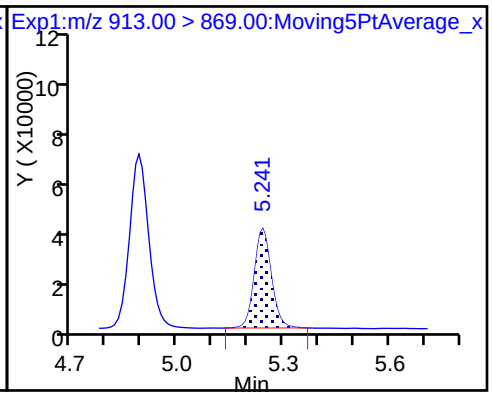
45 Perfluorohexadecanoic acid



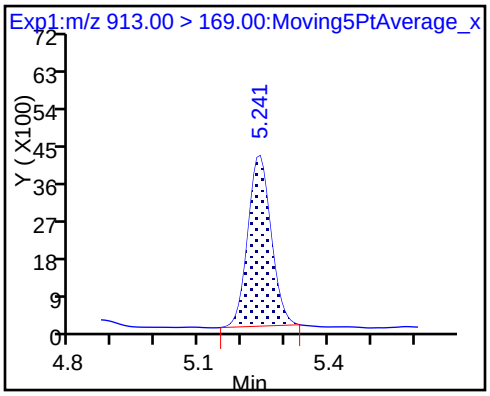
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento

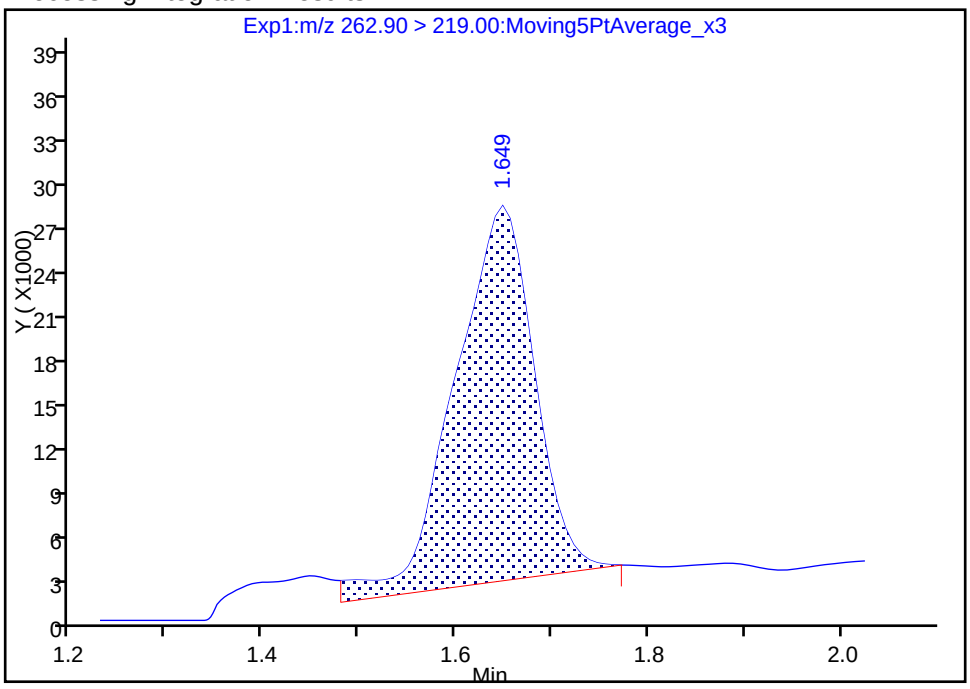
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_003.d
Injection Date: 04-Dec-2017 15:56:51 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

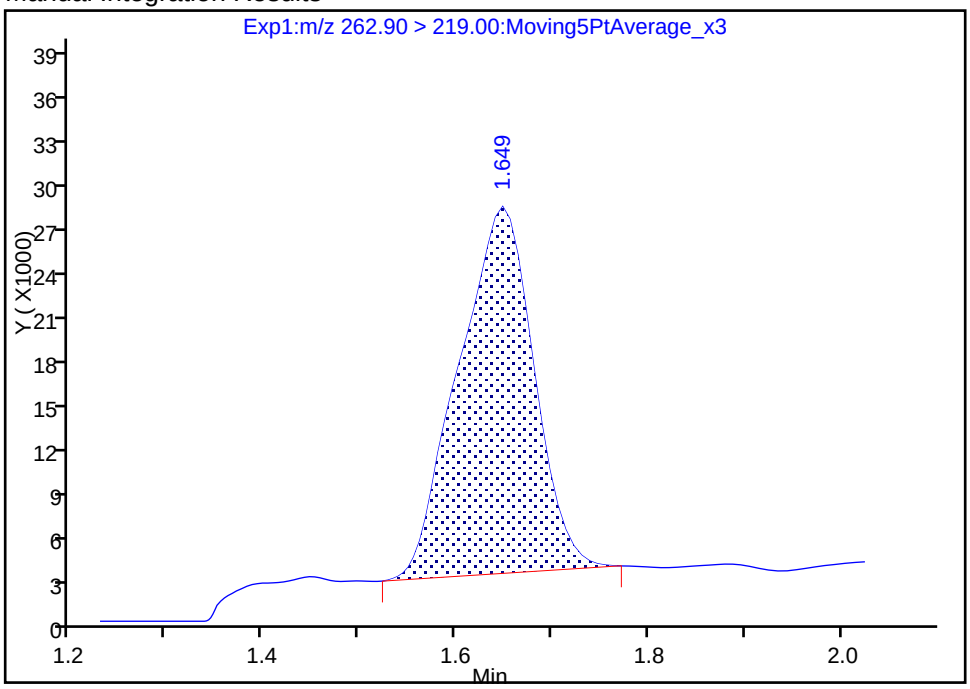
Processing Integration Results

RT: 1.65
Area: 147459
Amount: 0.051693
Amount Units: ng/ml



Manual Integration Results

RT: 1.65
Area: 135542
Amount: 0.051938
Amount Units: ng/ml



Reviewer: phomsophat, 04-Dec-2017 16:27:27
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_004.d
Lims ID: IC L3 Full
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 04-Dec-2017 16:04:42 ALS Bottle#: 12 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\20171204-51297.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 04-Dec-2017 19:07:21 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: phomsophat Date: 04-Dec-2017 16:24:32

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	1.399	1.401	-0.002	0.534	8944246	2.40		96.1	67461	
2 Perfluorobutyric acid										
212.90 > 169.00	1.399	1.402	-0.003	1.000	829578	0.2552		102	253	
D 3 13C5-PFPeA										
267.90 > 223.00	1.641	1.646	-0.005	0.626	5505317	2.37		94.9	58192	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.648	1.648	0.0	1.005	657858	0.2567		103	342	
D 47 13C3-PFBS										
301.90 > 83.00	1.681	1.681	0.0	0.641	110295	2.28		98.3	3418	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.681	1.682	-0.001	1.000	825020	0.2285		103	4246	
298.90 > 99.00	1.681	1.682	-0.001	1.000	343469		2.40(1.25-3.74)	103	3375	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.887	1.887	0.0	1.000	198045	0.2348		101	12112	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.924	1.923	0.001	1.000	610997	0.2580		103	1328	
313.00 > 119.00	1.924	1.923	0.001	1.000	58798		10.39(5.03-15.10)	103	1056	
D 7 13C2 PFHxA										
315.00 > 270.00	1.924	1.924	0.0	0.734	5799143	2.43		97.3	57078	
D 9 13C4-PFHpA										
367.00 > 322.00	2.250	2.254	-0.004	0.858	5753355	2.48		99.2	51976	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.260	2.255	0.005	1.005	599255	0.2506		100	759	
363.00 > 169.00	2.260	2.255	0.005	1.005	241187		2.48(1.13-3.40)	100	2283	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.270	2.269	0.001	1.000	666375	0.2254		99.1	1576	
399.00 > 99.00	2.270	2.269	0.001	1.000	237496		2.81(1.50-4.49)	99.1	1129	

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	2.270	2.271	-0.001	0.866	6574606	2.26		95.7	66086	
D 12 M2-6:2FTS										
429.00 > 81.00	2.606	2.605	0.001	0.994	1841567	2.37		99.7	43240	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.606	2.605	0.001	1.000	319592	0.2445		103	9823	
D 14 13C4 PFOA										
417.00 > 372.00	2.620	2.618	0.002	1.000	6384245	2.49		99.5	65274	
* 62 13C2-PFOA										
415.00 > 370.00	2.620	2.619	0.001		6248752	2.50			66288	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.620	2.621	-0.001	1.000	693749	0.2547		102	341	
413.00 > 169.00	2.620	2.621	-0.001	1.000	360287		1.93(0.84-2.52)	102	2724	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.628	2.626	0.002	1.000	576767	0.2418		102	12041	
449.00 > 99.00	2.628	2.626	0.002	1.000	155326		3.71(1.94-5.82)	102	5202	
D 18 13C4 PFOS										
503.00 > 80.00	2.995	2.993	0.002	1.143	4380920	2.32		97.1	43523	
20 Perfluorononanoic acid										
463.00 > 419.00	2.995	2.994	0.001	1.000	448913	0.2503		100	1437	
463.00 > 169.00	2.995	2.994	0.001	1.000	109669		4.09(1.90-5.69)	100	2967	
D 19 13C5 PFNA										
468.00 > 423.00	2.995	2.994	0.001	1.143	4600032	2.48		99.2	42094	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.995	2.994	0.001	1.000	456586	0.2403		104	2478	
499.00 > 99.00	2.995	2.994	0.001	1.000	104640		4.36(2.31-6.93)	104	2175	
D 26 M2-8:2FTS										
529.00 > 81.00	3.343	3.343	0.0	1.276	1404384	2.29		95.8	23109	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.351	3.344	0.007	1.002	186494	0.2576		108	4224	
D 23 13C2 PFDA										
515.00 > 470.00	3.359	3.356	0.003	1.282	3816836	2.43		97.1	34569	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.359	3.356	0.003	1.000	389843	0.2603		104	1570	
513.00 > 169.00	3.359	3.356	0.003	1.000	69569		5.60(2.36-7.09)	104	1377	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.359	3.359	0.0	1.000	614374	0.2645		106	10775	
D 21 13C8 FOSA										
506.00 > 78.00	3.359	3.359	0.0	1.282	6199614	2.44		97.5	39976	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.511	3.511	0.0	1.340	1998907	2.38		95.3	41434	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.519	3.515	0.004	1.002	209556	0.2503		100	1607	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.667	3.667	0.0	1.000	288079	0.2485		103	10543	
599.00 > 99.00	3.667	3.667	0.0	1.000	99849		2.89(1.39-4.16)	103	6404	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.675	3.677	-0.002	1.402	2035321	2.50		99.9	12053	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.684	3.685	-0.001	1.000	291297	0.2442		97.7	1221	
563.00 > 169.00	3.684	3.685	-0.001	1.000	68705		4.24(0.00-0.00)	97.7	4722	
D 30 13C2 PFUnA										
565.00 > 520.00	3.684	3.685	-0.001	1.406	3032542	2.50		100	32477	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.684	3.685	-0.001	1.002	201644	0.2630		105	3204	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.858	3.856	0.002	1.472	1667869	2.27		90.8	3864	
35 MeFOSA										
512.00 > 169.00	3.858	3.865	-0.007	1.000	174245	0.2736		109	2914	
D 36 13C2 PFDoA										
615.00 > 570.00	3.976	3.979	-0.003	1.517	3313277	2.46		98.3	41090	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.985	3.982	0.003	1.002	326739	0.2497		99.9	697	
613.00 > 169.00	3.976	3.982	-0.006	1.000	84064		3.89(2.13-6.40)	99.9	3287	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.048	4.048	0.0	1.545	1603127	2.34		93.8	3488	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.056	4.056	0.0	1.002	177846	0.2641		106	2896	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.239	4.243	-0.004	1.000	373509	0.2697		108	859	
663.00 > 169.00	4.239	4.243	-0.004	1.000	111691		3.34(1.25-3.76)	108	4344	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.476	4.481	-0.005	1.000	98348	0.2291		91.6	3534	
713.00 > 219.00	4.476	4.481	-0.005	1.000	67165		1.46(0.71-2.13)	91.6	3037	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.476	4.481	-0.005	1.708	4230459	2.69		108	28271	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.888	4.892	-0.004	1.865	6294517	2.42		96.9	19042	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.897	4.894	0.003	1.002	614444	0.2627		105	386	
813.00 > 169.00	4.897	4.894	0.003	1.002	115660		5.31(2.86-8.58)	105	2631	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.241	5.242	-0.001	1.000	631858	0.2626		105	140	
913.00 > 169.00	5.241	5.242	-0.001	1.000	82405		7.67(0.00-0.00)	105	877	

Reagents:

LCPFC_LL3_00002 Amount Added: 1.00 Units: mL

Report Date: 04-Dec-2017 19:07:21 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_004.d

Injection Date: 04-Dec-2017 16:04:42 Instrument ID: A8_N

Lims ID: IC L3 Full

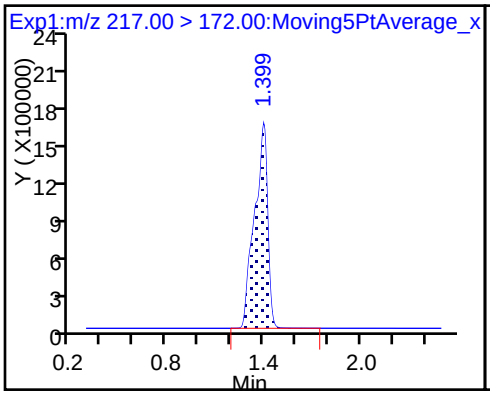
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: 4

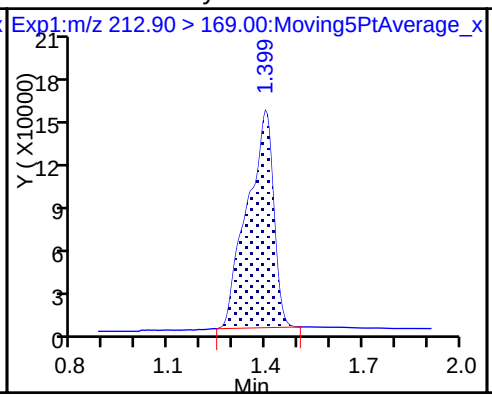
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

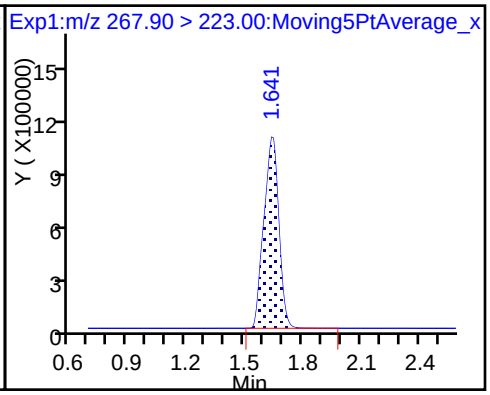
D 1 13C4 PFBA



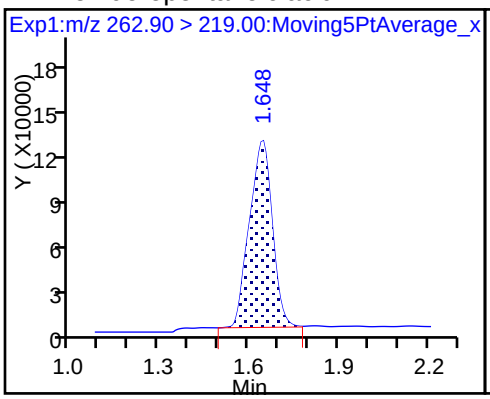
2 Perfluorobutyric acid



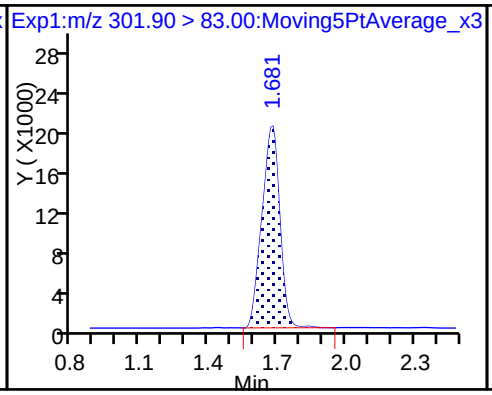
D 3 13C5-PFPeA



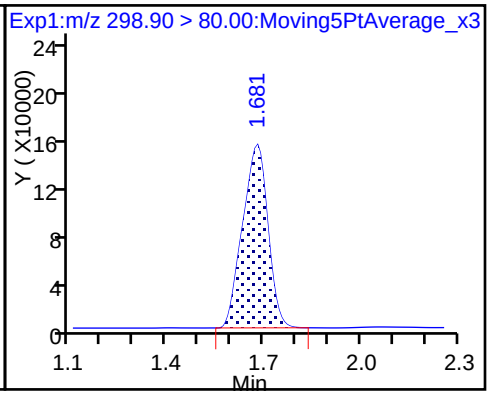
4 Perfluoropentanoic acid



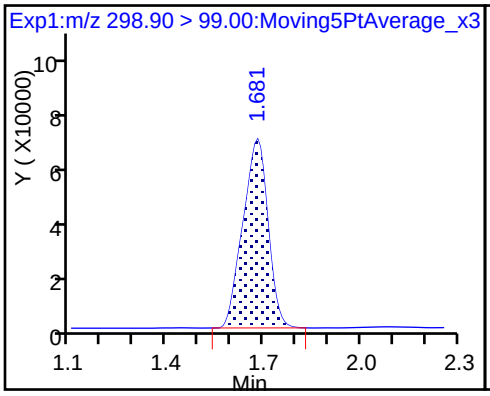
D 47 13C3-PFBS



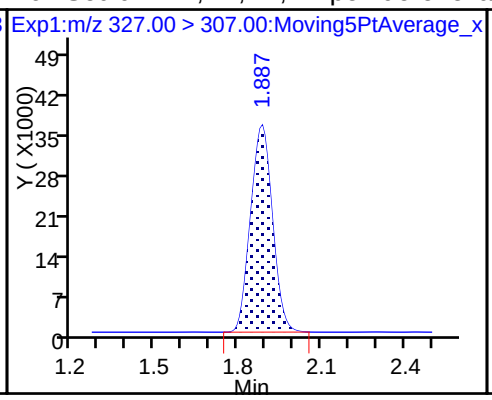
5 Perfluorobutanesulfonic acid



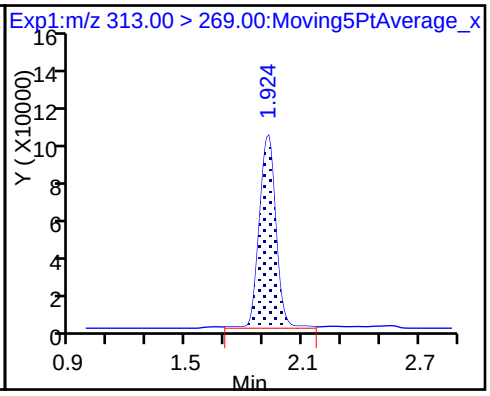
5 Perfluorobutanesulfonic acid



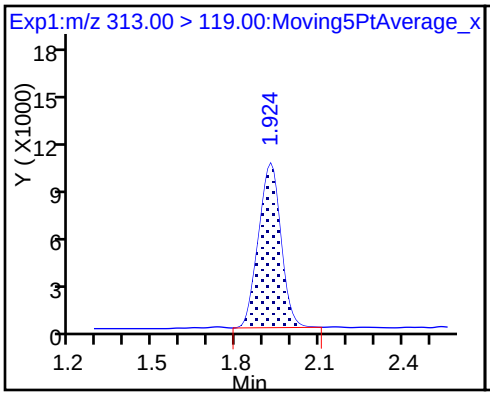
61 Sodium 1H,1H,2H,2H-perfluorohexane



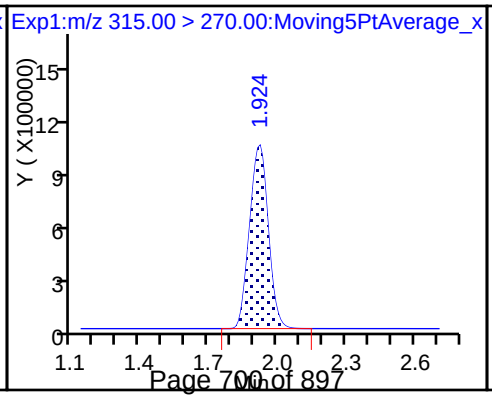
6 Perfluorohexanoic acid



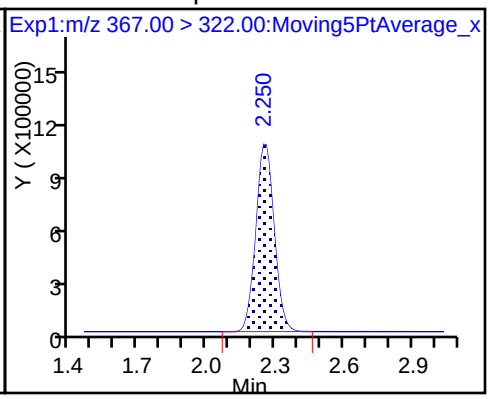
6 Perfluorohexanoic acid



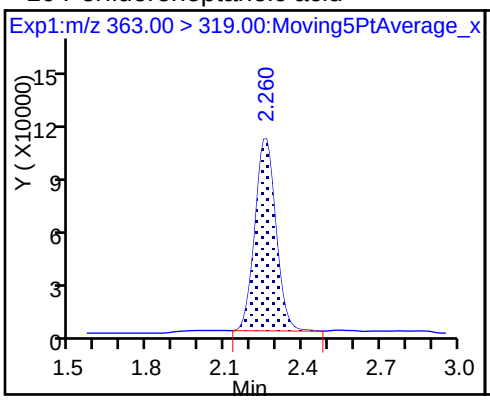
D 7 13C2 PFHxA



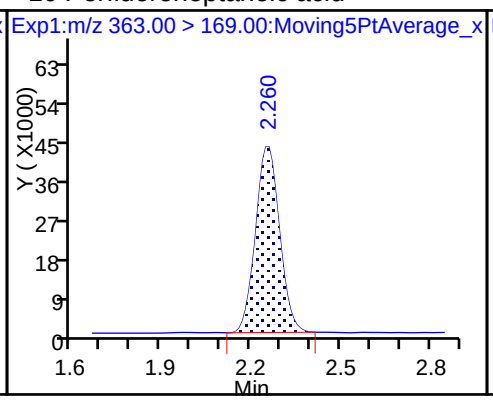
D 9 13C4-PFHpA



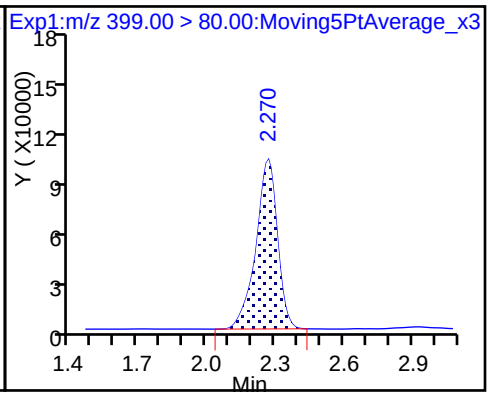
10 Perfluoroheptanoic acid



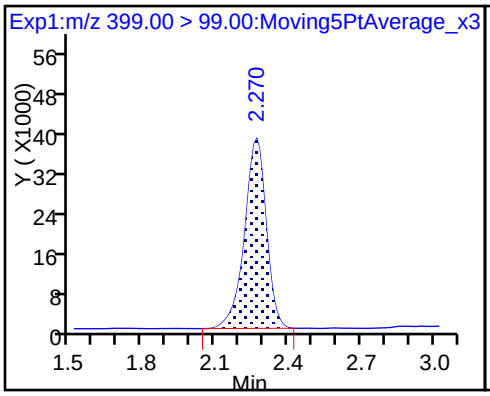
10 Perfluoroheptanoic acid



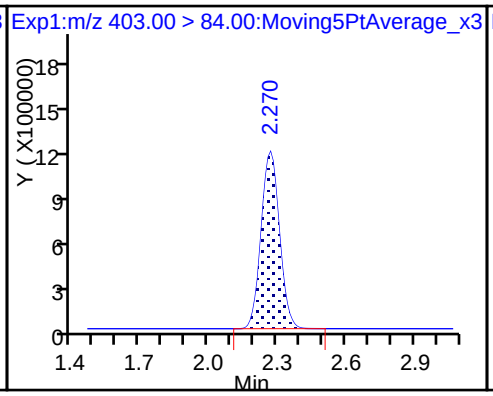
8 Perfluorohexanesulfonic acid



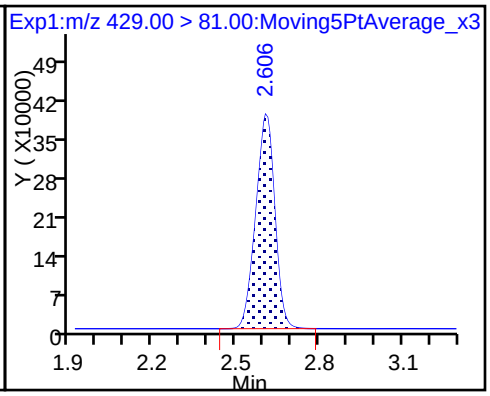
8 Perfluorohexanesulfonic acid



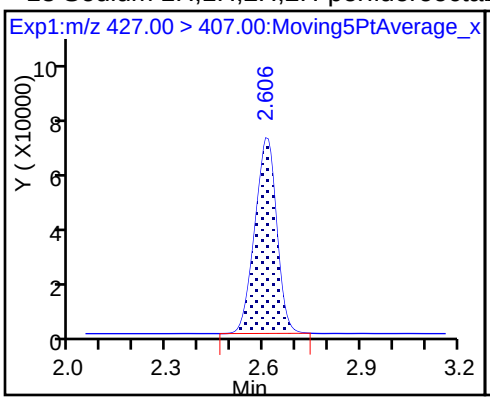
D 11 18O2 PFHxS



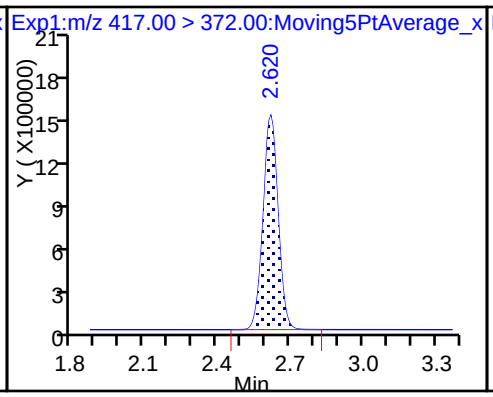
D 12 M2-6:2FTS



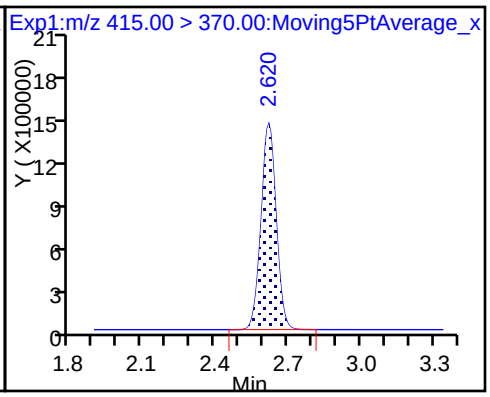
13 Sodium 1H,1H,2H,2H-perfluorooctane



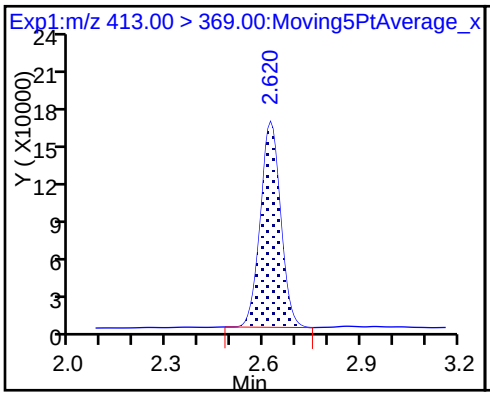
D 14 13C4 PFOA



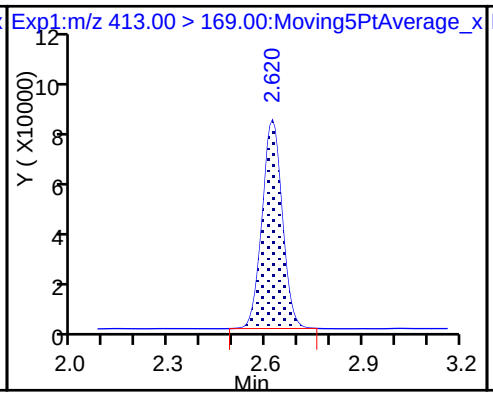
* 62 13C2-PFOA



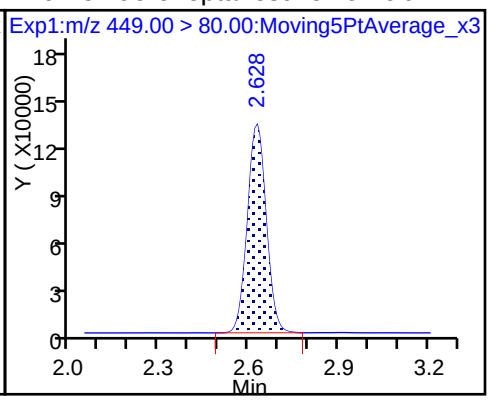
15 Perfluorooctanoic acid



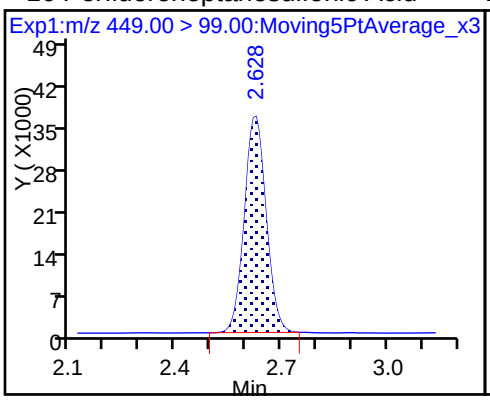
15 Perfluorooctanoic acid



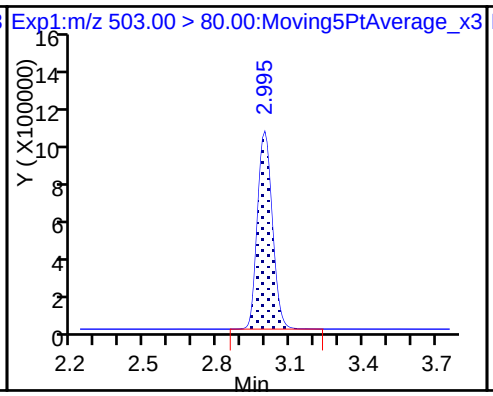
16 Perfluoroheptanesulfonic Acid



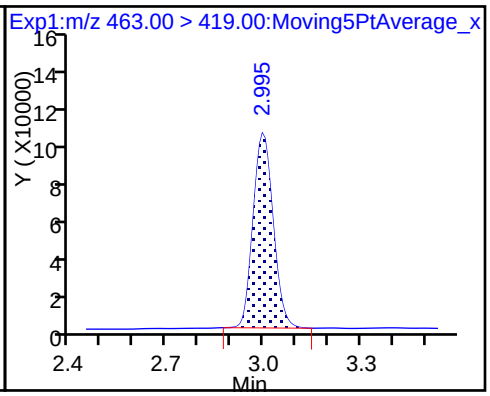
16 Perfluoroheptanesulfonic Acid



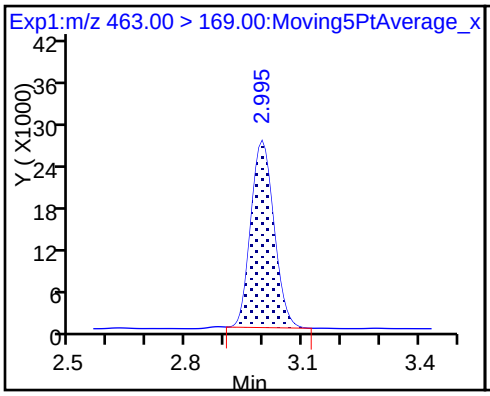
D 18 13C4 PFOS



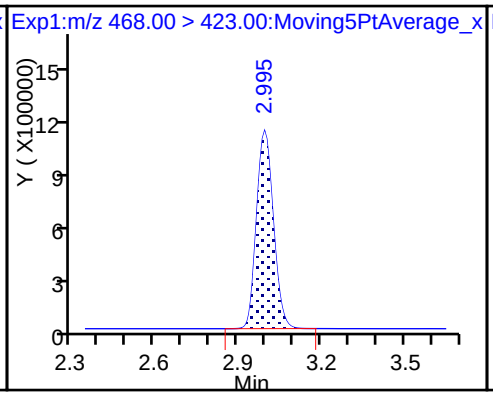
20 Perfluorononanoic acid



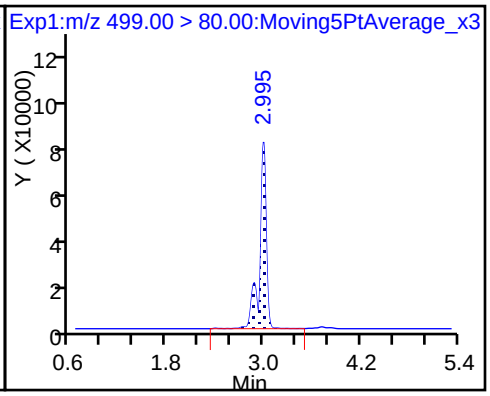
20 Perfluorononanoic acid



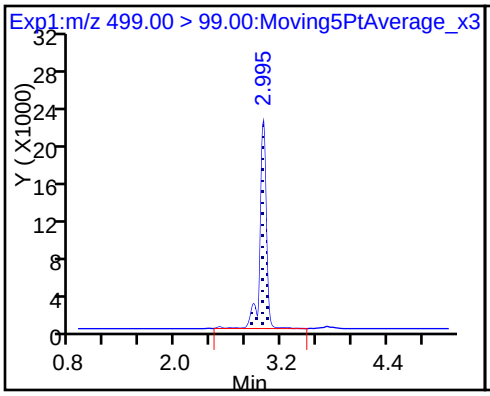
D 19 13C5 PFNA



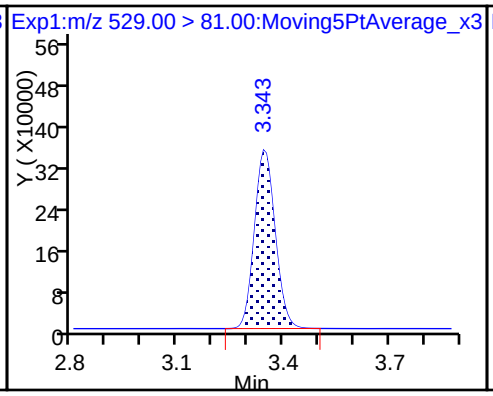
17 Perfluorooctane sulfonic acid



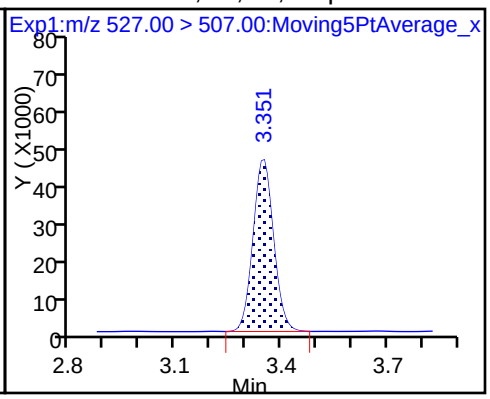
17 Perfluorooctane sulfonic acid



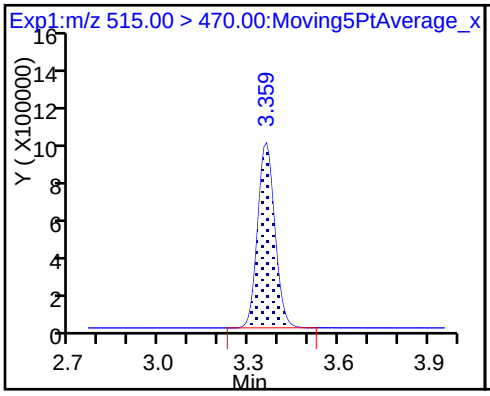
D 26 M2-8:2FTS



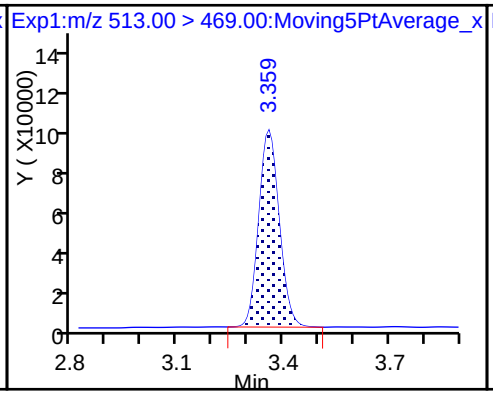
25 Sodium 1H,1H,2H,2H-perfluorodecane



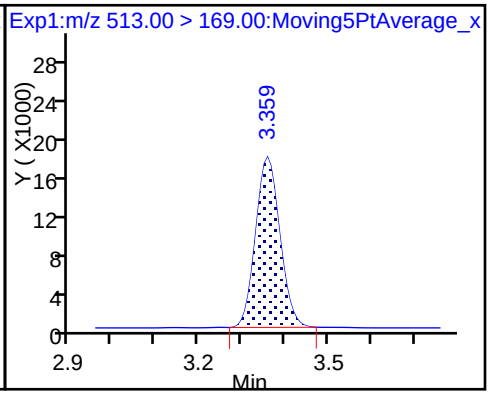
D 23 13C2 PFDA



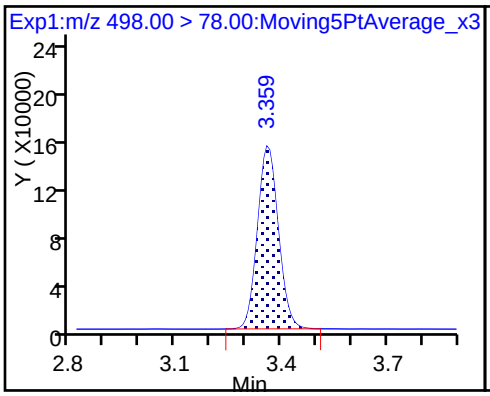
24 Perfluorodecanoic acid



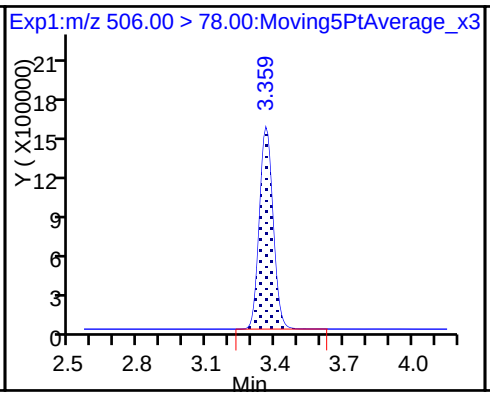
24 Perfluorodecanoic acid



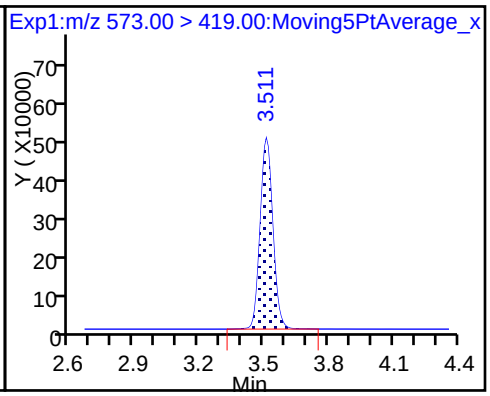
22 Perfluorooctane Sulfonamide



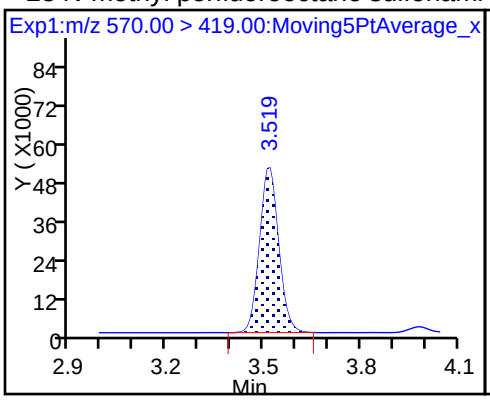
D 21 13C8 FOSA



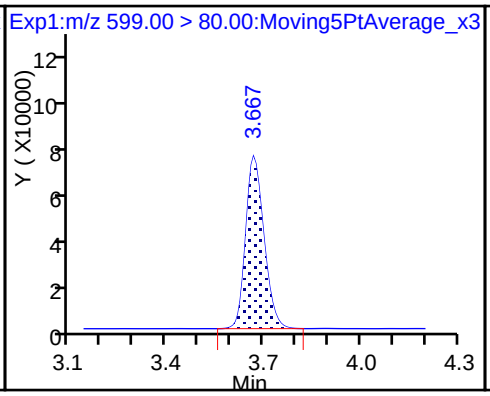
D 27 d3-NMeFOSAA



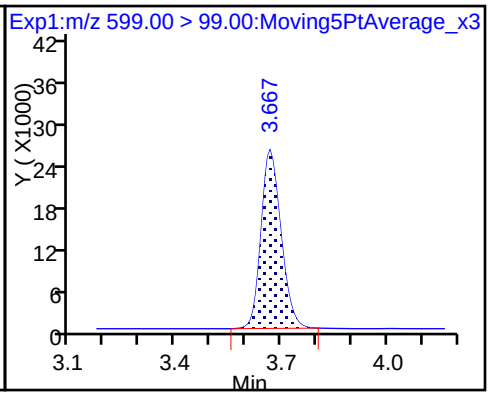
28 N-methyl perfluorooctane sulfonami



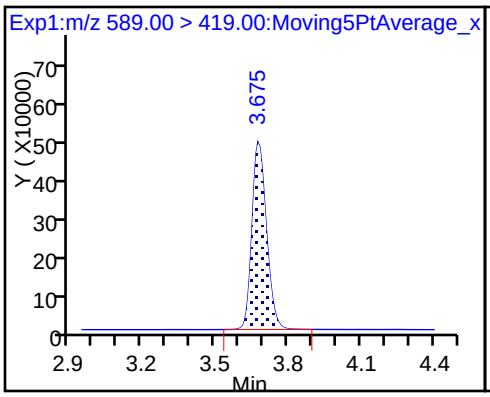
29 Perfluorodecane Sulfonic acid



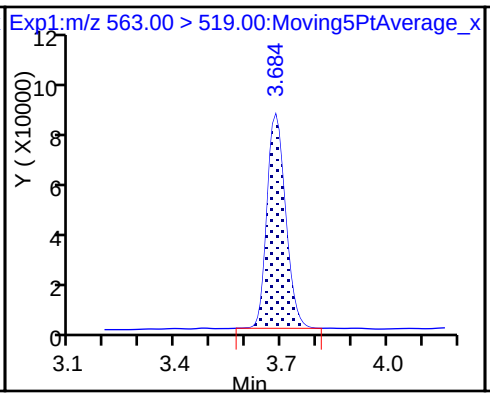
29 Perfluorodecane Sulfonic acid



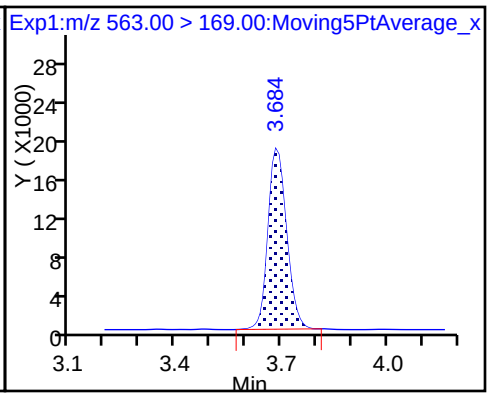
D 32 d5-NEtFOSAA



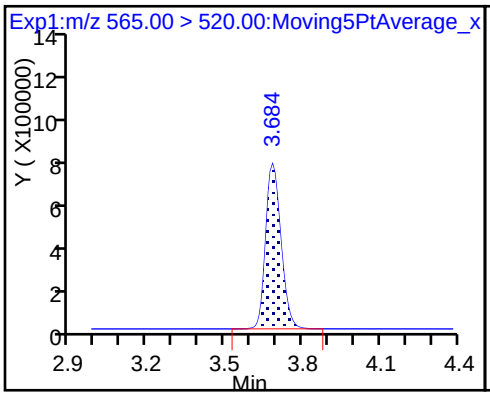
31 Perfluoroundecanoic acid



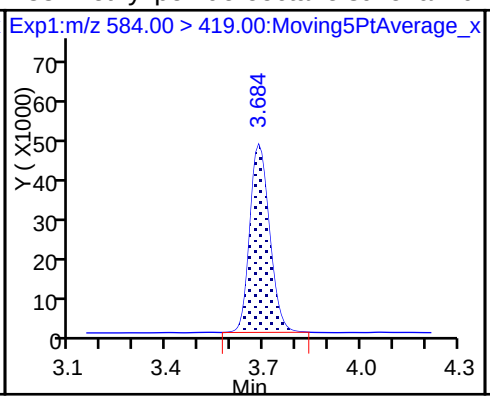
31 Perfluoroundecanoic acid



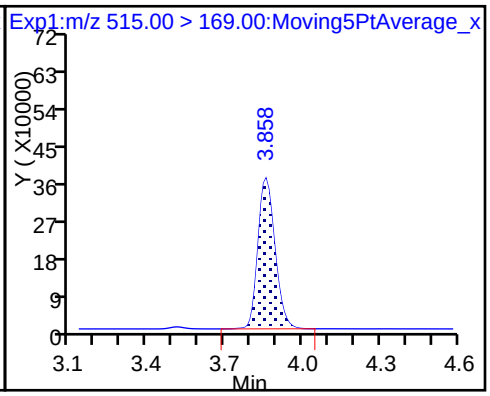
D 30 13C2 PFUnA



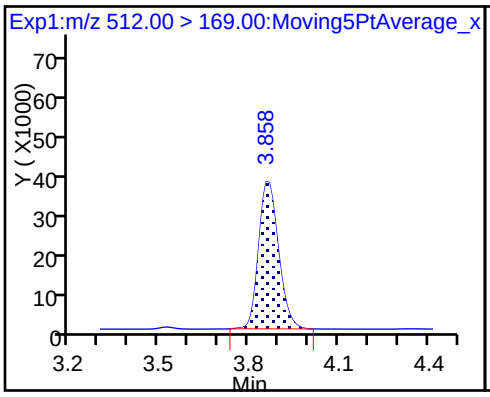
33 N-ethyl perfluorooctane sulfonamid



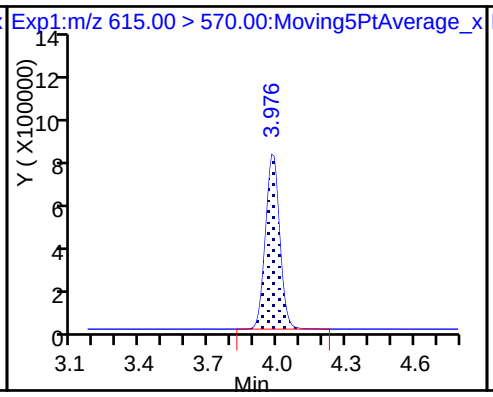
D 34 d-N-MeFOSA-M



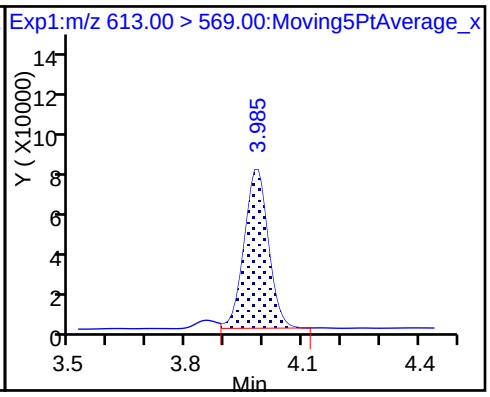
35 MeFOSA



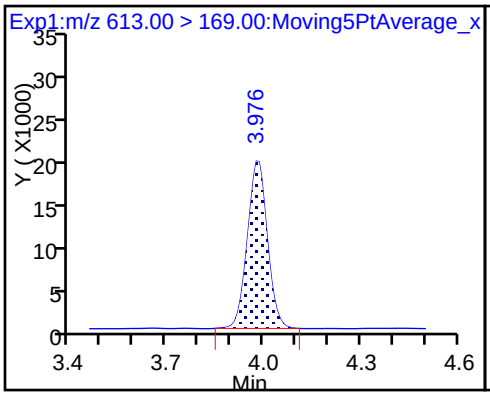
D 36 13C2 PFDoA



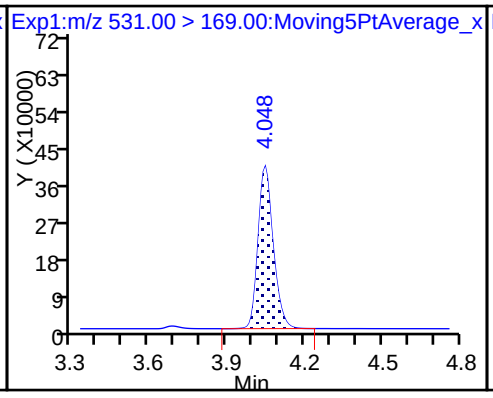
37 Perfluorododecanoic acid



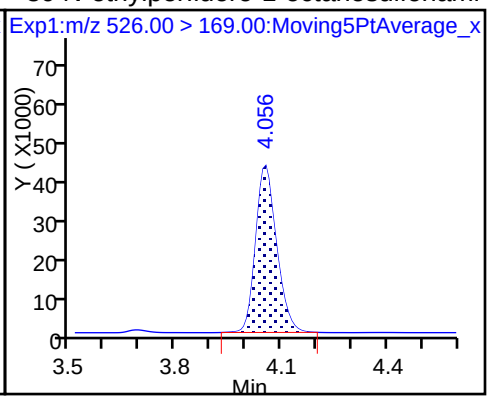
37 Perfluorododecanoic acid



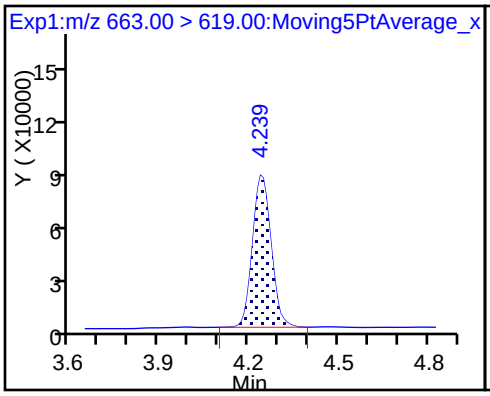
D 38 d-N-EtFOSA-M



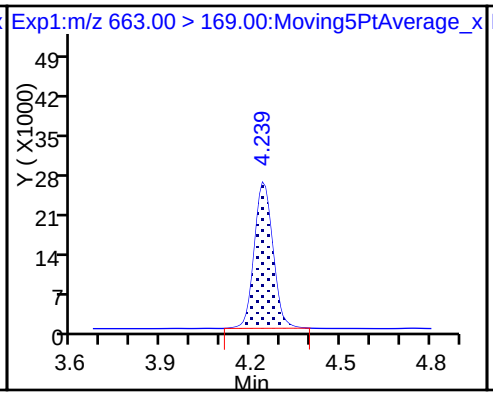
39 N-ethylperfluoro-1-octanesulfonami



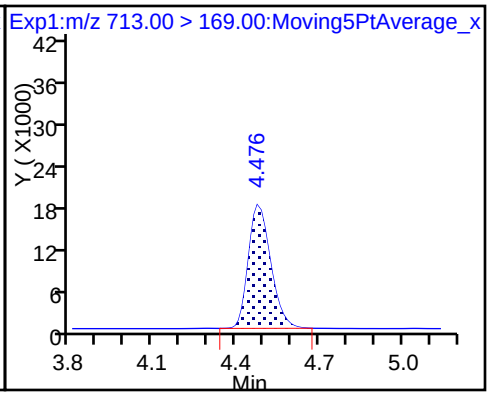
41 Perfluorotridecanoic acid



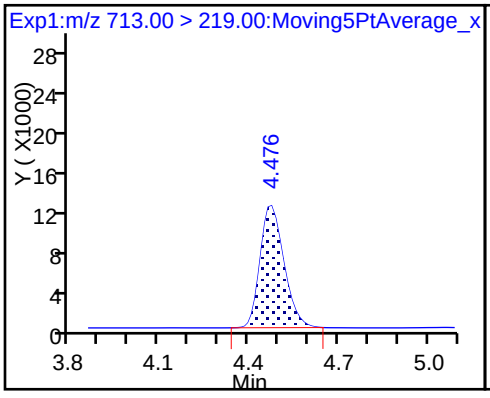
41 Perfluorotridecanoic acid



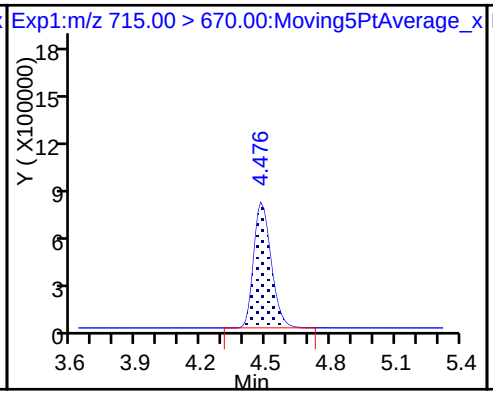
42 Perfluorotetradecanoic acid



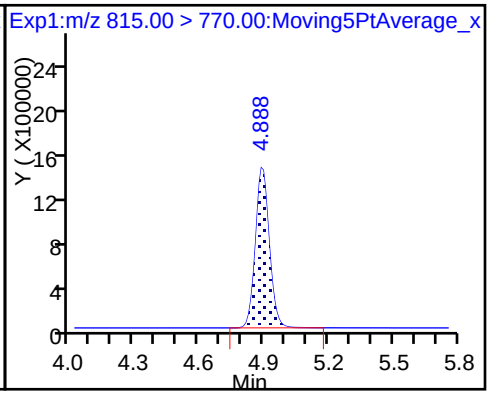
42 Perfluorotetradecanoic acid



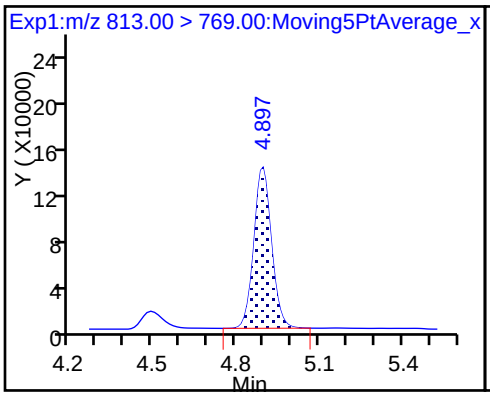
D 43 13C2-PFTeDA



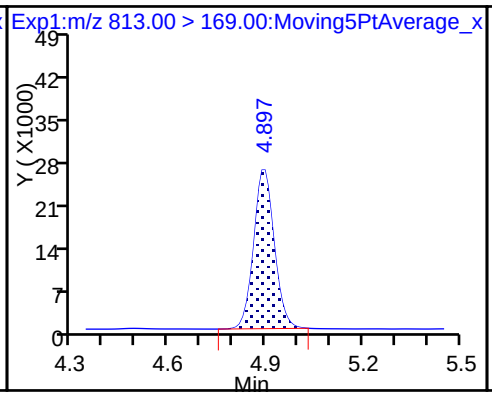
D 44 13C2-PFHxDA



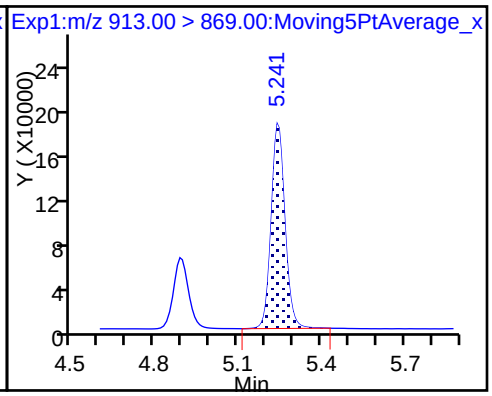
45 Perfluorohexadecanoic acid



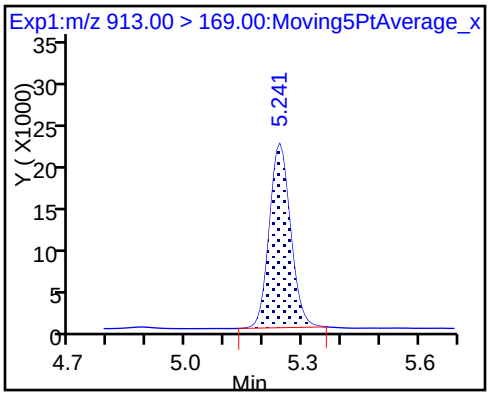
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_005.d
Lims ID: IC L4 Full
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 04-Dec-2017 16:12:34 ALS Bottle#: 13 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\20171204-51297.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 04-Dec-2017 19:07:24 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: phomsophat Date: 04-Dec-2017 16:25:27

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	1.400	1.401	-0.001	0.534	8693983	2.52		101	51885	
2 Perfluorobutyric acid										
212.90 > 169.00	1.400	1.402	-0.002	1.000	3250007	1.03		103	936	
D 3 13C5-PFPeA										
267.90 > 223.00	1.643	1.646	-0.003	0.626	5486176	2.55		102	69362	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.651	1.648	0.003	1.005	2521773	0.9875		98.7	1456	
D 47 13C3-PFBS										
301.90 > 83.00	1.683	1.681	0.002	0.641	102481	2.29		98.5	2343	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.683	1.682	0.001	1.000	3225845	0.9615		109	15676	
298.90 > 99.00	1.683	1.682	0.001	1.000	1288231		2.50(1.25-3.74)	109	12926	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.890	1.887	0.003	1.000	749506	0.99		106	35197	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.927	1.923	0.004	1.000	2220279	0.9602		96.0	4244	
313.00 > 119.00	1.927	1.923	0.004	1.000	209989		10.57(5.03-15.10)	96.0	4076	
D 7 13C2 PFHxA										
315.00 > 270.00	1.927	1.924	0.003	0.734	5662531	2.56		102	47077	
D 9 13C4-PFHpA										
367.00 > 322.00	2.253	2.254	-0.001	0.859	5579165	2.59		104	45231	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.253	2.255	-0.002	1.000	2334058	1.01		101	3024	
363.00 > 169.00	2.253	2.255	-0.002	1.000	908336		2.57(1.13-3.40)	101	8999	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.264	2.269	-0.005	0.995	2575397	0.8642		95.0	5542	
399.00 > 99.00	2.264	2.269	-0.005	0.995	866199		2.97(1.50-4.49)	95.0	4011	

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	2.274	2.271	0.003	0.867	6627522	2.46		104	46779	
D 12 M2-6:2FTS										
429.00 > 81.00	2.602	2.605	-0.003	0.992	1645515	2.28		96.0	37497	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.602	2.605	-0.003	1.000	1043721	0.8935		94.2	26479	
D 14 13C4 PFOA										
417.00 > 372.00	2.616	2.618	-0.002	0.997	6081734	2.55		102	53008	
* 62 13C2-PFOA										
415.00 > 370.00	2.624	2.619	0.005		5795585	2.50			45739	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.624	2.621	0.003	1.003	2591017	1.00		99.9	1321	
413.00 > 169.00	2.624	2.621	0.003	1.003	1395861		1.86(0.84-2.52)	99.9	8959	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.631	2.626	0.005	1.000	2280426	0.9687		102	30906	
449.00 > 99.00	2.631	2.626	0.005	1.000	609029		3.74(1.94-5.82)	102	13744	
D 18 13C4 PFOS										
503.00 > 80.00	3.000	2.993	0.007	1.143	4323332	2.47		103	35327	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.000	2.994	0.006	1.000	1729608	0.9225		99.4	7361	
499.00 > 99.00	3.000	2.994	0.006	1.000	405992		4.26(2.31-6.93)	99.4	8226	
D 19 13C5 PFNA										
468.00 > 423.00	3.000	2.994	0.006	1.143	4401513	2.56		102	47110	
20 Perfluorononanoic acid										
463.00 > 419.00	3.000	2.994	0.006	1.000	1753950	1.02		102	5258	
463.00 > 169.00	3.000	2.994	0.006	1.000	430469		4.07(1.90-5.69)	102	16974	
D 26 M2-8:2FTS										
529.00 > 81.00	3.347	3.343	0.004	1.276	1371577	2.41		101	28715	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.347	3.344	0.003	1.000	677314	0.9580		100	15345	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.362	3.356	0.006	1.000	1468220	0.9828		98.3	4935	
513.00 > 169.00	3.362	3.356	0.006	1.000	273531		5.37(2.36-7.09)	98.3	2013	
D 23 13C2 PFDA										
515.00 > 470.00	3.362	3.356	0.006	1.282	3807504	2.61		104	41484	
D 21 13C8 FOSA										
506.00 > 78.00	3.362	3.359	0.003	1.282	6025486	2.56		102	32245	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.362	3.359	0.003	1.000	2422346	1.07		107	21965	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.515	3.511	0.004	1.340	1970435	2.53		101	27446	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.515	3.515	0.0	1.000	813999	0.9862		98.6	5427	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.671	3.667	0.004	1.000	1091162	0.9539		99.0	27310	
599.00 > 99.00	3.671	3.667	0.004	1.000	364367		2.99(1.39-4.16)	99.0	15197	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.680	3.677	0.003	1.403	2007076	2.65		106	10999	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.689	3.685	0.004	1.002	762806	1.01		101	9635	
D 30 13C2 PFUnA										
565.00 > 520.00	3.689	3.685	0.004	1.406	2900047	2.58		103	33442	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.689	3.685	0.004	1.000	1066672	0.9351		93.5	4926	
563.00 > 169.00	3.689	3.685	0.004	1.000	239569		4.45(0.00-0.00)	93.5	11024	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.854	3.856	-0.002	1.469	1655616	2.43		97.2	3819	
35 MeFOSA										
512.00 > 169.00	3.865	3.865	0.0	1.003	670337	1.06		106	2764	
D 36 13C2 PFDoA										
615.00 > 570.00	3.981	3.979	0.002	1.517	3179371	2.54		102	38315	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.981	3.982	-0.001	1.000	1269740	1.01		101	2775	
613.00 > 169.00	3.981	3.982	-0.001	1.000	305298		4.16(2.13-6.40)	101	14474	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.052	4.048	0.004	1.544	1587546	2.50		100	3552	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.060	4.056	0.004	1.002	661598	0.99		99.2	3377	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.243	4.243	0.0	1.000	1378400	1.04		104	3642	
663.00 > 169.00	4.243	4.243	0.0	1.000	442611		3.11(1.25-3.76)	104	17296	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.486	4.481	0.005	1.710	3764283	2.58		103	25501	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.486	4.481	0.005	1.000	354521	0.9280		92.8	10372	
713.00 > 219.00	4.472	4.481	-0.009	0.997	259232		1.37(0.71-2.13)	92.8	9256	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.895	4.892	0.003	1.866	6361239	2.64		106	20712	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.895	4.894	0.001	1.000	2214468	1.00		100.0	1125	
813.00 > 169.00	4.895	4.894	0.001	1.000	416649		5.31(2.86-8.58)	100.0	6322	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.246	5.242	0.004	1.000	2508373	1.03		103	515	
913.00 > 169.00	5.239	5.242	-0.003	0.999	319225		7.86(0.00-0.00)	103	2005	

Reagents:

LCPFC_LL4_00002 Amount Added: 1.00 Units: mL

Report Date: 04-Dec-2017 19:07:25 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_005.d

Injection Date: 04-Dec-2017 16:12:34 Instrument ID: A8_N

Lims ID: IC L4 Full

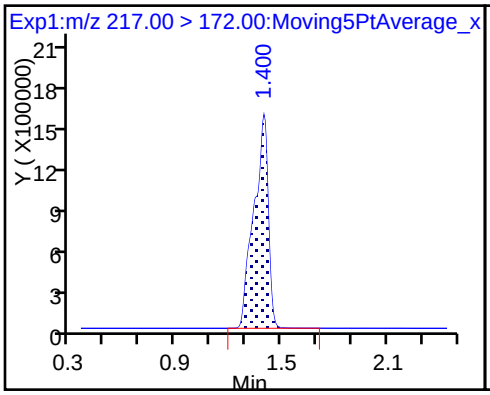
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 5

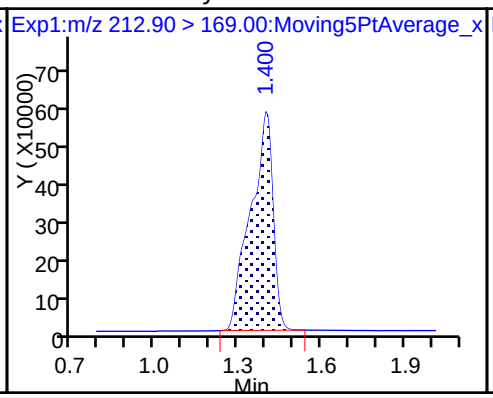
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

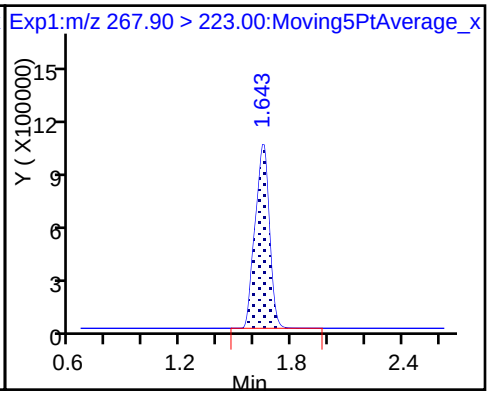
D 1 13C4 PFBA



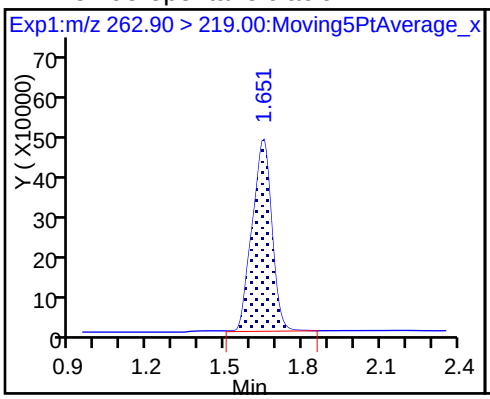
2 Perfluorobutyric acid



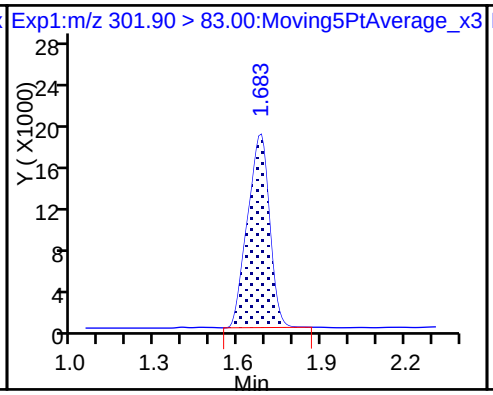
D 3 13C5-PFPeA



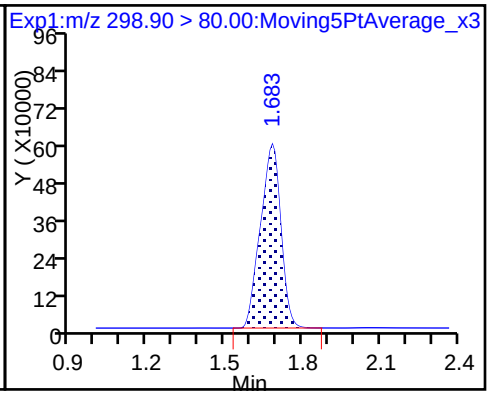
4 Perfluoropentanoic acid



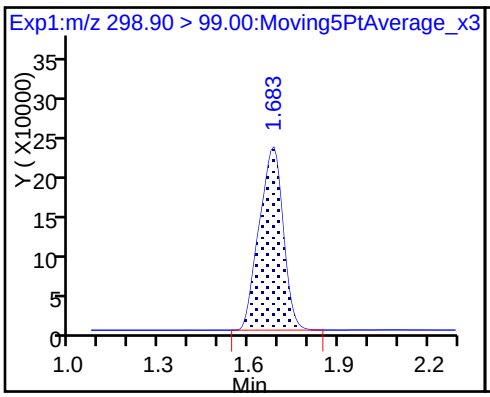
D 47 13C3-PFBS



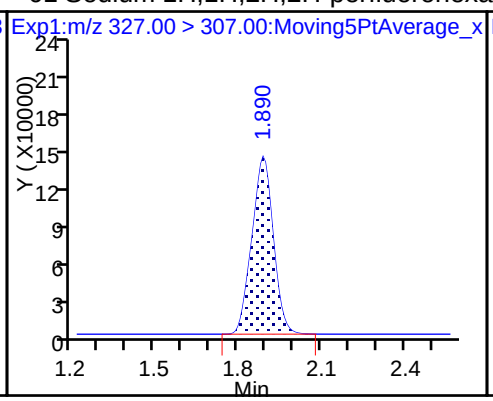
5 Perfluorobutanesulfonic acid



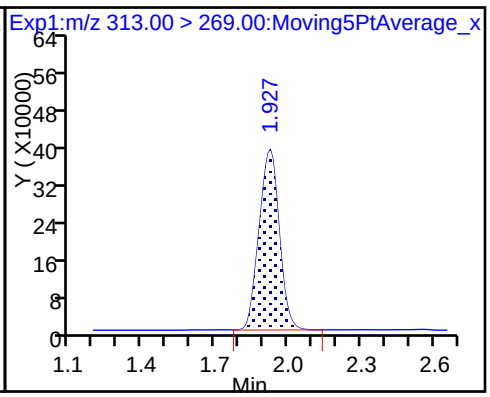
5 Perfluorobutanesulfonic acid



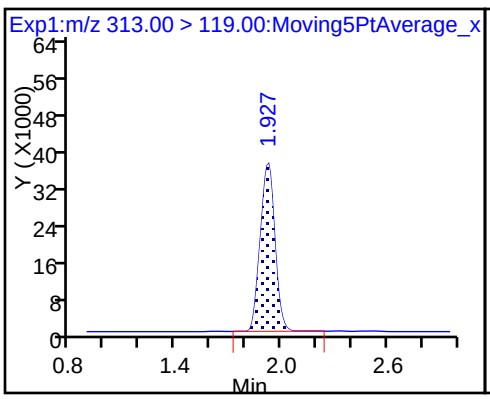
61 Sodium 1H,1H,2H,2H-perfluorohexane



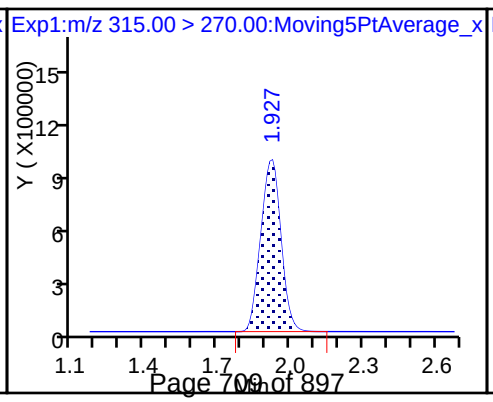
6 Perfluorohexanoic acid



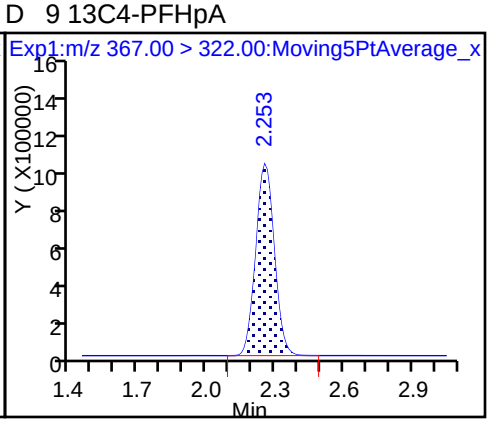
6 Perfluorohexanoic acid



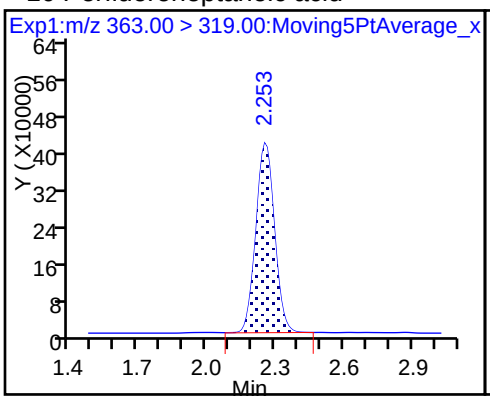
D 7 13C2 PFHxA



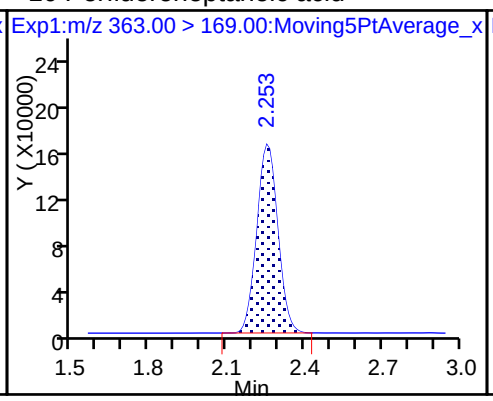
D 9 13C4-PFHpA



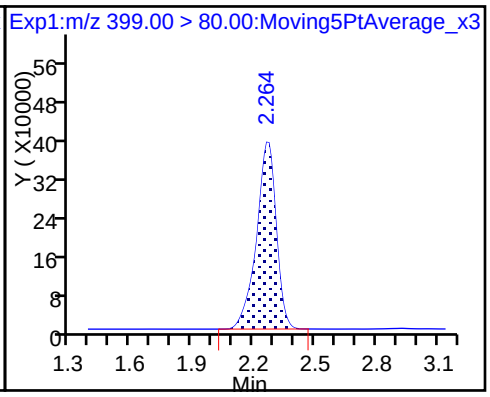
10 Perfluoroheptanoic acid



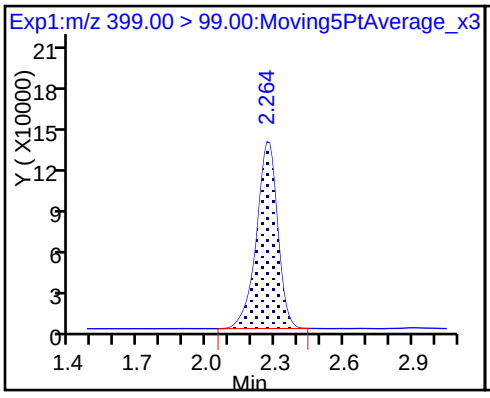
10 Perfluoroheptanoic acid



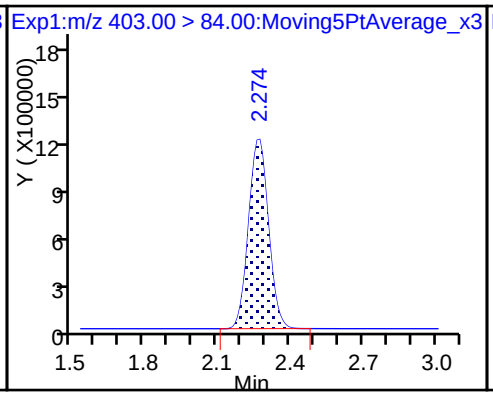
8 Perfluorohexanesulfonic acid



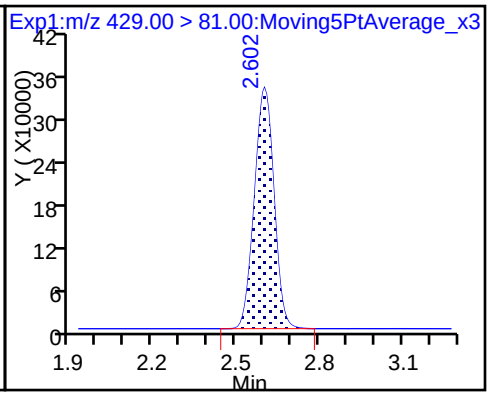
8 Perfluorohexanesulfonic acid



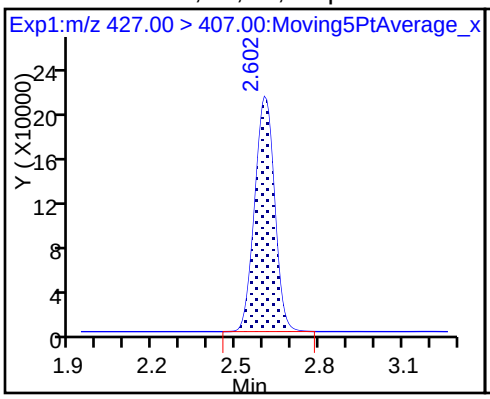
D 11 18O2 PFHxS



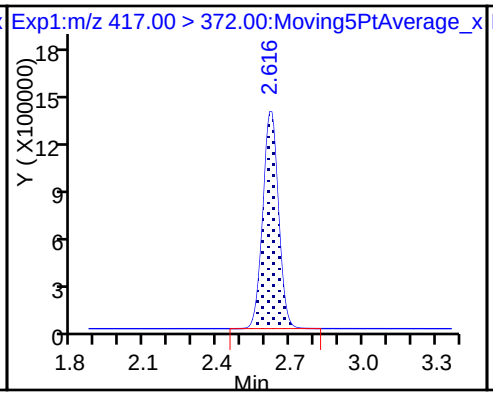
D 12 M2-6:2FTS



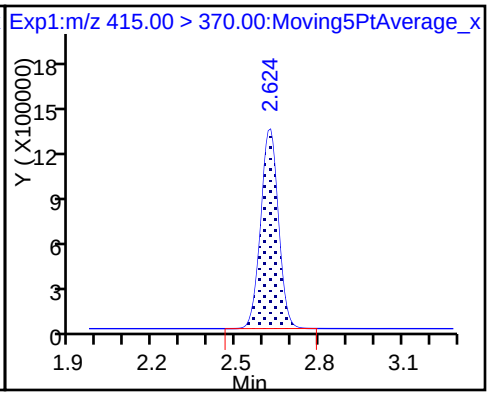
13 Sodium 1H,1H,2H,2H-perfluorooctane



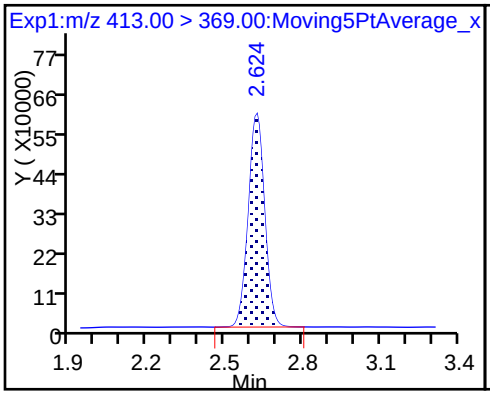
D 14 13C4 PFOA



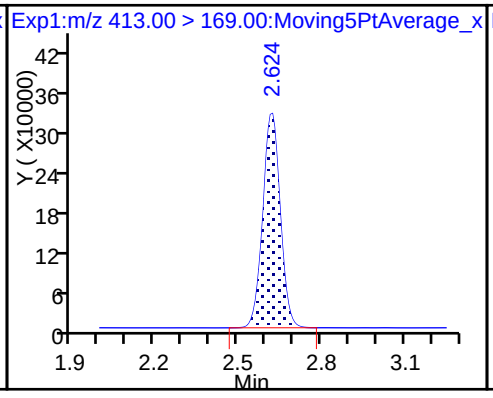
* 62 13C2-PFOA



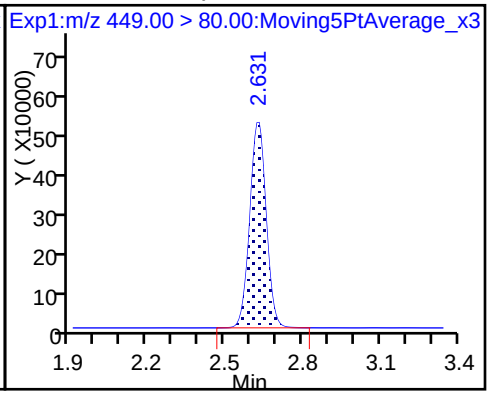
15 Perfluorooctanoic acid



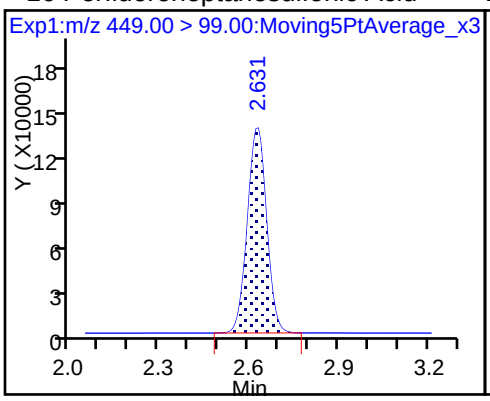
15 Perfluorooctanoic acid



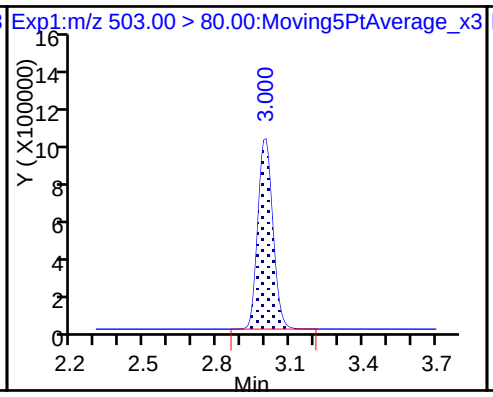
16 Perfluoroheptanesulfonic Acid



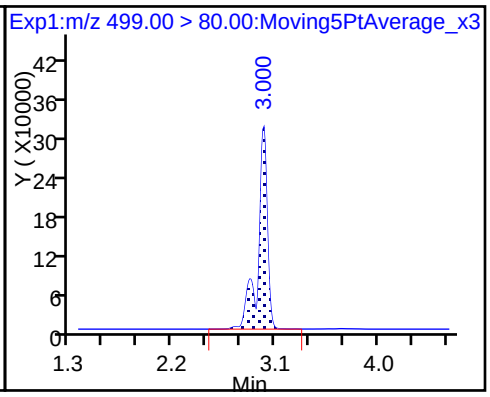
16 Perfluoroheptanesulfonic Acid



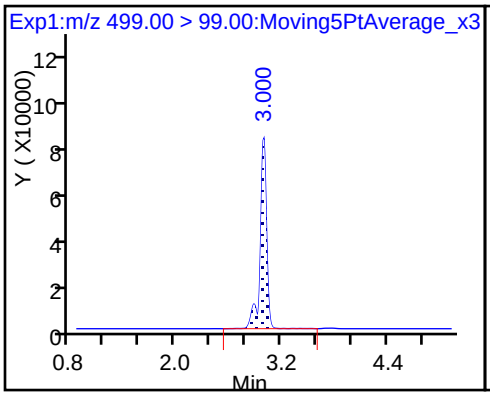
D 18 13C4 PFOS



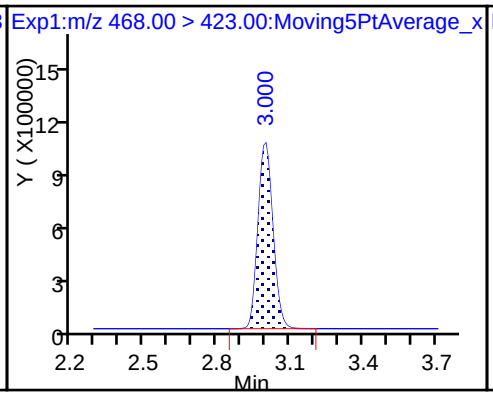
17 Perfluorooctane sulfonic acid



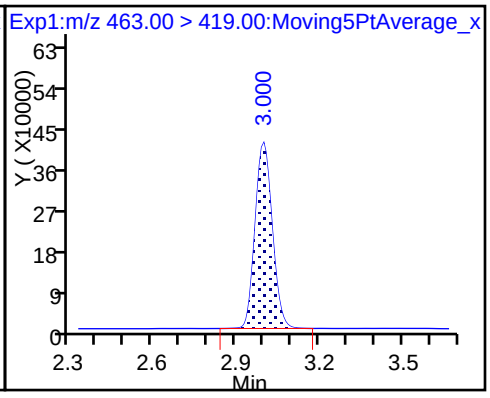
17 Perfluorooctane sulfonic acid



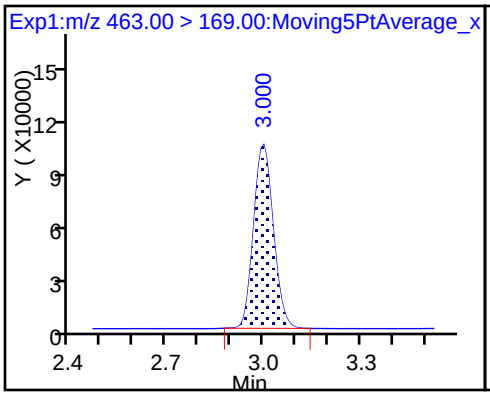
D 19 13C5 PFNA



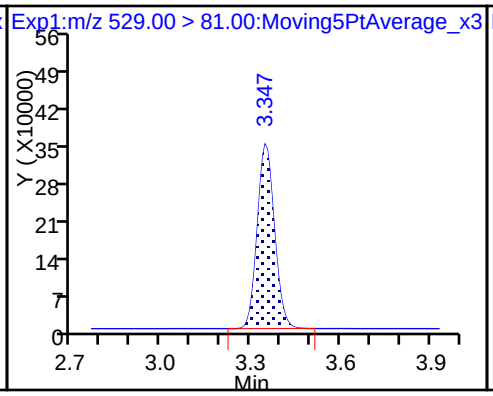
20 Perfluorononanoic acid



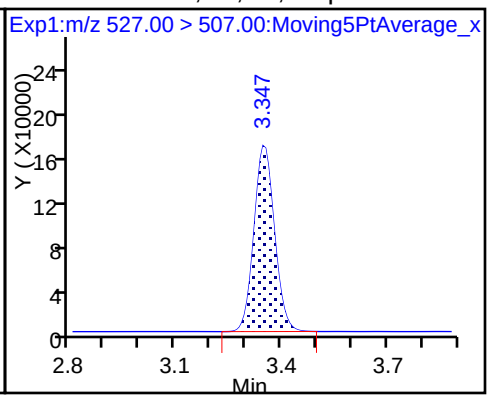
20 Perfluorononanoic acid



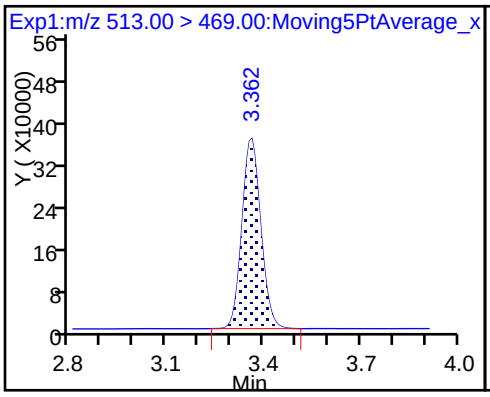
D 26 M2-8:2FTS



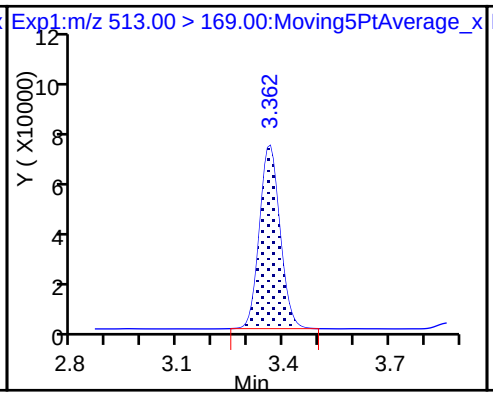
25 Sodium 1H,1H,2H,2H-perfluorodecane



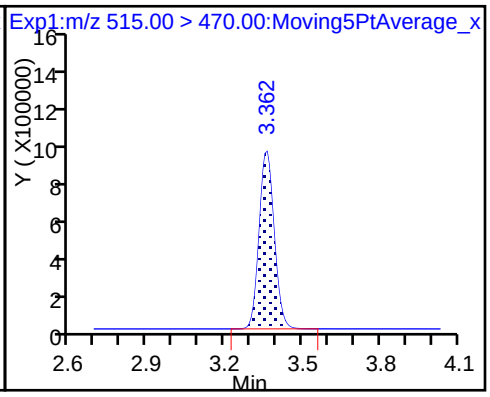
24 Perfluorodecanoic acid



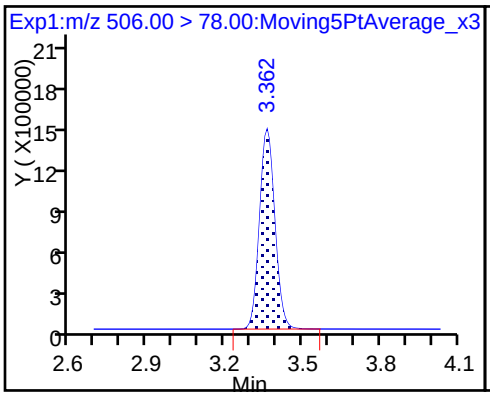
24 Perfluorodecanoic acid



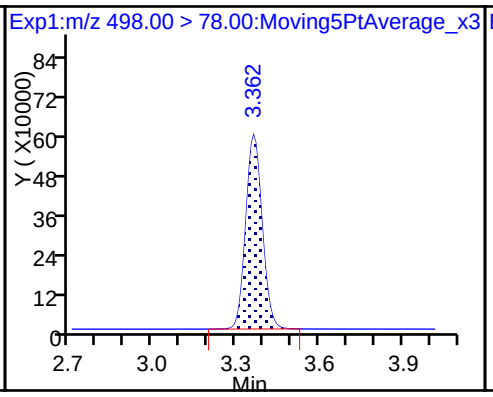
D 23 13C2 PFDA



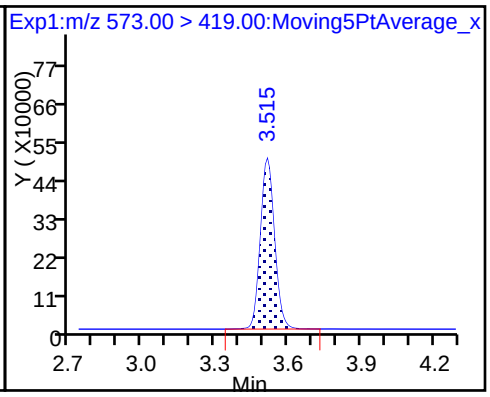
D 21 13C8 FOSA



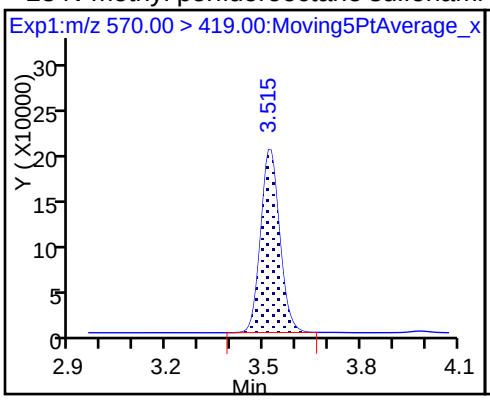
22 Perfluorooctane Sulfonamide



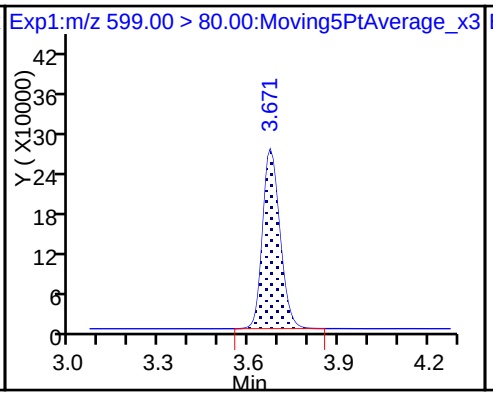
D 27 d3-NMeFOSAA



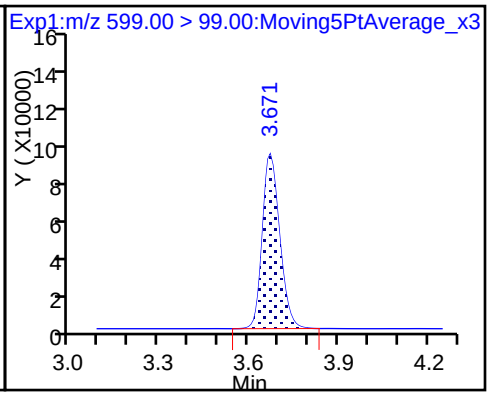
28 N-methyl perfluorooctane sulfonami



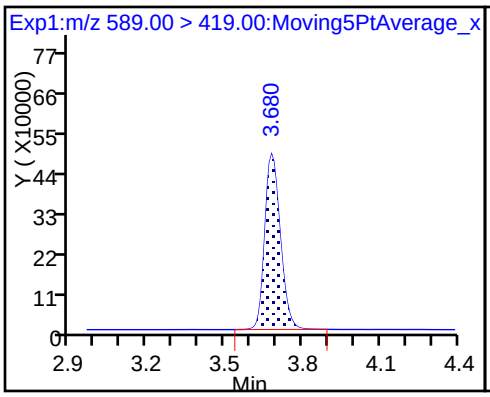
29 Perfluorodecane Sulfonic acid



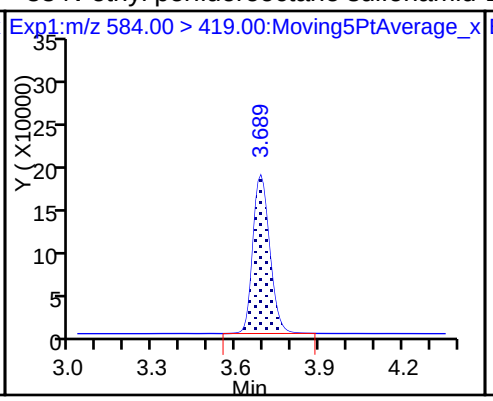
29 Perfluorodecane Sulfonic acid



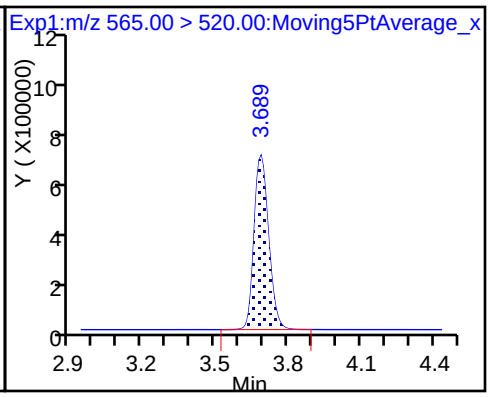
D 32 d5-NEtFOSAA



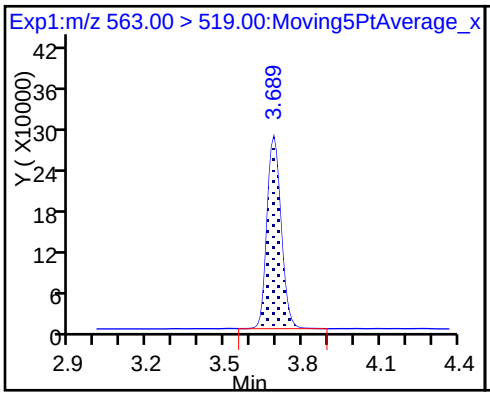
33 N-ethyl perfluorooctane sulfonamid



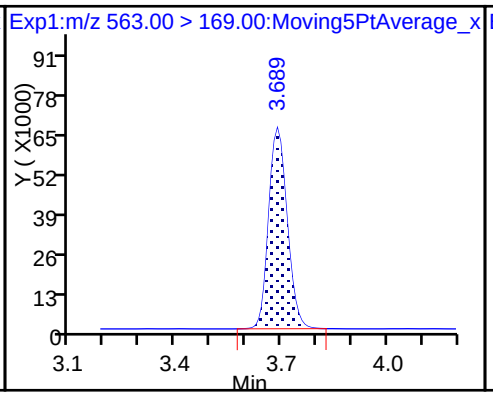
D 30 13C2 PFUnA



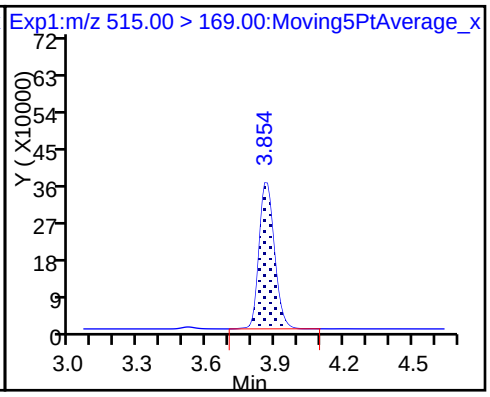
31 Perfluoroundecanoic acid



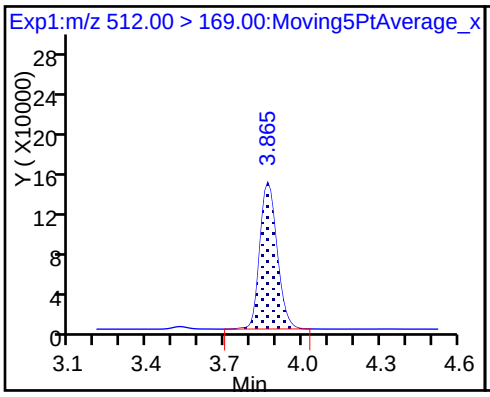
31 Perfluoroundecanoic acid



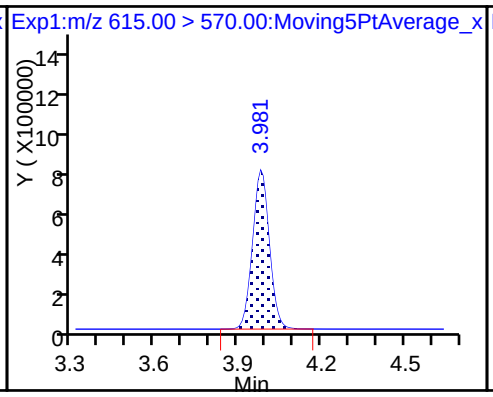
D 34 d-N-MeFOSA-M



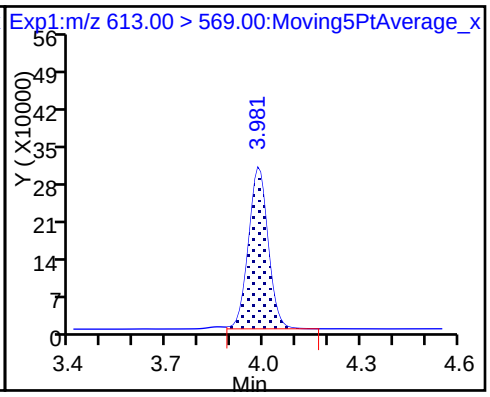
35 MeFOSA



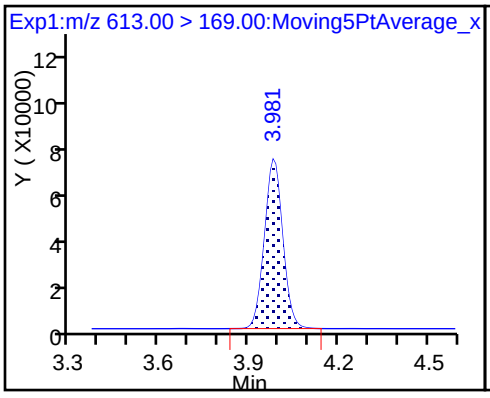
D 36 13C2 PFDoA



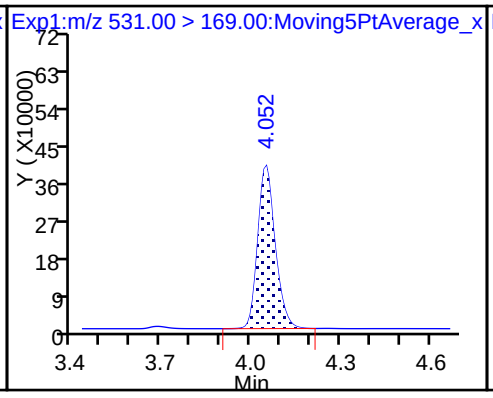
37 Perfluorododecanoic acid



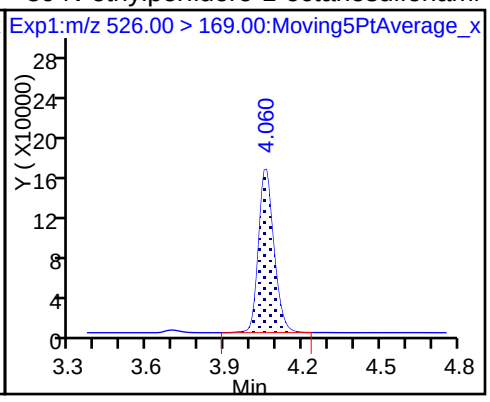
37 Perfluorododecanoic acid



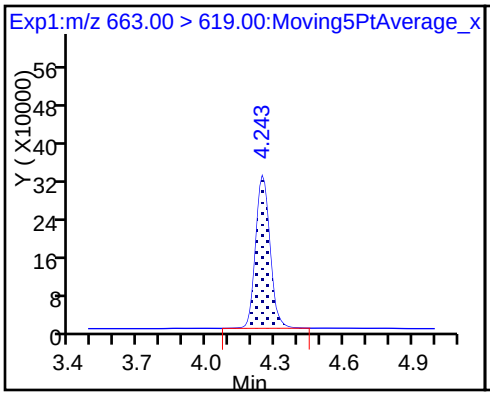
D 38 d-N-EtFOSA-M



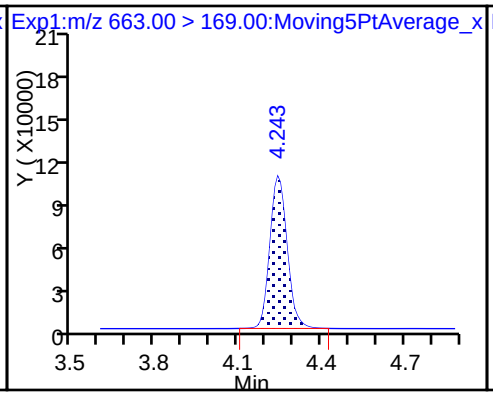
39 N-ethylperfluoro-1-octanesulfonami



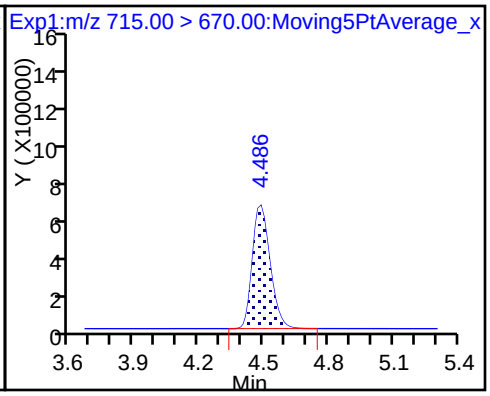
41 Perfluorotridecanoic acid



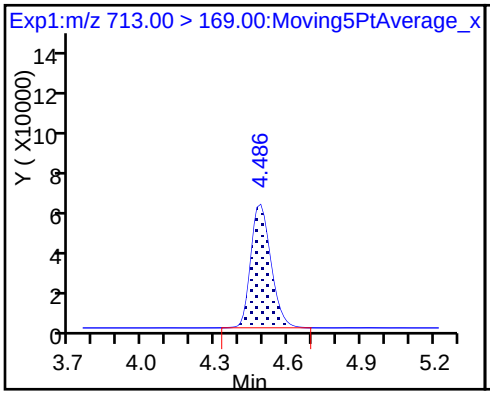
41 Perfluorotridecanoic acid



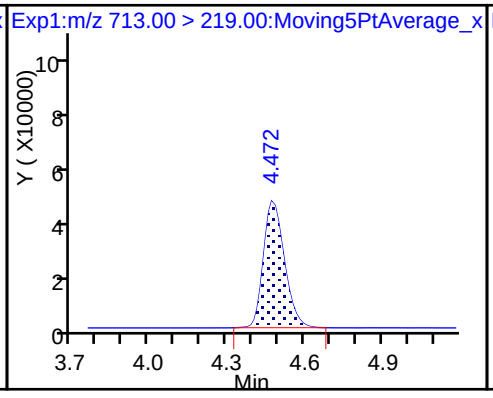
D 43 13C2-PFTeDA



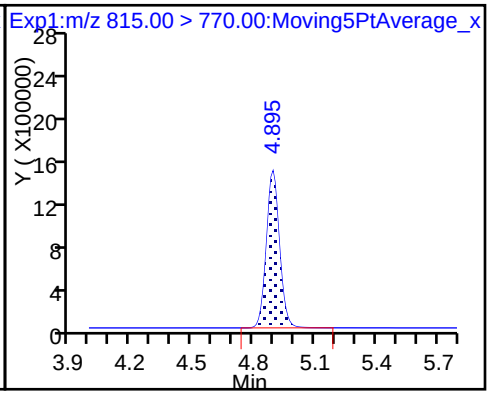
42 Perfluorotetradecanoic acid



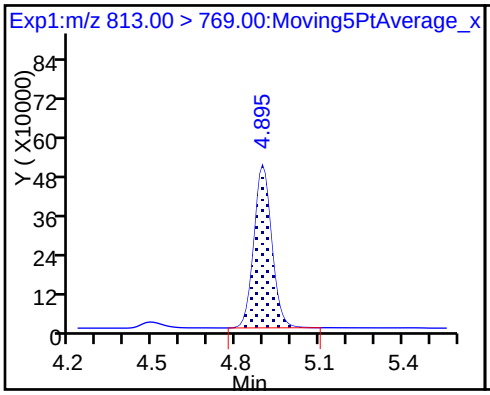
42 Perfluorotetradecanoic acid



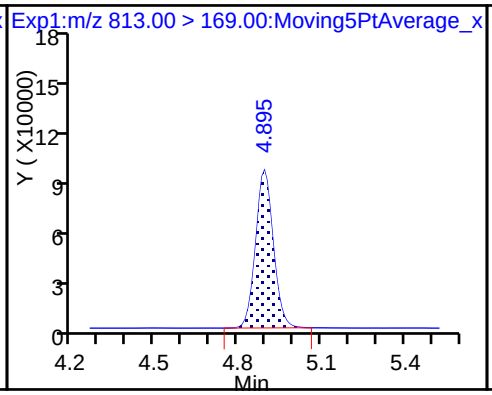
D 44 13C2-PFHxDA



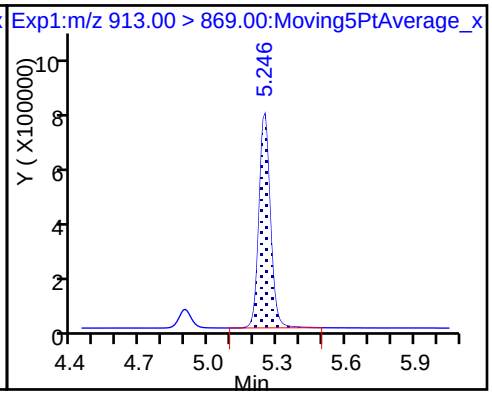
45 Perfluorohexadecanoic acid



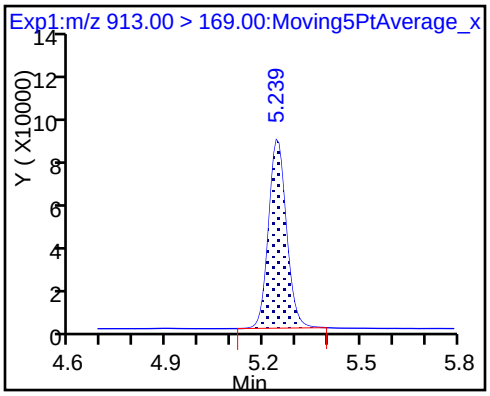
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



Report Date: 04-Dec-2017 19:07:29 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_006.d
Lims ID: IC L5 Full
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 04-Dec-2017 16:20:25 ALS Bottle#: 14 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\20171204-51297.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 04-Dec-2017 19:07:28 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: phomsophat Date: 04-Dec-2017 16:49:38

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	1.399	1.401	-0.002	0.535	8660817	2.39		95.4	54989	
2 Perfluorobutyric acid										
212.90 > 169.00	1.399	1.402	-0.003	1.000	8103624	2.57		103	2170	
D 3 13C5-PFPeA										
267.90 > 223.00	1.648	1.646	0.002	0.631	5438586	2.40		96.1	46955	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.648	1.648	0.0	1.000	6221422	2.46		98.3	4024	
D 47 13C3-PFBS										
301.90 > 83.00	1.681	1.681	0.0	0.643	103355	2.20		94.4	2317	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.681	1.682	-0.001	1.000	7915154	2.34		106	37091	
298.90 > 99.00	1.681	1.682	-0.001	1.000	3353921		2.36(1.25-3.74)	106	25981	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.887	1.887	0.0	1.000	1818901	2.16		92.5	65990	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.925	1.923	0.002	1.000	5684235	2.57		103	14663	
313.00 > 119.00	1.925	1.923	0.002	1.000	504858		11.26(5.03-15.10)	103	11075	
D 7 13C2 PFHxA										
315.00 > 270.00	1.925	1.924	0.001	0.736	5410683	2.33		93.0	63653	
D 9 13C4-PFHpA										
367.00 > 322.00	2.250	2.254	-0.004	0.861	5419539	2.40		95.8	54299	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.250	2.255	-0.005	1.000	5768119	2.56		102	7387	
363.00 > 169.00	2.250	2.255	-0.005	1.000	2229145		2.59(1.13-3.40)	102	17487	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.271	2.269	0.002	1.000	6340167	2.20		96.7	12681	
399.00 > 99.00	2.271	2.269	0.002	1.000	2100677		3.02(1.50-4.49)	96.7	8437	

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	2.271	2.271	0.0	0.869	6409168	2.26		95.7	54756	
D 12 M2-6:2FTS										
429.00 > 81.00	2.606	2.605	0.001	0.997	1838871	2.42		102	36236	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.606	2.605	0.001	1.000	2781378	2.13		89.9	57277	
D 14 13C4 PFOA										
417.00 > 372.00	2.621	2.618	0.003	1.003	6195524	2.48		99.0	62969	
* 62 13C2-PFOA										
415.00 > 370.00	2.614	2.619	-0.005		6093812	2.50			61186	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.621	2.621	0.0	1.000	6486499	2.45		98.2	3326	
413.00 > 169.00	2.621	2.621	0.0	1.000	3490087		1.86(0.84-2.52)	98.2	22102	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.621	2.626	-0.005	1.000	5792972	2.50		105	49558	
449.00 > 99.00	2.621	2.626	-0.005	1.000	1538446		3.77(1.94-5.82)	105	25459	
D 18 13C4 PFOS										
503.00 > 80.00	2.989	2.993	-0.004	1.143	4248600	2.31		96.5	32903	
20 Perfluorononanoic acid										
463.00 > 419.00	2.989	2.994	-0.005	1.000	4329674	2.54		102	10748	
463.00 > 169.00	2.989	2.994	-0.005	1.000	1052076		4.12(1.90-5.69)	102	24836	
D 19 13C5 PFNA										
468.00 > 423.00	2.989	2.994	-0.005	1.143	4368620	2.41		96.6	41155	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.989	2.994	-0.005	1.000	4429145	2.40		104	18283	
499.00 > 99.00	2.989	2.994	-0.005	1.000	958603		4.62(2.31-6.93)	104	13231	
D 26 M2-8:2FTS										
529.00 > 81.00	3.338	3.343	-0.005	1.277	1380175	2.31		96.5	24300	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.338	3.344	-0.006	1.000	1777969	2.50		104	36811	
D 23 13C2 PFDA										
515.00 > 470.00	3.353	3.356	-0.003	1.283	3698804	2.41		96.5	35678	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.353	3.356	-0.003	1.000	3580422	2.47		98.7	13989	
513.00 > 169.00	3.353	3.356	-0.003	1.000	665742		5.38(2.36-7.09)	98.7	2257	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.353	3.359	-0.006	1.000	5901786	2.64		105	42073	
D 21 13C8 FOSA										
506.00 > 78.00	3.353	3.359	-0.006	1.283	5974226	2.41		96.4	34079	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.505	3.511	-0.006	1.341	1957557	2.39		95.7	22176	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.512	3.515	-0.003	1.002	2103368	2.57		103	11726	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.662	3.667	-0.005	1.000	2833055	2.52		105	45642	
599.00 > 99.00	3.662	3.667	-0.005	1.000	926555		3.06(1.39-4.16)	105	26351	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.677	3.677	0.0	1.407	2028871	2.55		102	12012	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.677	3.685	-0.008	1.000	2840384	2.54		102	12549	
563.00 > 169.00	3.685	3.685	0.0	1.002	577992		4.91(0.00-0.00)	102	22479	
D 30 13C2 PFUnA										
565.00 > 520.00	3.677	3.685	-0.008	1.407	2840864	2.41		96.2	30216	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.677	3.685	-0.008	1.000	1881492	2.46		98.5	19647	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.851	3.856	-0.005	1.473	1659925	2.32		92.7	4208	
35 MeFOSA										
512.00 > 169.00	3.862	3.865	-0.003	1.003	1684839	2.66		106	3717	
D 36 13C2 PFDoA										
615.00 > 570.00	3.978	3.979	-0.001	1.522	3097457	2.36		94.2	38788	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.978	3.982	-0.004	1.000	3087281	2.52		101	6776	
613.00 > 169.00	3.978	3.982	-0.004	1.000	766204		4.03(2.13-6.40)	101	30290	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.041	4.048	-0.007	1.546	1572774	2.36		94.3	3300	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.049	4.056	-0.007	1.002	1670598	2.53		101	3719	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.240	4.243	-0.003	1.000	3323761	2.57		103	9486	
663.00 > 169.00	4.240	4.243	-0.003	1.000	1099443		3.02(1.25-3.76)	103	32066	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.477	4.481	-0.004	1.000	955034	2.52		101	21459	
713.00 > 219.00	4.466	4.481	-0.015	0.997	613182		1.56(0.71-2.13)	101	22090	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.477	4.481	-0.004	1.713	3739126	2.44		97.6	26883	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.889	4.892	-0.003	1.871	6119574	2.42		96.6	16581	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.889	4.894	-0.005	1.000	5531905	2.63		105	3508	
813.00 > 169.00	4.889	4.894	-0.005	1.000	998654		5.54(2.86-8.58)	105	10954	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.242	5.242	0.0	1.000	6251649	2.67		107	1222	
913.00 > 169.00	5.235	5.242	-0.007	0.999	786206		7.95(0.00-0.00)	107	3181	

Reagents:

LCPFC_LL5_00002 Amount Added: 1.00 Units: mL

Report Date: 04-Dec-2017 19:07:29 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_006.d

Injection Date: 04-Dec-2017 16:20:25 Instrument ID: A8_N

Lims ID: IC L5 Full

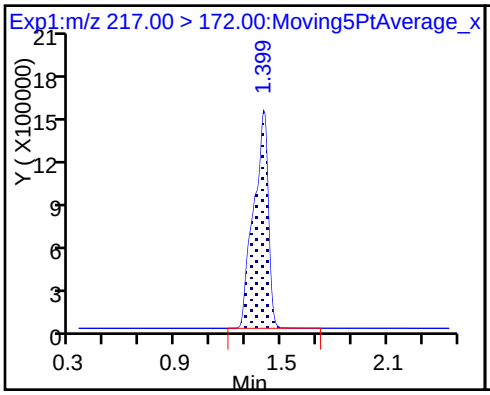
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 6

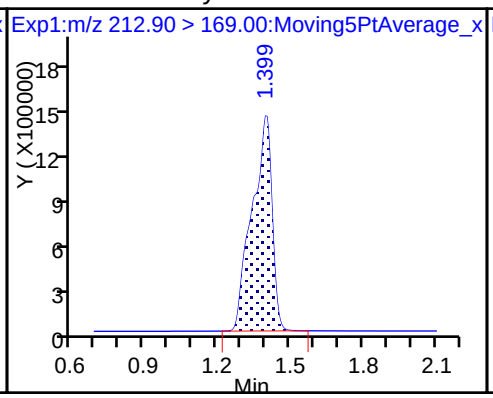
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

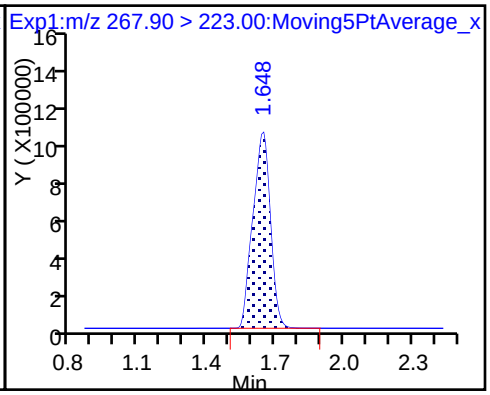
D 1 13C4 PFBA



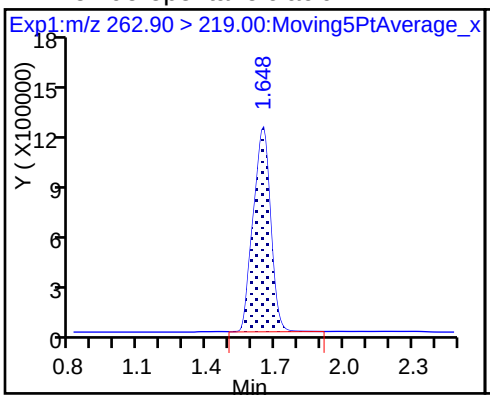
2 Perfluorobutyric acid



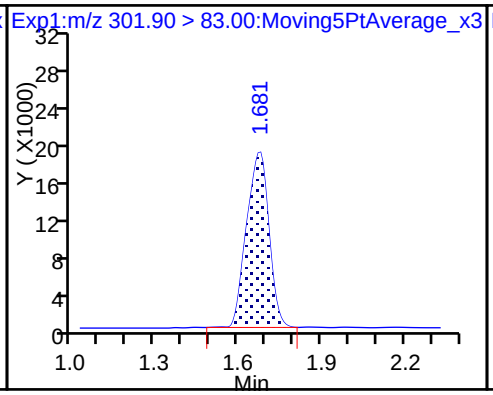
D 3 13C5-PFPeA



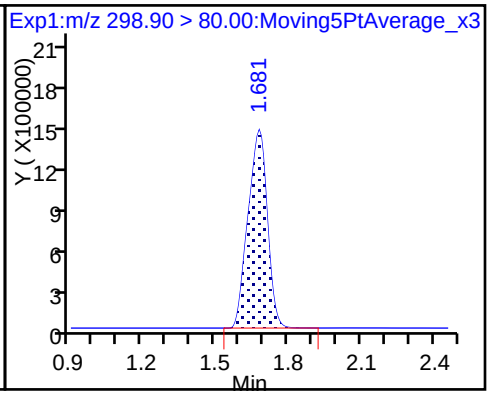
4 Perfluoropentanoic acid



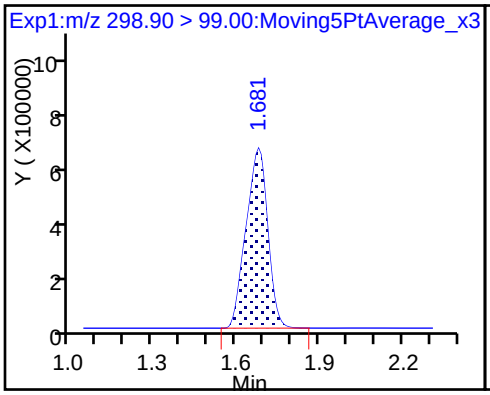
D 47 13C3-PFBS



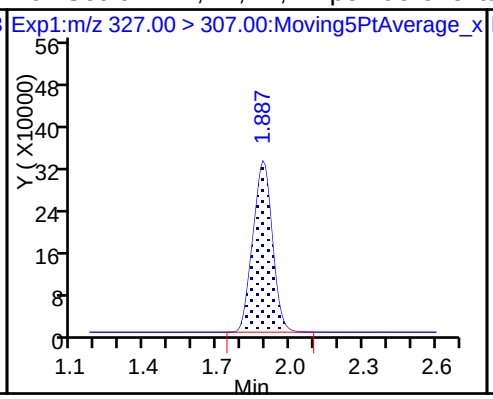
5 Perfluorobutanesulfonic acid



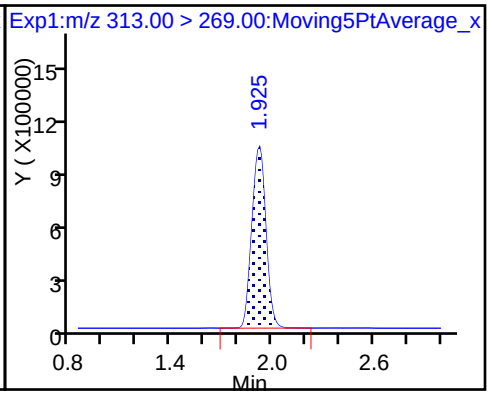
5 Perfluorobutanesulfonic acid



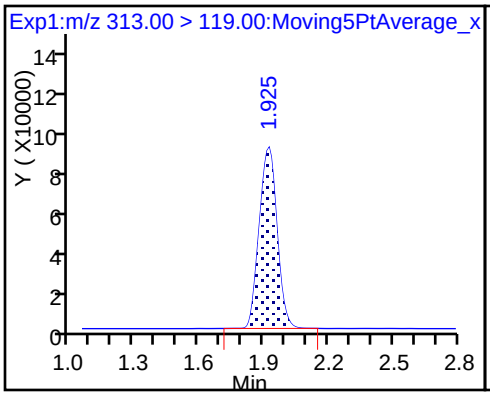
61 Sodium 1H,1H,2H,2H-perfluorohexane



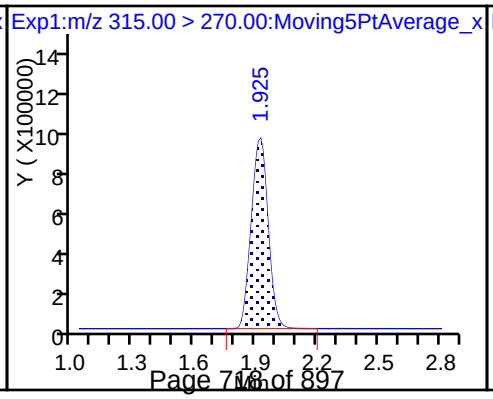
6 Perfluorohexanoic acid



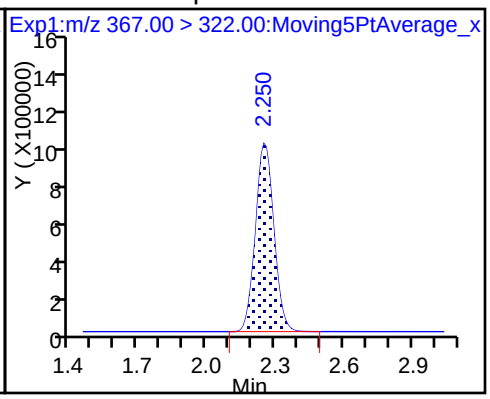
6 Perfluorohexanoic acid



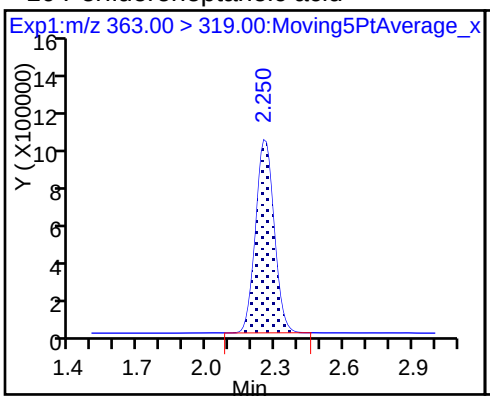
D 7 13C2 PFHxA



D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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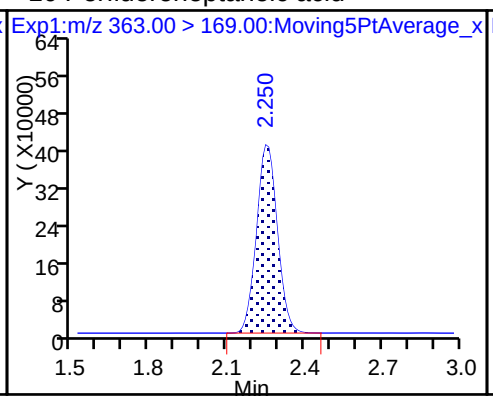
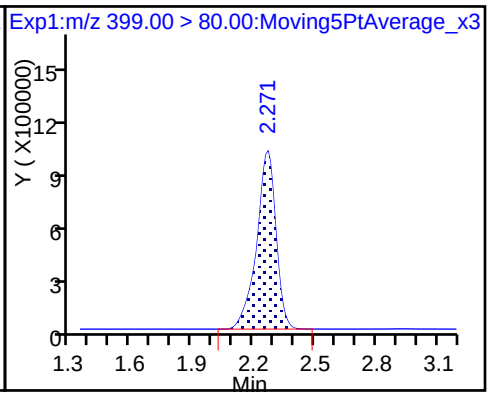
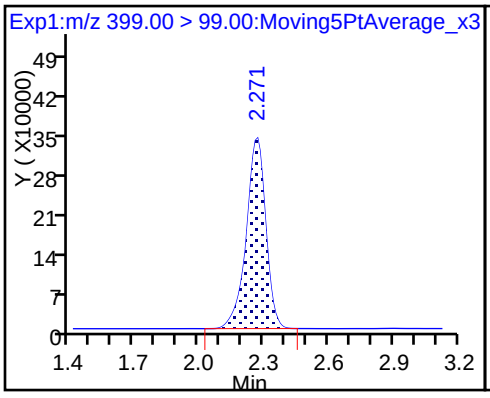


