N60087_003871
BRUNSWICK_NAS
SSIC 5000-33c

LABORATORY DATA PACKAGE, 320-38875-1, NAS BRUNSWICK ME

06/05/2018

TESTAMERICA LABORATORIES INC

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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 320-38875-1

Job Description: Brunswick GWETS

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

Attention: Jeff Orient

Approved for release.
David R Alltucker
Project Manager I
6/5/2018 3:02 PM

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06/05/2018

Table of Contents

Table of Contents

Qualifiers

LCMS

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

Glossary

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

Job Narrative
320-38875-1

Receipt
The samples were received on 5/4/2018 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 7.1º C.

Receipt Exceptions

The following samples were received at the laboratory outside the required temperature criteria at 7.1C, but under method 537's requiremtn that samples be received by the laboratoy at 10.0º C or less. TP-PFC-029-TPI (320-38875-1), TP-PFC-029-MIDCARBON (320-38875-2), TP-PFC-029-TPE (320-38875-3) and TP-PFC-029-TPE-D (320-38875-4). The cooler was received with melted ice.

LCMS
Method(s) 537 (modified), EPA 537 (Mod), EPA 537(Mod): 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) EPA 537 (Mod): The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit for 13C4 PFOS and 18O2 PFHxS: (320-38935-A-32-B MS). Matrix interference is suspected because these samples were diluted due to high target analytes and the IDA recoveries in the analysis of the diluted extract were within method recommended limits. Both sets of data have been reported. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample.

Method(s) EPA 537 (Mod): The concentration of several analytes associated with the following samples exceeded the instrument calibration range: TP-PFC-029-TPI (320-38875-1). These analytes have been qualified; however, the peaks did not saturate the instrument detector. The samples were diluted to bring the concentrations of these analytes within the instrument calibration range and both sets of data have been reported.

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

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

Detection Summary

Client: Tetra Tech, Inc.
Project/Site: Brunswick GWETS

TestAmerica Job ID: 320-38875-1

Client Sample ID: TP-PFC-029-TPI — Lab Sample ID: 320-38875-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	74	M	1.7	0.51	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	200	M	1.7	0.37	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	360	E M	1.7	0.40	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	76	M	1.7	0.52	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1500	E	1.7	0.46	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	2.4		1.7	0.45	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.82	J M	1.7	0.41	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	49	M	1.7	0.40	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	400	E	1.7	0.33	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	7.7		1.7	0.32	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	330	E	3.4	0.95	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	81	D	17	5.1	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	200	D	17	3.7	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	380	D	17	4.0	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	73	D	17	5.2	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1700	D	17	4.6	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	50	D	17	4.0	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	410	D	17	3.3	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS) - DL	8.7	J D	17	3.2	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	330	D	34	9.5	ng/L	10		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-029-MIDCARBON — Lab Sample ID: 320-38875-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	130		1.7	0.50	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	240	M	1.7	0.37	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	160	M	1.7	0.40	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.8		1.7	0.52	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	39	M	1.7	0.46	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	5.5		1.7	0.39	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.5		1.7	0.32	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-029-TPE — Lab Sample ID: 320-38875-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	130		1.8	0.54	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	190	M	1.8	0.39	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	78		1.8	0.43	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.3	J	1.8	0.56	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	2.6	M	1.8	0.49	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.4	J	1.8	0.42	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.68	J	1.8	0.35	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.6	J M	3.7	1.0	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-029-TPE-D — Lab Sample ID: 320-38875-4

This Detection Summary does not include radiochemical test results.

Client Sample ID: TP-PFC-029-TPE-D (Continued)

Lab Sample ID: 320-38875-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	130		1.9	0.56	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	190	M	1.9	0.41	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	80		1.9	0.44	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.0		1.9	0.58	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	3.5	M	1.9	0.51	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	2.2		1.9	0.44	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	7.0		1.9	0.36	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	9.2		3.8	1.0	ng/L	1		EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: TP-PFC-029-TPI

Date Collected: 05/03/18 09:20
Date Received: 05/04/18 09:30

Lab Sample ID: 320-38875-1

Matrix: Water

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**74**	**M**	1.7	0.51	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluoropentanoic acid (PFPeA)	**200**	**M**	1.7	0.37	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorohexanoic acid (PFHxA)	**360**	**E M**	1.7	0.40	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluoroheptanoic acid (PFHpA)	**76**	**M**	1.7	0.52	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorooctanoic acid (PFOA)	**1500**	**E**	1.7	0.46	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorononanoic acid (PFNA)	**2.4**		1.7	0.45	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorodecanoic acid (PFDA)	**0.82**	**J M**	1.7	0.41	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluoroundecanoic acid (PFUnA)	1.3	U M	1.7	0.62	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	0.45	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	0.65	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.4	0.71	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorobutanesulfonic acid (PFBS)	**49**	**M**	1.7	0.40	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorohexanesulfonic acid (PFHxS)	**400**	**E**	1.7	0.33	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluoroheptanesulfonic Acid (PFHpS)	**7.7**		1.7	0.32	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorooctanesulfonic acid (PFOS)	**330**	**E**	3.4	0.95	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	0.48	ng/L		05/16/18 14:51	05/28/18 07:39	1
Perfluorooctane Sulfonamide (FOSA)	2.6	U M	3.4	1.1	ng/L		05/16/18 14:51	05/28/18 07:39	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*81*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:39*	*1*
13C4 PFBA	*83*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:39*	*1*
13C5 PFPeA	*97*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:39*	*1*
13C2 PFHxA	*95*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:39*	*1*
13C4-PFHpA	*91*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:39*	*1*
13C4 PFOA	*85*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:39*	*1*
13C5 PFNA	*102*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:39*	*1*
13C2 PFDA	*96*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:39*	*1*
13C2 PFUnA	*101*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:39*	*1*
13C2 PFDoA	*89*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:39*	*1*
18O2 PFHxS	*89*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:39*	*1*
13C2-PFTeDA	*79*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:39*	*1*
13C4 PFOS	*87*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:39*	*1*
13C3-PFBS	*95*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:39*	*1*

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**81**	**D**	17	5.1	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluoropentanoic acid (PFPeA)	**200**	**D**	17	3.7	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluorohexanoic acid (PFHxA)	**380**	**D**	17	4.0	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluoroheptanoic acid (PFHpA)	**73**	**D**	17	5.2	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluorooctanoic acid (PFOA)	**1700**	**D**	17	4.6	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluorononanoic acid (PFNA)	13	U	17	4.5	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluorodecanoic acid (PFDA)	8.6	U	17	4.1	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluoroundecanoic acid (PFUnA)	13	U	17	6.2	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluorododecanoic acid (PFDoA)	13	U	17	4.5	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluorotridecanoic Acid (PFTriA)	26	U	34	6.5	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluorotetradecanoic acid (PFTeA)	26	U	34	7.1	ng/L		05/16/18 14:51	05/29/18 00:09	10

Client Sample ID: TP-PFC-029-TPI

Lab Sample ID: 320-38875-1

Date Collected: 05/03/18 09:20

Matrix: Water

Date Received: 05/04/18 09:30

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**50**	**D**	17	4.0	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluorohexanesulfonic acid (PFHxS)	**410**	**D**	17	3.3	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluoroheptanesulfonic Acid (PFHpS)	**8.7**	**J D**	17	3.2	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluorooctanesulfonic acid (PFOS)	**330**	**D**	34	9.5	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluorodecanesulfonic acid (PFDS)	13	U	17	4.8	ng/L		05/16/18 14:51	05/29/18 00:09	10
Perfluorooctane Sulfonamide (FOSA)	26	U	34	11	ng/L		05/16/18 14:51	05/29/18 00:09	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*73*		*50 - 150*	*05/16/18 14:51*	*05/29/18 00:09*	*10*
13C4 PFBA	*78*		*50 - 150*	*05/16/18 14:51*	*05/29/18 00:09*	*10*
13C5 PFPeA	*84*		*50 - 150*	*05/16/18 14:51*	*05/29/18 00:09*	*10*
13C2 PFHxA	*81*		*50 - 150*	*05/16/18 14:51*	*05/29/18 00:09*	*10*
13C4-PFHpA	*81*		*50 - 150*	*05/16/18 14:51*	*05/29/18 00:09*	*10*
13C4 PFOA	*87*		*50 - 150*	*05/16/18 14:51*	*05/29/18 00:09*	*10*
13C5 PFNA	*86*		*50 - 150*	*05/16/18 14:51*	*05/29/18 00:09*	*10*
13C2 PFDA	*83*		*50 - 150*	*05/16/18 14:51*	*05/29/18 00:09*	*10*
13C2 PFUnA	*90*		*50 - 150*	*05/16/18 14:51*	*05/29/18 00:09*	*10*
13C2 PFDoA	*87*		*50 - 150*	*05/16/18 14:51*	*05/29/18 00:09*	*10*
18O2 PFHxS	*80*		*50 - 150*	*05/16/18 14:51*	*05/29/18 00:09*	*10*
13C2-PFTeDA	*69*		*50 - 150*	*05/16/18 14:51*	*05/29/18 00:09*	*10*
13C4 PFOS	*75*		*50 - 150*	*05/16/18 14:51*	*05/29/18 00:09*	*10*
13C3-PFBS	*76*		*50 - 150*	*05/16/18 14:51*	*05/29/18 00:09*	*10*

Client Sample ID: TP-PFC-029-MIDCARBON

Lab Sample ID: 320-38875-2

Date Collected: 05/03/18 09:25

Matrix: Water

Date Received: 05/04/18 09:30

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**130**		1.7	0.50	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluoropentanoic acid (PFPeA)	**240**	**M**	1.7	0.37	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorohexanoic acid (PFHxA)	**160**	**M**	1.7	0.40	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluoroheptanoic acid (PFHpA)	**6.8**		1.7	0.52	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorooctanoic acid (PFOA)	**39**	**M**	1.7	0.46	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorononanoic acid (PFNA)	1.3	U	1.7	0.44	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorodecanoic acid (PFDA)	0.85	U	1.7	0.41	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	0.61	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	0.44	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	0.65	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.4	0.71	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorobutanesulfonic acid (PFBS)	**5.5**		1.7	0.39	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorohexanesulfonic acid (PFHxS)	**2.5**		1.7	0.32	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.85	U	1.7	0.32	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorooctanesulfonic acid (PFOS)	2.6	U M	3.4	0.94	ng/L		05/16/18 14:51	05/28/18 07:47	1
Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	0.48	ng/L		05/16/18 14:51	05/28/18 07:47	1

Client Sample ID: TP-PFC-029-MIDCARBON

Lab Sample ID: 320-38875-2

Date Collected: 05/03/18 09:25

Matrix: Water

Date Received: 05/04/18 09:30

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.4	1.1	ng/L		05/16/18 14:51	05/28/18 07:47	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*67*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:47*	*1*
13C4 PFBA	*73*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:47*	*1*
13C5 PFPeA	*76*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:47*	*1*
13C2 PFHxA	*78*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:47*	*1*
13C4-PFHpA	*75*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:47*	*1*
13C4 PFOA	*78*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:47*	*1*
13C5 PFNA	*82*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:47*	*1*
13C2 PFDA	*77*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:47*	*1*
13C2 PFUnA	*74*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:47*	*1*
13C2 PFDoA	*66*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:47*	*1*
18O2 PFHxS	*77*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:47*	*1*
13C2-PFTeDA	*60*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:47*	*1*
13C4 PFOS	*73*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:47*	*1*
13C3-PFBS	*72*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:47*	*1*

Client Sample ID: TP-PFC-029-TPE

Lab Sample ID: 320-38875-3

Date Collected: 05/03/18 09:30

Matrix: Water

Date Received: 05/04/18 09:30

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**130**		1.8	0.54	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluoropentanoic acid (PFPeA)	**190**	**M**	1.8	0.39	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorohexanoic acid (PFHxA)	**78**		1.8	0.43	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluoroheptanoic acid (PFHpA)	**1.3**	**J**	1.8	0.56	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorooctanoic acid (PFOA)	**2.6**	**M**	1.8	0.49	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorononanoic acid (PFNA)	1.4	U	1.8	0.48	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorodecanoic acid (PFDA)	0.92	U	1.8	0.44	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluoroundecanoic acid (PFUnA)	1.4	U	1.8	0.66	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorododecanoic acid (PFDoA)	1.4	U	1.8	0.48	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorotridecanoic Acid (PFTriA)	2.7	U	3.7	0.70	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorotetradecanoic acid (PFTeA)	2.7	U	3.7	0.76	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorobutanesulfonic acid (PFBS)	**1.4**	**J**	1.8	0.42	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorohexanesulfonic acid (PFHxS)	**0.68**	**J**	1.8	0.35	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.92	U	1.8	0.34	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorooctanesulfonic acid (PFOS)	**2.6**	**J M**	3.7	1.0	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorodecanesulfonic acid (PFDS)	1.4	U	1.8	0.51	ng/L		05/16/18 14:51	05/28/18 07:55	1
Perfluorooctane Sulfonamide (FOSA)	2.7	U	3.7	1.2	ng/L		05/16/18 14:51	05/28/18 07:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*64*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:55*	*1*
13C4 PFBA	*72*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:55*	*1*
13C5 PFPeA	*76*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:55*	*1*
13C2 PFHxA	*74*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:55*	*1*
13C4-PFHpA	*74*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:55*	*1*

Client Sample ID: TP-PFC-029-TPE

Lab Sample ID: 320-38875-3

Date Collected: 05/03/18 09:30

Matrix: Water

Date Received: 05/04/18 09:30

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*79*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:55*	*1*
13C5 PFNA	*81*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:55*	*1*
13C2 PFDA	*72*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:55*	*1*
13C2 PFUnA	*78*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:55*	*1*
13C2 PFDoA	*69*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:55*	*1*
18O2 PFHxS	*73*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:55*	*1*
13C2-PFTeDA	*60*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:55*	*1*
13C4 PFOS	*73*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:55*	*1*
13C3-PFBS	*72*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:55*	*1*

Client Sample ID: TP-PFC-029-TPE-D

Lab Sample ID: 320-38875-4

Date Collected: 05/03/18 00:00

Matrix: Water

Date Received: 05/04/18 09:30

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**130**		1.9	0.56	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluoropentanoic acid (PFPeA)	**190**	**M**	1.9	0.41	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorohexanoic acid (PFHxA)	**80**		1.9	0.44	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluoroheptanoic acid (PFHpA)	**2.0**		1.9	0.58	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorooctanoic acid (PFOA)	**3.5**	**M**	1.9	0.51	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorononanoic acid (PFNA)	1.4	U	1.9	0.49	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorodecanoic acid (PFDA)	0.95	U	1.9	0.45	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluoroundecanoic acid (PFUnA)	1.4	U	1.9	0.68	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorododecanoic acid (PFDoA)	1.4	U	1.9	0.49	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorotridecanoic Acid (PFTriA)	2.8	U	3.8	0.72	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorotetradecanoic acid (PFTeA)	2.8	U	3.8	0.79	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorobutanesulfonic acid (PFBS)	**2.2**		1.9	0.44	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorohexanesulfonic acid (PFHxS)	**7.0**		1.9	0.36	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.95	U M	1.9	0.35	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorooctanesulfonic acid (PFOS)	**9.2**		3.8	1.0	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorodecanesulfonic acid (PFDS)	1.4	U	1.9	0.53	ng/L		05/16/18 14:51	05/28/18 08:02	1
Perfluorooctane Sulfonamide (FOSA)	2.8	U	3.8	1.2	ng/L		05/16/18 14:51	05/28/18 08:02	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*67*		*50 - 150*	*05/16/18 14:51*	*05/28/18 08:02*	*1*
13C4 PFBA	*75*		*50 - 150*	*05/16/18 14:51*	*05/28/18 08:02*	*1*
13C5 PFPeA	*80*		*50 - 150*	*05/16/18 14:51*	*05/28/18 08:02*	*1*
13C2 PFHxA	*76*		*50 - 150*	*05/16/18 14:51*	*05/28/18 08:02*	*1*
13C4-PFHpA	*78*		*50 - 150*	*05/16/18 14:51*	*05/28/18 08:02*	*1*
13C4 PFOA	*84*		*50 - 150*	*05/16/18 14:51*	*05/28/18 08:02*	*1*
13C5 PFNA	*91*		*50 - 150*	*05/16/18 14:51*	*05/28/18 08:02*	*1*
13C2 PFDA	*79*		*50 - 150*	*05/16/18 14:51*	*05/28/18 08:02*	*1*
13C2 PFUnA	*86*		*50 - 150*	*05/16/18 14:51*	*05/28/18 08:02*	*1*
13C2 PFDoA	*76*		*50 - 150*	*05/16/18 14:51*	*05/28/18 08:02*	*1*
18O2 PFHxS	*78*		*50 - 150*	*05/16/18 14:51*	*05/28/18 08:02*	*1*
13C2-PFTeDA	*70*		*50 - 150*	*05/16/18 14:51*	*05/28/18 08:02*	*1*

Client Sample ID: TP-PFC-029-TPE-D

Date Collected: 05/03/18 00:00
Date Received: 05/04/18 09:30

Lab Sample ID: 320-38875-4

Matrix: Water

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	78		50 - 150	05/16/18 14:51	05/28/18 08:02	1
13C3-PFBS	78		50 - 150	05/16/18 14:51	05/28/18 08:02	1

Default Detection Limits

Client: Tetra Tech, Inc.
Project/Site: Brunswick GWETS

TestAmerica Job ID: 320-38875-1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	2.0	0.46	ng/L	EPA 537 (Mod)
Perfluorobutanoic acid (PFBA)	2.0	0.59	ng/L	EPA 537 (Mod)
Perfluorodecanesulfonic acid (PFDS)	2.0	0.56	ng/L	EPA 537 (Mod)
Perfluorodecanoic acid (PFDA)	2.0	0.48	ng/L	EPA 537 (Mod)
Perfluorododecanoic acid (PFDoA)	2.0	0.52	ng/L	EPA 537 (Mod)
Perfluoroheptanesulfonic Acid (PFHpS)	2.0	0.37	ng/L	EPA 537 (Mod)
Perfluoroheptanoic acid (PFHpA)	2.0	0.61	ng/L	EPA 537 (Mod)
Perfluorohexanesulfonic acid (PFHxS)	2.0	0.38	ng/L	EPA 537 (Mod)
Perfluorohexanoic acid (PFHxA)	2.0	0.47	ng/L	EPA 537 (Mod)
Perfluorononanoic acid (PFNA)	2.0	0.52	ng/L	EPA 537 (Mod)
Perfluorooctane Sulfonamide (FOSA)	4.0	1.3	ng/L	EPA 537 (Mod)
Perfluorooctanesulfonic acid (PFOS)	4.0	1.1	ng/L	EPA 537 (Mod)
Perfluorooctanoic acid (PFOA)	2.0	0.54	ng/L	EPA 537 (Mod)
Perfluoropentanoic acid (PFPeA)	2.0	0.43	ng/L	EPA 537 (Mod)
Perfluorotetradecanoic acid (PFTeA)	4.0	0.83	ng/L	EPA 537 (Mod)
Perfluorotridecanoic Acid (PFTriA)	4.0	0.76	ng/L	EPA 537 (Mod)
Perfluoroundecanoic acid (PFUnA)	2.0	0.72	ng/L	EPA 537 (Mod)

Isotope Dilution Summary

Client: Tetra Tech, Inc.
Project/Site: Brunswick GWETS

TestAmerica Job ID: 320-38875-1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFOSA (50-150)	PFBA (50-150)	PFPeA (50-150)	PFHxA (50-150)	PFHpA (50-150)	PFOA (50-150)	PFNA (50-150)	PFDA (50-150)
320-38875-1	TP-PFC-029-TPI	81	83	97	95	91	85	102	96
320-38875-1 - DL	TP-PFC-029-TPI	73	78	84	81	81	87	86	83
320-38875-2	TP-PFC-029-MIDCARBON	67	73	76	78	75	78	82	77
320-38875-3	TP-PFC-029-TPE	64	72	76	74	74	79	81	72
320-38875-4	TP-PFC-029-TPE-D	67	75	80	76	78	84	91	79
LCS 320-223615/2-A	Lab Control Sample	69	80	87	86	85	90	90	86
MB 320-223615/1-A	Method Blank	71	79	85	85	84	93	94	86

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFUnA (50-150)	PFDoA (50-150)	PFHxS (50-150)	PFTDA (50-150)	PFOS (50-150)	3C3-PFBS (50-150)		
320-38875-1	TP-PFC-029-TPI	101	89	89	79	87	95		
320-38875-1 - DL	TP-PFC-029-TPI	90	87	80	69	75	76		
320-38875-2	TP-PFC-029-MIDCARBON	74	66	77	60	73	72		
320-38875-3	TP-PFC-029-TPE	78	69	73	60	73	72		
320-38875-4	TP-PFC-029-TPE-D	86	76	78	70	78	78		
LCS 320-223615/2-A	Lab Control Sample	94	82	80	82	86	78		
MB 320-223615/1-A	Method Blank	90	85	85	84	81	80		

Surrogate Legend

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

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Lab Sample ID: MB 320-223615/1-A
Matrix: Water
Analysis Batch: 225818

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 223615

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.5	U	2.0	0.59	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	0.43	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorohexanoic acid (PFHxA)	1.0	U	2.0	0.47	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluoroheptanoic acid (PFHpA)	1.5	U	2.0	0.61	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorooctanoic acid (PFOA)	1.5	U M	2.0	0.54	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorononanoic acid (PFNA)	1.5	U	2.0	0.52	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorodecanoic acid (PFDA)	1.0	U	2.0	0.48	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluoroundecanoic acid (PFUnA)	1.5	U	2.0	0.72	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorododecanoic acid (PFDoA)	1.5	U	2.0	0.52	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	0.76	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorotetradecanoic acid (PFTeA)	3.0	U	4.0	0.83	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	0.46	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	0.38	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	0.37	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	1.1	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorodecanesulfonic acid (PFDS)	1.5	U	2.0	0.56	ng/L		05/16/18 14:51	05/28/18 07:23	1
Perfluorooctane Sulfonamide (FOSA)	3.0	U	4.0	1.3	ng/L		05/16/18 14:51	05/28/18 07:23	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*71*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:23*	*1*
13C4 PFBA	*79*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:23*	*1*
13C5 PFPeA	*85*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:23*	*1*
13C2 PFHxA	*85*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:23*	*1*
13C4-PFHpA	*84*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:23*	*1*
13C4 PFOA	*93*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:23*	*1*
13C5 PFNA	*94*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:23*	*1*
13C2 PFDA	*86*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:23*	*1*
13C2 PFUnA	*90*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:23*	*1*
13C2 PFDoA	*85*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:23*	*1*
18O2 PFHxS	*85*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:23*	*1*
13C2-PFTeDA	*84*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:23*	*1*
13C4 PFOS	*81*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:23*	*1*
13C3-PFBS	*80*		*50 - 150*	*05/16/18 14:51*	*05/28/18 07:23*	*1*

Lab Sample ID: LCS 320-223615/2-A
Matrix: Water
Analysis Batch: 225818

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 223615

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	40.0	41.6		ng/L		104	83 - 118
Perfluoropentanoic acid (PFPeA)	40.0	36.7		ng/L		92	83 - 108
Perfluorohexanoic acid (PFHxA)	40.0	39.4		ng/L		98	83 - 109
Perfluoroheptanoic acid (PFHpA)	40.0	39.6		ng/L		99	80 - 113
Perfluorooctanoic acid (PFOA)	40.0	35.7		ng/L		89	80 - 107
Perfluorononanoic acid (PFNA)	40.0	37.6		ng/L		94	83 - 113
Perfluorodecanoic acid (PFDA)	40.0	42.6		ng/L		107	85 - 113
Perfluoroundecanoic acid (PFUnA)	40.0	36.2		ng/L		91	76 - 105

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: LCS 320-223615/2-A
Matrix: Water
Analysis Batch: 225818

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 223615

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorododecanoic acid (PFDoA)	40.0	40.9		ng/L		102	87 - 116
Perfluorotridecanoic Acid (PFTriA)	40.0	39.3		ng/L		98	75 - 129
Perfluorotetradecanoic acid (PFTeA)	40.0	36.7		ng/L		92	82 - 115
Perfluorobutanesulfonic acid (PFBS)	35.4	36.3		ng/L		103	87 - 120
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.0		ng/L		96	81 - 106
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	34.4		ng/L		90	80 - 117
Perfluorooctanesulfonic acid (PFOS)	37.1	33.5		ng/L		90	82 - 112
Perfluorodecanesulfonic acid (PFDS)	38.6	35.3		ng/L		91	81 - 114
Perfluorooctane Sulfonamide (FOSA)	40.0	40.5		ng/L		101	85 - 114

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*69*		*50 - 150*
13C4 PFBA	*80*		*50 - 150*
13C5 PFPeA	*87*		*50 - 150*
13C2 PFHxA	*86*		*50 - 150*
13C4-PFHpA	*85*		*50 - 150*
13C4 PFOA	*90*		*50 - 150*
13C5 PFNA	*90*		*50 - 150*
13C2 PFDA	*86*		*50 - 150*
13C2 PFUnA	*94*		*50 - 150*
13C2 PFDoA	*82*		*50 - 150*
18O2 PFHxS	*80*		*50 - 150*
13C2-PFTeDA	*82*		*50 - 150*
13C4 PFOS	*86*		*50 - 150*
13C3-PFBS	*78*		*50 - 150*

LCMS

Prep Batch: 223615

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-38875-1	TP-PFC-029-TPI	Total/NA	Water	3535	
320-38875-1 - DL	TP-PFC-029-TPI	Total/NA	Water	3535	
320-38875-2	TP-PFC-029-MIDCARBON	Total/NA	Water	3535	
320-38875-3	TP-PFC-029-TPE	Total/NA	Water	3535	
320-38875-4	TP-PFC-029-TPE-D	Total/NA	Water	3535	
MB 320-223615/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-223615/2-A	Lab Control Sample	Total/NA	Water	3535	

Analysis Batch: 225818

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-38875-1	TP-PFC-029-TPI	Total/NA	Water	EPA 537 (Mod)	223615
320-38875-2	TP-PFC-029-MIDCARBON	Total/NA	Water	EPA 537 (Mod)	223615
320-38875-3	TP-PFC-029-TPE	Total/NA	Water	EPA 537 (Mod)	223615
320-38875-4	TP-PFC-029-TPE-D	Total/NA	Water	EPA 537 (Mod)	223615
MB 320-223615/1-A	Method Blank	Total/NA	Water	EPA 537 (Mod)	223615
LCS 320-223615/2-A	Lab Control Sample	Total/NA	Water	EPA 537 (Mod)	223615

Analysis Batch: 225884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-38875-1 - DL	TP-PFC-029-TPI	Total/NA	Water	EPA 537 (Mod)	223615

Lab Chronicle

Client: Tetra Tech, Inc.
Project/Site: Brunswick GWETS

TestAmerica Job ID: 320-38875-1

Client Sample ID: TP-PFC-029-TPI
Lab Sample ID: 320-38875-1
Date Collected: 05/03/18 09:20
Matrix: Water
Date Received: 05/04/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			223615	05/16/18 14:51	AME	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	225818	05/28/18 07:39	D1R	TAL SAC
Total/NA	Prep	3535	DL		223615	05/16/18 14:51	AME	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	10	225884	05/29/18 00:09	D1R	TAL SAC

Client Sample ID: TP-PFC-029-MIDCARBON
Lab Sample ID: 320-38875-2
Date Collected: 05/03/18 09:25
Matrix: Water
Date Received: 05/04/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			223615	05/16/18 14:51	AME	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	225818	05/28/18 07:47	D1R	TAL SAC

Client Sample ID: TP-PFC-029-TPE
Lab Sample ID: 320-38875-3
Date Collected: 05/03/18 09:30
Matrix: Water
Date Received: 05/04/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			223615	05/16/18 14:51	AME	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	225818	05/28/18 07:55	D1R	TAL SAC

Client Sample ID: TP-PFC-029-TPE-D
Lab Sample ID: 320-38875-4
Date Collected: 05/03/18 00:00
Matrix: Water
Date Received: 05/04/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			223615	05/16/18 14:51	AME	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	225818	05/28/18 08:02	D1R	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: 320-38875-1
Project/Site: Brunswick GWETS

Laboratory: TestAmerica Sacramento

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4040	01-29-19

Method Summary

Client: Tetra Tech, Inc.
Project/Site: Brunswick GWETS

TestAmerica Job ID: 320-38875-1

Method	Method Description	Protocol	Laboratory
EPA 537 (Mod)	PFAS for QSM 5.1, Table B-15	DOD 5.1	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC

Protocol References:

DOD 5.1 = Department of Defense Quality Systems Manual V5.1

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

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: Brunswick GWETS

TestAmerica Job ID: 320-38875-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-38875-1	TP-PFC-029-TPI	Water	05/03/18 09:20	05/04/18 09:30
320-38875-2	TP-PFC-029-MIDCARBON	Water	05/03/18 09:25	05/04/18 09:30
320-38875-3	TP-PFC-029-TPE	Water	05/03/18 09:30	05/04/18 09:30
320-38875-4	TP-PFC-029-TPE-D	Water	05/03/18 00:00	05/04/18 09:30

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 223413

Lab Sample ID: IC 320-223413/2 Client Sample ID:

Date Analyzed: 05/15/18 15:13 Lab File ID: 2017.05.15LLB_ICAL_002.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanoic acid (PFHxA)	2.05	Peak assignment corrected	westendorfc	05/15/18 16:30
Perfluorononanoic acid (PFNA)	3.11	Split Peak	westendorfc	05/15/18 16:30

Lab Sample ID: IC 320-223413/3 Client Sample ID:

Date Analyzed: 05/15/18 15:21 Lab File ID: 2017.05.15LLB_ICAL_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.46	Baseline	westendorfc	05/15/18 16:30
Perfluoropentanoic acid (PFPeA)	1.75	Baseline	westendorfc	05/15/18 16:31
Perfluorohexanoic acid (PFHxA)	2.04	Baseline	westendorfc	05/15/18 16:31
Perfluorooctanesulfonic acid (PFOS)	3.11	Baseline	westendorfc	05/15/18 16:31

Lab Sample ID: ICB 320-223413/12 Client Sample ID:

Date Analyzed: 05/15/18 17:15 Lab File ID: 2018.05.15LLCC_ICAL_009.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.75	Baseline	hannigana	05/16/18 08:05
Perfluorooctanoic acid (PFOA)	2.73	Assign Peak	hannigana	05/16/18 08:05
Perfluorononanoic acid (PFNA)		Invalid Compound ID	hannigana	05/16/18 08:05

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 225818

Lab Sample ID: CCB 320-225818/1 Client Sample ID:

Date Analyzed: 05/28/18 07:00 Lab File ID: 2018.05.27LLADX_001.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.70	Assign Peak	ruangyotsakuld	05/30/18 10:55
Perfluorononanoic acid (PFNA)		Invalid Compound ID	barnettj	05/29/18 18:24

Lab Sample ID: MB 320-223615/1-A Client Sample ID:

Date Analyzed: 05/28/18 07:23 Lab File ID: 2018.05.27LLADX_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.71	Isomers	ruangyotsakuld	05/30/18 10:59

Lab Sample ID: 320-38875-1 Client Sample ID: TP-PFC-029-TPI

Date Analyzed: 05/28/18 07:39 Lab File ID: 2018.05.27LLADX_006.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.46	Baseline	ruangyotsakuld	05/30/18 11:02
Perfluoropentanoic acid (PFPeA)	1.73	Baseline	ruangyotsakuld	05/30/18 11:02
Perfluorobutanesulfonic acid (PFBS)	1.77	Baseline	ruangyotsakuld	05/30/18 11:02
Perfluorohexanoic acid (PFHxA)	2.01	Baseline	ruangyotsakuld	05/30/18 11:02
Perfluoroheptanoic acid (PFHpA)	2.34	Baseline	ruangyotsakuld	05/30/18 11:02
Perfluorooctane Sulfonamide (FOSA)	3.37	Wrong peak	ruangyotsakuld	05/30/18 11:03
Perfluorodecanoic acid (PFDA)	3.44	Split Peak	ruangyotsakuld	05/30/18 11:03
Perfluoroundecanoic acid (PFUnA)	3.76	Baseline	ruangyotsakuld	05/30/18 11:03

EPA 537 (Mod)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 225818

Lab Sample ID: 320-38875-2 Client Sample ID: TP-PFC-029-MIDCARBON

Date Analyzed: 05/28/18 07:47 Lab File ID: 2018.05.27LLADX_007.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.73	Baseline	ruangyotsakuld	05/30/18 11:05
Perfluorohexanoic acid (PFHxA)	2.01	Baseline	ruangyotsakuld	05/30/18 11:05
Perfluorooctanoic acid (PFOA)	2.70	Isomers	ruangyotsakuld	05/30/18 11:05
Perfluorooctanesulfonic acid (PFOS)	2.95	Baseline	ruangyotsakuld	05/30/18 11:06

Lab Sample ID: 320-38875-3 Client Sample ID: TP-PFC-029-TPE

Date Analyzed: 05/28/18 07:55 Lab File ID: 2018.05.27LLADX_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.73	Baseline	ruangyotsakuld	05/30/18 11:07
Perfluorooctanoic acid (PFOA)	2.61	Baseline	ruangyotsakuld	05/30/18 11:08
Perfluorooctanesulfonic acid (PFOS)	3.06	Baseline	ruangyotsakuld	05/30/18 11:08

Lab Sample ID: 320-38875-4 Client Sample ID: TP-PFC-029-TPE-D

Date Analyzed: 05/28/18 08:02 Lab File ID: 2018.05.27LLADX_009.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.72	Baseline	ruangyotsakuld	05/30/18 11:09
Perfluorooctanoic acid (PFOA)	2.69	Isomers	ruangyotsakuld	05/30/18 11:10
Perfluoroheptanesulfonic Acid (PFHpS)	2.70	Baseline	ruangyotsakuld	05/30/18 11:10

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 225873

Lab Sample ID: CCB 320-225873/1 Client Sample ID:

Date Analyzed: 05/28/18 17:14 Lab File ID: 2018.05.28LLA_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)		Invalid Compound ID	mongkols	05/30/18 09:29

Lab Sample ID: CCVL 320-225873/2 Client Sample ID:

Date Analyzed: 05/28/18 17:22 Lab File ID: 2018.05.28LLA_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.46	Baseline	mongkols	05/30/18 09:30
Perfluorohexanoic acid (PFHxA)	2.01	Baseline	mongkols	05/30/18 09:30
Perfluorooctanoic acid (PFOA)	2.70	Baseline	mongkols	05/30/18 09:30
Perfluorononanoic acid (PFNA)	3.06	Split Peak	mongkols	05/30/18 09:31
Perfluorooctanesulfonic acid (PFOS)	3.06	Baseline	mongkols	05/30/18 09:30
Perfluorododecanoic acid (PFDoA)	4.04	Baseline	mongkols	05/30/18 09:31

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFC_ALL_SU_00065	11/15/18	05/15/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM3HFPO-DA_00002	200 uL	13C3 HFPO-DA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
.LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
.LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
.LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
.LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM3HFPO-DA_00002	08/17/20	WELLINGTON, Lot M3HFPODA0817			(Purchased Reagent)		13C3 HFPO-DA	50 ug/mL
.LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
.LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
.LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC-IS_00050	11/15/18	05/15/18	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_LL0_00006	08/20/18	02/22/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ALL_SU_00041	10 mL	13C2-PFOA	2.5 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC_LL0_00006	08/20/18	02/22/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ALL_SU_00041	10 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
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC_LL1_00005	08/20/18	02/22/18	MeOH/H2O, Lot 90285	200 mL	LCMPFC_ALL_SU_00041	10 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-PFOA	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_00136	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-ethyl perfluorooctane sulfonamidoacetic acid	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorodecanoic acid (PFDA)	0.025 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
							Perfluorohexanesulfonic acid (PFHxS)	0.02275 ng/mL
							Perfluorononanoic acid (PFNA)	0.025 ng/mL
							Perfluorononanesulfonic acid	0.024 ng/mL
							Perfluorooctanoic acid (PFOA)	0.025 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0232 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.025 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.025 ng/mL
							Perfluoropentanesulfonic acid	0.02345 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_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00136	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LCPFCSP_00132	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-ethyl perfluorooctane sulfonamidoacetic acid	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
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorononanesulfonic acid	0.096 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
							Perfluoropentanesulfonic acid	0.0938 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	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-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003	200 uL	Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 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-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSAA_00005	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)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(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
...LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
...LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	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
...LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
...LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFTrDA_00006	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
LCPFC_LL2_00004	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00041	10 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-PFOA	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_00136	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-ethyl perfluorooctane sulfonamidoacetic acid	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanoic acid (PFHxA)	0.05 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0455 ng/mL
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorononanesulfonic acid	0.048 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
							Perfluoropentanesulfonic acid	0.0469 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_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00136	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LCPFCSP_00132	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-ethyl perfluorooctane sulfonamidoacetic acid	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
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorononanesulfonic acid	0.096 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
							Perfluoropentanesulfonic acid	0.0938 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	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-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003	200 uL	Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...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-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSAA_00005	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)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(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
...LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
...LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	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
...LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
...LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00006	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
LCPFC_LL3_00004	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00041	10 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-PFOA	2.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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_00136	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-ethyl perfluorooctane sulfonamidoacetic acid	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
							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
							Perfluorohexanesulfonic acid (PFHxS)	0.2275 ng/mL
							Perfluorononanoic acid (PFNA)	0.25 ng/mL
							Perfluorononanesulfonic acid	0.24 ng/mL
							Perfluorooctanoic acid (PFOA)	0.25 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.232 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.25 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoropentanoic acid (PFPeA)	0.25 ng/mL
							Perfluoropentanesulfonic acid	0.2345 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_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00136	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LCPFCSP_00132	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-ethyl perfluorooctane sulfonamidoacetic acid	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
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorononanesulfonic acid	0.096 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
							Perfluoropentanesulfonic acid	0.0938 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

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-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003	200 uL	Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSAA_00005	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)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(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
...LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
...LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	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
...LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
...LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00006	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
LCPFC_LL4_00004	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00041	10 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-PFOA	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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_00132	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
							N-ethyl perfluorooctane sulfonamidoacetic acid	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
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorononanesulfonic acid	0.96 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	1 ng/mL
							Perfluoropentanoic acid (PFPeA)	1 ng/mL
							Perfluoropentanesulfonic acid	0.938 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	1 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	1 ng/mL
							Perfluoroundecanoic acid (PFUnA)	1 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003	200 uL	Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 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-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCN-MeFOSAA_00005	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)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(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
..LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	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
..LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00006	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
LCPFC_LL5_00004	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00041	10 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-PFOA	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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_00132	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-ethyl perfluorooctane sulfonamidoacetic acid	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
							Perfluorohexanesulfonic acid (PFHxS)	2.275 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorononanesulfonic acid	2.4 ng/mL
							Perfluorooctanoic acid (PFOA)	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
							Perfluoropentanesulfonic acid	2.345 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_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003	200 uL	Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 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-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSAA_00005	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(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
..LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	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
..LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00006	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
LCPFC_LL6_00005	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00041	10 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-PFOA	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

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00132	1 mL	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-ethyl perfluorooctane sulfonamidoacetic acid	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
							Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorononanesulfonic acid	4.8 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.64 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	5 ng/mL
							Perfluoropentanoic acid (PFPeA)	5 ng/mL
							Perfluoropentanesulfonic acid	4.69 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	5 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	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-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003	200 uL	Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 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-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSAA_00005	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)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..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
..LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	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
..LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00006	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
LCPFC_LL7_00004	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00041	10 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-PFOA	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_00132	2 mL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	9.34 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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-ethyl perfluorooctane sulfonamidoacetic acid	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
							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
							Perfluorohexanesulfonic acid (PFHxS)	9.1 ng/mL
							Perfluorononanoic acid (PFNA)	10 ng/mL
							Perfluorononanesulfonic acid	9.6 ng/mL
							Perfluorooctanoic acid (PFOA)	10 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	9.28 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	10 ng/mL
							Perfluoropentanoic acid (PFPeA)	10 ng/mL
							Perfluoropentanesulfonic acid	9.38 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	10 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	10 ng/mL
							Perfluoroundecanoic acid (PFUnA)	10 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	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-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003	200 uL	Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 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-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSAA_00005	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)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..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
..LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	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
..LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00006	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
LCPFCIC_FULL_00011	07/02/18	02/22/18	MeOH/H2O, Lot 09285	200 mL	LCMPFC_ALL_SU_00041	10 mL	13C2-PFOA	2.5 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	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
LCPFCIC_FULL_00011	07/02/18	02/22/18	MeOH/H2O, Lot 09285	200 mL	LCMPFC_ALL_SU_00041	10 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
					LCPFAC-24PAR_00001	250 uL	Perfluorobutanesulfonic acid (PFBS)	2.2125 ng/mL
							Perfluorobutanoic acid (PFBA)	2.5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	2.4125 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorodecanoic acid (PFDA)	2.5 ng/mL
							Perfluorododecanoic acid (PFDoA)	2.5 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	2.375 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.28 ng/mL
							Perfluorohexanoic acid (PFHxA)	2.5 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	2.5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	2.31375 ng/mL
							Perfluorooctanoic acid (PFOA)	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_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFAC-24PAR_00001	09/15/22	Wellington Laboratories, Lot PFAC24PAR0917			(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
							Perfluoroheptanesulfonic Acid (PFHpS)	1.9 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.824 ug/mL
							Perfluorohexanoic acid (PFHxA)	2 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.851 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
LCPFCSP_00144	11/15/18	05/15/18	Methanol, Lot 090285	250 mL	LC11CIPF3OUdS_00001	100 uL	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonate	0.01884 ug/mL
					LC4:2FTS_00003	100 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.01868 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC6:2FTS_00003	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
					LC9CI-PF3ONS_00001	100 uL	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	0.01864 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCDONA_00001	100 uL	Adona	0.02 ug/mL
					LCHFPO-DA_00001	100 uL	Perfluoro(2-propoxypropanoic) acid	0.02 ug/mL
					LCN-EtFOSA-M_00005	100 uL	N-ethylperfluoro-1-octanesulfonamide	0.02 ug/mL
					LCN-MeFOSA-M_00004	100 uL	MeFOSA	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
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 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
					LCPFPeA_00007	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00007	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFTrDA_00007	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUdA_00007	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
.LC11CIPF3OUdS_00001	09/30/21	Wellington Labs, Lot 11CIPF3OUdS0916			(Purchased Reagent)		11-Chloroeicosafluoro-3-oxaundecane-1-sulfonate	47.1 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
.LC9CI-PF3ONS_00001	09/30/21	Wellington Labs, Lot 9CIPF3ONS0916			(Purchased Reagent)		9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	46.6 ug/mL
.LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCDONA_00001	04/10/22	WELLINGTON, Lot NADONA0417			(Purchased Reagent)		Adona	50 ug/mL
.LCHFPO-DA_00001	07/03/20	WELLINGTON, Lot HFPODA0717			(Purchased Reagent)		Perfluoro(2-propoxypropanoic) acid	50 ug/mL
.LCN-EtFOSA-M_00005	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
.LCN-MeFOSA-M_00004	05/24/21	WELLINGTON, Lot NMeFOSA0516M			(Purchased Reagent)		MeFOSA	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
.LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.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
.LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
.LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 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

LC11CIPF3OUdS_00001

r: 9/5/17 SQ

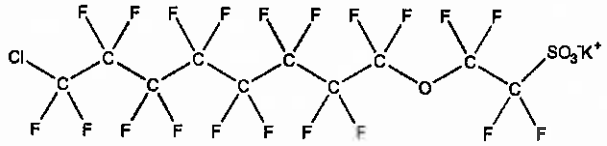
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: 11Cl-PF3OUdS **LOT NUMBER:** 11ClPF3OUdS0916

COMPOUND: Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate

STRUCTURE: **CAS #:** 83329-89-9



MOLECULAR FORMULA: $C_{10}F_{20}ClSO_4K$ **MOLECULAR WEIGHT:** 670.69

CONCENTRATION: 50.0 ± 2.5 µg/ml (K Salt) **SOLVENT(S):** Methanol

47.1 ± 2.4 µg/ml (11Cl-PF3OUdS anion)

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.
- This compound is a minor component of the commercial formulation known as F-53B.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/19/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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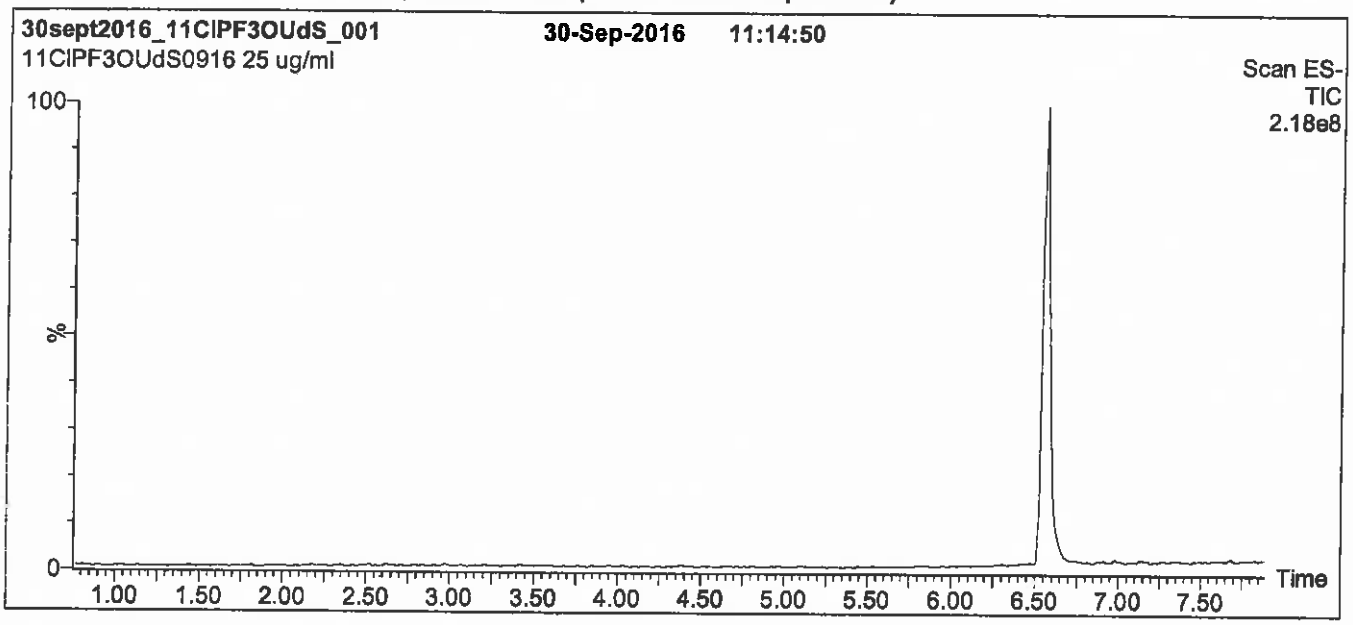
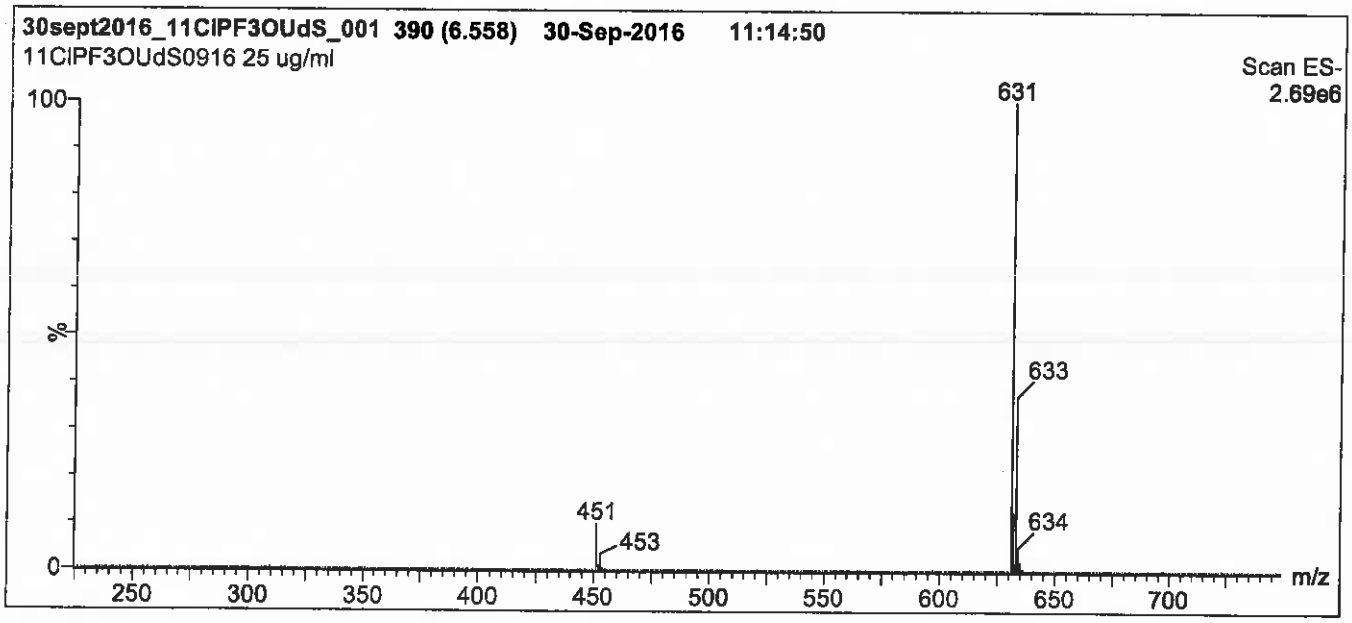
CALA

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: **11Cl-PF3OUdS; 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

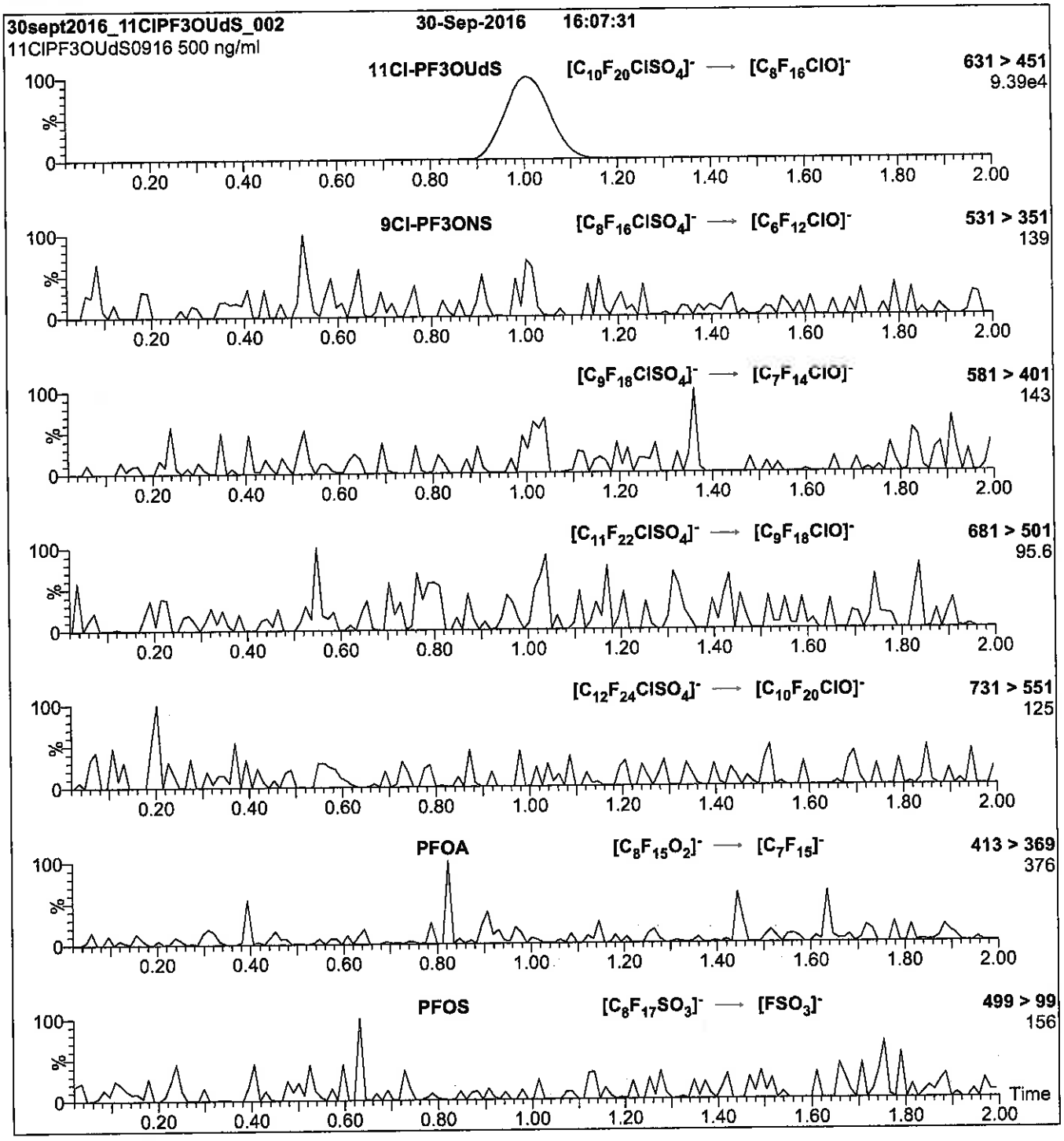
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 45.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **11Cl-PF3OUdS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 11Cl-PF3OUdS)

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) = 20

Reagent

LC4:2FTS_00003

n: 7/12/17 SK

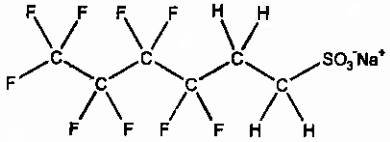
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/21/2016 (mm/dd/yyyy)

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

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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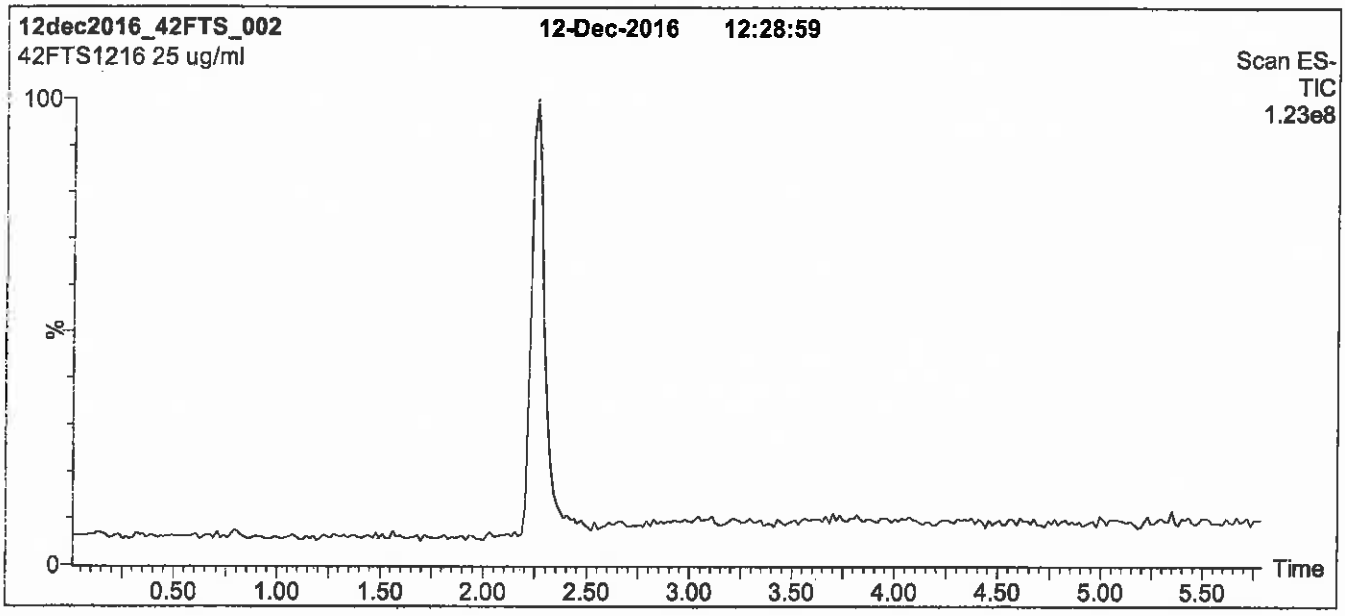
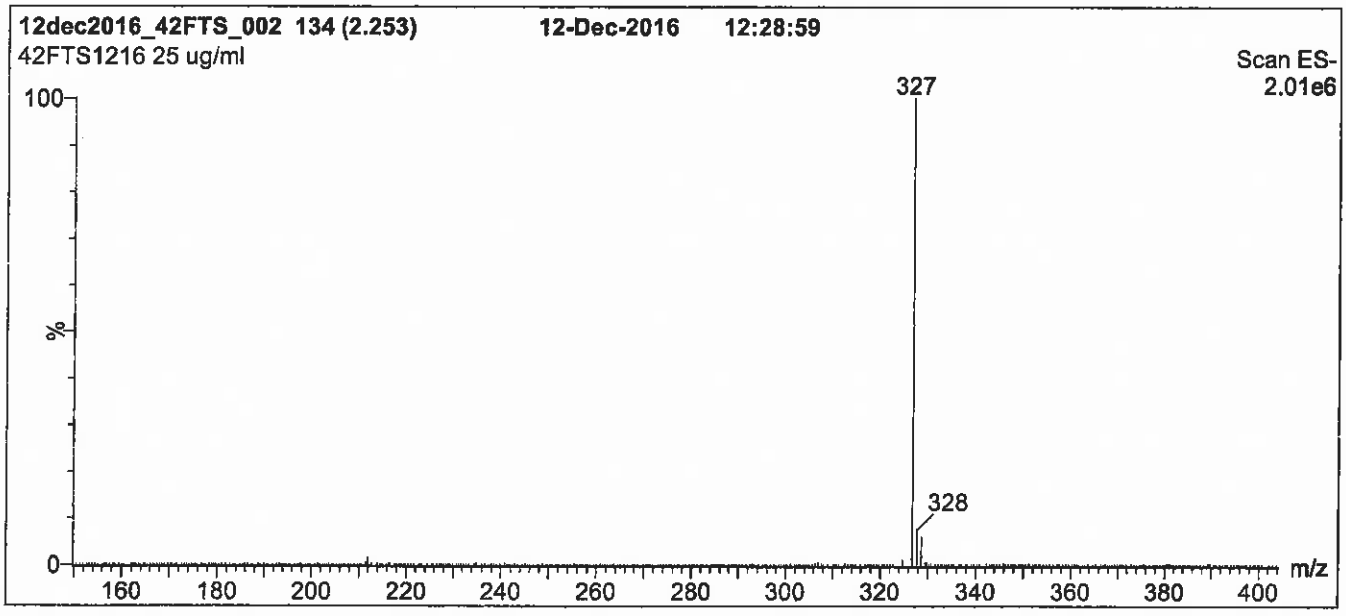
Figure 1: **4:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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

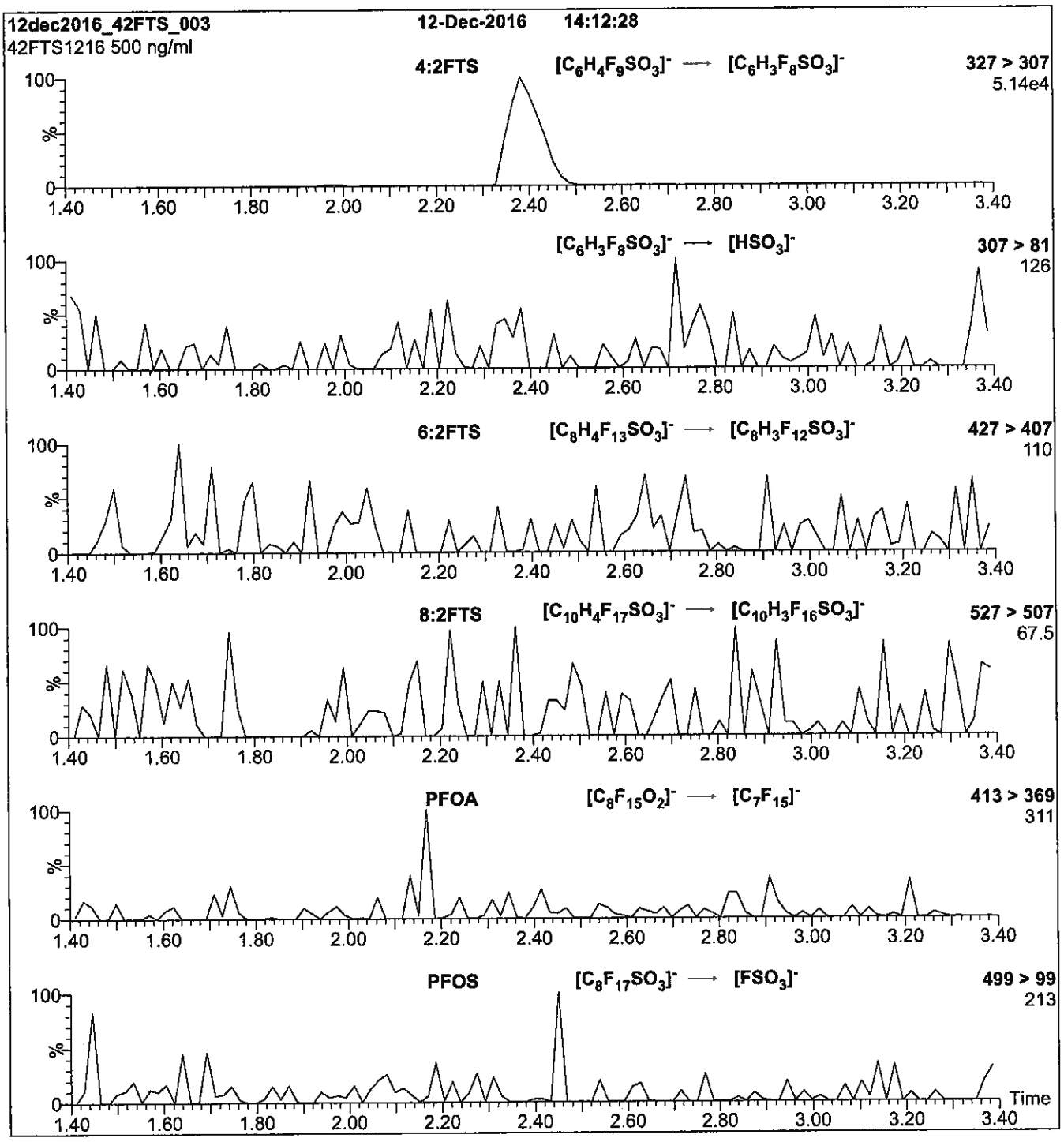
Flow: 300 µl/min

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

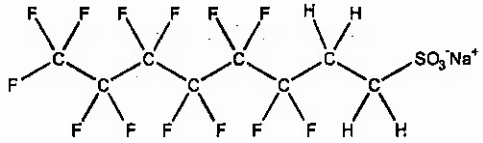
WELLINGTON LABORATORIES

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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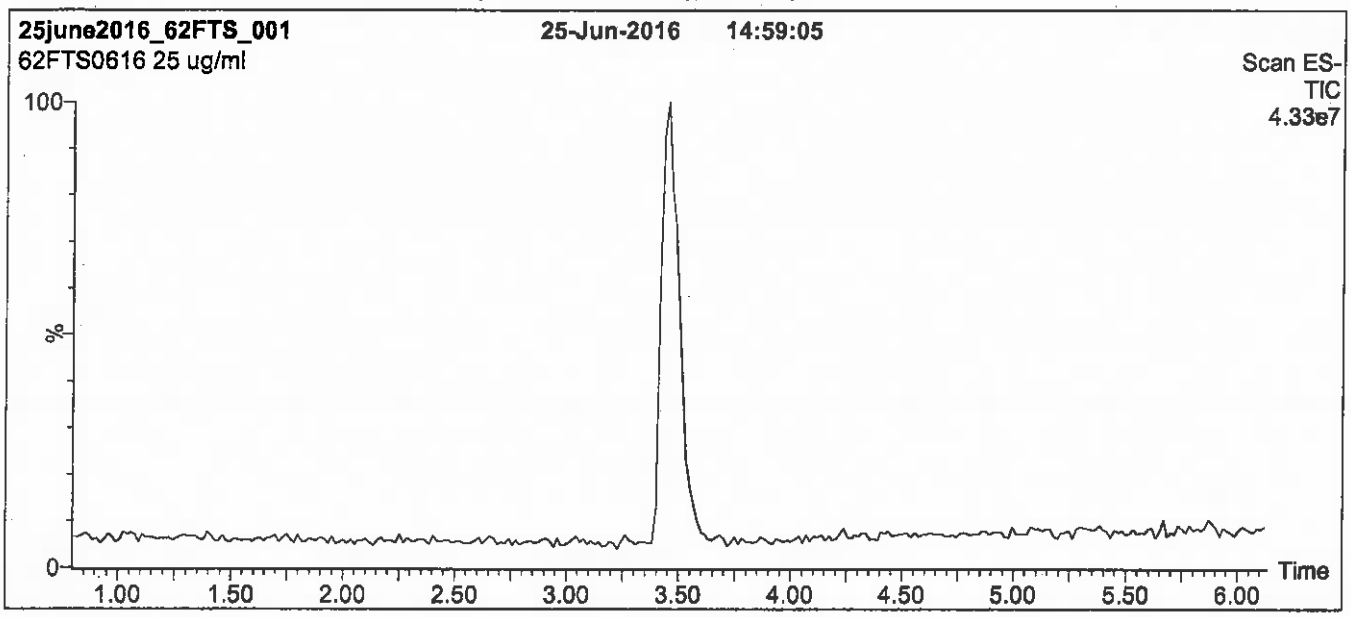
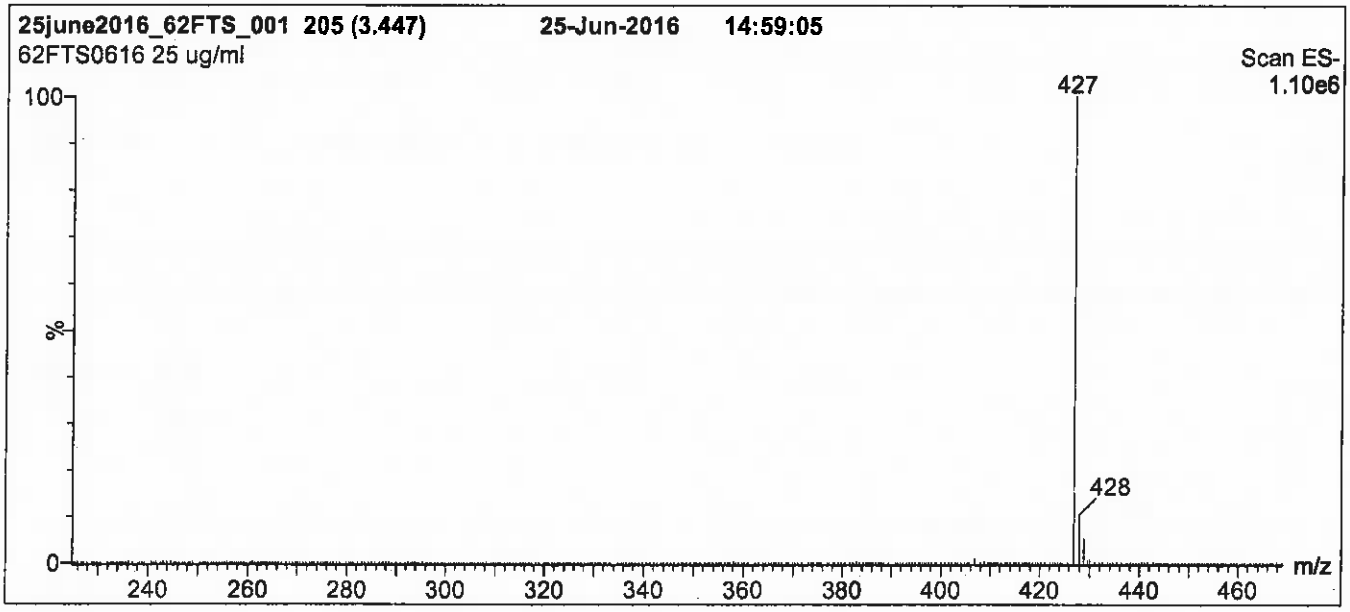
Figure 1: **6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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

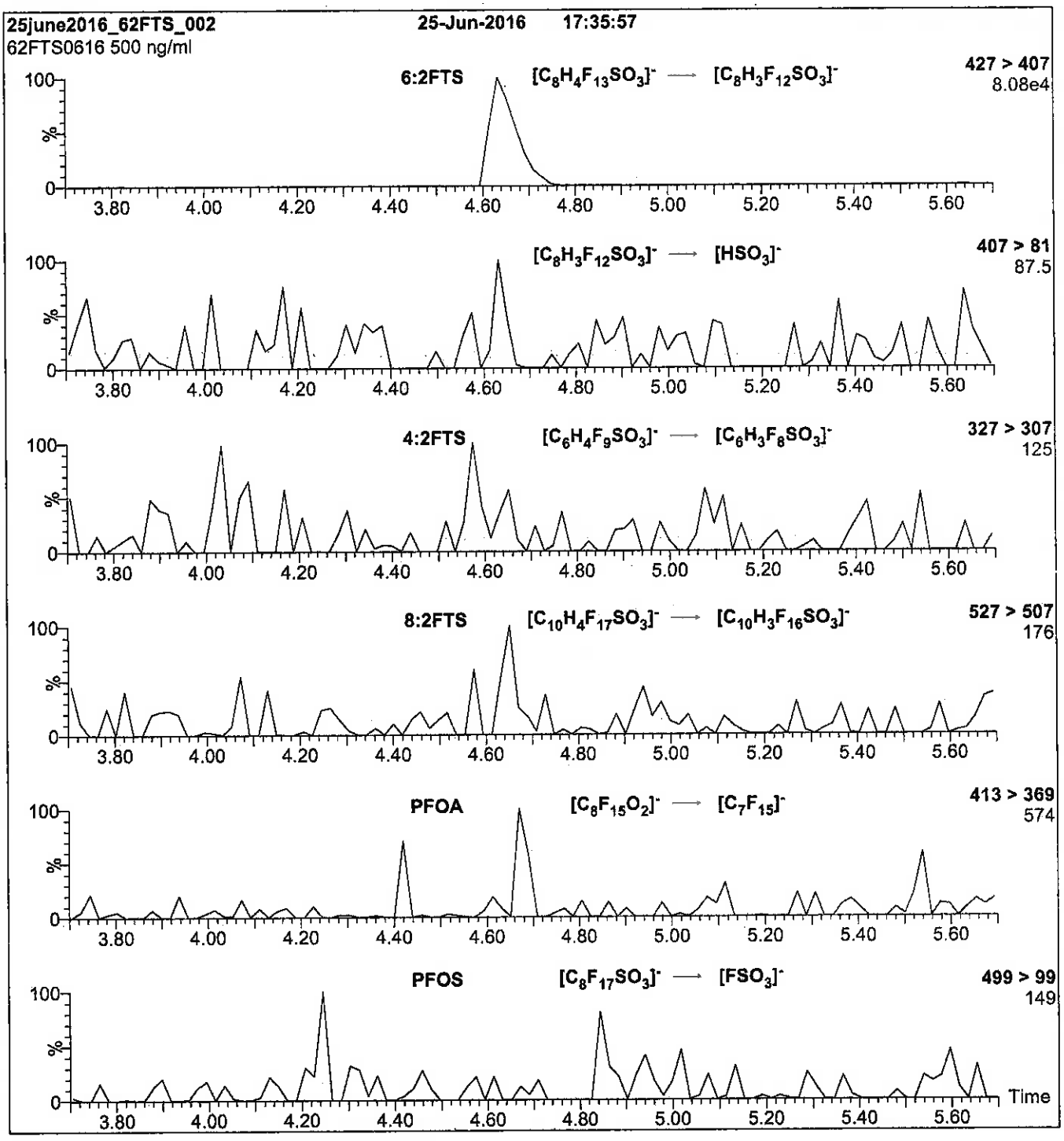
Flow: 300 µl/min

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

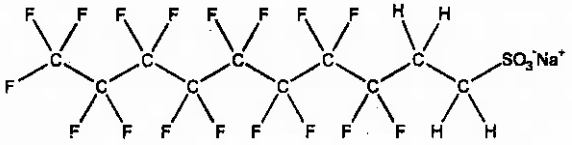
LC8:2FTS_00003

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:

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ADDITIONAL INFORMATION:

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

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ANAB ACCREDITED

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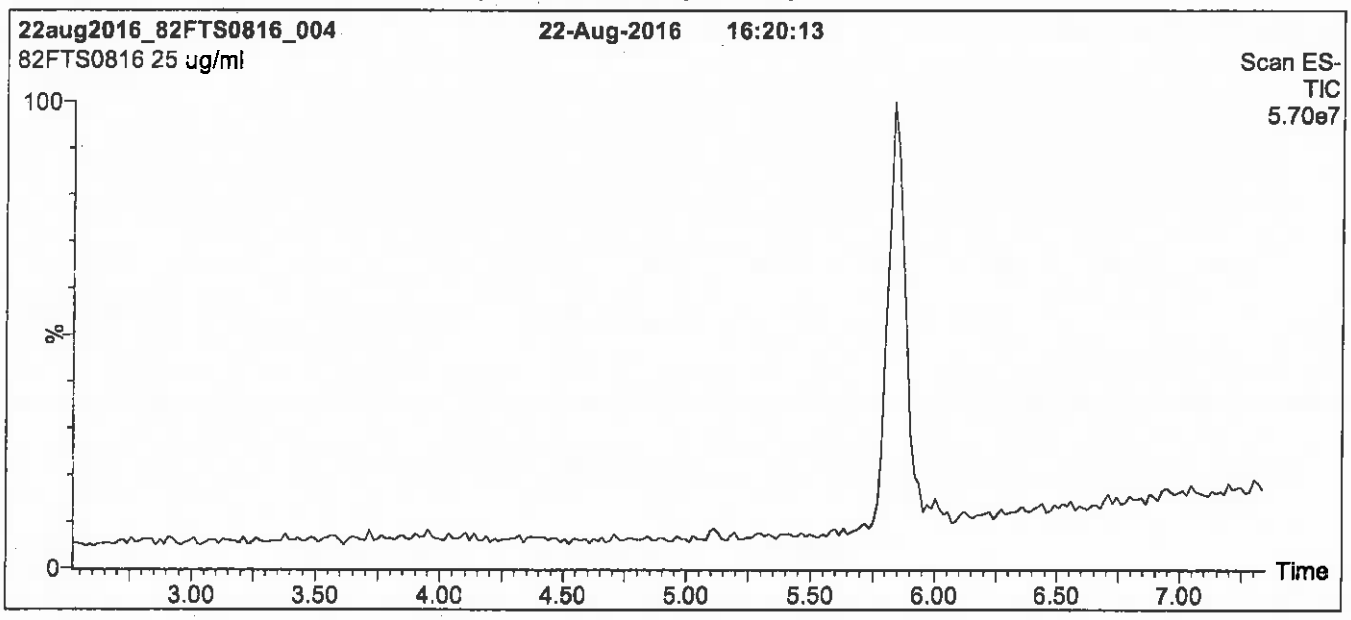
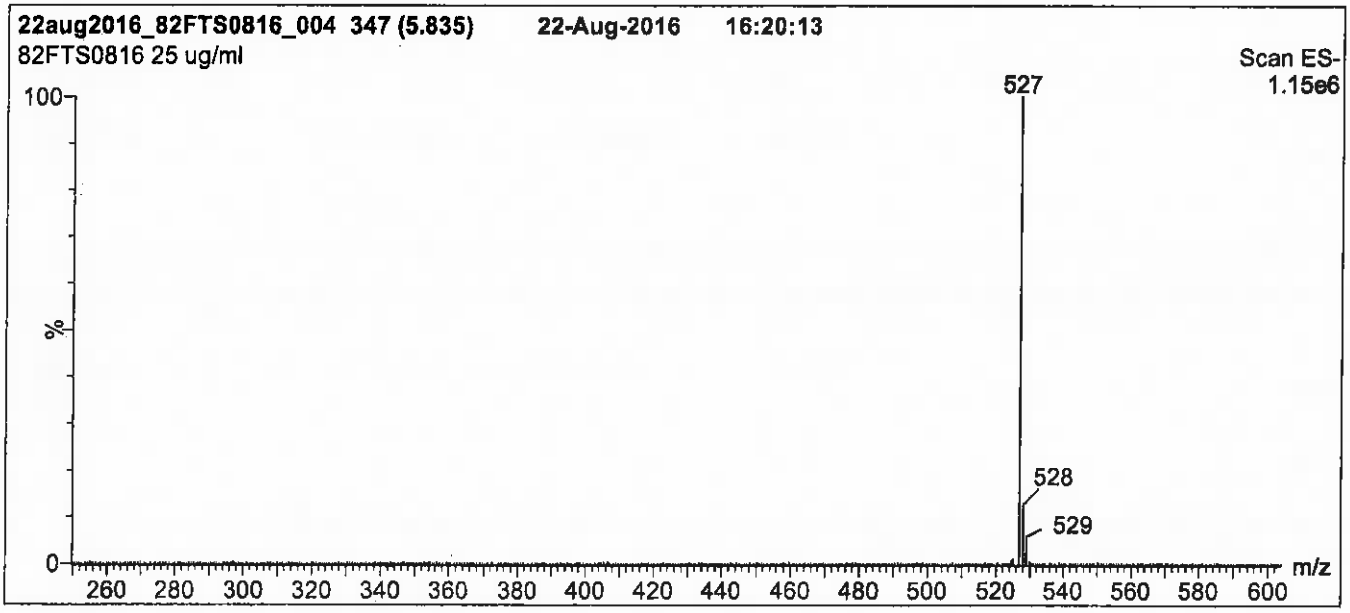
Figure 1: **8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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

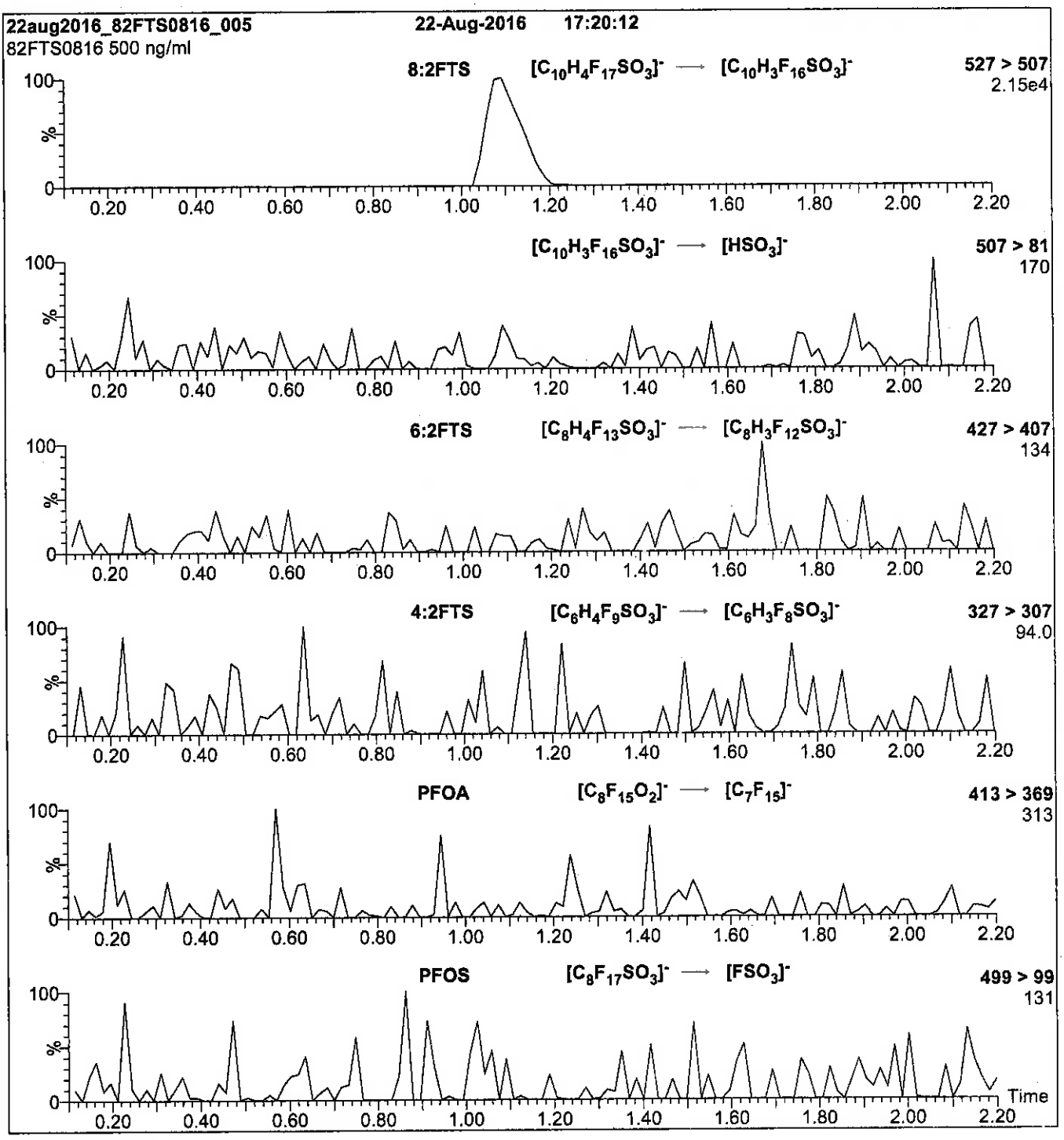
Flow: 300 µl/min

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

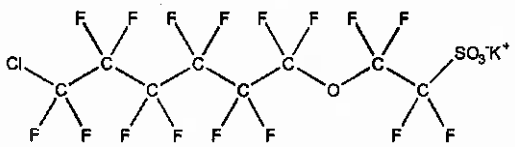
LC9CI-PF3ONS_00001

r: 9/5/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	9Cl-PF3ONS	**LOT NUMBER:**	9ClPF3ONS0916
COMPOUND:	Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate		
STRUCTURE:		**CAS #:**	73606-19-6



MOLECULAR FORMULA:	$C_8F_{16}ClSO_4K$	**MOLECULAR WEIGHT:**	570.67
CONCENTRATION:	50.0 ± 2.5 µg/ml (K Salt) 46.6 ± 2.3 µg/ml (9Cl-PF3ONS anion)	**SOLVENT(S):**	Methanol
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.
- This compound is the major component of the commercial formulation known as F-53B.