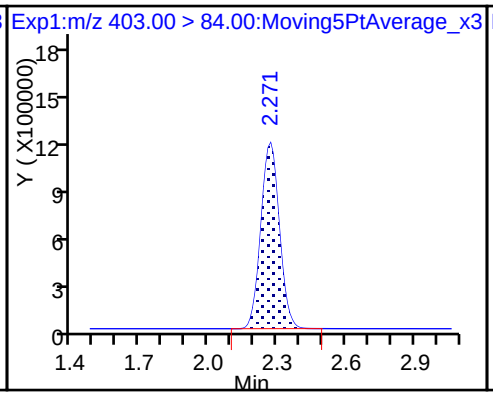
8 Perfluorohexanesulfonic acid



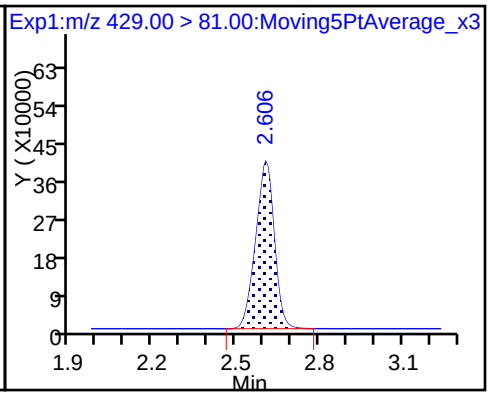
8 Perfluorohexanesulfonic acid



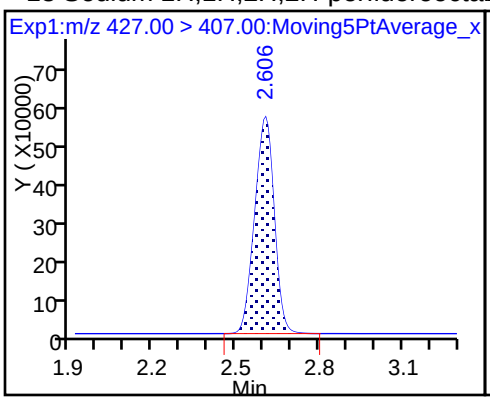
D 11 18O2 PFHxS



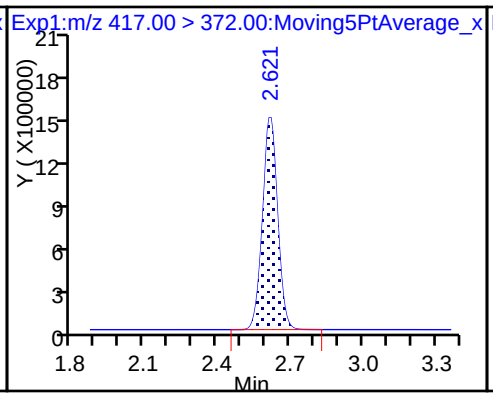
D 12 M2-6:2FTS



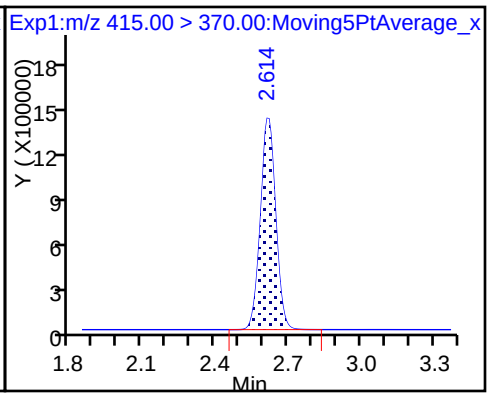
13 Sodium 1H,1H,2H,2H-perfluorooctane



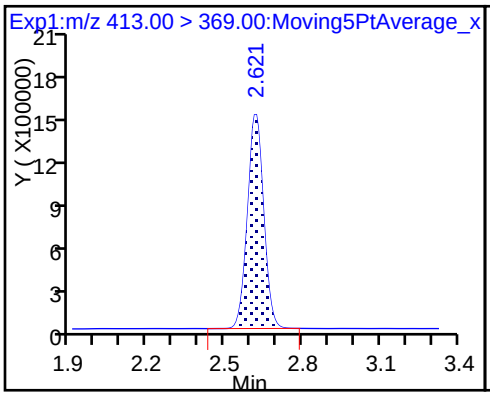
D 14 13C4 PFOA



* 62 13C2-PFOA



15 Perfluorooctanoic acid



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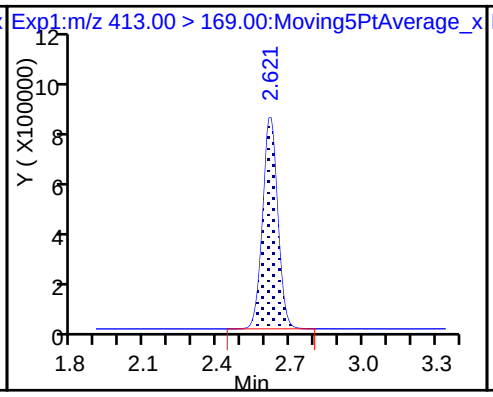
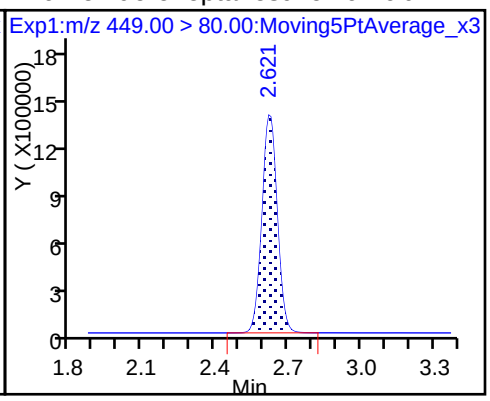
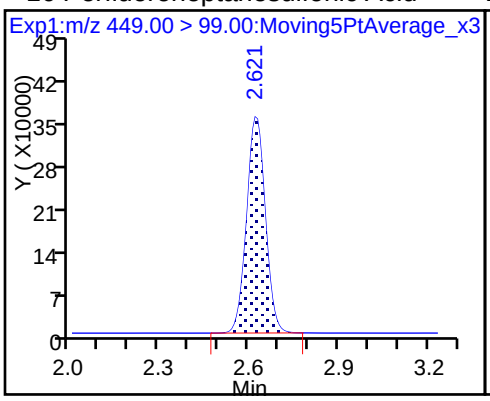


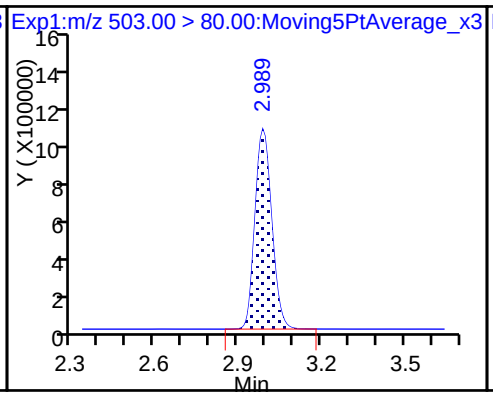
16 Perfluoroheptanesulfonic Acid



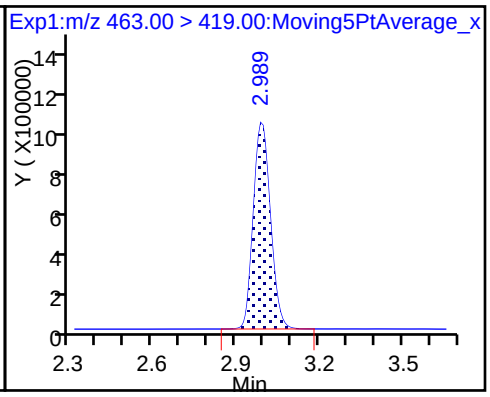
16 Perfluoroheptanesulfonic Acid



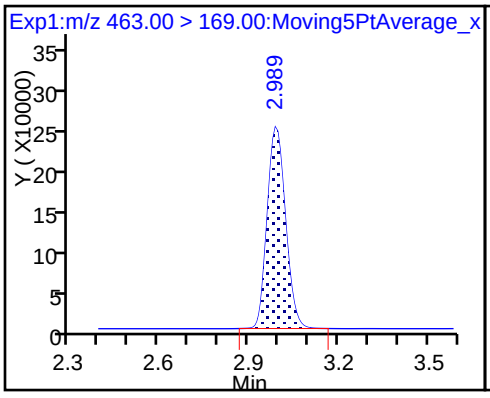
D 18 13C4 PFOS



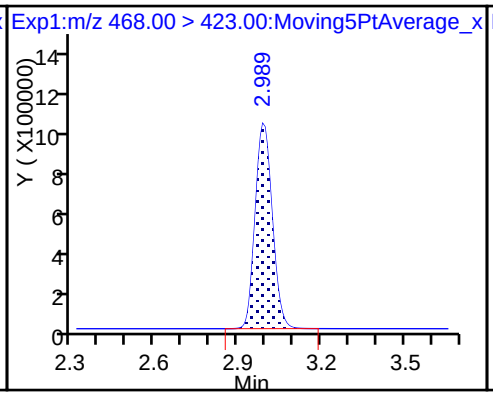
20 Perfluorononanoic acid



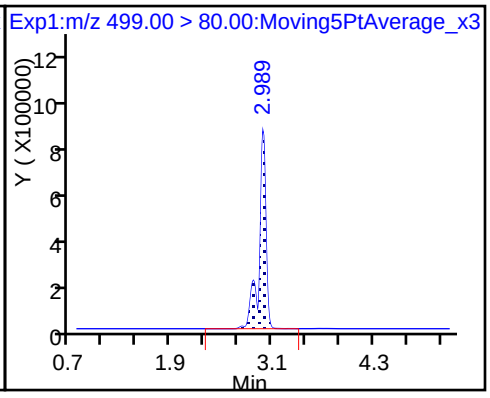
20 Perfluorononanoic acid



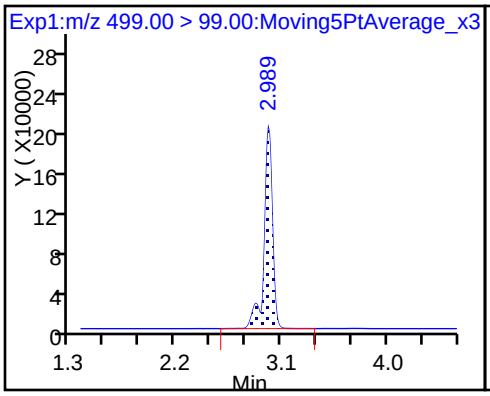
D 19 13C5 PFNA



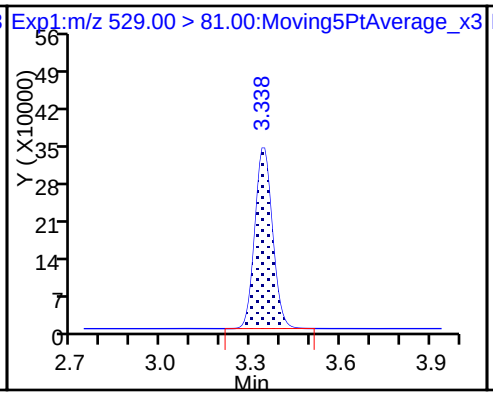
17 Perfluorooctane sulfonic acid



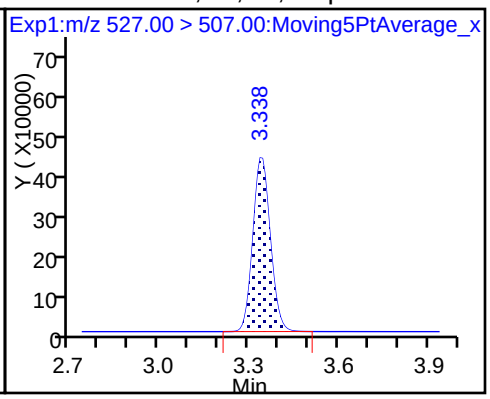
17 Perfluorooctane sulfonic acid



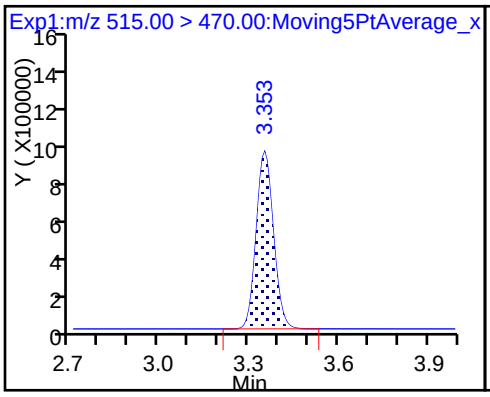
D 26 M2-8:2FTS



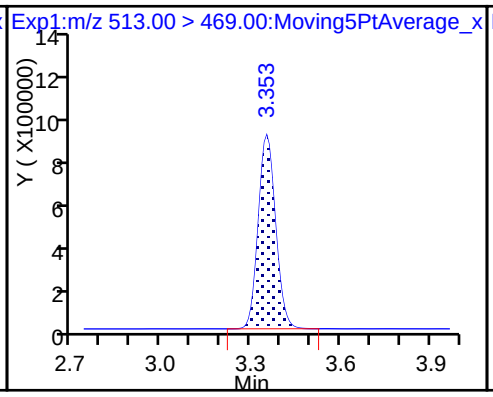
25 Sodium 1H,1H,2H,2H-perfluorodecane



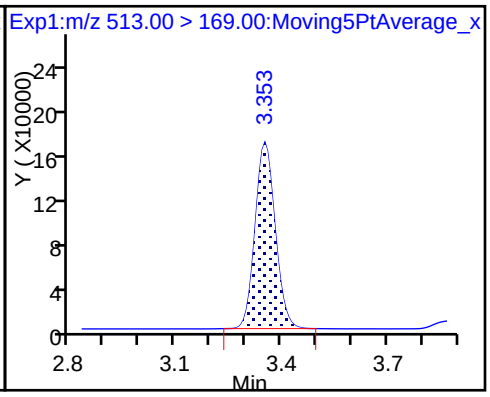
D 23 13C2 PFDA



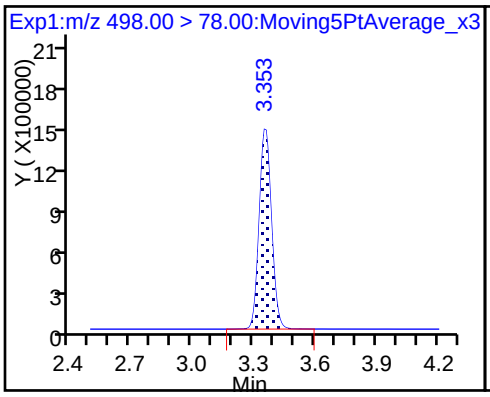
24 Perfluorodecanoic acid



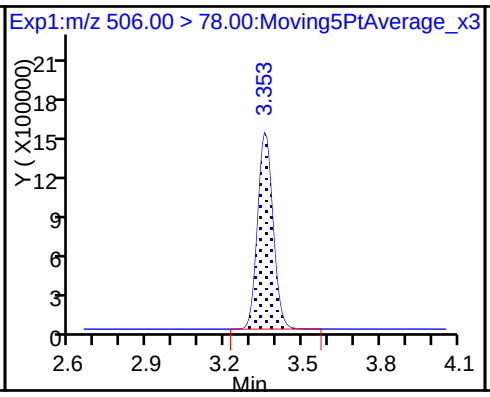
24 Perfluorodecanoic acid



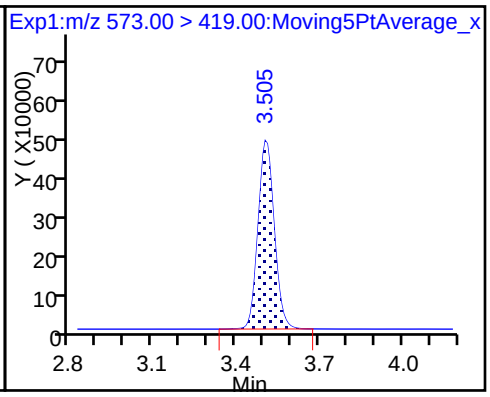
22 Perfluorooctane Sulfonamide



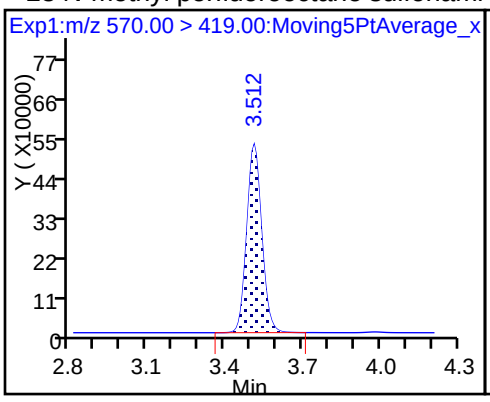
D 21 13C8 FOSA



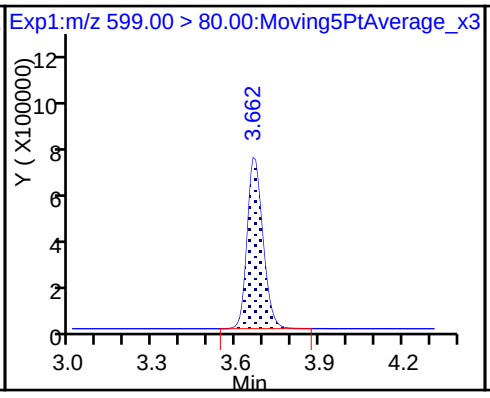
D 27 d3-NMeFOSAA



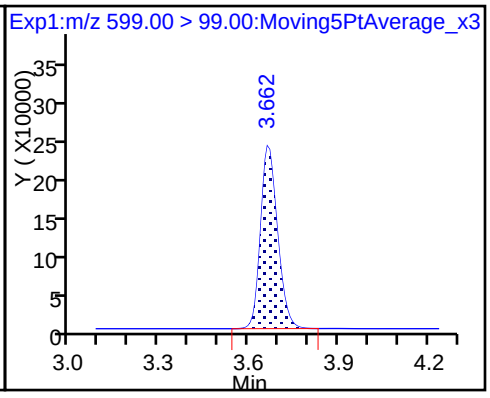
28 N-methyl perfluorooctane sulfonami



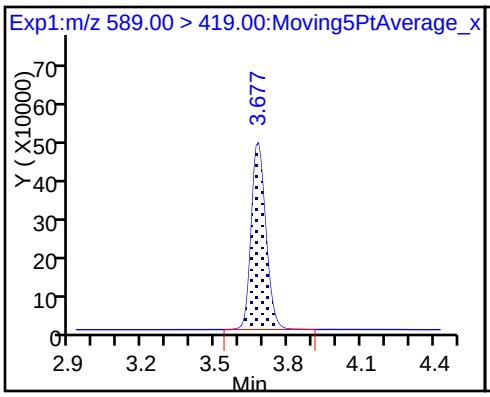
29 Perfluorodecane Sulfonic acid



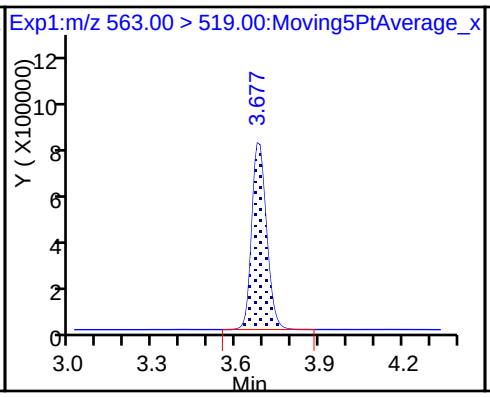
29 Perfluorodecane Sulfonic acid



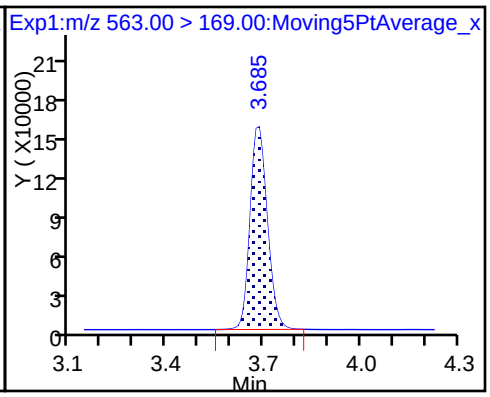
D 32 d5-NEtFOSAA



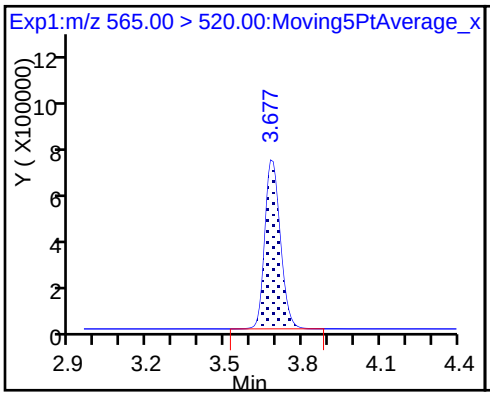
31 Perfluoroundecanoic acid



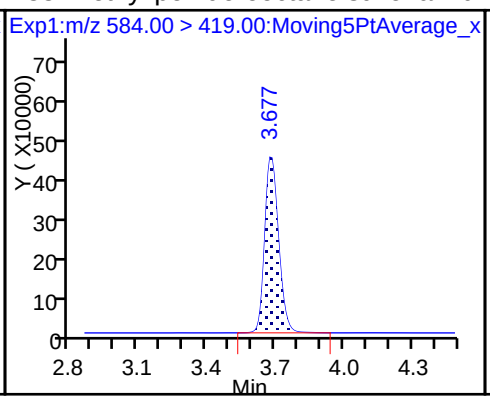
31 Perfluoroundecanoic acid



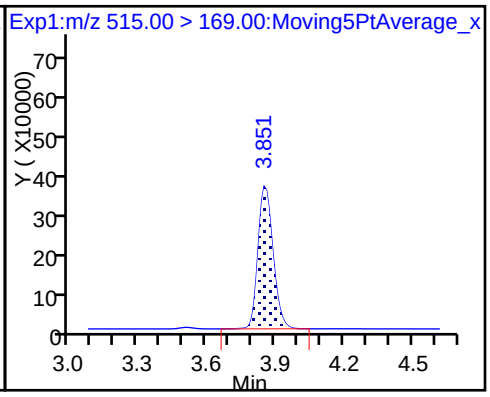
D 30 13C2 PFUnA



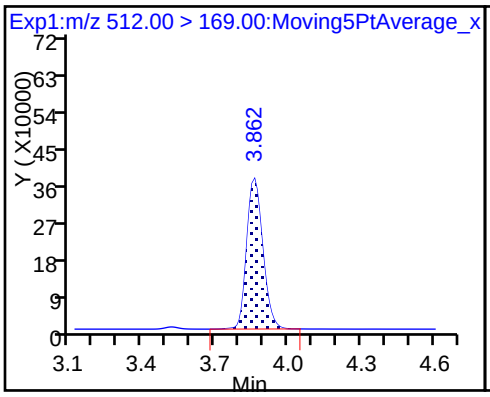
33 N-ethyl perfluorooctane sulfonamid



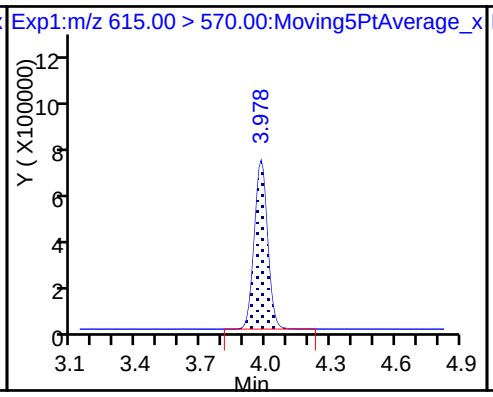
D 34 d-N-MeFOSA-M



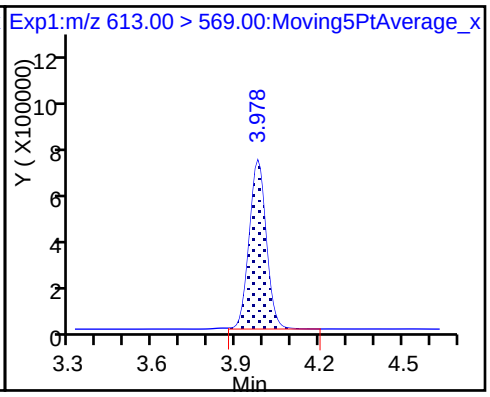
35 MeFOSA



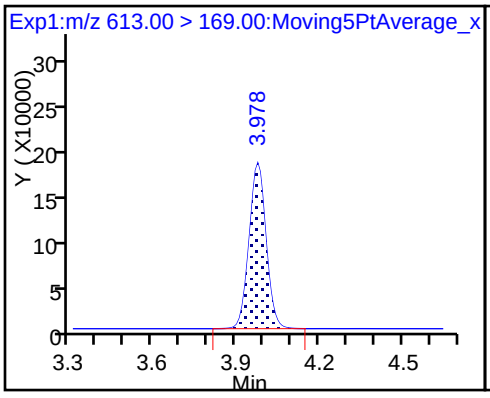
D 36 13C2 PFDoA



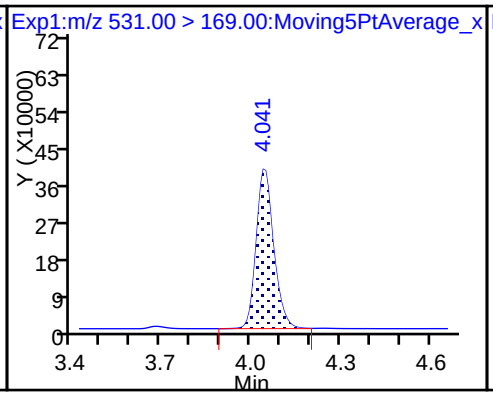
37 Perfluorododecanoic acid



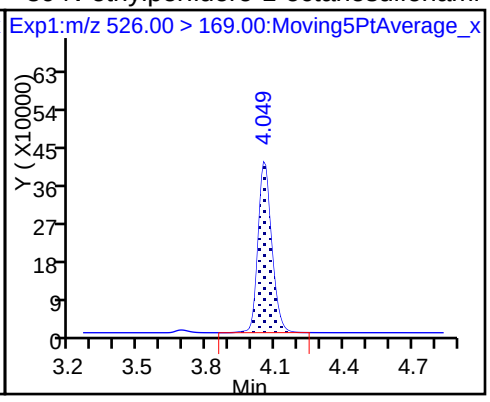
37 Perfluorododecanoic acid



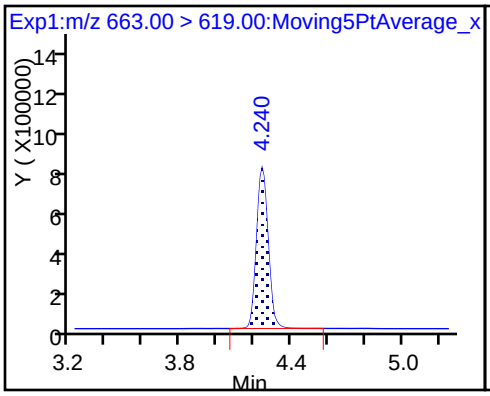
D 38 d-N-EtFOSA-M



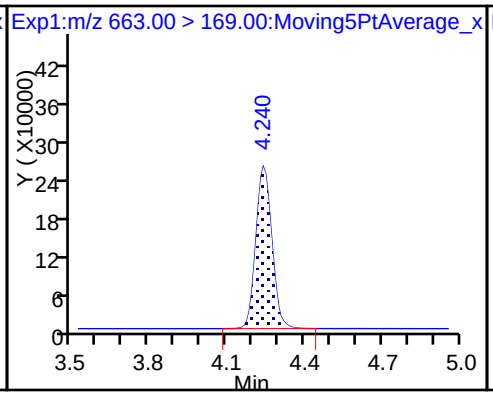
39 N-ethylperfluoro-1-octanesulfonami



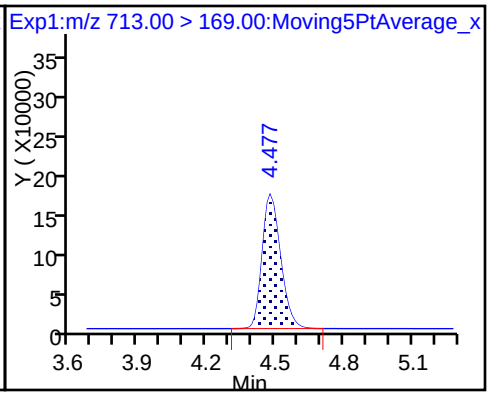
41 Perfluorotridecanoic acid



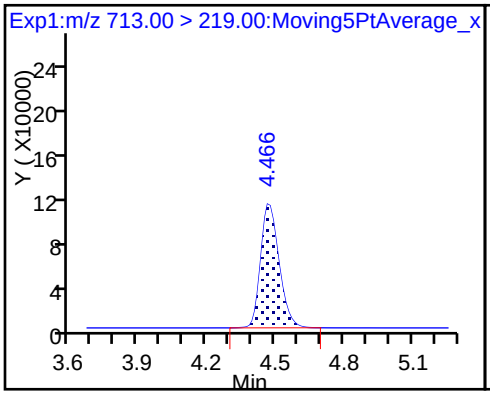
41 Perfluorotridecanoic acid



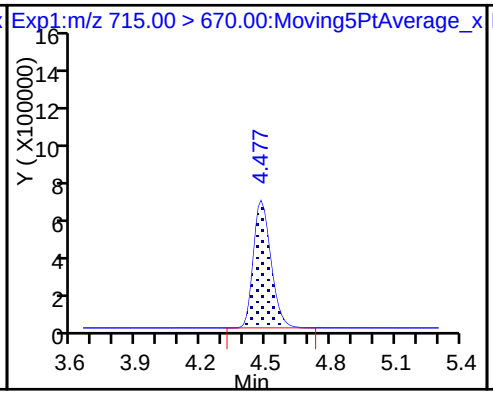
42 Perfluorotetradecanoic acid



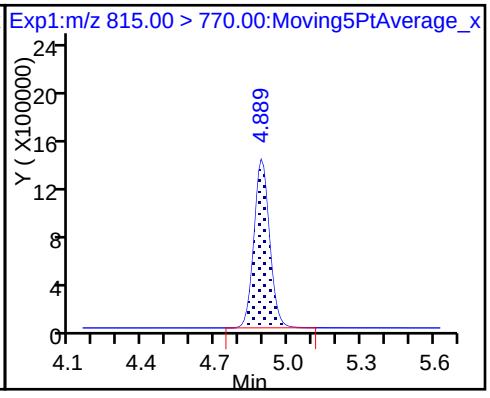
42 Perfluorotetradecanoic acid



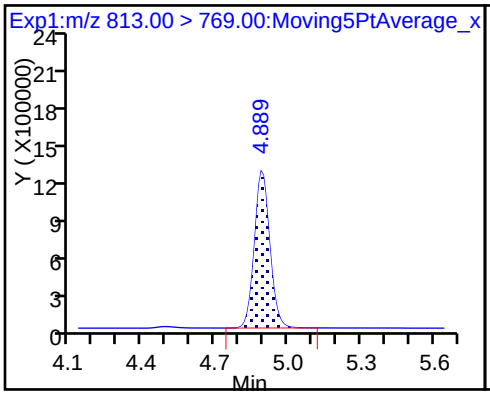
D 43 13C2-PFTeDA



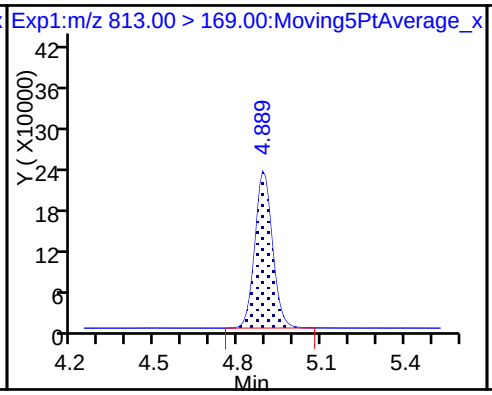
D 44 13C2-PFHxDA



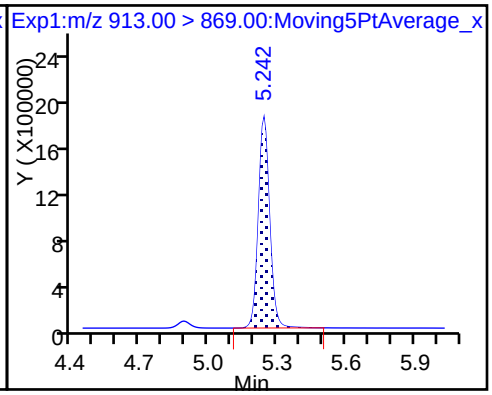
45 Perfluorohexadecanoic acid



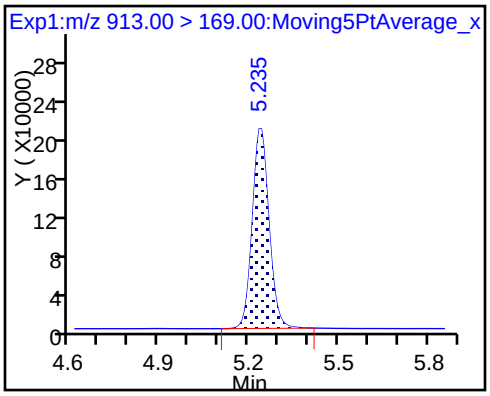
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_007.d
Lims ID: IC L6 Full
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 04-Dec-2017 16:28:15 ALS Bottle#: 15 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\20171204-51297.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 04-Dec-2017 19:07:32 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: phomsophat Date: 04-Dec-2017 16:50:09

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	1.404	1.401	0.003	0.536	8633918	2.52		101	59966	
2 Perfluorobutyric acid										
212.90 > 169.00	1.404	1.402	0.002	1.000	16017345	5.11		102	5109	
D 3 13C5-PFPeA										
267.90 > 223.00	1.647	1.646	0.001	0.629	5400463	2.53		101	54977	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.647	1.648	-0.001	1.000	12434175	4.95		98.9	7953	
D 47 13C3-PFBS										
301.90 > 83.00	1.679	1.681	-0.002	0.641	103297	2.33		100	2742	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.679	1.682	-0.003	1.000	15445497	4.57		103	57389	
298.90 > 99.00	1.679	1.682	-0.003	1.000	6639859		2.33(1.25-3.74)	103	43393	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.886	1.887	-0.001	1.000	3659841	4.65		99.6	83809	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.923	1.923	0.0	1.000	11087289	4.98		99.5	26317	
313.00 > 119.00	1.923	1.923	0.0	1.000	1008394		10.99(5.03-15.10)	99.5	19619	
D 7 13C2 PFHxA										
315.00 > 270.00	1.923	1.924	-0.001	0.734	5457006	2.49		99.4	43056	
D 9 13C4-PFHpA										
367.00 > 322.00	2.258	2.254	0.004	0.862	5346111	2.50		100	41809	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.258	2.255	0.003	1.000	11345726	5.11		102	16599	
363.00 > 169.00	2.258	2.255	0.003	1.000	4416381		2.57(1.13-3.40)	102	33234	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.269	2.269	0.0	1.000	12453435	4.42		97.0	20293	
399.00 > 99.00	2.269	2.269	0.0	1.000	4140842		3.01(1.50-4.49)	97.0	14737	

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	2.269	2.271	-0.002	0.866	6272276	2.35		99.3	51081	
D 12 M2-6:2FTS										
429.00 > 81.00	2.604	2.605	-0.001	0.994	1718247	2.40		101	32926	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.604	2.605	-0.001	1.000	5410631	4.44		93.6	85875	
D 14 13C4 PFOA										
417.00 > 372.00	2.619	2.618	0.001	1.000	5801176	2.46		98.2	58507	
* 62 13C2-PFOA										
415.00 > 370.00	2.619	2.619	0.0		5750605	2.50			63731	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.619	2.621	-0.002	1.000	12462909	5.04		101	6461	
413.00 > 169.00	2.619	2.621	-0.002	1.000	6623986		1.88(0.84-2.52)	101	35604	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.626	2.626	0.0	1.000	11352397	5.01		105	78880	
449.00 > 99.00	2.626	2.626	0.0	1.000	3012329		3.77(1.94-5.82)	105	36731	
D 18 13C4 PFOS										
503.00 > 80.00	2.993	2.993	0.0	1.143	4159568	2.39		100	33016	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.993	2.994	-0.001	1.000	8412511	4.66		101	499950	
499.00 > 99.00	2.993	2.994	-0.001	1.000	1859922		4.52(2.31-6.93)	101	34860	
D 19 13C5 PFNA										
468.00 > 423.00	2.993	2.994	-0.001	1.143	4303391	2.52		101	42675	
20 Perfluorononanoic acid										
463.00 > 419.00	2.993	2.994	-0.001	1.000	8727865	5.20		104	24800	
463.00 > 169.00	2.993	2.994	-0.001	1.000	2128666		4.10(1.90-5.69)	104	38407	
D 26 M2-8:2FTS										
529.00 > 81.00	3.342	3.343	-0.001	1.276	1329091	2.36		98.5	22033	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.342	3.344	-0.002	1.000	3335732	4.87		102	45976	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.357	3.356	0.001	1.000	7250393	5.03		101	33042	
513.00 > 169.00	3.357	3.356	0.001	1.000	1299035		5.58(2.36-7.09)	101	2364	
D 23 13C2 PFDA										
515.00 > 470.00	3.357	3.356	0.001	1.282	3675640	2.54		102	30770	
D 21 13C8 FOSA										
506.00 > 78.00	3.357	3.359	-0.002	1.282	5986273	2.56		102	44396	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.357	3.359	-0.002	1.000	11108013	4.95		99.0	33771	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.510	3.511	-0.001	1.341	1901694	2.46		98.5	23475	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.518	3.515	0.003	1.002	4064917	5.10		102	16809	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.665	3.667	-0.002	1.000	5247839	4.77		98.9	57779	
599.00 > 99.00	3.665	3.667	-0.002	1.000	1706684		3.07(1.39-4.16)	98.9	35931	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.673	3.677	-0.004	1.403	1842284	2.46		98.2	8367	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.682	3.685	-0.003	1.002	3634581	5.24		105	26086	
D 30 13C2 PFUnA										
565.00 > 520.00	3.682	3.685	-0.003	1.406	2682738	2.41		96.3	30865	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.682	3.685	-0.003	1.000	5303373	5.03		101	20303	
563.00 > 169.00	3.682	3.685	-0.003	1.000	1103569		4.81(0.00-0.00)	101	37538	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.856	3.856	0.0	1.473	1711960	2.53		101	4286	
35 MeFOSA										
512.00 > 169.00	3.867	3.865	0.002	1.003	3433227	5.25		105	3765	
D 36 13C2 PFDoA										
615.00 > 570.00	3.983	3.979	0.004	1.521	3057546	2.46		98.6	29190	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.983	3.982	0.001	1.000	6290779	5.21		104	26642	
613.00 > 169.00	3.983	3.982	0.001	1.000	1469544		4.28(2.13-6.40)	104	49641	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.046	4.048	-0.002	1.545	1568109	2.49		99.6	3332	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.053	4.056	-0.003	1.002	3354313	5.09		102	3536	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.244	4.243	0.001	1.000	6632282	5.19		104	16363	
663.00 > 169.00	4.244	4.243	0.001	1.000	2081785		3.19(1.25-3.76)	104	60122	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.487	4.481	0.006	1.714	3469556	2.40		96.0	20981	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.487	4.481	0.006	1.000	1743731	4.95		99.0	33969	
713.00 > 219.00	4.473	4.481	-0.008	0.997	1210933		1.44(0.71-2.13)	99.0	21513	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.896	4.892	0.004	1.870	6093216	2.55		102	23196	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.896	4.894	0.002	1.000	10283347	4.94		98.8	5270	
813.00 > 169.00	4.896	4.894	0.002	1.000	1955883		5.26(2.86-8.58)	98.8	14858	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.240	5.242	-0.002	1.000	11410437	4.90		98.0	1912	
913.00 > 169.00	5.240	5.242	-0.002	1.000	1490730		7.65(0.00-0.00)	98.0	4216	

Reagents:

LCPFC_LL6_00002 Amount Added: 1.00 Units: mL

Report Date: 04-Dec-2017 19:07:32 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_007.d

Injection Date: 04-Dec-2017 16:28:15 Instrument ID: A8_N

Lims ID: IC L6 Full

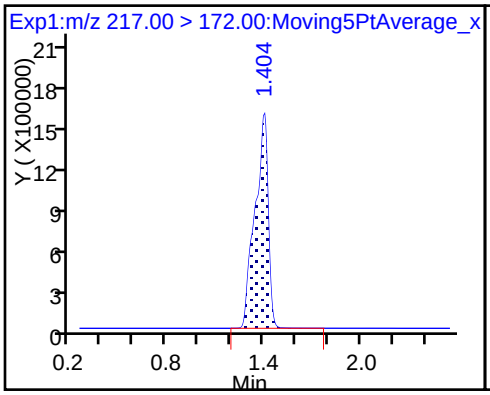
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 15 Worklist Smp#: 7

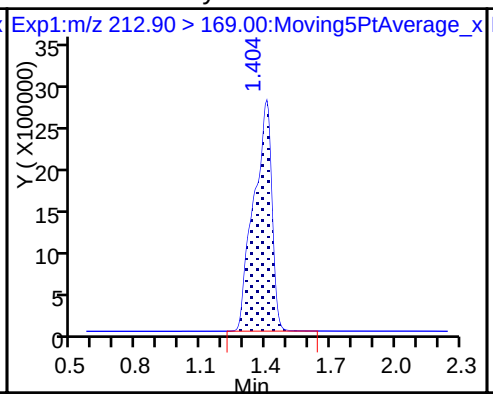
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

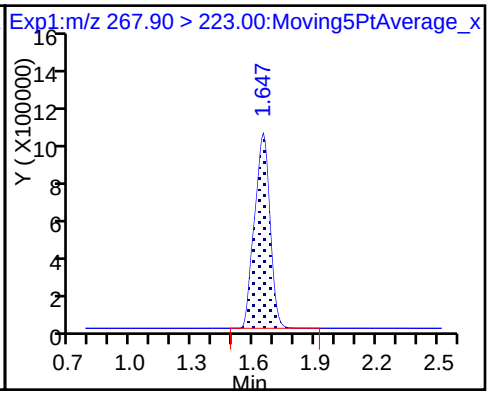
D 1 13C4 PFBA



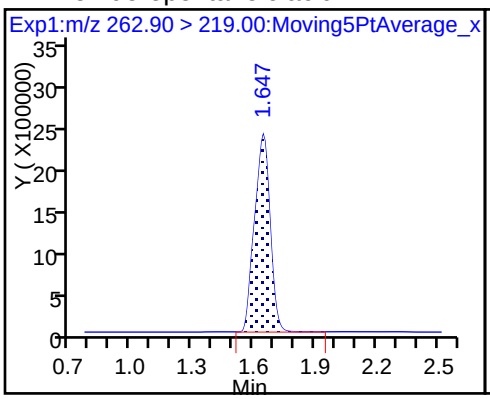
2 Perfluorobutyric acid



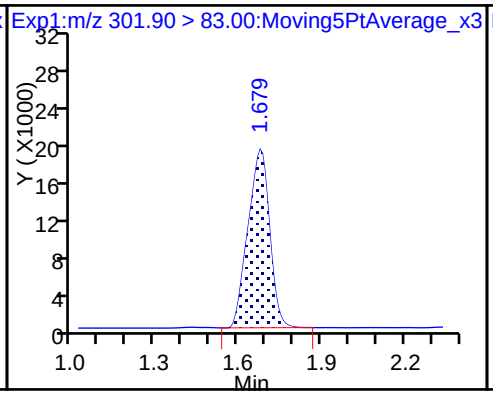
D 3 13C5-PFPeA



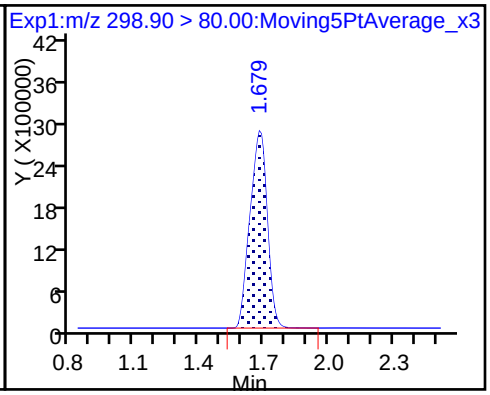
4 Perfluoropentanoic acid



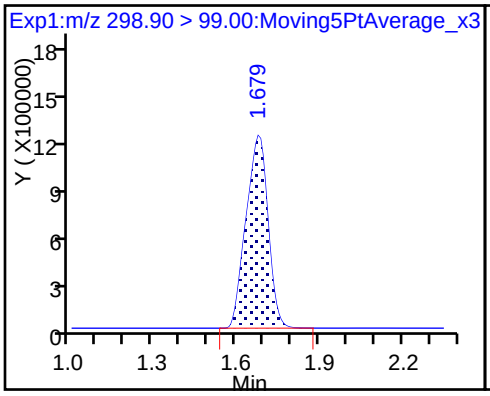
D 47 13C3-PFBS



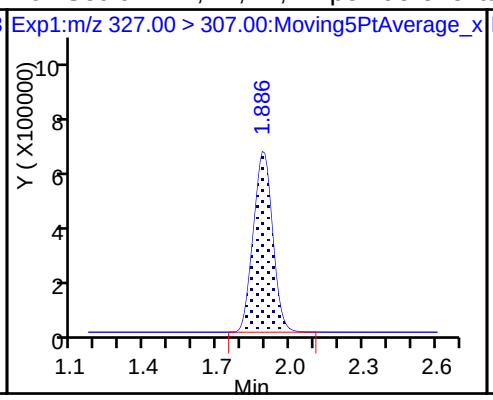
5 Perfluorobutanesulfonic acid



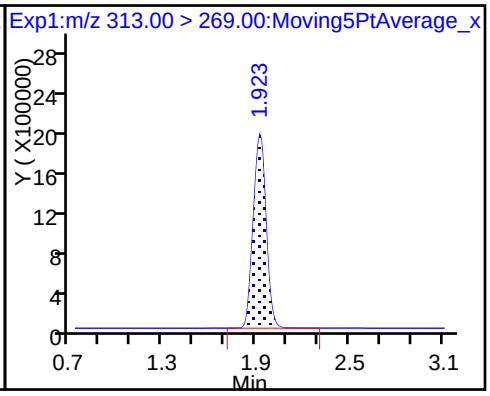
5 Perfluorobutanesulfonic acid



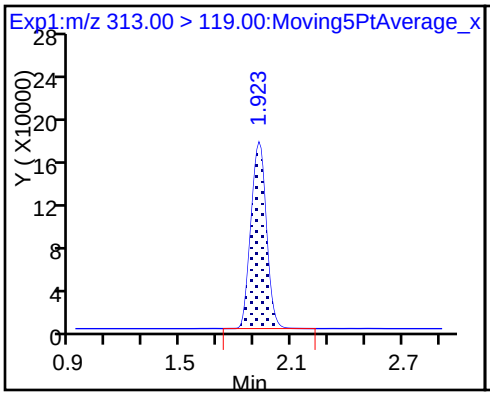
61 Sodium 1H,1H,2H,2H-perfluorohexane



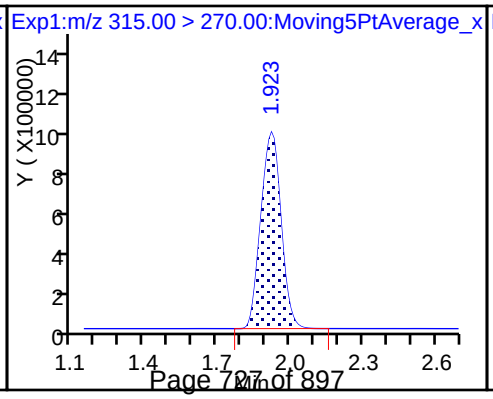
6 Perfluorohexanoic acid



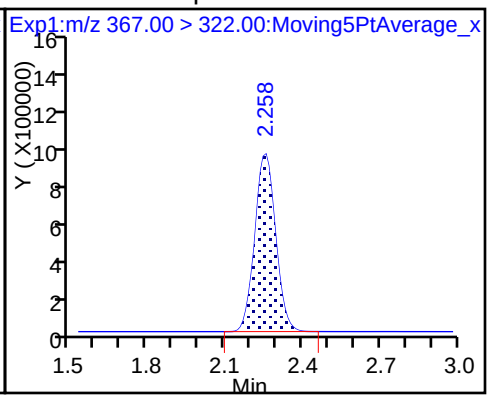
6 Perfluorohexanoic acid



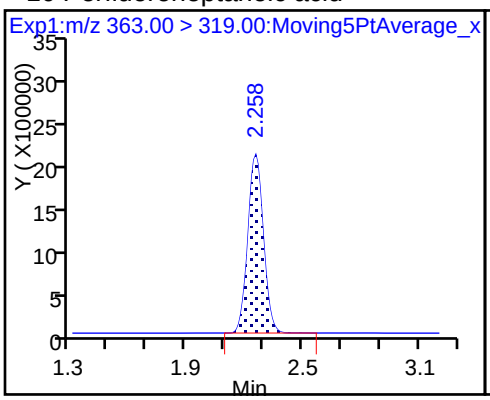
D 7 13C2 PFHxA



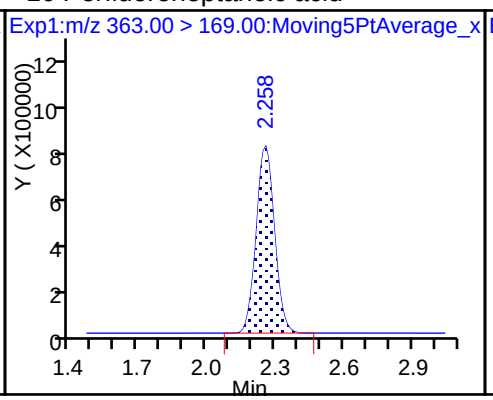
D 9 13C4-PFHpA



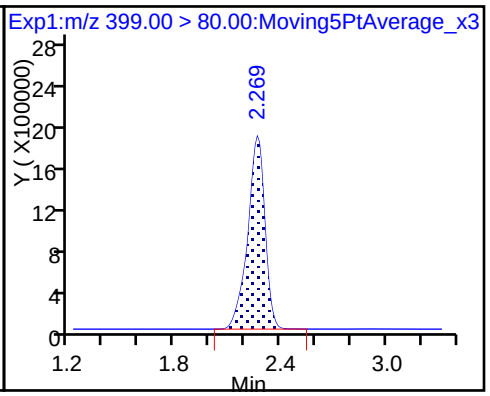
10 Perfluoroheptanoic acid



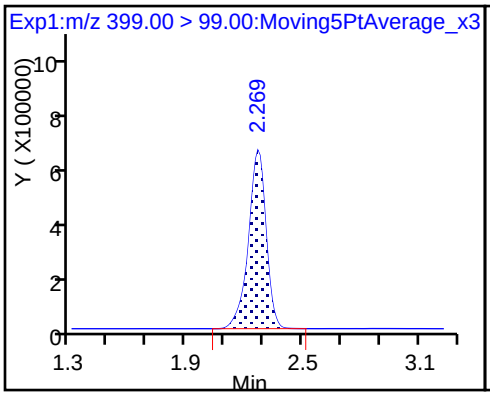
10 Perfluoroheptanoic acid



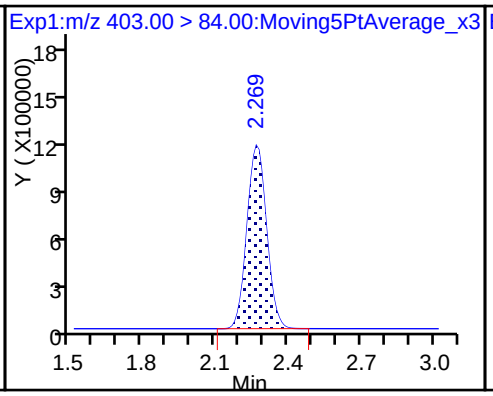
8 Perfluorohexanesulfonic acid



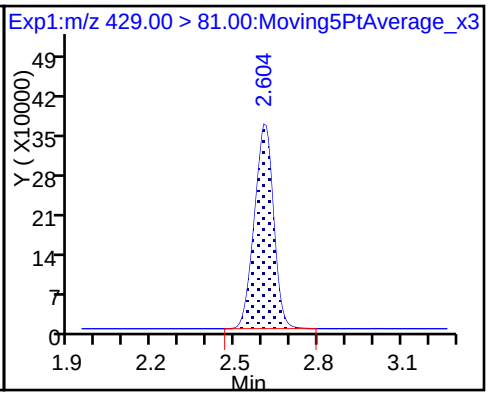
8 Perfluorohexanesulfonic acid



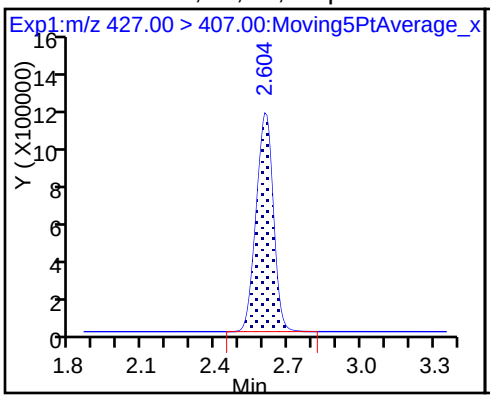
D 11 18O2 PFHxS



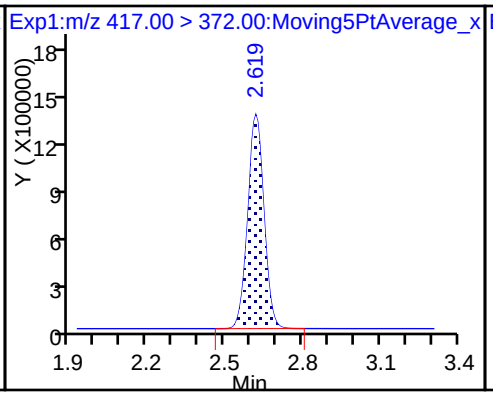
D 12 M2-6:2FTS



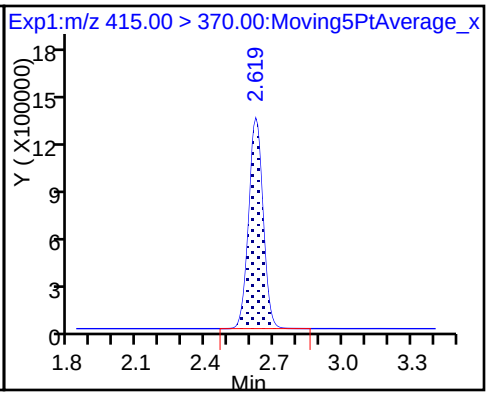
13 Sodium 1H,1H,2H,2H-perfluorooctane



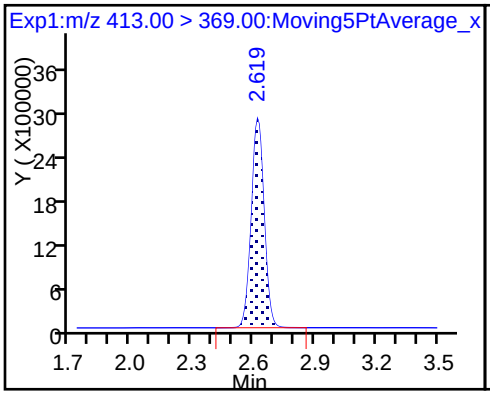
D 14 13C4 PFOA



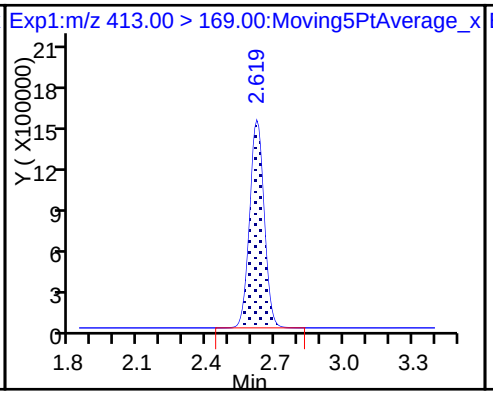
* 62 13C2-PFOA



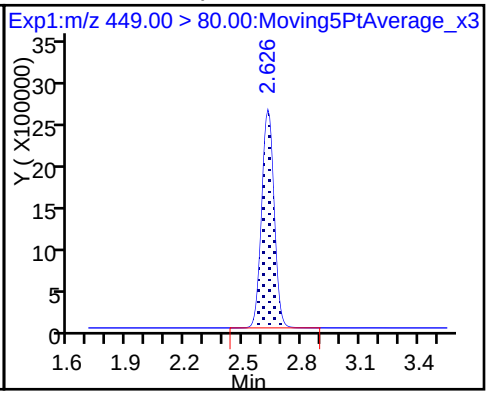
15 Perfluorooctanoic acid



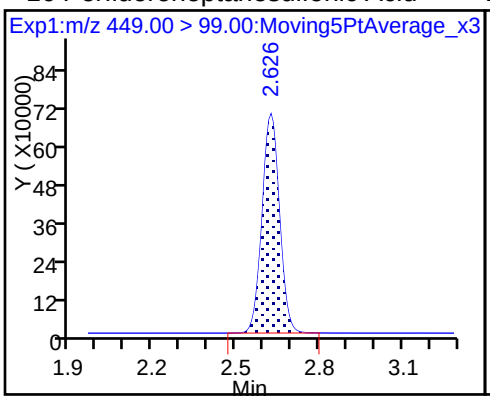
15 Perfluorooctanoic acid



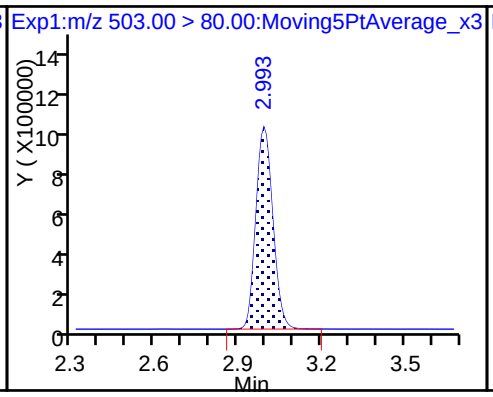
16 Perfluoroheptanesulfonic Acid



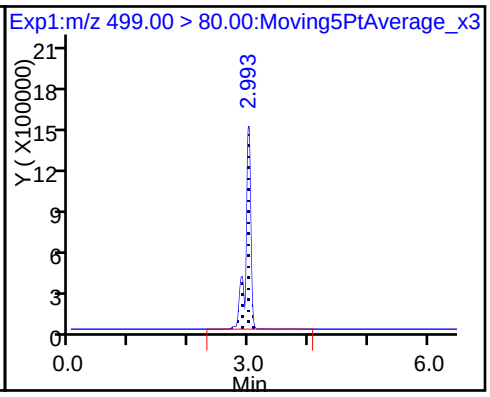
16 Perfluoroheptanesulfonic Acid



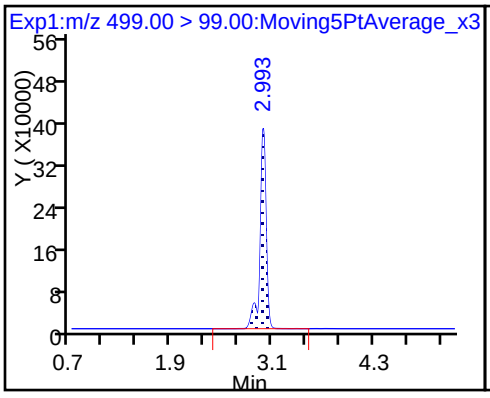
D 18 13C4 PFOS



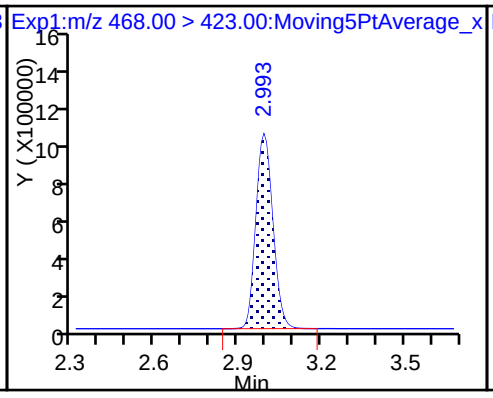
17 Perfluorooctane sulfonic acid



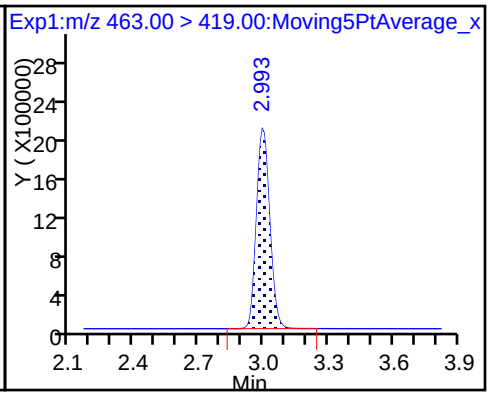
17 Perfluorooctane sulfonic acid



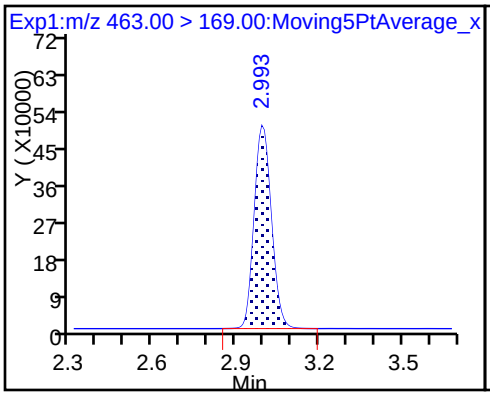
D 19 13C5 PFNA



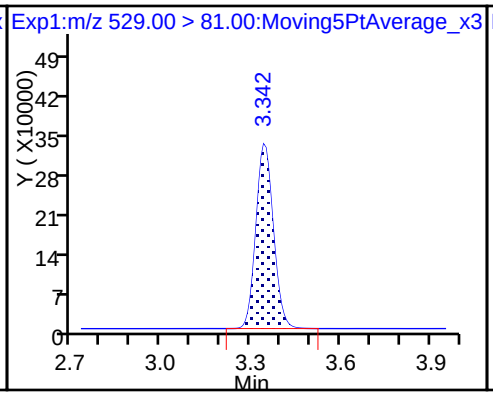
20 Perfluorononanoic acid



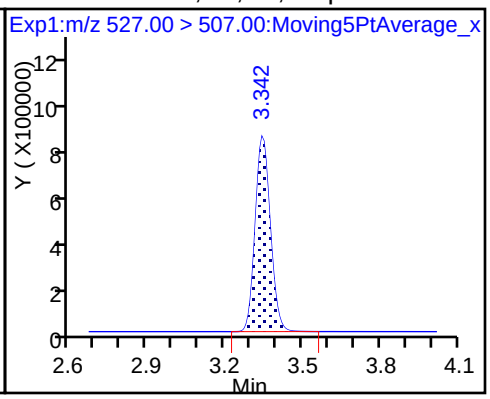
20 Perfluorononanoic acid



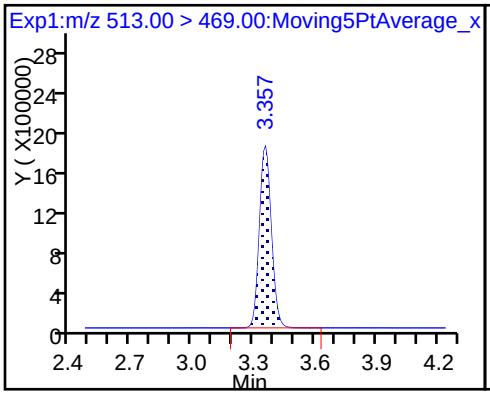
D 26 M2-8:2FTS



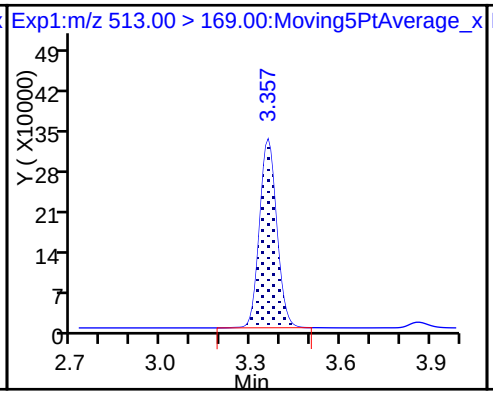
25 Sodium 1H,1H,2H,2H-perfluorodecane



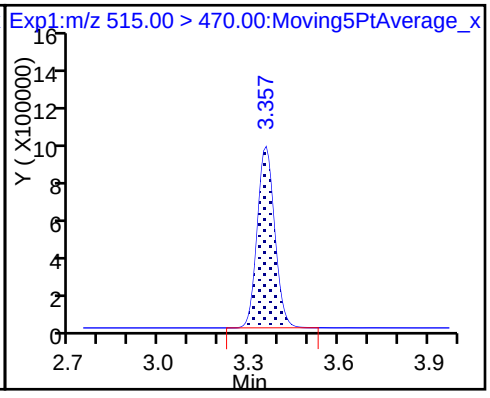
24 Perfluorodecanoic acid



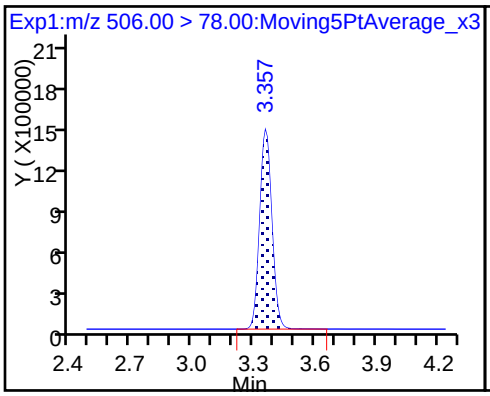
24 Perfluorodecanoic acid



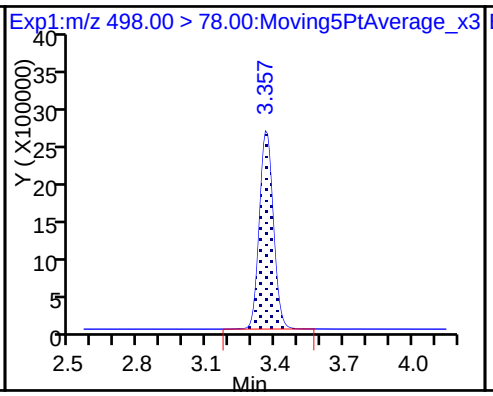
D 23 13C2 PFDA



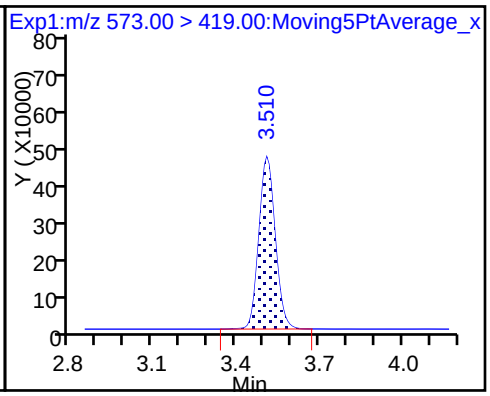
D 21 13C8 FOSA



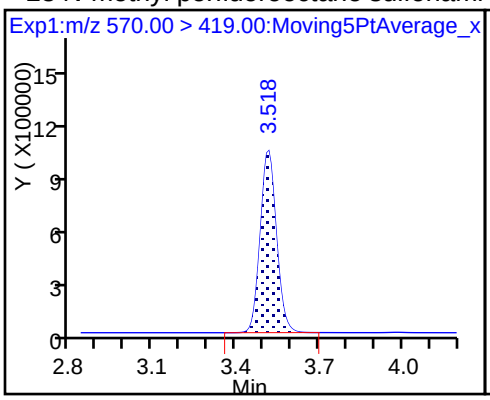
22 Perfluorooctane Sulfonamide



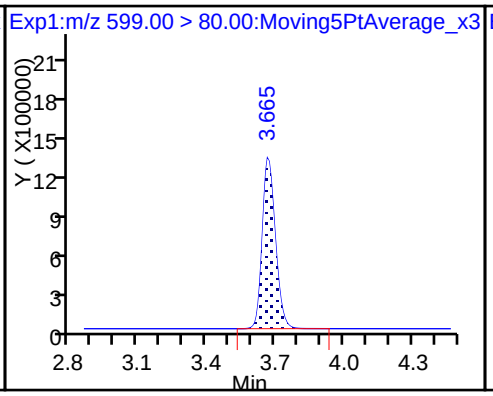
D 27 d3-NMeFOSAA



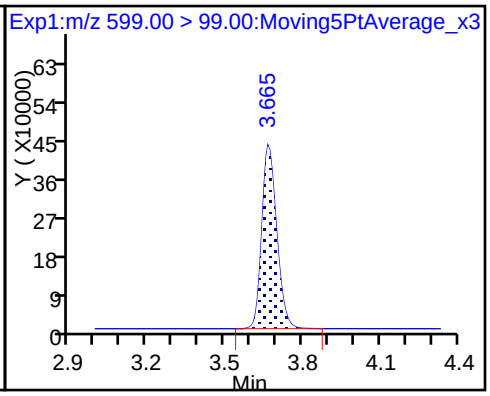
28 N-methyl perfluorooctane sulfonami



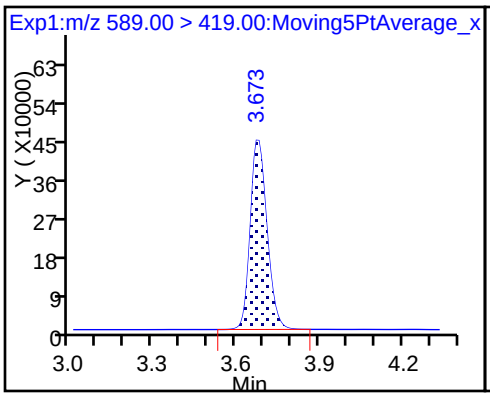
29 Perfluorodecane Sulfonic acid



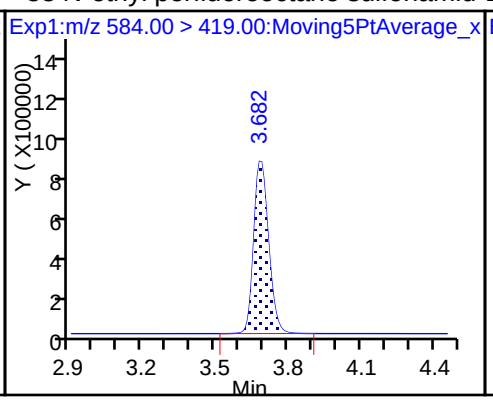
29 Perfluorodecane Sulfonic acid



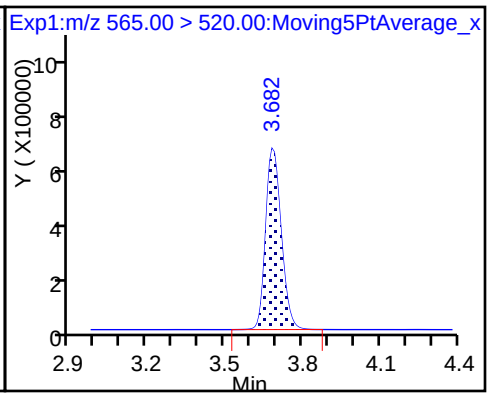
D 32 d5-NEtFOSAA



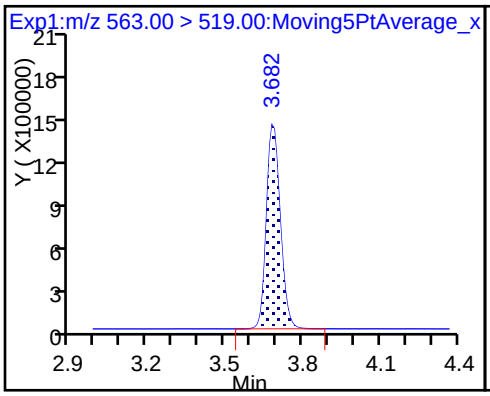
33 N-ethyl perfluorooctane sulfonamid



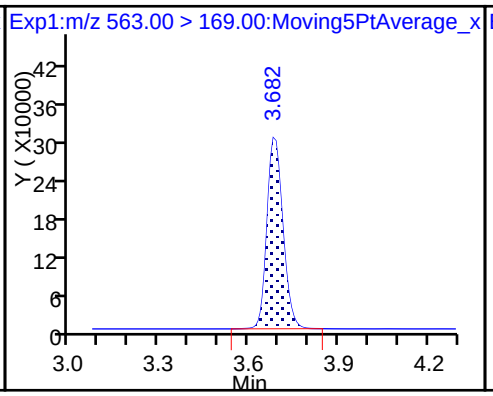
D 30 13C2 PFUnA



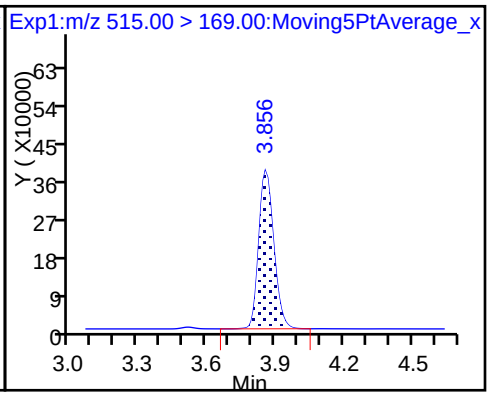
31 Perfluoroundecanoic acid



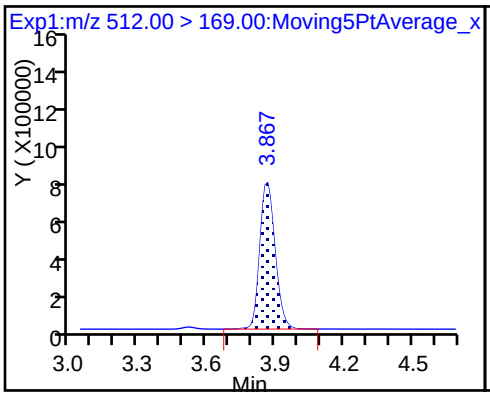
31 Perfluoroundecanoic acid



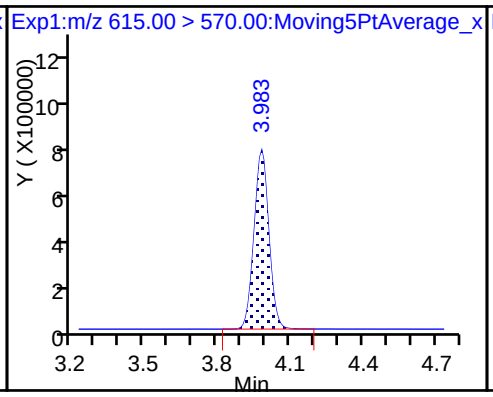
D 34 d-N-MeFOSA-M



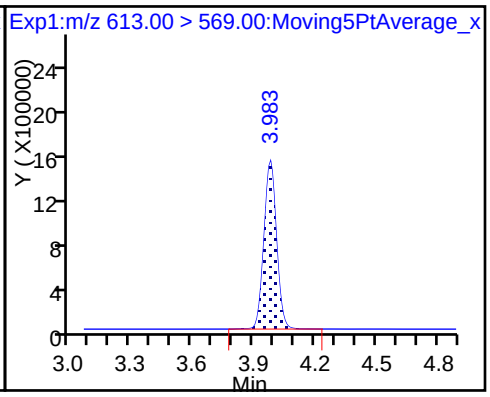
35 MeFOSA



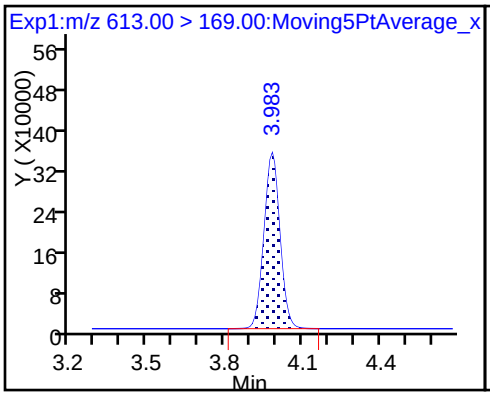
D 36 13C2 PFDoA



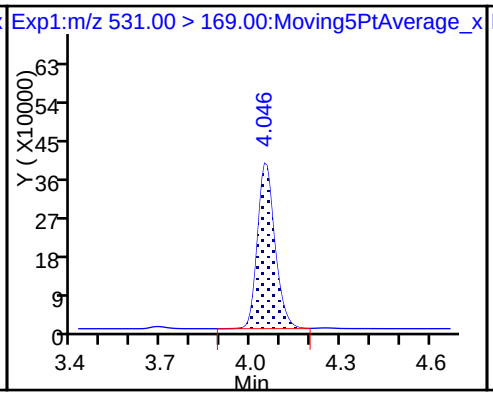
37 Perfluorododecanoic acid



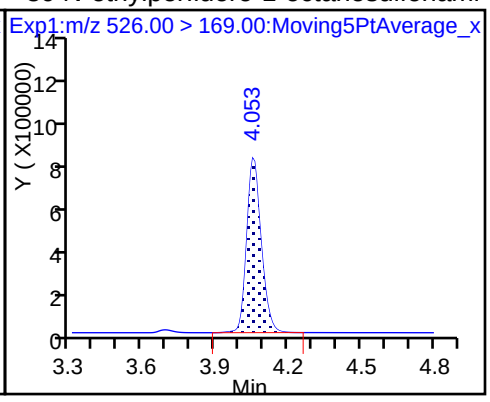
37 Perfluorododecanoic acid



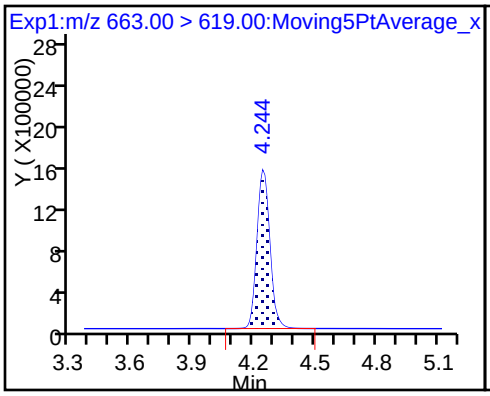
D 38 d-N-EtFOSA-M



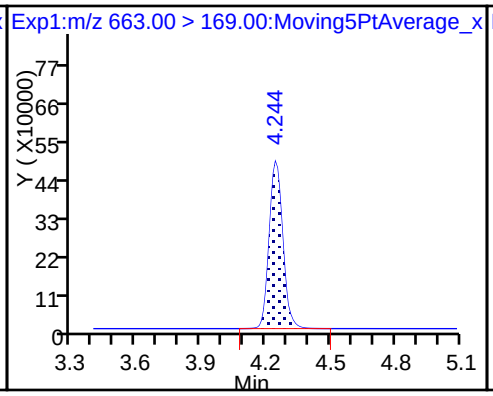
39 N-ethylperfluoro-1-octanesulfonami



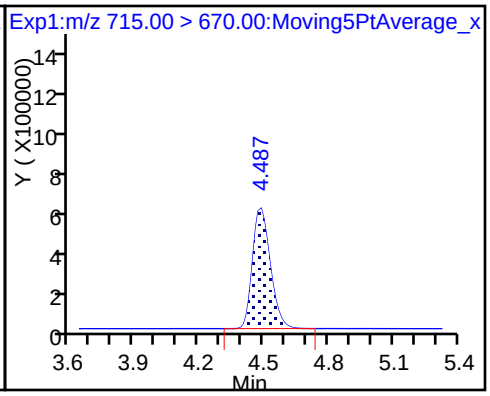
41 Perfluorotridecanoic acid



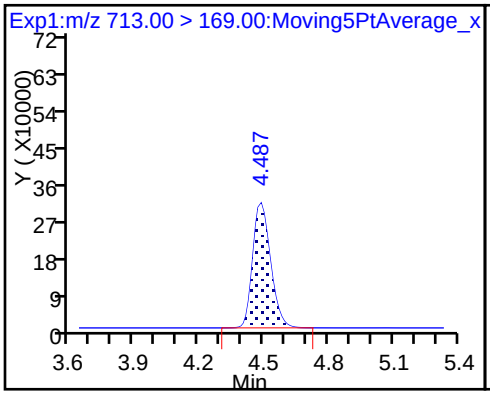
41 Perfluorotridecanoic acid



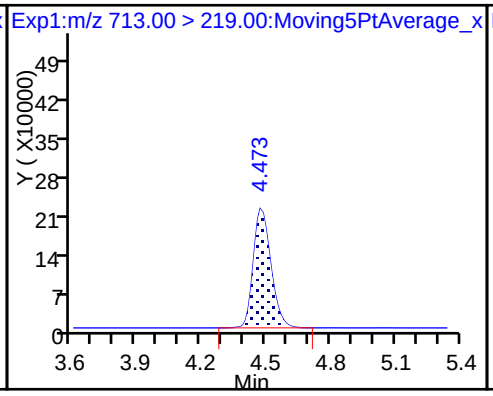
D 43 13C2-PFTeDA



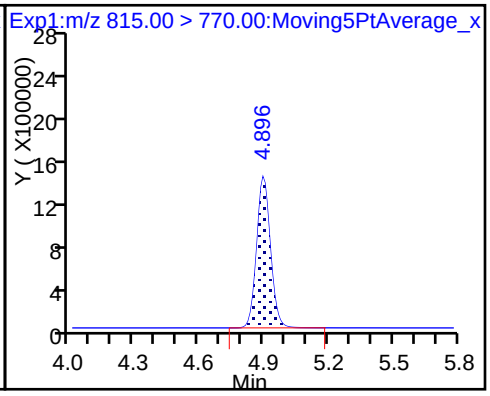
42 Perfluorotetradecanoic acid



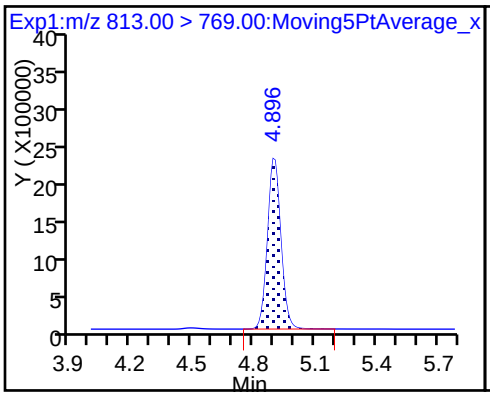
42 Perfluorotetradecanoic acid



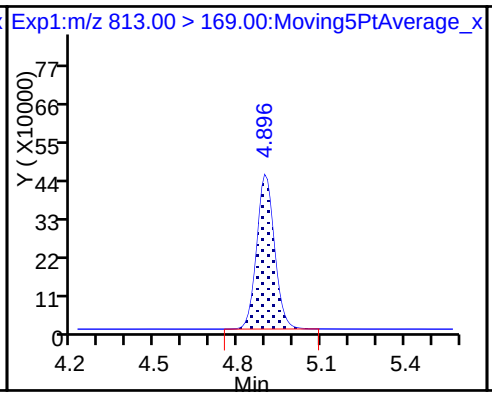
D 44 13C2-PFHxDA



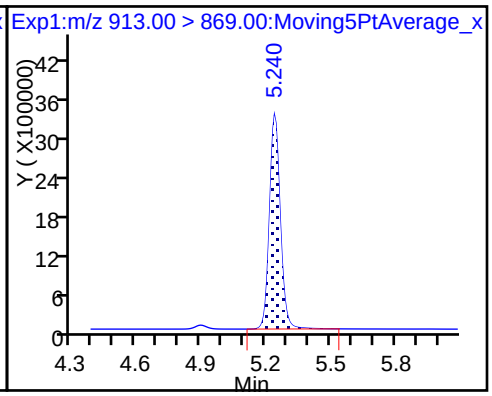
45 Perfluorohexadecanoic acid



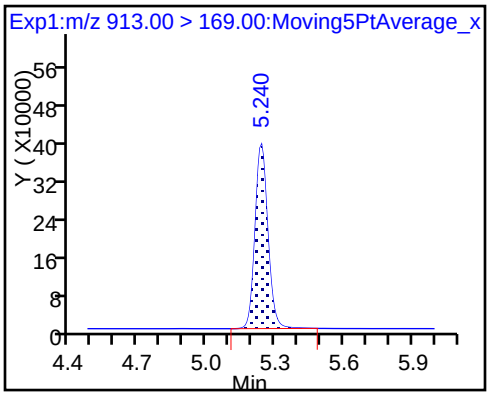
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_008.d
Lims ID: IC L7 Full
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 04-Dec-2017 16:36:07 ALS Bottle#: 16 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\20171204-51297.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 04-Dec-2017 19:07:35 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: phomsophat Date: 04-Dec-2017 16:56:52

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	1.405	1.401	0.004	0.535	8355556	2.50		100	59356	
2 Perfluorobutyric acid										
212.90 > 169.00	1.405	1.402	0.003	1.000	30325086	9.99		99.9	9173	
D 3 13C5-PFPeA										
267.90 > 223.00	1.650	1.646	0.004	0.629	5359848	2.58		103	78878	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.650	1.648	0.002	1.000	22789920	9.13		91.3	13948	
D 47 13C3-PFBS										
301.90 > 83.00	1.682	1.681	0.001	0.641	103121	2.38		103	3741	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.682	1.682	0.0	1.000	28463816	8.43		95.4	81804	
298.90 > 99.00	1.682	1.682	0.0	1.000	12550060		2.27(1.25-3.74)	95.4	76003	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.889	1.887	0.002	1.000	7005464	9.88		106	105410	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.926	1.923	0.003	1.000	21198747	9.70		97.0	48467	
313.00 > 119.00	1.926	1.923	0.003	1.000	1968192		10.77(5.03-15.10)	97.0	28747	
D 7 13C2 PFHxA										
315.00 > 270.00	1.926	1.924	0.002	0.734	5353254	2.50		100	47298	
D 9 13C4-PFHpA										
367.00 > 322.00	2.263	2.254	0.009	0.862	5108146	2.46		98.3	45133	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.263	2.255	0.008	1.000	21155159	9.96		99.6	30246	
363.00 > 169.00	2.263	2.255	0.008	1.000	8557043		2.47(1.13-3.40)	99.6	43439	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.273	2.269	0.004	1.000	23639232	8.47		93.0	31147	
399.00 > 99.00	2.273	2.269	0.004	1.000	8361652		2.83(1.50-4.49)	93.0	25748	

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	2.273	2.271	0.002	0.866	6209580	2.39		101	55231	
D 12 M2-6:2FTS										
429.00 > 81.00	2.610	2.605	0.005	0.994	1547518	2.22		93.4	30955	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.610	2.605	0.005	1.000	9844898	8.96		94.5	87740	
D 14 13C4 PFOA										
417.00 > 372.00	2.624	2.618	0.006	1.000	5672017	2.47		98.6	58587	
* 62 13C2-PFOA										
415.00 > 370.00	2.624	2.619	0.005		5600507	2.50			67151	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.624	2.621	0.003	1.000	22179047	9.17		91.7	11501	
413.00 > 169.00	2.624	2.621	0.003	1.000	12563750		1.77(0.84-2.52)	91.7	50330	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.631	2.626	0.005	1.000	20298371	9.16		96.2	83141	
449.00 > 99.00	2.631	2.626	0.005	1.000	5958292		3.41(1.94-5.82)	96.2	44094	
D 18 13C4 PFOS										
503.00 > 80.00	3.000	2.993	0.007	1.143	4071767	2.41		101	29198	
20 Perfluorononanoic acid										
463.00 > 419.00	3.000	2.994	0.006	1.000	16132833	9.99		99.9	40621	
463.00 > 169.00	3.000	2.994	0.006	1.000	4073850		3.96(1.90-5.69)	99.9	47878	
D 19 13C5 PFNA										
468.00 > 423.00	3.000	2.994	0.006	1.143	4142344	2.49		99.6	54284	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.000	2.994	0.006	1.000	16236576	9.20		99.1	929560	
499.00 > 99.00	3.000	2.994	0.006	1.000	3616508		4.49(2.31-6.93)	99.1	52773	
D 26 M2-8:2FTS										
529.00 > 81.00	3.349	3.343	0.006	1.276	1373886	2.50		105	26382	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.349	3.344	0.005	1.000	6593874	9.31		97.2	70776	
D 23 13C2 PFDA										
515.00 > 470.00	3.357	3.356	0.001	1.279	3388613	2.40		96.2	41619	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.357	3.356	0.001	1.000	13565320	10.2		102	37350	
513.00 > 169.00	3.357	3.356	0.001	1.000	2479743		5.47(2.36-7.09)	102	2400	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.364	3.359	0.005	1.000	20023558	9.67		96.7	46311	
D 21 13C8 FOSA										
506.00 > 78.00	3.364	3.359	0.005	1.282	5528057	2.43		97.0	32570	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.516	3.511	0.005	1.340	1895903	2.52		101	22338	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.516	3.515	0.001	1.000	8192092	10.3		103	27054	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.673	3.667	0.006	1.000	10321356	9.58		99.4	58211	
599.00 > 99.00	3.673	3.667	0.006	1.000	3380239		3.05(1.39-4.16)	99.4	64488	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.682	3.677	0.005	1.403	1718330	2.35		94.1	8708	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.690	3.685	0.005	1.000	10011006	9.74		97.4	32415	
563.00 > 169.00	3.690	3.685	0.005	1.000	2123452		4.71(0.00-0.00)	97.4	63339	
D 30 13C2 PFUnA										
565.00 > 520.00	3.690	3.685	0.005	1.406	2611948	2.41		96.2	27148	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.690	3.685	0.005	1.002	6693367	10.3		103	47609	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.856	3.856	0.0	1.469	1750368	2.66		106	4208	
35 MeFOSA										
512.00 > 169.00	3.867	3.865	0.002	1.003	6931131	10.4		104	3804	
D 36 13C2 PFDoA										
615.00 > 570.00	3.983	3.979	0.004	1.518	3062001	2.53		101	26173	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.983	3.982	0.001	1.000	11465899	9.48		94.8	56492	
613.00 > 169.00	3.983	3.982	0.001	1.000	3038174		3.77(2.13-6.40)	94.8	45414	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.054	4.048	0.006	1.545	1587890	2.59		104	2961	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.061	4.056	0.005	1.002	6801725	10.2		102	4094	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.244	4.243	0.001	1.000	12015798	9.39		93.9	26062	
663.00 > 169.00	4.244	4.243	0.001	1.000	3912573		3.07(1.25-3.76)	93.9	59833	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.487	4.481	0.006	1.000	3423281	9.98		99.8	42661	
713.00 > 219.00	4.473	4.481	-0.008	0.997	2290514		1.49(0.71-2.13)	99.8	50803	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.487	4.481	0.006	1.710	3381530	2.40		96.1	28188	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.896	4.892	0.004	1.866	5668173	2.43		97.4	16895	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.896	4.894	0.002	1.000	18690044	9.68		96.8	9352	
813.00 > 169.00	4.896	4.894	0.002	1.000	3582954		5.22(2.86-8.58)	96.8	16142	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.247	5.242	0.005	1.000	20739410	9.57		95.7	3040	
913.00 > 169.00	5.247	5.242	0.005	1.000	2884560		7.19(0.00-0.00)	95.7	4741	

Reagents:

LCPFC_LL7_00002 Amount Added: 1.00 Units: mL

Report Date: 04-Dec-2017 19:07:35 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_008.d

Injection Date: 04-Dec-2017 16:36:07 Instrument ID: A8_N

Lims ID: IC L7 Full

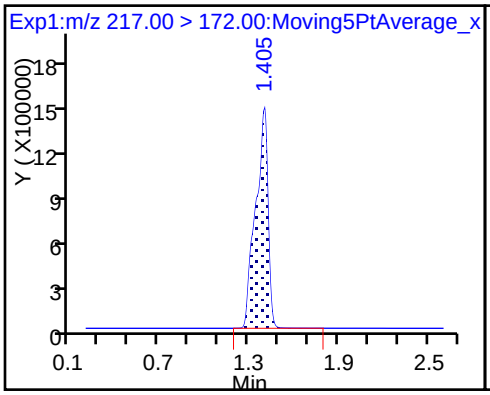
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 16 Worklist Smp#: 8

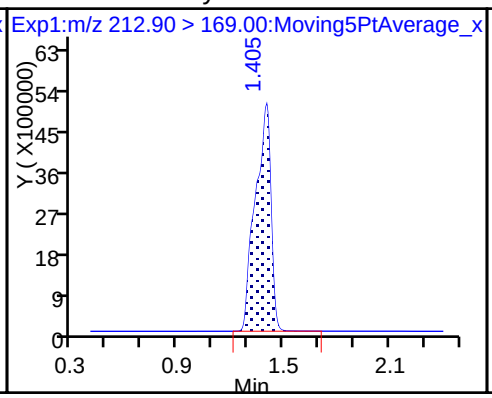
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

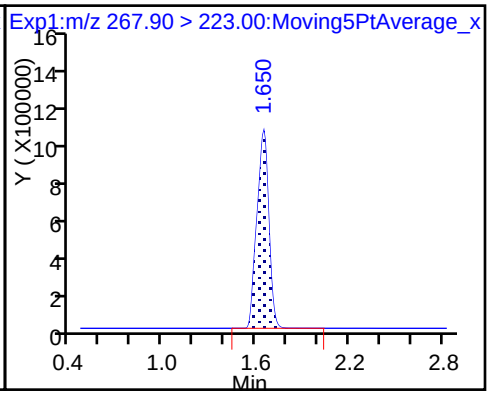
D 1 13C4 PFBA



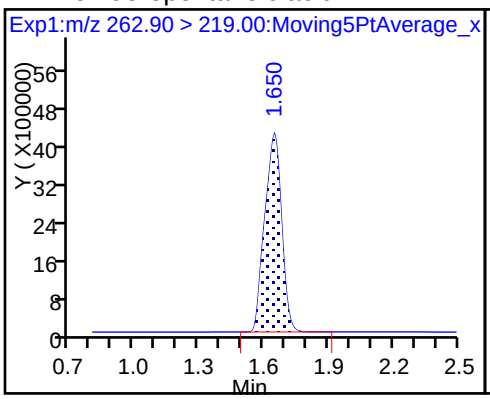
2 Perfluorobutyric acid



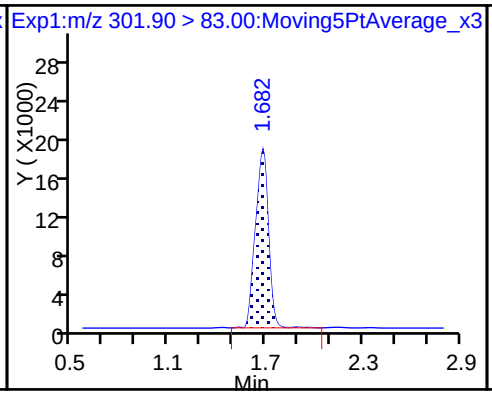
D 3 13C5-PFPeA



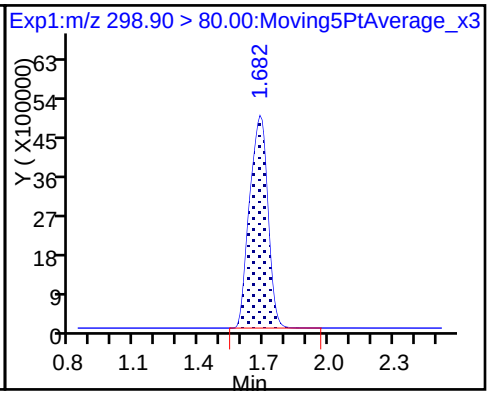
4 Perfluoropentanoic acid



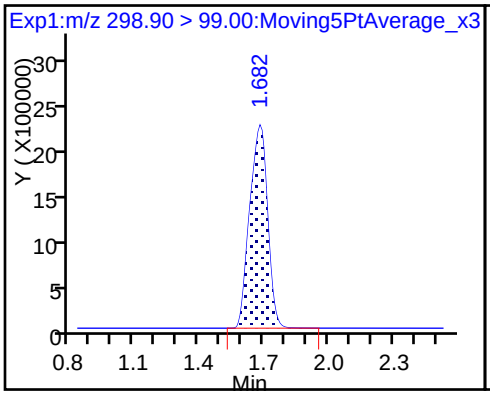
D 47 13C3-PFBS



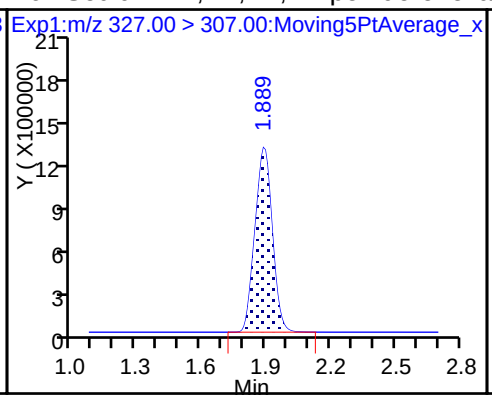
5 Perfluorobutanesulfonic acid



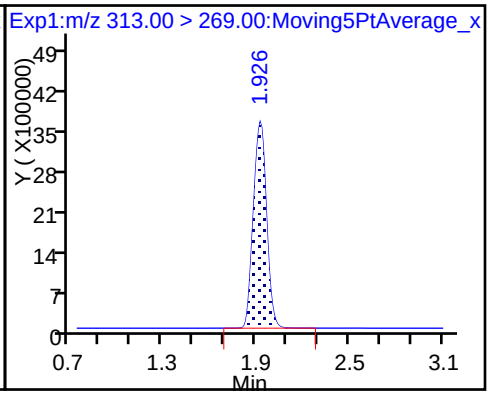
5 Perfluorobutanesulfonic acid



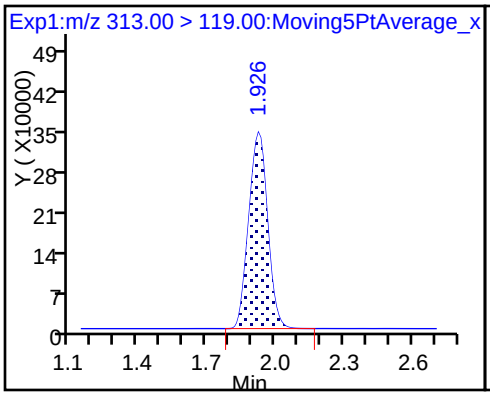
61 Sodium 1H,1H,2H,2H-perfluorohexane



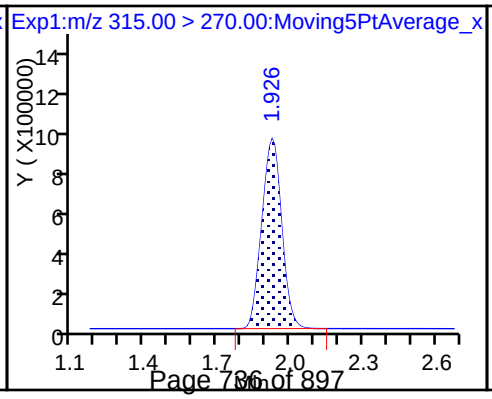
6 Perfluorohexanoic acid



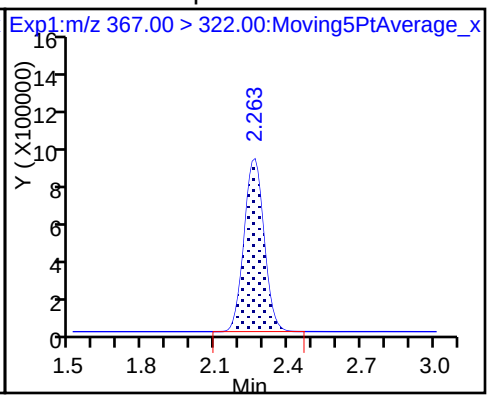
6 Perfluorohexanoic acid



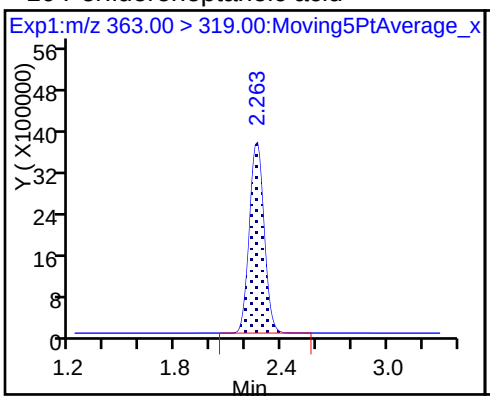
D 7 13C2 PFHxA



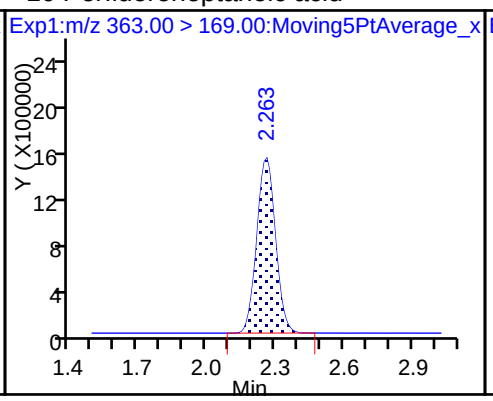
D 9 13C4-PFHpA



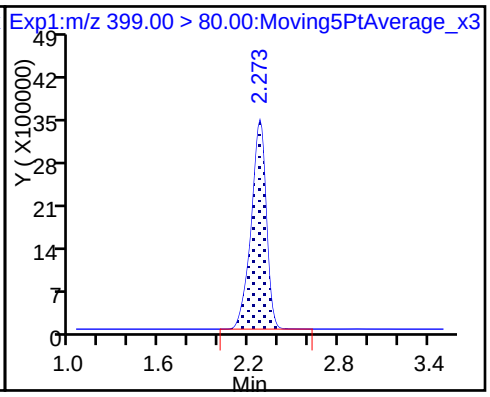
10 Perfluoroheptanoic acid



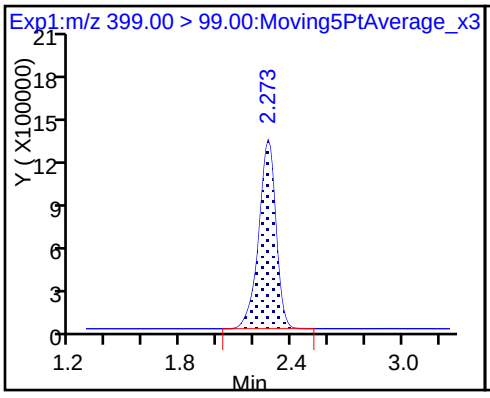
10 Perfluoroheptanoic acid



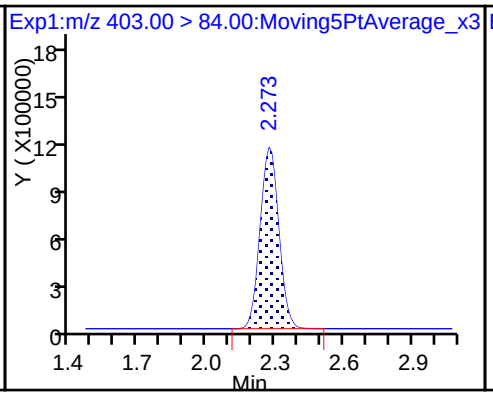
8 Perfluorohexanesulfonic acid



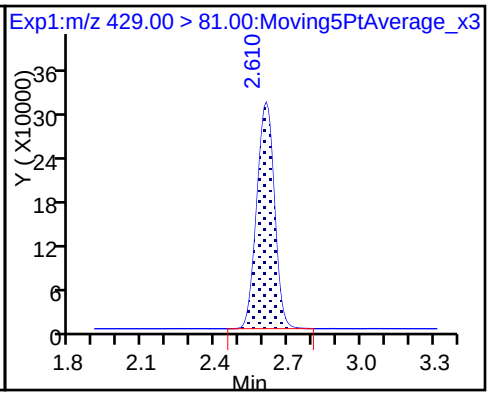
8 Perfluorohexanesulfonic acid



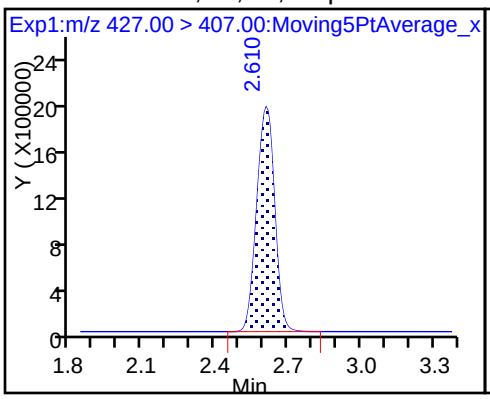
D 11 18O2 PFHxS



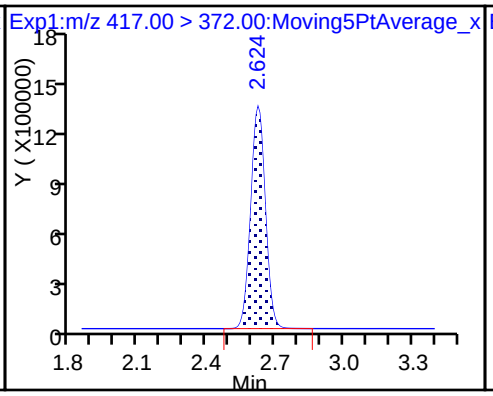
D 12 M2-6:2FTS



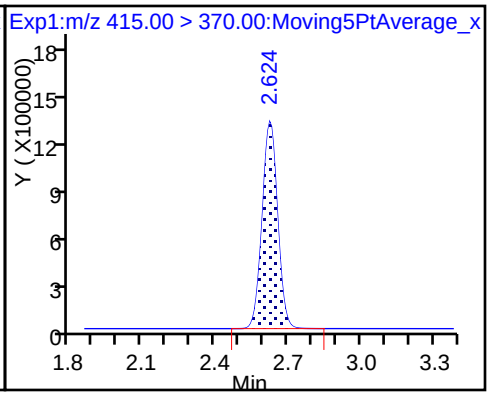
13 Sodium 1H,1H,2H,2H-perfluorooctane



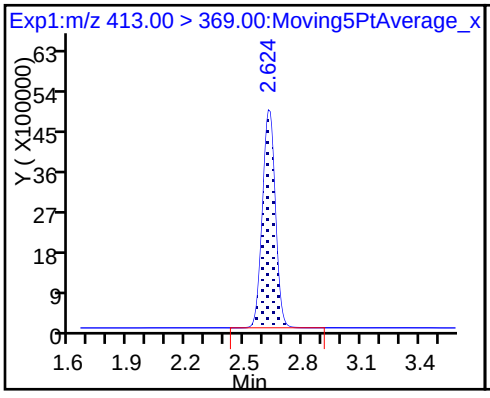
D 14 13C4 PFOA



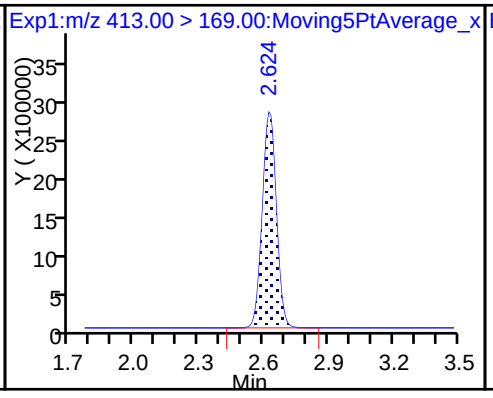
* 62 13C2-PFOA



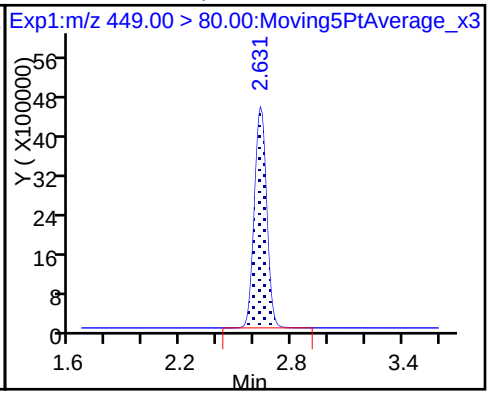
15 Perfluorooctanoic acid



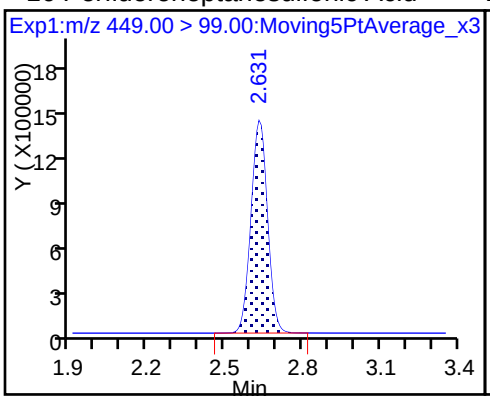
15 Perfluorooctanoic acid



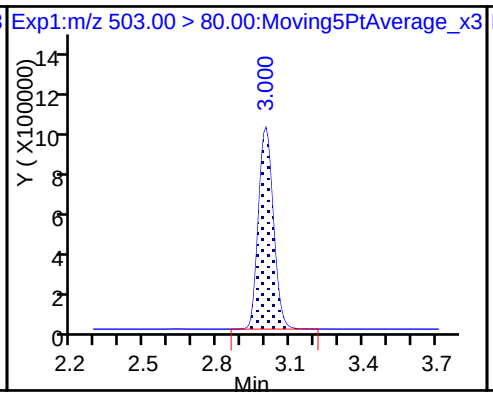
16 Perfluoroheptanesulfonic Acid



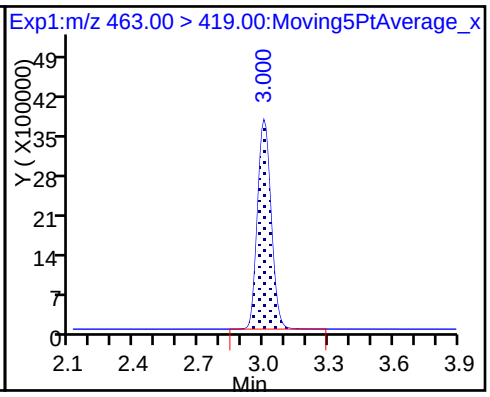
16 Perfluoroheptanesulfonic Acid



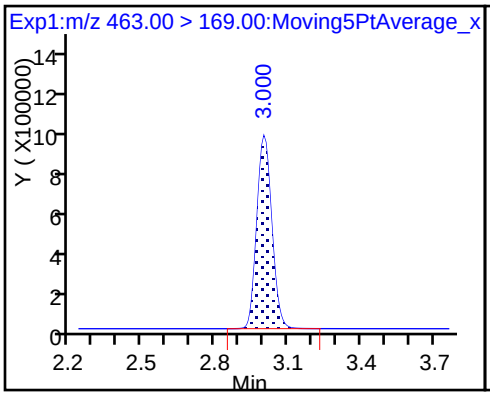
D 18 13C4 PFOS



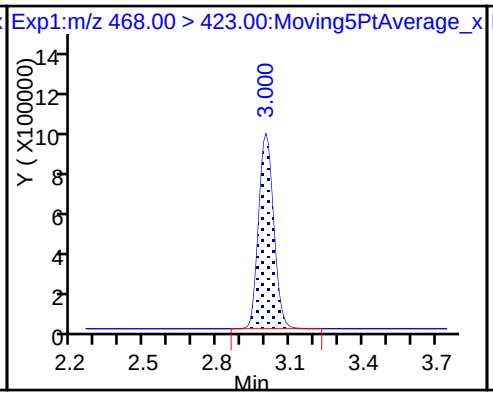
20 Perfluorononanoic acid



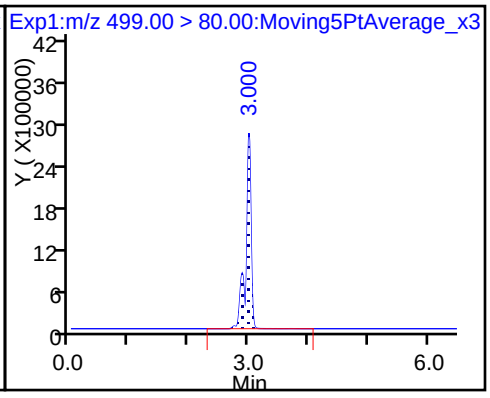
20 Perfluorononanoic acid



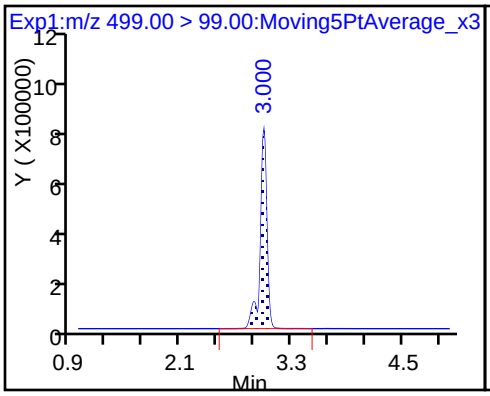
D 19 13C5 PFNA



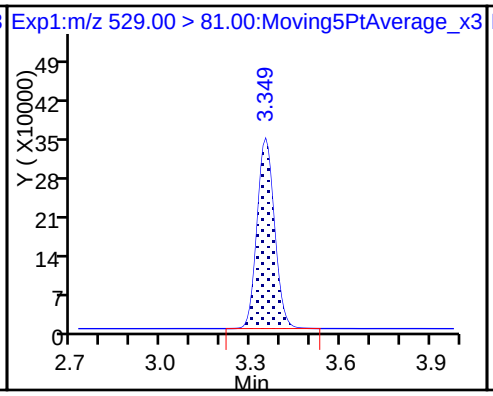
17 Perfluorooctane sulfonic acid



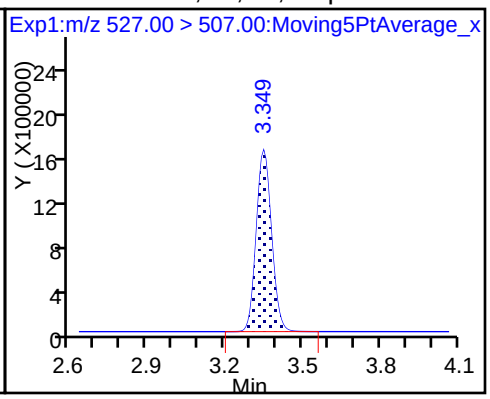
17 Perfluorooctane sulfonic acid



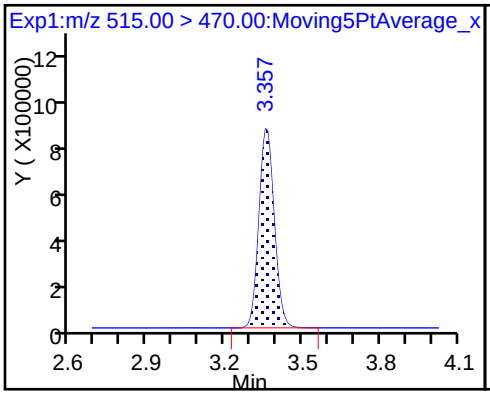
D 26 M2-8:2FTS



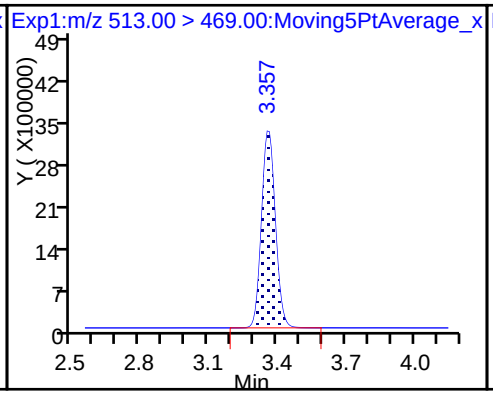
25 Sodium 1H,1H,2H,2H-perfluorodecane



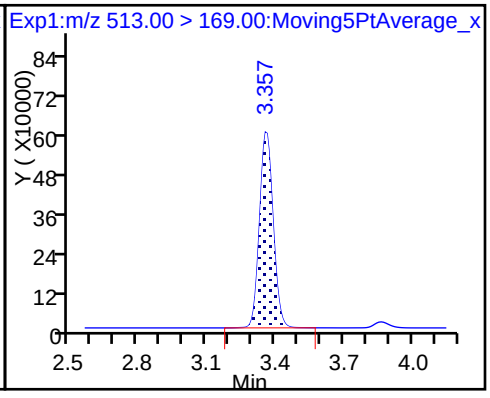
D 23 13C2 PFDA



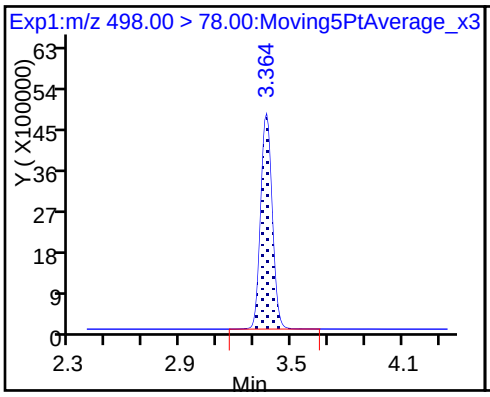
24 Perfluorodecanoic acid



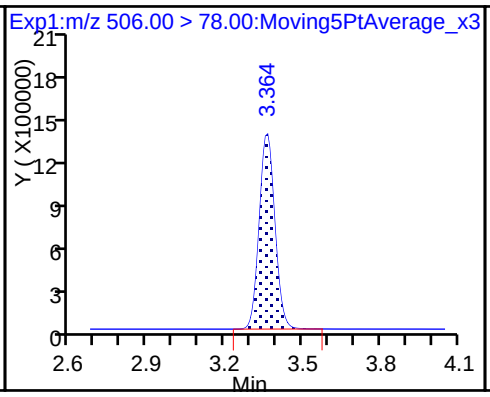
24 Perfluorodecanoic acid



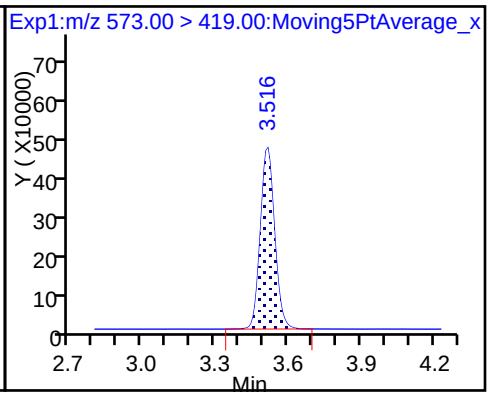
22 Perfluorooctane Sulfonamide



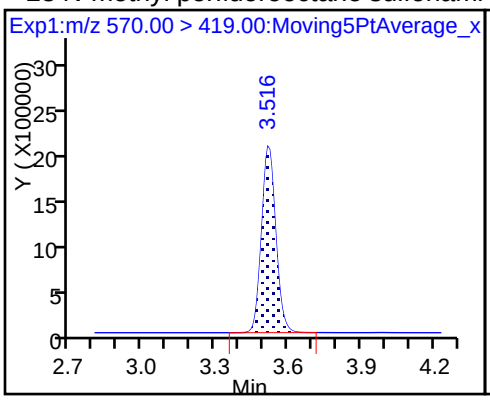
D 21 13C8 FOSA



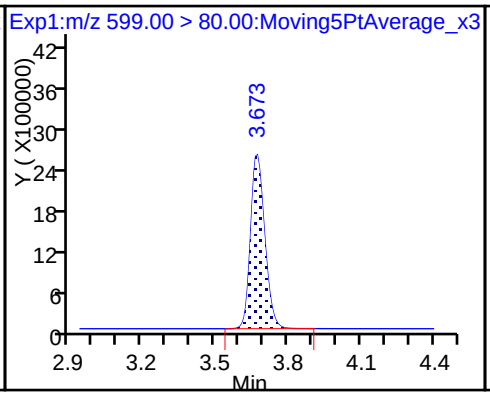
D 27 d3-NMeFOSAA



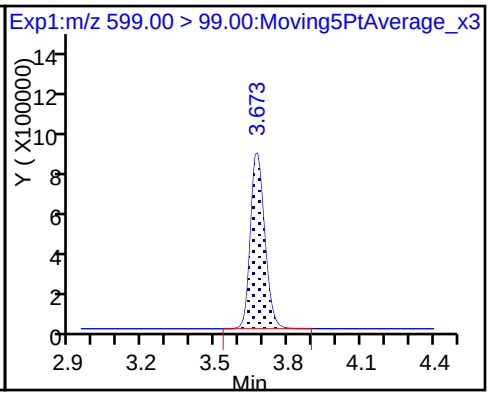
28 N-methyl perfluorooctane sulfonami



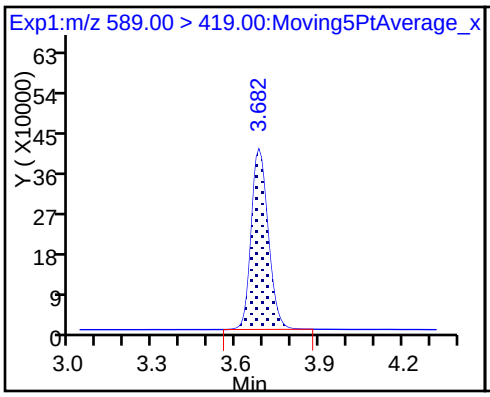
29 Perfluorodecane Sulfonic acid



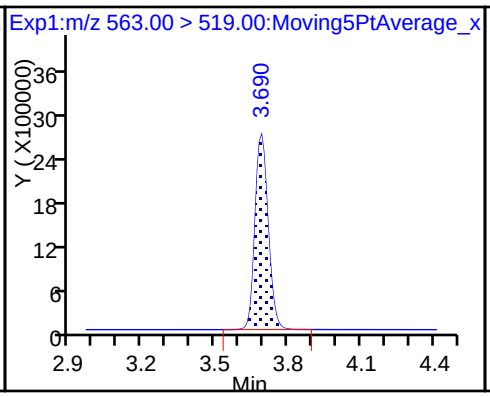
29 Perfluorodecane Sulfonic acid



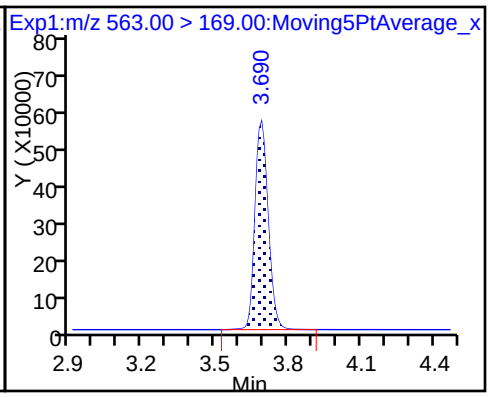
D 32 d5-NEtFOSAA



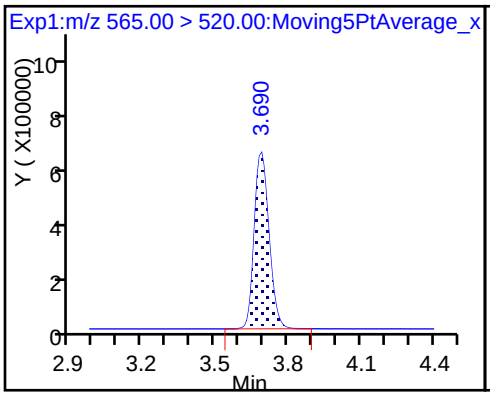
31 Perfluoroundecanoic acid



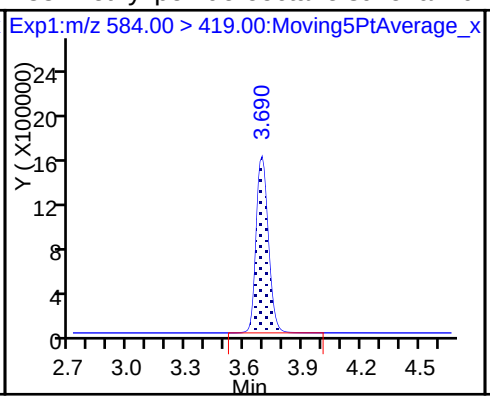
31 Perfluoroundecanoic acid



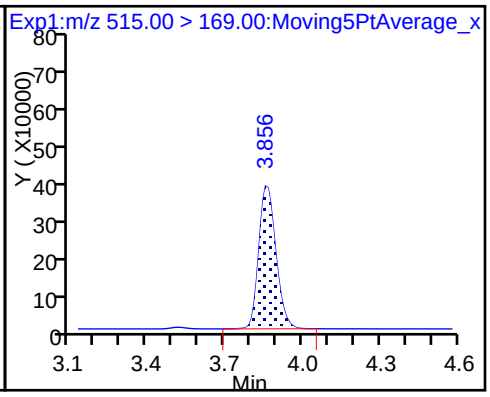
D 30 13C2 PFUnA



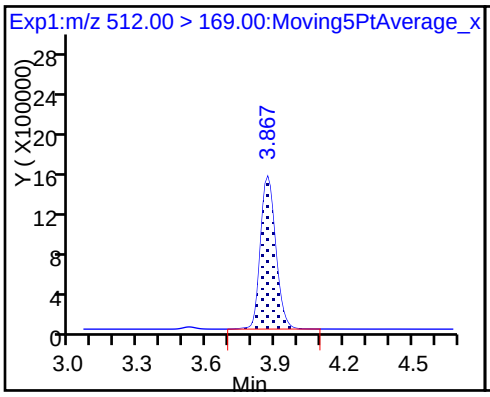
33 N-ethyl perfluorooctane sulfonamid



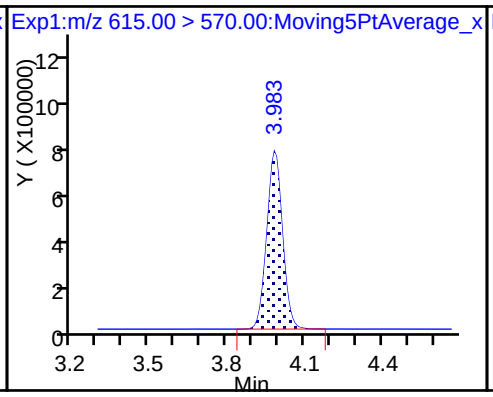
D 34 d-N-MeFOSA-M



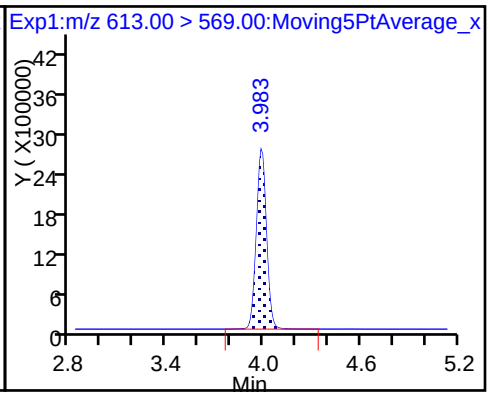
35 MeFOSA



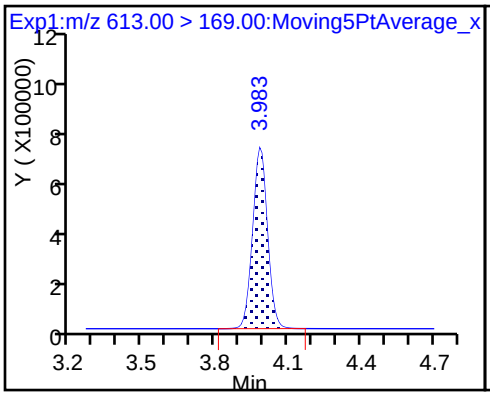
D 36 13C2 PFDoA



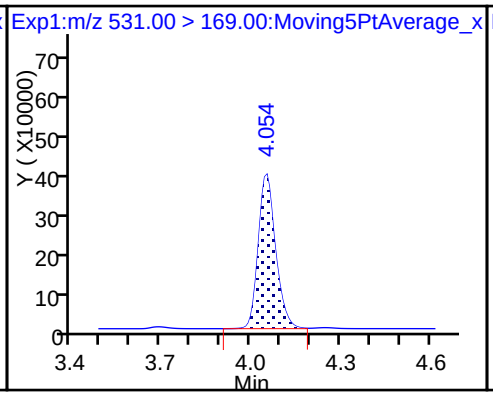
37 Perfluorododecanoic acid



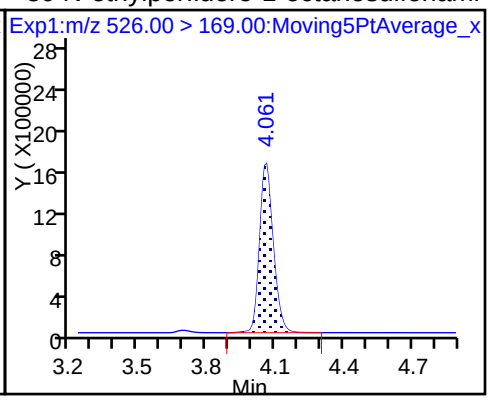
37 Perfluorododecanoic acid



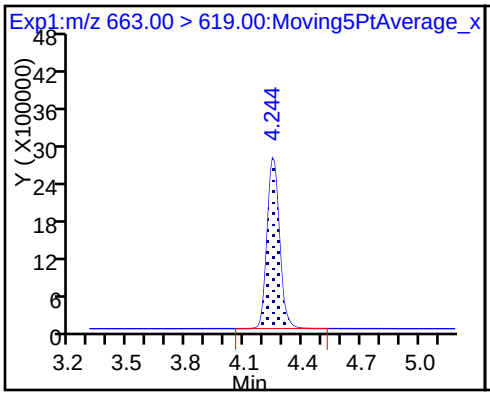
D 38 d-N-EtFOSA-M



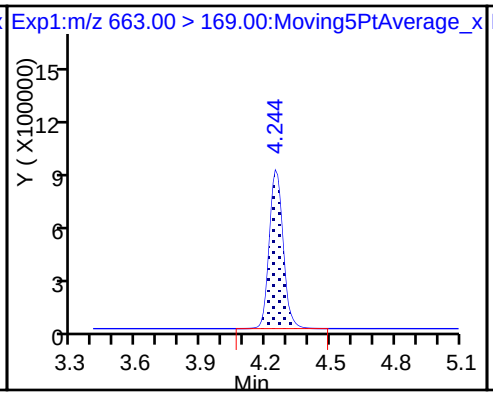
39 N-ethylperfluoro-1-octanesulfonami



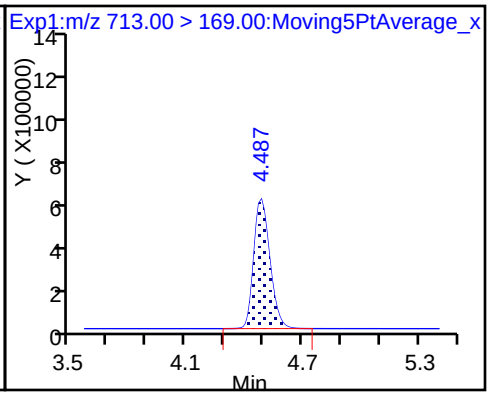
41 Perfluorotridecanoic acid



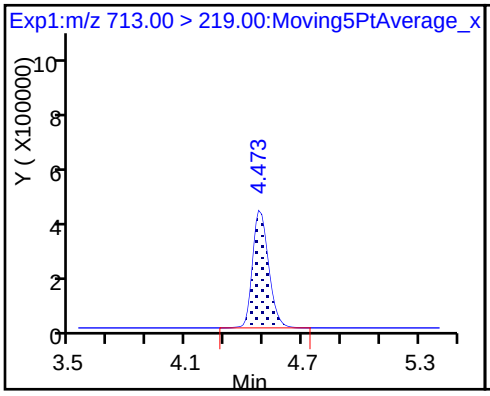
41 Perfluorotridecanoic acid



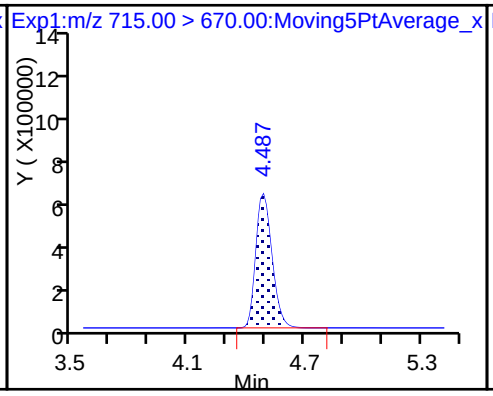
42 Perfluorotetradecanoic acid



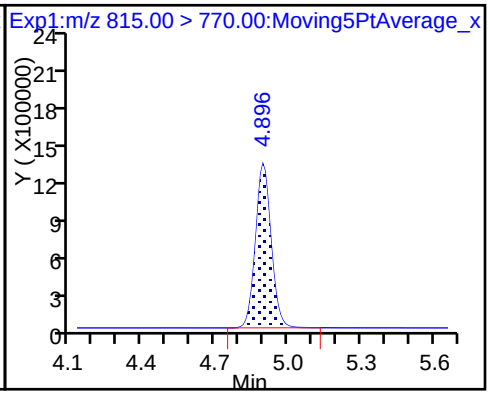
42 Perfluorotetradecanoic acid



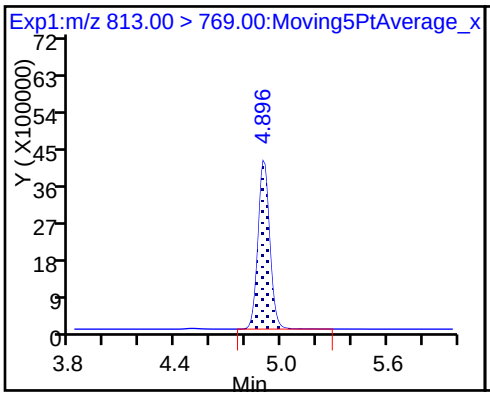
D 43 13C2-PFTeDA



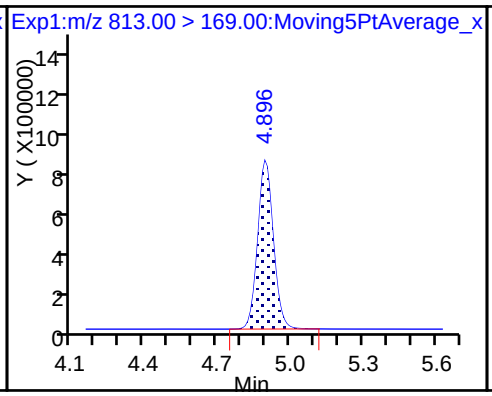
D 44 13C2-PFHxDA



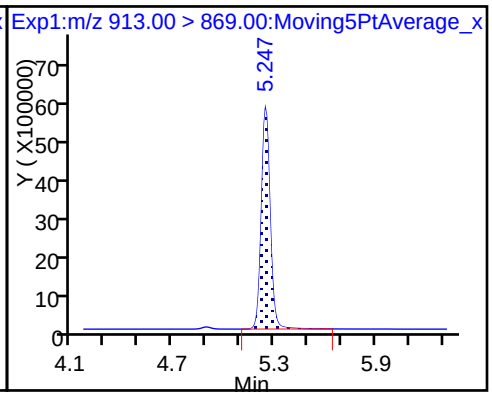
45 Perfluorohexadecanoic acid



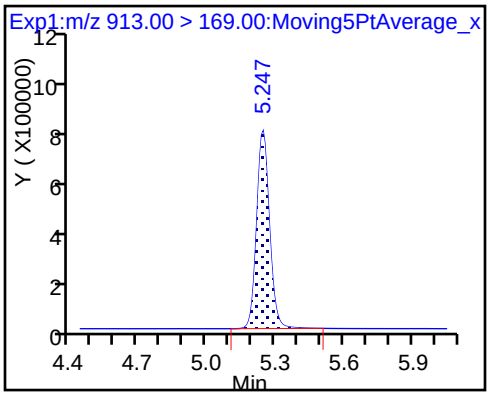
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_009.d
Lims ID: IC L8 Full
Client ID:
Sample Type: IC Calib Level: 8
Inject. Date: 04-Dec-2017 16:43:58 ALS Bottle#: 17 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\20171204-51297.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 04-Dec-2017 19:07:38 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: phomsophat Date: 04-Dec-2017 18:51:51