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Certified By: B.G. Chittim **Date:** 10/19/2016 (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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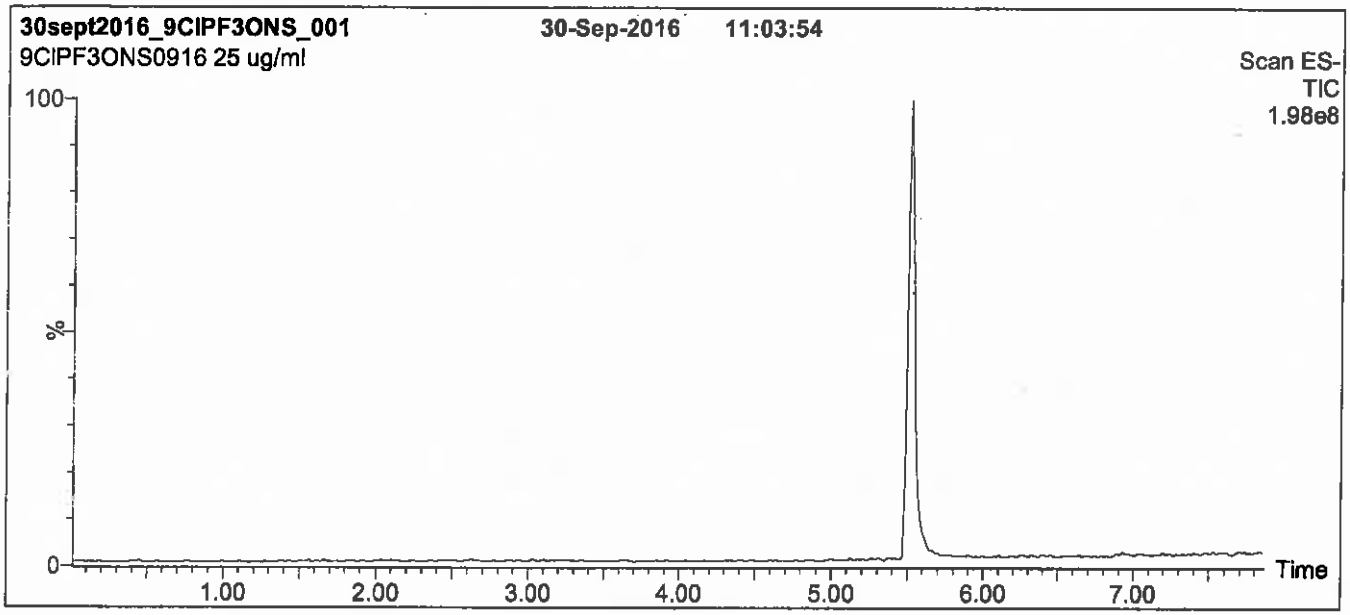
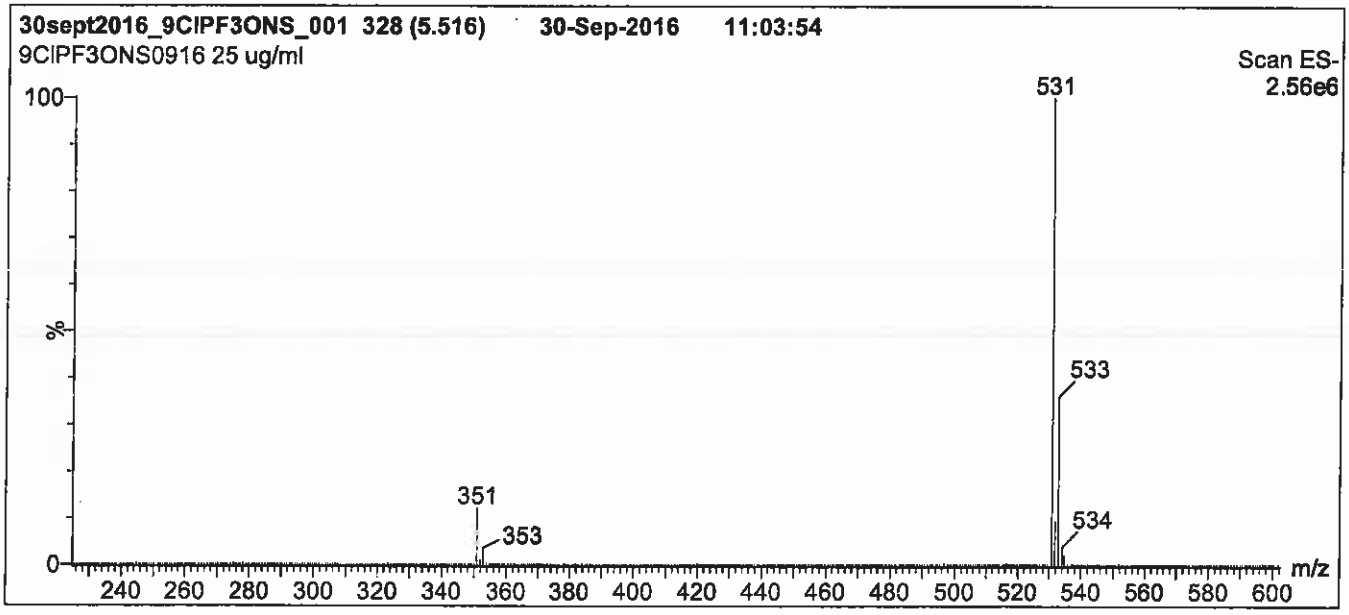
Figure 1: **9Cl-PF3ONS; LC/MS Data (TIC and Mass Spectrum)**





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

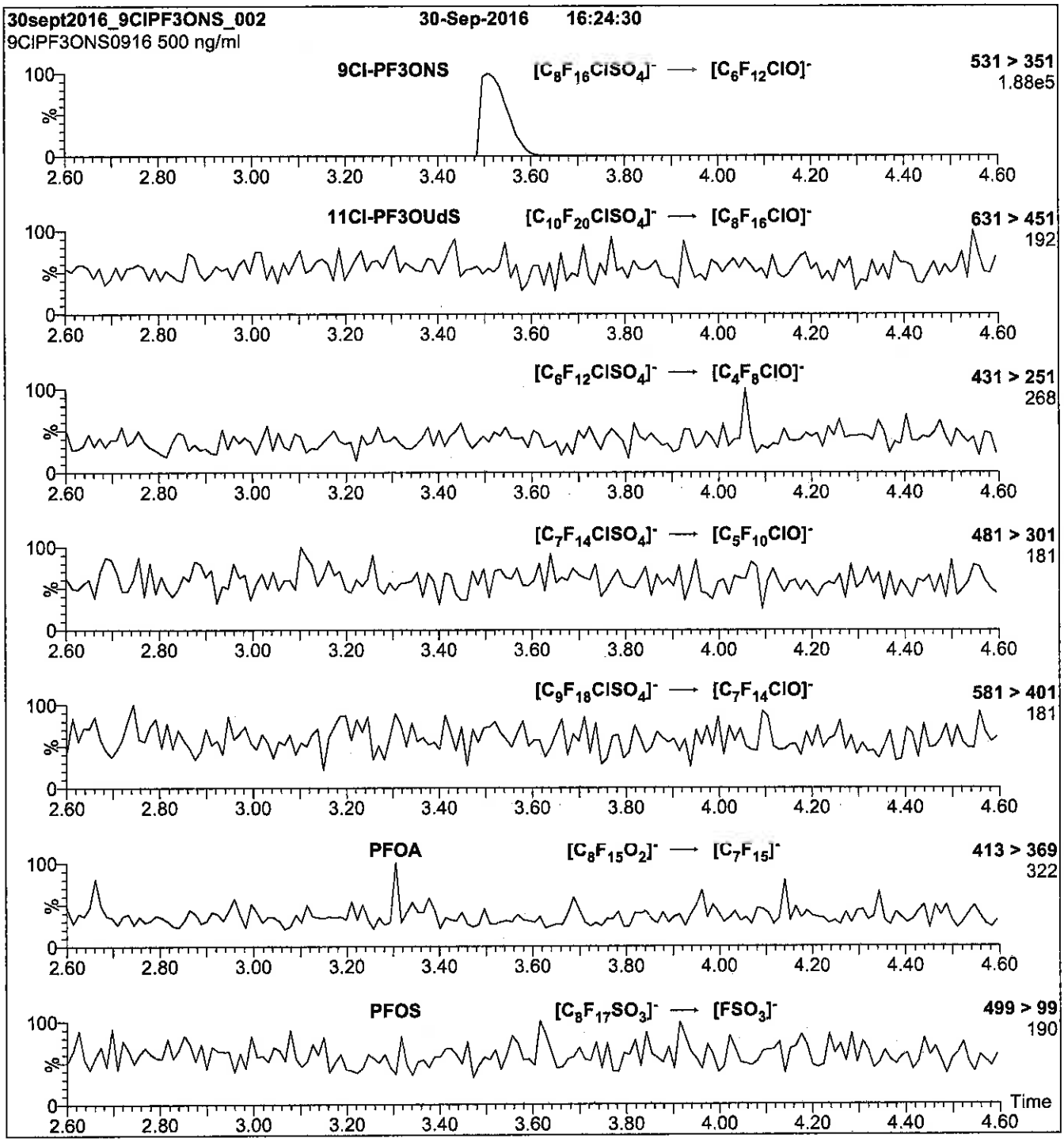
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **9Cl-PF3ONS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 9Cl-PF3ONS)

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

LCbr-NEtFOSAA_00001

RE 4/18/19 SEV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-NEtFOSAA

N-Ethylperfluorooctanesulfonamidoacetic Acid Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-NEtFOSAA
LOT NUMBER:	brNEtFOSAA0118
CONCENTRATION:	50.0 ± 2.5 µg/ml
SOLVENT(S):	Methanol/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	01/10/2018
LAST TESTED: (mm/dd/yyyy)	01/17/2018
EXPIRY DATE: (mm/dd/yyyy)	01/17/2023
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

The chemical purity has been determined to be ≥98% N-ethylperfluorooctanesulfonamidoacetic acid (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 (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This 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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. 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 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

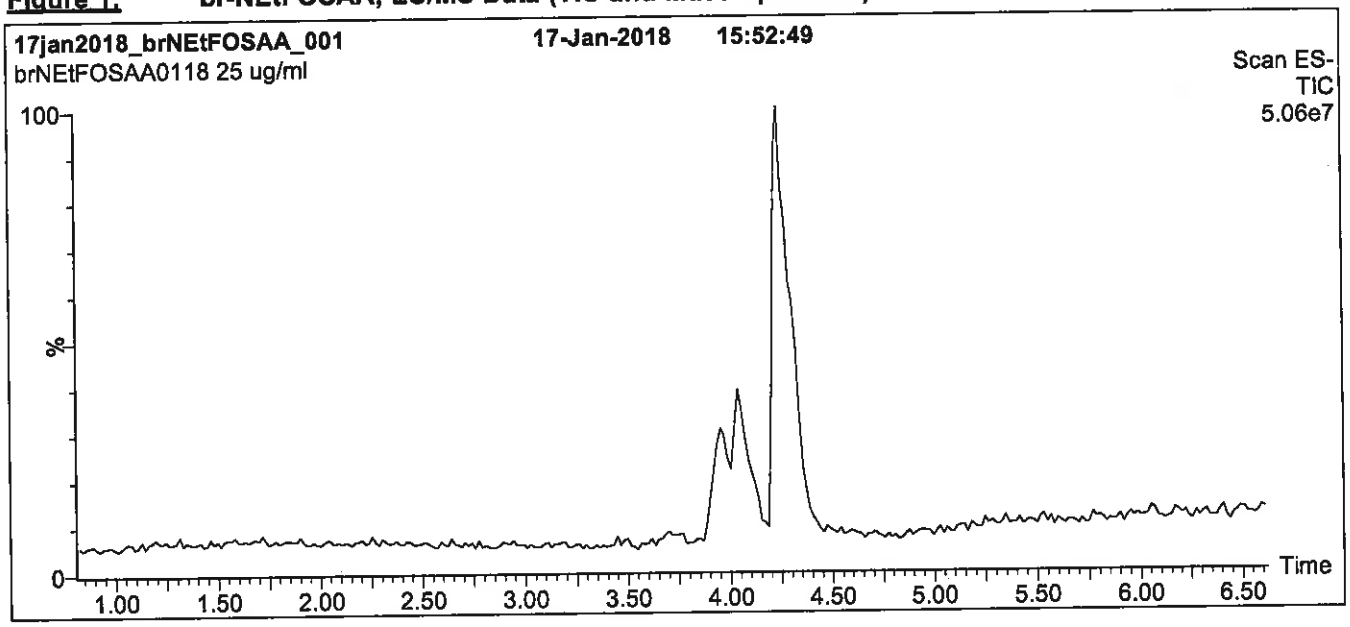
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	N-ethylperfluoro-1-octanesulfonamidoacetic acid	$CF_3(CF_2)_7SO_2N(C_2H_5)CH_2CO_2H$	77.5
2	N-ethylperfluoro-3-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_3CF(CF_3)(CF_2)_2SO_2N(C_2H_5)CH_2CO_2H$	2.3
3	N-ethylperfluoro-4-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_2CF(CF_3)(CF_2)_3SO_2N(C_2H_5)CH_2CO_2H$	2.2
4	N-ethylperfluoro-5-methylheptanesulfonamidoacetic acid	$CF_3CF_2CF(CF_3)(CF_2)_4SO_2N(C_2H_5)CH_2CO_2H$	5.4
5	N-ethylperfluoro-6-methylheptanesulfonamidoacetic acid	$CF_3CF(CF_3)(CF_2)_5SO_2N(C_2H_5)CH_2CO_2H$	10.4
6	N-ethylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	$CF_3C(CF_3)_2(CF_2)_4SO_2N(C_2H_5)CH_2CO_2H$	0.3
7	N-ethylperfluoro-4,5-dimethylhexanesulfonamidoacetic acid	$CF_3CF(CF_3)CF(CF_2)_3SO_2N(C_2H_5)CH_2CO_2H$	0.3
8	N-ethylperfluoro-3,5-dimethylhexanesulfonamidoacetic acid	$CF_3CF(CF_3)CF_2CF(CF_2)_2SO_2N(C_2H_5)CH_2CO_2H$	0.3
9	Other Unidentified Isomers		1.3

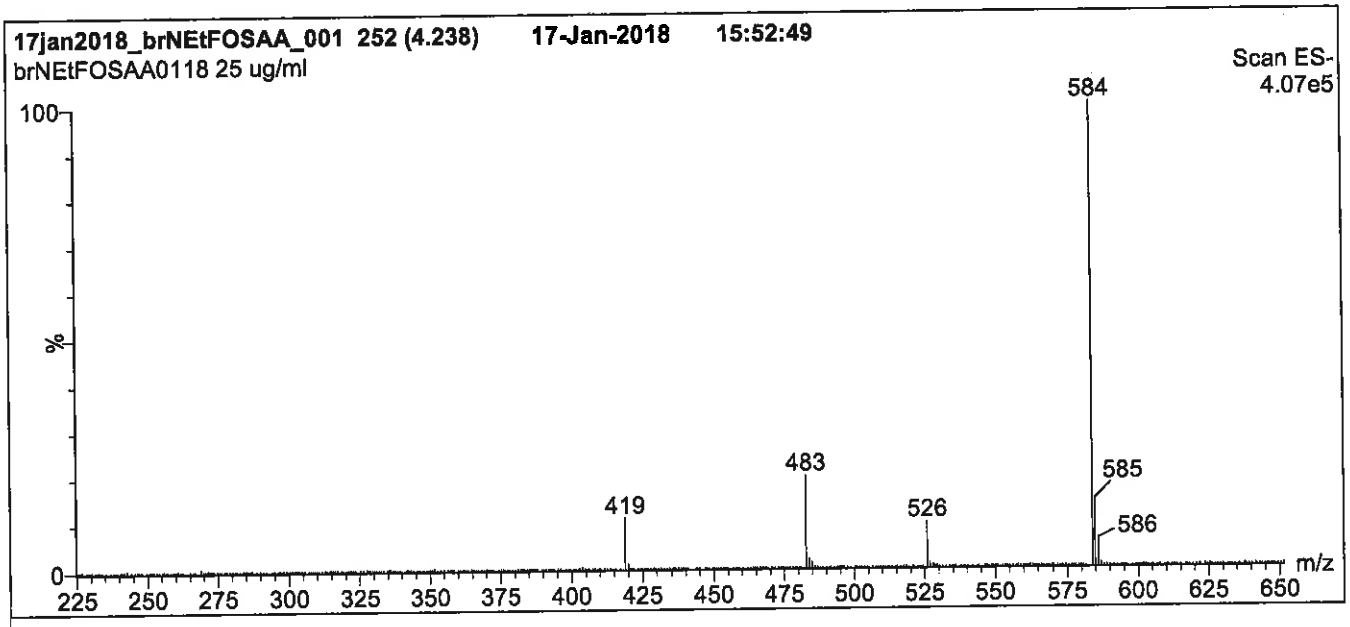
* Percent of total N-ethylperfluorooctanesulfonamidoacetic acid isomers only.

Certified By: _____ **Date:** 03/22/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

Figure 1: **br-NEtFOSAA; 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

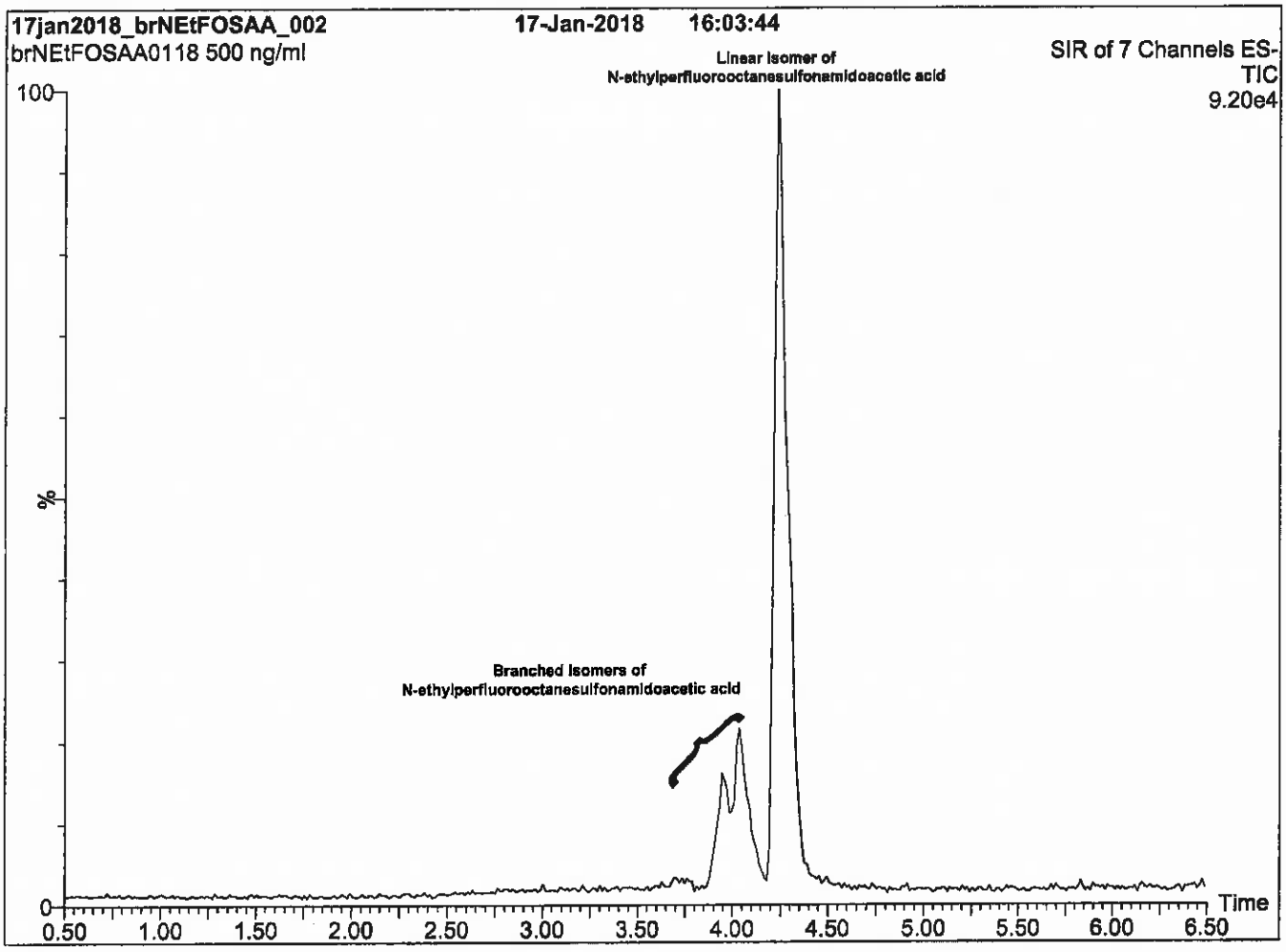
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: **br-NEtFOSAA; 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

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

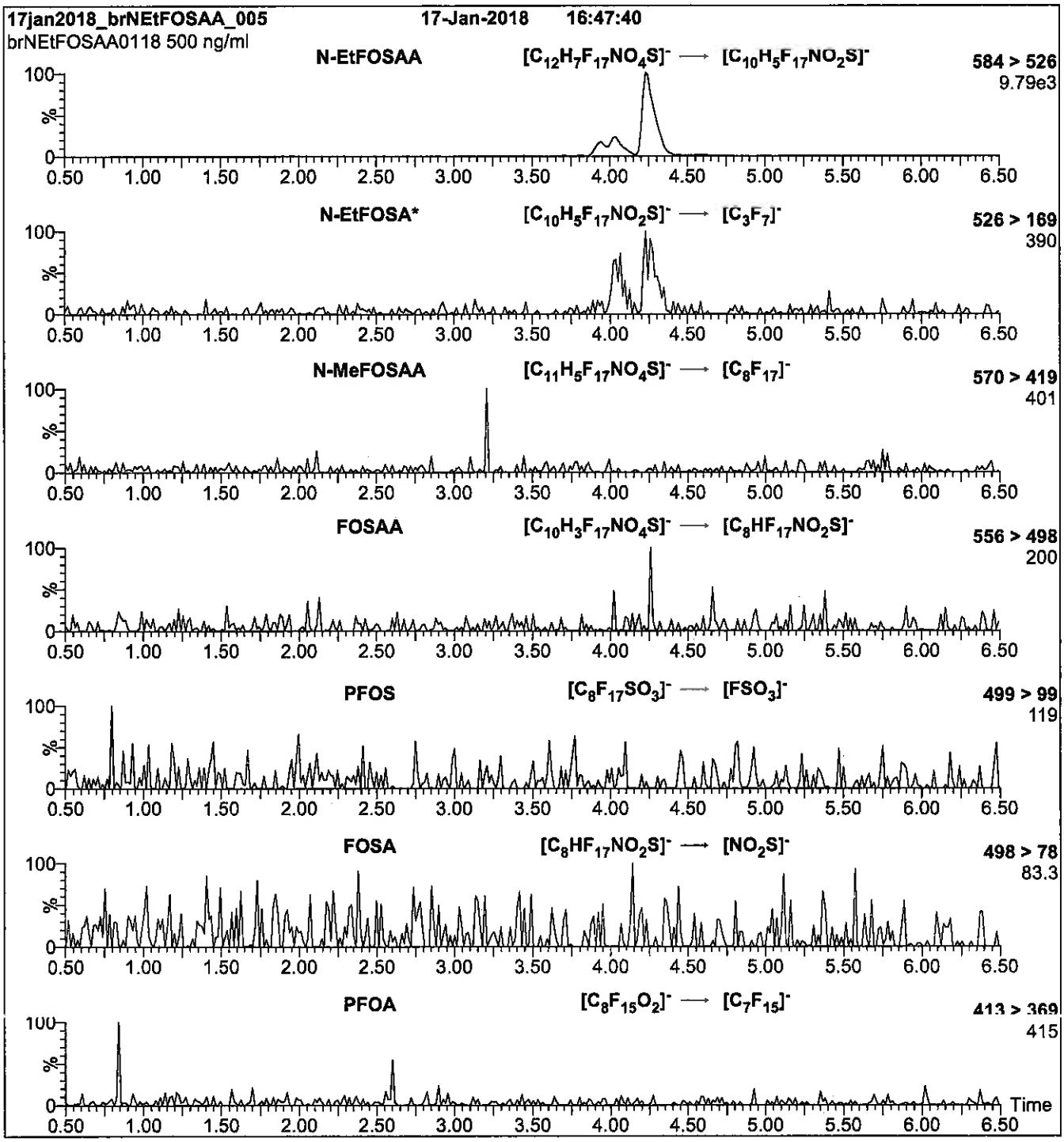
Flow: 300 µl/min

MS Parameters

Experiment: SIR (7 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15-60
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



*Note: N-EtFOSA is formed by in-source fragmentation.

Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 11-40 (variable)

Reagent

LCbr-NMeFOSAA_00001

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-NMeFOSAA

N-Methylperfluorooctanesulfonamidoacetic Acid Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-NMeFOSAA
LOT NUMBER:	brNMeFOSAA0118
CONCENTRATION:	50.0 ± 2.5 µg/ml
SOLVENT(S):	Methanol/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	01/10/2018
LAST TESTED: (mm/dd/yyyy)	01/17/2018
EXPIRY DATE: (mm/dd/yyyy)	01/17/2023
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

The chemical purity has been determined to be ≥98% N-methylperfluorooctanesulfonamidoacetic acid (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 (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

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:

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HANDLING:

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SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. 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, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This 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:

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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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. 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

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-NMeFOSAA; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

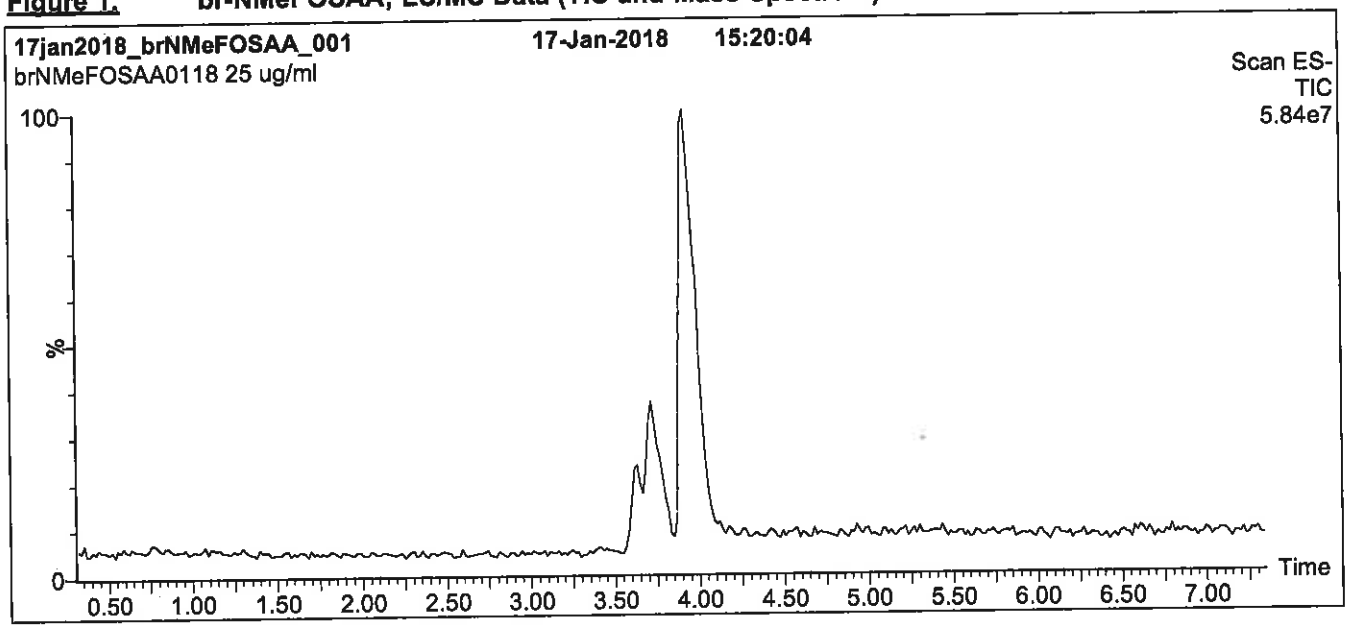
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	N-methylperfluoro-1-octanesulfonamidoacetic acid	$CF_3(CF_2)_7SO_2N(CH_3)CH_2CO_2H$	76.0
2	N-methylperfluoro-3-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_3CF(CF_3)(CF_2)_2SO_2N(CH_3)CH_2CO_2H$	0.7
3	N-methylperfluoro-4-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_2CF(CF_3)(CF_2)_3SO_2N(CH_3)CH_2CO_2H$	2.0
4	N-methylperfluoro-5-methylheptanesulfonamidoacetic acid	$CF_3CF_2CF(CF_3)(CF_2)_4SO_2N(CH_3)CH_2CO_2H$	6.0
5	N-methylperfluoro-6-methylheptanesulfonamidoacetic acid	$CF_3CF(CF_3)(CF_2)_5SO_2N(CH_3)CH_2CO_2H$	14.0
6	N-methylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	$CF_3C(CF_3)_2(CF_2)_4SO_2N(CH_3)CH_2CO_2H$	0.2
7	Other Unidentified Isomers		1.1

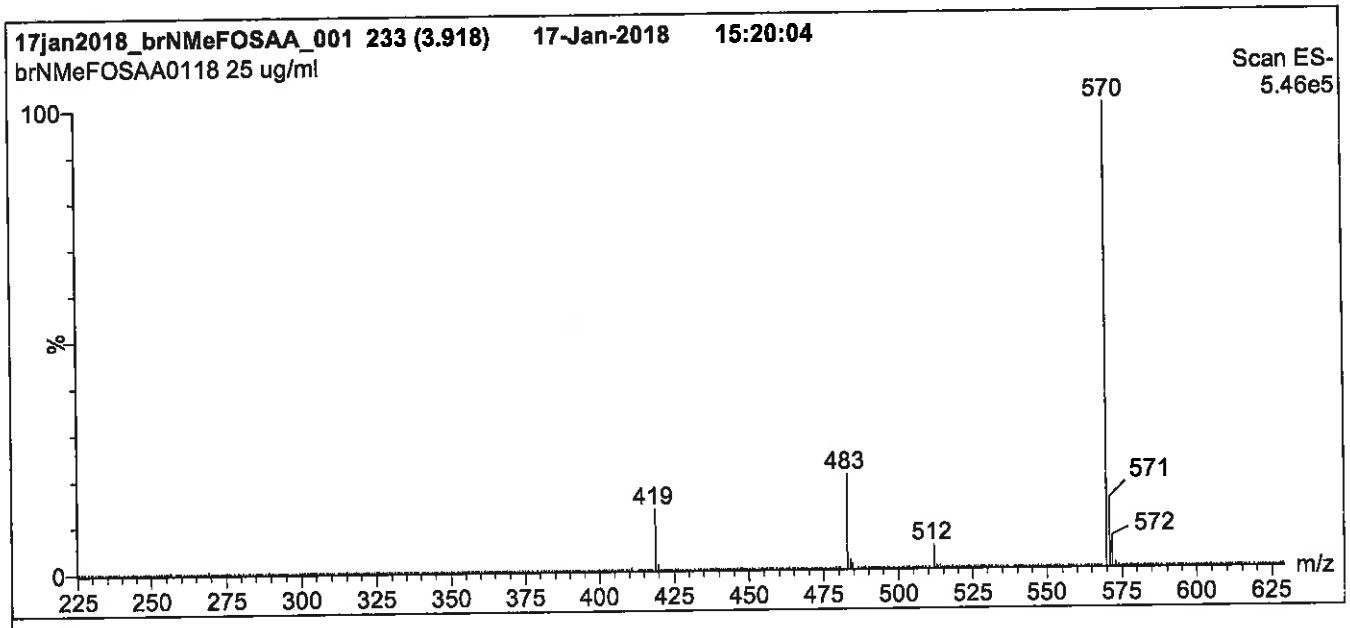
* Percent of total N-methylperfluorooctanesulfonamidoacetic acid isomers only.

Certified By: _____ **Date:** 03/22/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

Figure 1: **br-NMeFOSAA; 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

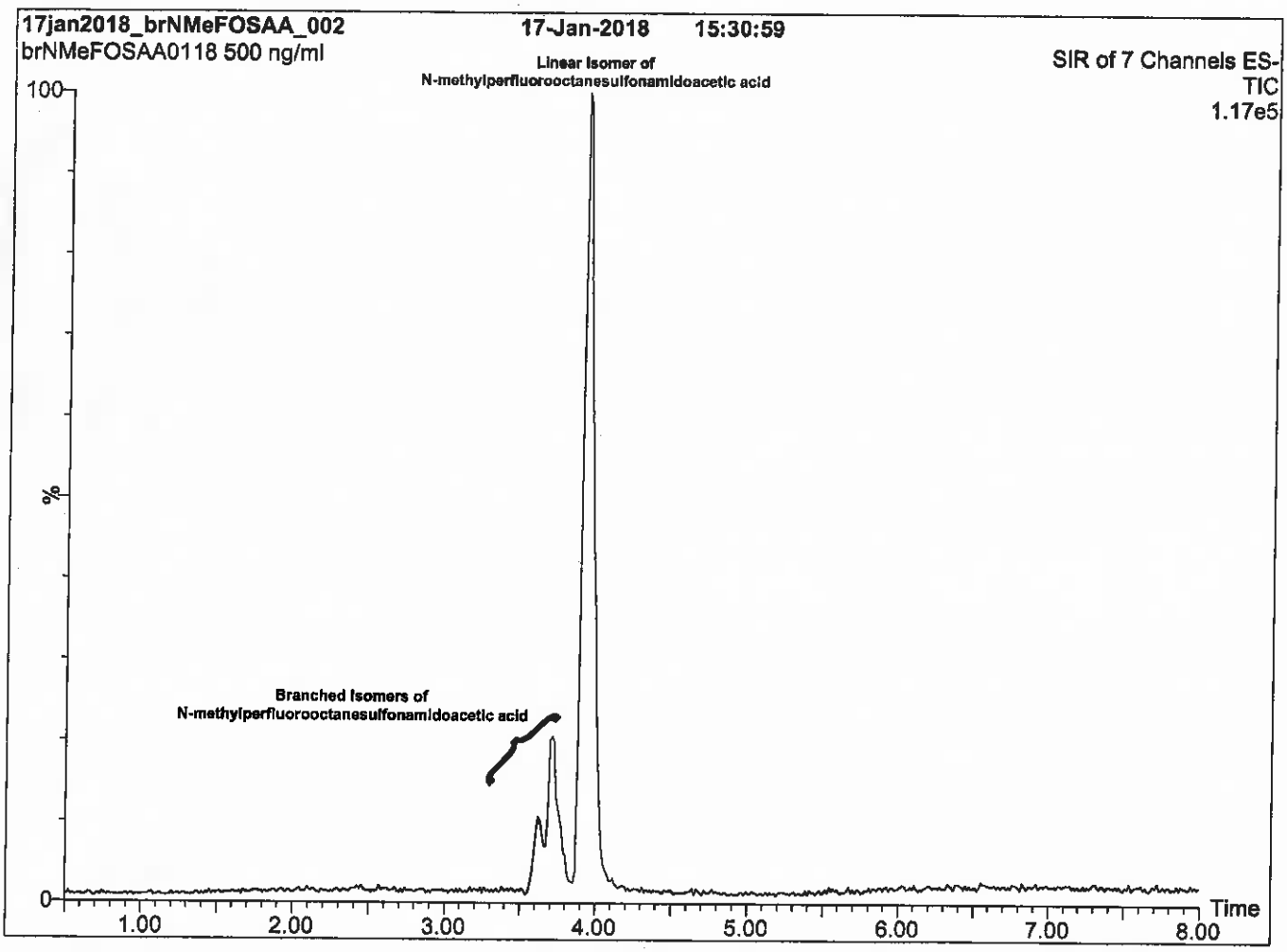
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: **br-NMeFOSAA; 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

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

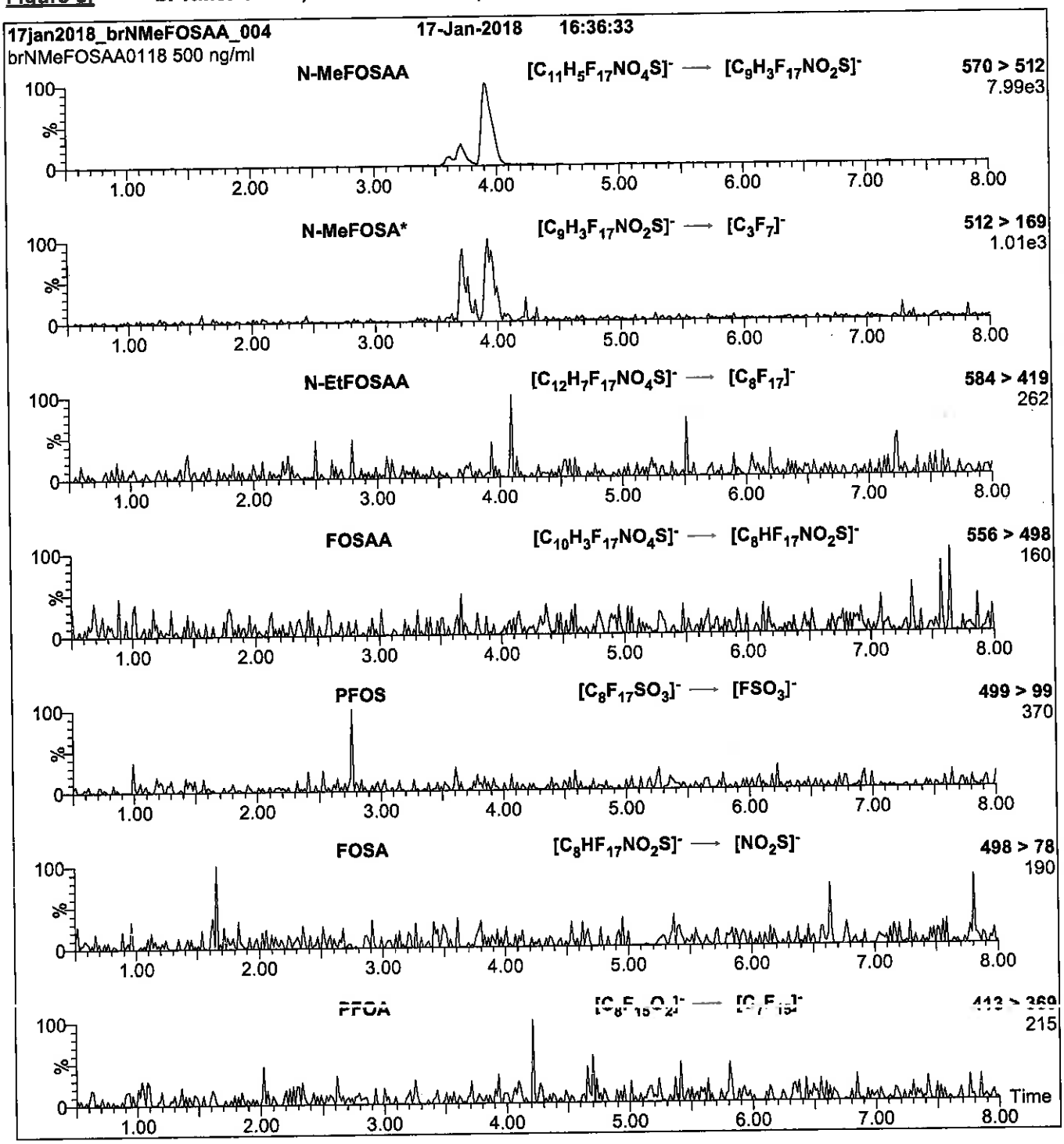
Flow: 300 µl/min

MS Parameters

Experiment: SIR (7 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15-60
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



*Note: N-MeFOSA is formed by in-source fragmentation.

Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 11-40 (variable)

Reagent

LCd3-NMeFOSAA_00006

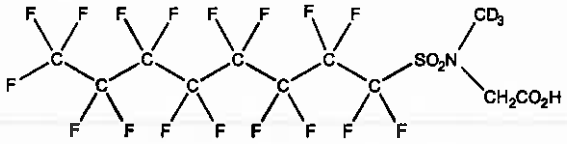
1106123
ID: LCd3-NMeFOSAA_00006
Exp: 05/19/22 Prpd: CCL
d3-N-MeFOSAA

R: 12/4/17 CCL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	d3-N-MeFOSAA	**LOT NUMBER:**	d3NMeFOSAA0517
COMPOUND:	N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_{11}D_3H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	574.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	05/19/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/19/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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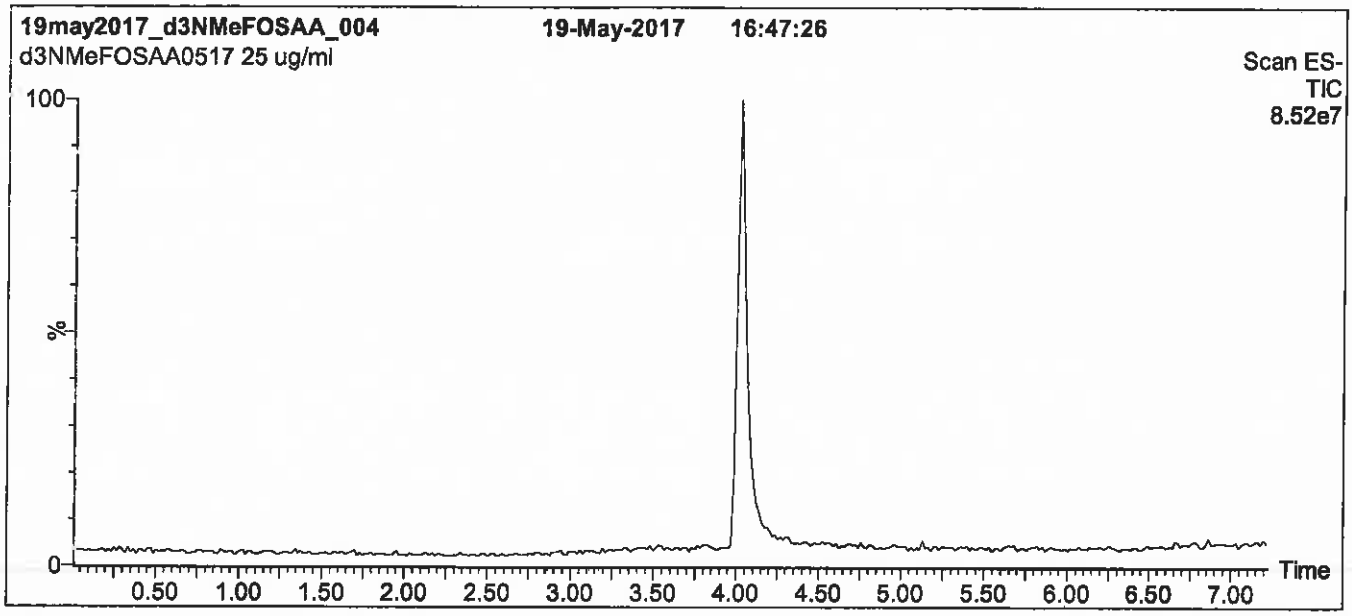
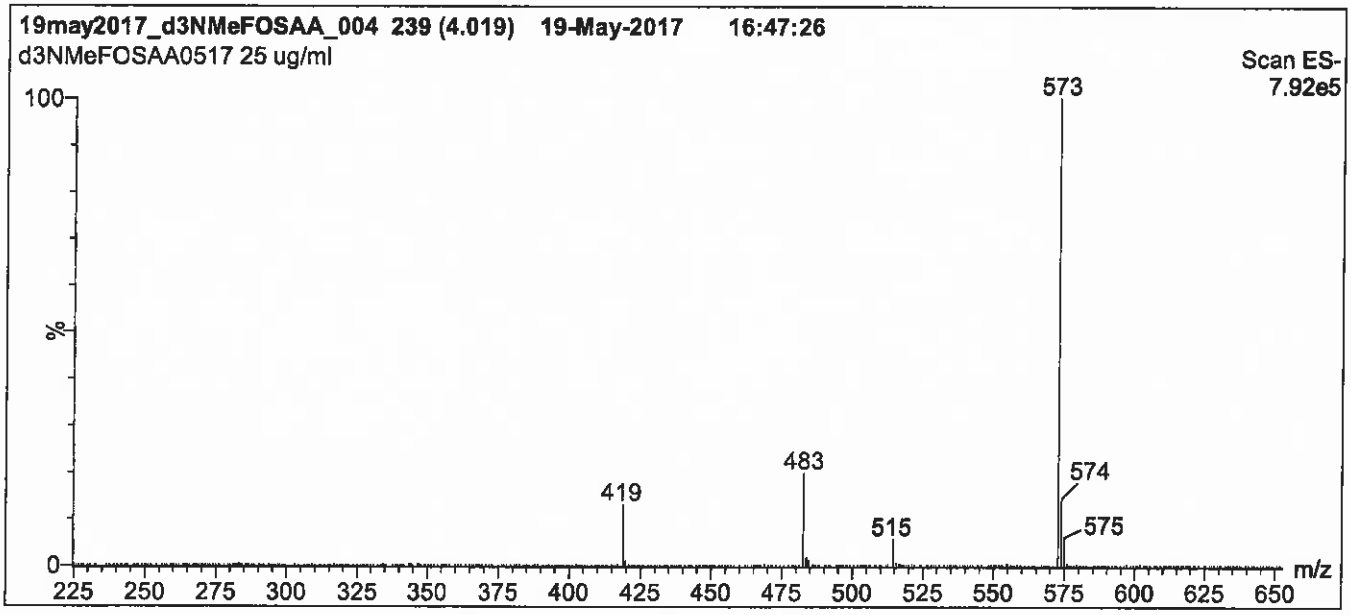
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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

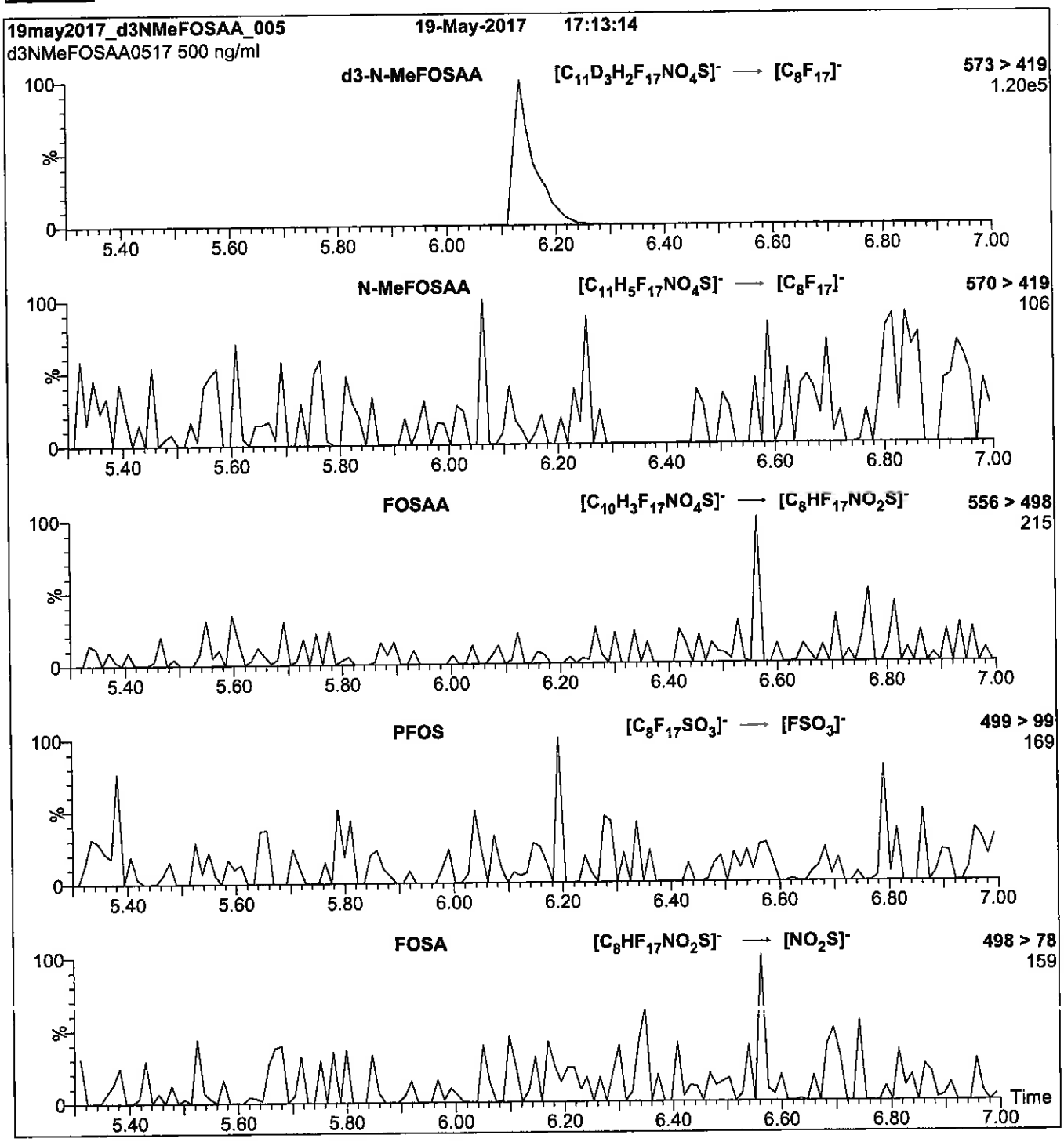
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml d3-N-MeFOSAA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 20

Reagent

LCd5-NEtFOSAA_00006

R: 12/4/17 ccc

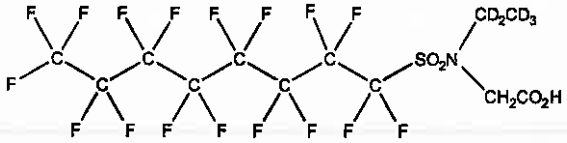
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA **LOT NUMBER:** d5NEtFOSAA1117

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)	11/08/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/08/2022		
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 molety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/16/2017 (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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where x is expressed as a relative standard uncertainty of the individual parameter.

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CALA

ANAB ACCREDITED

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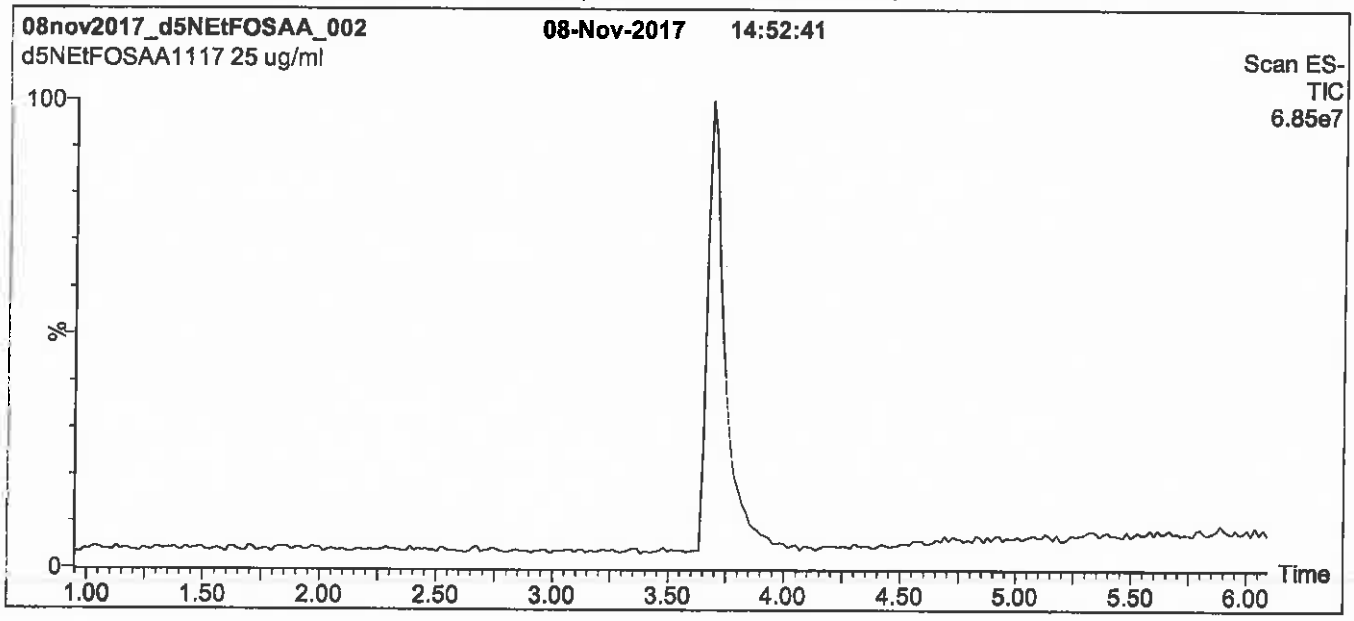
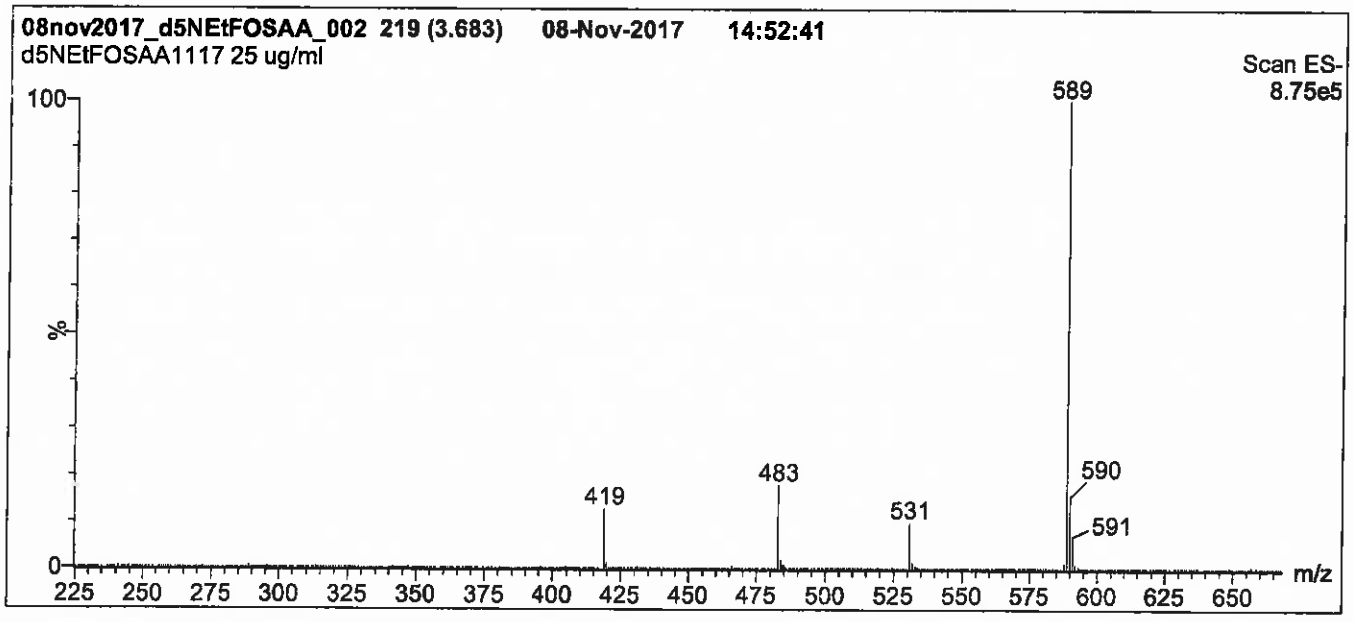
Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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
(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

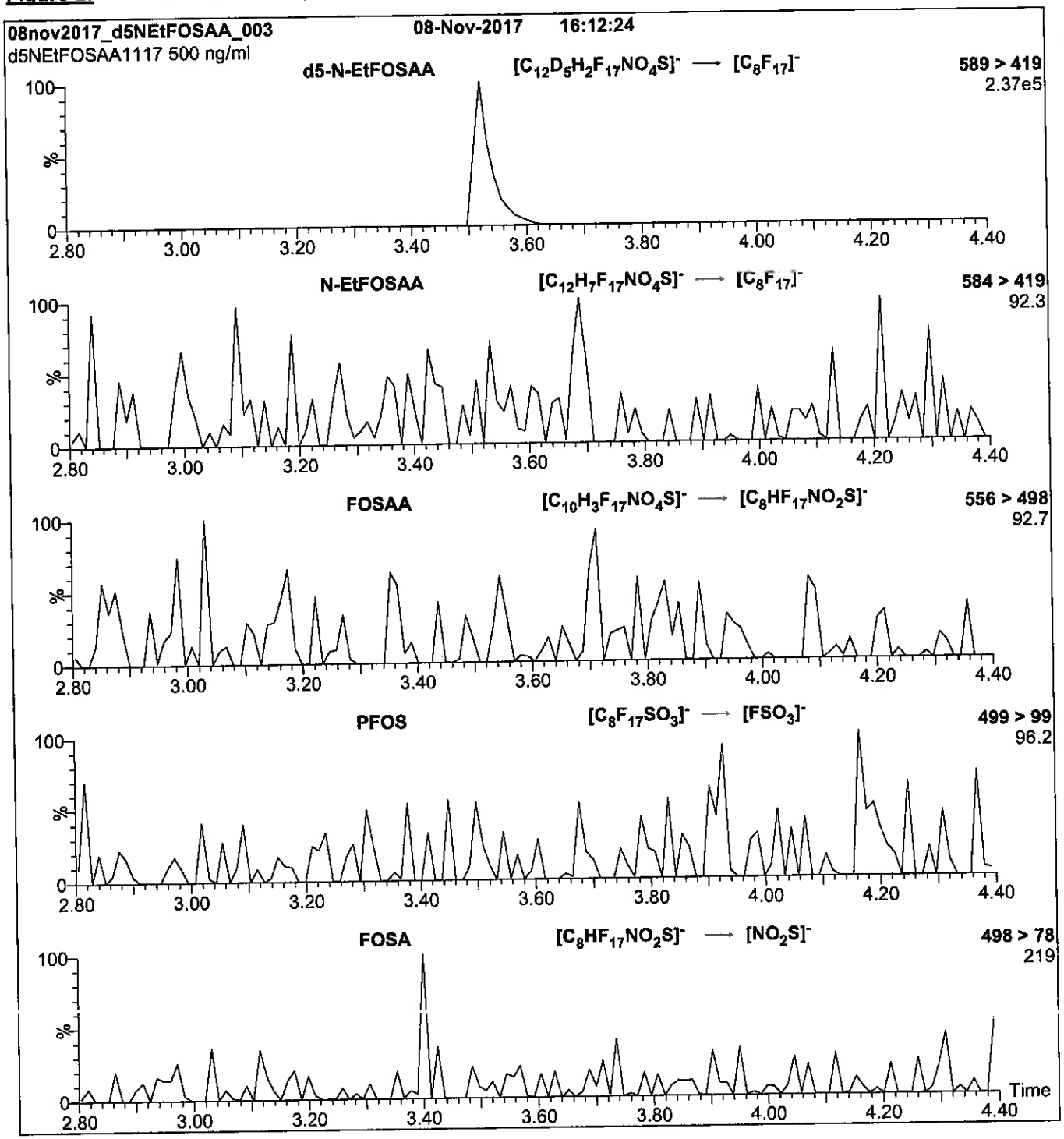
Flow: 300 µl/min

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: **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) = 3.50e-3
Collision Energy (eV) = 20

Reagent

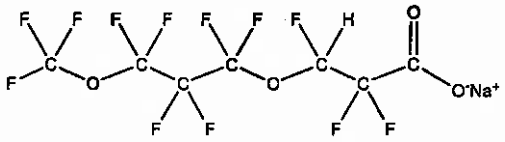
LCDONA_00001

R: 9/5/17 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	NaDONA	**LOT NUMBER:**	NaDONA0417
COMPOUND:	Sodium dodecafluoro-3H-4,8-dioxanonanoate		
STRUCTURE:		**CAS #:**	958445-44-8 (ammonium salt)



MOLECULAR FORMULA:	$C_7HF_{12}O_4Na$	**MOLECULAR WEIGHT:**	400.05
CONCENTRATION:	50 ± 2.5 µg/ml (Na Salt)	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	04/10/2017		
EXPIRY DATE: (mm/dd/yyyy)	04/10/2022		
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.
- Product is commercially known as ADONA.
- 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:** 04/12/2017 (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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SYNTHESIS / CHARACTERIZATION:

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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.

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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CALA

ANAB ACCREDITED

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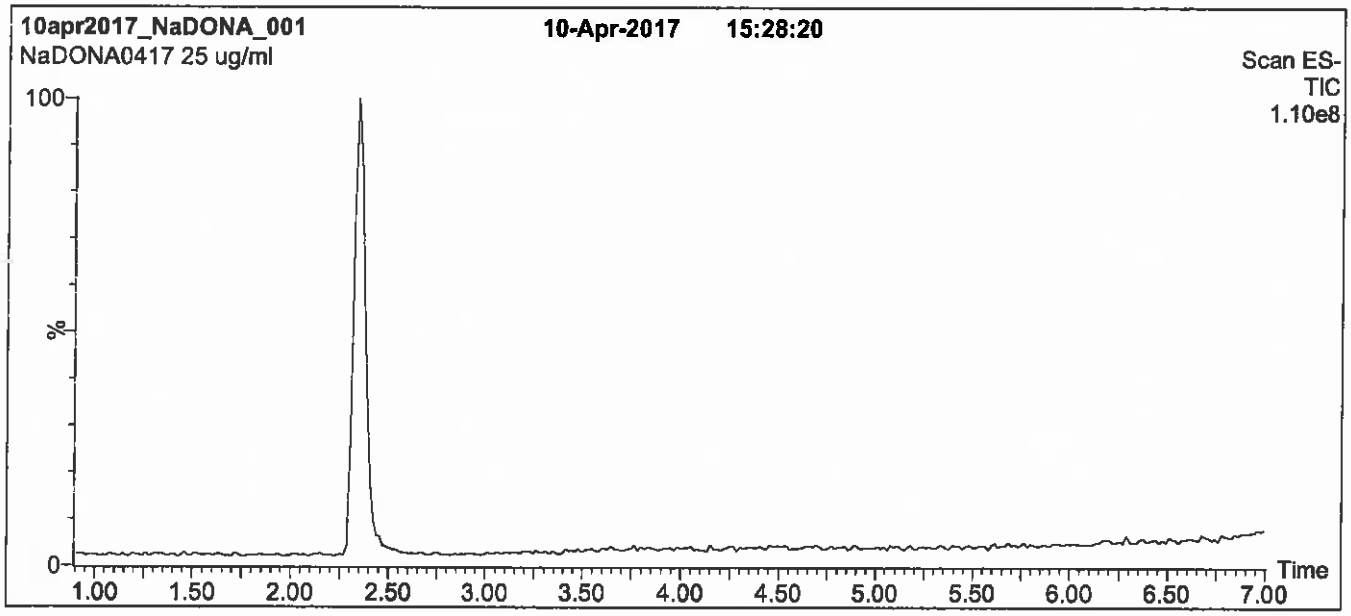
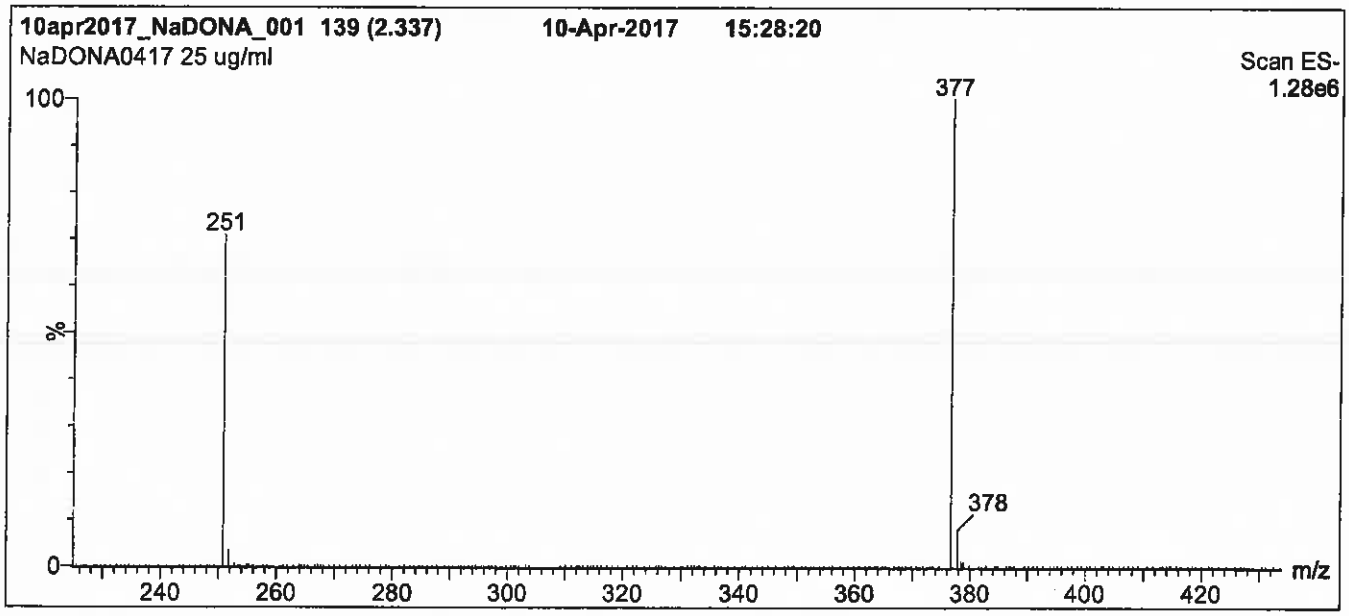
Figure 1: **NaDONA; LC/MS Data (TIC and Mass Spectrum)**





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

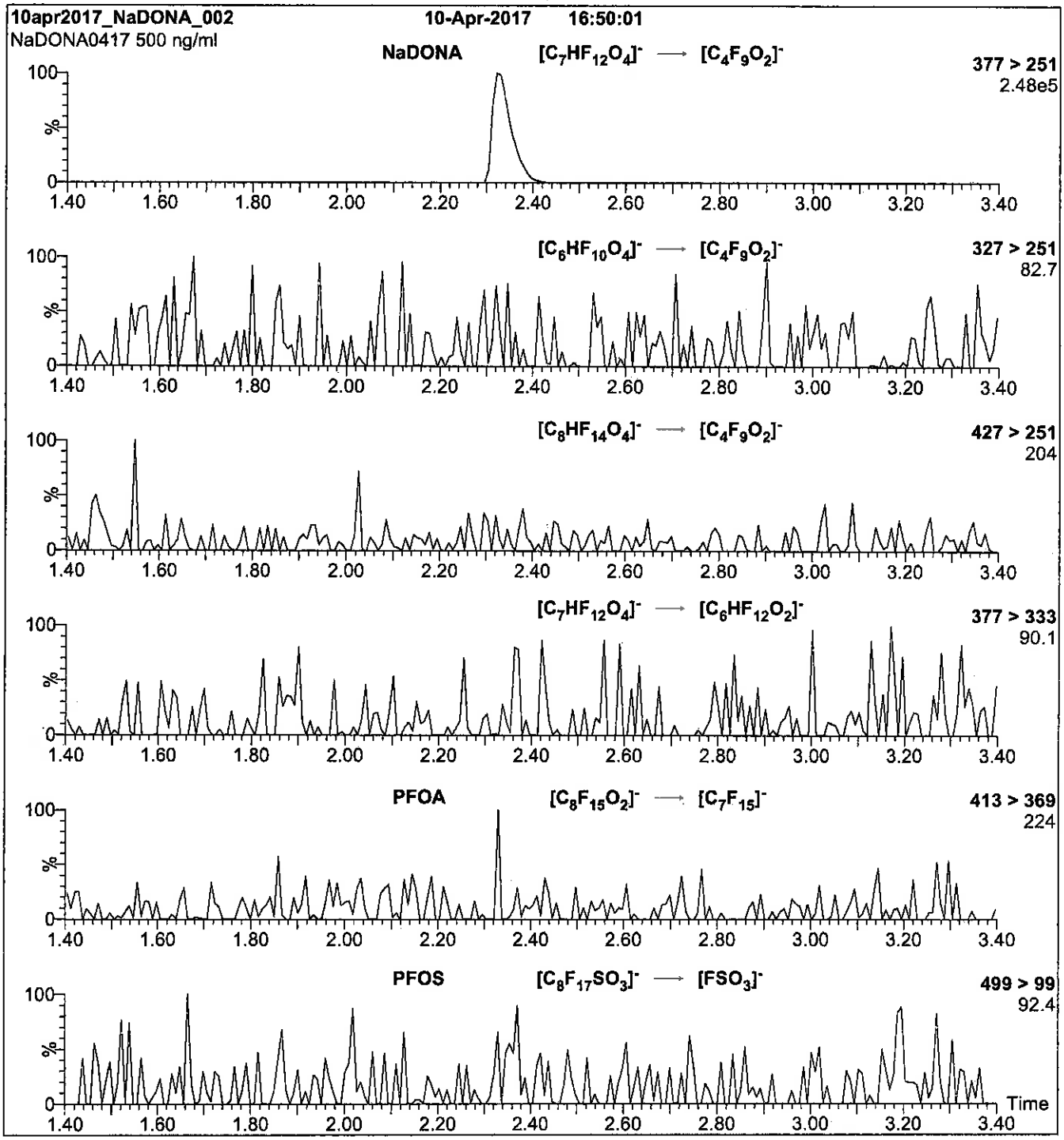
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

Reagent

LCHFPO-DA_00001

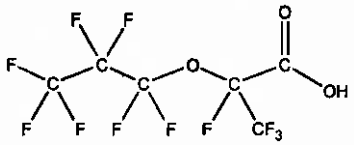
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: HFPO-DA **LOT NUMBER:** HFPODA0717

COMPOUND: 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid

STRUCTURE: **CAS #:** 13252-13-6



MOLECULAR FORMULA:	$C_6HF_{11}O_3$	**MOLECULAR WEIGHT:**	330.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/13/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/13/2020		
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.
- Product is commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/14/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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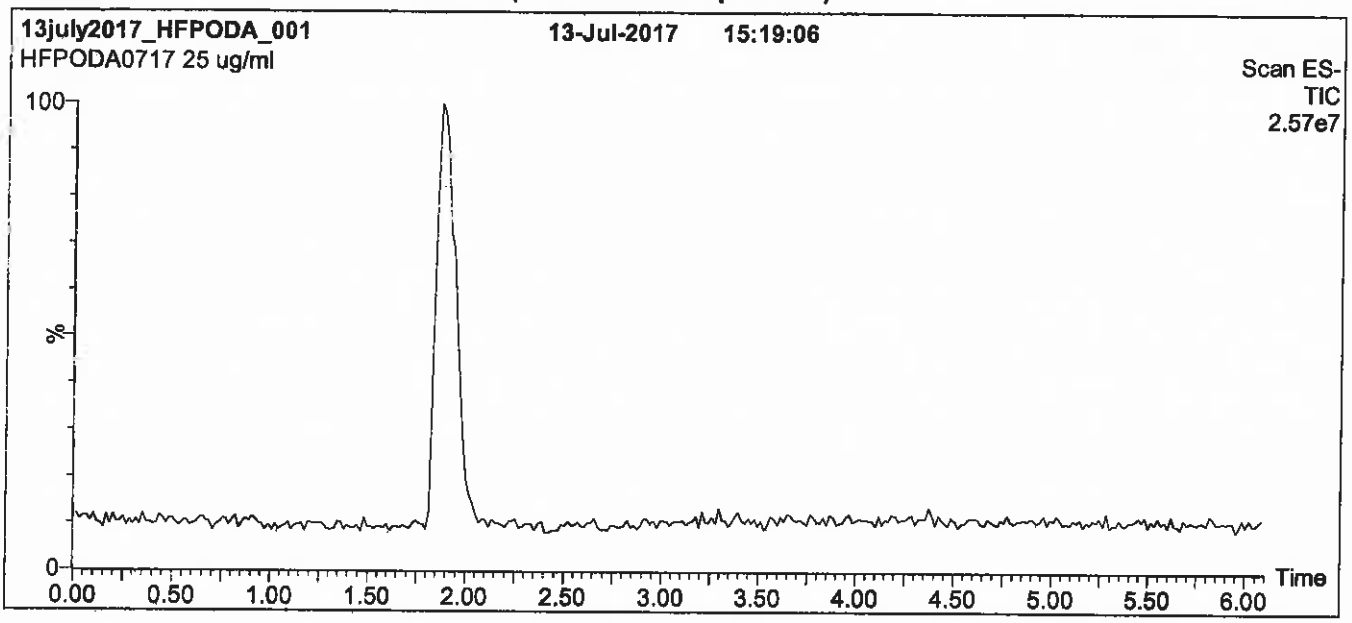
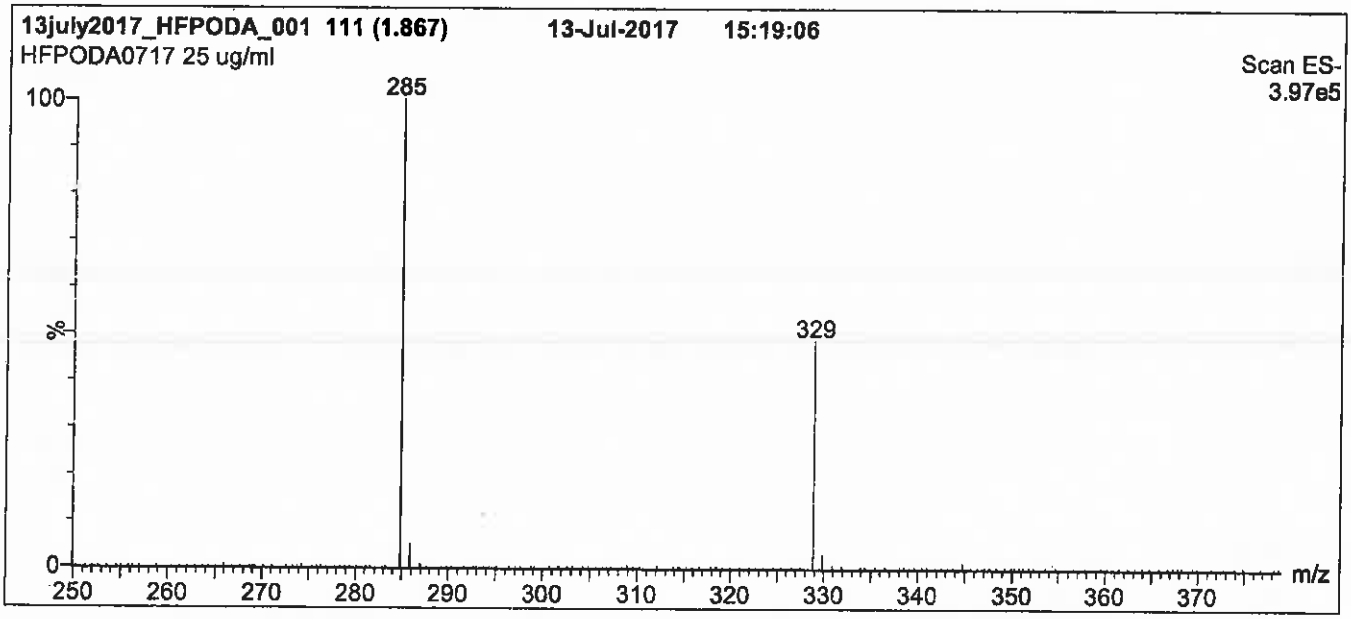
Figure 1: **HFPO-DA; LC/MS Data (TIC and Mass Spectrum)**





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% MeOH / 45% H_2O 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

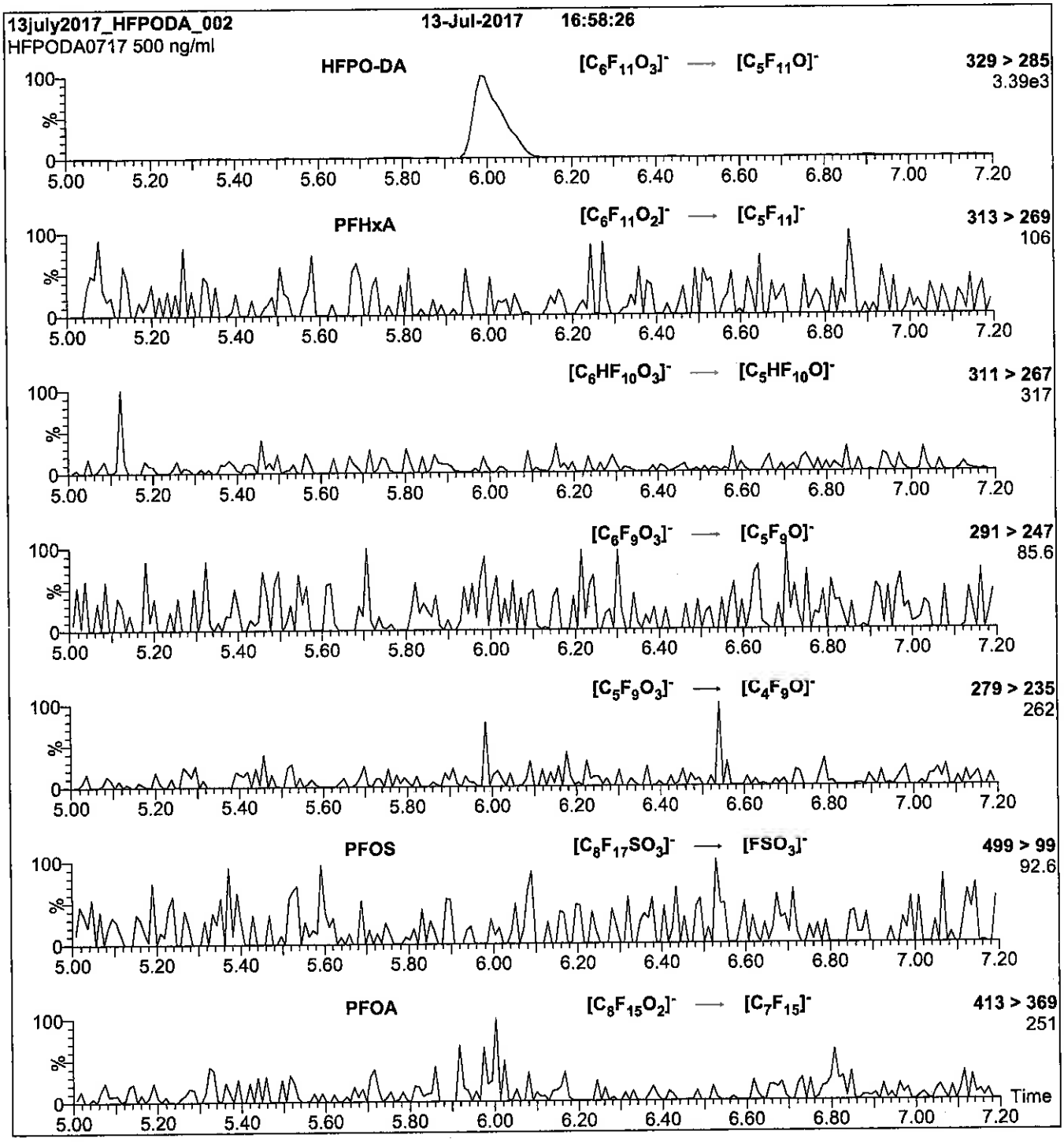
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 700

Figure 2: **HFPO-DA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml HFPO-DA)

Mobile phase: Isocratic 80% MeOH / 20% H_2O with 10 mM NH_4OAc buffer

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 5

Reagent

LCM2-6:FTS_00006

R: 12/4/17 CCL

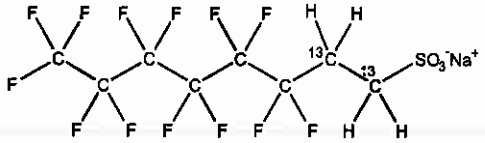
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	452.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.5 ± 2.4 µg/ml (M2-6:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	02/17/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 6:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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CALA

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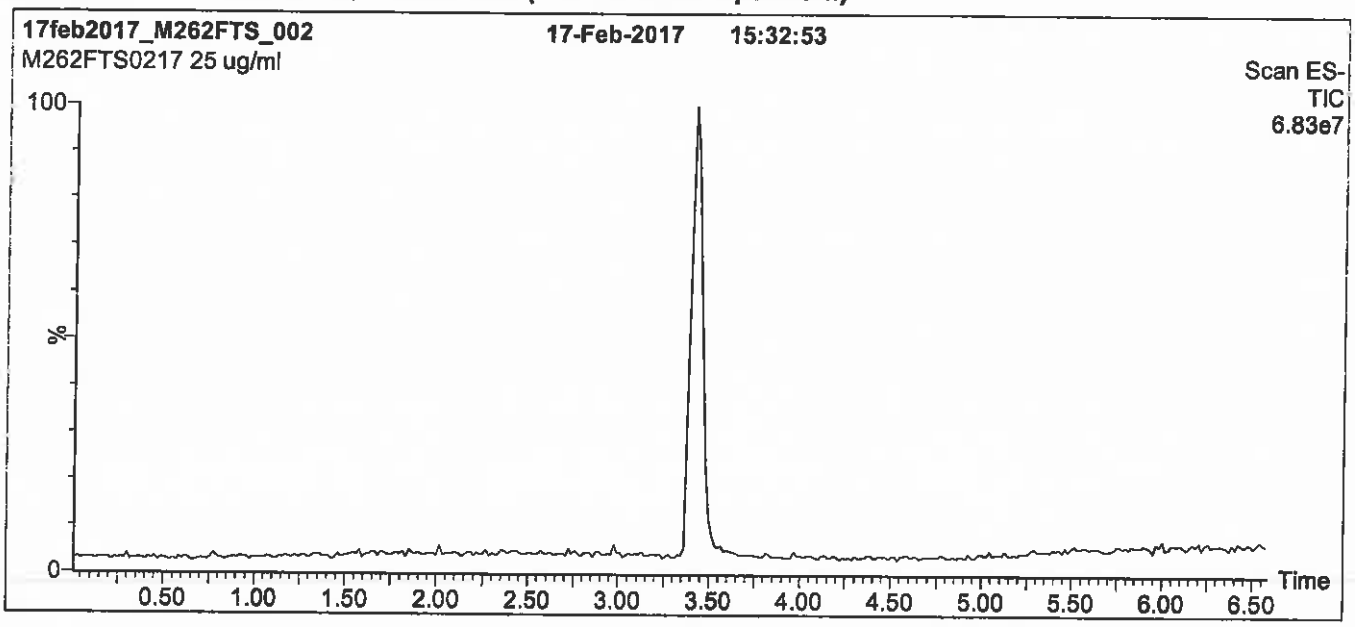

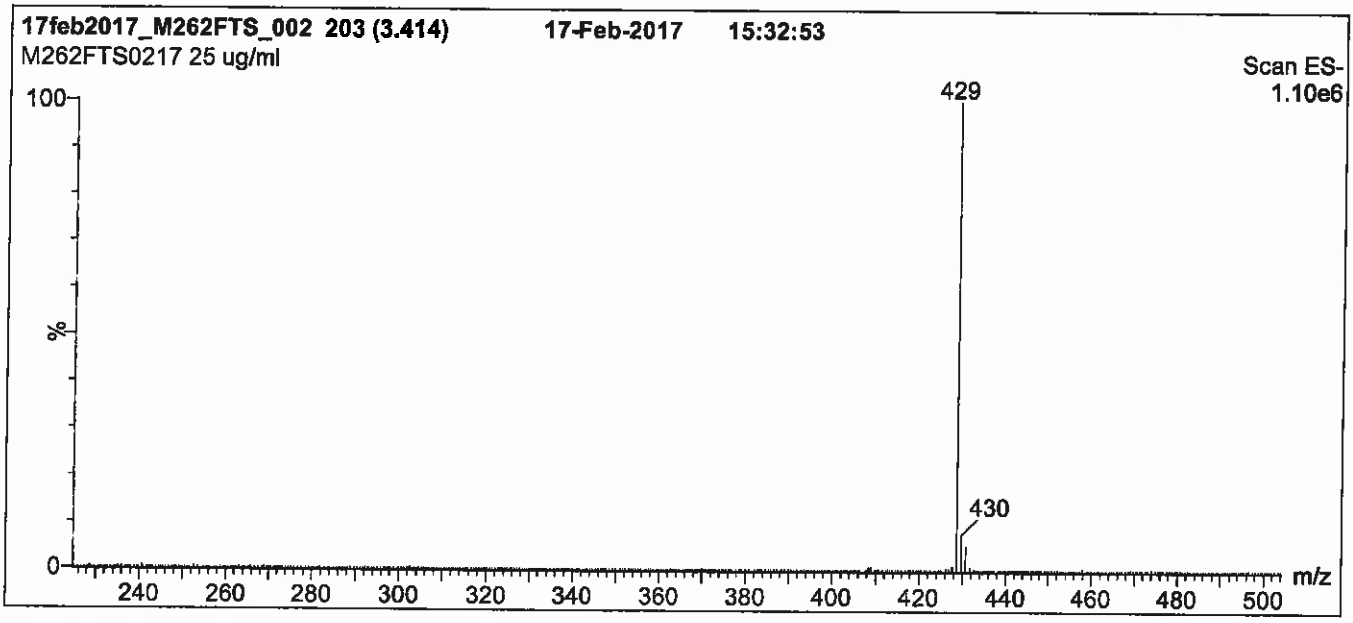

Conditions for Figure 1:

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
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Ramp to 90% organic over 8 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

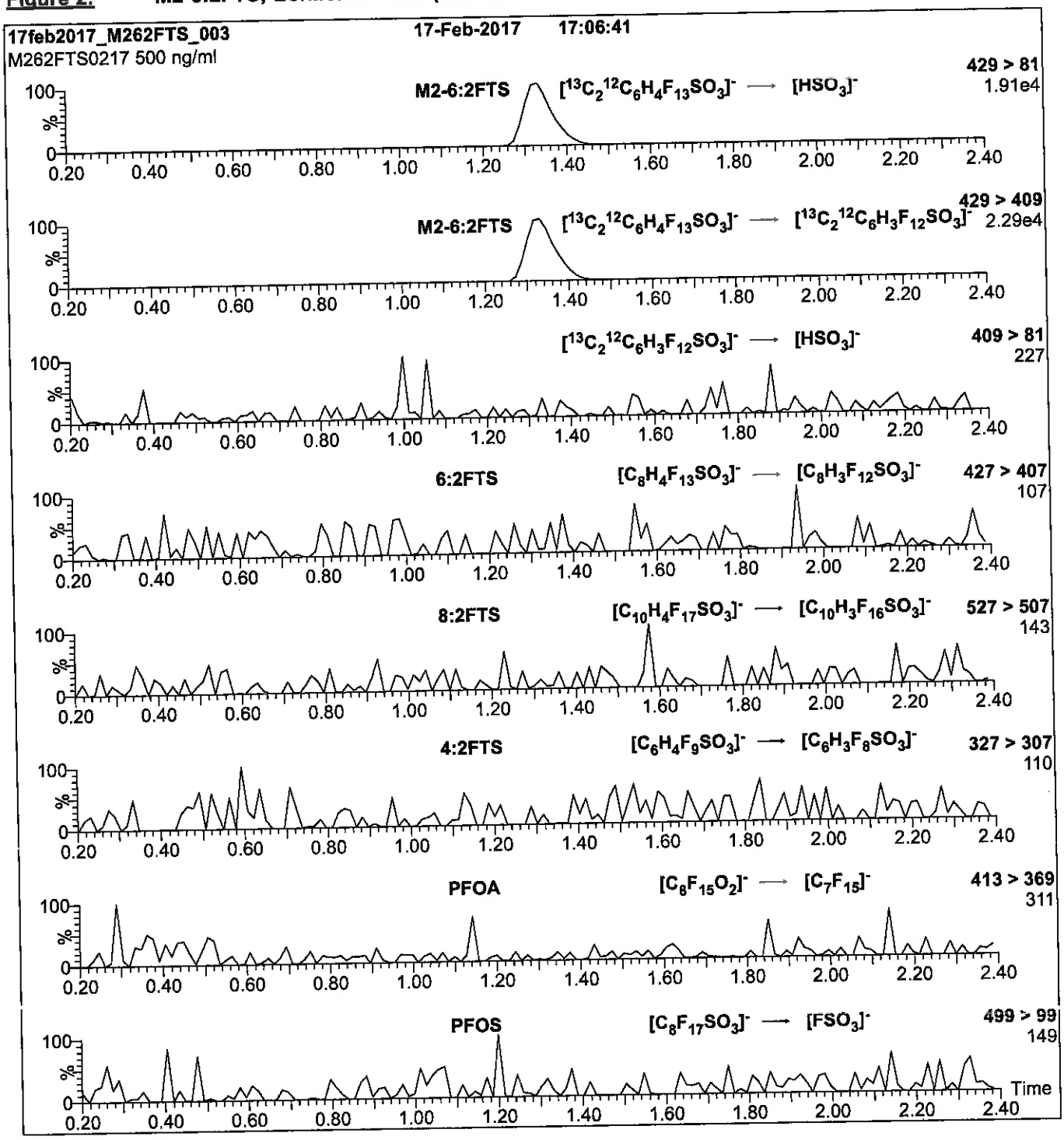
Flow: 300 µl/min

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_00008

1106092
ID: LCM2-8:2FTS_00008
Exp: 07/05/22 Prpd: CCL
M2-8:2FTS

R: 12/4/17 CCL

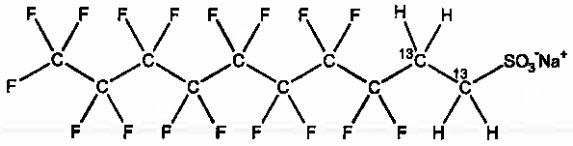
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	552.15
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/ml (M2-8:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C
LAST TESTED: (mm/dd/yyyy)	07/05/2017		(1,2-$^{13}C_2$)
EXPIRY DATE: (mm/dd/yyyy)	07/05/2022		
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Figure 1: LC/MS Data (TIC and Mass Spectrum)
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UNCERTAINTY:

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

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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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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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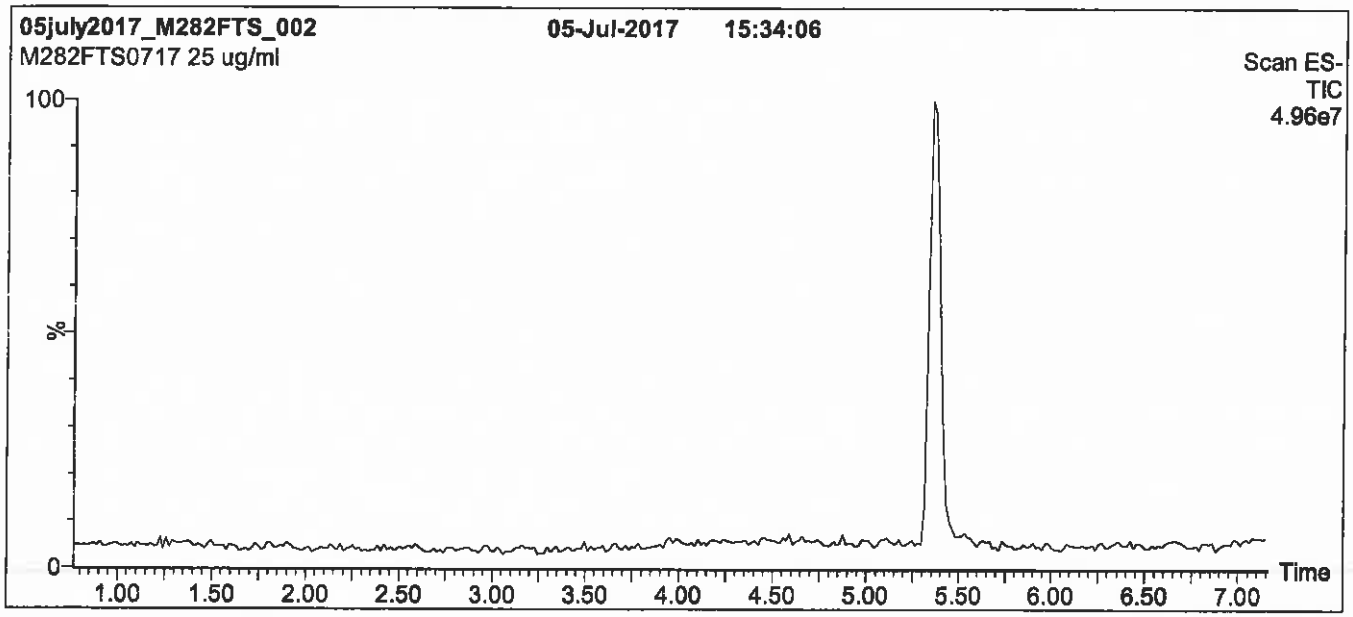
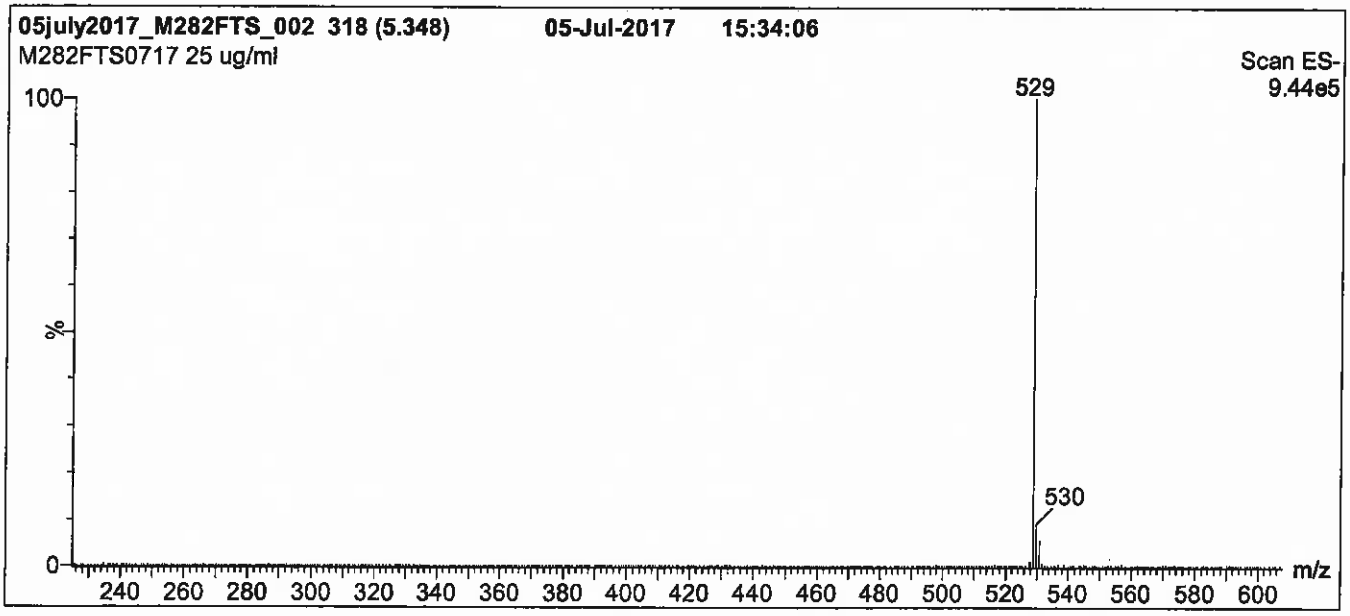
Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: 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

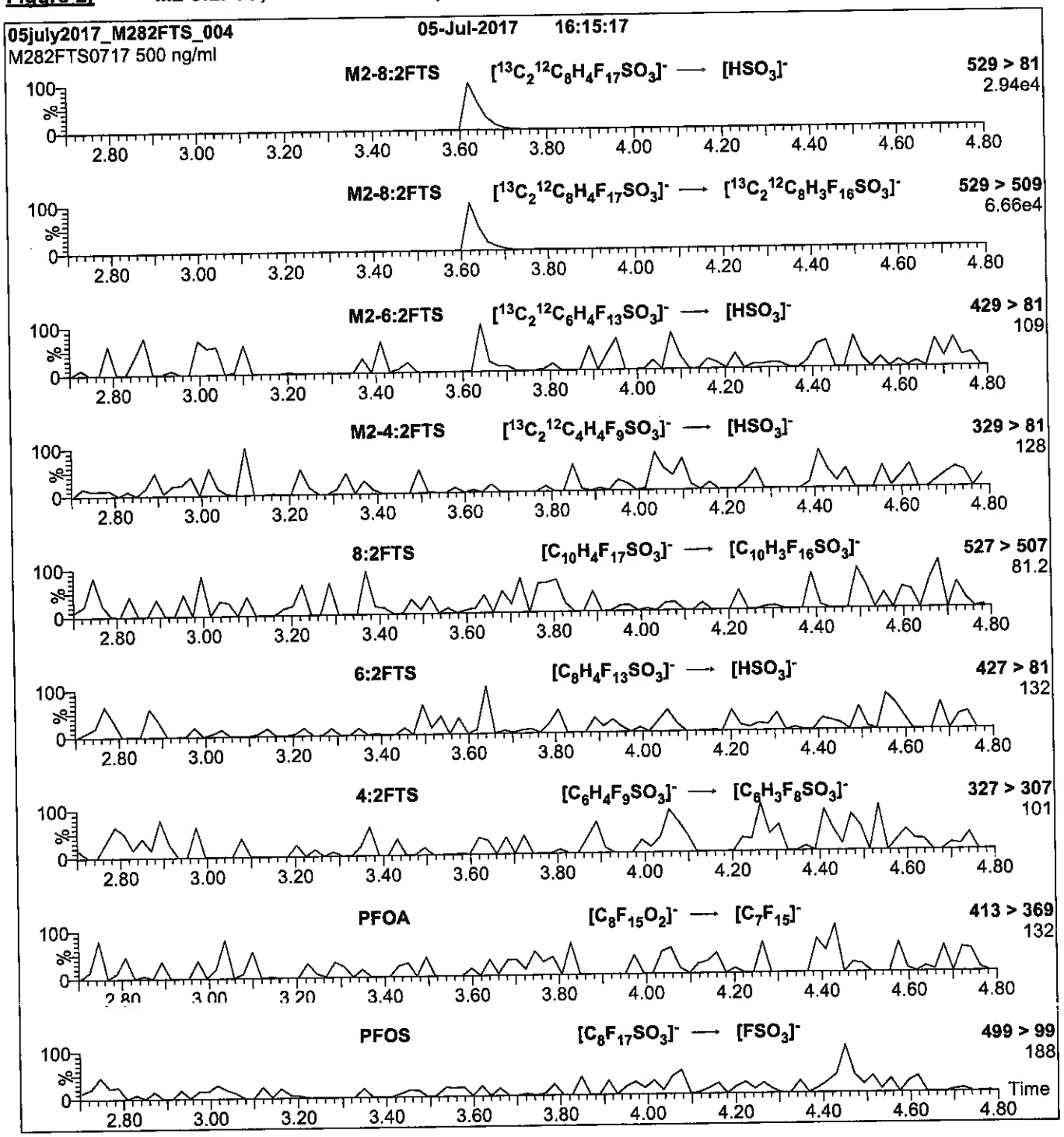
Flow: 300 µl/min

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_00013

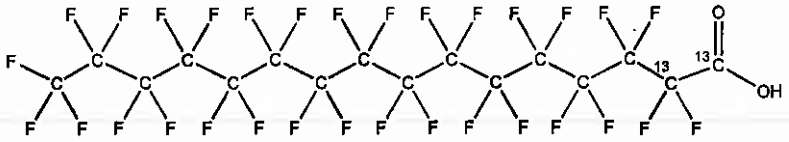
1106068
ID: LCM2PFHxDA_00013
Exp: 07/13/22 Prpd: CCL
13C2-PFHxDA at 50ug/mL

R: 12/4/17 ccz

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/14/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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CALA

ANAB ACCREDITED

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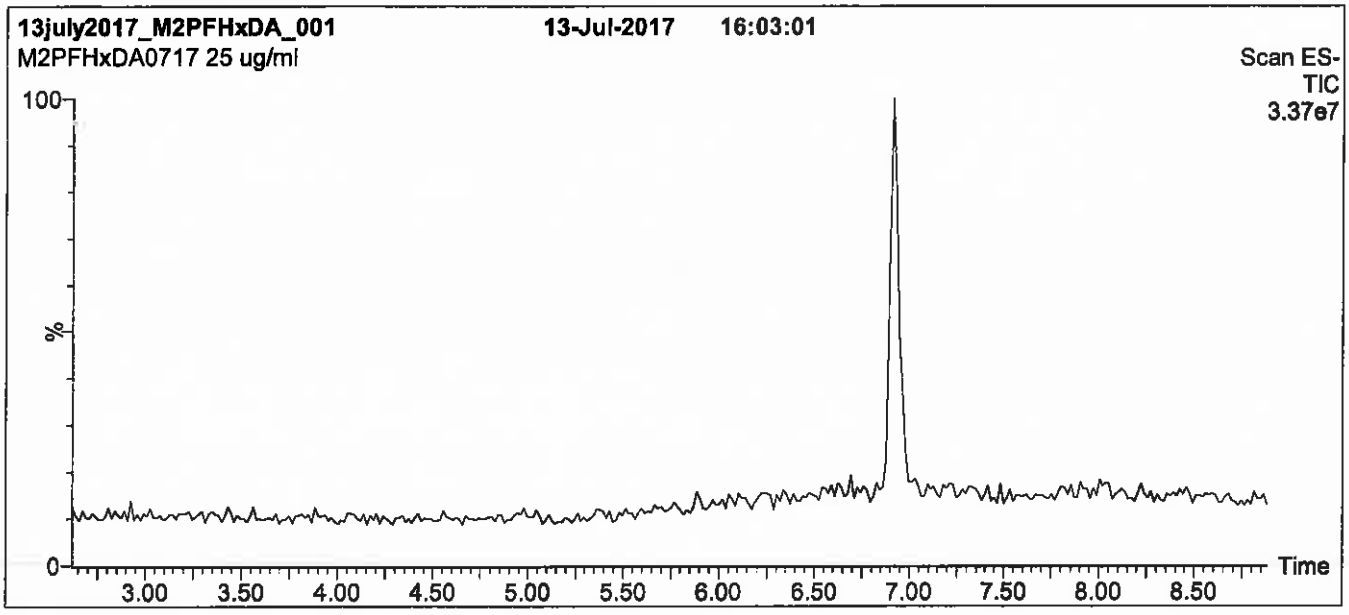
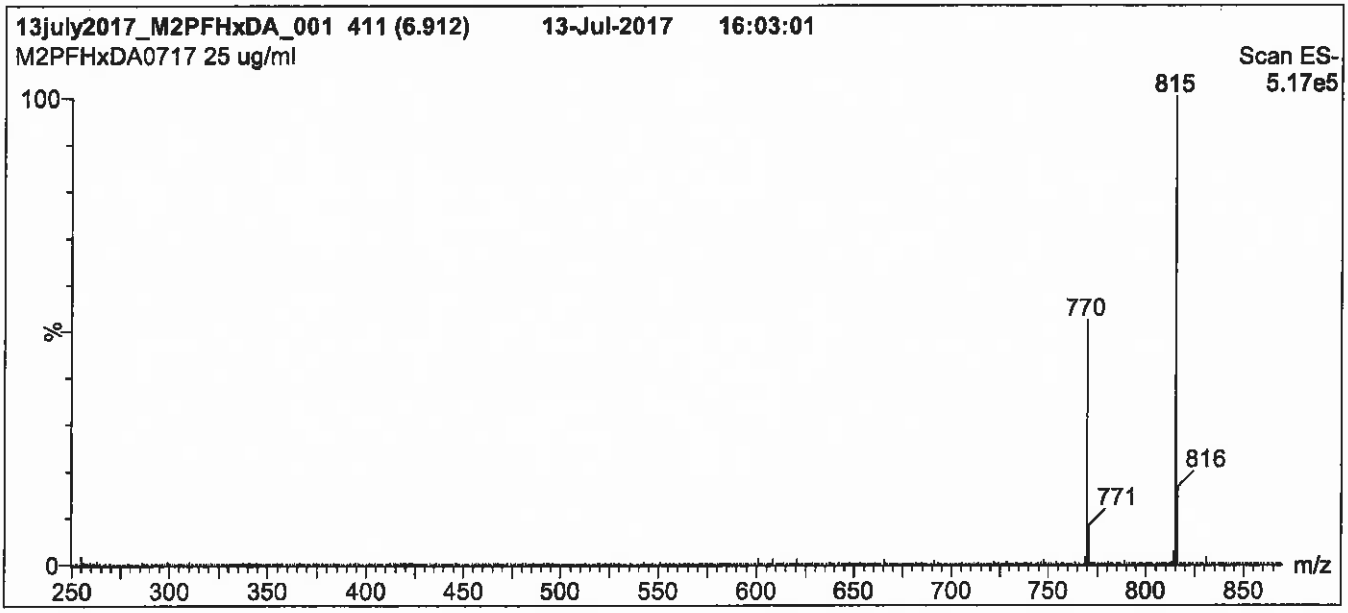
Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





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

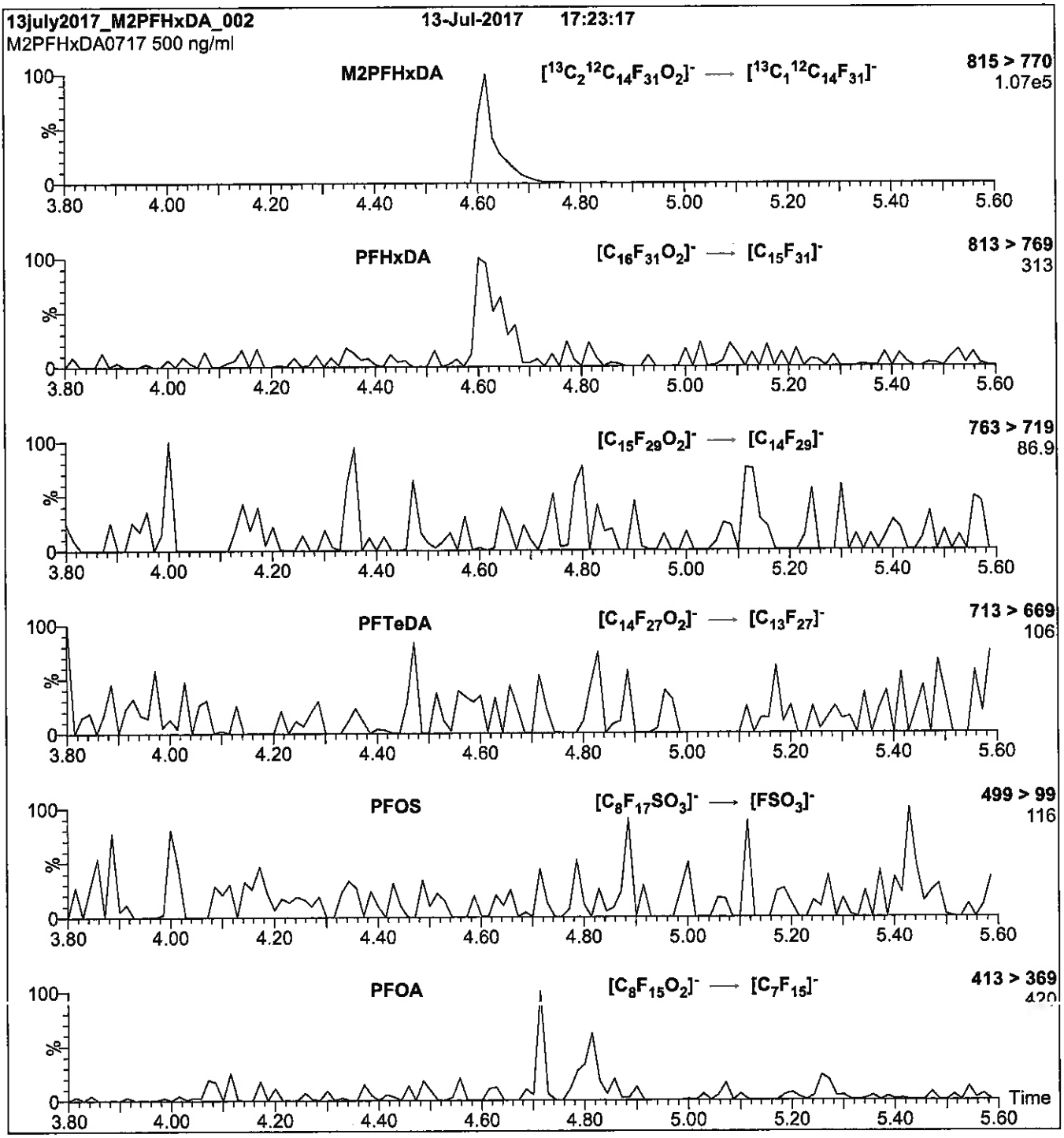
Flow: 300 µl/min

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

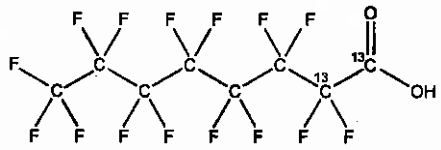
LCM2PFOA_00008

R. 5/8/17 SKW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6HF_{15}O_2$	**MOLECULAR WEIGHT:**	416.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
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 ACCREDITED

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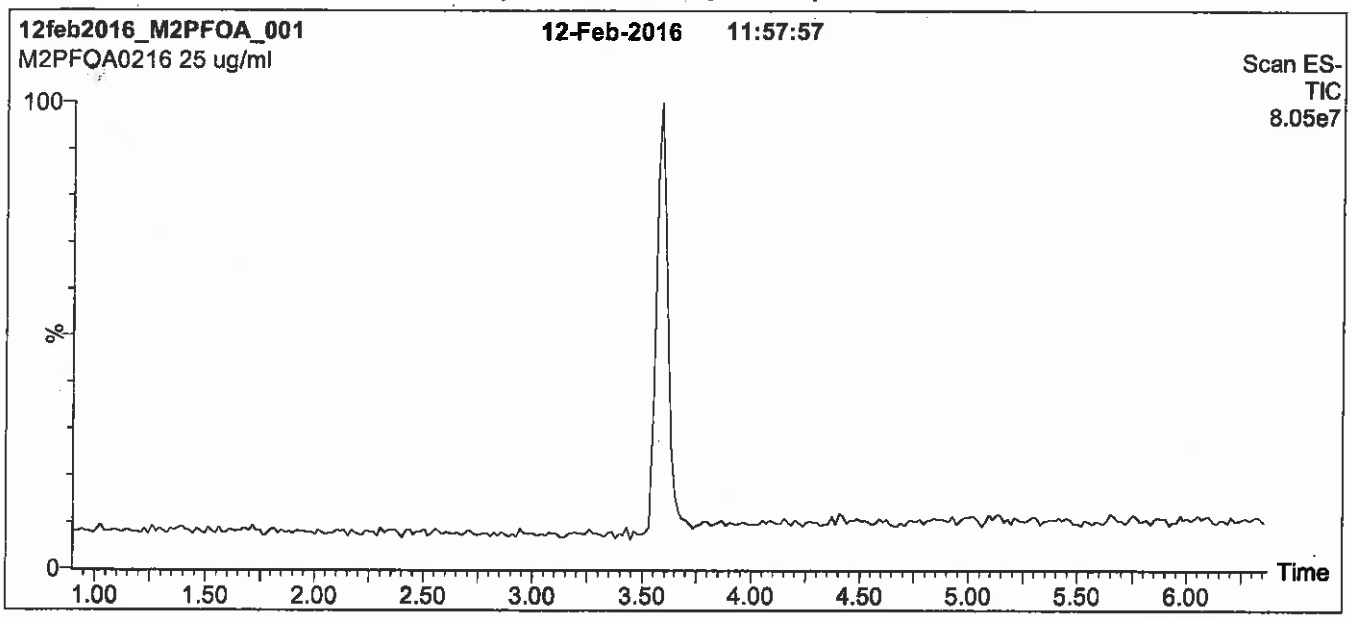
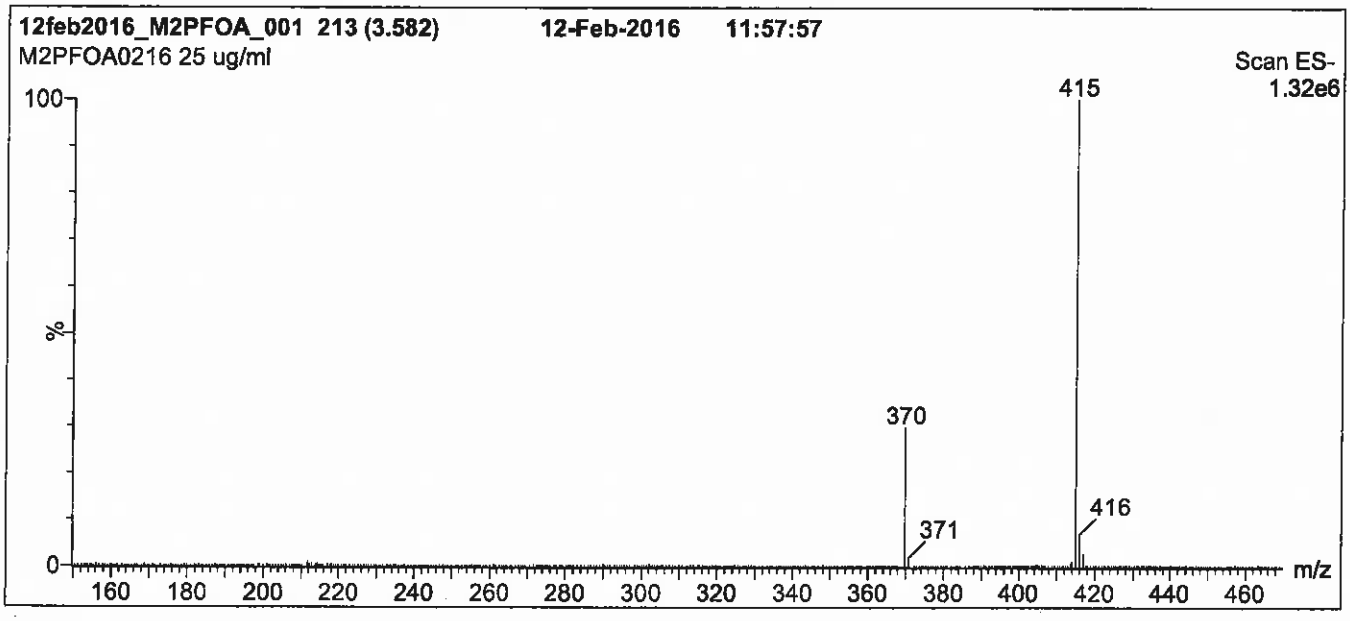
Figure 1: **M2PFOA; LC/MS Data (TIC and Mass Spectrum)**





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: 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

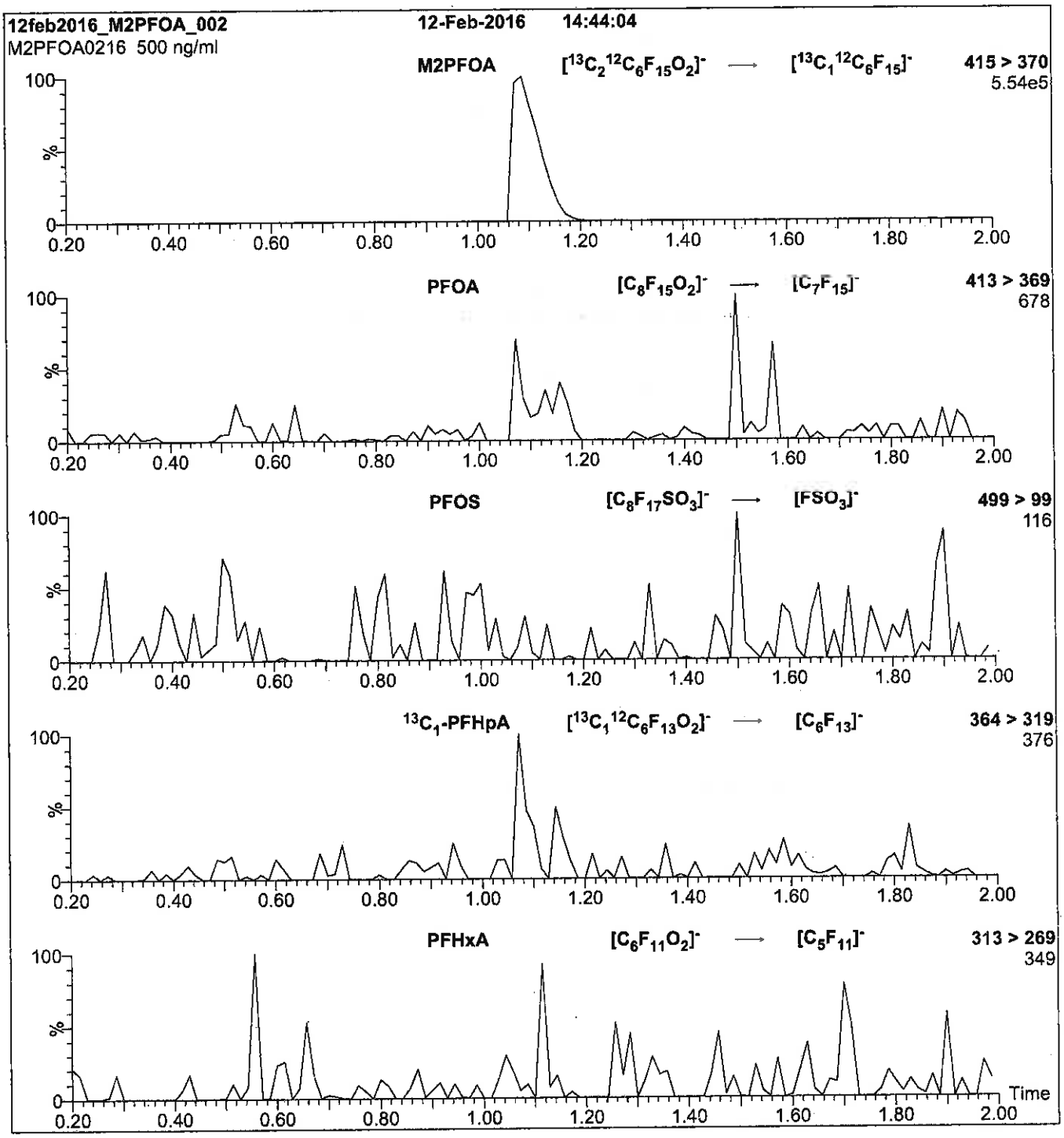
Flow: 300 µl/min

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_00012

1106065
ID: LCM2PFTeDA_00012
Exp: 11/30/22 Prpd: CCL
13C2-PFTeDA at 50ug/mL

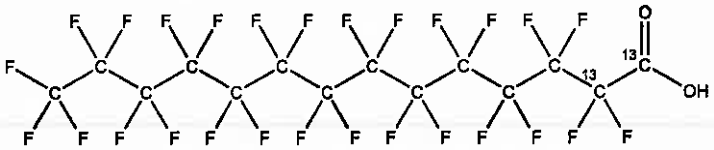
r: 12/4/17 ccl

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFTeDA
LOT NUMBER: M2PFTeDA1117
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
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CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/30/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/30/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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Certified By: _____ **Date:** 12/01/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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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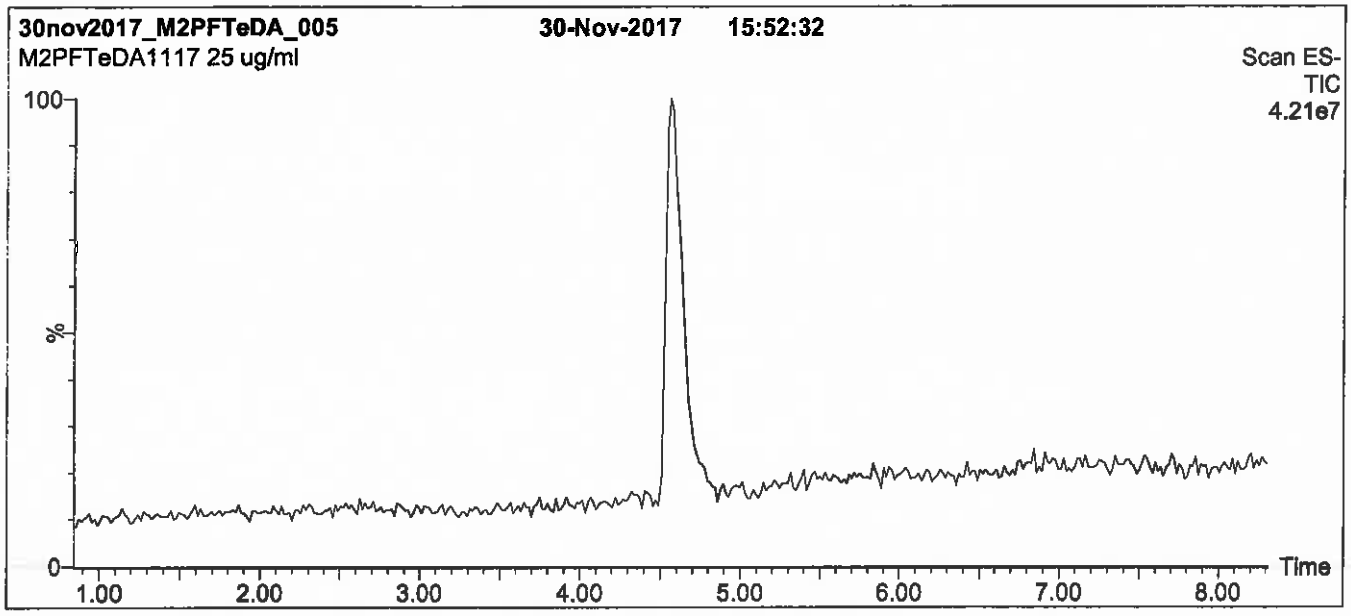
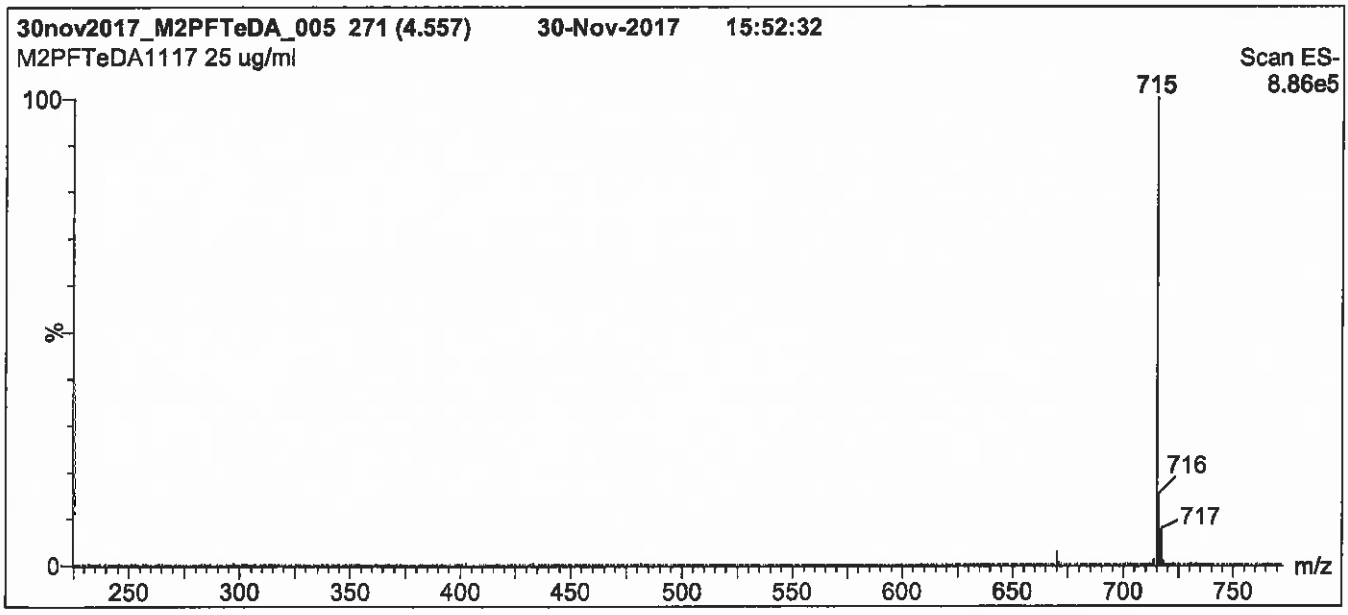
CALA

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: **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

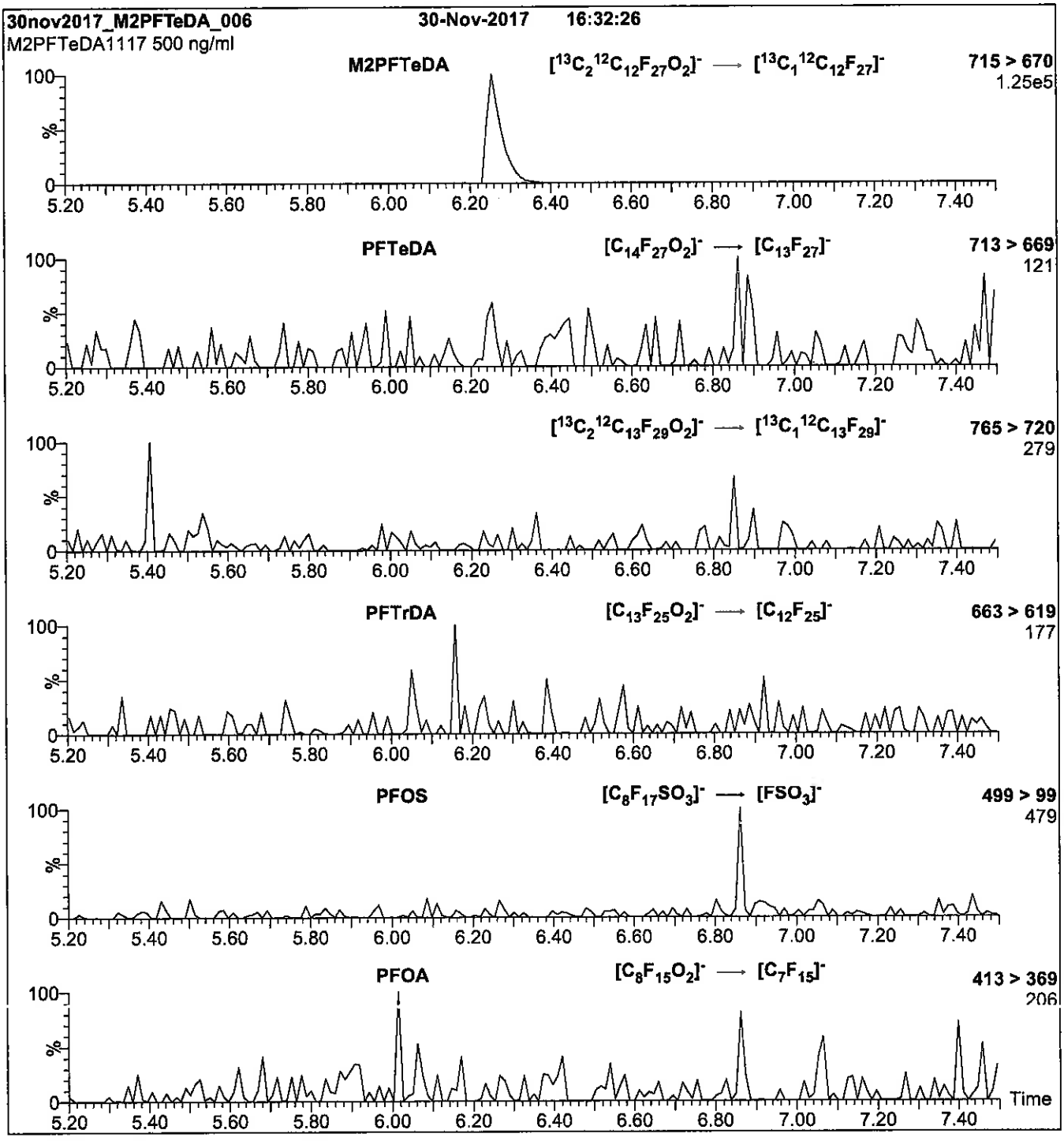
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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: **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) = 3.31e-3
Collision Energy (eV) = 14

Reagent

LCM3HFPO-DA_00002

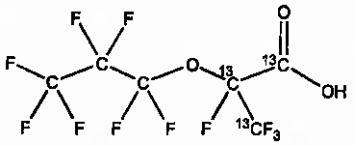
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M3HFPO-DA **LOT NUMBER:** M3HFPODA0817

COMPOUND: 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-$^{13}C_3$-propanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_3{}^{12}C_3HF_{11}O_3$	**MOLECULAR WEIGHT:**	333.03
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	08/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	08/17/2020		
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 ~ 1.5% of two constitutional isomers.
- Product is commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/25/2017 (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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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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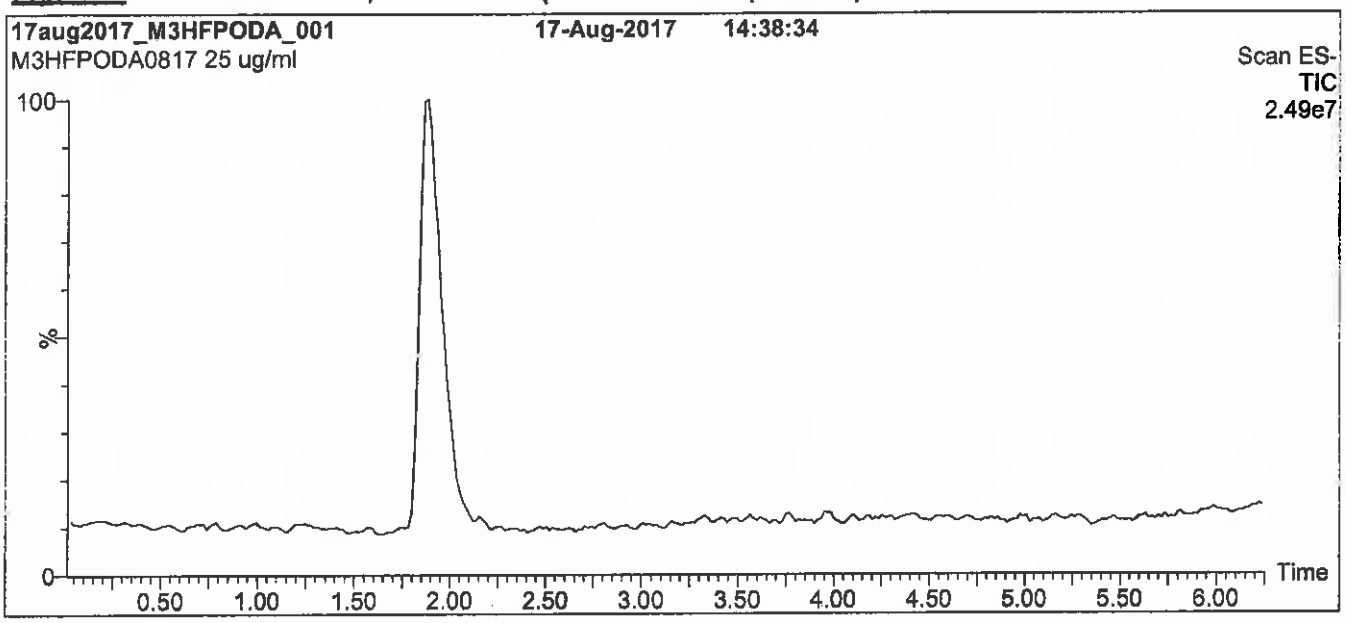
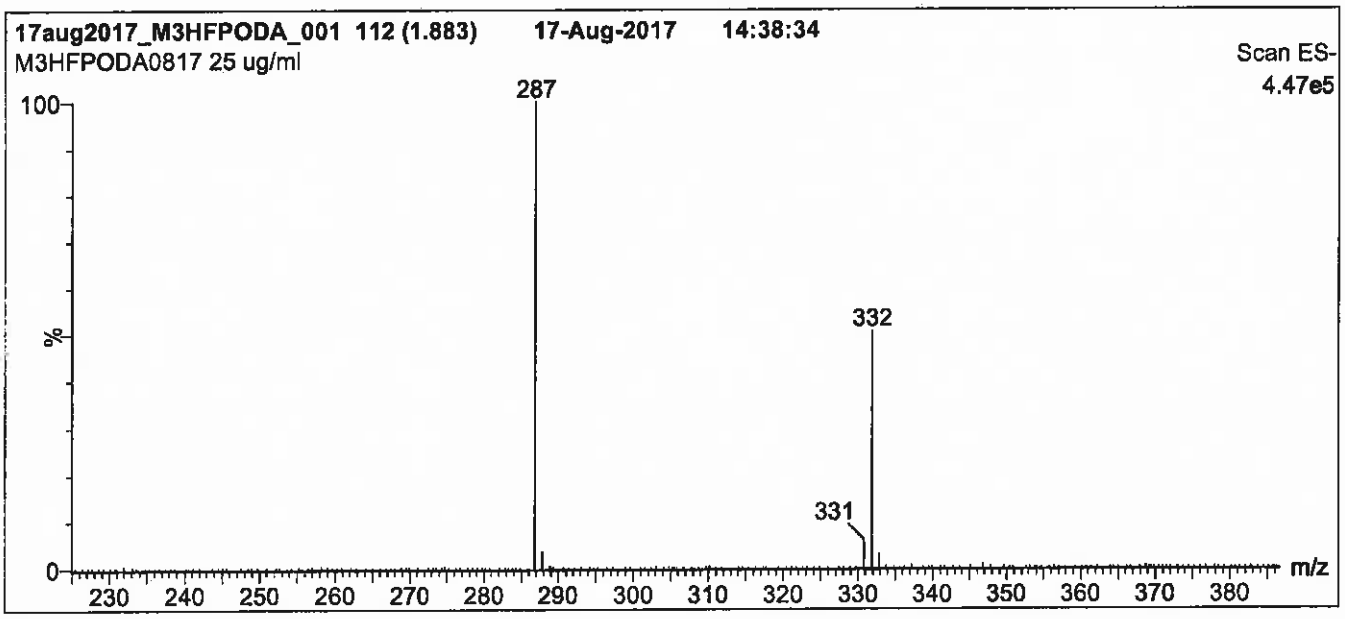
Figure 1: **M3HFPO-DA; LC/MS Data (TIC and Mass Spectrum)**





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% MeOH / 45% H_2O 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

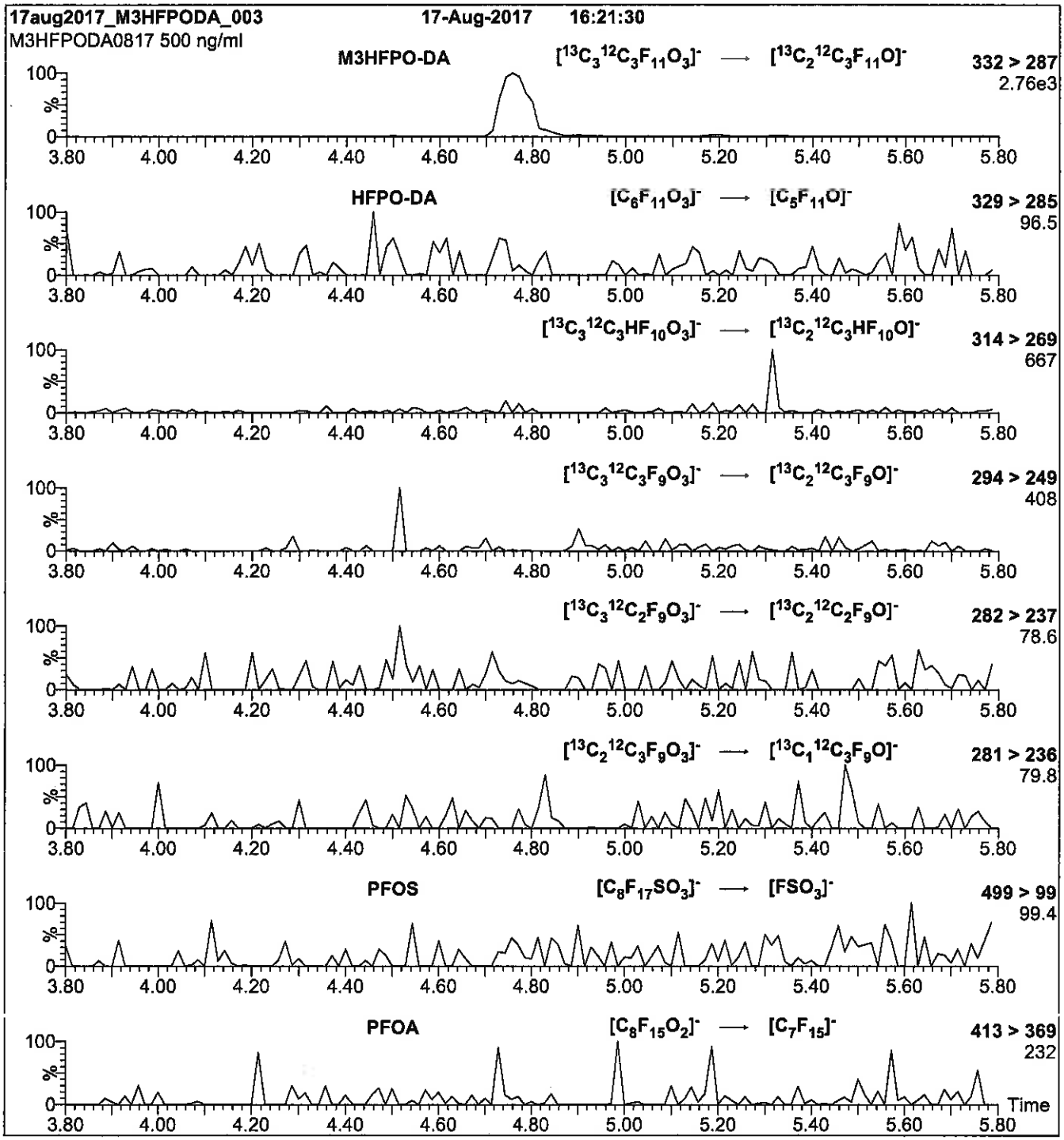
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: **M3HFPO-DA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M3HFPO-DA)

Mobile phase: Isocratic 80% MeOH / 20% H_2O with 10 mM NH_4OAc buffer

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 5

Reagent

LCM4PFHPA_00012

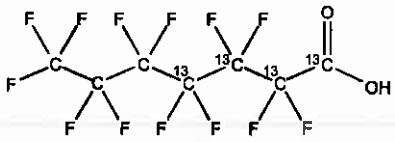
1106316
ID: LCM4PFHPA_00012
Exp: 05/03/22 Prpd: CCL
13C4-Perfluoroheptanoic a

V: 12/4/17 CCL

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: _____ **Date:** 05/11/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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CALA

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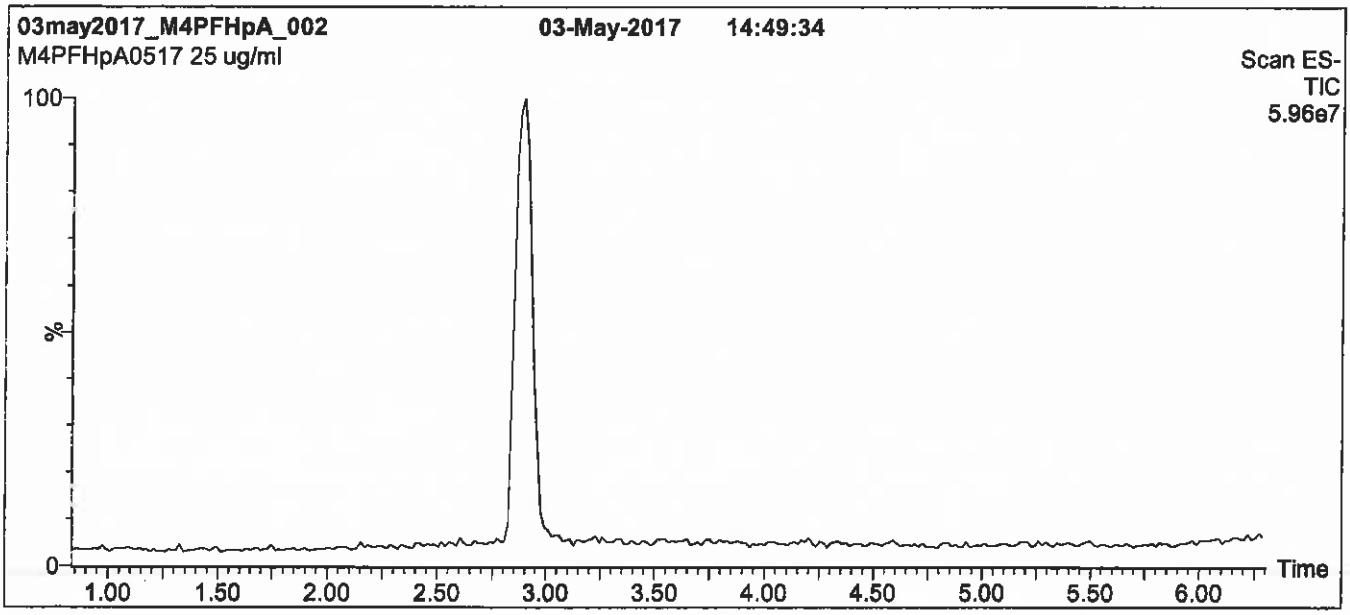
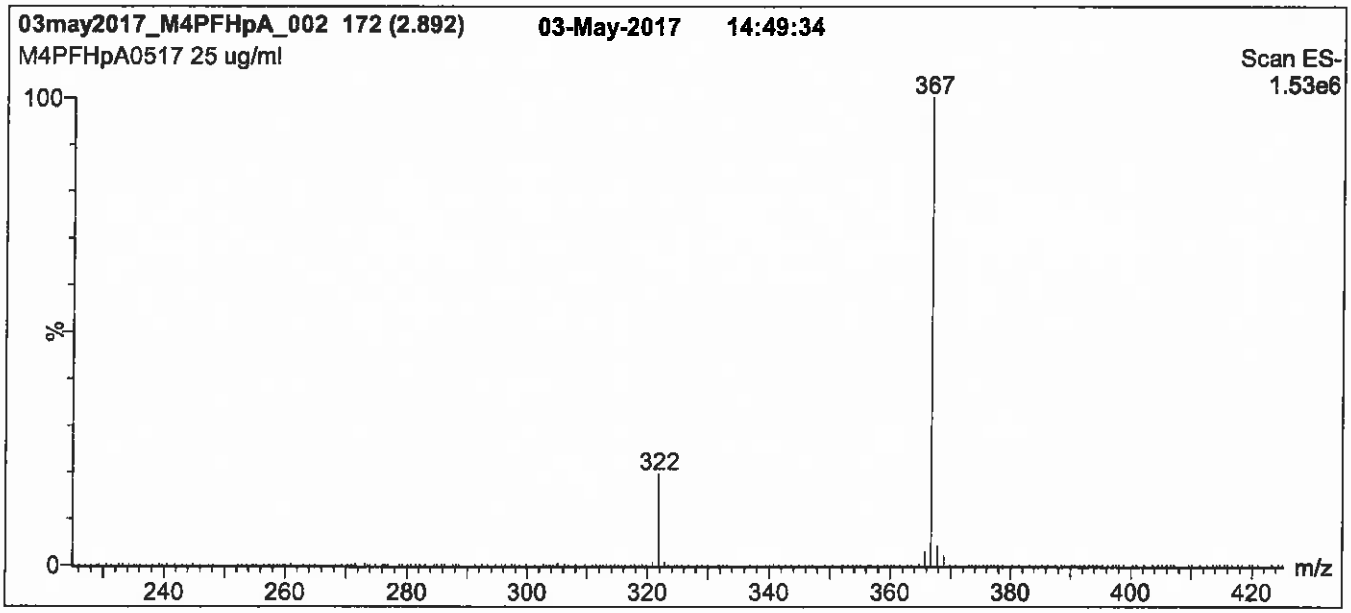
Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

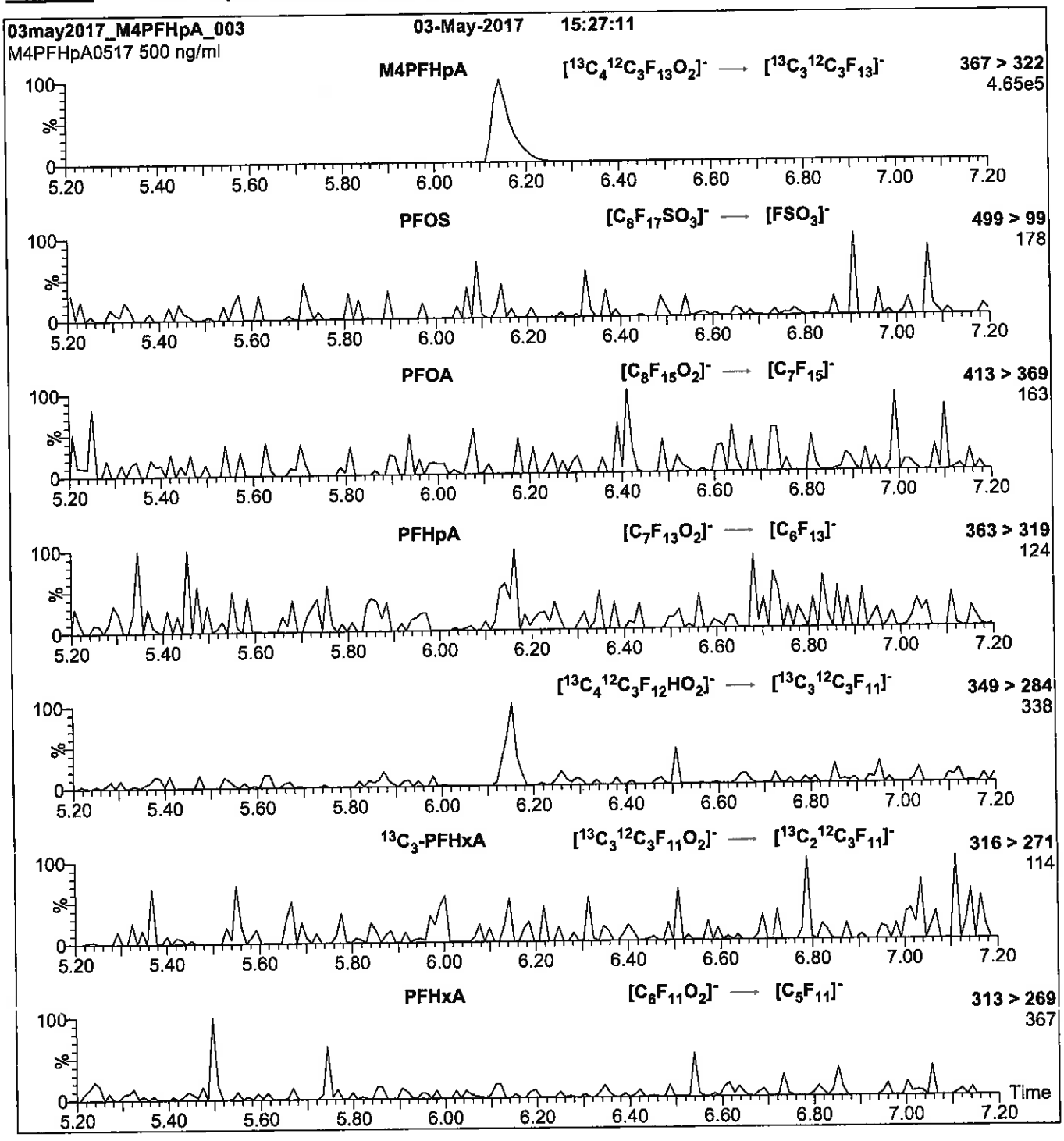
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M4PFHpA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

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

Reagent

LCM5PFPEA_00013

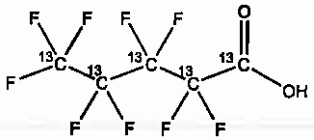
1106313
ID: LCM5PFPEA_00013
Exp: 07/20/22 Rpd: CCL
13C5-Perfluoropentanoic a

r: 12/4/17 ccc

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M5PFPeA	**LOT NUMBER:**	M5PFPeA0717
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)	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-pentanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/26/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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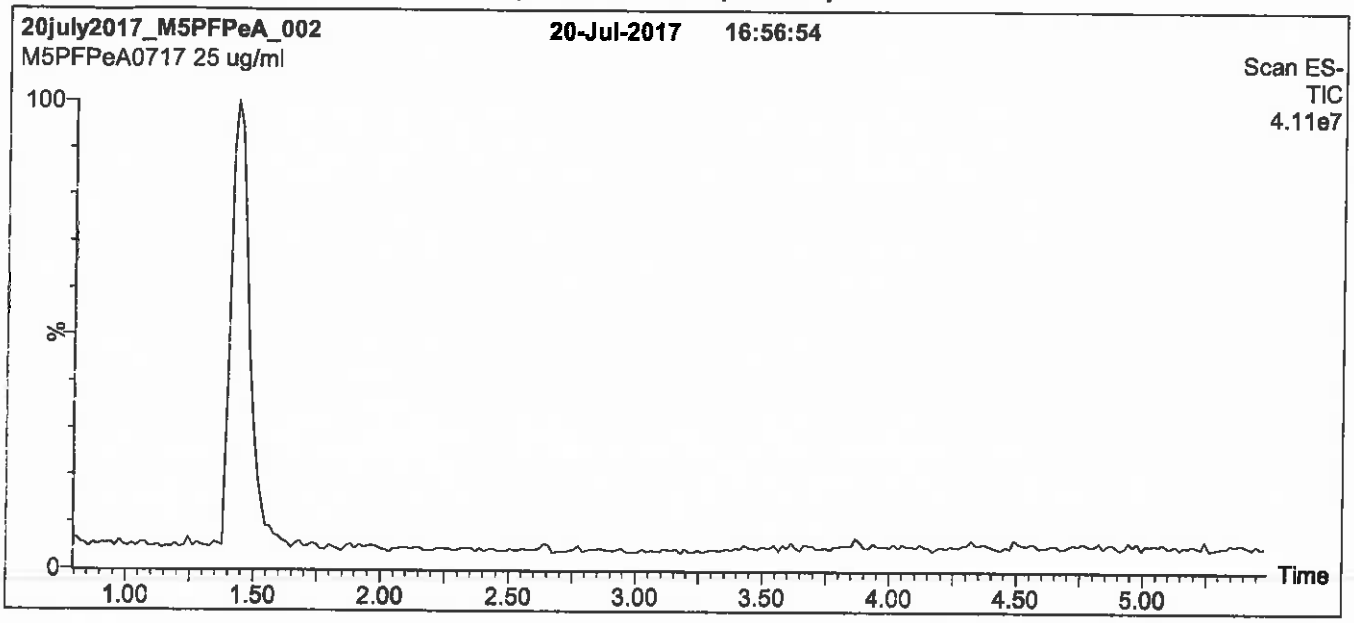
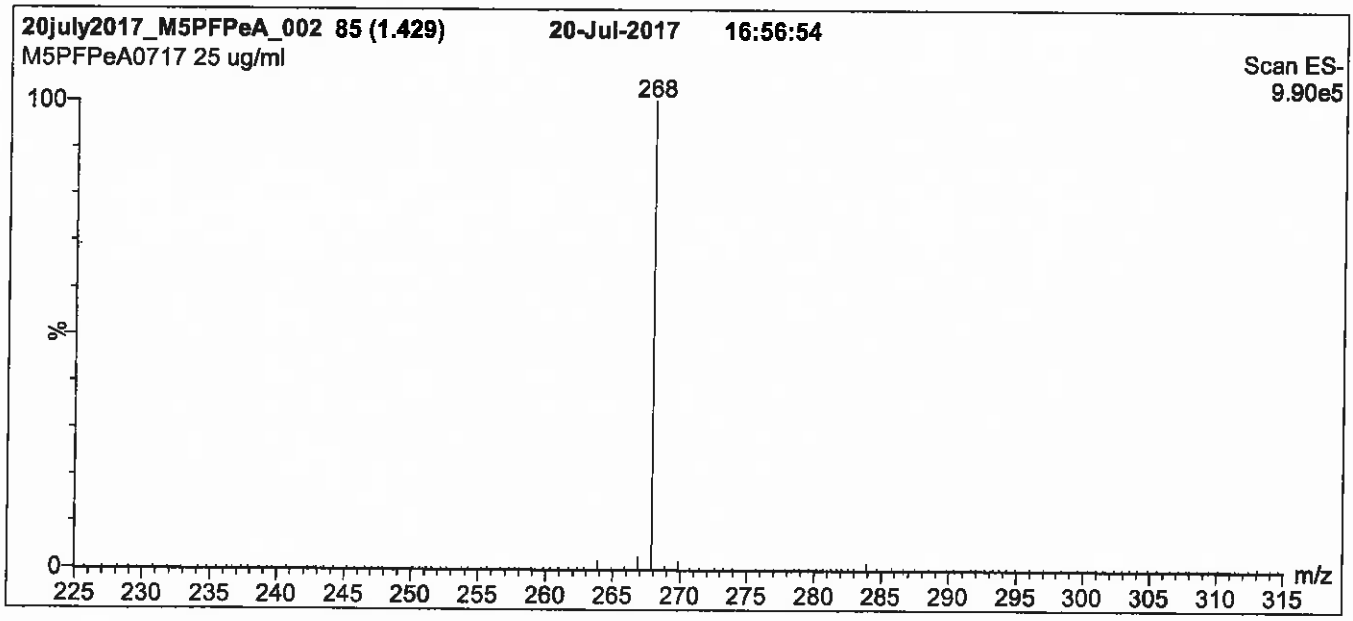
Figure 1: **M5PFPeA; LC/MS Data (TIC and Mass Spectrum)**





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: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Hold for 1 min. Ramp to 90% organic over 7 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

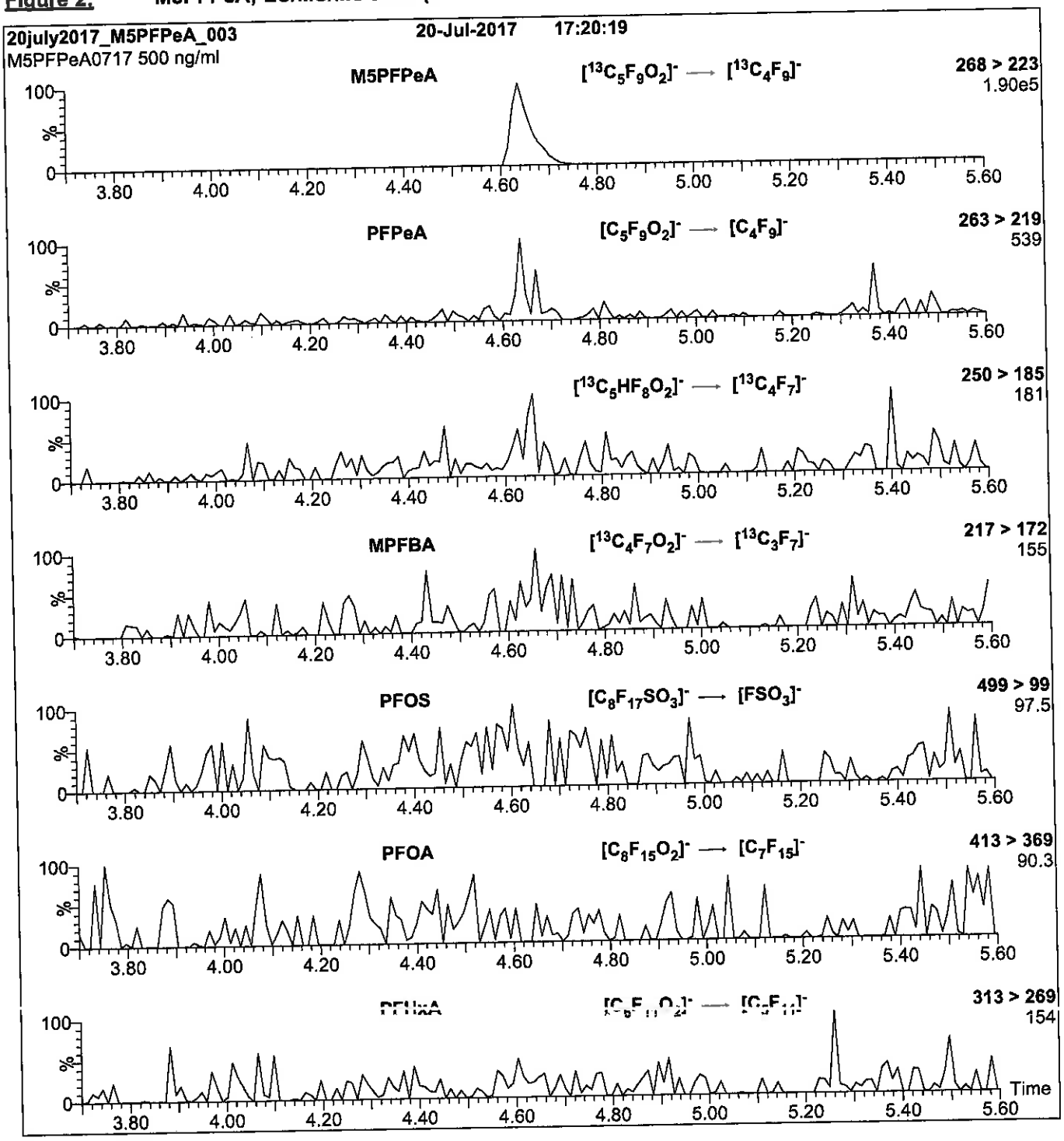
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 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) = 3.54e-3
Collision Energy (eV) = 9

Reagent

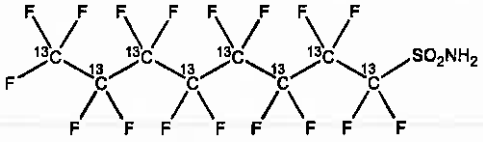
LCM8FOSA_00016

r: 12/4/17
CCL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M8FOSA-I	**LOT NUMBER:**	M8FOSA1017I
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)	10/11/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/11/2022		
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:** 10/20/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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.

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.

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CALA

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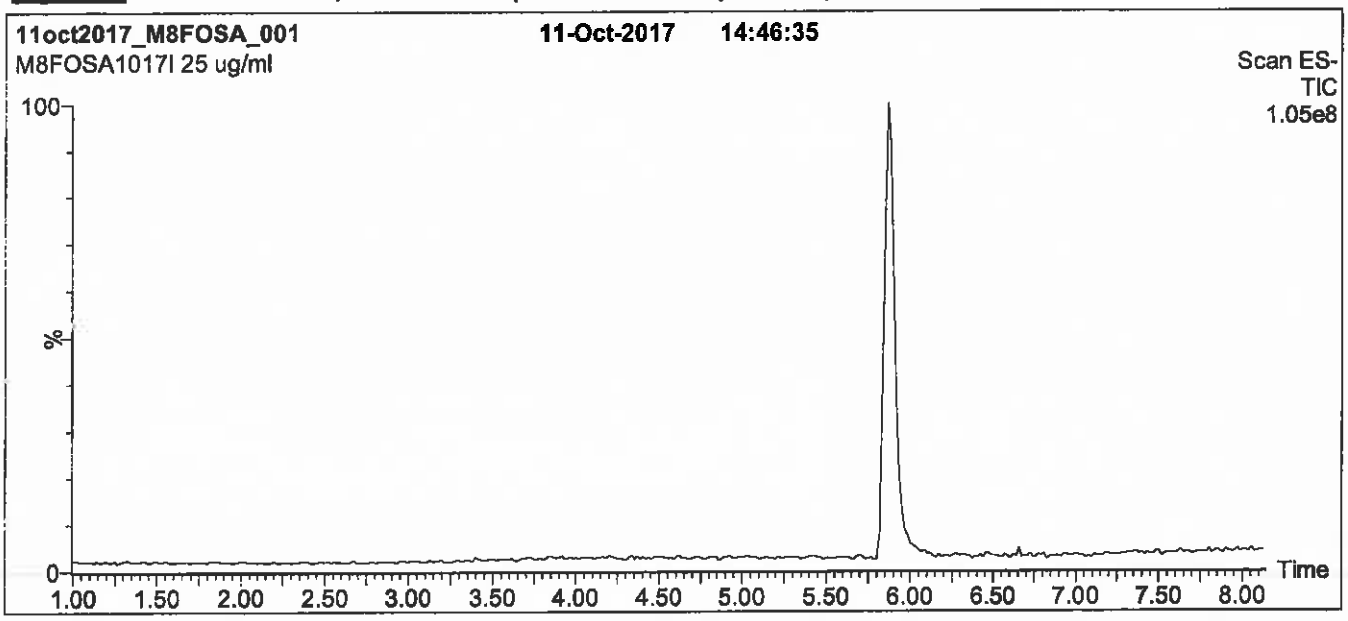
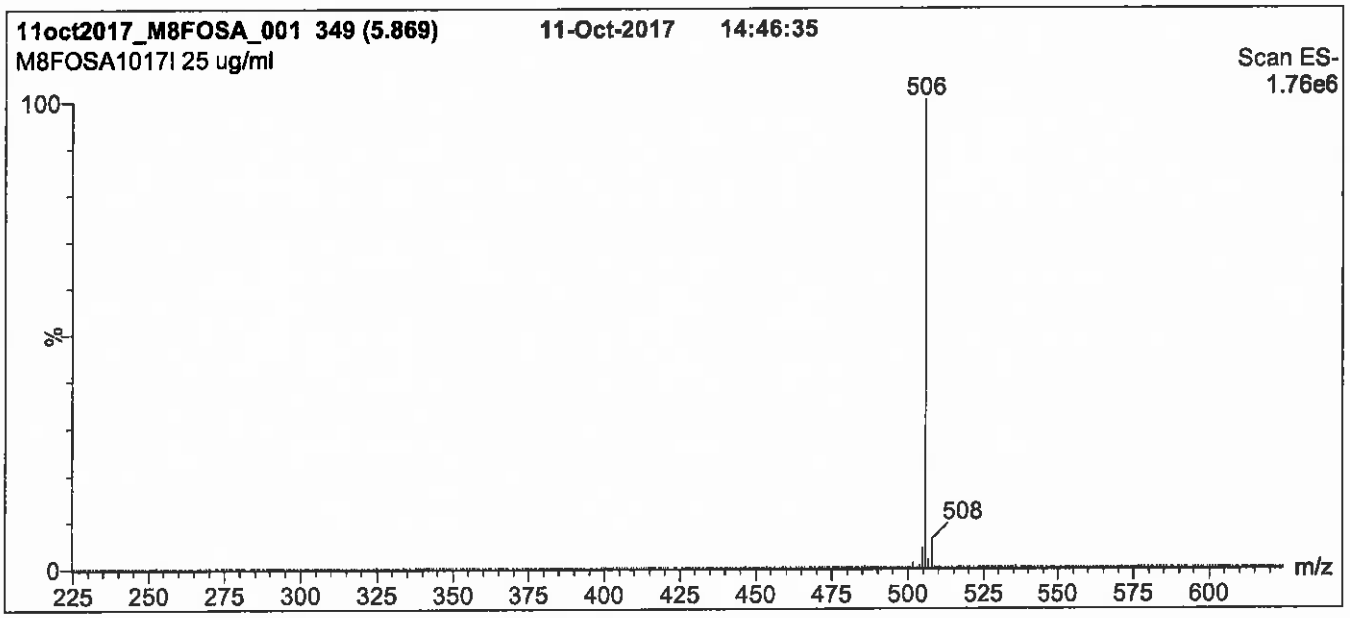
Figure 1: **M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





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 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

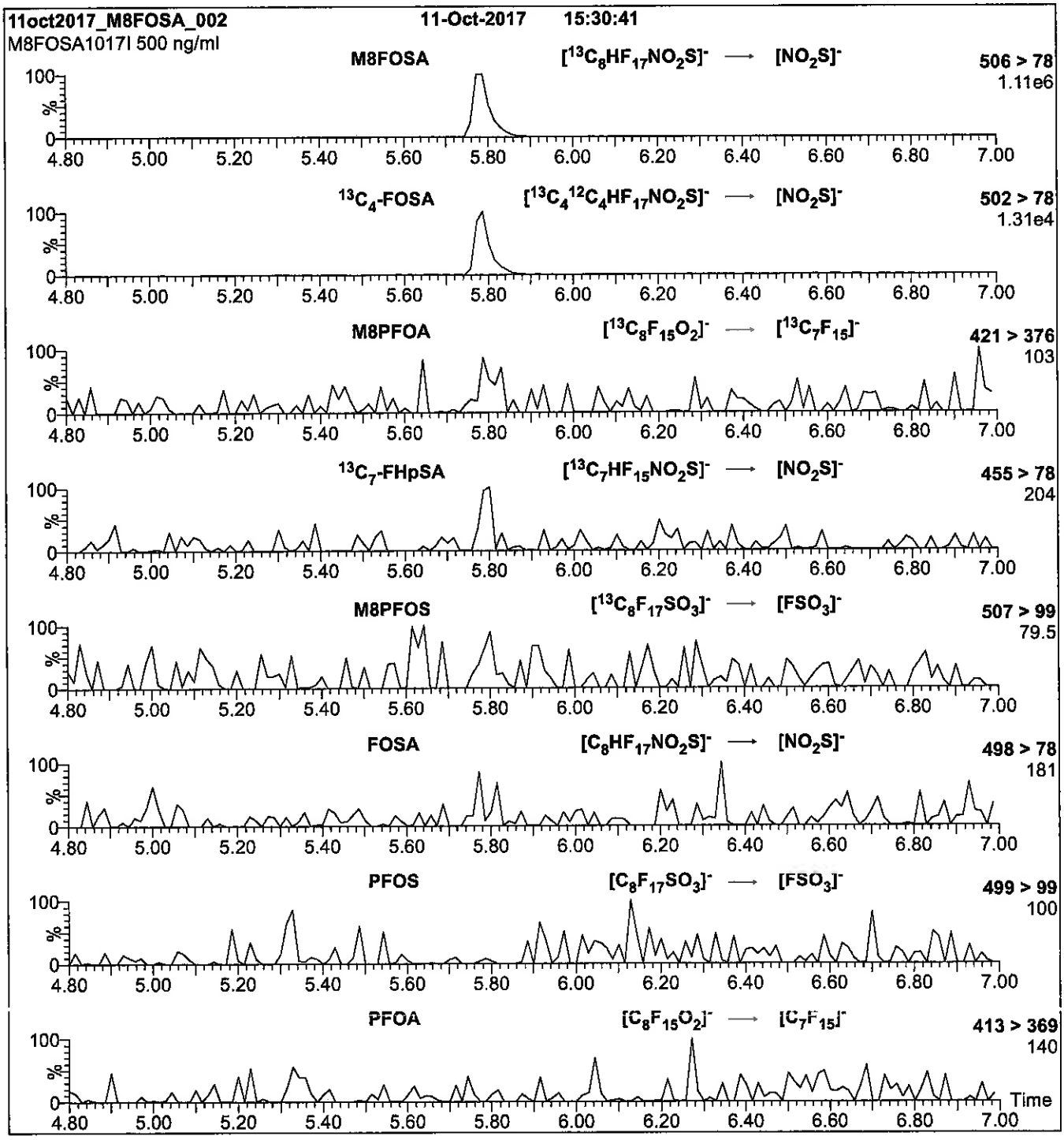
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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: **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) = 3.43e-3
Collision Energy (eV) = 30

Reagent

LCMPFBA_00013

r: 12/4/17 ccc

WELLINGTON LABORATORIES

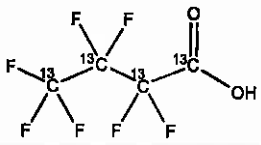
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFBA0417

STRUCTURE:

CAS #: Not available



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

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

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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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CALA

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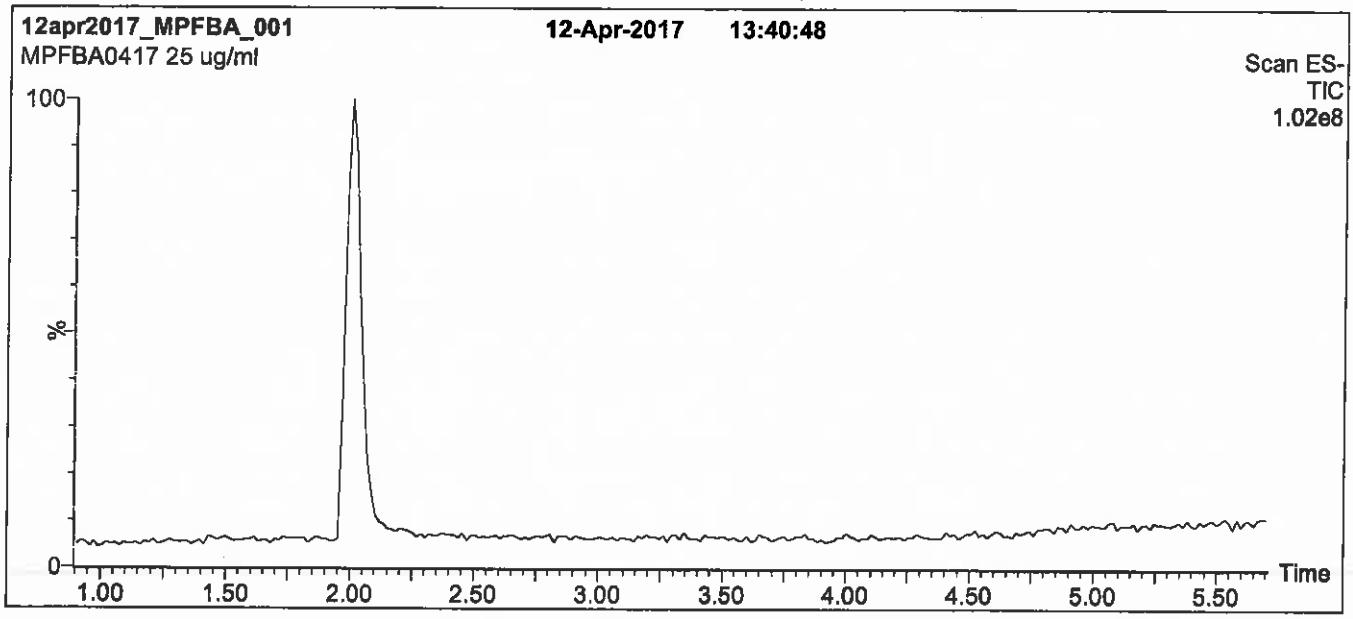
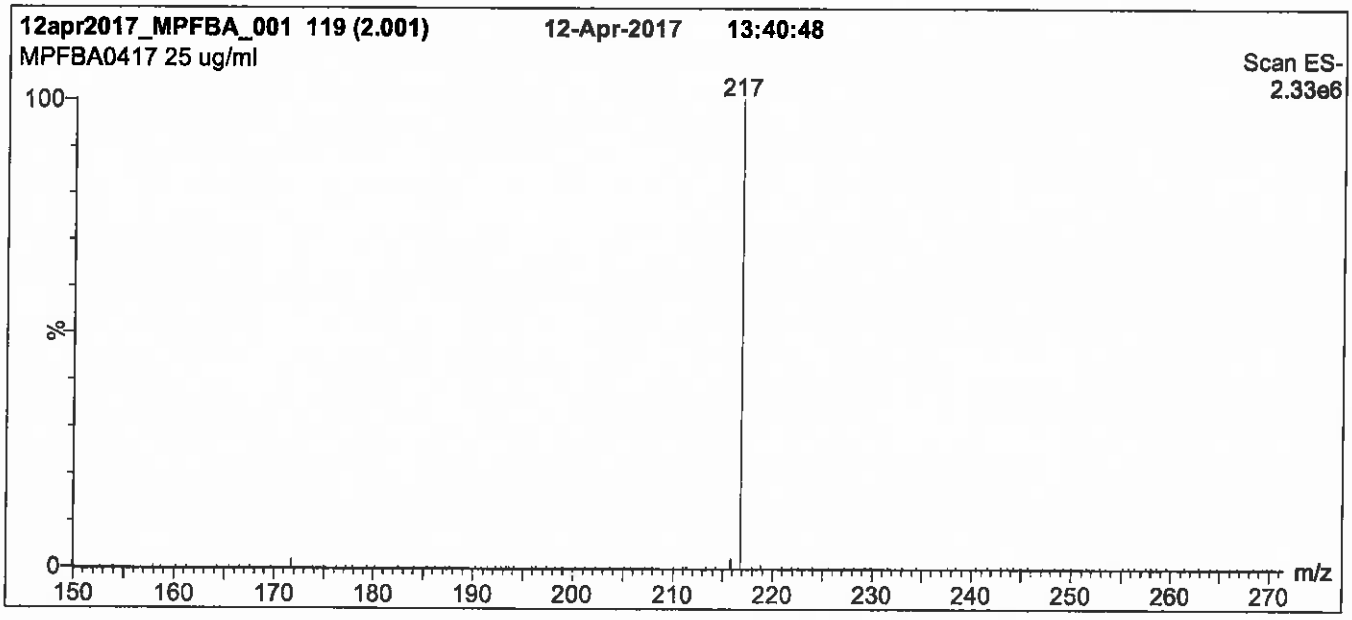
Figure 1: **MPFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

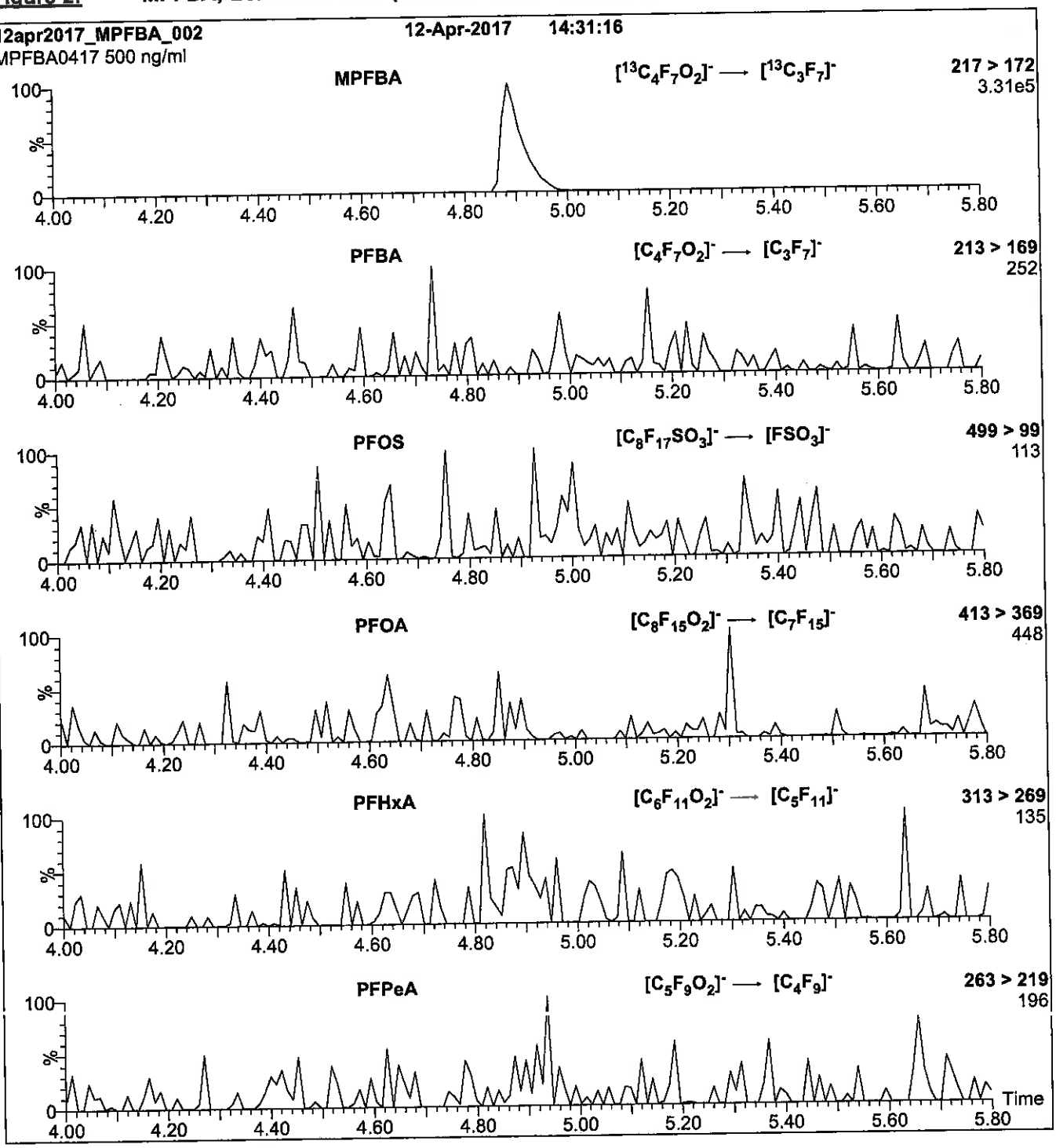
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFBS_00006

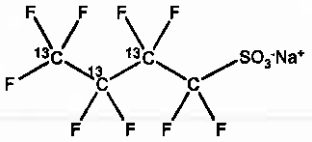
1106130
ID: LCMPFBS_00006
Exp: 05/24/22 Prpd: CCL
13C3-Perfluorobutanesulfo

r: 12/4/17 CCL

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:	$^{13}C_3{}^{12}CF_8SO_3Na$	**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)	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: _____ **Date:** 05/25/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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CALA

ANAB ACCREDITED

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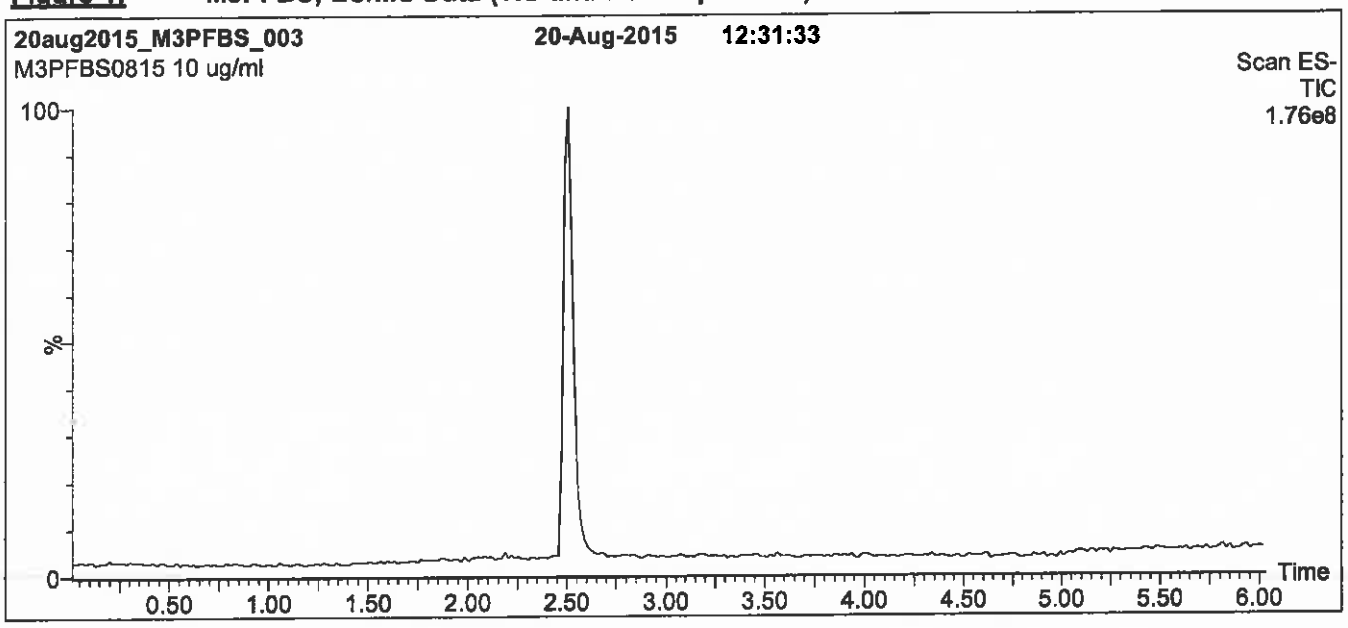
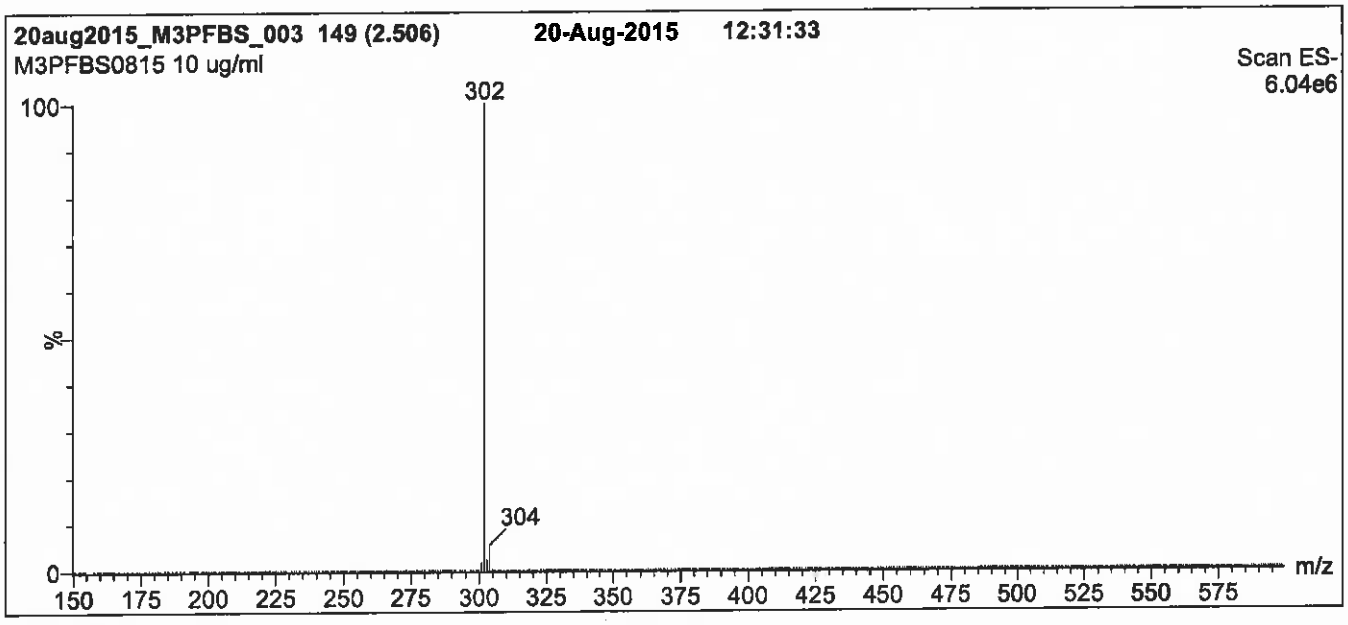
Figure 1: **M3PFBS; LC/MS Data (TIC and Mass Spectrum)**





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

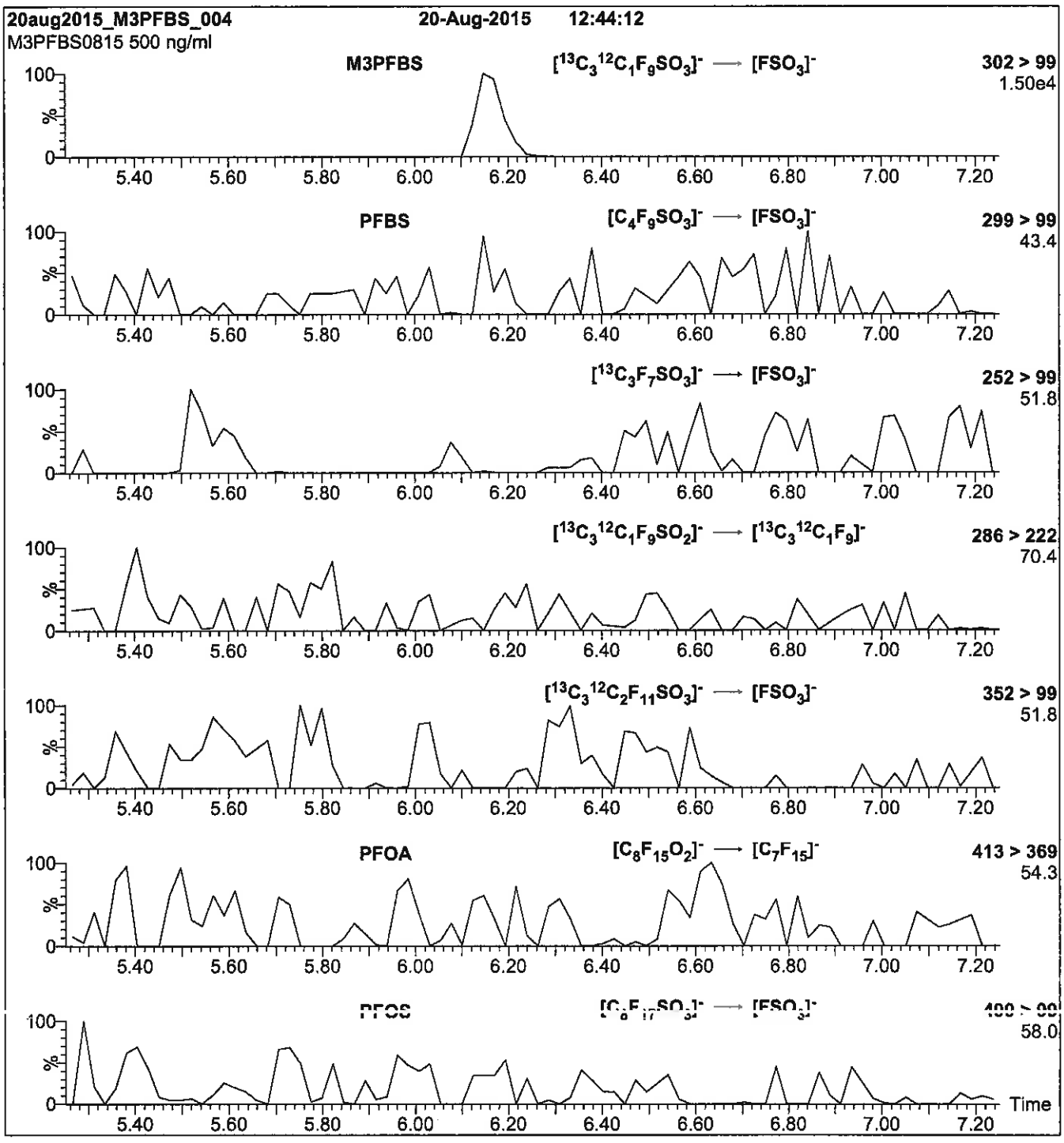
Flow: 300 µl/min

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

LCMPFDA_00018

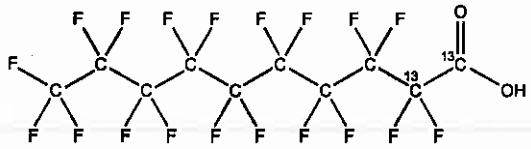
1106159
ID: LCMPFDA_00018
Exp: 07/13/22 Prpd: CCL
13C2-Perfluorodecanoic a

r: 12/4/17 cc

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		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: 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 $^{13}C_4$-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/14/2017 (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.