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	1.404	1.401	0.003	0.536	7965653	2.75		110	46182	
2 Perfluorobutyric acid										
212.90 > 169.00	1.404	1.402	0.002	1.000	51311116	17.7		88.6	17077	
D 3 13C5-PFPeA										
267.90 > 223.00	1.647	1.646	0.001	0.629	4965540	2.75		110	66967	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.647	1.648	-0.001	1.000	38522728	16.7		83.3	22833	
D 47 13C3-PFBS										
301.90 > 83.00	1.679	1.681	-0.002	0.641	98631	2.62		113	2486	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.687	1.682	0.005	1.005	45840995	14.2		80.3	89015	
298.90 > 99.00	1.687	1.682	0.005	1.005	23037793		1.99(1.25-3.74)	80.3	105467	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.886	1.887	-0.001	1.000	13073743	21.6		115	211390	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.923	1.923	0.0	1.000	36014620	17.8		88.8	87721	
313.00 > 119.00	1.923	1.923	0.0	1.000	3808394		9.46(5.03-15.10)	88.8	73089	
D 7 13C2 PFHxA										
315.00 > 270.00	1.923	1.924	-0.001	0.734	4968232	2.67		107	42763	
D 9 13C4-PFHpA										
367.00 > 322.00	2.258	2.254	0.004	0.862	4640871	2.57		103	48137	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.258	2.255	0.003	1.000	34413663	17.8		89.2	39284	
363.00 > 169.00	2.258	2.255	0.003	1.000	15243564		2.26(1.13-3.40)	89.2	56476	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.268	2.269	-0.001	1.000	40621142	16.6		91.0	38275	
399.00 > 99.00	2.268	2.269	-0.001	1.000	15111490		2.69(1.50-4.49)	91.0	39479	

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	2.268	2.271	-0.003	0.866	5455632	2.41		102	50560	
D 12 M2-6:2FTS										
429.00 > 81.00	2.598	2.605	-0.007	0.992	1323901	2.18		92.0	23218	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.604	2.605	-0.001	1.002	16219600	17.3		91.0	83254	
D 14 13C4 PFOA										
417.00 > 372.00	2.618	2.618	0.0	1.000	5059591	2.53		101	56578	
* 62 13C2-PFOA										
415.00 > 370.00	2.618	2.619	-0.001		4867505	2.50			49229	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.618	2.621	-0.003	1.000	36256854	16.8		84.0	18289	
413.00 > 169.00	2.618	2.621	-0.003	1.000	21641027		1.68(0.84-2.52)	84.0	60628	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.626	2.626	0.0	1.000	33050481	16.3		85.6	96312	
449.00 > 99.00	2.626	2.626	0.0	1.000	10697096		3.09(1.94-5.82)	85.6	55933	
D 18 13C4 PFOS										
503.00 > 80.00	2.993	2.993	0.0	1.143	3724410	2.53		106	19026	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.993	2.994	-0.001	1.000	28542678	17.7		95.2	36229	
499.00 > 99.00	2.993	2.994	-0.001	1.000	6722317		4.25(2.31-6.93)	95.2	444216	
D 19 13C5 PFNA										
468.00 > 423.00	2.993	2.994	-0.001	1.143	3684676	2.55		102	40414	
20 Perfluorononanoic acid										
463.00 > 419.00	2.993	2.994	-0.001	1.000	26819393	18.7		93.3	46310	
463.00 > 169.00	2.993	2.994	-0.001	1.000	7575012		3.54(1.90-5.69)	93.3	59966	
D 26 M2-8:2FTS										
529.00 > 81.00	3.342	3.343	-0.001	1.276	1165374	2.44		102	12791	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.342	3.344	-0.002	1.000	11171284	18.6		97.1	95880	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.357	3.356	0.001	1.000	23214862	17.8		89.0	89054	
513.00 > 169.00	3.357	3.356	0.001	1.000	4710289		4.93(2.36-7.09)	89.0	2255	
D 23 13C2 PFDA										
515.00 > 470.00	3.357	3.356	0.001	1.282	3322458	2.71		109	35606	
D 21 13C8 FOSA										
506.00 > 78.00	3.357	3.359	-0.002	1.282	5223719	2.64		106	37829	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.357	3.359	-0.002	1.000	32240646	16.5		82.4	63248	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.510	3.511	-0.001	1.341	1749381	2.68		107	17175	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.517	3.515	0.002	1.002	14505483	19.8		99.0	41326	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.665	3.667	-0.002	1.000	17049700	17.3		89.7	92131	
599.00 > 99.00	3.665	3.667	-0.002	1.000	5942756		2.87(1.39-4.16)	89.7	58486	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.681	3.677	0.004	1.406	1482404	2.33		93.4	7186	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.690	3.685	0.005	1.002	11844723	21.2		106	44206	
D 30 13C2 PFUnA										
565.00 > 520.00	3.690	3.685	0.005	1.409	2421439	2.57		103	26269	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.690	3.685	0.005	1.000	17311402	18.2		90.9	61010	
563.00 > 169.00	3.690	3.685	0.005	1.000	3864268		4.48(0.00-0.00)	90.9	64392	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.856	3.856	0.0	1.473	1721873	3.01		120	4744	
35 MeFOSA										
512.00 > 169.00	3.866	3.865	0.001	1.003	12698938	19.3		96.6	4003	
D 36 13C2 PFDoA										
615.00 > 570.00	3.983	3.979	0.004	1.521	2736968	2.61		104	22284	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.983	3.982	0.001	1.000	20341082	18.8		94.1	58451	
613.00 > 169.00	3.983	3.982	0.001	1.000	5501424		3.70(2.13-6.40)	94.1	58916	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.053	4.048	0.005	1.548	1606922	3.02		121	2207	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.061	4.056	0.005	1.002	12929404	19.2		95.8	4397	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.253	4.243	0.010	1.000	20360336	17.8		89.0	57206	
663.00 > 169.00	4.244	4.243	0.001	0.998	7143379		2.85(1.25-3.76)	89.0	90055	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.487	4.481	0.006	1.714	2949102	2.41		96.4	21431	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.487	4.481	0.006	1.000	6336454	21.2		106	55221	
713.00 > 219.00	4.473	4.481	-0.008	0.997	4022027		1.58(0.71-2.13)	106	35275	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.896	4.892	0.004	1.870	5091489	2.52		101	21252	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.896	4.894	0.002	1.000	30740196	17.7		88.7	13214	
813.00 > 169.00	4.896	4.894	0.002	1.000	6564835		4.68(2.86-8.58)	88.7	23877	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.240	5.242	-0.002	1.000	34162529	17.6		87.8	5266	
913.00 > 169.00	5.240	5.242	-0.002	1.000	5393603		6.33(0.00-0.00)	87.8	5939	

Reagents:

LCPFC_LL8_00001 Amount Added: 1.00 Units: mL

Report Date: 04-Dec-2017 19:07:39 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_009.d

Injection Date: 04-Dec-2017 16:43:58 Instrument ID: A8_N

Lims ID: IC L8 Full

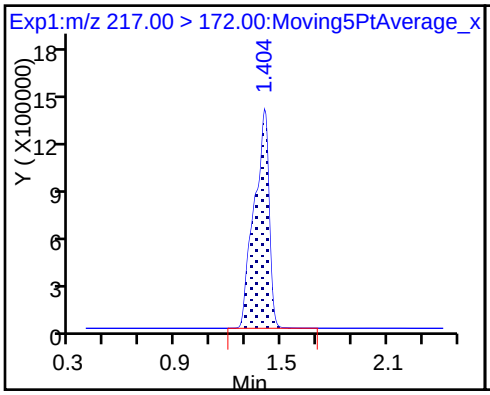
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 17 Worklist Smp#: 9

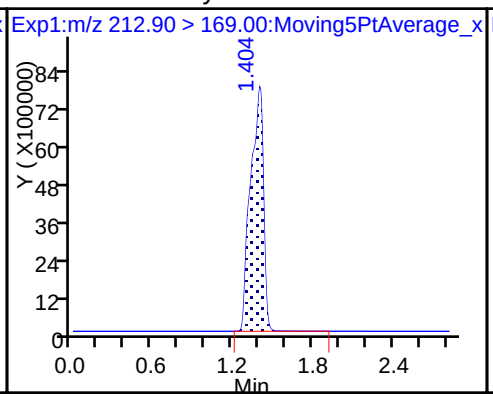
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

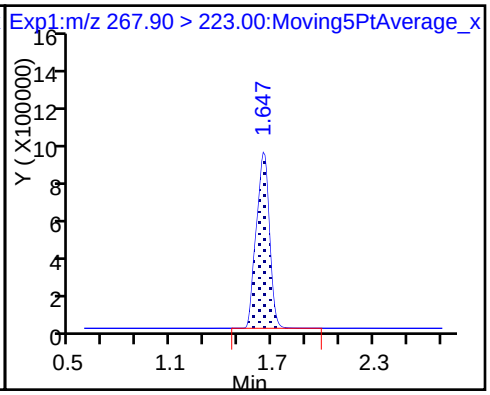
D 1 13C4 PFBA



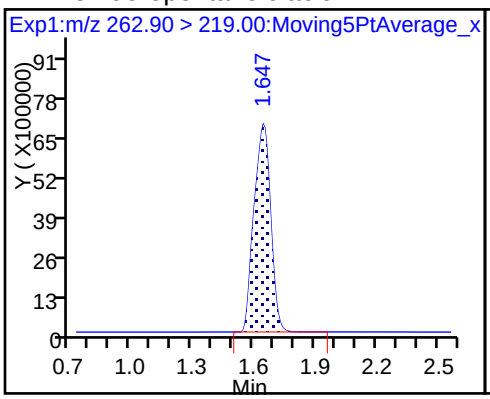
2 Perfluorobutyric acid



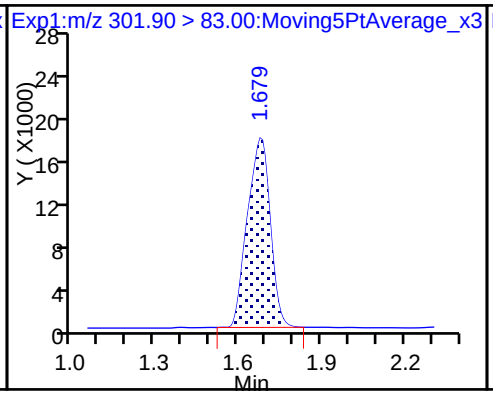
D 3 13C5-PFPeA



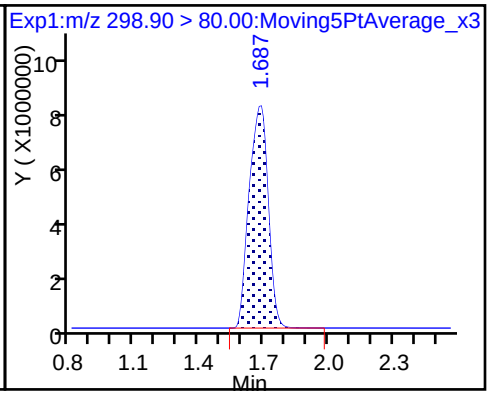
4 Perfluoropentanoic acid



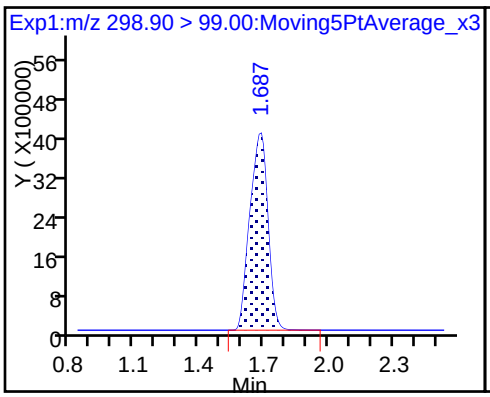
D 47 13C3-PFBS



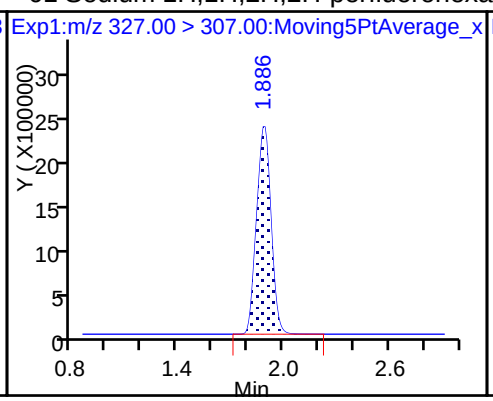
5 Perfluorobutanesulfonic acid



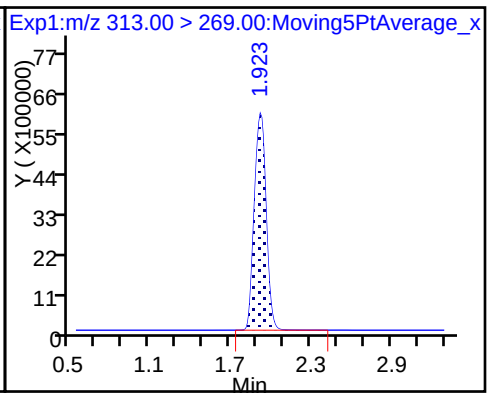
5 Perfluorobutanesulfonic acid



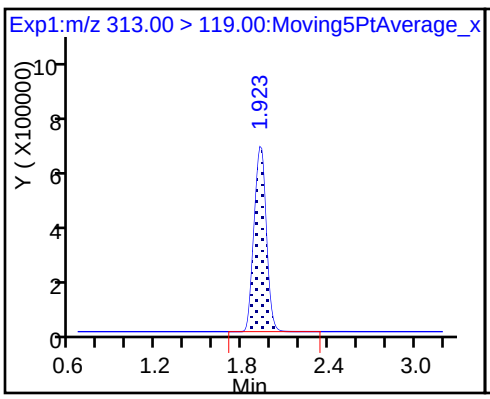
61 Sodium 1H,1H,2H,2H-perfluorohexane



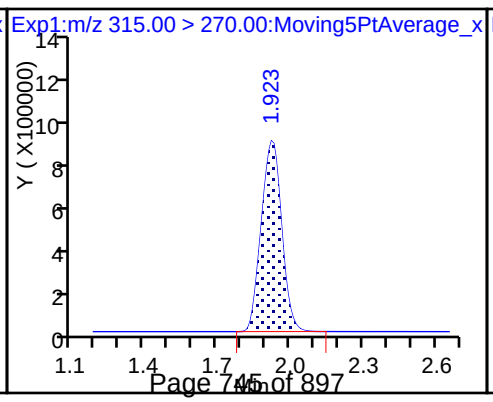
6 Perfluorohexanoic acid



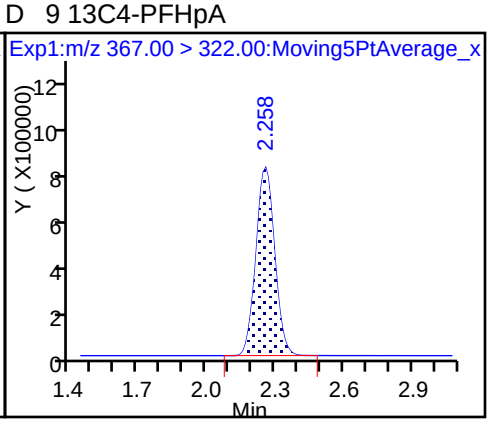
6 Perfluorohexanoic acid



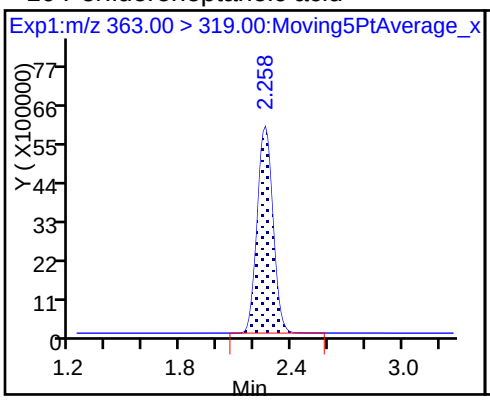
D 7 13C2 PFHxA



D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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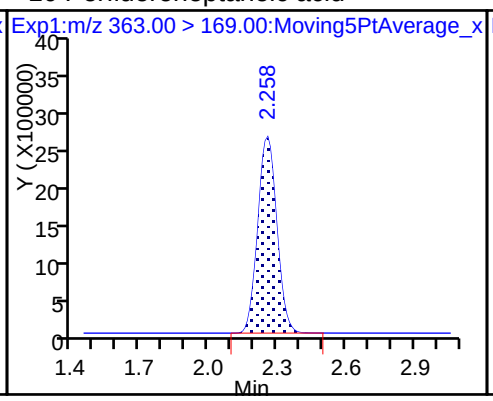
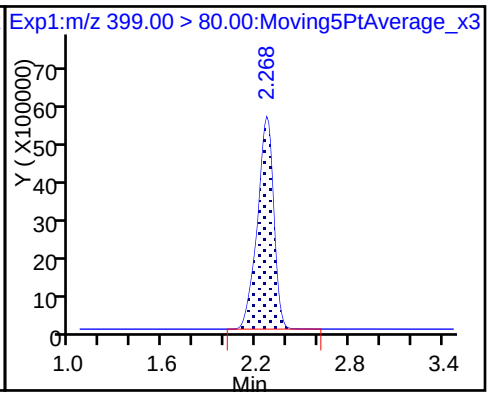
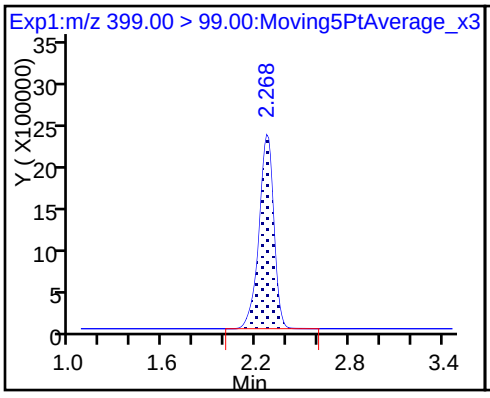


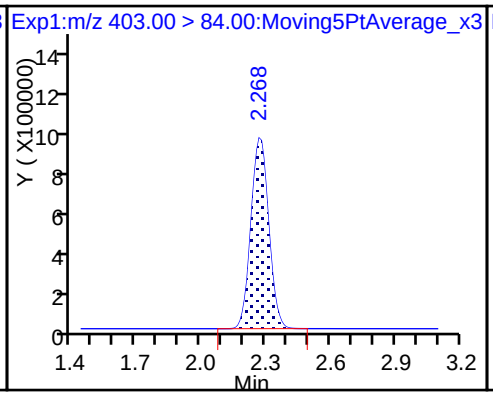
8 Perfluorohexanesulfonic acid



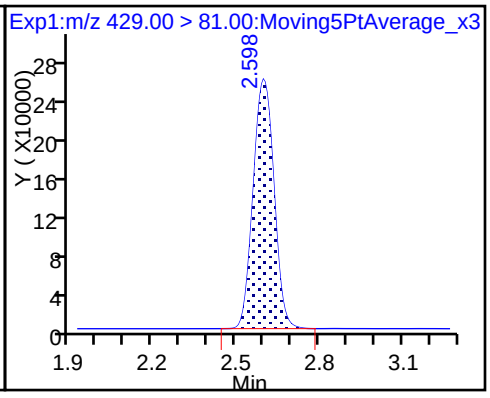
8 Perfluorohexanesulfonic acid



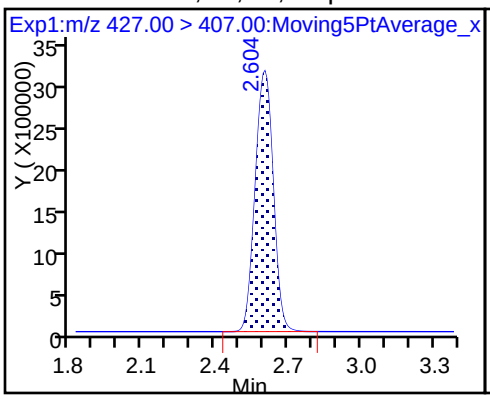
D 11 18O2 PFHxS



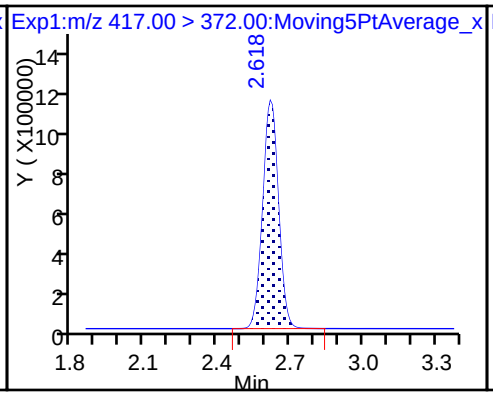
D 12 M2-6:2FTS



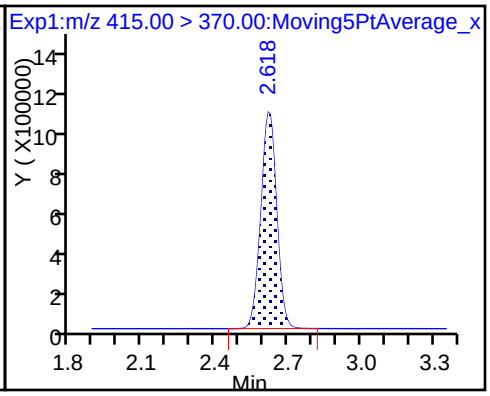
13 Sodium 1H,1H,2H,2H-perfluorooctane



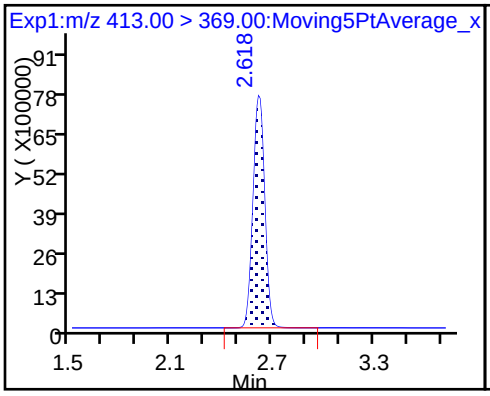
D 14 13C4 PFOA



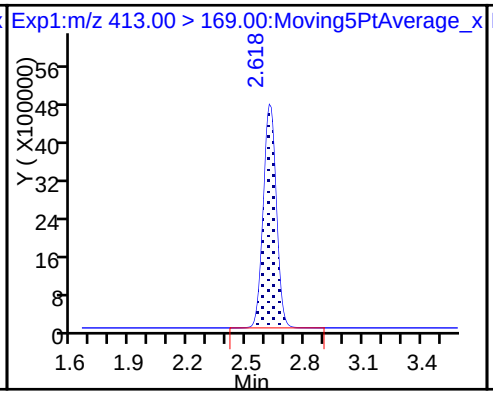
* 62 13C2-PFOA



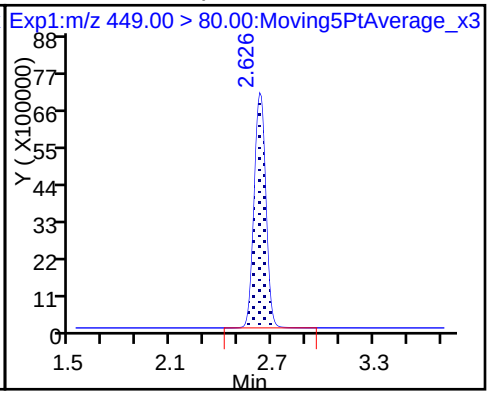
15 Perfluorooctanoic acid



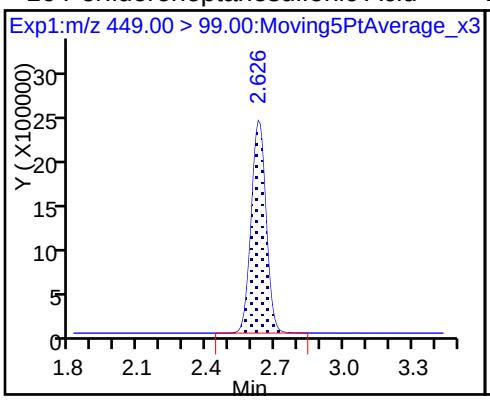
15 Perfluorooctanoic acid



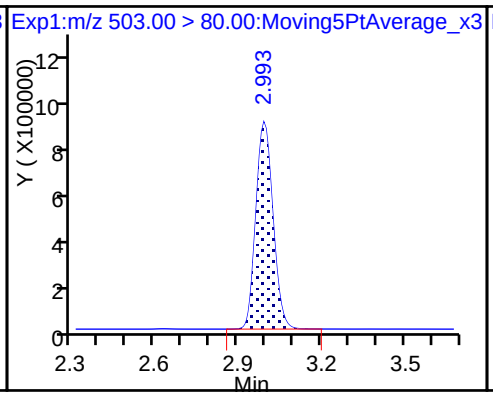
16 Perfluoroheptanesulfonic Acid



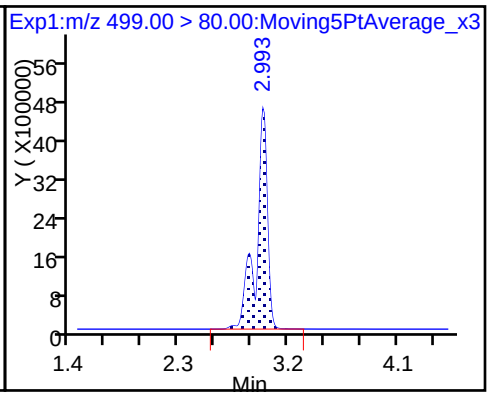
16 Perfluoroheptanesulfonic Acid



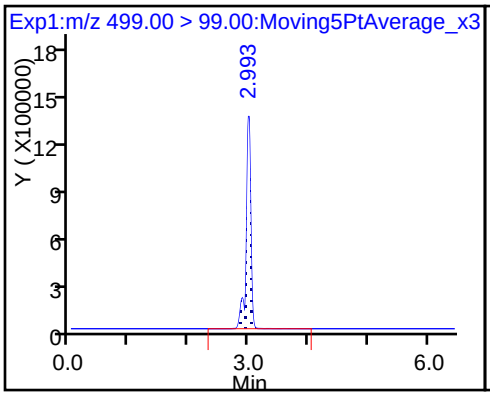
D 18 13C4 PFOS



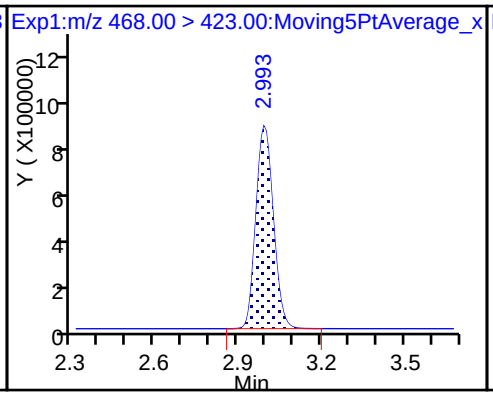
17 Perfluorooctane sulfonic acid



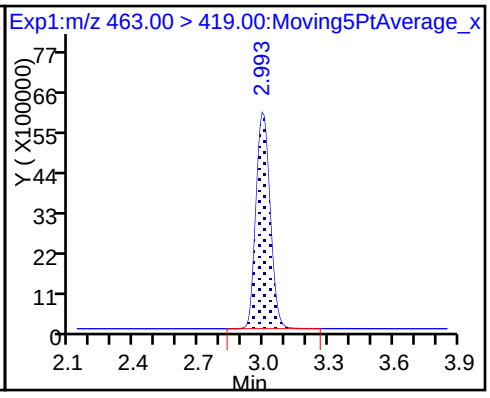
17 Perfluorooctane sulfonic acid



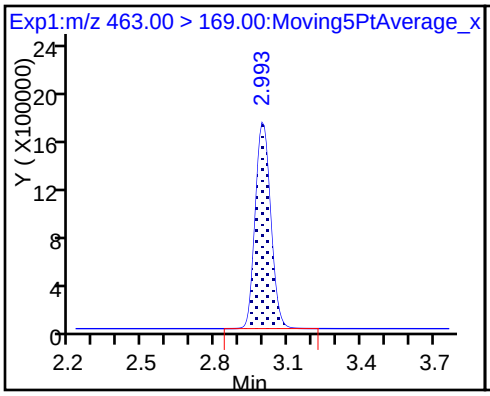
D 19 13C5 PFNA



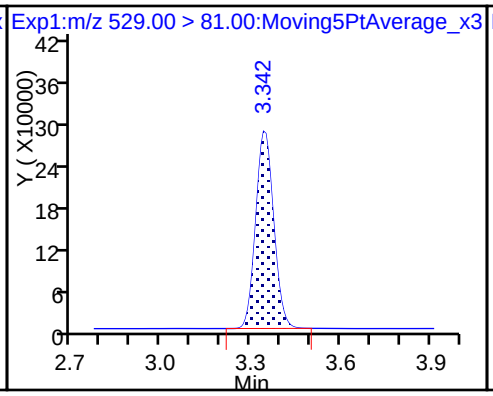
20 Perfluorononanoic acid



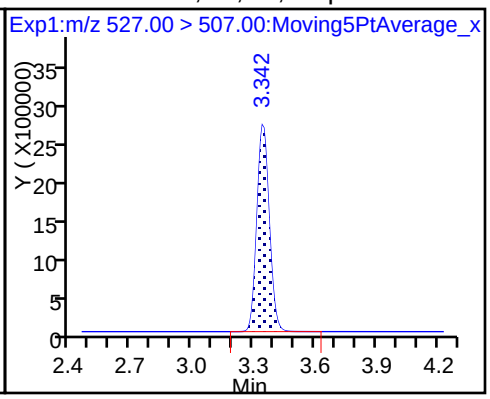
20 Perfluorononanoic acid



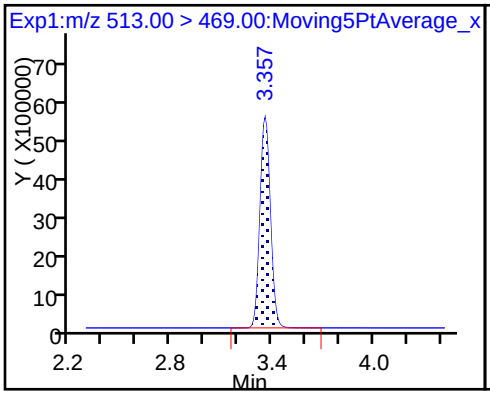
D 26 M2-8:2FTS



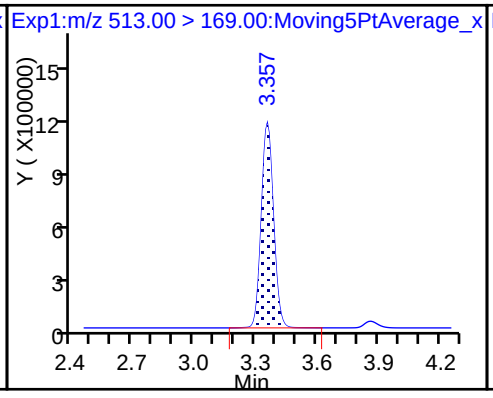
25 Sodium 1H,1H,2H,2H-perfluorodecane



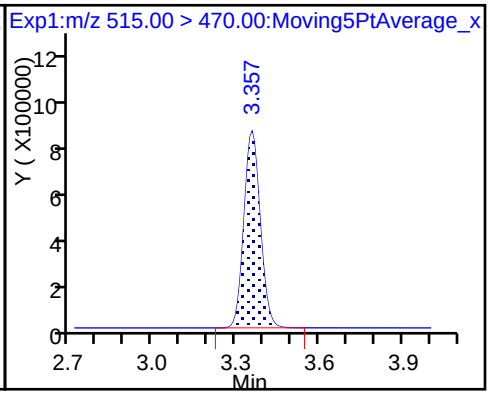
24 Perfluorodecanoic acid



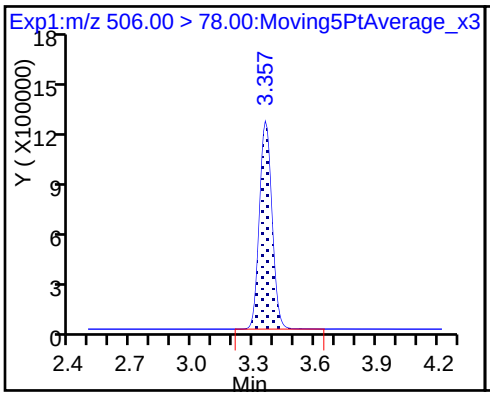
24 Perfluorodecanoic acid



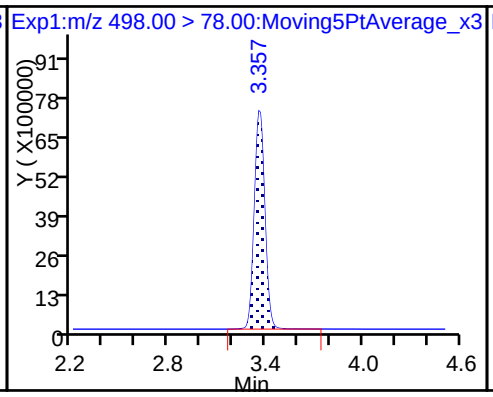
D 23 13C2 PFDA



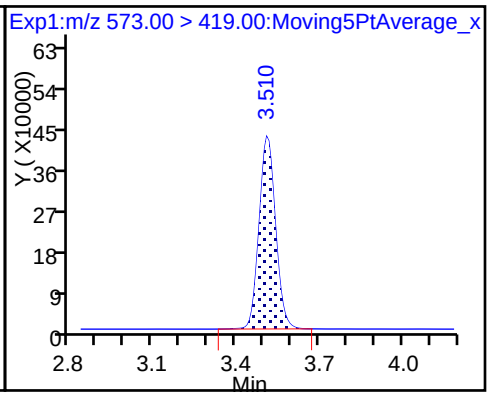
D 21 13C8 FOSA



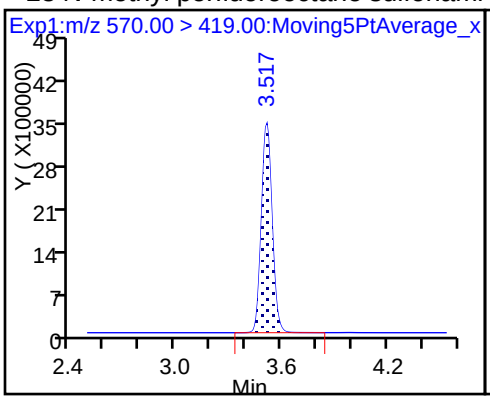
22 Perfluorooctane Sulfonamide



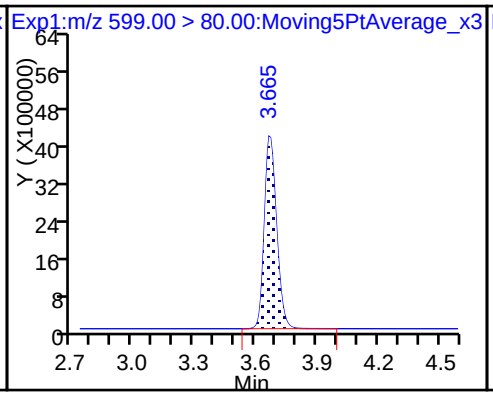
D 27 d3-NMeFOSAA



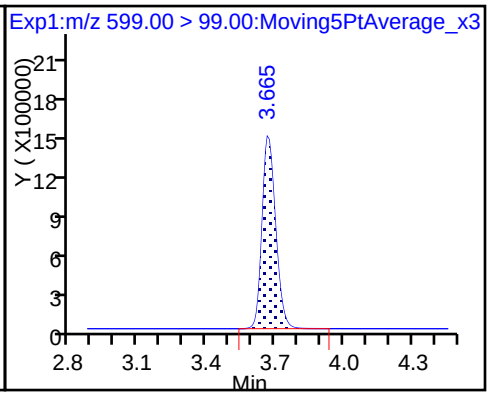
28 N-methyl perfluorooctane sulfonami



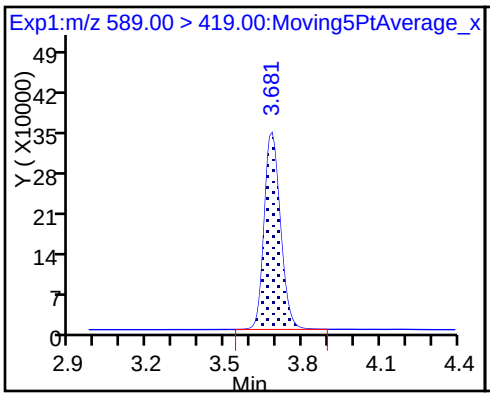
29 Perfluorodecane Sulfonic acid



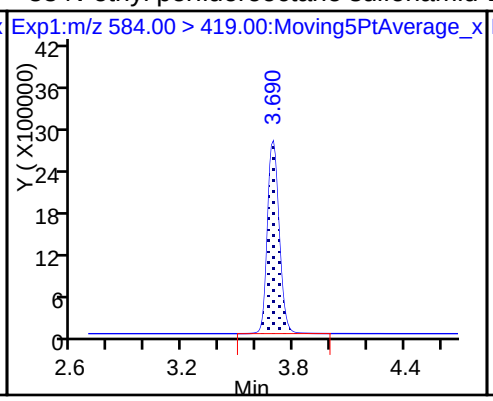
29 Perfluorodecane Sulfonic acid



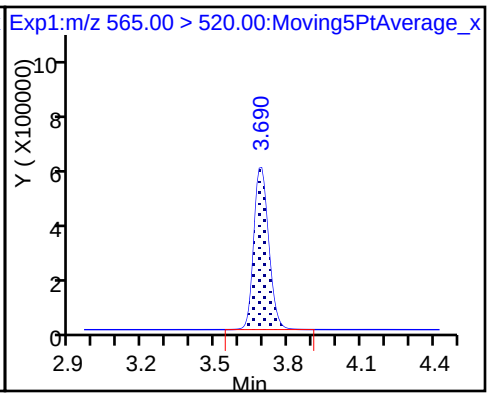
D 32 d5-NEtFOSAA



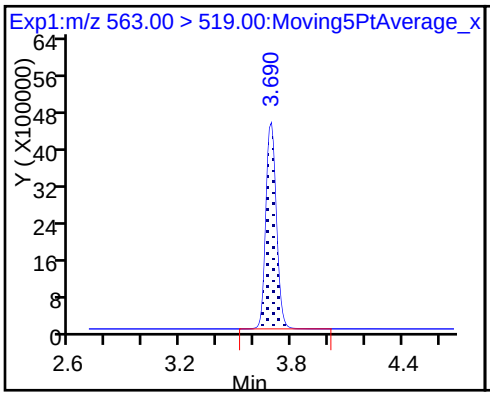
33 N-ethyl perfluorooctane sulfonamid



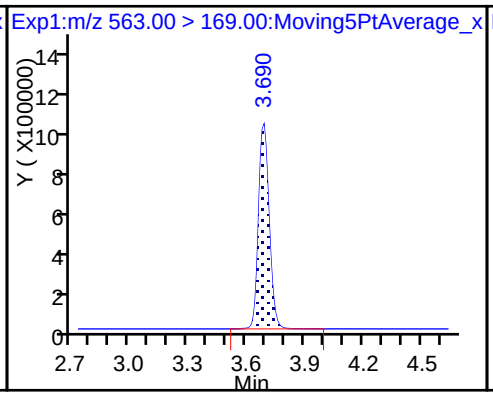
D 30 13C2 PFUnA



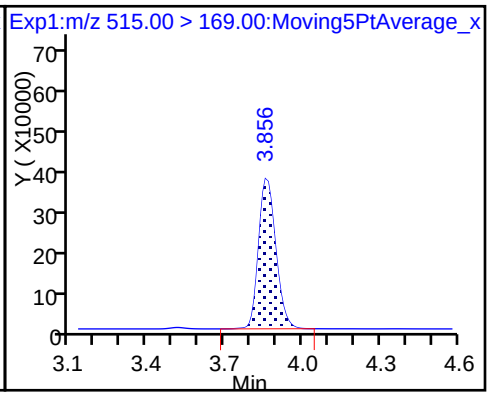
31 Perfluoroundecanoic acid



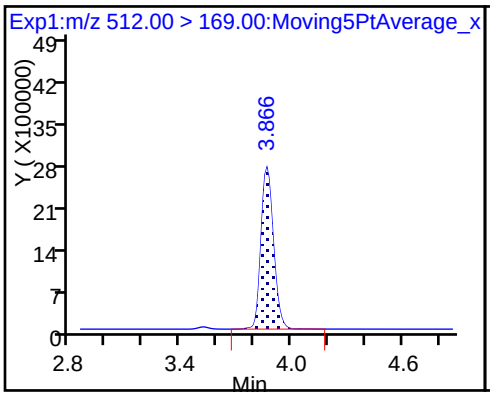
31 Perfluoroundecanoic acid



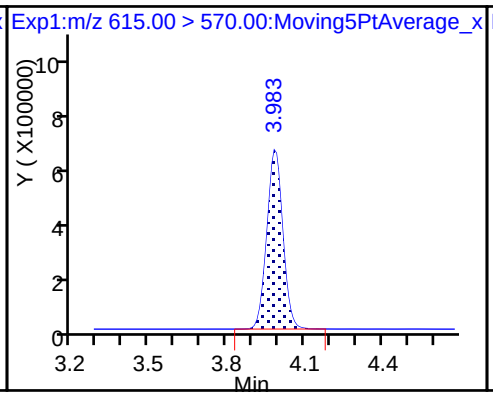
D 34 d-N-MeFOSA-M



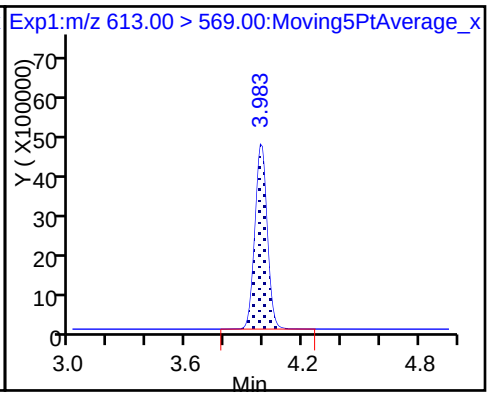
35 MeFOSA



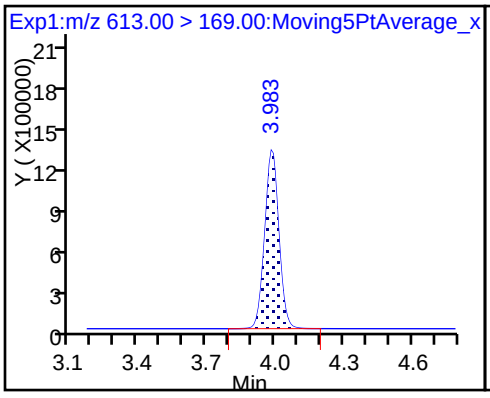
D 36 13C2 PFDoA



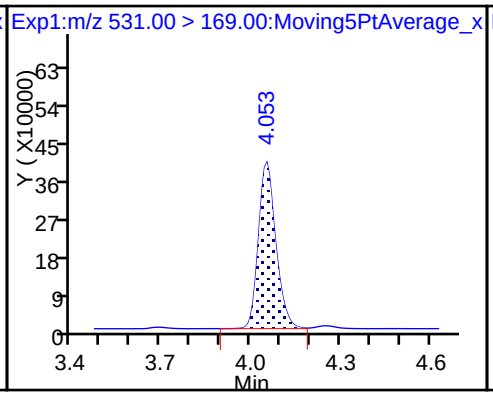
37 Perfluorododecanoic acid



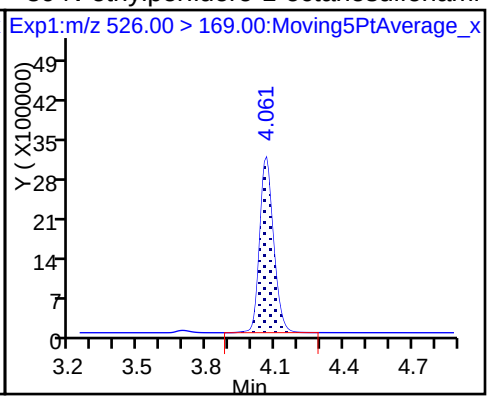
37 Perfluorododecanoic acid



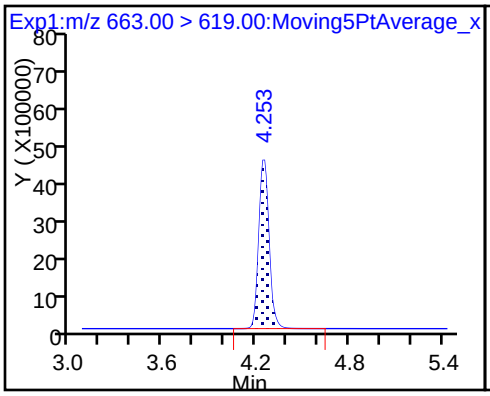
D 38 d-N-EtFOSA-M



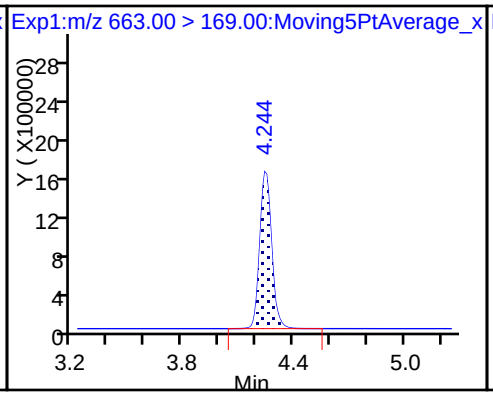
39 N-ethylperfluoro-1-octanesulfonami



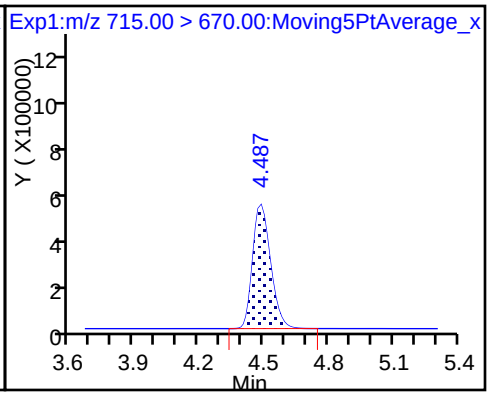
41 Perfluorotridecanoic acid



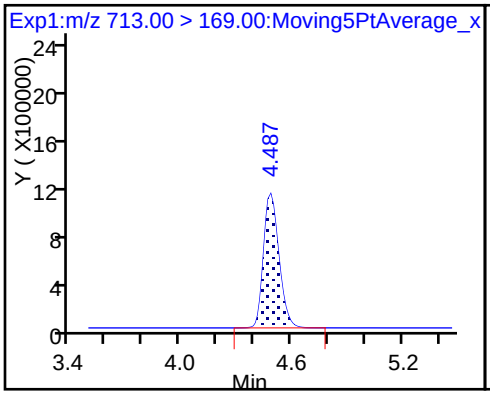
41 Perfluorotridecanoic acid



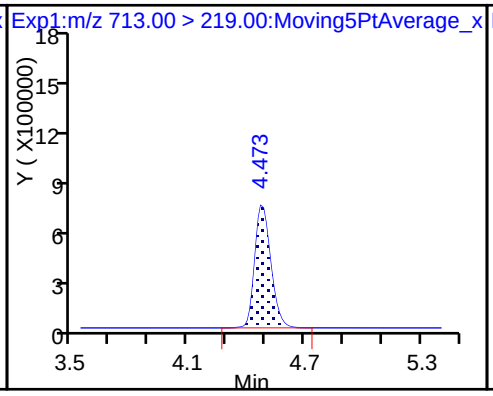
D 43 13C2-PFTeDA



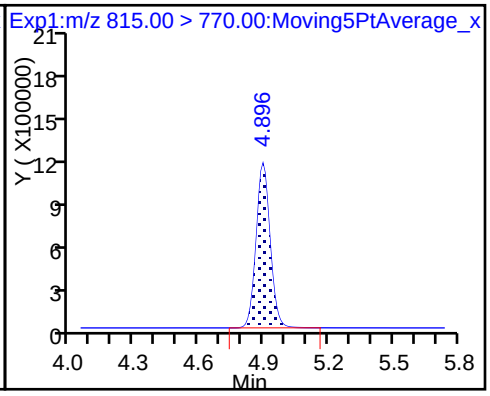
42 Perfluorotetradecanoic acid



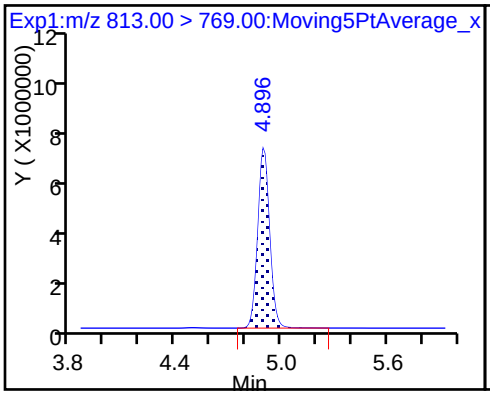
42 Perfluorotetradecanoic acid



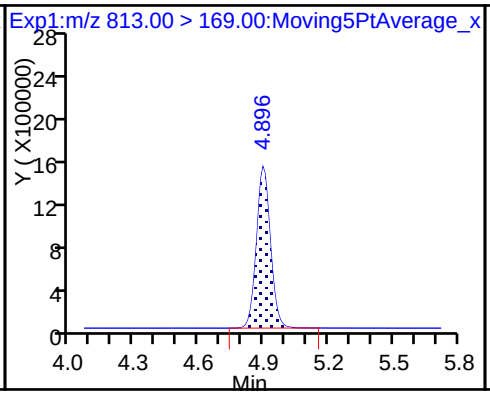
D 44 13C2-PFHxDA



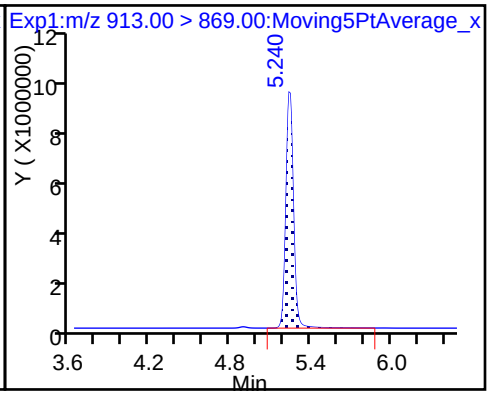
45 Perfluorohexadecanoic acid



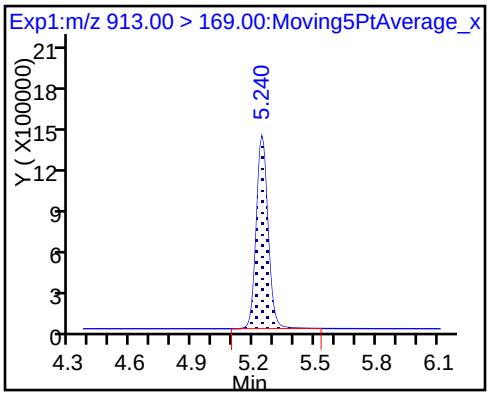
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d
Lims ID: IC M2-4:2FTS
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 04-Dec-2017 16:51:48 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\20171204-51297.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 04-Dec-2017 19:07:42 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK018

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	1.866	1.866	0.0	0.711	196115	NC			2722	
* 62 13C2-PFOA										
415.00 > 370.00	2.624	2.619	0.005		5987306	2.50			62947	

QC Flag Legend

Processing Flags
NC - Not Calibrated

Reagents:

LCM2-4:2LLIC_00002 Amount Added: 1.00 Units: mL

Report Date: 04-Dec-2017 19:07:42 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Injection Date: 04-Dec-2017 16:51:48 Instrument ID: A8_N

Lims ID: IC M2-4:2FTS

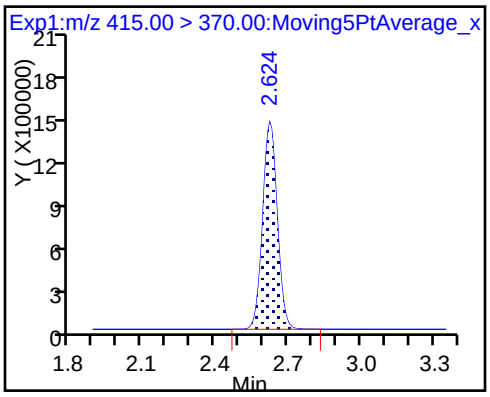
Client ID:

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.: 320-34072-1

SDG No.:

Lab Sample ID: ICV 320-198210/12 Calibration Date: 12/04/2017 17:07

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.04ICAL_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	0.9084	0.9154		2.52	2.50	0.8	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.164	1.129		2.43	2.50	-3.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.11	77.62		2.26	2.21	2.0	25.0
4:2 FTS	AveID	1.088	1.024		2.20	2.34	-5.9	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.003		2.46	2.50	-1.7	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.039	1.068		2.57	2.50	2.8	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.063	1.050		2.33	2.36	-1.3	25.0
6:2FTS	AveID	1.686	1.436		2.02	2.37	-14.8	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.301	1.283		2.35	2.38	-1.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.067	1.088		2.55	2.50	2.0	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9749	1.049		2.69	2.50	7.6	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.036	0.9838		2.27	2.39	-5.1	25.0
8:2FTS	AveID	1.235	1.159		2.25	2.40	-6.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9809	0.9717		2.48	2.50	-0.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9368	0.9316		2.49	2.50	-0.6	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.047	0.9817		2.34	2.50	-6.3	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6323	0.6771		2.58	2.41	7.1	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9417	0.8852		2.35	2.50	-6.0	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9833	1.007		2.56	2.50	2.4	25.0
MeFOSA	AveID	0.9545	0.9709		2.54	2.50	1.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9872	1.072		2.71	2.50	8.6	25.0
N-EtFOSA-M	AveID	1.050	1.019		2.43	2.50	-3.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.045	1.131		2.71	2.50	8.2	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2537	0.2434		2.40	2.50	-4.1	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9646		2.81	2.50	12.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9556	1.055		2.76	2.50	10.4	25.0
13C4 PFBA	Ave	1.489	1.433		2.41	2.50	-3.8	50.0
13C5 PFPeA	Ave	0.9288	0.8871		2.39	2.50	-4.5	50.0
13C3-PFBS	Ave	0.0193	0.0188		2.26	2.33	-2.9	50.0
13C2 PFHxA	Ave	0.9542	0.9295		2.44	2.50	-2.6	50.0
13C4-PFHpA	Ave	0.9279	0.8997		2.42	2.50	-3.0	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: ICV 320-198210/12 Calibration Date: 12/04/2017 17:07

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.04ICAL_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.162	1.123		2.29	2.37	-3.3	50.0
M2-6:2FTS	Ave	0.3113	0.3305		2.52	2.38	6.2	50.0
13C4 PFOA	Ave	1.027	0.9727		2.37	2.50	-5.3	50.0
13C4 PFOS	Ave	0.7554	0.7208		2.28	2.39	-4.6	50.0
13C5 PFNA	Ave	0.7423	0.7132		2.40	2.50	-3.9	50.0
M2-8:2FTS	Ave	0.2450	0.2564		2.51	2.40	4.6	50.0
13C2 PFDA	Ave	0.6290	0.6237		2.48	2.50	-0.8	50.0
13C8 FOSA	Ave	1.017	0.9707		2.39	2.50	-4.6	50.0
d3-NMeFOSAA	Ave	0.3356	0.3475		2.59	2.50	3.6	50.0
13C2 PFUnA	Ave	0.4846	0.4570		2.36	2.50	-5.7	50.0
d5-NEtFOSAA	Ave	0.3261	0.3401		2.61	2.50	4.3	50.0
d-N-MeFOSA-M	Ave	0.2938	0.2856		2.43	2.50	-2.8	50.0
13C2 PFDoA	Ave	0.5394	0.5082		2.36	2.50	-5.8	50.0
d-N-EtFOSA-M	Ave	0.2737	0.2720		2.49	2.50	-0.6	50.0
13C2-PFTeDA	Ave	0.6284	0.6246		2.48	2.50	-0.6	50.0
13C2-PFHxDA	Ave	1.040	0.996		2.40	2.50	-4.2	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_012.d
Lims ID: ICV Full
Client ID:
Sample Type: ICV
Inject. Date: 04-Dec-2017 17:07:31 ALS Bottle#: 18 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\20171204-51297.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 04-Dec-2017 19:13:35 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: phomsophat Date: 04-Dec-2017 18:59:43

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	1.404	1.401	0.003	0.536	8406421	2.41		96.2	58630	
2 Perfluorobutyric acid										
212.90 > 169.00	1.404	1.402	0.002	1.000	7695412	2.52			2356	
D 3 13C5-PFPeA										
267.90 > 223.00	1.647	1.646	0.001	0.629	5204331	2.39		95.5	61692	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.647	1.648	-0.001	1.000	5876085	2.43			3720	
D 47 13C3-PFBS										
301.90 > 83.00	1.679	1.681	-0.002	0.641	102273	2.26		97.1	2802	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.687	1.682	0.005	1.005	7554616	2.26			29723	
298.90 > 99.00	1.679	1.682	-0.003	1.000	3261313		2.32(1.25-3.74)		25684	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.886	1.887	-0.001	1.000	1854437	2.20			57477	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.923	1.923	0.0	1.000	5470450	2.46			11601	
313.00 > 119.00	1.923	1.923	0.0	1.000	517628		10.57(5.03-15.10)		7651	
D 7 13C2 PFHxA										
315.00 > 270.00	1.923	1.924	-0.001	0.734	5453095	2.44		97.4	50971	
D 9 13C4-PFHpA										
367.00 > 322.00	2.258	2.254	0.004	0.862	5278390	2.42		97.0	50266	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.258	2.255	0.003	1.000	5638456	2.57			7068	
363.00 > 169.00	2.258	2.255	0.003	1.000	2202021		2.56(1.13-3.40)		17351	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.268	2.269	-0.001	1.000	6533456	2.33			14251	
399.00 > 99.00	2.268	2.269	-0.001	1.000	2082022		3.14(1.50-4.49)		9625	

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	2.268	2.271	-0.003	0.866	6231245	2.29		96.7	59445	
D 12 M2-6:2FTS										
429.00 > 81.00	2.604	2.605	-0.001	0.994	1842033	2.52		106	42141	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.611	2.605	0.006	1.003	2640255	2.02			49600	
D 14 13C4 PFOA										
417.00 > 372.00	2.618	2.618	0.0	1.000	5706626	2.37		94.7	53023	
* 62 13C2-PFOA										
415.00 > 370.00	2.618	2.619	-0.001		5866554	2.50			59057	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.625	2.621	0.004	1.003	6210380	2.55			3090	
413.00 > 169.00	2.618	2.621	-0.003	1.000	3321056		1.87(0.84-2.52)		19811	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.625	2.626	-0.001	1.000	5166367	2.35			57488	
449.00 > 99.00	2.625	2.626	-0.001	1.000	1348039		3.83(1.94-5.82)		31406	
D 18 13C4 PFOS										
503.00 > 80.00	2.992	2.993	-0.001	1.143	4042343	2.28		95.4	38699	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.992	2.994	-0.002	1.000	3972715	2.27			188650	
499.00 > 99.00	2.992	2.994	-0.002	1.000	917205		4.33(2.31-6.93)		12757	
D 19 13C5 PFNA										
468.00 > 423.00	2.992	2.994	-0.002	1.143	4183899	2.40		96.1	49544	
20 Perfluorononanoic acid										
463.00 > 419.00	2.992	2.994	-0.002	1.000	4388544	2.69			13046	
463.00 > 169.00	2.992	2.994	-0.002	1.000	1045930		4.20(1.90-5.69)		31132	
D 26 M2-8:2FTS										
529.00 > 81.00	3.349	3.343	0.006	1.279	1440713	2.51		105	25457	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.342	3.344	-0.002	0.998	1670279	2.25			31931	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.357	3.356	0.001	1.000	3555261	2.48			13159	
513.00 > 169.00	3.357	3.356	0.001	1.000	652371		5.45(2.36-7.09)		2397	
D 23 13C2 PFDA										
515.00 > 470.00	3.357	3.356	0.001	1.282	3658799	2.48		99.2	36819	
D 21 13C8 FOSA										
506.00 > 78.00	3.357	3.359	-0.002	1.282	5694424	2.39		95.4	37010	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.357	3.359	-0.002	1.000	5304778	2.49			27099	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.509	3.511	-0.002	1.340	2038669	2.59		104	22975	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.517	3.515	0.002	1.002	2001370	2.34			12612	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.666	3.667	-0.001	1.000	2762670	2.58			58337	
599.00 > 99.00	3.666	3.667	-0.001	1.000	909997		3.04(1.39-4.16)		28732	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.682	3.677	0.005	1.406	1995028	2.61		104	10459	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.682	3.685	-0.003	1.000	1765998	2.35			14501	
D 30 13C2 PFUnA										
565.00 > 520.00	3.682	3.685	-0.003	1.406	2680940	2.36		94.3	25053	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.682	3.685	-0.003	1.000	2698855	2.56			12170	
563.00 > 169.00	3.682	3.685	-0.003	1.000	567156		4.76(0.00-0.00)		19283	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.856	3.856	0.0	1.473	1675226	2.43		97.2	3707	
35 MeFOSA										
512.00 > 169.00	3.867	3.865	0.002	1.003	1626549	2.54			3834	
D 36 13C2 PFDoA										
615.00 > 570.00	3.983	3.979	0.004	1.521	2981359	2.36		94.2	31000	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.983	3.982	0.001	1.000	3195606	2.71			7797	
613.00 > 169.00	3.983	3.982	0.001	1.000	753365		4.24(2.13-6.40)		29943	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.046	4.048	-0.002	1.545	1595803	2.49		99.4	3438	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.054	4.056	-0.002	1.002	1626038	2.43			3418	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.245	4.243	0.002	1.000	3370698	2.71			9042	
663.00 > 169.00	4.245	4.243	0.002	1.000	1053770		3.20(1.25-3.76)		30731	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.488	4.481	0.007	1.714	3664309	2.48		99.4	24788	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.488	4.481	0.007	1.000	891724	2.40			22346	
713.00 > 219.00	4.473	4.481	-0.008	0.997	594748		1.50(0.71-2.13)		26714	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.896	4.892	0.004	1.870	5843143	2.40		95.8	21322	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.896	4.894	0.002	1.000	5636072	2.81			2994	
813.00 > 169.00	4.896	4.894	0.002	1.000	990747		5.69(2.86-8.58)		9400	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.247	5.242	0.005	1.000	6167017	2.76			1185	
913.00 > 169.00	5.240	5.242	-0.002	0.999	740495		8.33(0.00-0.00)		2664	

Reagents:

LCPFCIC_FULL_00007 Amount Added: 0.25 Units: mL

Report Date: 04-Dec-2017 19:13:36 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_012.d

Injection Date: 04-Dec-2017 17:07:31 Instrument ID: A8_N

Lims ID: ICV Full

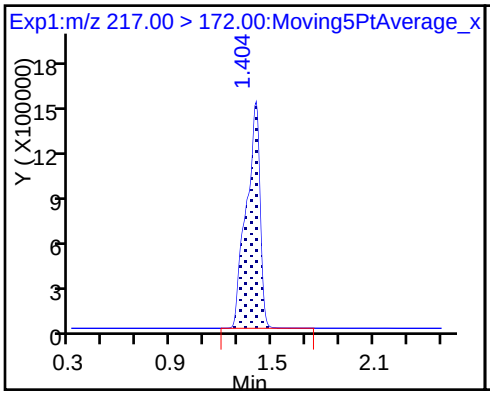
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 18 Worklist Smp#: 12

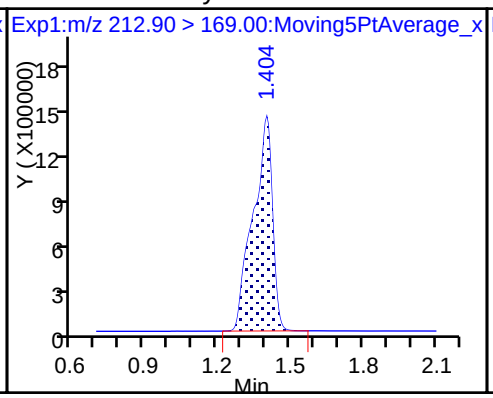
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

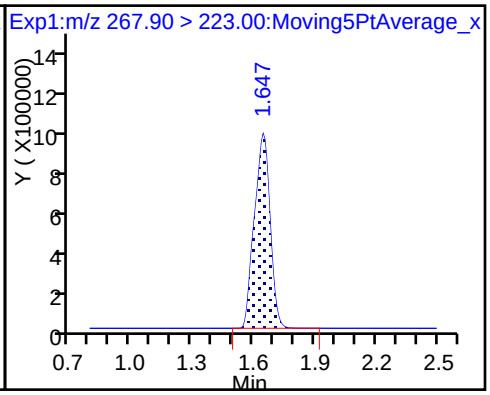
D 1 13C4 PFBA



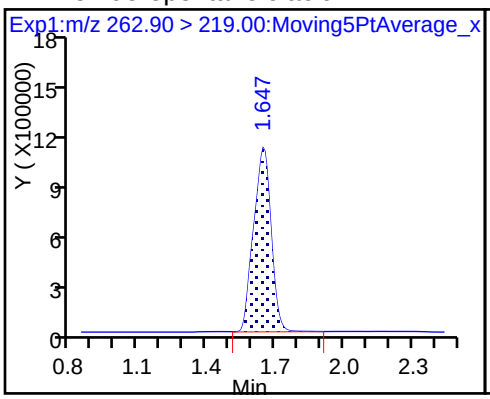
2 Perfluorobutyric acid



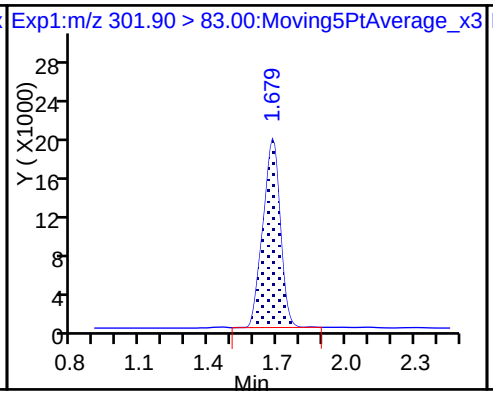
D 3 13C5-PFPeA



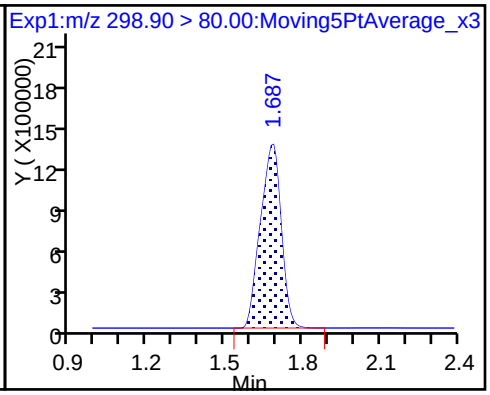
4 Perfluoropentanoic acid



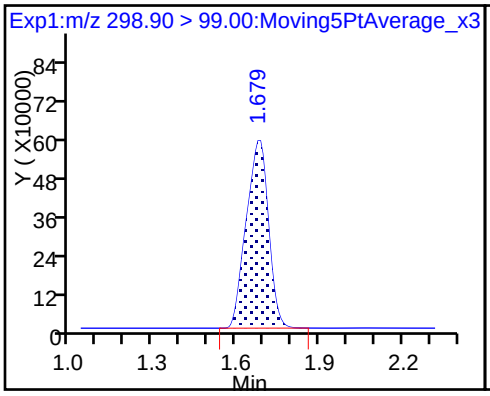
D 47 13C3-PFBS



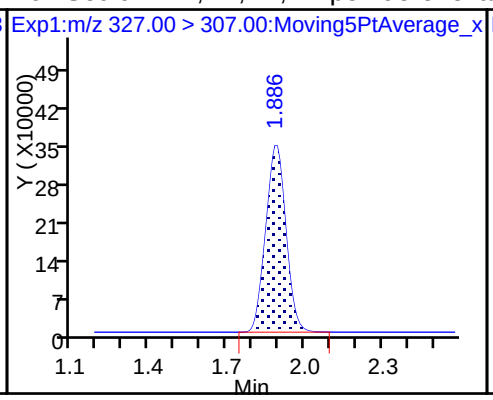
5 Perfluorobutanesulfonic acid



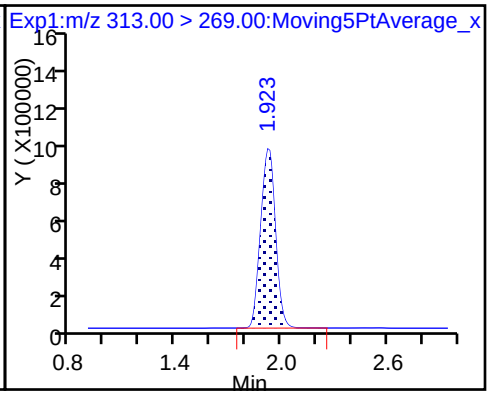
5 Perfluorobutanesulfonic acid



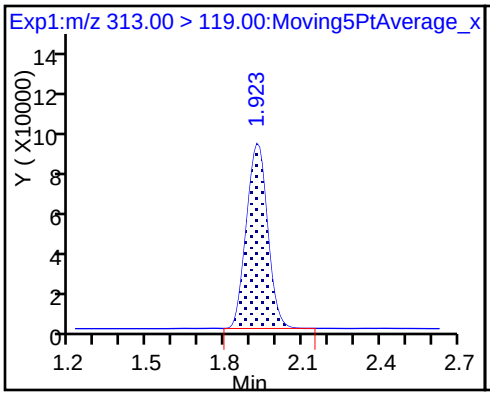
61 Sodium 1H,1H,2H,2H-perfluorohexane



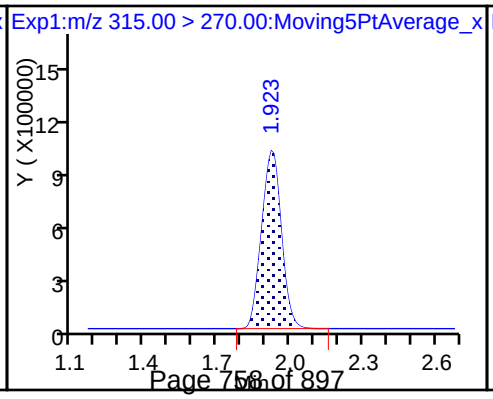
6 Perfluorohexanoic acid



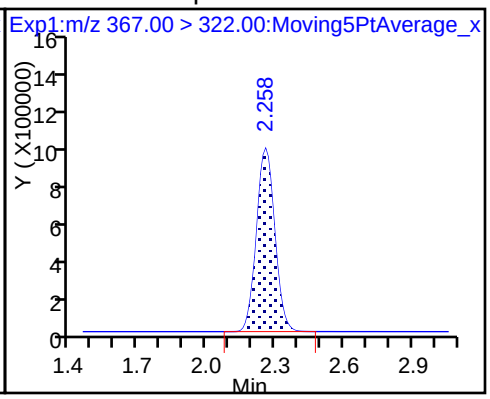
6 Perfluorohexanoic acid



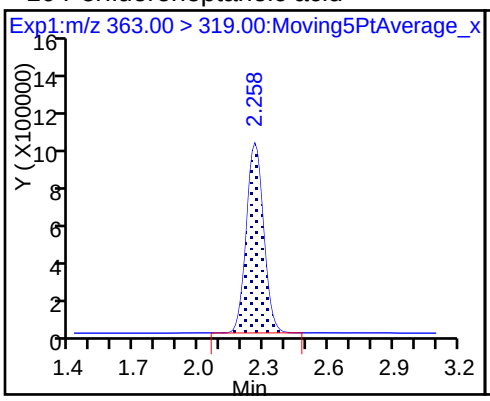
D 7 13C2 PFHxA



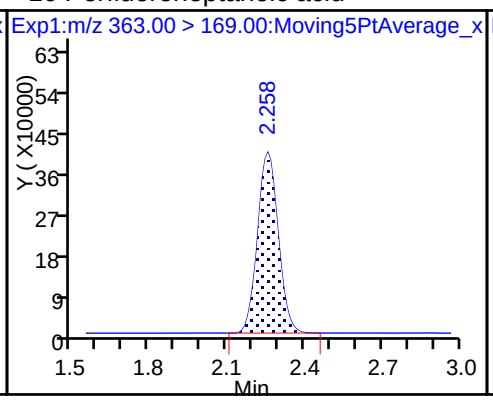
D 9 13C4-PFHpA



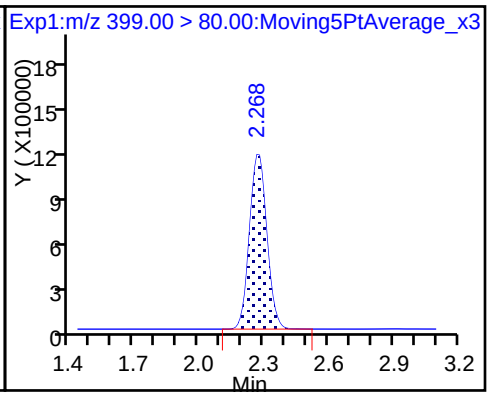
10 Perfluoroheptanoic acid



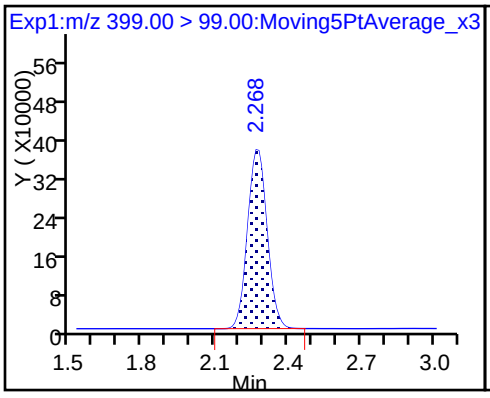
10 Perfluoroheptanoic acid



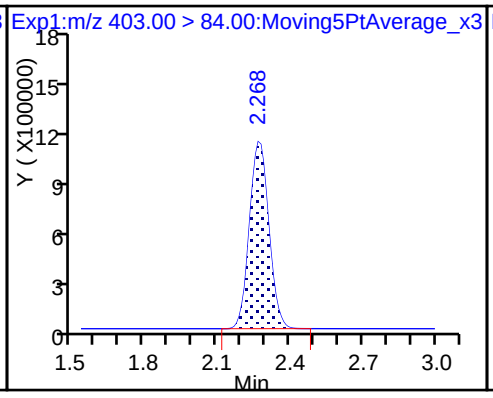
8 Perfluorohexanesulfonic acid



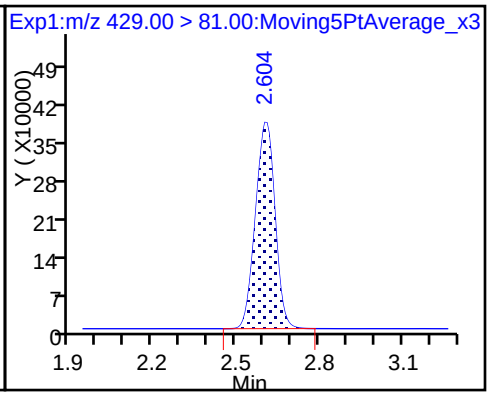
8 Perfluorohexanesulfonic acid



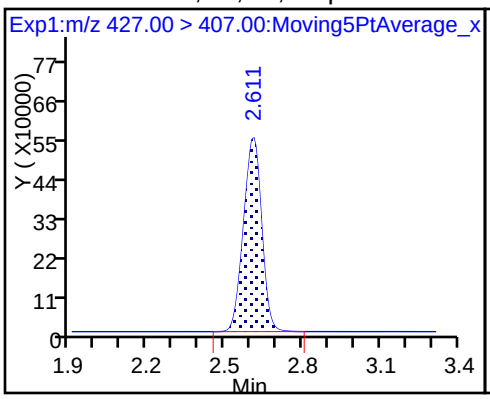
D 11 18O2 PFHxS



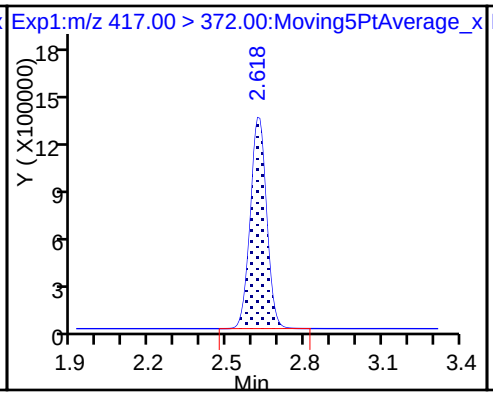
D 12 M2-6:2FTS



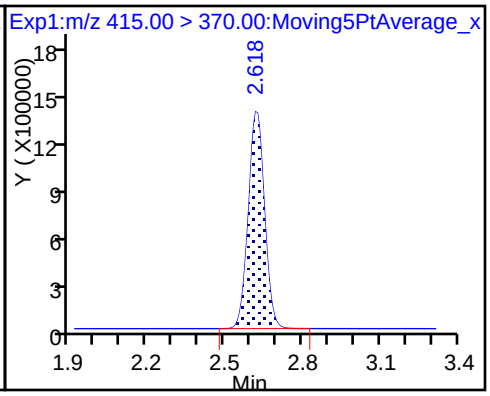
13 Sodium 1H,1H,2H,2H-perfluorooctane



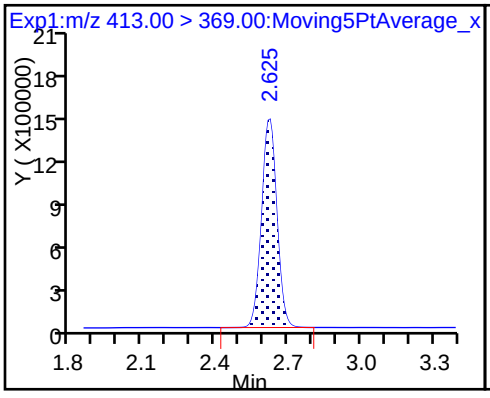
D 14 13C4 PFOA



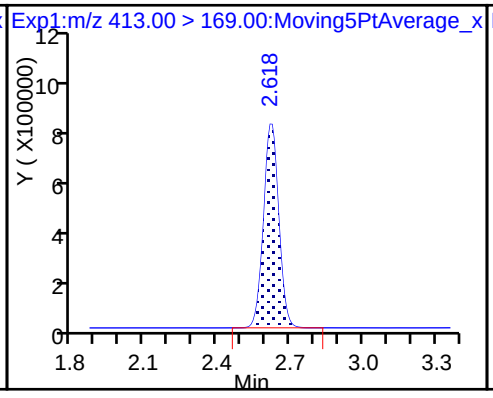
* 62 13C2-PFOA



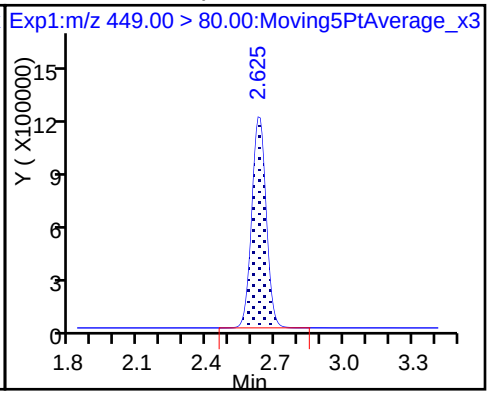
15 Perfluorooctanoic acid



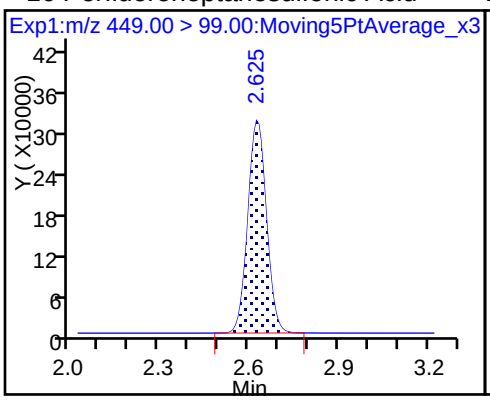
15 Perfluorooctanoic acid



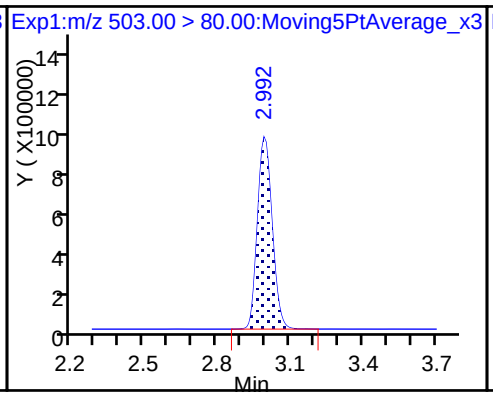
16 Perfluoroheptanesulfonic Acid



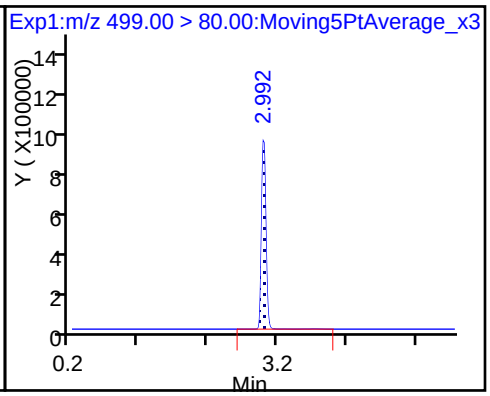
16 Perfluoroheptanesulfonic Acid



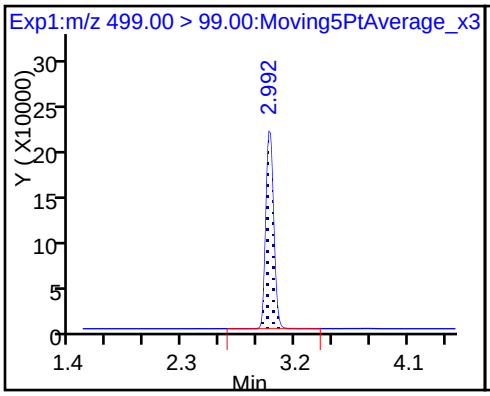
D 18 13C4 PFOS



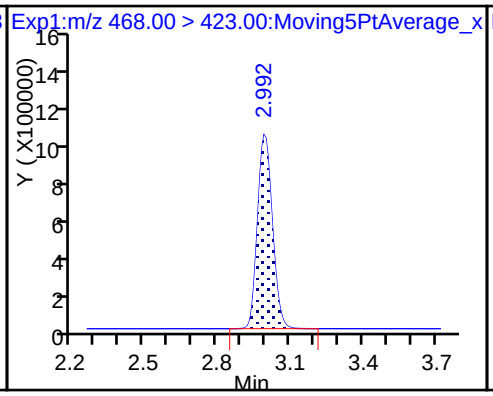
17 Perfluorooctane sulfonic acid



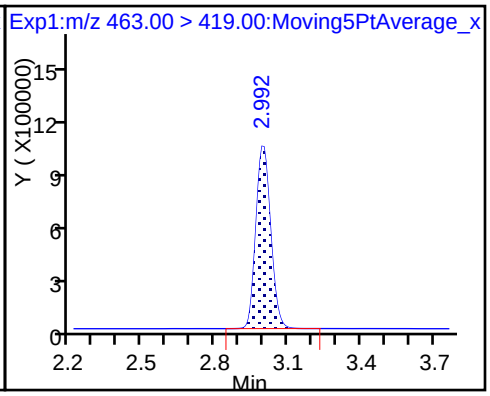
17 Perfluorooctane sulfonic acid



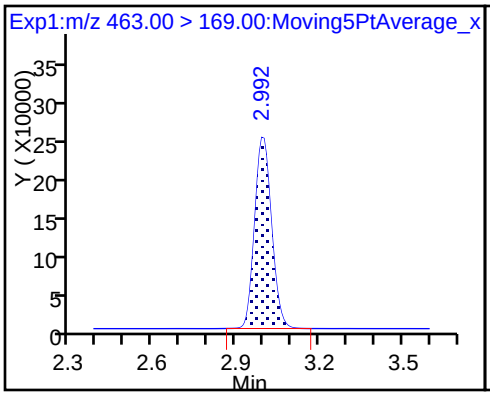
D 19 13C5 PFNA



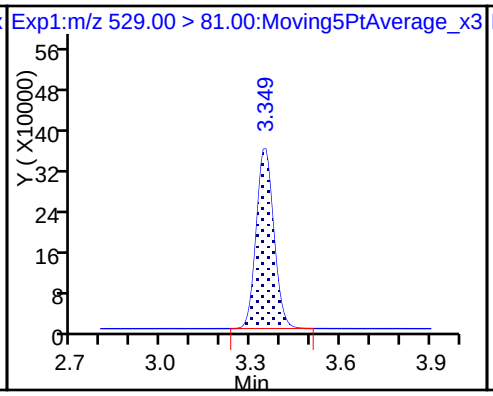
20 Perfluorononanoic acid



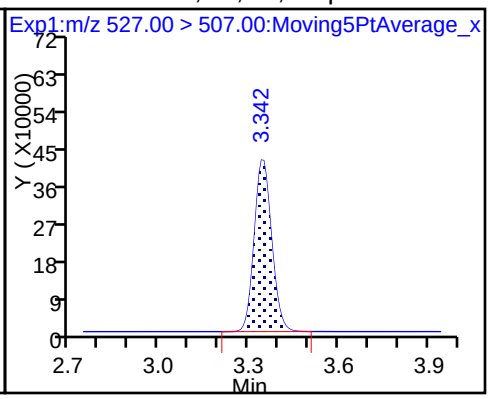
20 Perfluorononanoic acid



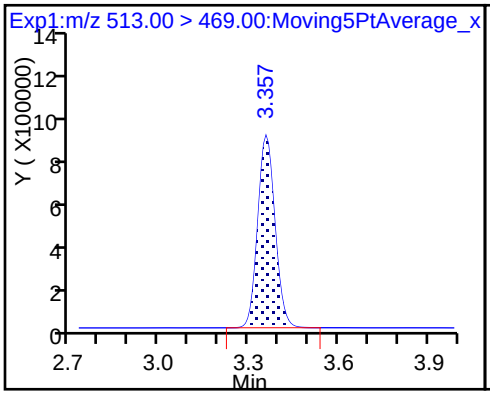
D 26 M2-8:2FTS



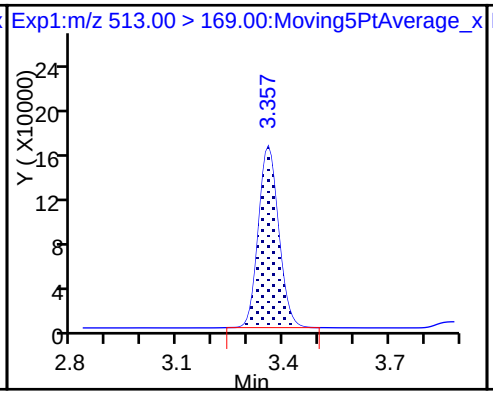
25 Sodium 1H,1H,2H,2H-perfluorodecane



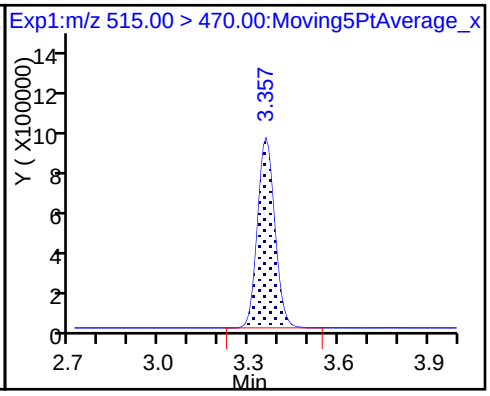
24 Perfluorodecanoic acid



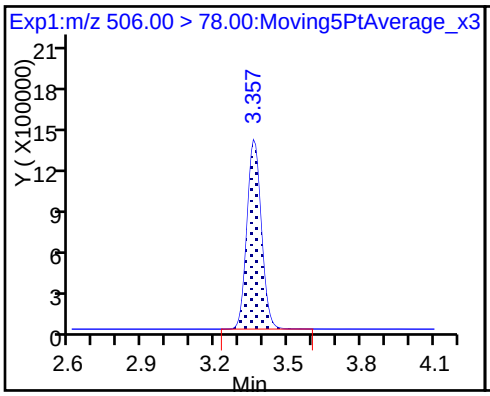
24 Perfluorodecanoic acid



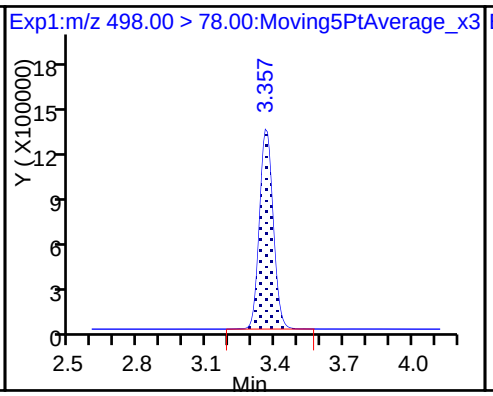
D 23 13C2 PFDA



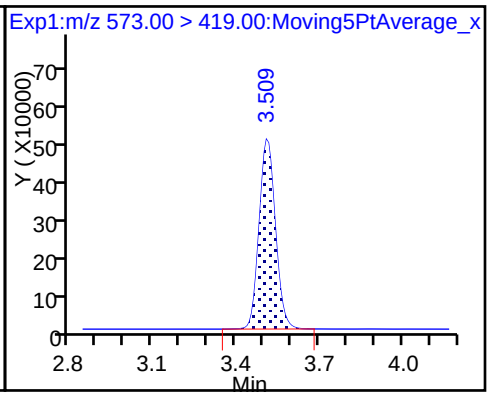
D 21 13C8 FOSA



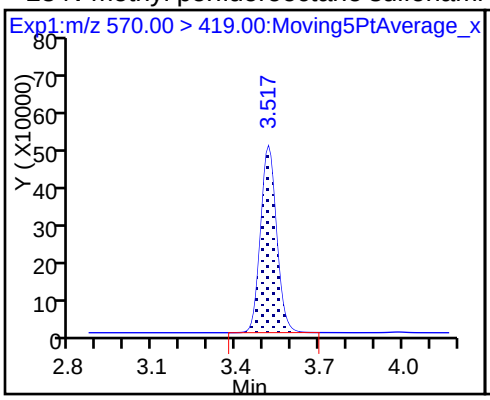
22 Perfluorooctane Sulfonamide



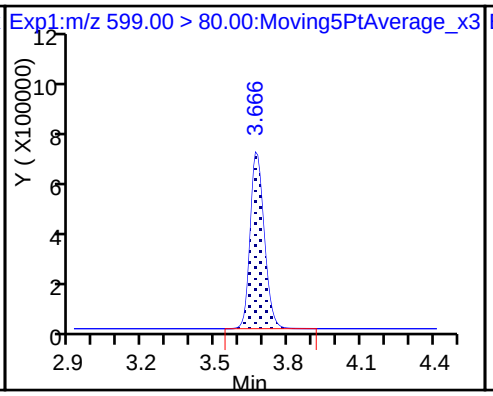
D 27 d3-NMeFOSAA



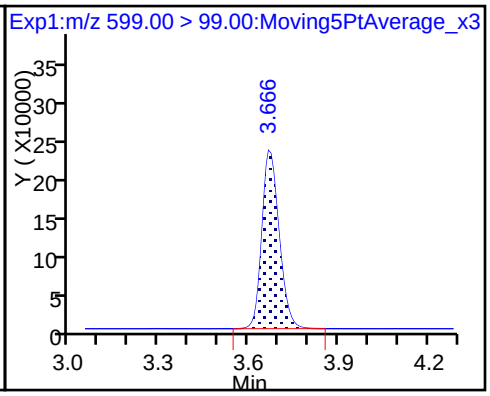
28 N-methyl perfluorooctane sulfonami



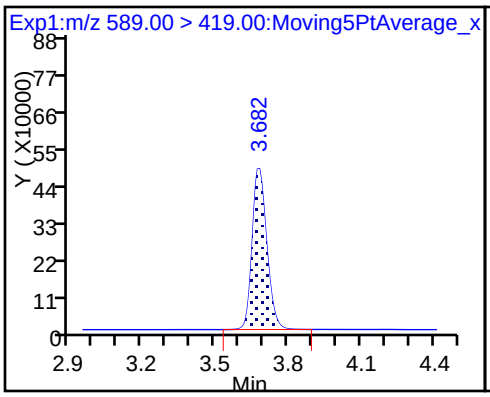
29 Perfluorodecane Sulfonic acid



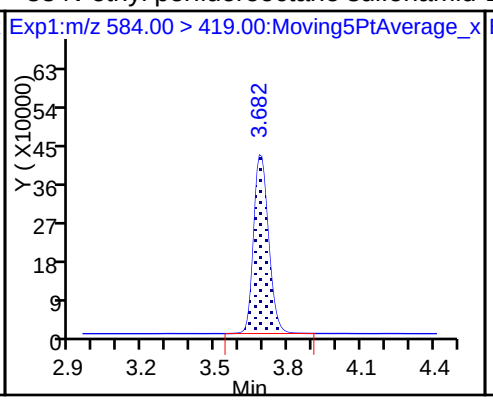
29 Perfluorodecane Sulfonic acid



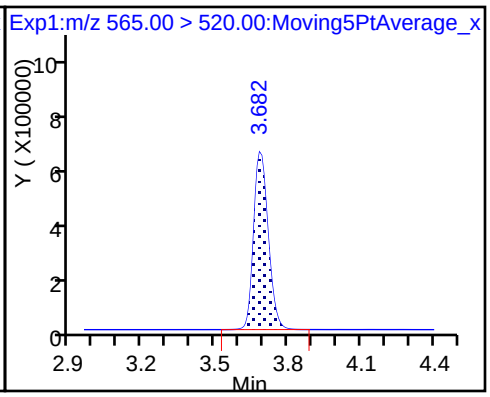
D 32 d5-NEtFOSAA



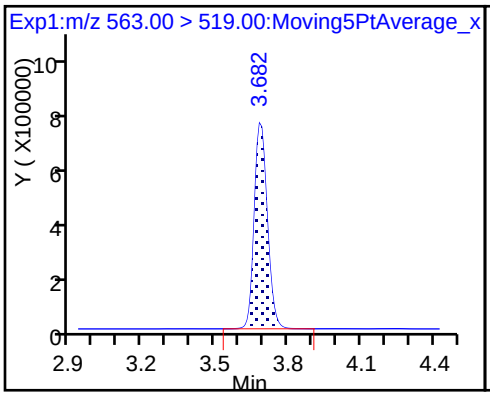
33 N-ethyl perfluorooctane sulfonamid



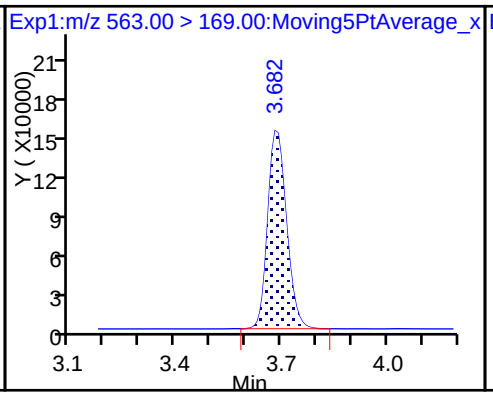
D 30 13C2 PFUnA



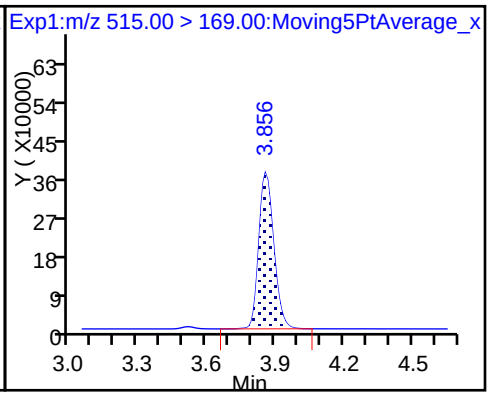
31 Perfluoroundecanoic acid



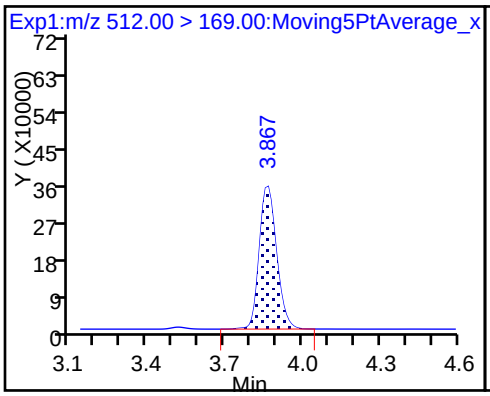
31 Perfluoroundecanoic acid



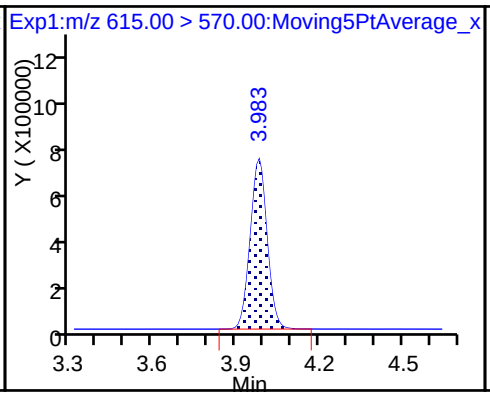
D 34 d-N-MeFOSA-M



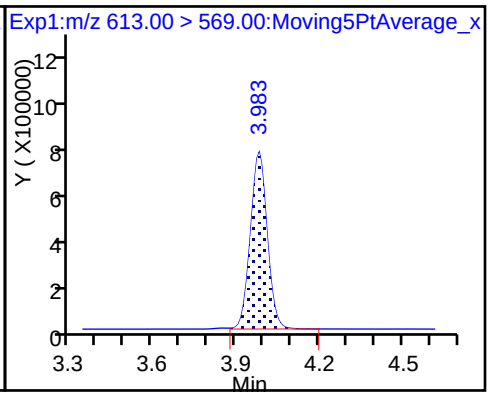
35 MeFOSA



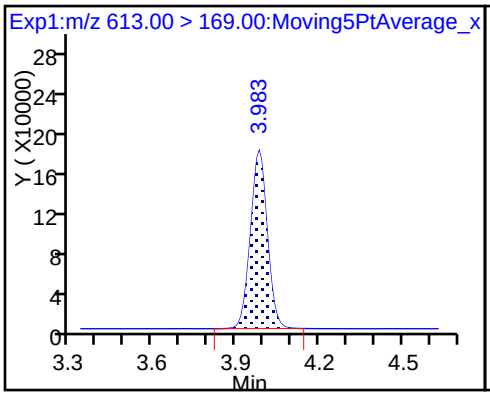
D 36 13C2 PFDoA



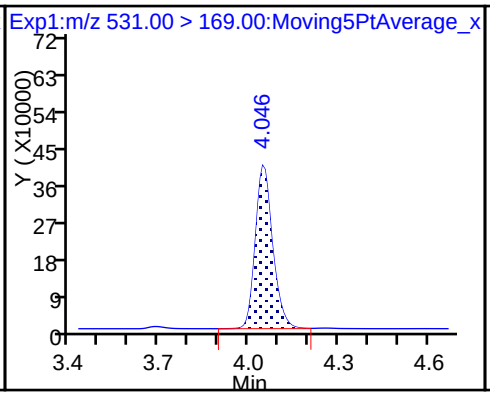
37 Perfluorododecanoic acid



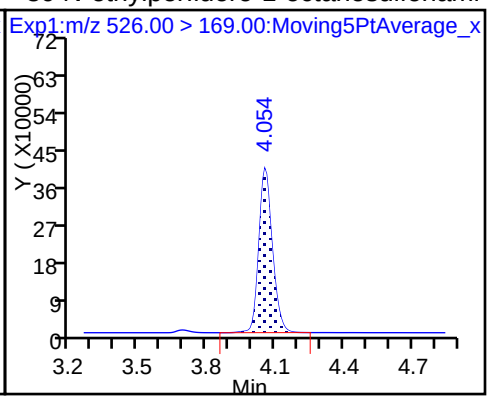
37 Perfluorododecanoic acid



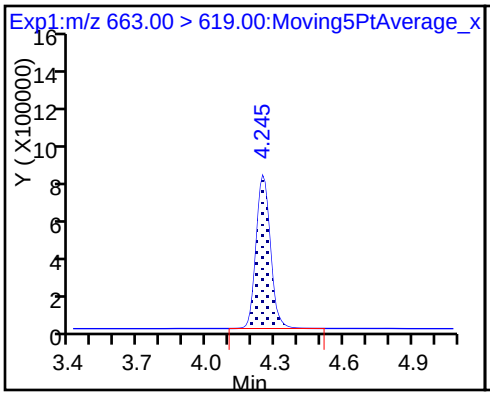
D 38 d-N-EtFOSA-M



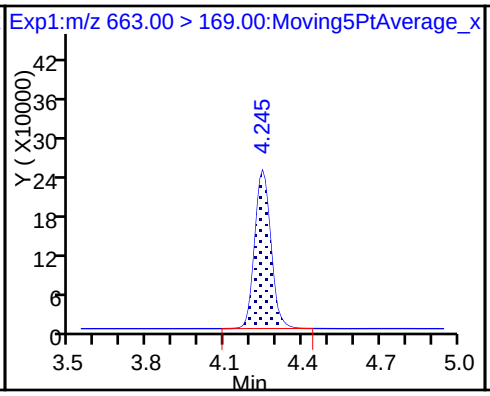
39 N-ethylperfluoro-1-octanesulfonami



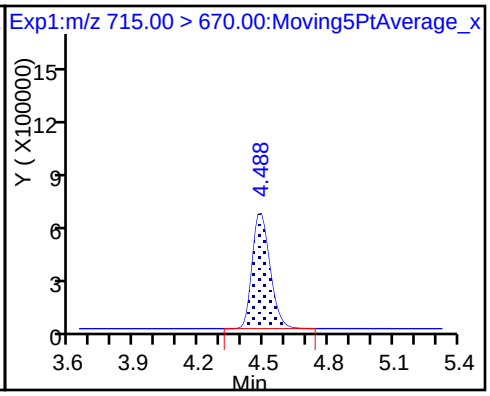
41 Perfluorotridecanoic acid



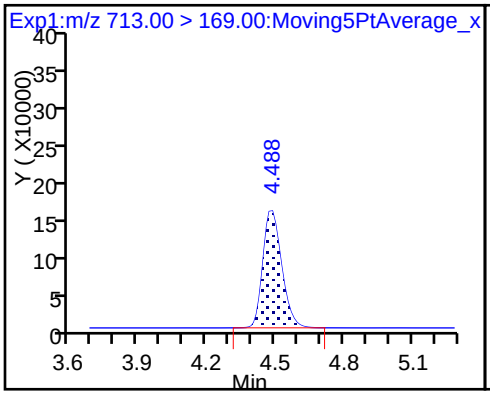
41 Perfluorotridecanoic acid



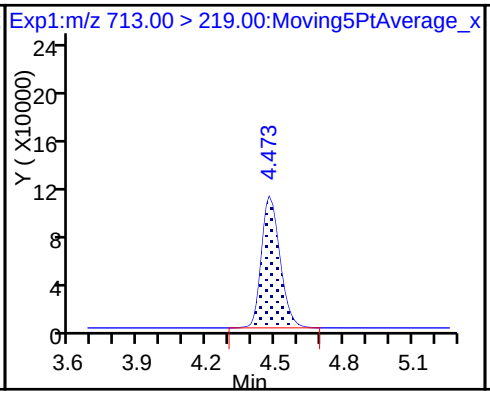
D 43 13C2-PFTeDA



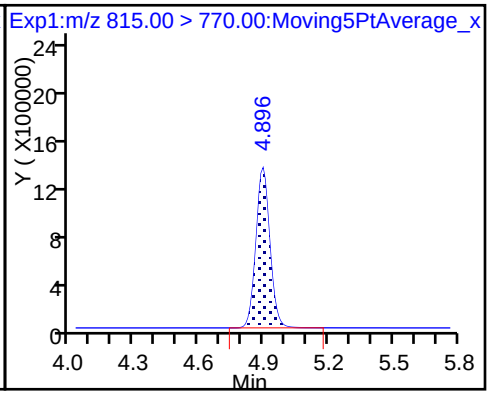
42 Perfluorotetradecanoic acid



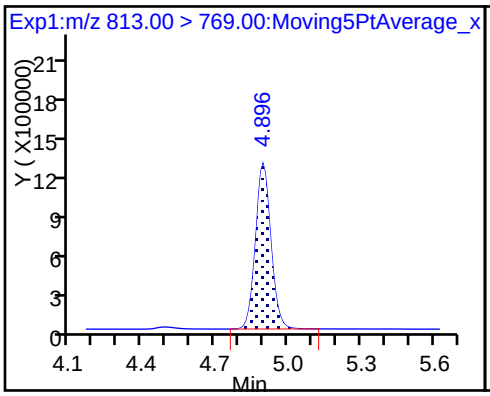
42 Perfluorotetradecanoic acid



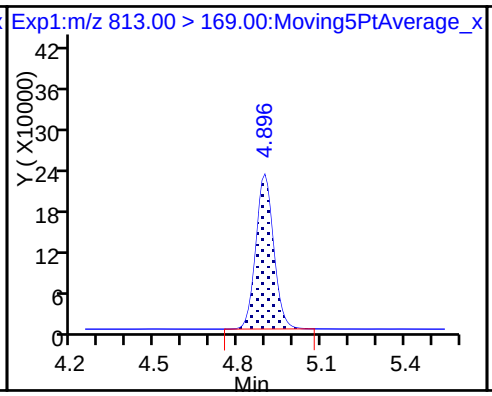
D 44 13C2-PFHxDA



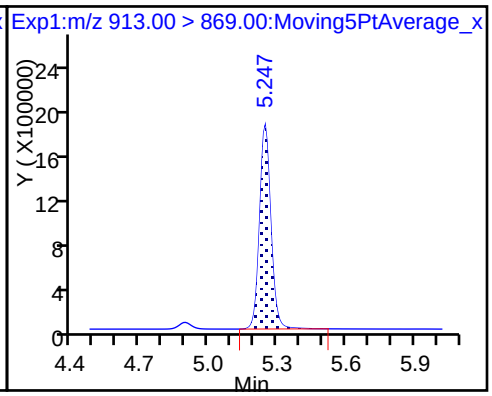
45 Perfluorohexadecanoic acid



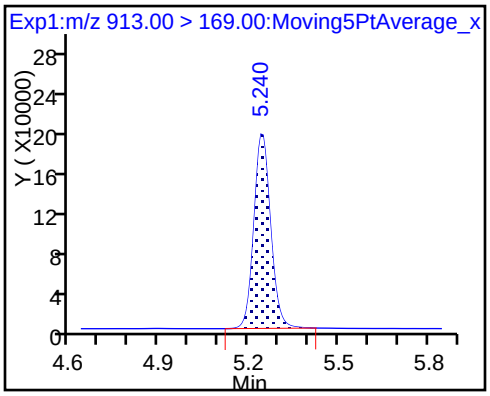
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCVL 320-199573/1 Calibration Date: 12/12/2017 15:08

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.12LLA_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	0.9084	0.9132		0.0503	0.0500	0.5	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.164	1.220		0.0524	0.0500	4.8	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.11	76.93		0.0447	0.0442	1.1	50.0
4:2 FTS	AveID	1.088	0.6600		0.283	0.467	-39.3	50.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.040		0.0509	0.0500	1.9	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.039	1.007		0.0485	0.0500	-3.1	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.063	1.259		0.0539	0.0455	18.4	50.0
6:2FTS	AveID	1.686	1.818		0.511	0.474	7.8	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.067	1.195		0.0560	0.0500	12.1	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.301	1.366		0.0500	0.0476	4.9	50.0
Perfluorononanoic acid (PFNA)	AveID	0.9749	1.011		0.0519	0.0500	3.7	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.036	1.080		0.0483	0.0464	4.2	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9368	1.014		0.0541	0.0500	8.2	50.0
8:2FTS	AveID	1.235	1.186		0.460	0.479	-3.9	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9809	1.039		0.0529	0.0500	5.9	50.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.047	1.043		0.498	0.500	-0.4	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6323	0.5329		0.0406	0.0482	-15.7	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9417	1.021		0.542	0.500	8.4	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9833	0.9661		0.0491	0.0500	-1.8	50.0
MeFOSA	AveID	0.9545	0.9862		0.517	0.500	3.3	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9872	1.003		0.0508	0.0500	1.6	50.0
N-EtFOSA-M	AveID	1.050	1.109		0.528	0.500	5.6	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.045	1.199		0.0574	0.0500	14.7	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2537	0.2616		0.0516	0.0500	3.1	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.203		0.0463	0.0500	-7.3	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9556	0.9740		0.0510	0.0500	1.9	50.0
13C4 PFBA	Ave	1.489	1.472		2.47	2.50	-1.2	50.0
13C5 PFPeA	Ave	0.9288	0.8569		2.31	2.50	-7.7	50.0
13C3-PFBS	Ave	0.0193	0.0186		2.24	2.33	-3.7	50.0
13C2 PFHxA	Ave	0.9542	0.9337		2.45	2.50	-2.1	50.0
13C4-PFHpA	Ave	0.9279	0.8885		2.39	2.50	-4.2	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCVL 320-199573/1 Calibration Date: 12/12/2017 15:08

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.12LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.162	1.114		2.27	2.37	-4.1	50.0
M2-6:2FTS	Ave	0.3113	0.4517		3.45	2.38	45.1	50.0
13C4 PFOA	Ave	1.027	1.038		2.53	2.50	1.1	50.0
13C4 PFOS	Ave	0.7554	0.7307		2.31	2.39	-3.3	50.0
13C5 PFNA	Ave	0.7423	0.7345		2.47	2.50	-1.1	50.0
13C8 FOSA	Ave	1.017	0.9806		2.41	2.50	-3.6	50.0
M2-8:2FTS	Ave	0.2450	0.1974		1.93	2.40	-19.4	50.0
13C2 PFDA	Ave	0.6290	0.5765		2.29	2.50	-8.3	50.0
d3-NMeFOSAA	Ave	0.3356	0.3274		2.44	2.50	-2.4	50.0
13C2 PFUnA	Ave	0.4846	0.4644		2.40	2.50	-4.2	50.0
d5-NEtFOSAA	Ave	0.3261	0.3262		2.50	2.50	0.0	50.0
d-N-MeFOSA-M	Ave	0.2938	0.2732		2.32	2.50	-7.0	50.0
13C2 PFDoA	Ave	0.5394	0.4897		2.27	2.50	-9.2	50.0
d-N-EtFOSA-M	Ave	0.2737	0.2466		2.25	2.50	-9.9	50.0
13C2-PFTeDA	Ave	0.6284	0.5479		2.18	2.50	-12.8	50.0
13C2-PFHxDA	Ave	1.040	1.098		2.64	2.50	5.6	50.0

FORM VII 537 (modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171212-51666.b\2017.12.12LLA_005.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 12-Dec-2017 15:08:16 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\20171212-51666.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 13-Dec-2017 09:43:34 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK047

First Level Reviewer: hannigana Date: 13-Dec-2017 09:43:34

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	1.409	1.401	0.008	0.534	8774797	2.47		98.8	50588	
2 Perfluorobutyric acid										
212.90 > 169.00	1.415	1.402	0.013	1.004	160256	0.0503		101	40.2	
D 3 13C5-PFPeA										
267.90 > 223.00	1.654	1.646	0.008	0.627	5108954	2.31		92.3	47977	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.662	1.648	0.014	1.005	124625	0.0524		105	74.2	
D 47 13C3-PFBS										
301.90 > 83.00	1.696	1.681	0.015	0.642	103152	2.24		96.3	3901	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.696	1.682	0.014	1.000	150866	0.0447		101	890	
298.90 > 99.00	1.696	1.682	0.014	1.000	65954		2.29(1.25-3.74)		623	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.903	1.887	0.016	1.000	332033	0.2834		60.7	15176	
6 Perfluorohexanoic acid										M
313.00 > 269.00	1.942	1.923	0.019	1.000	115793	0.0509		102	247	M
313.00 > 119.00	1.942	1.923	0.019	1.000	12916		8.97(5.03-15.10)		316	
D 7 13C2 PFHxA										
315.00 > 270.00	1.942	1.924	0.018	0.736	5567373	2.45		97.9	58901	
D 9 13C4-PFHpA										
367.00 > 322.00	2.279	2.254	0.025	0.863	5297866	2.39		95.8	43655	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.279	2.255	0.024	1.000	106702	0.0485		96.9	173	
363.00 > 169.00	2.279	2.255	0.024	1.000	47758		2.23(1.13-3.40)		346	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.289	2.269	0.020	1.000	152253	0.0539		118	1502	
399.00 > 99.00	2.289	2.269	0.020	1.000	47530		3.20(1.50-4.49)		413	

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	2.289	2.271	0.018	0.867	6285821	2.27		95.9	52547	
D 12 M2-6:2FTS										
429.00 > 81.00	2.625	2.605	0.020	0.995	2558358	3.45		145	72420	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.625	2.605	0.020	1.000	928238	0.5111		108	26484	
D 14 13C4 PFOA										
417.00 > 372.00	2.640	2.618	0.022	1.000	6190503	2.53		101	46877	
* 62 13C2-PFOA										
415.00 > 370.00	2.640	2.619	0.021		5962472	2.50			54060	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.640	2.621	0.019	1.000	147992	0.0560		112	67.7	
413.00 > 169.00	2.640	2.621	0.019	1.000	77668		1.91(0.84-2.52)		719	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.647	2.626	0.021	1.000	113287	0.0500		105	3320	
449.00 > 99.00	2.640	2.626	0.014	0.997	32473		3.49(1.94-5.82)		950	
D 18 13C4 PFOS										
503.00 > 80.00	3.016	2.993	0.023	1.142	4165251	2.31		96.7	38044	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.016	2.994	0.022	1.000	87329	0.0483		104	459	
499.00 > 99.00	3.016	2.994	0.022	1.000	17473		5.00(2.31-6.93)		263	
D 19 13C5 PFNA										
468.00 > 423.00	3.016	2.994	0.022	1.142	4379233	2.47		98.9	41592	
20 Perfluorononanoic acid										
463.00 > 419.00	3.016	2.994	0.022	1.000	88575	0.0519		104	312	
463.00 > 169.00	3.016	2.994	0.022	1.000	20493		4.32(1.90-5.69)		424	
D 26 M2-8:2FTS										
529.00 > 81.00	3.372	3.343	0.029	1.277	1127358	1.93		80.6	20361	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.372	3.344	0.028	1.000	267420	0.4602		96.1	9552	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.380	3.356	0.024	1.000	71401	0.0529		106	391	
513.00 > 169.00	3.380	3.356	0.024	1.000	13145		5.43(2.36-7.09)		191	
D 23 13C2 PFDA										
515.00 > 470.00	3.380	3.356	0.024	1.280	3437499	2.29		91.7	37538	
D 21 13C8 FOSA										
506.00 > 78.00	3.357	3.359	-0.002	1.272	5846703	2.41		96.4	42318	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.357	3.359	-0.002	1.000	118574	0.0541		108	4866	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.539	3.511	0.028	1.341	1951955	2.44		97.6	27061	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.539	3.515	0.024	1.000	407237	0.4981		99.6	2631	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.699	3.667	0.032	1.000	44761	0.0406		84.3	1518	
599.00 > 99.00	3.691	3.667	0.024	0.998	20003		2.24(1.39-4.16)		1020	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.708	3.677	0.031	1.405	1944873	2.50		100	13228	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.708	3.685	0.023	1.000	397170	0.5421		108	5726	
D 30 13C2 PFUnA										
565.00 > 520.00	3.708	3.685	0.023	1.405	2768714	2.40		95.8	31067	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.717	3.685	0.032	1.002	53495	0.0491		98.2	304	
563.00 > 169.00	3.708	3.685	0.023	1.000	13798		3.88(0.00-0.00)		602	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.856	3.856	0.0	1.461	1629198	2.32		93.0	3885	
35 MeFOSA										
512.00 > 169.00	3.856	3.865	-0.009	1.000	321357	0.5166		103	2526	
D 36 13C2 PFDoA										
615.00 > 570.00	4.007	3.979	0.028	1.518	2919634	2.27		90.8	32962	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.007	3.982	0.025	1.000	58592	0.0508		102	183	
613.00 > 169.00	4.015	3.982	0.033	1.002	14204		4.13(2.13-6.40)		1174	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.046	4.048	-0.002	1.533	1470379	2.25		90.1	3130	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.054	4.056	-0.002	1.002	326070	0.5280		106	2242	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.281	4.243	0.038	1.000	69992	0.0574		115	190	
663.00 > 169.00	4.281	4.243	0.038	1.000	19713		3.55(1.25-3.76)		923	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.515	4.481	0.034	1.710	3266729	2.18		87.2	23485	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.515	4.481	0.034	1.000	17092	0.0516		103	743	
713.00 > 219.00	4.515	4.481	0.034	1.000	11682		1.46(0.71-2.13)		410	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.932	4.892	0.040	1.868	6545046	2.64		106	24336	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.932	4.894	0.038	1.000	157458	0.0463		92.7	91.0	
813.00 > 169.00	4.932	4.894	0.038	1.000	27071		5.82(2.86-8.58)		908	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.297	5.242	0.055	1.000	127500	0.0510		102	40.2	
913.00 > 169.00	5.290	5.242	0.048	0.999	15518		8.22(0.00-0.00)		297	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC_CCVL_00001 Amount Added: 1.00 Units: mL

Report Date: 13-Dec-2017 09:43:34 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171212-51666.b\2017.12.12LLA_005.d

Injection Date: 12-Dec-2017 15:08:16 Instrument ID: A8_N

Lims ID: CCVL

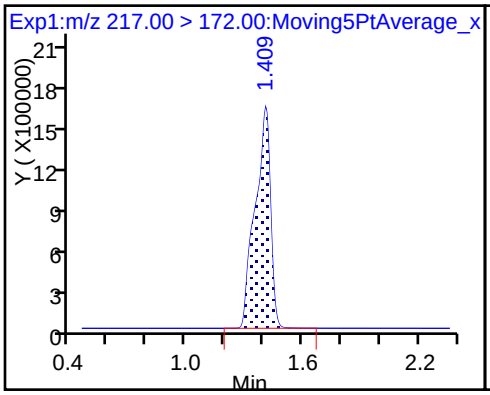
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 1

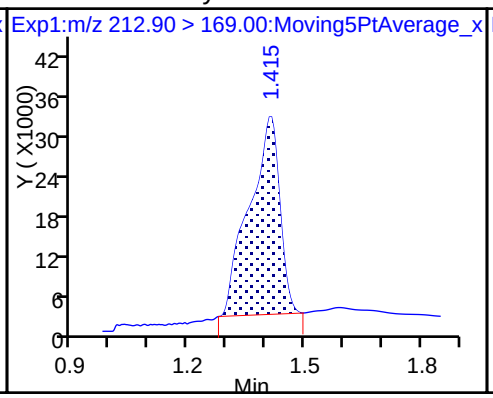
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

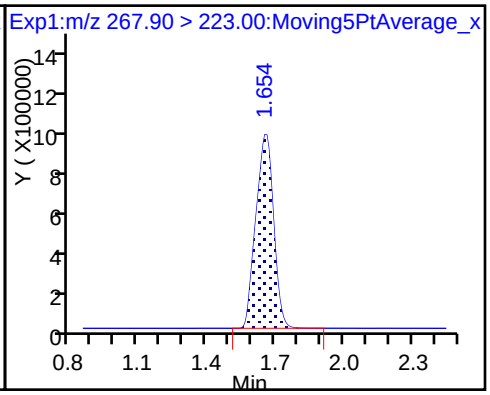
D 1 13C4 PFBA



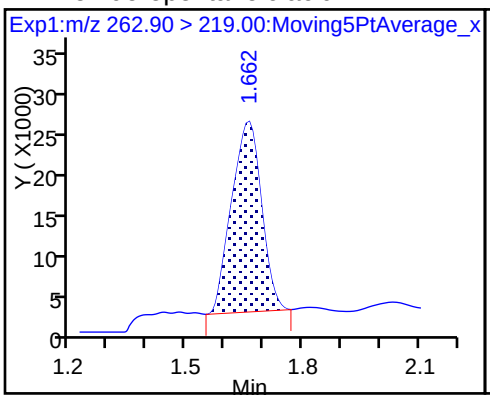
2 Perfluorobutyric acid



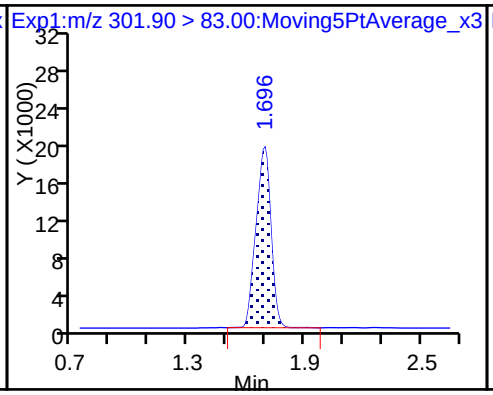
D 3 13C5-PFPeA



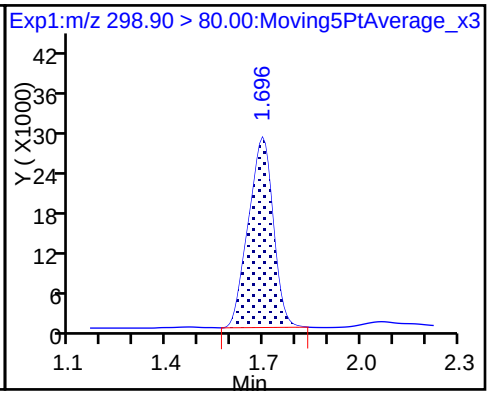
4 Perfluoropentanoic acid



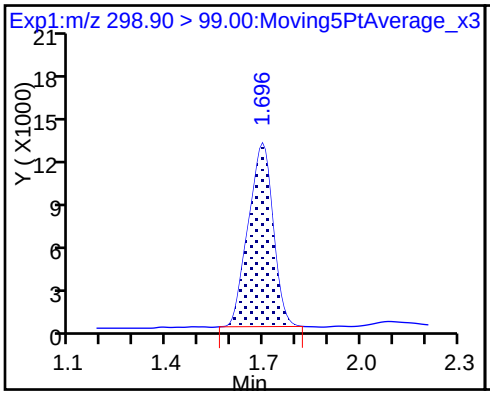
D 47 13C3-PFBS



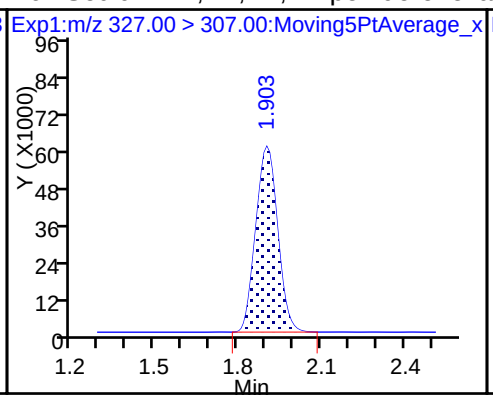
5 Perfluorobutanesulfonic acid



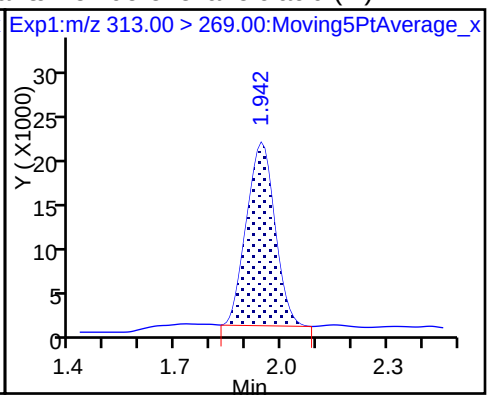
5 Perfluorobutanesulfonic acid



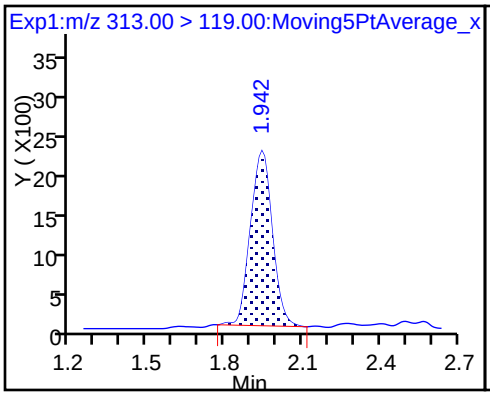
61 Sodium 1H,1H,2H,2H-perfluorohexane



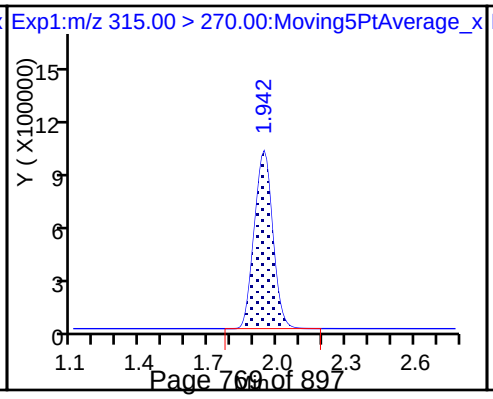
6 Perfluorohexanoic acid (M)



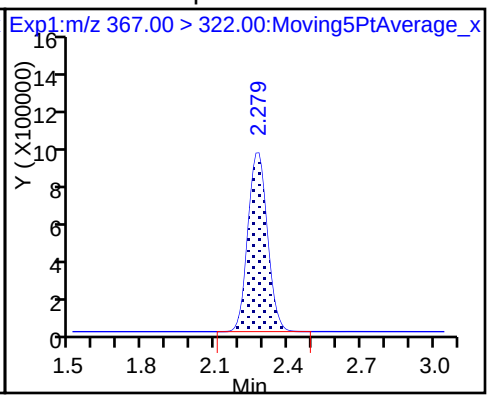
6 Perfluorohexanoic acid



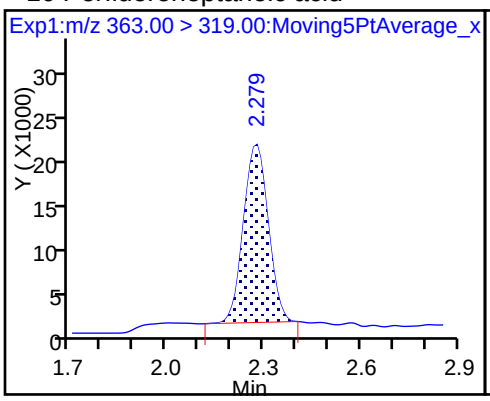
D 7 13C2 PFHxA



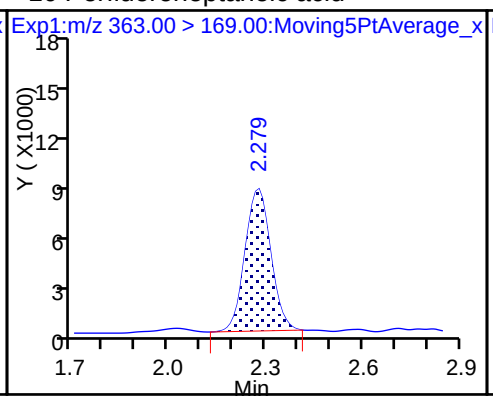
D 9 13C4-PFHpA



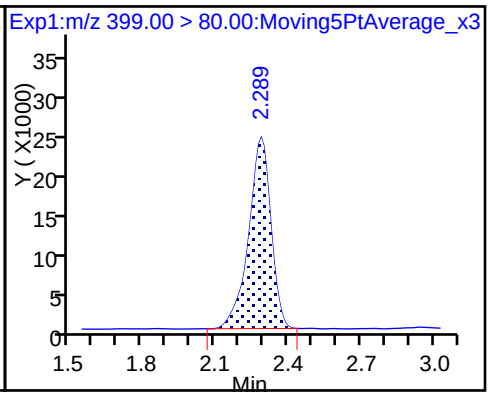
10 Perfluoroheptanoic acid



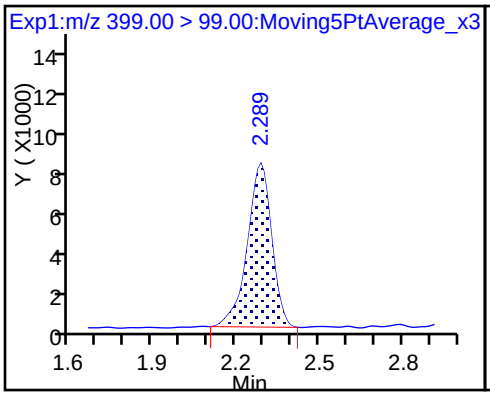
10 Perfluoroheptanoic acid



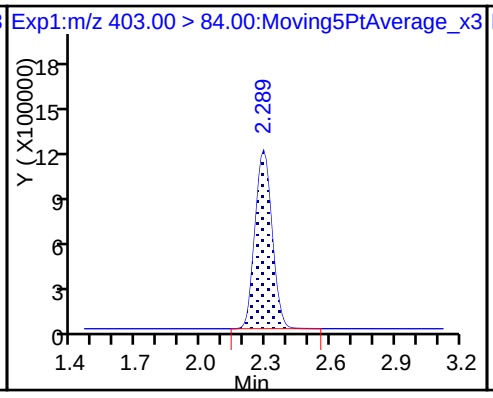
8 Perfluorohexanesulfonic acid



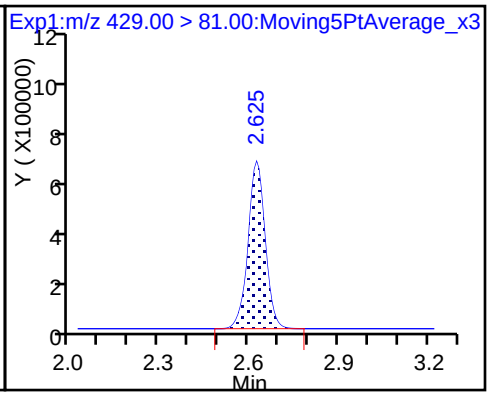
8 Perfluorohexanesulfonic acid



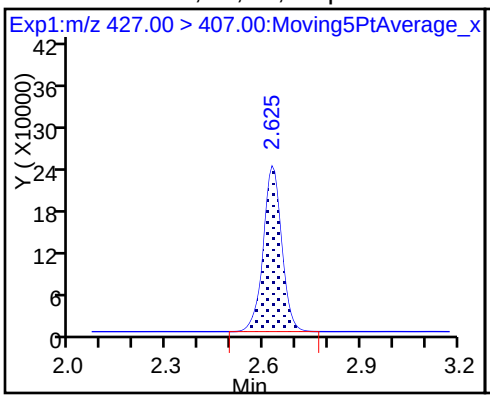
D 11 18O2 PFHxS



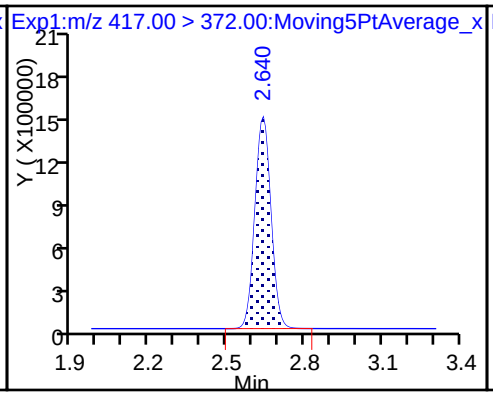
D 12 M2-6:2FTS



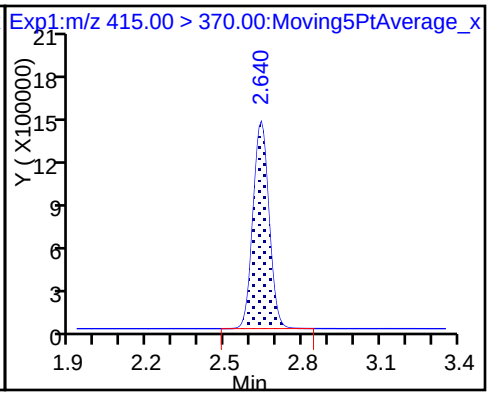
13 Sodium 1H,1H,2H,2H-perfluorooctane



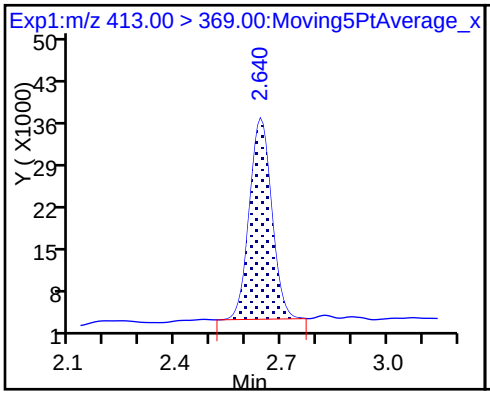
D 14 13C4 PFOA



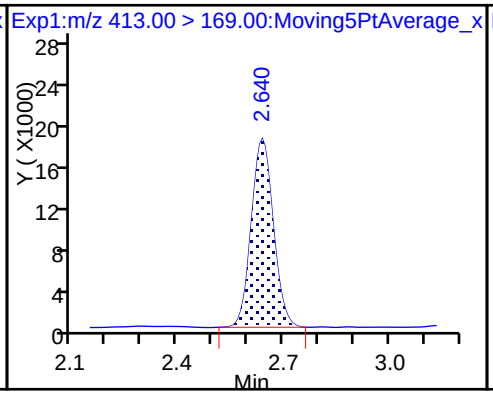
* 62 13C2-PFOA



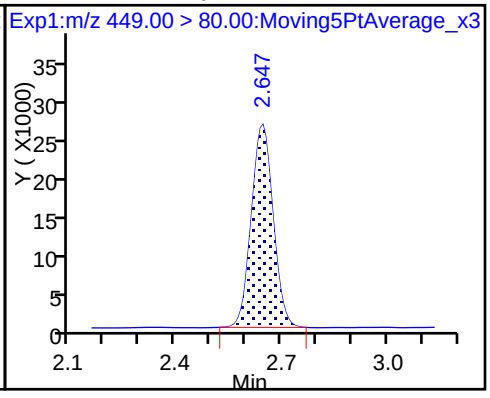
15 Perfluorooctanoic acid



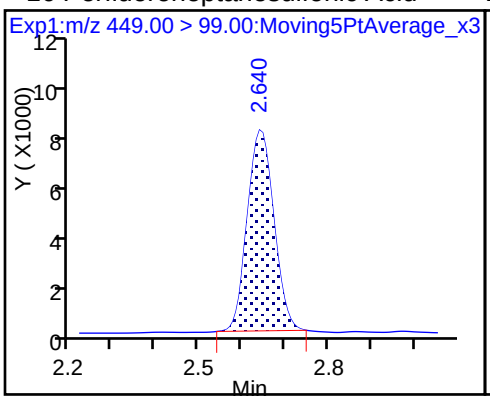
15 Perfluorooctanoic acid



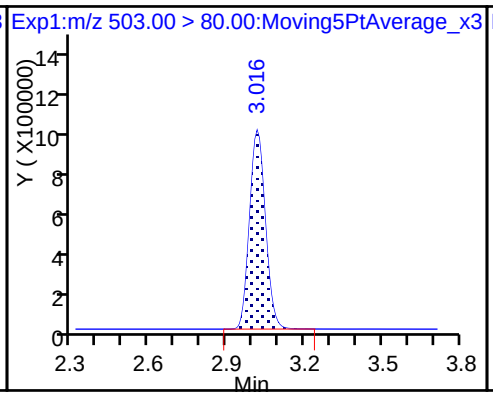
16 Perfluoroheptanesulfonic Acid



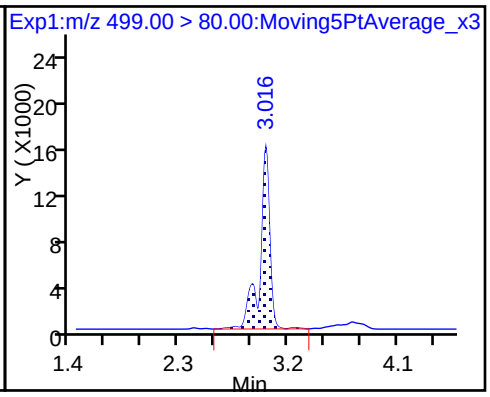
16 Perfluoroheptanesulfonic Acid



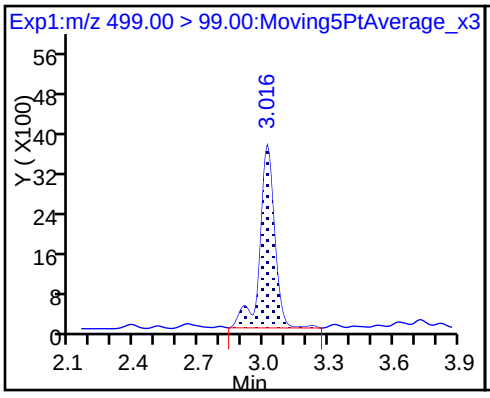
D 18 13C4 PFOS



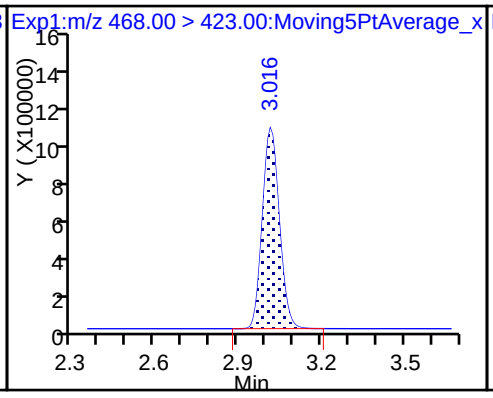
17 Perfluorooctane sulfonic acid



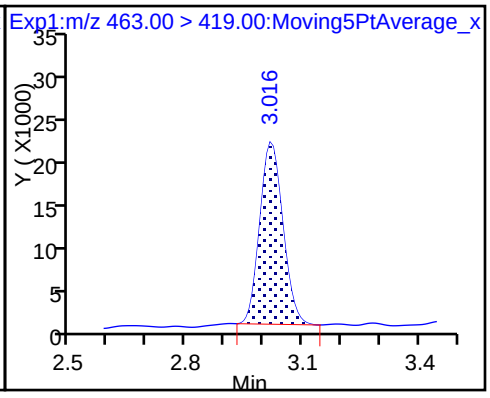
17 Perfluorooctane sulfonic acid



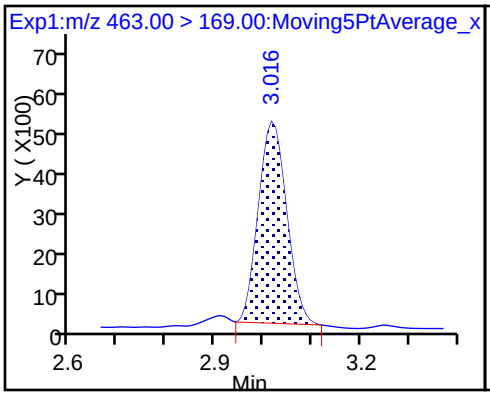
D 19 13C5 PFNA



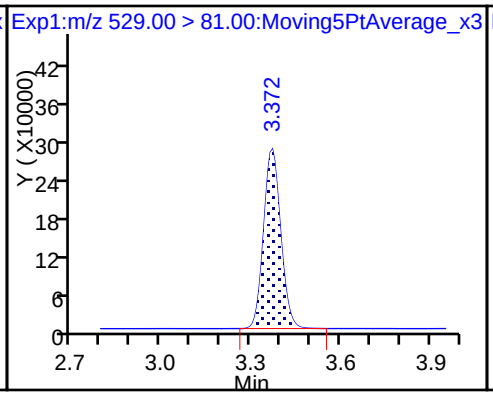
20 Perfluorononanoic acid



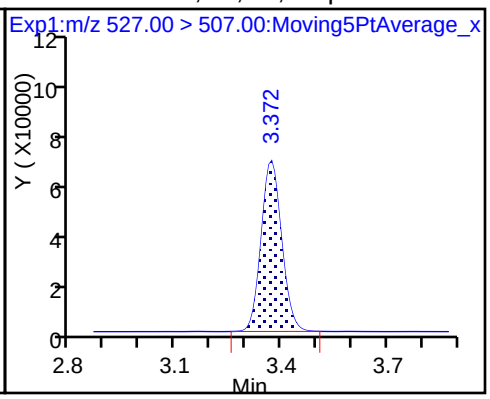
20 Perfluorononanoic acid



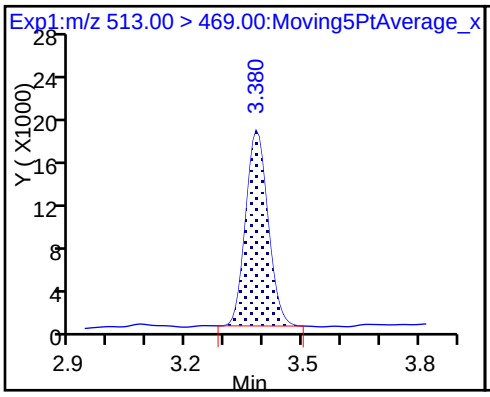
D 26 M2-8:2FTS



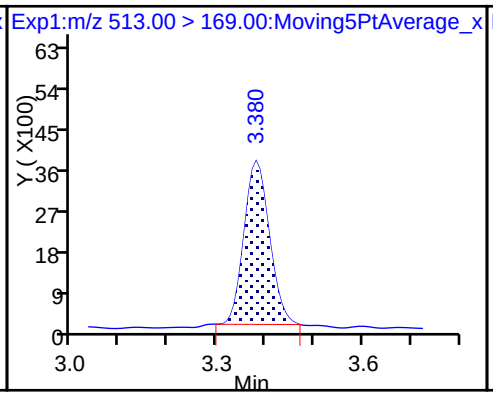
25 Sodium 1H,1H,2H,2H-perfluorodecane



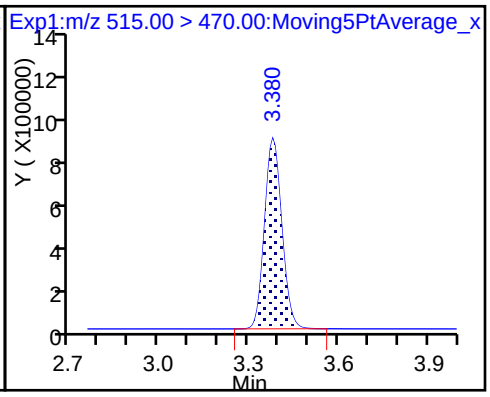
24 Perfluorodecanoic acid



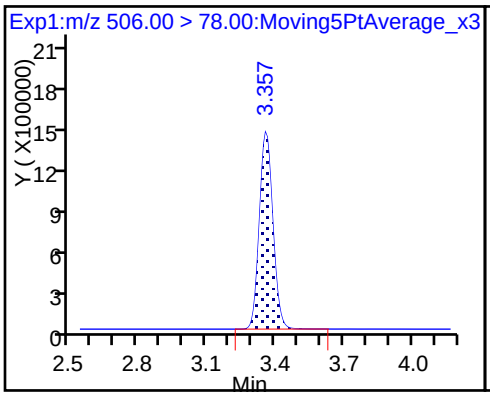
24 Perfluorodecanoic acid



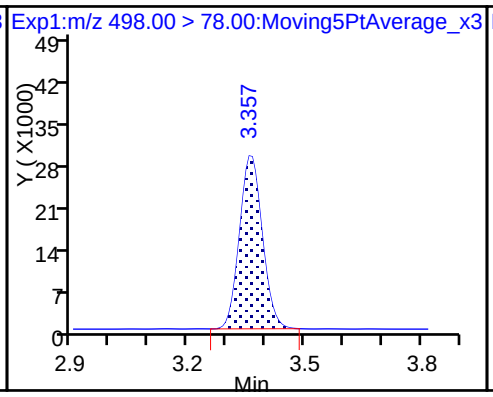
D 23 13C2 PFDA



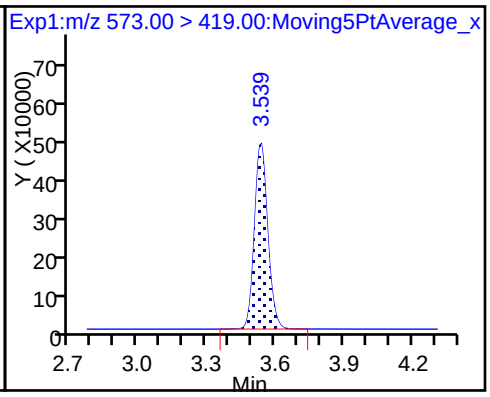
D 21 13C8 FOSA



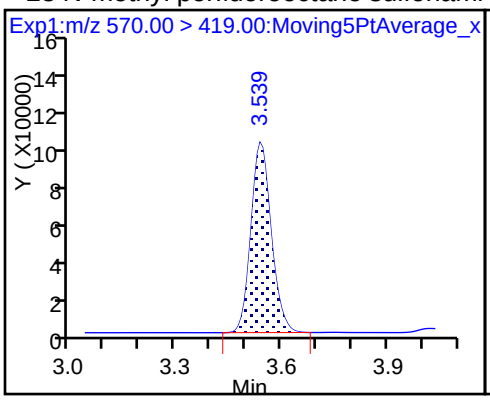
22 Perfluorooctane Sulfonamide



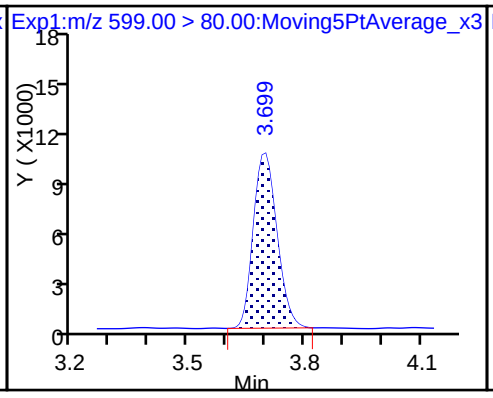
D 27 d3-NMeFOSAA



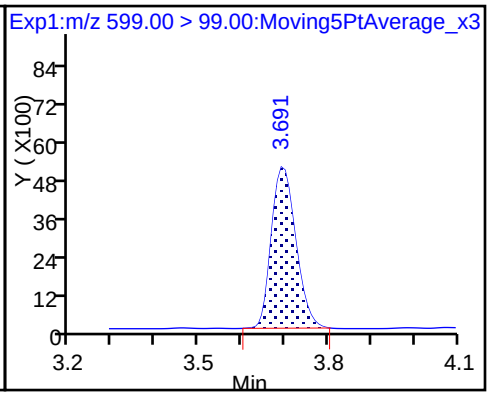
28 N-methyl perfluorooctane sulfonami



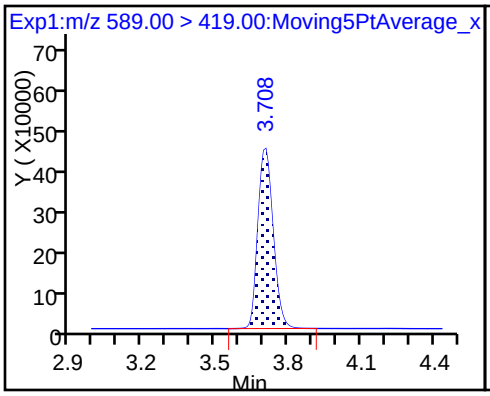
29 Perfluorodecane Sulfonic acid



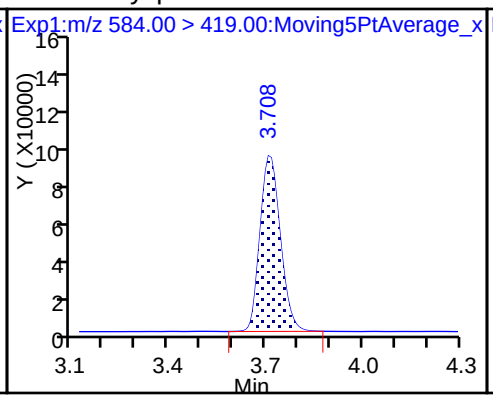
29 Perfluorodecane Sulfonic acid



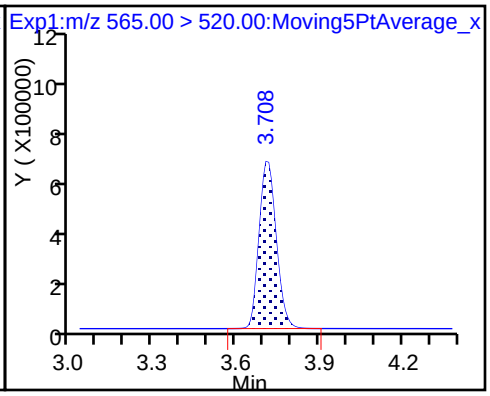
D 32 d5-NEtFOSAA



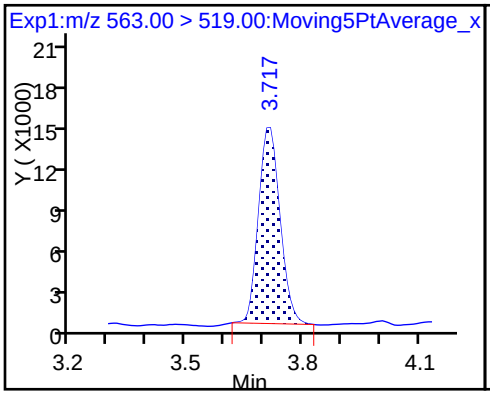
33 N-ethyl perfluorooctane sulfonamid



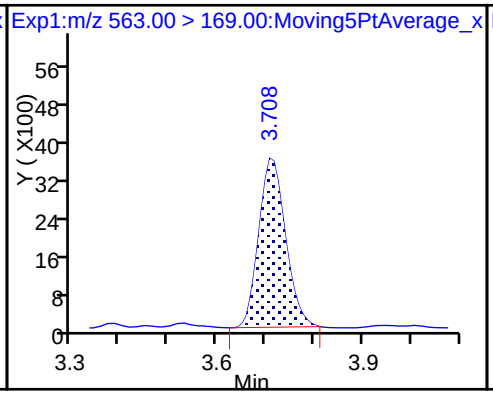
D 30 13C2 PFUnA



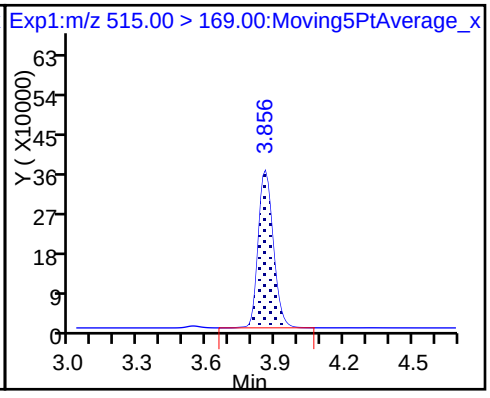
31 Perfluoroundecanoic acid



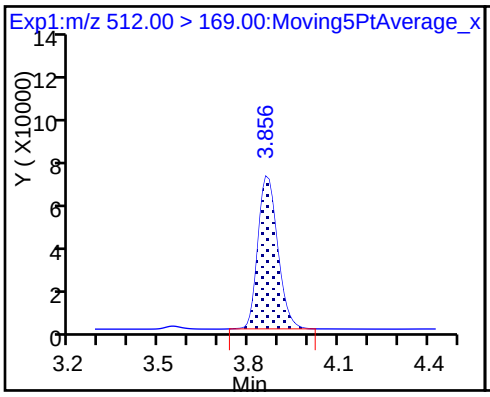
31 Perfluoroundecanoic acid



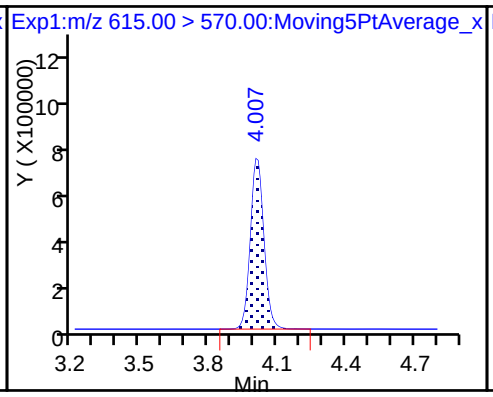
D 34 d-N-MeFOSA-M



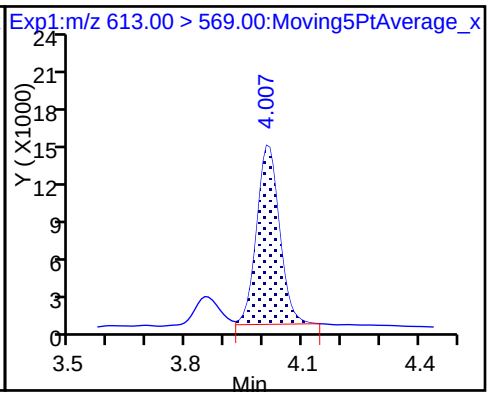
35 MeFOSA



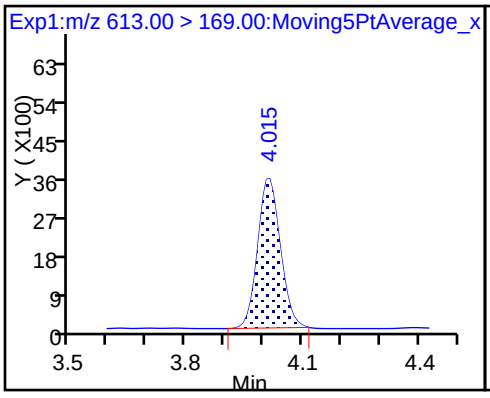
D 36 13C2 PFDoA



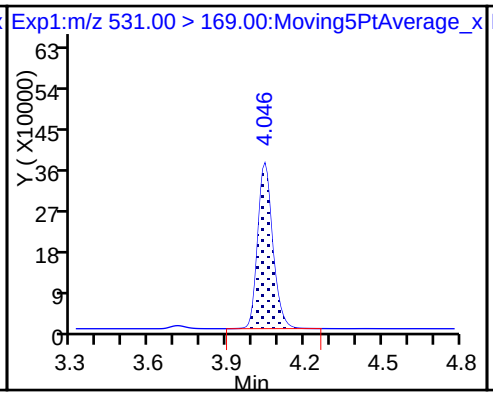
37 Perfluorododecanoic acid



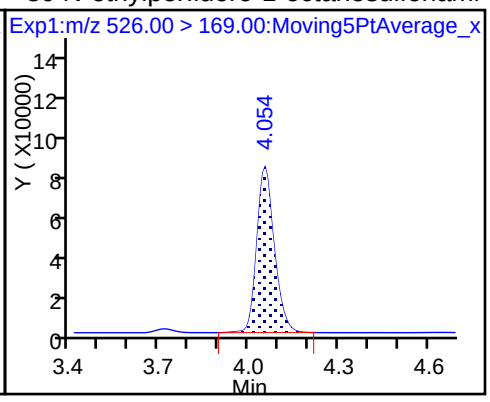
37 Perfluorododecanoic acid



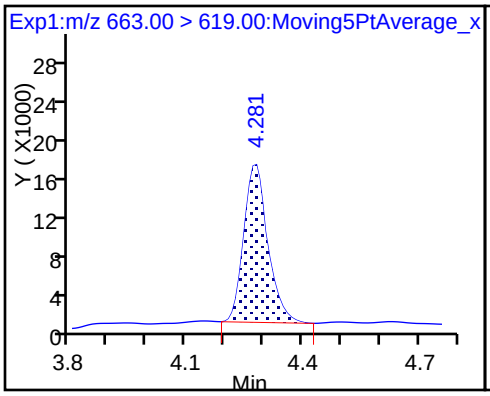
D 38 d-N-EtFOSA-M



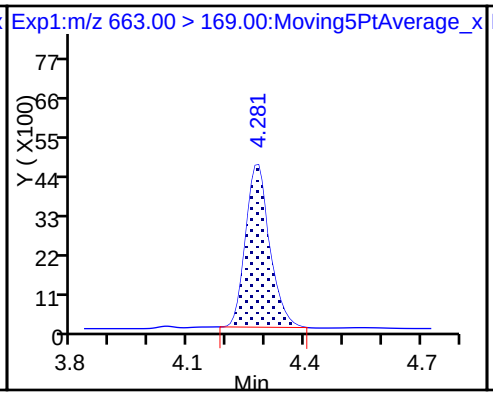
39 N-ethylperfluoro-1-octanesulfonami



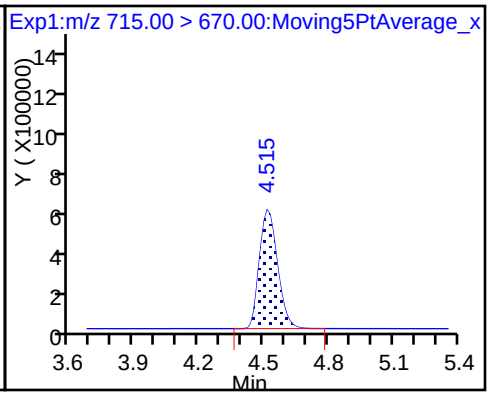
41 Perfluorotridecanoic acid



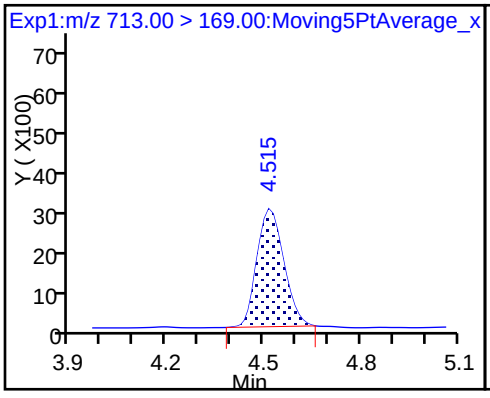
41 Perfluorotridecanoic acid



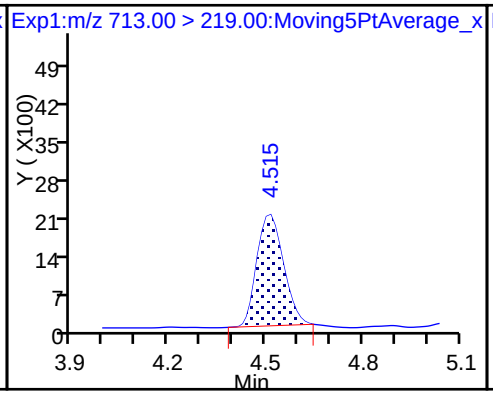
D 43 13C2-PFTeDA



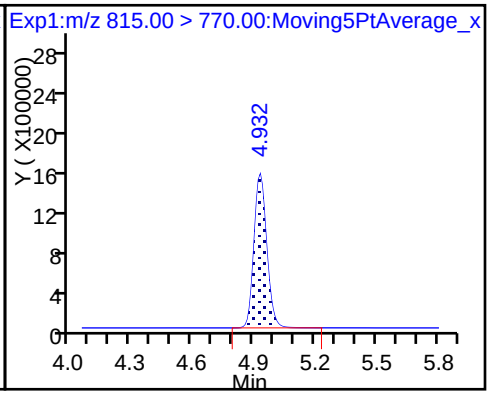
42 Perfluorotetradecanoic acid



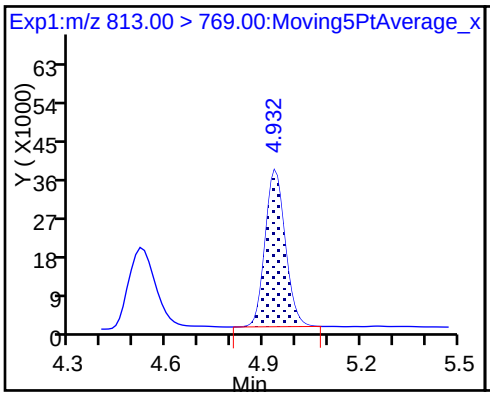
42 Perfluorotetradecanoic acid



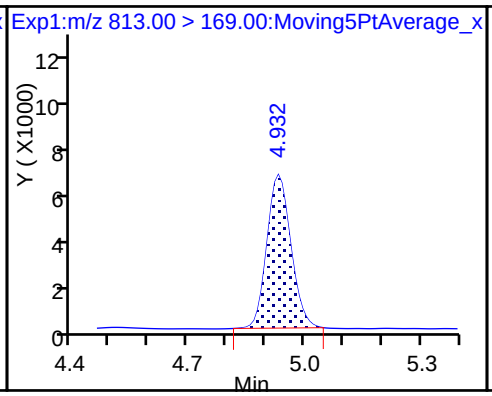
D 44 13C2-PFHxDA



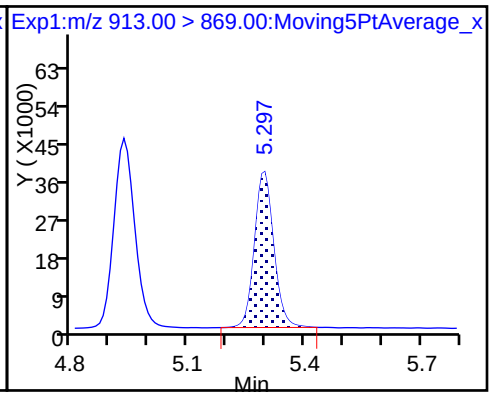
45 Perfluorohexadecanoic acid



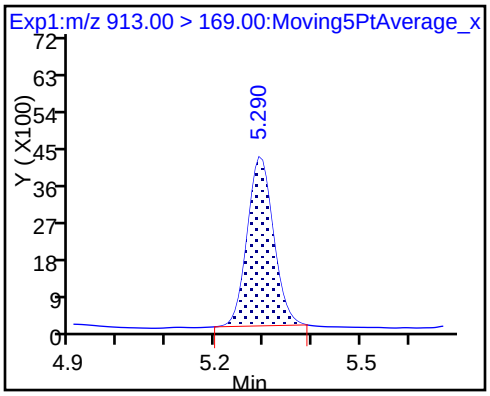
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

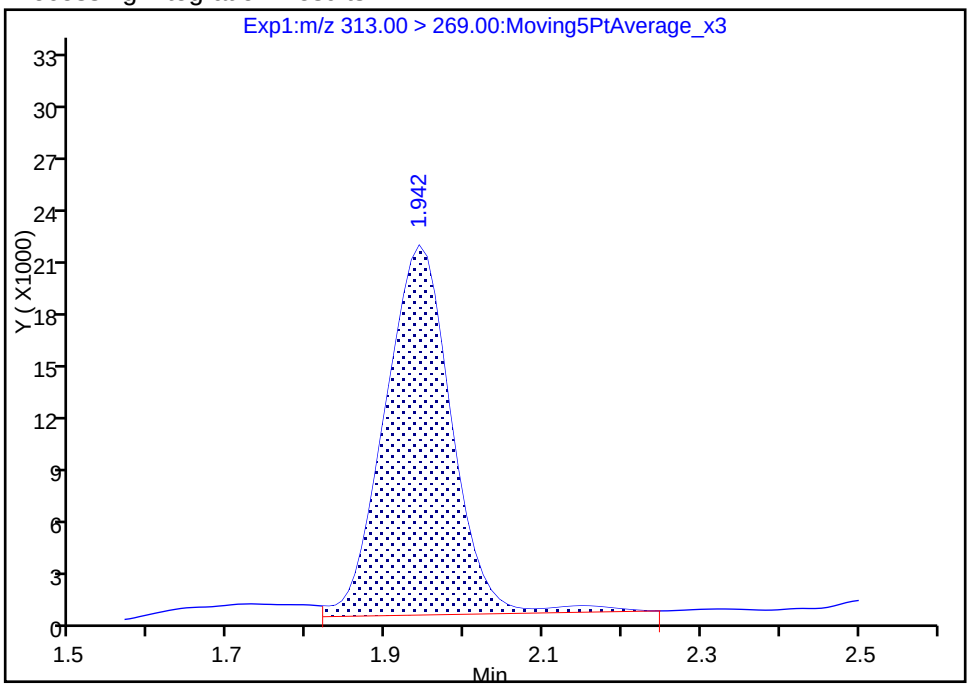
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171212-51666.b\2017.12.12LLA_005.d
Injection Date: 12-Dec-2017 15:08:16 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

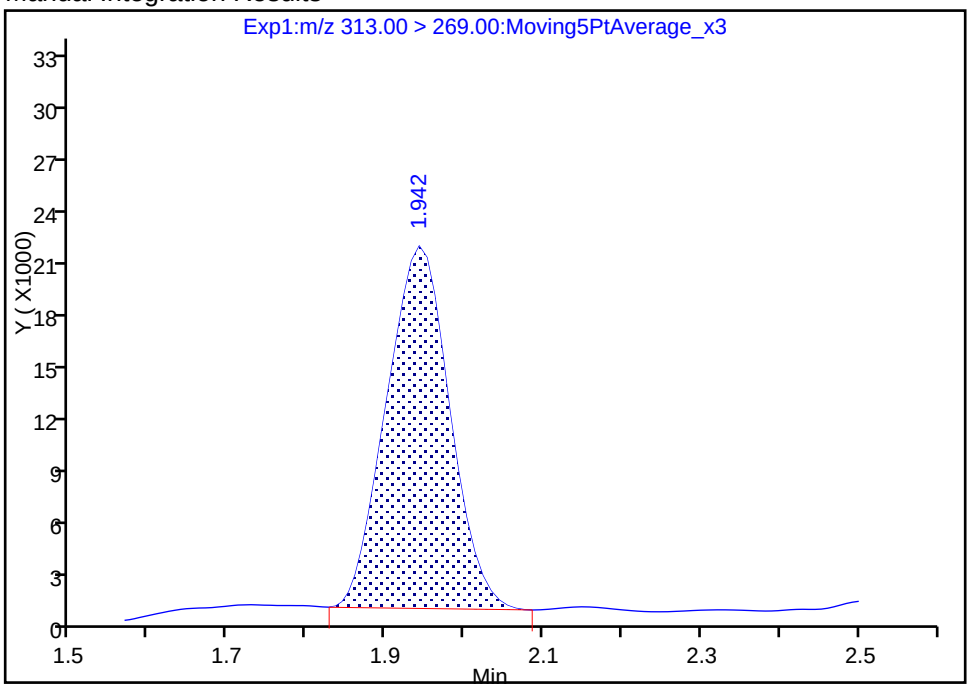
Processing Integration Results

RT: 1.94
Area: 124509
Amount: 0.054764
Amount Units: ng/ml



Manual Integration Results

RT: 1.94
Area: 115793
Amount: 0.050931
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 09:42:43
Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCV 320-199646/1 Calibration Date: 12/12/2017 21:34

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.12LLB_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9084	0.9377		2.58	2.50	3.2	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.164	1.136		2.44	2.50	-2.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.11	81.79		2.37	2.21	7.5	25.0
4:2 FTS	AveID	1.088	0.4491		0.964	2.34	-58.7*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.9804		2.40	2.50	-4.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.039	1.009		2.43	2.50	-2.9	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.063	1.025		2.19	2.28	-3.6	25.0
6:2FTS	AveID	1.686	1.543		2.17	2.37	-8.5	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.067	1.025		2.40	2.50	-3.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.301	1.381		2.53	2.38	6.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.036	1.027		2.30	2.32	-0.9	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9749	1.018		2.61	2.50	4.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9368	0.9889		2.64	2.50	5.6	25.0
8:2FTS	AveID	1.235	1.257		2.44	2.40	1.8	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9809	1.013		2.58	2.50	3.3	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.047	1.093		2.61	2.50	4.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6323	0.6345		2.42	2.41	0.3	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9417	0.9538		2.53	2.50	1.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9833	0.9426		2.40	2.50	-4.1	25.0
MeFOSA	AveID	0.9545	0.9703		2.54	2.50	1.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9872	1.000		2.53	2.50	1.3	25.0
N-EtFOSA-M	AveID	1.050	1.039		2.47	2.50	-1.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.045	1.078		2.58	2.50	3.2	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2537	0.2290		2.26	2.50	-9.8	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9406		2.74	2.50	9.7	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9556	1.052		2.75	2.50	10.0	25.0
13C4 PFBA	Ave	1.489	1.421		2.39	2.50	-4.6	50.0
13C5 PFPeA	Ave	0.9288	0.8663		2.33	2.50	-6.7	50.0
13C3-PFBS	Ave	0.0193	0.0174		2.10	2.33	-9.7	50.0
13C2 PFHxA	Ave	0.9542	0.8849		2.32	2.50	-7.3	50.0
13C4-PFHpA	Ave	0.9279	0.8723		2.35	2.50	-6.0	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCV 320-199646/1 Calibration Date: 12/12/2017 21:34

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.12LLB_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.162	1.118		2.28	2.37	-3.7	50.0
M2-6:2FTS	Ave	0.3113	0.6361		4.85	2.38	104.3*	50.0
13C4 PFOA	Ave	1.027	1.034		2.52	2.50	0.7	50.0
13C4 PFOS	Ave	0.7554	0.6987		2.21	2.39	-7.5	50.0
13C5 PFNA	Ave	0.7423	0.6854		2.31	2.50	-7.7	50.0
13C8 FOSA	Ave	1.017	0.9276		2.28	2.50	-8.8	50.0
M2-8:2FTS	Ave	0.2450	0.1904		1.86	2.40	-22.3	50.0
13C2 PFDA	Ave	0.6290	0.5568		2.21	2.50	-11.5	50.0
d3-NMeFOSAA	Ave	0.3356	0.3126		2.33	2.50	-6.9	50.0
d5-NEtFOSAA	Ave	0.3261	0.3147		2.41	2.50	-3.5	50.0
13C2 PFUnA	Ave	0.4846	0.4288		2.21	2.50	-11.5	50.0
d-N-MeFOSA-M	Ave	0.2938	0.2748		2.34	2.50	-6.5	50.0
13C2 PFDoA	Ave	0.5394	0.4726		2.19	2.50	-12.4	50.0
d-N-EtFOSA-M	Ave	0.2737	0.2506		2.29	2.50	-8.4	50.0
13C2-PFTeDA	Ave	0.6284	0.5580		2.22	2.50	-11.2	50.0
13C2-PFHxDA	Ave	1.040	0.9041		2.17	2.50	-13.0	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_002.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 12-Dec-2017 21:34:43 ALS Bottle#: 14 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCVL5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub18

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 13-Dec-2017 13:39:08 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK047

First Level Reviewer: hannigana Date: 13-Dec-2017 13:17:07

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	1.398	1.401	-0.003	0.534	8804666	2.39		95.4	54655	
2 Perfluorobutyric acid										
212.90 > 169.00	1.398	1.402	-0.004	1.000	8255823	2.58		103	1963	
D 3 13C5-PFPeA										
267.90 > 223.00	1.646	1.646	0.0	0.629	5368778	2.33		93.3	53939	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.646	1.648	-0.002	1.000	6098259	2.44		97.6	4425	
D 47 13C3-PFBS										
301.90 > 83.00	1.679	1.681	-0.002	0.641	100485	2.10		90.3	3104	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.679	1.682	-0.003	1.000	7811788	2.37		107	33652	
298.90 > 99.00	1.679	1.682	-0.003	1.000	3209633		2.43(1.25-3.74)		24637	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.894	1.887	0.007	1.000	1653555	0.9641		41.3	50384	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.923	1.923	0.0	1.000	5376588	2.40		96.0	14128	
313.00 > 119.00	1.923	1.923	0.0	1.000	504002		10.67(5.03-15.10)		9802	
D 7 13C2 PFHxA										
315.00 > 270.00	1.923	1.924	-0.001	0.734	5484129	2.32		92.7	53904	
D 9 13C4-PFHpA										
367.00 > 322.00	2.257	2.254	0.003	0.862	5406174	2.35		94.0	46703	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.257	2.255	0.002	1.000	5455937	2.43		97.1	8638	
363.00 > 169.00	2.257	2.255	0.002	1.000	2226447		2.45(1.13-3.40)		16874	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.268	2.269	-0.001	1.000	6466219	2.19		96.4	21156	
399.00 > 99.00	2.268	2.269	-0.001	1.000	2108524		3.07(1.50-4.49)		11252	

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	2.268	2.271	-0.003	0.866	6555560	2.28		96.3	56365	
D 12 M2-6:2FTS										
429.00 > 81.00	2.603	2.605	-0.002	0.994	3744961	4.85		204	92983	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.603	2.605	-0.002	1.000	5765023	2.17		91.5	129811	
D 14 13C4 PFOA										
417.00 > 372.00	2.618	2.618	0.0	1.000	6405234	2.52		101	59807	
* 62 13C2-PFOA										
415.00 > 370.00	2.618	2.619	-0.001		6197293	2.50			46547	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.618	2.621	-0.003	1.000	6564354	2.40		96.1	3076	
413.00 > 169.00	2.618	2.621	-0.003	1.000	3617518		1.81(0.84-2.52)		23400	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.625	2.626	-0.001	1.000	5694668	2.53		106	50112	
449.00 > 99.00	2.625	2.626	-0.001	1.000	1493619		3.81(1.94-5.82)		28559	
D 18 13C4 PFOS										
503.00 > 80.00	2.992	2.993	-0.001	1.143	4139750	2.21		92.5	37815	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.992	2.994	-0.002	1.000	4128964	2.30		99.1	17980	
499.00 > 99.00	2.992	2.994	-0.002	1.000	914226		4.52(2.31-6.93)		11782	
D 19 13C5 PFNA										
468.00 > 423.00	2.992	2.994	-0.002	1.143	4247810	2.31		92.3	43552	
20 Perfluorononanoic acid										
463.00 > 419.00	3.000	2.994	0.006	1.003	4323112	2.61		104	13059	
463.00 > 169.00	2.992	2.994	-0.002	1.000	1029666		4.20(1.90-5.69)		24103	
D 26 M2-8:2FTS										
529.00 > 81.00	3.348	3.343	0.005	1.279	1130628	1.86		77.7	20128	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.348	3.344	0.004	1.000	1421350	2.44		102	29610	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.363	3.356	0.007	1.000	3494901	2.58		103	16936	
513.00 > 169.00	3.363	3.356	0.007	1.000	603755		5.79(2.36-7.09)		2428	
D 23 13C2 PFDA										
515.00 > 470.00	3.363	3.356	0.007	1.285	3450590	2.21		88.5	37285	
D 21 13C8 FOSA										
506.00 > 78.00	3.340	3.359	-0.019	1.276	5748875	2.28		91.2	25108	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.340	3.359	-0.019	1.000	5685099	2.64		106	34327	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.515	3.511	0.004	1.343	1937017	2.33		93.1	19132	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.522	3.515	0.007	1.002	2117732	2.61		104	13224	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.671	3.667	0.004	1.000	2648752	2.42		100	55214	
599.00 > 99.00	3.671	3.667	0.004	1.000	863369		3.07(1.39-4.16)		23938	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.680	3.677	0.003	1.406	1950539	2.41		96.5	15956	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.689	3.685	0.004	1.002	1860347	2.53		101	19165	
D 30 13C2 PFUnA										
565.00 > 520.00	3.689	3.685	0.004	1.409	2657380	2.21		88.5	42728	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.689	3.685	0.004	1.000	2504849	2.40		95.9	11676	
563.00 > 169.00	3.689	3.685	0.004	1.000	533668		4.69(0.00-0.00)		20917	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.836	3.856	-0.020	1.465	1703269	2.34		93.5	4248	
35 MeFOSA										
512.00 > 169.00	3.845	3.865	-0.020	1.002	1652753	2.54		102	3513	
D 36 13C2 PFDoA										
615.00 > 570.00	3.989	3.979	0.010	1.524	2929017	2.19		87.6	32307	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.989	3.982	0.007	1.000	2928625	2.53		101	6698	
613.00 > 169.00	3.989	3.982	0.007	1.000	731717		4.00(2.13-6.40)		22051	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.028	4.048	-0.020	1.539	1552819	2.29		91.6	3058	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.036	4.056	-0.020	1.002	1613380	2.47		99.0	3492	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.252	4.243	0.009	1.000	3158228	2.58		103	9811	
663.00 > 169.00	4.252	4.243	0.009	1.000	977601		3.23(1.25-3.76)		25209	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.500	4.481	0.019	1.719	3458084	2.22		88.8	21460	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.500	4.481	0.019	1.000	791788	2.26		90.2	19519	
713.00 > 219.00	4.486	4.481	0.005	0.997	566578		1.40(0.71-2.13)		16723	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.913	4.892	0.021	1.877	5603180	2.17		87.0	17976	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.913	4.894	0.019	1.000	5270526	2.74		110	2744	
813.00 > 169.00	4.913	4.894	0.019	1.000	938122		5.62(2.86-8.58)		10330	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.274	5.242	0.032	1.000	5892511	2.75		110	1187	
913.00 > 169.00	5.274	5.242	0.032	1.000	748977		7.87(0.00-0.00)		2754	

Reagents:

LCPFC_LL5_00002 Amount Added: 1.00 Units: mL

Report Date: 13-Dec-2017 13:39:09 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_002.d

Injection Date: 12-Dec-2017 21:34:43 Instrument ID: A8_N

Lims ID: CCV L5

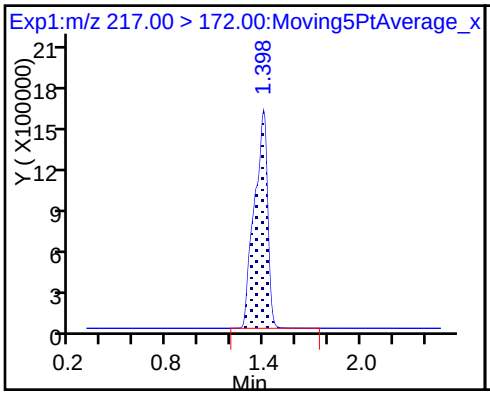
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 1

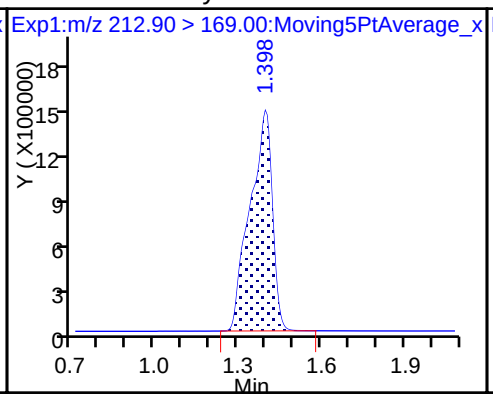
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

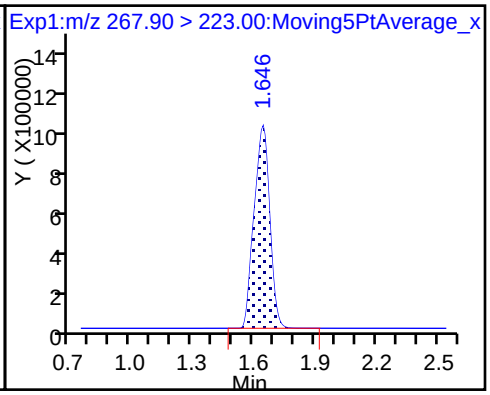
D 1 13C4 PFBA



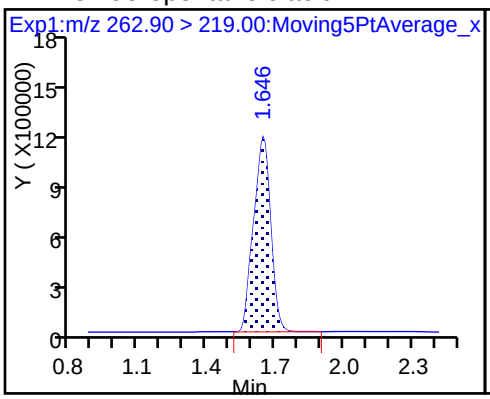
2 Perfluorobutyric acid



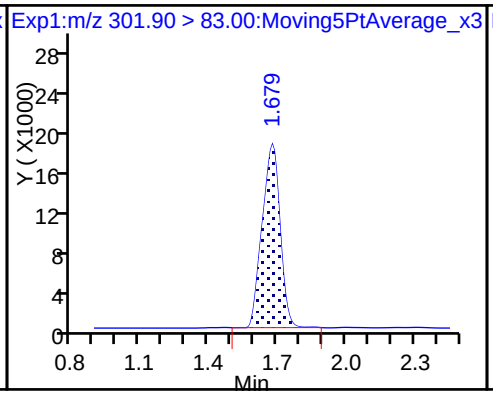
D 3 13C5-PFPeA



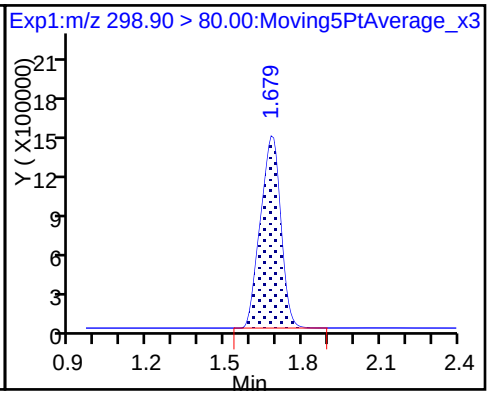
4 Perfluoropentanoic acid



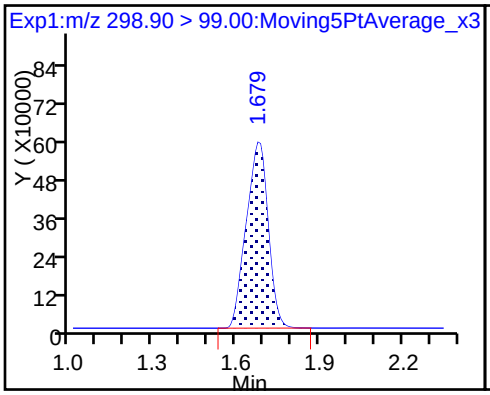
D 47 13C3-PFBS



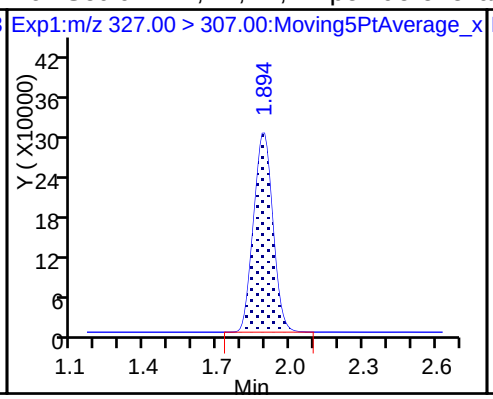
5 Perfluorobutanesulfonic acid



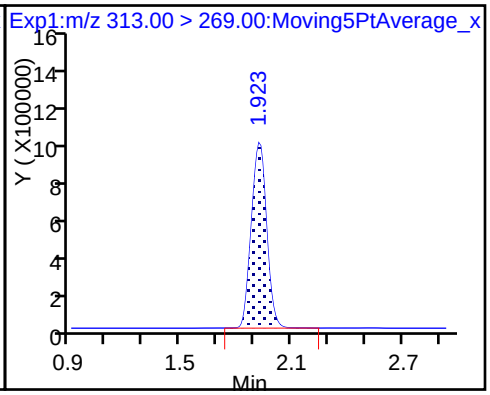
5 Perfluorobutanesulfonic acid



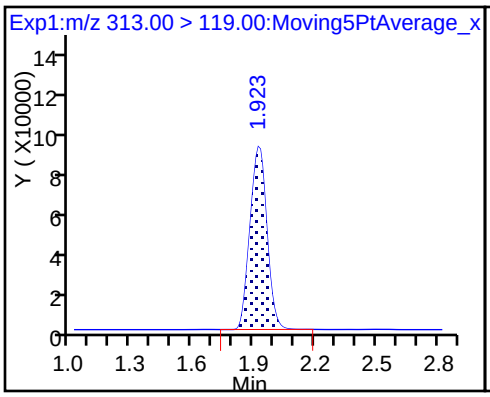
61 Sodium 1H,1H,2H,2H-perfluorohexane



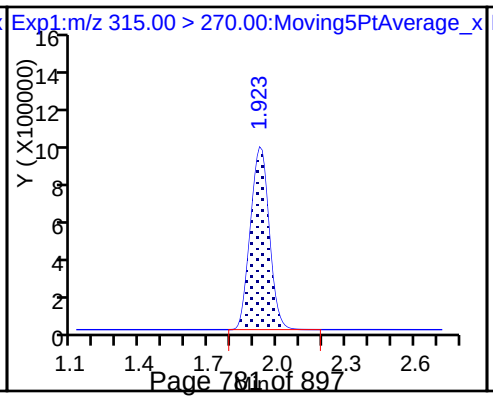
6 Perfluorohexanoic acid



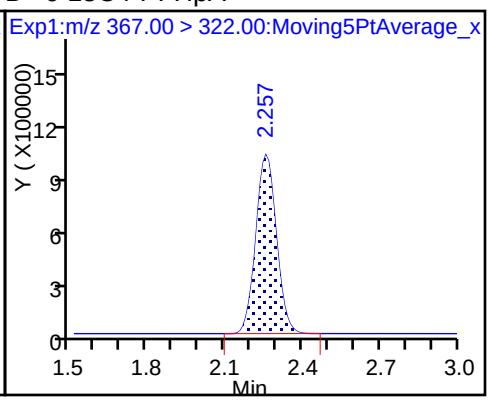
6 Perfluorohexanoic acid



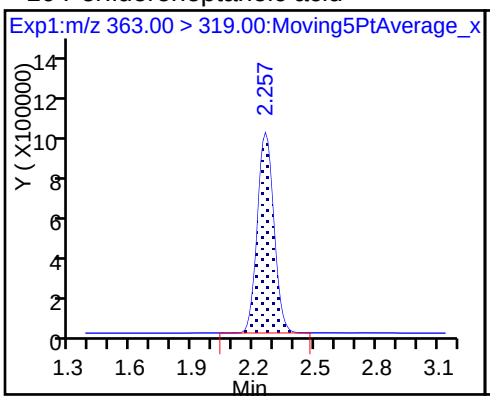
D 7 13C2 PFHxA



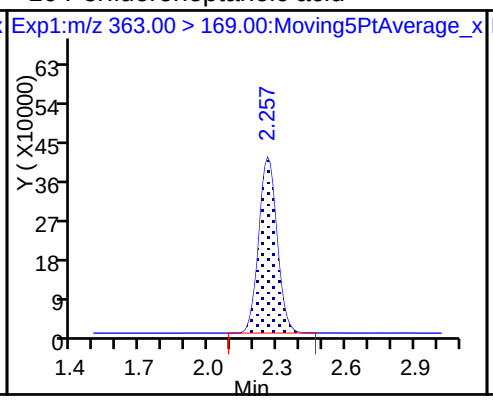
D 9 13C4-PFHpA



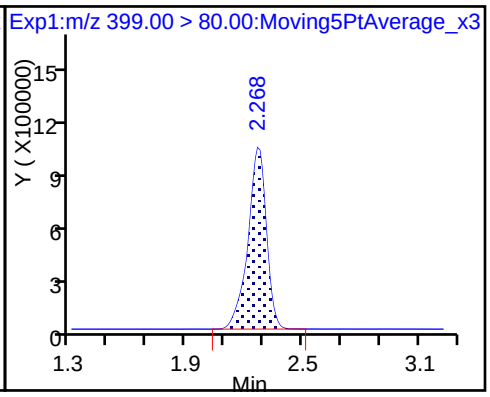
10 Perfluoroheptanoic acid



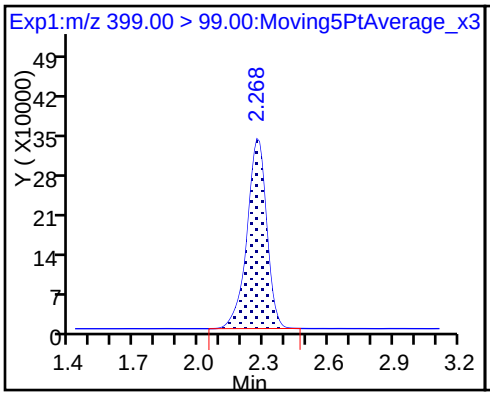
10 Perfluoroheptanoic acid



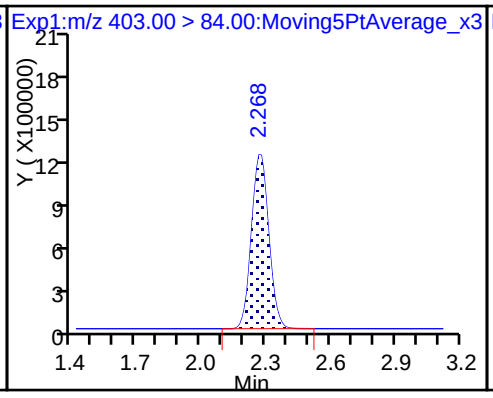
8 Perfluorohexanesulfonic acid



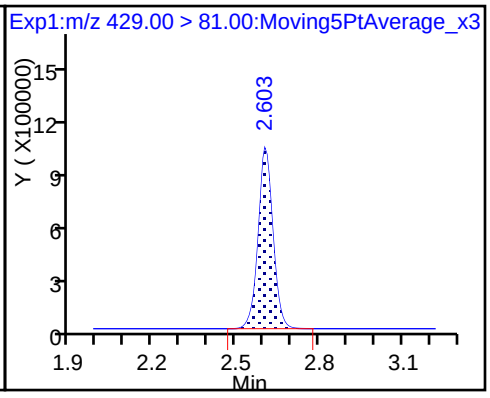
8 Perfluorohexanesulfonic acid



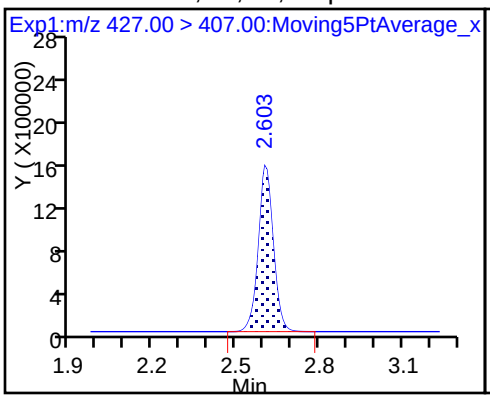
D 11 18O2 PFHxS



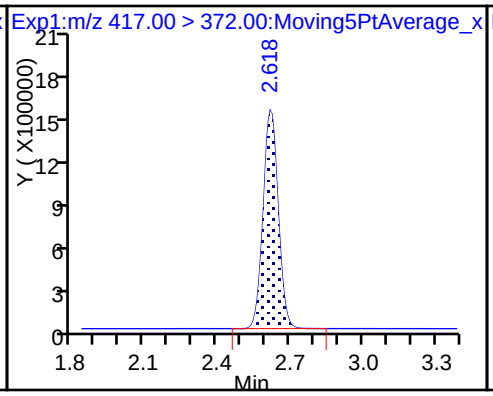
D 12 M2-6:2FTS



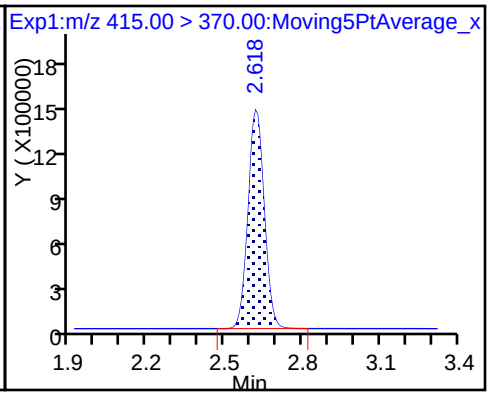
13 Sodium 1H,1H,2H,2H-perfluorooctane



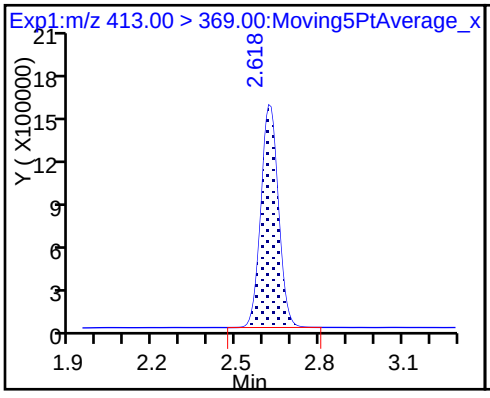
D 14 13C4 PFOA



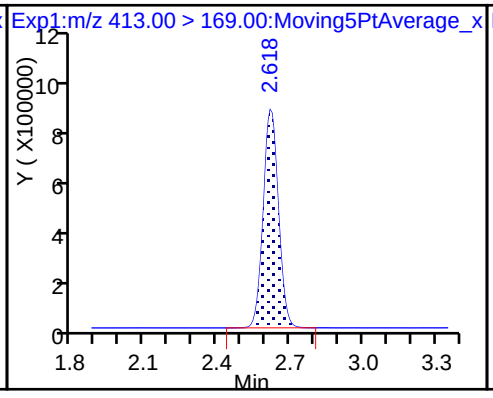
* 62 13C2-PFOA



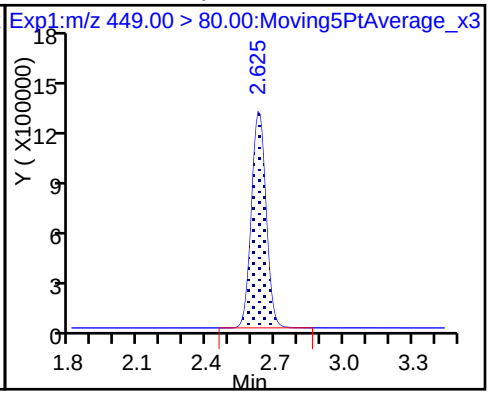
15 Perfluorooctanoic acid



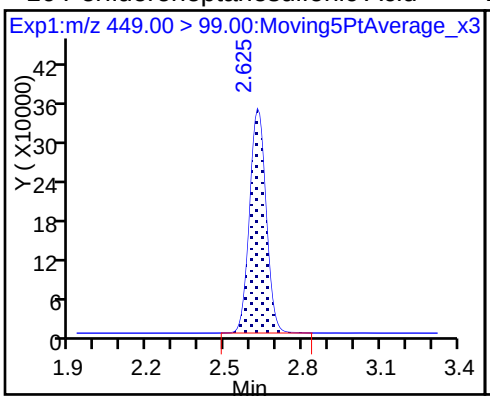
15 Perfluorooctanoic acid



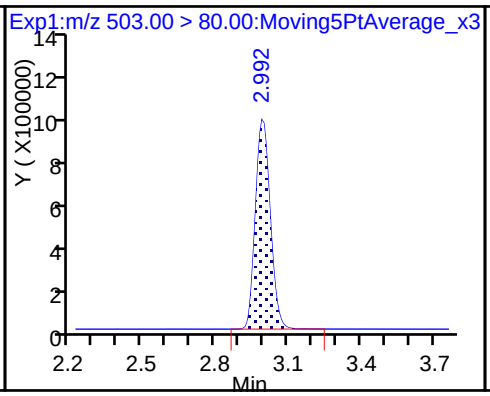
16 Perfluoroheptanesulfonic Acid



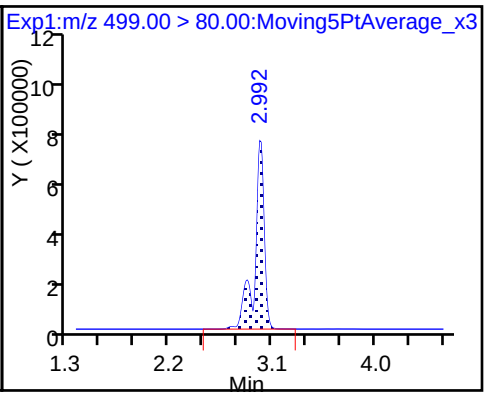
16 Perfluoroheptanesulfonic Acid



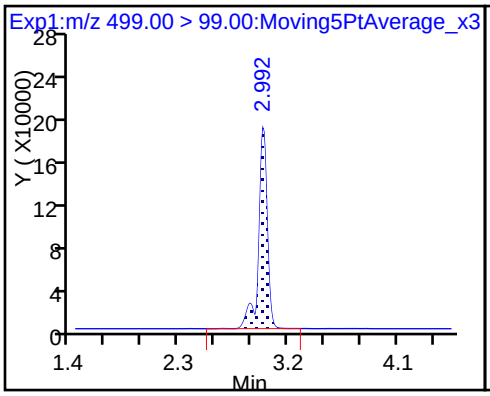
D 18 13C4 PFOS



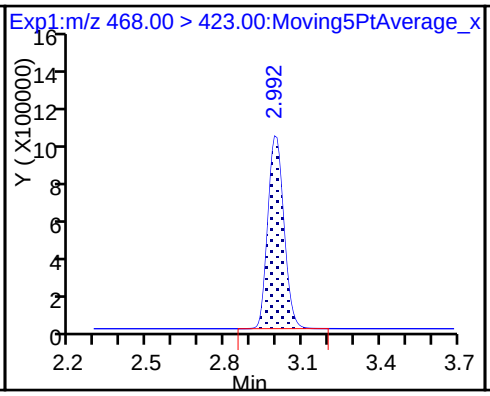
17 Perfluorooctane sulfonic acid



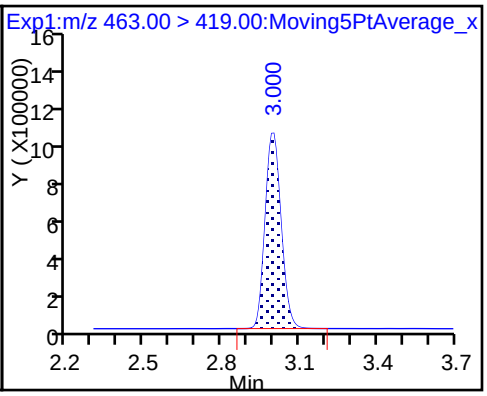
17 Perfluorooctane sulfonic acid



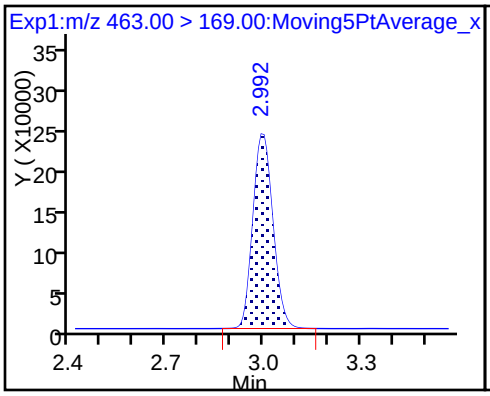
D 19 13C5 PFNA



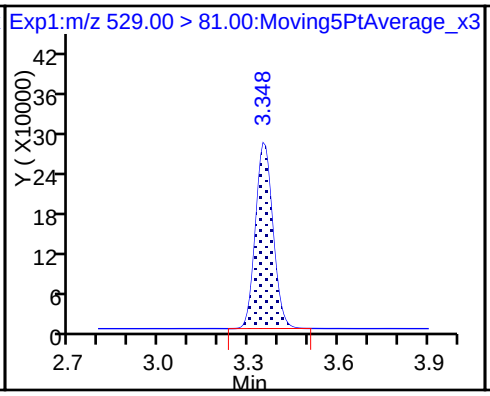
20 Perfluorononanoic acid



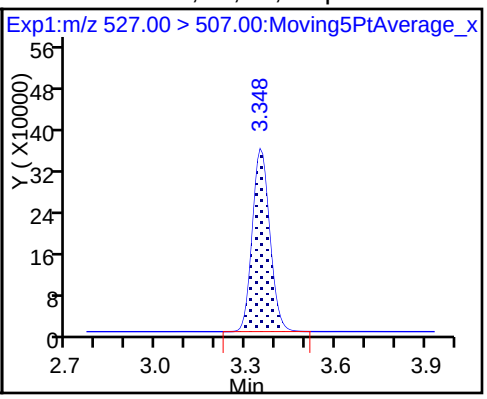
20 Perfluorononanoic acid



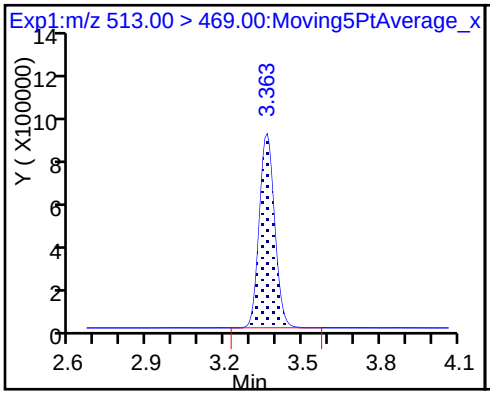
D 26 M2-8:2FTS



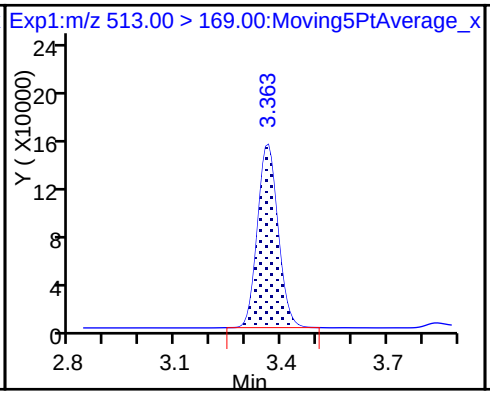
25 Sodium 1H,1H,2H,2H-perfluorodecane



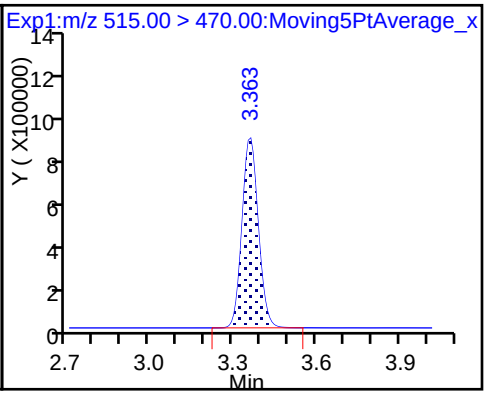
24 Perfluorodecanoic acid



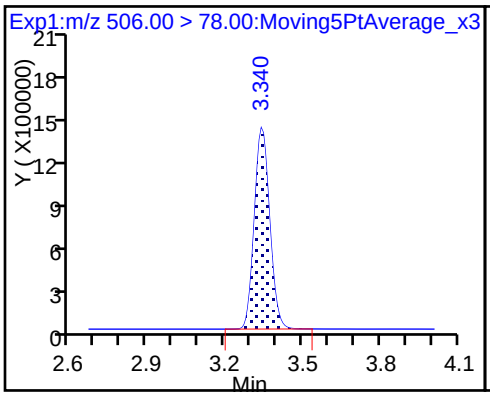
24 Perfluorodecanoic acid



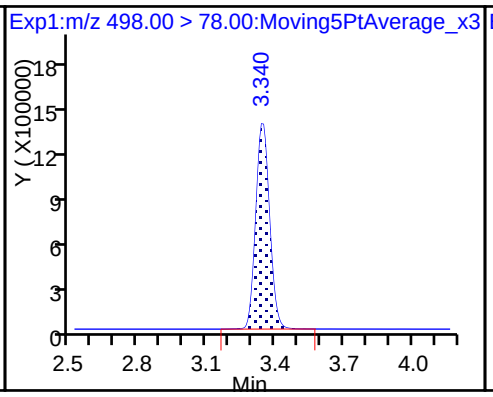
D 23 13C2 PFDA



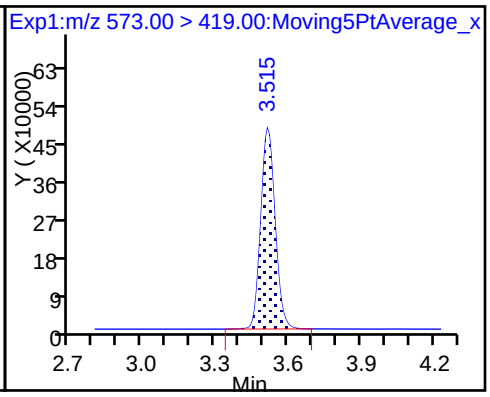
D 21 13C8 FOSA



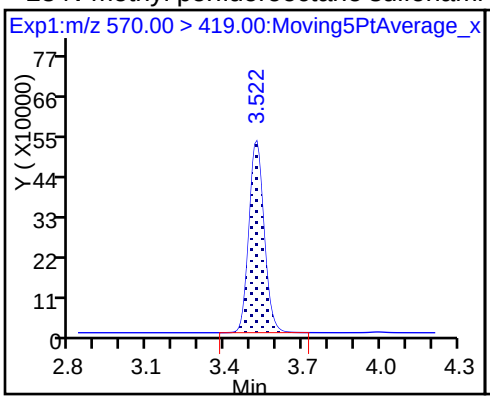
22 Perfluorooctane Sulfonamide



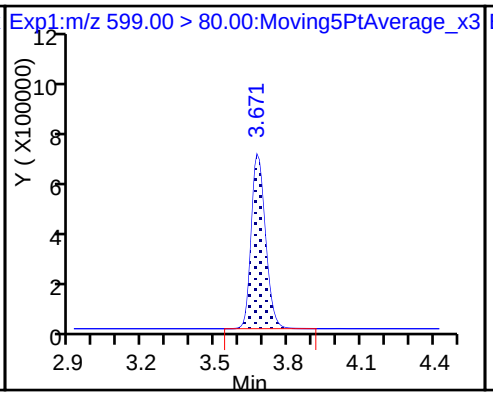
D 27 d3-NMeFOSAA



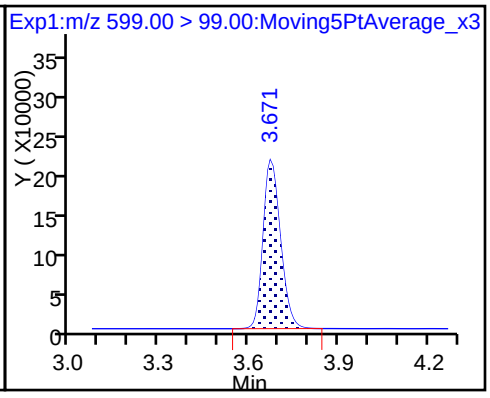
28 N-methyl perfluorooctane sulfonami



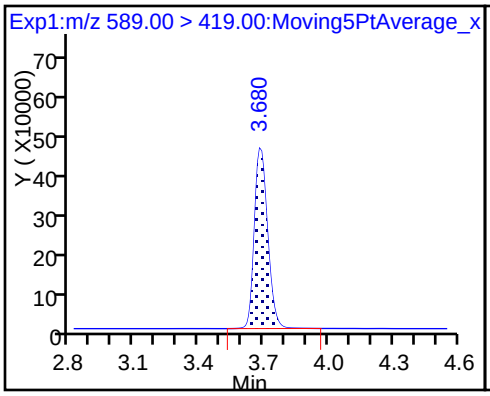
29 Perfluorodecane Sulfonic acid



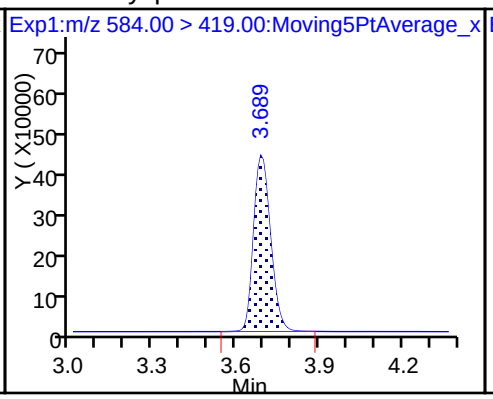
29 Perfluorodecane Sulfonic acid



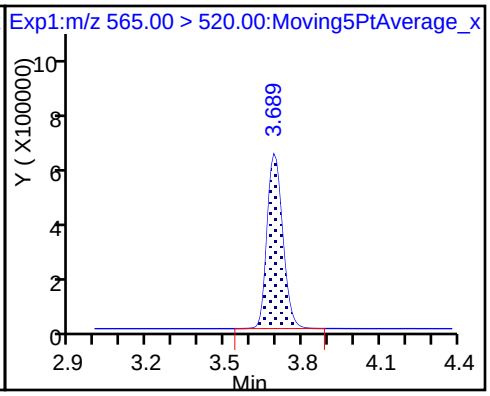
D 32 d5-NEtFOSAA



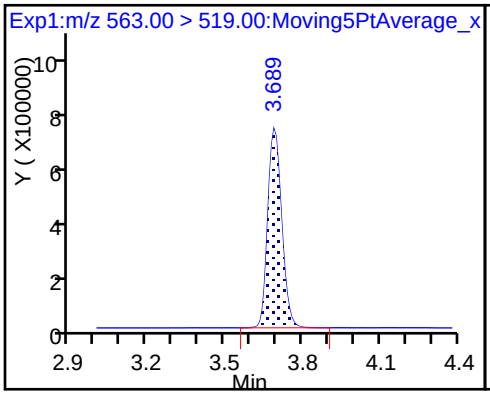
33 N-ethyl perfluorooctane sulfonamid



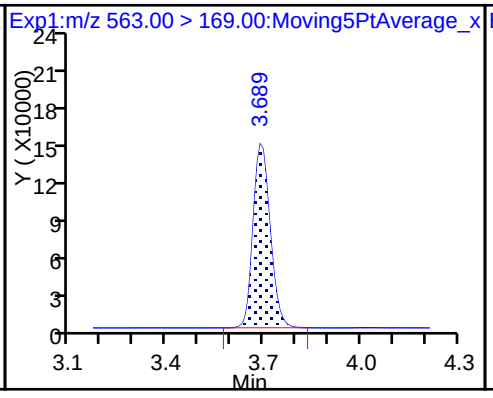
D 30 13C2 PFUnA



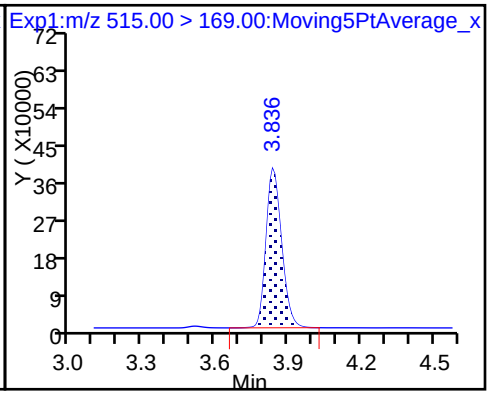
31 Perfluoroundecanoic acid



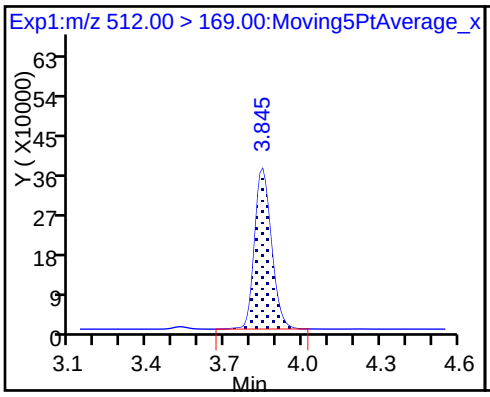
31 Perfluoroundecanoic acid



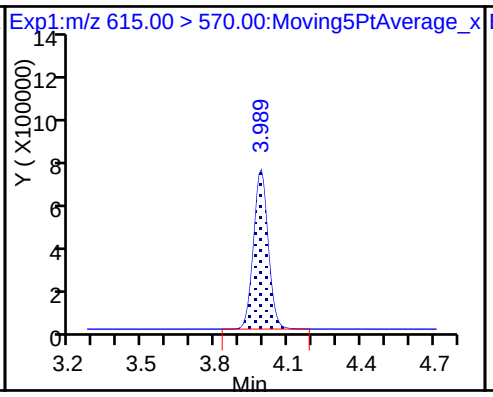
D 34 d-N-MeFOSA-M



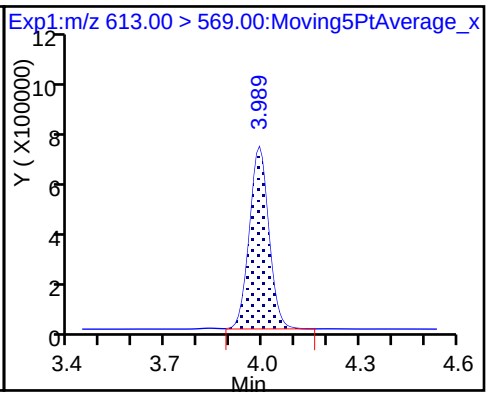
35 MeFOSA



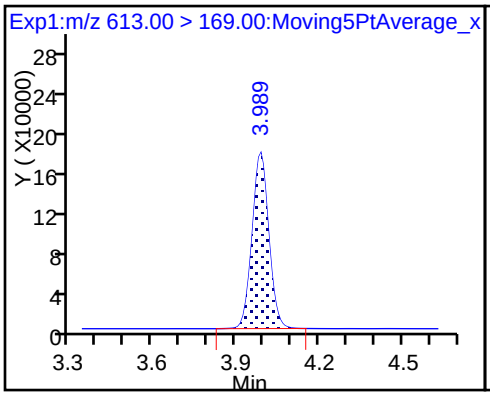
D 36 13C2 PFDoA



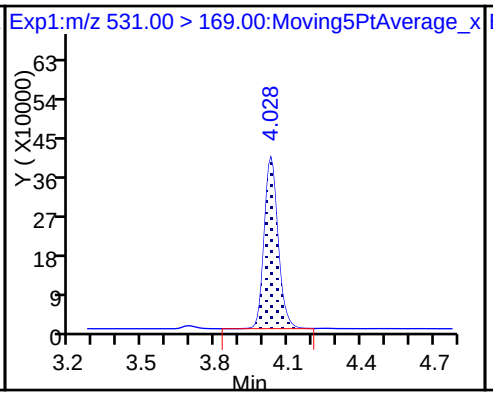
37 Perfluorododecanoic acid



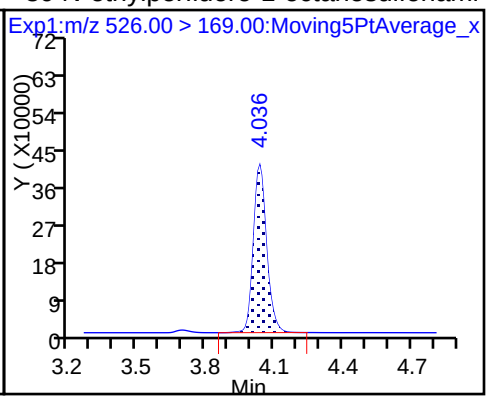
37 Perfluorododecanoic acid



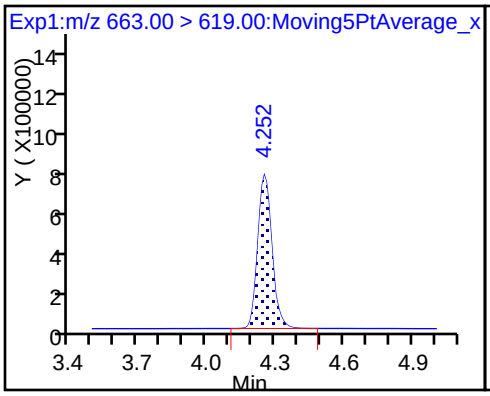
D 38 d-N-EtFOSA-M



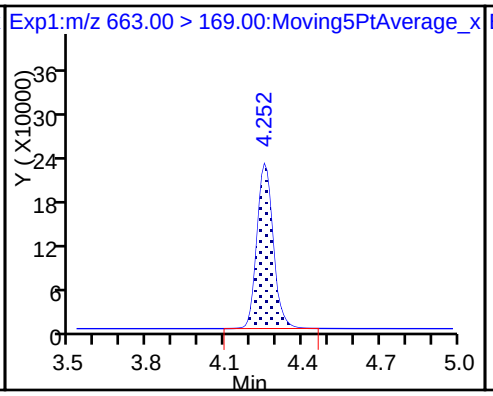
39 N-ethylperfluoro-1-octanesulfonami



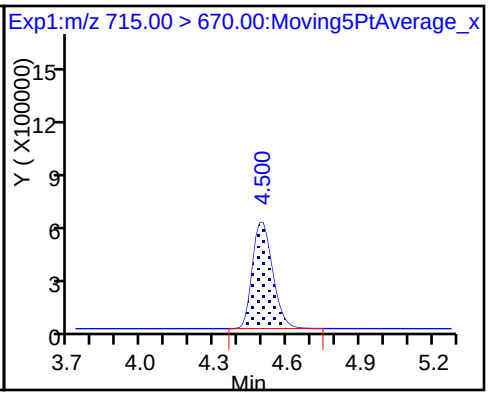
41 Perfluorotridecanoic acid



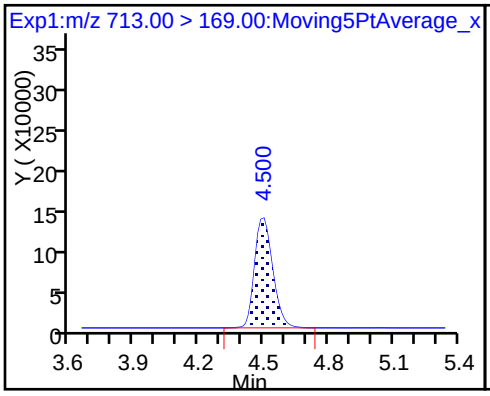
41 Perfluorotridecanoic acid



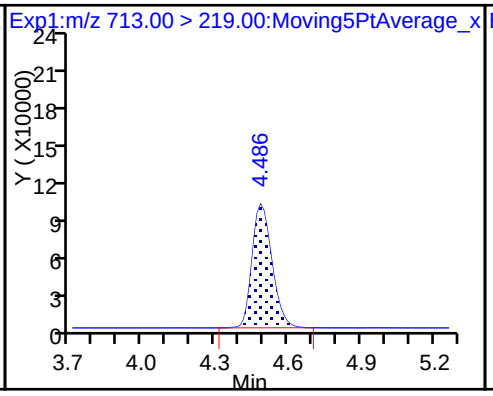
D 43 13C2-PFTeDA



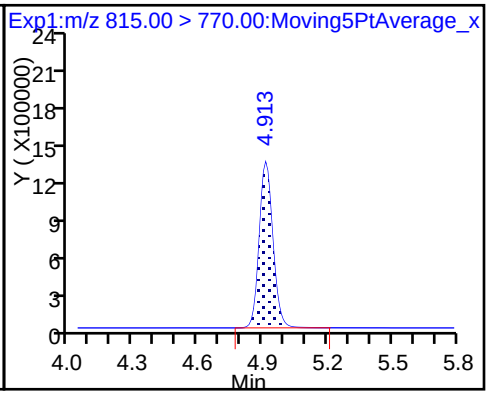
42 Perfluorotetradecanoic acid



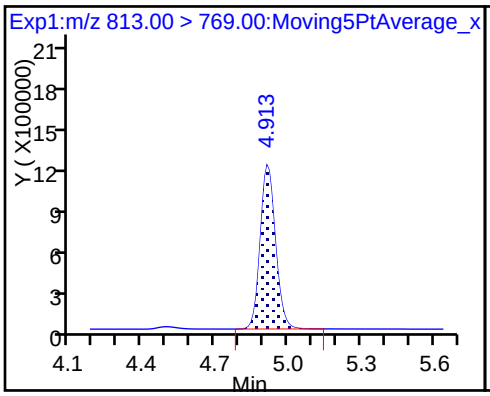
42 Perfluorotetradecanoic acid



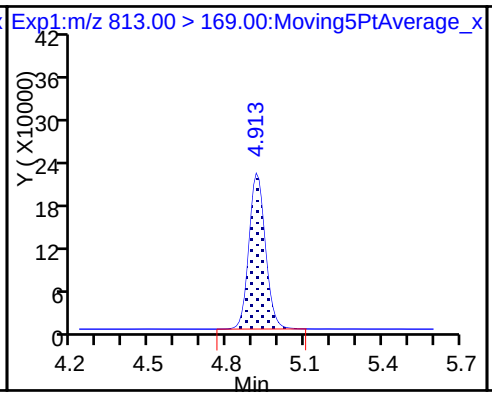
D 44 13C2-PFHxDA



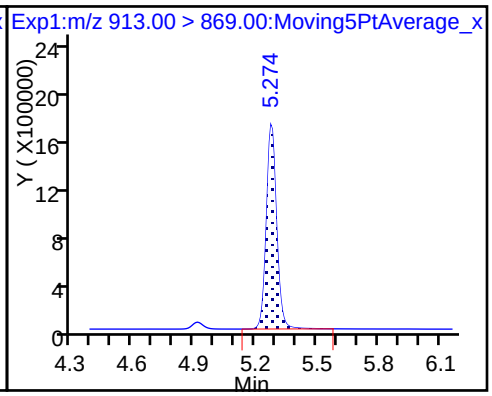
45 Perfluorohexadecanoic acid



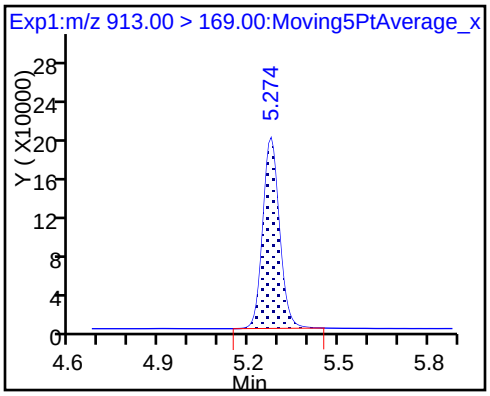
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCV 320-199646/9 Calibration Date: 12/12/2017 22:37

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.12LLB_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	0.9084	0.9346		1.03	1.00	2.9	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.164	1.112		0.956	1.00	-4.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.11	80.37		0.933	0.884	5.6	25.0
4:2 FTS	AveID	1.088	0.4954		0.425	0.934	-54.5*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.9836		0.963	1.00	-3.7	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.039	1.053		1.01	1.00	1.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.063	1.037		0.887	0.910	-2.5	25.0
6:2FTS	AveID	1.686	1.747		0.982	0.948	3.6	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.067	1.051		0.985	1.00	-1.5	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.301	1.328		0.972	0.952	2.1	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9749	0.9675		0.992	1.00	-0.8	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.036	1.017		0.911	0.928	-1.8	25.0
8:2FTS	AveID	1.235	1.274		0.989	0.958	3.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9368	1.018		1.09	1.00	8.7	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9809	0.9803		0.999	1.00	-0.0	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.047	1.068		1.02	1.00	2.0	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6323	0.6108		0.931	0.964	-3.4	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9417	0.9894		1.05	1.00	5.1	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9833	0.8903		0.905	1.00	-9.5	25.0
MeFOSA	AveID	0.9545	1.002		1.05	1.00	5.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9872	0.996		1.01	1.00	0.9	25.0
N-EtFOSA-M	AveID	1.050	1.093		1.04	1.00	4.1	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.045	1.055		1.01	1.00	1.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2537	0.2547		1.00	1.00	0.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8830		1.01	1.00	1.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9556	1.005		1.05	1.00	5.1	25.0
13C4 PFBA	Ave	1.489	1.417		2.38	2.50	-4.9	50.0
13C5 PFPeA	Ave	0.9288	0.8597		2.31	2.50	-7.4	50.0
13C3-PFBS	Ave	0.0193	0.0177		2.13	2.33	-8.5	50.0
13C2 PFHxA	Ave	0.9542	0.9048		2.37	2.50	-5.2	50.0
13C4-PFHpA	Ave	0.9279	0.8680		2.34	2.50	-6.5	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCV 320-199646/9 Calibration Date: 12/12/2017 22:37

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.12LLB_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.162	1.098		2.24	2.37	-5.4	50.0
M2-6:2FTS	Ave	0.3113	0.5842		4.46	2.38	87.7*	50.0
13C4 PFOA	Ave	1.027	1.015		2.47	2.50	-1.2	50.0
13C4 PFOS	Ave	0.7554	0.7181		2.27	2.39	-4.9	50.0
13C5 PFNA	Ave	0.7423	0.7161		2.41	2.50	-3.5	50.0
13C8 FOSA	Ave	1.017	0.9433		2.32	2.50	-7.3	50.0
M2-8:2FTS	Ave	0.2450	0.1886		1.84	2.40	-23.0	50.0
13C2 PFDA	Ave	0.6290	0.5726		2.28	2.50	-9.0	50.0
d3-NMeFOSAA	Ave	0.3356	0.3254		2.42	2.50	-3.0	50.0
d5-NEtFOSAA	Ave	0.3261	0.3177		2.44	2.50	-2.6	50.0
13C2 PFUnA	Ave	0.4846	0.4579		2.36	2.50	-5.5	50.0
d-N-MeFOSA-M	Ave	0.2938	0.2659		2.26	2.50	-9.5	50.0
13C2 PFDoA	Ave	0.5394	0.4814		2.23	2.50	-10.8	50.0
d-N-EtFOSA-M	Ave	0.2737	0.2399		2.19	2.50	-12.3	50.0
13C2-PFTeDA	Ave	0.6284	0.5549		2.21	2.50	-11.7	50.0
13C2-PFHxDA	Ave	1.040	1.000		2.40	2.50	-3.8	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_010.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 12-Dec-2017 22:37:54 ALS Bottle#: 13 Worklist Smp#: 9
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\20171213-51692.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 13-Dec-2017 13:39:52 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK047

First Level Reviewer: hannigana Date: 13-Dec-2017 13:39:47

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	1.401	1.401	0.0	0.534	8704907	2.38		95.1	45419	
2 Perfluorobutyric acid										
212.90 > 169.00	1.406	1.402	0.004	1.004	3254321	1.03		103	820	
D 3 13C5-PFPeA										
267.90 > 223.00	1.651	1.646	0.005	0.629	5283279	2.31		92.6	50272	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.651	1.648	0.003	1.000	2350063	0.9556		95.6	1572	
D 47 13C3-PFBS										
301.90 > 83.00	1.684	1.681	0.003	0.642	100975	2.13		91.5	3679	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.684	1.682	0.002	1.000	3085545	0.9334		106	15711	
298.90 > 99.00	1.684	1.682	0.002	1.000	1276901		2.42(1.25-3.74)		9757	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.891	1.887	0.004	1.000	664383	0.4254		45.5	24167	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.929	1.923	0.006	1.000	2187775	0.9635		96.3	4917	
313.00 > 119.00	1.929	1.923	0.006	1.000	191943		11.40(5.03-15.10)		3731	
D 7 13C2 PFHxA										
315.00 > 270.00	1.929	1.924	0.005	0.735	5560432	2.37		94.8	47240	
D 9 13C4-PFHpA										
367.00 > 322.00	2.256	2.254	0.002	0.860	5333846	2.34		93.5	43182	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.266	2.255	0.011	1.005	2247014	1.01		101	3979	
363.00 > 169.00	2.266	2.255	0.011	1.005	920714		2.44(1.13-3.40)		8781	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.277	2.269	0.008	1.000	2547540	0.8873		97.5	14500	
399.00 > 99.00	2.277	2.269	0.008	1.000	818810		3.11(1.50-4.49)		6545	

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	2.277	2.271	0.006	0.868	6385456	2.24		94.6	54912	
D 12 M2-6:2FTS										
429.00 > 81.00	2.609	2.605	0.004	0.994	3410476	4.46		188	83518	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.609	2.605	0.004	1.000	2378246	0.9823		104	80748	
D 14 13C4 PFOA										
417.00 > 372.00	2.624	2.618	0.006	1.000	6236069	2.47		98.8	58965	
* 62 13C2-PFOA										
415.00 > 370.00	2.624	2.619	0.005		6145264	2.50			59854	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.624	2.621	0.003	1.000	2621462	0.9853		98.5	1205	
413.00 > 169.00	2.624	2.621	0.003	1.000	1410063		1.86(0.84-2.52)		9082	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.631	2.626	0.005	1.000	2232340	0.9718		102	26905	
449.00 > 99.00	2.631	2.626	0.005	1.000	606772		3.68(1.94-5.82)		14048	
D 18 13C4 PFOS										
503.00 > 80.00	3.000	2.993	0.007	1.143	4218655	2.27		95.1	32241	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.000	2.994	0.006	1.000	1666366	0.9109		98.2	8879	
499.00 > 99.00	3.000	2.994	0.006	1.000	374065		4.45(2.31-6.93)		6310	
D 19 13C5 PFNA										
468.00 > 423.00	3.000	2.994	0.006	1.143	4400442	2.41		96.5	47158	
20 Perfluorononanoic acid										
463.00 > 419.00	3.000	2.994	0.006	1.000	1703019	0.99		99.2	5205	
463.00 > 169.00	3.000	2.994	0.006	1.000	437285		3.89(1.90-5.69)		13036	
D 26 M2-8:2FTS										
529.00 > 81.00	3.347	3.343	0.004	1.276	1110315	1.84		77.0	19639	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.347	3.344	0.003	1.000	565975	0.9889		103	17502	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.363	3.356	0.007	1.000	1379689	1.00		99.9	6570	
513.00 > 169.00	3.363	3.356	0.007	1.000	240209		5.74(2.36-7.09)		1998	
D 23 13C2 PFDA										
515.00 > 470.00	3.363	3.356	0.007	1.282	3518528	2.28		91.0	36664	
D 21 13C8 FOSA										
506.00 > 78.00	3.347	3.359	-0.012	1.276	5796724	2.32		92.7	27123	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.347	3.359	-0.012	1.000	2361234	1.09		109	23228	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.515	3.511	0.004	1.339	1999479	2.42		97.0	26316	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.522	3.515	0.007	1.002	854163	1.02		102	6264	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.671	3.667	0.004	1.000	1039330	0.9312		96.6	32217	
599.00 > 99.00	3.671	3.667	0.004	1.000	359767		2.89(1.39-4.16)		12904	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.680	3.677	0.003	1.403	1952588	2.44		97.4	15451	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.689	3.685	0.004	1.002	772714	1.05		105	12199	
D 30 13C2 PFUnA										
565.00 > 520.00	3.689	3.685	0.004	1.406	2813640	2.36		94.5	51604	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.689	3.685	0.004	1.000	1001956	0.9054		90.5	5706	
563.00 > 169.00	3.689	3.685	0.004	1.000	227782		4.40(0.00-0.00)		10319	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.836	3.856	-0.020	1.462	1634055	2.26		90.5	3924	
35 MeFOSA										
512.00 > 169.00	3.845	3.865	-0.020	1.002	654987	1.05		105	3222	
D 36 13C2 PFDoA										
615.00 > 570.00	3.989	3.979	0.010	1.520	2958164	2.23		89.2	31333	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.989	3.982	0.007	1.000	1178513	1.01		101	3042	
613.00 > 169.00	3.989	3.982	0.007	1.000	285660		4.13(2.13-6.40)		13980	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.028	4.048	-0.020	1.535	1474375	2.19		87.7	2934	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.036	4.056	-0.020	1.002	644316	1.04		104	2891	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.252	4.243	0.009	1.000	1248348	1.01		101	3442	
663.00 > 169.00	4.252	4.243	0.009	1.000	435793		2.86(1.25-3.76)		20382	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.500	4.481	0.019	1.715	3409745	2.21		88.3	24678	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.500	4.481	0.019	1.000	347343	1.00		100	12078	
713.00 > 219.00	4.486	4.481	0.005	0.997	235576		1.47(0.71-2.13)		10411	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.913	4.892	0.021	1.872	6143887	2.40		96.2	18379	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.922	4.894	0.028	1.002	2170037	1.01		101	1157	
813.00 > 169.00	4.922	4.894	0.028	1.002	386529		5.61(2.86-8.58)		6302	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.281	5.242	0.039	1.000	2469118	1.05		105	559	
913.00 > 169.00	5.274	5.242	0.032	0.999	306115		8.07(0.00-0.00)		2035	

Reagents:

LCPFC_LL4_00002 Amount Added: 1.00 Units: mL

Report Date: 13-Dec-2017 13:39:53 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_010.d

Injection Date: 12-Dec-2017 22:37:54 Instrument ID: A8_N

Lims ID: CCV L4

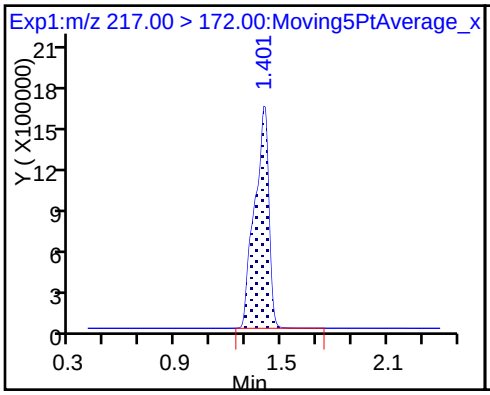
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 9

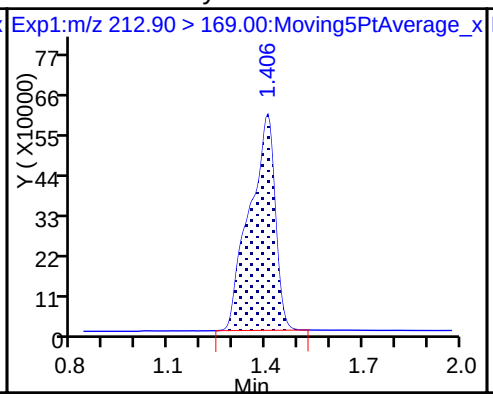
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