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:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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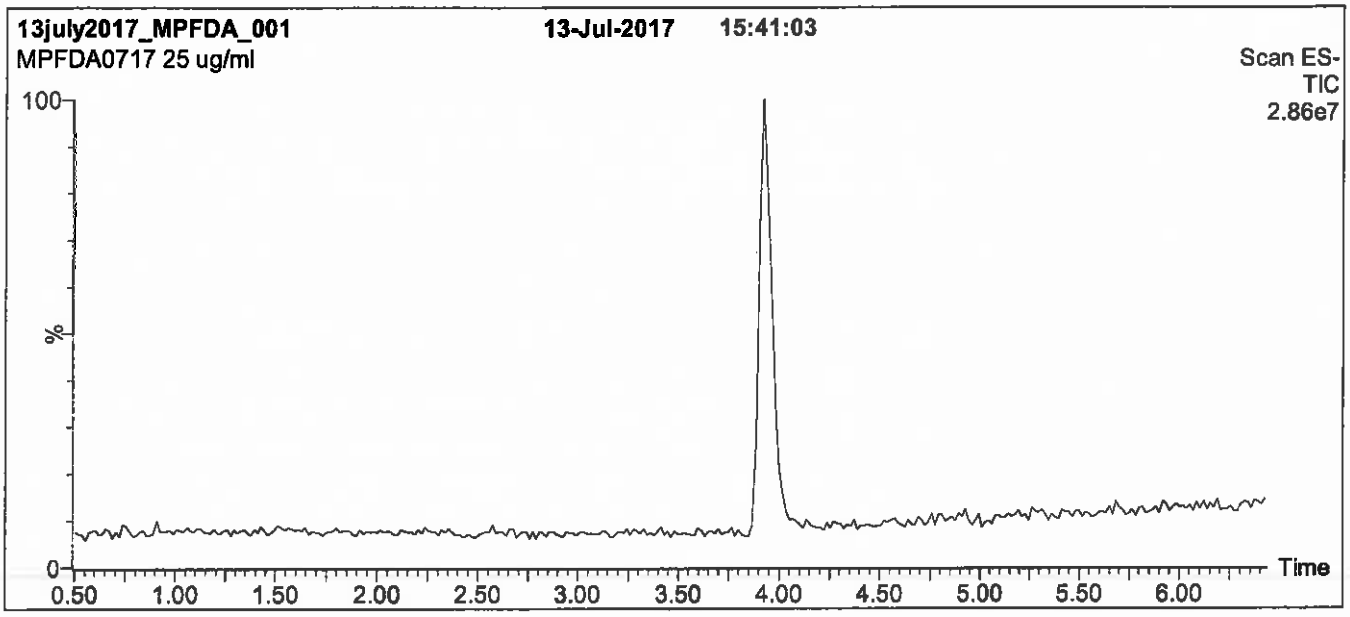
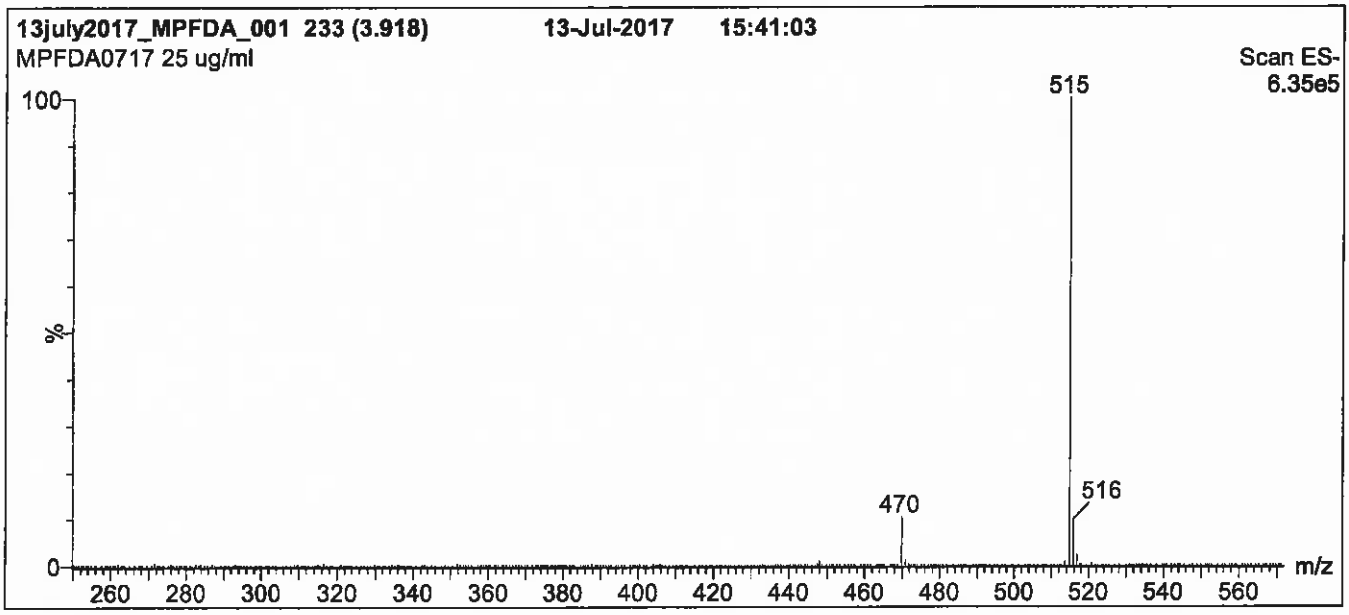
Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

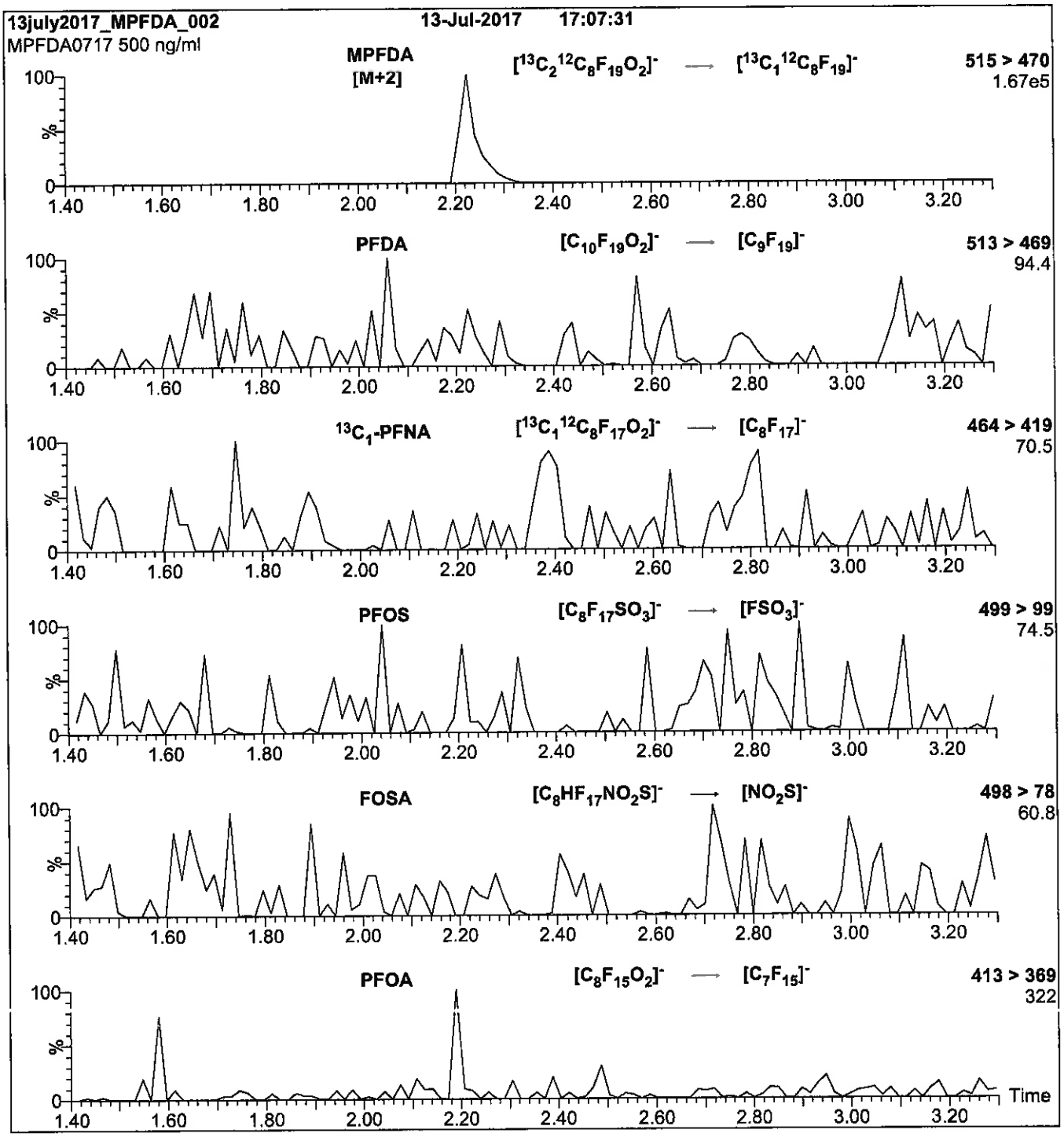
Flow: 300 µl/min

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_00013

1106319
ID: LCMPFDoA_00013
Exp: 05/23/22 Prpd: CCL
13C2-Perfluorododecanoic

r: 12/4/17 cc

WELLINGTON LABORATORIES

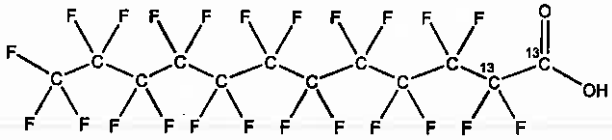
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/26/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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SYNTHESIS / CHARACTERIZATION:

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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 REFERENCE MATERIAL PRODUCER

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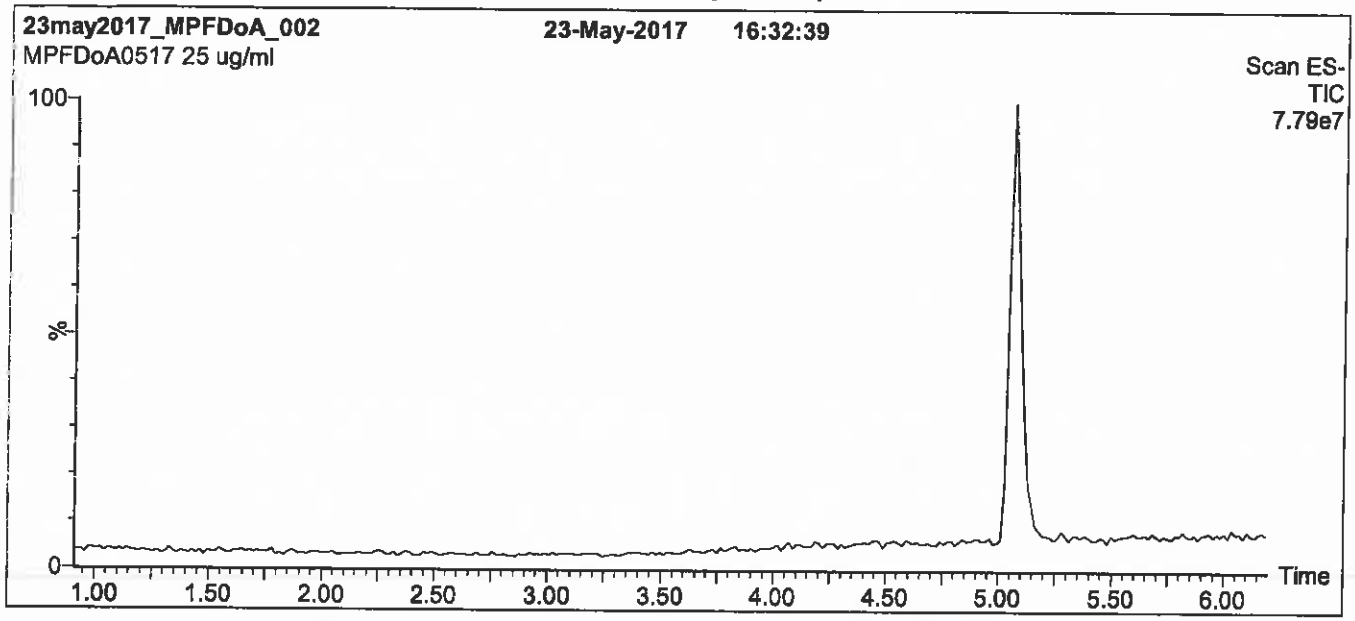
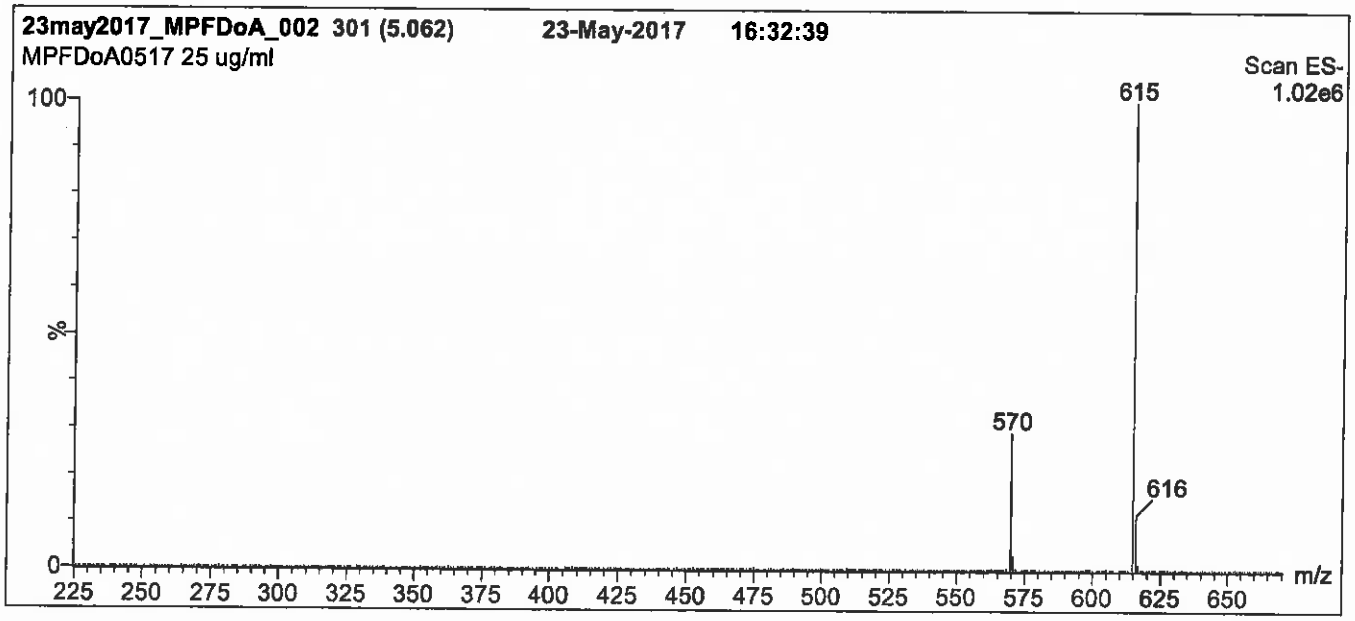
Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

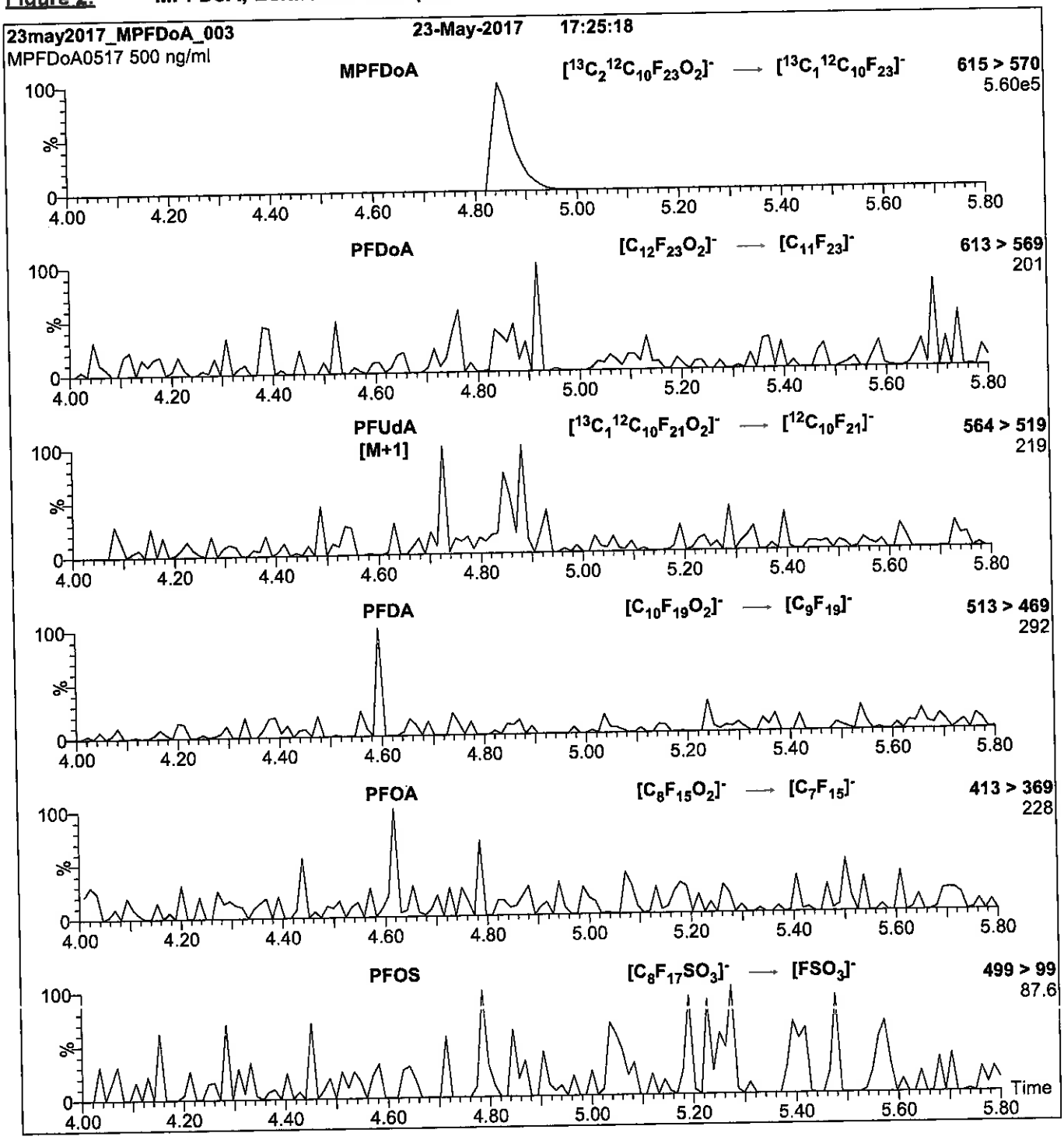
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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_00019

r: 12/4/17 ccc

WELLINGTON LABORATORIES

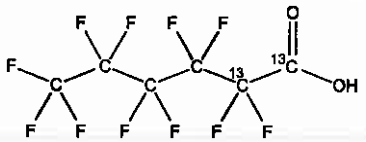
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFHxA1017

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_4HF_{11}O_2$	**MOLECULAR WEIGHT:**	316.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	10/27/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/27/2022		
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-hexanoic acid and < 0.3% of perfluoro-n-octanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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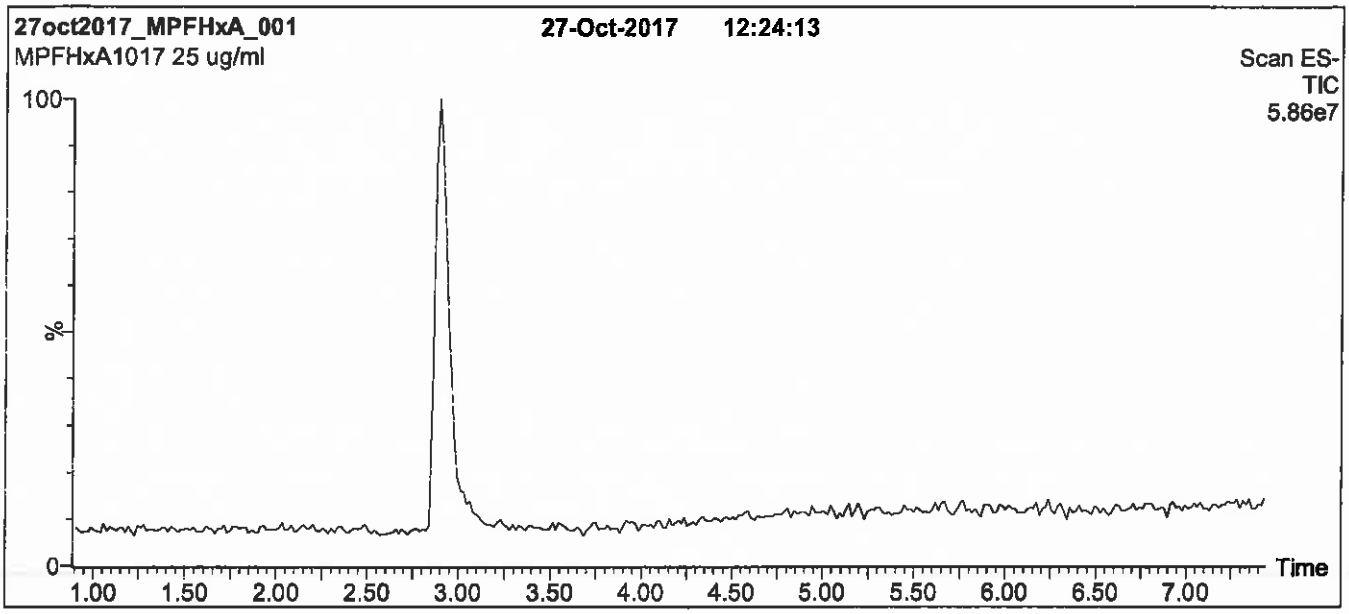
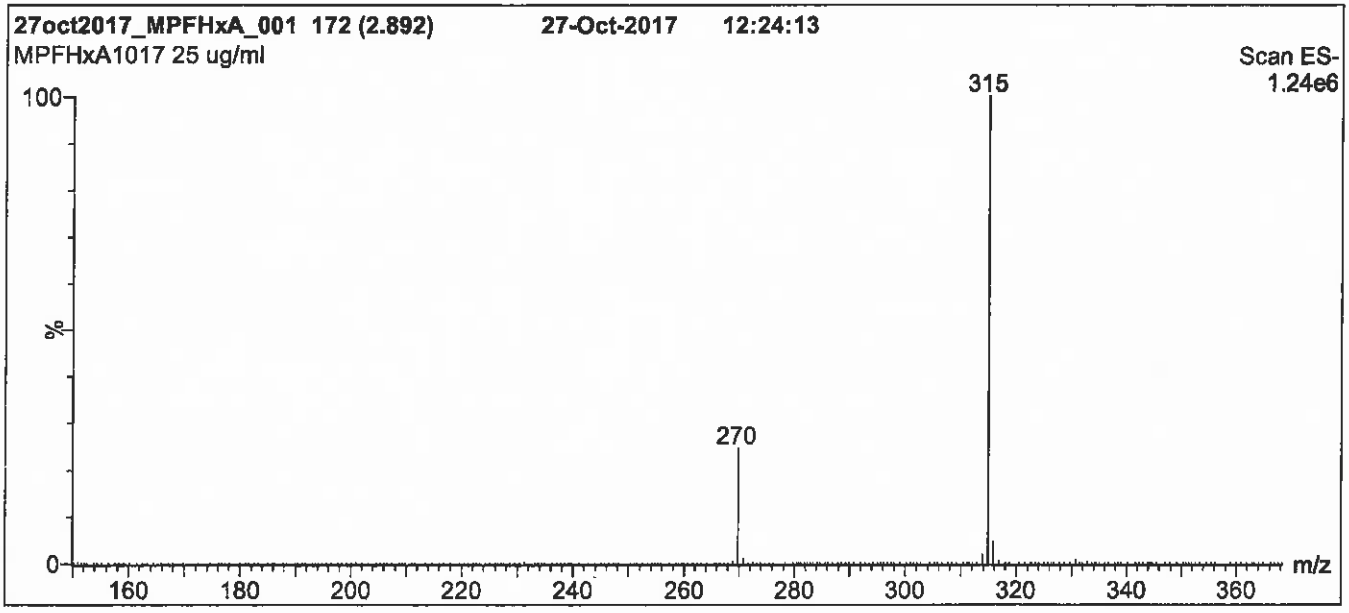
Figure 1: **MPFHxA; LC/MS Data (TIC and Mass Spectrum)**





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

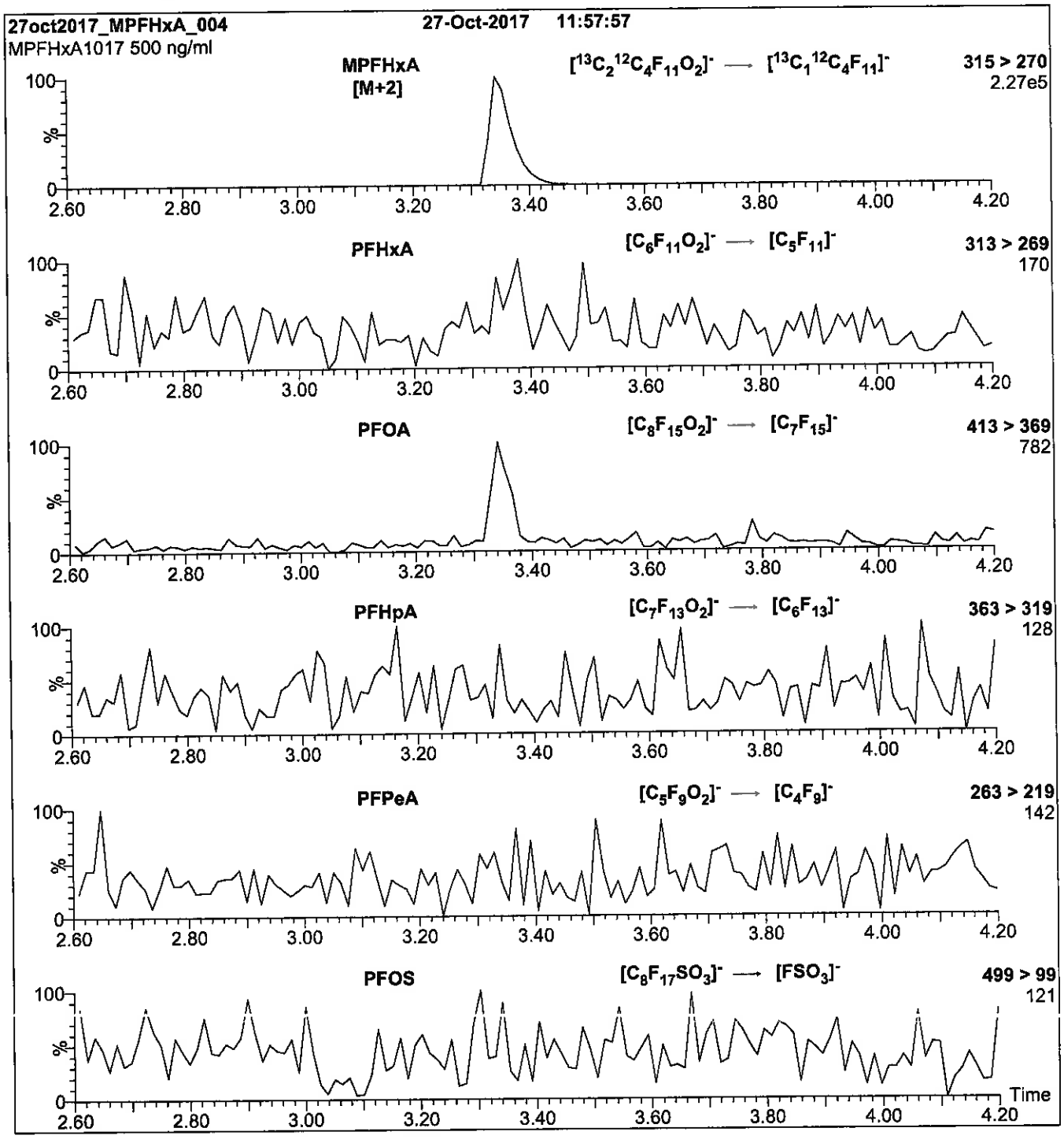
Flow: 300 µl/min

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

Reagent

LCMPFHxS_00013

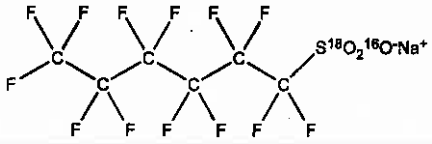
1106238
ID: LCMPFHxS_00013
Exp: 02/17/22 Prpd: CCL
18O2-Perfluorohexanesulfo

r: 12/4/17 CCL

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:	$C_6F_{13}S^{18}O_2{}^{16}ONa$	**MOLECULAR WEIGHT:**	426.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.3 ± 2.4 µg/ml (MPFHxS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	>94% ($^{18}O_2$)
LAST TESTED: (mm/dd/yyyy)	02/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	02/17/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS ($C_6F_{13}S^{18}O_2{}^{16}O^-$) has been observed to be up to 10% lower than for PFHxS ($C_6F_{13}S^{16}O_3^-$) when both compounds are injected together. This difference may vary between instruments.
- Contains ~ 1.0% of sodium perfluoro-1-octane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFOS).
- Due to the isotopic purity of the starting material ($^{18}O_2$ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/02/2017 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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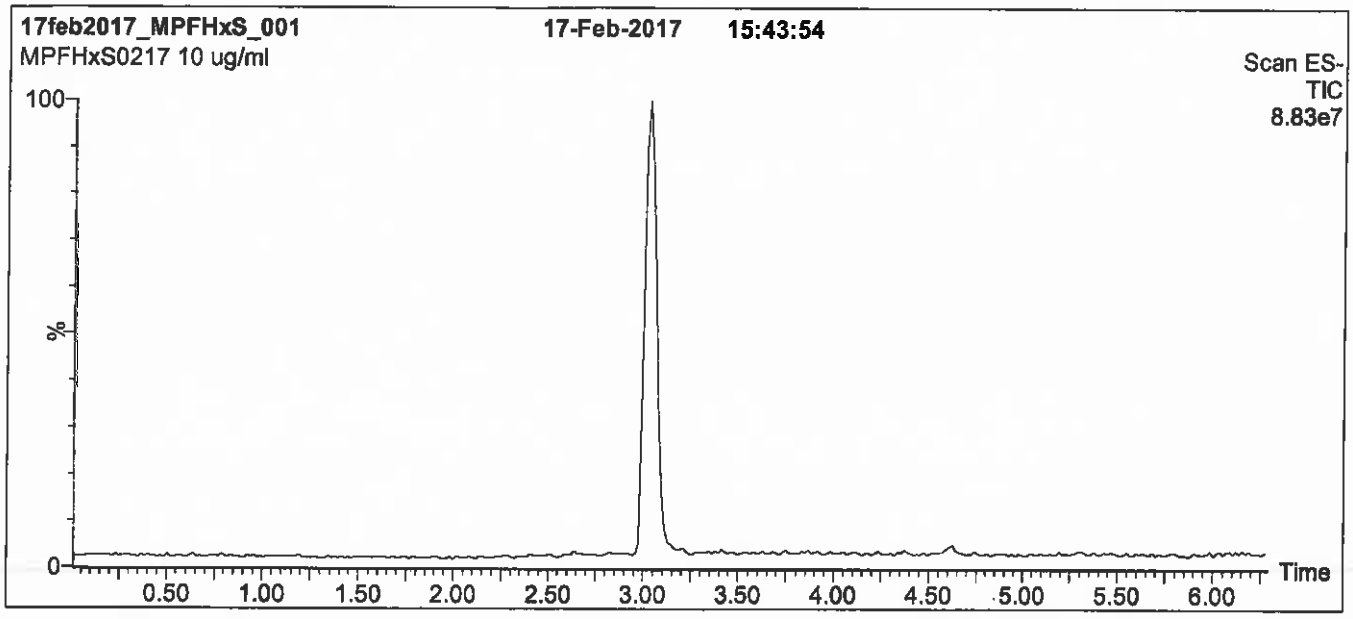
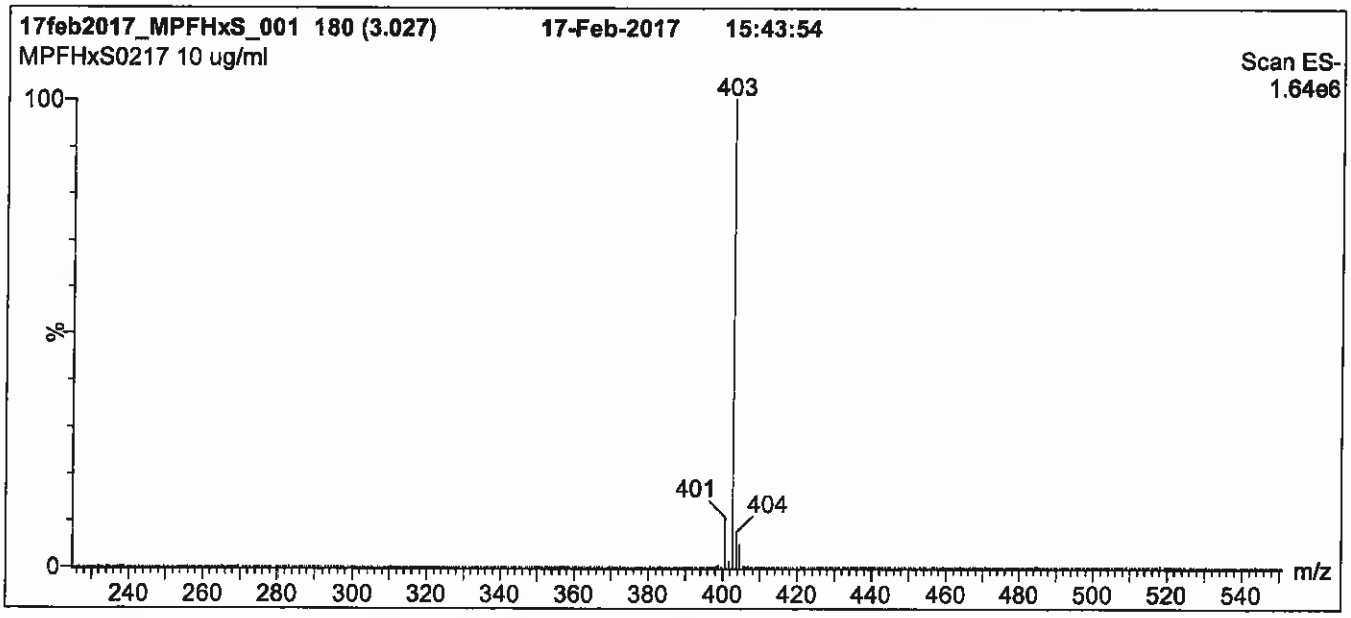




Conditions for Figure 1:

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

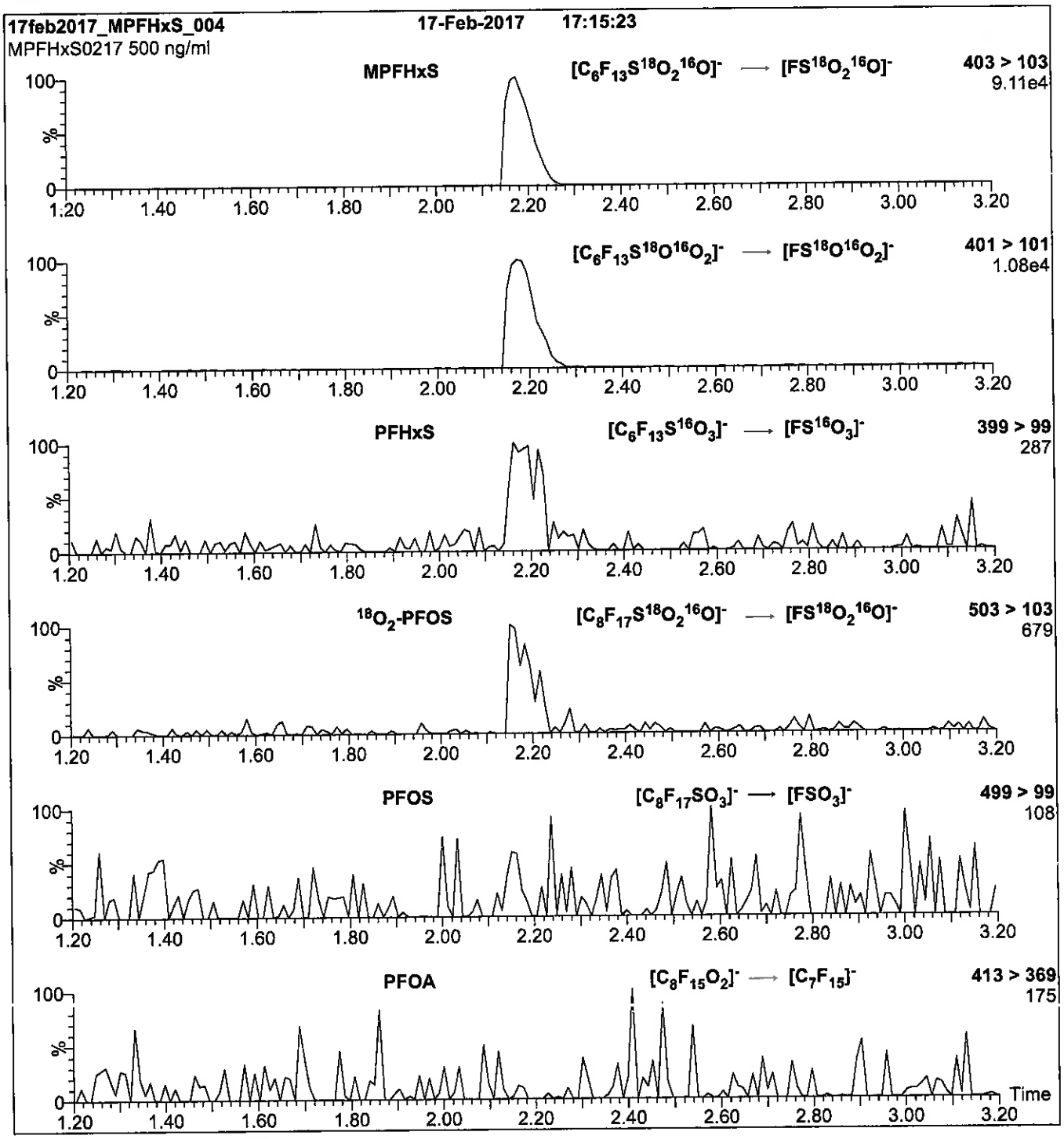
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFNA_00013

1105307
ID: LCMPFNA_00013
Exp: 09/30/21 Prpd: CCL
13C5-Perfluorononanoic aci

r: 12/4/17 ccc

WELLINGTON LABORATORIES

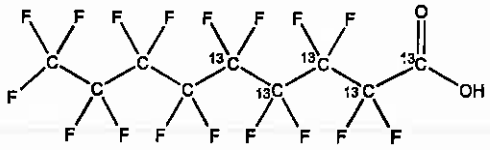
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFNA0916

STRUCTURE:

CAS #: Not available



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

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

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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 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:

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SYNTHESIS / CHARACTERIZATION:

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

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±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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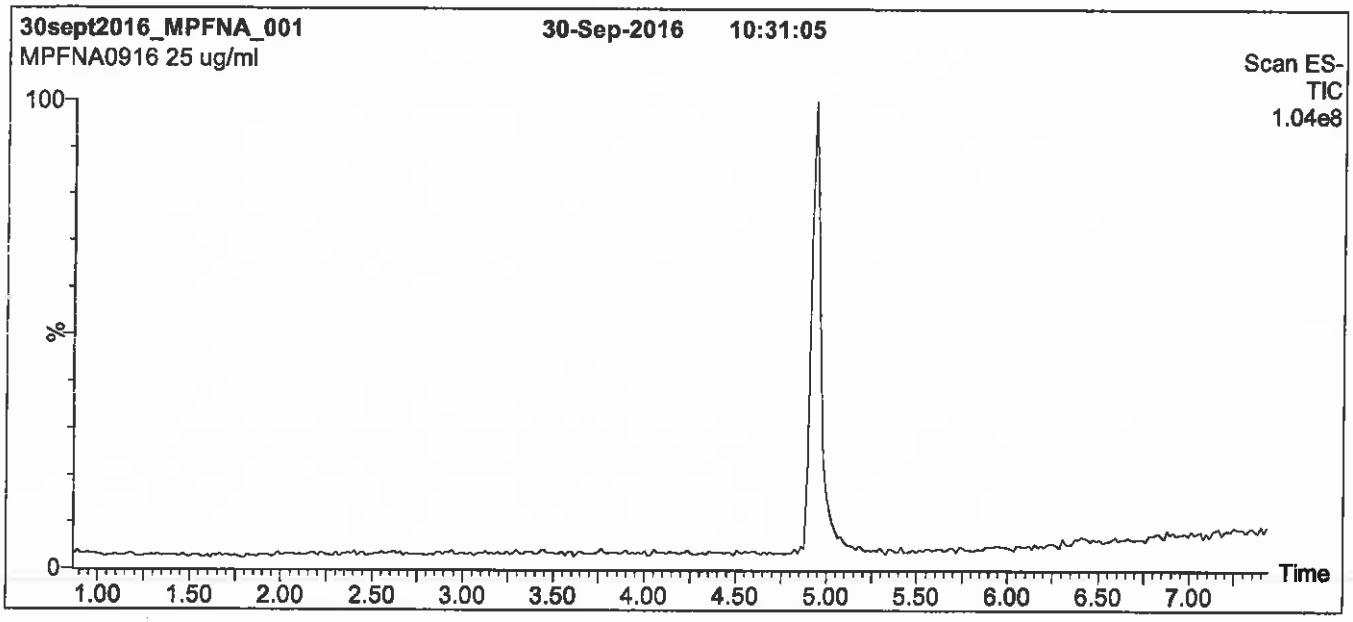
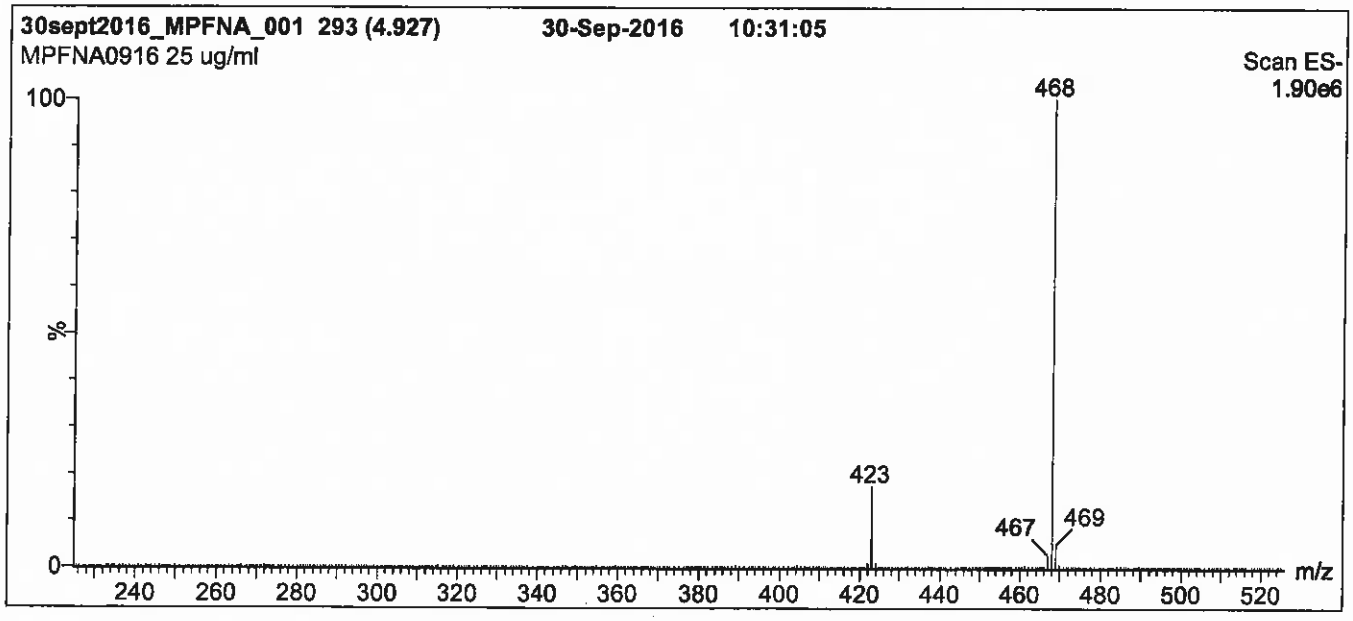
Figure 1: **MPFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

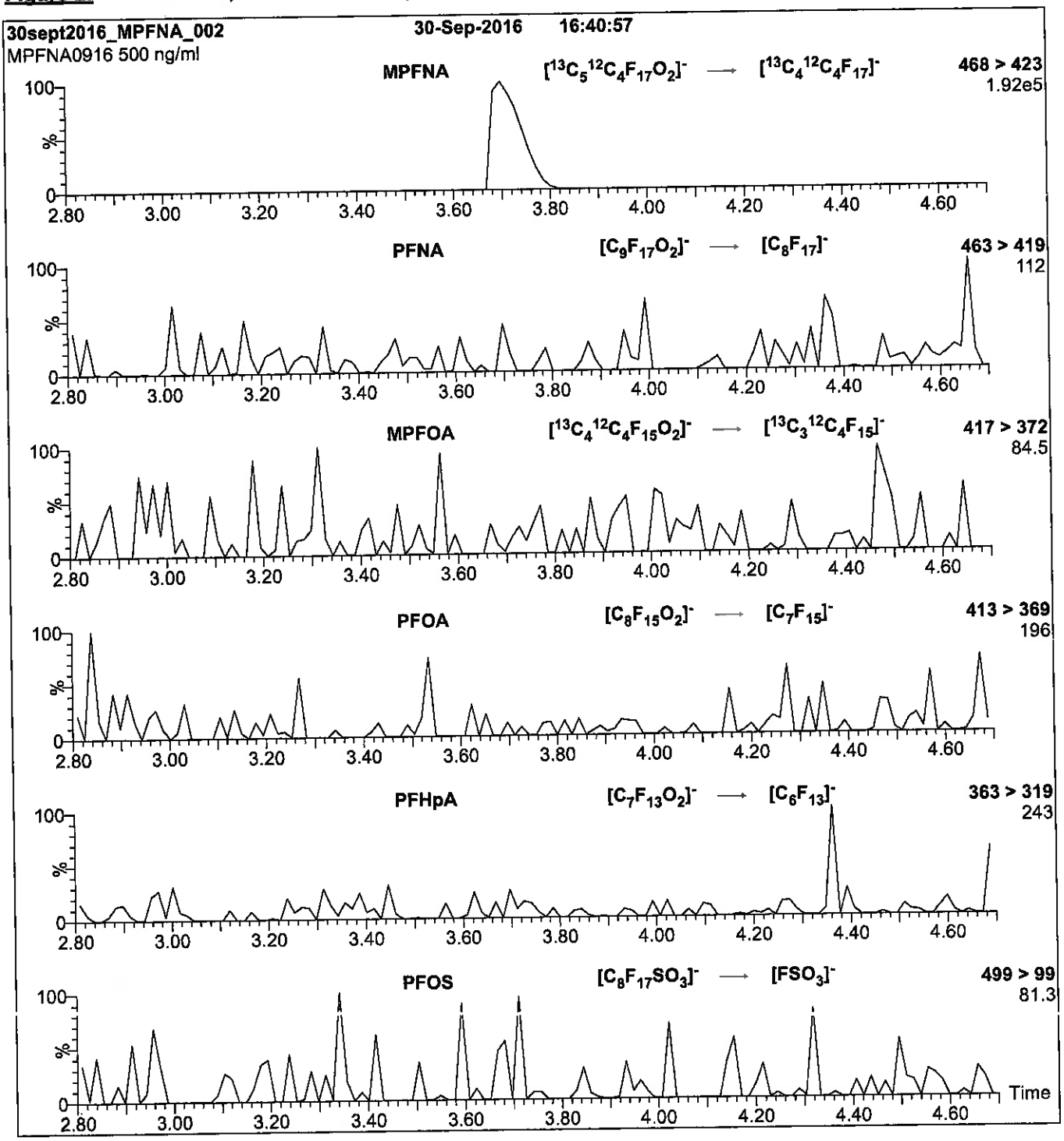
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 11

Reagent

LCMPFOA_00017

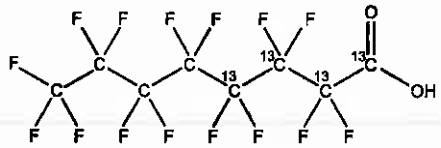
1106032
ID: LCMPFOA_00017
Exp: 10/17/22 Prpd: SKV
13C4-Perfluorooctanoic ac

R: 12/4/19 cc

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFOA	**LOT NUMBER:**	MPFOA1017
COMPOUND:	Perfluoro-n-[1,2,3,4-$^{13}C_4$]octanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4HF_{16}O_2$	**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)	10/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/17/2022		
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.
- 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:** 10/19/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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CALA

ANAB ACCREDITED

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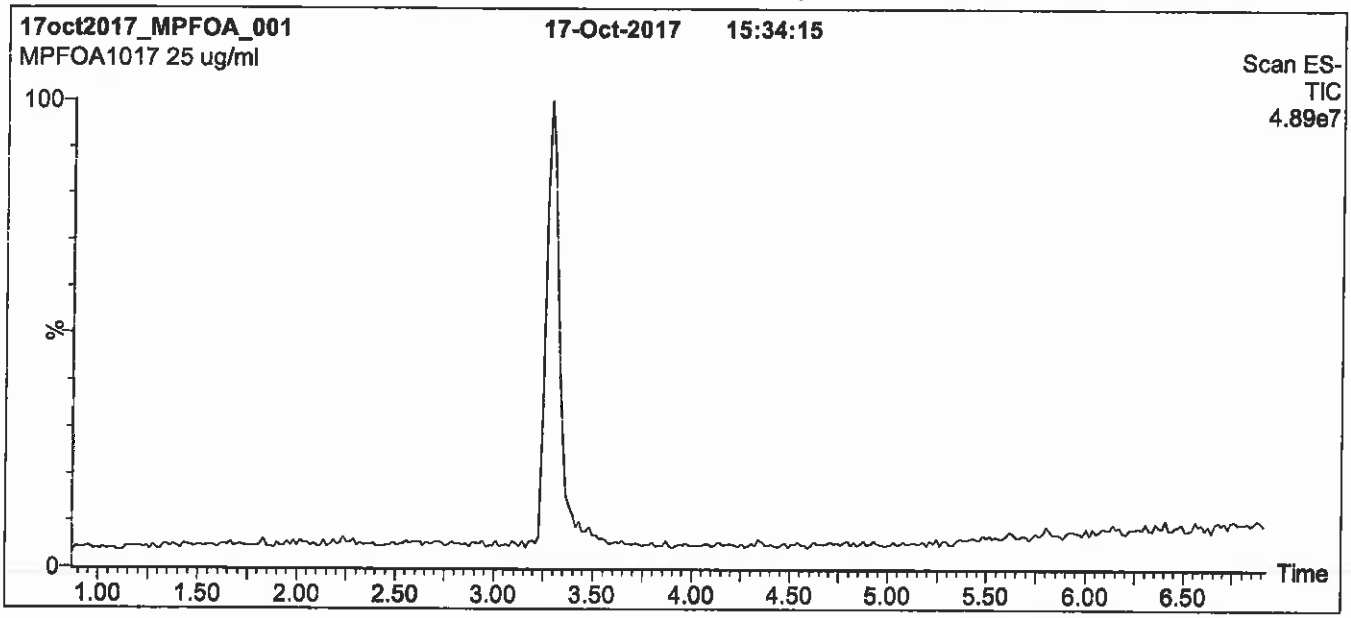
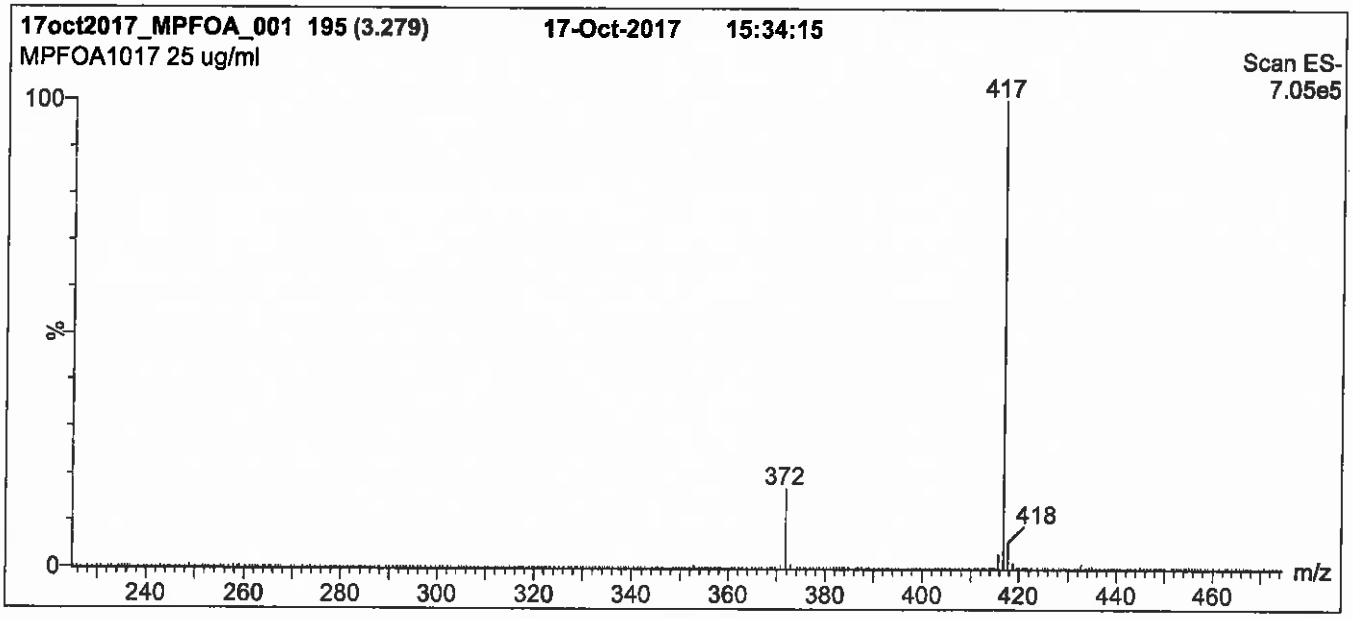
Figure 1: **MPFOA; LC/MS Data (TIC and Mass Spectrum)**





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: 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

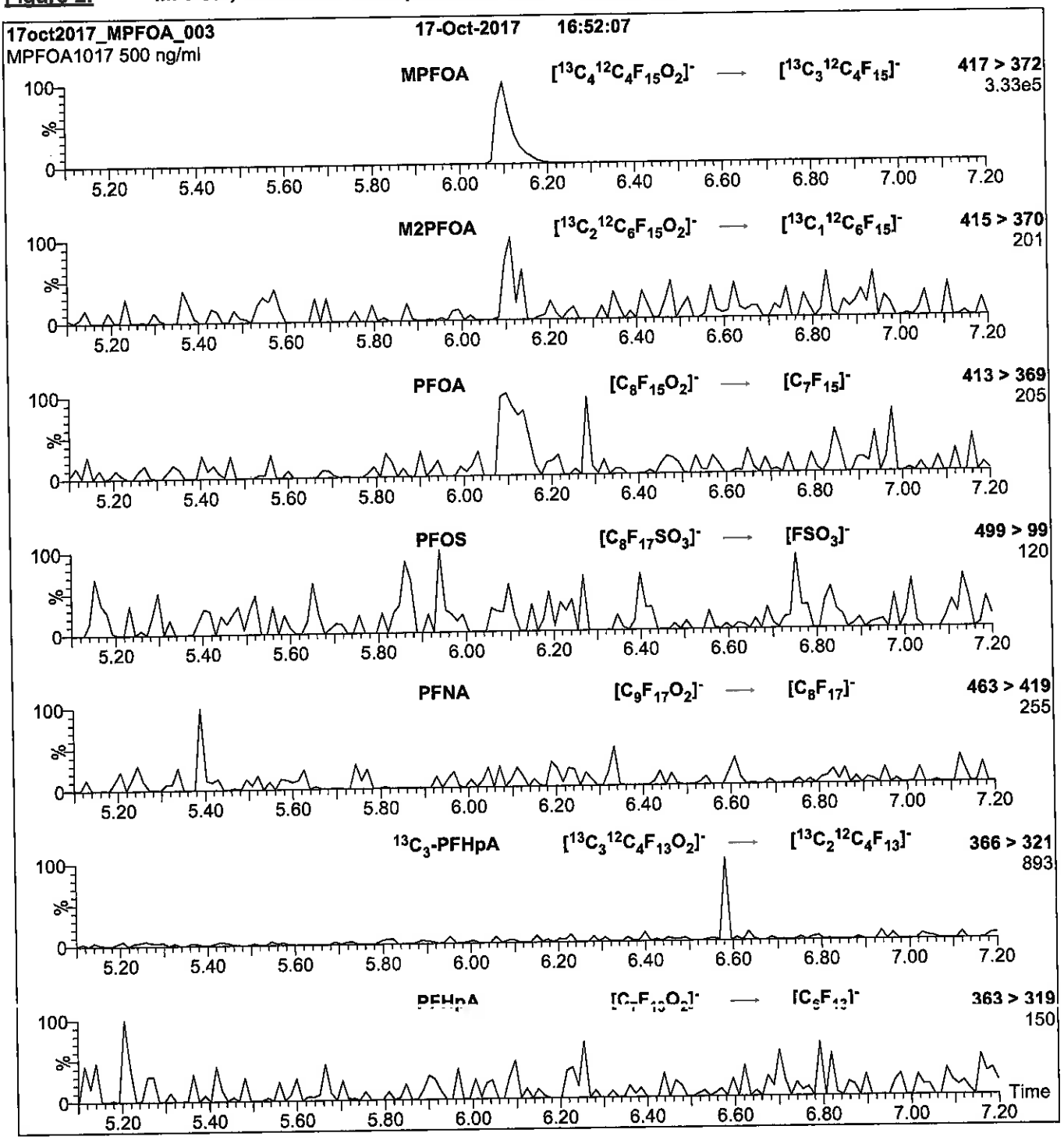
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 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) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCMPFOS_00025

1106029
ID: LCMPFOS_00025
Exp: 10/17/22 Prpd: SKV
13C4-Perfluorooctanesulfo

P: 12/4/17 CCL

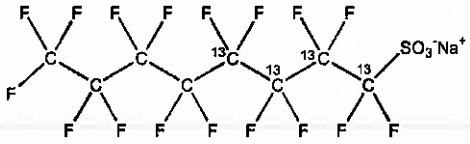
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS1017

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)	10/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/17/2022		
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.
- Contains ~ 0.4% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/18/2017 (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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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:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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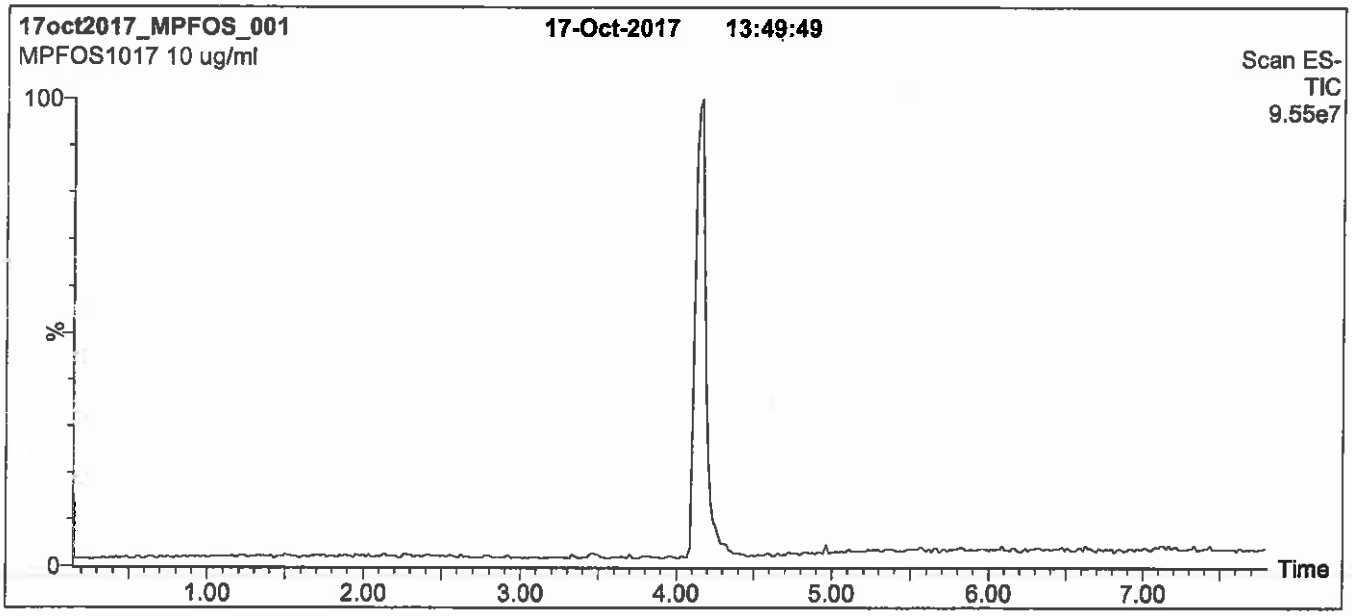
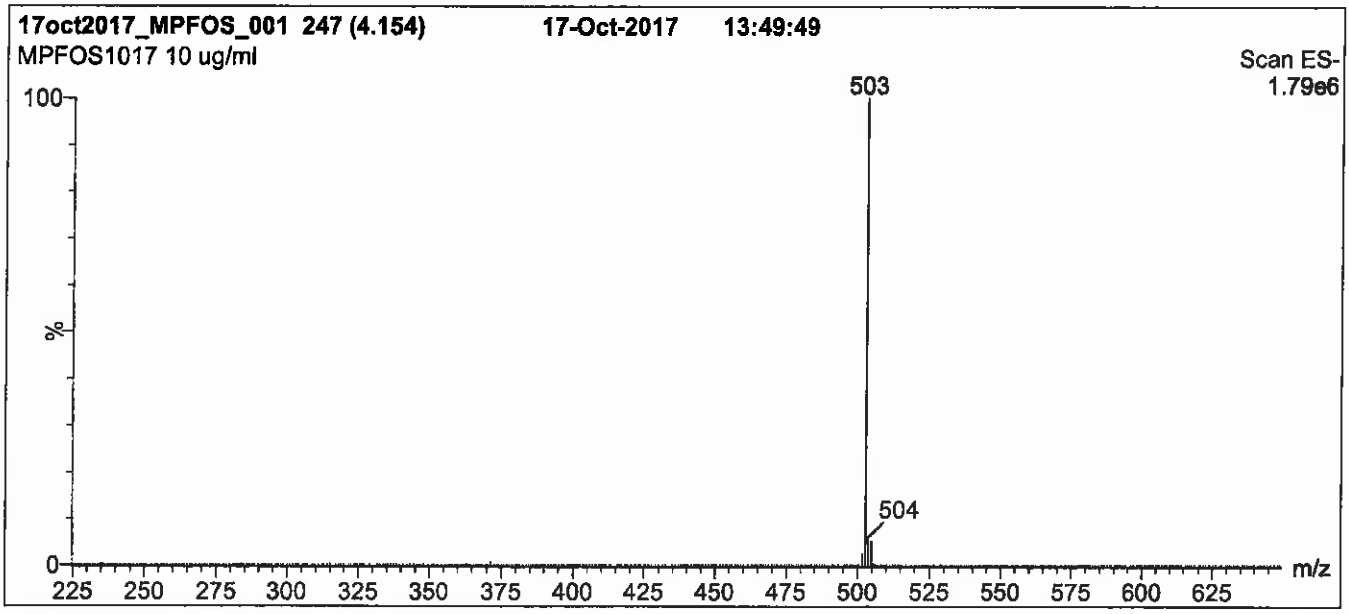
Figure 1: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





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 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

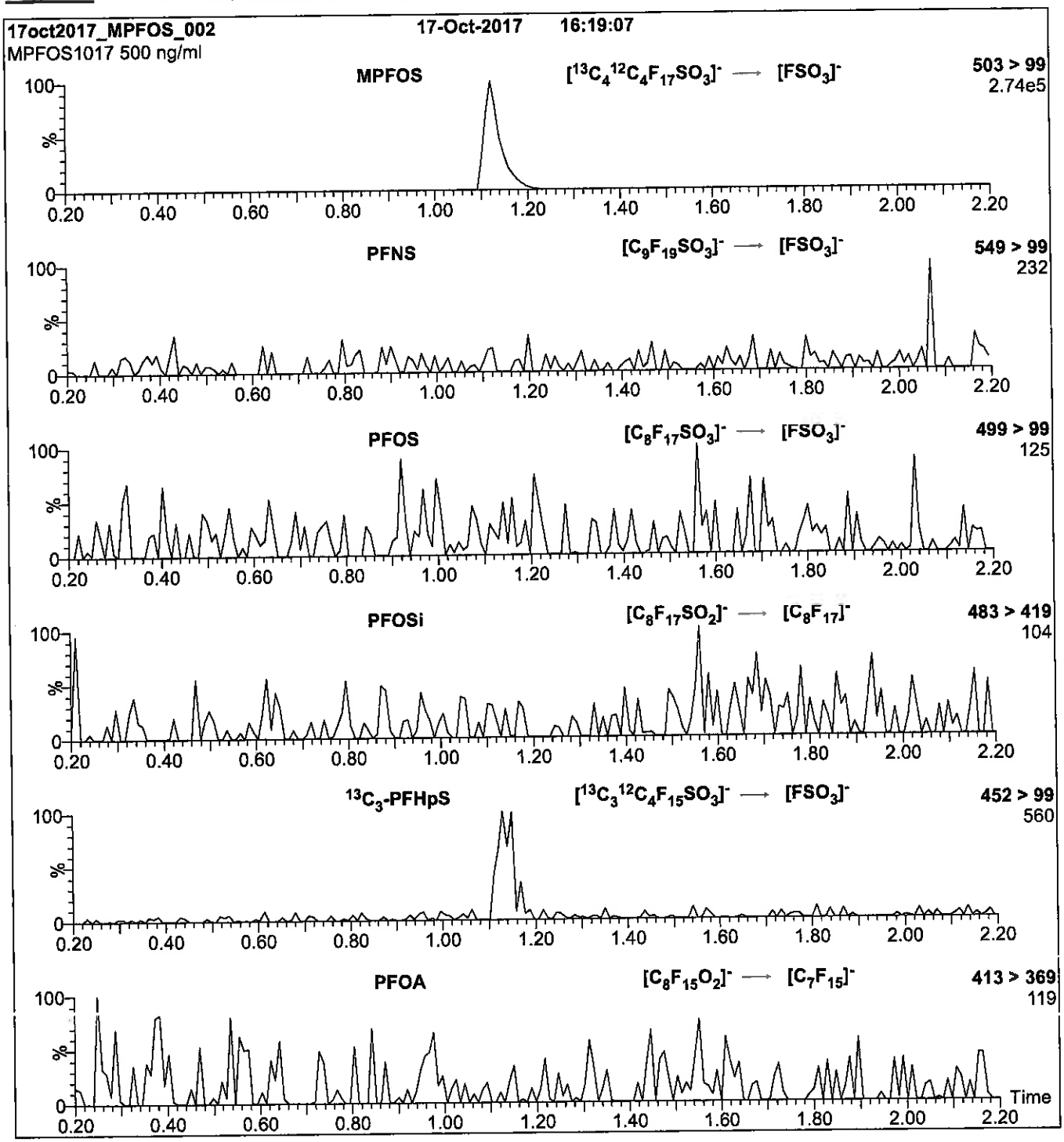
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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_00014

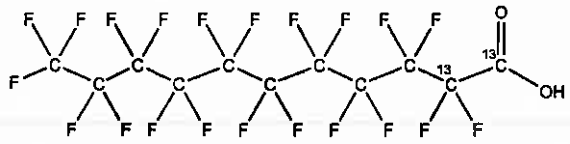
1106187
ID: LCMPFUdA_00014
Exp: 11/22/21 Prpd: CCL
13C2-Perfluoroundecanoic

R: 12/4/17 ccl

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 ($1,2\text{-}^{13}C_2$)
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.
- Presence of 1-$^{13}C_1$-PFUdA (~1%; see Figure 2), 2-$^{13}C_1$-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ^{13}C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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

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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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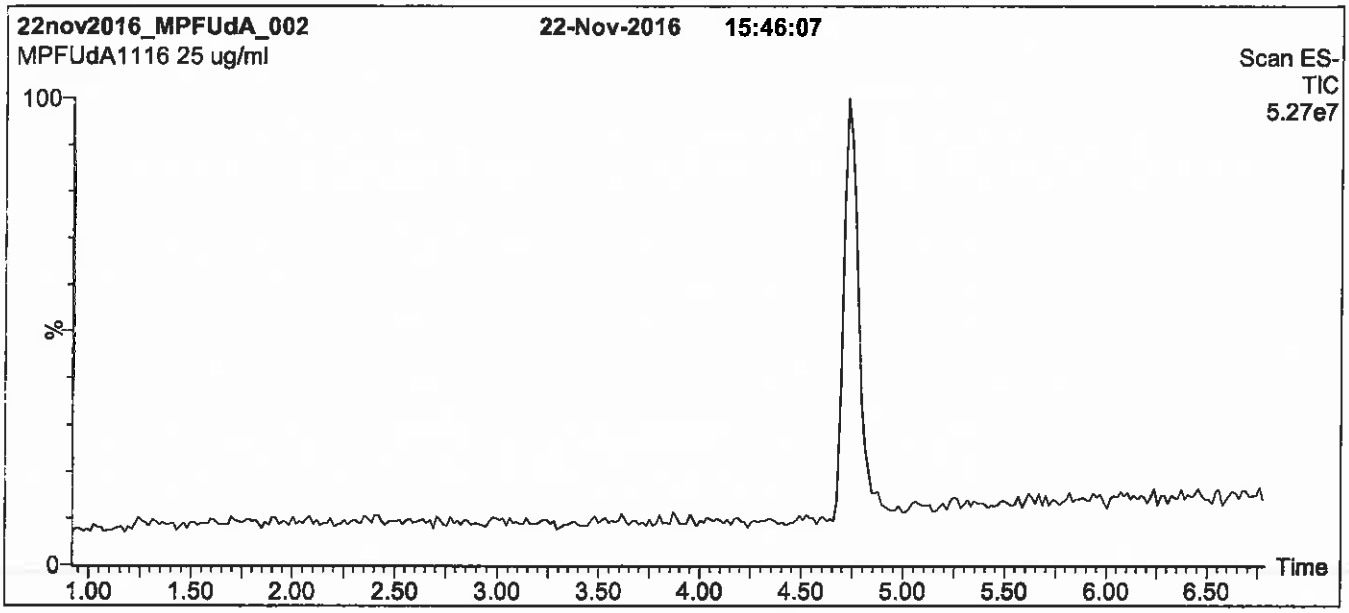
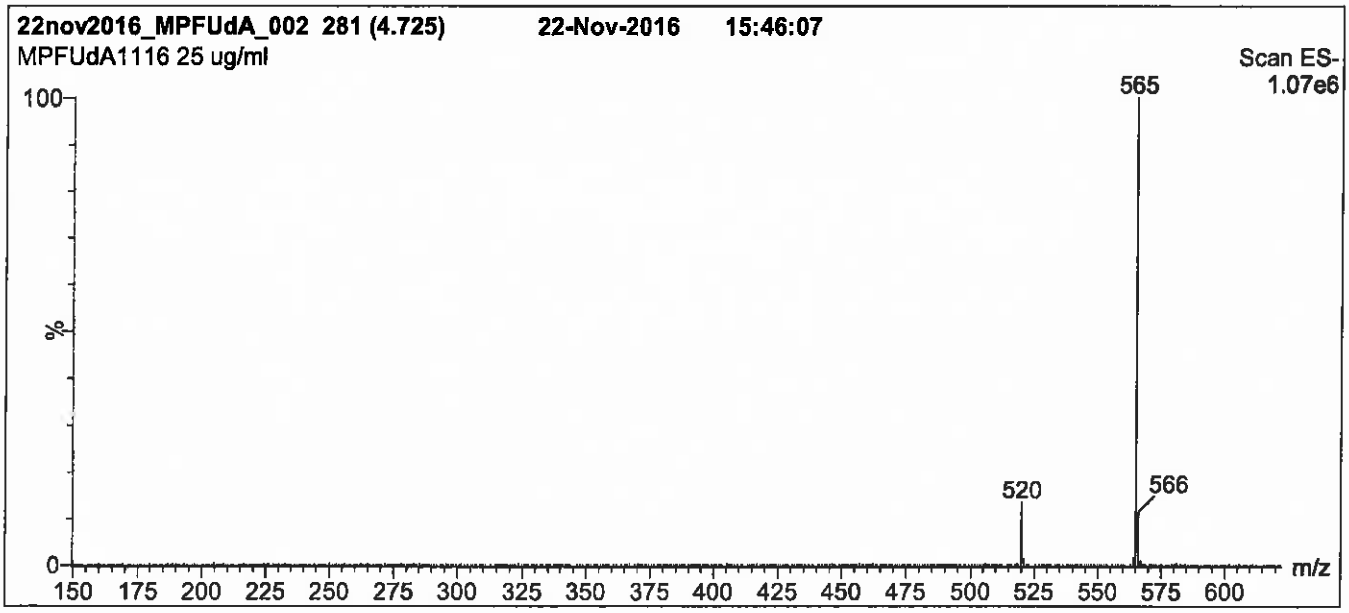
Figure 1: **MPFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

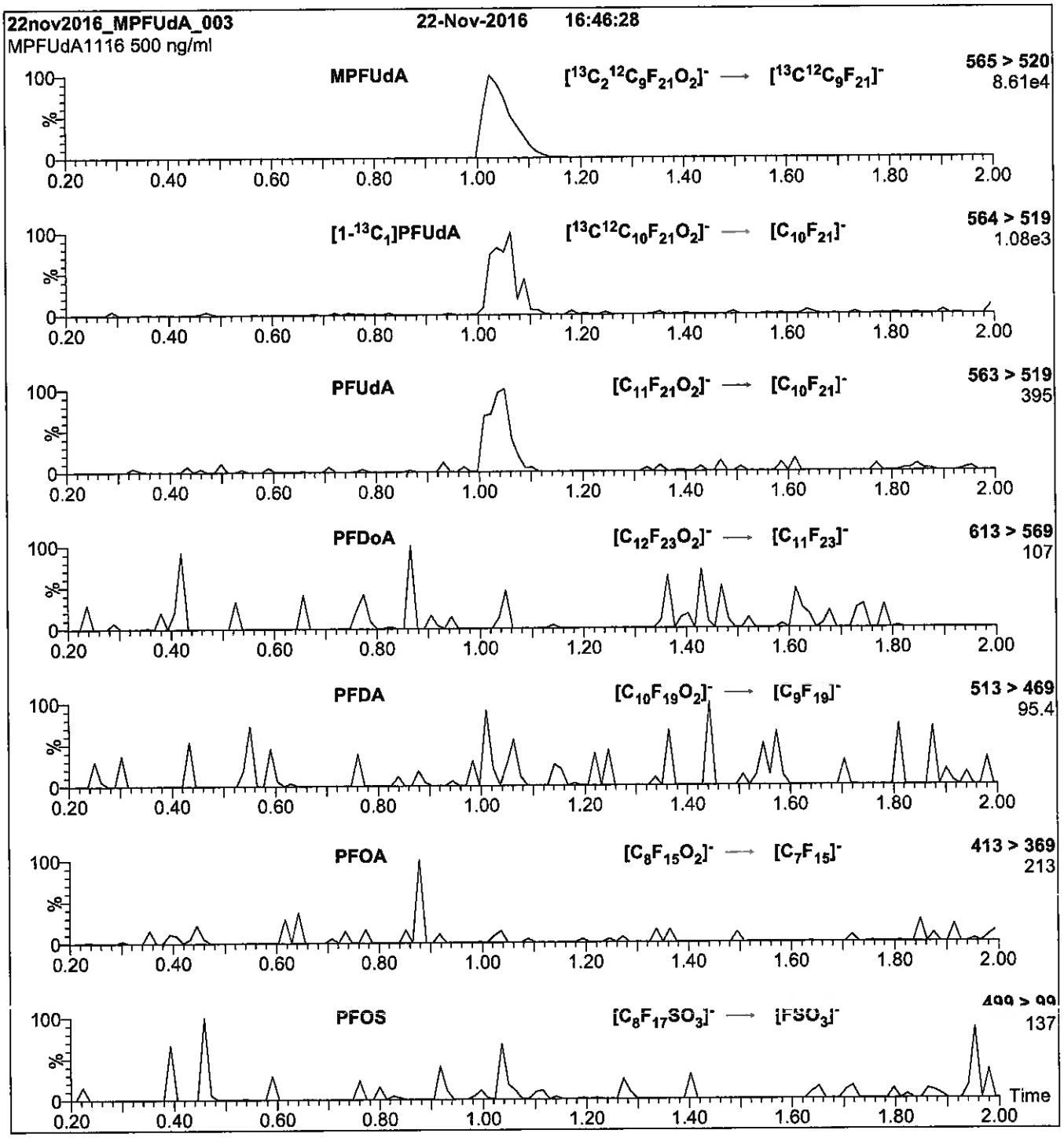
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

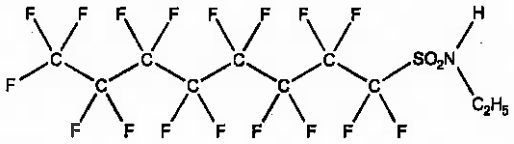
LCN-EtFOSA-M_00005

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
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CALA

ANAB ACCREDITED

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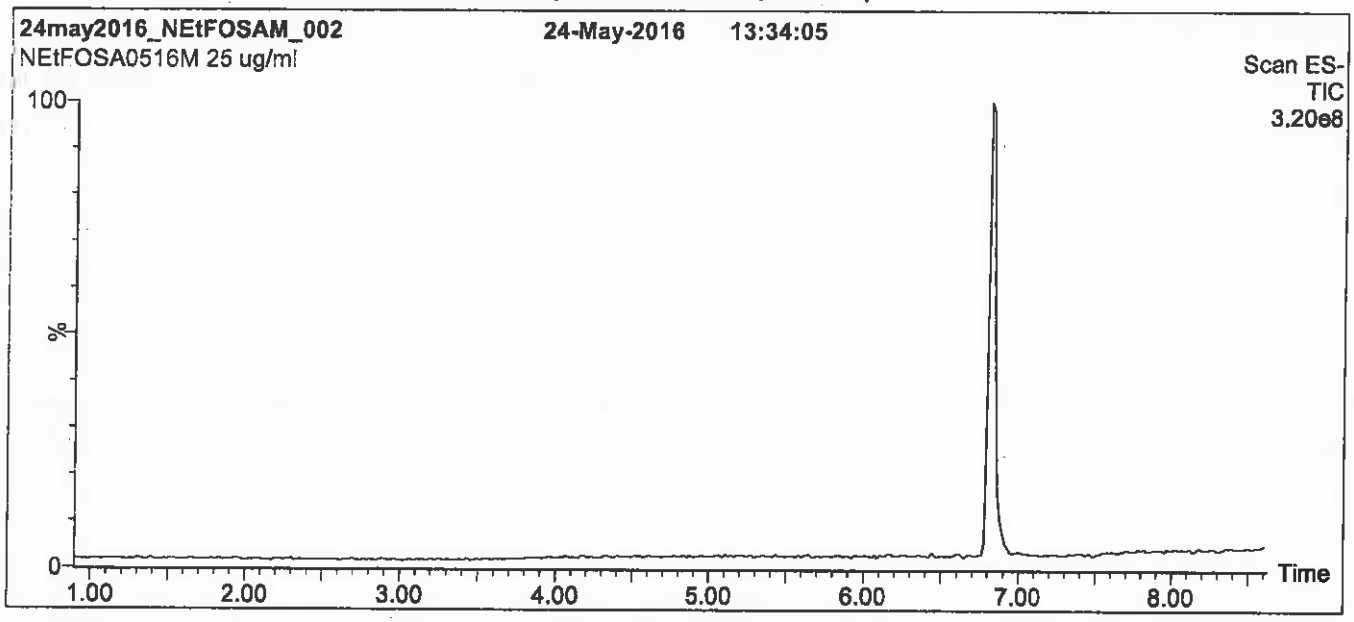
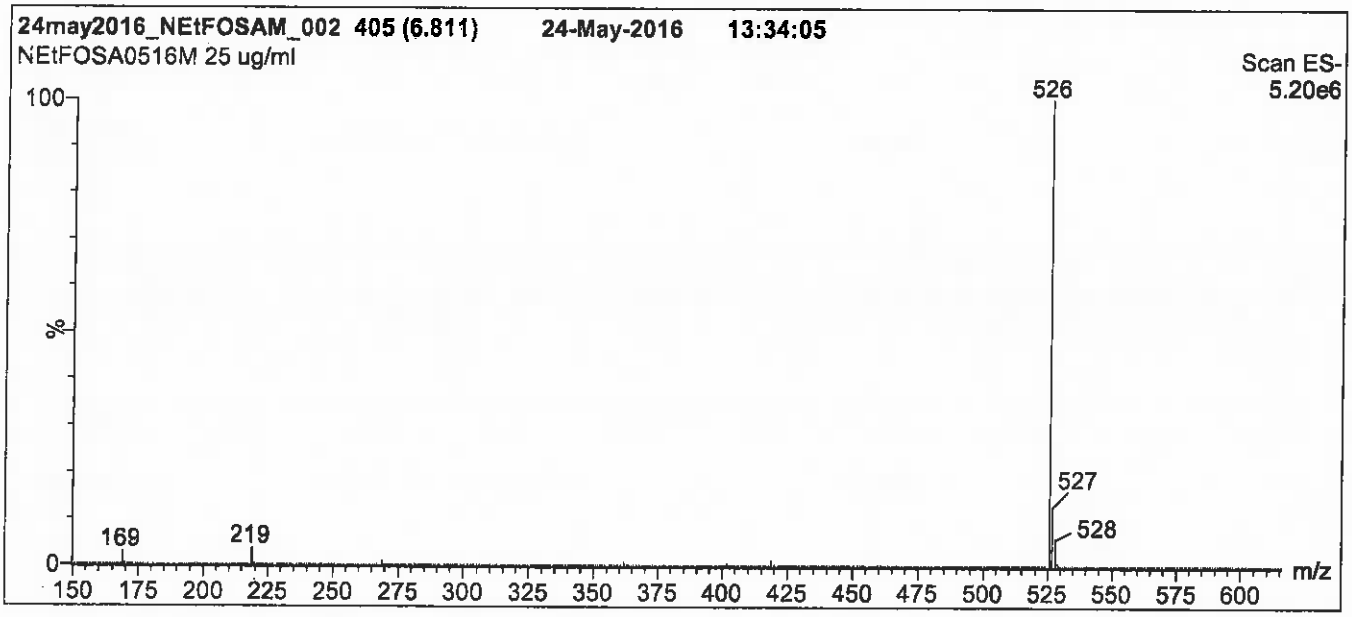
Figure 1: **N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





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MS: Micromass Quattro *micro* API MS

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

Mobile phase: Gradient
Start: 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

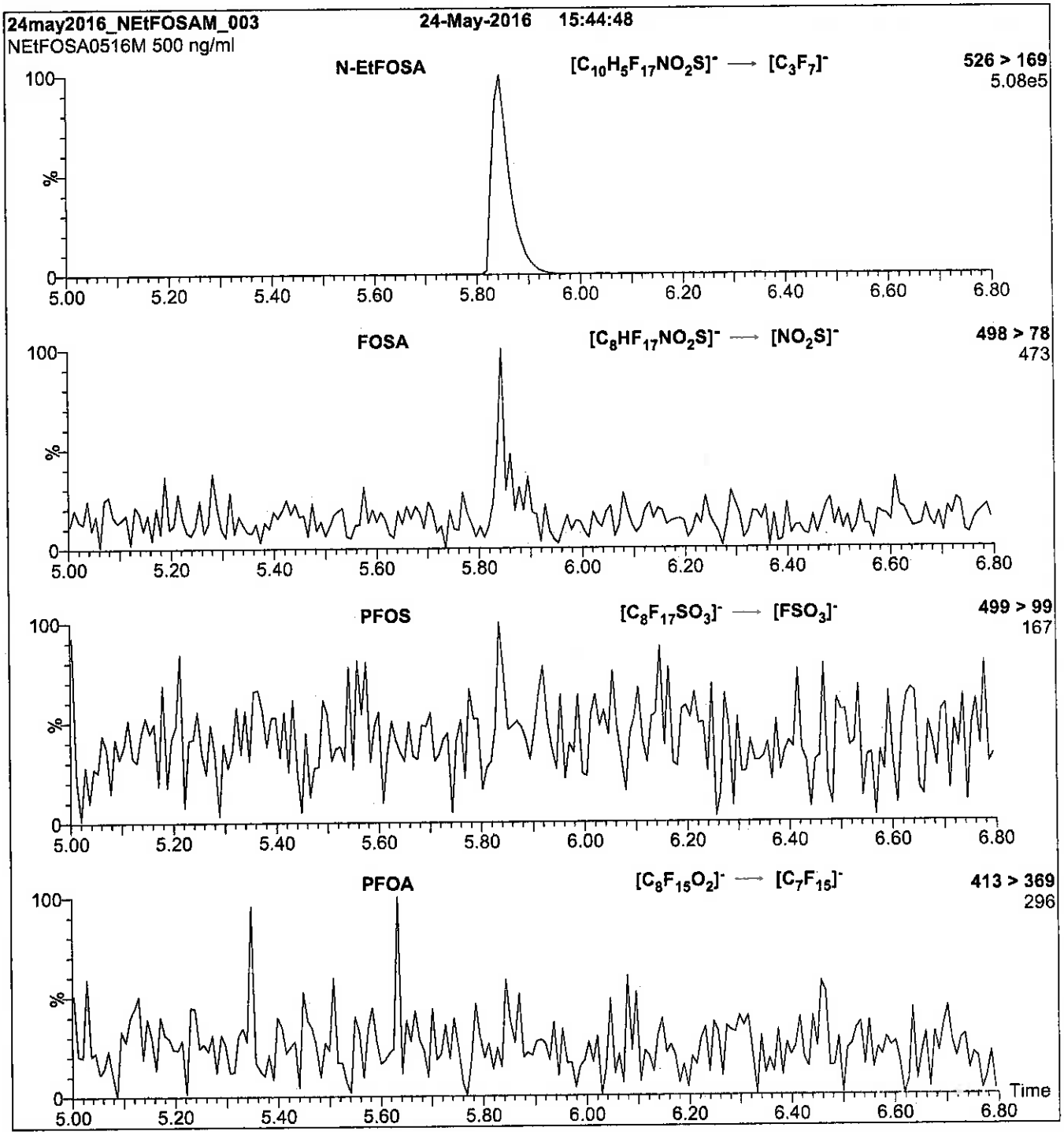
Flow: 300 µl/min

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

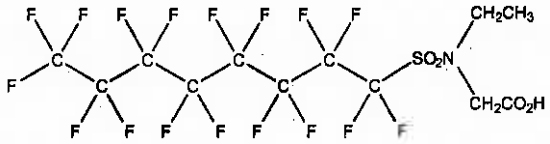
LCN-EtFOSAA_00004

P: 12/29/16 SFV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-EtFOSAA	**LOT NUMBER:**	NEtFOSAA0916
COMPOUND:	N-ethylperfluoro-1-octanesulfonamidoacetic acid		
STRUCTURE:		**CAS #:**	2991-50-6



MOLECULAR FORMULA:	$C_{12}H_8F_{17}NO_4S$	**MOLECULAR WEIGHT:**	585.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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:

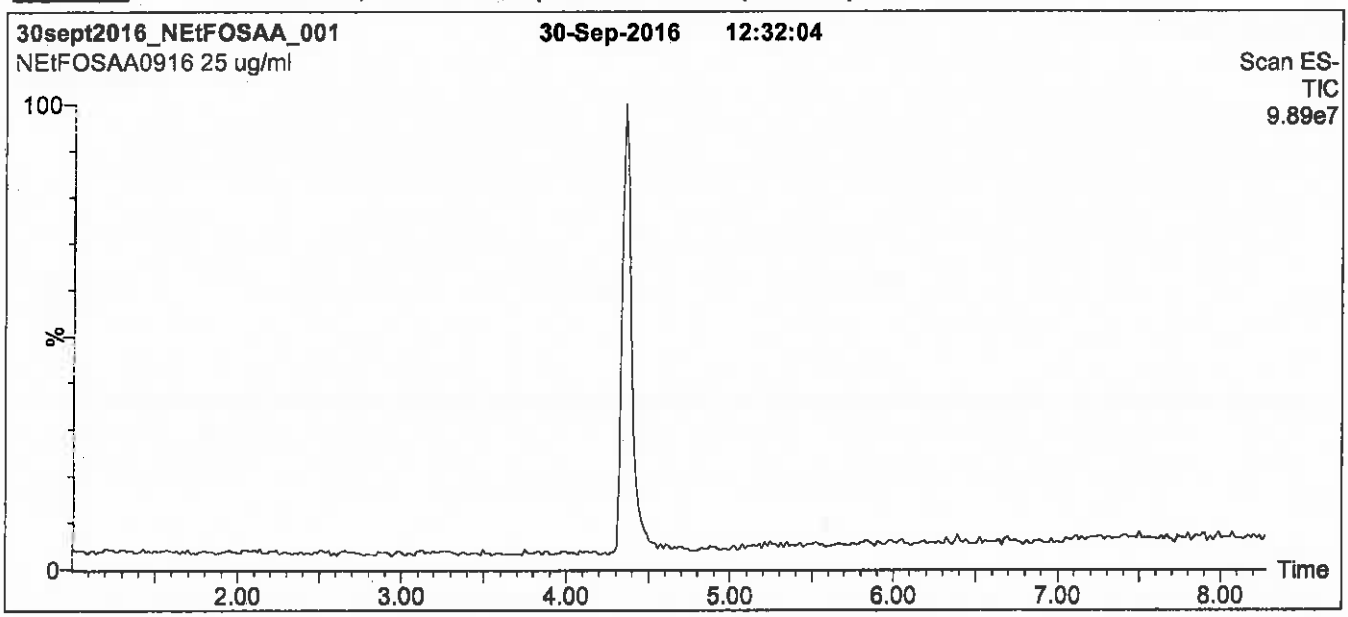
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

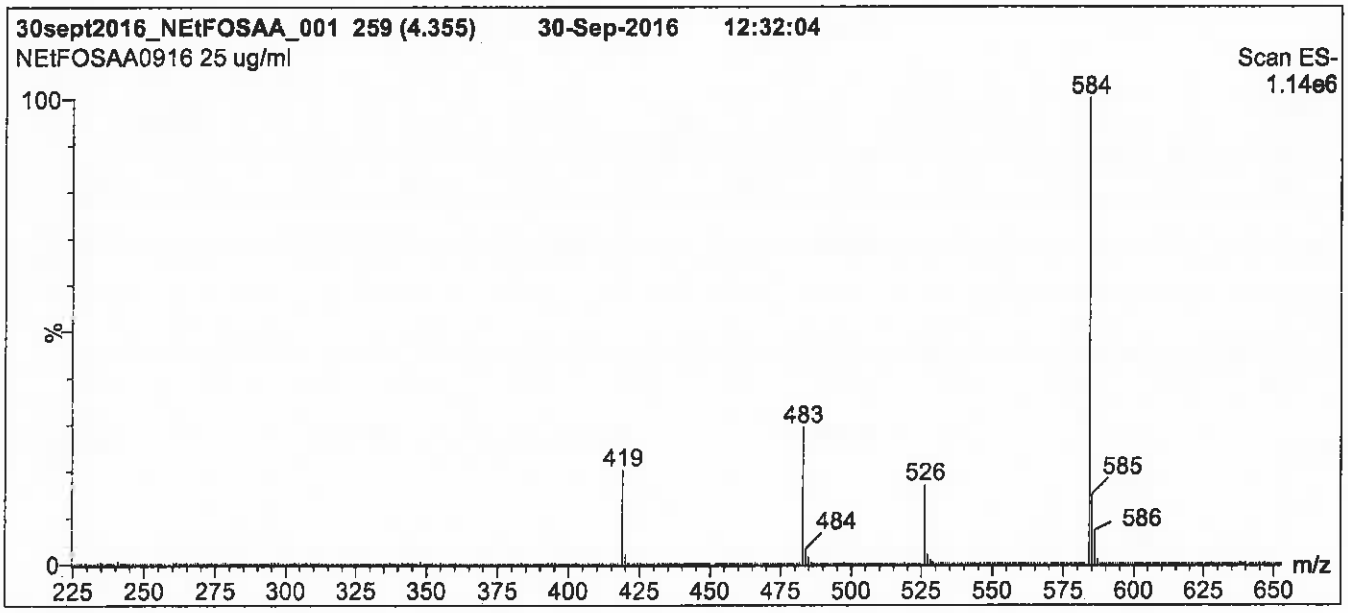
CALA

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

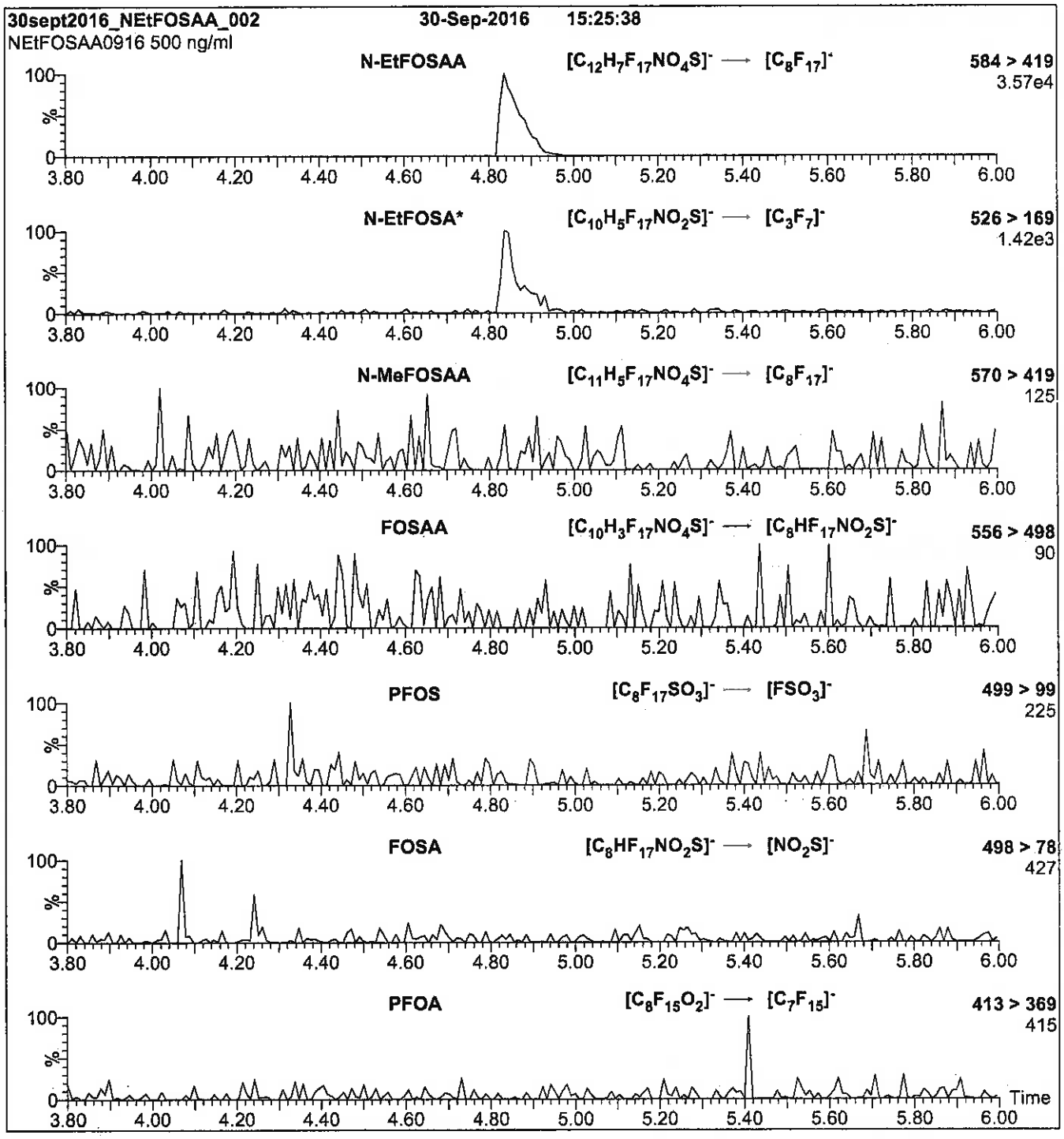
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Note: N-EtFOSA is formed by fragmentation of N-EtFOSAA.

Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 20

Reagent

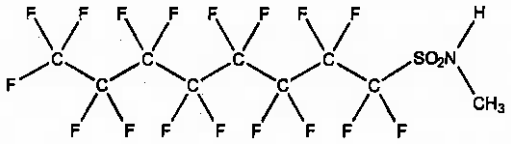
LCN-MeFOSA-M_00004

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

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The 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.

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

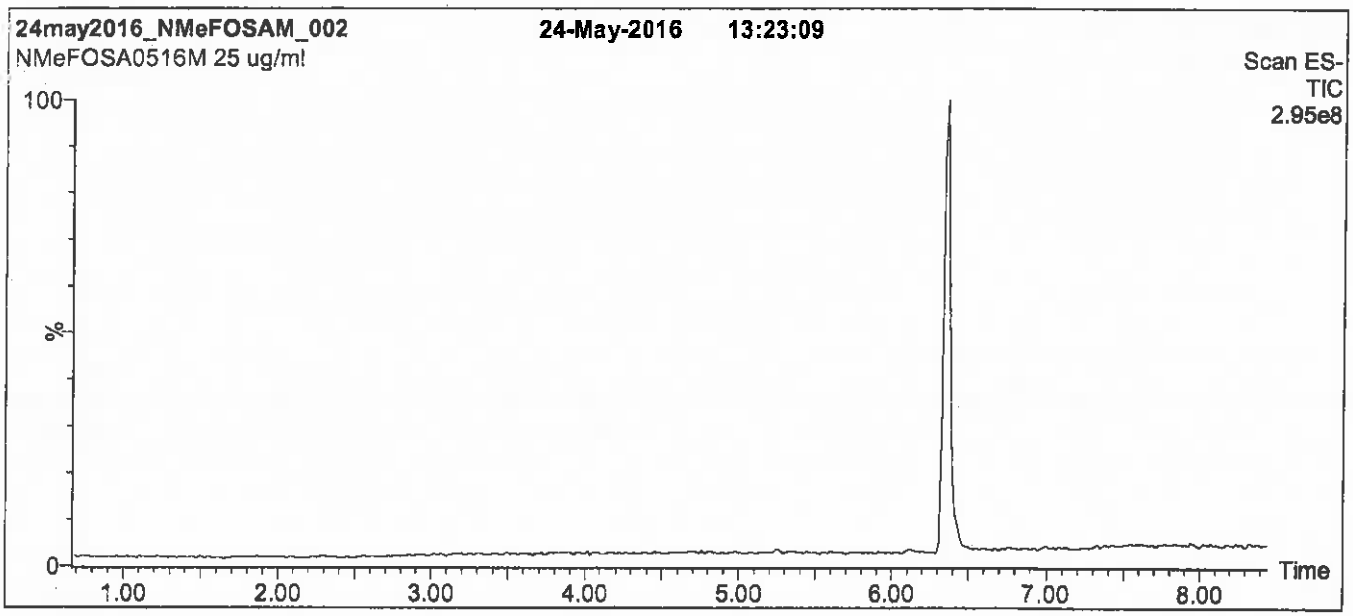
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

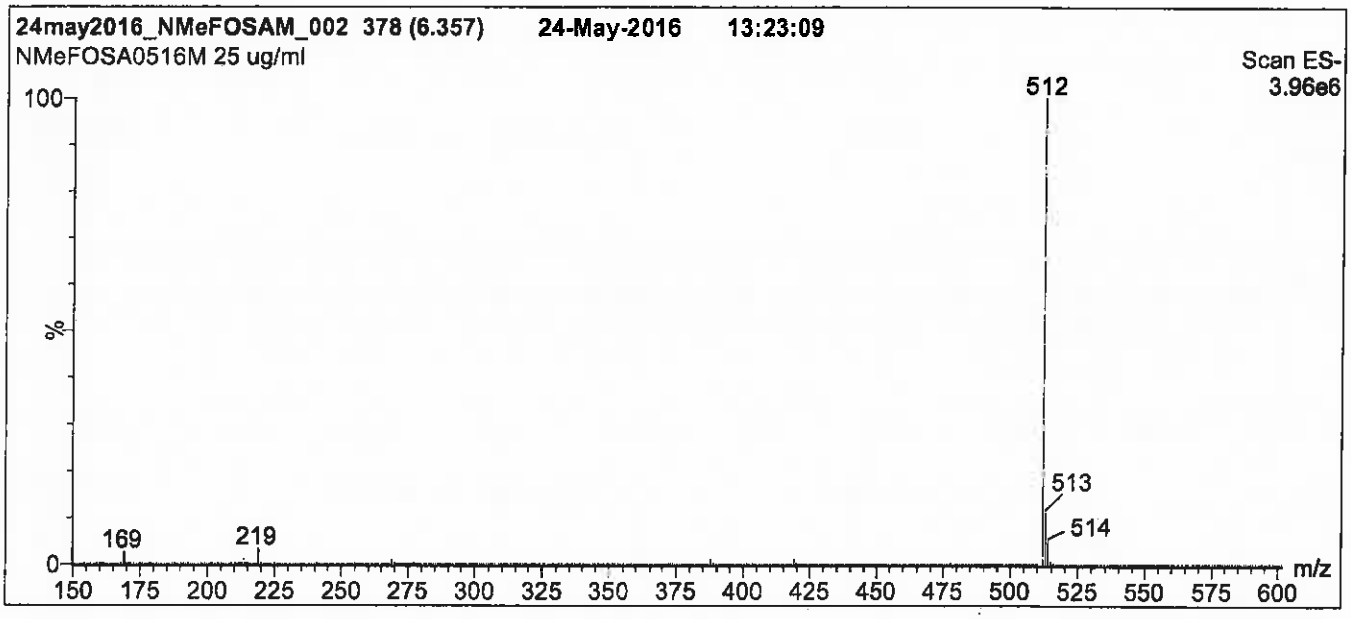
CALA

ANAB ACCREDITED

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

Figure 1: **N-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

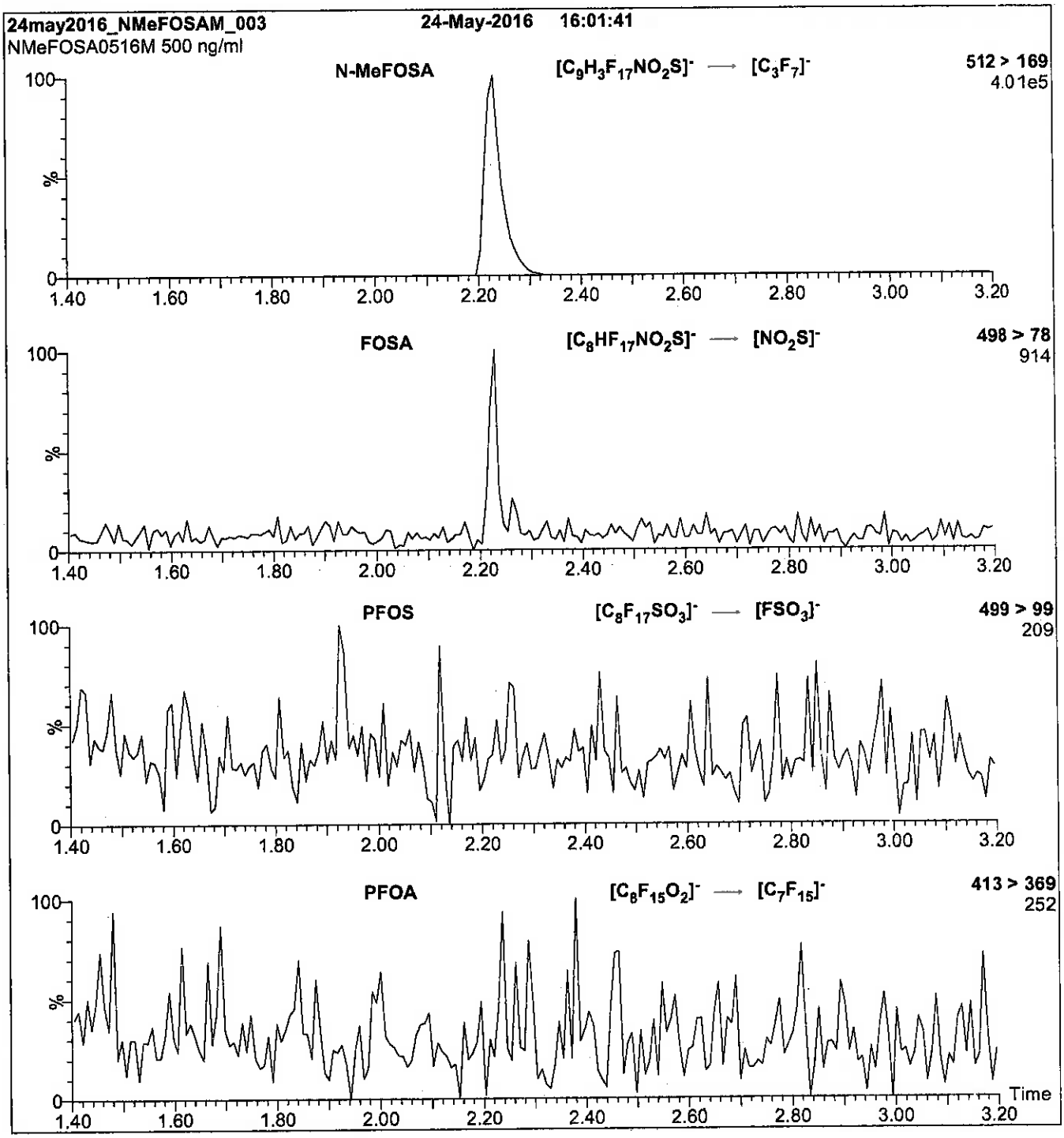
Flow: 300 µl/min

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_00005

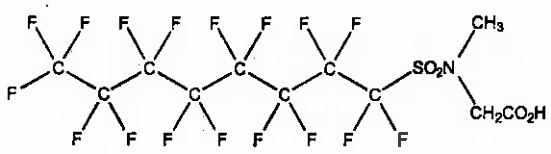
P: R/28/16 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-MeFOSAA
LOT NUMBER: NMeFOSAA0916
COMPOUND: N-methylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:
CAS #: 2355-31-9



MOLECULAR FORMULA: $C_{11}H_8F_{17}NO_4S$
MOLECULAR WEIGHT: 571.21
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/12/2016
EXPIRY DATE: (mm/dd/yyyy) 10/12/2021
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/25/2016 (mm/dd/yyyy)

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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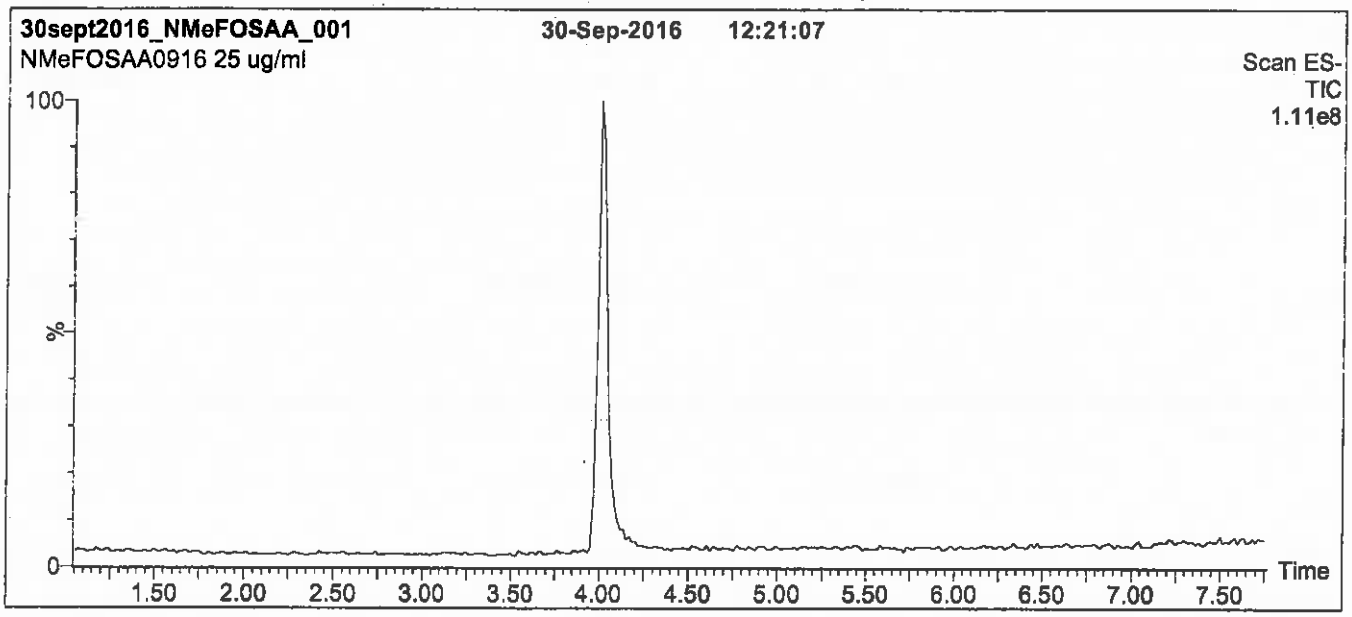
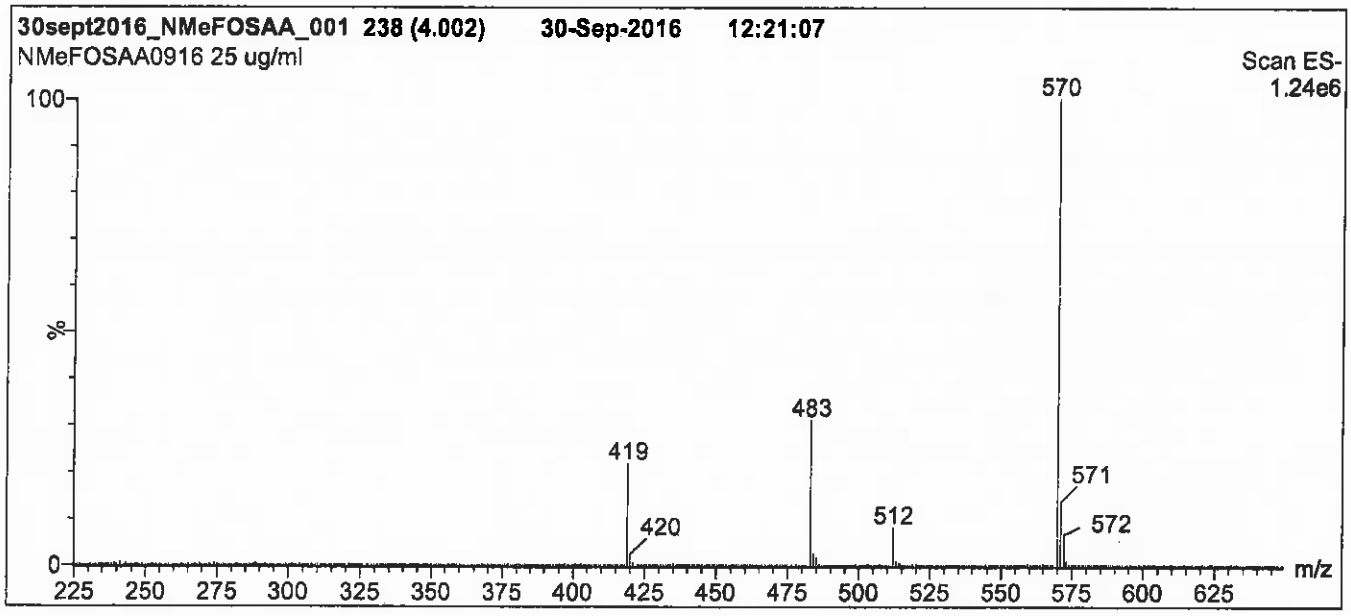
Figure 1: **N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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

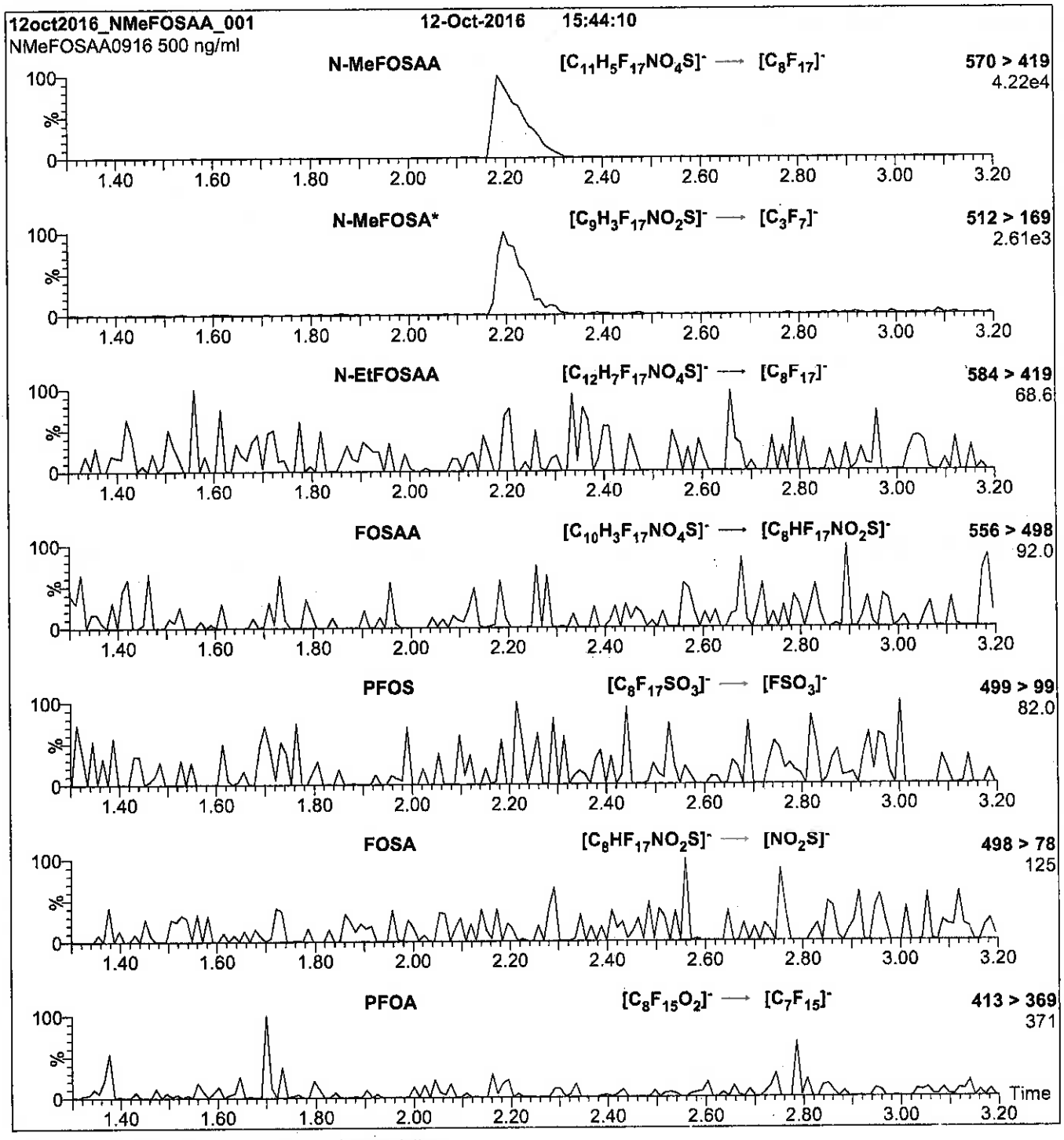
Flow: 300 µl/min

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

LCPFAC-24PAR_00001

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-24PAR

Native Per- and Poly-fluoroalkyl Substance
Precision and Recovery Standard Solution

PRODUCT CODE:	PFAC-24PAR
LOT NUMBER:	PFAC24PAR0917
SOLVENT(S):	Methanol / Isopropanol (4%) / Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	09/13/2017
LAST TESTED: (mm/dd/yyyy)	09/15/2017
EXPIRY DATE: (mm/dd/yyyy)	09/15/2022
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

PFAC-24PAR is a solution/mixture of eleven native linear perfluoroalkylcarboxylic acids (C_4-C_{14}), seven native perfluoroalkylsulfonates (C_4, C_5, C_7, C_9, and C_{10} linear; C_8 and C_8 linear and branched), three native telomer sulfonates (4:2, 6:2, and 8:2), two native perfluorooctanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide. The components and their concentrations are given in Table A.

The individual native perfluoroalkylcarboxylic acids, native perfluoroalkylsulfonates, native telomer sulfonates, native perfluorooctanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Table B: Isomeric Components and Percent Composition of PFHxSK
Table C: Isomeric Components and Percent Composition of PFOSK
Figure 1: LC/MS Data (SIR)
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 acids to their respective methyl esters.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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, as well as mixtures and calibration solutions, are compared to older lots in a similar manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

Table A: **PFAC-24PAR; Components and Concentrations (ng/ml, ± 5% in Methanol / Isopropanol (4%) / Water (<1%))**

Compound	Abbreviation	Concentration (ng/ml)	Peak Assignment in Figure 1
Perfluoro-n-butanoic acid	PFBA	2000	A
Perfluoro-n-pentanoic acid	PFPeA	2000	B
Perfluoro-n-hexanoic acid	PFHxA	2000	E
Perfluoro-n-heptanoic acid	PFHpA	2000	G
Perfluoro-n-octanoic acid	PFOA	2000	K
Perfluoro-n-nonanoic acid	PFNA	2000	M
Perfluoro-n-decanoic acid	PFDA	2000	Q
Perfluoro-n-undecanoic acid	PFUdA	2000	V
Perfluoro-n-dodecanoic acid	PFDoA	2000	X
Perfluoro-n-tridecanoic acid	PFTrDA	2000	Y
Perfluoro-n-tetradecanoic acid	PFTeDA	2000	Z
Perfluoro-1-octanesulfonamide	FOSA	2000	T
N-methylperfluoro-1-octanesulfonamidoacetic acid	N-MeFOSAA	2000	S
N-ethylperfluoro-1-octanesulfonamidoacetic acid	N-EtFOSAA	2000	U

Compound	Abbreviation	Concentration (ng/ml)		Peak Assignment in Figure 1
		as the salt	as the anion	
Potassium perfluoro-1-butanesulfonate	L-PFBS	2000	1770	C
Sodium perfluoro-1-pentanesulfonate	L-PFPeS	2000	1880	F
Potassium perfluorohexanesulfonate*	PFHxSK: linear isomer	1620	1480	I
	PFHxSK: ∑ branched isomers	378	344	H
Sodium perfluoro-1-heptanesulfonate	L-PFHpS	2000	1900	L
Potassium perfluorooctanesulfonate**	PFOSK: linear isomer	1580	1460	O
	PFOSK: ∑ branched isomers	422	391	N
Sodium perfluoro-1-nonanesulfonate	L-PFNS	2000	1920	R
Sodium perfluoro-1-decanesulfonate	L-PFDS	2000	1930	W
Sodium 1H,1H,2H,2H-perfluoro-1-hexanesulfonate	4:2FTS	2000	1870	D
Sodium 1H,1H,2H,2H-perfluoro-1-octanesulfonate	6:2FTS	2000	1900	J
Sodium 1H,1H,2H,2H-perfluoro-1-decanesulfonate	8:2FTS	2000	1920	P

* See Table B for percent composition of linear and branched PFHxSK isomers.
** See Table C for percent composition of linear and branched PFOSK isomers.

Table B: **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	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9	18.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4	
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	5.0	
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	8.9	
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)CF_2CF_2SO_3^-K^+$	0.2	
7	Other Unidentified Isomers		0.5	

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

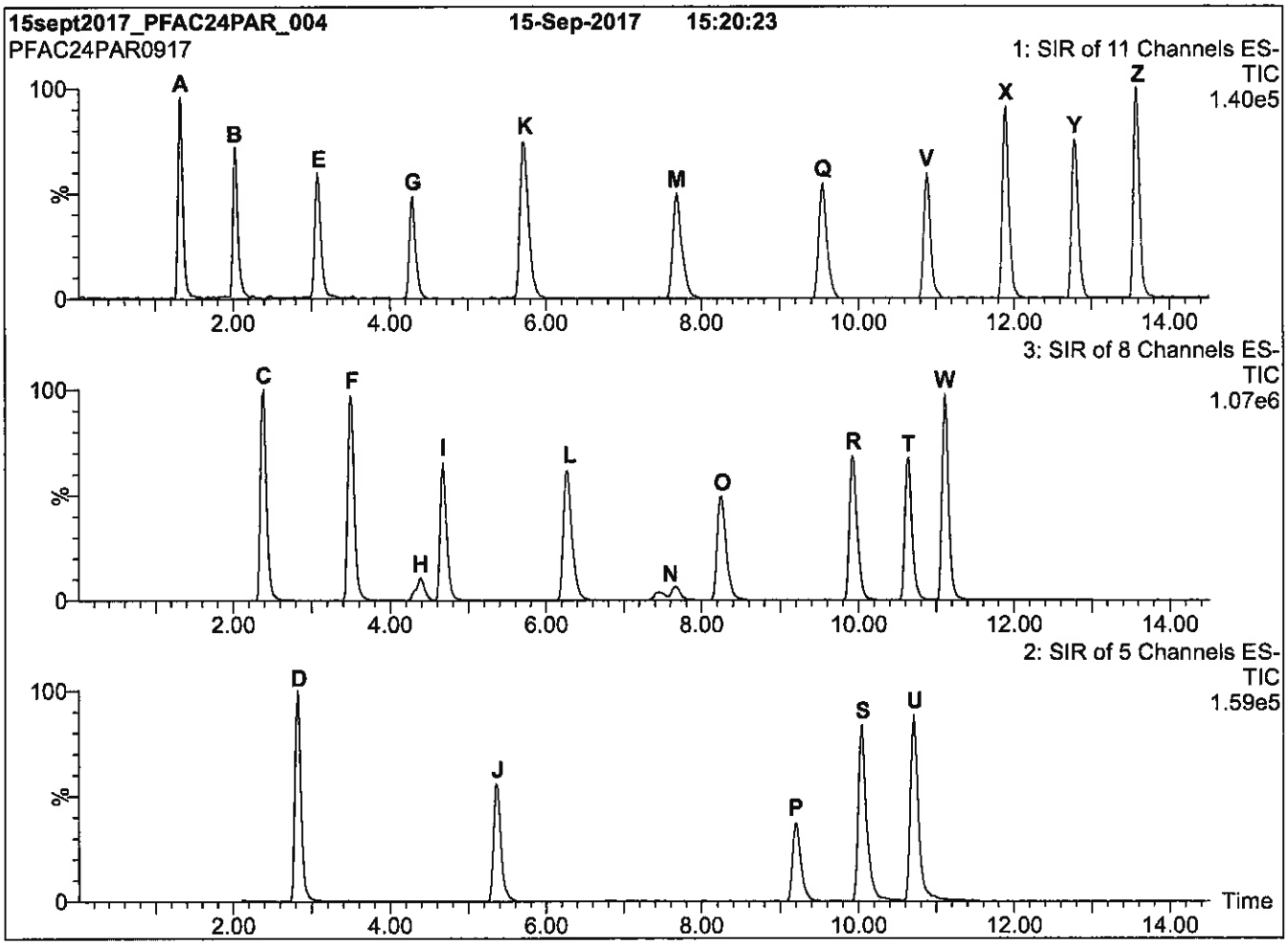
Table C: **PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

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	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2	21.1
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	$CF_3C(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2	
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2C(CF_3)CF_2CF_2CF_2SO_3^-K^+$	0.03	
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	0.4	
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	0.07	

* Percent of total perfluorooctanesulfonate isomers only.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: _____ **Date:** 09/19/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Figure 1: **PFAC-24PAR; LC/MS Data (Total Ion Current Chromatogram; SIR)**



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 55% organic over 3.5 min.
Ramp to 70% organic over 6.5 min.
Ramp to 85% organic over 5 min and hold for
1 min before returning to initial conditions in 0.5 min.
Time: 17 min

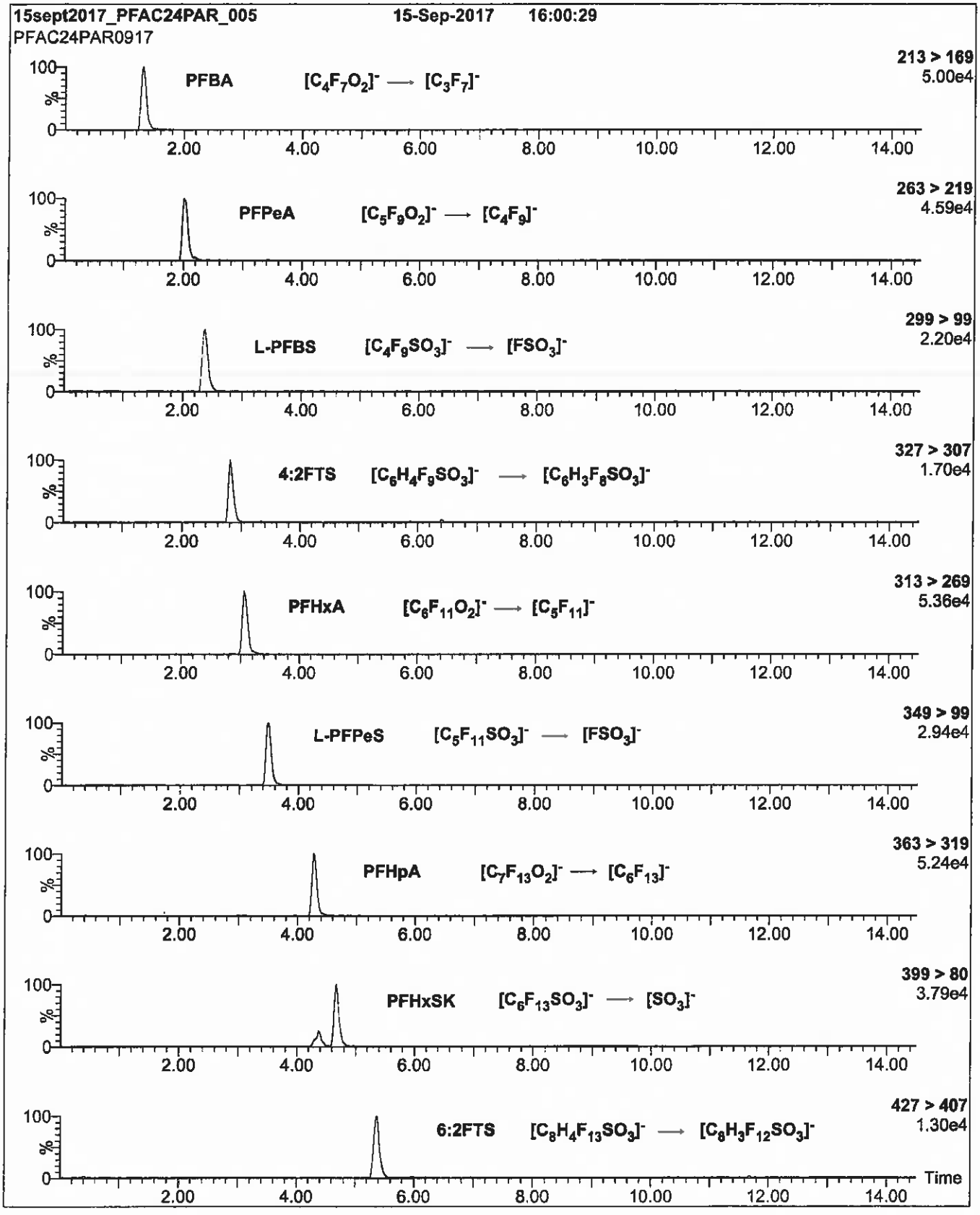
Flow: 300 µl/min

MS Parameters

Experiment: SIR

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

Figure 2: **PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)**



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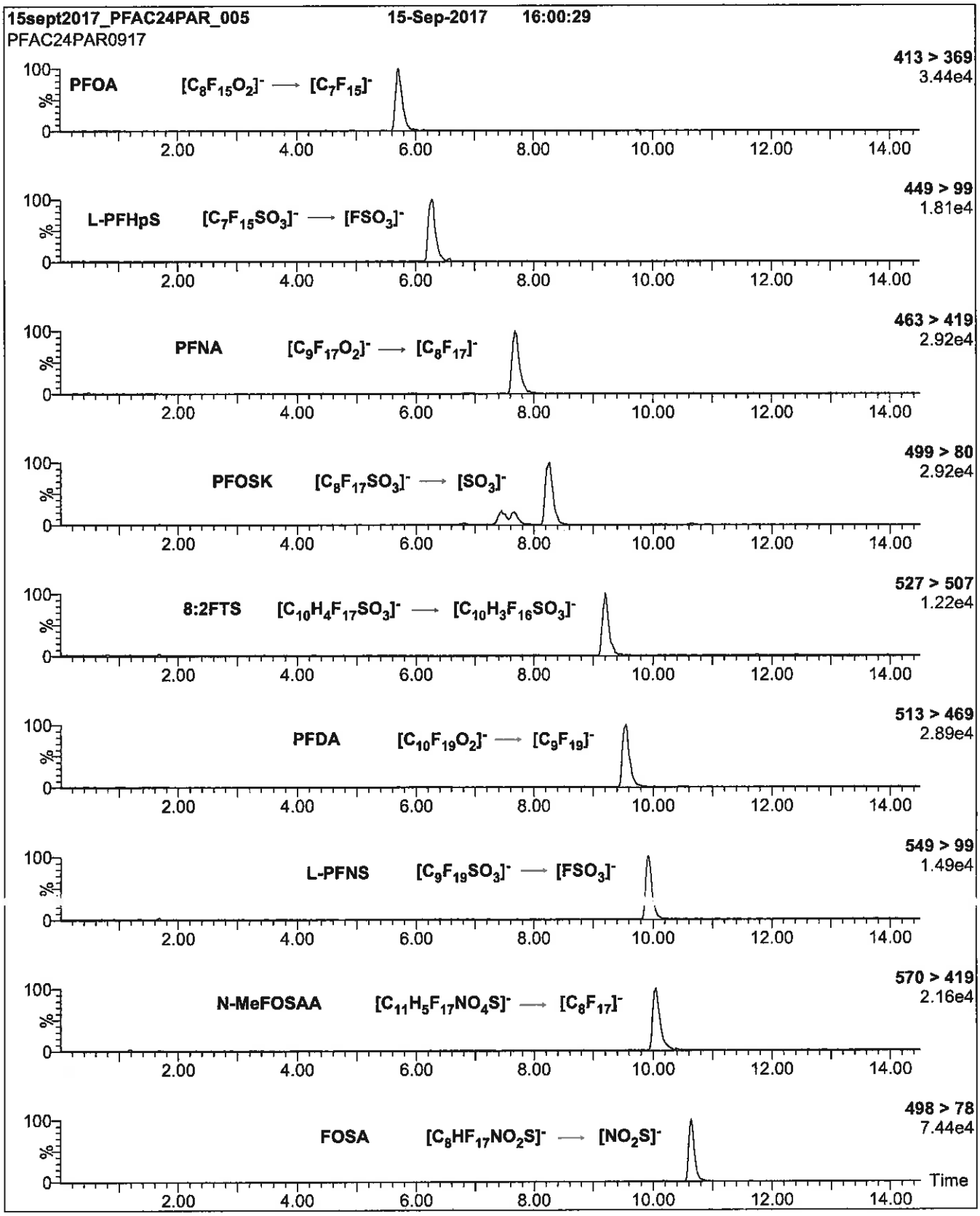
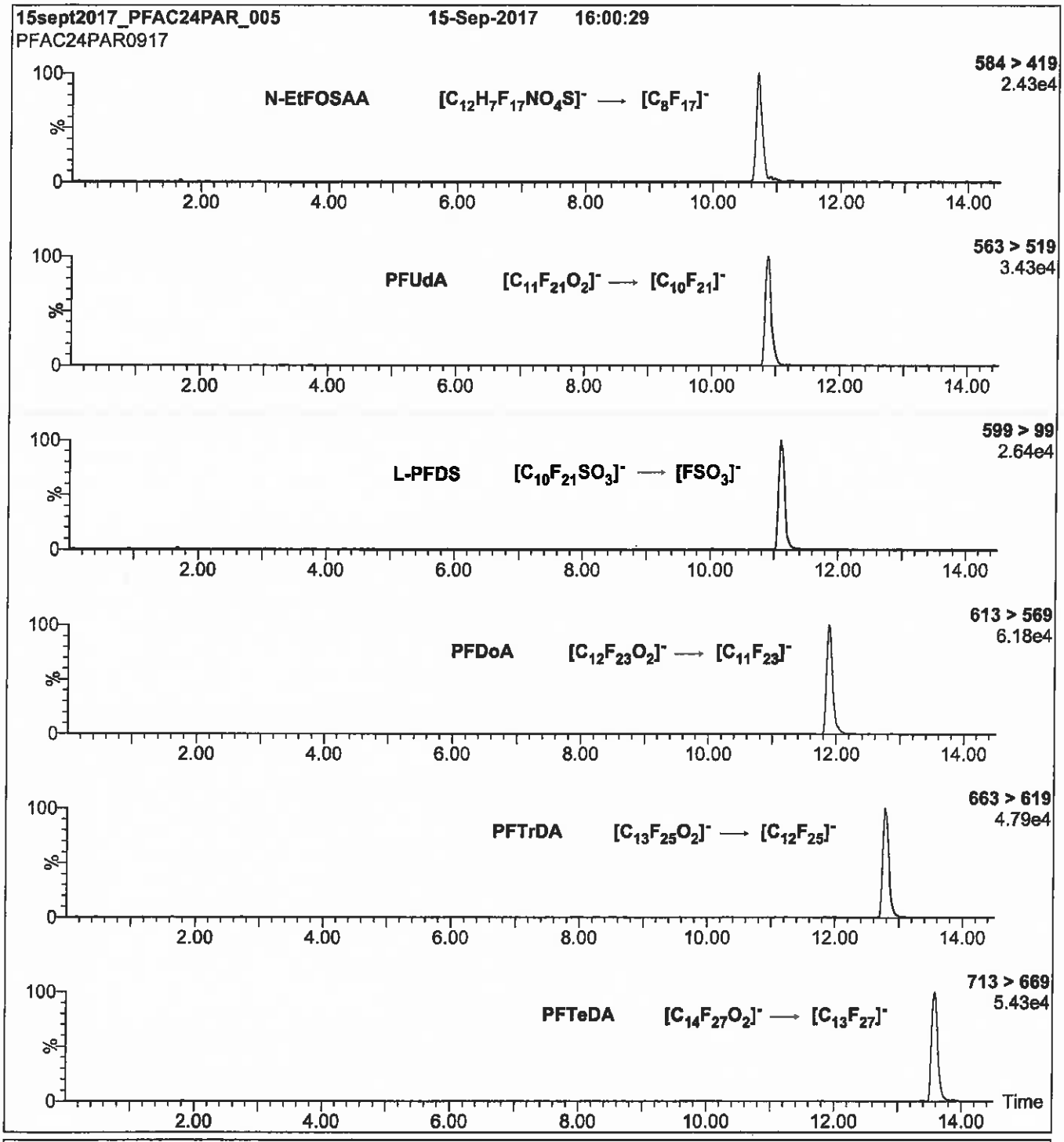


Figure 2: **PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFAC-24PAR)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3

Collision Energy (eV) = 8-50 (variable)

Reagent

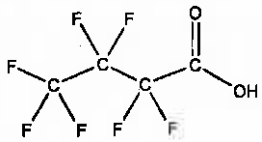
LCPFBA_00007

r: 12/20/16 SN
S

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFBA	**LOT NUMBER:**	PFBA0516
COMPOUND:	Perfluoro-n-butanoic acid		
STRUCTURE:		**CAS #:**	375-22-4



MOLECULAR FORMULA:	$C_4HF_7O_2$	**MOLECULAR WEIGHT:**	214.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/27/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/27/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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

INTENDED USE:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED

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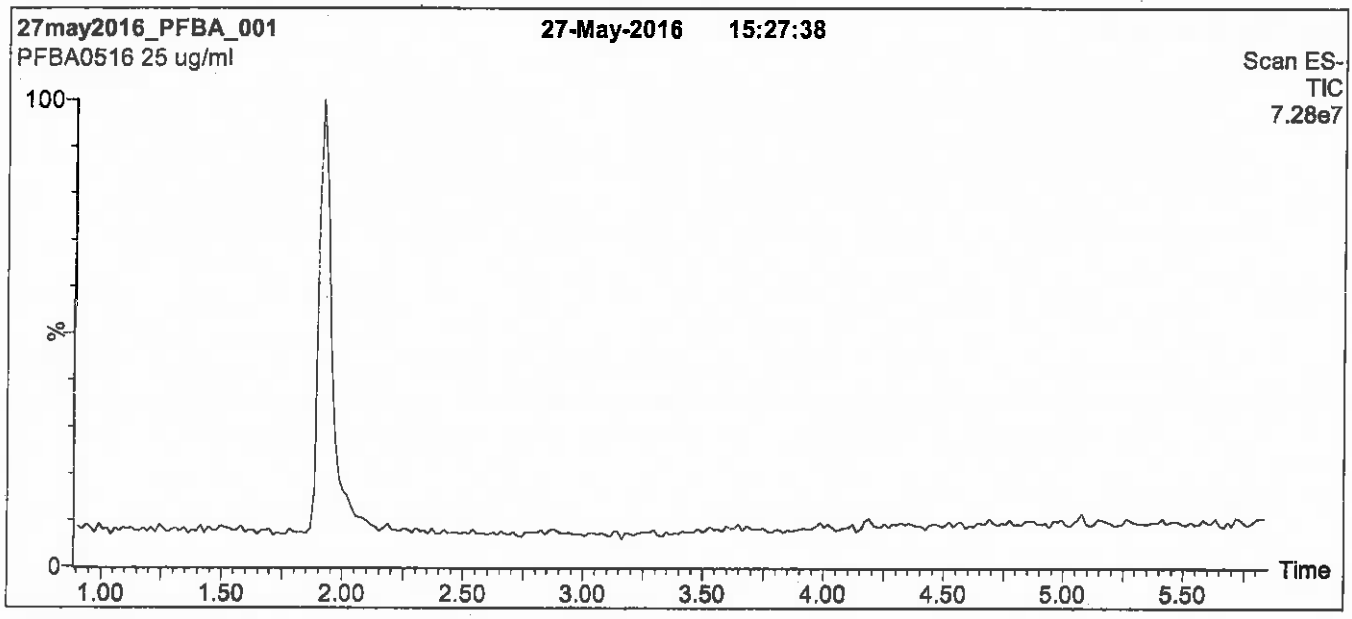
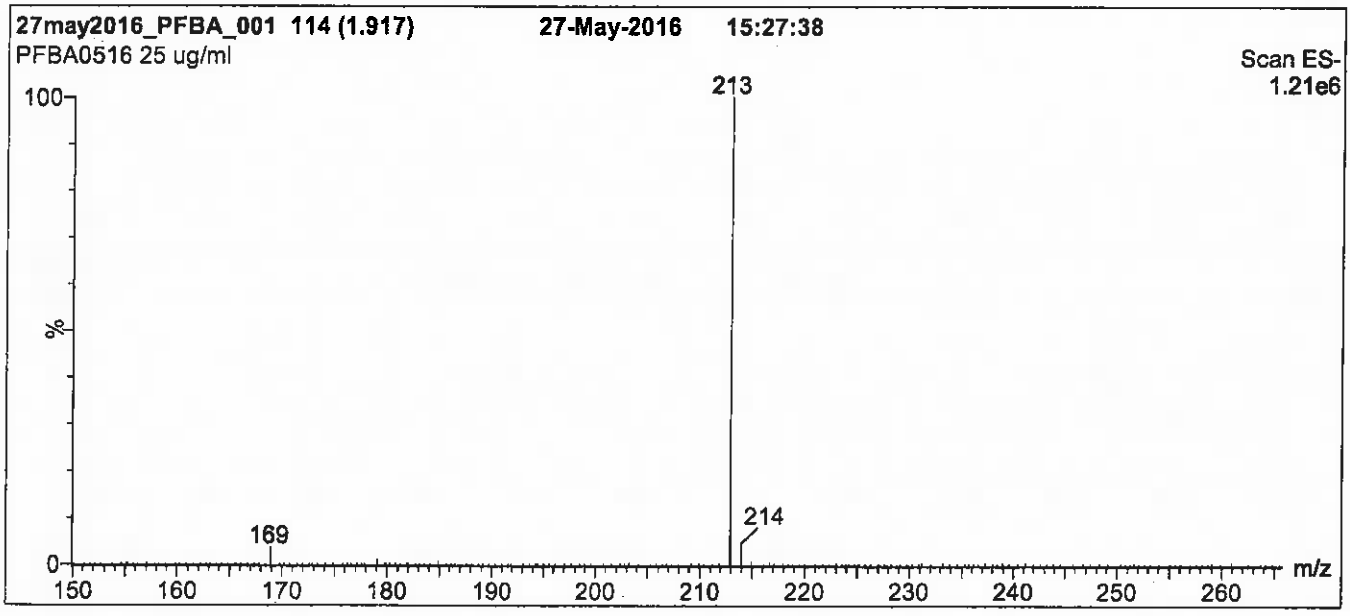
Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





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

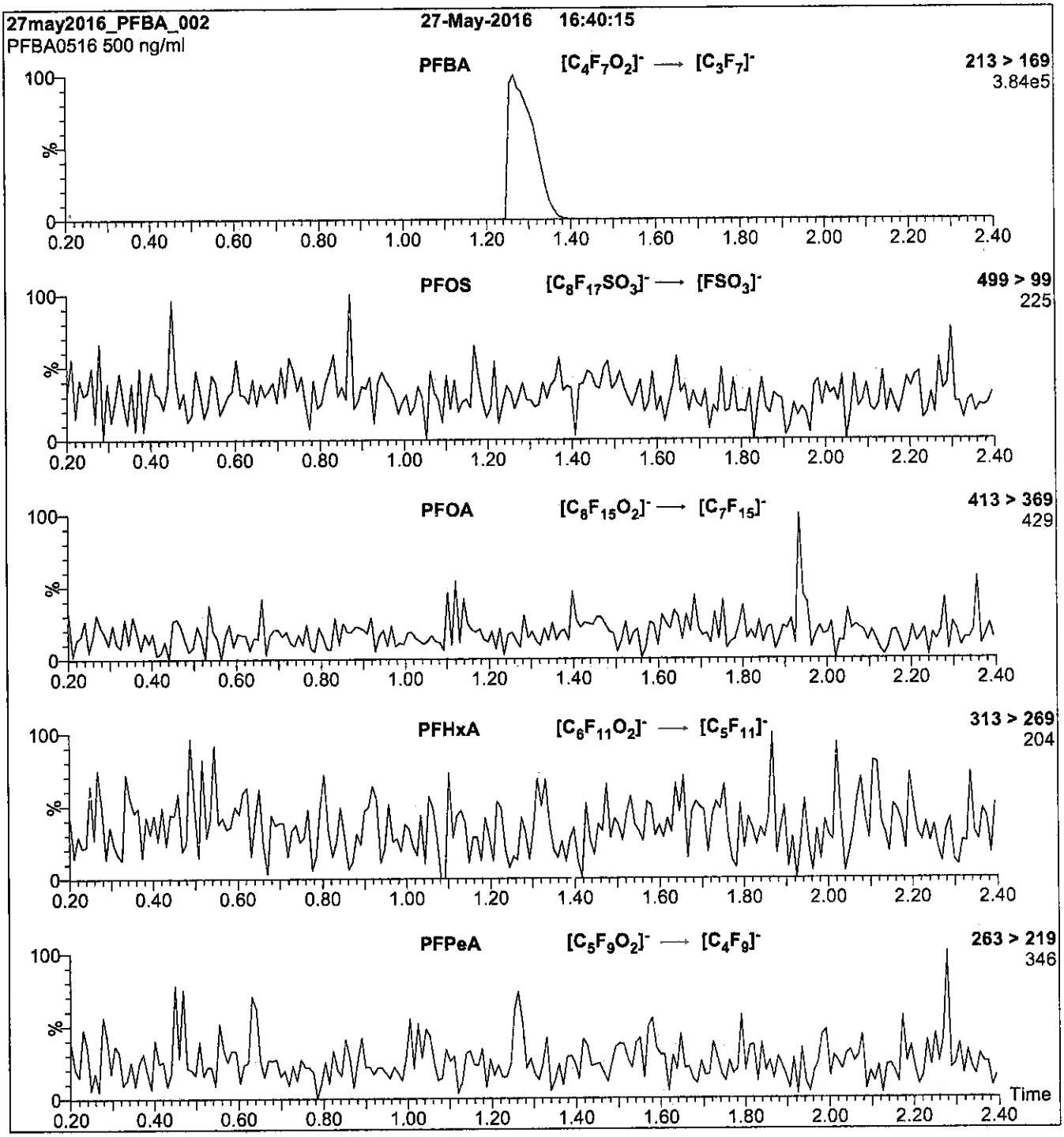
Flow: 300 µl/min

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

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

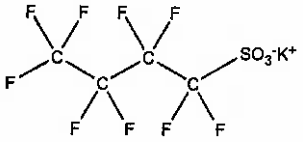
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: LPFBS0316

STRUCTURE:

CAS #: 29420-49-3



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.

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Certified By: B.G. Chittim **Date:** 03/21/2016 (mm/dd/yyyy)

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

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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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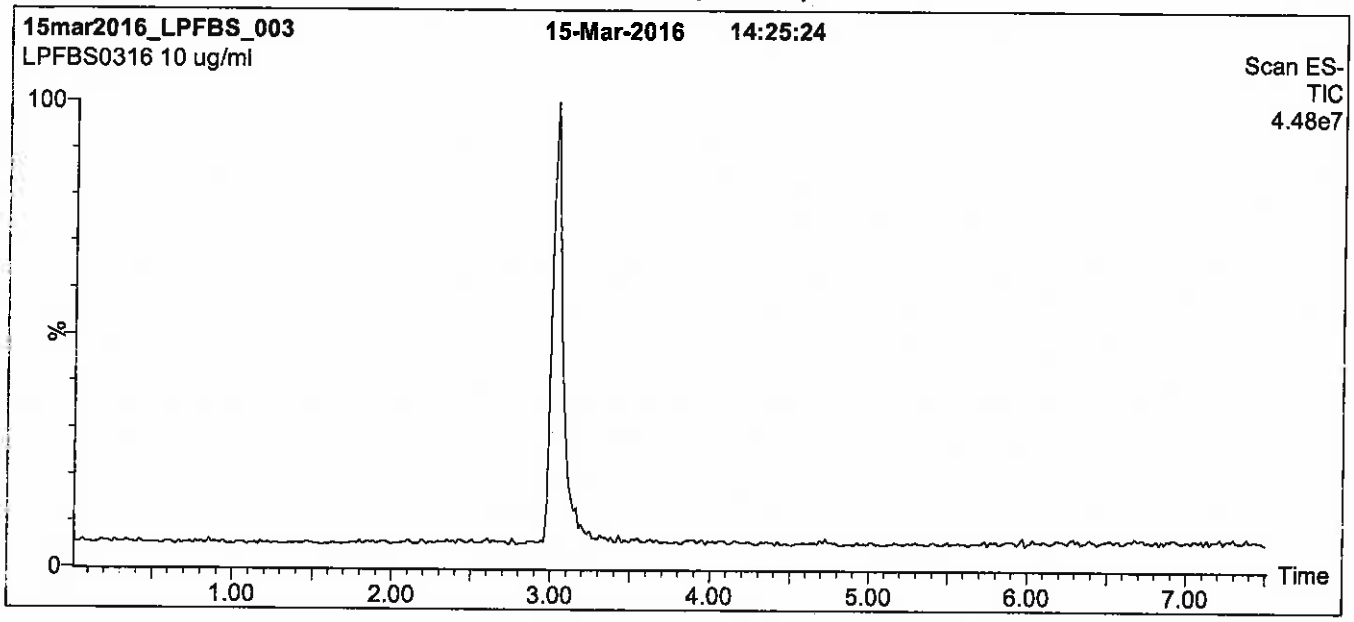
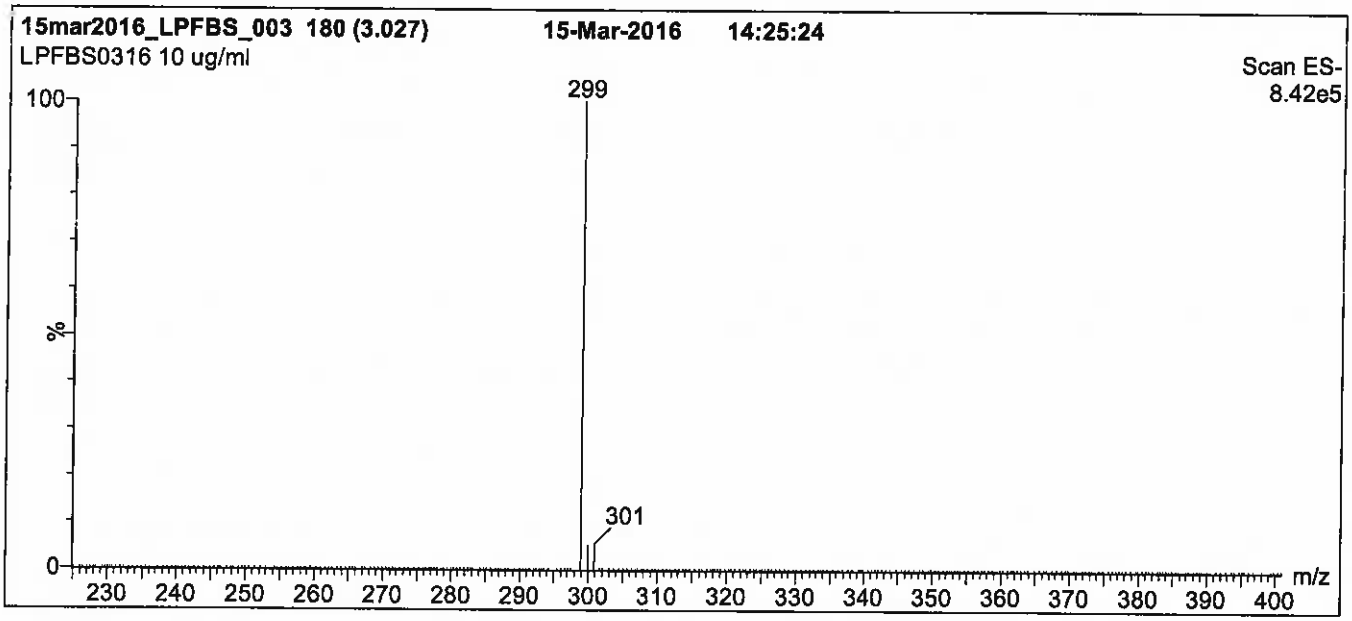
CALA

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

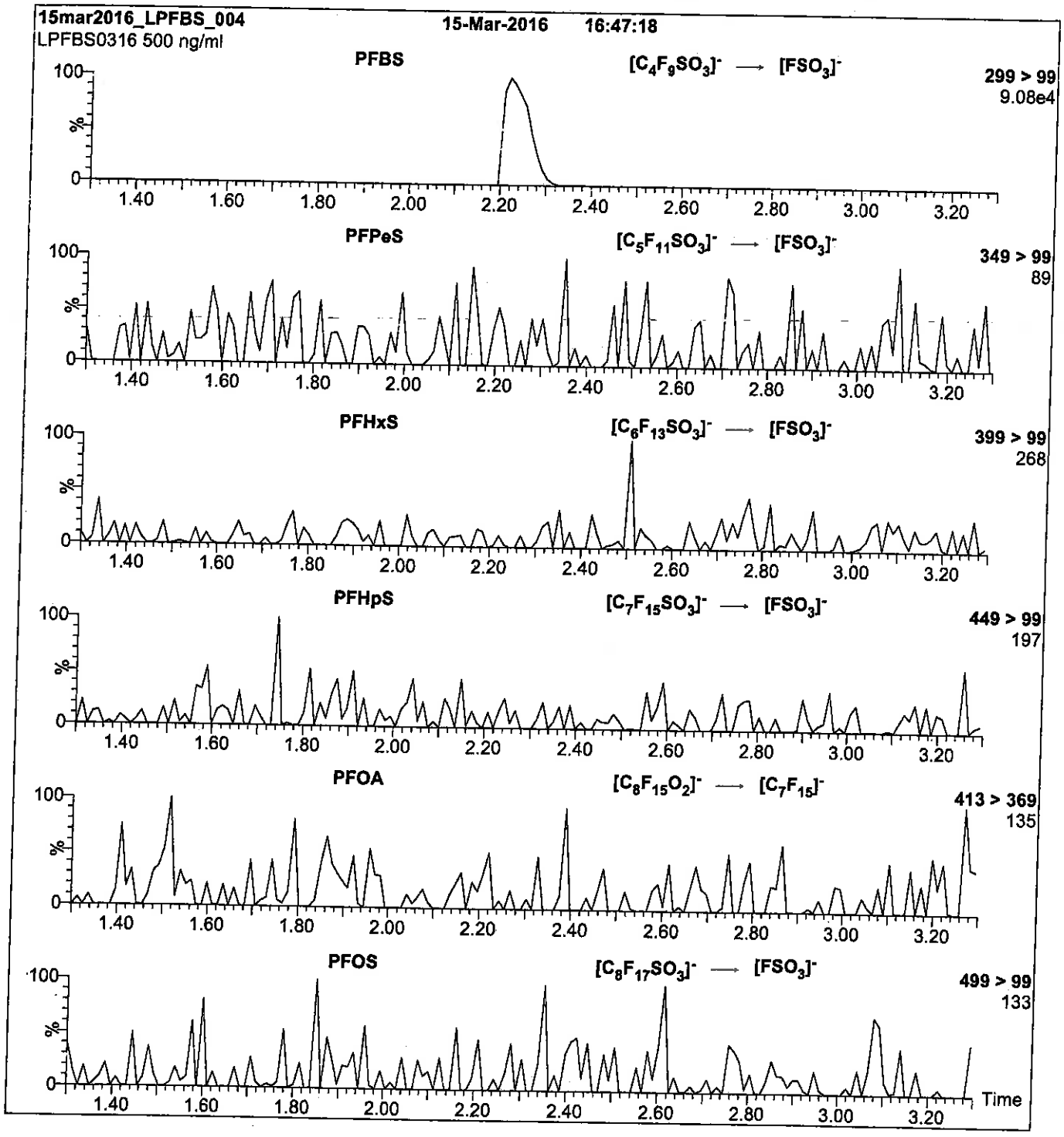
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 25

Reagent

LCPFDA_00007

R: SBC 9/13/16
scanned 10/4/16 SR

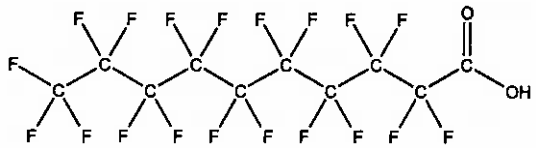
730620
ID: LCPFDA_00006
Exp: 05/31/21 Prpd: SBC
PF-n-decanoic acid

730621
ID: LCPFDA_00007
Exp: 05/31/21 Prpd: SBC
PF-n-decanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFDA	**LOT NUMBER:**	PFDA0516
COMPOUND:	Perfluoro-n-decanoic acid		
STRUCTURE:		**CAS #:**	335-76-2



MOLECULAR FORMULA:	$C_{10}HF_{19}O_2$	**MOLECULAR WEIGHT:**	514.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/31/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ B.G. Chittim **Date:** 06/13/2016 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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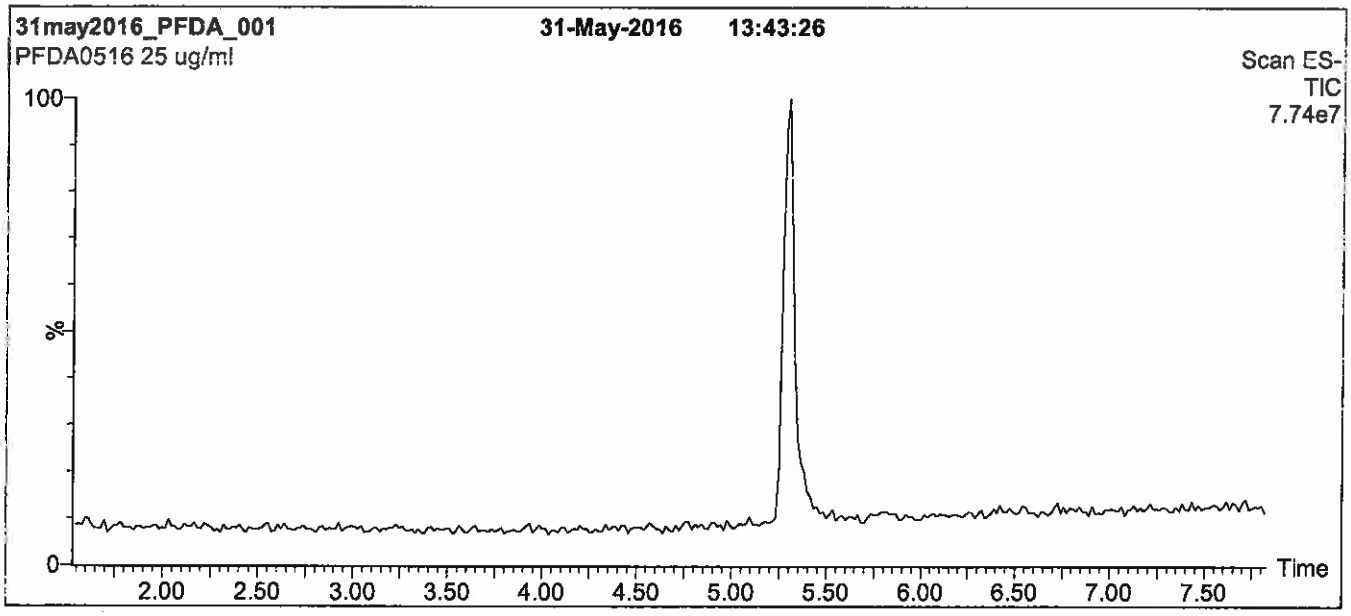
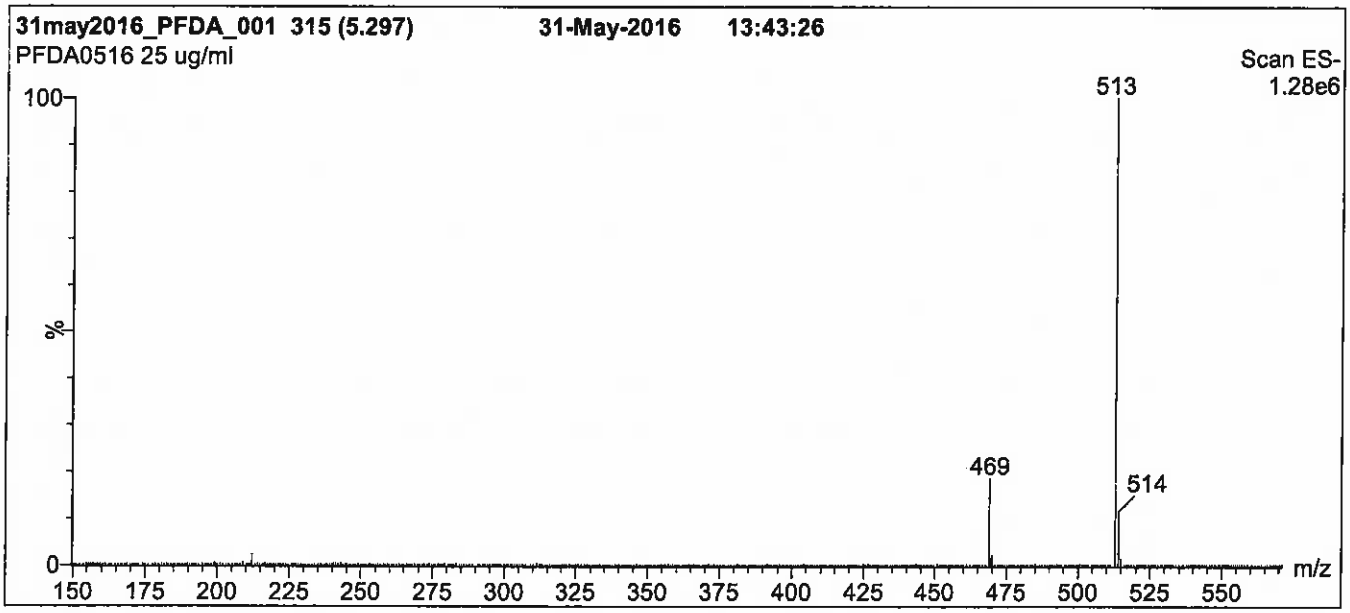




Conditions for Figure 1:

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

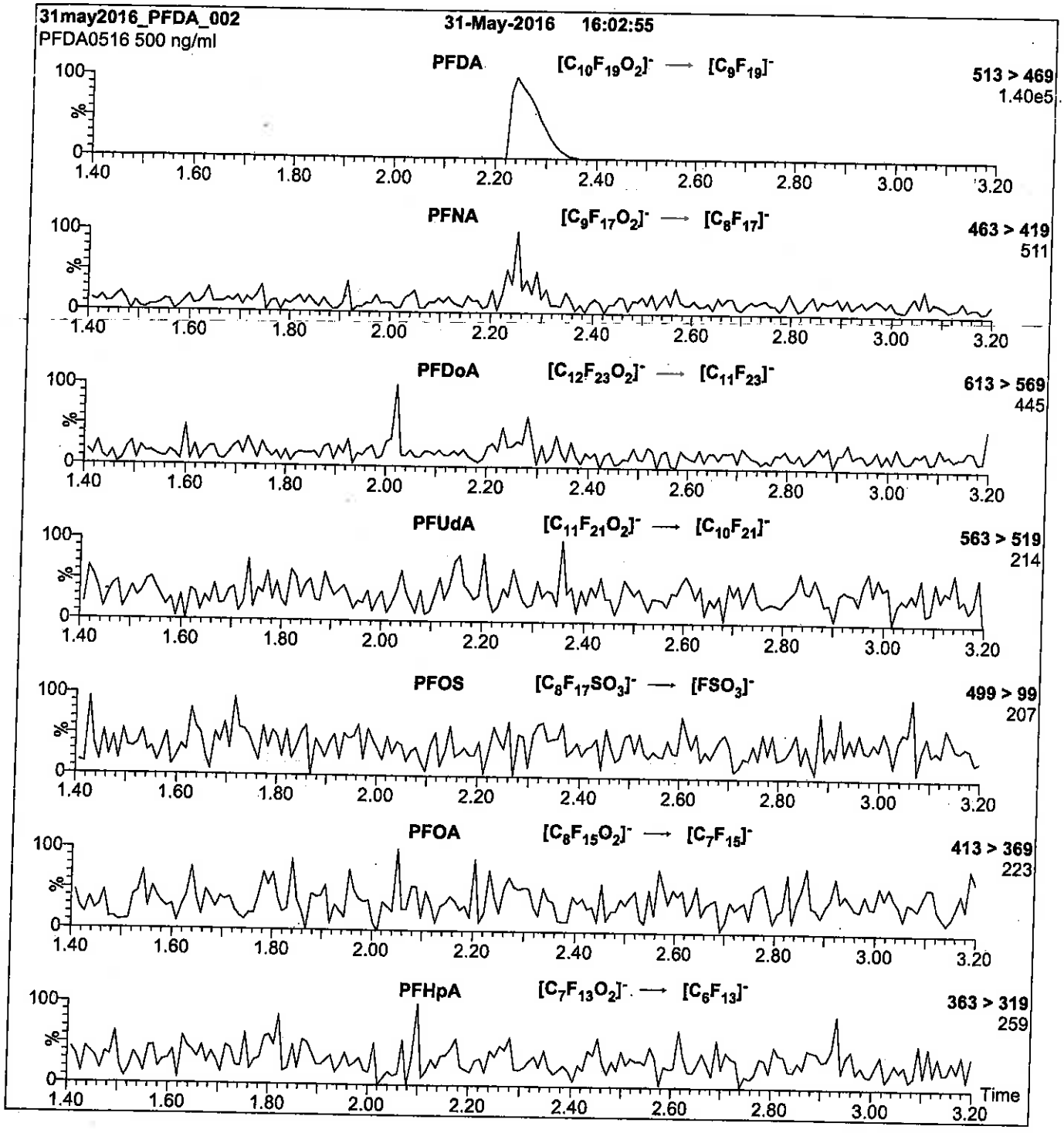
Flow: 300 µl/min

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

LCPFDA_00008

R: 9/21/17 SKJ

WELLINGTON LABORATORIES

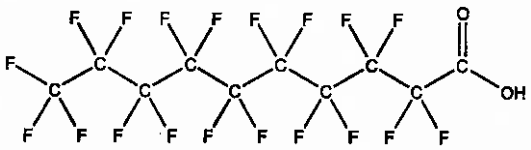
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFDA
COMPOUND: Perfluoro-n-decanoic acid

LOT NUMBER: PFDA0517

STRUCTURE:

CAS #: 335-76-2



MOLECULAR FORMULA: $C_{10}HF_{19}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 514.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/29/2017
EXPIRY DATE: (mm/dd/yyyy) 05/29/2022
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 ~ 0.2% of perfluoro-n-nonanoic acid (PFNA).