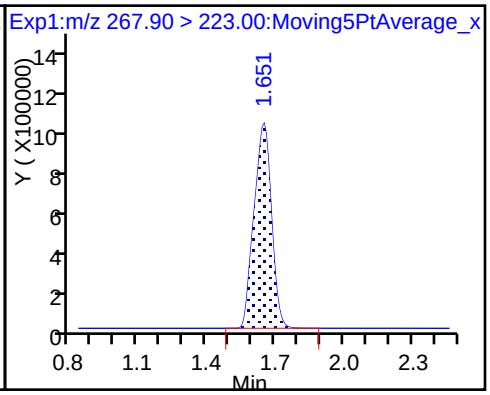
D 1 13C4 PFBA



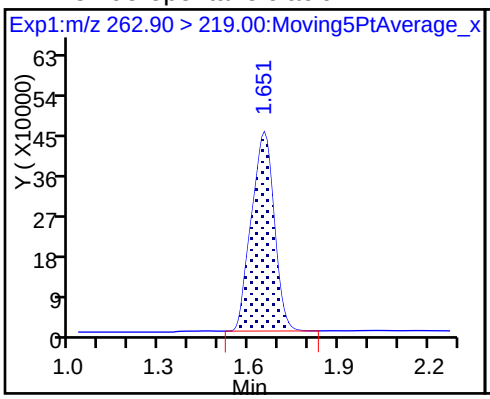
2 Perfluorobutyric acid



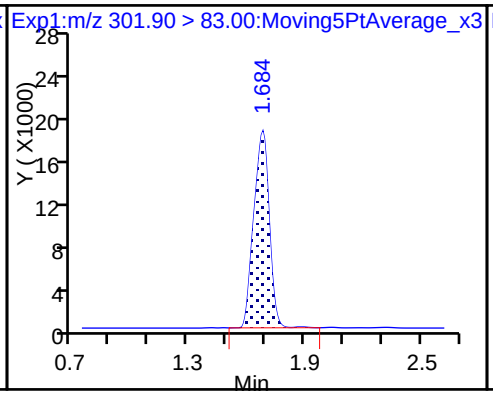
D 3 13C5-PFPeA



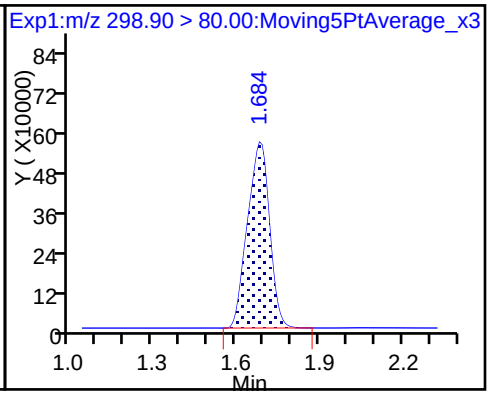
4 Perfluoropentanoic acid



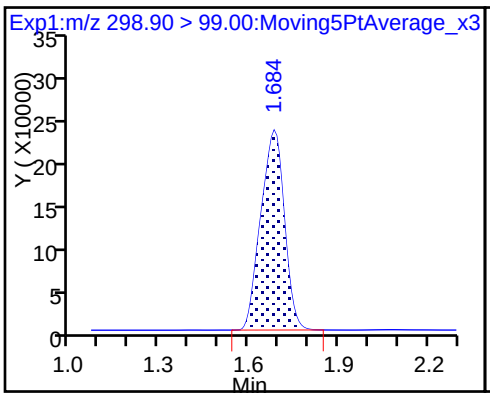
D 47 13C3-PFBS



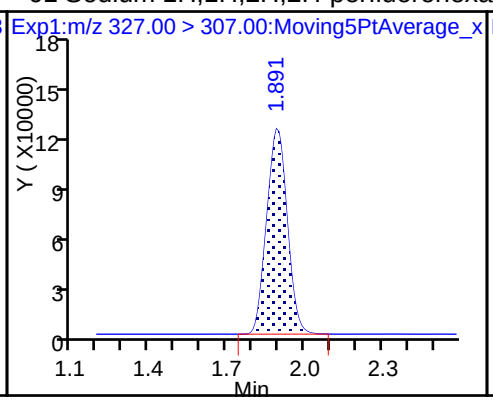
5 Perfluorobutanesulfonic acid



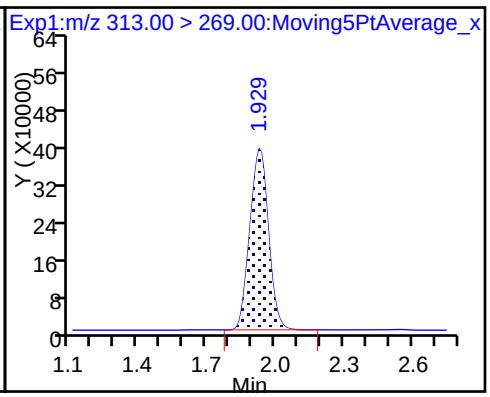
5 Perfluorobutanesulfonic acid



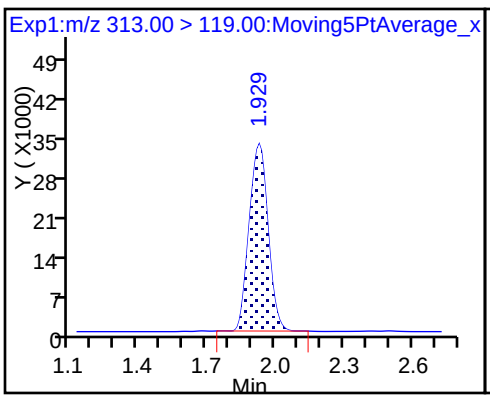
61 Sodium 1H,1H,2H,2H-perfluorohexane



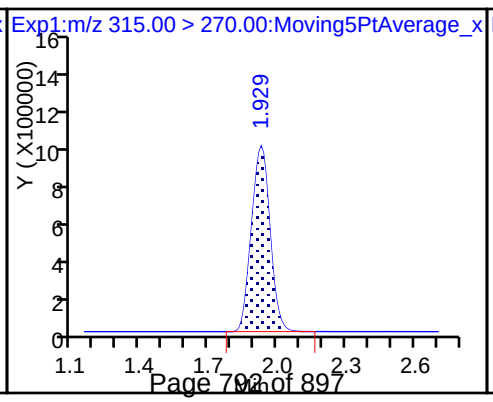
6 Perfluorohexanoic acid



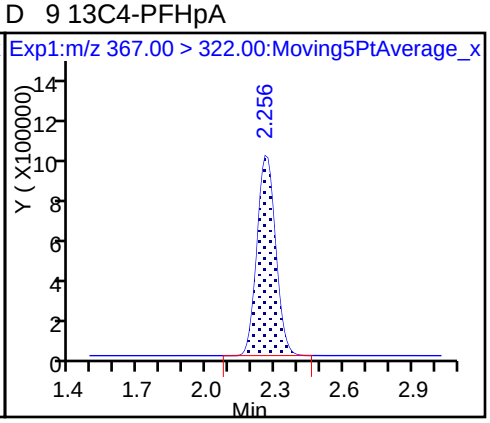
6 Perfluorohexanoic acid



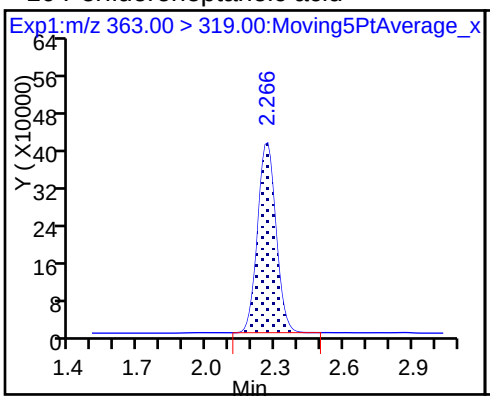
D 7 13C2 PFHxA



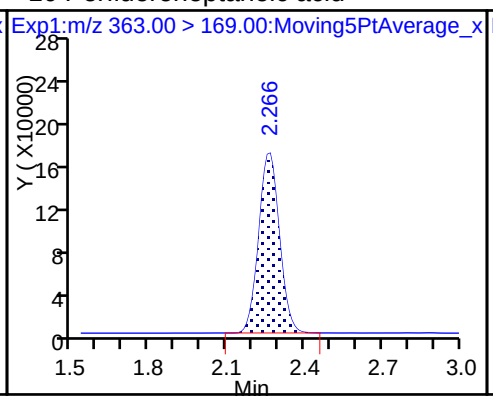
D 9 13C4-PFHpA



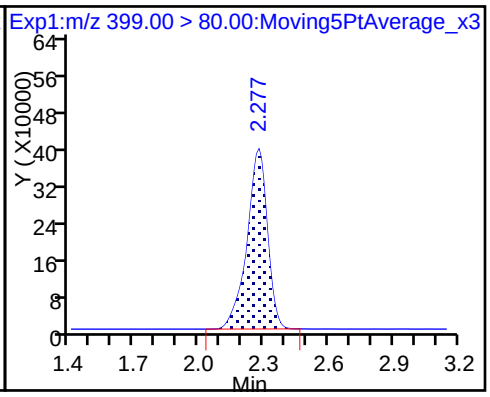
10 Perfluoroheptanoic acid



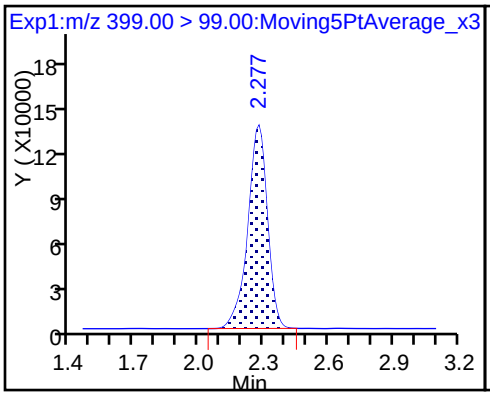
10 Perfluoroheptanoic acid



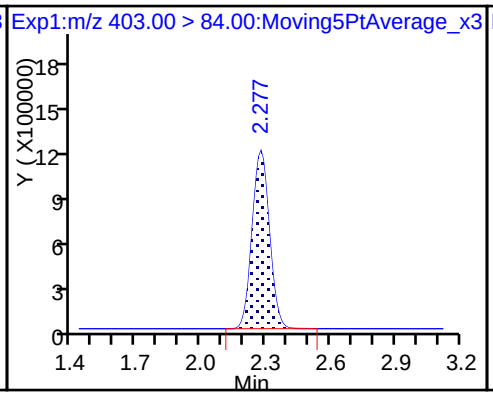
8 Perfluorohexanesulfonic acid



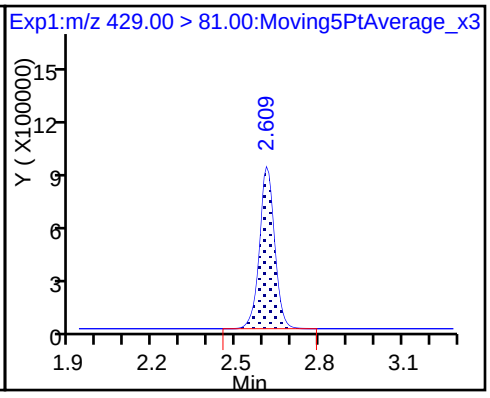
8 Perfluorohexanesulfonic acid



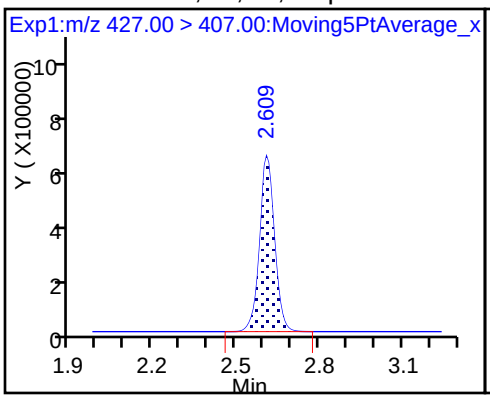
D 11 18O2 PFHxS



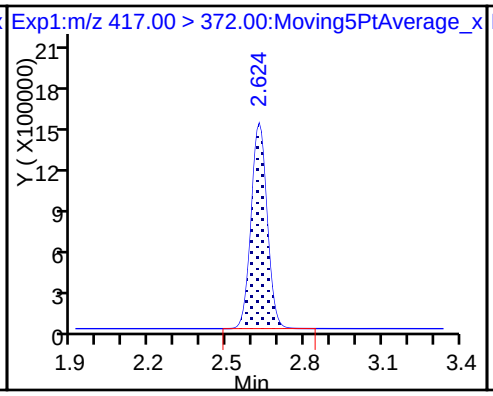
D 12 M2-6:2FTS



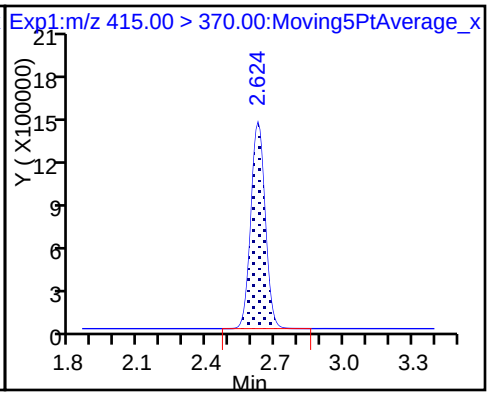
13 Sodium 1H,1H,2H,2H-perfluorooctane



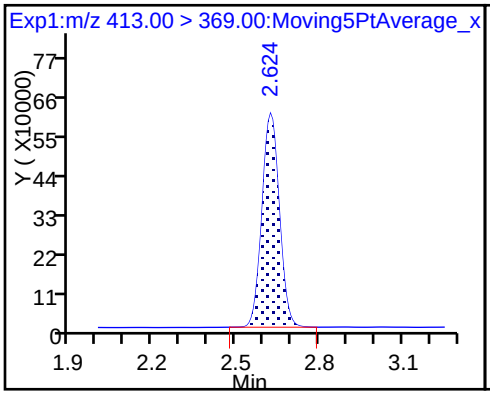
D 14 13C4 PFOA



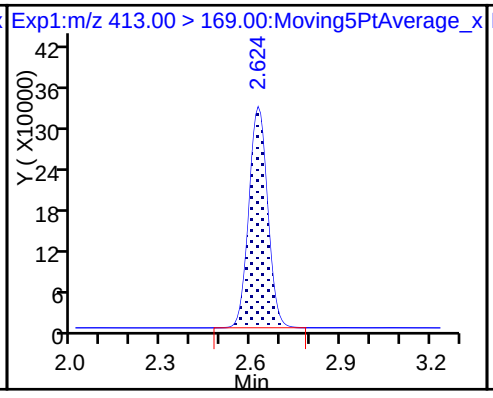
* 62 13C2-PFOA



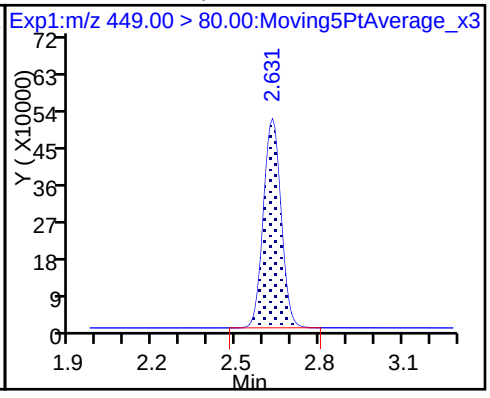
15 Perfluorooctanoic acid



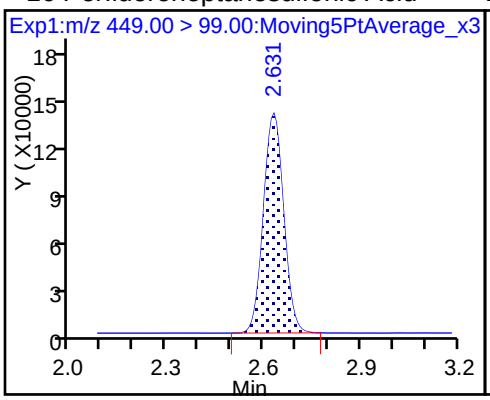
15 Perfluorooctanoic acid



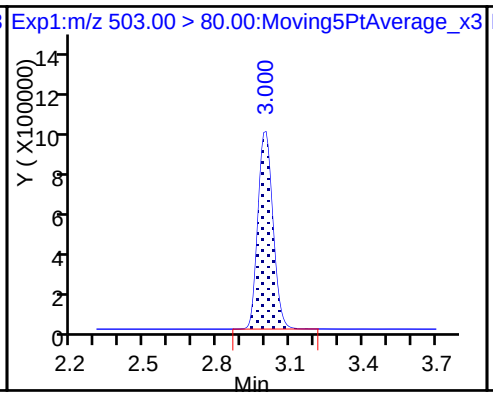
16 Perfluoroheptanesulfonic Acid



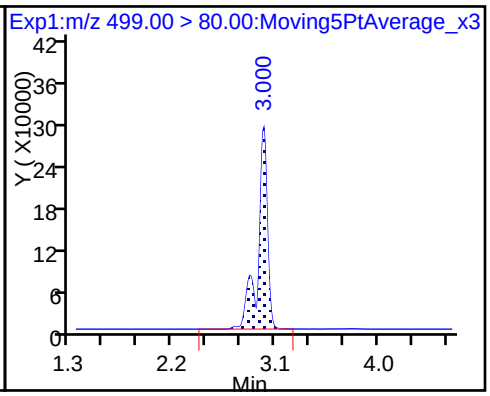
16 Perfluoroheptanesulfonic Acid



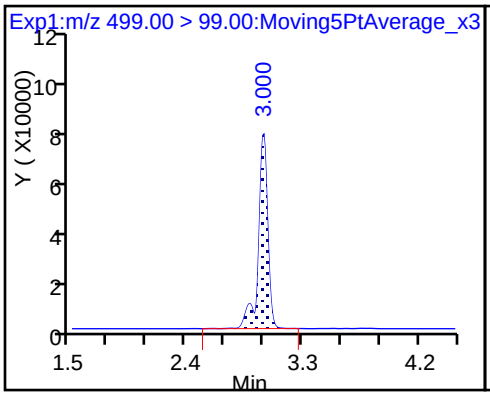
D 18 13C4 PFOS



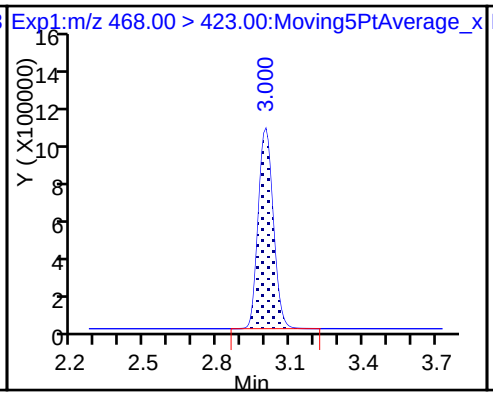
17 Perfluorooctane sulfonic acid



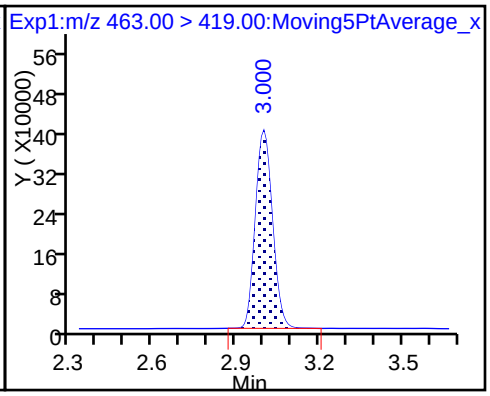
17 Perfluorooctane sulfonic acid



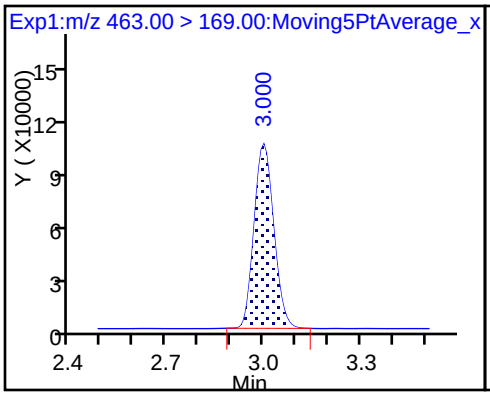
D 19 13C5 PFNA



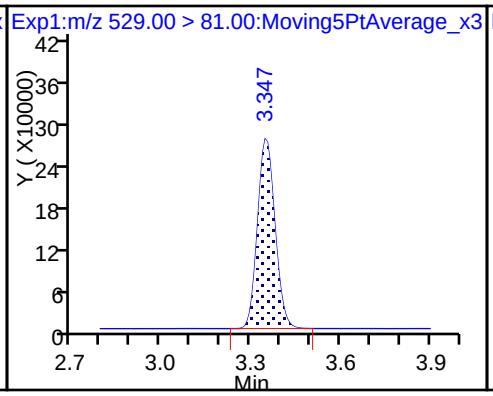
20 Perfluorononanoic acid



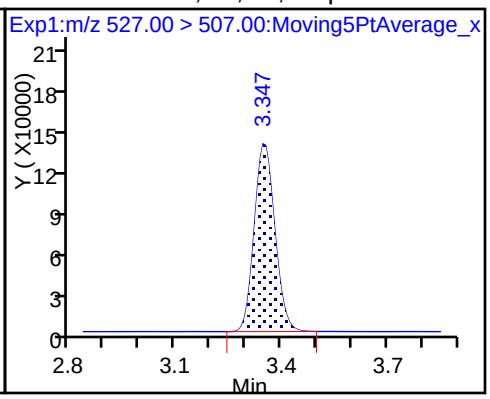
20 Perfluorononanoic acid



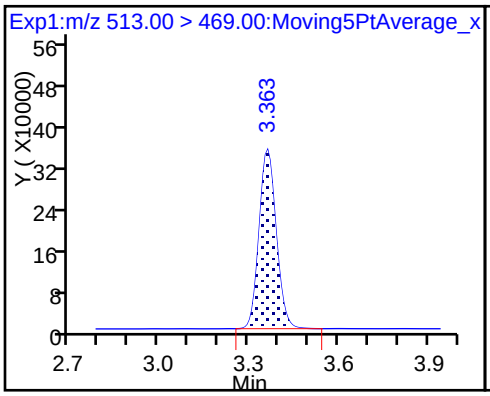
D 26 M2-8:2FTS



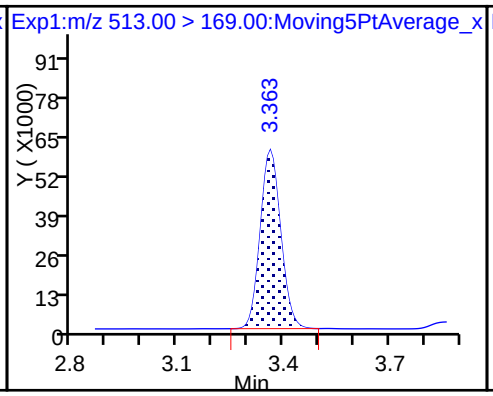
25 Sodium 1H,1H,2H,2H-perfluorodecane



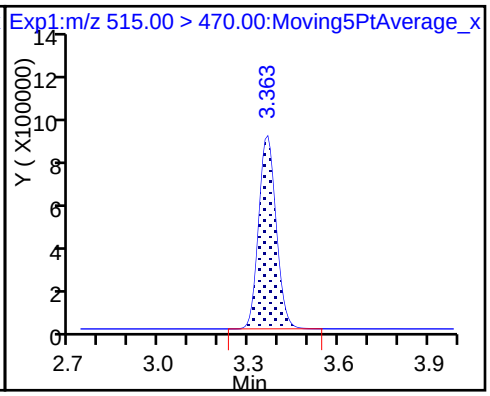
24 Perfluorodecanoic acid



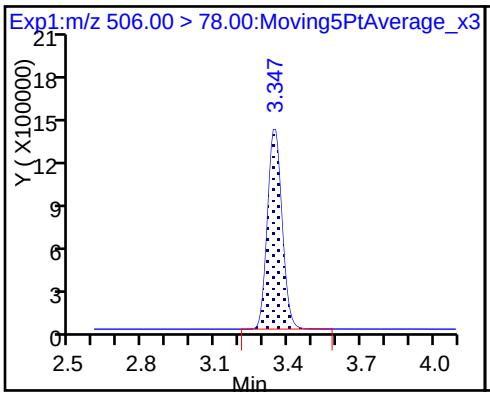
24 Perfluorodecanoic acid



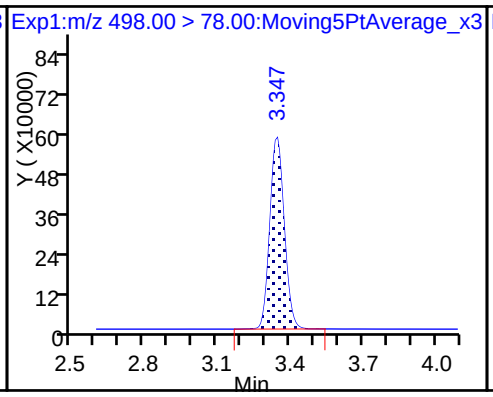
D 23 13C2 PFDA



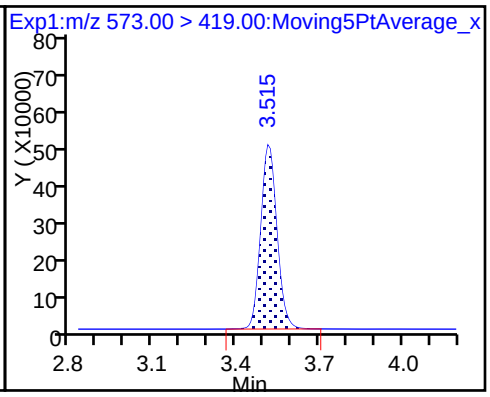
D 21 13C8 FOSA



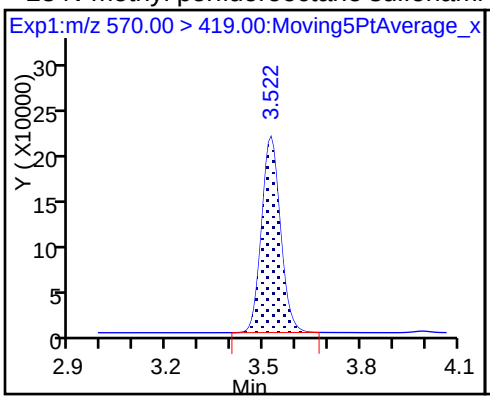
22 Perfluorooctane Sulfonamide



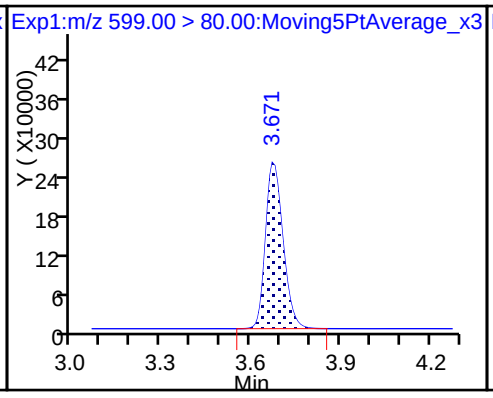
D 27 d3-NMeFOSAA



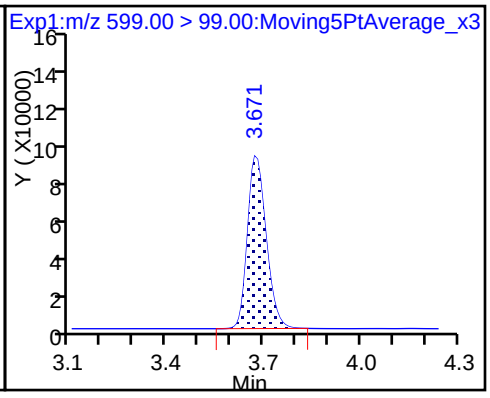
28 N-methyl perfluorooctane sulfonami



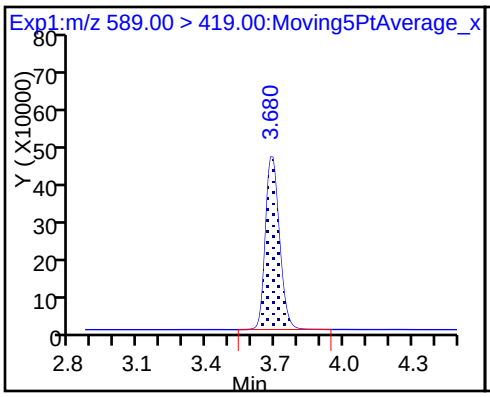
29 Perfluorodecane Sulfonic acid



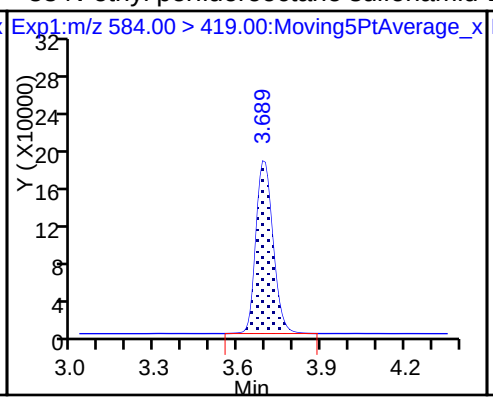
29 Perfluorodecane Sulfonic acid



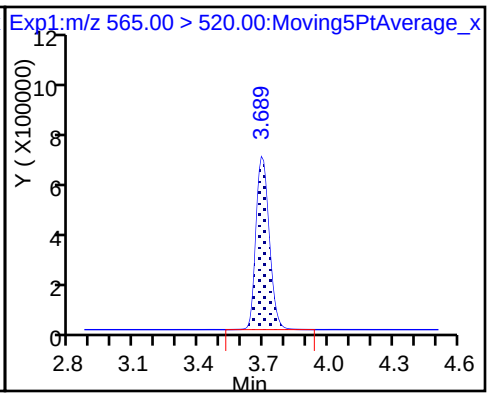
D 32 d5-NEtFOSAA



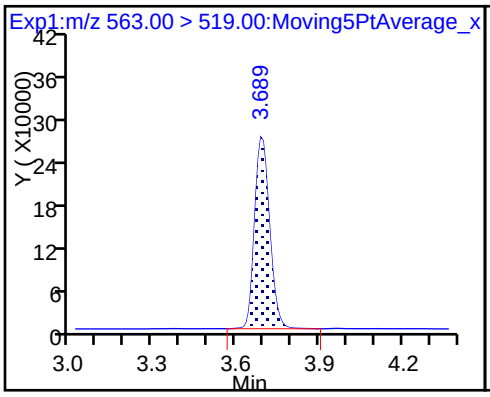
33 N-ethyl perfluorooctane sulfonamid



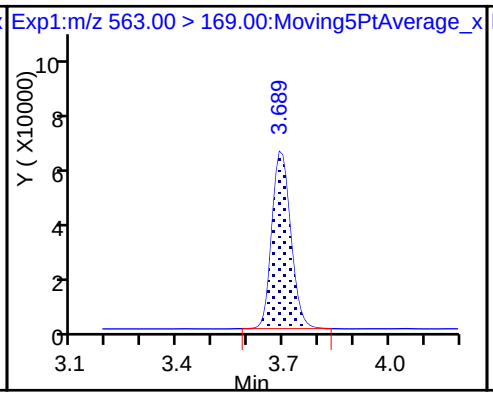
D 30 13C2 PFUnA



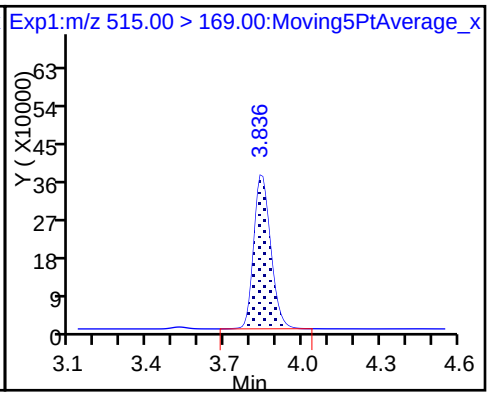
31 Perfluoroundecanoic acid



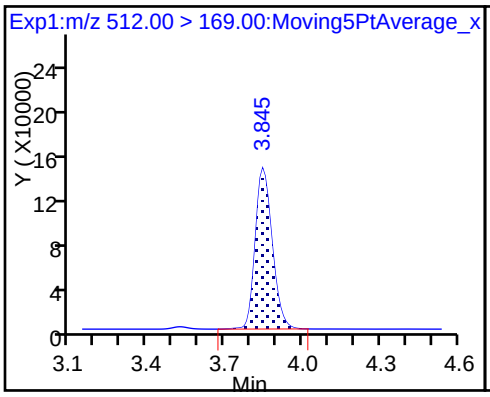
31 Perfluoroundecanoic acid



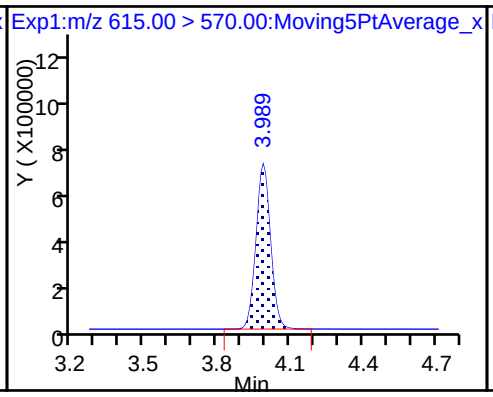
D 34 d-N-MeFOSA-M



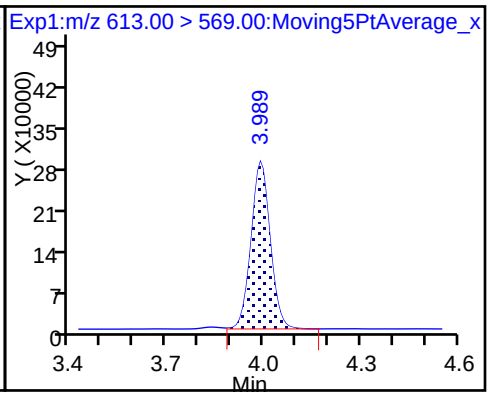
35 MeFOSA



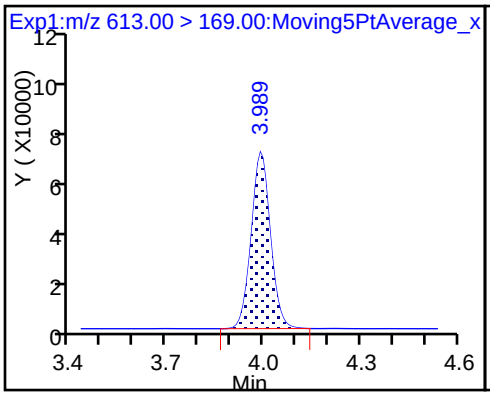
D 36 13C2 PFDoA



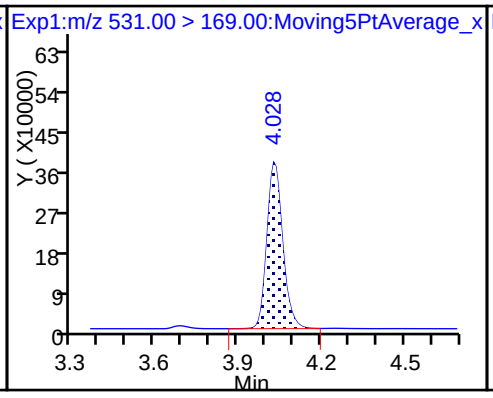
37 Perfluorododecanoic acid



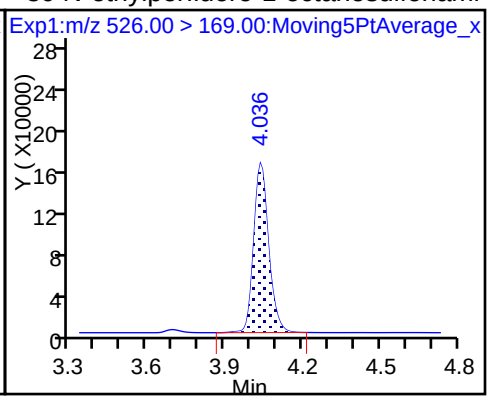
37 Perfluorododecanoic acid



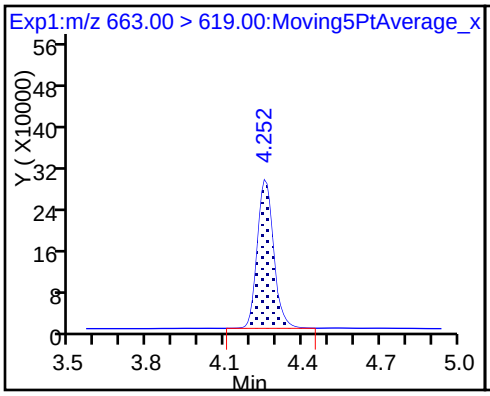
D 38 d-N-EtFOSA-M



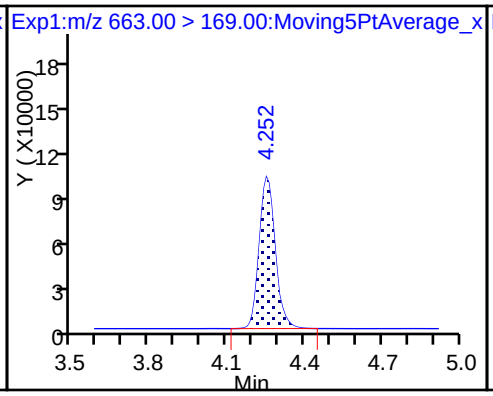
39 N-ethylperfluoro-1-octanesulfonami



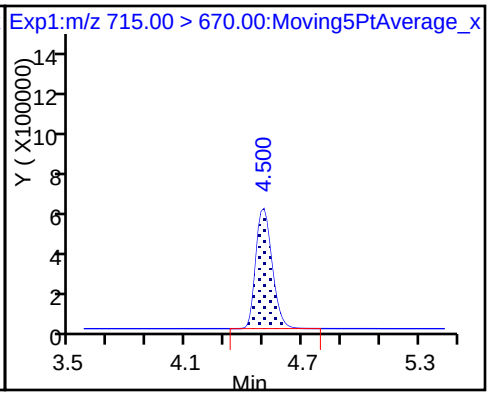
41 Perfluorotridecanoic acid



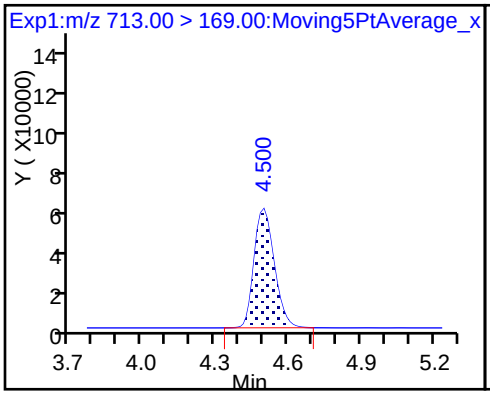
41 Perfluorotridecanoic acid



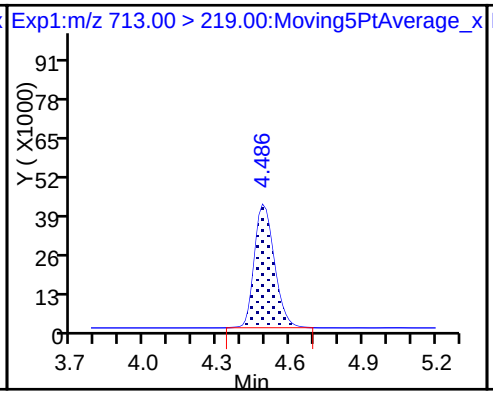
D 43 13C2-PFTeDA



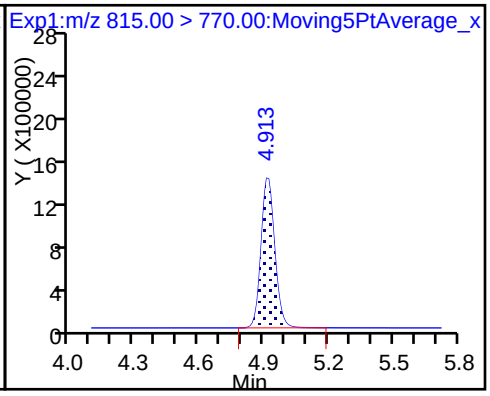
42 Perfluorotetradecanoic acid



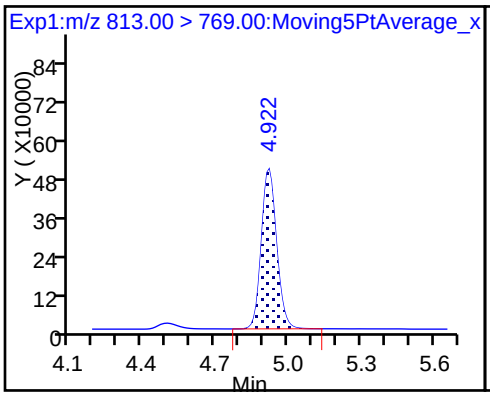
42 Perfluorotetradecanoic acid



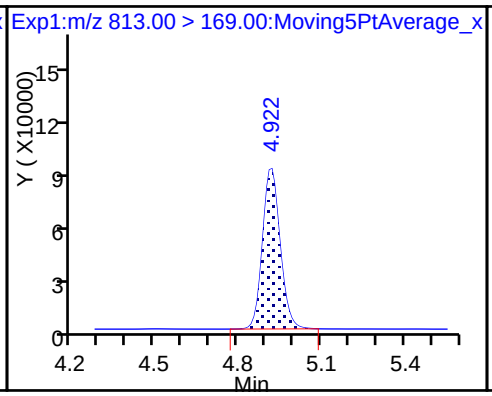
D 44 13C2-PFHxDA



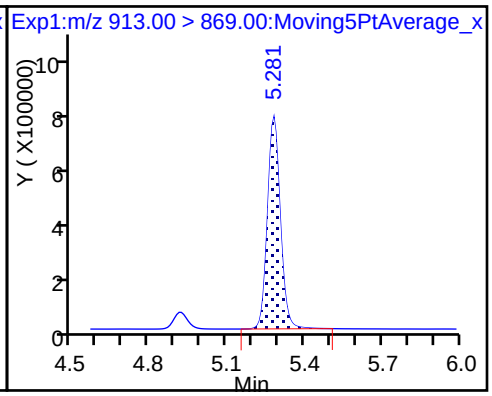
45 Perfluorohexadecanoic acid



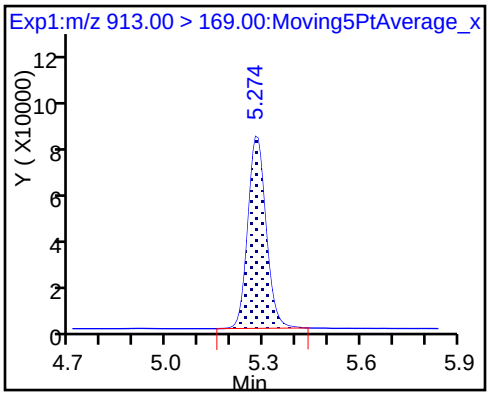
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCVL 320-199709/1 Calibration Date: 12/13/2017 10:42

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.13LLA_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	0.9084	0.9189		0.0506	0.0500	1.1	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.164	1.197		0.0514	0.0500	2.9	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.11	79.33		0.0461	0.0442	4.2	50.0
4:2 FTS	AveID	1.088	0.7321		0.314	0.467	-32.7	50.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.031		0.0505	0.0500	1.0	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.039	1.094		0.0526	0.0500	5.3	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.063	1.131		0.0484	0.0455	6.3	50.0
6:2FTS	AveID	1.686	1.655		0.465	0.474	-1.8	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.067	1.133		0.0531	0.0500	6.3	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.301	1.382		0.0505	0.0476	6.2	50.0
Perfluorononanoic acid (PFNA)	AveID	0.9749	0.9616		0.0493	0.0500	-1.4	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.036	1.067		0.0478	0.0464	2.9	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9368	0.9823		0.0524	0.0500	4.9	50.0
8:2FTS	AveID	1.235	1.211		0.470	0.479	-1.9	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9809	1.023		0.0521	0.0500	4.3	50.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.047	1.078		0.514	0.500	2.9	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6323	0.6597		0.0503	0.0482	4.3	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9417	0.9144		0.486	0.500	-2.9	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9833	1.025		0.0521	0.0500	4.2	50.0
MeFOSA	AveID	0.9545	1.016		0.532	0.500	6.5	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9872	1.036		0.0525	0.0500	5.0	50.0
N-EtFOSA-M	AveID	1.050	1.052		0.501	0.500	0.2	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.045	1.002		0.0479	0.0500	-4.1	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2537	0.2532		0.0499	0.0500	-0.2	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.392		0.0575	0.0500	14.9	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9556	1.091		0.0571	0.0500	14.2	50.0
13C4 PFBA	Ave	1.489	1.421		2.39	2.50	-4.6	50.0
13C5 PFPeA	Ave	0.9288	0.8594		2.31	2.50	-7.5	50.0
13C3-PFBS	Ave	0.0193	0.0178		2.14	2.33	-8.1	50.0
13C2 PFHxA	Ave	0.9542	0.9112		2.39	2.50	-4.5	50.0
13C4-PFHpA	Ave	0.9279	0.8743		2.36	2.50	-5.8	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCVL 320-199709/1 Calibration Date: 12/13/2017 10:42

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.13LLA_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.162	1.110		2.26	2.37	-4.4	50.0
M2-6:2FTS	Ave	0.3113	0.3421		2.61	2.38	9.9	50.0
13C4 PFOA	Ave	1.027	1.020		2.48	2.50	-0.7	50.0
13C4 PFOS	Ave	0.7554	0.6955		2.20	2.39	-7.9	50.0
13C5 PFNA	Ave	0.7423	0.7030		2.37	2.50	-5.3	50.0
13C8 FOSA	Ave	1.017	0.9158		2.25	2.50	-10.0	50.0
M2-8:2FTS	Ave	0.2450	0.1666		1.63	2.40	-32.0	50.0
13C2 PFDA	Ave	0.6290	0.5671		2.25	2.50	-9.8	50.0
d3-NMeFOSAA	Ave	0.3356	0.2973		2.22	2.50	-11.4	50.0
d5-NEtFOSAA	Ave	0.3261	0.3228		2.47	2.50	-1.0	50.0
13C2 PFUnA	Ave	0.4846	0.4175		2.15	2.50	-13.8	50.0
d-N-MeFOSA-M	Ave	0.2938	0.2602		2.21	2.50	-11.4	50.0
13C2 PFDoA	Ave	0.5394	0.4768		2.21	2.50	-11.6	50.0
d-N-EtFOSA-M	Ave	0.2737	0.2360		2.16	2.50	-13.8	50.0
13C2-PFTeDA	Ave	0.6284	0.5445		2.17	2.50	-13.4	50.0
13C2-PFHxDA	Ave	1.040	0.9802		2.36	2.50	-5.7	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51711.b\2017.12.13LLA_001.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 13-Dec-2017 10:42:27 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\20171213-51711.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 14-Dec-2017 12:21:52 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK015

First Level Reviewer: roycea Date: 14-Dec-2017 12:21:52

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	1.399	1.401	-0.002	0.534	8674502	2.39		95.4	47057	
2 Perfluorobutyric acid										
212.90 > 169.00	1.399	1.402	-0.003	1.000	159413	0.0506		101	36.8	
D 3 13C5-PFPeA										
267.90 > 223.00	1.649	1.646	0.003	0.629	5247936	2.31		92.5	41967	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.649	1.648	0.001	1.000	125634	0.0514		103	116	
D 47 13C3-PFBS										
301.90 > 83.00	1.681	1.681	0.0	0.641	100806	2.14		91.9	3138	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.681	1.682	-0.001	1.000	152034	0.0461		104	675	
298.90 > 99.00	1.681	1.682	-0.001	1.000	63082		2.41(1.25-3.74)		480	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.896	1.887	0.009	1.000	285665	0.3143		67.3	13377	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.925	1.923	0.002	1.000	114746	0.0505		101	240	
313.00 > 119.00	1.934	1.923	0.011	1.005	12091		9.49(5.03-15.10)		258	
D 7 13C2 PFHxA										
315.00 > 270.00	1.925	1.924	0.001	0.734	5563753	2.39		95.5	44646	
D 9 13C4-PFHpA										
367.00 > 322.00	2.260	2.254	0.006	0.862	5338904	2.36		94.2	36109	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.260	2.255	0.005	1.000	116817	0.0526		105	232	
363.00 > 169.00	2.260	2.255	0.005	1.000	43160		2.71(1.13-3.40)		375	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.271	2.269	0.002	1.000	139493	0.0484		106	1344	
399.00 > 99.00	2.271	2.269	0.002	1.000	45273		3.08(1.50-4.49)		438	

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	2.271	2.271	0.0	0.866	6412514	2.26		95.6	43134	
D 12 M2-6:2FTS										
429.00 > 81.00	2.614	2.605	0.009	0.997	1984464	2.61		110	44474	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.614	2.605	0.009	1.000	655442	0.4653		98.2	22490	
D 14 13C4 PFOA										
417.00 > 372.00	2.621	2.618	0.003	1.000	6228613	2.48		99.3	50648	
* 62 13C2-PFOA										
415.00 > 370.00	2.621	2.619	0.002		6106263	2.50			55300	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.621	2.621	0.0	1.000	141177	0.0531		106	120	
413.00 > 169.00	2.621	2.621	0.0	1.000	72972		1.93(0.84-2.52)		546	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.628	2.626	0.002	1.000	111739	0.0505		106	4318	
449.00 > 99.00	2.628	2.626	0.002	1.000	32383		3.45(1.94-5.82)		1058	
D 18 13C4 PFOS										
503.00 > 80.00	2.996	2.993	0.003	1.143	4060113	2.20		92.1	31379	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.996	2.994	0.002	1.000	84104	0.0478		103	474	
499.00 > 99.00	3.003	2.994	0.009	1.003	20827		4.04(2.31-6.93)		307	
D 19 13C5 PFNA										
468.00 > 423.00	2.996	2.994	0.002	1.143	4292571	2.37		94.7	37860	
20 Perfluorononanoic acid										
463.00 > 419.00	2.996	2.994	0.002	1.000	82555	0.0493		98.6	319	
463.00 > 169.00	2.996	2.994	0.002	1.000	18220		4.53(1.90-5.69)		342	
D 26 M2-8:2FTS										
529.00 > 81.00	3.351	3.343	0.008	1.279	974756	1.63		68.0	17547	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.351	3.344	0.007	1.000	235995	0.4697		98.1	8480	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.359	3.356	0.003	1.000	70836	0.0521		104	453	
513.00 > 169.00	3.359	3.356	0.003	1.000	11301		6.27(2.36-7.09)		141	
D 23 13C2 PFDA										
515.00 > 470.00	3.359	3.356	0.003	1.282	3462669	2.25		90.2	32112	
D 21 13C8 FOSA										
506.00 > 78.00	3.344	3.359	-0.015	1.276	5592160	2.25		90.0	25024	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.344	3.359	-0.015	1.000	109867	0.0524		105	3401	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.519	3.511	0.008	1.343	1815521	2.22		88.6	22443	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.519	3.515	0.004	1.000	391272	0.5145		103	3271	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.675	3.667	0.008	1.000	54019	0.0503		104	1958	
599.00 > 99.00	3.675	3.667	0.008	1.000	14819		3.65(1.39-4.16)		1221	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.684	3.677	0.007	1.406	1970991	2.47		99.0	11041	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.692	3.685	0.007	1.002	360460	0.4855		97.1	6657	
D 30 13C2 PFUnA										
565.00 > 520.00	3.692	3.685	0.007	1.409	2549395	2.15		86.2	36022	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.692	3.685	0.007	1.000	52242	0.0521		104	325	
563.00 > 169.00	3.692	3.685	0.007	1.000	12150		4.30(0.00-0.00)		538	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.840	3.856	-0.016	1.465	1588936	2.21		88.6	3621	
35 MeFOSA										
512.00 > 169.00	3.849	3.865	-0.016	1.002	323024	0.5325		106	3623	
D 36 13C2 PFDoA										
615.00 > 570.00	3.986	3.979	0.007	1.521	2911134	2.21		88.4	31822	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.986	3.982	0.004	1.000	60335	0.0525		105	187	
613.00 > 169.00	3.986	3.982	0.004	1.000	16191		3.73(2.13-6.40)		658	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.033	4.048	-0.015	1.539	1440848	2.16		86.2	3488	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.041	4.056	-0.015	1.002	303040	0.5008		100	2172	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.258	4.243	0.015	1.000	58317	0.0479		95.9	283	
663.00 > 169.00	4.248	4.243	0.005	0.998	20082		2.90(1.25-3.76)		1558	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.491	4.481	0.010	1.713	3324631	2.17		86.6	26655	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.491	4.481	0.010	1.000	16837	0.0499		99.8	599	
713.00 > 219.00	4.491	4.481	0.010	1.000	11048		1.52(0.71-2.13)		664	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.915	4.892	0.023	1.875	5985331	2.36		94.3	19566	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.915	4.894	0.021	1.000	166626	0.0575		115	121	
813.00 > 169.00	4.915	4.894	0.021	1.000	29822		5.59(2.86-8.58)		1149	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.269	5.242	0.027	1.000	130610	0.0571		114	49.6	
913.00 > 169.00	5.269	5.242	0.027	1.000	15894		8.22(0.00-0.00)		270	

Reagents:

LCPFC_CCVL_00001 Amount Added: 1.00 Units: mL

Report Date: 14-Dec-2017 12:21:53 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51711.b\2017.12.13LLA_001.d

Injection Date: 13-Dec-2017 10:42:27 Instrument ID: A8_N

Lims ID: CCVL

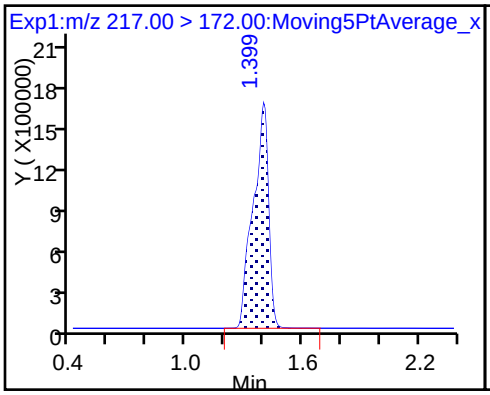
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 1

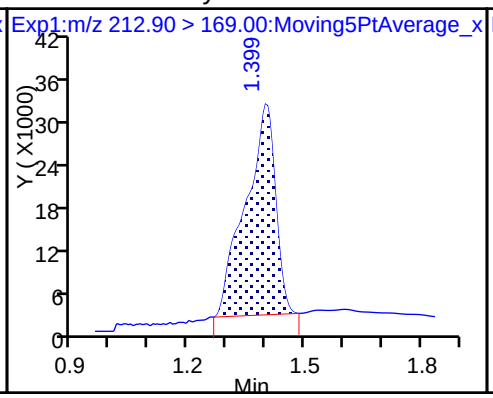
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

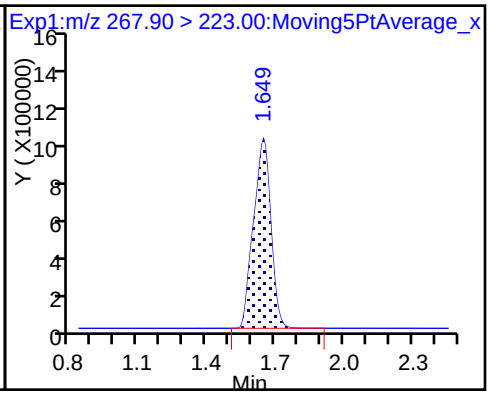
D 1 13C4 PFBA



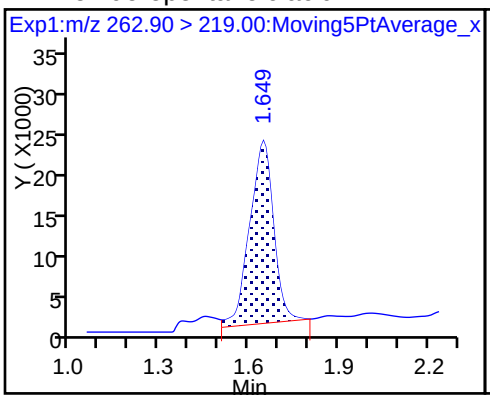
2 Perfluorobutyric acid



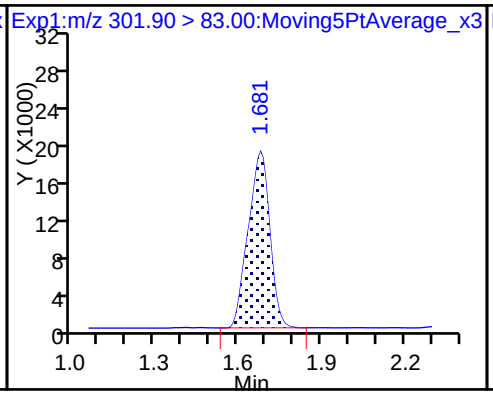
D 3 13C5-PFPeA



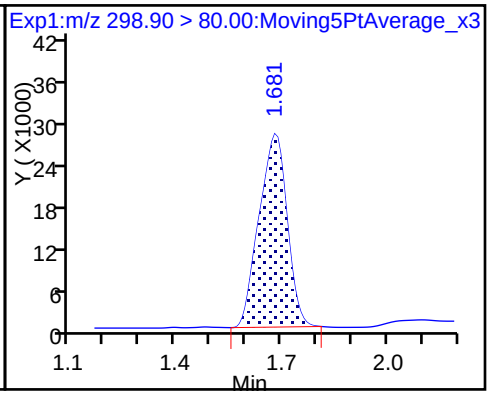
4 Perfluoropentanoic acid



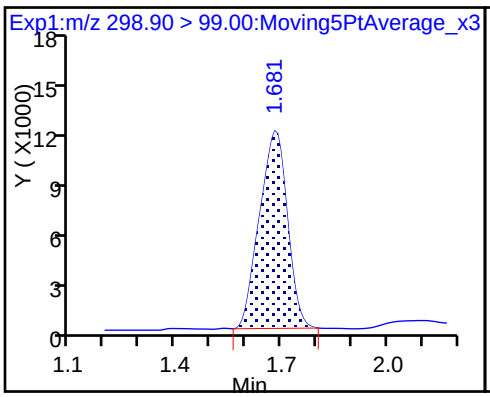
D 47 13C3-PFBS



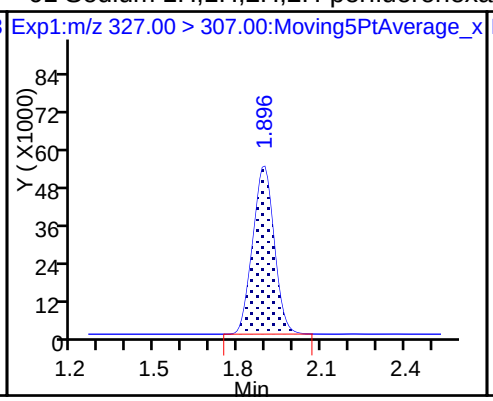
5 Perfluorobutanesulfonic acid



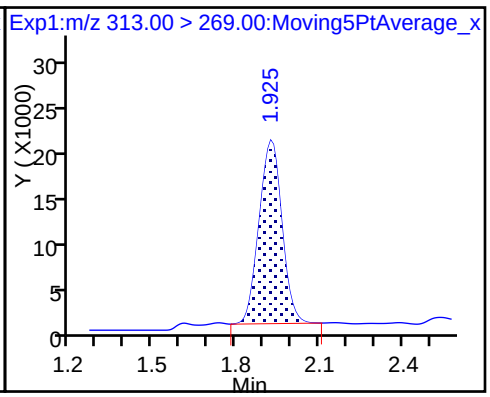
5 Perfluorobutanesulfonic acid



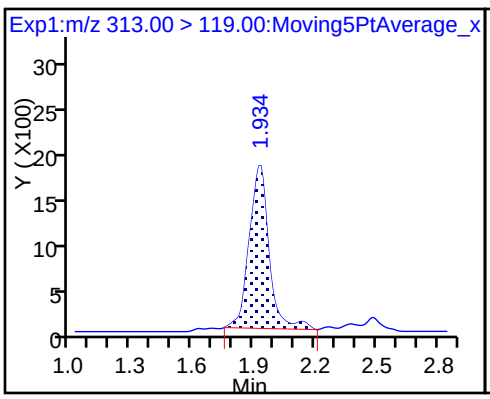
61 Sodium 1H,1H,2H,2H-perfluorohexane



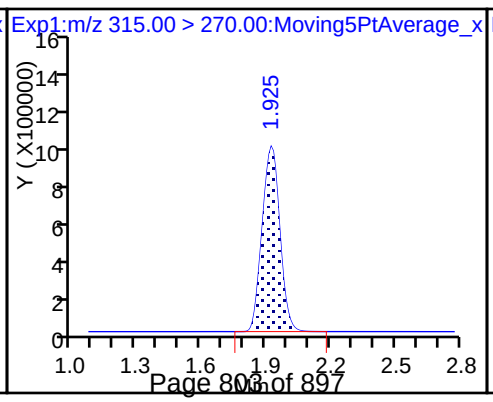
6 Perfluorohexanoic acid



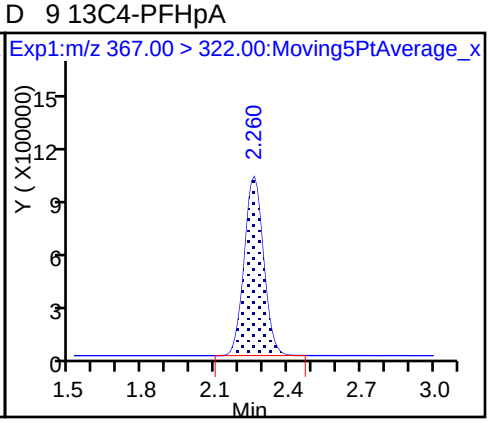
6 Perfluorohexanoic acid



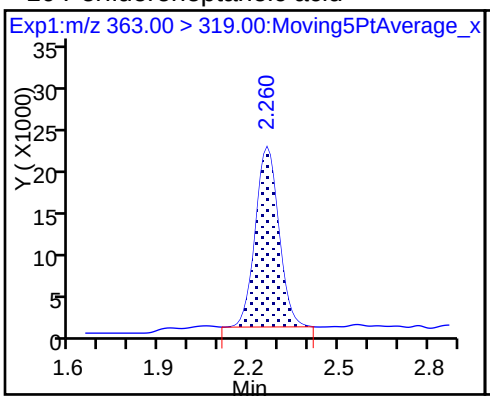
D 7 13C2 PFHxA



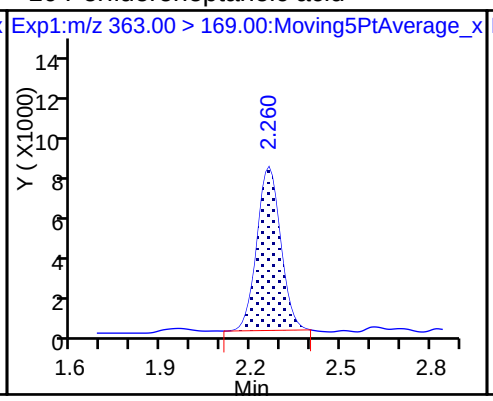
D 9 13C4-PFHpA



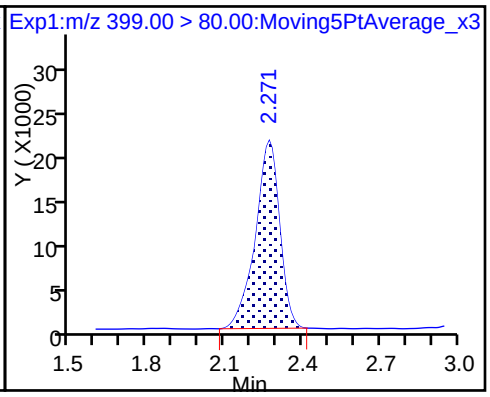
10 Perfluoroheptanoic acid



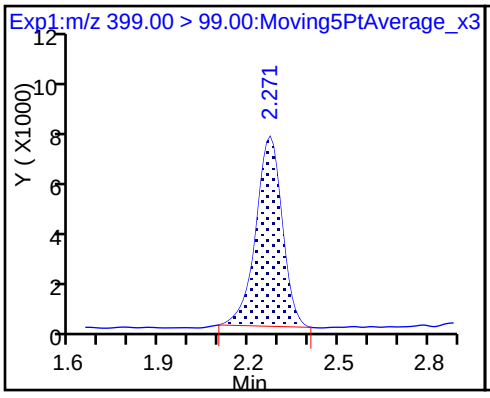
10 Perfluoroheptanoic acid



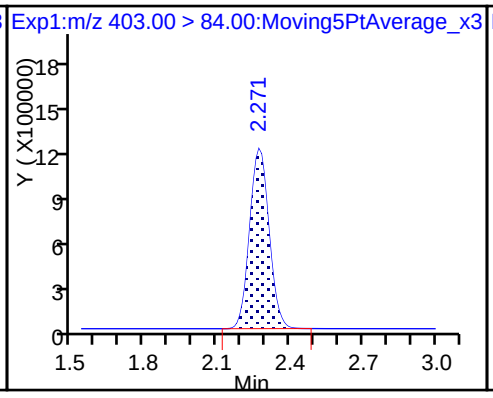
8 Perfluorohexanesulfonic acid



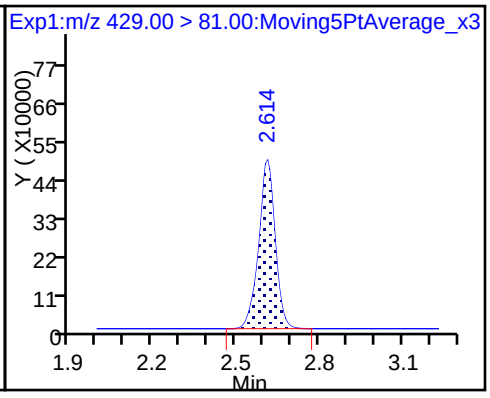
8 Perfluorohexanesulfonic acid



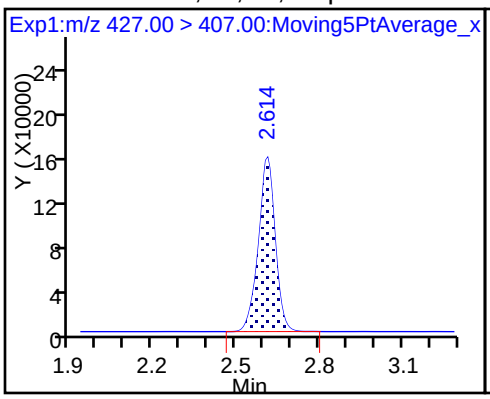
D 11 18O2 PFHxS



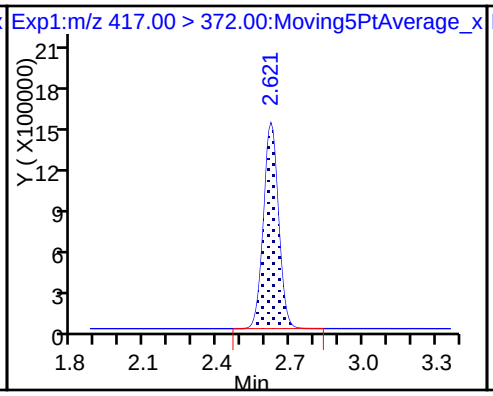
D 12 M2-6:2FTS



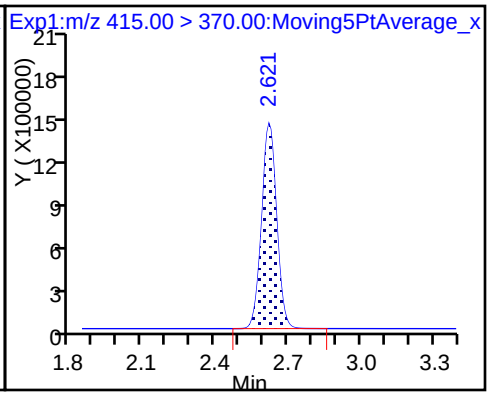
13 Sodium 1H,1H,2H,2H-perfluorooctane



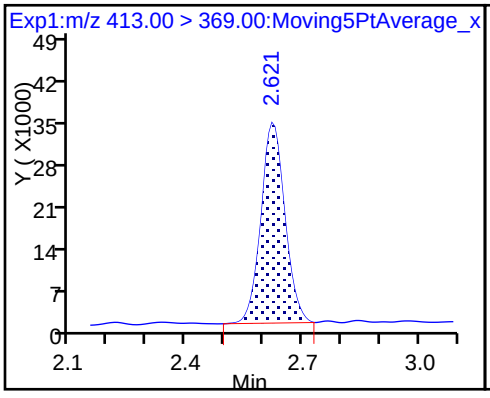
D 14 13C4 PFOA



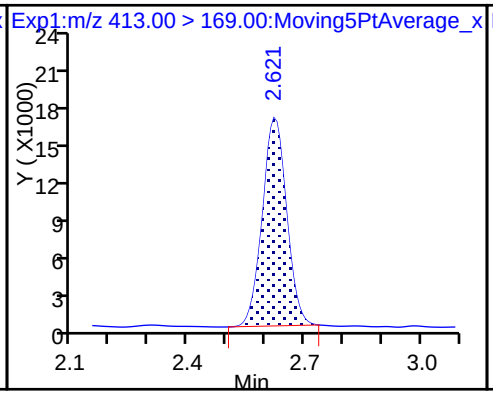
* 62 13C2-PFOA



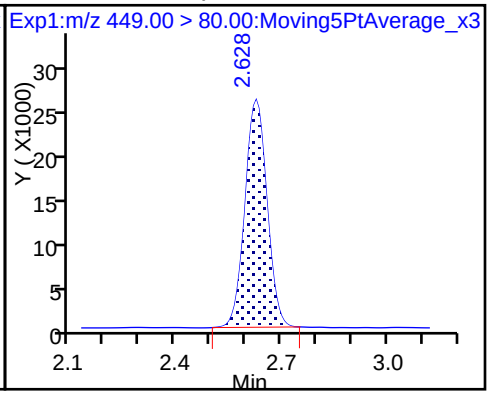
15 Perfluorooctanoic acid



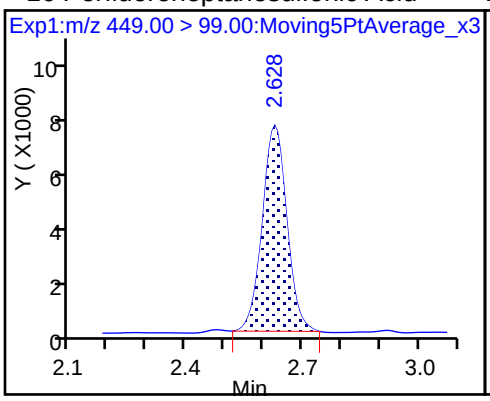
15 Perfluorooctanoic acid



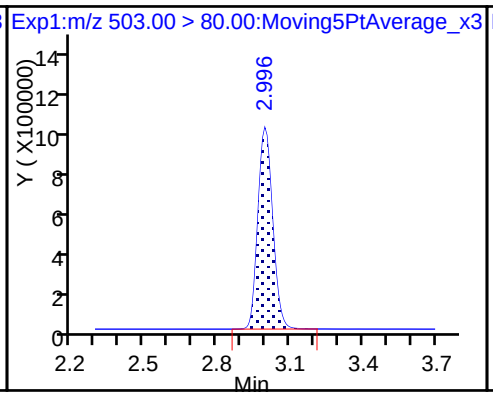
16 Perfluoroheptanesulfonic Acid



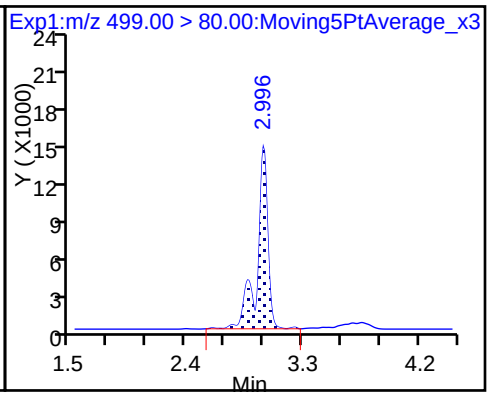
16 Perfluoroheptanesulfonic Acid



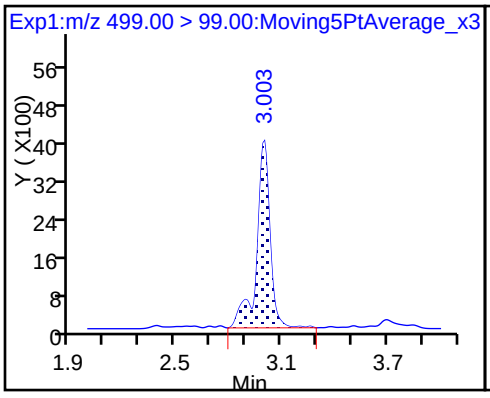
D 18 13C4 PFOS



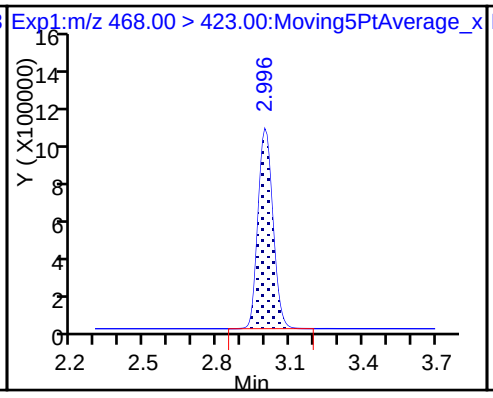
17 Perfluorooctane sulfonic acid



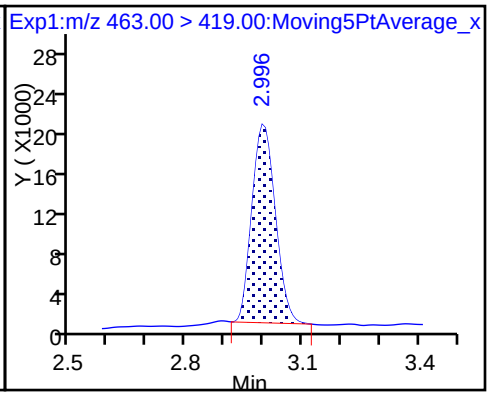
17 Perfluorooctane sulfonic acid



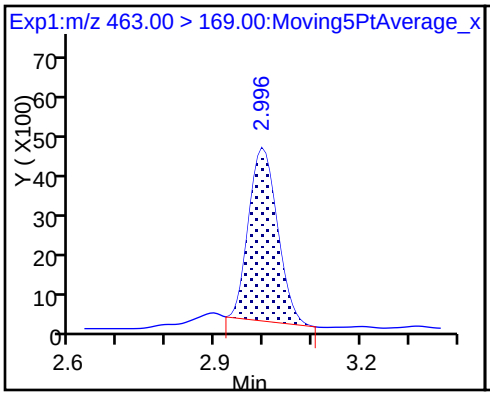
D 19 13C5 PFNA



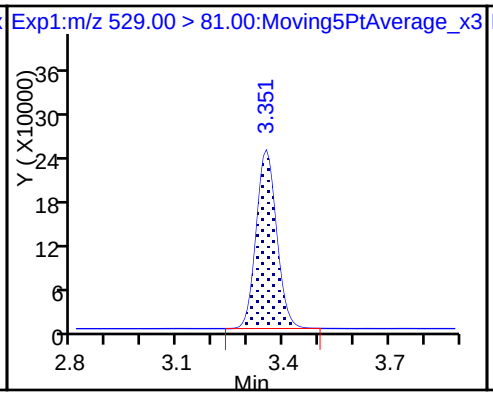
20 Perfluorononanoic acid



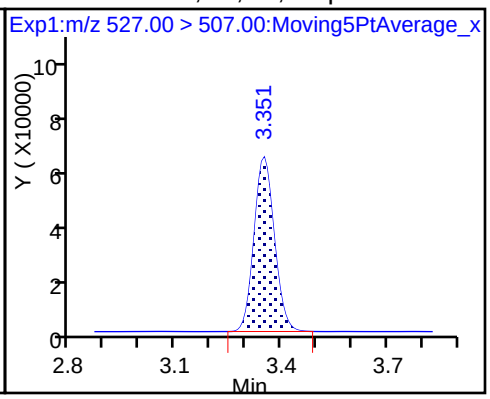
20 Perfluorononanoic acid



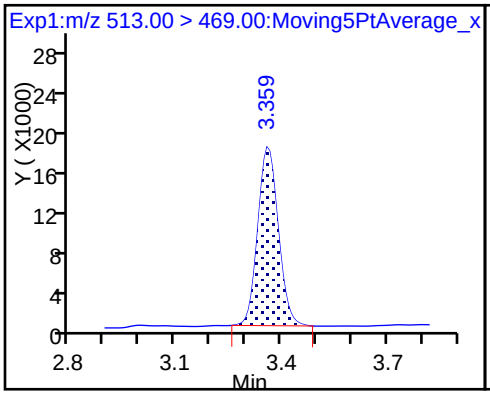
D 26 M2-8:2FTS



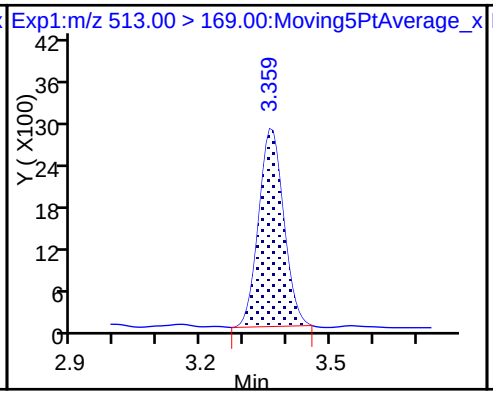
25 Sodium 1H,1H,2H,2H-perfluorodecane



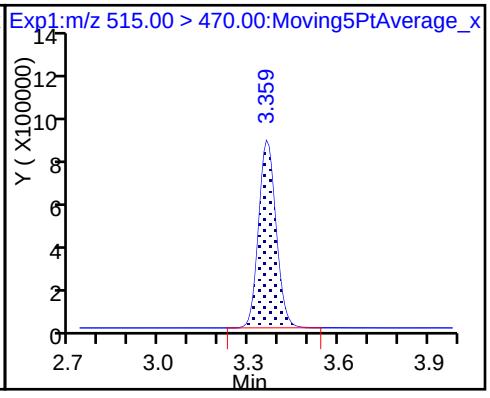
24 Perfluorodecanoic acid



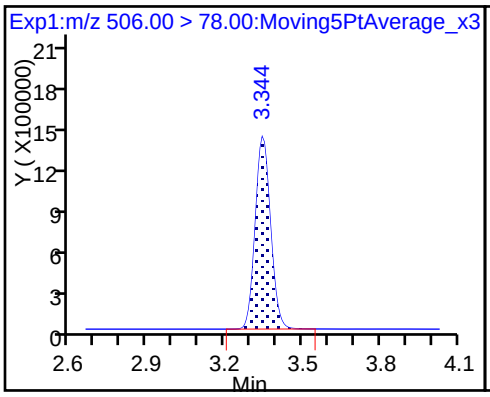
24 Perfluorodecanoic acid



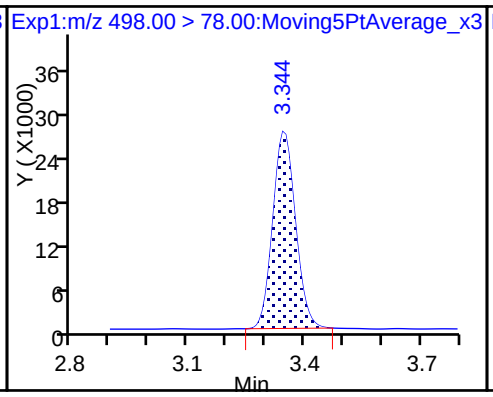
D 23 13C2 PFDA



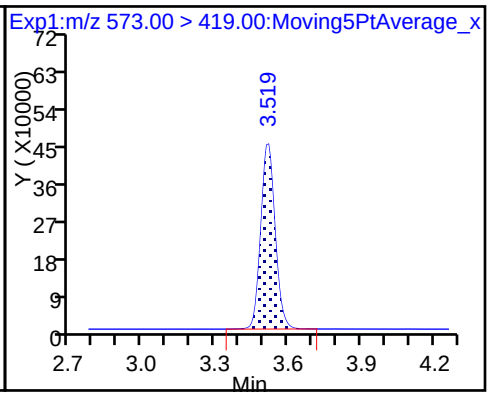
D 21 13C8 FOSA



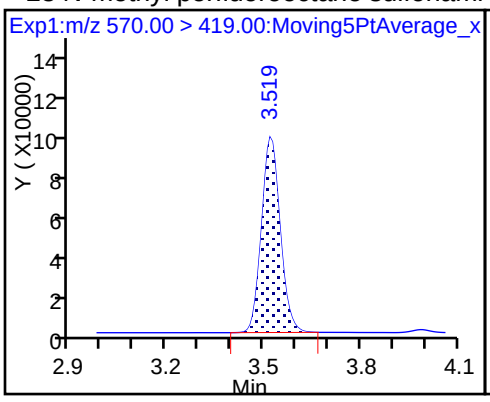
22 Perfluorooctane Sulfonamide



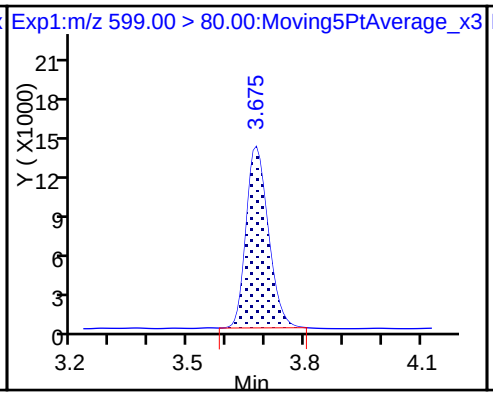
D 27 d3-NMeFOSAA



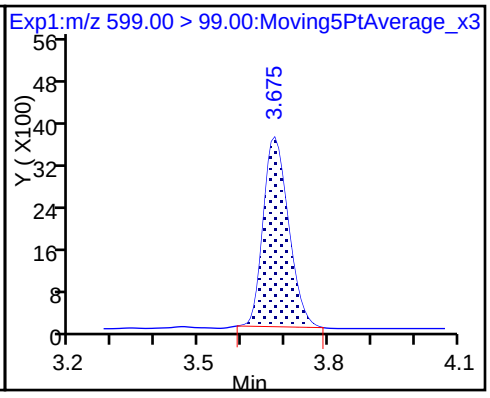
28 N-methyl perfluorooctane sulfonami



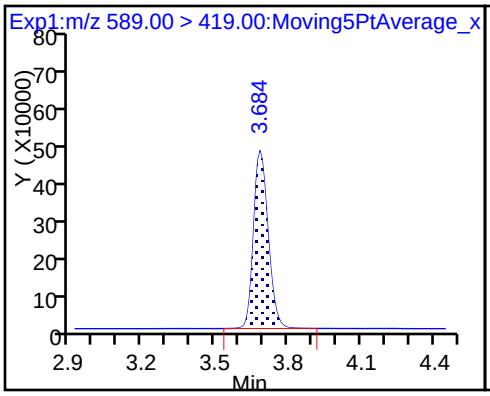
29 Perfluorodecane Sulfonic acid



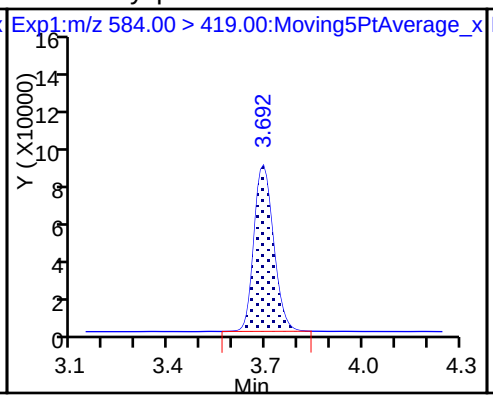
29 Perfluorodecane Sulfonic acid



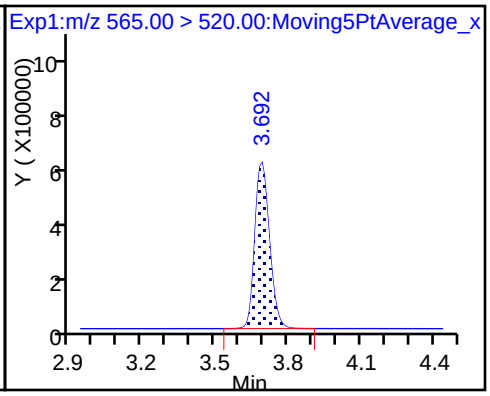
D 32 d5-NEtFOSAA



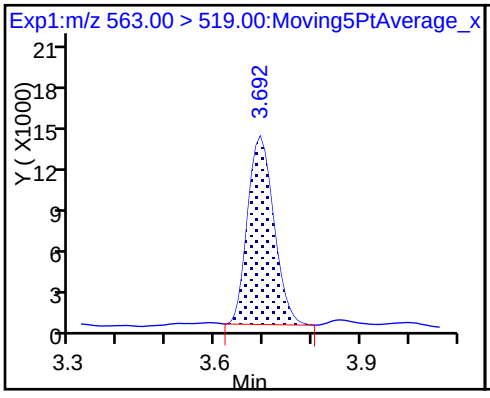
33 N-ethyl perfluorooctane sulfonamid



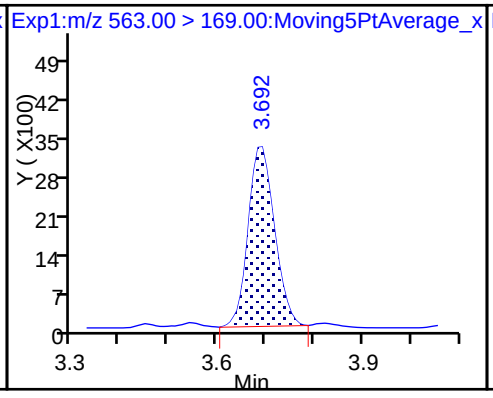
D 30 13C2 PFUnA



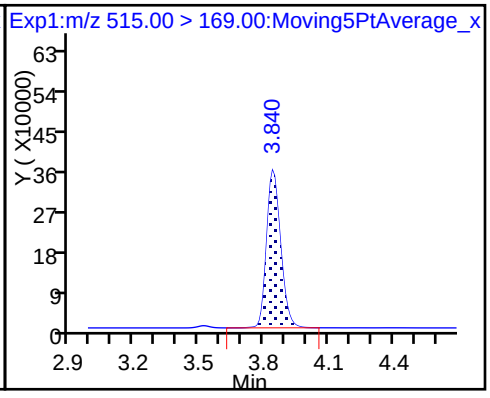
31 Perfluoroundecanoic acid



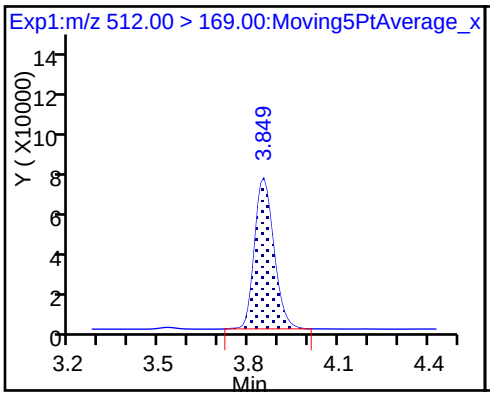
31 Perfluoroundecanoic acid



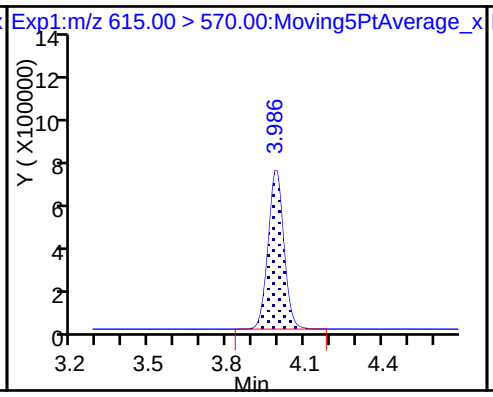
D 34 d-N-MeFOSA-M



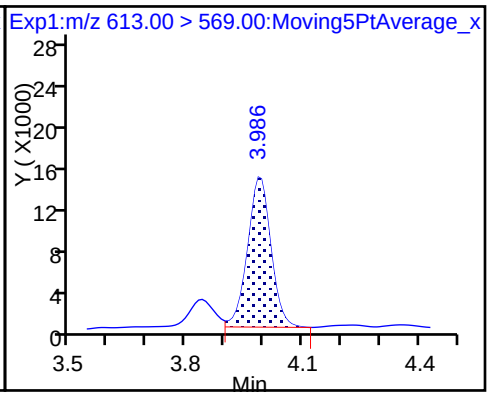
35 MeFOSA



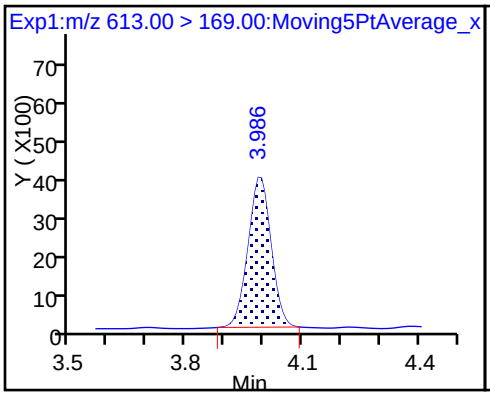
D 36 13C2 PFDoA



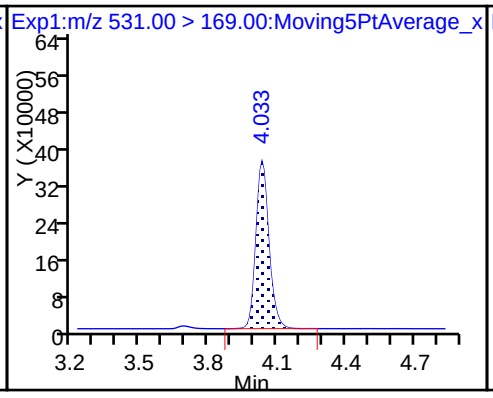
37 Perfluorododecanoic acid



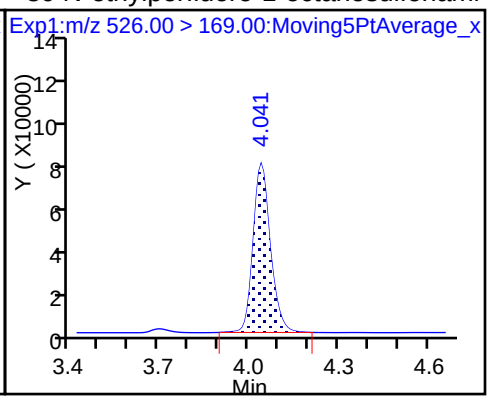
37 Perfluorododecanoic acid



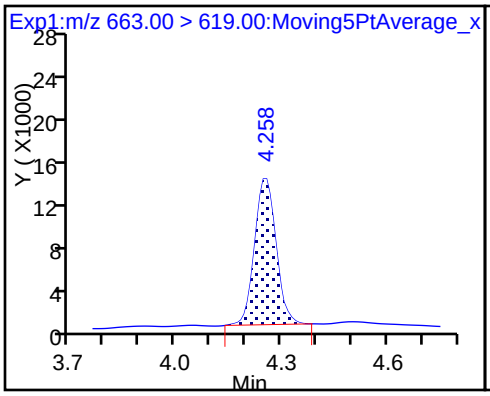
D 38 d-N-EtFOSA-M



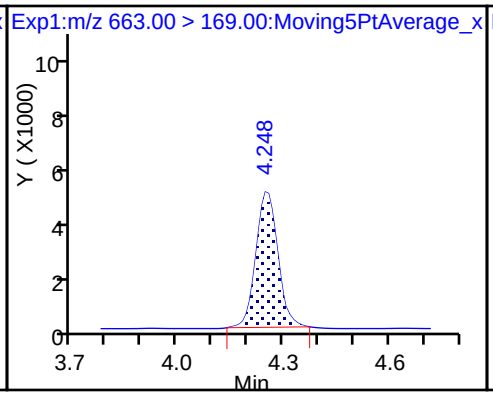
39 N-ethylperfluoro-1-octanesulfonami



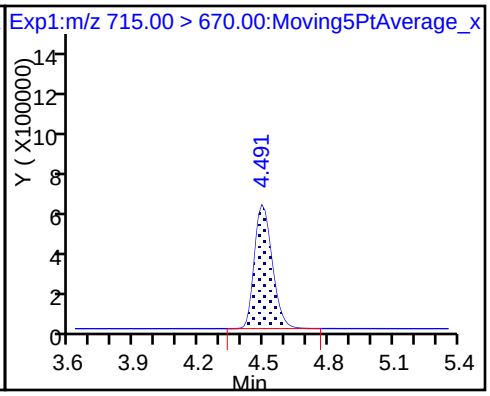
41 Perfluorotridecanoic acid



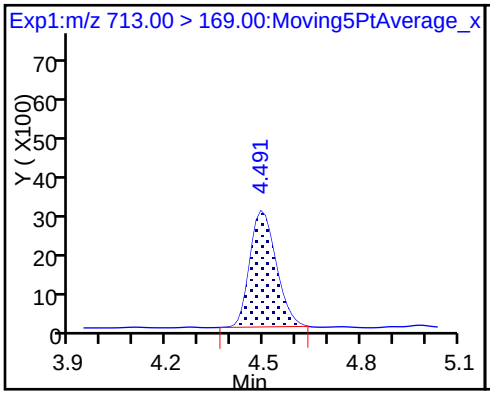
41 Perfluorotridecanoic acid



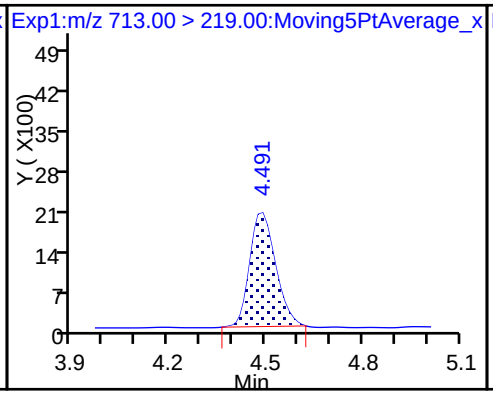
D 43 13C2-PFTeDA



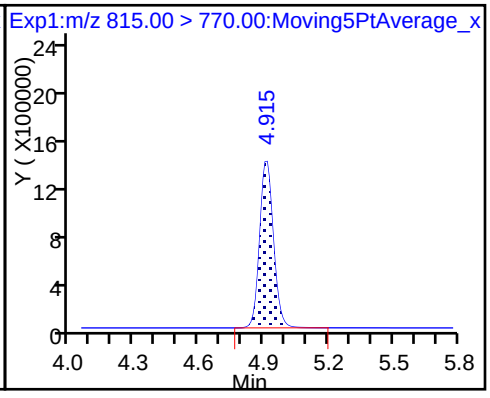
42 Perfluorotetradecanoic acid



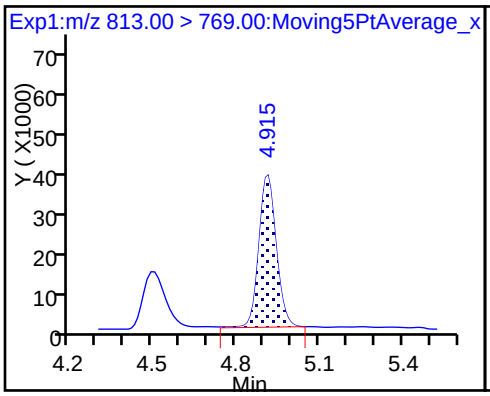
42 Perfluorotetradecanoic acid



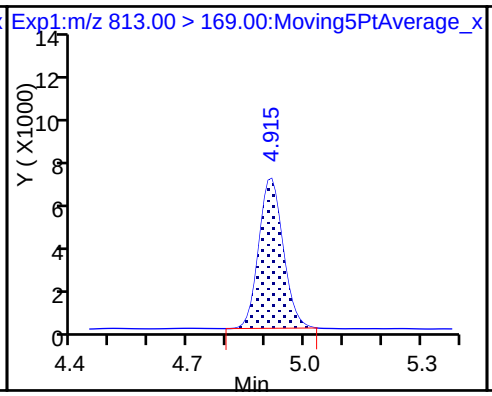
D 44 13C2-PFHxDA



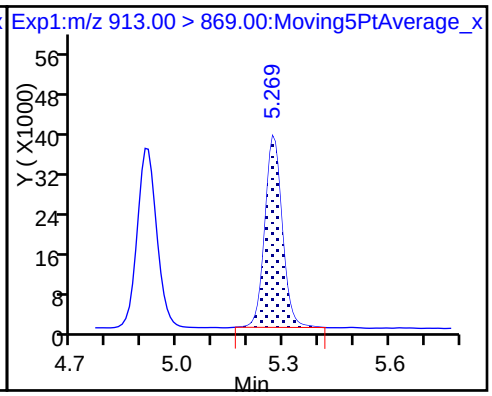
45 Perfluorohexadecanoic acid



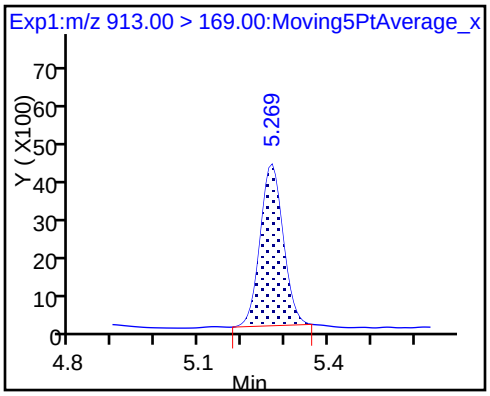
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCV 320-199735/1 Calibration Date: 12/13/2017 15:03

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.13LLA_024.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9084	0.9306		1.02	1.00	2.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.164	1.139		0.979	1.00	-2.1	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.11	76.92		0.893	0.884	1.1	25.0
4:2 FTS	AveID	1.088	0.9883		0.849	0.934	-9.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.999		0.979	1.00	-2.1	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.039	1.061		1.02	1.00	2.1	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.063	0.9754		0.835	0.910	-8.3	25.0
6:2FTS	AveID	1.686	1.635		0.919	0.948	-3.1	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.067	1.040		0.975	1.00	-2.5	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.301	1.405		1.03	0.952	8.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.036	1.060		0.949	0.928	2.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9749	0.9859		1.01	1.00	1.1	25.0
8:2FTS	AveID	1.235	1.248		0.969	0.958	1.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9809	1.039		1.06	1.00	5.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9368	1.024		1.09	1.00	9.3	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.047	1.110		1.06	1.00	6.0	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6323	0.6348		0.968	0.964	0.4	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9417	0.9533		1.01	1.00	1.2	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9833	1.092		1.11	1.00	11.0	25.0
MeFOSA	AveID	0.9545	1.028		1.08	1.00	7.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9872	0.999		1.01	1.00	1.2	25.0
N-EtFOSA-M	AveID	1.050	1.035		0.986	1.00	-1.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.045	1.073		1.03	1.00	2.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2537	0.2463		0.971	1.00	-2.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8975		1.03	1.00	3.2	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9556	1.035		1.08	1.00	8.3	25.0
13C4 PFBA	Ave	1.489	1.540		2.59	2.50	3.4	50.0
13C5 PFPeA	Ave	0.9288	0.9512		2.56	2.50	2.4	50.0
13C3-PFBS	Ave	0.0193	0.0200		2.41	2.33	3.6	50.0
13C2 PFHxA	Ave	0.9542	0.9890		2.59	2.50	3.6	50.0
13C4-PFHpA	Ave	0.9279	0.9693		2.61	2.50	4.5	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCV 320-199735/1 Calibration Date: 12/13/2017 15:03

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.13LLA_024.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.162	1.275		2.60	2.37	9.7	50.0
M2-6:2FTS	Ave	0.3113	0.3341		2.55	2.38	7.3	50.0
13C4 PFOA	Ave	1.027	1.090		2.65	2.50	6.1	50.0
13C4 PFOS	Ave	0.7554	0.7683		2.43	2.39	1.7	50.0
13C5 PFNA	Ave	0.7423	0.7872		2.65	2.50	6.0	50.0
M2-8:2FTS	Ave	0.2450	0.1987		1.94	2.40	-18.9	50.0
13C2 PFDA	Ave	0.6290	0.6062		2.41	2.50	-3.6	50.0
13C8 FOSA	Ave	1.017	1.010		2.48	2.50	-0.7	50.0
d3-NMeFOSAA	Ave	0.3356	0.3314		2.47	2.50	-1.2	50.0
d5-NEtFOSAA	Ave	0.3261	0.3674		2.82	2.50	12.6	50.0
13C2 PFUnA	Ave	0.4846	0.4963		2.56	2.50	2.4	50.0
d-N-MeFOSA-M	Ave	0.2938	0.2890		2.46	2.50	-1.7	50.0
13C2 PFDoA	Ave	0.5394	0.4892		2.27	2.50	-9.3	50.0
d-N-EtFOSA-M	Ave	0.2737	0.2719		2.48	2.50	-0.6	50.0
13C2-PFTeDA	Ave	0.6284	0.6068		2.41	2.50	-3.4	50.0
13C2-PFHxDA	Ave	1.040	1.013		2.44	2.50	-2.6	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51718.b\2017.12.13LLA_024.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 13-Dec-2017 15:03:11 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\20171213-51718.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 13-Dec-2017 15:33:36 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK047

First Level Reviewer: hannigana Date: 13-Dec-2017 15:33:36

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	1.383	1.401	-0.019	0.533	8654498	2.59		103	55953	
2 Perfluorobutyric acid										
212.90 > 169.00	1.383	1.402	-0.020	1.000	3221457	1.02		102	676	
D 3 13C5-PFPeA										
267.90 > 223.00	1.626	1.646	-0.020	0.627	5343889	2.56		102	57366	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.633	1.648	-0.015	1.005	2434679	0.9788		97.9	1784	
D 47 13C3-PFBS										
301.90 > 83.00	1.664	1.681	-0.017	0.641	104502	2.41		104	3030	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.664	1.682	-0.018	1.000	3056099	0.8933		101	13833	
298.90 > 99.00	1.664	1.682	-0.018	1.000	1282681		2.38(1.25-3.74)		9148	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.871	1.887	-0.016	1.000	692928	0.8486		90.9	31328	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.905	1.923	-0.018	1.000	2220202	0.9785		97.9	4978	
313.00 > 119.00	1.905	1.923	-0.018	1.000	207684		10.69(5.03-15.10)		3926	
D 7 13C2 PFHxA										
315.00 > 270.00	1.905	1.924	-0.019	0.734	5556168	2.59		104	63547	
D 9 13C4-PFHpA										
367.00 > 322.00	2.230	2.254	-0.024	0.860	5445537	2.61		104	51425	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.230	2.255	-0.025	1.000	2310866	1.02		102	3672	
363.00 > 169.00	2.230	2.255	-0.025	1.000	907845		2.55(1.13-3.40)		8425	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.250	2.269	-0.019	1.000	2542944	0.8347		91.7	12945	
399.00 > 99.00	2.250	2.269	-0.019	1.000	859328		2.96(1.50-4.49)		6373	

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	2.250	2.271	-0.021	0.867	6775560	2.60		110	42078	
D 12 M2-6:2FTS										
429.00 > 81.00	2.587	2.605	-0.018	0.997	1782900	2.55		107	35400	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.587	2.605	-0.018	1.000	1163237	0.9191		96.9	25444	
D 14 13C4 PFOA										
417.00 > 372.00	2.594	2.618	-0.024	1.000	6123257	2.65		106	56320	
* 62 13C2-PFOA										
415.00 > 370.00	2.594	2.619	-0.025		5618175	2.50			42485	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.594	2.621	-0.027	1.000	2546569	0.9748		97.5	1248	
413.00 > 169.00	2.594	2.621	-0.027	1.000	1309981		1.94(0.84-2.52)		8676	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.600	2.626	-0.026	1.000	2309501	1.03		108	23766	
449.00 > 99.00	2.600	2.626	-0.026	1.000	623656		3.70(1.94-5.82)		10025	
D 18 13C4 PFOS										
503.00 > 80.00	2.964	2.993	-0.029	1.143	4126248	2.43		102	32887	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.964	2.994	-0.030	1.000	1698816	0.9494		102	7064	
499.00 > 99.00	2.964	2.994	-0.030	1.000	360336		4.71(2.31-6.93)		4452	
D 19 13C5 PFNA										
468.00 > 423.00	2.964	2.994	-0.030	1.143	4422527	2.65		106	50195	
20 Perfluorononanoic acid										
463.00 > 419.00	2.971	2.994	-0.023	1.002	1744136	1.01		101	5531	
463.00 > 169.00	2.964	2.994	-0.030	1.000	426352		4.09(1.90-5.69)		12637	
D 26 M2-8:2FTS										
529.00 > 81.00	3.321	3.343	-0.022	1.280	1069662	1.94		81.1	17756	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.321	3.344	-0.023	1.000	534060	0.9686		101	14891	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.328	3.356	-0.028	1.000	1415394	1.06		106	6791	
513.00 > 169.00	3.328	3.356	-0.028	1.000	250036		5.66(2.36-7.09)		1912	
D 23 13C2 PFDA										
515.00 > 470.00	3.328	3.356	-0.028	1.283	3405525	2.41		96.4	40377	
D 21 13C8 FOSA										
506.00 > 78.00	3.336	3.359	-0.023	1.286	5672511	2.48		99.3	26405	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.336	3.359	-0.023	1.000	2322438	1.09		109	24484	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.488	3.511	-0.023	1.345	1861741	2.47		98.8	18403	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.496	3.515	-0.019	1.002	826919	1.06		106	5293	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.647	3.667	-0.020	1.000	1056556	0.9678		100	30573	
599.00 > 99.00	3.647	3.667	-0.020	1.000	358587		2.95(1.39-4.16)		15574	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.653	3.677	-0.024	1.408	2063891	2.82		113	15725	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.660	3.685	-0.025	1.002	786986	1.01		101	9775	
D 30 13C2 PFUnA										
565.00 > 520.00	3.660	3.685	-0.025	1.411	2788510	2.56		102	41913	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.660	3.685	-0.025	1.000	1217851	1.11		111	8091	
563.00 > 169.00	3.660	3.685	-0.025	1.000	228644		5.33(0.00-0.00)		9340	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.840	3.856	-0.016	1.480	1623404	2.46		98.3	5136	
35 MeFOSA										
512.00 > 169.00	3.849	3.865	-0.016	1.002	667257	1.08		108	3655	
D 36 13C2 PFDoA										
615.00 > 570.00	3.959	3.979	-0.020	1.526	2748584	2.27		90.7	28497	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.959	3.982	-0.023	1.000	1098812	1.01		101	4158	
613.00 > 169.00	3.959	3.982	-0.023	1.000	278269		3.95(2.13-6.40)		15950	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.032	4.048	-0.016	1.554	1527747	2.48		99.4	7617	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.040	4.056	-0.016	1.002	632617	0.9859		98.6	3957	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.221	4.243	-0.022	1.000	1179348	1.03		103	4123	
663.00 > 169.00	4.221	4.243	-0.022	1.000	394727		2.99(1.25-3.76)		18357	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.453	4.481	-0.028	1.717	3409236	2.41		96.6	24928	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.465	4.481	-0.016	1.003	335838	0.9707		97.1	10216	
713.00 > 219.00	4.453	4.481	-0.028	1.000	221248		1.52(0.71-2.13)		10346	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.870	4.892	-0.022	1.877	5689522	2.44		97.4	15437	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.870	4.894	-0.024	1.000	2042489	1.03		103	2877	
813.00 > 169.00	4.870	4.894	-0.024	1.000	378484		5.40(2.86-8.58)		7683	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.219	5.242	-0.023	1.000	2355733	1.08		108	614	
913.00 > 169.00	5.219	5.242	-0.023	1.000	292217		8.06(0.00-0.00)		2408	

Reagents:

LCPFC_LL4_00002 Amount Added: 1.00 Units: mL

Report Date: 13-Dec-2017 15:33:37 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51718.b\2017.12.13LLA_024.d

Injection Date: 13-Dec-2017 15:03:11 Instrument ID: A8_N

Lims ID: CCV L4

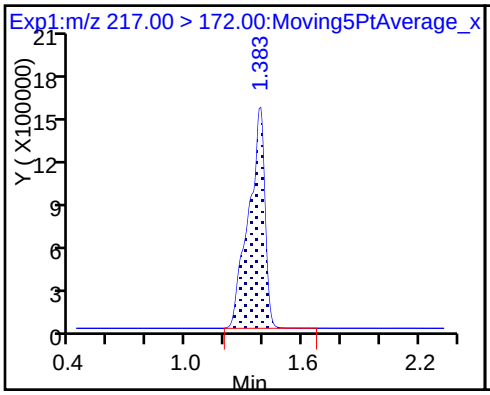
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 1

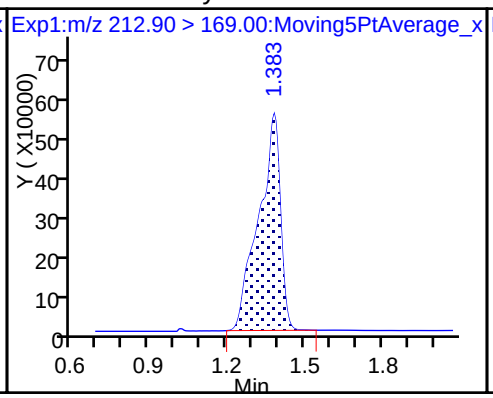
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

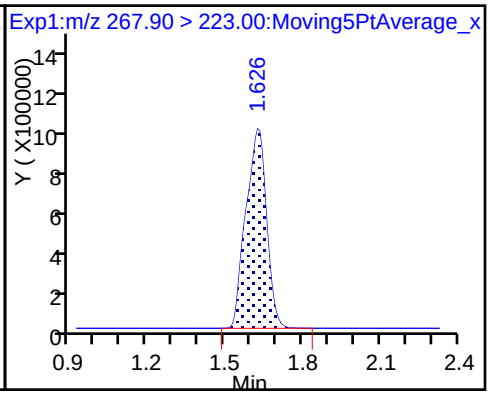
D 1 13C4 PFBA



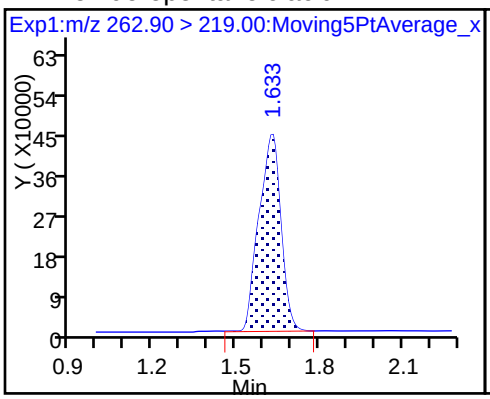
2 Perfluorobutyric acid



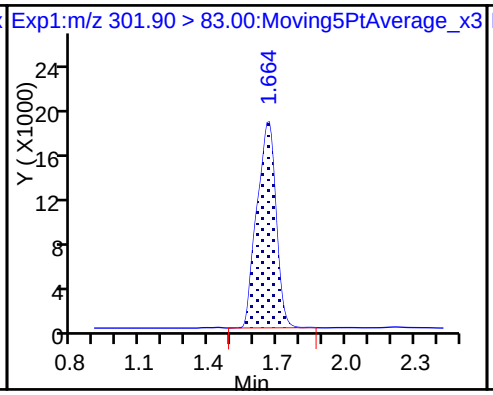
D 3 13C5-PFPeA



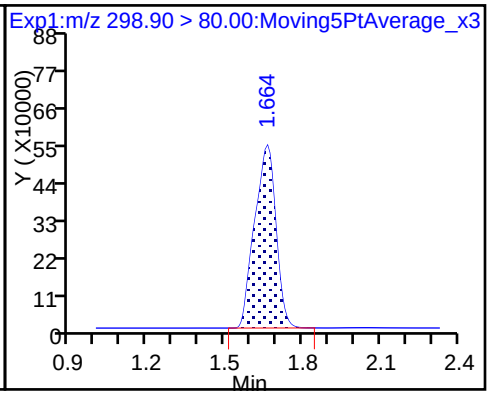
4 Perfluoropentanoic acid



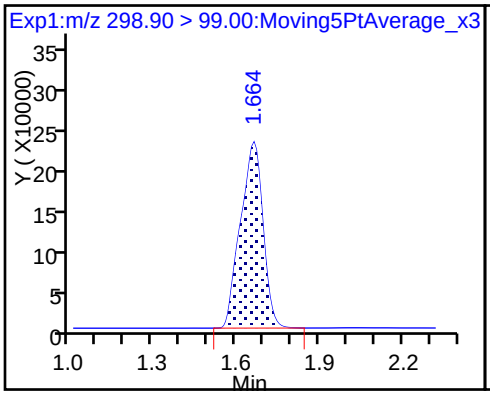
D 47 13C3-PFBS



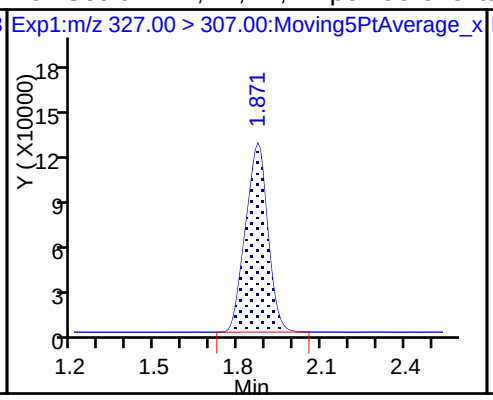
5 Perfluorobutanesulfonic acid



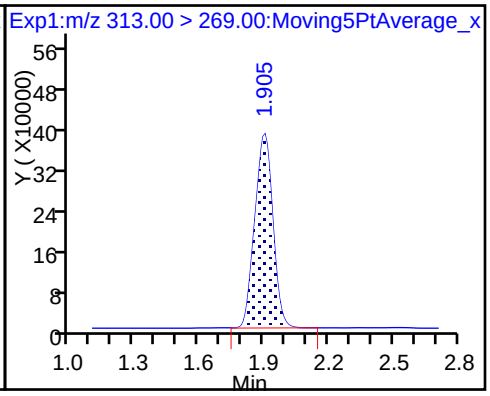
5 Perfluorobutanesulfonic acid



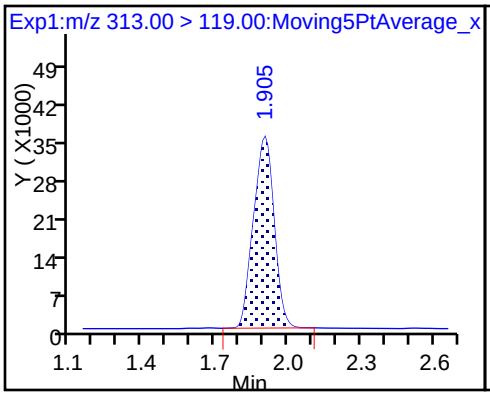
61 Sodium 1H,1H,2H,2H-perfluorohexane



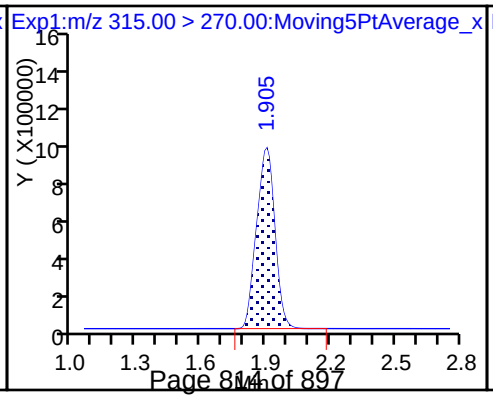
6 Perfluorohexanoic acid



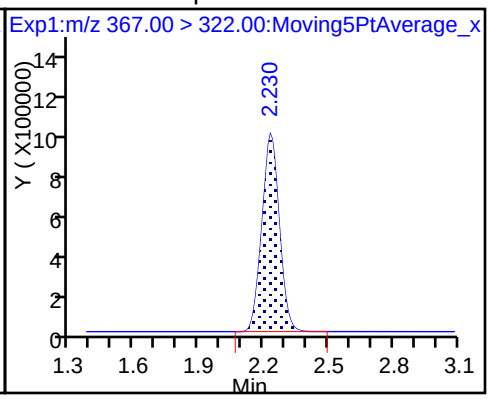
6 Perfluorohexanoic acid



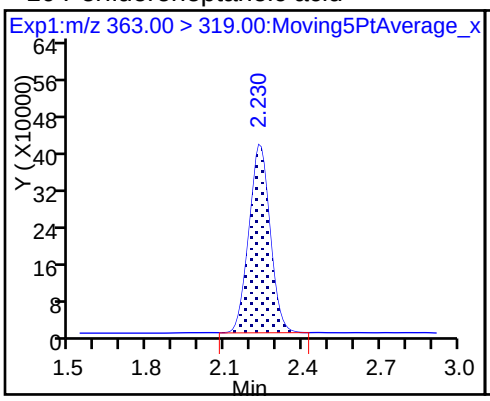
D 7 13C2 PFHxA



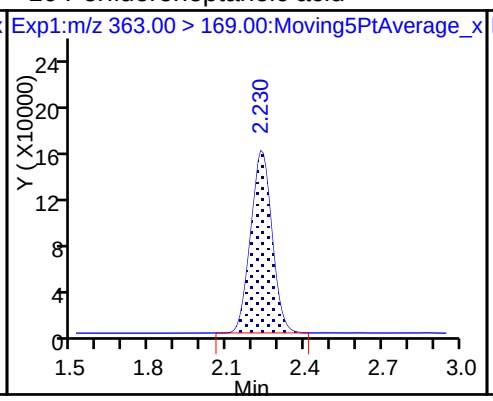
D 9 13C4-PFHpA



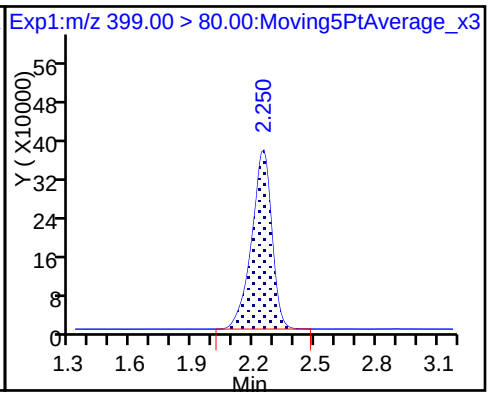
10 Perfluoroheptanoic acid



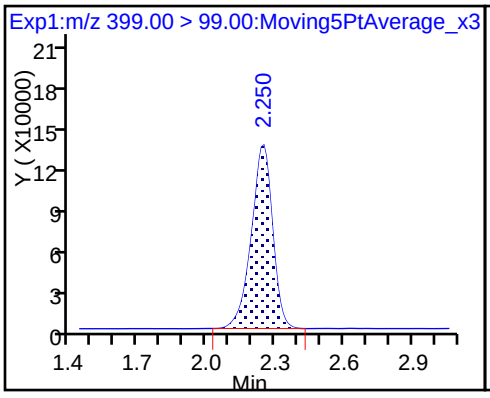
10 Perfluoroheptanoic acid



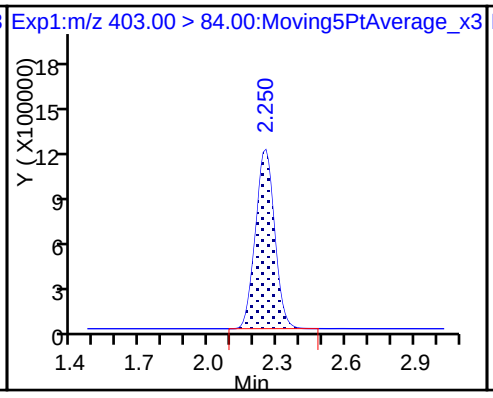
8 Perfluorohexanesulfonic acid



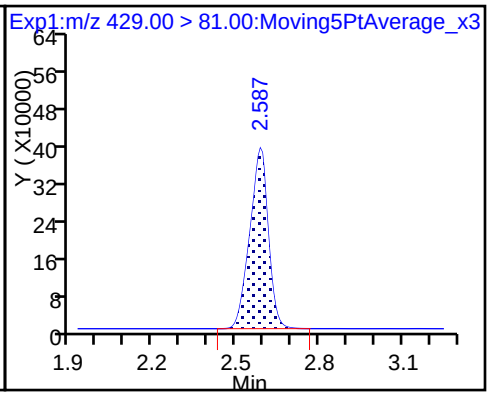
8 Perfluorohexanesulfonic acid



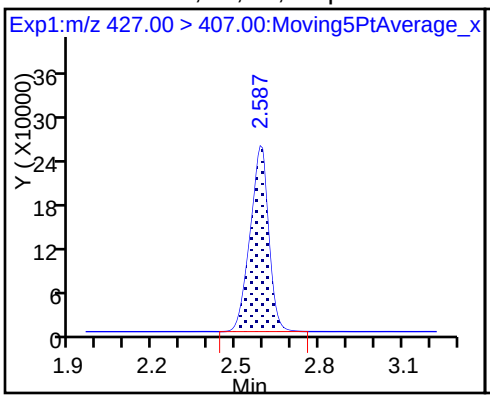
D 11 18O2 PFHxS



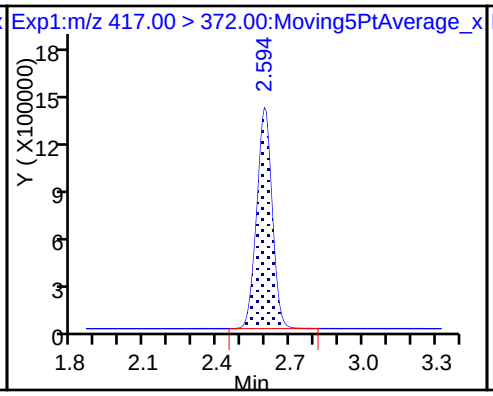
D 12 M2-6:2FTS



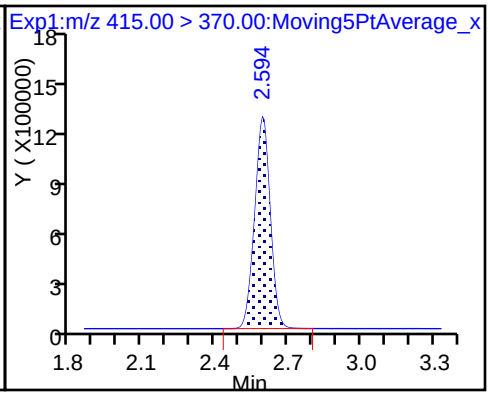
13 Sodium 1H,1H,2H,2H-perfluorooctane



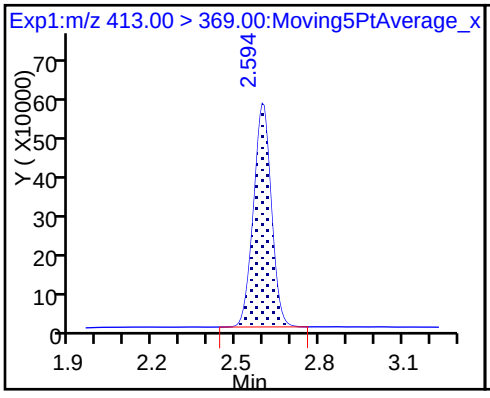
D 14 13C4 PFOA



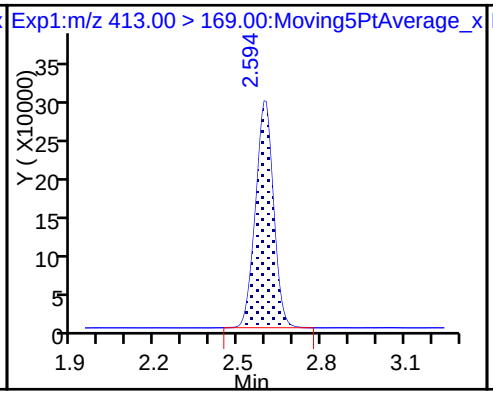
* 62 13C2-PFOA



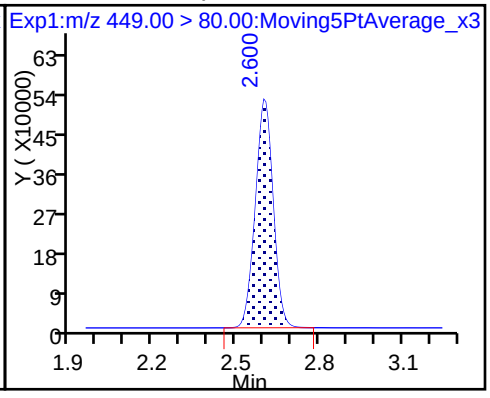
15 Perfluorooctanoic acid



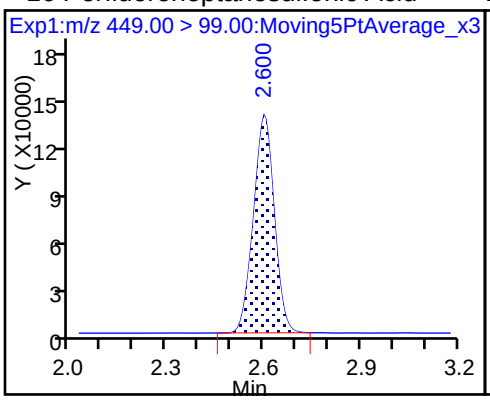
15 Perfluorooctanoic acid



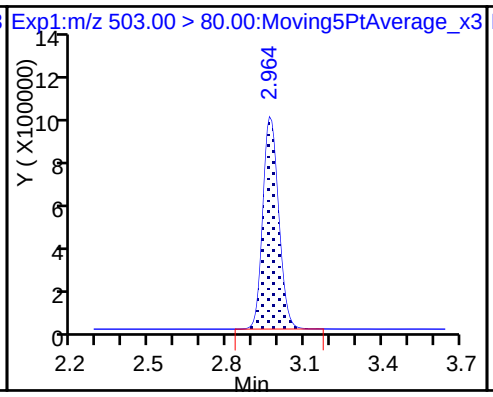
16 Perfluoroheptanesulfonic Acid



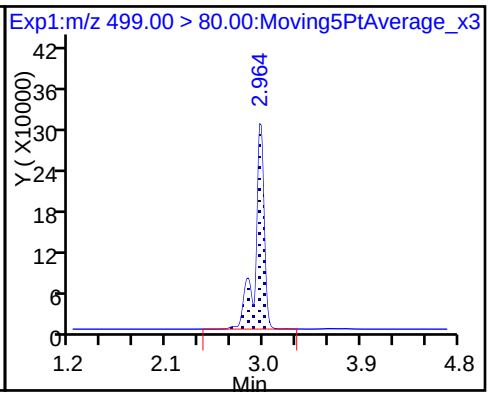
16 Perfluoroheptanesulfonic Acid



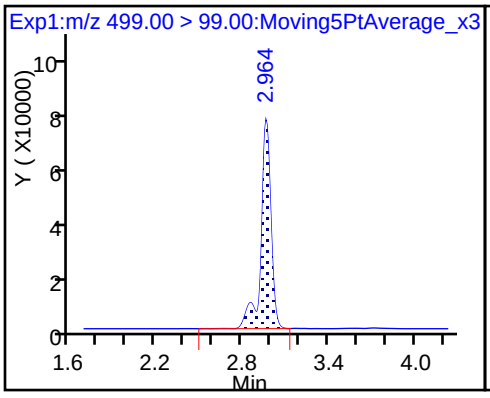
D 18 13C4 PFOS



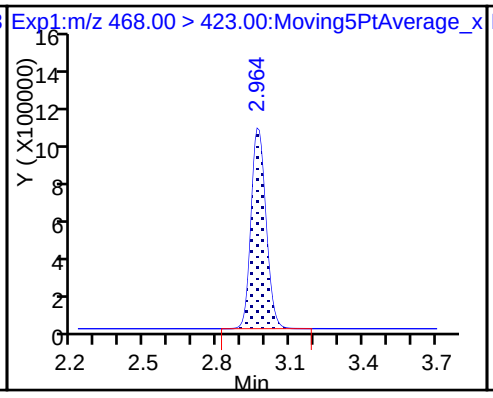
17 Perfluorooctane sulfonic acid



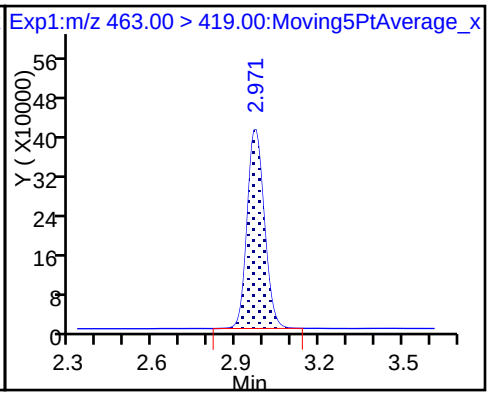
17 Perfluorooctane sulfonic acid



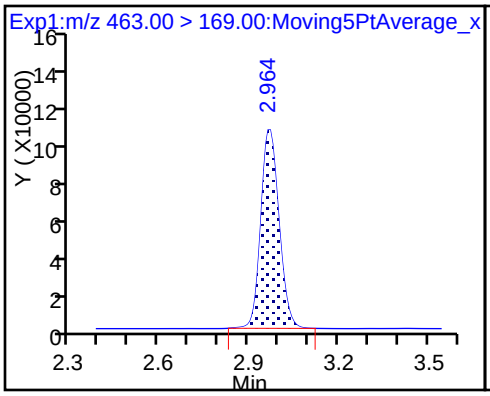
D 19 13C5 PFNA



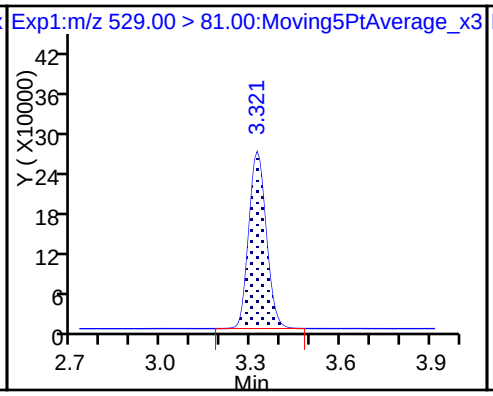
20 Perfluorononanoic acid



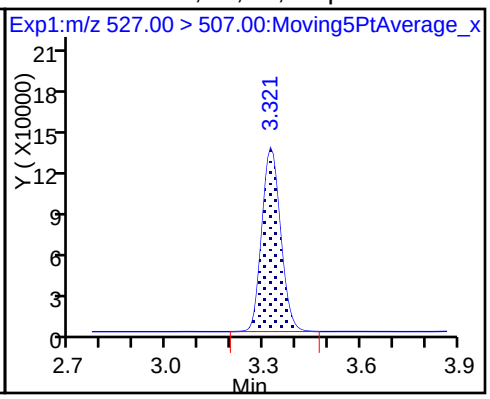
20 Perfluorononanoic acid



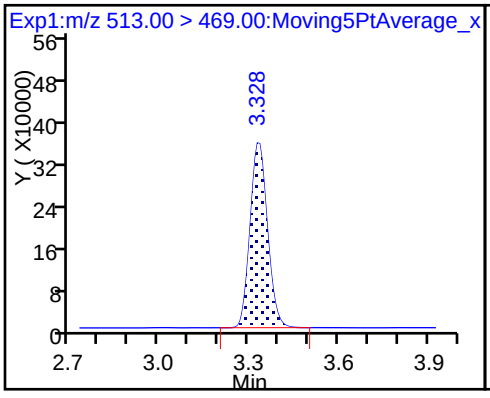
D 26 M2-8:2FTS



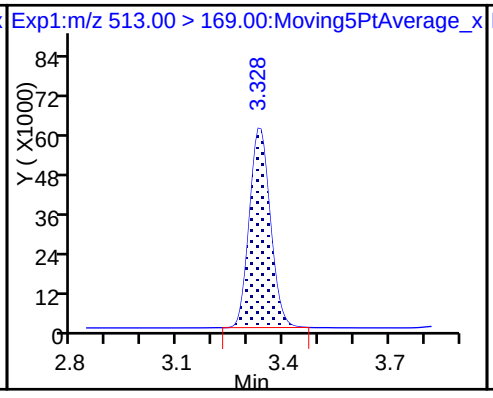
25 Sodium 1H,1H,2H,2H-perfluorodecane



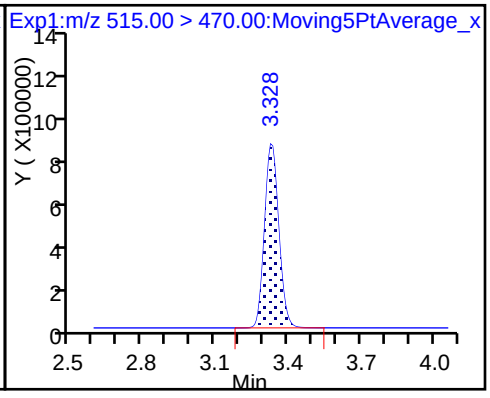
24 Perfluorodecanoic acid



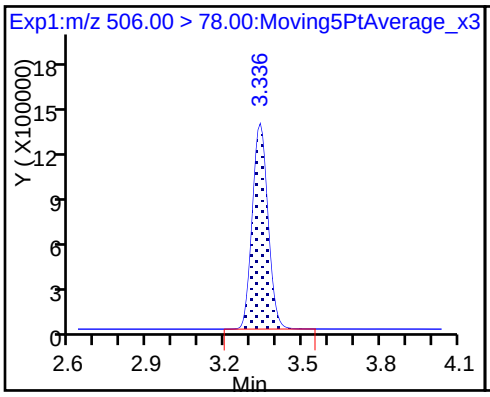
24 Perfluorodecanoic acid



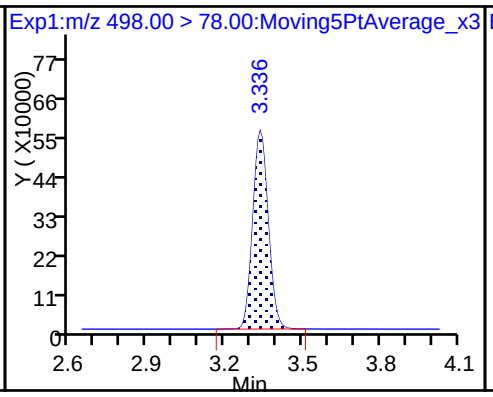
D 23 13C2 PFDA



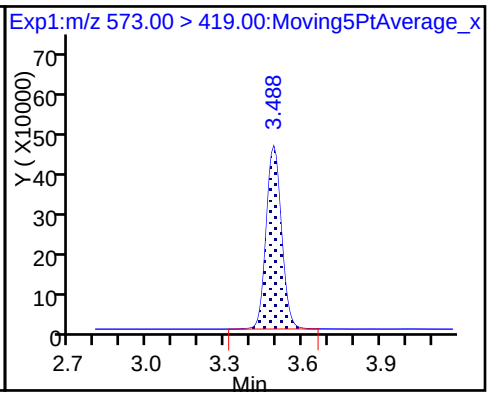
D 21 13C8 FOSA



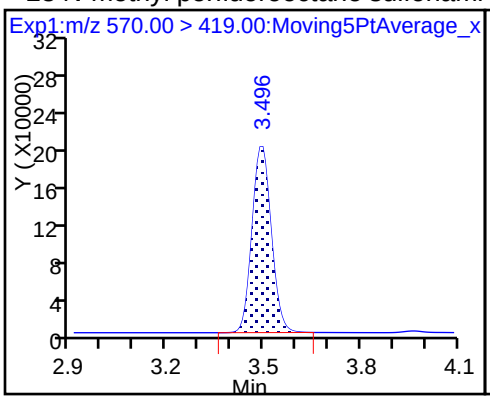
22 Perfluorooctane Sulfonamide



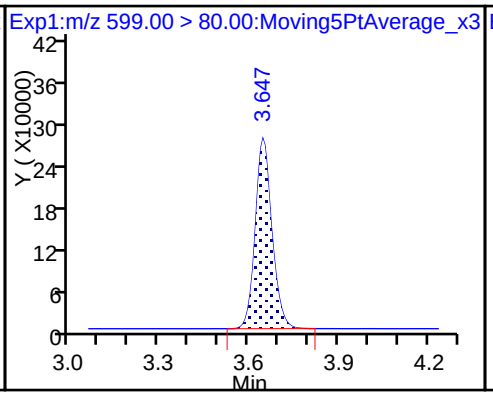
D 27 d3-NMeFOSAA



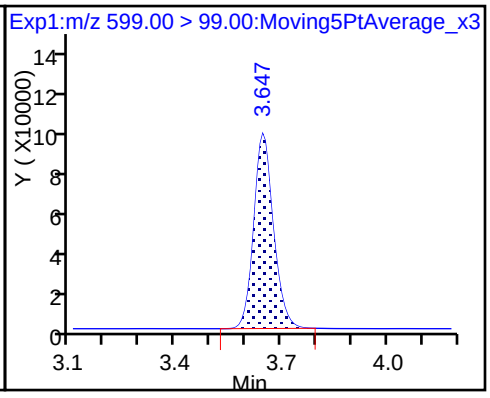
28 N-methyl perfluorooctane sulfonami



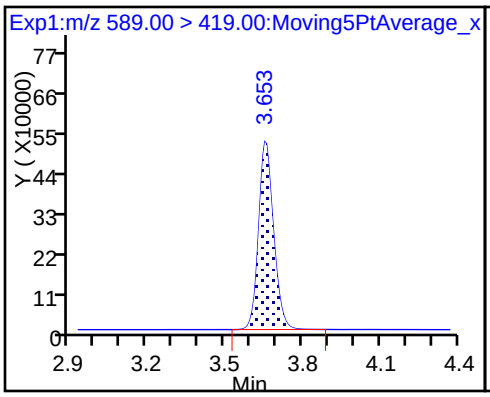
29 Perfluorodecane Sulfonic acid



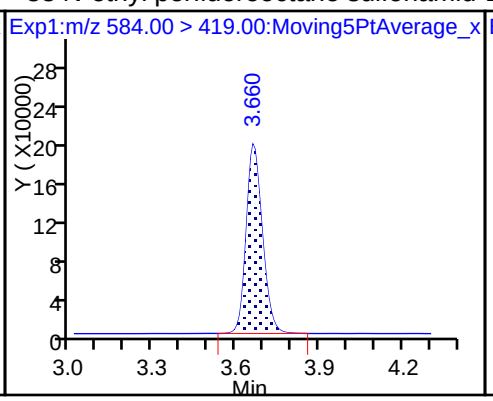
29 Perfluorodecane Sulfonic acid



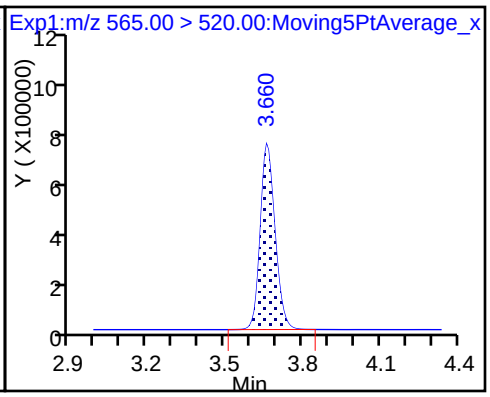
D 32 d5-NEtFOSAA



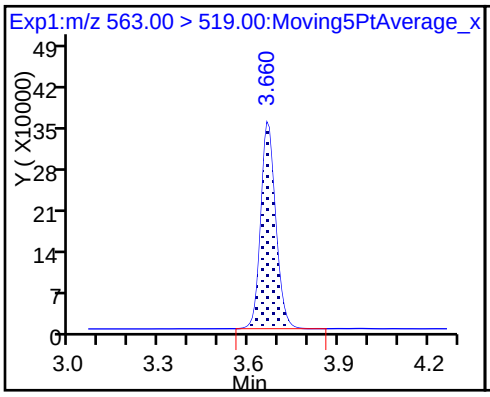
33 N-ethyl perfluorooctane sulfonamid



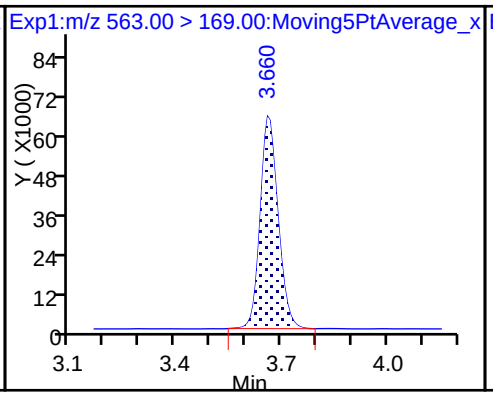
D 30 13C2 PFUnA



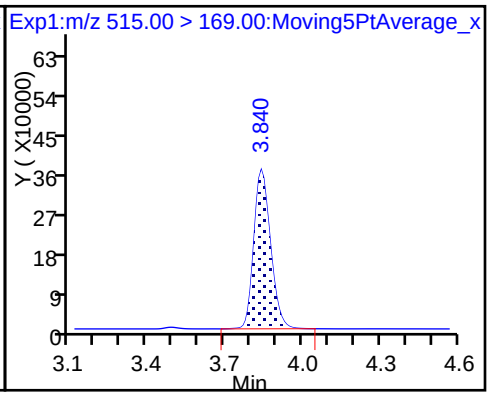
31 Perfluoroundecanoic acid



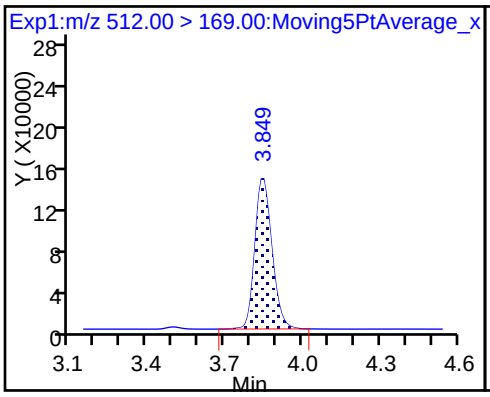
31 Perfluoroundecanoic acid



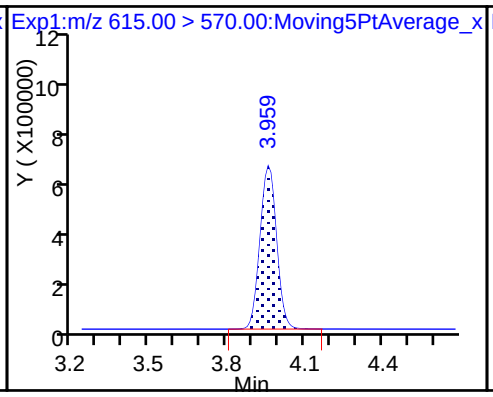
D 34 d-N-MeFOSA-M



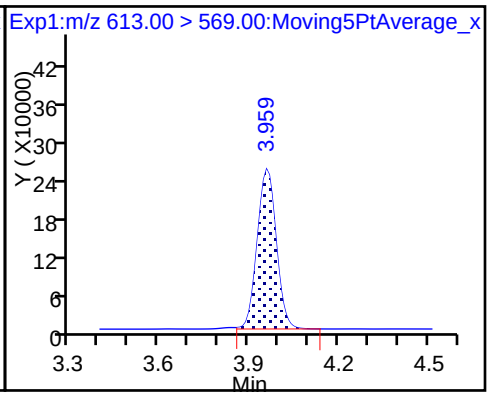
35 MeFOSA



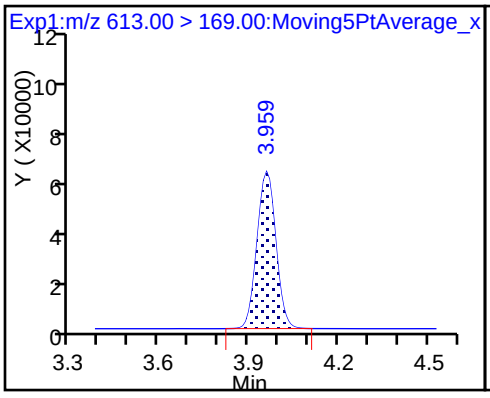
D 36 13C2 PFDoA



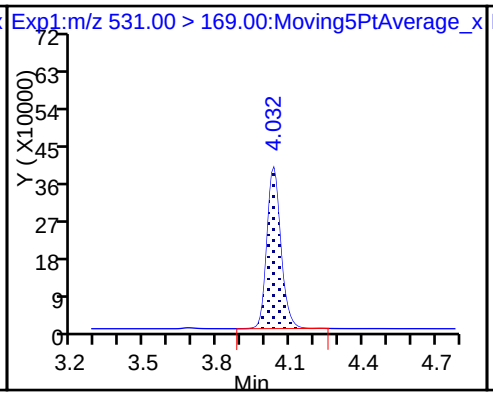
37 Perfluorododecanoic acid



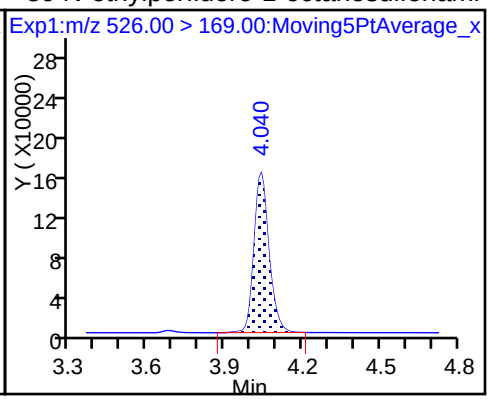
37 Perfluorododecanoic acid



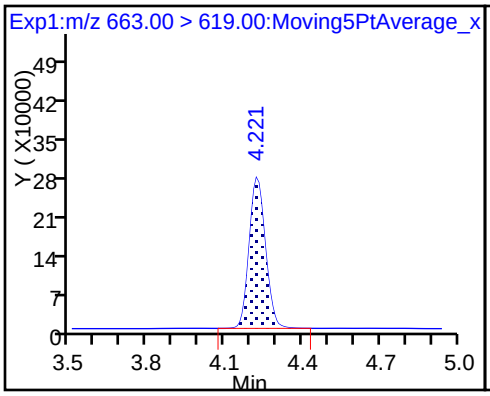
D 38 d-N-EtFOSA-M



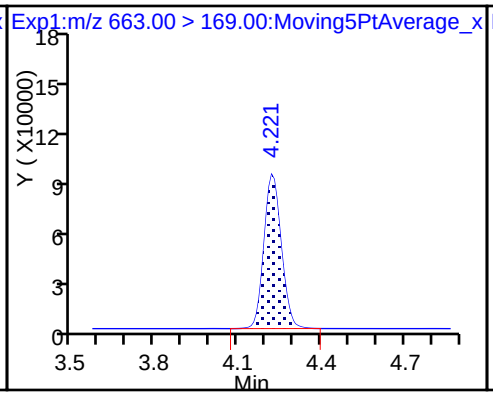
39 N-ethylperfluoro-1-octanesulfonami



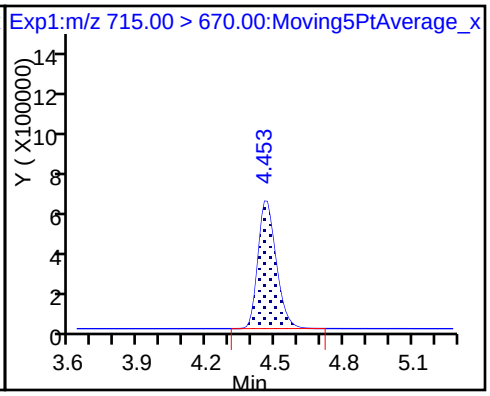
41 Perfluorotridecanoic acid



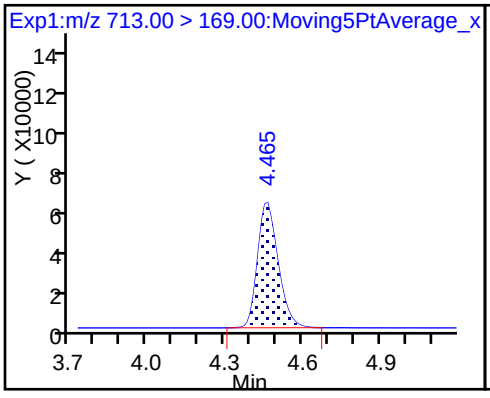
41 Perfluorotridecanoic acid



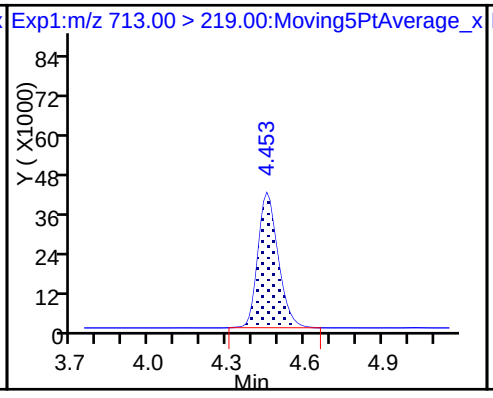
D 43 13C2-PFTeDA



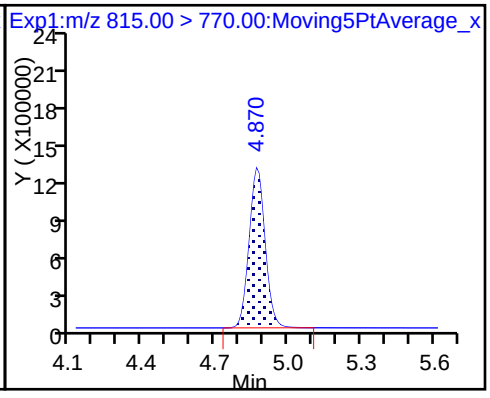
42 Perfluorotetradecanoic acid



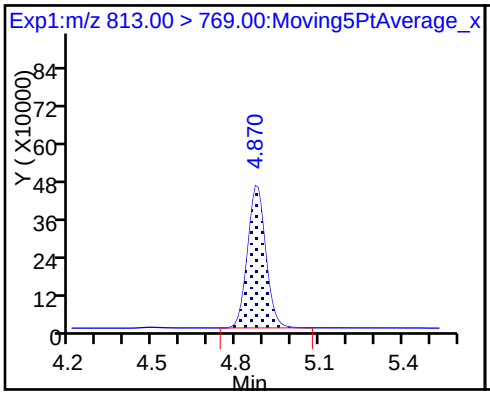
42 Perfluorotetradecanoic acid



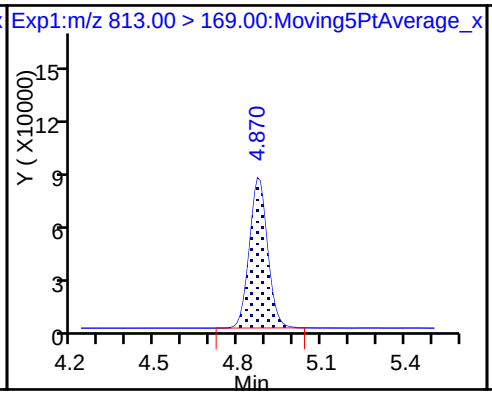
D 44 13C2-PFHxDA



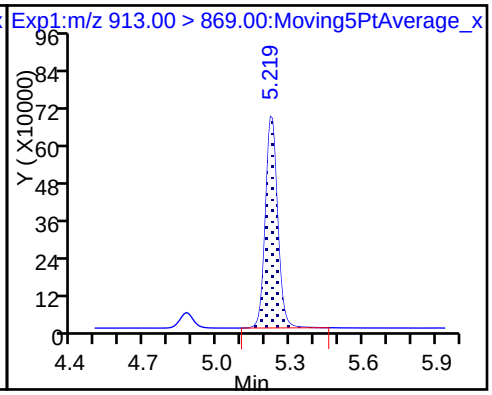
45 Perfluorohexadecanoic acid



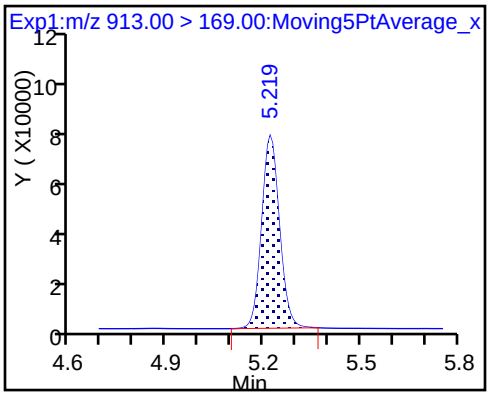
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCV 320-199735/3 Calibration Date: 12/13/2017 15:18

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.13LLA_026.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9084	0.9409		2.59	2.50	3.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.164	1.125		2.42	2.50	-3.3	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.11	76.16		2.21	2.21	0.0	25.0
4:2 FTS	AveID	1.088	0.7283		1.56	2.34	-33.0*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.021		2.50	2.50	-0.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.039	1.041		2.51	2.50	0.2	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.063	1.052		2.25	2.28	-1.1	25.0
6:2FTS	AveID	1.686	1.723		2.42	2.37	2.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.067	1.050		2.46	2.50	-1.6	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.301	1.432		2.62	2.38	10.0	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9749	0.997		2.56	2.50	2.3	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.036	1.076		2.41	2.32	3.9	25.0
8:2FTS	AveID	1.235	1.284		2.49	2.40	4.0	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9368	1.003		2.68	2.50	7.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9809	0.9692		2.47	2.50	-1.2	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.047	1.061		2.53	2.50	1.3	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6323	0.6365		2.43	2.41	0.7	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9417	0.9545		2.53	2.50	1.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9833	0.9562		2.43	2.50	-2.8	25.0
MeFOSA	AveID	0.9545	1.016		2.66	2.50	6.5	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9872	0.9942		2.52	2.50	0.7	25.0
N-EtFOSA-M	AveID	1.050	1.043		2.48	2.50	-0.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.045	1.018		2.44	2.50	-2.6	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2537	0.2460		2.42	2.50	-3.0	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9062		2.64	2.50	5.7	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9556	1.035		2.71	2.50	8.3	25.0
13C4 PFBA	Ave	1.489	1.426		2.39	2.50	-4.3	50.0
13C5 PFPeA	Ave	0.9288	0.8884		2.39	2.50	-4.4	50.0
13C3-PFBS	Ave	0.0193	0.0184		2.22	2.33	-4.6	50.0
13C2 PFHxA	Ave	0.9542	0.8844		2.32	2.50	-7.3	50.0
13C4-PFHpA	Ave	0.9279	0.8841		2.38	2.50	-4.7	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCV 320-199735/3 Calibration Date: 12/13/2017 15:18

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.13LLA_026.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.162	1.092		2.22	2.37	-6.0	50.0
M2-6:2FTS	Ave	0.3113	0.4009		3.06	2.38	28.8	50.0
13C4 PFOA	Ave	1.027	1.013		2.47	2.50	-1.3	50.0
13C4 PFOS	Ave	0.7554	0.6957		2.20	2.39	-7.9	50.0
13C5 PFNA	Ave	0.7423	0.7009		2.36	2.50	-5.6	50.0
M2-8:2FTS	Ave	0.2450	0.1891		1.85	2.40	-22.8	50.0
13C8 FOSA	Ave	1.017	0.9439		2.32	2.50	-7.2	50.0
13C2 PFDA	Ave	0.6290	0.5869		2.33	2.50	-6.7	50.0
d3-NMeFOSAA	Ave	0.3356	0.3265		2.43	2.50	-2.7	50.0
d5-NEtFOSAA	Ave	0.3261	0.3162		2.42	2.50	-3.0	50.0
13C2 PFUnA	Ave	0.4846	0.4395		2.27	2.50	-9.3	50.0
d-N-MeFOSA-M	Ave	0.2938	0.2689		2.29	2.50	-8.5	50.0
13C2 PFDoA	Ave	0.5394	0.4929		2.28	2.50	-8.6	50.0
d-N-EtFOSA-M	Ave	0.2737	0.2538		2.32	2.50	-7.3	50.0
13C2-PFTeDA	Ave	0.6284	0.5212		2.07	2.50	-17.1	50.0
13C2-PFHxDA	Ave	1.040	0.9597		2.31	2.50	-7.7	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51718.b\2017.12.13LLA_026.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 13-Dec-2017 15:18:55 ALS Bottle#: 14 Worklist Smp#: 3
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\20171213-51718.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 13-Dec-2017 15:34:19 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK047

First Level Reviewer: hannigana Date: 13-Dec-2017 15:34:18

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	1.404	1.401	0.003	0.536	8467279	2.39		95.7	57675	
2 Perfluorobutyric acid										
212.90 > 169.00	1.404	1.402	0.002	1.000	7966671	2.59		104	2204	
D 3 13C5-PFPeA										
267.90 > 223.00	1.648	1.646	0.002	0.629	5276259	2.39		95.6	58513	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.648	1.648	0.0	1.000	5937444	2.42		96.7	4805	
D 47 13C3-PFBS										
301.90 > 83.00	1.680	1.681	-0.001	0.641	101730	2.22		95.4	3070	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.689	1.682	0.007	1.005	7364287	2.21		100	27101	
298.90 > 99.00	1.689	1.682	0.007	1.005	3158130		2.33(1.25-3.74)		17811	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.895	1.887	0.008	1.000	1619724	1.56		67.0	59746	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.924	1.923	0.001	1.000	5361801	2.50		100.0	12815	
313.00 > 119.00	1.924	1.923	0.001	1.000	499746		10.73(5.03-15.10)		8643	
D 7 13C2 PFHxA										
315.00 > 270.00	1.924	1.924	0.0	0.734	5252691	2.32		92.7	53525	
D 9 13C4-PFHpA										
367.00 > 322.00	2.260	2.254	0.006	0.862	5250886	2.38		95.3	46964	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.260	2.255	0.005	1.000	5466805	2.51		100	9240	
363.00 > 169.00	2.260	2.255	0.005	1.000	2112572		2.59(1.13-3.40)		15705	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.270	2.269	0.001	1.000	6207042	2.25		98.9	19128	
399.00 > 99.00	2.270	2.269	0.001	1.000	2083352		2.98(1.50-4.49)		11807	

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	2.270	2.271	-0.001	0.866	6135853	2.22		94.0	40520	
D 12 M2-6:2FTS										
429.00 > 81.00	2.613	2.605	0.008	0.997	2262055	3.06		129	43326	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.613	2.605	0.008	1.000	3888328	2.42		102	90082	
D 14 13C4 PFOA										
417.00 > 372.00	2.620	2.618	0.002	1.000	6019524	2.47		98.7	45366	
* 62 13C2-PFOA										
415.00 > 370.00	2.620	2.619	0.001		5939374	2.50			54832	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.620	2.621	-0.001	1.000	6319210	2.46		98.4	3148	
413.00 > 169.00	2.620	2.621	-0.001	1.000	3329649		1.90(0.84-2.52)		20823	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.628	2.626	0.002	1.000	5632965	2.62		110	38181	
449.00 > 99.00	2.628	2.626	0.002	1.000	1457683		3.86(1.94-5.82)		22186	
D 18 13C4 PFOS										
503.00 > 80.00	2.995	2.993	0.002	1.143	3950333	2.20		92.1	31156	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.995	2.994	0.001	1.000	4127685	2.41		104	11914	
499.00 > 99.00	2.995	2.994	0.001	1.000	897399		4.60(2.31-6.93)		12230	
D 19 13C5 PFNA										
468.00 > 423.00	2.995	2.994	0.001	1.143	4162617	2.36		94.4	46313	
20 Perfluorononanoic acid										
463.00 > 419.00	2.995	2.994	0.001	1.000	4149823	2.56		102	13293	
463.00 > 169.00	2.995	2.994	0.001	1.000	1024871		4.05(1.90-5.69)		27042	
D 26 M2-8:2FTS										
529.00 > 81.00	3.343	3.343	0.0	1.276	1075960	1.85		77.2	20346	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.343	3.344	-0.001	1.000	1381732	2.49		104	28473	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.359	3.356	0.003	1.000	3378678	2.47		98.8	18039	
513.00 > 169.00	3.359	3.356	0.003	1.000	611583		5.52(2.36-7.09)		2185	
D 23 13C2 PFDA										
515.00 > 470.00	3.359	3.356	0.003	1.282	3485904	2.33		93.3	33438	
D 21 13C8 FOSA										
506.00 > 78.00	3.351	3.359	-0.008	1.279	5606160	2.32		92.8	32634	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.351	3.359	-0.008	1.000	5621253	2.68		107	37039	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.511	3.511	0.0	1.340	1938970	2.43		97.3	28112	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.519	3.515	0.004	1.002	2056942	2.53		101	14042	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.667	3.667	0.0	1.000	2535274	2.43		101	53191	
599.00 > 99.00	3.667	3.667	0.0	1.000	788389		3.22(1.39-4.16)		19894	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.675	3.677	-0.002	1.402	1878077	2.42		97.0	14078	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.684	3.685	-0.001	1.002	1792622	2.53		101	23796	
D 30 13C2 PFUnA										
565.00 > 520.00	3.684	3.685	-0.001	1.406	2610582	2.27		90.7	35680	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.684	3.685	-0.001	1.000	2496267	2.43		97.2	15579	
563.00 > 169.00	3.684	3.685	-0.001	1.000	528130		4.73(0.00-0.00)		28969	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.849	3.856	-0.007	1.469	1597220	2.29		91.5	3364	
35 MeFOSA										
512.00 > 169.00	3.859	3.865	-0.006	1.002	1622927	2.66		106	3610	
D 36 13C2 PFDoA										
615.00 > 570.00	3.986	3.979	0.007	1.521	2927667	2.28		91.4	33394	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.986	3.982	0.004	1.000	2910663	2.52		101	8894	
613.00 > 169.00	3.986	3.982	0.004	1.000	683831		4.26(2.13-6.40)		20265	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.041	4.048	-0.007	1.542	1507474	2.32		92.7	3425	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.048	4.056	-0.008	1.002	1571781	2.48		99.3	3130	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.248	4.243	0.005	1.000	2980040	2.44		97.4	10059	
663.00 > 169.00	4.248	4.243	0.005	1.000	914243		3.26(1.25-3.76)		30411	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.491	4.481	0.010	1.714	3095691	2.07		82.9	20129	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.491	4.481	0.010	1.000	761580	2.42		97.0	16715	
713.00 > 219.00	4.476	4.481	-0.005	0.997	545528		1.40(0.71-2.13)		19562	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.897	4.892	0.005	1.869	5700148	2.31		92.3	20775	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.897	4.894	0.003	1.000	5165691	2.64		106	3245	
813.00 > 169.00	4.897	4.894	0.003	1.000	884567		5.84(2.86-8.58)		9302	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.248	5.242	0.006	1.000	5902152	2.71		108	1270	
913.00 > 169.00	5.248	5.242	0.006	1.000	742284		7.95(0.00-0.00)		3250	

Reagents:

LCPFC_LL5_00002 Amount Added: 1.00 Units: mL

Report Date: 13-Dec-2017 15:34:19 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51718.b\2017.12.13LLA_026.d

Injection Date: 13-Dec-2017 15:18:55 Instrument ID: A8_N

Lims ID: CCV L5

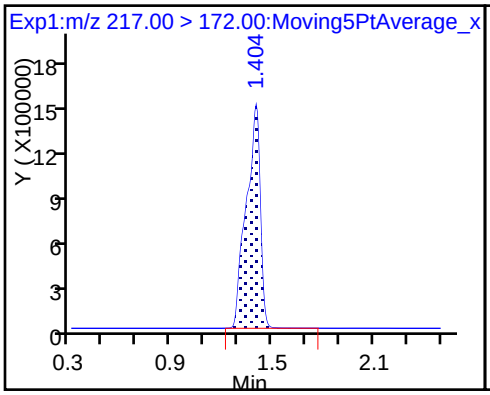
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 3

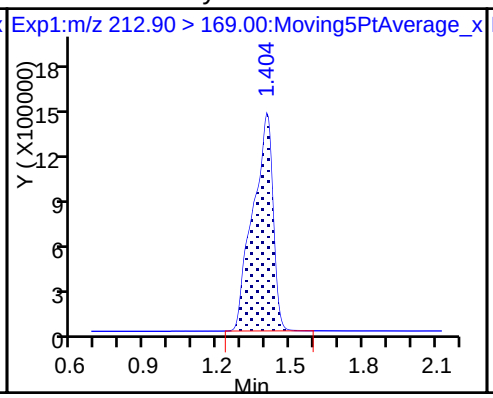
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

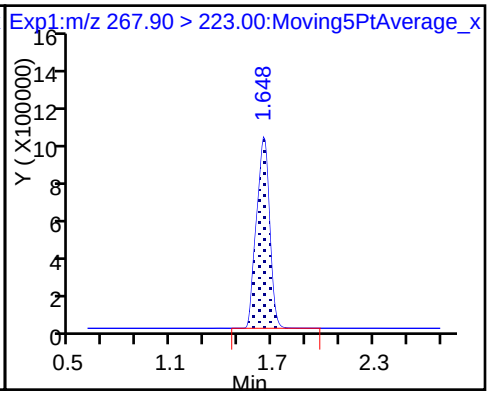
D 1 13C4 PFBA



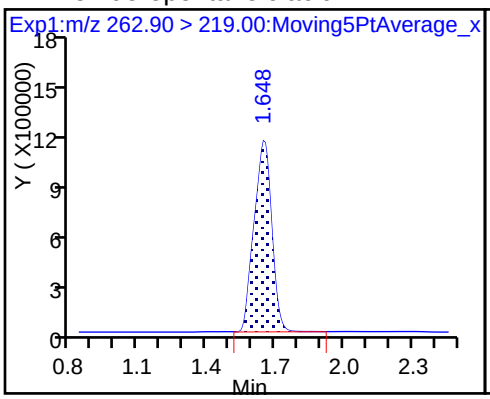
2 Perfluorobutyric acid



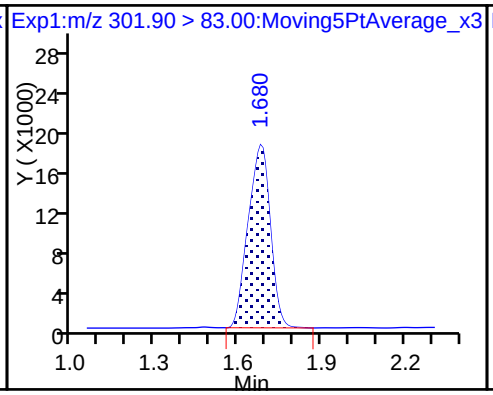
D 3 13C5-PFPeA



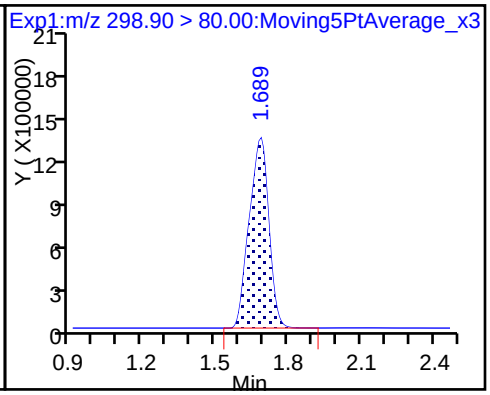
4 Perfluoropentanoic acid



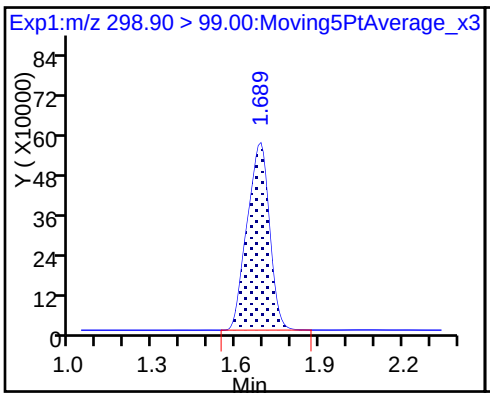
D 47 13C3-PFBS



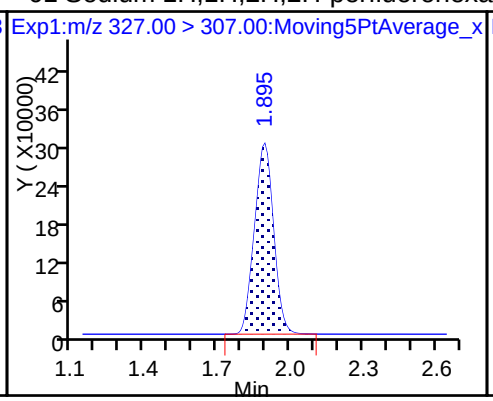
5 Perfluorobutanesulfonic acid



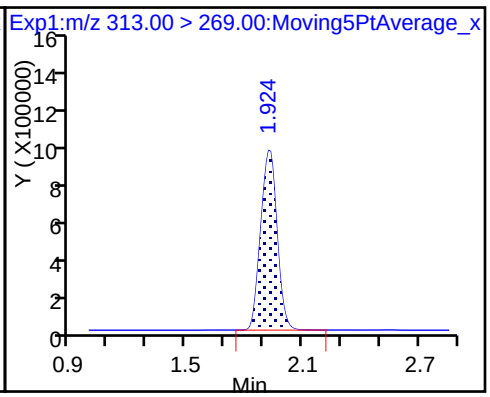
5 Perfluorobutanesulfonic acid



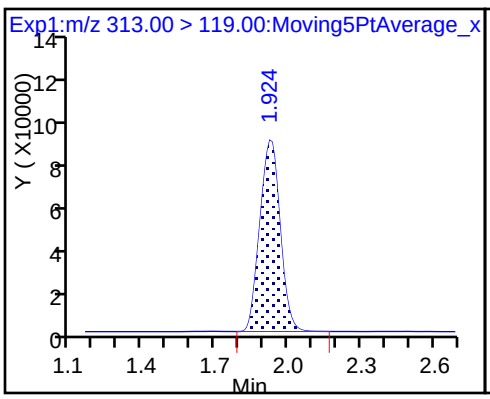
61 Sodium 1H,1H,2H,2H-perfluorohexane



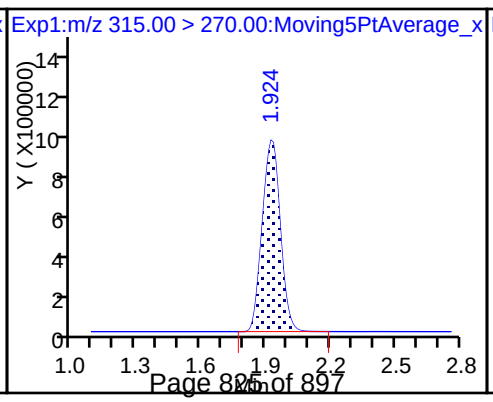
6 Perfluorohexanoic acid



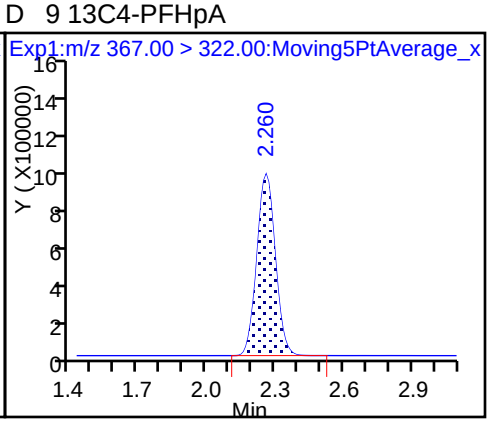
6 Perfluorohexanoic acid



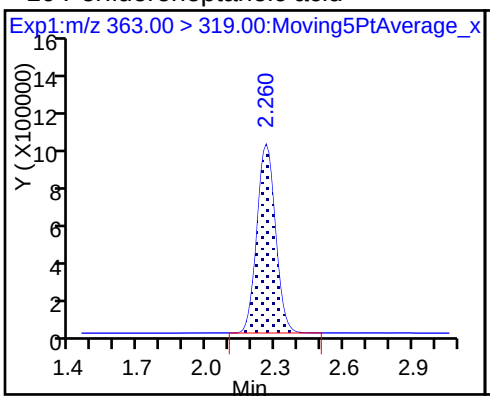
D 7 13C2 PFHxA



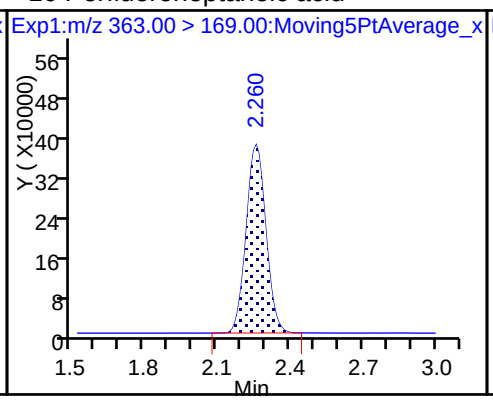
D 9 13C4-PFHpA



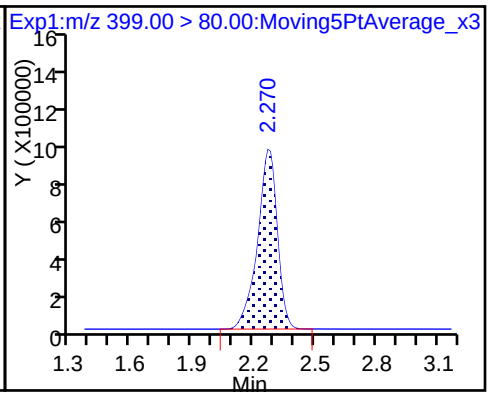
10 Perfluoroheptanoic acid



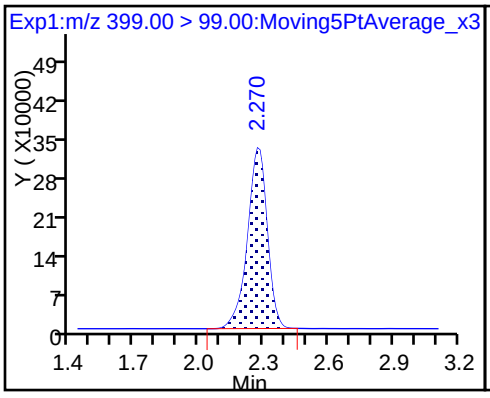
10 Perfluoroheptanoic acid



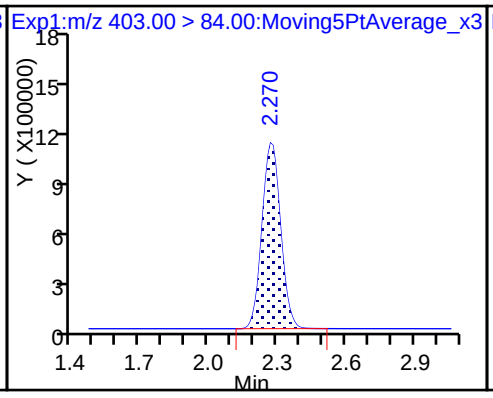
8 Perfluorohexanesulfonic acid



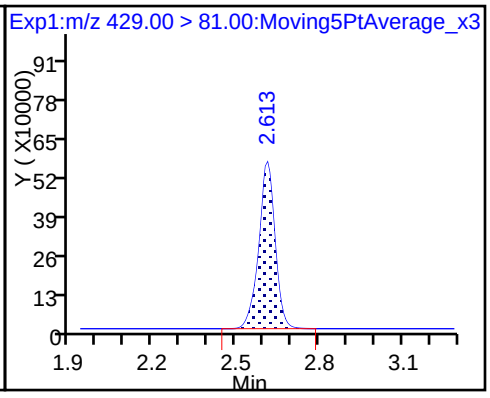
8 Perfluorohexanesulfonic acid



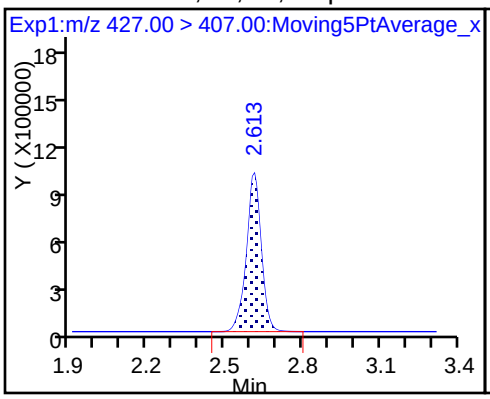
D 11 18O2 PFHxS



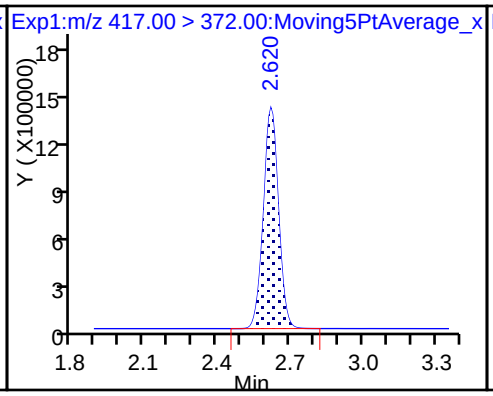
D 12 M2-6:2FTS



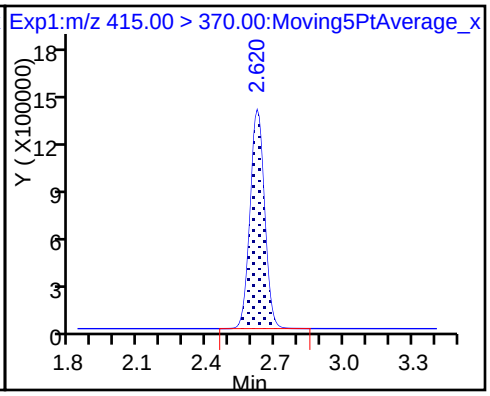
13 Sodium 1H,1H,2H,2H-perfluorooctane



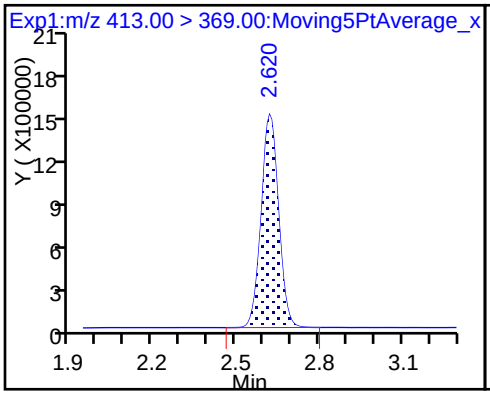
D 14 13C4 PFOA



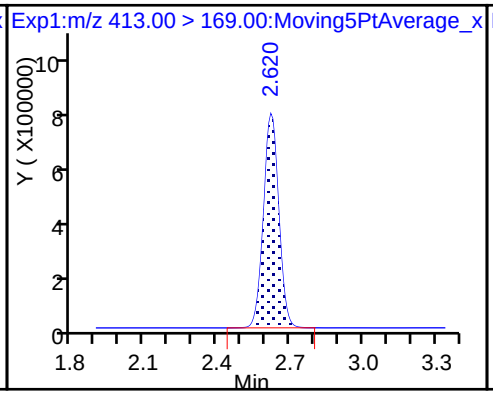
* 62 13C2-PFOA



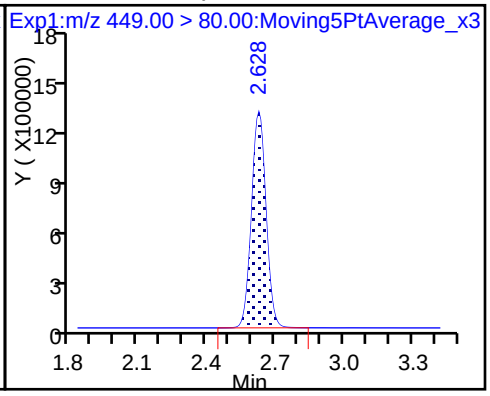
15 Perfluorooctanoic acid



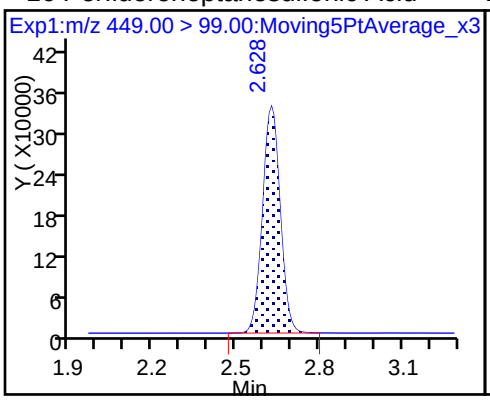
15 Perfluorooctanoic acid



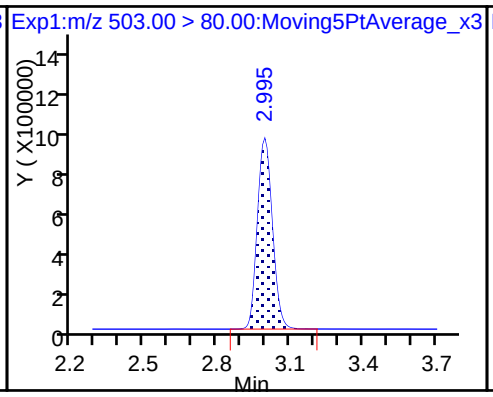
16 Perfluoroheptanesulfonic Acid



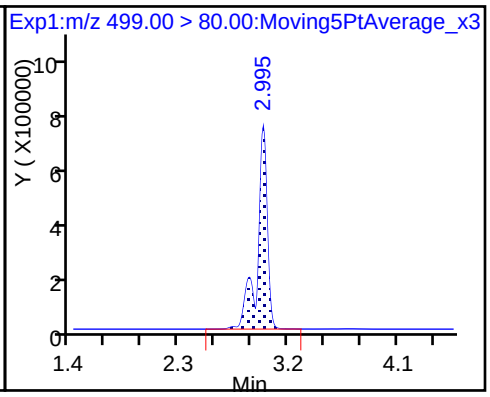
16 Perfluoroheptanesulfonic Acid



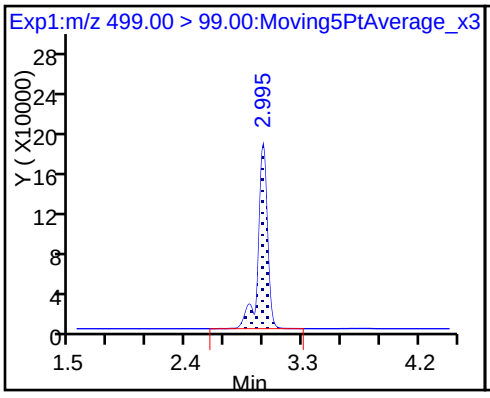
D 18 13C4 PFOS



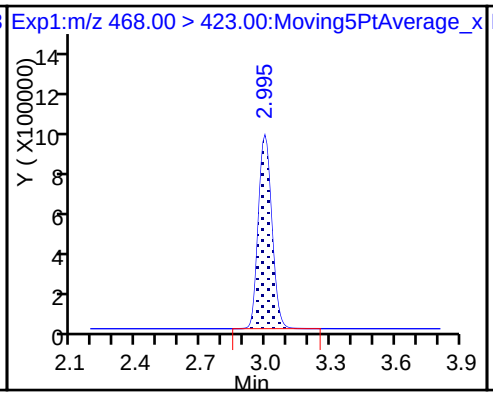
17 Perfluorooctane sulfonic acid



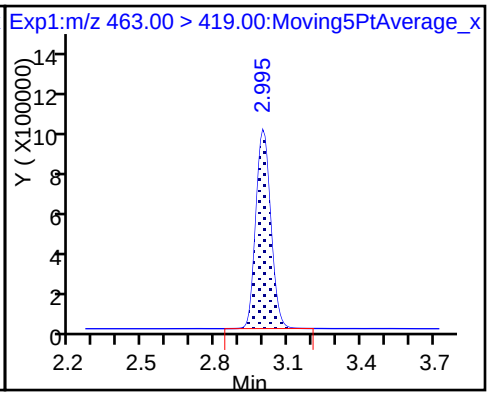
17 Perfluorooctane sulfonic acid



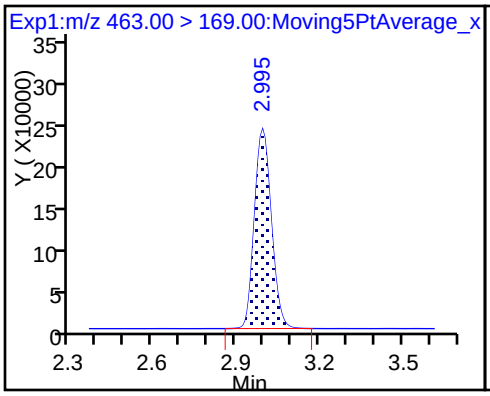
D 19 13C5 PFNA



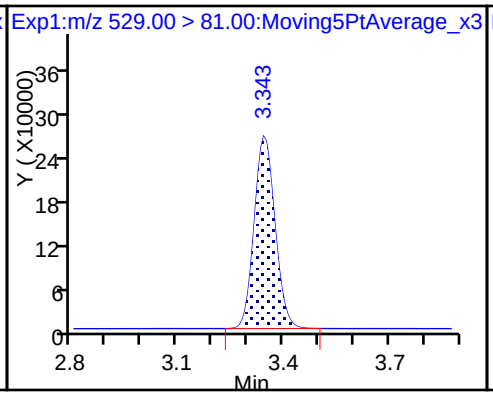
20 Perfluorononanoic acid



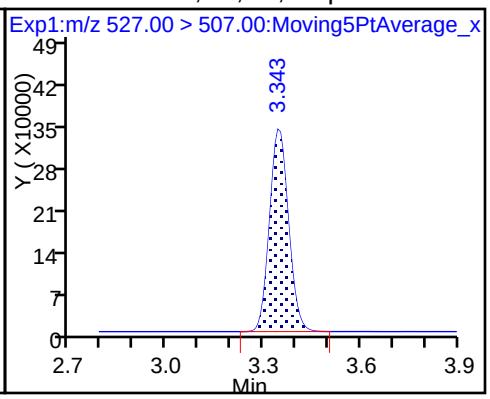
20 Perfluorononanoic acid



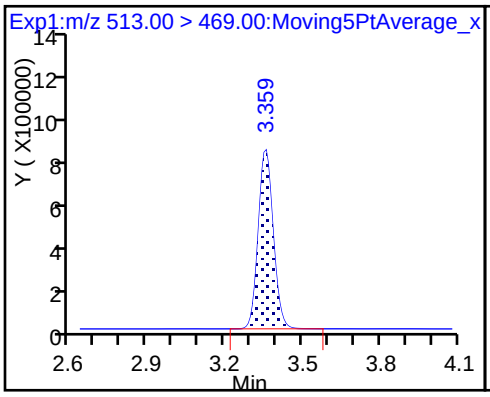
D 26 M2-8:2FTS



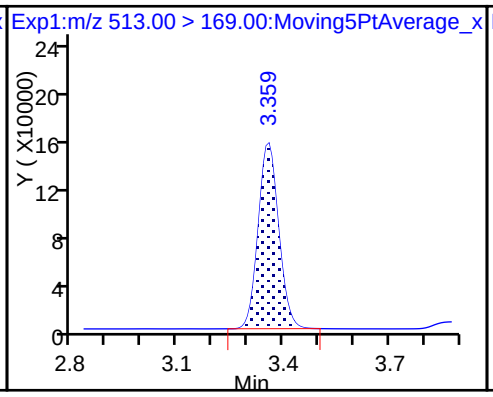
25 Sodium 1H,1H,2H,2H-perfluorodecane



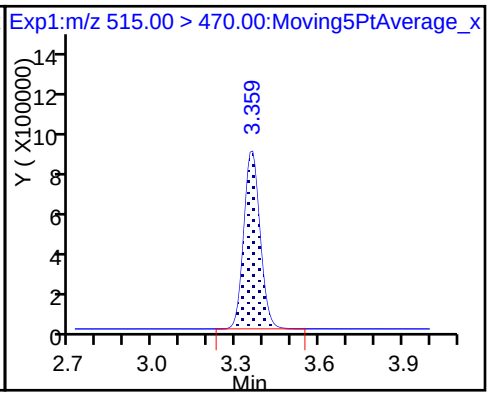
24 Perfluorodecanoic acid



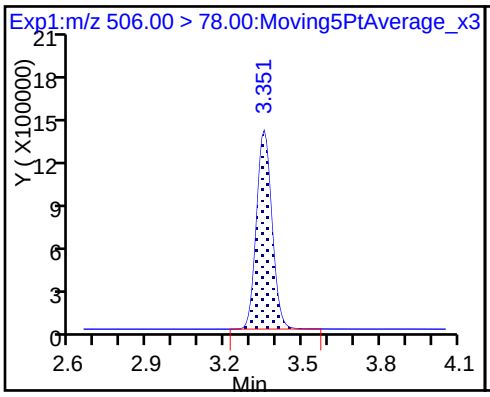
24 Perfluorodecanoic acid



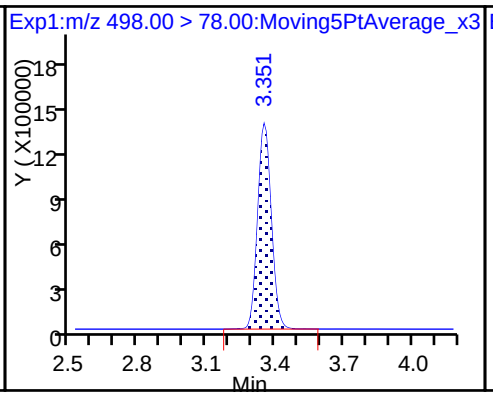
D 23 13C2 PFDA



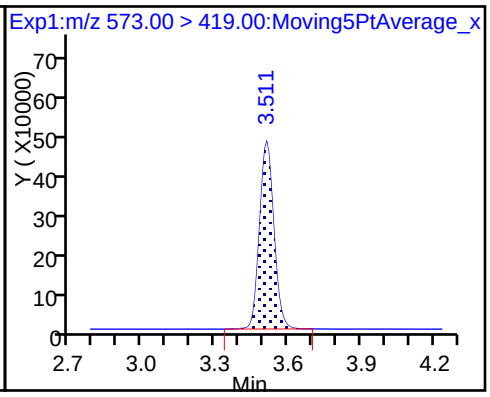
D 21 13C8 FOSA



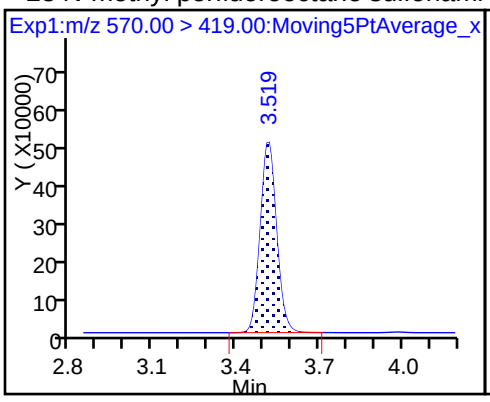
22 Perfluorooctane Sulfonamide



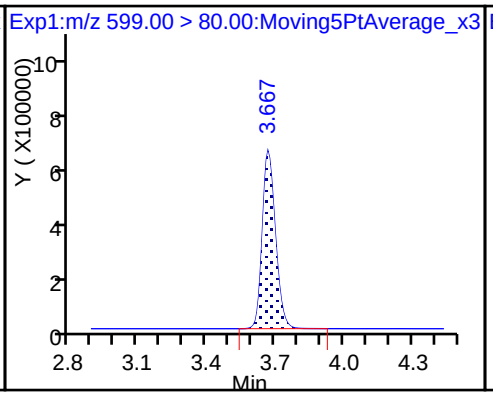
D 27 d3-NMeFOSAA



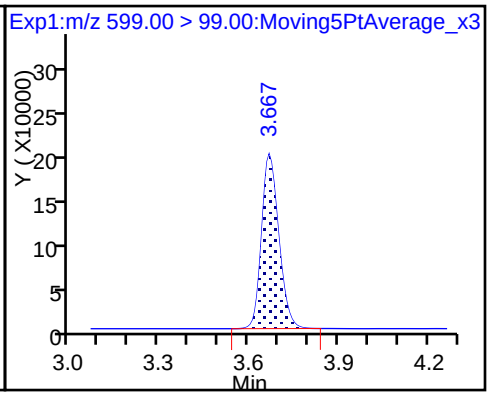
28 N-methyl perfluorooctane sulfonami



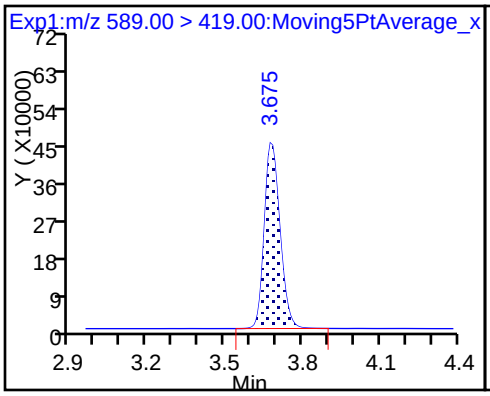
29 Perfluorodecane Sulfonic acid



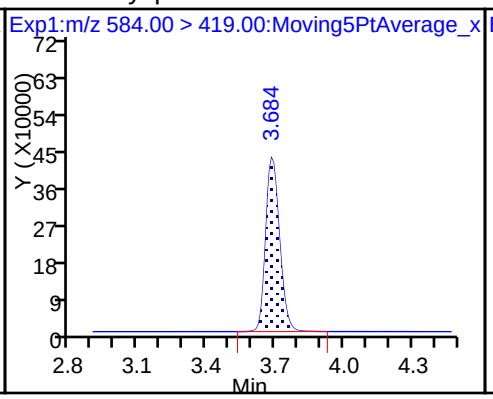
29 Perfluorodecane Sulfonic acid



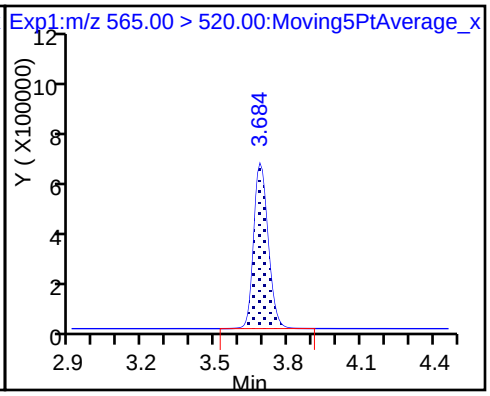
D 32 d5-NEtFOSAA



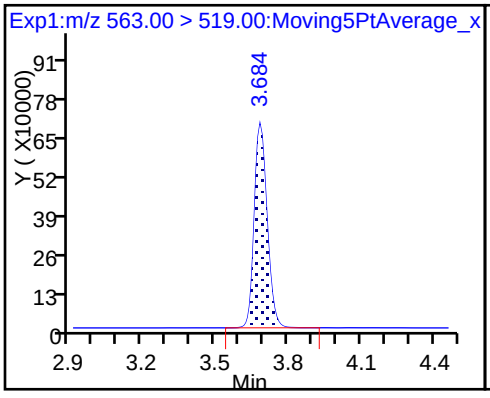
33 N-ethyl perfluorooctane sulfonamid



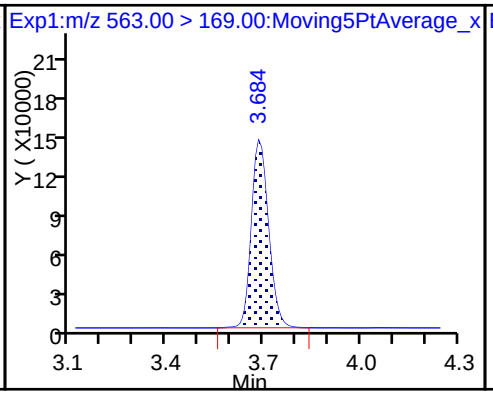
D 30 13C2 PFUnA



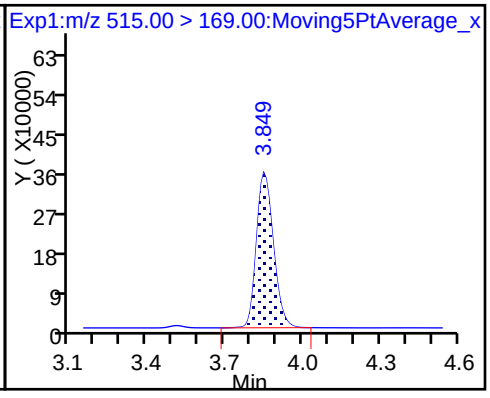
31 Perfluoroundecanoic acid



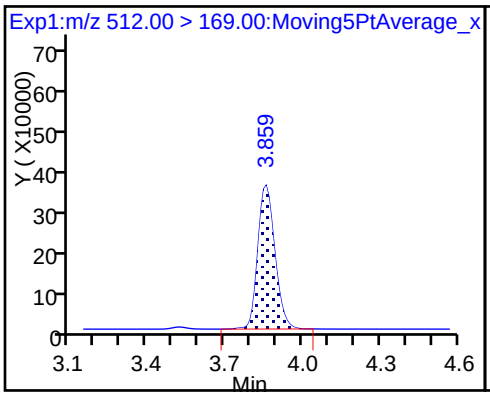
31 Perfluoroundecanoic acid



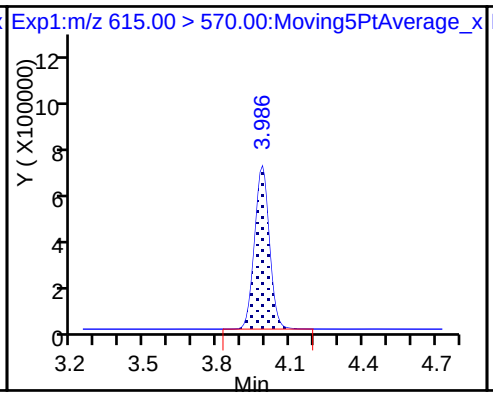
D 34 d-N-MeFOSA-M



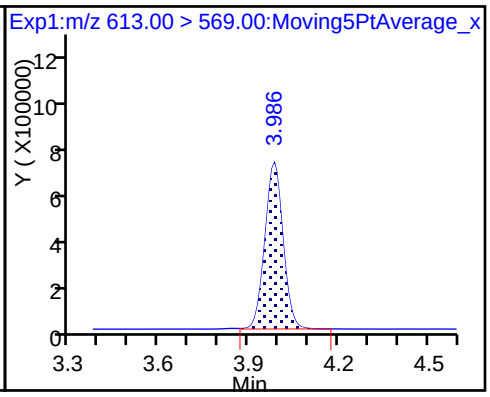
35 MeFOSA



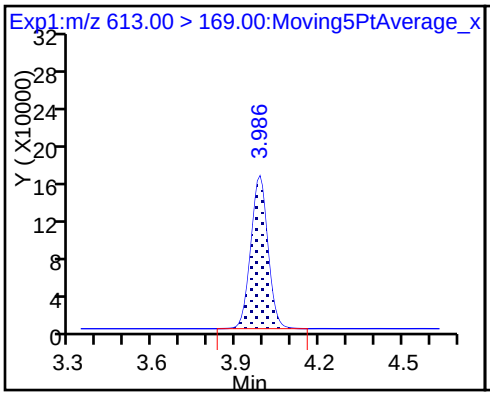
D 36 13C2 PFDoA



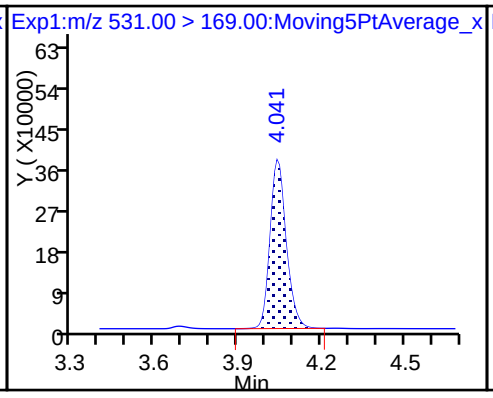
37 Perfluorododecanoic acid



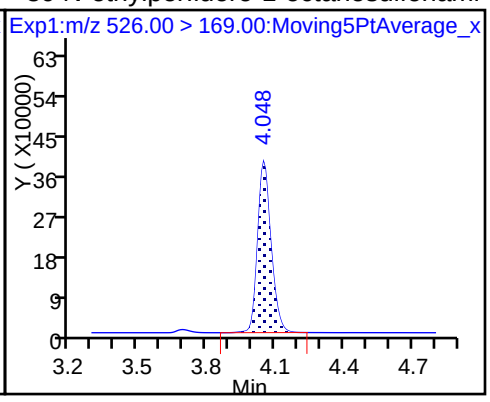
37 Perfluorododecanoic acid



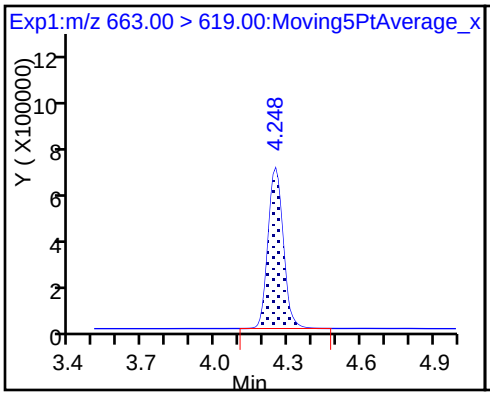
D 38 d-N-EtFOSA-M



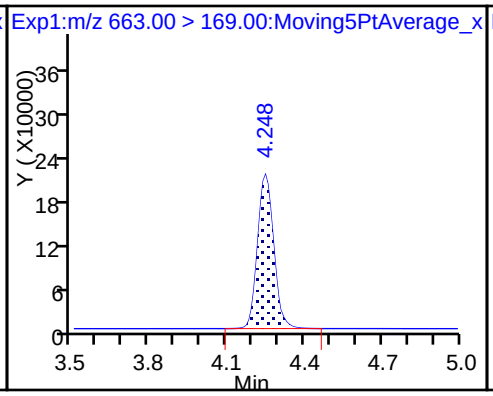
39 N-ethylperfluoro-1-octanesulfonami



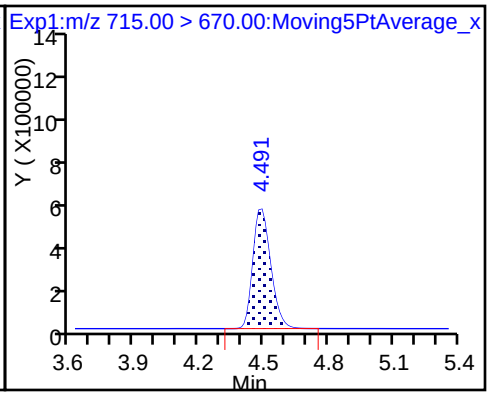
41 Perfluorotridecanoic acid



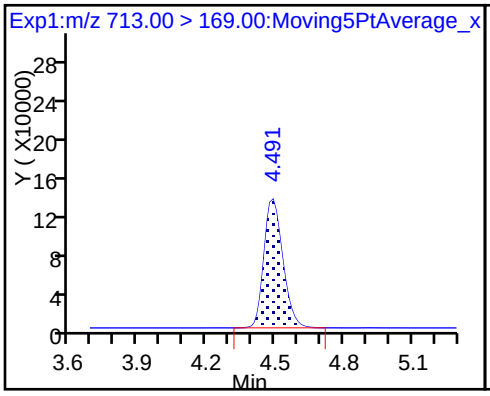
41 Perfluorotridecanoic acid



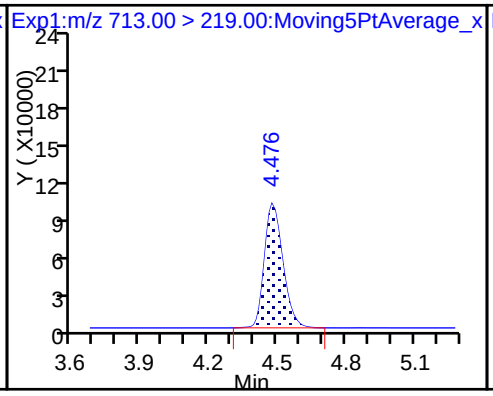
D 43 13C2-PFTeDA



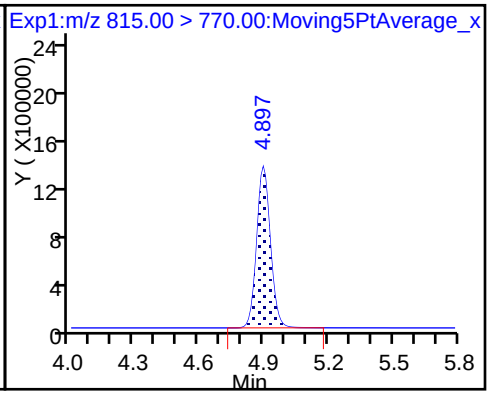
42 Perfluorotetradecanoic acid



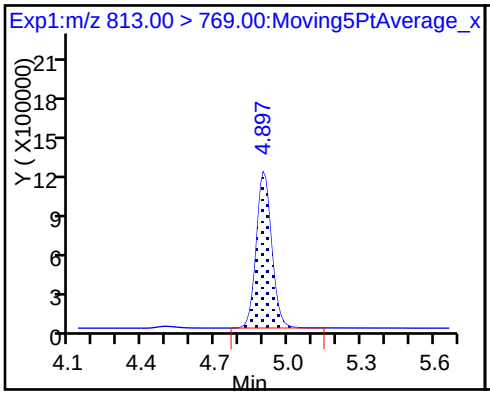
42 Perfluorotetradecanoic acid



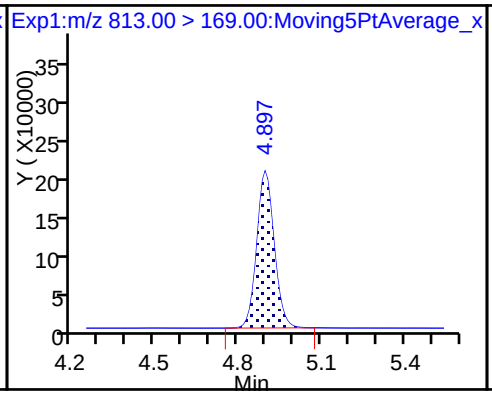
D 44 13C2-PFHxDA



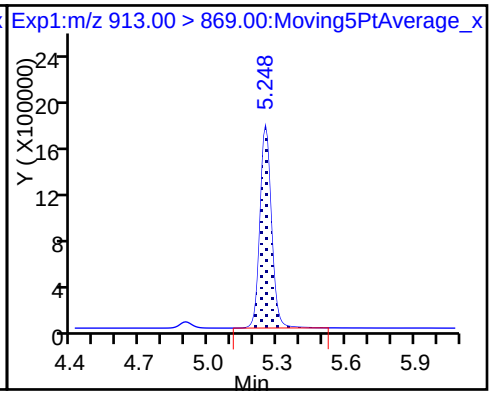
45 Perfluorohexadecanoic acid



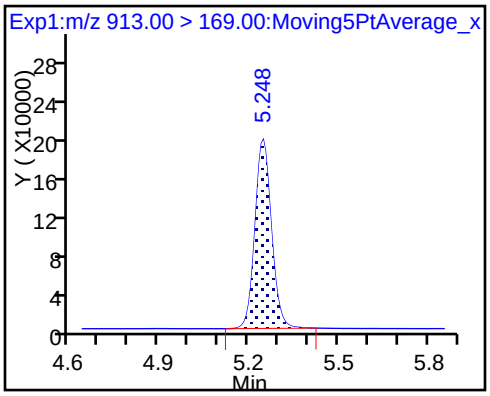
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-199444/1-A

Matrix: Water | Lab File ID: 2017.12.12LLB_003.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 250(mL) | Date Analyzed: 12/12/2017 21:42

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | 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 M	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)	2.0	U	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.: 320-34072-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-199444/1-A

Matrix: Water Lab File ID: 2017.12.12LLB_003.d

Analysis Method: 537 (modified) Date Collected:

Extraction Method: 3535 Date Extracted: 12/12/2017 08:28

Sample wt/vol: 250(mL) Date Analyzed: 12/12/2017 21:42

Con. Extract Vol.: 10.0(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	110		25-150
STL00992	13C4 PFBA	120	M	25-150
STL00993	13C2 PFHxA	114		25-150
STL00990	13C4 PFOA	112		25-150
STL00995	13C5 PFNA	115		25-150
STL00996	13C2 PFDA	121		25-150
STL00997	13C2 PFUnA	110		25-150
STL00998	13C2 PFDoA	109		25-150
STL00994	18O2 PFHxS	118		25-150
STL00991	13C4 PFOS	117		25-150
STL02116	13C2-PFTeDA	126		25-150
STL01892	13C4-PFHpA	119		25-150
STL01893	13C5 PFPeA	115		25-150
STL02337	13C3-PFBS	117		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_003.d
Lims ID: MB 320-199444/1-A
Client ID:
Sample Type: MB
Inject. Date: 12-Dec-2017 21:42:34 ALS Bottle#: 1 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-199444/1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 13-Dec-2017 13:39:08 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK047

First Level Reviewer: hannigana Date: 13-Dec-2017 13:19:23

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	1.404	1.401	0.003	0.535	9212034	3.01		120	29600	M
2 Perfluorobutyric acid										
212.90 > 169.00	1.404	1.402	0.002	1.000	16924	0.005056			4.1	
D 3 13C5-PFPeA										
267.90 > 223.00	1.647	1.646	0.001	0.627	5488846	2.87		115	52265	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.647	1.648	-0.001	1.000	10174	0.003982			5.7	
D 47 13C3-PFBS										
301.90 > 83.00	1.684	1.681	0.003	0.642	107943	2.72		117	2941	
D 60 M2-4:2FTS										
329.00 > 81.00	1.874	1.866	0.008	0.714	854	NC			22.9	
D 7 13C2 PFHxA										
315.00 > 270.00	1.928	1.924	0.004	0.735	5610561	2.86		114	50533	
D 9 13C4-PFHpA										
367.00 > 322.00	2.265	2.254	0.011	0.863	5659109	2.96		119	48045	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.275	2.269	0.006	1.000	20647	0.006906			211	
399.00 > 99.00	2.275	2.269	0.006	1.000	6741		3.06(1.50-4.49)		70.3	
D 11 18O2 PFHxS										
403.00 > 84.00	2.275	2.271	0.004	0.867	6648676	2.78		118	87104	
D 12 M2-6:2FTS										
429.00 > 81.00	2.597	2.605	-0.008	0.989	1242632	1.94		81.7	28443	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.597	2.605	-0.008	1.000	8618	0.009769			277	
D 14 13C4 PFOA										
417.00 > 372.00	2.624	2.618	0.006	1.000	5899755	2.79		112	56520	
* 62 13C2-PFOA										
415.00 > 370.00	2.624	2.619	0.005		5143604	2.50			58678	

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	2.624	2.621	0.003	1.000	14944	0.005937			6.0	M
413.00 > 169.00	2.624	2.621	0.003	1.000	6008		2.49(0.84-2.52)		55.3	
D 18 13C4 PFOS										
503.00 > 80.00	3.000	2.993	0.007	1.143	4347908	2.80		117	36989	
D 19 13C5 PFNA										
468.00 > 423.00	3.000	2.994	0.006	1.143	4392820	2.88		115	56011	
D 26 M2-8:2FTS										
529.00 > 81.00	3.357	3.343	0.014	1.279	1339263	2.66		111	26512	
D 23 13C2 PFDA										
515.00 > 470.00	3.372	3.356	0.016	1.285	3901670	3.02		121	47927	
D 21 13C8 FOSA										
506.00 > 78.00	3.349	3.359	-0.010	1.276	5764622	2.75		110	28022	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.349	3.359	-0.010	1.000	10394	0.004812			214	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.524	3.511	0.013	1.343	2143666	3.10		124	28756	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.524	3.515	0.009	1.000	3430	0.003820			32.6	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.691	3.677	0.013	1.406	2154839	3.21		128	17375	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.691	3.685	0.005	1.000	3708	0.004568			71.5	
D 30 13C2 PFUnA										
565.00 > 520.00	3.691	3.685	0.005	1.406	2735458	2.74		110	47606	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.691	3.685	0.005	1.000	7067	0.006568			38.5	
563.00 > 169.00	3.691	3.685	0.005	1.000	2055		3.44(0.00-0.00)		110	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.847	3.856	-0.009	1.466	1035158	1.71		68.5	2337	
D 36 13C2 PFDoA										
615.00 > 570.00	3.991	3.979	0.012	1.521	3029568	2.73		109	29571	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.030	4.048	-0.018	1.536	674075	1.20		47.9	1462	
D 40 d-N-EtFOSE-M										
570.00 > 136.00	4.394	4.240	0.154	1.675	221	NC			3.0	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.254	4.243	0.011	1.000	3522	0.002782			11.3	
663.00 > 169.00	4.263	4.243	0.020	1.002	2304		1.53(1.25-3.76)		152	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.501	4.481	0.020	1.715	4082955	3.16		126	27232	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.914	4.892	0.022	1.873	5967154	2.79		112	15158	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.914	4.894	0.020	1.000	55064	0.002718			28.3	
813.00 > 169.00	4.914	4.894	0.020	1.000	10444		5.27(2.86-8.58)		304	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.282	5.242	0.040	1.000	20060	0.008794			4.7	
913.00 > 169.00	5.275	5.242	0.033	0.999	2346		8.55(0.00-0.00)		25.2	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 13-Dec-2017 13:39:12 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_003.d

Injection Date: 12-Dec-2017 21:42:34 Instrument ID: A8_N

Lims ID: MB 320-199444/1-A

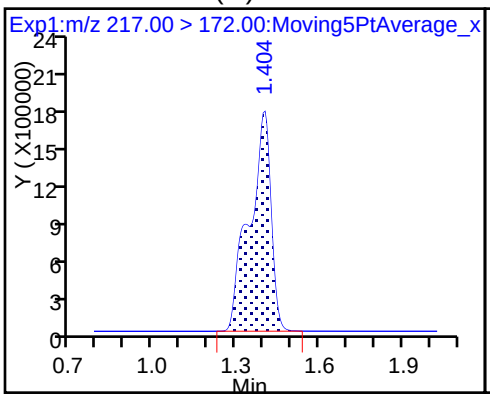
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 2

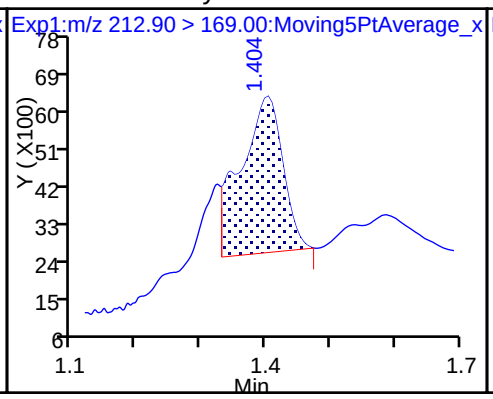
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

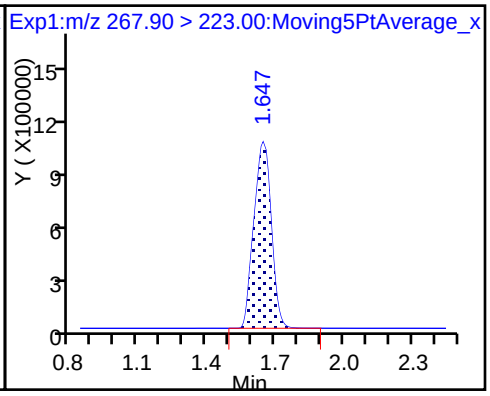
D 1 13C4 PFBA (M)



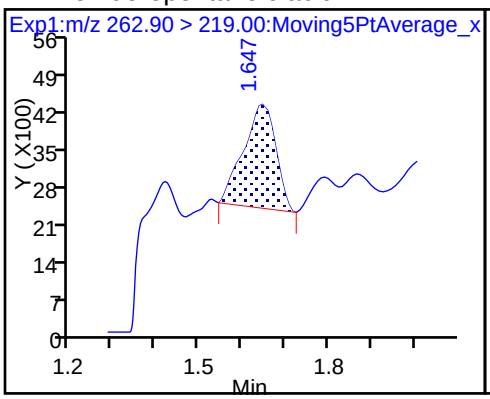
2 Perfluorobutyric acid



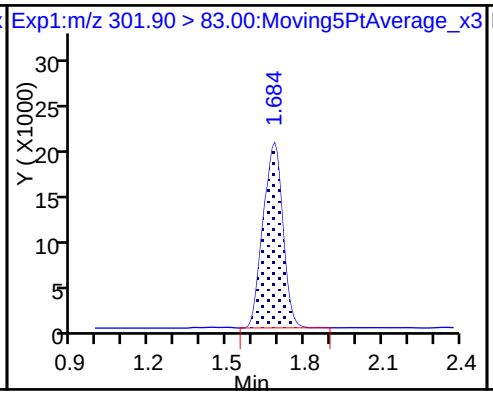
D 3 13C5-PFPeA



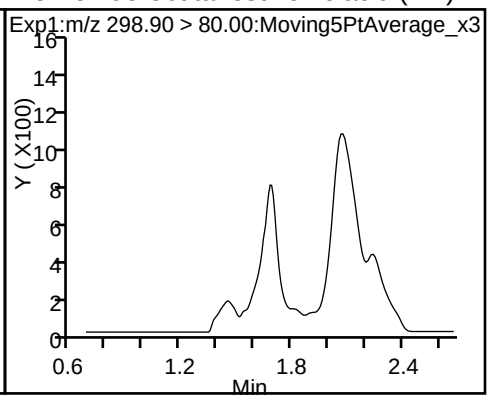
4 Perfluoropentanoic acid



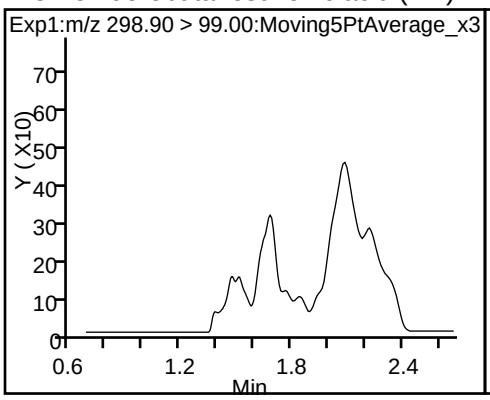
D 47 13C3-PFBS



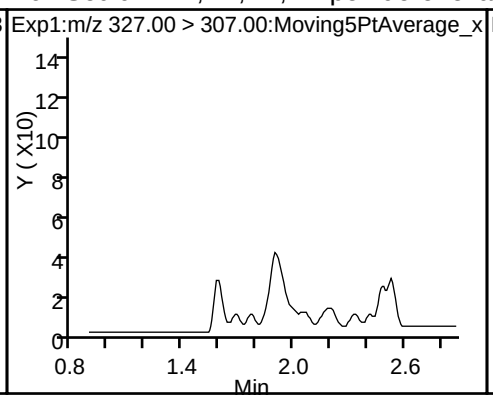
5 Perfluorobutanesulfonic acid (ND)



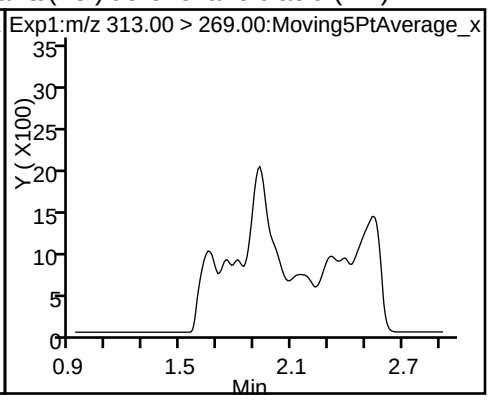
5 Perfluorobutanesulfonic acid (ND)



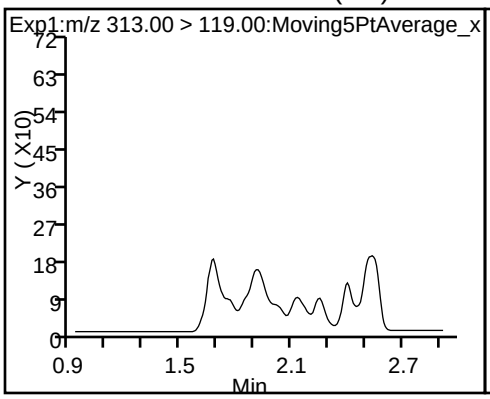
61 Sodium 1H,1H,2H,2H-perfluorohexane6(ND)



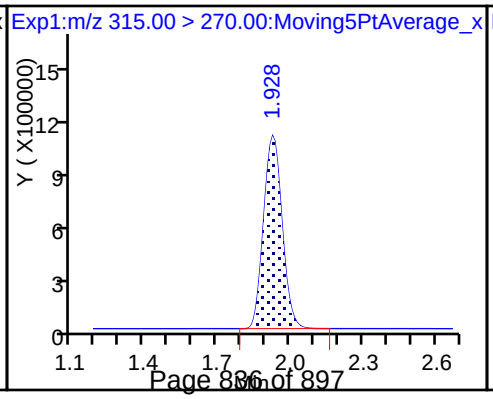
6 Perfluorohexanoic acid (ND)



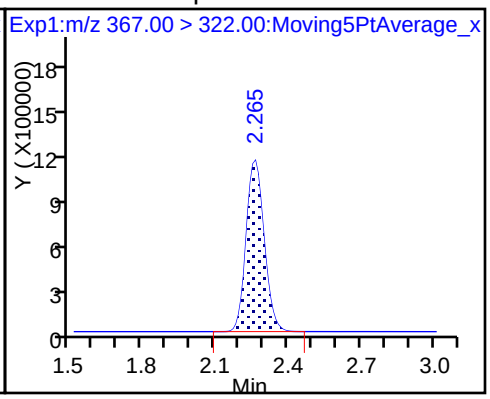
6 Perfluorohexanoic acid (ND)



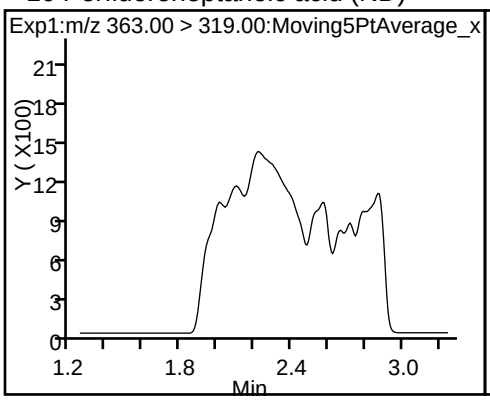
D 7 13C2 PFHxA



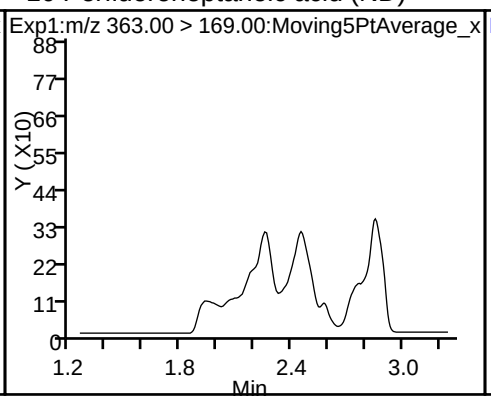
D 9 13C4-PFHpA



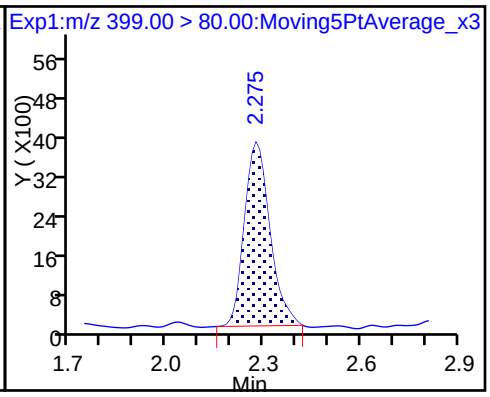
10 Perfluoroheptanoic acid (ND)



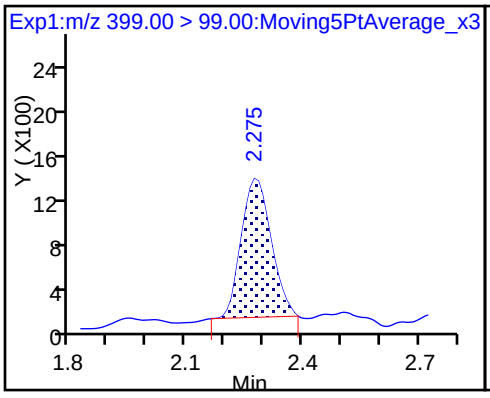
10 Perfluoroheptanoic acid (ND)



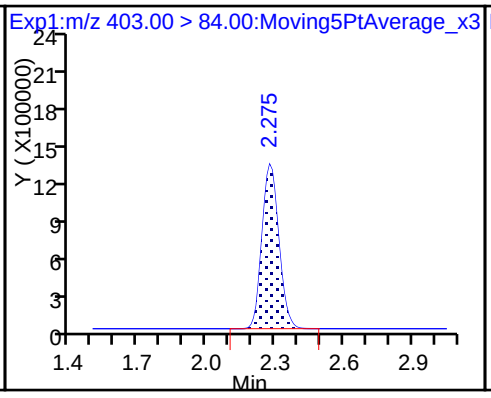
8 Perfluorohexanesulfonic acid



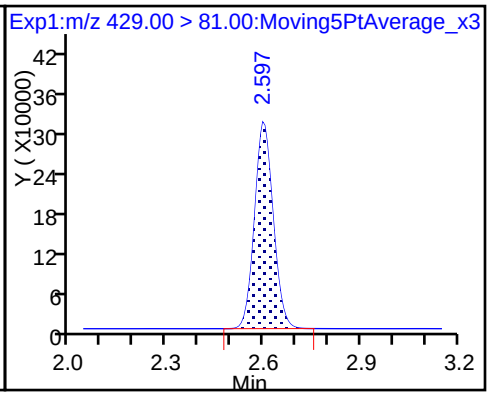
8 Perfluorohexanesulfonic acid



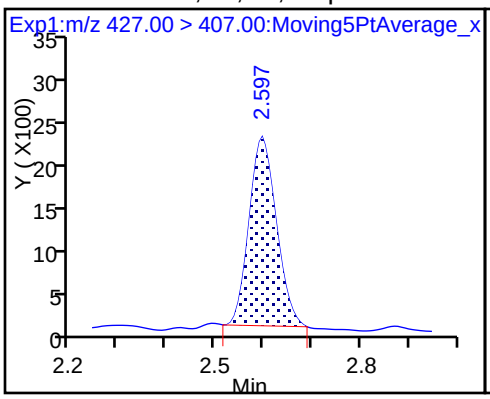
D 11 18O2 PFHxS



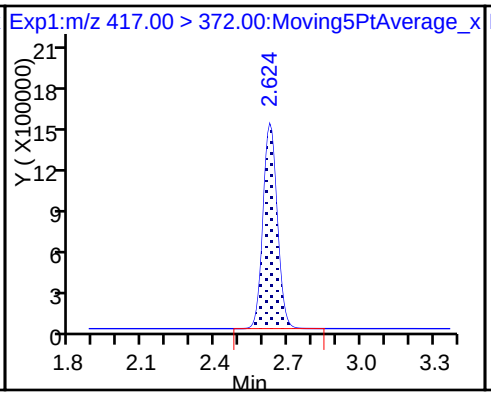
D 12 M2-6:2FTS



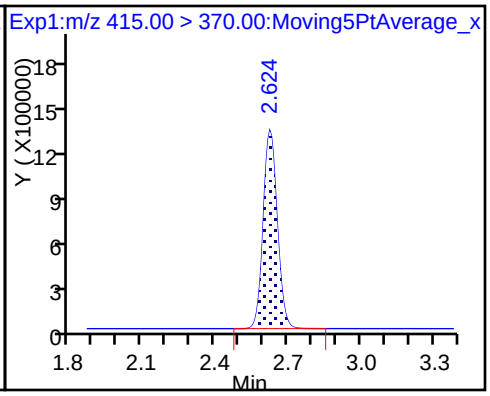
13 Sodium 1H,1H,2H,2H-perfluorooctane



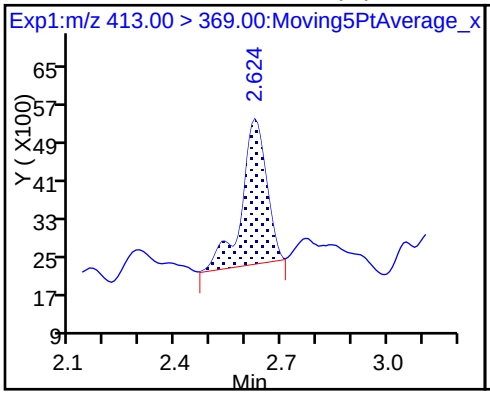
D 14 13C4 PFOA



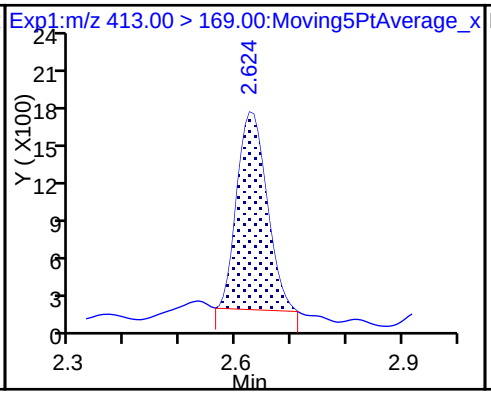
* 62 13C2-PFOA



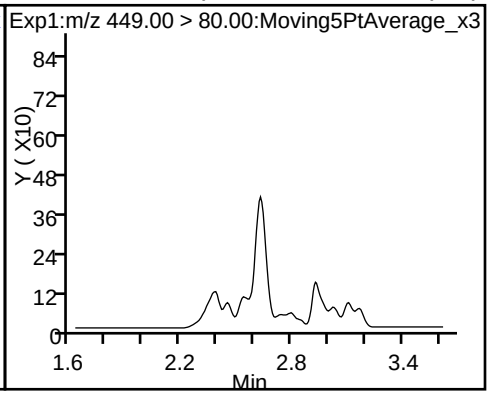
15 Perfluorooctanoic acid (M)



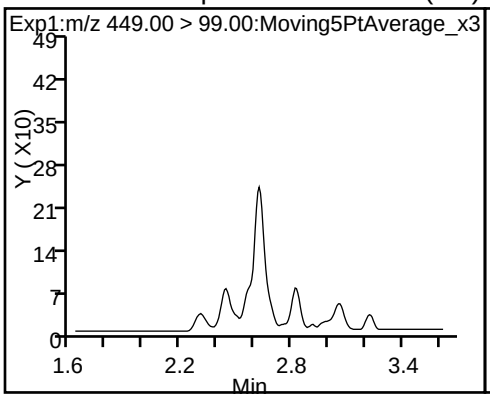
15 Perfluorooctanoic acid



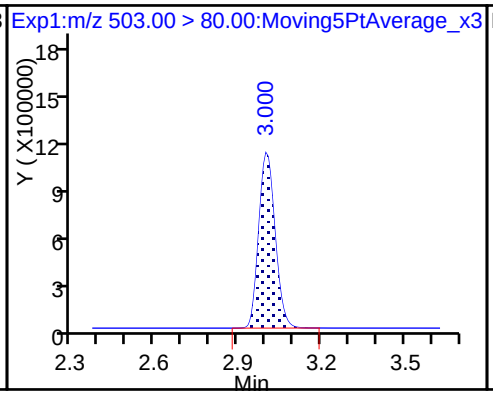
16 Perfluoroheptanesulfonic Acid (ND)



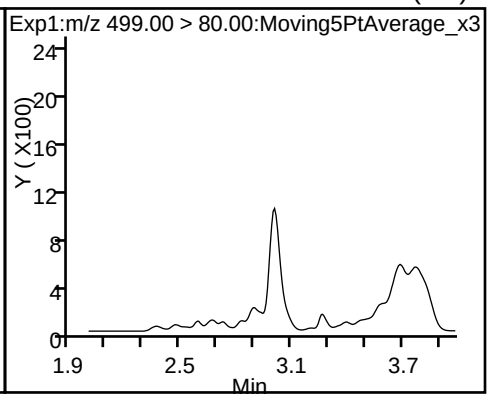
16 Perfluoroheptanesulfonic Acid (ND)



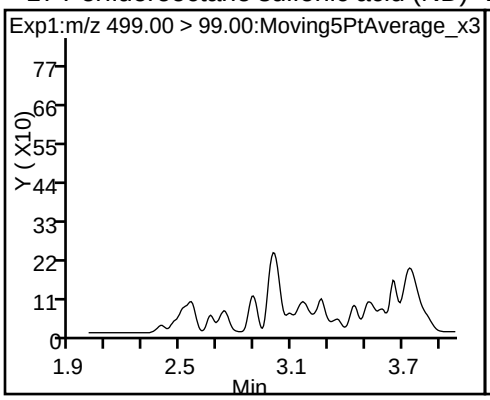
D 18 13C4 PFOS



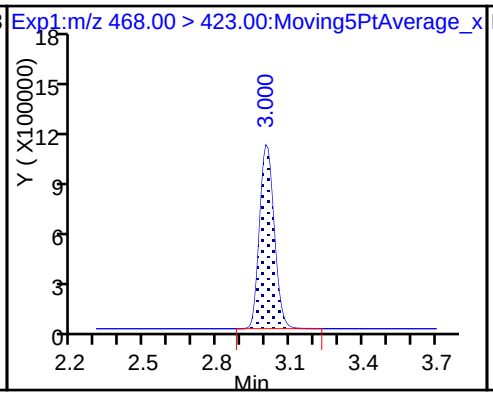
17 Perfluorooctane sulfonic acid (ND)



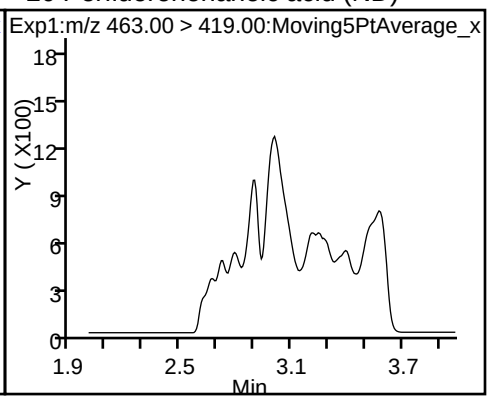
17 Perfluorooctane sulfonic acid (ND)



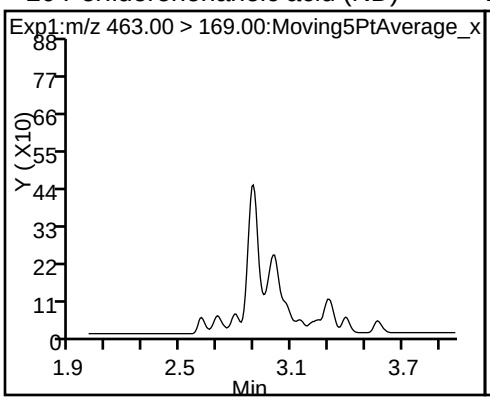
D 19 13C5 PFNA



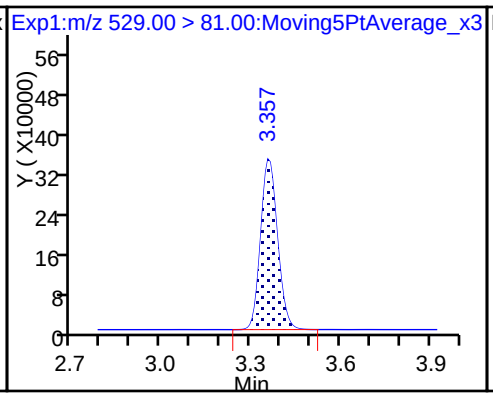
20 Perfluorononanoic acid (ND)



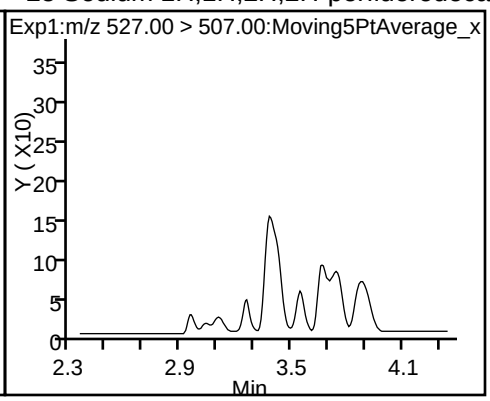
20 Perfluorononanoic acid (ND)



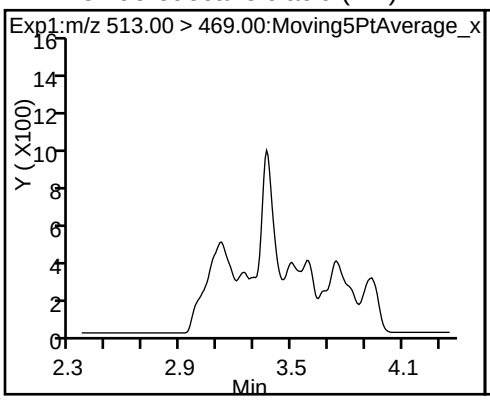
D 26 M2-8:2FTS



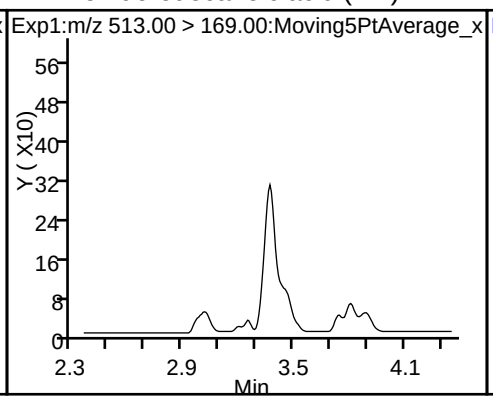
25 Sodium 1H,1H,2H,2H-perfluorodecane (ND)



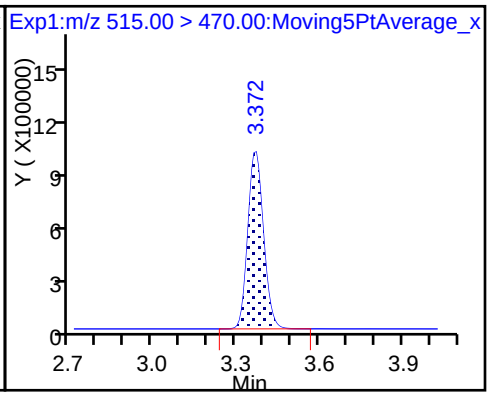
24 Perfluorodecanoic acid (ND)



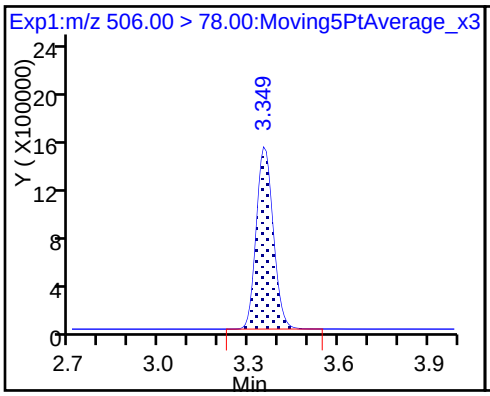
24 Perfluorodecanoic acid (ND)



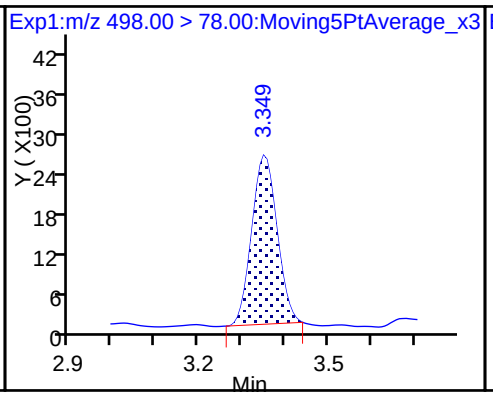
D 23 13C2 PFDA



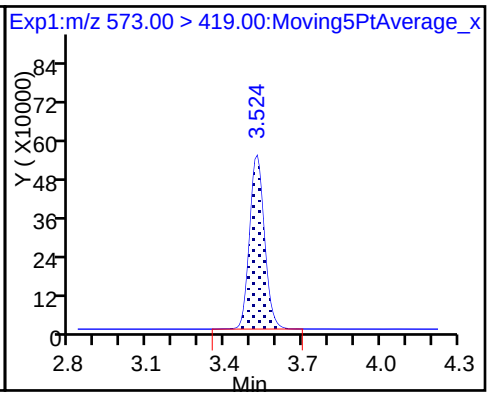
D 21 13C8 FOSA



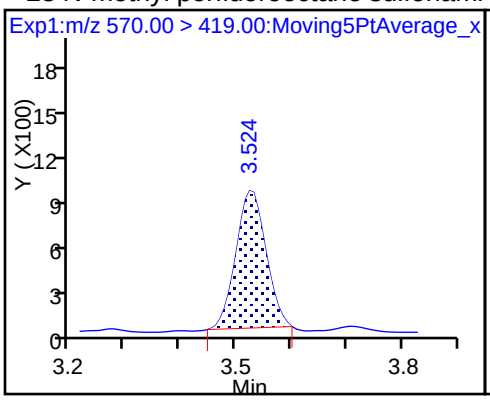
22 Perfluorooctane Sulfonamide



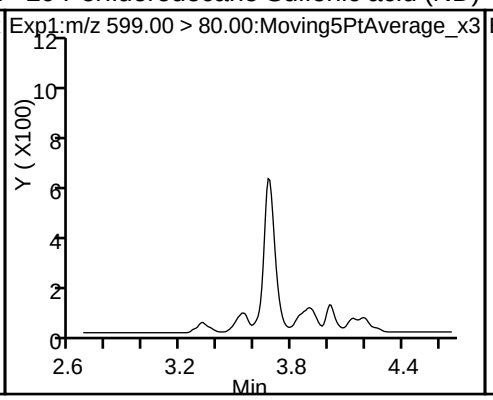
D 27 d3-NMeFOSAA



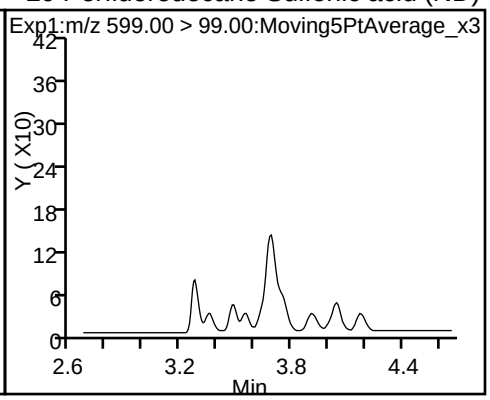
28 N-methyl perfluorooctane sulfonami



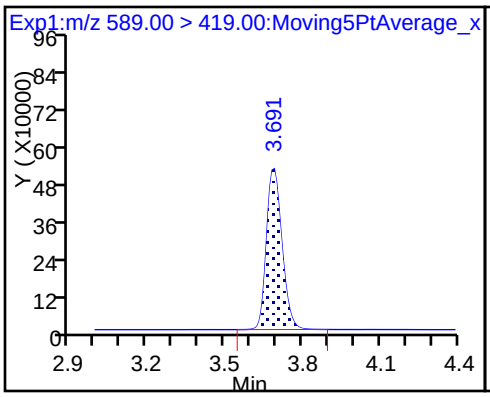
29 Perfluorodecane Sulfonic acid (ND)



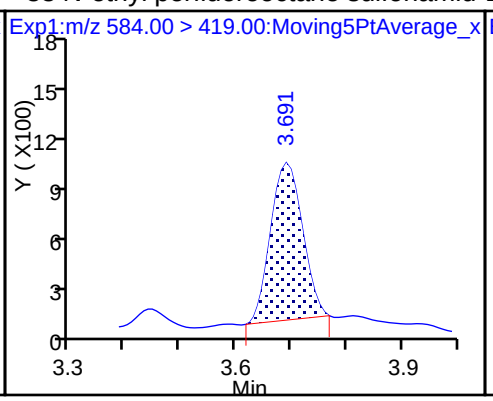
29 Perfluorodecane Sulfonic acid (ND)



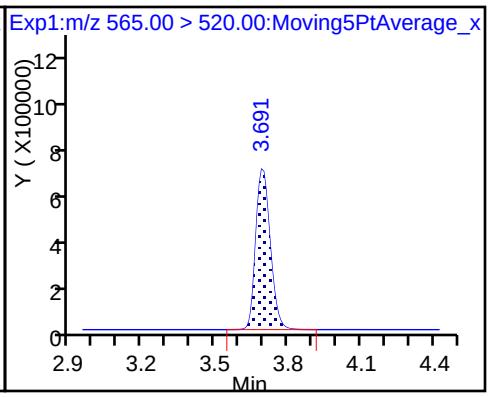
D 32 d5-NEtFOSAA



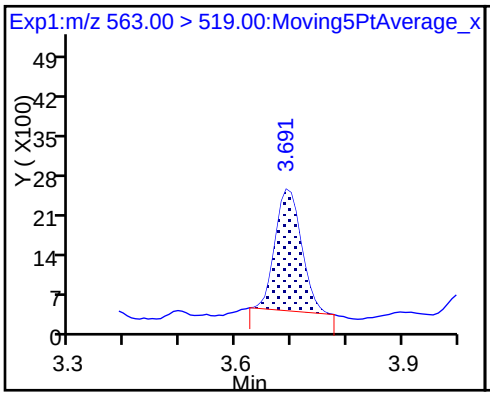
33 N-ethyl perfluorooctane sulfonamid



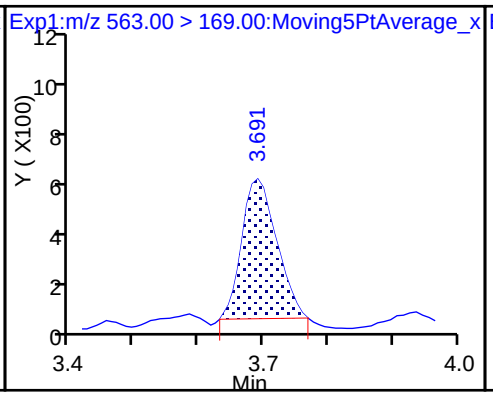
D 30 13C2 PFUnA



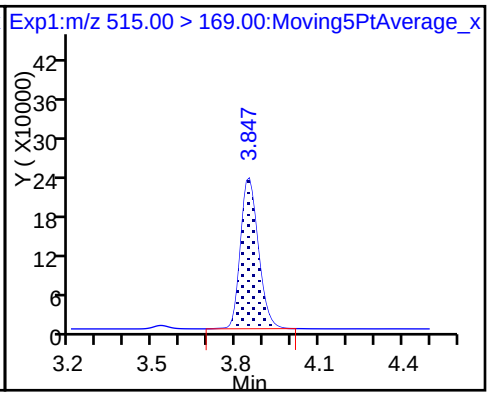
31 Perfluoroundecanoic acid



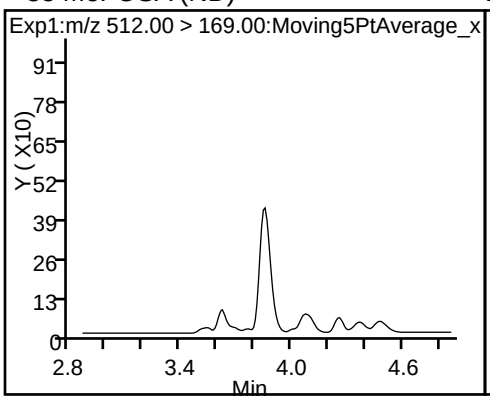
31 Perfluoroundecanoic acid



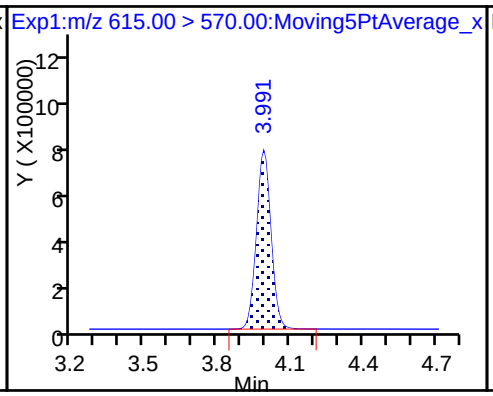
D 34 d-N-MeFOSA-M



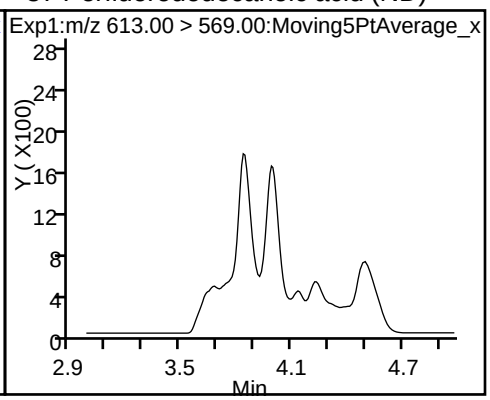
35 MeFOSA (ND)



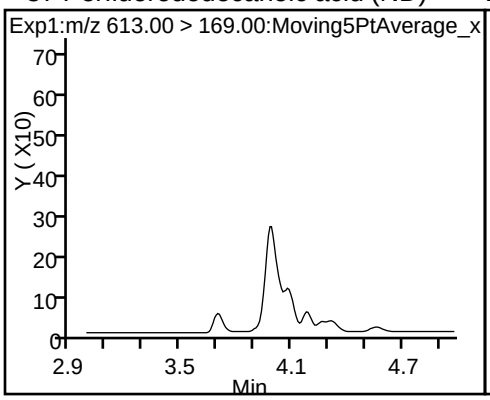
D 36 13C2 PFDoA



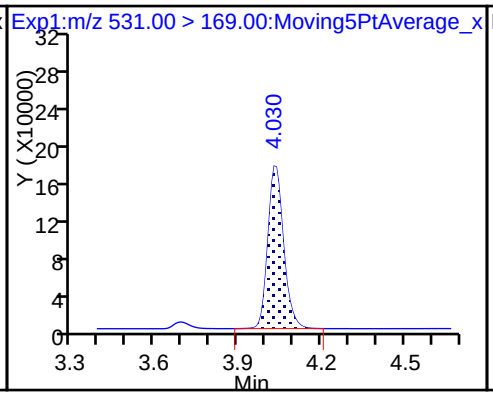
37 Perfluorododecanoic acid (ND)



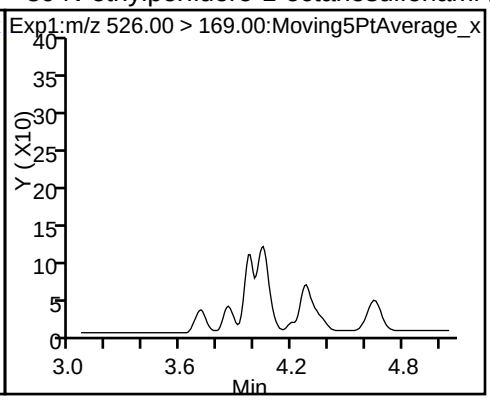
37 Perfluorododecanoic acid (ND)



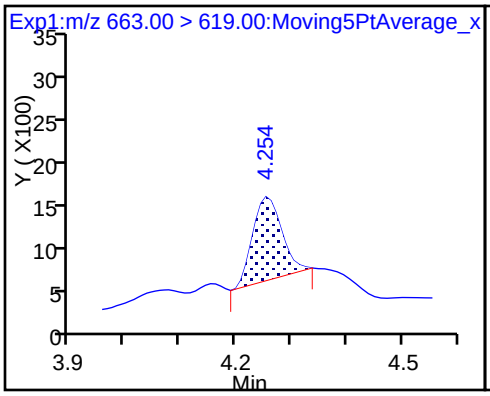
D 38 d-N-EtFOSA-M



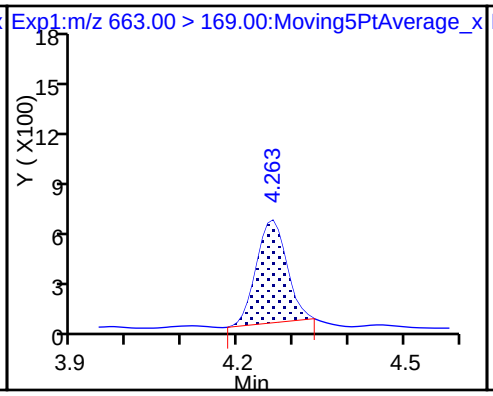
39 N-ethylperfluoro-1-octanesulfonami (ND)



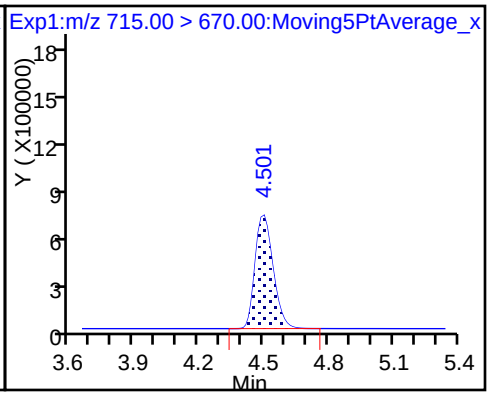
41 Perfluorotridecanoic acid



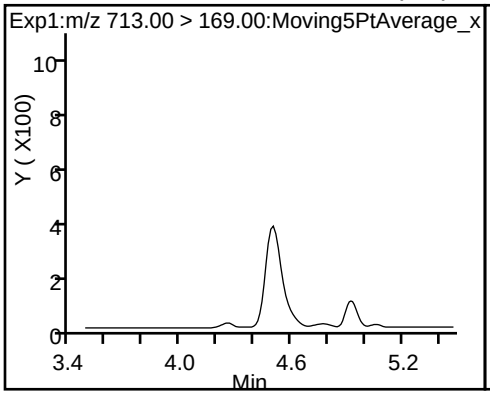
41 Perfluorotridecanoic acid



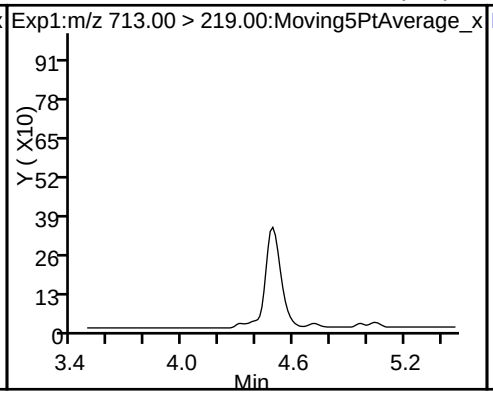
D 43 13C2-PFTeDA



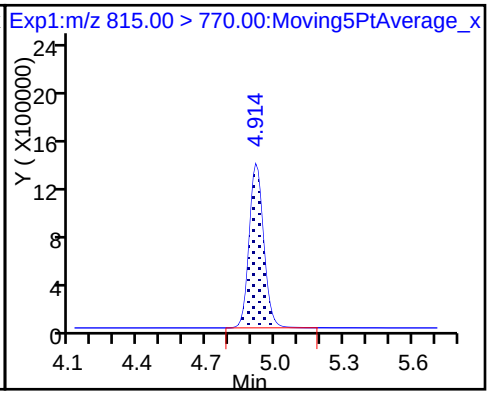
42 Perfluorotetradecanoic acid (ND)



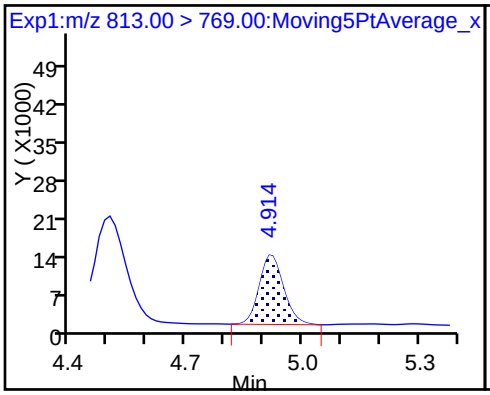
42 Perfluorotetradecanoic acid (ND)



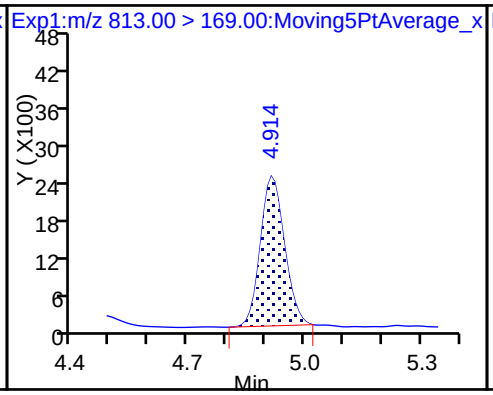
D 44 13C2-PFHxDA



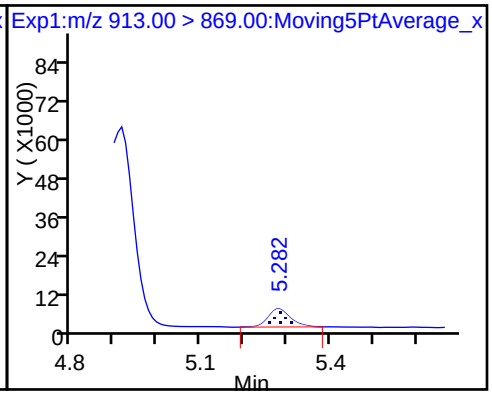
45 Perfluorohexadecanoic acid



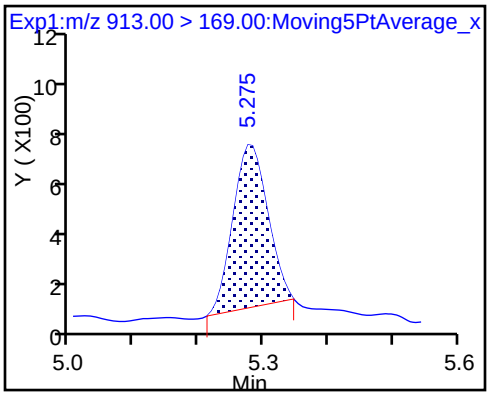
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

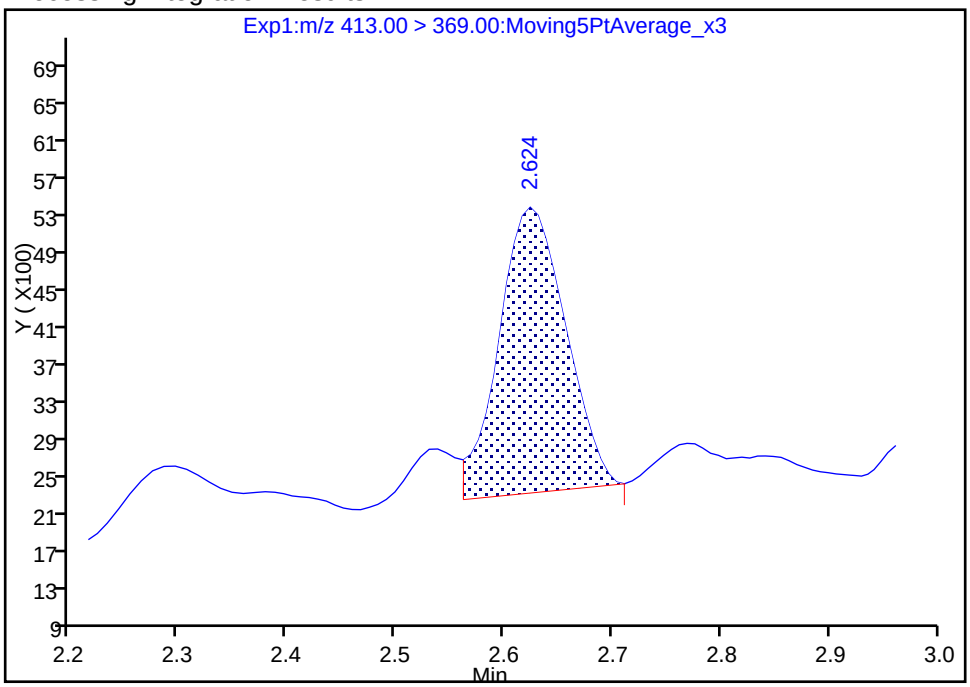
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_003.d
Injection Date: 12-Dec-2017 21:42:34 Instrument ID: A8_N
Lims ID: MB 320-199444/1-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

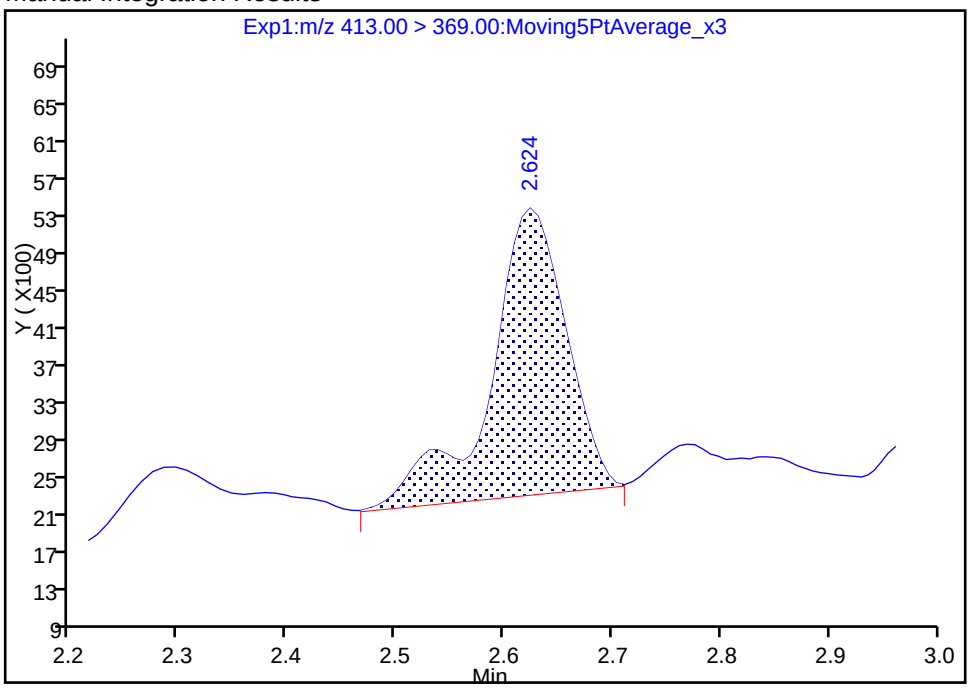
Processing Integration Results

RT: 2.62
Area: 12964
Amount: 0.005151
Amount Units: ng/ml



Manual Integration Results

RT: 2.62
Area: 14944
Amount: 0.005937
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:18:41
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

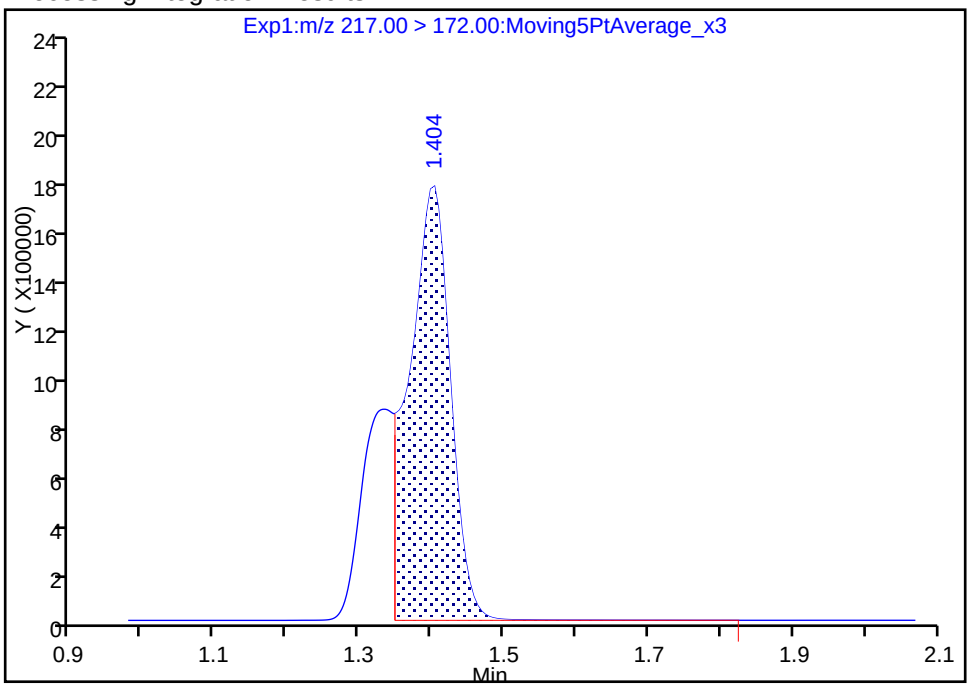
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_003.d
Injection Date: 12-Dec-2017 21:42:34 Instrument ID: A8_N
Lims ID: MB 320-199444/1-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

D 1 13C4 PFBA, CAS: STL00992

Signal: 1

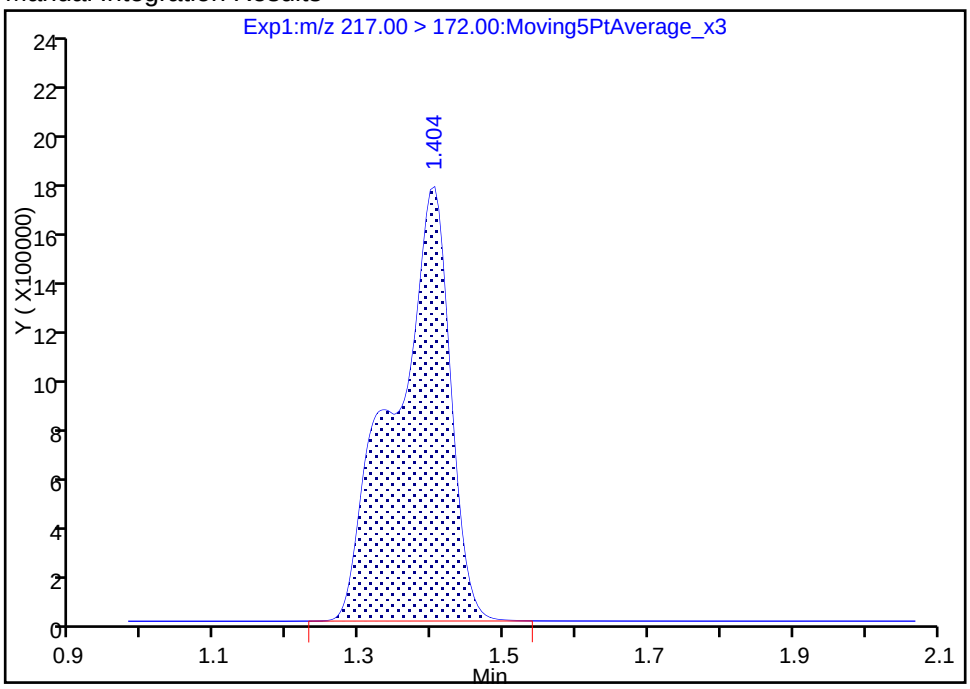
Processing Integration Results

RT: 1.40
Area: 6690917
Amount: 2.183946
Amount Units: ng/ml



Manual Integration Results

RT: 1.40
Area: 9212034
Amount: 3.006850
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:17:39
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-199444/2-A

Matrix: Water | Lab File ID: 2017.12.12LLB_004.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 250(mL) | Date Analyzed: 12/12/2017 21:50

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	40.8	M	2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	36.7		2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	39.5		4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	41.6		2.0	1.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	36.6		4.0	2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	38.7		2.0	1.0	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	39.7		2.0	1.0	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	33.2		4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	36.9		4.0	2.0	0.55
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	42.1		4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	37.5		2.0	1.0	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	38.2		2.0	1.0	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	36.1		2.0	1.0	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	40.6		2.0	1.0	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	38.3		4.0	2.0	0.54
335-77-3	Perfluorodecanesulfonic acid (PFDS)	38.3		2.0	1.0	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	42.3		2.0	1.0	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-199444/2-A

Matrix: Water | Lab File ID: 2017.12.12LLB_004.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 250(mL) | Date Analyzed: 12/12/2017 21:50

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	103		25-150
STL00992	13C4 PFBA	115	M	25-150
STL00993	13C2 PFHxA	107		25-150
STL00990	13C4 PFOA	110		25-150
STL00995	13C5 PFNA	111		25-150
STL00996	13C2 PFDA	113		25-150
STL00997	13C2 PFUnA	110		25-150
STL00998	13C2 PFDoA	111		25-150
STL00994	18O2 PFHxS	108		25-150
STL00991	13C4 PFOS	105		25-150
STL02116	13C2-PFTeDA	126		25-150
STL01892	13C4-PFHpA	108		25-150
STL01893	13C5 PFPeA	111		25-150
STL02337	13C3-PFBS	106		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_004.d
Lims ID: LCS 320-199444/2-A
Client ID:
Sample Type: LCS
Inject. Date: 12-Dec-2017 21:50:27 ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-199444/2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 13-Dec-2017 13:39:08 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK047

First Level Reviewer: hannigana Date: 13-Dec-2017 13:20:32

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	1.404	1.401	0.003	0.535	8822544	2.87		115	28484	M
2 Perfluorobutyric acid										M
212.90 > 169.00	1.404	1.402	0.002	1.000	3266304	1.02		102	906	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.654	1.646	0.008	0.630	5347587	2.79		111	51446	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.654	1.648	0.006	1.000	2285514	0.9182		91.8	1557	
D 47 13C3-PFBS										
301.90 > 83.00	1.687	1.681	0.006	0.643	98551	2.47		106	2430	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.687	1.682	0.005	1.000	3082557	0.9555		108	16943	
298.90 > 99.00	1.687	1.682	0.005	1.000	1260264		2.45(1.25-3.74)		10745	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.894	1.887	0.007	1.000	674877	1.22		131	33224	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.933	1.923	0.010	1.000	2118659	0.9866		98.7	5088	
313.00 > 119.00	1.933	1.923	0.010	1.000	201444		10.52(5.03-15.10)		3945	
D 7 13C2 PFHxA										
315.00 > 270.00	1.933	1.924	0.009	0.736	5258635	2.67		107	48063	
D 9 13C4-PFHpA										
367.00 > 322.00	2.258	2.254	0.004	0.860	5179295	2.70		108	46100	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.268	2.255	0.013	1.005	2239436	1.04		104	4004	
363.00 > 169.00	2.268	2.255	0.013	1.005	828790		2.70(1.13-3.40)		7082	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.279	2.269	0.010	1.000	2483132	0.9020		99.1	18153	
399.00 > 99.00	2.279	2.269	0.010	1.000	799730		3.10(1.50-4.49)		6393	

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	2.279	2.271	0.008	0.868	6122439	2.55		108	55265	
D 12 M2-6:2FTS										
429.00 > 81.00	2.598	2.605	-0.007	0.989	1206682	1.88		79.0	30900	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.598	2.605	-0.007	1.000	726561	0.8482		89.5	18390	
D 14 13C4 PFOA										
417.00 > 372.00	2.625	2.618	0.007	1.000	5845554	2.76		110	67047	
* 62 13C2-PFOA										
415.00 > 370.00	2.625	2.619	0.006		5165180	2.50			68379	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.625	2.621	0.004	1.000	2281249	0.9147		91.5	1209	
413.00 > 169.00	2.625	2.621	0.004	1.000	1210761		1.88(0.84-2.52)		8734	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.633	2.626	0.007	1.000	2172378	1.01		107	39721	
449.00 > 99.00	2.633	2.626	0.007	1.000	570606		3.81(1.94-5.82)		16097	
D 18 13C4 PFOS										
503.00 > 80.00	3.000	2.993	0.007	1.143	3934744	2.52		105	45997	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.000	2.994	0.006	1.000	1633436	0.9573		103	9290	
499.00 > 99.00	3.000	2.994	0.006	1.000	361625		4.52(2.31-6.93)		5226	
D 19 13C5 PFNA										
468.00 > 423.00	3.000	2.994	0.006	1.143	4268342	2.78		111	52299	
20 Perfluorononanoic acid										
463.00 > 419.00	3.008	2.994	0.014	1.003	1610193	0.9674		96.7	4693	
463.00 > 169.00	3.008	2.994	0.014	1.003	409435		3.93(1.90-5.69)		8370	
D 26 M2-8:2FTS										
529.00 > 81.00	3.357	3.343	0.014	1.279	1356098	2.68		112	26923	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.357	3.344	0.013	1.000	614174	0.8786		91.7	19720	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.372	3.356	0.016	1.000	1431131	0.99		99.2	7848	
513.00 > 169.00	3.372	3.356	0.016	1.000	251553		5.69(2.36-7.09)		2846	
D 23 13C2 PFDA										
515.00 > 470.00	3.372	3.356	0.016	1.284	3676895	2.83		113	55831	
D 21 13C8 FOSA										
506.00 > 78.00	3.349	3.359	-0.010	1.276	5410672	2.57		103	35718	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.357	3.359	-0.002	1.002	2143199	1.06		106	29007	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.524	3.511	0.013	1.342	2021719	2.92		117	28851	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.524	3.515	0.009	1.000	819103	0.9672		96.7	5948	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.682	3.667	0.015	1.000	995504	0.9563		99.2	16527	
599.00 > 99.00	3.682	3.667	0.015	1.000	325259		3.06(1.39-4.16)		8023	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.691	3.677	0.014	1.406	1972957	2.93		117	14467	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.699	3.685	0.014	1.002	720695	0.9697		97.0	13142	
D 30 13C2 PFUnA										
565.00 > 520.00	3.691	3.685	0.006	1.406	2741304	2.74		110	34883	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.699	3.685	0.014	1.002	894434	0.8295		83.0	3466	
563.00 > 169.00	3.699	3.685	0.014	1.002	203011		4.41(0.00-0.00)		6956	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.847	3.856	-0.009	1.465	951388	1.57		62.7	2395	
35 MeFOSA										
512.00 > 169.00	3.847	3.865	-0.018	1.000	393090	1.08		108	2067	
D 36 13C2 PFDoA										
615.00 > 570.00	3.991	3.979	0.012	1.520	3090219	2.77		111	36212	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.991	3.982	0.009	1.000	1125038	0.9220		92.2	3796	
613.00 > 169.00	3.991	3.982	0.009	1.000	284518		3.95(2.13-6.40)		13902	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.038	4.048	-0.010	1.538	572670	1.01		40.5	1212	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.046	4.056	-0.010	1.002	250273	1.04		104	1314	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.263	4.243	0.020	1.000	1360262	1.05		105	5246	
663.00 > 169.00	4.263	4.243	0.020	1.000	447548		3.04(1.25-3.76)		25956	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.501	4.481	0.020	1.714	4076419	3.14		126	27424	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.501	4.481	0.020	1.000	388225	0.9384		93.8	11300	
713.00 > 219.00	4.488	4.481	0.007	0.997	272477		1.42(0.71-2.13)		9515	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.923	4.892	0.031	1.875	5858598	2.73		109	17893	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.923	4.894	0.029	1.000	2166114	1.06		106	1105	
813.00 > 169.00	4.923	4.894	0.029	1.000	381773		5.67(2.86-8.58)		5882	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.276	5.242	0.034	1.000	2566442	1.15		115	573	
913.00 > 169.00	5.276	5.242	0.034	1.000	309767		8.29(0.00-0.00)		1879	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 13-Dec-2017 13:39:13 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_004.d