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

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

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UNCERTAINTY:

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CALA

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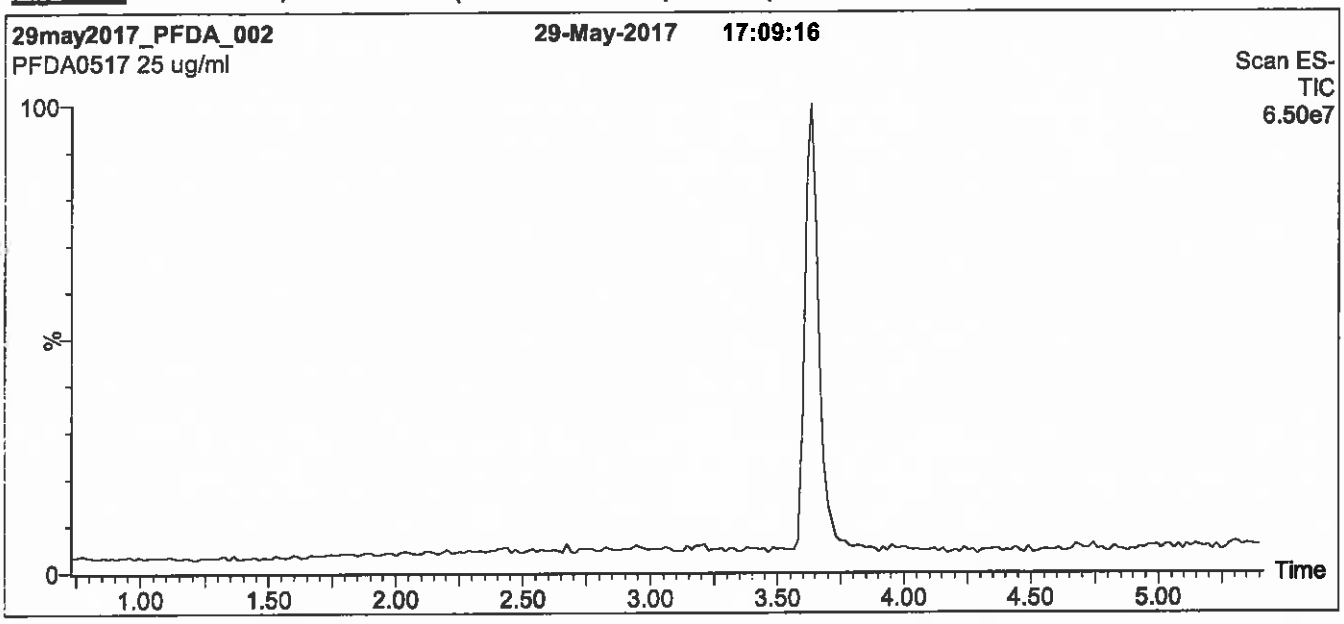

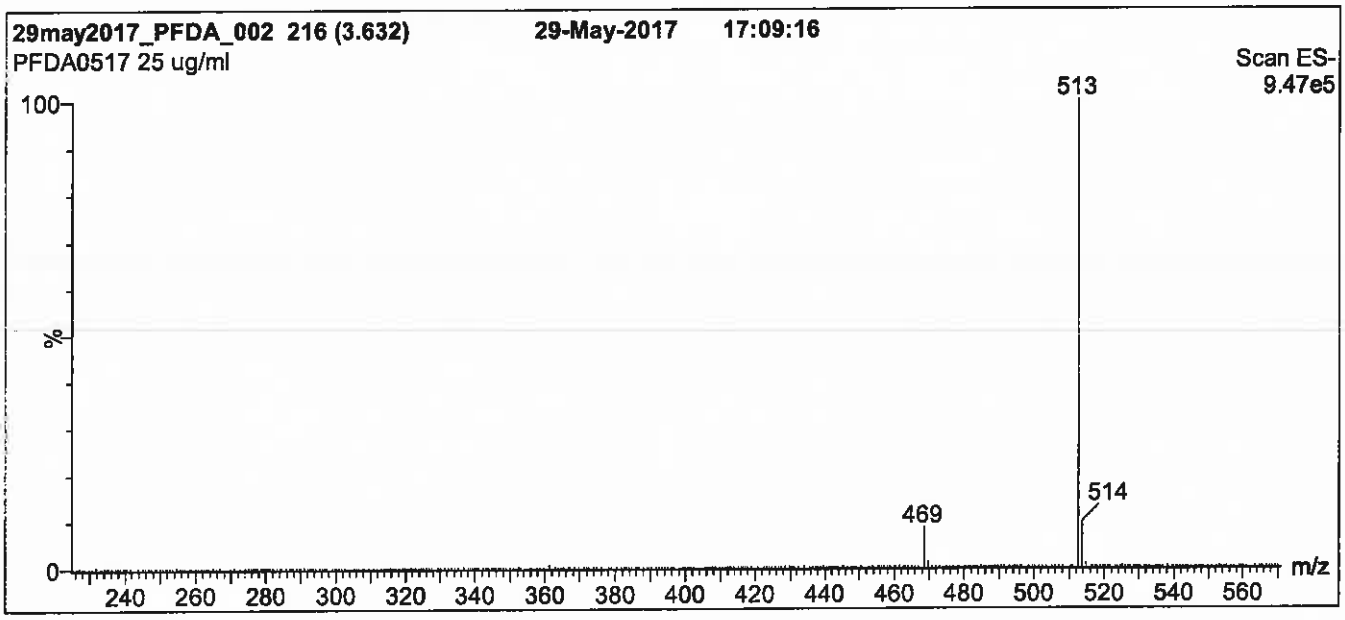

Conditions for Figure 1:

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
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

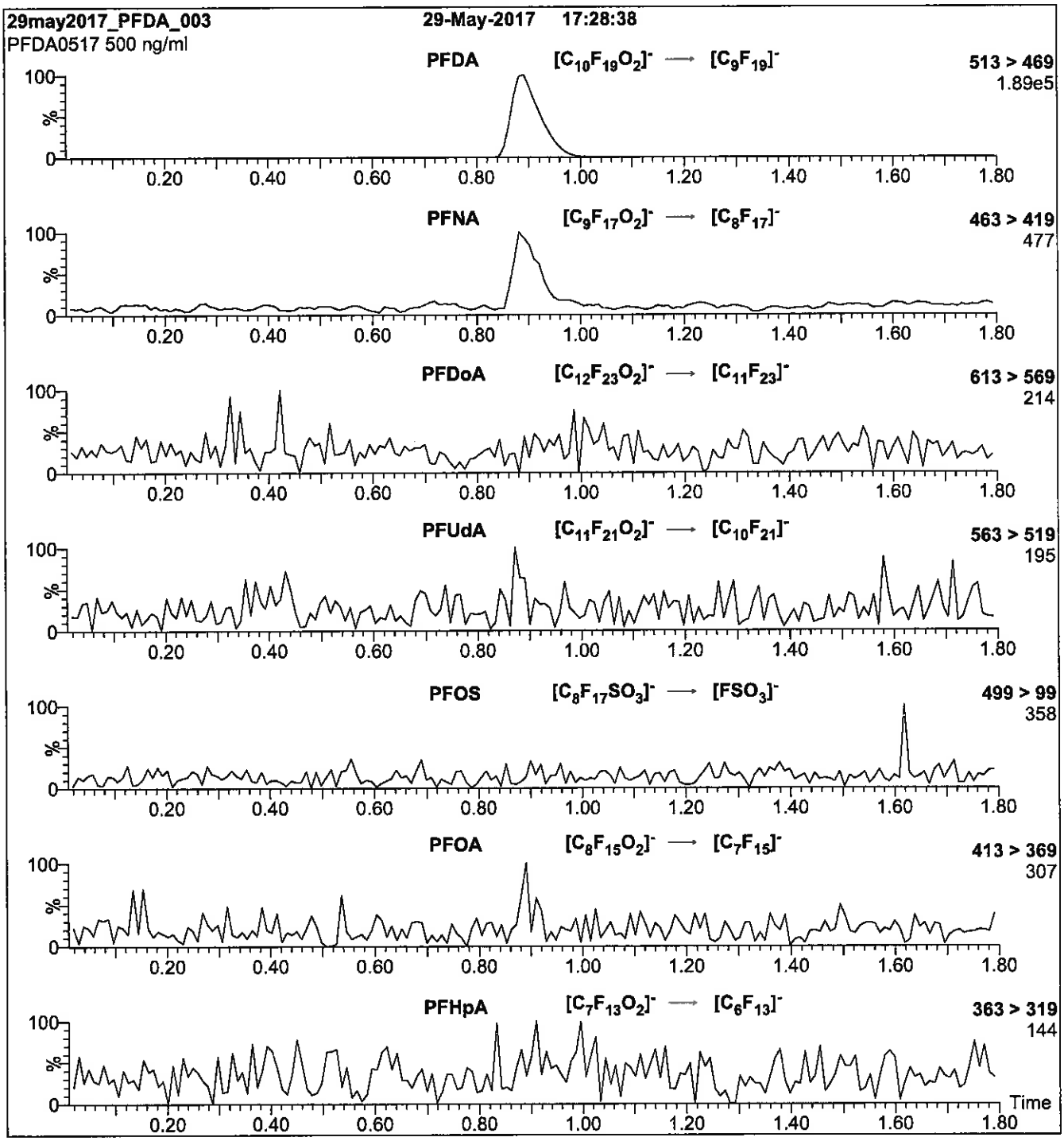
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 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) = 3.20e-3
Collision Energy (eV) = 13

Reagent

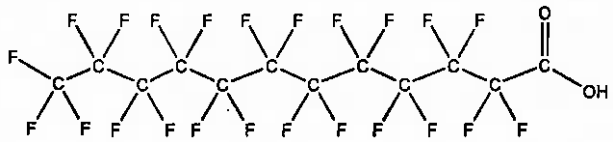
LCPFDoA_00007

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.

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Certified By: B.G. Chittim **Date:** 06/02/2016 (mm/dd/yyyy)

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CALA

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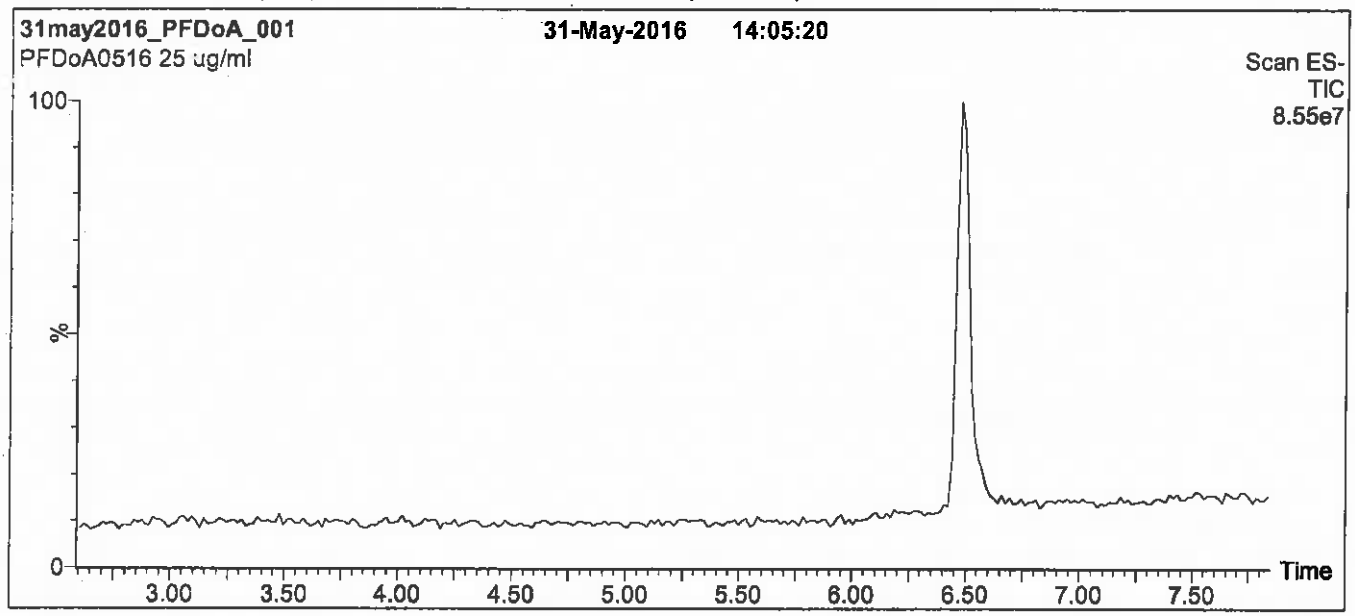
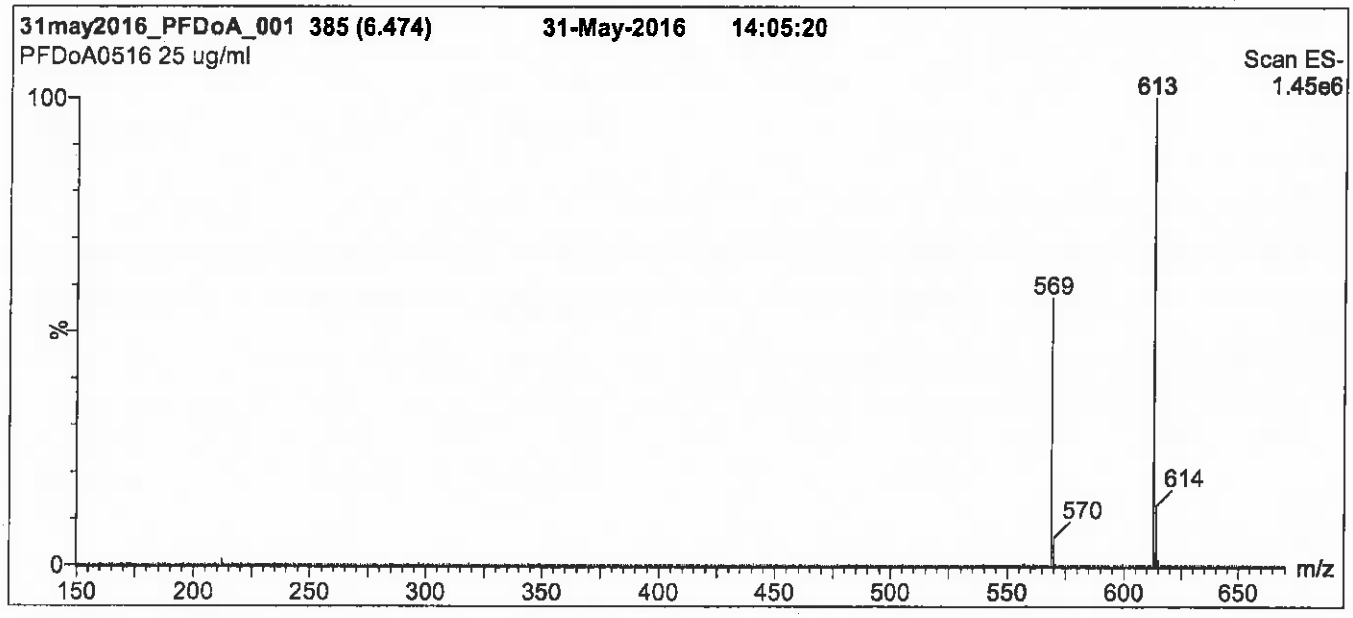
Figure 1: **PFDoA; LC/MS Data (TIC and Mass Spectrum)**





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

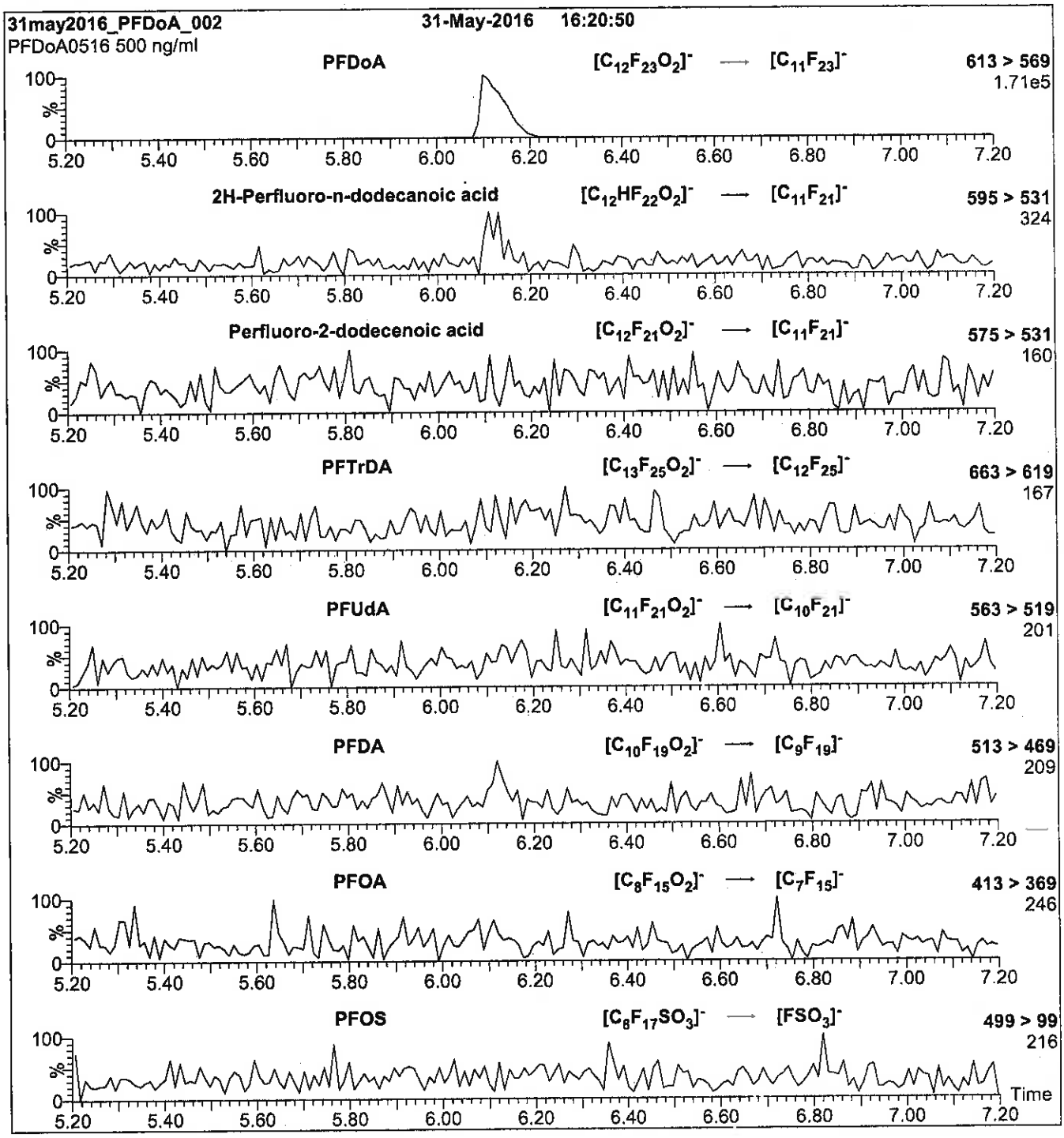
Flow: 300 µl/min

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

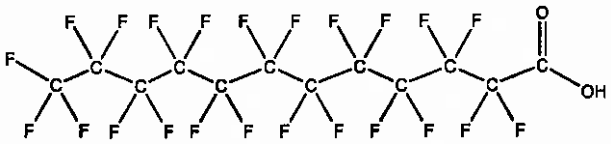
LCPFDoA_00008

P: 10/20/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFDoA	**LOT NUMBER:**	PFDoA0517
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)	05/29/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/29/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/30/2017 (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.

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 REFERENCE MATERIAL PRODUCER

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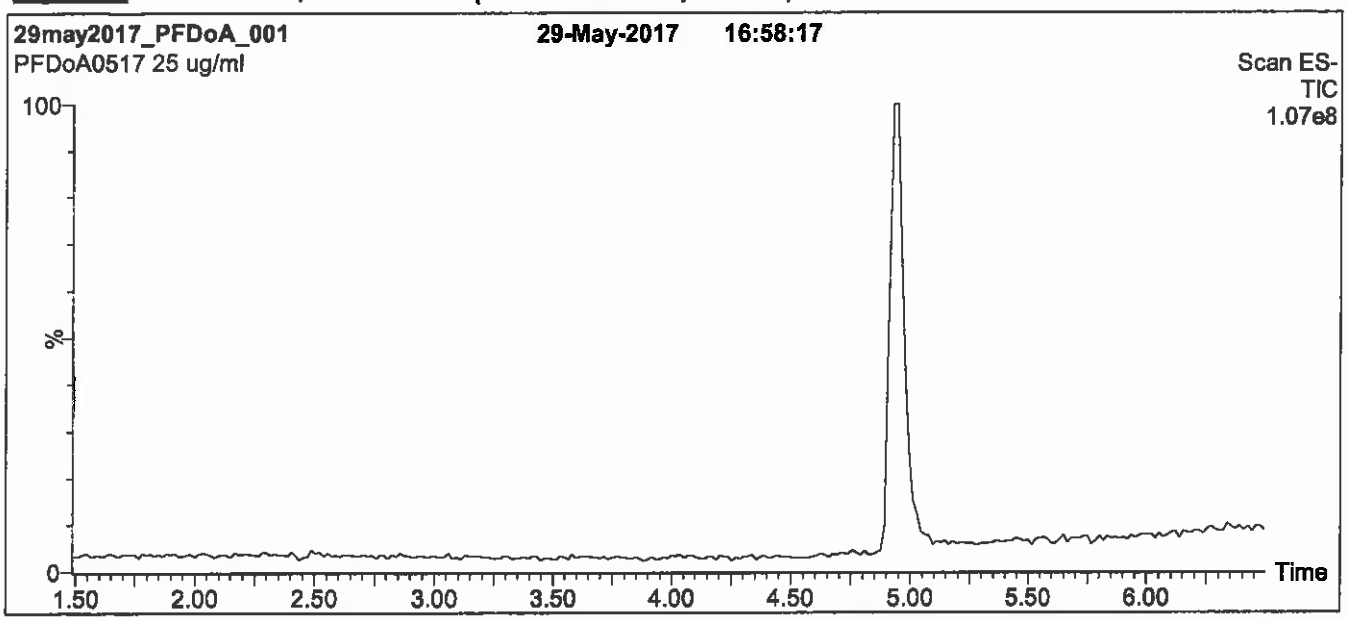
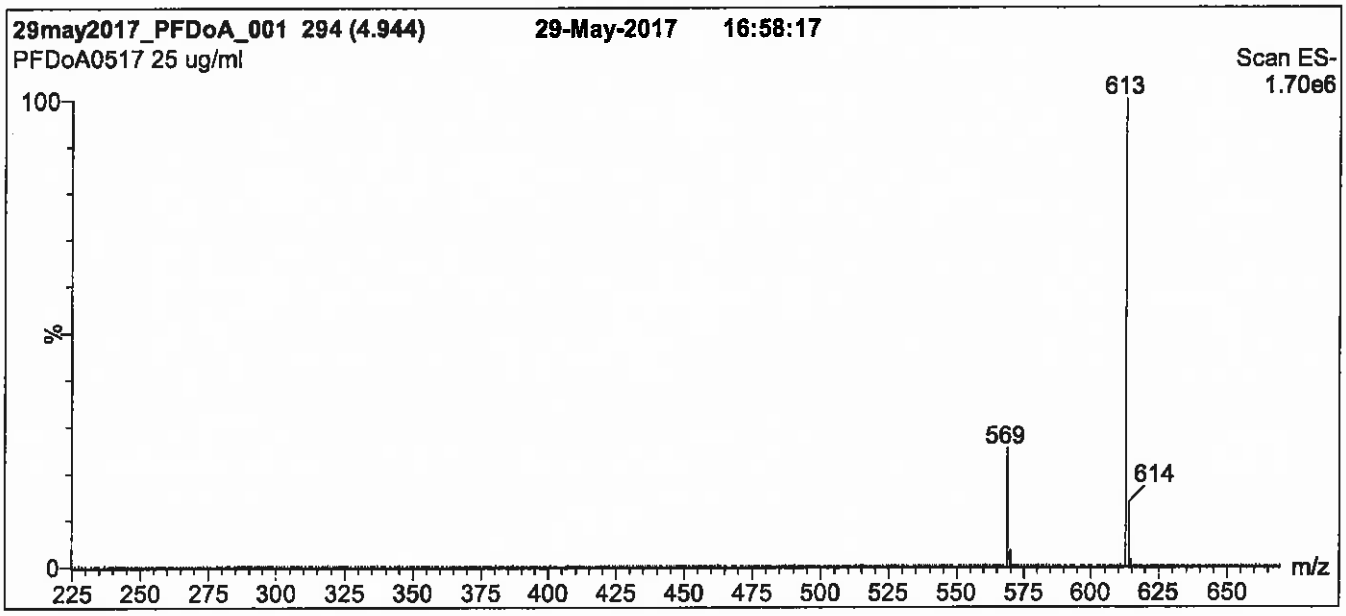
Figure 1: **PFDoA; LC/MS Data (TIC and Mass Spectrum)**





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: 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

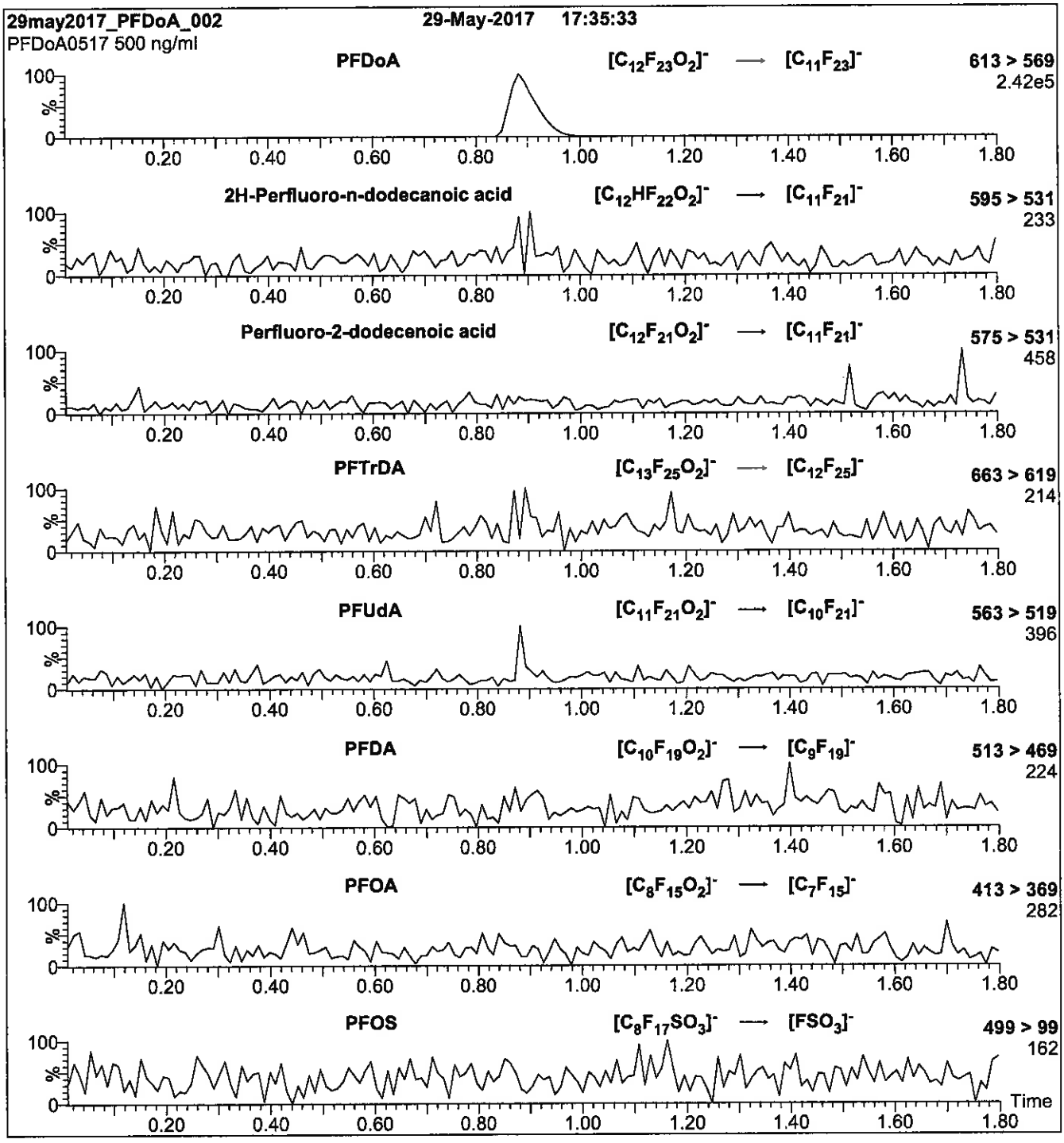
Flow: 300 µl/min

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: **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

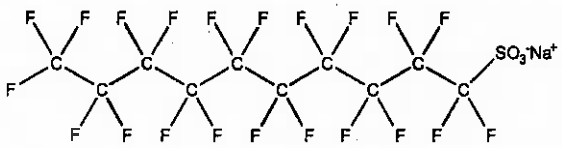
LCPFDSA_00002

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:

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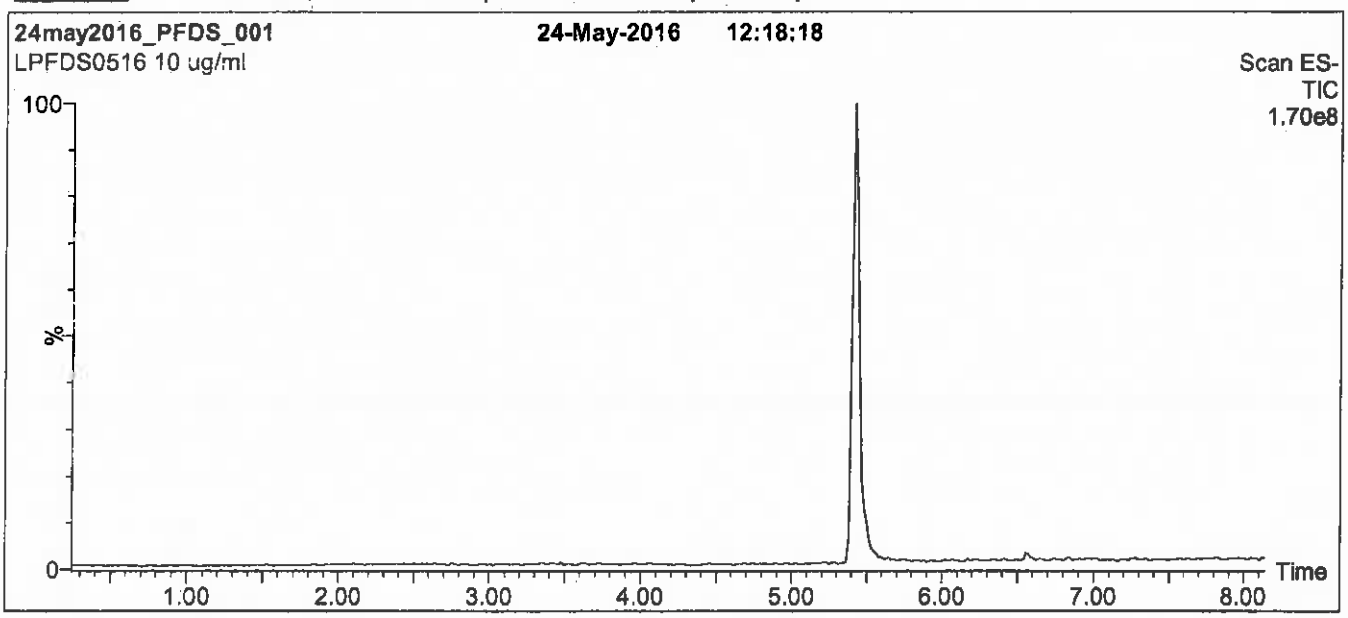
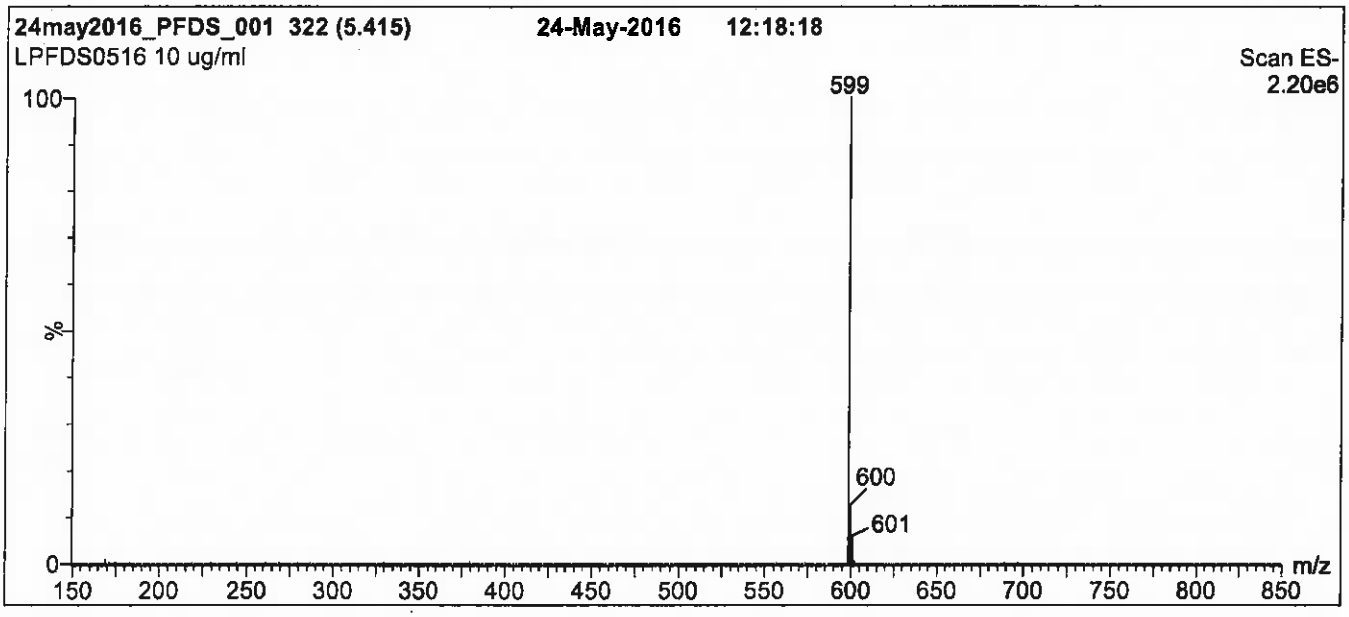
Figure 1: **L-PFDS; LC/MS Data (TIC and Mass Spectrum)**





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

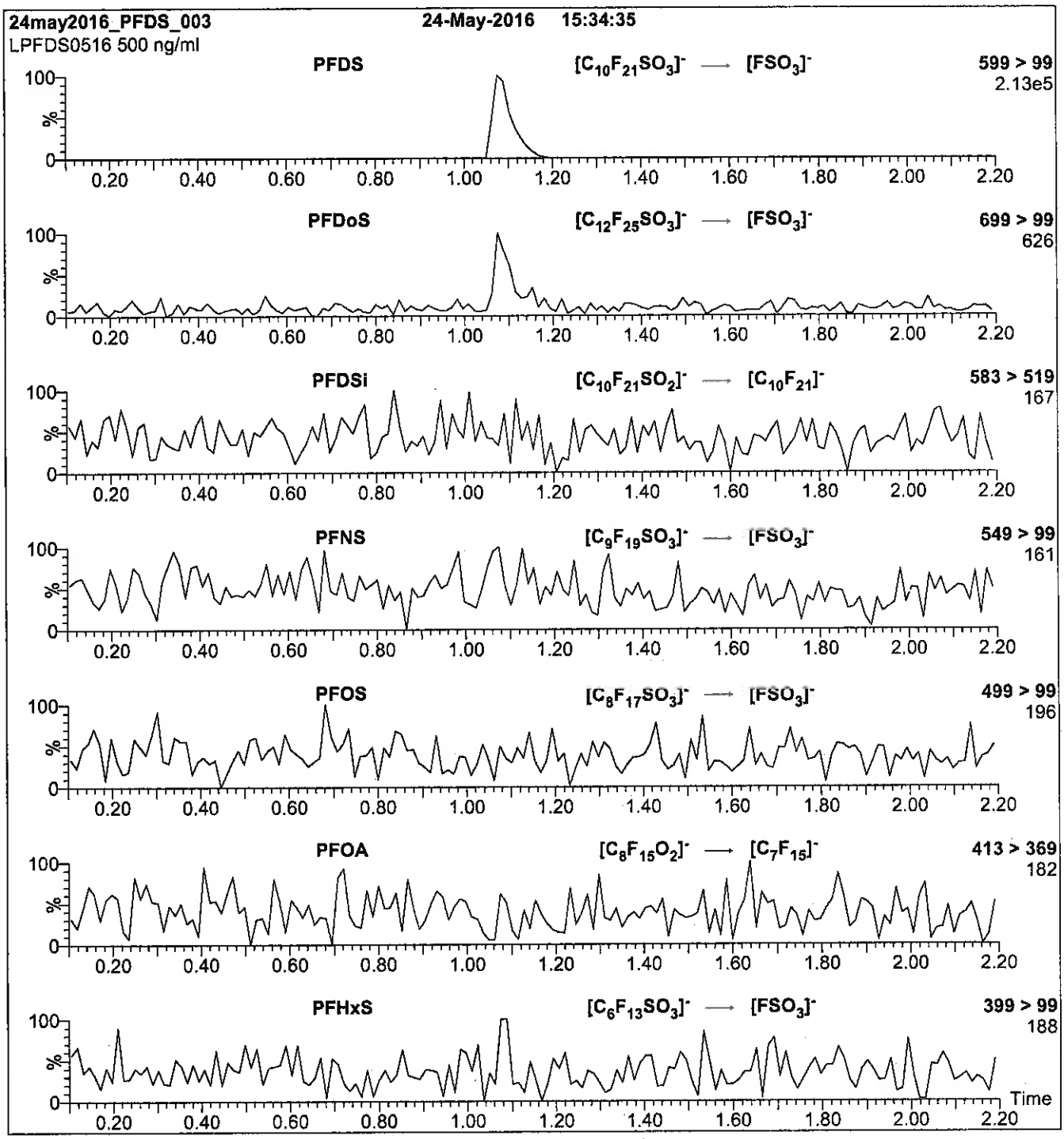
Flow: 300 µl/min

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

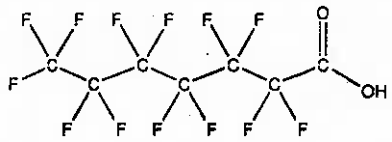
LCPFHpA_00008

P: 12/29/16 SGN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFHpA	**LOT NUMBER:**	PFHpA1216
COMPOUND:	Perfluoro-n-heptanoic acid		
STRUCTURE:		**CAS #:**	375-85-9



MOLECULAR FORMULA:	$C_7HF_{13}O_2$	**MOLECULAR WEIGHT:**	364.06
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/02/2016		
EXPIRY DATE: (mm/dd/yyyy)	12/02/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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CALA

ANAB ACCREDITED

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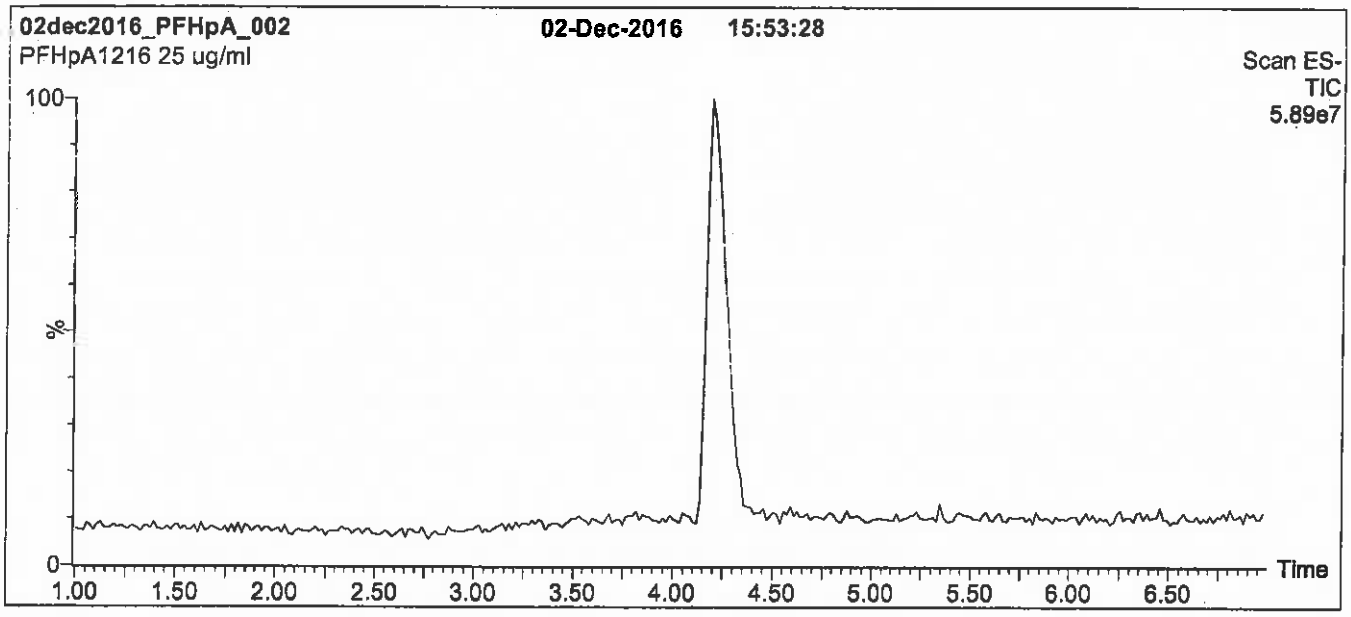
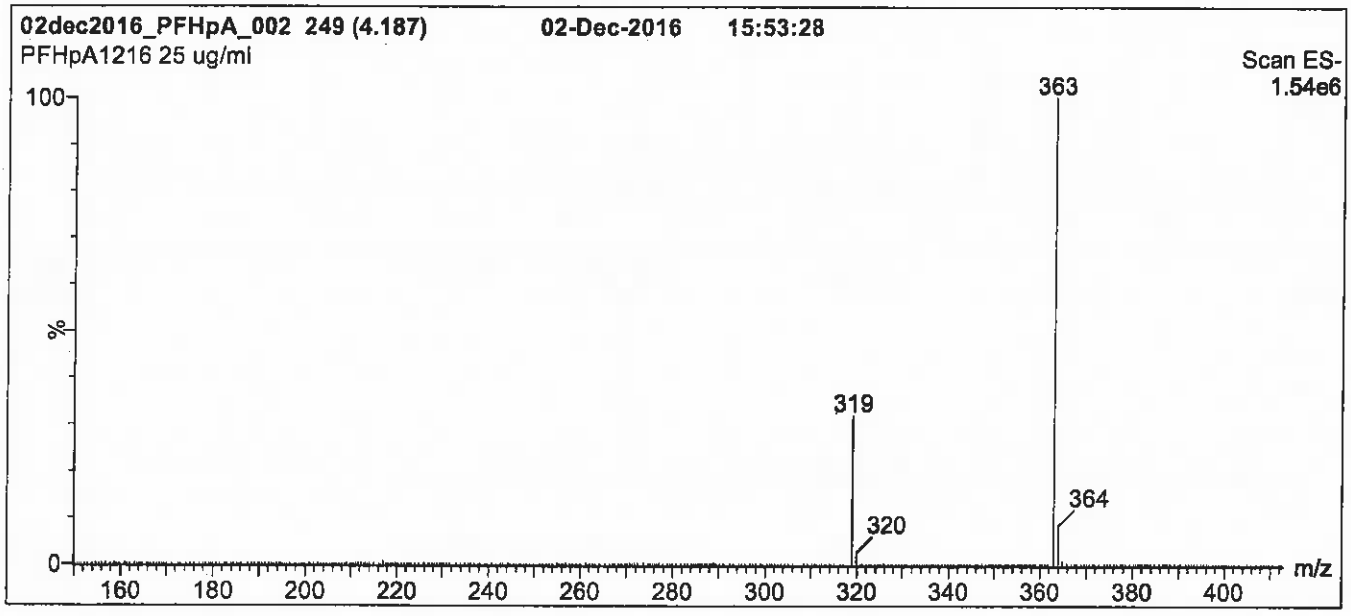
Figure 1: **PFHpA; LC/MS Data (TIC and Mass Spectrum)**





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: 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

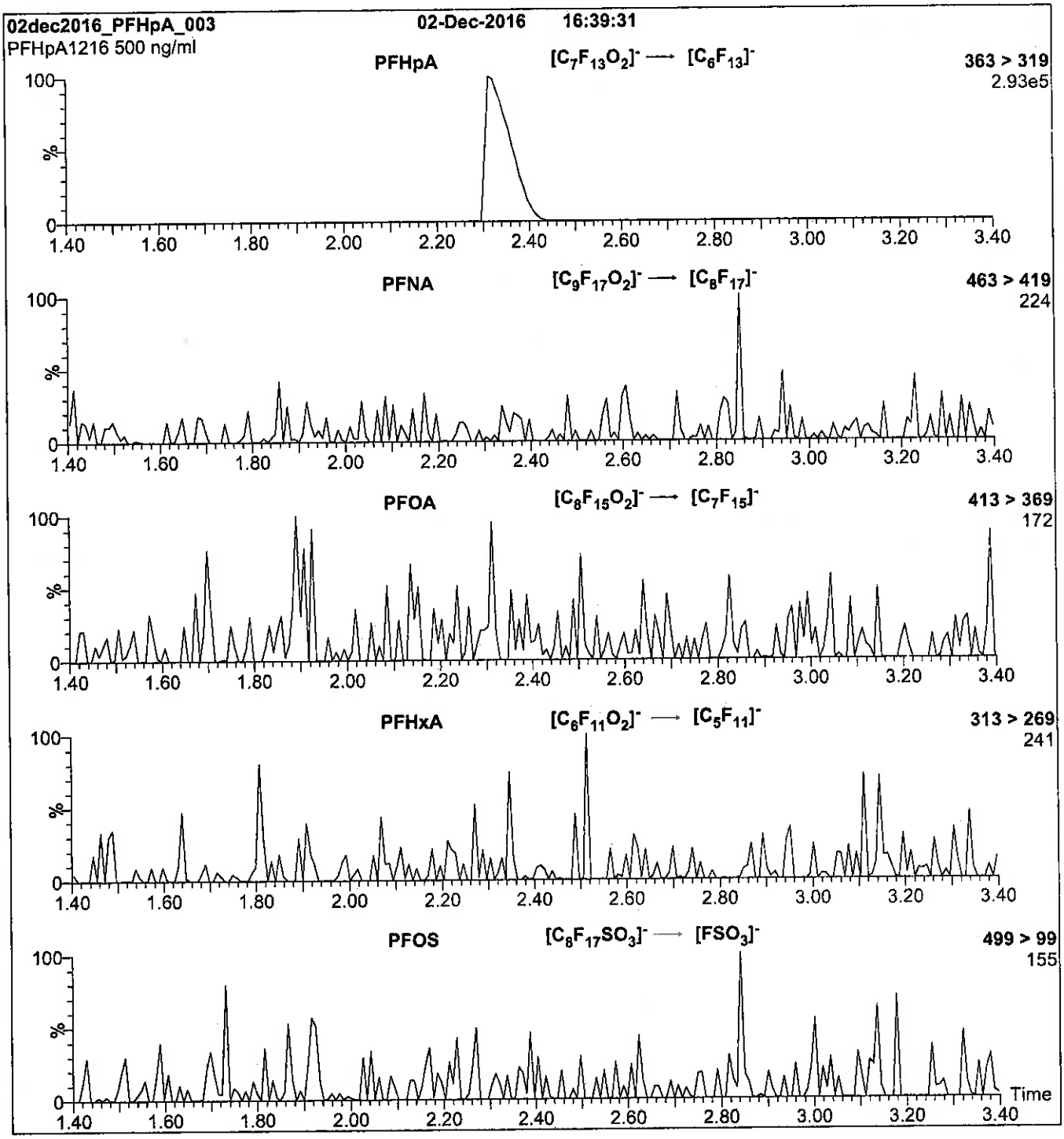
Flow: 300 µl/min

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

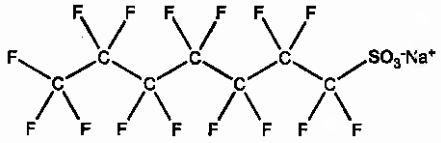
LCPFHpSA_00003

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

INTENDED USE:

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

HAZARDS:

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HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

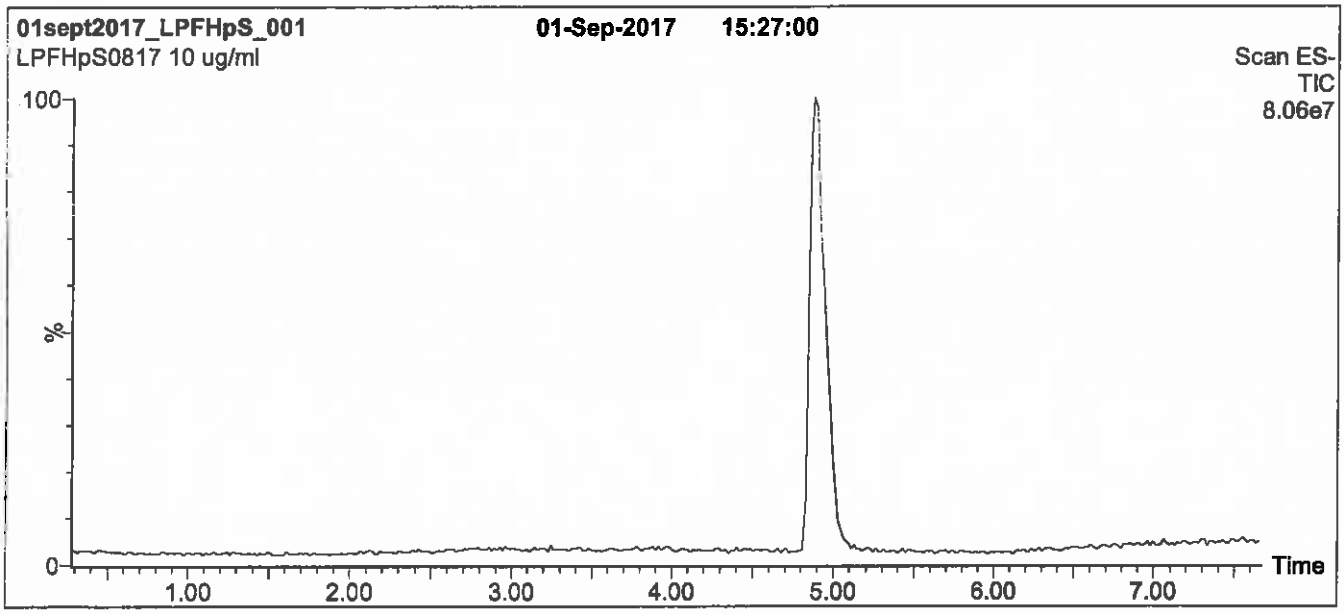
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

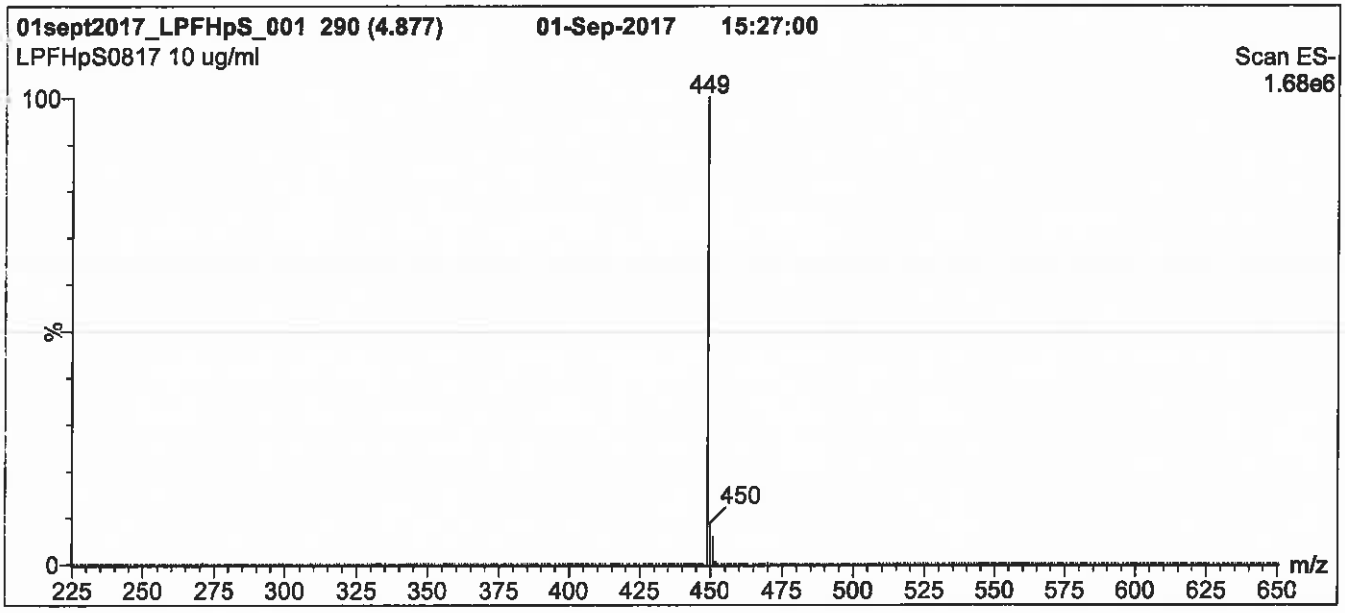
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold
for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

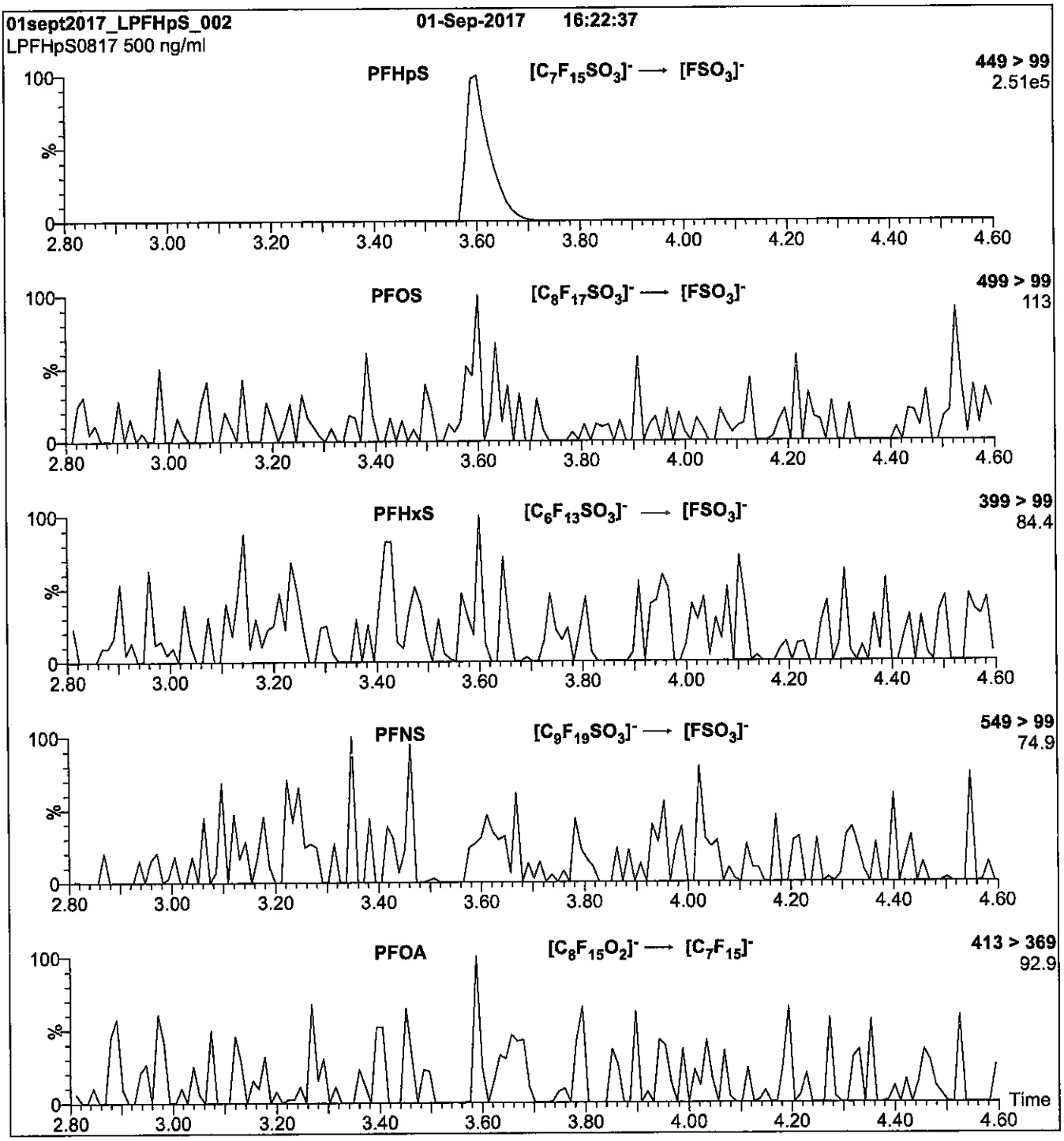
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 35

Reagent

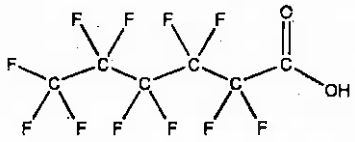
LCPFHxA_00007

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:

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EXPIRY DATE / PERIOD OF VALIDITY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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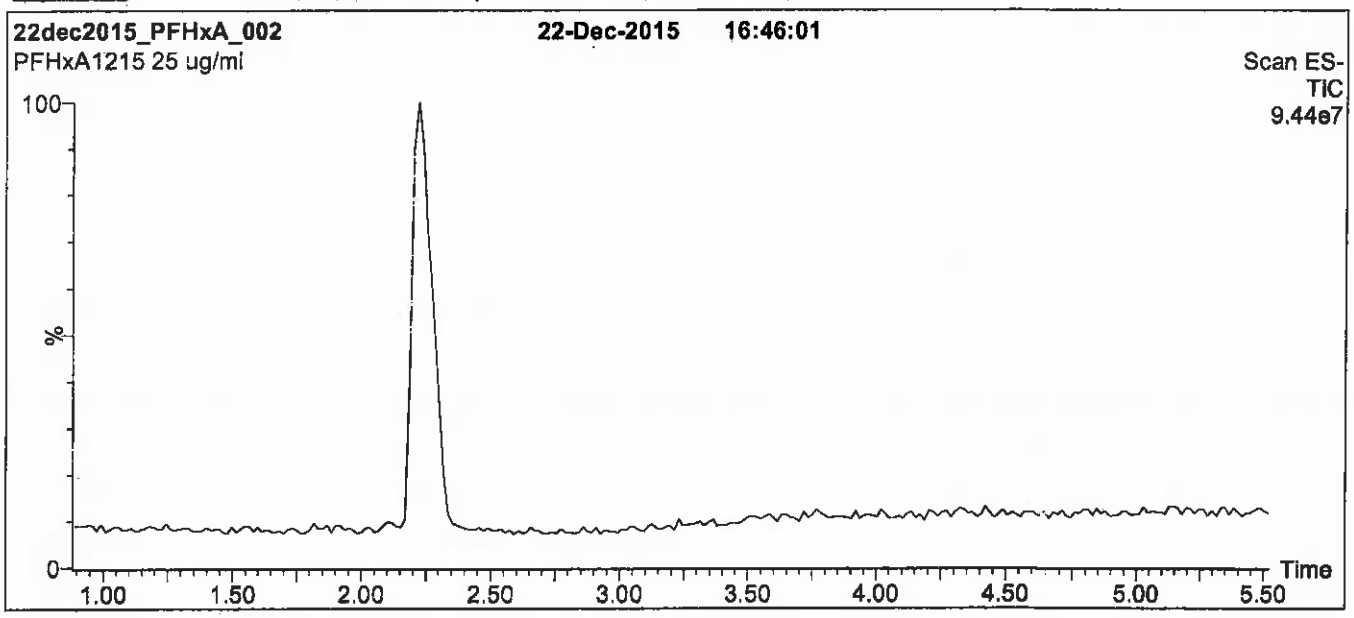
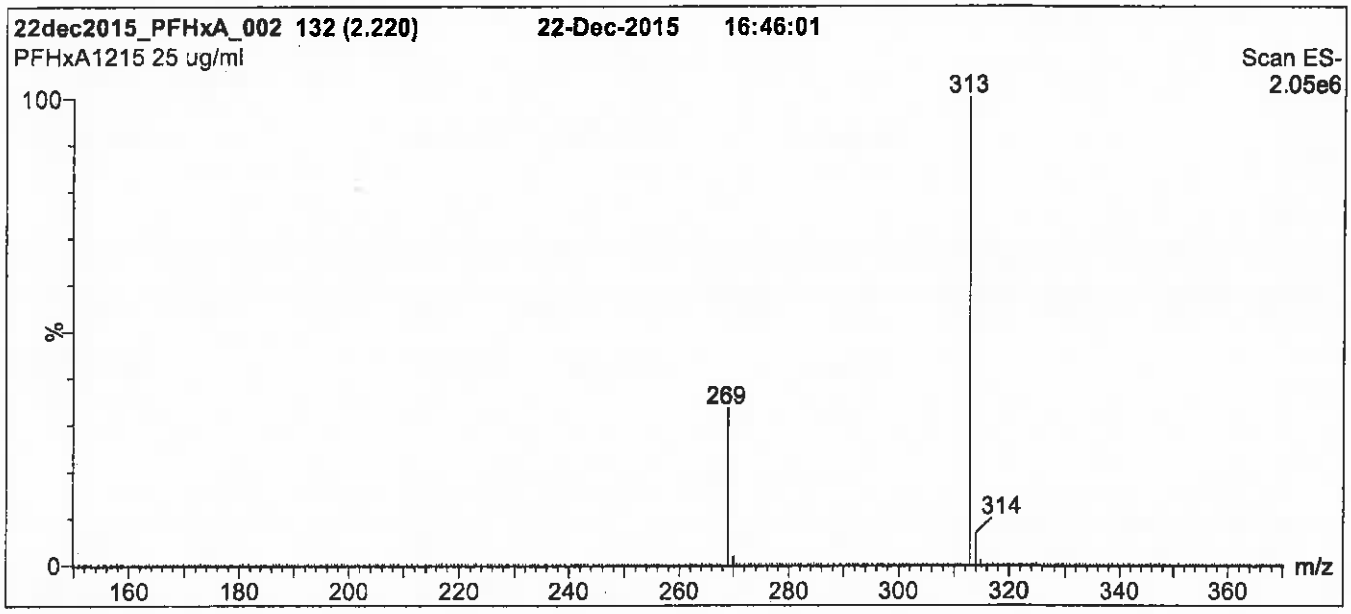
Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





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

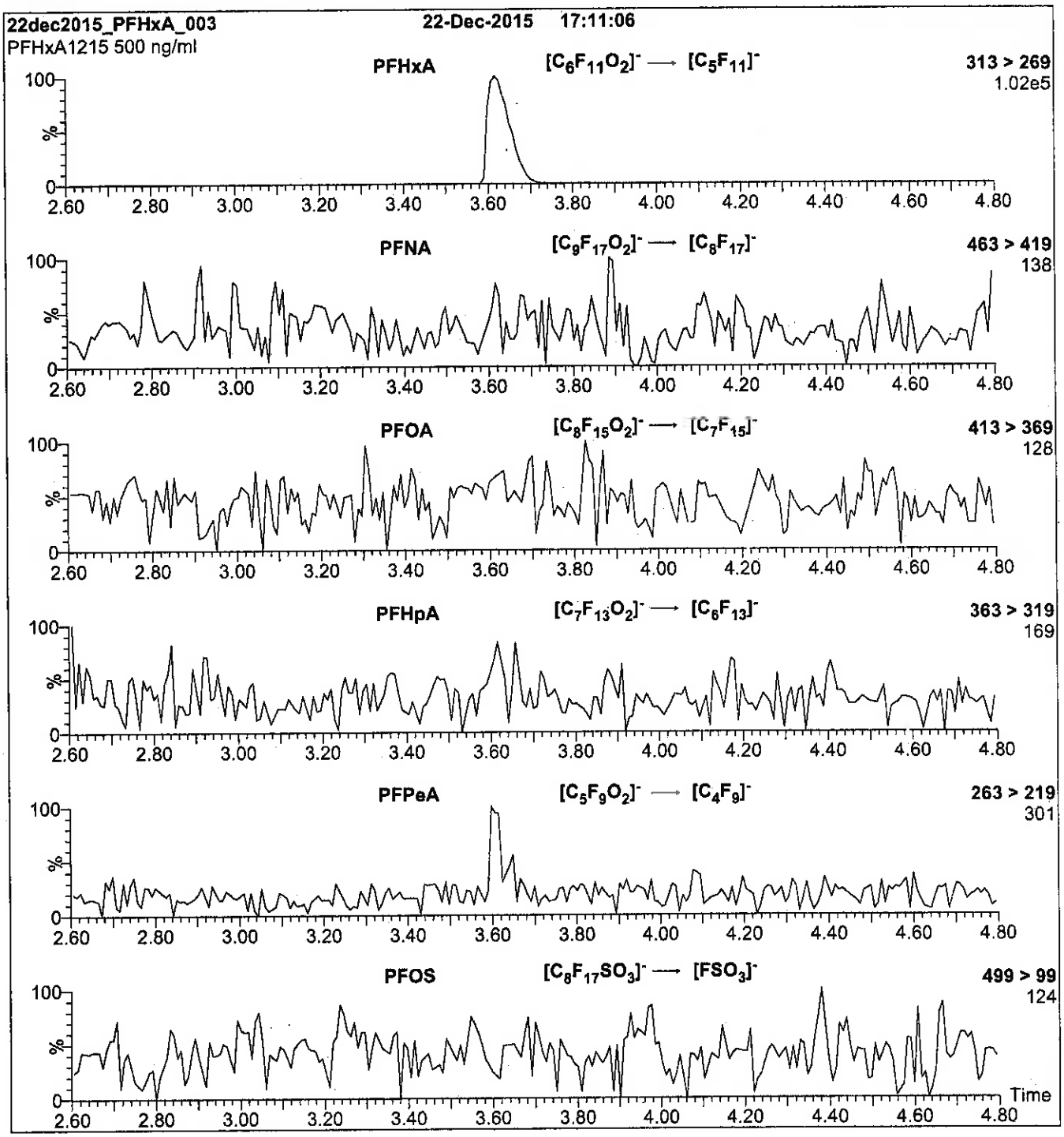
Flow: 300 µl/min

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

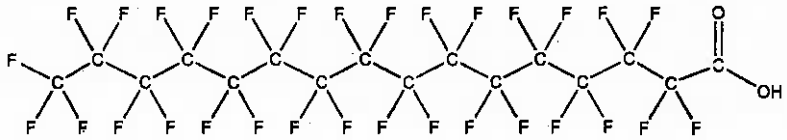
LCPFHxDA_00008

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



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
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CALA

ANAB ACCREDITED

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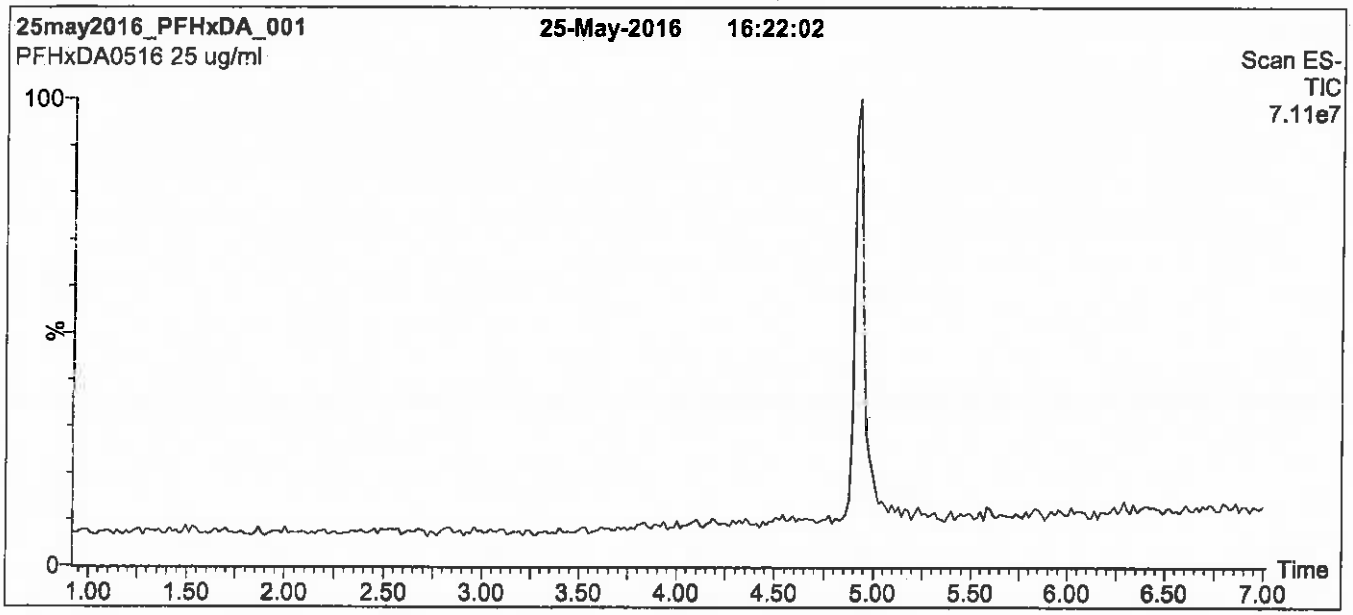
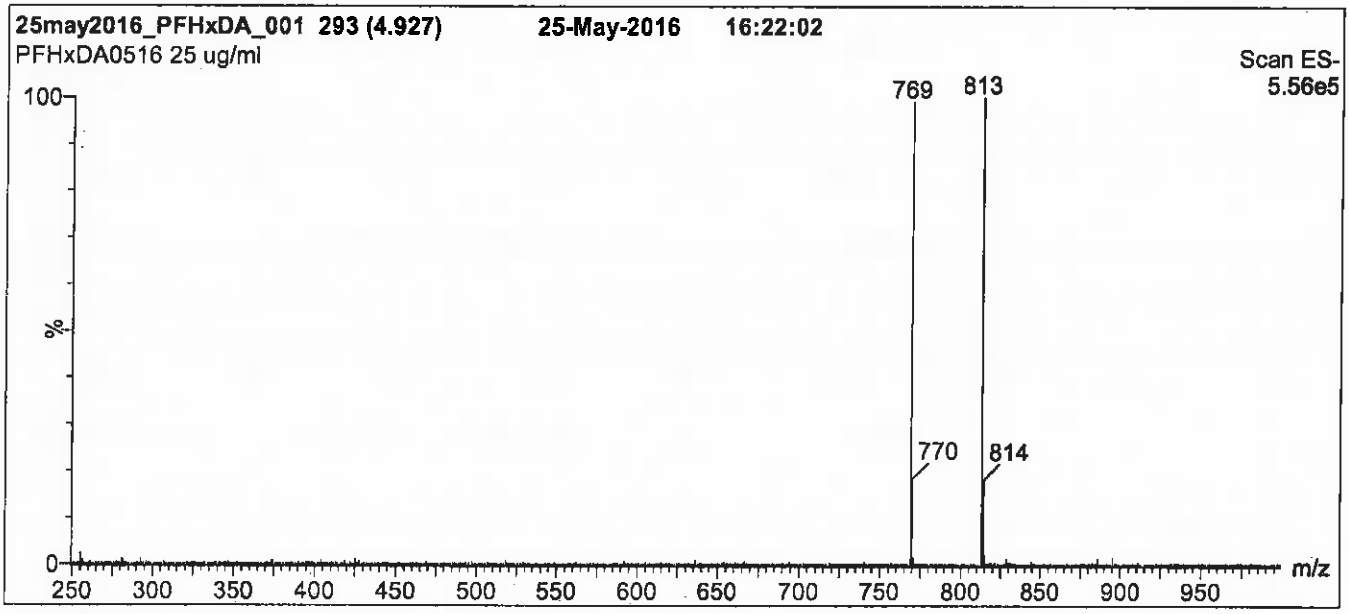
Figure 1: **PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





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

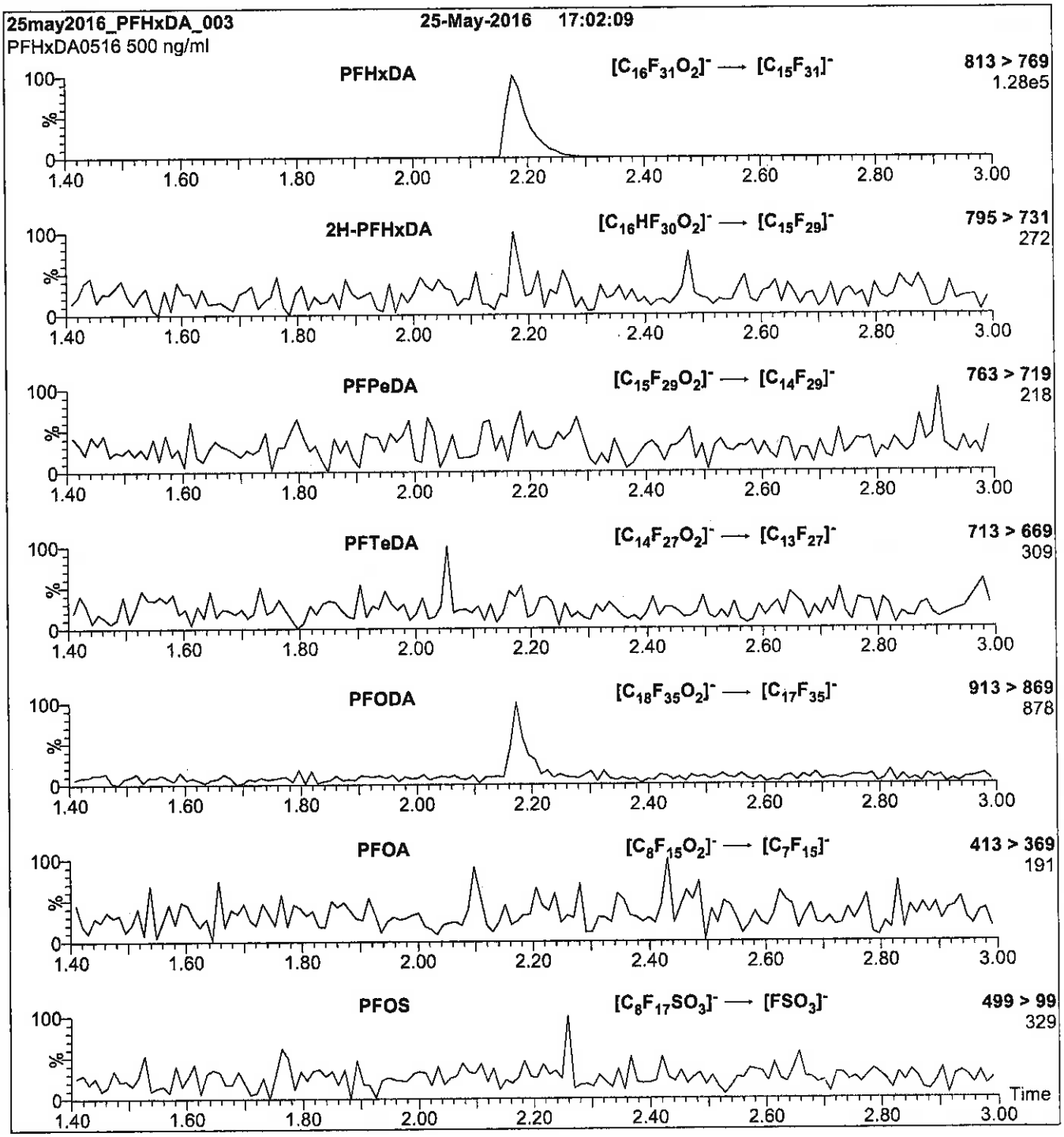
Flow: 300 µl/min

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

LCPFHxS-br_00004

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.