Injection Date: 12-Dec-2017 21:50:27 Instrument ID: A8_N

Lims ID: LCS 320-199444/2-A

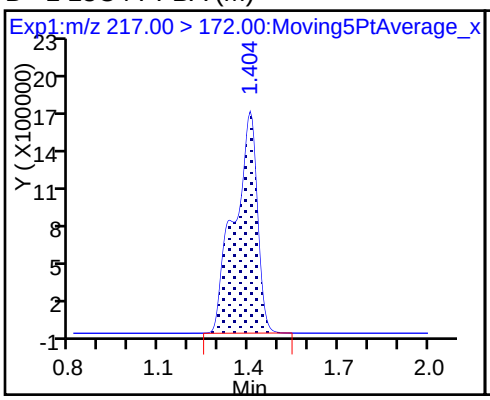
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 3

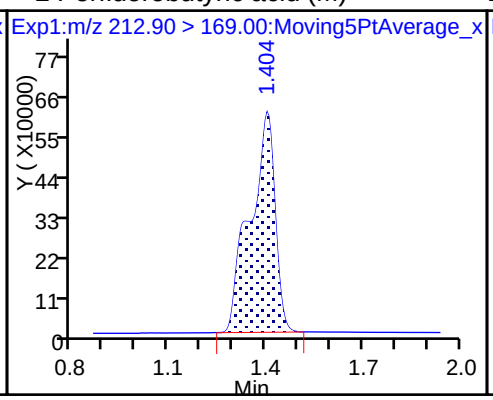
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

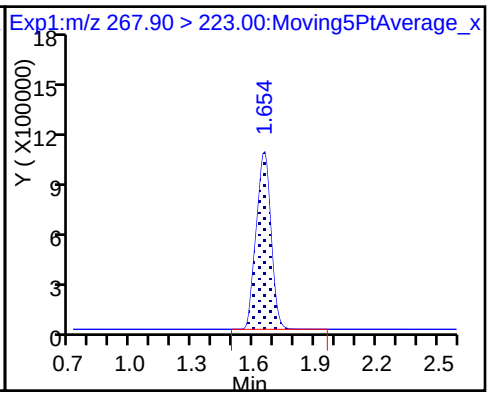
D 1 13C4 PFBA (M)



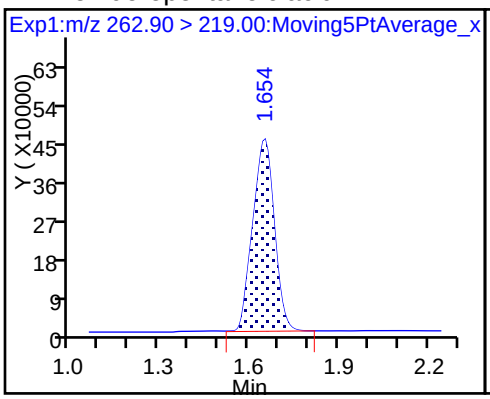
2 Perfluorobutyric acid (M)



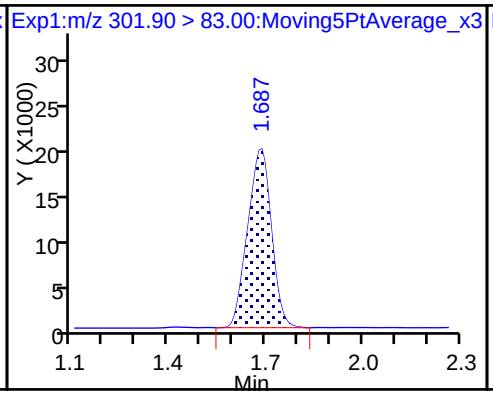
D 3 13C5-PFPeA



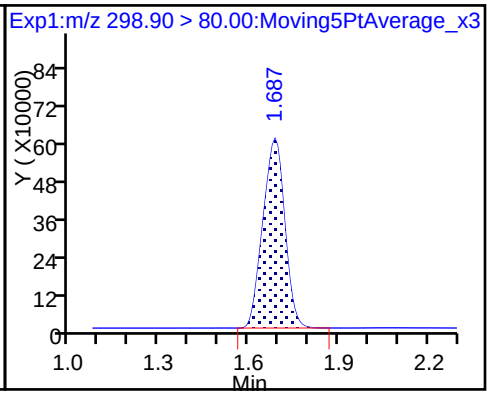
4 Perfluoropentanoic acid



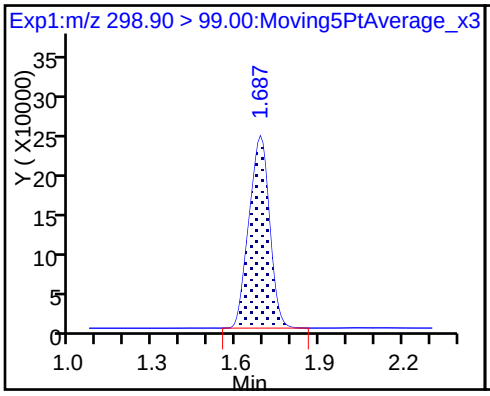
D 47 13C3-PFBS



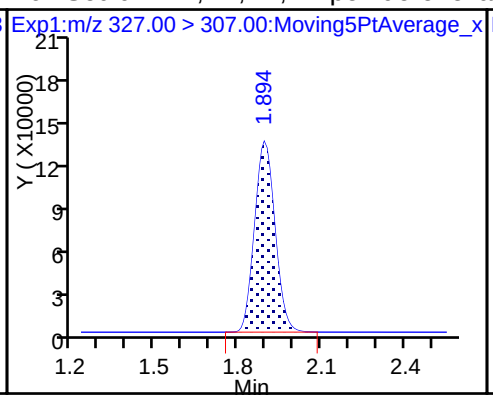
5 Perfluorobutanesulfonic acid



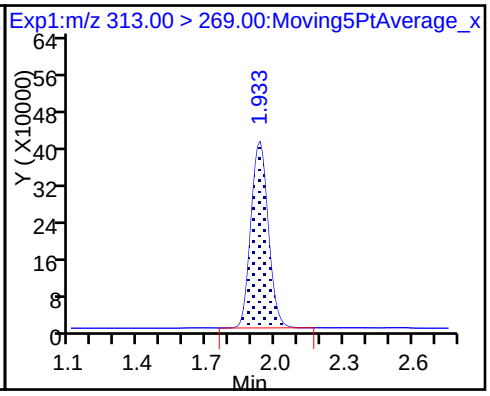
5 Perfluorobutanesulfonic acid



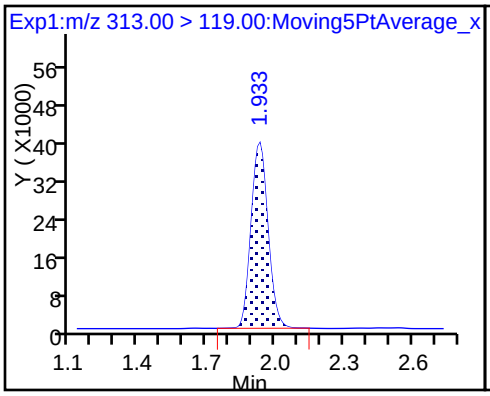
61 Sodium 1H,1H,2H,2H-perfluorohexane



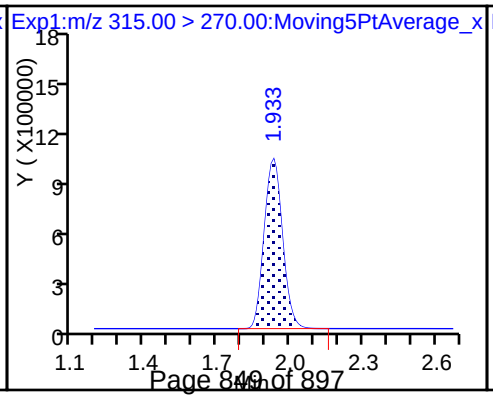
6 Perfluorohexanoic acid



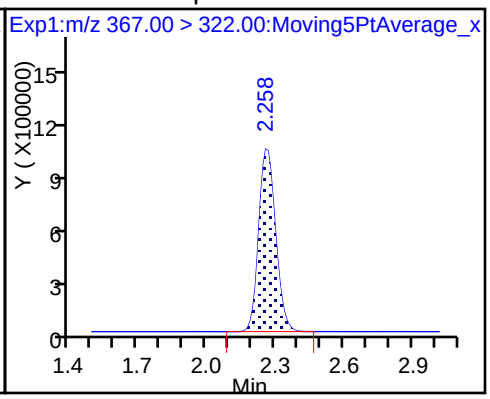
6 Perfluorohexanoic acid



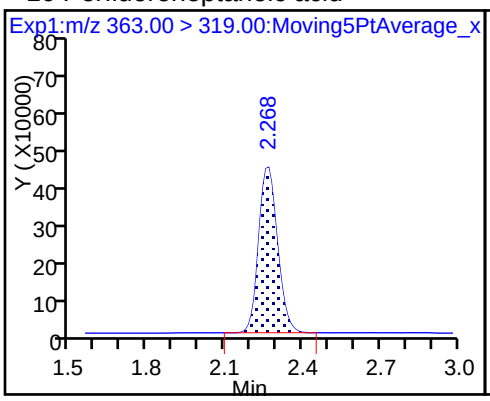
D 7 13C2 PFHxA



D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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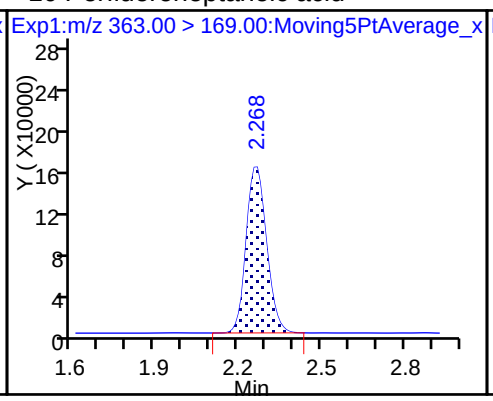
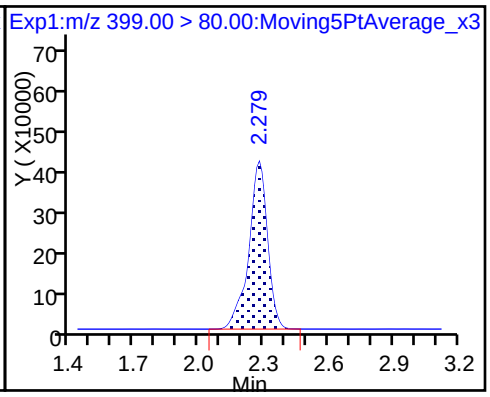
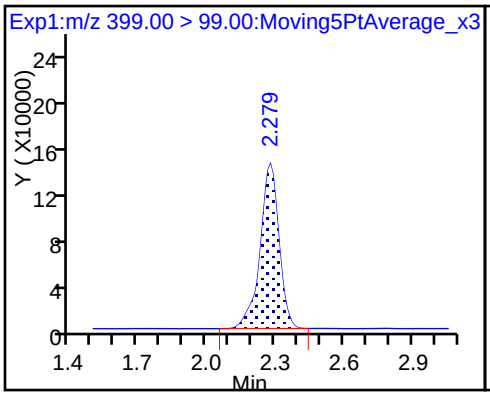


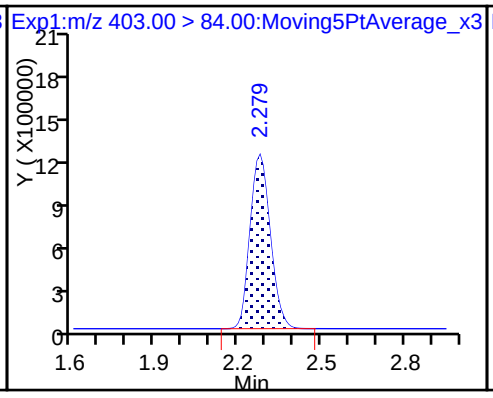
8 Perfluorohexanesulfonic acid



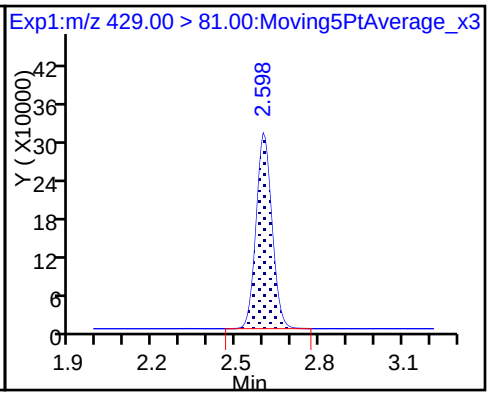
8 Perfluorohexanesulfonic acid



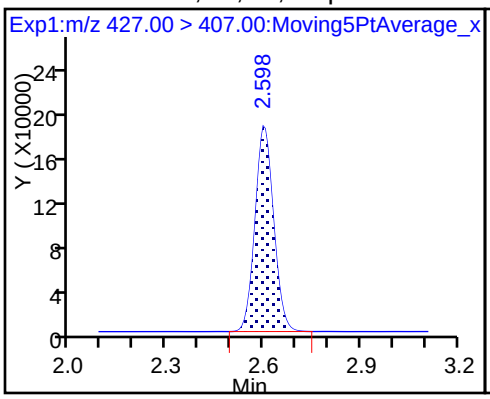
D 11 18O2 PFHxS



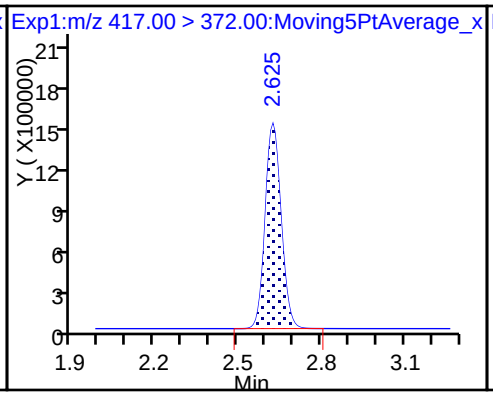
D 12 M2-6:2FTS



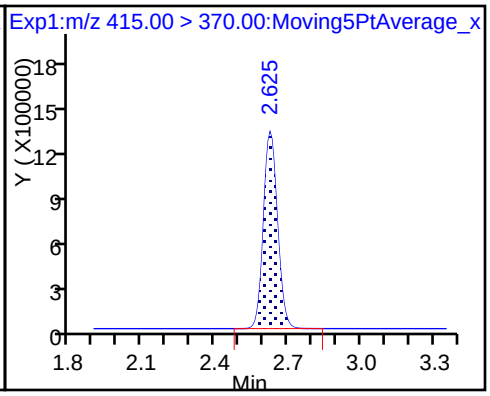
13 Sodium 1H,1H,2H,2H-perfluorooctane



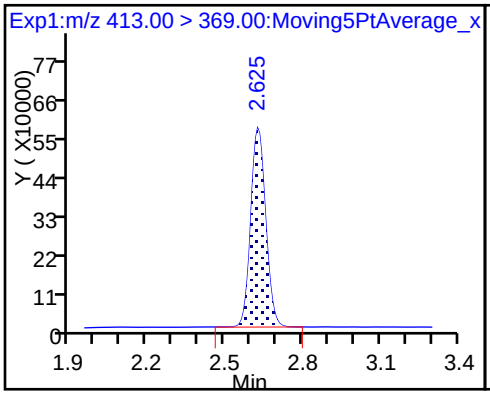
D 14 13C4 PFOA



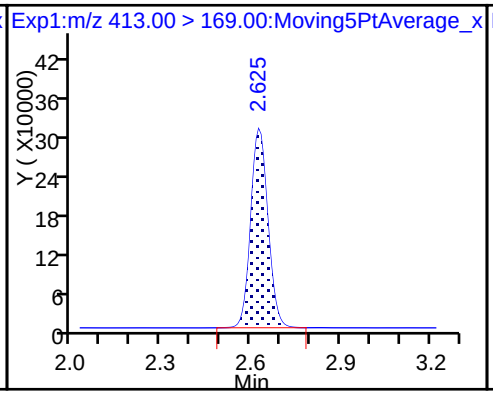
* 62 13C2-PFOA



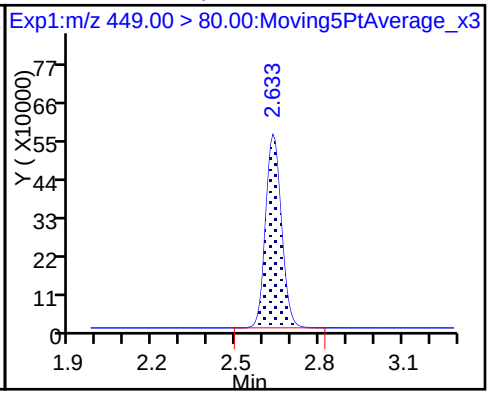
15 Perfluorooctanoic acid



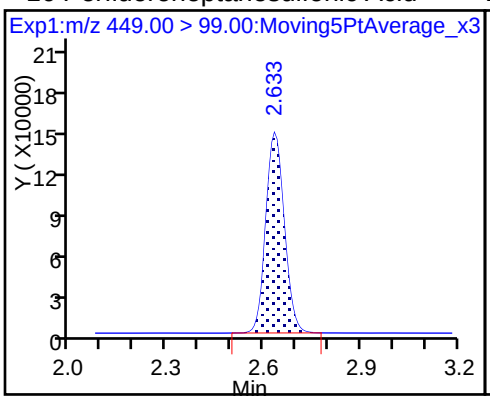
15 Perfluorooctanoic acid



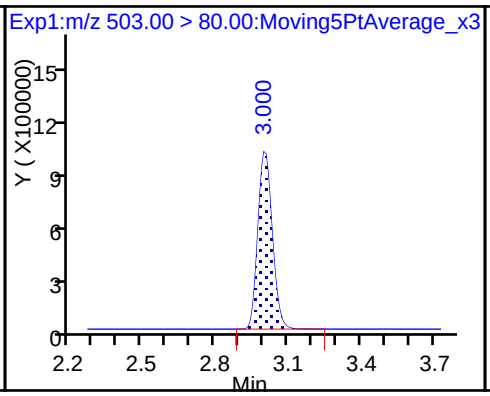
16 Perfluoroheptanesulfonic Acid



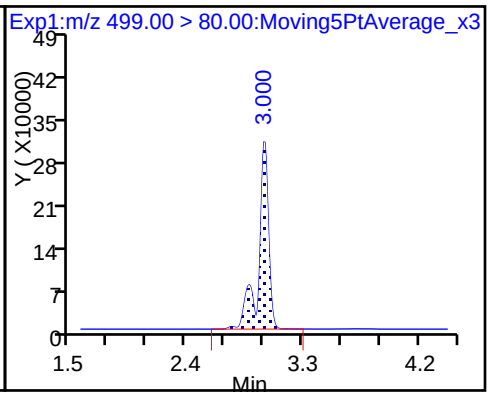
16 Perfluoroheptanesulfonic Acid



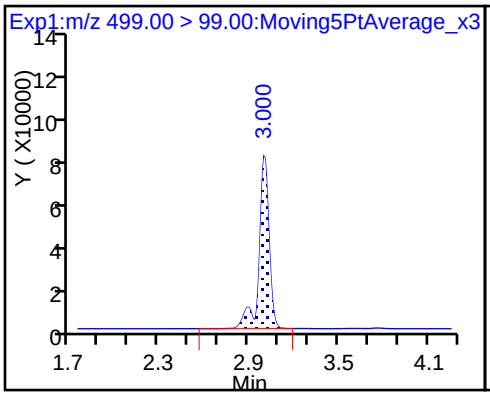
D 18 13C4 PFOS



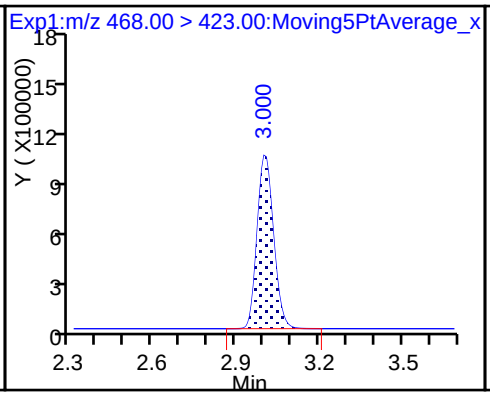
17 Perfluorooctane sulfonic acid



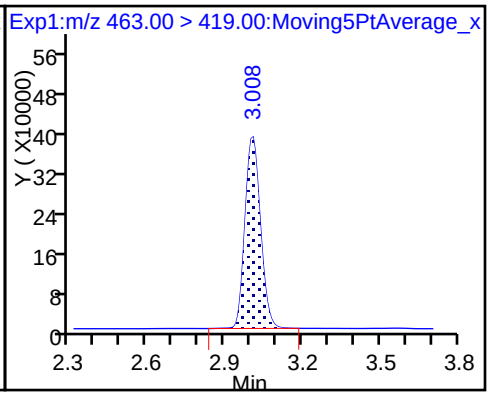
17 Perfluorooctane sulfonic acid



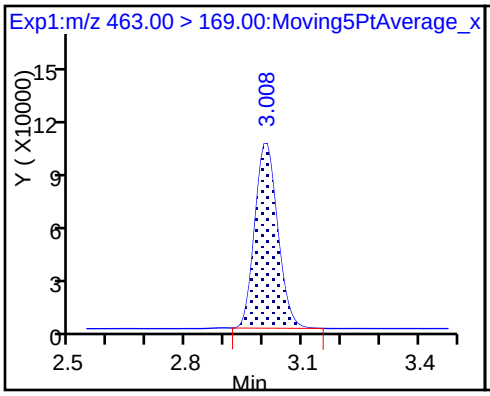
D 19 13C5 PFNA



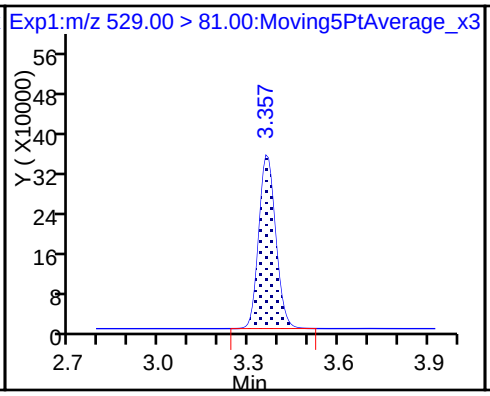
20 Perfluorononanoic acid



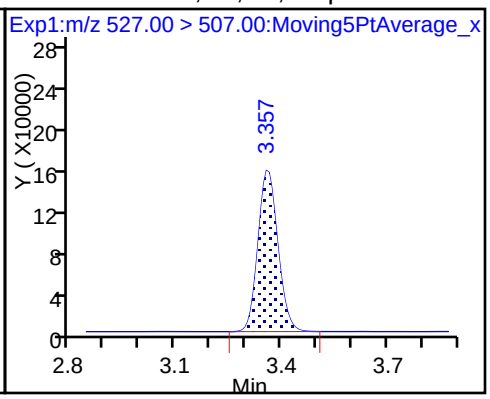
20 Perfluorononanoic acid



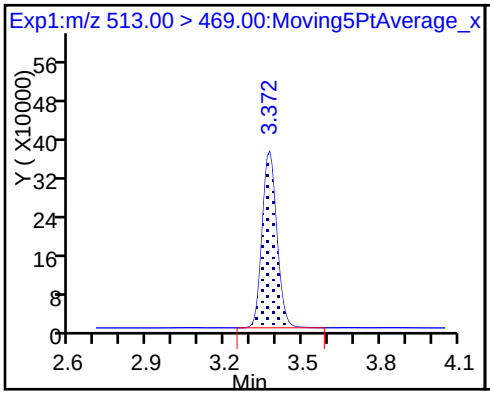
D 26 M2-8:2FTS



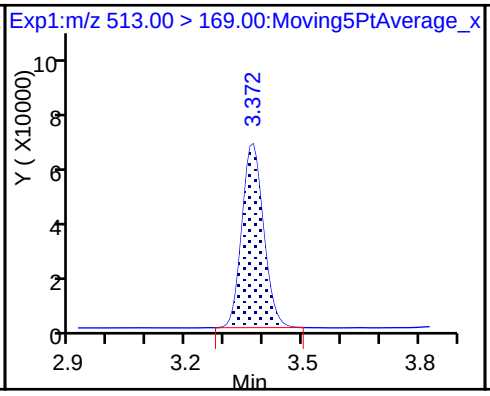
25 Sodium 1H,1H,2H,2H-perfluorodecane



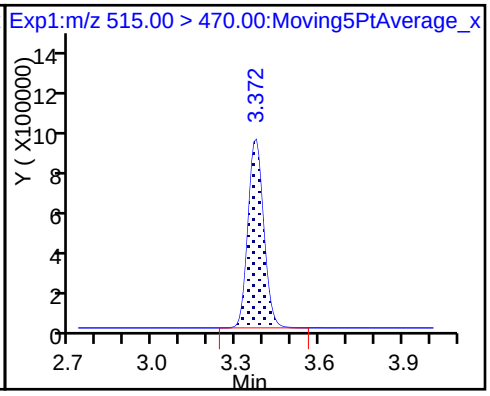
24 Perfluorodecanoic acid



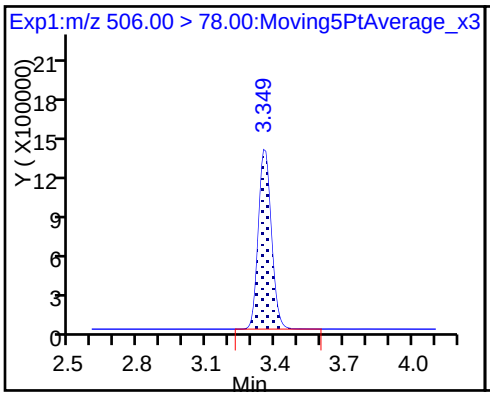
24 Perfluorodecanoic acid



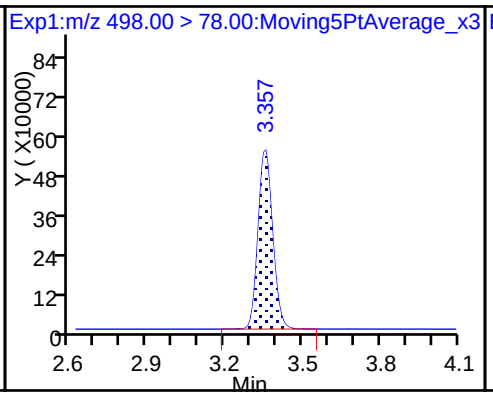
D 23 13C2 PFDA



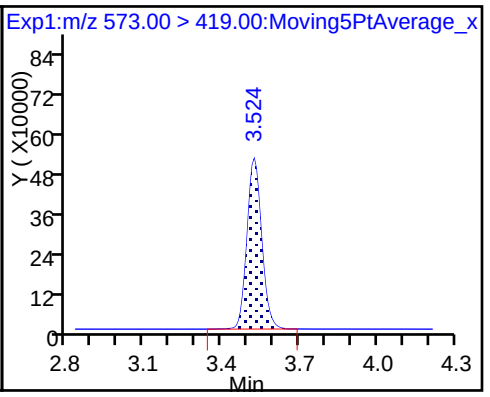
D 21 13C8 FOSA



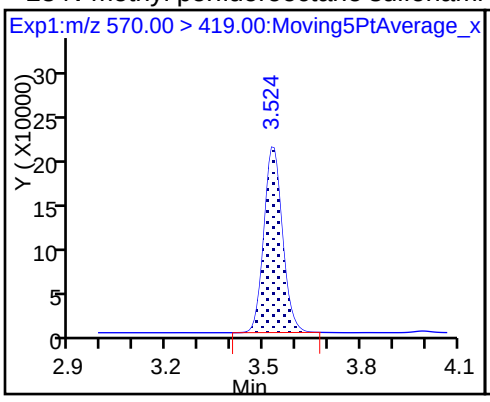
22 Perfluorooctane Sulfonamide



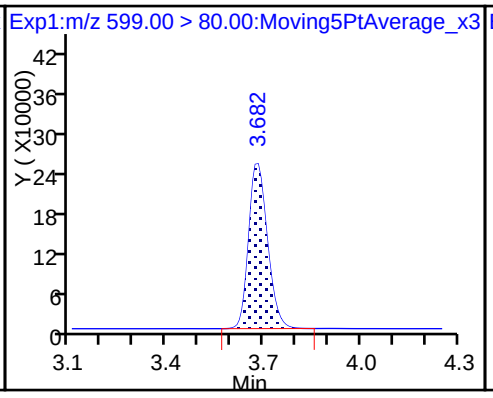
D 27 d3-NMeFOSAA



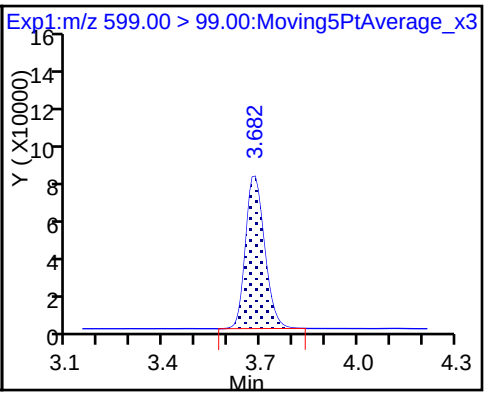
28 N-methyl perfluorooctane sulfonami



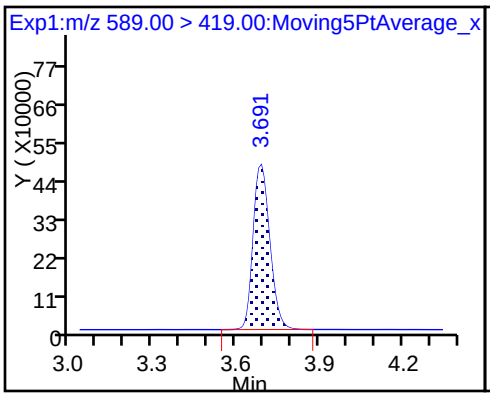
29 Perfluorodecane Sulfonic acid



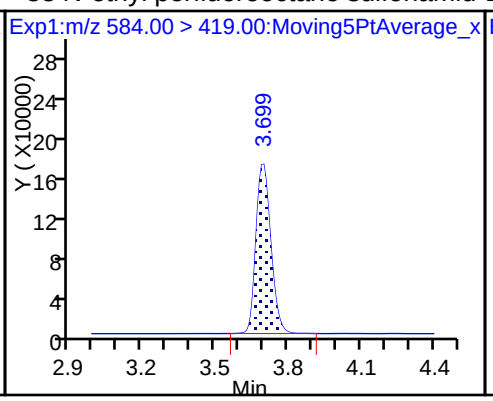
29 Perfluorodecane Sulfonic acid



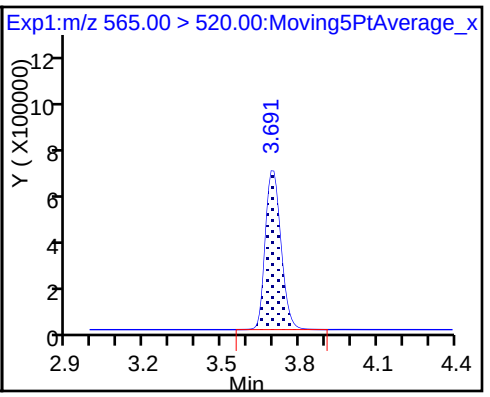
D 32 d5-NEtFOSAA



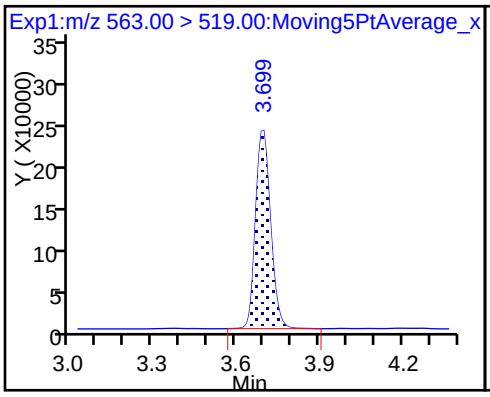
33 N-ethyl perfluorooctane sulfonamid



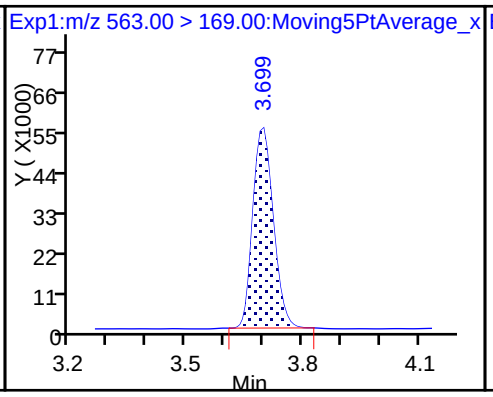
D 30 13C2 PFUnA



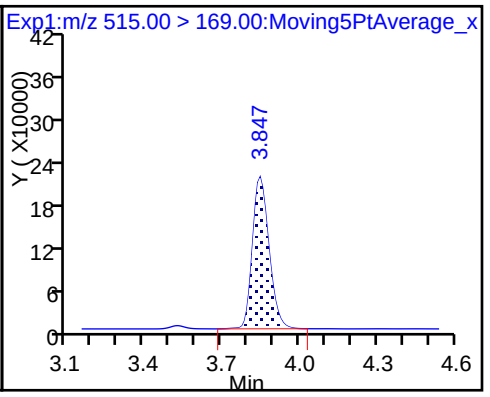
31 Perfluoroundecanoic acid



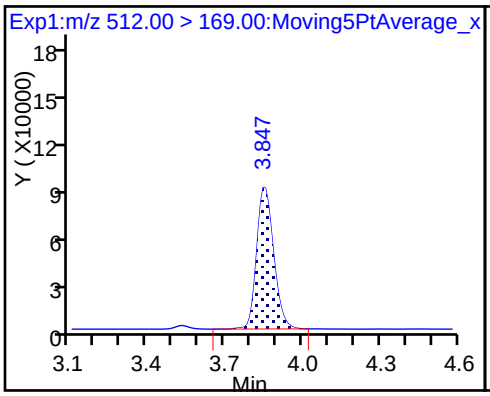
31 Perfluoroundecanoic acid



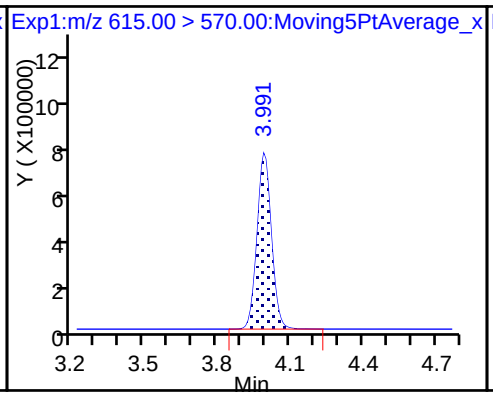
D 34 d-N-MeFOSA-M



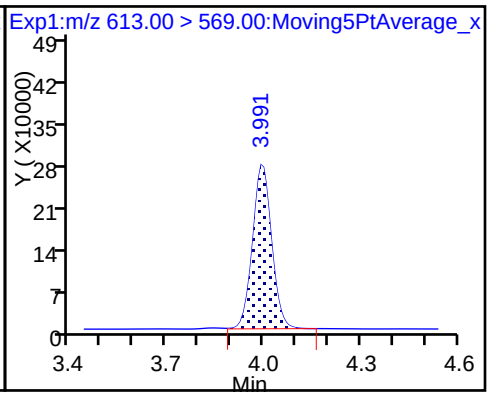
35 MeFOSA



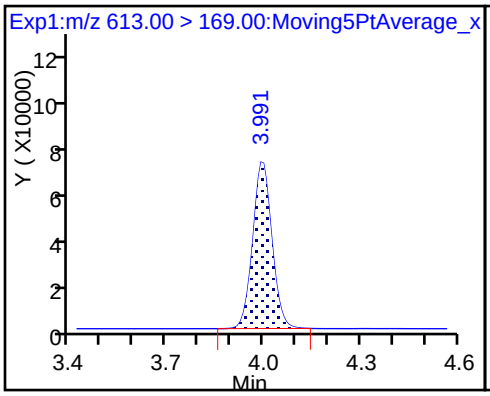
D 36 13C2 PFDoA



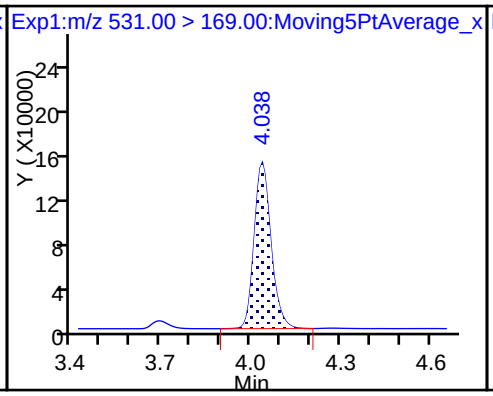
37 Perfluorododecanoic acid



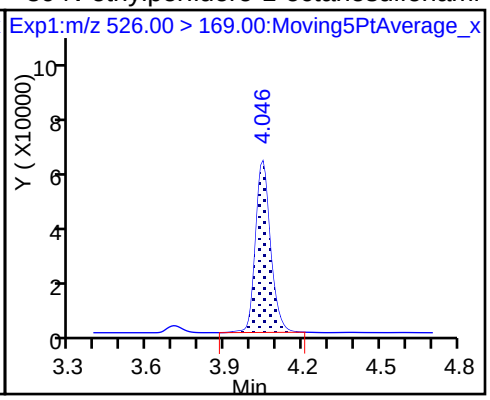
37 Perfluorododecanoic acid



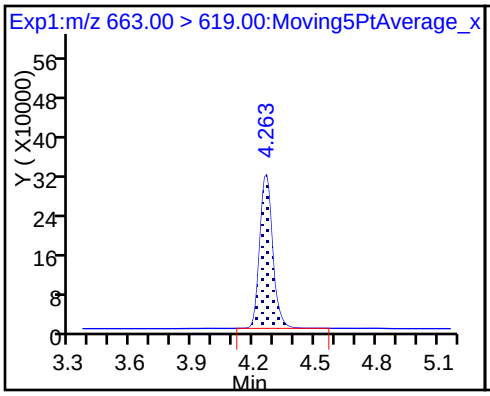
D 38 d-N-EtFOSA-M



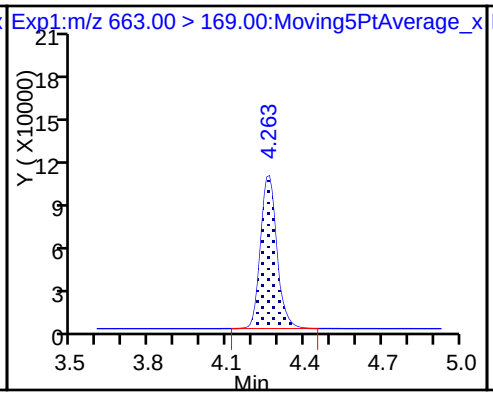
39 N-ethylperfluoro-1-octanesulfonami



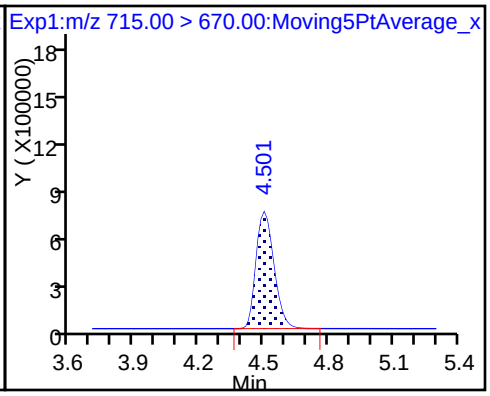
41 Perfluorotridecanoic acid



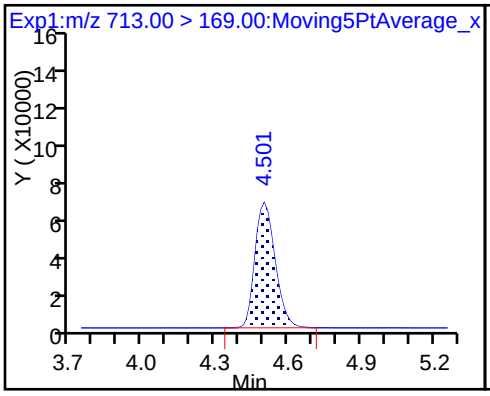
41 Perfluorotridecanoic acid



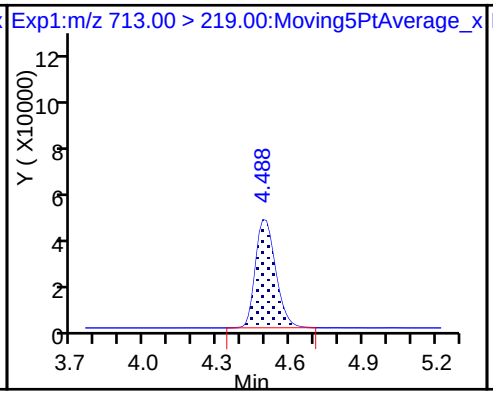
D 43 13C2-PFTeDA



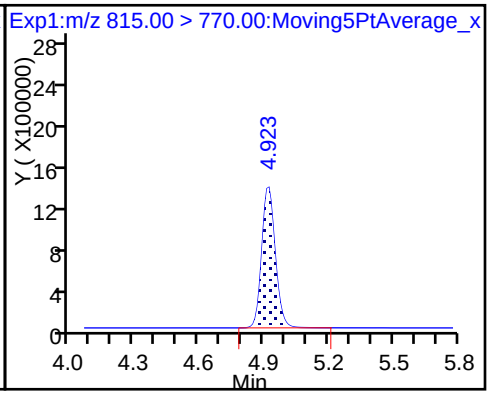
42 Perfluorotetradecanoic acid



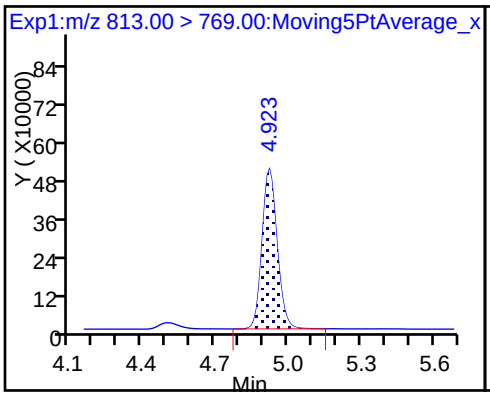
42 Perfluorotetradecanoic acid



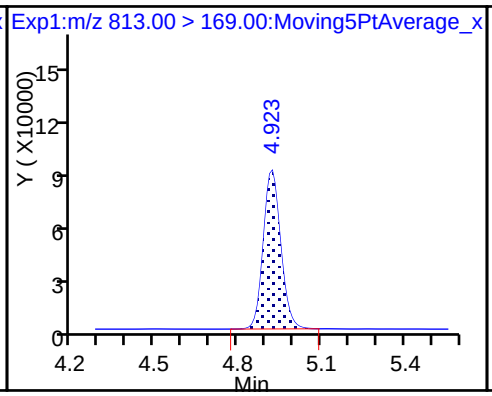
D 44 13C2-PFHxDA



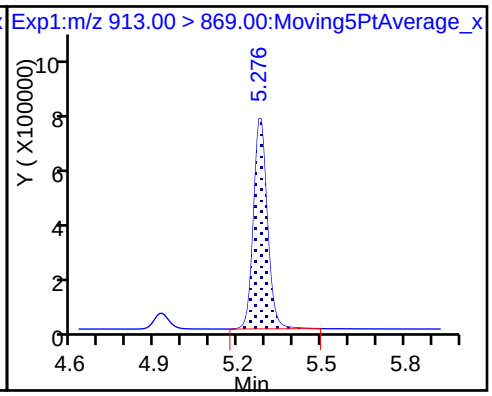
45 Perfluorohexadecanoic acid



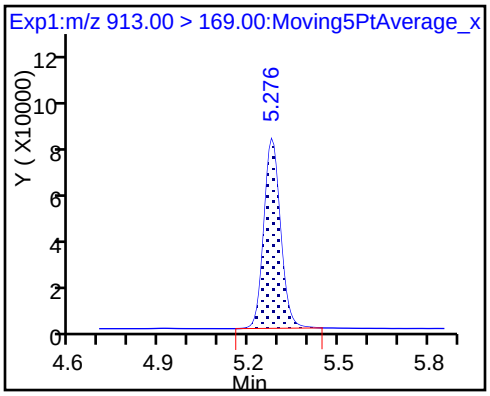
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento

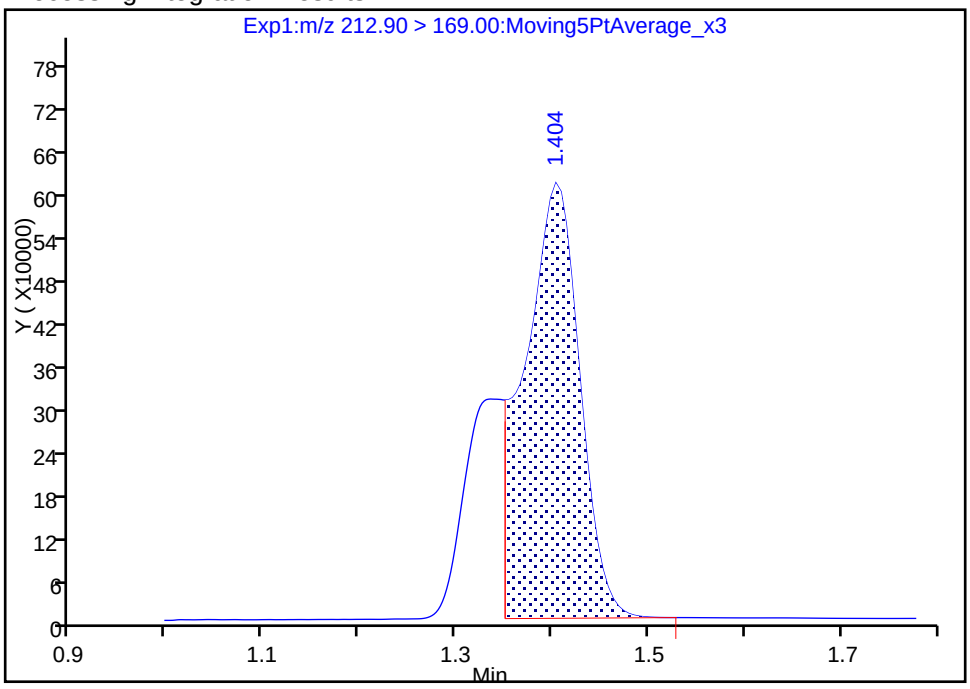
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_004.d
Injection Date: 12-Dec-2017 21:50:27 Instrument ID: A8_N
Lims ID: LCS 320-199444/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

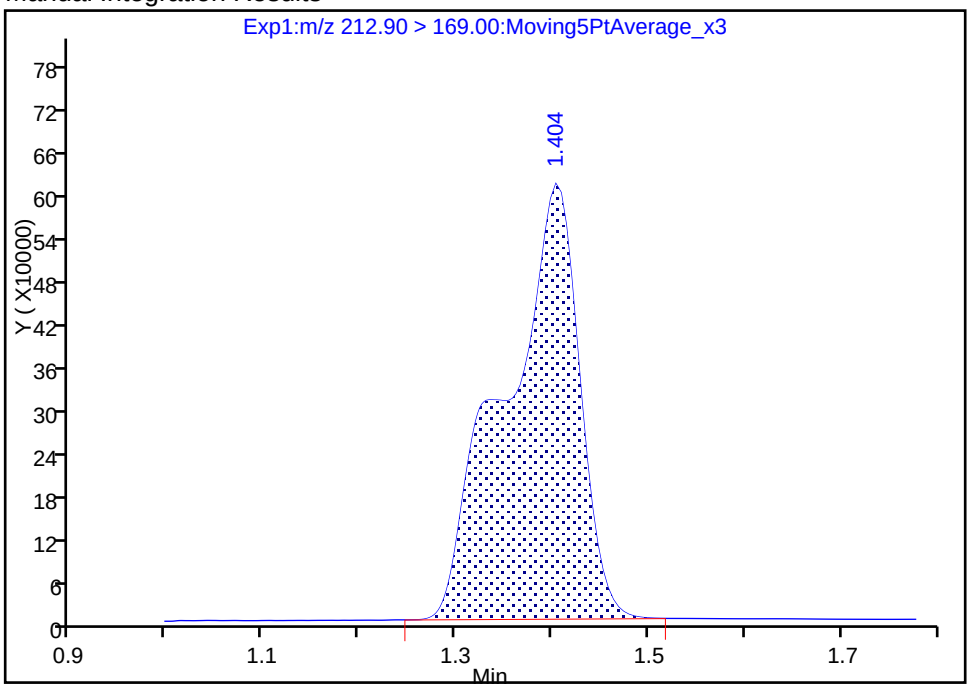
Processing Integration Results

RT: 1.40
Area: 2397621
Amount: 0.747887
Amount Units: ng/ml



Manual Integration Results

RT: 1.40
Area: 3266304
Amount: 1.018854
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:20:04
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

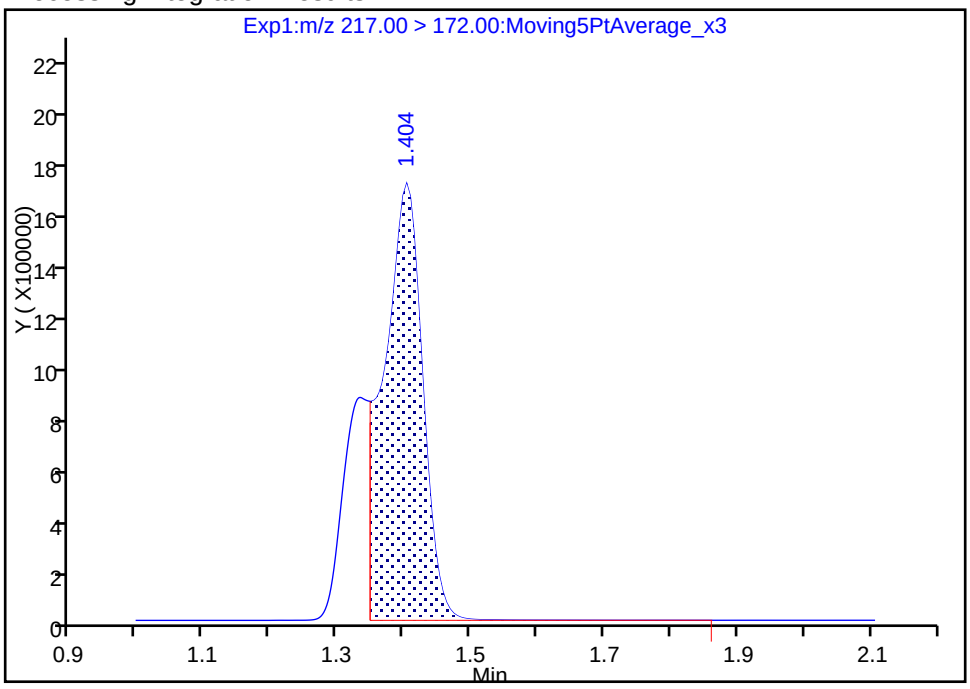
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_004.d
Injection Date: 12-Dec-2017 21:50:27 Instrument ID: A8_N
Lims ID: LCS 320-199444/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

D 1 13C4 PFBA, CAS: STL00992

Signal: 1

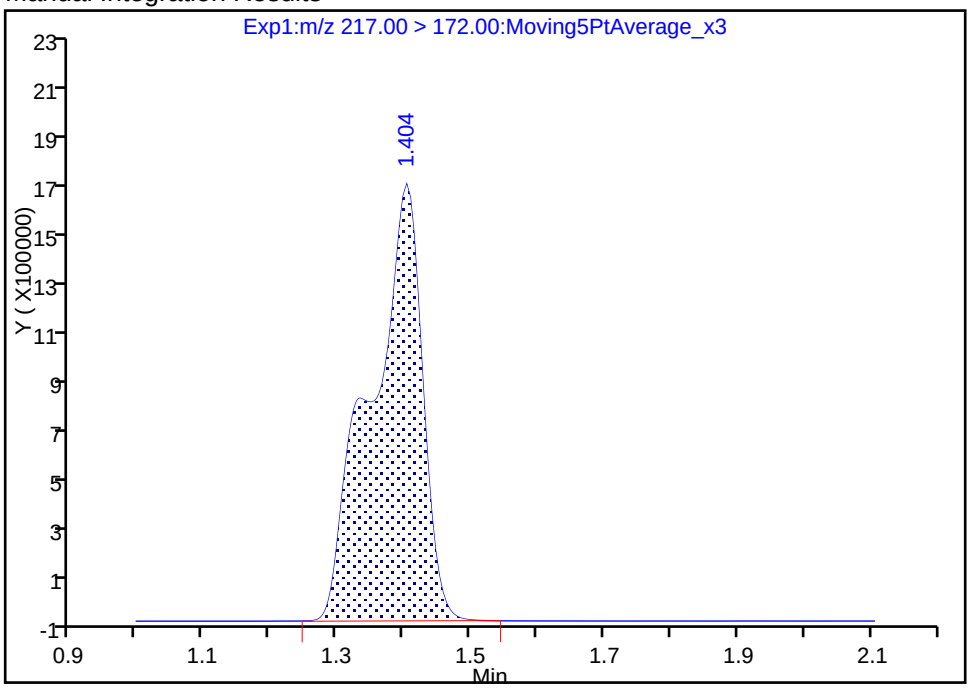
Processing Integration Results

RT: 1.40
Area: 6585088
Amount: 2.140425
Amount Units: ng/ml



Manual Integration Results

RT: 1.40
Area: 8822544
Amount: 2.867690
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:19:44
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCSD 320-199444/3-A

Matrix: Water | Lab File ID: 2017.12.12LLB_005.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 250(mL) | Date Analyzed: 12/12/2017 21:58

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	41.8	M	2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	38.4		2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	38.1		4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	39.2		2.0	1.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	38.0		4.0	2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	39.8		2.0	1.0	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	39.6		2.0	1.0	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	35.9		4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	42.4		4.0	2.0	0.55
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	48.8		4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	39.1		2.0	1.0	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36.8		2.0	1.0	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	35.2		2.0	1.0	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	37.8		2.0	1.0	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	36.4	M	4.0	2.0	0.54
335-77-3	Perfluorodecanesulfonic acid (PFDS)	34.5		2.0	1.0	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	42.5		2.0	1.0	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Client Sample ID: Lab Sample ID: LCSD 320-199444/3-A

Matrix: Water Lab File ID: 2017.12.12LLB_005.d

Analysis Method: 537 (modified) Date Collected:

Extraction Method: 3535 Date Extracted: 12/12/2017 08:28

Sample wt/vol: 250(mL) Date Analyzed: 12/12/2017 21:58

Con. Extract Vol.: 10.0(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	96		25-150
STL00992	13C4 PFBA	108	M	25-150
STL00993	13C2 PFHxA	104		25-150
STL00990	13C4 PFOA	103		25-150
STL00995	13C5 PFNA	106		25-150
STL00996	13C2 PFDA	113		25-150
STL00997	13C2 PFUnA	102		25-150
STL00998	13C2 PFDoA	98		25-150
STL00994	18O2 PFHxS	105		25-150
STL00991	13C4 PFOS	106		25-150
STL02116	13C2-PFTeDA	115		25-150
STL01892	13C4-PFHpA	107		25-150
STL01893	13C5 PFPeA	104		25-150
STL02337	13C3-PFBS	105		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_005.d
Lims ID: LCSD 320-199444/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 12-Dec-2017 21:58:22 ALS Bottle#: 3 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-199444/3-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 13-Dec-2017 13:39:08 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK047

First Level Reviewer: hannigana Date: 13-Dec-2017 13:22:03

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	1.406	1.401	0.005	0.534	8534241	2.70		108	27057	M
2 Perfluorobutyric acid										M
212.90 > 169.00	1.406	1.402	0.004	1.000	3241368	1.05		105	798	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.651	1.646	0.005	0.627	5145510	2.61		104	47864	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.651	1.648	0.003	1.000	2297882	0.9594		95.9	1561	
D 47 13C3-PFBS										
301.90 > 83.00	1.683	1.681	0.002	0.640	100256	2.45		105	3358	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.691	1.682	0.009	1.005	3020650	0.9203		104	18337	
298.90 > 99.00	1.691	1.682	0.009	1.005	1273337		2.37(1.25-3.74)		11917	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.898	1.887	0.011	1.000	667417	1.22		131	33629	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.936	1.923	0.013	1.000	2056467	0.9535		95.3	5194	
313.00 > 119.00	1.936	1.923	0.013	1.000	197714		10.40(5.03-15.10)		4783	
D 7 13C2 PFHxA										
315.00 > 270.00	1.936	1.924	0.012	0.736	5281616	2.61		104	53552	
D 9 13C4-PFHpA										
367.00 > 322.00	2.264	2.254	0.010	0.860	5245777	2.66		107	52200	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.264	2.255	0.009	1.000	2138151	0.9807		98.1	3598	
363.00 > 169.00	2.264	2.255	0.009	1.000	821469		2.60(1.13-3.40)		7726	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.285	2.269	0.016	1.000	2417402	0.8808		96.8	17341	
399.00 > 99.00	2.285	2.269	0.016	1.000	833324		2.90(1.50-4.49)		6672	

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	2.285	2.271	0.014	0.868	6103806	2.48		105	70785	
D 12 M2-6:2FTS										
429.00 > 81.00	2.602	2.605	-0.003	0.989	1190083	1.80		75.8	33976	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.602	2.605	-0.003	1.000	712051	0.8428		88.9	22545	
D 14 13C4 PFOA										
417.00 > 372.00	2.631	2.618	0.013	1.000	5623188	2.58		103	67598	
* 62 13C2-PFOA										
415.00 > 370.00	2.631	2.619	0.012		5307460	2.50			56300	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.631	2.621	0.010	1.000	2278939	0.9500		95.0	1193	
413.00 > 169.00	2.631	2.621	0.010	1.000	1190429		1.91(0.84-2.52)		8831	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.638	2.626	0.012	1.000	2081402	0.9438		99.1	33020	
449.00 > 99.00	2.638	2.626	0.012	1.000	585205		3.56(1.94-5.82)		13603	
D 18 13C4 PFOS										
503.00 > 80.00	3.007	2.993	0.014	1.143	4050183	2.53		106	40221	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.007	2.994	0.013	1.000	1597460	0.9095		98.0	6828	M
499.00 > 99.00	3.007	2.994	0.013	1.000	362752		4.40(2.31-6.93)		5553	
D 19 13C5 PFNA										
468.00 > 423.00	3.007	2.994	0.013	1.143	4186166	2.66		106	46814	
20 Perfluorononanoic acid										
463.00 > 419.00	3.007	2.994	0.013	1.000	1623154	0.99		99.4	5177	
463.00 > 169.00	3.007	2.994	0.013	1.000	397071		4.09(1.90-5.69)		9016	
D 26 M2-8:2FTS										
529.00 > 81.00	3.362	3.343	0.019	1.278	1293635	2.49		104	25570	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.362	3.344	0.018	1.000	643190	0.9646		101	24054	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.370	3.356	0.014	1.000	1458283	0.9889		98.9	7674	
513.00 > 169.00	3.370	3.356	0.014	1.000	261580		5.57(2.36-7.09)		2979	
D 23 13C2 PFDA										
515.00 > 470.00	3.370	3.356	0.014	1.281	3758123	2.81		113	57928	
D 21 13C8 FOSA										
506.00 > 78.00	3.355	3.359	-0.004	1.275	5189425	2.40		96.1	34482	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.355	3.359	-0.004	1.000	2065556	1.06		106	29922	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.522	3.511	0.011	1.339	1949847	2.74		109	21516	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.529	3.515	0.014	1.002	819046	1.00		100	6528	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.680	3.667	0.013	1.000	923256	0.8616		89.4	21004	
599.00 > 99.00	3.680	3.667	0.013	1.000	323188		2.86(1.39-4.16)		8021	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.688	3.677	0.011	1.402	1915821	2.77		111	11537	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.697	3.685	0.012	1.002	726229	1.01		101	9238	
D 30 13C2 PFUnA										
565.00 > 520.00	3.697	3.685	0.012	1.405	2625375	2.55		102	45500	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.697	3.685	0.012	1.000	926629	0.8973		89.7	3943	
563.00 > 169.00	3.697	3.685	0.012	1.000	214639		4.32(0.00-0.00)		12007	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.845	3.856	-0.011	1.461	835180	1.34		53.6	2213	
35 MeFOSA										
512.00 > 169.00	3.854	3.865	-0.011	1.002	345261	1.08		108	2081	
D 36 13C2 PFDoA										
615.00 > 570.00	3.989	3.979	0.010	1.516	2809623	2.45		98.1	32778	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.997	3.982	0.015	1.002	1175986	1.06		106	4039	
613.00 > 169.00	3.989	3.982	0.007	1.000	291192		4.04(2.13-6.40)		10146	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.036	4.048	-0.012	1.534	546646	0.9409		37.6	1214	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.044	4.056	-0.012	1.002	240624	1.05		105	1194	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.261	4.243	0.018	1.000	1432878	1.22		122	4518	
663.00 > 169.00	4.261	4.243	0.018	1.000	418705		3.42(1.25-3.76)		19384	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.500	4.481	0.019	1.710	3827113	2.87		115	33326	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.500	4.481	0.019	1.000	379344	0.9767		97.7	13229	
713.00 > 219.00	4.486	4.481	0.005	0.997	257418		1.47(0.71-2.13)		7559	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.912	4.892	0.020	1.867	5554234	2.52		101	15494	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.912	4.894	0.018	1.000	2137732	1.11		111	1139	
813.00 > 169.00	4.912	4.894	0.018	1.000	375041		5.70(2.86-8.58)		5151	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.274	5.242	0.032	1.000	2493219	1.17		117	557	
913.00 > 169.00	5.274	5.242	0.032	1.000	312627		7.98(0.00-0.00)		1748	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 13-Dec-2017 13:39:15 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_005.d

Injection Date: 12-Dec-2017 21:58:22 Instrument ID: A8_N

Lims ID: LCSD 320-199444/3-A

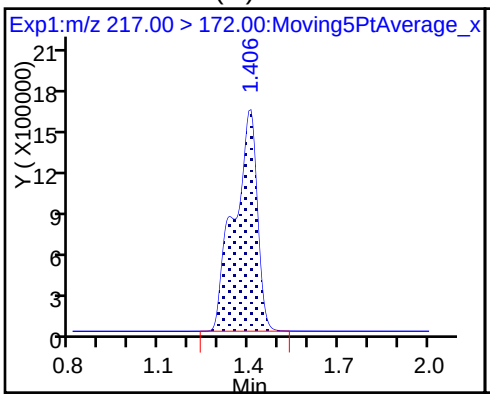
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 4

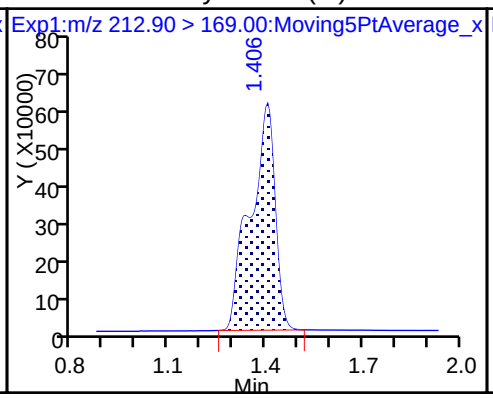
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

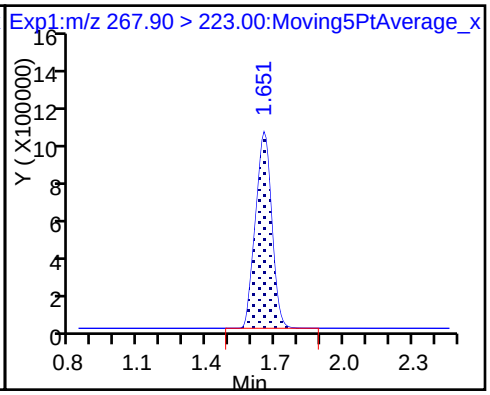
D 1 13C4 PFBA (M)



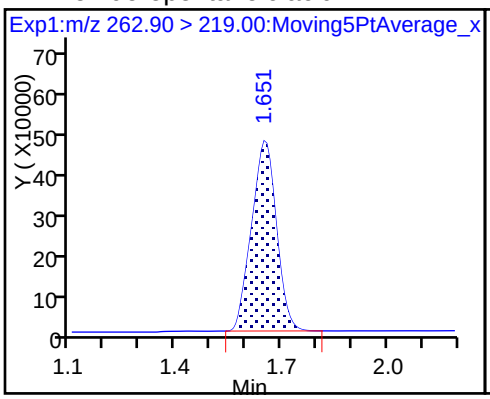
2 Perfluorobutyric acid (M)



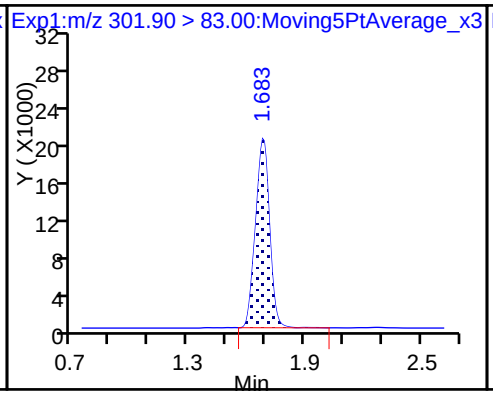
D 3 13C5-PFPeA



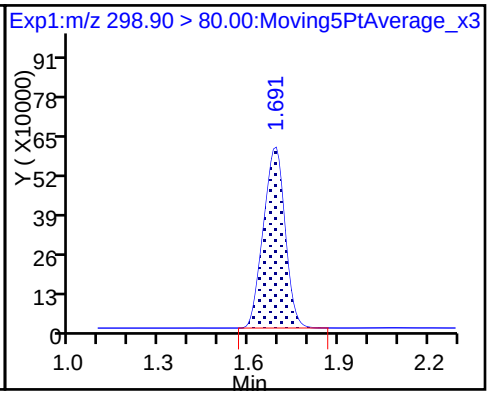
4 Perfluoropentanoic acid



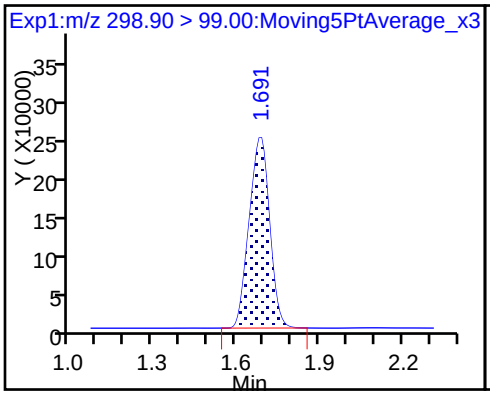
D 47 13C3-PFBS



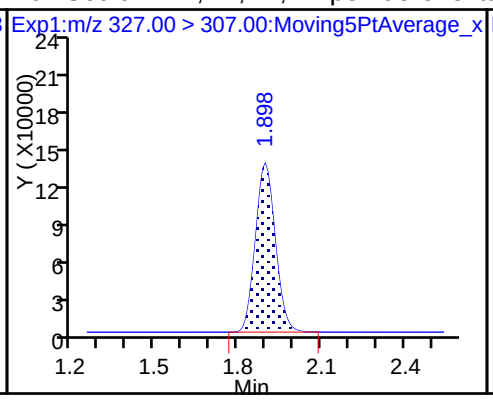
5 Perfluorobutanesulfonic acid



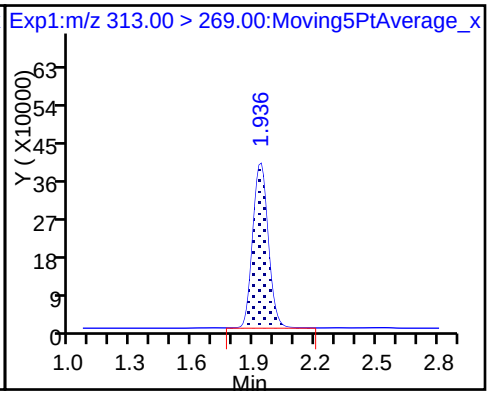
5 Perfluorobutanesulfonic acid



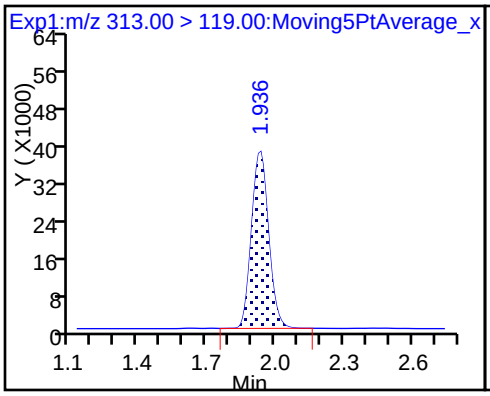
61 Sodium 1H,1H,2H,2H-perfluorohexane



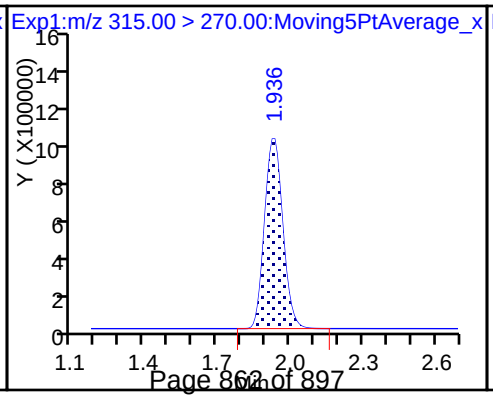
6 Perfluorohexanoic acid



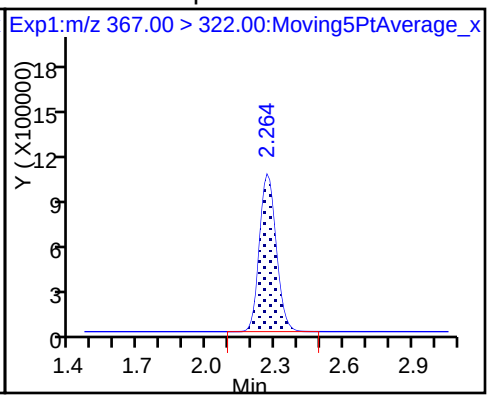
6 Perfluorohexanoic acid



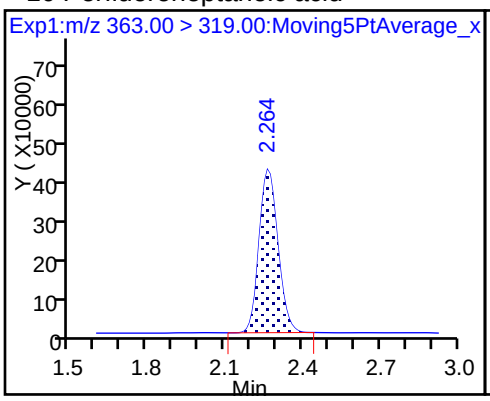
D 7 13C2 PFHxA



D 9 13C4-PFHpA



10 Perfluoroheptanoic acid



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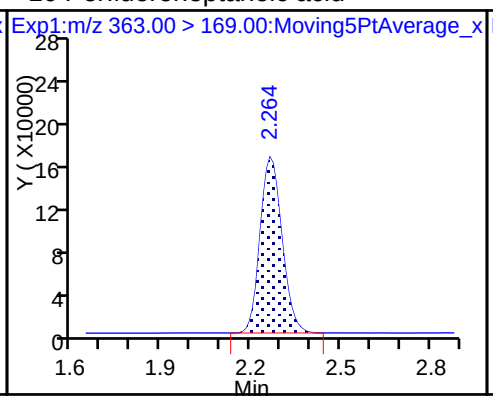
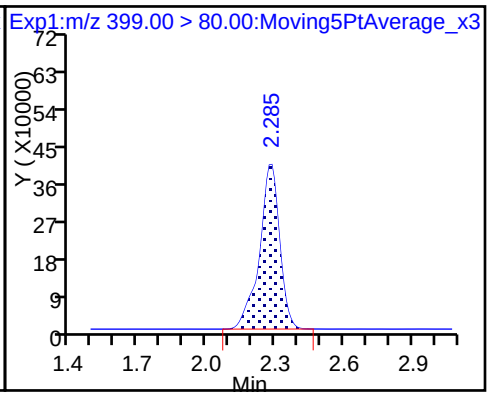
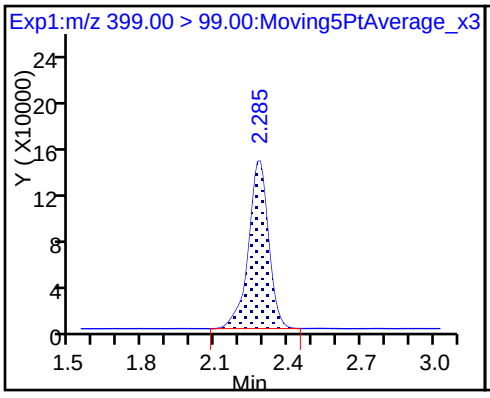


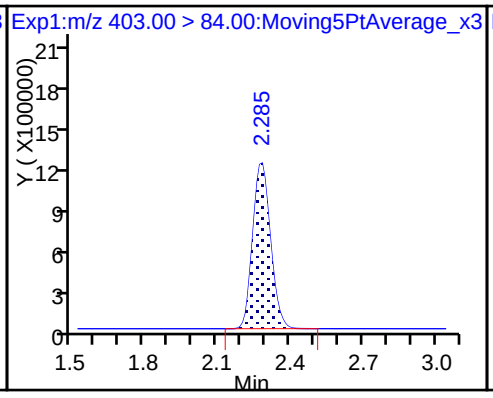
8 Perfluorohexanesulfonic acid



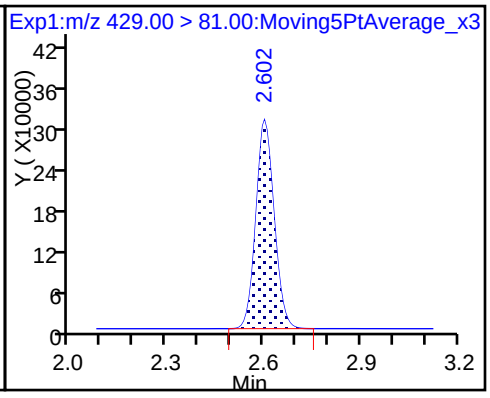
8 Perfluorohexanesulfonic acid



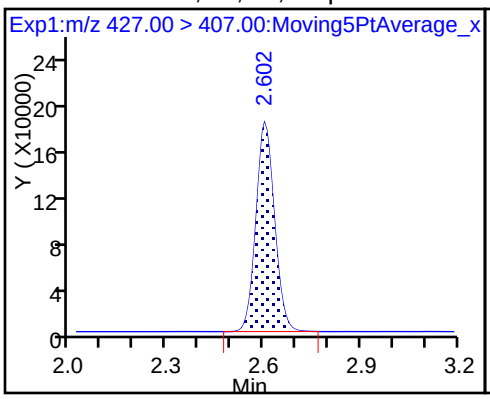
D 11 18O2 PFHxS



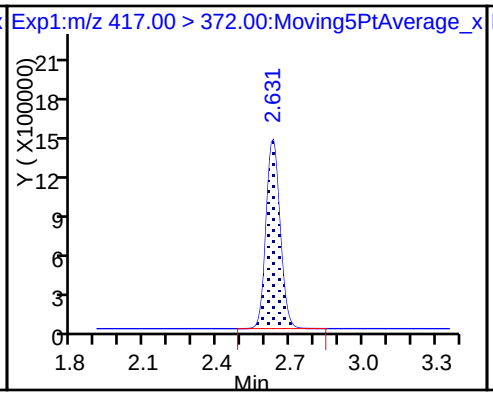
D 12 M2-6:2FTS



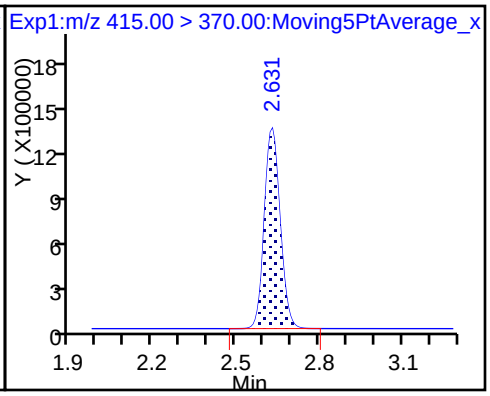
13 Sodium 1H,1H,2H,2H-perfluorooctane



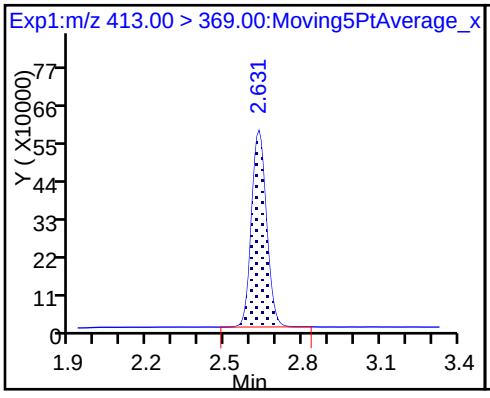
D 14 13C4 PFOA



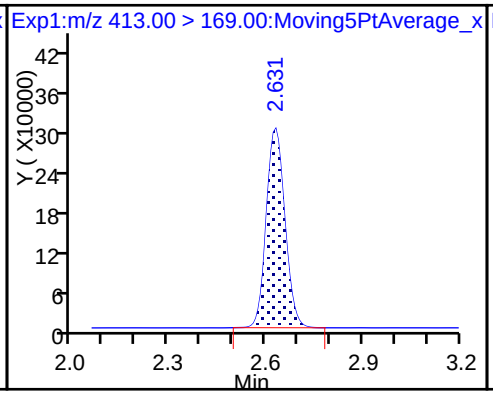
* 62 13C2-PFOA



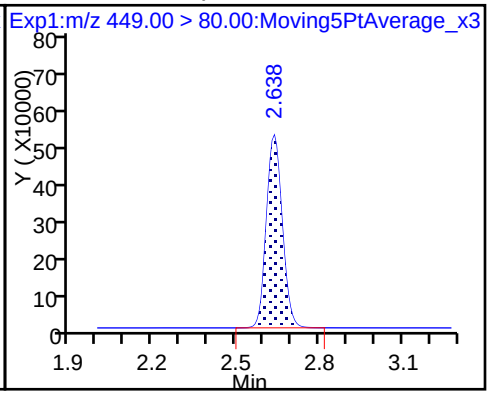
15 Perfluorooctanoic acid



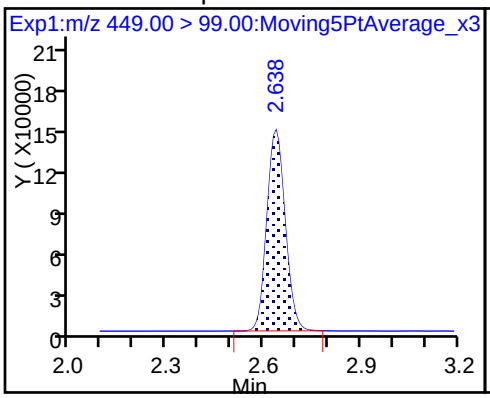
15 Perfluorooctanoic acid



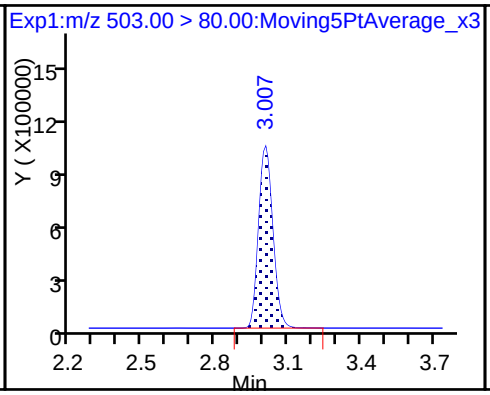
16 Perfluoroheptanesulfonic Acid



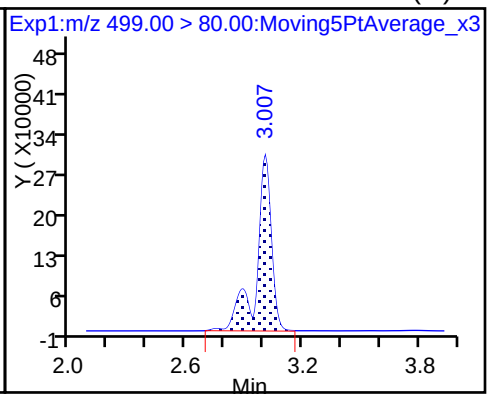
16 Perfluoroheptanesulfonic Acid



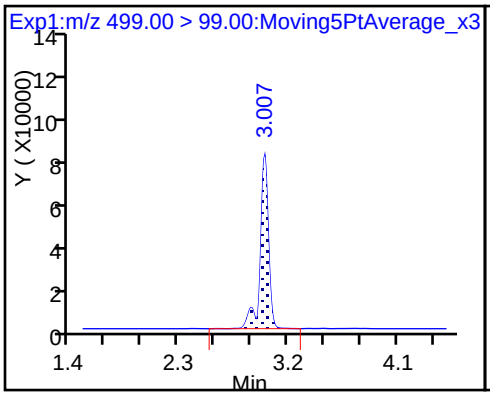
D 18 13C4 PFOS



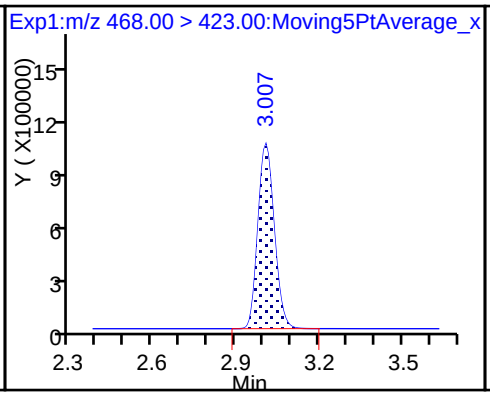
17 Perfluorooctane sulfonic acid (M)



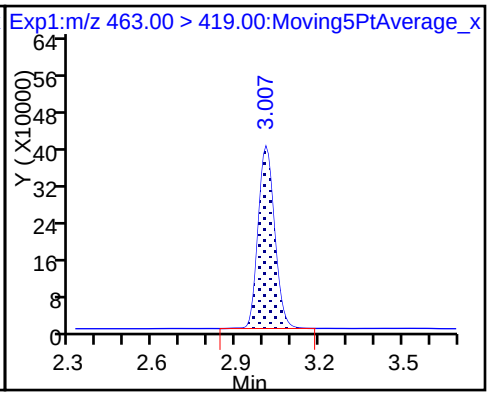
17 Perfluorooctane sulfonic acid



D 19 13C5 PFNA



20 Perfluorononanoic acid



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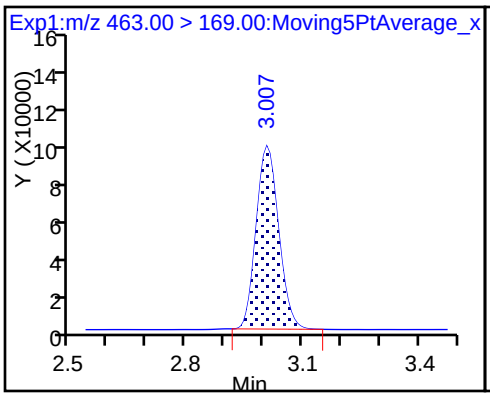
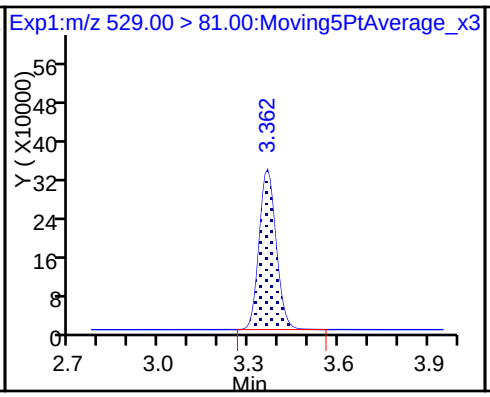
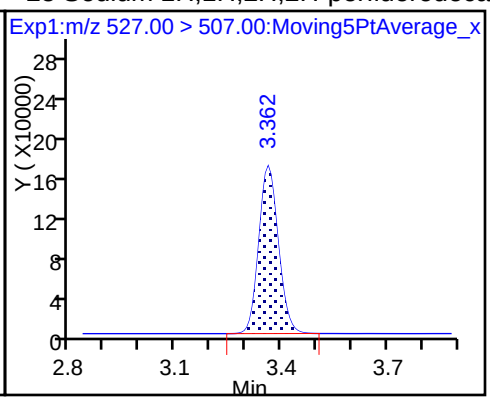


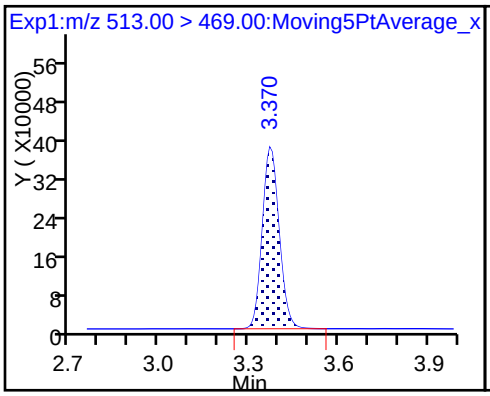
D 26 M2-8:2FTS



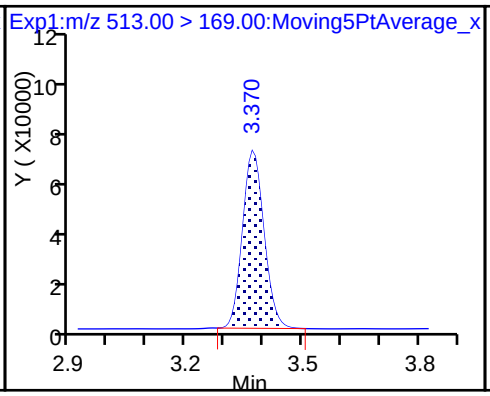
25 Sodium 1H,1H,2H,2H-perfluorodecane



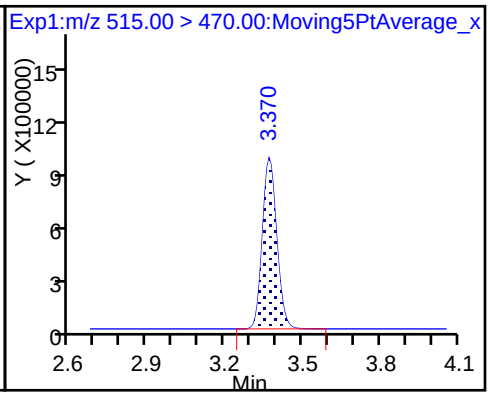
24 Perfluorodecanoic acid



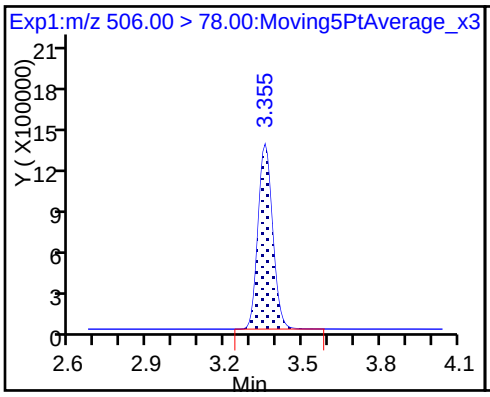
24 Perfluorodecanoic acid



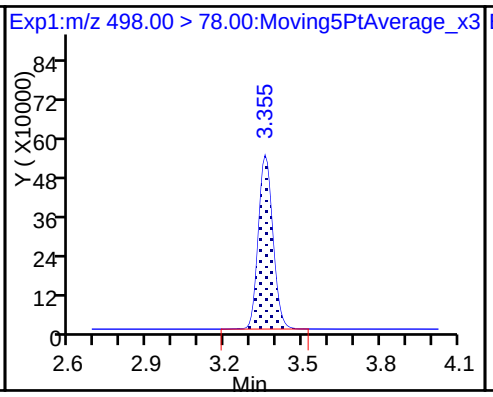
D 23 13C2 PFDA



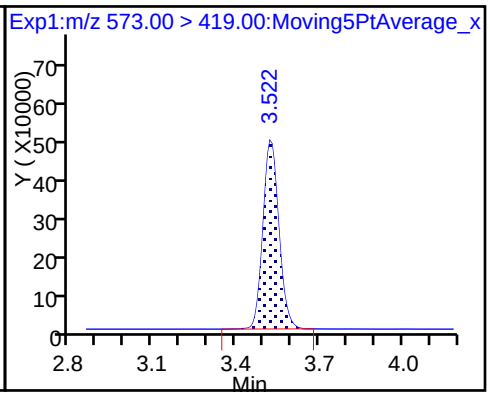
D 21 13C8 FOSA



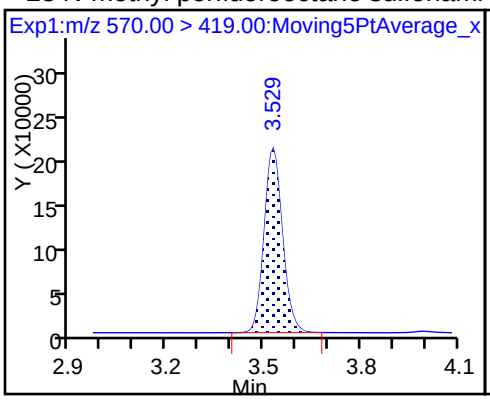
22 Perfluorooctane Sulfonamide



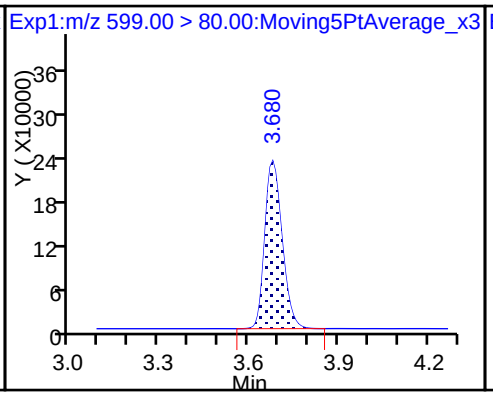
D 27 d3-NMeFOSAA



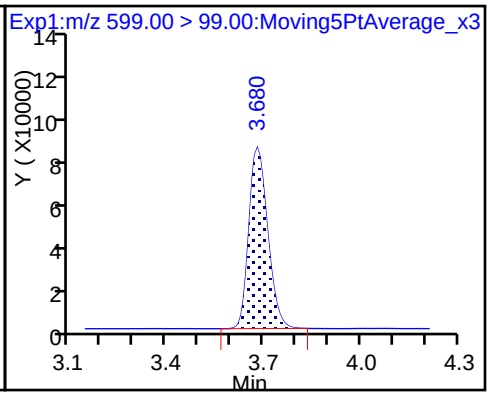
28 N-methyl perfluorooctane sulfonami



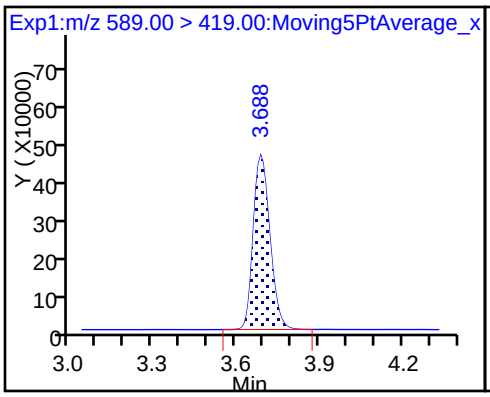
29 Perfluorodecane Sulfonic acid



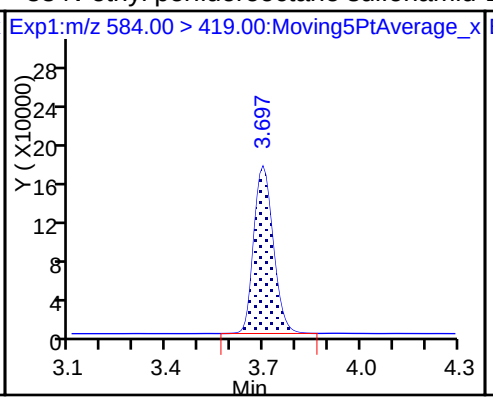
29 Perfluorodecane Sulfonic acid



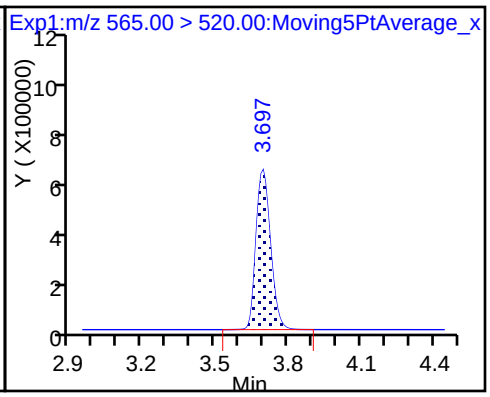
D 32 d5-NEtFOSAA



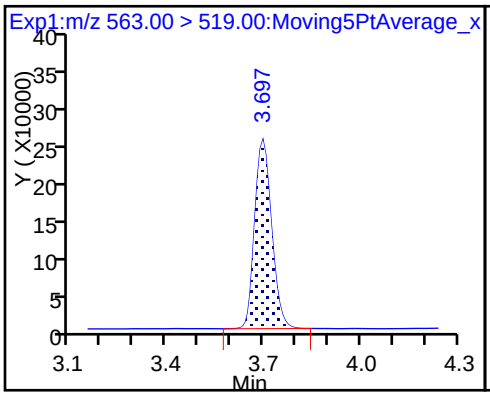
33 N-ethyl perfluorooctane sulfonamid



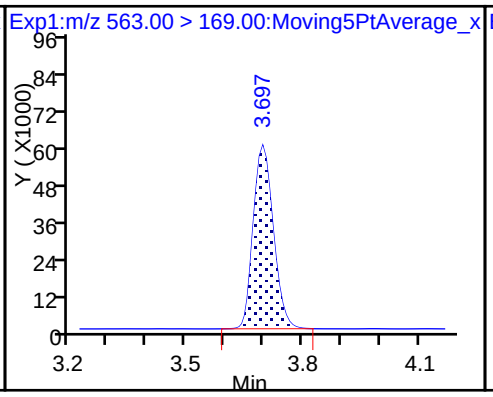
D 30 13C2 PFUnA



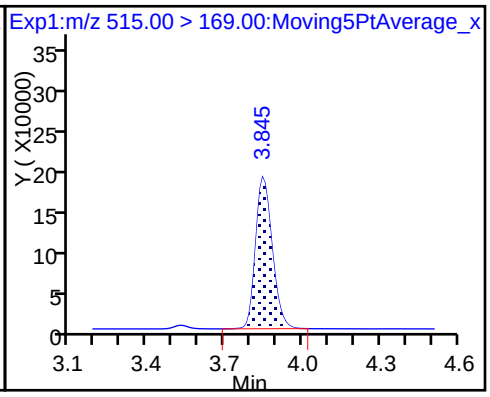
31 Perfluoroundecanoic acid



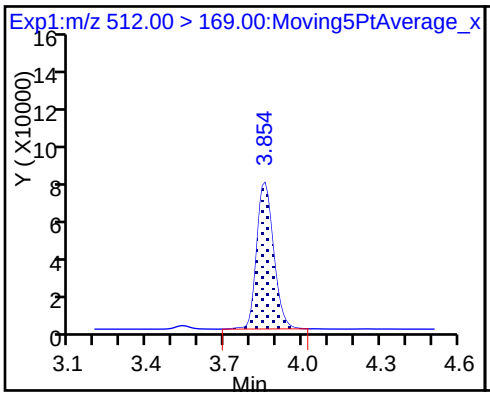
31 Perfluoroundecanoic acid



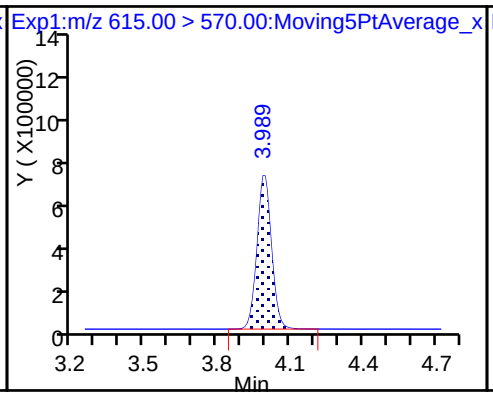
D 34 d-N-MeFOSA-M



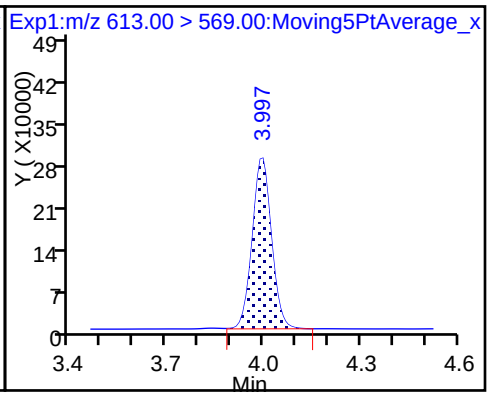
35 MeFOSA



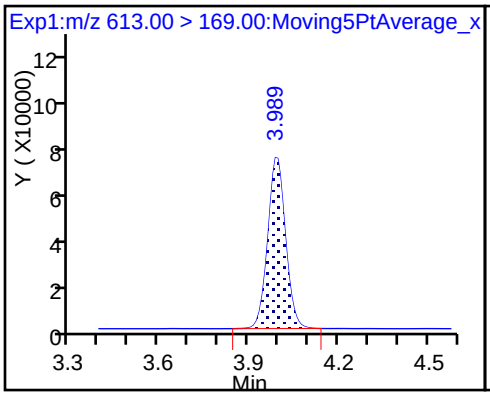
D 36 13C2 PFDoA



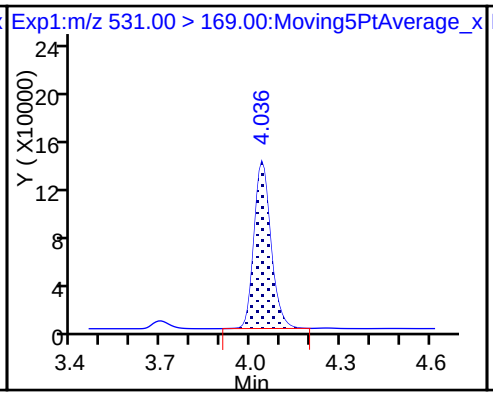
37 Perfluorododecanoic acid



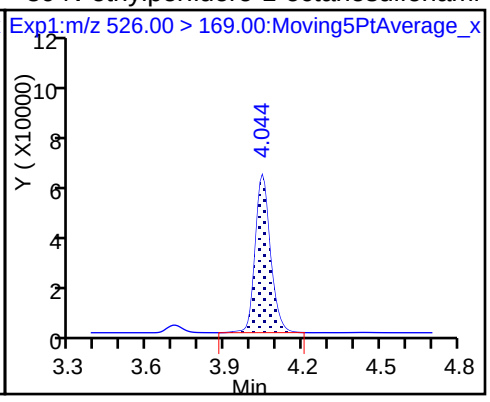
37 Perfluorododecanoic acid



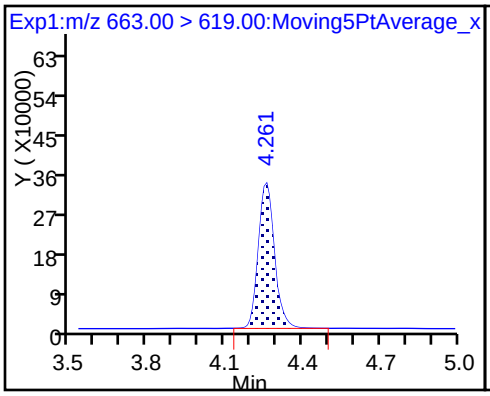
D 38 d-N-EtFOSA-M



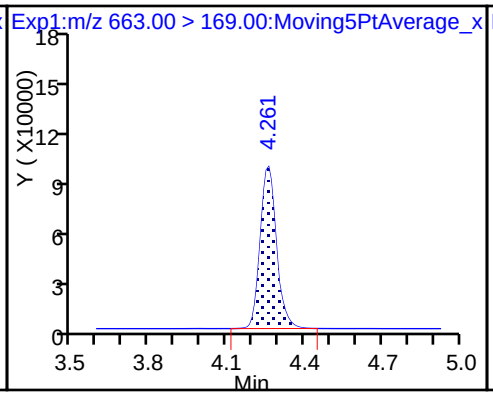
39 N-ethylperfluoro-1-octanesulfonami



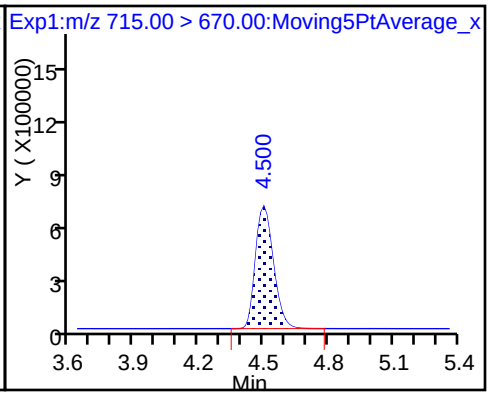
41 Perfluorotridecanoic acid



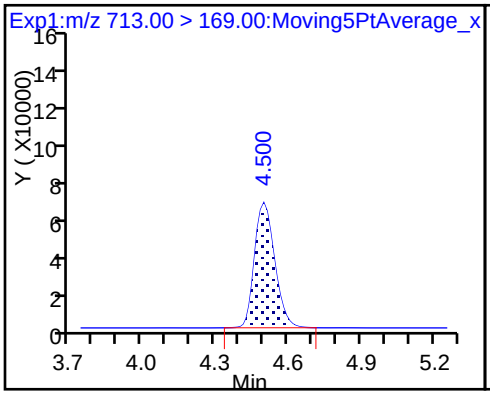
41 Perfluorotridecanoic acid



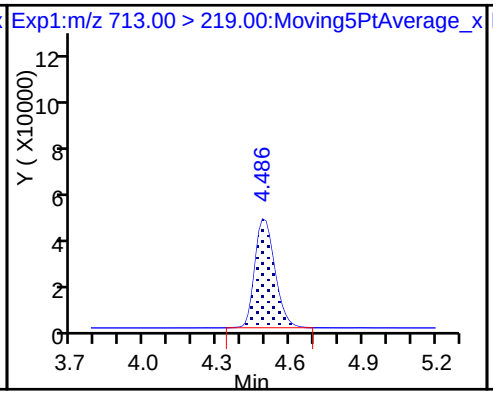
D 43 13C2-PFTeDA



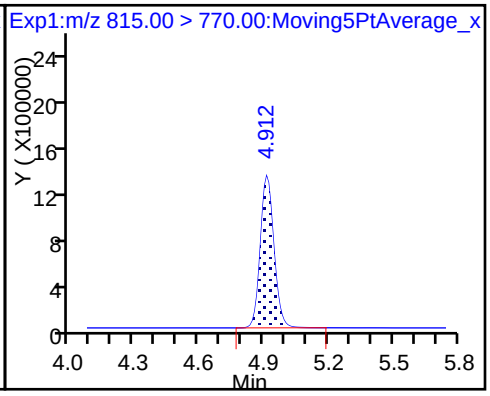
42 Perfluorotetradecanoic acid



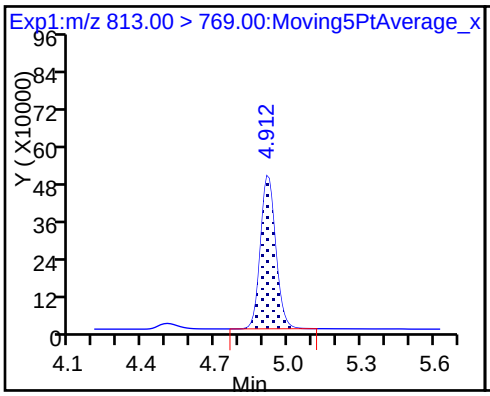
42 Perfluorotetradecanoic acid



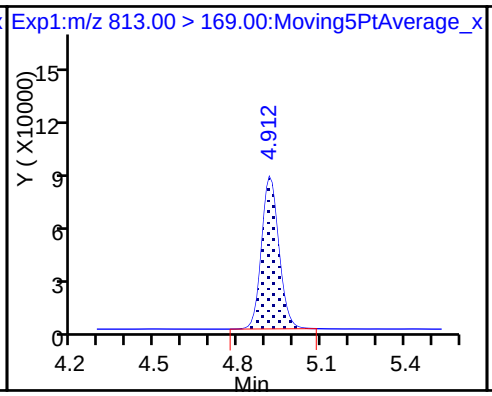
D 44 13C2-PFHxDA



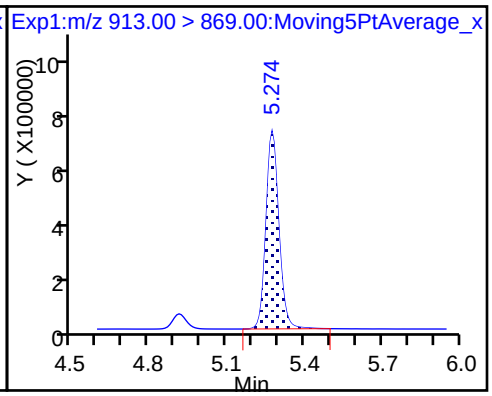
45 Perfluorohexadecanoic acid



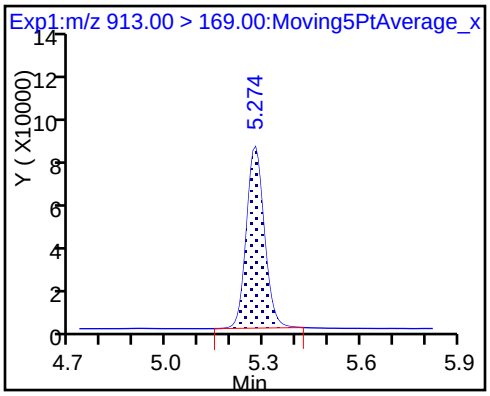
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento

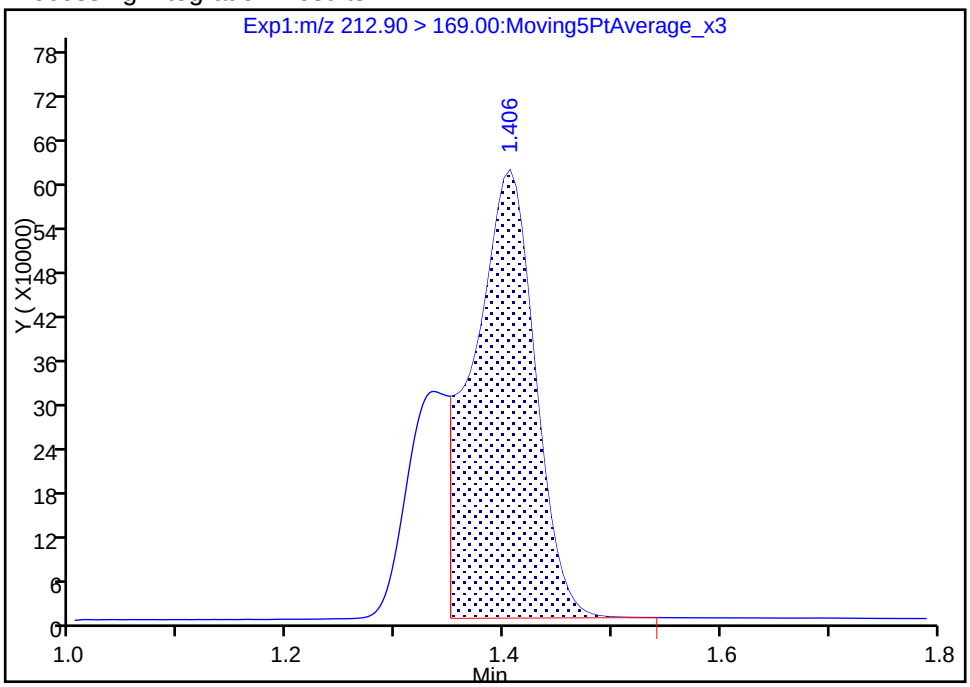
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_005.d
Injection Date: 12-Dec-2017 21:58:22 Instrument ID: A8_N
Lims ID: LCSD 320-199444/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

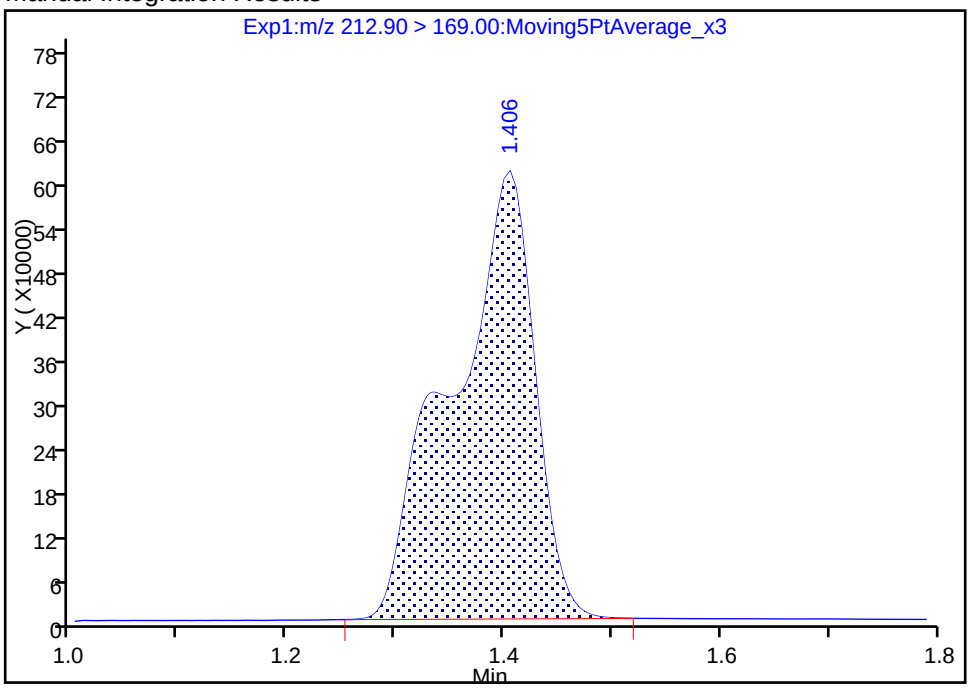
Processing Integration Results

RT: 1.41
Area: 2419803
Amount: 0.780305
Amount Units: ng/ml



Manual Integration Results

RT: 1.41
Area: 3241368
Amount: 1.045232
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:21:06
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

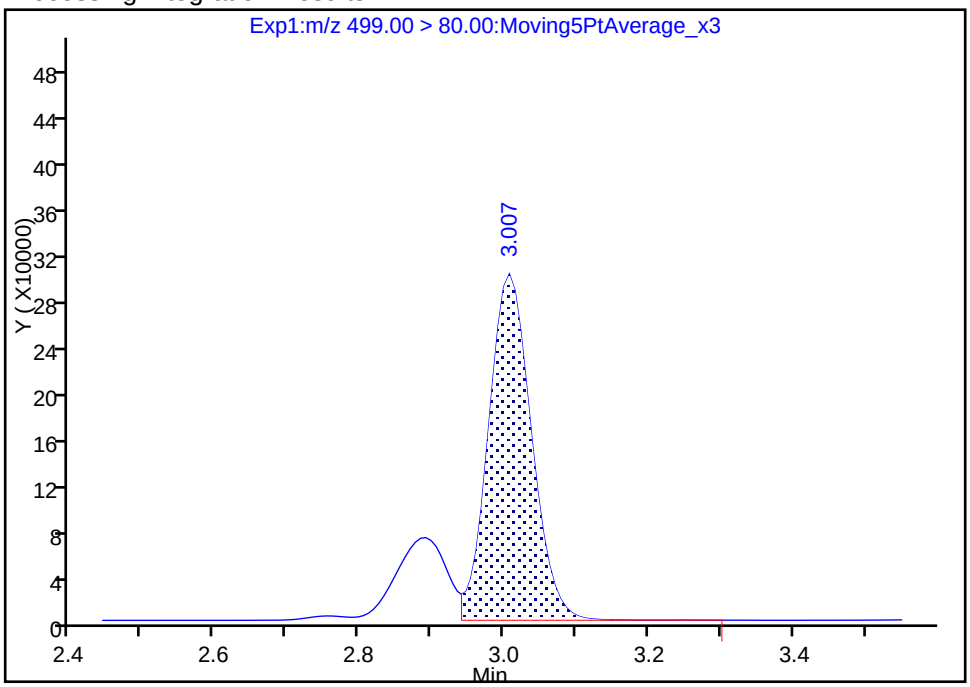
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_005.d				
Injection Date:	12-Dec-2017 21:58:22	Instrument ID:	A8_N		
Lims ID:	LCSD 320-199444/3-A				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	3	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

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

Signal: 1

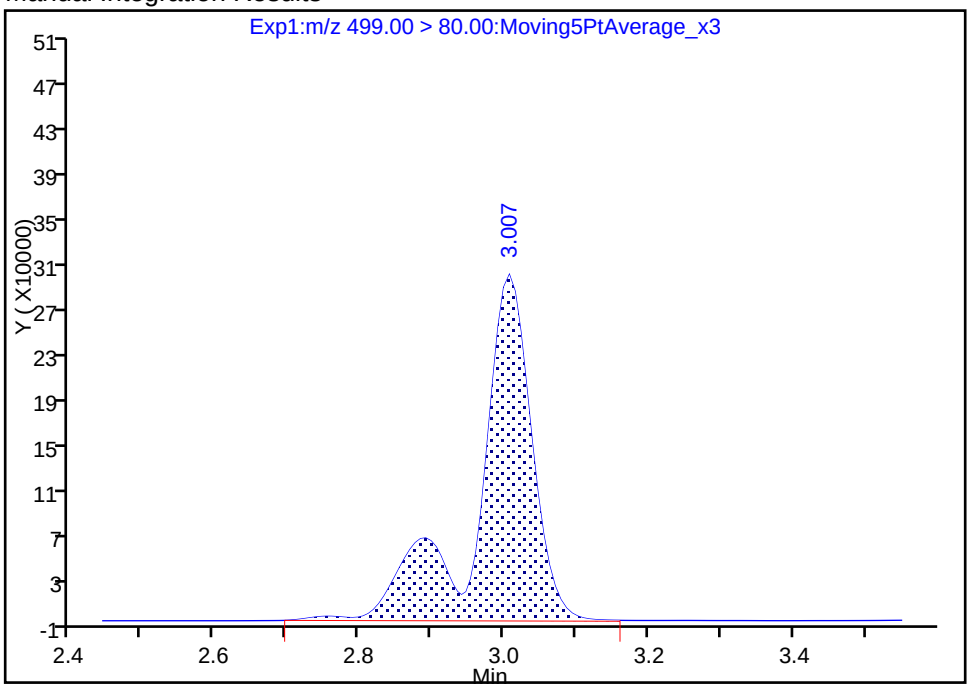
Processing Integration Results

RT: 3.01
Area: 1233793
Amount: 0.702471
Amount Units: ng/ml



Manual Integration Results

RT: 3.01
Area: 1597460
Amount: 0.909527
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:21:22

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

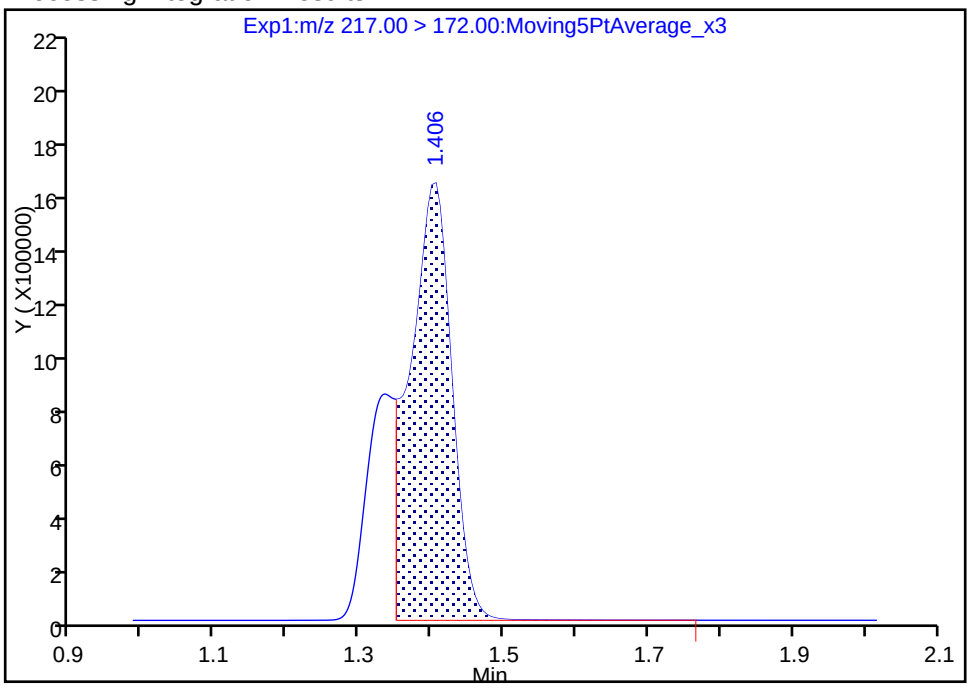
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b\2017.12.12LLB_005.d
Injection Date: 12-Dec-2017 21:58:22 Instrument ID: A8_N
Lims ID: LCSD 320-199444/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

D 1 13C4 PFBA, CAS: STL00992

Signal: 1

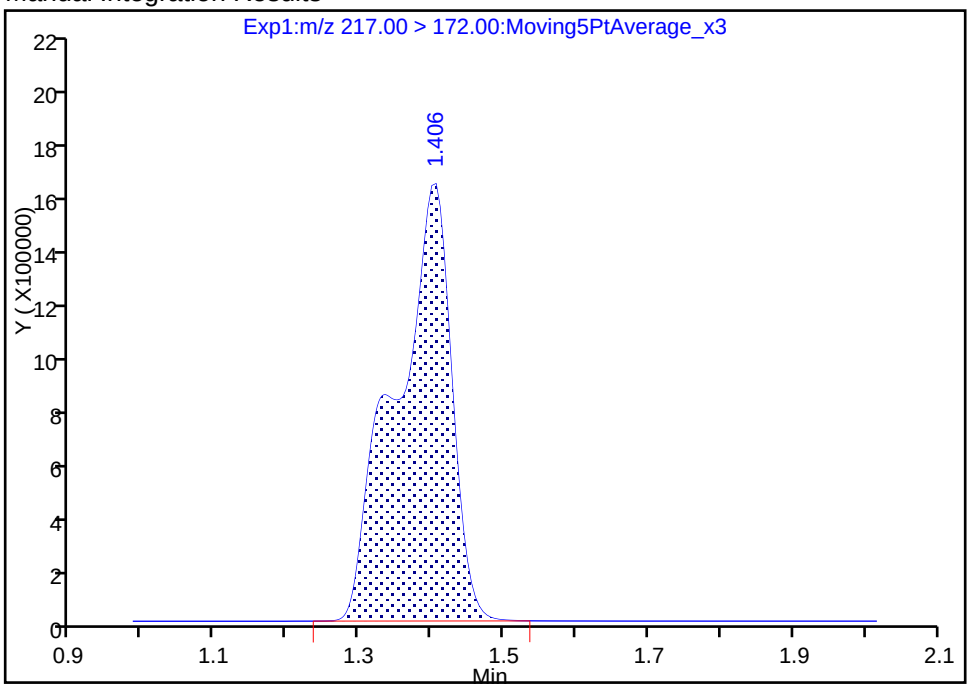
Processing Integration Results

RT: 1.41
Area: 6301941
Amount: 1.993478
Amount Units: ng/ml



Manual Integration Results

RT: 1.41
Area: 8534241
Amount: 2.699616
Amount Units: ng/ml



Reviewer: hannigana, 13-Dec-2017 13:20:51
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Instrument ID: A8_N Start Date: 12/04/2017 15:48

Analysis Batch Number: 198210 End Date: 12/04/2017 17:31

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-198210/2		12/04/2017 15:48	1	2017.12.04ICAL_002.d	GeminiC18 3x100 3(mm)
IC 320-198210/3		12/04/2017 15:56	1	2017.12.04ICAL_003.d	GeminiC18 3x100 3(mm)
IC 320-198210/4		12/04/2017 16:04	1	2017.12.04ICAL_004.d	GeminiC18 3x100 3(mm)
IC 320-198210/5		12/04/2017 16:12	1	2017.12.04ICAL_005.d	GeminiC18 3x100 3(mm)
IC 320-198210/6		12/04/2017 16:20	1	2017.12.04ICAL_006.d	GeminiC18 3x100 3(mm)
IC 320-198210/7		12/04/2017 16:28	1	2017.12.04ICAL_007.d	GeminiC18 3x100 3(mm)
IC 320-198210/8		12/04/2017 16:36	1	2017.12.04ICAL_008.d	GeminiC18 3x100 3(mm)
IC 320-198210/9		12/04/2017 16:43	1	2017.12.04ICAL_009.d	GeminiC18 3x100 3(mm)
IC 320-198210/10		12/04/2017 16:51	1	2017.12.04ICAL_010.d	GeminiC18 3x100 3(mm)
ICB 320-198210/11		12/04/2017 16:59	1		GeminiC18 3x100 3(mm)
ICV 320-198210/12		12/04/2017 17:07	1	2017.12.04ICAL_012.d	GeminiC18 3x100 3(mm)
ZZZZZ		12/04/2017 17:15	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/04/2017 17:23	1		GeminiC18 3x100 3(mm)
CCVL 320-198210/15		12/04/2017 17:31	1		GeminiC18 3x100 3(mm)

537 (modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Instrument ID: A8_N Start Date: 12/12/2017 15:08

Analysis Batch Number: 199573 End Date: 12/12/2017 17:30

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-199573/1		12/12/2017 15:08	1	2017.12.12LLA_005.d	GeminiC18 3x100 3(mm)
CCV 320-199573/2		12/12/2017 15:16	1		GeminiC18 3x100 3(mm)
CCV 320-199573/14		12/12/2017 16:50	1		GeminiC18 3x100 3(mm)
CCV 320-199573/19		12/12/2017 17:30	1		GeminiC18 3x100 3(mm)

537 (modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Instrument ID: A8_N Start Date: 12/12/2017 21:34

Analysis Batch Number: 199646 End Date: 12/12/2017 22:37

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-199646/1		12/12/2017 21:34	1	2017.12.12LLB_002.d	GeminiC18 3x100 3(mm)
MB 320-199444/1-A		12/12/2017 21:42	1	2017.12.12LLB_003.d	GeminiC18 3x100 3(mm)
LCS 320-199444/2-A		12/12/2017 21:50	1	2017.12.12LLB_004.d	GeminiC18 3x100 3(mm)
LCSD 320-199444/3-A		12/12/2017 21:58	1	2017.12.12LLB_005.d	GeminiC18 3x100 3(mm)
320-34072-1		12/12/2017 22:06	1	2017.12.12LLB_006.d	GeminiC18 3x100 3(mm)
320-34072-2		12/12/2017 22:14	1	2017.12.12LLB_007.d	GeminiC18 3x100 3(mm)
320-34072-3		12/12/2017 22:22	1	2017.12.12LLB_008.d	GeminiC18 3x100 3(mm)
320-34072-4		12/12/2017 22:29	1	2017.12.12LLB_009.d	GeminiC18 3x100 3(mm)
CCV 320-199646/9		12/12/2017 22:37	1	2017.12.12LLB_010.d	GeminiC18 3x100 3(mm)

537 (modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Instrument ID: A8_N Start Date: 12/13/2017 10:42

Analysis Batch Number: 199709 End Date: 12/13/2017 10:42

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-199709/1		12/13/2017 10:42	1	2017.12.13LLA_001.d	GeminiC18 3x100 3(mm)

537 (modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Instrument ID: A8_N Start Date: 12/13/2017 15:03

Analysis Batch Number: 199735 End Date: 12/13/2017 15:18

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-199735/1		12/13/2017 15:03	1	2017.12.13LLA_024.d	GeminiC18 3x100 3(mm)
320-34072-1 DL		12/13/2017 15:11	10	2017.12.13LLA_025.d	GeminiC18 3x100 3(mm)
CCV 320-199735/3		12/13/2017 15:18	1	2017.12.13LLA_026.d	GeminiC18 3x100 3(mm)

537 (modified)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Batch Number: 199444 Batch Start Date: 12/12/17 08:28 Batch Analyst: Branscum, Cassie

Batch Method: 3535 Batch End Date: 12/12/17 14:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00026	LCPFC-IS 00019
MB 320-199444/1		3535, 537 (modified)				250 mL	10.0 mL	500 uL	500 uL
LCS 320-199444/2		3535, 537 (modified)				250 mL	10.0 mL	500 uL	500 uL
LCSD 320-199444/3		3535, 537 (modified)				250 mL	10.0 mL	500 uL	500 uL
320-34072-A-1	TP-PFC-024-TPI	3535, 537 (modified)	T	277.20 g	28.43 g	248.8 mL	10.0 mL	500 uL	500 uL
320-34072-A-2	TP-PFC-024-MID-CARBON	3535, 537 (modified)	T	282.04 g	28.45 g	253.6 mL	10.0 mL	500 uL	500 uL
320-34072-A-3	TP-PFC-024-TPE	3535, 537 (modified)	T	278.30 g	28.33 g	250 mL	10.0 mL	500 uL	500 uL
320-34072-A-4	TP-PFC-024-TPE-D	3535, 537 (modified)	T	282.81 g	28.34 g	254.5 mL	10.0 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00117					
MB 320-199444/1		3535, 537 (modified)							
LCS 320-199444/2		3535, 537 (modified)		500 uL					
LCSD 320-199444/3		3535, 537 (modified)		500 uL					
320-34072-A-1	TP-PFC-024-TPI	3535, 537 (modified)	T						
320-34072-A-2	TP-PFC-024-MID-CARBON	3535, 537 (modified)	T						
320-34072-A-3	TP-PFC-024-TPE	3535, 537 (modified)	T						
320-34072-A-4	TP-PFC-024-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.: 320-34072-1

SDG No.:

Batch Number: 199444 Batch Start Date: 12/12/17 08:28 Batch Analyst: Branscum, Cassie

Batch Method: 3535 Batch End Date: 12/12/17 14:00

Batch Notes	
Analyst ID - Aliquot Step	CCB
Balance ID	QA-078
Analyst ID - Final Volume Step	CCB
H2O ID	12/4/17
Hexane ID	1095497
Internal Standard ID#	1106116
Manifold ID	8
Methanol ID	1105466
Sodium Hydroxide ID	1112059
Pipette ID	I46370G
Analyst ID - Reagent Drop	CCB
Analyst ID - IS Reagent Drop	CCB
Analyst ID - IS Reagent Drop Witness	KMK
Analyst ID - SU Reagent Drop	CCB
Analyst ID - SU Reagent Drop Witness	JNS
Solvent Lot #	1112027
Solvent Name	0.3%NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003137011A

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 34072 Work List ID(s): 51692, 51718