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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 REFERENCE MATERIAL PRODUCER

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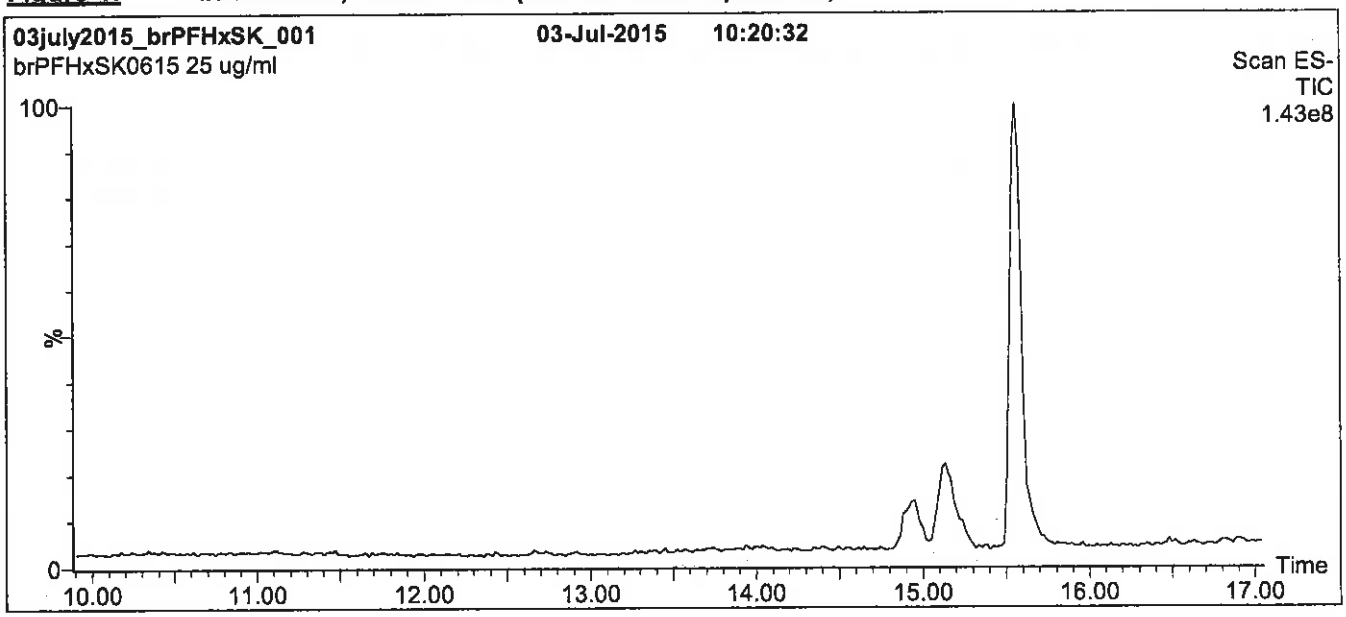
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

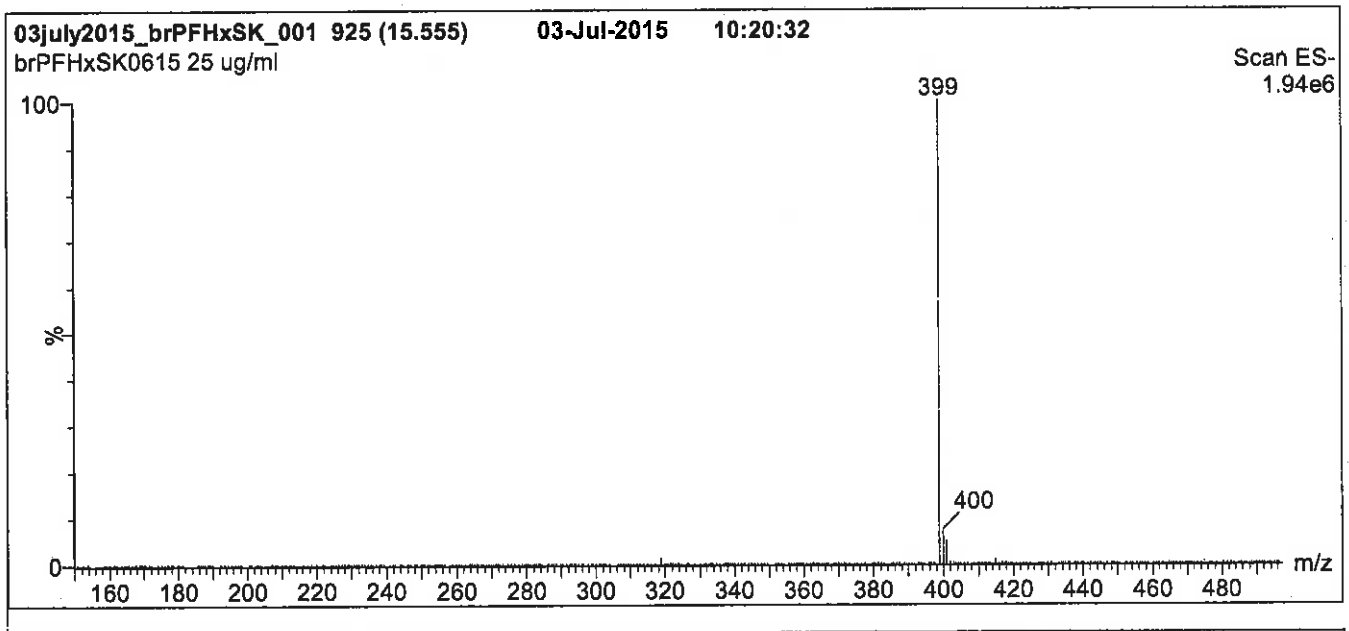
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

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

Certified By: _____ **Date:** 09/27/2016
B.G. Chittim (mm/dd/yyyy)

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

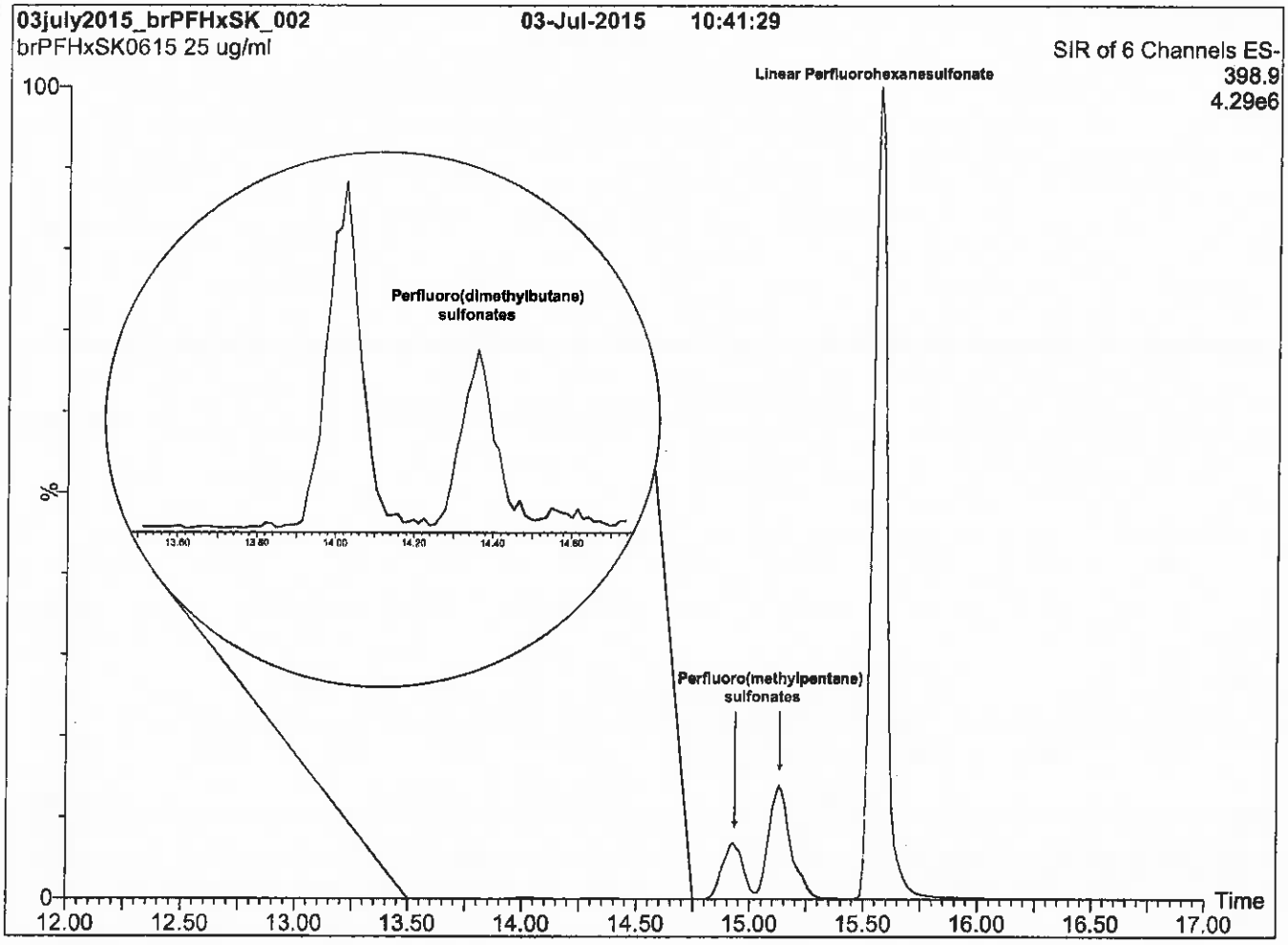
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Figure 2: **br-PFHxSK; LC/MS Data**



Conditions for Figure 2:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

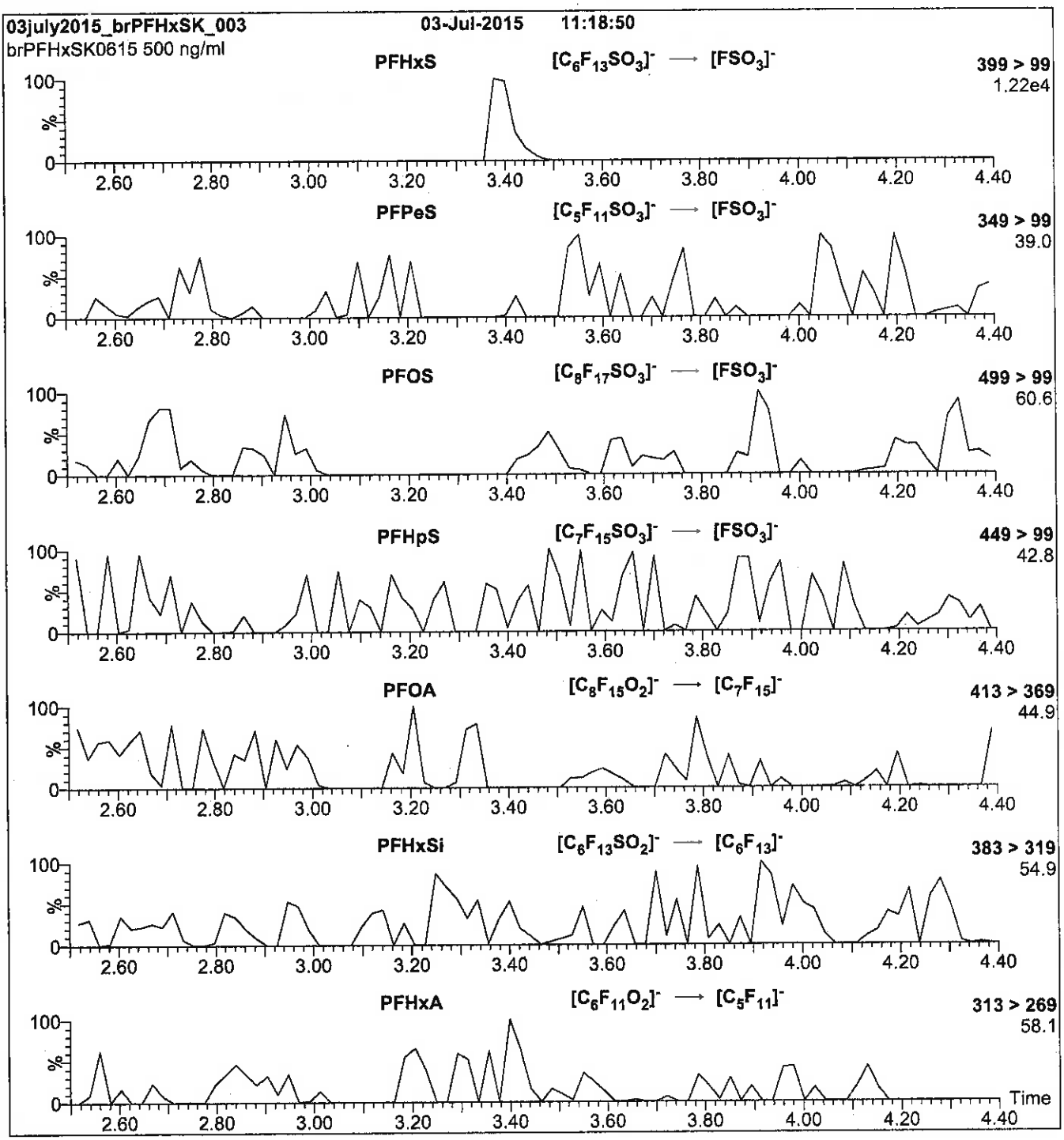
Flow: 300 µl/min

MS Parameters

Experiment: SIR (6 channels)

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

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



Conditions for Figure 3:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

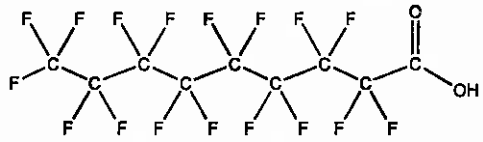
LCPFNA_00009

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

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CALA

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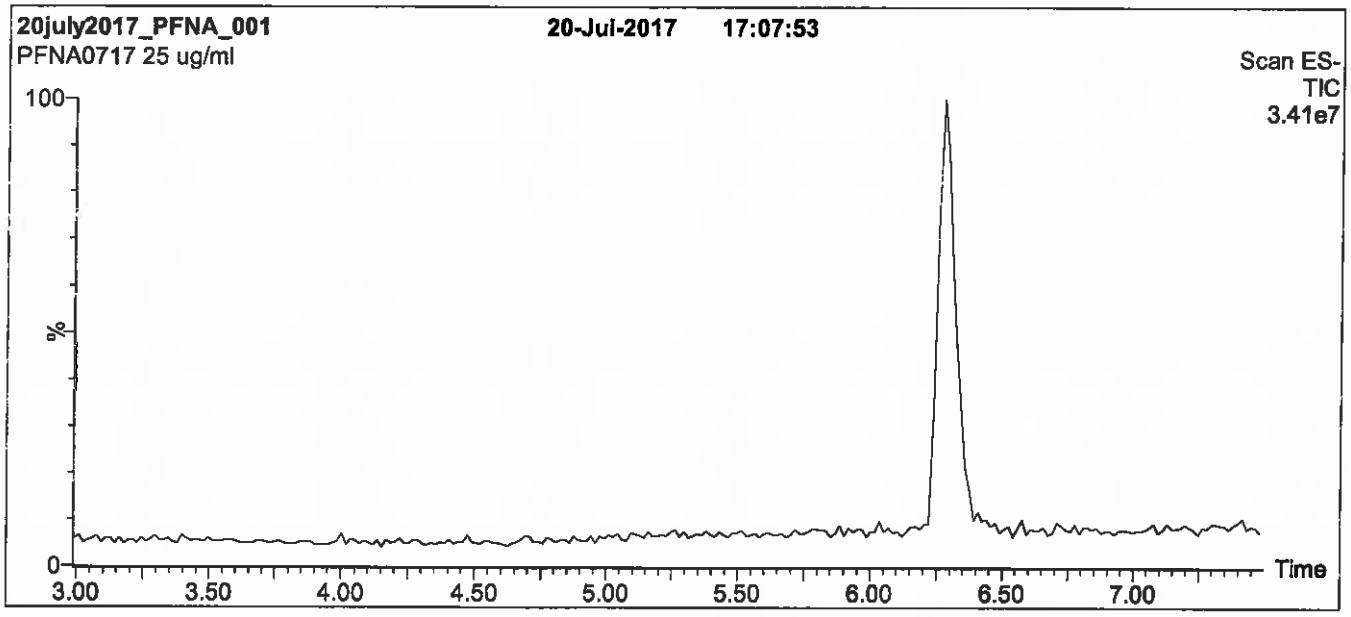

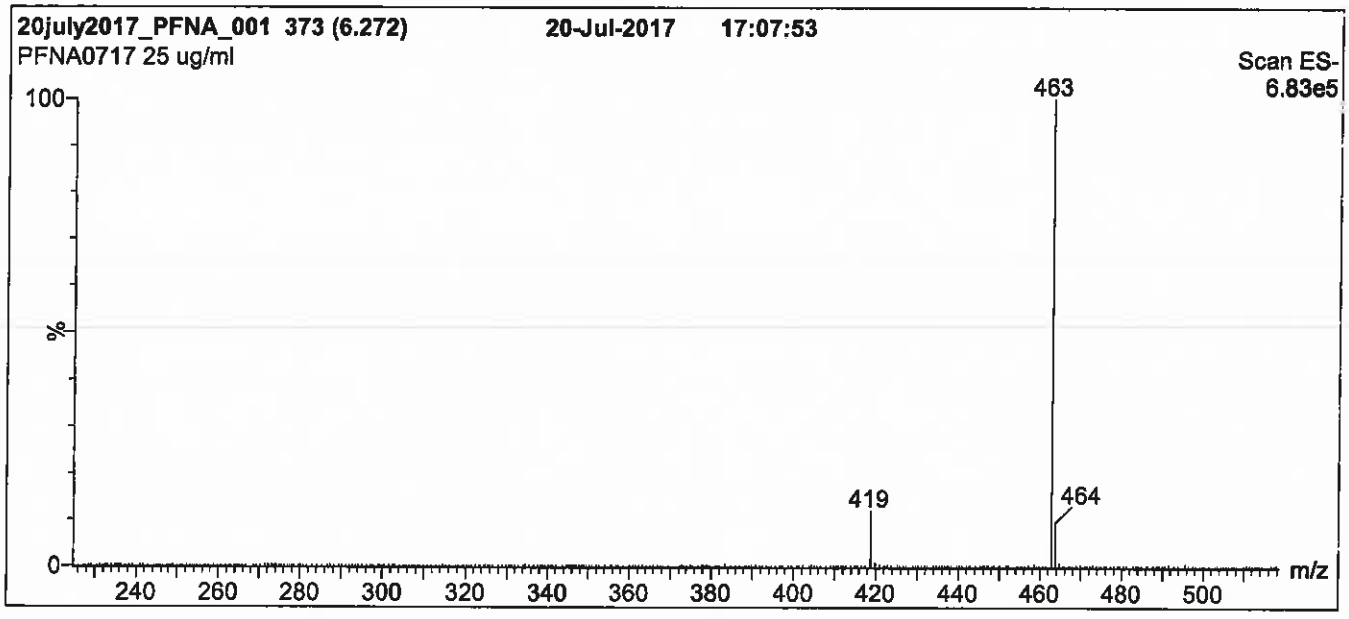

Conditions for Figure 1:

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)
Hold for 1 min. Ramp to 90% organic over 7 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
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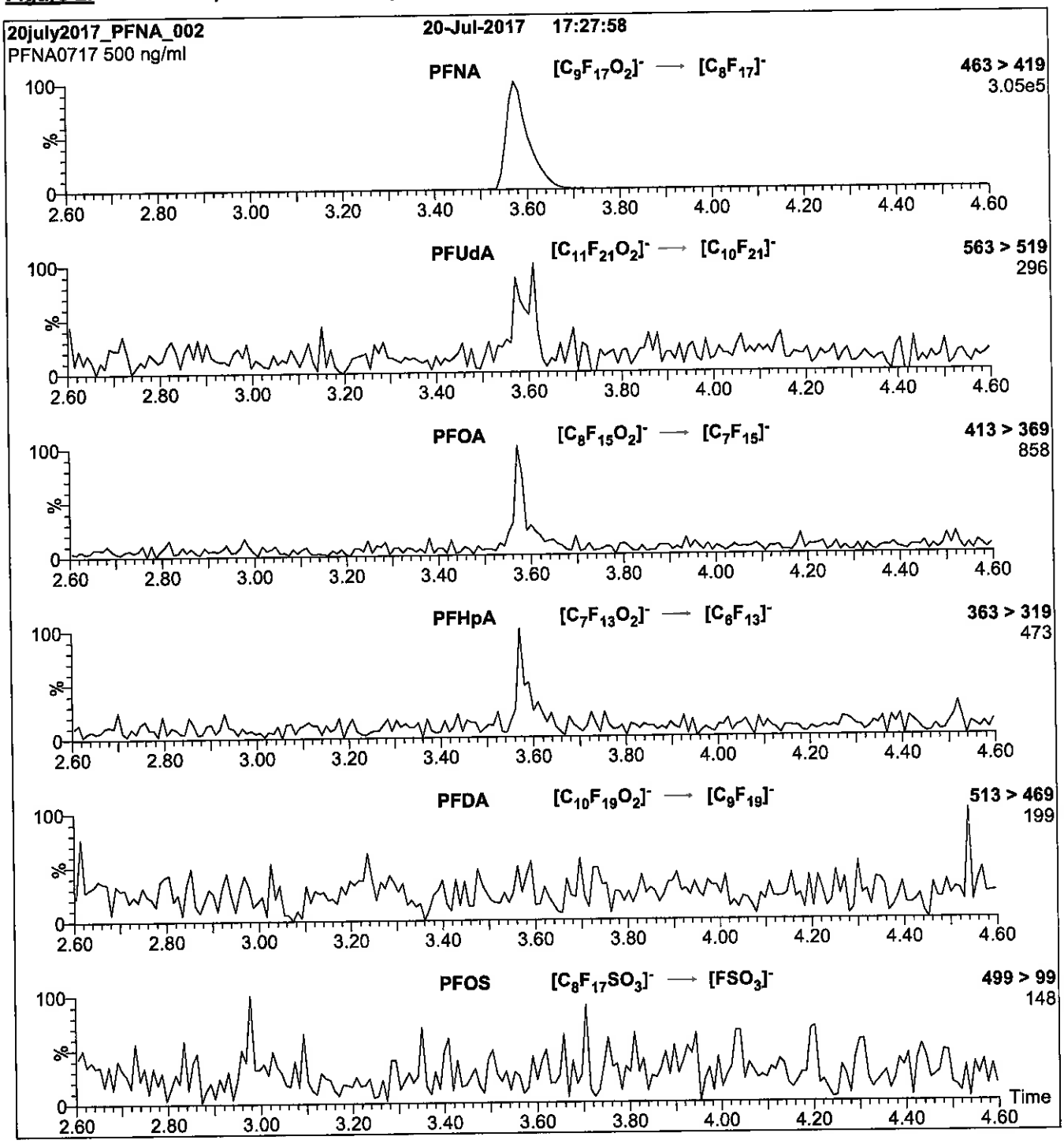
Figure 2: **PFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFNS_00003

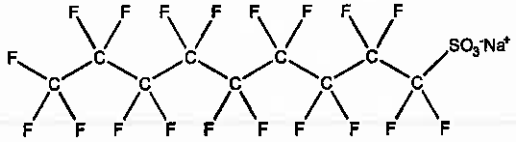
1106804
ID: LCPFNS_00003
Exp: 09/27/22 Prpd: SKV
L-PFNS at 48.0ug/mL

R: 12/4/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFNS	**LOT NUMBER:**	LPFNS0917
COMPOUND:	Sodium perfluoro-1-nonanesulfonate		
STRUCTURE:		**CAS #:**	98789-57-2



MOLECULAR FORMULA:	$C_9F_{19}SO_3Na$	**MOLECULAR WEIGHT:**	572.12
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.0 ± 2.4 µg/ml (PFNS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/27/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/27/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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CALA

ANAB ACCREDITED

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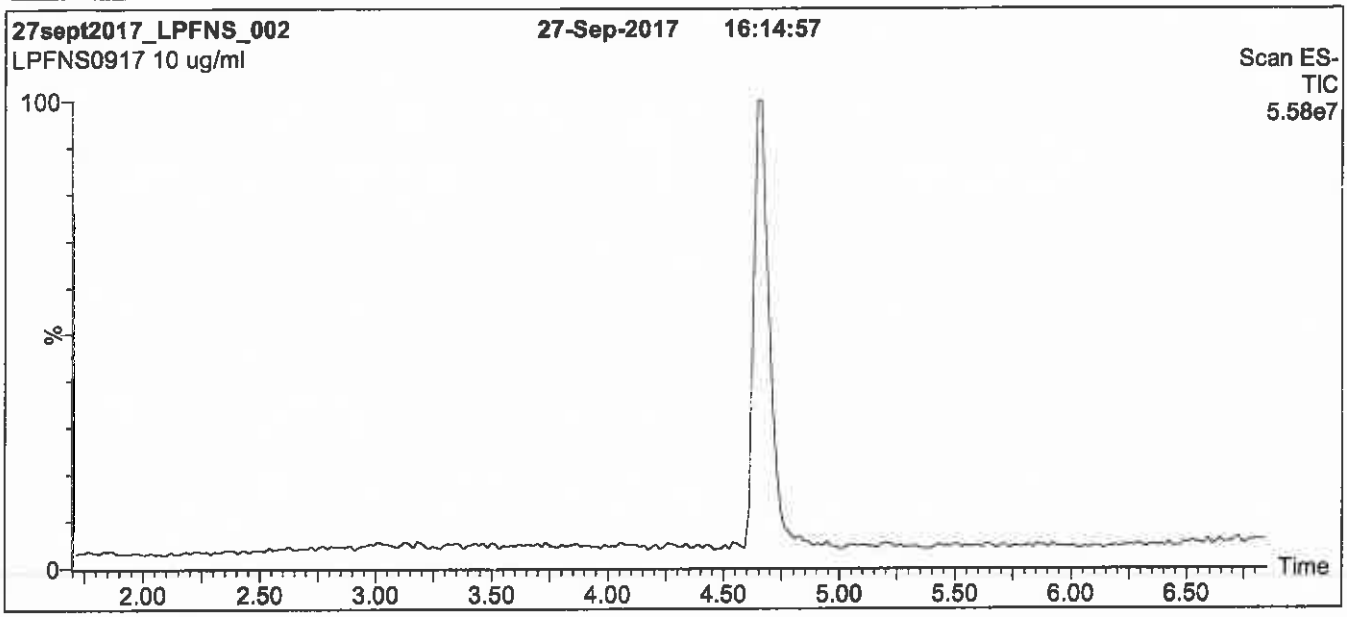
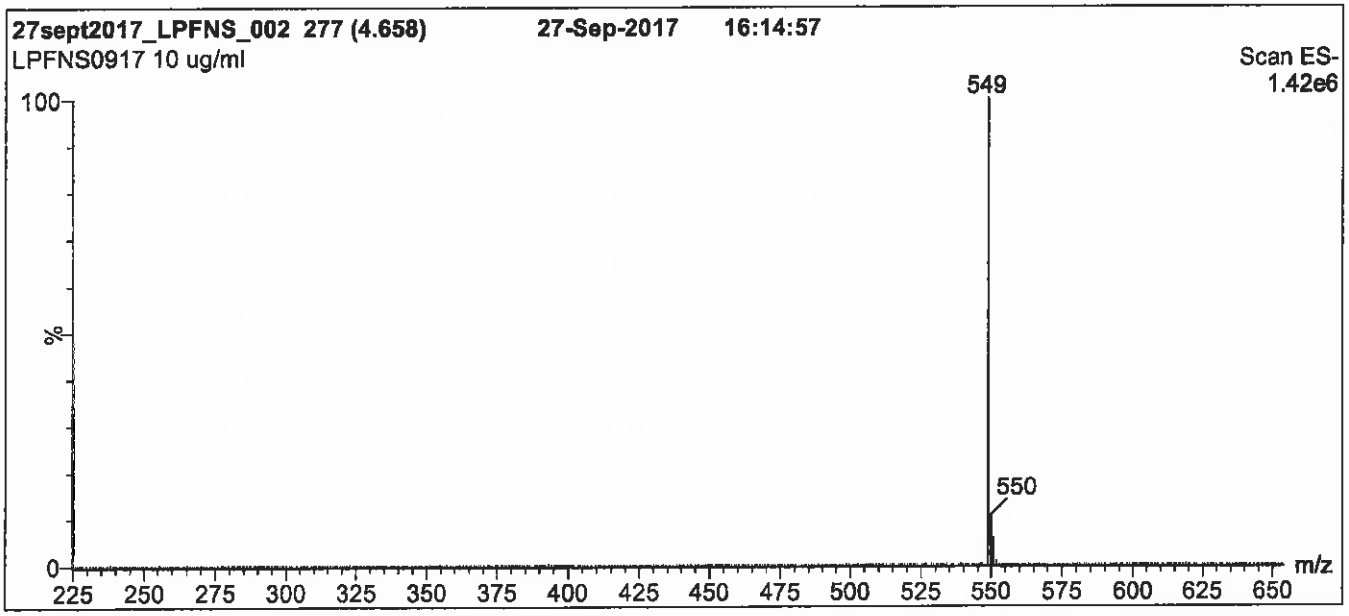
Figure 1: **L-PFNS; LC/MS Data (TIC and Mass Spectrum)**





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
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(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

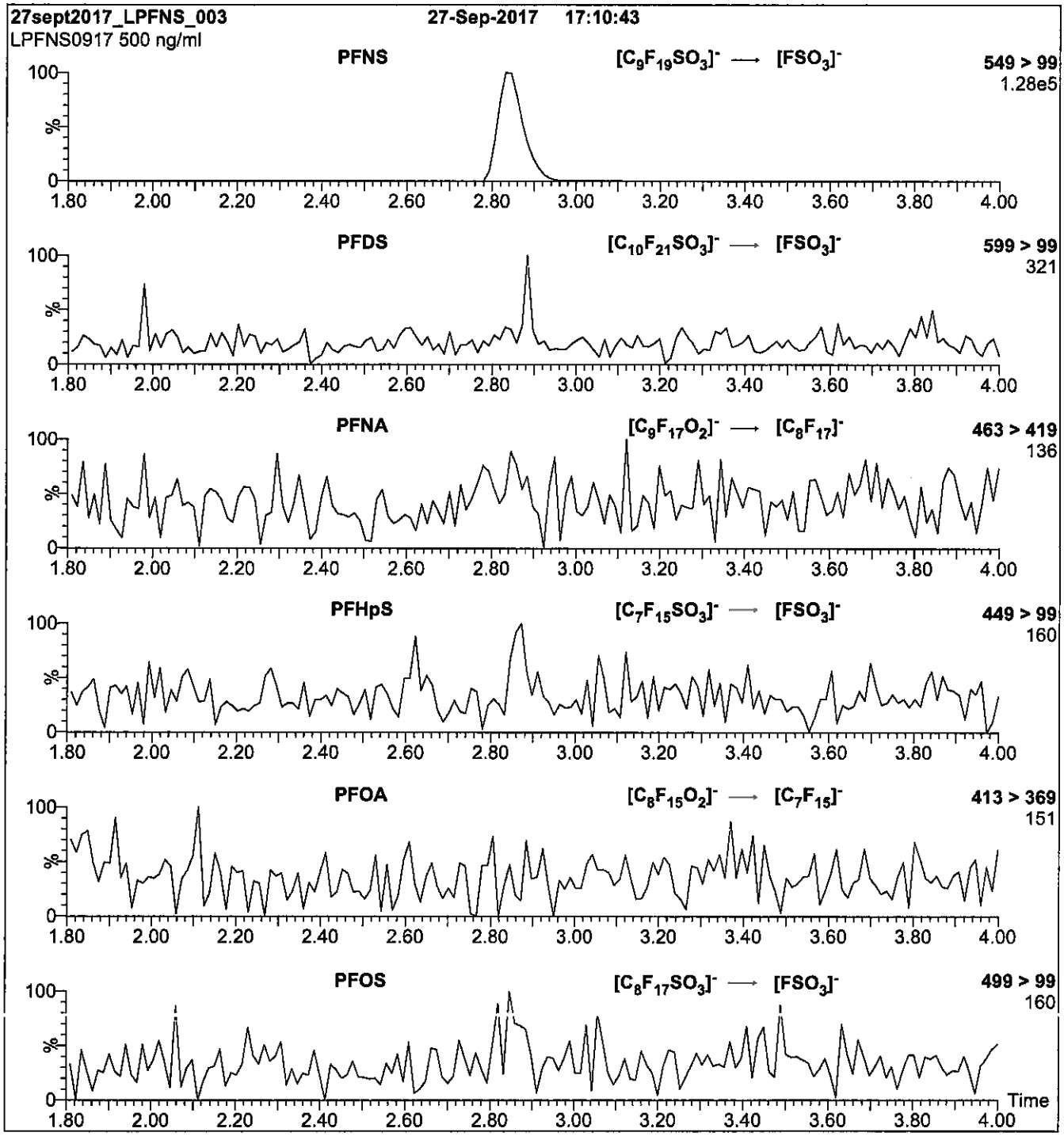
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 45

Reagent

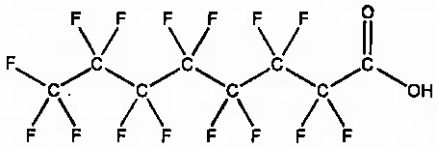
LCPFOA_00008

r: 12/21/16 SPV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFOA	**LOT NUMBER:**	PFOA0716
COMPOUND:	Perfluoro-n-octanoic acid		
STRUCTURE:		**CAS #:**	335-67-1



MOLECULAR FORMULA:	$C_8HF_{15}O_2$	**MOLECULAR WEIGHT:**	414.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	08/02/2016		
EXPIRY DATE: (mm/dd/yyyy)	08/02/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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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,...x_n on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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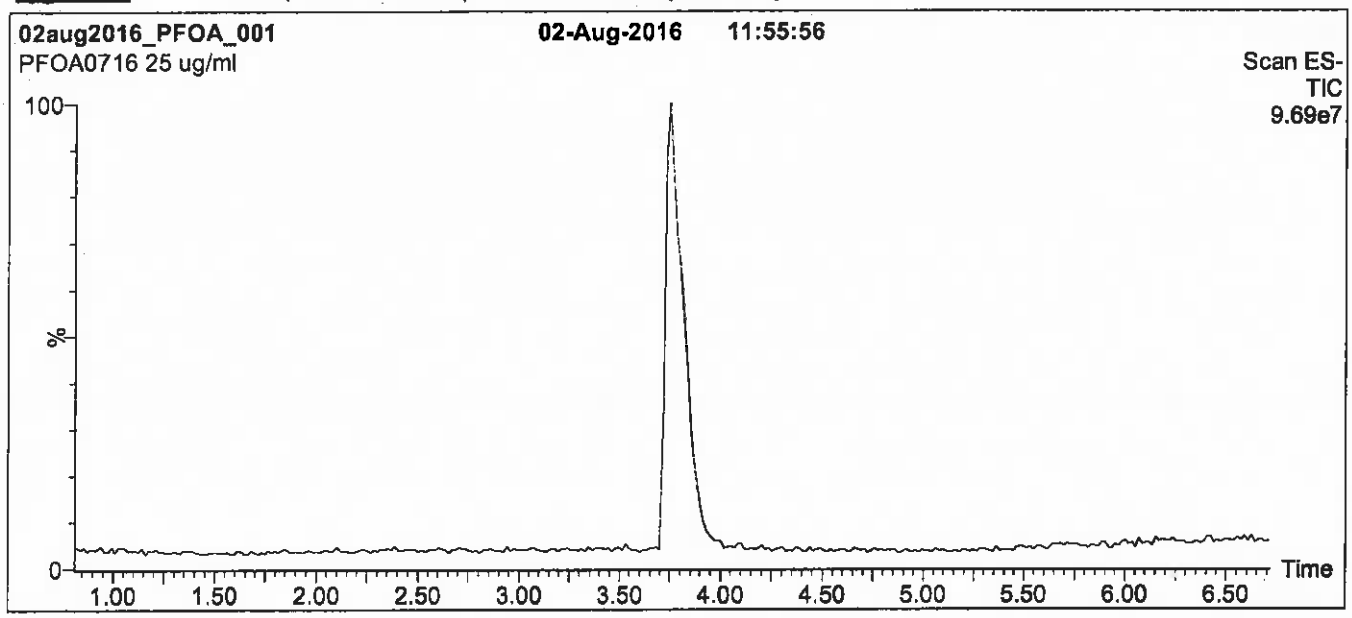
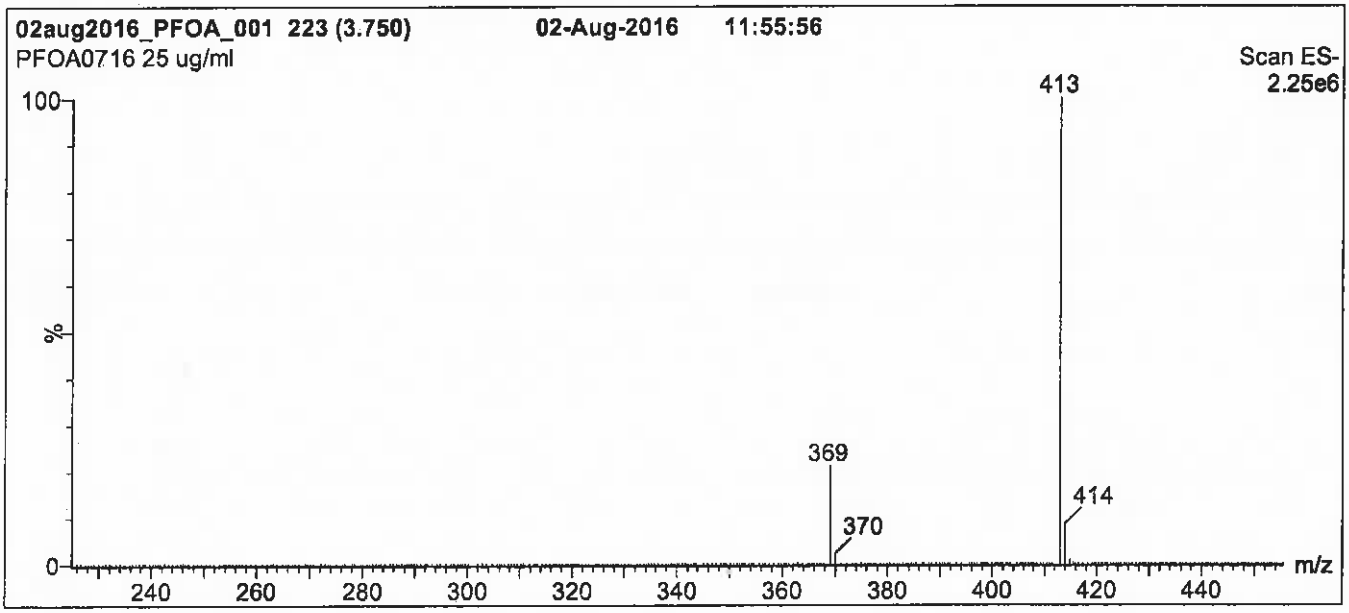
Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

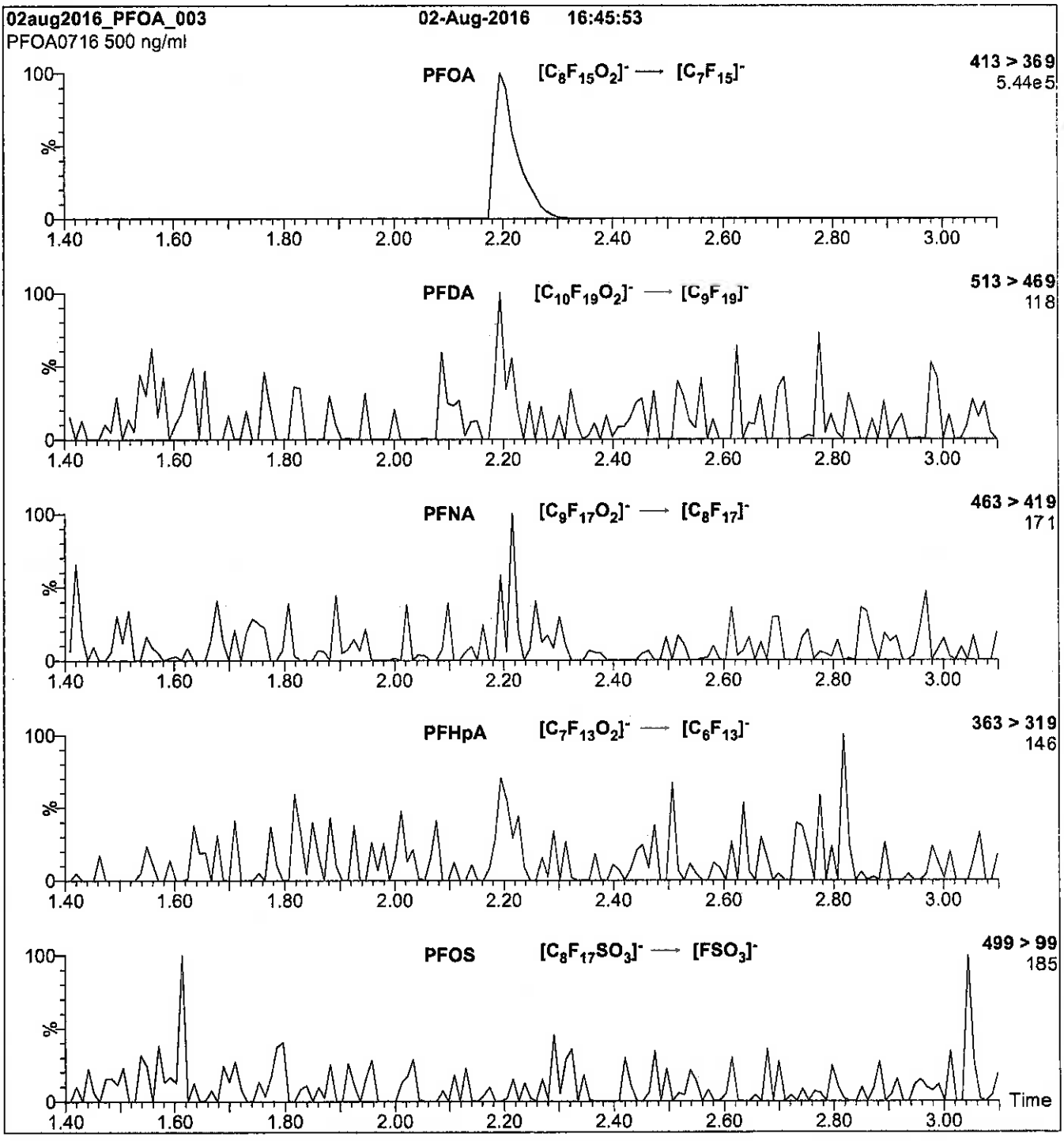
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

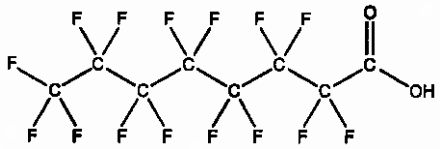
LCPFOA_00009

P: 10/2017 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFOA	**LOT NUMBER:**	PFOA0917
COMPOUND:	Perfluoro-n-octanoic acid		
STRUCTURE:		**CAS #:**	335-67-1



MOLECULAR FORMULA:	$C_8HF_{15}O_2$	**MOLECULAR WEIGHT:**	414.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/27/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/27/2022		
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:** 09/28/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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

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

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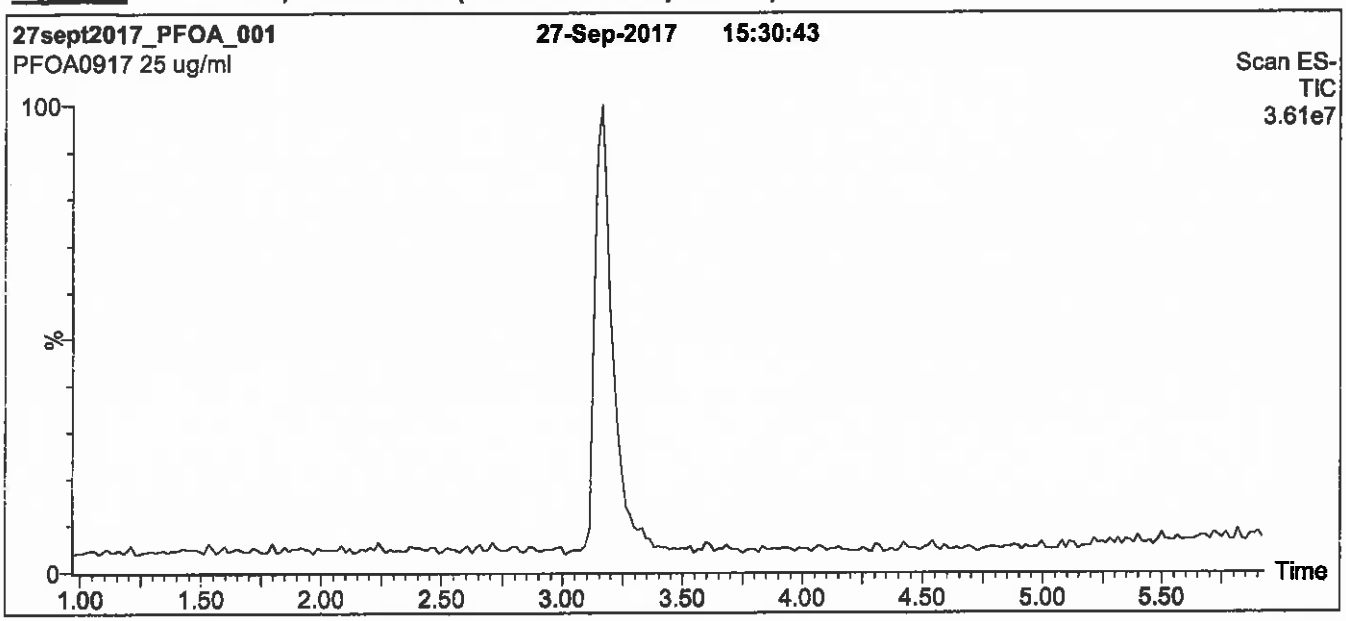
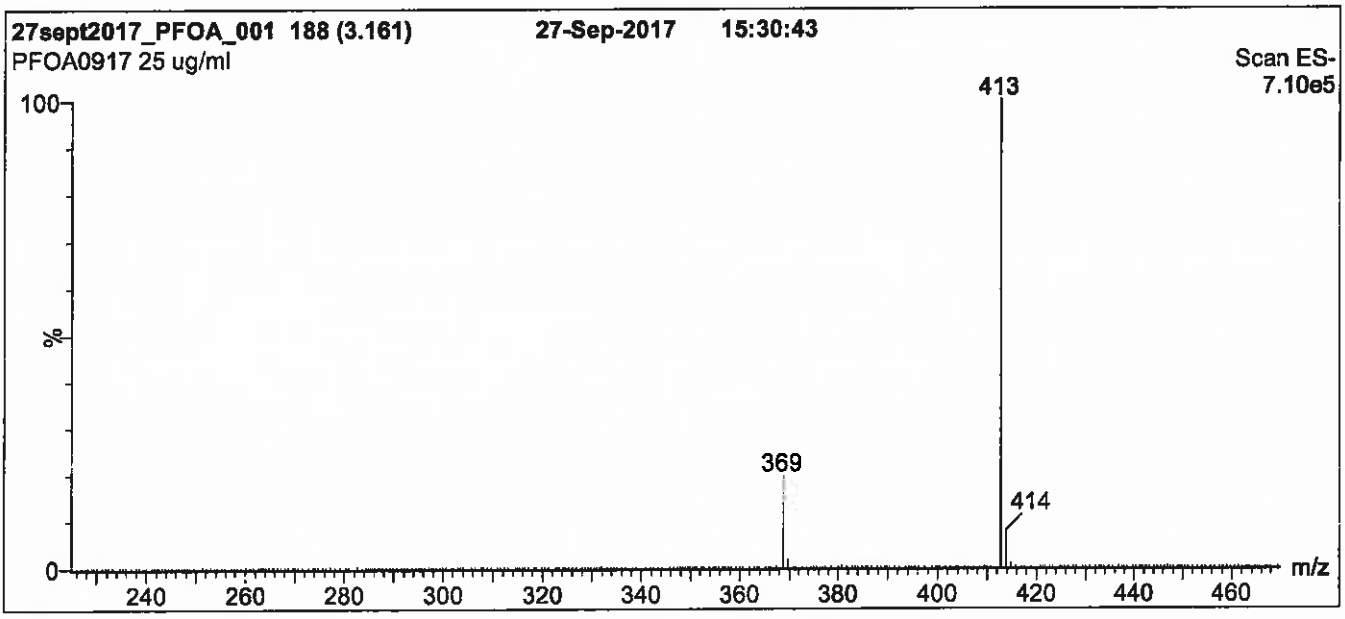




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

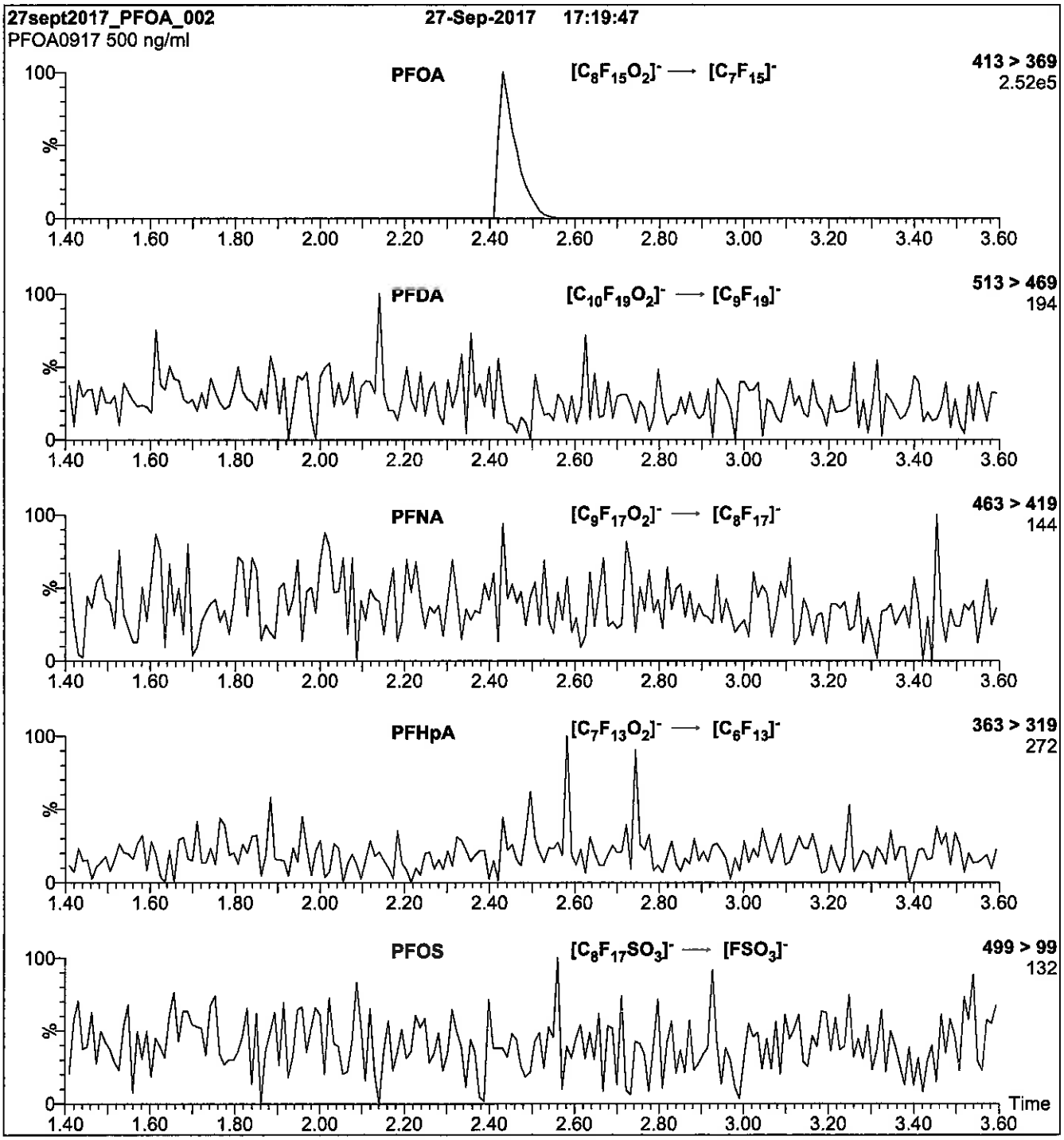
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 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) = 3.46e-3
Collision Energy (eV) = 11

Reagent

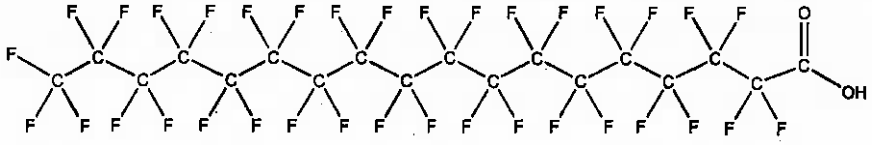
LCPFODA_00008

R: 12/20/16 SFN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



MOLECULAR FORMULA:	$C_{18}HF_{35}O_2$	**MOLECULAR WEIGHT:**	914.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	04/29/2016		
EXPIRY DATE: (mm/dd/yyyy)	04/29/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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Certified By: B.G. Chittim **Date:** 05/20/2016 (mm/dd/yyyy)

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CALA

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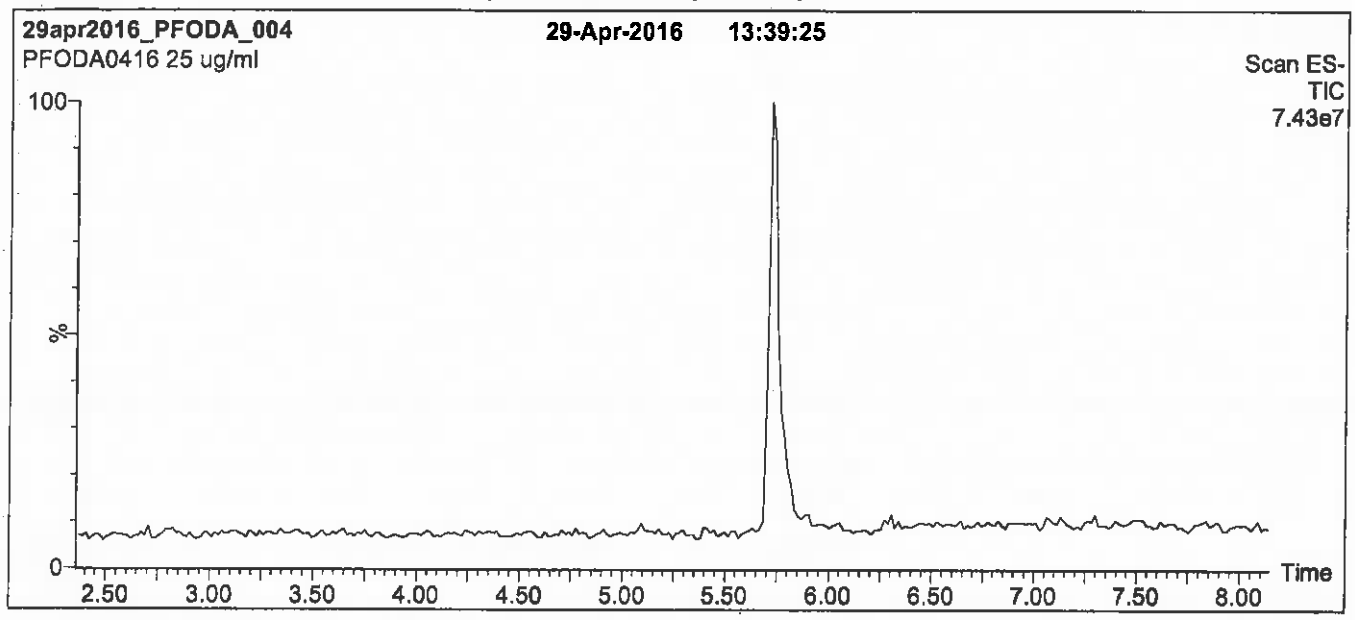
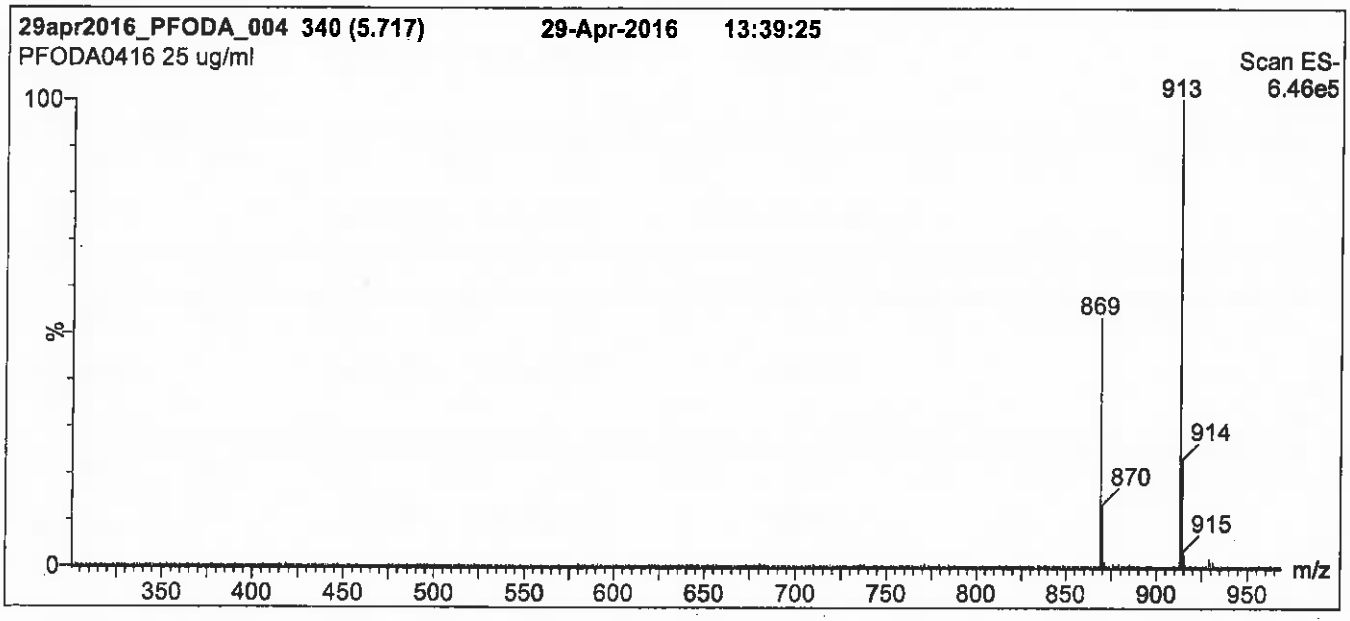
Figure 1: **PFODA; LC/MS Data (TIC and Mass Spectrum)**





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

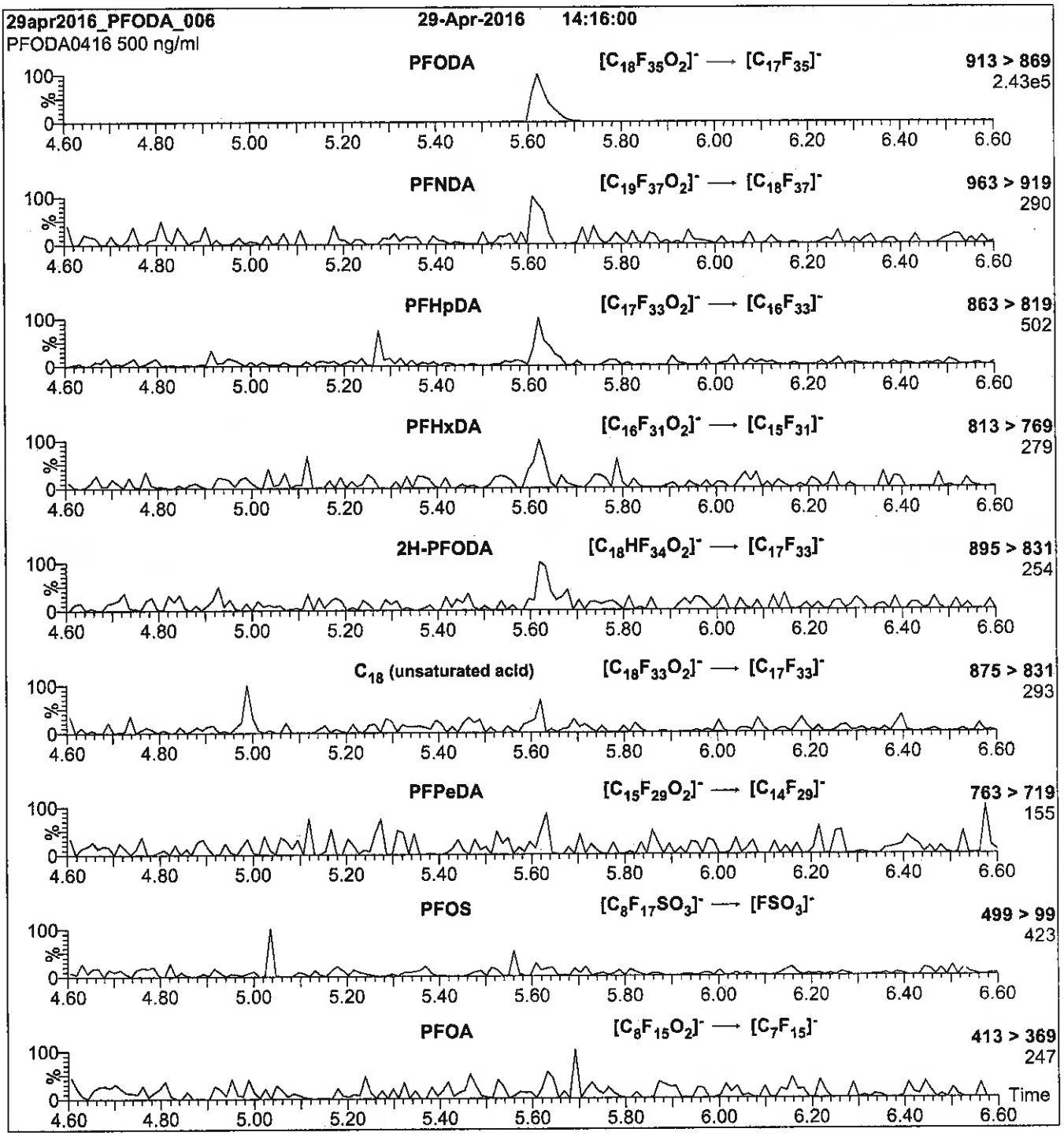
Flow: 300 µl/min

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

LCPFOS-br_00004

r: R/20/16 STD

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

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

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CALA

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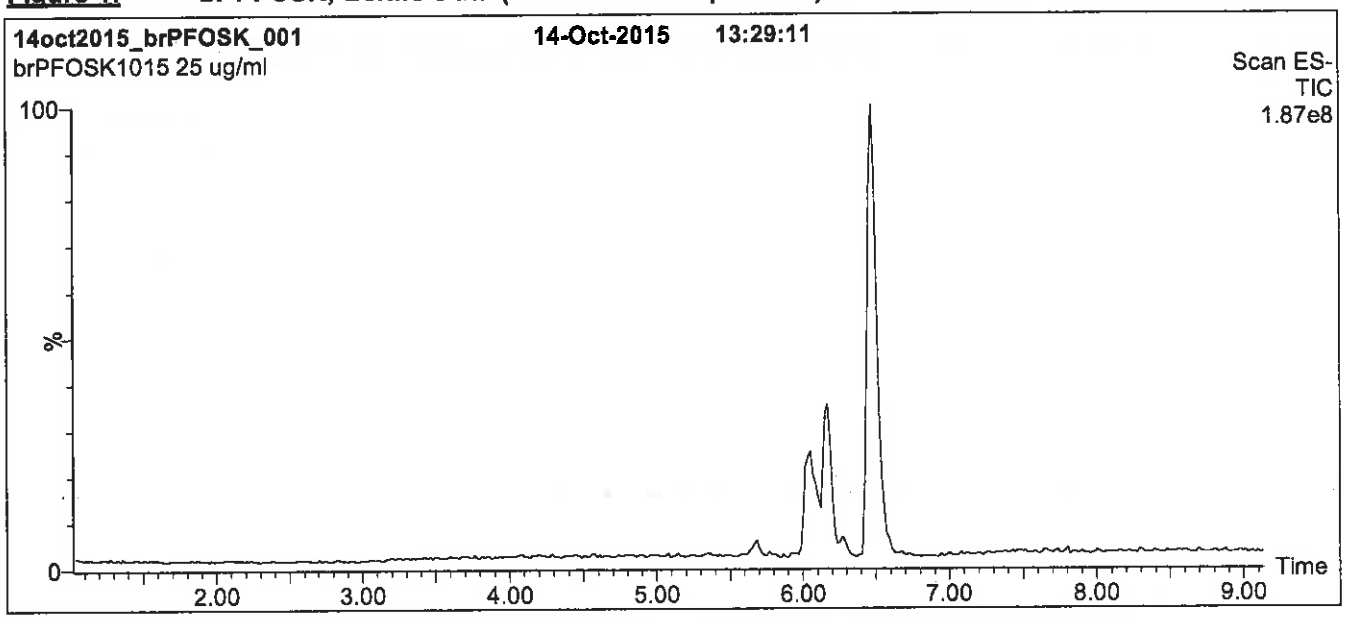
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

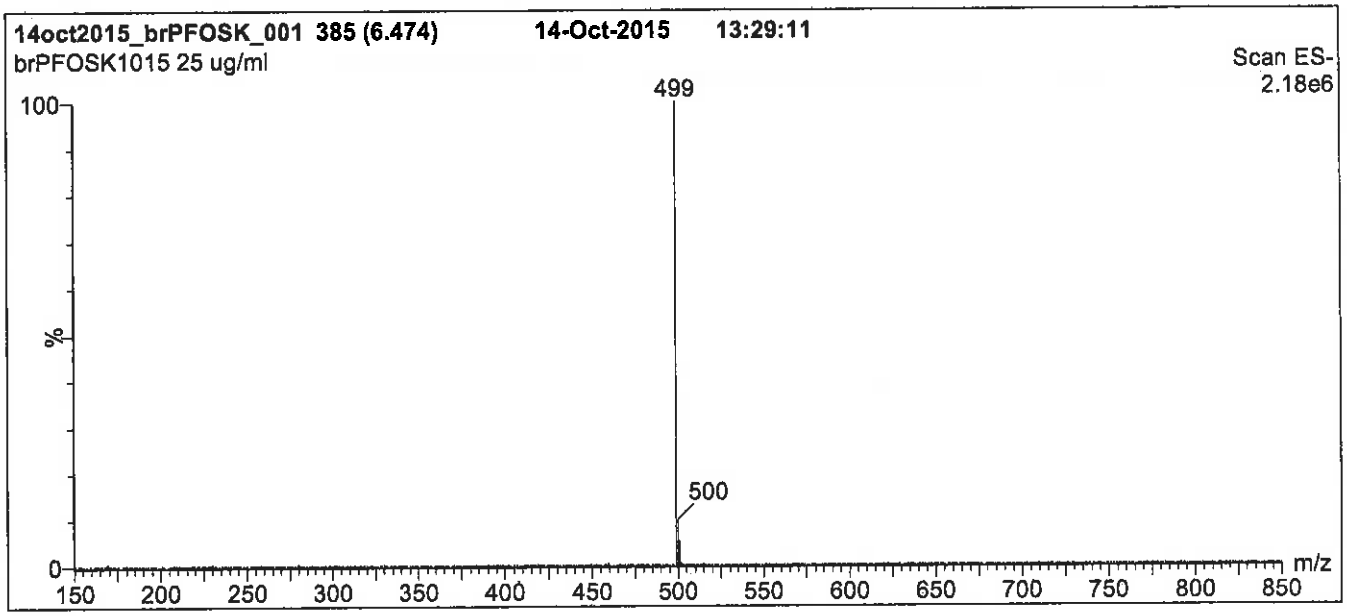
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-C(CF_3)(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2-C(CF_3)(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF_2-CF(CF_3)-CF_2CF_2SO_3^-K^+$	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: _____ **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

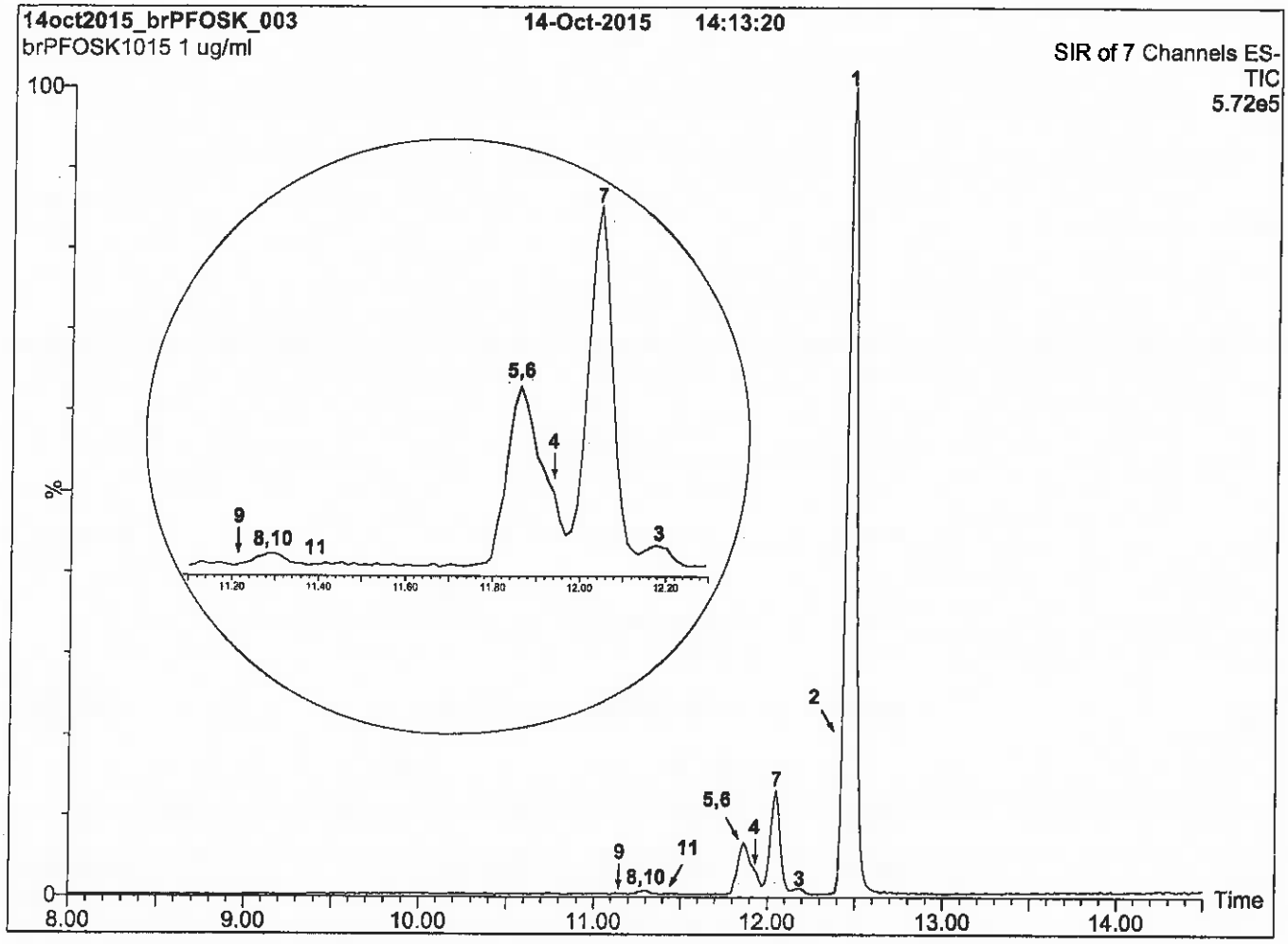
Flow: 300 µl/min

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

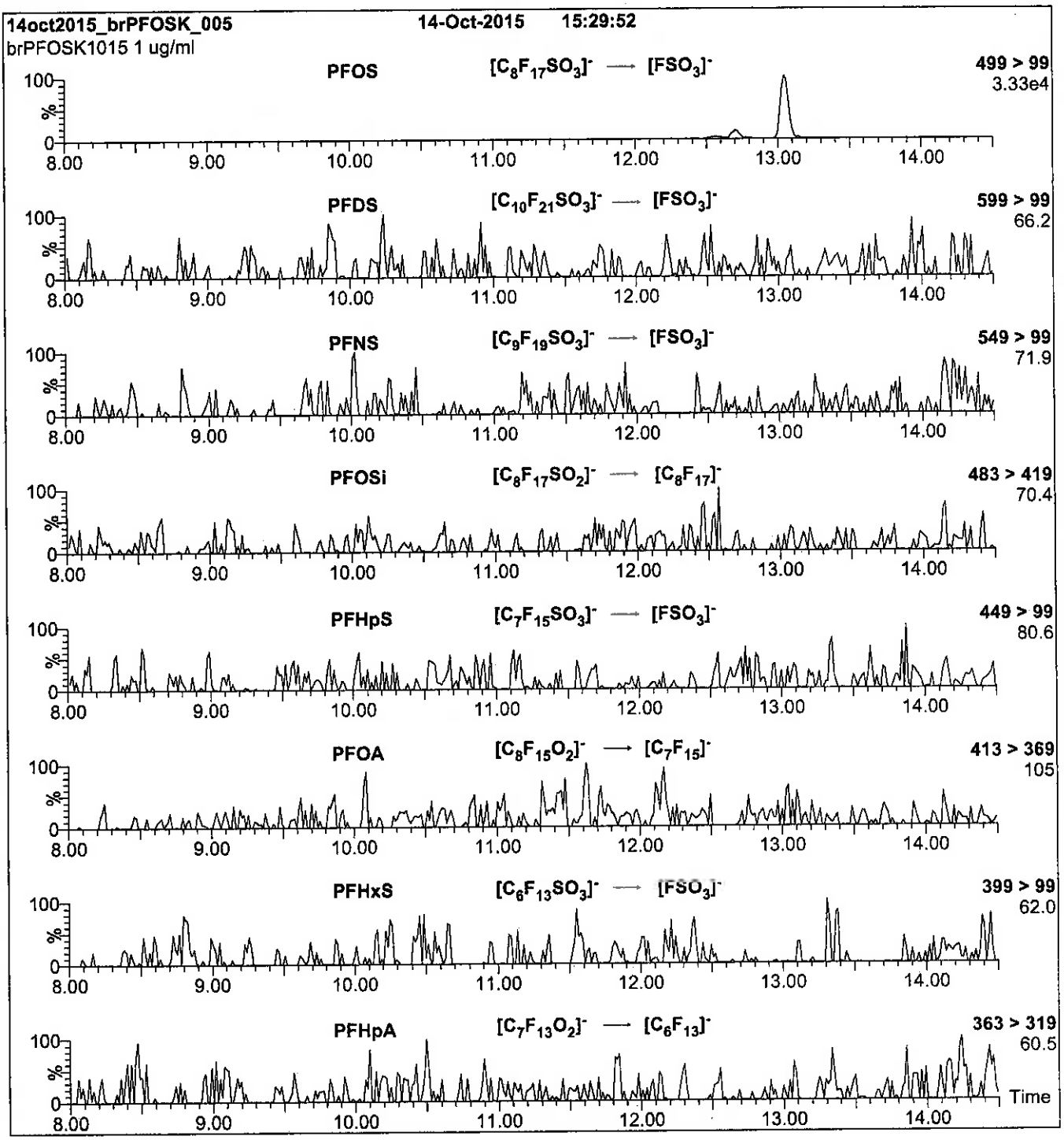
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

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

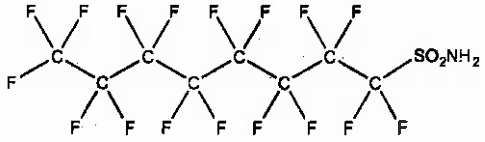
LCPFOSA_00010

12/20/16 SKJ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	FOSA-I	**LOT NUMBER:**	FOSA0916I
COMPOUND:	Perfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	754-91-6



MOLECULAR FORMULA:	$C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	499.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

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CALA

ANAB

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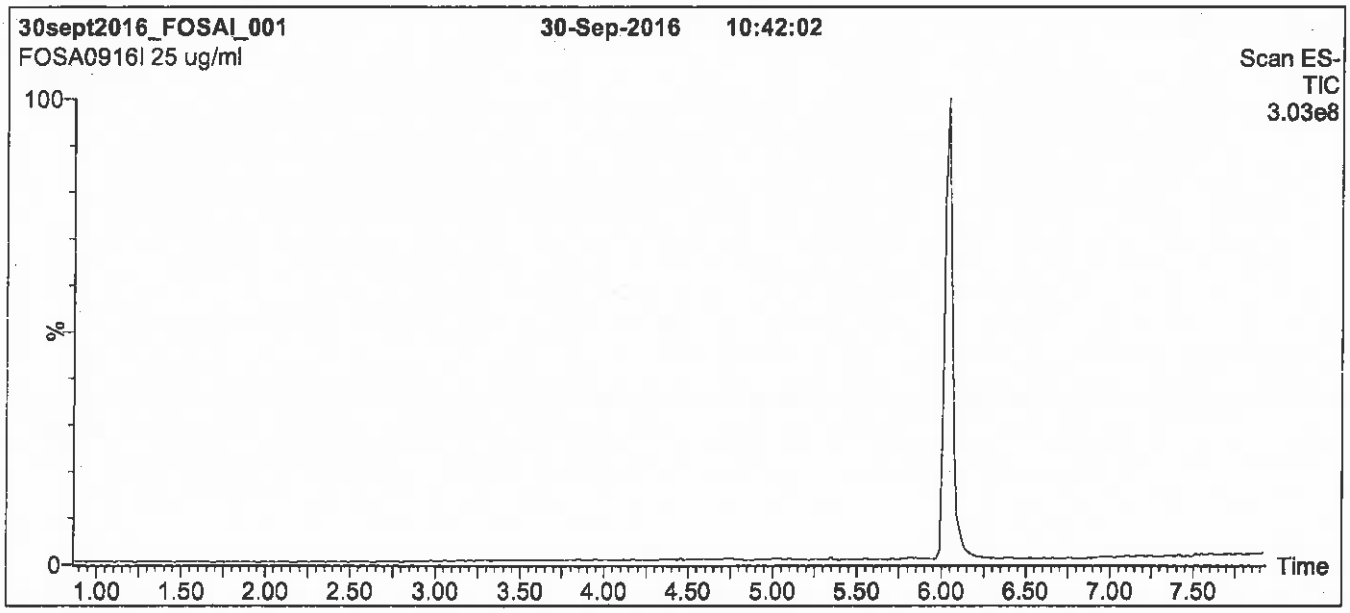
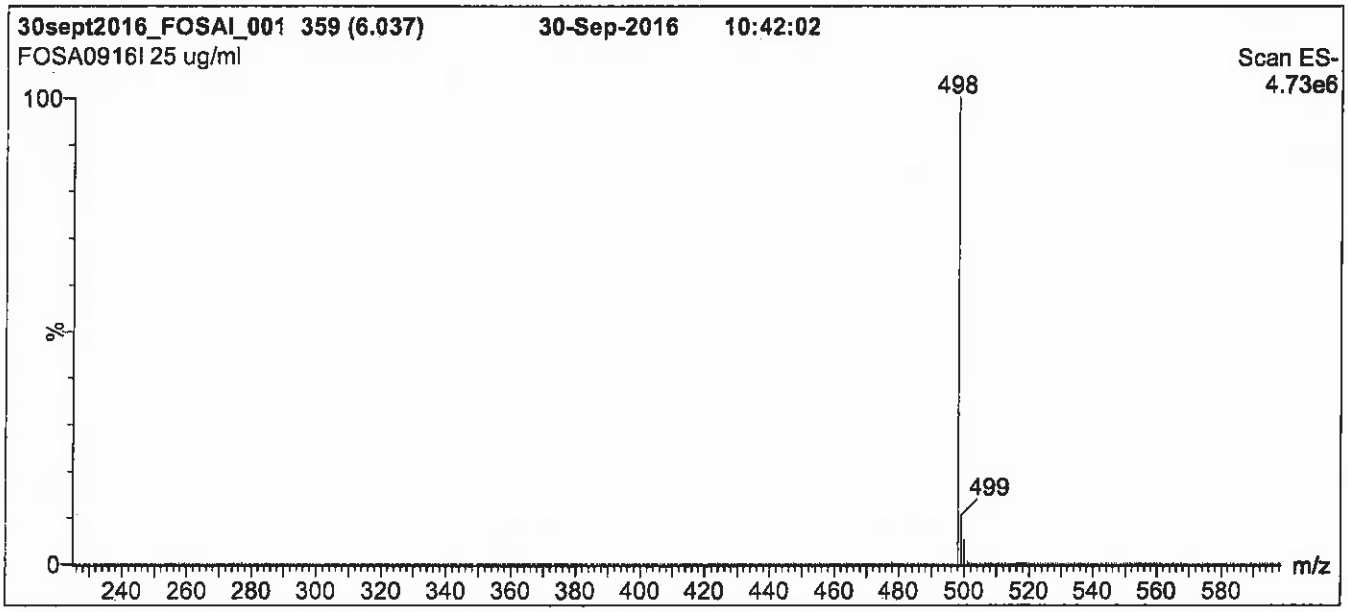




Conditions for Figure 1:

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

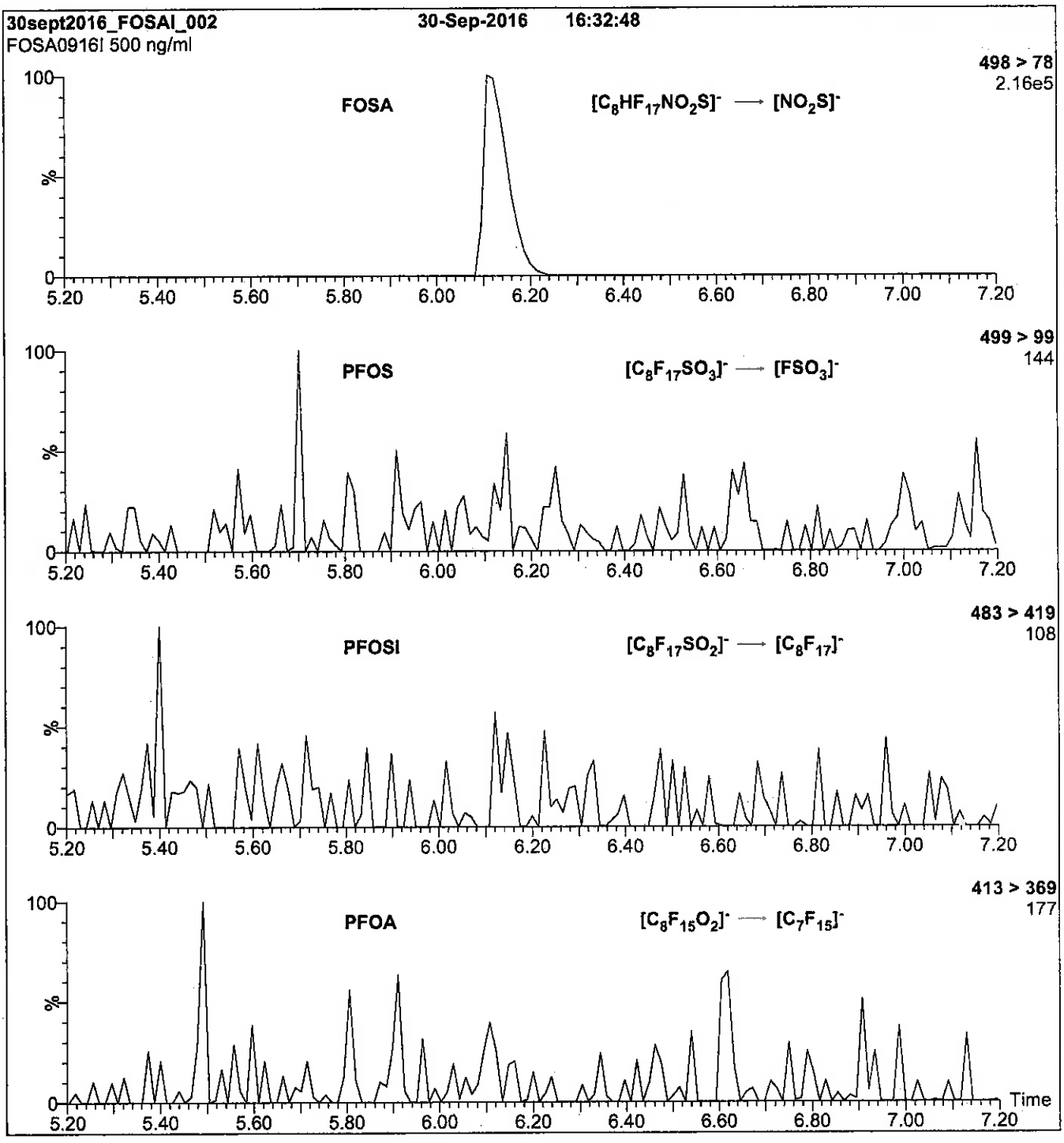
Flow: 300 µl/min

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

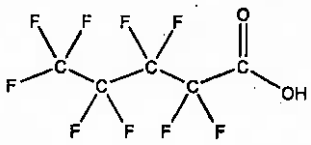
LCPFPeA_00007

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFPeA	**LOT NUMBER:**	PFPeA0516
COMPOUND:	Perfluoro-n-pentanoic acid		
STRUCTURE:		**CAS #:**	2706-90-3



MOLECULAR FORMULA:	$C_5HF_8O_2$	**MOLECULAR WEIGHT:**	264.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/31/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 06/02/2016 (mm/dd/yyyy)

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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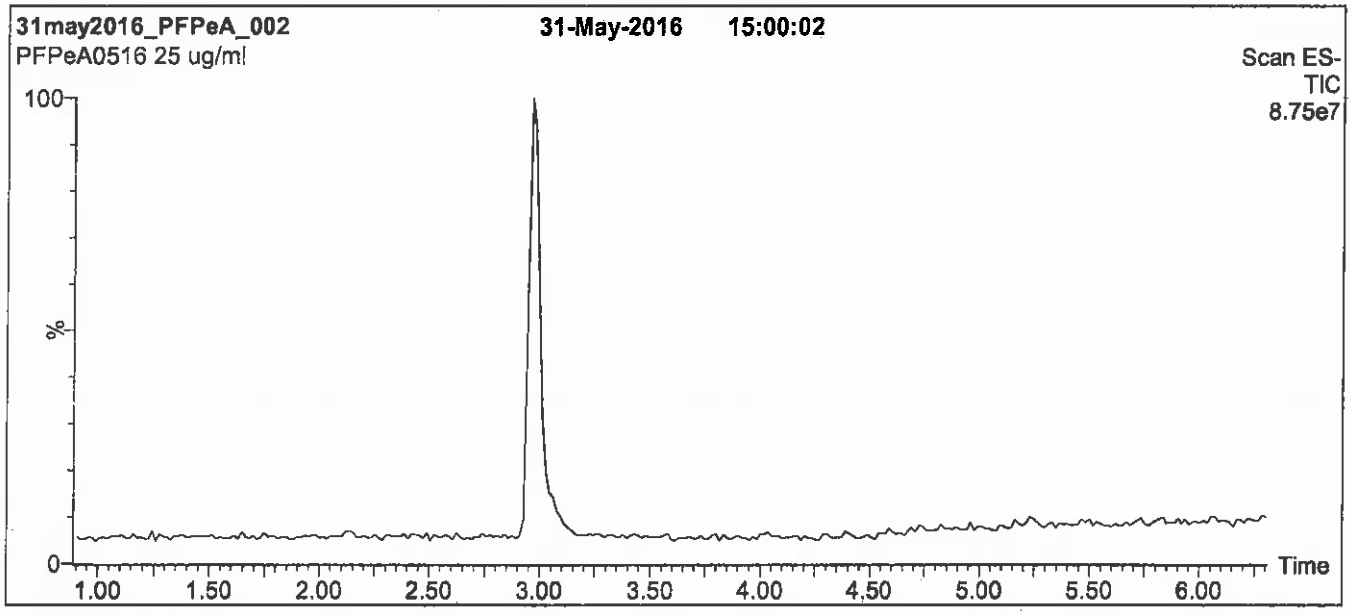
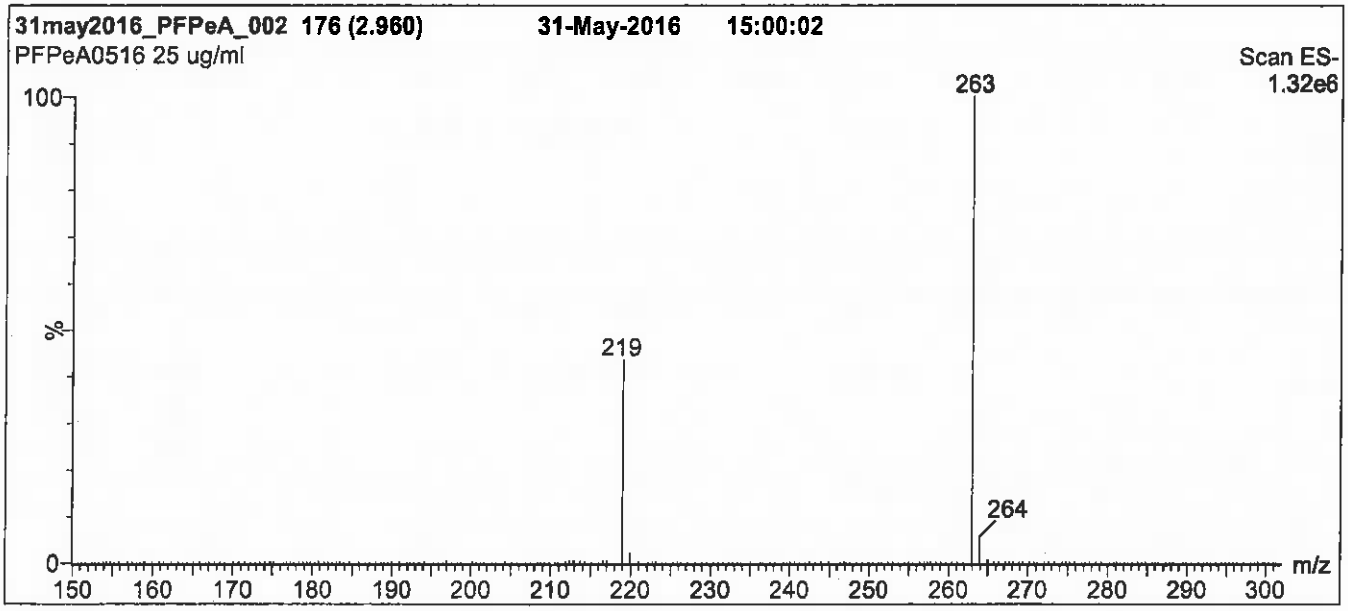
Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

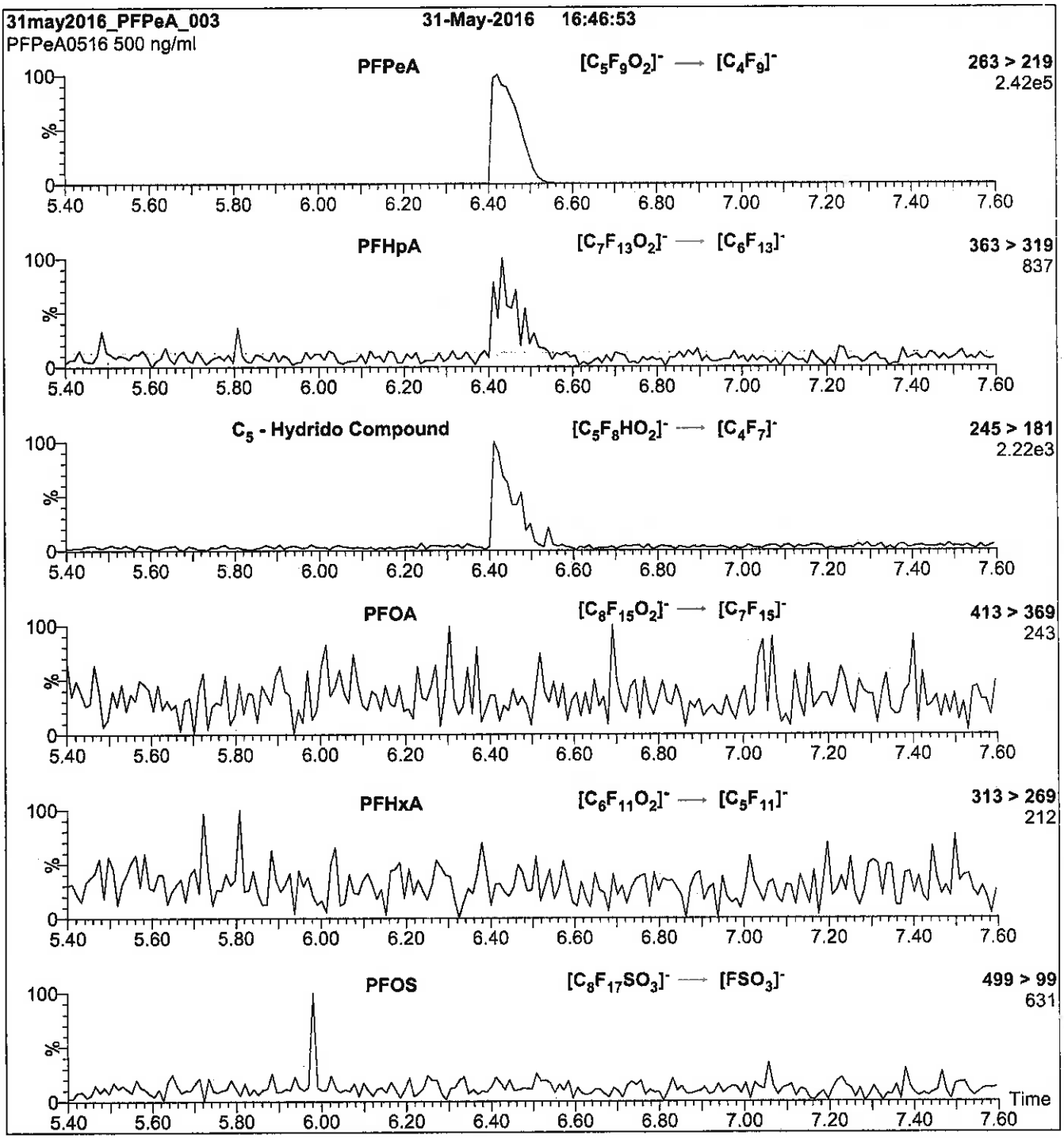
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 9

Reagent

LCPFPeS_00003

1106801
ID: LCPFPeS_00003
Exp: 01/11/22 Prpd: SKV
PF-1-pentanesulfonate Na

P: 12/4/17 SKV

WELLINGTON LABORATORIES

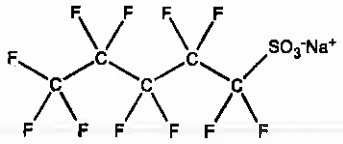
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: L-PFPeS
COMPOUND: Sodium perfluoro-1-pentanesulfonate

LOT NUMBER: LPFPeS0117

STRUCTURE:

CAS #: 630402-22-1



MOLECULAR FORMULA: $C_5F_{11}SO_3Na$
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
46.9 ± 2.3 µg/ml (PFPeS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/11/2017
EXPIRY DATE: (mm/dd/yyyy) 01/11/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 372.09
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/06/2017 (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.