Extraction Batch: 199444 Analysis Batch(es): 199646, 199735, 200241

Delivery Rank 4 Due Date: 12/18/2017

A Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# 198210	✓	✓	
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# 110861, 110844, 110846	✓	✓	
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: 12/13/2017

2nd Level Reviewer: [signature] Date: 12/15/2017

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 12DEC2017NCD_PFC Worklist Number: 51692
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.b
QC Batching: Disabled Limit Group Batching: Enabled

CCV: 199573

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 199646	LC PFC ICAL Raw Batch: 199647
# 1 CCV L5	# 1 CCV L5	# 1 CCV L5
# 2 MB 320-199444/1-A	# 2 MB 320-199444/1-A	
# 3 LCS 320-199444/2-A	# 3 LCS 320-199444/2-A	
# 4 LCSD 320-199444/3-A	# 4 LCSD 320-199444/3-A	
# 5 320-34072-A-1-A	# 5 320-34072-A-1-A	
# 6 320-34072-A-2-A	# 6 320-34072-A-2-A	
# 7 320-34072-A-3-A	# 7 320-34072-A-3-A	
# 8 320-34072-A-4-A	# 8 320-34072-A-4-A	
# 9 CCV L4	# 9 CCV L4	# 9 CCV L4

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 13DEC2017NCC_PFC Worklist Number: 51718
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51718.b
QC Batching: Disabled Limit Group Batching: Enabled

CCV: 199709

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 199735	LC PFC ICAL Raw Batch: 199736
# 1 CCV L4 # 2 320-34072-A-1-A # 3 CCV L5	# 1 CCV L4 # 2 320-34072-A-1-A # 3 CCV L5	# 1 CCV L4 # 3 CCV L5

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 12DEC2017NCA_PFC Worklist Num: 51666
Instrument: A8_N Method: A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171212-51666.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
CCVL	320-0051666-001	CCVL	12-Dec-2017 15:08:16	2017.12.12LLA_005.d	21	1.0		sv
CCV L4	320-0051666-002	CCV	12-Dec-2017 15:16:08	2017.12.12LLA_006.d	13	1.0		sv
RB	320-0051666-003	RB	12-Dec-2017 15:23:59	2017.12.12LLA_007.d	20	1.0		sv
MB 320-199361/1-A	320-0051666-004	MB	12-Dec-2017 15:31:52	2017.12.12LLA_008.d	1	1.0		sv
LCS 320-199361/2-A	320-0051666-005	LCS	12-Dec-2017 15:39:47	2017.12.12LLA_009.d	2	1.0		sv
LCSD 320-199361/3-A	320-0051666-006	LCSD	12-Dec-2017 15:47:42	2017.12.12LLA_010.d	3	1.0		sv
480-128567-T-1-A	320-0051666-007	Client	12-Dec-2017 15:55:37	2017.12.12LLA_011.d	4	1.0	8-SCH-001-001-01	sv
480-128567-AE-2-A	320-0051666-008	Client	12-Dec-2017 16:03:32	2017.12.12LLA_012.d	5	1.0	8-SCH-001-001-02	sv
480-128567-T-3-A	320-0051666-009	Client	12-Dec-2017 16:11:27	2017.12.12LLA_013.d	6	1.0	8-SCH-001-001-03	sv
480-128567-T-4-A	320-0051666-010	Client	12-Dec-2017 16:19:21	2017.12.12LLA_014.d	7	1.0	8-SCH-001-001-04	sv
480-128567-C-5-A	320-0051666-011	Client	12-Dec-2017 16:27:13	2017.12.12LLA_015.d	8	1.0	8-SCH-001-001-05	sv
480-128567-C-6-A	320-0051666-012	Client	12-Dec-2017 16:35:06	2017.12.12LLA_016.d	9	1.0	8-SCH-001-001-06	sv
480-128567-A-7-A	320-0051666-013	Client	12-Dec-2017 16:42:59	2017.12.12LLA_017.d	10	1.0	8-SCH-001-001-07	sv
CCV L5	320-0051666-014	CCV	12-Dec-2017 16:50:51	2017.12.12LLA_018.d	14	1.0		sv
480-128651-A-1-A	320-0051666-015	Client	12-Dec-2017 16:58:42	2017.12.12LLA_019.d	11	1.0	3-WES-001-001-01	sv
480-128651-N-2-A	320-0051666-016	Client	12-Dec-2017 17:06:34	2017.12.12LLA_020.d	12	1.0	3-WES-001-001-02	sv
480-128651-N-3-A	320-0051666-017	Client	12-Dec-2017 17:14:29	2017.12.12LLA_021.d	13	1.0	3-WES-001-001-03	sv
480-128651-A-4-A	320-0051666-018	Client	12-Dec-2017 17:22:24	2017.12.12LLA_022.d	14	1.0	3-WES-001-001-04	sv
CCV L4	320-0051666-019	CCV	12-Dec-2017 17:30:19	2017.12.12LLA_023.d	13	1.0		sv

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 12DEC2017NCD_PFC Worklist Num: 51692
Instrument: A8_N Method: A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51692.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
CCV L5	320-0051692-001	CCV	12-Dec-2017 21:34:43	2017.12.12LLB_002.d	14	1.0		sv
MB 320-199444/1-A	320-0051692-002	MB	12-Dec-2017 21:42:34	2017.12.12LLB_003.d	1	1.0		sv
LCS 320-199444/2-A	320-0051692-003	LCS	12-Dec-2017 21:50:27	2017.12.12LLB_004.d	2	1.0		sv
LCSD 320-199444/3-A	320-0051692-004	LCSD	12-Dec-2017 21:58:22	2017.12.12LLB_005.d	3	1.0		sv
320-34072-A-1-A	320-0051692-005	Client	12-Dec-2017 22:06:17	2017.12.12LLB_006.d	4	1.0	TP-PFC-024-TPI	sv
320-34072-A-2-A	320-0051692-006	Client	12-Dec-2017 22:14:11	2017.12.12LLB_007.d	5	1.0	TP-PFC-024-MID-CARBON	sv
320-34072-A-3-A	320-0051692-007	Client	12-Dec-2017 22:22:05	2017.12.12LLB_008.d	6	1.0	TP-PFC-024-TPE	sv
320-34072-A-4-A	320-0051692-008	Client	12-Dec-2017 22:29:59	2017.12.12LLB_009.d	7	1.0	TP-PFC-024-TPE-D	sv
CCV L4	320-0051692-009	CCV	12-Dec-2017 22:37:54	2017.12.12LLB_010.d	13	1.0		sv

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 13DEC2017NCA_PFC Worklist Num: 51711
Instrument: A8_N Method: A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51711.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	Fract
CCVL	320-0051711-001	CCVL	13-Dec-2017 10:42:27	2017.12.13LLA_001.d	21	1.0	sv
CCV L4	320-0051711-002	CCV	13-Dec-2017 10:50:19	2017.12.13LLA_002.d	13	1.0	sv
RB	320-0051711-003	RB	13-Dec-2017 10:58:11	2017.12.13LLA_003.d	20	1.0	sv
Dissection Kit A	320-0051711-004	Client	13-Dec-2017 11:06:02	2017.12.13LLA_004.d	1	1.0	sv
Dissection Kit B	320-0051711-005	Client	13-Dec-2017 11:13:54	2017.12.13LLA_005.d	2	1.0	sv
Dissection Kit C	320-0051711-006	Client	13-Dec-2017 11:21:47	2017.12.13LLA_006.d	3	1.0	sv
Cracker Tool 1	320-0051711-007	Client	13-Dec-2017 11:29:40	2017.12.13LLA_007.d	4	1.0	sv
Cracker Tool 2	320-0051711-008	Client	13-Dec-2017 11:37:35	2017.12.13LLA_008.d	5	1.0	sv
Blender Vessel A	320-0051711-009	Client	13-Dec-2017 11:45:29	2017.12.13LLA_009.d	6	1.0	sv
Blender Vessel B	320-0051711-010	Client	13-Dec-2017 11:53:25	2017.12.13LLA_010.d	7	1.0	sv
Blender Vessel C	320-0051711-011	Client	13-Dec-2017 12:01:21	2017.12.13LLA_011.d	8	1.0	sv
CCV L5	320-0051711-012	CCV	13-Dec-2017 12:09:13	2017.12.13LLA_012.d	14	1.0	sv

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 13DEC2017NCC_PFC Worklist Num: 51718
Instrument: A8_N Method: A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51718.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
CCV L4	320-0051718-001	CCV	13-Dec-2017 15:03:11	2017.12.13LLA_024.d	13	1.0		sv
320-34072-A-1-A	320-0051718-002	Client	13-Dec-2017 15:11:02	2017.12.13LLA_025.d	18	10.0	TP-PFC-024-TPI	sv
CCV L5	320-0051718-003	CCV	13-Dec-2017 15:18:55	2017.12.13LLA_026.d	14	1.0		sv

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Test America – Sacramento

Sample Dilution Record

Method ID PFC_1DA **Job #** 320-34072

Analyst (Print Name) Alyssa Hannigan **Analyst Initials** ABH

Date 12/13/2017

Sample#	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
320-84072	10,000	80	800	10

Comments:

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 15DEC2017NCE_PFC Worklist Number: 51844
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171218-51844.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC ICAL Raw Batch: 200240	LC PFC_DOD ICAL Raw Batch: 200241	LC PFC_QSM5-1 ICAL Raw Batch: 200242
# 1 CCV L4	# 1 CCV L4	# 1 CCV L4	# 1 CCV L4
# 2 320-34072-A-1-A		# 2 320-34072-A-1-A	
# 3 CCV L5	# 3 CCV L5	# 3 CCV L5	# 3 CCV L5

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 15DEC2017NCE_PFC Worklist Num: 51844
Instrument: A8_N Method: A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171218-51844.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
CCV L4	320-0051844-001	CCV	15-Dec-2017 19:54:27	2017.12.15LLA_063.d	13	1.0		sv
320-34072-A-1-A	320-0051844-002	Client	15-Dec-2017 20:02:17	2017.12.15LLA_064.d	45	1.0	TP-PFC-024-TPI	sv
CCV L5	320-0051844-003	CCV	15-Dec-2017 20:10:09	2017.12.15LLA_065.d	14	1.0		sv

NC Method

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

13

AB 12/12/17
AB 12/15/17

Batch Number: 320-199444
Method Code: 320-3535_PFC-320

Analyst: Branscum, Cassie

Batch Open: 12/12/2017 8:28:00AM
Batch End: 12/12/2017 2:00:00PM

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~320-199444/1 N/A	N/A		250 mL 10.0 mL	NA			N/A	N/A	N/A		MB 320-199444/1-A
2	LCS~320-199444/2 N/A	N/A		250 mL 10.0 mL	NA			N/A	N/A	N/A		LCS 320-199444/2-A
3	LCSD~320-199444/3 N/A	N/A		250 mL 10.0 mL	NA			N/A	N/A	N/A		LCSD 320-199444/3-A
4	320-34072-A-1 (PFC_IDA_DOD5)	N/A (320-34072-1)	277.20 g 28.43 g	248.8 mL 10.0 mL	NA			12/16/17	8_Days	4	10X, RJ	320-34072-A-1-A
5	320-34072-A-2 (PFC_IDA_DOD5)	N/A (320-34072-1)	282.04 g 28.45 g	253.6 mL 10.0 mL	NA			12/16/17	8_Days	4		320-34072-A-2-A
6	320-34072-A-3 (PFC_IDA_DOD5)	N/A (320-34072-1)	278.30 g 28.33 g	250 mL 10.0 mL	NA			12/16/17	8_Days	4		320-34072-A-3-A
7	320-34072-A-4 (PFC_IDA_DOD5)	N/A (320-34072-1)	282.81 g 28.34 g	254.5 mL 10.0 mL	NA			12/16/17	8_Days	4		320-34072-A-4-A

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199444
Method Code: 320-3535_PFC-320

Analyst: Branscum, Cassie

Batch Open: 12/12/2017 8:28:00AM
Batch End: 12/12/2017 2:00:00PM

Batch Notes

Manifold ID	8
Methanol ID	1105466
Hexane ID	1095497
Sodium Hydroxide ID	1112059
First Start time	NA
First End time	NA
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003137011A
Balance ID	QA-078
H2O ID	12/4/17
Pipette ID	I46370G
Solvent Name	0.3%NH4OH/MeOH
Solvent Lot #	1112027
Analyst ID - Reagent Drop	CCB
Analyst ID - SU Reagent Drop	CCB
Analyst ID - SU Reagent Drop Witness	JNS
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: 320-199444 Analyst: Branscum, Cassie Batch Open: 12/12/2017 8:28:00AM

Method Code: 320-3535_PFC-320 Batch End: 12/12/2017 2:00:00PM

Analyst ID - IS Reagent Drop Witness	KMK
Internal Standard ID#	1106116
Analyst ID - Concentration	NA
Analyst ID - Aliquot Step	CCB
Analyst ID - Final Volume Step	CCB
SOP Number	WS-LC-0025
Batch Comment	NA

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199444 | Analyst: Branscum, Cassie | Batch Open: 12/12/2017 8:28:00AM

Method Code: 320-3535_PFC-320 | Batch End:

Batch Notes

Manifold ID	8
Methanol ID	1105466
Hexane ID	1095497
Sodium Hydroxide ID	1112059
First Start time	NA
First End time	NA
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	~~186004647~~ CCB 12/12/17 003137011A
Balance ID	QA-078
H2O ID	12/4/17
Pipette ID	I46370G
Solvent Name	0.3%NH4OH/MeOH
Solvent Lot #	1112027
Analyst ID - Reagent Drop	CCB
Analyst ID - SU Reagent Drop	CCB
Analyst ID - SU Reagent Drop Witness	JWS
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: 320-199444 Analyst: Branscum, Cassie Batch Open: 12/12/2017 8:28:00AM

Method Code: 320-3535_PFC-320 Batch End:

Analyst ID - IS Reagent Drop Witness	KMK
Internal Standard ID#	1106116
Analyst ID - Concentration	NA
Analyst ID - Aliquot Step	CB
Analyst ID - Final Volume Step	CB
SOP Number	WS-LC-0025
Batch Comment	NA

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-199444 Analyst: Branscum, Cassie Batch Open: 12/12/2017 8:28:00AM

Method Code: 320-3535_PFC-320 Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-199444/1	LCMPFC_ALL_SU_00026	500 uL	10.0 mL	CS 12-12-17	JNS 12/12/17
LCS 320-199444/2	LCMPFC_ALL_SU_00026	500 uL	10.0 mL		
LCS 320-199444/2	LCPFCSP_00117	500 uL	10.0 mL		
LCSD 320-199444/3	LCMPFC_ALL_SU_00026	500 uL	10.0 mL		
LCSD 320-199444/3	LCPFCSP_00117	500 uL	10.0 mL		
320-34072-A-1	LCMPFC_ALL_SU_00026	500 uL	10.0 mL		
320-34072-A-2	LCMPFC_ALL_SU_00026	500 uL	10.0 mL		
320-34072-A-3	LCMPFC_ALL_SU_00026	500 uL	10.0 mL		
320-34072-A-4	LCMPFC_ALL_SU_00026	500 uL	10.0 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

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Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s) 320-199444 Test 3535_PFC

Earliest Holding Time 12/20/17

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	✓	✓
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: [signature] Date: 12/12/17

2nd Level Reviewer: VPM Date: 12/12/17

Comments:

Shipping and Receiving Documents

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record 242021

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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 Lamontagne	Date: 11/9/17	COC No: 242021
Company Name: Tetra Tech	Tel/Fax: (412) 921-8650	Lab Contact: David Alltucker	Carrier: Fed Ex	1 of 1 COCs
Address: 881 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: (401) 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# 112G08005-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-024-TPI	12/7/17	~~0935~~ 1000	G	W	4	N	N	x	
TP-PFC-024-MID-CARBON		0940			4	N	N	x	
TP-PFC-024-TPE		0945			4	N	N	x	
TP-PFC-024-TPE-D		0000			4	N	N	x	

320-34072 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.: | Cooler Temp. (°C): Obs'd: 1.4 Corr'd: ____ | Therm ID No.: AK3

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Tetra Tech	12/7/17 1500	[signature]	TAWS	12/8/17 1015
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: 320-34072-1

Login Number: 34072
List Number: 1
Creator: Her, David A

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?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","360","ng/L","D","5.4","DL","","TRG","","","40","LOQ","NO","-99","","248.8","10.0","20",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","30","ng/L","U","11","DL","","TRG","","","40","LOQ","NO","-99","","248.8","10.0","30",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","200","ng/L","D","4.9","DL","","TRG","","","20","LOQ","NO","-99","","248.8","10.0","10",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","350","ng/L","D","5.8","DL","","TRG","","","40","LOQ","NO","-99","","248.8","10.0","20",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","20","ng/L","U","5.5","DL","","TRG","","","40","LOQ","NO","-99","","248.8","10.0","20",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","1700","ng/L","D M","8.5","DL","","TRG","","","40","LOQ","YES","-99","","248.8","10.0","20",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","10","ng/L","U","3.1","DL","","TRG","","","20","LOQ","NO","-99","","248.8","10.0","10",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","10","ng/L","U","3.2","DL","","TRG","","","20","LOQ","NO","-99","","248.8","10.0","10",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","420","ng/L","D","3.0","DL","","TRG","","","20","LOQ","NO","-99","","248.8","10.0","10",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","74","ng/L","D","3.5","DL","","TRG","","","20","LOQ","NO","-99","","248.8","10.0","10",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","51","ng/L","D","3.0","DL","","TRG","","","20","LOQ","NO","-99","","248.8","10.0","10",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","72","ng/L","D","2.5","DL","","TRG","","","20","LOQ","NO","-99","","248.8","10.0","10",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","8.8","ng/L","J D","3.0","DL","","TRG","","","20","LOQ","NO","-99","","248.8","10.0","10",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","10","ng/L","U","2.7","DL","","TRG","","","20","LOQ","NO","-99","","248.8","10.0","10",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","10","ng/L","U","2.9","DL","","TRG","","","20","LOQ","NO","-99","","248.8","10.0","10",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","30","ng/L","U","13","DL","","TRG","","","40","LOQ","NO","-99","","248.8","10.0","30",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","10","ng/L","U","3.5","DL","","TRG","","","20","LOQ","NO","-99","","248.8","10.0","10",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","STL00990","13C4 PFOA","110","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","100","","248.8","10.0","1000",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","STL00991","13C4 PFOS","100","ng/L","","-99","DL","","TRG","104","","-99","LOQ","YES","96.1","","248.8","10.0","1000",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","STL00992","13C4 PFBA","110","ng/L","","-99","DL","","TRG","114","","-99","LOQ","YES","100","","248.8","10.0","1000",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","STL00993","13C2 PFHxA","110","ng/L","","-99","DL","","TRG","110","","-99","LOQ","YES","100","","248.8","10.0","1000",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","STL00994","18O2 PFHxS","110","ng/L","","-99","DL","","TRG","111","","-99","LOQ","YES","95.1","","248.8","10.0","1000",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","STL00995","13C5 PFNA","110","ng/L","","-99","DL","","TRG","105","","-99","LOQ","YES","100","","248.8","10.0","1000",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","STL00996","13C2 PFDA","100","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","100","","248.8","10.0","1000",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","STL00997","13C2 PFUnA","100","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","100","","248.8","10.0","1000",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","STL00998","13C2 PFDoA","100","ng/L","","-99","DL","","TRG","101","","-99","LOQ","YES","100","","248.8","10.0","1000",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","STL01056","13C8

FOSA","100","ng/L","","-99","DL","","TRG","101","","-99","LOQ","YES","100","","248.8","10.0","1000",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","STL01892","13C4-
PFHpA","110","ng/L","","-99","DL","","TRG","113","","-99","LOQ","YES","100","","248.8","10.0","1000",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","STL01893","13C5
PFPeA","110","ng/L","","-99","DL","","TRG","114","","-99","LOQ","YES","100","","248.8","10.0","1000",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","STL02116","13C2-
PFTeDA","99","ng/L","","-99","DL","","TRG","98","","-99","LOQ","YES","100","","248.8","10.0","1000",""
"TP-PFC-024-TPI","537 (modified)","DL","320-34072-1","TALSAC","STL02337","13C3-
PFBS","100","ng/L","","-99","DL","","TRG","110","","-99","LOQ","YES","93.4","","248.8","10.0","1000",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","350","ng/L","M","0.54","DL","","TRG","","","4.0","LOQ","YES","-99","","248.8","10.0","2.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA)","3.0","ng/L","U","1.1","DL","","TRG","","","4.0","LOQ","YES","-99","","248.8","10.0","3.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA)","190","ng/L","","0.49","DL","","TRG","","","2.0","LOQ","YES","-99","","248.8","10.0","1.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","340","ng/L","","0.58","DL","","TRG","","","4.0","LOQ","YES","-99","","248.8","10.0","2.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDoA)","2.0","ng/L","U","0.55","DL","","TRG","","","4.0","LOQ","YES","-99","","248.8","10.0","2.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","1200","ng/L","M E","0.85","DL","","TRG","","","4.0","LOQ","NO","-99","","248.8","10.0","2.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","335-76-2","Perfluorodecanoic acid
(PFDA)","0.79","ng/L","J","0.31","DL","","TRG","","","2.0","LOQ","YES","-99","","248.8","10.0","1.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","1.0","ng/L","U","0.32","DL","","TRG","","","2.0","LOQ","YES","-99","","248.8","10.0","1.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","370","ng/L","","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","248.8","10.0","1.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","77","ng/L","","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","248.8","10.0","1.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","50","ng/L","","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","248.8","10.0","1.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","73","ng/L","","0.25","DL","","TRG","","","2.0","LOQ","YES","-99","","248.8","10.0","1.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","6.5","ng/L","","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","248.8","10.0","1.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","2.7","ng/L","","0.27","DL","","TRG","","","2.0","LOQ","YES","-99","","248.8","10.0","1.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","1.0","ng/L","U","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","248.8","10.0","1.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","3.0","ng/L","U","1.3","DL","","TRG","","","4.0","LOQ","YES","-99","","248.8","10.0","3.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA)","1.0","ng/L","U","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","248.8","10.0","1.0",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","STL00990","13C4
PFOA","110","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","100","","248.8","10.0","100",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","STL00991","13C4
PFOS","130","ng/L","","-99","DL","","TRG","137","","-99","LOQ","YES","96.1","","248.8","10.0","100",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","STL00992","13C4
PFBA","140","ng/L","","-99","DL","","TRG","135","","-99","LOQ","YES","100","","248.8","10.0","100",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","STL00993","13C2
PFHxA","130","ng/L","","-99","DL","","TRG","132","","-99","LOQ","YES","100","","248.8","10.0","100",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","STL00994","18O2
PFHxS","120","ng/L","","-99","DL","","TRG","131","","-99","LOQ","YES","95.1","","248.8","10.0","100",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","STL00995","13C5

PFNA","140","ng/L","","-99","DL","","TRG","136","","-99","LOQ","YES","100","","248.8","10.0","100",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","STL00996","13C2
PFDA","140","ng/L","","-99","DL","","TRG","139","","-99","LOQ","YES","100","","248.8","10.0","100",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","STL00997","13C2
PFUnA","130","ng/L","","-99","DL","","TRG","134","","-99","LOQ","YES","100","","248.8","10.0","100",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","STL00998","13C2
PFDoA","130","ng/L","","-99","DL","","TRG","128","","-99","LOQ","YES","100","","248.8","10.0","100",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","STL01056","13C8
FOSA","130","ng/L","","-99","DL","","TRG","132","","-99","LOQ","YES","100","","248.8","10.0","100",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","STL01892","13C4-
PFHpA","130","ng/L","","-99","DL","","TRG","128","","-99","LOQ","YES","100","","248.8","10.0","100",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","STL01893","13C5
PFPeA","160","ng/L","Q","-99","DL","","TRG","156","","-99","LOQ","YES","100","","248.8","10.0","100",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","STL02116","13C2-
PFTeDA","140","ng/L","","-99","DL","","TRG","144","","-99","LOQ","YES","100","","248.8","10.0","100",""
"TP-PFC-024-TPI","537 (modified)","RES","320-34072-1","TALSAC","STL02337","13C3-
PFBS","140","ng/L","","-99","DL","","TRG","148","","-99","LOQ","YES","93.4","","248.8","10.0","100",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","1763-23-
1","Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.53","DL","","TRG","","","3.9","LOQ","YES","-99","","253.6","10.0","2.0",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","2058-94-8","Perfluoroundecanoic
acid (PFUnA)","3.0","ng/L","U","1.1","DL","","TRG","","","3.9","LOQ","YES","-99","","253.6","10.0","3.0",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","2706-90-3","Perfluoropentanoic
acid (PFPeA)","120","ng/L","","0.48","DL","","TRG","","","2.0","LOQ","YES","-99","","253.6","10.0","0.99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","307-24-4","Perfluorohexanoic
acid (PFHxA)","34","ng/L","","0.57","DL","","TRG","","","3.9","LOQ","YES","-99","","253.6","10.0","2.0",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","307-55-1","Perfluorododecanoic
acid (PFDoA)","2.0","ng/L","U","0.54","DL","","TRG","","","3.9","LOQ","YES","-99","","253.6","10.0","2.0",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","335-67-1","Perfluorooctanoic
acid (PFOA)","4.2","ng/L","M","0.84","DL","","TRG","","","3.9","LOQ","YES","-99","","253.6","10.0","2.0",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","335-76-2","Perfluorodecanoic
acid (PFDA)","0.99","ng/L","U","0.31","DL","","TRG","","","2.0","LOQ","YES","-99","","253.6","10.0","0.99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","335-77-
3","Perfluorodecanesulfonic acid
(PFDS)","0.99","ng/L","U","0.32","DL","","TRG","","","2.0","LOQ","YES","-99","","253.6","10.0","0.99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","355-46-
4","Perfluorohexanesulfonic acid
(PFHxS)","0.51","ng/L","J","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","253.6","10.0","0.99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","375-22-4","Perfluorobutanoic
acid (PFBA)","140","ng/L","M","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","253.6","10.0","0.99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","375-73-
5","Perfluorobutanesulfonic acid
(PFBS)","0.59","ng/L","J","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","253.6","10.0","0.99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","375-85-9","Perfluoroheptanoic
acid (PFHpA)","0.50","ng/L","J M","0.25","DL","","TRG","","","2.0","LOQ","YES","-99","","253.6","10.0","0.99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","375-92-
8","Perfluoroheptanesulfonic Acid
(PFHpS)","0.99","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","253.6","10.0","0.99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","375-95-1","Perfluorononanoic
acid (PFNA)","0.99","ng/L","U","0.27","DL","","TRG","","","2.0","LOQ","YES","-99","","253.6","10.0","0.99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","376-06-
7","Perfluorotetradecanoic acid
(PFTeA)","0.99","ng/L","U","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","253.6","10.0","0.99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","72629-94-

8","Perfluorotridecanoic Acid
(PFTriA)","3.0","ng/L","U","1.3","DL","","TRG","","","3.9","LOQ","YES","-99","","253.6","10.0","3.0",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","754-91-6","Perfluorooctane
Sulfonamide
(FOSA)","0.99","ng/L","U","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","253.6","10.0","0.99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","STL00990","13C4
PFOA","110","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","98.6","","253.6","10.0","99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","STL00991","13C4
PFOS","100","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","94.2","","253.6","10.0","99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","STL00992","13C4
PFBA","110","ng/L","","-99","DL","","TRG","113","","-99","LOQ","YES","98.6","","253.6","10.0","99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","STL00993","13C2
PFHxA","110","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","98.6","","253.6","10.0","99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","STL00994","18O2
PFHxS","99","ng/L","","-99","DL","","TRG","106","","-99","LOQ","YES","93.3","","253.6","10.0","99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","STL00995","13C5
PFNA","110","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","98.6","","253.6","10.0","99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","STL00996","13C2
PFDA","100","ng/L","","-99","DL","","TRG","106","","-99","LOQ","YES","98.6","","253.6","10.0","99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","STL00997","13C2
PFUnA","100","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","98.6","","253.6","10.0","99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","STL00998","13C2
PFDoA","99","ng/L","","-99","DL","","TRG","100","","-99","LOQ","YES","98.6","","253.6","10.0","99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","STL01056","13C8
FOSA","99","ng/L","","-99","DL","","TRG","101","","-99","LOQ","YES","98.6","","253.6","10.0","99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","STL01892","13C4-
PFHpA","110","ng/L","","-99","DL","","TRG","110","","-99","LOQ","YES","98.6","","253.6","10.0","99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","STL01893","13C5
PFPeA","110","ng/L","","-99","DL","","TRG","112","","-99","LOQ","YES","98.6","","253.6","10.0","99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","STL02116","13C2-
PFTeDA","120","ng/L","","-99","DL","","TRG","123","","-99","LOQ","YES","98.6","","253.6","10.0","99",""
"TP-PFC-024-MID-CARBON","537 (modified)","RES","320-34072-2","TALSAC","STL02337","13C3-
PFBS","93","ng/L","","-99","DL","","TRG","101","","-99","LOQ","YES","91.7","","253.6","10.0","99",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.54","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","2.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA)","3.0","ng/L","U","1.1","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","3.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA)","72","ng/L","","0.49","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","13","ng/L","","0.58","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","2.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDoA)","2.0","ng/L","U","0.55","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","2.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","2.0","ng/L","U M","0.85","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","2.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","335-76-2","Perfluorodecanoic acid
(PFDA)","1.0","ng/L","U","0.31","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","1.0","ng/L","U","0.32","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","0.30","ng/L","J","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","140","ng/L","","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid

(PFBS)","1.0","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","1.0","ng/L","U M","0.25","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","1.0","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.0","ng/L","U","0.27","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","0.80","ng/L","J","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","3.0","ng/L","U","1.3","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","3.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA)","0.37","ng/L","J","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","STL00990","13C4
PFOA","110","ng/L","","-99","DL","","TRG","106","","-99","LOQ","YES","100","","250","10.0","100",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","STL00991","13C4
PFOS","100","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","95.6","","250","10.0","100",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","STL00992","13C4
PFBA","120","ng/L","","-99","DL","","TRG","116","","-99","LOQ","YES","100","","250","10.0","100",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","STL00993","13C2
PFHxA","110","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","100","","250","10.0","100",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","STL00994","18O2
PFHxS","100","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","94.6","","250","10.0","100",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","STL00995","13C5
PFNA","110","ng/L","","-99","DL","","TRG","114","","-99","LOQ","YES","100","","250","10.0","100",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","STL00996","13C2
PFDA","110","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","100","","250","10.0","100",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","STL00997","13C2
PFUnA","110","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","100","","250","10.0","100",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","STL00998","13C2
PFDoA","100","ng/L","","-99","DL","","TRG","103","","-99","LOQ","YES","100","","250","10.0","100",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","STL01056","13C8
FOSA","110","ng/L","","-99","DL","","TRG","105","","-99","LOQ","YES","100","","250","10.0","100",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","STL01892","13C4-
PFHpA","110","ng/L","","-99","DL","","TRG","112","","-99","LOQ","YES","100","","250","10.0","100",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","STL01893","13C5
PFPeA","110","ng/L","","-99","DL","","TRG","111","","-99","LOQ","YES","100","","250","10.0","100",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","STL02116","13C2-
PFTeDA","130","ng/L","","-99","DL","","TRG","132","","-99","LOQ","YES","100","","250","10.0","100",""
"TP-PFC-024-TPE","537 (modified)","RES","320-34072-3","TALSAC","STL02337","13C3-
PFBS","100","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","93.0","","250","10.0","100",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.53","DL","","TRG","","","3.9","LOQ","YES","-99","","254.5","10.0","2.0",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA)","2.9","ng/L","U","1.1","DL","","TRG","","","3.9","LOQ","YES","-99","","254.5","10.0","2.9",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA)","76","ng/L","","0.48","DL","","TRG","","","2.0","LOQ","YES","-99","","254.5","10.0","0.98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","13","ng/L","","0.57","DL","","TRG","","","3.9","LOQ","YES","-99","","254.5","10.0","2.0",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDoA)","2.0","ng/L","U","0.54","DL","","TRG","","","3.9","LOQ","YES","-99","","254.5","10.0","2.0",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","2.0","ng/L","U M","0.83","DL","","TRG","","","3.9","LOQ","YES","-99","","254.5","10.0","2.0",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","335-76-2","Perfluorodecanoic acid

(PFDA)","0.98","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","254.5","10.0","0.98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","0.98","ng/L","U","0.31","DL","","TRG","","","2.0","LOQ","YES","-99","","254.5","10.0","0.98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","0.35","ng/L","J","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","254.5","10.0","0.98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","140","ng/L","M","0.34","DL","","TRG","","","2.0","LOQ","YES","-99","","254.5","10.0","0.98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","0.29","ng/L","J","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","254.5","10.0","0.98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","0.98","ng/L","U M","0.25","DL","","TRG","","","2.0","LOQ","YES","-99","","254.5","10.0","0.98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","0.98","ng/L","U","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","254.5","10.0","0.98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","0.98","ng/L","U","0.27","DL","","TRG","","","2.0","LOQ","YES","-99","","254.5","10.0","0.98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","0.98","ng/L","U","0.28","DL","","TRG","","","2.0","LOQ","YES","-99","","254.5","10.0","0.98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","2.9","ng/L","U","1.3","DL","","TRG","","","3.9","LOQ","YES","-99","","254.5","10.0","2.9",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA)","0.98","ng/L","U","0.34","DL","","TRG","","","2.0","LOQ","YES","-99","","254.5","10.0","0.98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","STL00990","13C4
PFOA","110","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","98.2","","254.5","10.0","98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","STL00991","13C4
PFOS","99","ng/L","","-99","DL","","TRG","105","","-99","LOQ","YES","93.9","","254.5","10.0","98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","STL00992","13C4
PFBA","110","ng/L","","-99","DL","","TRG","114","","-99","LOQ","YES","98.2","","254.5","10.0","98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","STL00993","13C2
PFHxA","110","ng/L","","-99","DL","","TRG","113","","-99","LOQ","YES","98.2","","254.5","10.0","98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","STL00994","18O2
PFHxS","100","ng/L","","-99","DL","","TRG","110","","-99","LOQ","YES","92.9","","254.5","10.0","98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","STL00995","13C5
PFNA","110","ng/L","","-99","DL","","TRG","110","","-99","LOQ","YES","98.2","","254.5","10.0","98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","STL00996","13C2
PFDA","110","ng/L","","-99","DL","","TRG","111","","-99","LOQ","YES","98.2","","254.5","10.0","98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","STL00997","13C2
PFUnA","110","ng/L","","-99","DL","","TRG","110","","-99","LOQ","YES","98.2","","254.5","10.0","98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","STL00998","13C2
PFDoA","98","ng/L","","-99","DL","","TRG","100","","-99","LOQ","YES","98.2","","254.5","10.0","98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","STL01056","13C8
FOSA","110","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","98.2","","254.5","10.0","98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","STL01892","13C4-
PFHpA","110","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","98.2","","254.5","10.0","98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","STL01893","13C5
PFPeA","110","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","98.2","","254.5","10.0","98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","STL02116","13C2-
PFTeDA","120","ng/L","","-99","DL","","TRG","127","","-99","LOQ","YES","98.2","","254.5","10.0","98",""
"TP-PFC-024-TPE-D","537 (modified)","RES","320-34072-4","TALSAC","STL02337","13C3-
PFBS","98","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","91.4","","254.5","10.0","98",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","1763-23-
1","Perfluorooctanesulfonic acid
(PFOS)","38.3","ng/L","","0.54","DL","","SPK","103","","4.0","LOQ","YES","37.1","","250","10.0","2.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","2058-94-
8","Perfluoroundecanoic acid

(PFUnA)","33.2","ng/L","","1.1","DL","","SPK","83","","4.0","LOQ","YES","40.0","","250","10.0","3.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","2706-90-3","Perfluoropentanoic
acid (PFPeA)","36.7","ng/L","","0.49","DL","","SPK","92","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","307-24-4","Perfluorohexanoic
acid (PFHxA)","39.5","ng/L","","0.58","DL","","SPK","99","","4.0","LOQ","YES","40.0","","250","10.0","2.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","307-55-1","Perfluorododecanoic
acid (PFDoA)","36.9","ng/L","","0.55","DL","","SPK","92","","4.0","LOQ","YES","40.0","","250","10.0","2.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","335-67-1","Perfluorooctanoic
acid (PFOA)","36.6","ng/L","","0.85","DL","","SPK","91","","4.0","LOQ","YES","40.0","","250","10.0","2.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","335-76-2","Perfluorodecanoic
acid (PFDA)","39.7","ng/L","","0.31","DL","","SPK","99","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","335-77-
3","Perfluorodecanesulfonic acid
(PFDS)","38.3","ng/L","","0.32","DL","","SPK","99","","2.0","LOQ","YES","38.6","","250","10.0","1.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","355-46-
4","Perfluorohexanesulfonic acid
(PFHxS)","36.1","ng/L","","0.30","DL","","SPK","99","","2.0","LOQ","YES","36.4","","250","10.0","1.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","375-22-4","Perfluorobutanoic
acid (PFBA)","40.8","ng/L","M","0.35","DL","","SPK","102","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","375-73-
5","Perfluorobutanesulfonic acid
(PFBS)","38.2","ng/L","","0.30","DL","","SPK","108","","2.0","LOQ","YES","35.4","","250","10.0","1.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","375-85-9","Perfluoroheptanoic
acid (PFHpA)","41.6","ng/L","","0.25","DL","","SPK","104","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","375-92-
8","Perfluoroheptanesulfonic Acid
(PFHpS)","40.6","ng/L","","0.30","DL","","SPK","107","","2.0","LOQ","YES","38.1","","250","10.0","1.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","375-95-1","Perfluorononanoic
acid (PFNA)","38.7","ng/L","","0.27","DL","","SPK","97","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","376-06-
7","Perfluorotetradecanoic acid
(PFTeA)","37.5","ng/L","","0.29","DL","","SPK","94","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","72629-94-
8","Perfluorotridecanoic Acid
(PFTriA)","42.1","ng/L","","1.3","DL","","SPK","105","","4.0","LOQ","YES","40.0","","250","10.0","3.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","754-91-6","Perfluorooctane
Sulfonamide
(FOSA)","42.3","ng/L","","0.35","DL","","SPK","106","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","STL00990","13C4
PFOA","110","ng/L","","-99","DL","","SPK","110","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","STL00991","13C4
PFOS","101","ng/L","","-99","DL","","SPK","105","","-99","LOQ","YES","95.6","","250","10.0","100",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","STL00992","13C4
PFBA","115","ng/L","M","-99","DL","","SPK","115","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","STL00993","13C2
PFHxA","107","ng/L","","-99","DL","","SPK","107","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","STL00994","18O2
PFHxS","102","ng/L","","-99","DL","","SPK","108","","-99","LOQ","YES","94.6","","250","10.0","100",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","STL00995","13C5
PFNA","111","ng/L","","-99","DL","","SPK","111","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","STL00996","13C2
PFDA","113","ng/L","","-99","DL","","SPK","113","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","STL00997","13C2
PFUnA","110","ng/L","","-99","DL","","SPK","110","","-99","LOQ","YES","100","","250","10.0","100",""

"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","STL00998","13C2 PFDoA","111","ng/L","","-99","DL","","SPK","111","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","STL01056","13C8 FOSA","103","ng/L","","-99","DL","","SPK","103","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","STL01892","13C4-PFHpA","108","ng/L","","-99","DL","","SPK","108","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","STL01893","13C5 PFPeA","111","ng/L","","-99","DL","","SPK","111","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","STL02116","13C2-PFTeDA","126","ng/L","","-99","DL","","SPK","126","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-199444/2-A","537 (modified)","RES","LCS 320-199444/2-A","TALSAC","STL02337","13C3-PFBS","98.8","ng/L","","-99","DL","","SPK","106","","-99","LOQ","YES","93.0","","250","10.0","100",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","36.4","ng/L","M","0.54","DL","","SPK","98","5","4.0","LOQ","YES","37.1","LCS 320-199444/2-A","250","10.0","2.0",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","35.9","ng/L","","1.1","DL","","SPK","90","8","4.0","LOQ","YES","40.0","LCS 320-199444/2-A","250","10.0","3.0",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","38.4","ng/L","","0.49","DL","","SPK","96","4","2.0","LOQ","YES","40.0","LCS 320-199444/2-A","250","10.0","1.0",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","38.1","ng/L","","0.58","DL","","SPK","95","3","4.0","LOQ","YES","40.0","LCS 320-199444/2-A","250","10.0","2.0",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","42.4","ng/L","","0.55","DL","","SPK","106","14","4.0","LOQ","YES","40.0","LCS 320-199444/2-A","250","10.0","2.0",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","38.0","ng/L","","0.85","DL","","SPK","95","4","4.0","LOQ","YES","40.0","LCS 320-199444/2-A","250","10.0","2.0",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","39.6","ng/L","","0.31","DL","","SPK","99","0","2.0","LOQ","YES","40.0","LCS 320-199444/2-A","250","10.0","1.0",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","34.5","ng/L","","0.32","DL","","SPK","89","10","2.0","LOQ","YES","38.6","LCS 320-199444/2-A","250","10.0","1.0",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","35.2","ng/L","","0.30","DL","","SPK","97","2","2.0","LOQ","YES","36.4","LCS 320-199444/2-A","250","10.0","1.0",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","41.8","ng/L","M","0.35","DL","","SPK","105","3","2.0","LOQ","YES","40.0","LCS 320-199444/2-A","250","10.0","1.0",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36.8","ng/L","","0.30","DL","","SPK","104","4","2.0","LOQ","YES","35.4","LCS 320-199444/2-A","250","10.0","1.0",""

"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","39.2","ng/L","","0.25","DL","","SPK","98","6","2.0","LOQ","YES","40.0","LCS 320-199444/2-A","250","10.0","1.0",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","37.8","ng/L","","0.30","DL","","SPK","99","7","2.0","LOQ","YES","38.1","LCS 320-199444/2-A","250","10.0","1.0",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","39.8","ng/L","","0.27","DL","","SPK","99","3","2.0","LOQ","YES","40.0","LCS 320-199444/2-A","250","10.0","1.0",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","39.1","ng/L","","0.29","DL","","SPK","98","4","2.0","LOQ","YES","40.0","LCS 320-199444/2-A","250","10.0","1.0",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","48.8","ng/L","","1.3","DL","","SPK","122","15","4.0","LOQ","YES","40.0","LCS 320-199444/2-A","250","10.0","3.0",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","42.5","ng/L","","0.35","DL","","SPK","106","0","2.0","LOQ","YES","40.0","LCS 320-199444/2-A","250","10.0","1.0",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","STL00990","13C4 PFOA","103","ng/L","","-99","DL","","SPK","103","","-99","LOQ","YES","100","LCS 320-199444/2-A","250","10.0","100",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","STL00991","13C4 PFOS","101","ng/L","","-99","DL","","SPK","106","","-99","LOQ","YES","95.6","LCS 320-199444/2-A","250","10.0","100",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","STL00992","13C4 PFBA","108","ng/L","M","-99","DL","","SPK","108","","-99","LOQ","YES","100","LCS 320-199444/2-A","250","10.0","100",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","STL00993","13C2 PFHxA","104","ng/L","","-99","DL","","SPK","104","","-99","LOQ","YES","100","LCS 320-199444/2-A","250","10.0","100",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","STL00994","18O2 PFHxS","99.0","ng/L","","-99","DL","","SPK","105","","-99","LOQ","YES","94.6","LCS 320-199444/2-A","250","10.0","100",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","STL00995","13C5 PFNA","106","ng/L","","-99","DL","","SPK","106","","-99","LOQ","YES","100","LCS 320-199444/2-A","250","10.0","100",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","STL00996","13C2 PFDA","113","ng/L","","-99","DL","","SPK","113","","-99","LOQ","YES","100","LCS 320-199444/2-A","250","10.0","100",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","STL00997","13C2 PFUnA","102","ng/L","","-99","DL","","SPK","102","","-99","LOQ","YES","100","LCS 320-199444/2-A","250","10.0","100",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","STL00998","13C2 PFDoA","98.1","ng/L","","-99","DL","","SPK","98","","-99","LOQ","YES","100","LCS 320-199444/2-A","250","10.0","100",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","STL01056","13C8 FOSA","96.1","ng/L","","-99","DL","","SPK","96","","-99","LOQ","YES","100","LCS 320-199444/2-A","250","10.0","100",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","STL01892","13C4-PFHpA","107","ng/L","","-99","DL","","SPK","107","","-99","LOQ","YES","100","LCS 320-199444/2-

A","250","10.0","100",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","STL01893","13C5 PFPeA","104","ng/L","","-99","DL","","SPK","104","","-99","LOQ","YES","100","LCS 320-199444/2-A","250","10.0","100",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","STL02116","13C2-PFTeDA","115","ng/L","","-99","DL","","SPK","115","","-99","LOQ","YES","100","LCS 320-199444/2-A","250","10.0","100",""
"LCSD 320-199444/3-A","537 (modified)","RES","LCSD 320-199444/3-A","TALSAC","STL02337","13C3-PFBS","97.8","ng/L","","-99","DL","","SPK","105","","-99","LOQ","YES","93.0","LCS 320-199444/2-A","250","10.0","100",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","2.0","ng/L","U","0.54","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","2.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","3.0","ng/L","U","1.1","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","3.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","1.0","ng/L","U","0.49","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","2.0","ng/L","U","0.58","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","2.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","2.0","ng/L","U","0.55","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","2.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","2.0","ng/L","U M","0.85","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","2.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","1.0","ng/L","U","0.31","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","1.0","ng/L","U","0.32","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","1.0","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","1.0","ng/L","U","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","1.0","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","1.0","ng/L","U","0.25","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","1.0","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","1.0","ng/L","U","0.27","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","1.0","ng/L","U","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","3.0","ng/L","U","1.3","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","3.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","1.0","ng/L","U","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","STL00990","13C4 PFOA","112","ng/L","","-99","DL","","TRG","112","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","STL00991","13C4 PFOS","112","ng/L","","-99","DL","","TRG","117","","-99","LOQ","YES","95.6","","250","10.0","100",""

"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","STL00992","13C4 PFBA","120","ng/L","M","-99","DL","","TRG","120","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","STL00993","13C2 PFHxA","114","ng/L","","-99","DL","","TRG","114","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","STL00994","18O2 PFHxS","111","ng/L","","-99","DL","","TRG","118","","-99","LOQ","YES","94.6","","250","10.0","100",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","STL00995","13C5 PFNA","115","ng/L","","-99","DL","","TRG","115","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","STL00996","13C2 PFDA","121","ng/L","","-99","DL","","TRG","121","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","STL00997","13C2 PFUnA","110","ng/L","","-99","DL","","TRG","110","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","STL00998","13C2 PFDoA","109","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","STL01056","13C8 FOSA","110","ng/L","","-99","DL","","TRG","110","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","STL01892","13C4-PFHpA","119","ng/L","","-99","DL","","TRG","119","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","STL01893","13C5 PFPeA","115","ng/L","","-99","DL","","TRG","115","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","STL02116","13C2-PFTeDA","126","ng/L","","-99","DL","","TRG","126","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-199444/1-A","537 (modified)","RES","MB 320-199444/1-A","TALSAC","STL02337","13C3-PFBS","109","ng/L","","-99","DL","","TRG","117","","-99","LOQ","YES","93.0","","250","10.0","100",""
"Unknown","Unknown","TP-PFC-024-TPI","12/07/2017 10:00","AQ","320-34072-1","NM","","1.40","537 (modified)","3535","RES","12/12/2017 08:28","12/12/2017 22:06","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199444","320-199444","NA","320-199646","320-34072-1","12/08/2017 10:15","12/11/2017 08:30",""
"Unknown","Unknown","TP-PFC-024-TPI","12/07/2017 10:00","AQ","320-34072-1","NM","","1.40","537 (modified)","3535","DL","12/12/2017 08:28","12/13/2017 15:11","TALSAC","COA","WET","NA","10","NA","NA","","100","320-199444","320-199444","NA","320-199735","320-34072-1","12/08/2017 10:15","12/11/2017 08:30",""
"Unknown","Unknown","TP-PFC-024-MID-CARBON","12/07/2017 09:40","AQ","320-34072-2","NM","","1.40","537 (modified)","3535","RES","12/12/2017 08:28","12/12/2017 22:14","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199444","320-199444","NA","320-199646","320-34072-1","12/08/2017 10:15","12/11/2017 08:30",""
"Unknown","Unknown","TP-PFC-024-TPE","12/07/2017 09:45","AQ","320-34072-3","NM","","1.40","537 (modified)","3535","RES","12/12/2017 08:28","12/12/2017 22:22","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199444","320-199444","NA","320-199646","320-34072-1","12/08/2017 10:15","12/11/2017 08:30",""
"Unknown","Unknown","TP-PFC-024-TPE-D","12/07/2017 00:00","AQ","320-34072-4","NM","","1.40","537 (modified)","3535","RES","12/12/2017 08:28","12/12/2017 22:29","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199444","320-199444","NA","320-199646","320-34072-1","12/08/2017 10:15","12/11/2017 08:30",""
"Unknown","Unknown","LCS 320-199444/2-A","","AQ","LCS 320-199444/2-A","LCS","","-99","537 (modified)","3535","RES","12/12/2017 08:28","12/12/2017 21:50","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199444","320-199444","NA","320-199646","320-34072-1","12/12/2017 08:28","12/11/2017 08:30",""
"Unknown","Unknown","LCSD 320-199444/3-A","","AQ","LCSD 320-199444/3-A","LCSD","","-99","537 (modified)","3535","RES","12/12/2017 08:28","12/12/2017 21:58","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199444","320-199444","NA","320-199646","320-34072-1","12/12/2017 08:28","12/11/2017 08:30",""
"Unknown","Unknown","MB 320-199444/1-A","","AQ","MB 320-199444/1-A","MB","","-99","537 (modified)","3535","RES","12/12/2017 08:28","12/12/2017

21:42","TALSAC","COA","WET","NA","1","NA","NA","","100","320-199444","320-199444","NA","320-199646","320-34072-1","12/12/2017 08:28","12/11/2017 08:30",""

TETRA TECH **INTERNAL CORRESPONDENCE**

TO: **J. ORIENT** **DATE:** **JANUARY 4, 2018**

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) 320-34072-1

SAMPLES: 4/Aqueous/PFAS

TP-PFC-024-MID-CARBON TP-PFC-024-TPE TP-PFC-024-TPE-D
TP-PFC-024-TPI

Overview

The sample set for former NAS Brunswick, SDG 320-34072-1 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-024-TPE/TP-PFC-024-TPE-D.

The samples were collected by Tetra Tech, Inc. on December 7, 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.

SURROGATE SPIKE RECOVERIES

The labeled surrogate compound, 13C5-perfluoropentanoic acid (13C5-PFPeA), had a Percent Recovery (%R) above the upper quality control limit in sample TP-PFC-024-TPI. As stated in the laboratory case narrative, a confirmation run verified the result. The detected result reported for the associated PFAS compound was qualified as estimated, (J), in this sample.

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-024-TPI. The sample was reanalyzed at a 10X 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: One labeled surrogate compound %R was high in one sample.

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.

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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

PROJ_NO: 08005-WE21	NSAMPLE	TP-PFC-024-MID-CARBON			TP-PFC-024-TPE			TP-PFC-024-TPE-D			TP-PFC-024-TPI		
SDG: 320-34072-1	LAB_ID	320-34072-2			320-34072-3			320-34072-4			320-34072-1		
FRACTION: PFAS	SAMP_DATE	12/7/2017			12/7/2017			12/7/2017			12/7/2017		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF							TP-PFC-024-TPE					
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		4.2			2	U		2	U				
PERFLUOROBUTANESULFONIC ACID		0.59	J	P	1	U		0.29	J	P	50		
PERFLUOROBUTANOIC ACID		140			140			140			77		
PERFLUORODECANE SULFONIC ACID		0.99	U		1	U		0.98	U		1	U	
PERFLUORODECANOIC ACID		0.99	U		1	U		0.98	U		0.79	J	P
PERFLUORODODECANOIC ACID		2	U		2	U		2	U		2	U	
PERFLUOROHEPTANESULFONIC ACID		0.99	U		1	U		0.98	U		6.5		
PERFLUOROHEPTANOIC ACID		0.5	J	P	1	U		0.98	U		73		
PERFLUOROHEXANESULFONIC ACID		0.51	J	P	0.3	J	P	0.35	J	P	370		
PERFLUOROHEXANOIC ACID		34			13			13			340		
PERFLUORONONANOIC ACID		0.99	U		1	U		0.98	U		2.7		
PERFLUOROOCTANE SULFONAMIDE		0.99	U		0.37	J	P	0.98	U		1	U	
PERFLUOROOCTANE SULFONIC ACID		2	U		2	U		2	U		350		
PERFLUOROPENTANOIC ACID		120			72			76			190	J	R
PERFLUOROTETRADECANOIC ACID		0.99	U		0.8	J	P	0.98	U		1	U	
PERFLUOROTRIDECANOIC ACID		3	U		3	U		2.9	U		3	U	
PERFLUOROUNDECANOIC ACID		3	U		3	U		2.9	U		3	U	

PROJ_NO: 08005-WE21	NSAMPLE	TP-PFC-024-TPI-DL		
SDG: 320-34072-1	LAB_ID	320-34072-1		
FRACTION: PFAS	SAMP_DATE	12/7/2017		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		1700		
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				

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

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-TPI | Lab Sample ID: 320-34072-1

Matrix: Water | Lab File ID: 2017.12.12LLB_006.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 10:00

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 248.8(mL) | Date Analyzed: 12/12/2017 22:06

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	77		2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	190		2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	340		4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	73		2.0	1.0	0.25
335-67-1	*Perfluorooctanoic acid (PFOA)*	*1200*	*M E*	*4.0*	2.0	*0.85*
375-95-1	Perfluorononanoic acid (PFNA)	2.7		2.0	1.0	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	0.79	J	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)	50		2.0	1.0	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	370		2.0	1.0	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	6.5		2.0	1.0	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	350	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.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-TPI | Lab Sample ID: 320-34072-1

Matrix: Water | Lab File ID: 2017.12.12LLB_006.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 10:00

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 248.8(mL) | Date Analyzed: 12/12/2017 22:06

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	132		25-150
STL00992	13C4 PFBA	135		25-150
STL00993	13C2 PFHxA	132		25-150
STL00990	13C4 PFOA	109		25-150
STL00995	13C5 PFNA	136		25-150
STL00996	13C2 PFDA	139		25-150
STL00997	13C2 PFUnA	134		25-150
STL00998	13C2 PFDoA	128		25-150
STL00994	18O2 PFHxS	131		25-150
STL00991	13C4 PFOS	137		25-150
STL02116	13C2-PFTeDA	144		25-150
STL01892	13C4-PFHpA	128		25-150
STL01893	13C5 PFPeA	156	Q	25-150
STL02337	13C3-PFBS	148		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-TPI DL | Lab Sample ID: 320-34072-1 DL

Matrix: Water | Lab File ID: 2017.12.13LLA_025.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 10:00

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 248.8(mL) | Date Analyzed: 12/13/2017 15:11

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199735 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	*Perfluorobutanoic acid (PFBA)*	*74*	*D*	*20*	10	*3.5*
2706-90-3	*Perfluoropentanoic acid (PFPeA)*	*200*	*D*	*20*	10	*4.9*
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*350*	*D*	*40*	20	*5.8*
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*72*	*D*	*20*	10	*2.5*
335-67-1	Perfluorooctanoic acid (PFOA)	1700	D M	40	20	8.5
375-95-1	*Perfluorononanoic acid (PFNA)*	*10*	*U*	*20*	10	*2.7*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*10*	*U*	*20*	10	*3.1*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*30*	*U*	*40*	30	*11*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*20*	*U*	*40*	20	*5.5*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*30*	*U*	*40*	30	*13*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*10*	*U*	*20*	10	*2.9*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*51*	*D*	*20*	10	*3.0*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*420*	*D*	*20*	10	*3.0*
375-92-8	*Perfluoroheptanesulfonic Acid (PFHpS)*	*8.8*	*J D*	*20*	10	*3.0*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*360*	*D*	*40*	20	*5.4*
335-77-3	*Perfluorodecanesulfonic acid (PFDS)*	*10*	*U*	*20*	10	*3.2*
754-91-6	*Perfluorooctane Sulfonamide (FOSA)*	*10*	*U*	*20*	10	*3.5*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-TPI DL | Lab Sample ID: 320-34072-1 DL

Matrix: Water | Lab File ID: 2017.12.13LLA_025.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 10:00

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 248.8(mL) | Date Analyzed: 12/13/2017 15:11

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199735 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	101		25-150
STL00992	13C4 PFBA	114		25-150
STL00993	13C2 PFHxA	110		25-150
STL00990	13C4 PFOA	109		25-150
STL00995	13C5 PFNA	105		25-150
STL00996	13C2 PFDA	102		25-150
STL00997	13C2 PFUnA	102		25-150
STL00998	13C2 PFDoA	101		25-150
STL00994	18O2 PFHxS	111		25-150
STL00991	13C4 PFOS	104		25-150
STL02116	13C2-PFTeDA	98		25-150
STL01892	13C4-PFHpA	113		25-150
STL01893	13C5 PFPeA	114		25-150
STL02337	13C3-PFBS	110		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-MID-CARBON | Lab Sample ID: 320-34072-2

Matrix: Water | Lab File ID: 2017.12.12LLB_007.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 09:40

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 253.6(mL) | Date Analyzed: 12/12/2017 22:14

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	140	M	2.0	0.99	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	120		2.0	0.99	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	34		3.9	2.0	0.57
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.50	J M	2.0	0.99	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	4.2	M	3.9	2.0	0.84
375-95-1	Perfluorononanoic acid (PFNA)	0.99	U	2.0	0.99	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	0.99	U	2.0	0.99	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	3.0	U	3.9	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	3.9	2.0	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	3.9	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.99	U	2.0	0.99	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.59	J	2.0	0.99	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.51	J	2.0	0.99	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.99	U	2.0	0.99	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	3.9	2.0	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.99	U	2.0	0.99	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.99	U	2.0	0.99	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-MID-CARBON | Lab Sample ID: 320-34072-2

Matrix: Water | Lab File ID: 2017.12.12LLB_007.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 09:40

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 253.6(mL) | Date Analyzed: 12/12/2017 22:14

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	101		25-150
STL00992	13C4 PFBA	113		25-150
STL00993	13C2 PFHxA	108		25-150
STL00990	13C4 PFOA	108		25-150
STL00995	13C5 PFNA	109		25-150
STL00996	13C2 PFDA	106		25-150
STL00997	13C2 PFUnA	102		25-150
STL00998	13C2 PFDoA	100		25-150
STL00994	18O2 PFHxS	106		25-150
STL00991	13C4 PFOS	107		25-150
STL02116	13C2-PFTeDA	123		25-150
STL01892	13C4-PFHpA	110		25-150
STL01893	13C5 PFPeA	112		25-150
STL02337	13C3-PFBS	101		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-TPE | Lab Sample ID: 320-34072-3

Matrix: Water | Lab File ID: 2017.12.12LLB_008.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 09:45

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 250(mL) | Date Analyzed: 12/12/2017 22:22

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	140		2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	72		2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	13		4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.0	U M	2.0	1.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	U M	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)	0.80	J	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)	0.30	J	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)	2.0	U	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)	0.37	J	2.0	1.0	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-TPE | Lab Sample ID: 320-34072-3

Matrix: Water | Lab File ID: 2017.12.12LLB_008.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 09:45

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 250(mL) | Date Analyzed: 12/12/2017 22:22

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	105		25-150
STL00992	13C4 PFBA	116		25-150
STL00993	13C2 PFHxA	107		25-150
STL00990	13C4 PFOA	106		25-150
STL00995	13C5 PFNA	114		25-150
STL00996	13C2 PFDA	109		25-150
STL00997	13C2 PFUnA	107		25-150
STL00998	13C2 PFDoA	103		25-150
STL00994	18O2 PFHxS	108		25-150
STL00991	13C4 PFOS	107		25-150
STL02116	13C2-PFTeDA	132		25-150
STL01892	13C4-PFHpA	112		25-150
STL01893	13C5 PFPeA	111		25-150
STL02337	13C3-PFBS	108		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-TPE-D | Lab Sample ID: 320-34072-4

Matrix: Water | Lab File ID: 2017.12.12LLB_009.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 00:00

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 254.5(mL) | Date Analyzed: 12/12/2017 22:29

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	140	M	2.0	0.98	0.34
2706-90-3	Perfluoropentanoic acid (PFPeA)	76		2.0	0.98	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	13		3.9	2.0	0.57
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.98	U M	2.0	0.98	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	U M	3.9	2.0	0.83
375-95-1	Perfluorononanoic acid (PFNA)	0.98	U	2.0	0.98	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	0.98	U	2.0	0.98	0.30
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.9	U	3.9	2.9	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	3.9	2.0	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.9	U	3.9	2.9	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.98	U	2.0	0.98	0.28
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.29	J	2.0	0.98	0.29
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.35	J	2.0	0.98	0.29
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.98	U	2.0	0.98	0.29
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	3.9	2.0	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.98	U	2.0	0.98	0.31
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.98	U	2.0	0.98	0.34

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: TP-PFC-024-TPE-D | Lab Sample ID: 320-34072-4

Matrix: Water | Lab File ID: 2017.12.12LLB_009.d

Analysis Method: 537 (modified) | Date Collected: 12/07/2017 00:00

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 254.5(mL) | Date Analyzed: 12/12/2017 22:29

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	107		25-150
STL00992	13C4 PFBA	114		25-150
STL00993	13C2 PFHxA	113		25-150
STL00990	13C4 PFOA	108		25-150
STL00995	13C5 PFNA	110		25-150
STL00996	13C2 PFDA	111		25-150
STL00997	13C2 PFUnA	110		25-150
STL00998	13C2 PFDoA	100		25-150
STL00994	18O2 PFHxS	110		25-150
STL00991	13C4 PFOS	105		25-150
STL02116	13C2-PFTeDA	127		25-150
STL01892	13C4-PFHpA	108		25-150
STL01893	13C5 PFPeA	109		25-150
STL02337	13C3-PFBS	107		25-150

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

NAS BRUNSWICK
SDG 320-34072-1

SAMPLE IDENTIFICATION	TP-PFC-024-TPI	
COMPOUND	PENTADECAFLUOROOCTANOIC ACID	
COMPOUND AREA	10083421	
INTERNAL STANDARD AMOUNT (ng/ml)	0.25	
DILUTION FACTOR	10	
INTERNAL STANDARD AREA	573739	
AVERAGE RRF	1.0666	
SAMPLE VOLUME (ml)	248.8	
VOLUME EXTRACT (ml)	10	
VOLUME INJECTED (µl)	1	
ml to L	1000	
CONCENTRATION =	1655.70	ng/L

10083421 x 0.25ng/ml x 1000ml x 10ml x 10/(573739 x 1.0666 x 248.8ml x 1µl x 1L)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51718.b\2017.12.13LLA_025.d
Lims ID: 320-34072-A-1-A
Client ID: TP-PFC-024-TPI
Sample Type: Client
Inject. Date: 13-Dec-2017 15:11:02 ALS Bottle#: 18 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-34072-a-1-a 10X
Misc. Info.: Plate: 1 Rack: 4
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171213-51718.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 13-Dec-2017 15:35:12 Calib Date: 04-Dec-2017 16:51:48
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171204-51297.b\2017.12.04ICAL_010.d

Column 1 : Det: EXP1
Process Host: XAWRK047

First Level Reviewer: hannigana Date: 13-Dec-2017 15:35:12

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	1.399	1.401	-0.002	0.535	868477	0.2845		114	5812	
2 Perfluorobutyric acid										
212.90 > 169.00	1.404	1.402	0.002	1.004	583974	0.1850			135	
D 3 13C5-PFPeA										
267.90 > 223.00	1.648	1.646	0.002	0.631	543107	0.2852		114	5563	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.648	1.648	0.0	1.000	1237747	0.4896			774	
D 47 13C3-PFBS										
301.90 > 83.00	1.681	1.681	0.0	0.643	10167	0.2568		110	323	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.681	1.682	-0.001	1.000	418951	0.1259			1386	
298.90 > 99.00	1.681	1.682	-0.001	1.000	184450		2.27(1.25-3.74)		1022	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.924	1.923	0.001	1.000	1914738	0.8755			3855	
313.00 > 119.00	1.924	1.923	0.001	1.000	162376		11.79(5.03-15.10)		2688	
D 7 13C2 PFHxA										
315.00 > 270.00	1.924	1.924	0.0	0.736	535577	0.2738		110	6078	
D 9 13C4-PFHpA										
367.00 > 322.00	2.260	2.254	0.006	0.865	538540	0.2831		113	7667	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.249	2.255	-0.006	0.995	400387	0.1789			644	
363.00 > 169.00	2.249	2.255	-0.006	0.995	154497		2.59(1.13-3.40)		1250	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.270	2.269	0.001	1.000	2912750	1.04			14658	
399.00 > 99.00	2.270	2.269	0.001	1.000	919269		3.17(1.50-4.49)		4322	
D 11 18O2 PFHxS										
403.00 > 84.00	2.270	2.271	-0.001	0.869	623319	0.2617		111	16645	

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	2.613	2.618	-0.005	1.000	573739	0.2725		109	11437	
* 62 13C2-PFOA										
415.00 > 370.00	2.613	2.619	-0.006		512542	0.2500			8174	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.613	2.621	-0.008	1.000	10083421	4.12			4979	
413.00 > 169.00	2.613	2.621	-0.008	1.000	6000991		1.68(0.84-2.52)		17733	M
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.628	2.626	0.002	1.000	46050	0.0219			147	
449.00 > 99.00	2.620	2.626	-0.006	0.997	16875		2.73(1.94-5.82)		216	
D 18 13C4 PFOS										
503.00 > 80.00	2.987	2.993	-0.006	1.143	385973	0.2492		104	8602	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.987	2.994	-0.007	1.000	1497465	0.8947			4200	
499.00 > 99.00	2.987	2.994	-0.007	1.000	334372		4.48(2.31-6.93)		3842	
D 19 13C5 PFNA										
468.00 > 423.00	2.987	2.994	-0.007	1.143	400394	0.2631		105	8059	
D 23 13C2 PFDA										
515.00 > 470.00	3.351	3.356	-0.005	1.282	328371	0.2546		102	6370	
D 21 13C8 FOSA										
506.00 > 78.00	3.351	3.359	-0.008	1.282	526725	0.2526		101	7761	
D 30 13C2 PFUnA										
565.00 > 520.00	3.674	3.685	-0.011	1.406	252485	0.2542		102	5672	
D 36 13C2 PFDoA										
615.00 > 570.00	3.975	3.979	-0.004	1.521	279984	0.2532		101	6105	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.474	4.481	-0.007	1.712	317123	0.2461		98.5	3792	

QC Flag Legend

Review Flags

M - Manually Integrated

ANALYTE	ORIGINAL	DUPLICATE	RL	RPD	RPD > 30%	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2xRL
PERFLUOROBUTANESULFONIC ACID	1	0.29	2	110.08	TRUE	FALSE	FALSE	FALSE
PERFLUOROBUTANOIC ACID	140	140	2	0.00	FALSE	TRUE	TRUE	FALSE
PERFLUOROHEXANESULFONIC ACID	0.3	0.35	2	15.38	FALSE	FALSE	FALSE	FALSE
PERFLUOROHEXANOIC ACID	13	13	4	0.00	FALSE	TRUE	TRUE	FALSE
PERFLUOROOCTANE SULFONAMIDE	0.37	0.98	2	90.37	TRUE	FALSE	FALSE	FALSE
PERFLUOROPENTANOIC ACID	72	76	2	5.41	FALSE	TRUE	TRUE	FALSE

SDG 320-34072-1

TP-PFC-024-TPE/TP-PFC-024-TPE-D

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record 242021

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 Lamontagne	Date: 11/9/17	COC No: 242021
Company Name: Tetra Tech	Tel/Fax: (412) 921-8650	Lab Contact: David Alltucker	Carrier: Fed Ex	1 of 1 COCs
Address: 881 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: (401) 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# 112G08005-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-024-TPI	12/7/17	~~0935~~ 1000	G	W	4	N	N	x	
TP-PFC-024-MID-CARBON		0940			4	N	N	x	
TP-PFC-024-TPE		0945			4	N	N	x	
TP-PFC-024-TPE-D		0000			4	N	N	x	

320-34072 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.: | Cooler Temp. (°C): Obs'd: 1.4 Corr'd: ____ | Therm ID No.: AK3

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Tetra Tech	12/7/17 1500	[signature]	TAWS	12/8/17 1015
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: 320-34072-1

Login Number: 34072
List Number: 1
Creator: Her, David A

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?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Narrative
320-34072-1

Receipt
The samples were received on 12/8/2017 10:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4° 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-024-TPI (320-34072-1). This analyte has been qualified; however, the peak did not saturate the instrument detector. A 10X dilution will be performed and that data will be reported as the primary data.

Method(s) 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for 13C5 PFPeA the following sample: TP-PFC-024-TPI (320-34072-1). A confirmation run of this sample confirmed the high IDA recovery. Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method(s) 537 (modified): The following sample was diluted to bring the concentration of Perfluorooctanoic acid (PFOA) within the calibration range: TP-PFC-024-TPI (320-34072-1). 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 preparation batch 320-199444.

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

Qualifiers

LCMS

Qualifier	Qualifier Description
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
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)

Method Summary

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

TestAmerica Job ID: 320-34072-1

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: 320-34072-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-34072-1	TP-PFC-024-TPI	Water	12/07/17 10:00	12/08/17 10:15
320-34072-2	TP-PFC-024-MID-CARBON	Water	12/07/17 09:40	12/08/17 10:15
320-34072-3	TP-PFC-024-TPE	Water	12/07/17 09:45	12/08/17 10:15
320-34072-4	TP-PFC-024-TPE-D	Water	12/07/17 00:00	12/08/17 10:15

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	PFBS #	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #
TP-PFC-024-TPI	320-34072-1	135	156 Q	148	132	128	131	109	136
TP-PFC-024-TPI DL	320-34072-1 DL	114	114	110	110	113	111	109	105
TP-PFC-024-MID-CARBON	320-34072-2	113	112	101	108	110	106	108	109
TP-PFC-024-TPE	320-34072-3	116	111	108	107	112	108	106	114
TP-PFC-024-TPE-D	320-34072-4	114	109	107	113	108	110	108	110
	MB 320-199444/1-A	120 M	115	117	114	119	118	112	115
	LCS 320-199444/2-A	115 M	111	106	107	108	108	110	111
	LCSD 320-199444/3-A	108 M	104	105	104	107	105	103	106

	QC LIMITS
PFBA = 13C4 PFBA	25-150
PFPeA = 13C5 PFPeA	25-150
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.: 320-34072-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFOS #	PFOSA #	PFDA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-024-TPI	320-34072-1	137	132	139	134	128	144
TP-PFC-024-TPI DL	320-34072-1 DL	104	101	102	102	101	98
TP-PFC-024-MID-CARBON	320-34072-2	107	101	106	102	100	123
TP-PFC-024-TPE	320-34072-3	107	105	109	107	103	132
TP-PFC-024-TPE-D	320-34072-4	105	107	111	110	100	127
	MB 320-199444/1-A	117	110	121	110	109	126
	LCS 320-199444/2-A	105	103	113	110	111	126
	LCSD 320-199444/3-A	106	96	113	102	98	115

	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.: 320-34072-1

SDG No.:

Lab File ID: 2017.12.12LLB_003.d Lab Sample ID: MB 320-199444/1-A

Matrix: Water Date Extracted: 12/12/2017 08:28

Instrument ID: A8_N Date Analyzed: 12/12/2017 21:42

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-199444/2-A	2017.12.12LLB_004.d	12/12/2017 21:50
	LCSD 320-199444/3-A	2017.12.12LLB_005.d	12/12/2017 21:58
TP-PFC-024-TPI	320-34072-1	2017.12.12LLB_006.d	12/12/2017 22:06
TP-PFC-024-MID-CARBON	320-34072-2	2017.12.12LLB_007.d	12/12/2017 22:14
TP-PFC-024-TPE	320-34072-3	2017.12.12LLB_008.d	12/12/2017 22:22
TP-PFC-024-TPE-D	320-34072-4	2017.12.12LLB_009.d	12/12/2017 22:29
TP-PFC-024-TPI DL	320-34072-1 DL	2017.12.13LLA_025.d	12/13/2017 15:11

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-34072-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-199444/1-A

Matrix: Water | Lab File ID: 2017.12.12LLB_003.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 12/12/2017 08:28

Sample wt/vol: 250(mL) | Date Analyzed: 12/12/2017 21:42

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 | 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 M	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)	2.0	U	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.: 320-34072-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-199444/1-A

Matrix: Water Lab File ID: 2017.12.12LLB_003.d

Analysis Method: 537 (modified) Date Collected:

Extraction Method: 3535 Date Extracted: 12/12/2017 08:28

Sample wt/vol: 250(mL) Date Analyzed: 12/12/2017 21:42

Con. Extract Vol.: 10.0(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

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

Analysis Batch No.: 199646 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	110		25-150
STL00992	13C4 PFBA	120	M	25-150
STL00993	13C2 PFHxA	114		25-150
STL00990	13C4 PFOA	112		25-150
STL00995	13C5 PFNA	115		25-150
STL00996	13C2 PFDA	121		25-150
STL00997	13C2 PFUnA	110		25-150
STL00998	13C2 PFDoA	109		25-150
STL00994	18O2 PFHxS	118		25-150
STL00991	13C4 PFOS	117		25-150
STL02116	13C2-PFTeDA	126		25-150
STL01892	13C4-PFHpA	119		25-150
STL01893	13C5 PFPeA	115		25-150
STL02337	13C3-PFBS	117		25-150

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.12.12LLB_004.d

Lab ID: LCS 320-199444/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	40.8	102	89-128	M
Perfluoropentanoic acid (PFPeA)	40.0	36.7	92	66-136	
Perfluorohexanoic acid (PFHxA)	40.0	39.5	99	86-126	
Perfluoroheptanoic acid (PFHpA)	40.0	41.6	104	89-127	
Perfluorooctanoic acid (PFOA)	40.0	36.6	91	80-120	
Perfluorononanoic acid (PFNA)	40.0	38.7	97	77-137	
Perfluorodecanoic acid (PFDA)	40.0	39.7	99	84-123	
Perfluoroundecanoic acid (PFUnA)	40.0	33.2	83	73-122	
Perfluorododecanoic acid (PFDoA)	40.0	36.9	92	82-122	
Perfluorotridecanoic Acid (PFTriA)	40.0	42.1	105	56-163	
Perfluorotetradecanoic acid (PFTeA)	40.0	37.5	94	66-120	
Perfluorobutanesulfonic acid (PFBS)	35.4	38.2	108	88-130	
Perfluorohexanesulfonic acid (PFHxS)	36.4	36.1	99	87-126	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	40.6	107	92-135	
Perfluorooctanesulfonic acid (PFOS)	37.1	38.3	103	83-126	
Perfluorodecanesulfonic acid (PFDS)	38.6	38.3	99	80-129	
Perfluorooctane Sulfonamide (FOSA)	40.0	42.3	106	91-133	
13C8 FOSA	100	103	103	25-150	
13C4 PFBA	100	115	115	25-150	M
13C2 PFHxA	100	107	107	25-150	
13C4 PFOA	100	110	110	25-150	
13C5 PFNA	100	111	111	25-150	
13C2 PFDA	100	113	113	25-150	
13C2 PFUnA	100	110	110	25-150	
13C2 PFDoA	100	111	111	25-150	
18O2 PFHxS	94.6	102	108	25-150	
13C4 PFOS	95.6	101	105	25-150	
13C2-PFTeDA	100	126	126	25-150	
13C4-PFHpA	100	108	108	25-150	
13C5 PFPeA	100	111	111	25-150	
13C3-PFBS	93.0	98.8	106	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.: 320-34072-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.12.12LLB_005.d

Lab ID: LCSD 320-199444/3-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	41.8	105	3	30	89-128	M
Perfluoropentanoic acid (PFPeA)	40.0	38.4	96	4	30	66-136	
Perfluorohexanoic acid (PFHxA)	40.0	38.1	95	3	30	86-126	
Perfluoroheptanoic acid (PFHpA)	40.0	39.2	98	6	30	89-127	
Perfluorooctanoic acid (PFOA)	40.0	38.0	95	4	30	80-120	
Perfluorononanoic acid (PFNA)	40.0	39.8	99	3	30	77-137	
Perfluorodecanoic acid (PFDA)	40.0	39.6	99	0	30	84-123	
Perfluoroundecanoic acid (PFUnA)	40.0	35.9	90	8	30	73-122	
Perfluorododecanoic acid (PFDoA)	40.0	42.4	106	14	30	82-122	
Perfluorotridecanoic Acid (PFTriA)	40.0	48.8	122	15	30	56-163	
Perfluorotetradecanoic acid (PFTeA)	40.0	39.1	98	4	30	66-120	
Perfluorobutanesulfonic acid (PFBS)	35.4	36.8	104	4	30	88-130	
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.2	97	2	30	87-126	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	37.8	99	7	30	92-135	
Perfluorooctanesulfonic acid (PFOS)	37.1	36.4	98	5	30	83-126	M
Perfluorodecanesulfonic acid (PFDS)	38.6	34.5	89	10	30	80-129	
Perfluorooctane Sulfonamide (FOSA)	40.0	42.5	106	0	30	91-133	
13C8 FOSA	100	96.1	96			25-150	
13C4 PFBA	100	108	108			25-150	M
13C2 PFHxA	100	104	104			25-150	
13C4 PFOA	100	103	103			25-150	
13C5 PFNA	100	106	106			25-150	
13C2 PFDA	100	113	113			25-150	
13C2 PFUnA	100	102	102			25-150	
13C2 PFDoA	100	98.1	98			25-150	
18O2 PFHxS	94.6	99.0	105			25-150	
13C4 PFOS	95.6	101	106			25-150	
13C2-PFTeDA	100	115	115			25-150	
13C4-PFHpA	100	107	107			25-150	
13C5 PFPeA	100	104	104			25-150	
13C3-PFBS	93.0	97.8	105			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.: 320-34072-1

SDG No.:

Instrument ID: A8_N Start Date: 12/04/2017 15:48

Analysis Batch Number: 198210 End Date: 12/04/2017 17:31

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-198210/2		12/04/2017 15:48	1	2017.12.04ICAL_002.d	GeminiC18 3x100 3(mm)
IC 320-198210/3		12/04/2017 15:56	1	2017.12.04ICAL_003.d	GeminiC18 3x100 3(mm)
IC 320-198210/4		12/04/2017 16:04	1	2017.12.04ICAL_004.d	GeminiC18 3x100 3(mm)
IC 320-198210/5		12/04/2017 16:12	1	2017.12.04ICAL_005.d	GeminiC18 3x100 3(mm)
IC 320-198210/6		12/04/2017 16:20	1	2017.12.04ICAL_006.d	GeminiC18 3x100 3(mm)
IC 320-198210/7		12/04/2017 16:28	1	2017.12.04ICAL_007.d	GeminiC18 3x100 3(mm)
IC 320-198210/8		12/04/2017 16:36	1	2017.12.04ICAL_008.d	GeminiC18 3x100 3(mm)
IC 320-198210/9		12/04/2017 16:43	1	2017.12.04ICAL_009.d	GeminiC18 3x100 3(mm)
IC 320-198210/10		12/04/2017 16:51	1	2017.12.04ICAL_010.d	GeminiC18 3x100 3(mm)
ICB 320-198210/11		12/04/2017 16:59	1		GeminiC18 3x100 3(mm)
ICV 320-198210/12		12/04/2017 17:07	1	2017.12.04ICAL_012.d	GeminiC18 3x100 3(mm)
ZZZZZ		12/04/2017 17:15	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/04/2017 17:23	1		GeminiC18 3x100 3(mm)
CCVL 320-198210/15		12/04/2017 17:31	1		GeminiC18 3x100 3(mm)

537 (modified)

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1 Analy Batch No.: 198210

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/04/2017 15:48 Calibration End Date: 12/04/2017 16:51 Calibration ID: 36632

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-198210/2	2017.12.04ICAL_002.d
Level 2	IC 320-198210/3	2017.12.04ICAL_003.d
Level 3	IC 320-198210/4	2017.12.04ICAL_004.d
Level 4	IC 320-198210/5	2017.12.04ICAL_005.d
Level 5	IC 320-198210/6	2017.12.04ICAL_006.d
Level 6	IC 320-198210/7	2017.12.04ICAL_007.d
Level 7	IC 320-198210/8	2017.12.04ICAL_008.d
Level 8	IC 320-198210/9	2017.12.04ICAL_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)	0.8841 0.9276	0.9455 0.9073	0.9275 0.8052	0.9346	0.9357	AveID		0.9084				5.1		35.0			
Perfluoropentanoic acid (PFPeA)	1.4289 1.1512	1.2088 1.0630	1.1950 0.9698	1.1491	1.1439	AveID		1.1637				11.3		35.0			
Perfluorobutanesulfonic acid (PFBS)	74.228 78.653	80.262 72.597	78.694 61.120	82.789	80.567	AveID		76.114				9.1		50.0			
4:2 FTS	0.8812 1.0832	1.0722 1.1511	1.0938 1.2555	1.1582	1.0061	AveID		1.0877				10.2		35.0			
Perfluorohexanoic acid (PFHxA)	1.0760 1.0159	1.0950 0.9900	1.0536 0.9061	0.9803	1.0506	AveID		1.0209				6.0		35.0			
Perfluoroheptanoic acid (PFHpA)	1.0431 1.0611	1.0939 1.0354	1.0416 0.9269	1.0459	1.0643	AveID		1.0390				4.7		35.0			
Perfluorohexanesulfonic acid (PFHxS)	1.3084 1.0320	1.1183 0.9894	1.0537 0.9675	1.0099	1.0284	AveID		1.0634				10.2		35.0			
6:2FTS	1.9784 1.5778	1.9597 1.5938	1.7391 1.5347	1.5891	1.5157	AveID		1.6860				11.1		35.0			
Perfluorooctanoic acid (PFOA)	1.2798 1.0742	1.1066 0.9776	1.0867 0.8957	1.0651	1.0470	AveID		1.0666				10.3		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.3368 1.3703	1.3225 1.2515	1.3221 1.1139	1.3242	1.3692	AveID		1.3013				6.5		50.0			
Perfluorononanoic acid (PFNA)	0.9234 1.0141	1.0147 0.9737	0.9759 0.9098	0.9962	0.9911	AveID		0.9749				4.0		35.0			
Perfluorooctanesulfonic acid (PFOS)	1.0419 1.0417	1.0160 1.0270	1.0737 0.9869	1.0303	1.0739	AveID		1.0364				2.8		35.0			
8:2FTS	1.1412 1.2549	1.2311 1.1999	1.3279 1.1983	1.2346	1.2882	AveID		1.2345				4.7		35.0			
Perfluorodecanoic acid (PFDA)	0.9607 0.9863	1.0729 1.0008	1.0214 0.8734	0.9640	0.9680	AveID		0.9809				5.8		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.: 320-34072-1 Analy Batch No.: 198210

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/04/2017 15:48 Calibration End Date: 12/04/2017 16:51 Calibration ID: 36632

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								
Perfluorooctane Sulfonamide (FOSA)	0.9196 0.9278	0.9860 0.9055	0.9910 0.7715	1.0050	0.9879	AveID		0.9368				8.2		35.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9369 1.0688	1.0997 1.0802	1.0484 1.0365	1.0328	1.0745	AveID		1.0472				4.8		35.0			
Perfluorodecanesulfonic acid (PFDS)	0.6542 0.6256	0.6438 0.6285	0.6521 0.5675	0.6257	0.6613	AveID		0.6323				4.7		50.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.7909 0.9864	0.9156 0.9738	0.9907 0.9988	0.9501	0.9274	AveID		0.9417				7.2		35.0			
Perfluoroundecanoic acid (PFUnA)	1.1660 0.9884	0.9804 0.9582	0.9606 0.8937	0.9195	0.9998	AveID		0.9833				8.3		35.0			
MeFOSA	0.8430 1.0027	0.8063 0.9900	1.0447 0.9219	1.0122	1.0150	AveID		0.9545				9.2		35.0			
Perfluorododecanoic acid (PFDoA)	0.9674 1.0287	1.0550 0.9361	0.9862 0.9290	0.9984	0.9967	AveID		0.9872				4.4		35.0			
N-EtFOSA-M	0.8921 1.0695	1.1482 1.0709	1.1094 1.0058	1.0419	1.0622	AveID		1.0500				7.3		35.0			
Perfluorotridecanoic Acid (PFTriA)	0.9958 1.0846	1.0834 0.9810	1.1273 0.9299	1.0839	1.0731	AveID		1.0449				6.5		50.0			
Perfluorotetradecanoic acid (PFTeA)	0.2790 0.2513	0.2544 0.2531	0.2325 0.2686	0.2355	0.2554	AveID		0.2537				6.1		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	1.6258 0.8438	1.3649 0.8243	0.9762 0.7547	0.8703	0.9040	L2ID	0.0208	0.8499							0.9940		0.9900
Perfluoro-n-octadecanoic acid (PFODA)	0.8991 0.9363	1.0451 0.9147	1.0038 0.8387	0.9858	1.0216	AveID		0.9556				7.3		50.0			
13C4 PFBA	1.4764 1.5014	1.4537 1.4919	1.4314 1.6365	1.5001	1.4212	Ave		1.4891				4.5		50.0			
13C5 PFPeA	0.8920 0.9391	0.9020 0.9570	0.8810 1.0201	0.9466	0.8925	Ave		0.9288				5.0		50.0			
13C3-PFBS	0.0192 0.0193	0.0182 0.0198	0.0190 0.0218	0.0190	0.0182	Ave		0.0193				5.9		50.0			
13C2 PFHxA	0.9664 0.9489	0.9490 0.9559	0.9280 1.0207	0.9770	0.8879	Ave		0.9542				4.0		50.0			
13C4-PFHpA	0.9314 0.9297	0.9237 0.9121	0.9207 0.9534	0.9627	0.8894	Ave		0.9279				2.5		50.0			
18O2 PFHxS	1.1797 1.1530	1.1707 1.1720	1.1122 1.1848	1.2088	1.1118	Ave		1.1616				3.0		50.0			
M2-6:2FTS	0.3734 0.3145	0.2986 0.2909	0.3102 0.2863	0.2989	0.3176	Ave		0.3113				8.8		50.0			
13C4 PFOA	1.0473 1.0088	1.0187 1.0128	1.0217 1.0395	1.0494	1.0167	Ave		1.0268				1.6		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
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1 Analy Batch No.: 198210

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/04/2017 15:48 Calibration End Date: 12/04/2017 16:51 Calibration ID: 36632

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	0.7522 0.7566	0.7307 0.7605	0.7334 0.8004	0.7803	0.7293	Ave		0.7554				3.3		50.0			
13C5 PFNA	0.7405 0.7483	0.7403 0.7396	0.7362 0.7570	0.7595	0.7169	Ave		0.7423				1.8		50.0			
M2-8:2FTS	0.2463 0.2413	0.2485 0.2561	0.2346 0.2499	0.2470	0.2364	Ave		0.2450				2.9		50.0			
13C2 PFDA	0.6225 0.6392	0.6078 0.6051	0.6108 0.6826	0.6570	0.6070	Ave		0.6290				4.5		50.0			
13C8 FOSA	1.0208 1.0410	1.0030 0.9871	0.9921 1.0732	1.0397	0.9804	Ave		1.0171				3.2		50.0			
d3-NMeFOSAA	0.3430 0.3307	0.3318 0.3385	0.3199 0.3594	0.3400	0.3212	Ave		0.3356				3.8		50.0			
d5-NEtFOSAA	0.3323 0.3204	0.3401 0.3068	0.3257 0.3046	0.3463	0.3329	Ave		0.3261				4.6		50.0			
13C2 PFUnA	0.4994 0.4665	0.4948 0.4664	0.4853 0.4975	0.5004	0.4662	Ave		0.4846				3.3		50.0			
d-N-MeFOSA-M	0.2788 0.2977	0.2830 0.3125	0.2669 0.3537	0.2857	0.2724	Ave		0.2938				9.6		50.0			
13C2 PFDoA	0.5439 0.5317	0.5435 0.5467	0.5302 0.5623	0.5486	0.5083	Ave		0.5394				3.0		50.0			
d-N-EtFOSA-M	0.2535 0.2727	0.2608 0.2835	0.2566 0.3301	0.2739	0.2581	Ave		0.2737				9.2		50.0			
13C2-PFTeDA	0.6481 0.6033	0.6263 0.6038	0.6770 0.6059	0.6495	0.6136	Ave		0.6284				4.3		50.0			
13C2-PFHxDA	1.0894 1.0596	1.0004 1.0121	1.0073 1.0460	1.0976	1.0042	Ave		1.0396				3.8		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.: 320-34072-1 Analy Batch No.: 198210

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/04/2017 15:48 Calibration End Date: 12/04/2017 16:51 Calibration ID: 36632

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-198210/2	2017.12.04ICAL_002.d
Level 2	IC 320-198210/3	2017.12.04ICAL_003.d
Level 3	IC 320-198210/4	2017.12.04ICAL_004.d
Level 4	IC 320-198210/5	2017.12.04ICAL_005.d
Level 5	IC 320-198210/6	2017.12.04ICAL_006.d
Level 6	IC 320-198210/7	2017.12.04ICAL_007.d
Level 7	IC 320-198210/8	2017.12.04ICAL_008.d
Level 8	IC 320-198210/9	2017.12.04ICAL_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	78224 16017345	170852 30325086	829578 51311116	3250007	8103624	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	76382 12434175	135542 22789920	657858 38522728	2521773	6221422	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	75308 15445497	160661 28463816	825020 45840995	3225845	7915154	0.0221 4.42	0.0442 8.84	0.221 17.7	0.884	2.21
4:2 FTS		AveID	18416 3659841	37173 7005464	198045 13073743	749506	1818901	0.0234 4.67	0.0467 9.34	0.234 18.7	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	62320 11087289	129172 21198747	610997 36014620	2220279	5684235	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoroheptanoic acid (PFHpA)		AveID	58223 11345726	125602 21155159	599255 34413663	2334058	5768119	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	84174 12453435	148090 23639232	666375 40621142	2575397	6340167	0.0228 4.55	0.0455 9.10	0.228 18.2	0.910	2.28
6:2FTS		AveID	41964 5410631	68964 9844898	319592 16219600	1043721	2781378	0.0237 4.74	0.0474 9.48	0.237 19.0	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	80320 12462909	140133 22179047	693749 36256854	2591017	6486499	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	57367 11352397	114362 20298371	576767 33050481	2280426	5792972	0.0238 4.76	0.0476 9.52	0.238 19.0	0.952	2.38
Perfluorononanoic acid (PFNA)		AveID	40979 8727865	93375 16132833	448913 26819393	1753950	4329674	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)		AveID	43586 8412511	85637 16236576	456586 28542678	1729608	4429145	0.0232 4.64	0.0464 9.28	0.232 18.6	0.928	2.32
8:2FTS		AveID	16136 3335732	36430 6593874	186494 11171284	677314	1777969	0.0240 4.79	0.0479 9.58	0.240 19.2	0.958	2.40
Perfluorodecanoic acid (PFDA)		AveID	35837 7250393	81056 13565320	389843 23214862	1468220	3580422	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorooctane Sulfonamide (FOSA)		AveID	56258 11108013	122931 20023558	614374 32240646	2422346	5901786	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.: 320-34072-1 Analy Batch No.: 198210

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/04/2017 15:48 Calibration End Date: 12/04/2017 16:51 Calibration ID: 36632

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	19259 4064917	45355 8192092	209556 14505483	813999	2103368	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	28427 5247839	56374 10321356	288079 17049700	1091162	2833055	0.0241 4.82	0.0482 9.64	0.241 19.3	0.964	2.41
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	15751 3634581	38708 6693367	201644 11844723	762806	1881492	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoroundecanoic acid (PFUnA)		AveID	34900 5303373	60297 10011006	291297 17311402	1066672	2840384	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
MeFOSA		AveID	14087 3433227	28360 6931131	174245 12698938	670337	1684839	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	31534 6290779	71281 11465899	326739 20341082	1269740	3087281	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
N-EtFOSA-M		AveID	13553 3354313	37225 6801725	177846 12929404	661598	1670598	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	32459 6632282	73202 12015798	373509 20360336	1378400	3323761	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	10836 1743731	19806 3423281	98348 6336454	354521	955034	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	106142 10283347	169723 18690044	614444 30740196	2214468	5531905	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
Perfluoro-n-octadecanoic acid (PFODA)		AveID	58698 11410437	129959 20739410	631858 34162529	2508373	6251649	0.0250 5.00	0.0500 10.0	0.250 20.0	1.00	2.50
13C4 PFBA	13PFOA	Ave	8847788 8633918	9035119 8355556	8944246 7965653	8693983	8660817	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C5 PFPeA	13PFOA	Ave	5345531 5400463	5606439 5359848	5505317 4965540	5486176	5438586	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C3-PFBS	13PFOA	Ave	106734 103297	105293 103121	110295 98631	102481	103355	2.33 2.33	2.33 2.33	2.33 2.33	2.33	2.33
13C2 PFHxA	13PFOA	Ave	5791822 5457006	5898473 5353254	5799143 4968232	5662531	5410683	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C4-PFHpA	13PFOA	Ave	5581950 5346111	5741019 5108146	5753355 4640871	5579165	5419539	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
18O2 PFHxS	13PFOA	Ave	6688035 6272276	6883037 6209580	6574606 5455632	6627522	6409168	2.37 2.37	2.37 2.37	2.37 2.37	2.37	2.37
M2-6:2FTS	13PFOA	Ave	2125634 1718247	1763243 1547518	1841567 1323901	1645515	1838871	2.38 2.38	2.38 2.38	2.38 2.38	2.38	2.38
13C4 PFOA	13PFOA	Ave	6276186 5801176	6331644 5672017	6384245 5059591	6081734	6195524	2.50 2.50	2.50 2.50	2.50 2.50	2.50	2.50
13C4 PFOS	13PFOA	Ave	4309488 4159568	4341775 4071767	4380920 3724410	4323332	4248600	2.39 2.39	2.39 2.39	2.39 2.39	2.39	2.39
13C5 PFNA	13PFOA	Ave	4437613 4303391	4601234 4142344	4600032 3684676	4401513	4368620	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.: 320-34072-1 Analy Batch No.: 198210

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/04/2017 15:48 Calibration End Date: 12/04/2017 16:51 Calibration ID: 36632

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	Ave	1413990	1479516	1404384	1371577	1380175	2.40	2.40	2.40	2.40	2.40
	OA		1329091	1373886	1165374			2.40	2.40	2.40		
13C2 PFDA	13PF	Ave	3730433	3777541	3816836	3807504	3698804	2.50	2.50	2.50	2.50	2.50
	OA		3675640	3388613	3322458			2.50	2.50	2.50		
13C8 FOSA	13PF	Ave	6117373	6234029	6199614	6025486	5974226	2.50	2.50	2.50	2.50	2.50
	OA		5986273	5528057	5223719			2.50	2.50	2.50		
d3-NMeFOSAA	13PF	Ave	2055648	2062096	1998907	1970435	1957557	2.50	2.50	2.50	2.50	2.50
	OA		1901694	1895903	1749381			2.50	2.50	2.50		
d5-NEtFOSAA	13PF	Ave	1991458	2113821	2035321	2007076	2028871	2.50	2.50	2.50	2.50	2.50
	OA		1842284	1718330	1482404			2.50	2.50	2.50		
13C2 PFUnA	13PF	Ave	2993069	3075279	3032542	2900047	2840864	2.50	2.50	2.50	2.50	2.50
	OA		2682738	2611948	2421439			2.50	2.50	2.50		
d-N-MeFOSA-M	13PF	Ave	1670992	1758684	1667869	1655616	1659925	2.50	2.50	2.50	2.50	2.50
	OA		1711960	1750368	1721873			2.50	2.50	2.50		
13C2 PFDoA	13PF	Ave	3259539	3378244	3313277	3179371	3097457	2.50	2.50	2.50	2.50	2.50
	OA		3057546	3062001	2736968			2.50	2.50	2.50		
d-N-EtFOSA-M	13PF	Ave	1519293	1620984	1603127	1587546	1572774	2.50	2.50	2.50	2.50	2.50
	OA		1568109	1587890	1606922			2.50	2.50	2.50		
13C2-PFTeDA	13PF	Ave	3883886	3892459	4230459	3764283	3739126	2.50	2.50	2.50	2.50	2.50
	OA		3469556	3381530	2949102			2.50	2.50	2.50		
13C2-PFHxDA	13PF	Ave	6528514	6217463	6294517	6361239	6119574	2.50	2.50	2.50	2.50	2.50
	OA		6093216	5668173	5091489			2.50	2.50	2.50		

Curve Type Legend:

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

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: ICV 320-198210/12 Calibration Date: 12/04/2017 17:07

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.04ICAL_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	0.9084	0.9154		2.52	2.50	0.8	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.164	1.129		2.43	2.50	-3.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.11	77.62		2.26	2.21	2.0	25.0
4:2 FTS	AveID	1.088	1.024		2.20	2.34	-5.9	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.003		2.46	2.50	-1.7	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.039	1.068		2.57	2.50	2.8	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.063	1.050		2.33	2.36	-1.3	25.0
6:2FTS	AveID	1.686	1.436		2.02	2.37	-14.8	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.301	1.283		2.35	2.38	-1.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.067	1.088		2.55	2.50	2.0	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9749	1.049		2.69	2.50	7.6	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.036	0.9838		2.27	2.39	-5.1	25.0
8:2FTS	AveID	1.235	1.159		2.25	2.40	-6.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9809	0.9717		2.48	2.50	-0.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9368	0.9316		2.49	2.50	-0.6	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.047	0.9817		2.34	2.50	-6.3	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6323	0.6771		2.58	2.41	7.1	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9417	0.8852		2.35	2.50	-6.0	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9833	1.007		2.56	2.50	2.4	25.0
MeFOSA	AveID	0.9545	0.9709		2.54	2.50	1.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9872	1.072		2.71	2.50	8.6	25.0
N-EtFOSA-M	AveID	1.050	1.019		2.43	2.50	-3.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.045	1.131		2.71	2.50	8.2	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2537	0.2434		2.40	2.50	-4.1	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9646		2.81	2.50	12.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9556	1.055		2.76	2.50	10.4	25.0
13C4 PFBA	Ave	1.489	1.433		2.41	2.50	-3.8	50.0
13C5 PFPeA	Ave	0.9288	0.8871		2.39	2.50	-4.5	50.0
13C3-PFBS	Ave	0.0193	0.0188		2.26	2.33	-2.9	50.0
13C2 PFHxA	Ave	0.9542	0.9295		2.44	2.50	-2.6	50.0
13C4-PFHpA	Ave	0.9279	0.8997		2.42	2.50	-3.0	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: ICV 320-198210/12 Calibration Date: 12/04/2017 17:07

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.04ICAL_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.162	1.123		2.29	2.37	-3.3	50.0
M2-6:2FTS	Ave	0.3113	0.3305		2.52	2.38	6.2	50.0
13C4 PFOA	Ave	1.027	0.9727		2.37	2.50	-5.3	50.0
13C4 PFOS	Ave	0.7554	0.7208		2.28	2.39	-4.6	50.0
13C5 PFNA	Ave	0.7423	0.7132		2.40	2.50	-3.9	50.0
M2-8:2FTS	Ave	0.2450	0.2564		2.51	2.40	4.6	50.0
13C2 PFDA	Ave	0.6290	0.6237		2.48	2.50	-0.8	50.0
13C8 FOSA	Ave	1.017	0.9707		2.39	2.50	-4.6	50.0
d3-NMeFOSAA	Ave	0.3356	0.3475		2.59	2.50	3.6	50.0
13C2 PFUnA	Ave	0.4846	0.4570		2.36	2.50	-5.7	50.0
d5-NEtFOSAA	Ave	0.3261	0.3401		2.61	2.50	4.3	50.0
d-N-MeFOSA-M	Ave	0.2938	0.2856		2.43	2.50	-2.8	50.0
13C2 PFDoA	Ave	0.5394	0.5082		2.36	2.50	-5.8	50.0
d-N-EtFOSA-M	Ave	0.2737	0.2720		2.49	2.50	-0.6	50.0
13C2-PFTeDA	Ave	0.6284	0.6246		2.48	2.50	-0.6	50.0
13C2-PFHxDA	Ave	1.040	0.996		2.40	2.50	-4.2	50.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Instrument ID: A8_N Start Date: 12/12/2017 15:08

Analysis Batch Number: 199573 End Date: 12/12/2017 17:30

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-199573/1		12/12/2017 15:08	1	2017.12.12LLA_005.d	GeminiC18 3x100 3(mm)
CCV 320-199573/2		12/12/2017 15:16	1		GeminiC18 3x100 3(mm)
CCV 320-199573/14		12/12/2017 16:50	1		GeminiC18 3x100 3(mm)
CCV 320-199573/19		12/12/2017 17:30	1		GeminiC18 3x100 3(mm)

537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCVL 320-199573/1 Calibration Date: 12/12/2017 15:08

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.12LLA_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	0.9084	0.9132		0.0503	0.0500	0.5	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.164	1.220		0.0524	0.0500	4.8	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.11	76.93		0.0447	0.0442	1.1	50.0
4:2 FTS	AveID	1.088	0.6600		0.283	0.467	-39.3	50.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.040		0.0509	0.0500	1.9	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.039	1.007		0.0485	0.0500	-3.1	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.063	1.259		0.0539	0.0455	18.4	50.0
6:2FTS	AveID	1.686	1.818		0.511	0.474	7.8	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.067	1.195		0.0560	0.0500	12.1	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.301	1.366		0.0500	0.0476	4.9	50.0
Perfluorononanoic acid (PFNA)	AveID	0.9749	1.011		0.0519	0.0500	3.7	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.036	1.080		0.0483	0.0464	4.2	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9368	1.014		0.0541	0.0500	8.2	50.0
8:2FTS	AveID	1.235	1.186		0.460	0.479	-3.9	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9809	1.039		0.0529	0.0500	5.9	50.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.047	1.043		0.498	0.500	-0.4	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6323	0.5329		0.0406	0.0482	-15.7	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9417	1.021		0.542	0.500	8.4	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9833	0.9661		0.0491	0.0500	-1.8	50.0
MeFOSA	AveID	0.9545	0.9862		0.517	0.500	3.3	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9872	1.003		0.0508	0.0500	1.6	50.0
N-EtFOSA-M	AveID	1.050	1.109		0.528	0.500	5.6	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.045	1.199		0.0574	0.0500	14.7	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2537	0.2616		0.0516	0.0500	3.1	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.203		0.0463	0.0500	-7.3	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9556	0.9740		0.0510	0.0500	1.9	50.0
13C4 PFBA	Ave	1.489	1.472		2.47	2.50	-1.2	50.0
13C5 PFPeA	Ave	0.9288	0.8569		2.31	2.50	-7.7	50.0
13C3-PFBS	Ave	0.0193	0.0186		2.24	2.33	-3.7	50.0
13C2 PFHxA	Ave	0.9542	0.9337		2.45	2.50	-2.1	50.0
13C4-PFHpA	Ave	0.9279	0.8885		2.39	2.50	-4.2	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCVL 320-199573/1 Calibration Date: 12/12/2017 15:08

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.12LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.162	1.114		2.27	2.37	-4.1	50.0
M2-6:2FTS	Ave	0.3113	0.4517		3.45	2.38	45.1	50.0
13C4 PFOA	Ave	1.027	1.038		2.53	2.50	1.1	50.0
13C4 PFOS	Ave	0.7554	0.7307		2.31	2.39	-3.3	50.0
13C5 PFNA	Ave	0.7423	0.7345		2.47	2.50	-1.1	50.0
13C8 FOSA	Ave	1.017	0.9806		2.41	2.50	-3.6	50.0
M2-8:2FTS	Ave	0.2450	0.1974		1.93	2.40	-19.4	50.0
13C2 PFDA	Ave	0.6290	0.5765		2.29	2.50	-8.3	50.0
d3-NMeFOSAA	Ave	0.3356	0.3274		2.44	2.50	-2.4	50.0
13C2 PFUnA	Ave	0.4846	0.4644		2.40	2.50	-4.2	50.0
d5-NEtFOSAA	Ave	0.3261	0.3262		2.50	2.50	0.0	50.0
d-N-MeFOSA-M	Ave	0.2938	0.2732		2.32	2.50	-7.0	50.0
13C2 PFDoA	Ave	0.5394	0.4897		2.27	2.50	-9.2	50.0
d-N-EtFOSA-M	Ave	0.2737	0.2466		2.25	2.50	-9.9	50.0
13C2-PFTeDA	Ave	0.6284	0.5479		2.18	2.50	-12.8	50.0
13C2-PFHxDA	Ave	1.040	1.098		2.64	2.50	5.6	50.0

FORM VII 537 (modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Instrument ID: A8_N Start Date: 12/12/2017 21:34

Analysis Batch Number: 199646 End Date: 12/12/2017 22:37

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-199646/1		12/12/2017 21:34	1	2017.12.12LLB_002.d	GeminiC18 3x100 3(mm)
MB 320-199444/1-A		12/12/2017 21:42	1	2017.12.12LLB_003.d	GeminiC18 3x100 3(mm)
LCS 320-199444/2-A		12/12/2017 21:50	1	2017.12.12LLB_004.d	GeminiC18 3x100 3(mm)
LCSD 320-199444/3-A		12/12/2017 21:58	1	2017.12.12LLB_005.d	GeminiC18 3x100 3(mm)
320-34072-1		12/12/2017 22:06	1	2017.12.12LLB_006.d	GeminiC18 3x100 3(mm)
320-34072-2		12/12/2017 22:14	1	2017.12.12LLB_007.d	GeminiC18 3x100 3(mm)
320-34072-3		12/12/2017 22:22	1	2017.12.12LLB_008.d	GeminiC18 3x100 3(mm)
320-34072-4		12/12/2017 22:29	1	2017.12.12LLB_009.d	GeminiC18 3x100 3(mm)
CCV 320-199646/9		12/12/2017 22:37	1	2017.12.12LLB_010.d	GeminiC18 3x100 3(mm)

537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCV 320-199646/1 Calibration Date: 12/12/2017 21:34

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.12LLB_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9084	0.9377		2.58	2.50	3.2	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.164	1.136		2.44	2.50	-2.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.11	81.79		2.37	2.21	7.5	25.0
4:2 FTS	AveID	1.088	0.4491		0.964	2.34	-58.7*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.9804		2.40	2.50	-4.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.039	1.009		2.43	2.50	-2.9	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.063	1.025		2.19	2.28	-3.6	25.0
6:2FTS	AveID	1.686	1.543		2.17	2.37	-8.5	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.067	1.025		2.40	2.50	-3.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.301	1.381		2.53	2.38	6.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.036	1.027		2.30	2.32	-0.9	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9749	1.018		2.61	2.50	4.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9368	0.9889		2.64	2.50	5.6	25.0
8:2FTS	AveID	1.235	1.257		2.44	2.40	1.8	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9809	1.013		2.58	2.50	3.3	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.047	1.093		2.61	2.50	4.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6323	0.6345		2.42	2.41	0.3	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9417	0.9538		2.53	2.50	1.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9833	0.9426		2.40	2.50	-4.1	25.0
MeFOSA	AveID	0.9545	0.9703		2.54	2.50	1.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9872	1.000		2.53	2.50	1.3	25.0
N-EtFOSA-M	AveID	1.050	1.039		2.47	2.50	-1.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.045	1.078		2.58	2.50	3.2	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2537	0.2290		2.26	2.50	-9.8	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9406		2.74	2.50	9.7	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9556	1.052		2.75	2.50	10.0	25.0
13C4 PFBA	Ave	1.489	1.421		2.39	2.50	-4.6	50.0
13C5 PFPeA	Ave	0.9288	0.8663		2.33	2.50	-6.7	50.0
13C3-PFBS	Ave	0.0193	0.0174		2.10	2.33	-9.7	50.0
13C2 PFHxA	Ave	0.9542	0.8849		2.32	2.50	-7.3	50.0
13C4-PFHpA	Ave	0.9279	0.8723		2.35	2.50	-6.0	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCV 320-199646/1 Calibration Date: 12/12/2017 21:34

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.12LLB_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.162	1.118		2.28	2.37	-3.7	50.0
M2-6:2FTS	Ave	0.3113	0.6361		4.85	2.38	104.3*	50.0
13C4 PFOA	Ave	1.027	1.034		2.52	2.50	0.7	50.0
13C4 PFOS	Ave	0.7554	0.6987		2.21	2.39	-7.5	50.0
13C5 PFNA	Ave	0.7423	0.6854		2.31	2.50	-7.7	50.0
13C8 FOSA	Ave	1.017	0.9276		2.28	2.50	-8.8	50.0
M2-8:2FTS	Ave	0.2450	0.1904		1.86	2.40	-22.3	50.0
13C2 PFDA	Ave	0.6290	0.5568		2.21	2.50	-11.5	50.0
d3-NMeFOSAA	Ave	0.3356	0.3126		2.33	2.50	-6.9	50.0
d5-NEtFOSAA	Ave	0.3261	0.3147		2.41	2.50	-3.5	50.0
13C2 PFUnA	Ave	0.4846	0.4288		2.21	2.50	-11.5	50.0
d-N-MeFOSA-M	Ave	0.2938	0.2748		2.34	2.50	-6.5	50.0
13C2 PFDoA	Ave	0.5394	0.4726		2.19	2.50	-12.4	50.0
d-N-EtFOSA-M	Ave	0.2737	0.2506		2.29	2.50	-8.4	50.0
13C2-PFTeDA	Ave	0.6284	0.5580		2.22	2.50	-11.2	50.0
13C2-PFHxDA	Ave	1.040	0.9041		2.17	2.50	-13.0	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCV 320-199646/9 Calibration Date: 12/12/2017 22:37

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.12LLB_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	0.9084	0.9346		1.03	1.00	2.9	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.164	1.112		0.956	1.00	-4.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.11	80.37		0.933	0.884	5.6	25.0
4:2 FTS	AveID	1.088	0.4954		0.425	0.934	-54.5*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.9836		0.963	1.00	-3.7	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.039	1.053		1.01	1.00	1.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.063	1.037		0.887	0.910	-2.5	25.0
6:2FTS	AveID	1.686	1.747		0.982	0.948	3.6	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.067	1.051		0.985	1.00	-1.5	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.301	1.328		0.972	0.952	2.1	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9749	0.9675		0.992	1.00	-0.8	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.036	1.017		0.911	0.928	-1.8	25.0
8:2FTS	AveID	1.235	1.274		0.989	0.958	3.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9368	1.018		1.09	1.00	8.7	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9809	0.9803		0.999	1.00	-0.0	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.047	1.068		1.02	1.00	2.0	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6323	0.6108		0.931	0.964	-3.4	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9417	0.9894		1.05	1.00	5.1	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9833	0.8903		0.905	1.00	-9.5	25.0
MeFOSA	AveID	0.9545	1.002		1.05	1.00	5.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9872	0.996		1.01	1.00	0.9	25.0
N-EtFOSA-M	AveID	1.050	1.093		1.04	1.00	4.1	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.045	1.055		1.01	1.00	1.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2537	0.2547		1.00	1.00	0.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8830		1.01	1.00	1.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9556	1.005		1.05	1.00	5.1	25.0
13C4 PFBA	Ave	1.489	1.417		2.38	2.50	-4.9	50.0
13C5 PFPeA	Ave	0.9288	0.8597		2.31	2.50	-7.4	50.0
13C3-PFBS	Ave	0.0193	0.0177		2.13	2.33	-8.5	50.0
13C2 PFHxA	Ave	0.9542	0.9048		2.37	2.50	-5.2	50.0
13C4-PFHpA	Ave	0.9279	0.8680		2.34	2.50	-6.5	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCV 320-199646/9 Calibration Date: 12/12/2017 22:37

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.12LLB_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.162	1.098		2.24	2.37	-5.4	50.0
M2-6:2FTS	Ave	0.3113	0.5842		4.46	2.38	87.7*	50.0
13C4 PFOA	Ave	1.027	1.015		2.47	2.50	-1.2	50.0
13C4 PFOS	Ave	0.7554	0.7181		2.27	2.39	-4.9	50.0
13C5 PFNA	Ave	0.7423	0.7161		2.41	2.50	-3.5	50.0
13C8 FOSA	Ave	1.017	0.9433		2.32	2.50	-7.3	50.0
M2-8:2FTS	Ave	0.2450	0.1886		1.84	2.40	-23.0	50.0
13C2 PFDA	Ave	0.6290	0.5726		2.28	2.50	-9.0	50.0
d3-NMeFOSAA	Ave	0.3356	0.3254		2.42	2.50	-3.0	50.0
d5-NEtFOSAA	Ave	0.3261	0.3177		2.44	2.50	-2.6	50.0
13C2 PFUnA	Ave	0.4846	0.4579		2.36	2.50	-5.5	50.0
d-N-MeFOSA-M	Ave	0.2938	0.2659		2.26	2.50	-9.5	50.0
13C2 PFDoA	Ave	0.5394	0.4814		2.23	2.50	-10.8	50.0
d-N-EtFOSA-M	Ave	0.2737	0.2399		2.19	2.50	-12.3	50.0
13C2-PFTeDA	Ave	0.6284	0.5549		2.21	2.50	-11.7	50.0
13C2-PFHxDA	Ave	1.040	1.000		2.40	2.50	-3.8	50.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Instrument ID: A8_N Start Date: 12/13/2017 10:42

Analysis Batch Number: 199709 End Date: 12/13/2017 10:42

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-199709/1		12/13/2017 10:42	1	2017.12.13LLA_001.d	GeminiC18 3x100 3(mm)

537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCVL 320-199709/1 Calibration Date: 12/13/2017 10:42

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.13LLA_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	0.9084	0.9189		0.0506	0.0500	1.1	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.164	1.197		0.0514	0.0500	2.9	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.11	79.33		0.0461	0.0442	4.2	50.0
4:2 FTS	AveID	1.088	0.7321		0.314	0.467	-32.7	50.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.031		0.0505	0.0500	1.0	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.039	1.094		0.0526	0.0500	5.3	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.063	1.131		0.0484	0.0455	6.3	50.0
6:2FTS	AveID	1.686	1.655		0.465	0.474	-1.8	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.067	1.133		0.0531	0.0500	6.3	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.301	1.382		0.0505	0.0476	6.2	50.0
Perfluorononanoic acid (PFNA)	AveID	0.9749	0.9616		0.0493	0.0500	-1.4	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.036	1.067		0.0478	0.0464	2.9	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9368	0.9823		0.0524	0.0500	4.9	50.0
8:2FTS	AveID	1.235	1.211		0.470	0.479	-1.9	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9809	1.023		0.0521	0.0500	4.3	50.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.047	1.078		0.514	0.500	2.9	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6323	0.6597		0.0503	0.0482	4.3	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9417	0.9144		0.486	0.500	-2.9	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9833	1.025		0.0521	0.0500	4.2	50.0
MeFOSA	AveID	0.9545	1.016		0.532	0.500	6.5	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9872	1.036		0.0525	0.0500	5.0	50.0
N-EtFOSA-M	AveID	1.050	1.052		0.501	0.500	0.2	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.045	1.002		0.0479	0.0500	-4.1	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2537	0.2532		0.0499	0.0500	-0.2	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.392		0.0575	0.0500	14.9	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9556	1.091		0.0571	0.0500	14.2	50.0
13C4 PFBA	Ave	1.489	1.421		2.39	2.50	-4.6	50.0
13C5 PFPeA	Ave	0.9288	0.8594		2.31	2.50	-7.5	50.0
13C3-PFBS	Ave	0.0193	0.0178		2.14	2.33	-8.1	50.0
13C2 PFHxA	Ave	0.9542	0.9112		2.39	2.50	-4.5	50.0
13C4-PFHpA	Ave	0.9279	0.8743		2.36	2.50	-5.8	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCVL 320-199709/1 Calibration Date: 12/13/2017 10:42

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.13LLA_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.162	1.110		2.26	2.37	-4.4	50.0
M2-6:2FTS	Ave	0.3113	0.3421		2.61	2.38	9.9	50.0
13C4 PFOA	Ave	1.027	1.020		2.48	2.50	-0.7	50.0
13C4 PFOS	Ave	0.7554	0.6955		2.20	2.39	-7.9	50.0
13C5 PFNA	Ave	0.7423	0.7030		2.37	2.50	-5.3	50.0
13C8 FOSA	Ave	1.017	0.9158		2.25	2.50	-10.0	50.0
M2-8:2FTS	Ave	0.2450	0.1666		1.63	2.40	-32.0	50.0
13C2 PFDA	Ave	0.6290	0.5671		2.25	2.50	-9.8	50.0
d3-NMeFOSAA	Ave	0.3356	0.2973		2.22	2.50	-11.4	50.0
d5-NEtFOSAA	Ave	0.3261	0.3228		2.47	2.50	-1.0	50.0
13C2 PFUnA	Ave	0.4846	0.4175		2.15	2.50	-13.8	50.0
d-N-MeFOSA-M	Ave	0.2938	0.2602		2.21	2.50	-11.4	50.0
13C2 PFDoA	Ave	0.5394	0.4768		2.21	2.50	-11.6	50.0
d-N-EtFOSA-M	Ave	0.2737	0.2360		2.16	2.50	-13.8	50.0
13C2-PFTeDA	Ave	0.6284	0.5445		2.17	2.50	-13.4	50.0
13C2-PFHxDA	Ave	1.040	0.9802		2.36	2.50	-5.7	50.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Instrument ID: A8_N Start Date: 12/13/2017 15:03

Analysis Batch Number: 199735 End Date: 12/13/2017 15:18

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-199735/1		12/13/2017 15:03	1	2017.12.13LLA_024.d	GeminiC18 3x100 3(mm)
320-34072-1 DL		12/13/2017 15:11	10	2017.12.13LLA_025.d	GeminiC18 3x100 3(mm)
CCV 320-199735/3		12/13/2017 15:18	1	2017.12.13LLA_026.d	GeminiC18 3x100 3(mm)

537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCV 320-199735/1 Calibration Date: 12/13/2017 15:03

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.13LLA_024.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9084	0.9306		1.02	1.00	2.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.164	1.139		0.979	1.00	-2.1	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.11	76.92		0.893	0.884	1.1	25.0
4:2 FTS	AveID	1.088	0.9883		0.849	0.934	-9.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.999		0.979	1.00	-2.1	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.039	1.061		1.02	1.00	2.1	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.063	0.9754		0.835	0.910	-8.3	25.0
6:2FTS	AveID	1.686	1.635		0.919	0.948	-3.1	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.067	1.040		0.975	1.00	-2.5	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.301	1.405		1.03	0.952	8.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.036	1.060		0.949	0.928	2.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9749	0.9859		1.01	1.00	1.1	25.0
8:2FTS	AveID	1.235	1.248		0.969	0.958	1.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9809	1.039		1.06	1.00	5.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9368	1.024		1.09	1.00	9.3	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.047	1.110		1.06	1.00	6.0	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6323	0.6348		0.968	0.964	0.4	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9417	0.9533		1.01	1.00	1.2	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9833	1.092		1.11	1.00	11.0	25.0
MeFOSA	AveID	0.9545	1.028		1.08	1.00	7.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9872	0.999		1.01	1.00	1.2	25.0
N-EtFOSA-M	AveID	1.050	1.035		0.986	1.00	-1.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.045	1.073		1.03	1.00	2.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2537	0.2463		0.971	1.00	-2.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8975		1.03	1.00	3.2	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9556	1.035		1.08	1.00	8.3	25.0
13C4 PFBA	Ave	1.489	1.540		2.59	2.50	3.4	50.0
13C5 PFPeA	Ave	0.9288	0.9512		2.56	2.50	2.4	50.0
13C3-PFBS	Ave	0.0193	0.0200		2.41	2.33	3.6	50.0
13C2 PFHxA	Ave	0.9542	0.9890		2.59	2.50	3.6	50.0
13C4-PFHpA	Ave	0.9279	0.9693		2.61	2.50	4.5	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCV 320-199735/1 Calibration Date: 12/13/2017 15:03

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.13LLA_024.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.162	1.275		2.60	2.37	9.7	50.0
M2-6:2FTS	Ave	0.3113	0.3341		2.55	2.38	7.3	50.0
13C4 PFOA	Ave	1.027	1.090		2.65	2.50	6.1	50.0
13C4 PFOS	Ave	0.7554	0.7683		2.43	2.39	1.7	50.0
13C5 PFNA	Ave	0.7423	0.7872		2.65	2.50	6.0	50.0
M2-8:2FTS	Ave	0.2450	0.1987		1.94	2.40	-18.9	50.0
13C2 PFDA	Ave	0.6290	0.6062		2.41	2.50	-3.6	50.0
13C8 FOSA	Ave	1.017	1.010		2.48	2.50	-0.7	50.0
d3-NMeFOSAA	Ave	0.3356	0.3314		2.47	2.50	-1.2	50.0
d5-NEtFOSAA	Ave	0.3261	0.3674		2.82	2.50	12.6	50.0
13C2 PFUnA	Ave	0.4846	0.4963		2.56	2.50	2.4	50.0
d-N-MeFOSA-M	Ave	0.2938	0.2890		2.46	2.50	-1.7	50.0
13C2 PFDoA	Ave	0.5394	0.4892		2.27	2.50	-9.3	50.0
d-N-EtFOSA-M	Ave	0.2737	0.2719		2.48	2.50	-0.6	50.0
13C2-PFTeDA	Ave	0.6284	0.6068		2.41	2.50	-3.4	50.0
13C2-PFHxDA	Ave	1.040	1.013		2.44	2.50	-2.6	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCV 320-199735/3 Calibration Date: 12/13/2017 15:18

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.13LLA_026.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9084	0.9409		2.59	2.50	3.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.164	1.125		2.42	2.50	-3.3	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	76.11	76.16		2.21	2.21	0.0	25.0
4:2 FTS	AveID	1.088	0.7283		1.56	2.34	-33.0*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.021		2.50	2.50	-0.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.039	1.041		2.51	2.50	0.2	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.063	1.052		2.25	2.28	-1.1	25.0
6:2FTS	AveID	1.686	1.723		2.42	2.37	2.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.067	1.050		2.46	2.50	-1.6	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.301	1.432		2.62	2.38	10.0	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9749	0.997		2.56	2.50	2.3	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.036	1.076		2.41	2.32	3.9	25.0
8:2FTS	AveID	1.235	1.284		2.49	2.40	4.0	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9368	1.003		2.68	2.50	7.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9809	0.9692		2.47	2.50	-1.2	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.047	1.061		2.53	2.50	1.3	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6323	0.6365		2.43	2.41	0.7	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9417	0.9545		2.53	2.50	1.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9833	0.9562		2.43	2.50	-2.8	25.0
MeFOSA	AveID	0.9545	1.016		2.66	2.50	6.5	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9872	0.9942		2.52	2.50	0.7	25.0
N-EtFOSA-M	AveID	1.050	1.043		2.48	2.50	-0.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.045	1.018		2.44	2.50	-2.6	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2537	0.2460		2.42	2.50	-3.0	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9062		2.64	2.50	5.7	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9556	1.035		2.71	2.50	8.3	25.0
13C4 PFBA	Ave	1.489	1.426		2.39	2.50	-4.3	50.0
13C5 PFPeA	Ave	0.9288	0.8884		2.39	2.50	-4.4	50.0
13C3-PFBS	Ave	0.0193	0.0184		2.22	2.33	-4.6	50.0
13C2 PFHxA	Ave	0.9542	0.8844		2.32	2.50	-7.3	50.0
13C4-PFHpA	Ave	0.9279	0.8841		2.38	2.50	-4.7	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Lab Sample ID: CCV 320-199735/3 Calibration Date: 12/13/2017 15:18

Instrument ID: A8_N Calib Start Date: 12/04/2017 15:48

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 12/04/2017 16:51

Lab File ID: 2017.12.13LLA_026.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
18O2 PFHxS	Ave	1.162	1.092		2.22	2.37	-6.0	50.0
M2-6:2FTS	Ave	0.3113	0.4009		3.06	2.38	28.8	50.0
13C4 PFOA	Ave	1.027	1.013		2.47	2.50	-1.3	50.0
13C4 PFOS	Ave	0.7554	0.6957		2.20	2.39	-7.9	50.0
13C5 PFNA	Ave	0.7423	0.7009		2.36	2.50	-5.6	50.0
M2-8:2FTS	Ave	0.2450	0.1891		1.85	2.40	-22.8	50.0
13C8 FOSA	Ave	1.017	0.9439		2.32	2.50	-7.2	50.0
13C2 PFDA	Ave	0.6290	0.5869		2.33	2.50	-6.7	50.0
d3-NMeFOSAA	Ave	0.3356	0.3265		2.43	2.50	-2.7	50.0
d5-NEtFOSAA	Ave	0.3261	0.3162		2.42	2.50	-3.0	50.0
13C2 PFUnA	Ave	0.4846	0.4395		2.27	2.50	-9.3	50.0
d-N-MeFOSA-M	Ave	0.2938	0.2689		2.29	2.50	-8.5	50.0
13C2 PFDoA	Ave	0.5394	0.4929		2.28	2.50	-8.6	50.0
d-N-EtFOSA-M	Ave	0.2737	0.2538		2.32	2.50	-7.3	50.0
13C2-PFTeDA	Ave	0.6284	0.5212		2.07	2.50	-17.1	50.0
13C2-PFHxDA	Ave	1.040	0.9597		2.31	2.50	-7.7	50.0

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34072-1

SDG No.:

Batch Number: 199444 Batch Start Date: 12/12/17 08:28 Batch Analyst: Branscum, Cassie

Batch Method: 3535 Batch End Date: 12/12/17 14:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00026	LCPFC-IS 00019
MB 320-199444/1		3535, 537 (modified)				250 mL	10.0 mL	500 uL	500 uL
LCS 320-199444/2		3535, 537 (modified)				250 mL	10.0 mL	500 uL	500 uL
LCSD 320-199444/3		3535, 537 (modified)				250 mL	10.0 mL	500 uL	500 uL
320-34072-A-1	TP-PFC-024-TPI	3535, 537 (modified)	T	277.20 g	28.43 g	248.8 mL	10.0 mL	500 uL	500 uL
320-34072-A-2	TP-PFC-024-MID-CARBON	3535, 537 (modified)	T	282.04 g	28.45 g	253.6 mL	10.0 mL	500 uL	500 uL
320-34072-A-3	TP-PFC-024-TPE	3535, 537 (modified)	T	278.30 g	28.33 g	250 mL	10.0 mL	500 uL	500 uL
320-34072-A-4	TP-PFC-024-TPE-D	3535, 537 (modified)	T	282.81 g	28.34 g	254.5 mL	10.0 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00117					
MB 320-199444/1		3535, 537 (modified)							
LCS 320-199444/2		3535, 537 (modified)		500 uL					
LCSD 320-199444/3		3535, 537 (modified)		500 uL					
320-34072-A-1	TP-PFC-024-TPI	3535, 537 (modified)	T						
320-34072-A-2	TP-PFC-024-MID-CARBON	3535, 537 (modified)	T						
320-34072-A-3	TP-PFC-024-TPE	3535, 537 (modified)	T						
320-34072-A-4	TP-PFC-024-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.: 320-34072-1

SDG No.:

Batch Number: 199444 Batch Start Date: 12/12/17 08:28 Batch Analyst: Branscum, Cassie

Batch Method: 3535 Batch End Date: 12/12/17 14:00

Batch Notes	
Analyst ID - Aliquot Step	CCB
Balance ID	QA-078
Analyst ID - Final Volume Step	CCB
H2O ID	12/4/17
Hexane ID	1095497
Internal Standard ID#	1106116
Manifold ID	8
Methanol ID	1105466
Sodium Hydroxide ID	1112059
Pipette ID	I46370G
Analyst ID - Reagent Drop	CCB
Analyst ID - IS Reagent Drop	CCB
Analyst ID - IS Reagent Drop Witness	KMK
Analyst ID - SU Reagent Drop	CCB
Analyst ID - SU Reagent Drop Witness	JNS
Solvent Lot #	1112027
Solvent Name	0.3%NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003137011A

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

DODCMD_ID	INSTALLATION_ID	SDG	SITE_NAME	NORM_SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE	ANALYTICAL_METHOD	ANALYTICAL_METHOD_GRP_DESC
MID_ATLANTIC	BRUNSWICK_NAS	320-34072-1	SITE 00011	SITE 00011	TP-PFC-INFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-024-TPI	Ground water	Normal (Regular)	7-Dec-17	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-34072-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-024-TPE-D	Ground water	Field duplicate	7-Dec-17	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-34072-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-024-TPE	Ground water	Normal (Regular)	7-Dec-17	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-34072-1	SITE 00011	SITE 00011	TP-PFC-MIDPOINT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-024-MID-CARBON	Ground water	Normal (Regular)	7-Dec-17	537	Perfluoroalkyl Compounds