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 REFERENCE MATERIAL PRODUCER

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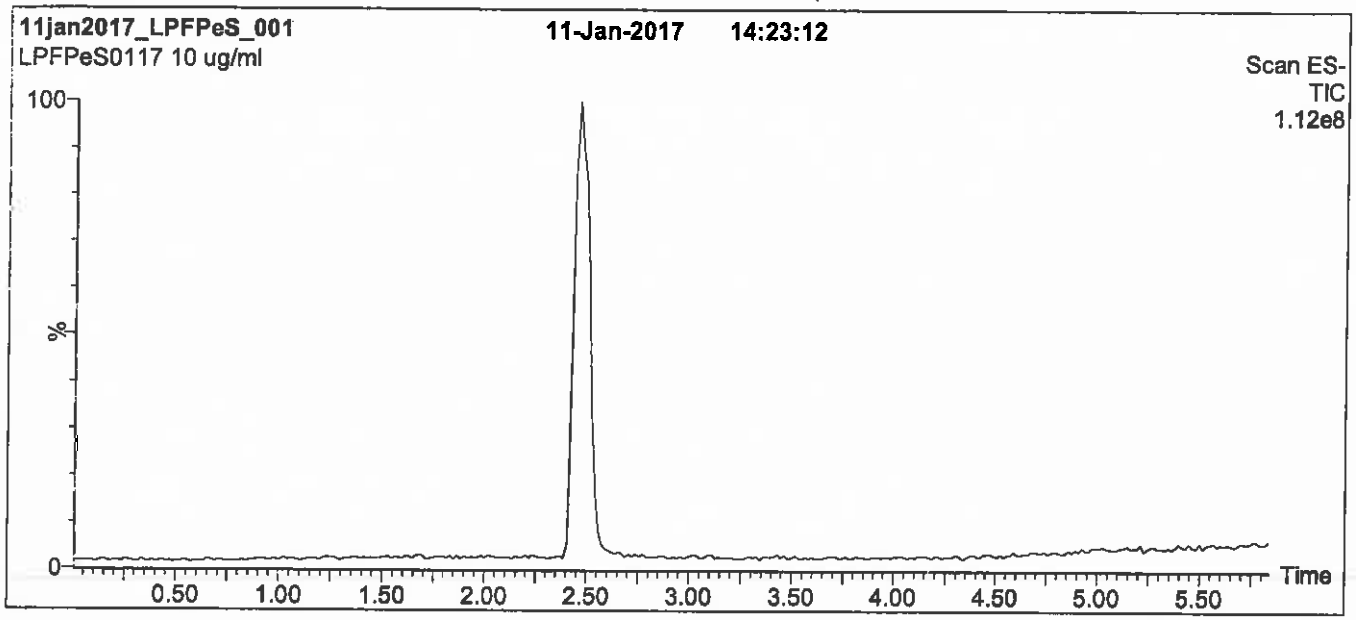
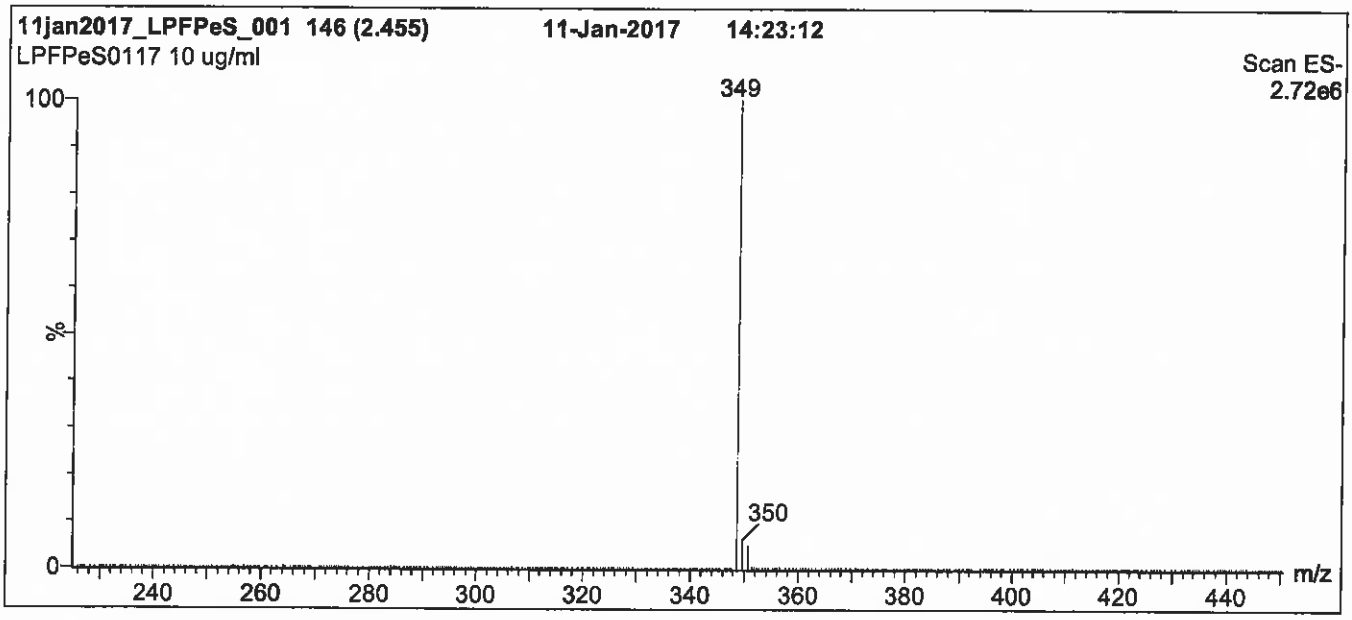
Figure 1: **L-PFPeS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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 over 0.5 min.
Time: 10 min

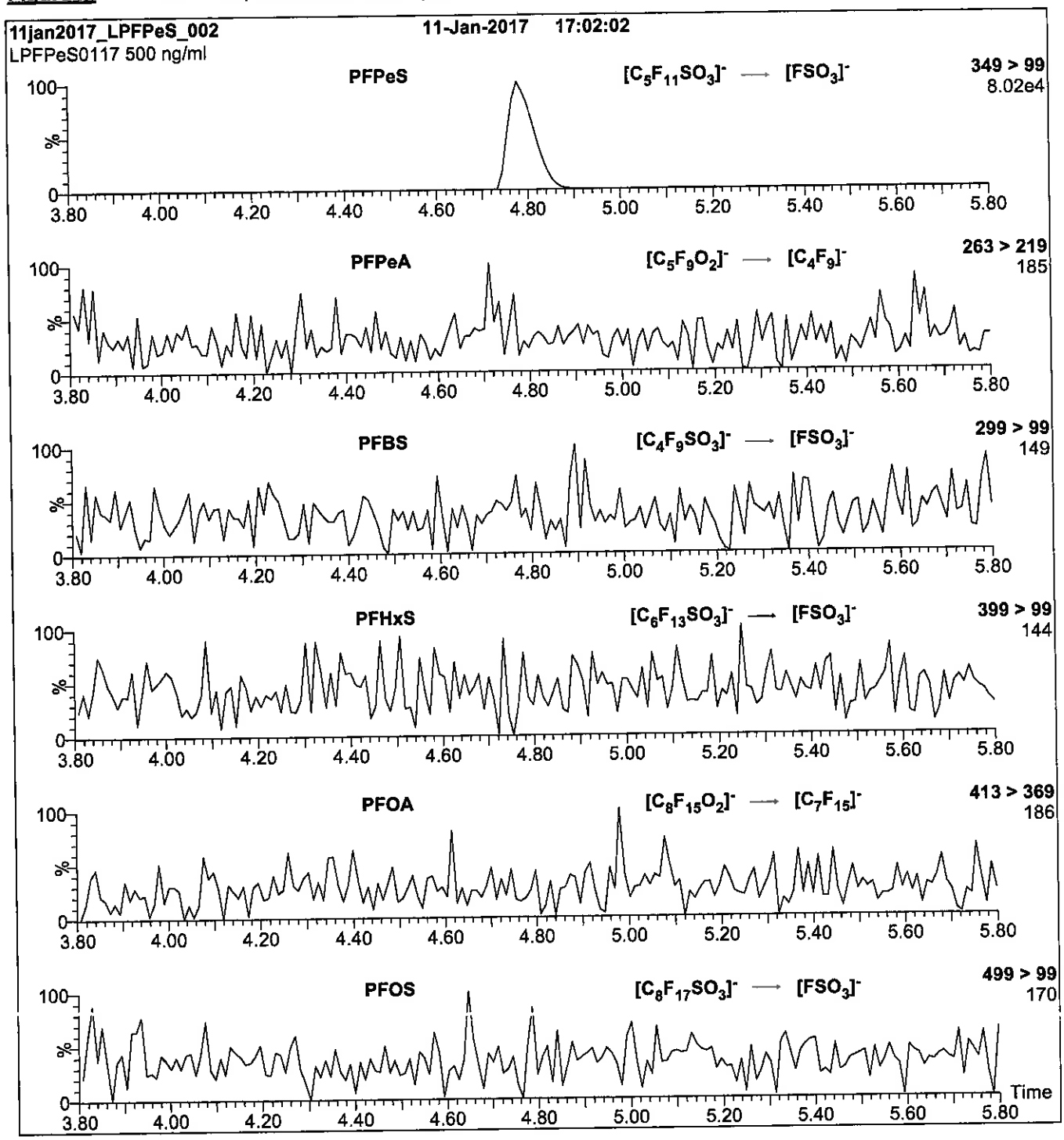
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFTeDA_00006

R: SBG 9/13/16

730645
ID: LCPFTeDA_00005
Exp: 12/09/20 Prpd: SBC
PF-n-tetradecanoic acid

730659
ID: LCPFTeDA_00006
Exp: 12/09/20 Prpd: SBC
PF-n-tetradecanoic acid

WELLINGTON LABORATORIES

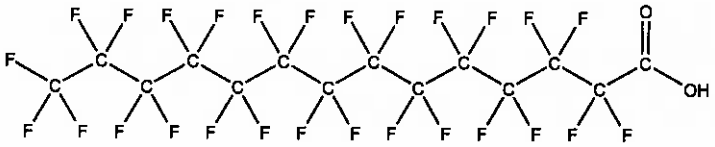
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTeDA
COMPOUND: Perfluoro-n-tetradecanoic acid

LOT NUMBER: PFTeDA1215

STRUCTURE:

CAS #: 376-06-7



MOLECULAR FORMULA: $C_{14}HF_{27}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 714.11
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/09/2015
EXPIRY DATE: (mm/dd/yyyy) 12/09/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of 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:** 12/09/2015 (mm/dd/yyyy)

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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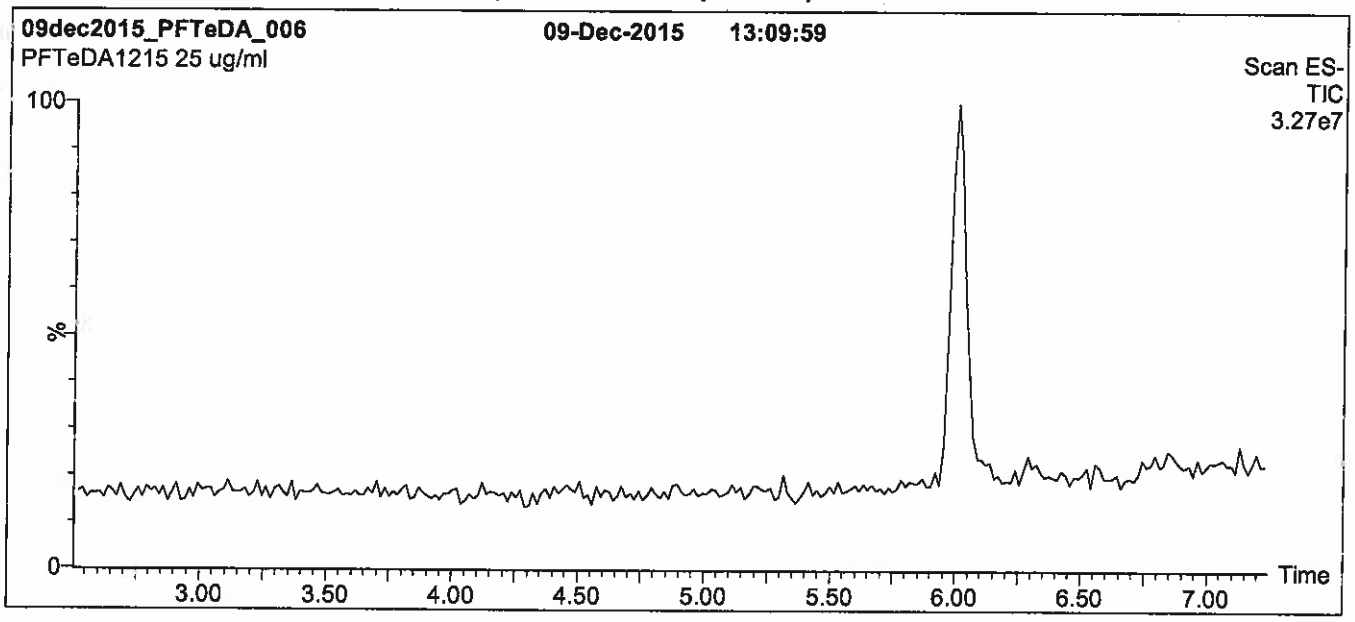
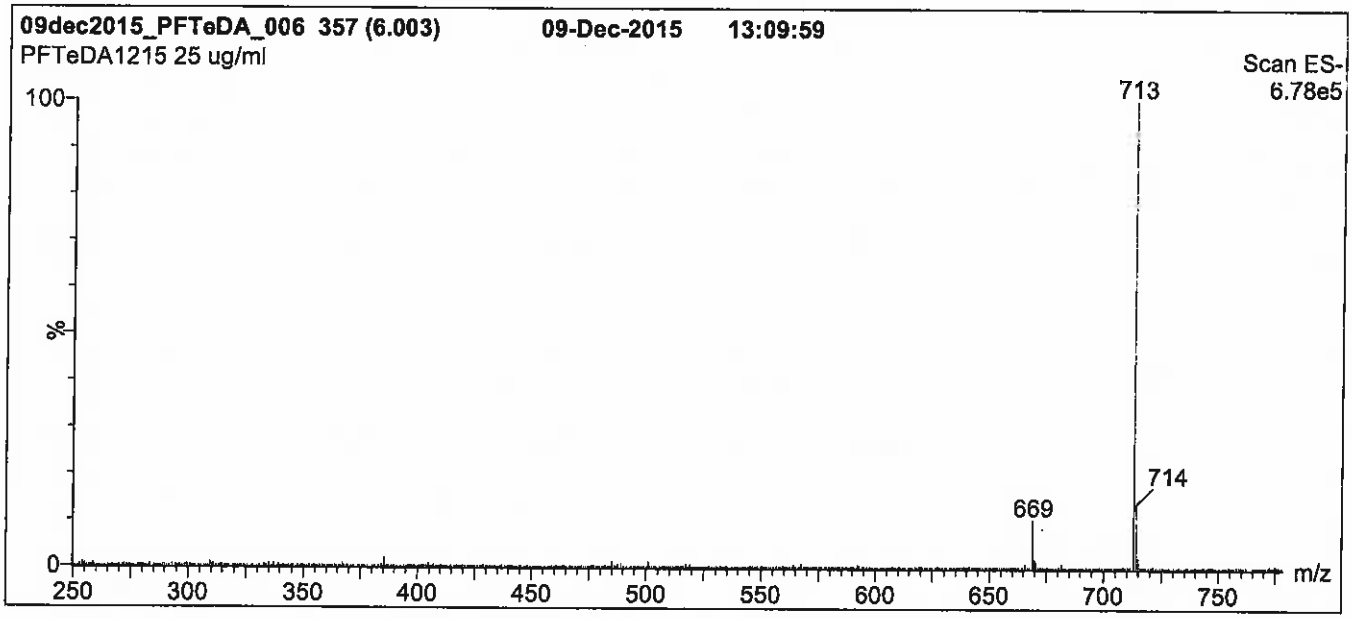
CALA

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: **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

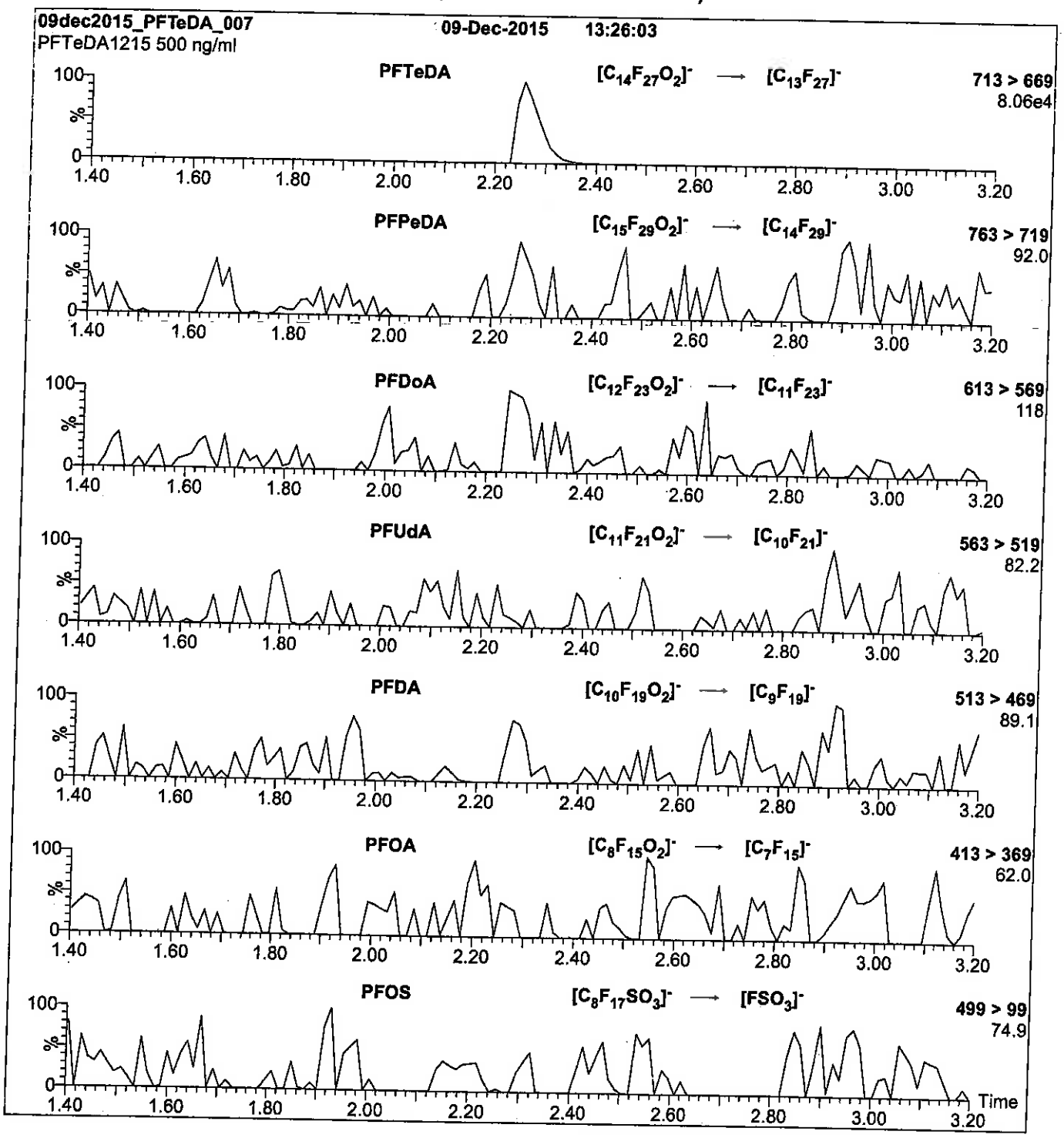
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 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) = 3.43e-3
Collision Energy (eV) = 14

Reagent

LCPFTeDA_00007

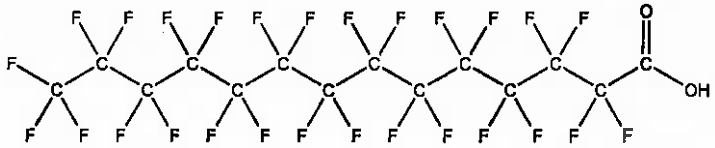
R: 12/20/16 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTeDA
COMPOUND: Perfluoro-n-tetradecanoic acid
LOT NUMBER: PFTeDA0916

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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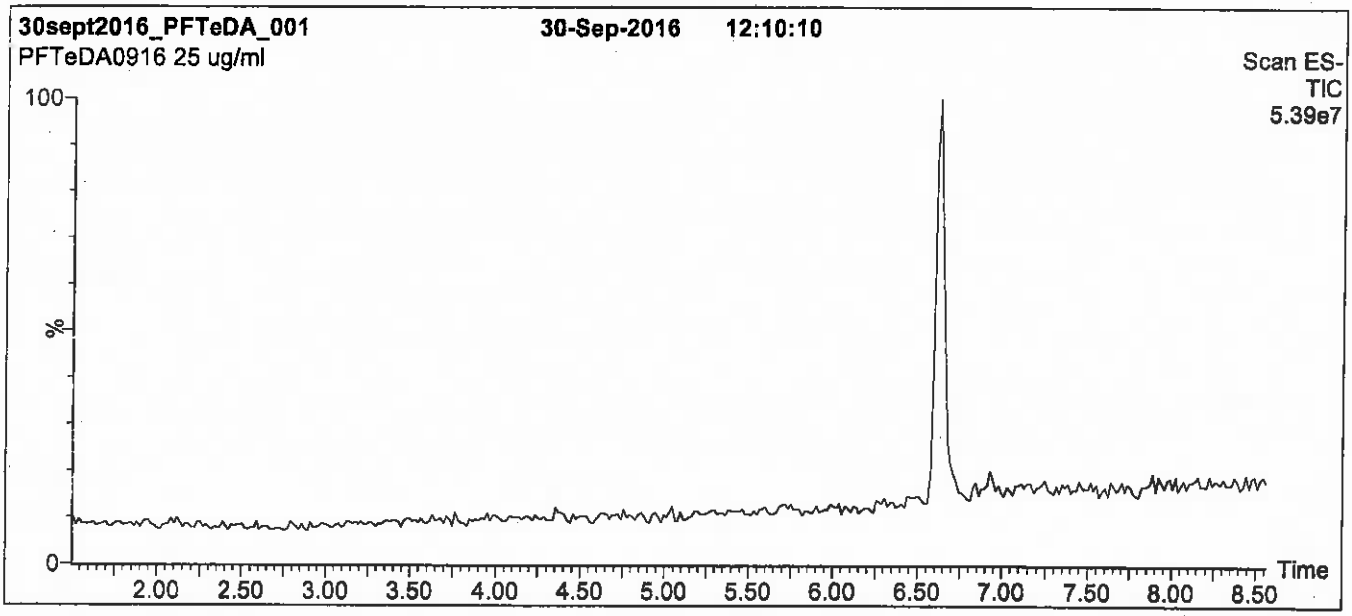
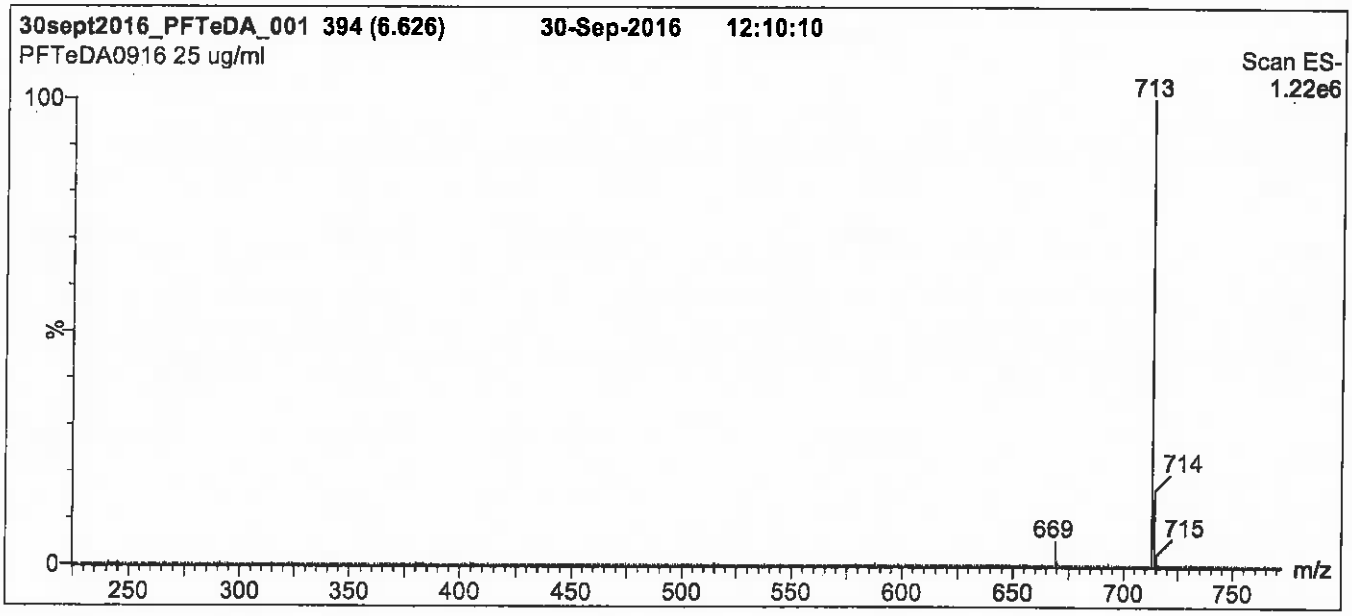
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

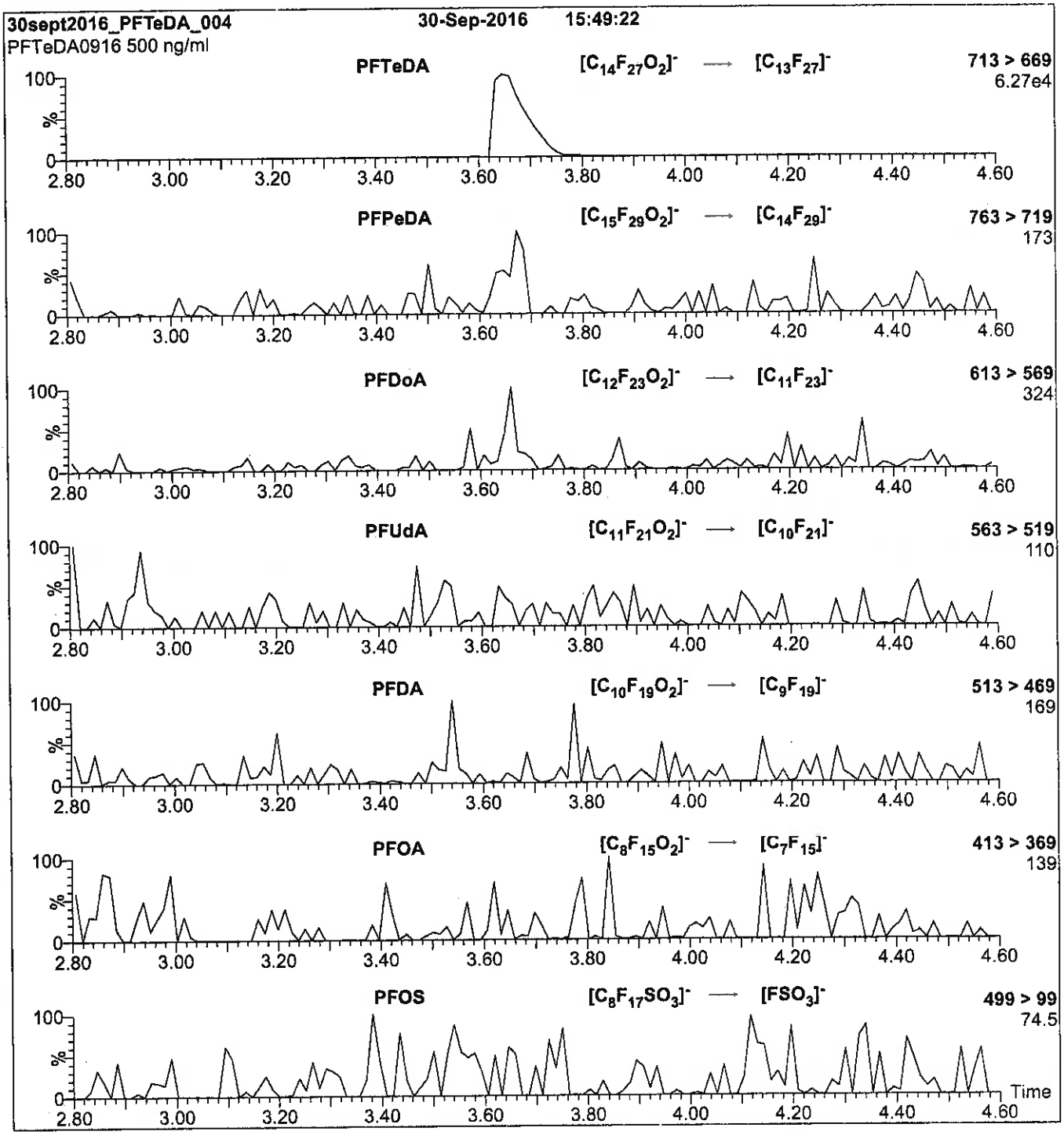
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 14

Reagent

LCPFTrDA_00006

R: SBC 9/13/16

730665
ID: LCPFTrDA_00005
Exp: 02/12/21 Prpd: SBC
PF-n-tridecanoic acid

730666
ID: LCPFTrDA_00006
Exp: 02/12/21 Prpd: SBC
PF-n-tridecanoic acid

WELLINGTON LABORATORIES

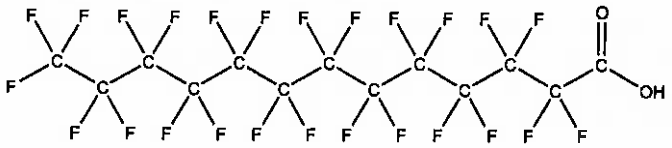
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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
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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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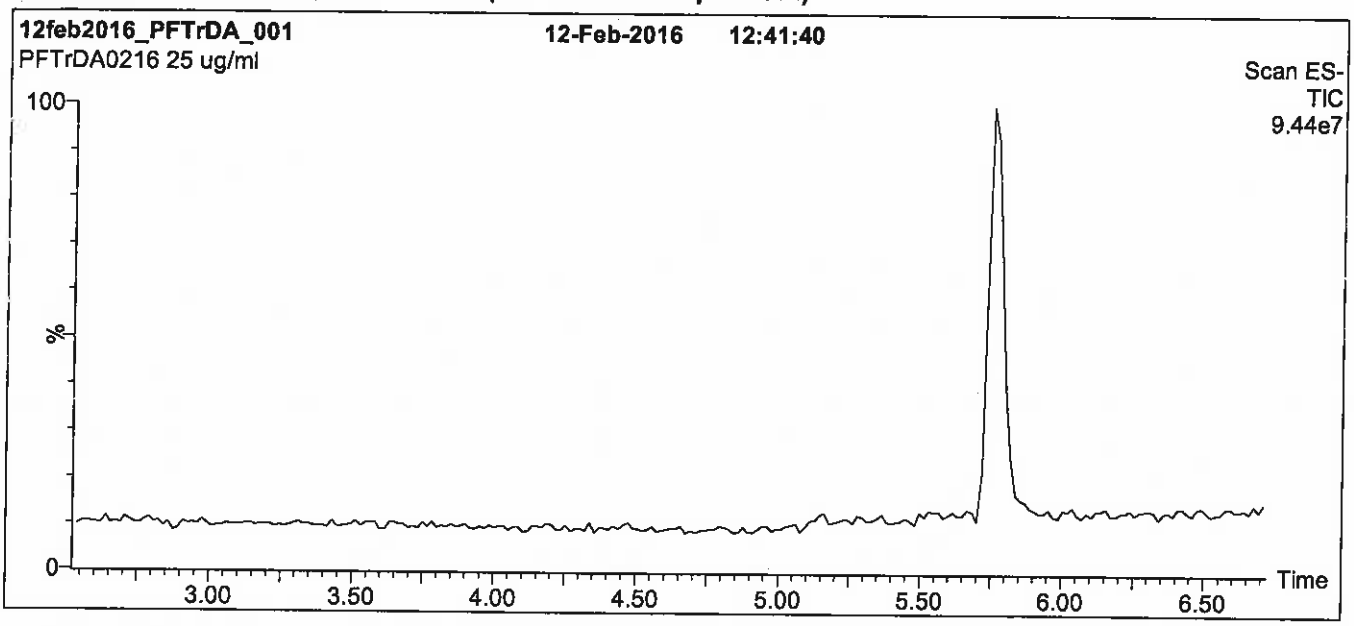
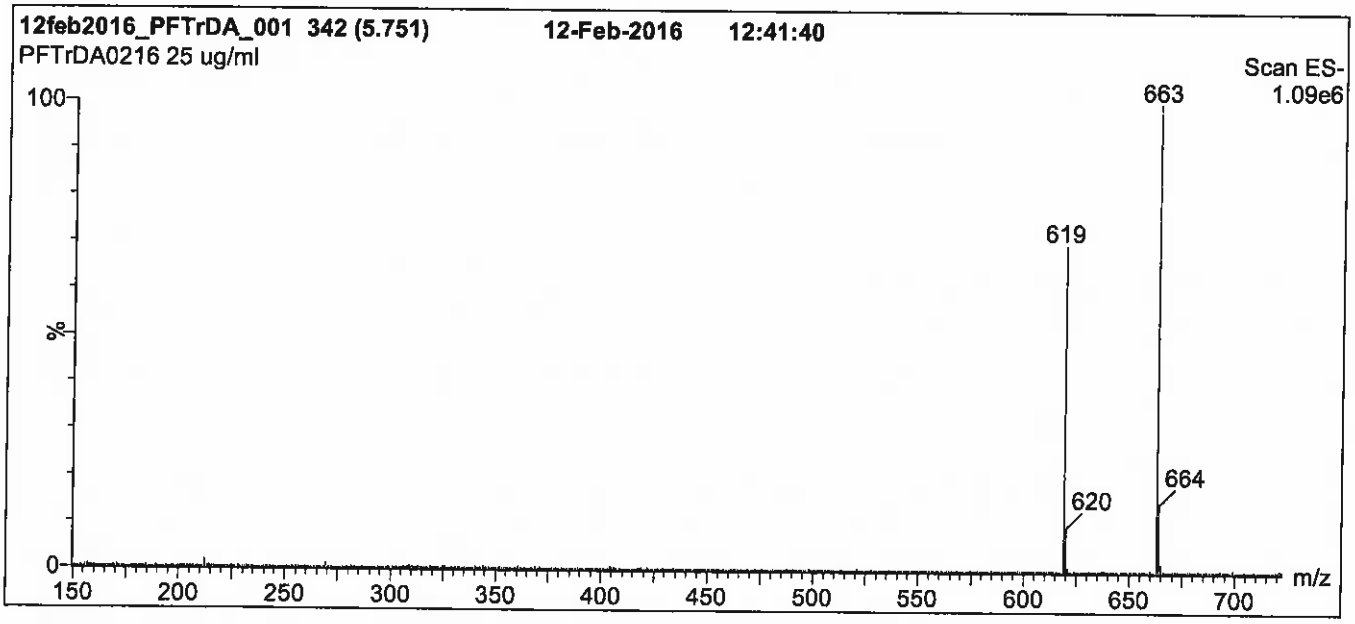
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

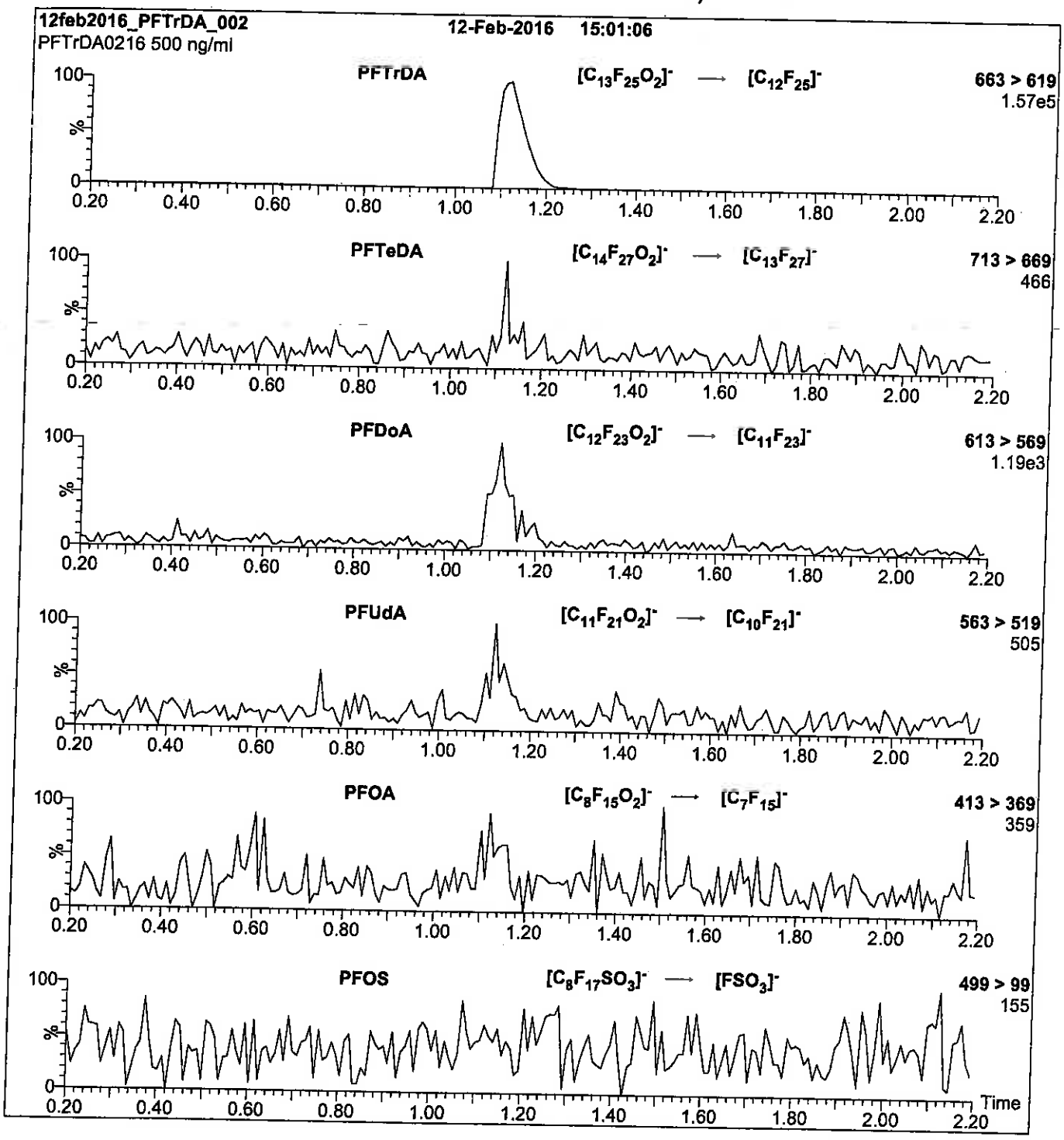
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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

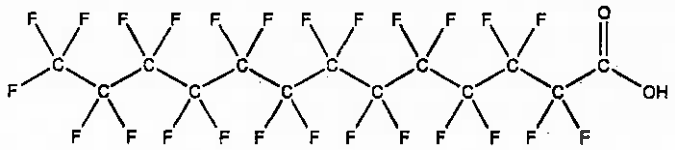
LCPFTrDA_00007

r: 12/29/16 SGJ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFTrDA	**LOT NUMBER:**	PFTrDA0216
COMPOUND:	Perfluoro-n-tridecanoic acid		
STRUCTURE:		**CAS #:**	72629-94-8



MOLECULAR FORMULA:	$C_{13}HF_{25}O_2$	**MOLECULAR WEIGHT:**	664.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	02/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	02/12/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/16/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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CALA

ANAB ACCREDITED

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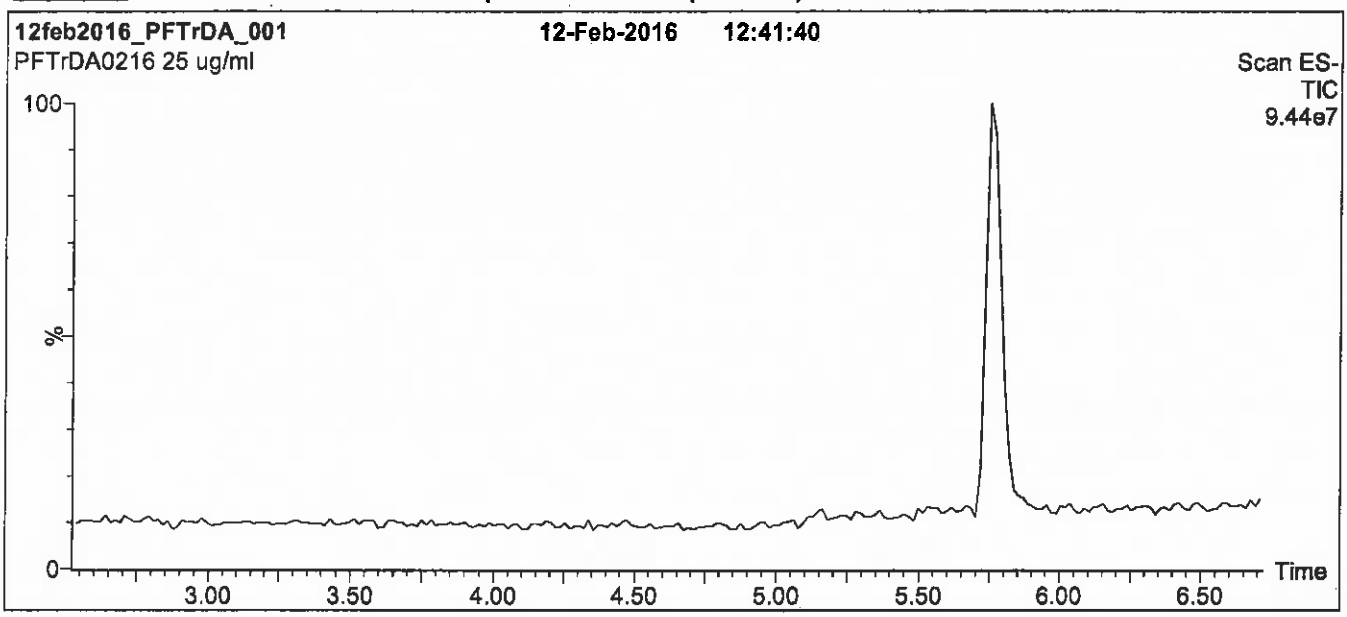
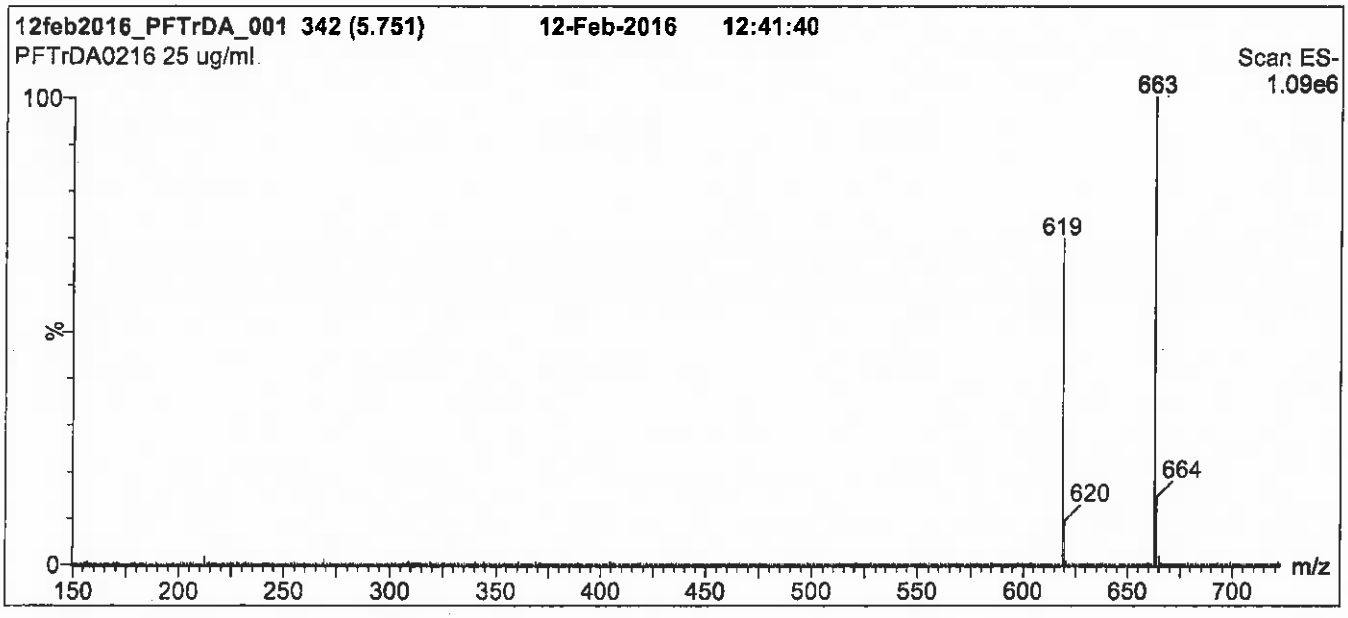




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

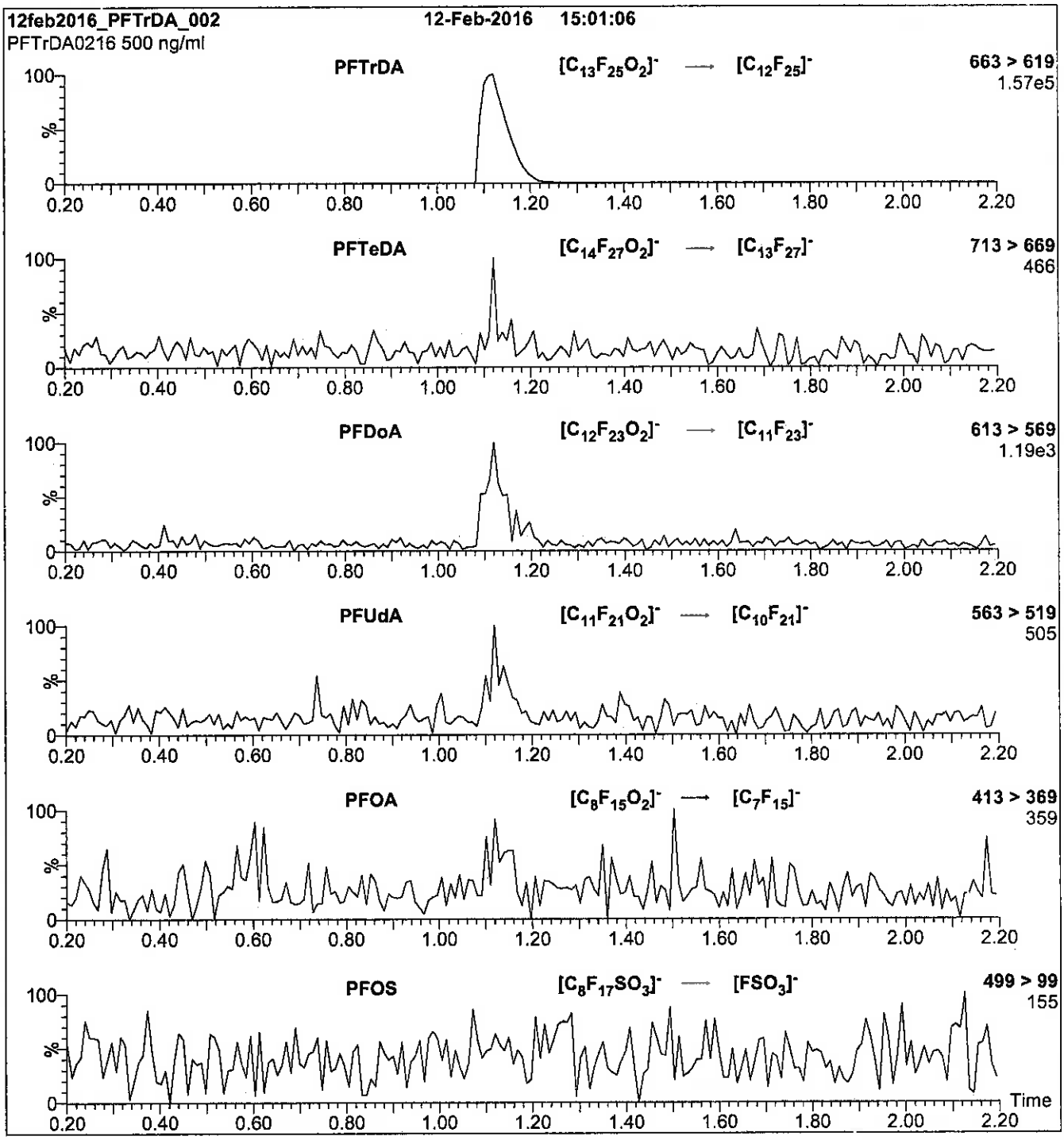
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

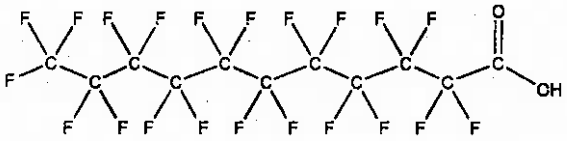
LCPFUdA_00007

r: 12/20/16 SK

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFUdA	**LOT NUMBER:**	PFUdA1016
COMPOUND:	Perfluoro-n-undecanoic acid		
STRUCTURE:		**CAS #:**	2058-94-8



MOLECULAR FORMULA:	$C_{11}HF_{21}O_2$	**MOLECULAR WEIGHT:**	564.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	10/18/2016		
EXPIRY DATE: (mm/dd/yyyy)	10/18/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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

ADDITIONAL INFORMATION:

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

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Certified By: B.G. Chittim **Date:** 10/19/2016 (mm/dd/yyyy)

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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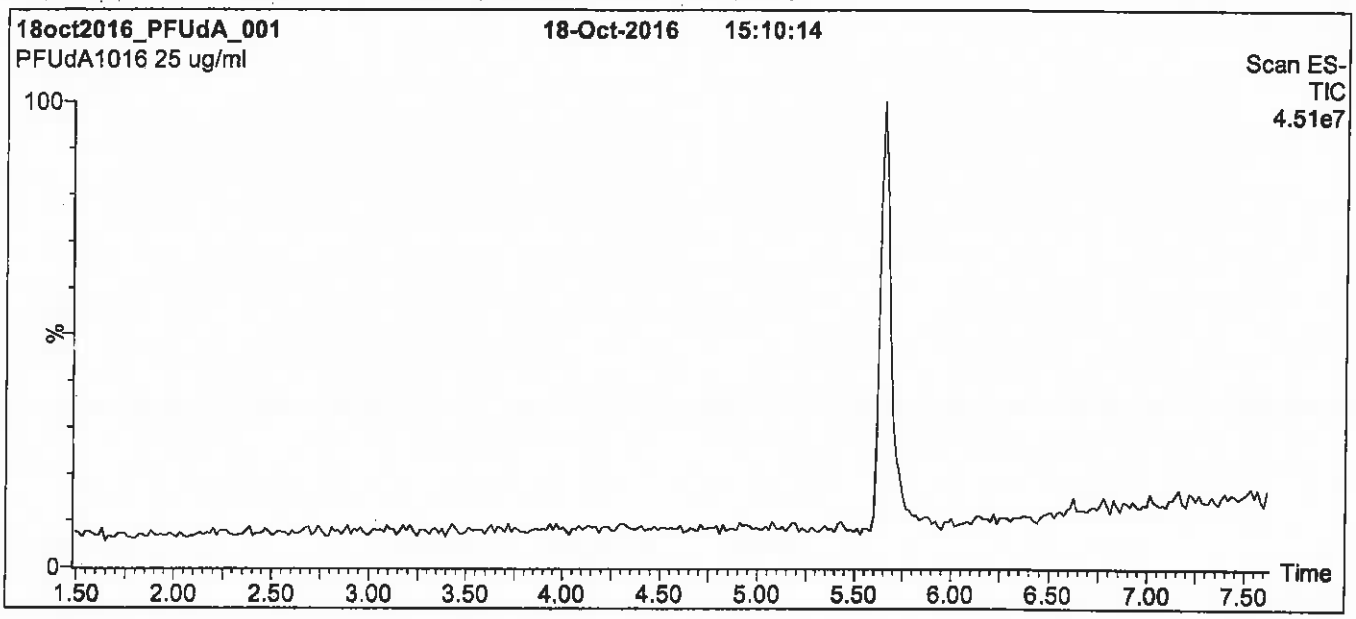
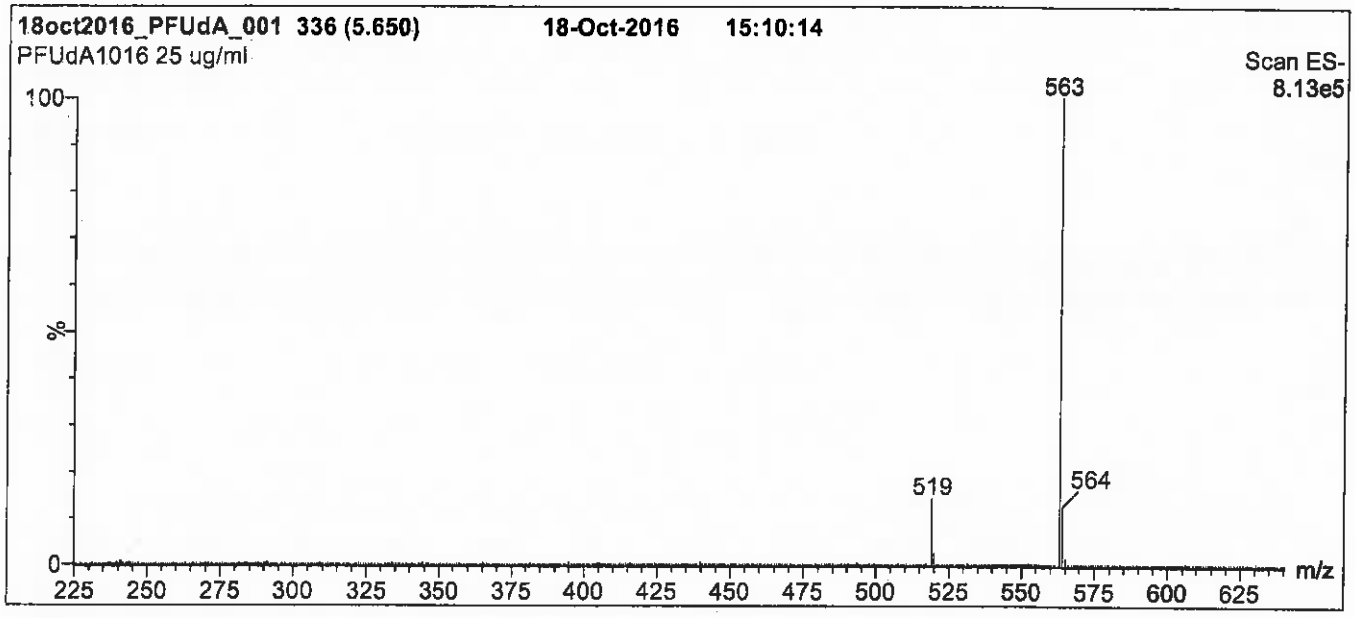




Conditions for Figure 1:

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

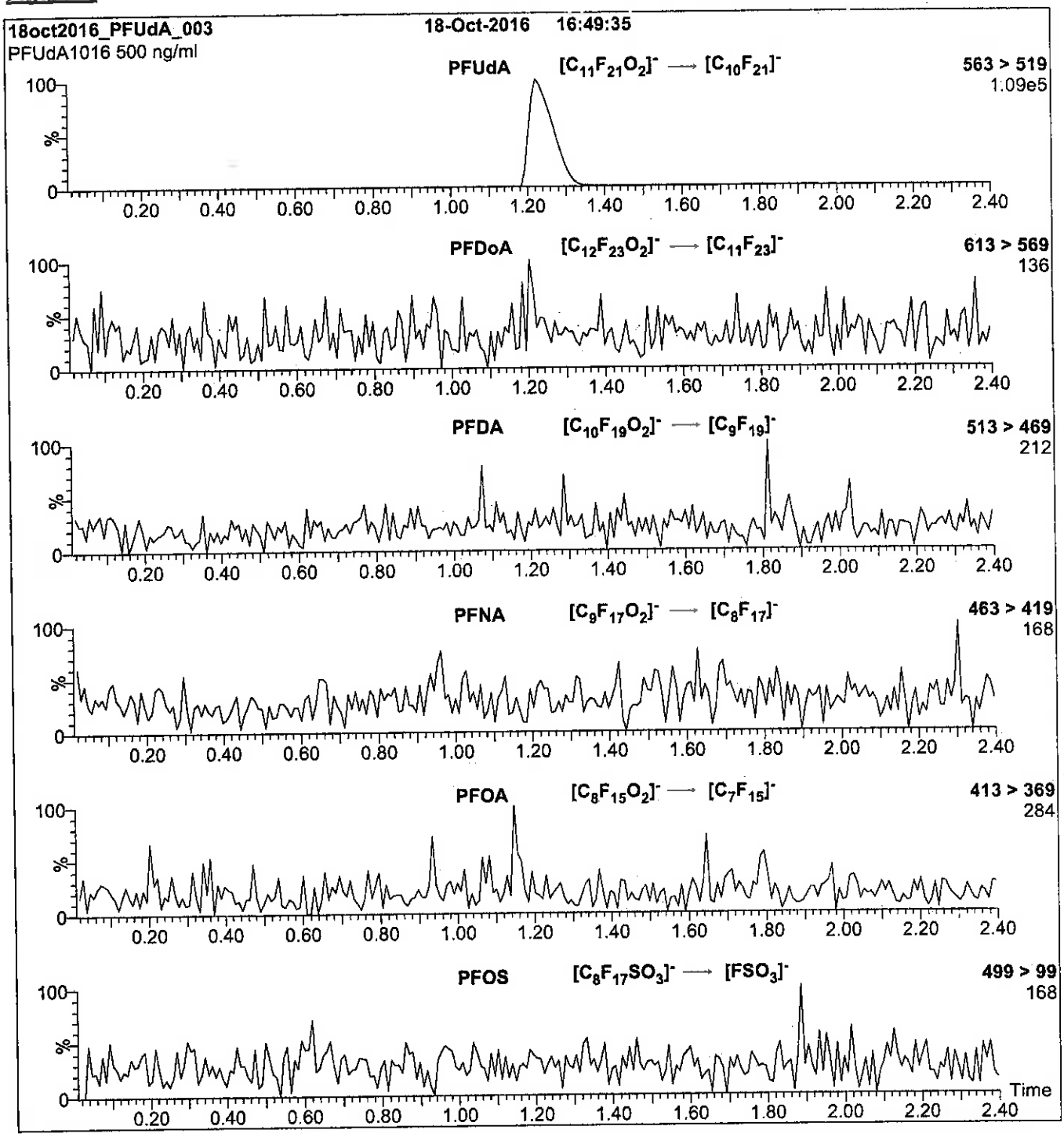
Flow: 300 µl/min

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.: 320-38875-1

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-029-TPI	320-38875-1	83	97	95	95	91	89	85	102
TP-PFC-029-TPI DL	320-38875-1 DL	78	84	76	81	81	80	87	86
TP-PFC-029-MIDCARB ON	320-38875-2	73	76	72	78	75	77	78	82
TP-PFC-029-TPE	320-38875-3	72	76	72	74	74	73	79	81
TP-PFC-029-TPE-D	320-38875-4	75	80	78	76	78	78	84	91
	MB 320-223615/1-A	79	85	80	85	84	85	93	94
	LCS 320-223615/2-A	80	87	78	86	85	80	90	90

	QC LIMITS
PFBA = 13C4 PFBA	50-150
PFPeA = 13C5 PFPeA	50-150
PFBS = 13C3-PFBS	50-150
PFHxA = 13C2 PFHxA	50-150
PFHpA = 13C4-PFHpA	50-150
PFHxS = 18O2 PFHxS	50-150
PFOA = 13C4 PFOA	50-150
PFNA = 13C5 PFNA	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

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-029-TPI	320-38875-1	87	81	96	101	89	79
TP-PFC-029-TPI DL	320-38875-1 DL	75	73	83	90	87	69
TP-PFC-029-MIDCARB ON	320-38875-2	73	67	77	74	66	60
TP-PFC-029-TPE	320-38875-3	73	64	72	78	69	60
TP-PFC-029-TPE-D	320-38875-4	78	67	79	86	76	70
	MB 320-223615/1-A	81	71	86	90	85	84
	LCS 320-223615/2-A	86	69	86	94	82	82

	QC LIMITS
PFOS = 13C4 PFOS	50-150
PFOSA = 13C8 FOSA	50-150
PFDA = 13C2 PFDA	50-150
PFUnA = 13C2 PFUnA	50-150
PFDoA = 13C2 PFDoA	50-150
PFTDA = 13C2-PFTeDA	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.05.27LLADX_005.d

Lab ID: LCS 320-223615/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	41.6	104	83-118	
Perfluoropentanoic acid (PFPeA)	40.0	36.7	92	83-108	
Perfluorohexanoic acid (PFHxA)	40.0	39.4	98	83-109	
Perfluoroheptanoic acid (PFHpA)	40.0	39.6	99	80-113	
Perfluorooctanoic acid (PFOA)	40.0	35.7	89	80-107	
Perfluorononanoic acid (PFNA)	40.0	37.6	94	83-113	
Perfluorodecanoic acid (PFDA)	40.0	42.6	107	85-113	
Perfluoroundecanoic acid (PFUnA)	40.0	36.2	91	76-105	
Perfluorododecanoic acid (PFDoA)	40.0	40.9	102	87-116	
Perfluorotridecanoic Acid (PFTriA)	40.0	39.3	98	75-129	
Perfluorotetradecanoic acid (PFTeA)	40.0	36.7	92	82-115	
Perfluorobutanesulfonic acid (PFBS)	35.4	36.3	103	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.0	96	81-106	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	34.4	90	80-117	
Perfluorooctanesulfonic acid (PFOS)	37.1	33.5	90	82-112	
Perfluorodecanesulfonic acid (PFDS)	38.6	35.3	91	81-114	
Perfluorooctane Sulfonamide (FOSA)	40.0	40.5	101	85-114	
13C8 FOSA	100	69.4	69	50-150	
13C4 PFBA	100	80.1	80	50-150	
13C5 PFPeA	100	86.9	87	50-150	
13C2 PFHxA	100	86.4	86	50-150	
13C4-PFHpA	100	85.4	85	50-150	
13C4 PFOA	100	90.3	90	50-150	
13C5 PFNA	100	90.0	90	50-150	
13C2 PFDA	100	85.8	86	50-150	
13C2 PFUnA	100	93.9	94	50-150	
13C2 PFDoA	100	82.4	82	50-150	
18O2 PFHxS	94.6	75.6	80	50-150	
13C2-PFTeDA	100	82.0	82	50-150	
13C4 PFOS	95.6	81.8	86	50-150	
13C3-PFBS	93.0	73.0	78	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab File ID: 2018.05.27LLADX_004.d Lab Sample ID: MB 320-223615/1-A

Matrix: Water Date Extracted: 05/16/2018 14:51

Instrument ID: A8_N Date Analyzed: 05/28/2018 07:23

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-223615/2-A	2018.05.27LLADX_005.d	05/28/2018 07:31
TP-PFC-029-TPI	320-38875-1	2018.05.27LLADX_006.d	05/28/2018 07:39
TP-PFC-029-MIDCARBON	320-38875-2	2018.05.27LLADX_007.d	05/28/2018 07:47
TP-PFC-029-TPE	320-38875-3	2018.05.27LLADX_008.d	05/28/2018 07:55
TP-PFC-029-TPE-D	320-38875-4	2018.05.27LLADX_009.d	05/28/2018 08:02
TP-PFC-029-TPI DL	320-38875-1 DL	2018.05.28LLA_056.d	05/29/2018 00:09

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Sample No.: IC 320-223413/5 Date Analyzed: 05/15/2018 15:36

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2017.05.15LLB_ICAL_ Heated Purge: (Y/N) N

Calibration ID: 39198

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		4762237	2.73				
UPPER LIMIT		7143356	2.93				
LOWER LIMIT		2381119	2.53				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-223413/12		4812155	2.73				
ICV 320-223413/13		4485749	2.72				
CCV 320-225818/3 CCVIS		5150922	2.70				
CCV 320-225873/3 CCVIS		4833381	2.70				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Sample No.: CCV 320-225818/3 Date Analyzed: 05/28/2018 07:15

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.05.27LLADX_003 Heated Purge: (Y/N) N

Calibration ID: 39198

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		5150922	2.70				
UPPER LIMIT		7726383	2.90				
LOWER LIMIT		2575461	2.50				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-225818/1		4948330	2.70				
CCVL 320-225818/2		4974159	2.70				
MB 320-223615/1-A		4525357	2.70				
LCS 320-223615/2-A		5050927	2.71				
320-38875-1	TP-PFC-029-TPI	3924419	2.70				
320-38875-2	TP-PFC-029-MIDCARBON	4817889	2.70				
320-38875-3	TP-PFC-029-TPE	5264580	2.70				
320-38875-4	TP-PFC-029-TPE-D	4741331	2.70				
CCV 320-225818/14		5195418	2.70				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Sample No.: CCV 320-225873/3 Date Analyzed: 05/28/2018 17:30

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.05.28LLA_005.d Heated Purge: (Y/N) N

Calibration ID: 39198

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		4833381	2.70				
UPPER LIMIT		7250072	2.90				
LOWER LIMIT		2416691	2.50				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-225873/1		4725130	2.69				
CCVL 320-225873/2		4921629	2.70				
CCV 320-225884/1		4945573	2.71				
320-38875-1 DL	TP-PFC-029-TPI DL	425723Q	2.71				
CCV 320-225884/11		4741080	2.71				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPI | Lab Sample ID: 320-38875-1

Matrix: Water | Lab File ID: 2018.05.27LLADX_006.d

Analysis Method: EPA 537 (Mod) | Date Collected: 05/03/2018 09:20

Extraction Method: 3535 | Date Extracted: 05/16/2018 14:51

Sample wt/vol: 290.5(mL) | Date Analyzed: 05/28/2018 07:39

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

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

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

Analysis Batch No.: 225818 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	74	M	1.7	1.3	0.51
2706-90-3	Perfluoropentanoic acid (PFPeA)	200	M	1.7	0.86	0.37
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*360*	*E M*	*1.7*	0.86	*0.40*
375-85-9	Perfluoroheptanoic acid (PFHpA)	76	M	1.7	1.3	0.52
335-67-1	*Perfluorooctanoic acid (PFOA)*	*1500*	*E*	*1.7*	1.3	*0.46*
375-95-1	Perfluorononanoic acid (PFNA)	2.4		1.7	1.3	0.45
335-76-2	Perfluorodecanoic acid (PFDA)	0.82	J M	1.7	0.86	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U M	1.7	1.3	0.62
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.45
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	2.6	0.65
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.4	2.6	0.71
375-73-5	Perfluorobutanesulfonic acid (PFBS)	49	M	1.7	0.86	0.40
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*400*	*E*	*1.7*	0.86	*0.33*
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	7.7		1.7	0.86	0.32
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*330*	*E*	*3.4*	2.6	*0.95*
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.48
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U M	3.4	2.6	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPI Lab Sample ID: 320-38875-1

Matrix: Water Lab File ID: 2018.05.27LLADX_006.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:20

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 290.5(mL) Date Analyzed: 05/28/2018 07:39

Con. Extract Vol.: 10(mL) Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	81		50-150
STL00992	13C4 PFBA	83		50-150
STL01893	13C5 PFPeA	97		50-150
STL00993	13C2 PFHxA	95		50-150
STL01892	13C4-PFHpA	91		50-150
STL00990	13C4 PFOA	85		50-150
STL00995	13C5 PFNA	102		50-150
STL00996	13C2 PFDA	96		50-150
STL00997	13C2 PFUnA	101		50-150
STL00998	13C2 PFDoA	89		50-150
STL00994	18O2 PFHxS	89		50-150
STL02116	13C2-PFTeDA	79		50-150
STL00991	13C4 PFOS	87		50-150
STL02337	13C3-PFBS	95		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d
Lims ID: 320-38875-A-1-A
Client ID: TP-PFC-029-TPI
Sample Type: Client
Inject. Date: 28-May-2018 07:39:26 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-38875-a-1-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-May-2018 11:04:54 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 11:04:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										M
212.90 > 169.00	1.461	1.452	0.009	1.000	3964404	2.14			1070	M
D 1 13C4 PFBA										
217.00 > 172.00	1.461	1.455	0.006	1.000	4973668	2.07		82.9	25766	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.726	1.720	0.006	1.000	10058089	5.70			2689	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.726	1.725	0.001	0.561	3737827	2.43		97.2	24025	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.771	1.756	0.015	1.005	3645364	1.42			4340	M
298.90 > 99.00	1.762	1.756	0.006	1.000	1534230		2.38(1.25-3.74)		3166	
D 47 13C3-PFBS										
301.90 > 83.00	1.762	1.761	0.001	1.000	76574	2.20		94.8	450	
D 7 13C2 PFHxA										
315.00 > 270.00	2.011	2.011	0.0	1.000	3879329	2.37		94.6	69806	
6 Perfluorohexanoic acid										EM
313.00 > 269.00	2.011	2.015	-0.004	1.000	16805071	10.5			11898	EM
313.00 > 119.00	2.022	2.015	0.007	1.006	1372335		12.25(5.03-15.10)		16015	
D 9 13C4-PFHpA										
367.00 > 322.00	2.355	2.342	0.013	1.000	3588033	2.28		91.3	46099	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.342	2.346	-0.004	0.994	3326820	2.19			3266	M
363.00 > 169.00	2.342	2.346	-0.004	0.994	1284147		2.59(1.13-3.40)		6925	
D 11 18O2 PFHxS										
403.00 > 84.00	2.368	2.355	0.013	1.000	4094662	2.11		89.2	71310	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.368	2.359	0.009	1.000	22403770	11.5			31622	E
399.00 > 99.00	2.355	2.359	-0.004	0.994	7262721		3.08(1.50-4.49)		22525	

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	2.703	2.695	0.008	1.000	3175517	2.14		85.5	48341	
15 Perfluorooctanoic acid										E
413.00 > 369.00	2.703	2.698	0.005	1.000	63148695	42.2			17099	E
413.00 > 169.00	2.703	2.698	0.005	1.000	42067563		1.50(0.84-2.52)		125353	
* 62 13C2-PFOA										
415.00 > 370.00	2.703	2.698	0.005		3924419	2.50			51692	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.711	2.705	0.006	1.000	349223	0.2246			137	
449.00 > 99.00	2.711	2.705	0.006	1.000	109532		3.19(1.94-5.82)		314	
D 19 13C5 PFNA										
468.00 > 423.00	3.074	3.063	0.011	1.000	3098062	2.55		102	71722	
D 18 13C4 PFOS										
503.00 > 80.00	3.074	3.063	0.011	1.000	2790177	2.09		87.5	19653	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.074	3.070	0.004	1.000	13266857	9.67			30107	E
499.00 > 99.00	3.074	3.070	0.004	1.000	2894860		4.58(2.31-6.93)		41876	
20 Perfluorononanoic acid										
463.00 > 419.00	3.074	3.070	0.004	1.000	91929	0.0700			121	
463.00 > 169.00	3.074	3.070	0.004	1.000	23958		3.84(1.90-5.69)		98.5	
D 21 13C8 FOSA										
506.00 > 78.00	3.407	3.395	0.012	1.000	3516007	2.01		80.5	29416	
22 Perfluorooctane Sulfonamide										M
498.00 > 78.00	3.370	3.402	-0.032	0.989	4766	0.003481			18.2	M
D 23 13C2 PFDA										
515.00 > 470.00	3.435	3.422	0.013	1.000	2487082	2.41		96.2	43642	
24 Perfluorodecanoic acid										M
513.00 > 469.00	3.435	3.430	0.005	1.000	23175	0.0240			63.1	
513.00 > 169.00	3.444	3.430	0.014	1.003	4998		4.64(2.36-7.09)		35.2	M
D 30 13C2 PFUnA										
565.00 > 520.00	3.762	3.748	0.014	1.000	2075894	2.54		101	42286	
31 Perfluoroundecanoic acid										RM
563.00 > 519.00	3.762	3.753	0.009	1.000	2605	0.003756			13.4	RM
563.00 > 169.00	3.762	3.753	0.009	1.000	1502		1.73(2.12-6.36)		61.2	
D 36 13C2 PFDoA										
615.00 > 570.00	4.051	4.048	0.003	1.000	1959551	2.22		89.0	16691	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.552	4.542	0.010	1.000	2126513	1.97		78.6	11460	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 30-May-2018 11:04:55 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d

Injection Date: 28-May-2018 07:39:26 Instrument ID: A8_N

Lims ID: 320-38875-A-1-A Lab Sample ID: 320-38875-1

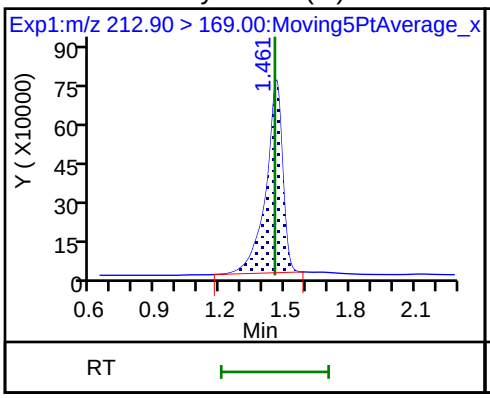
Client ID: TP-PFC-029-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6

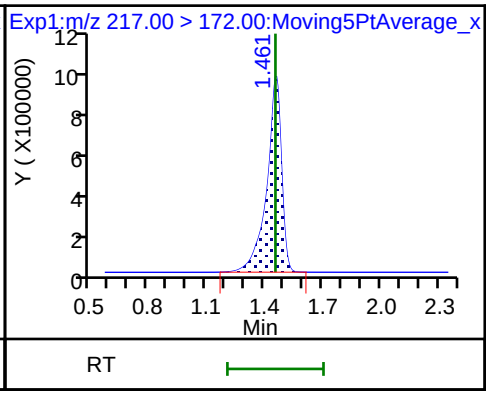
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

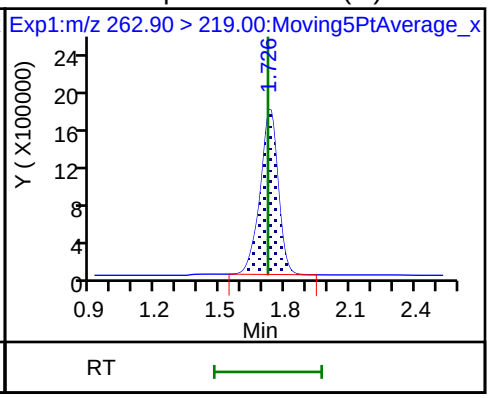
2 Perfluorobutyric acid (M)



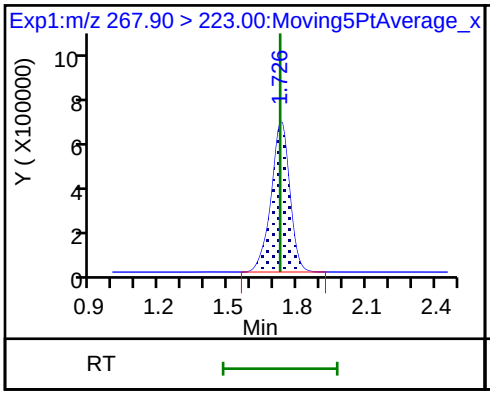
D 1 13C4 PFBA



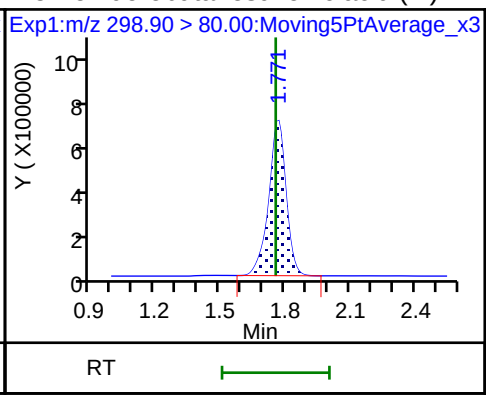
4 Perfluoropentanoic acid (M)



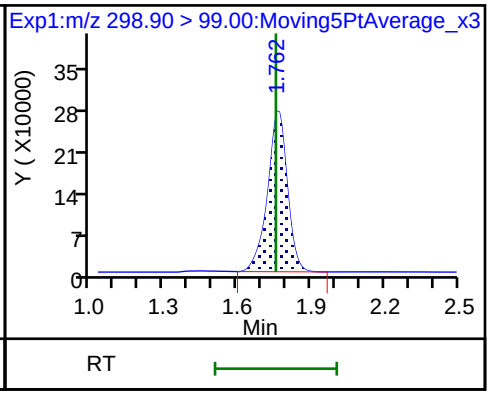
D 3 13C5-PFPeA



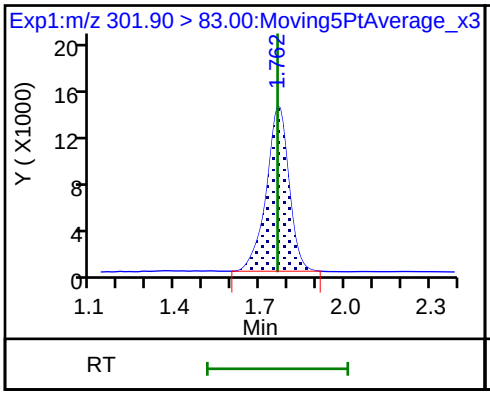
5 Perfluorobutanesulfonic acid (M)



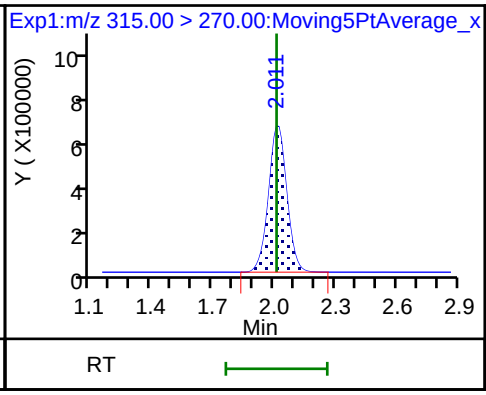
5 Perfluorobutanesulfonic acid



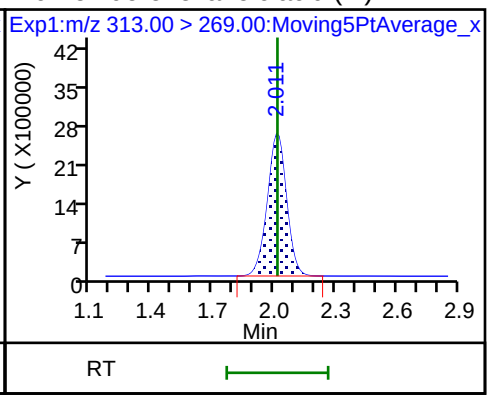
D 47 13C3-PFBS



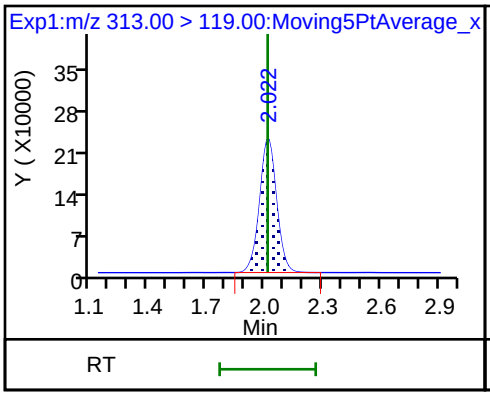
D 7 13C2 PFHxA



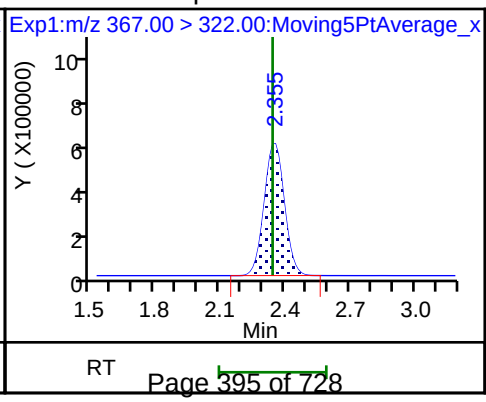
6 Perfluorohexanoic acid (M)



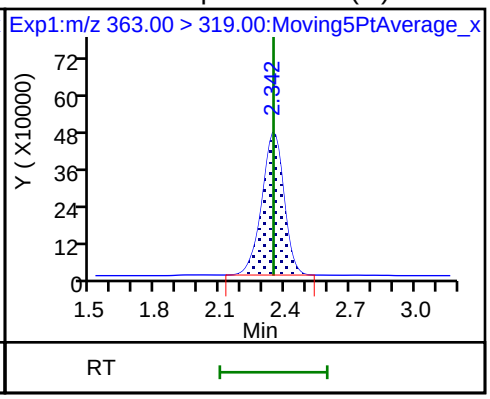
6 Perfluorohexanoic acid



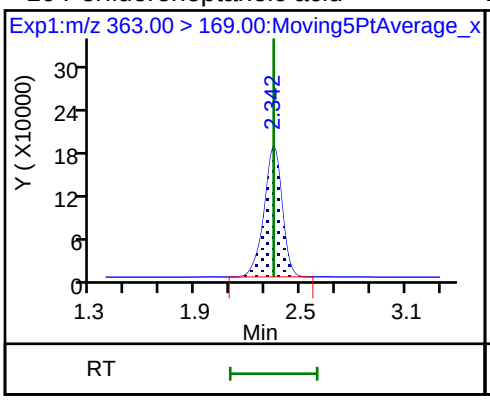
D 9 13C4-PFHpA



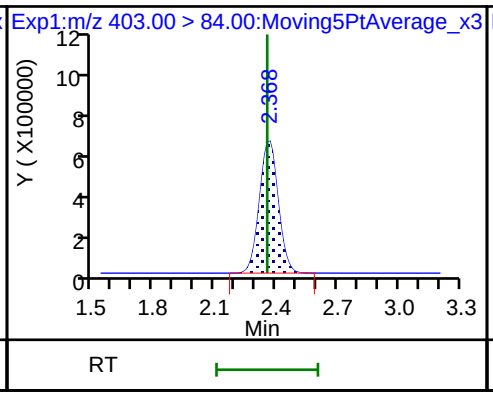
10 Perfluoroheptanoic acid (M)



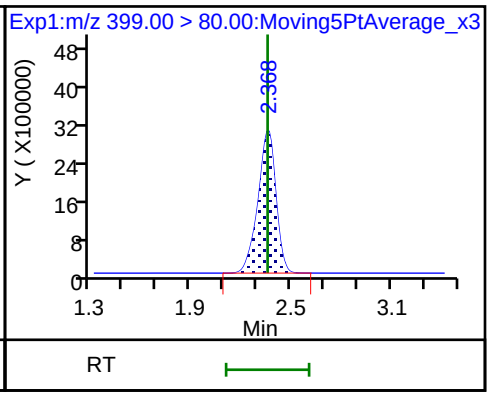
10 Perfluoroheptanoic acid



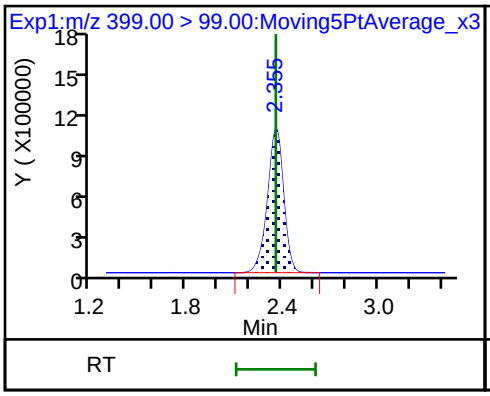
D 11 18O2 PFHxS



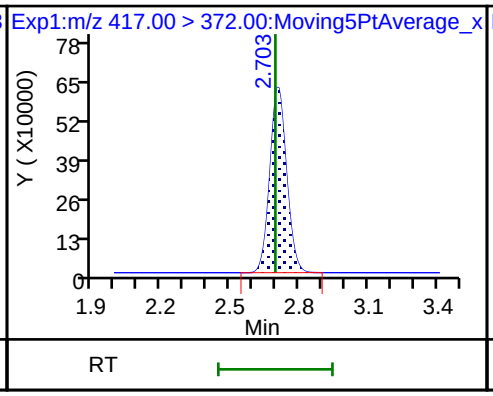
8 Perfluorohexanesulfonic acid



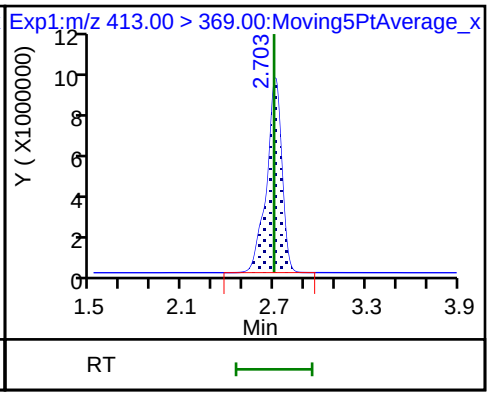
8 Perfluorohexanesulfonic acid



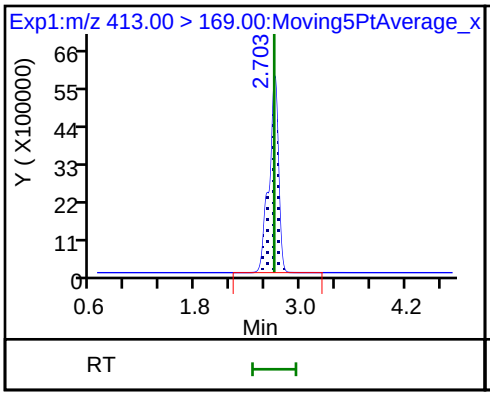
D 14 13C4 PFOA



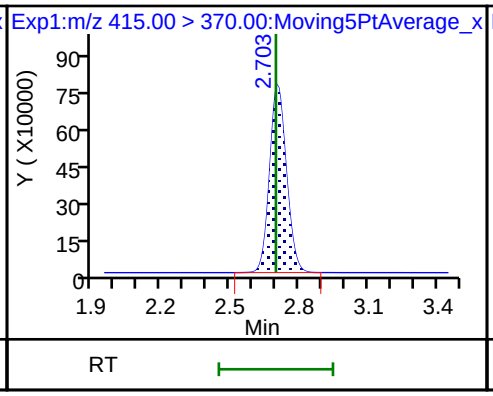
15 Perfluorooctanoic acid



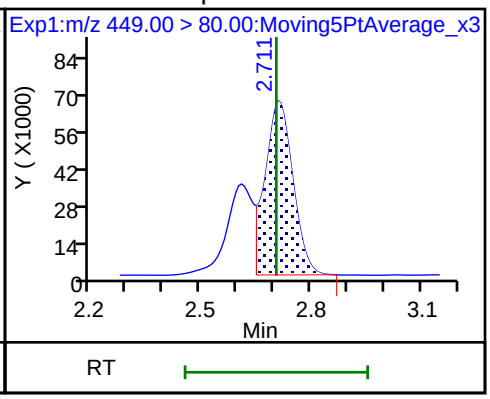
15 Perfluorooctanoic acid



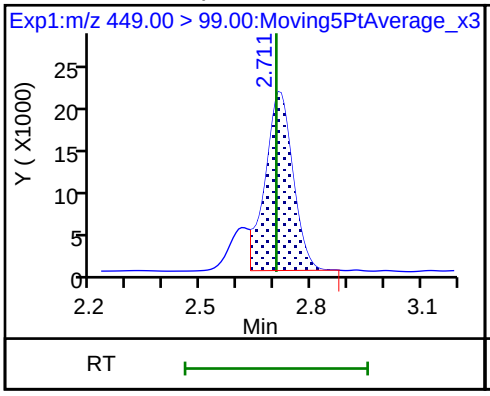
* 62 13C2-PFOA



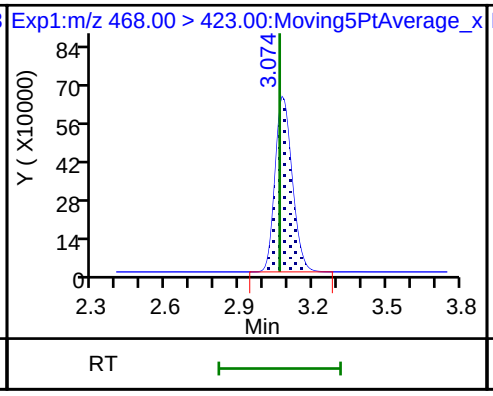
16 Perfluoroheptanesulfonic acid



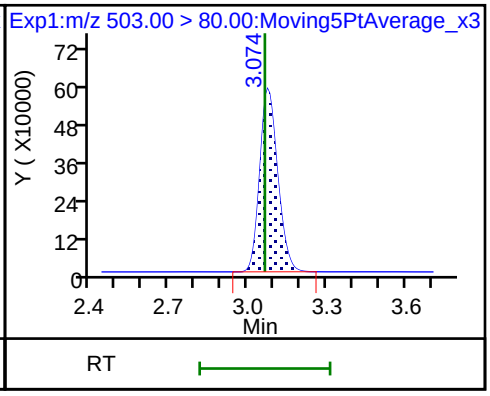
16 Perfluoroheptanesulfonic acid



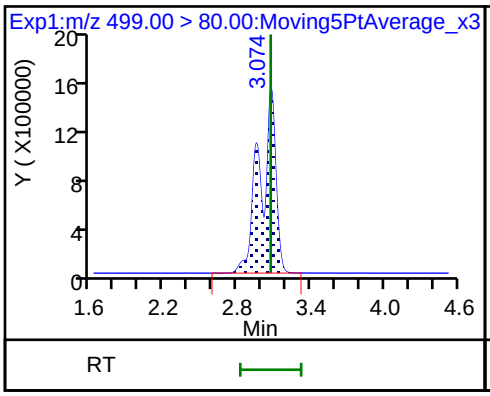
D 19 13C5 PFNA



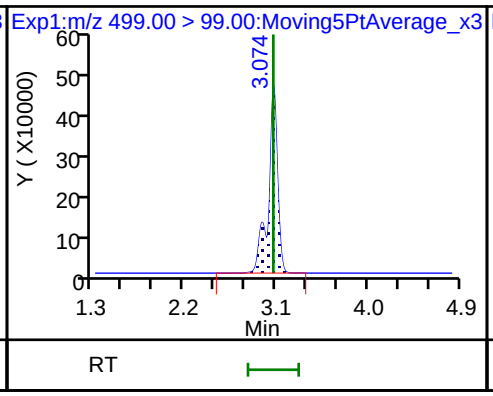
D 18 13C4 PFOS



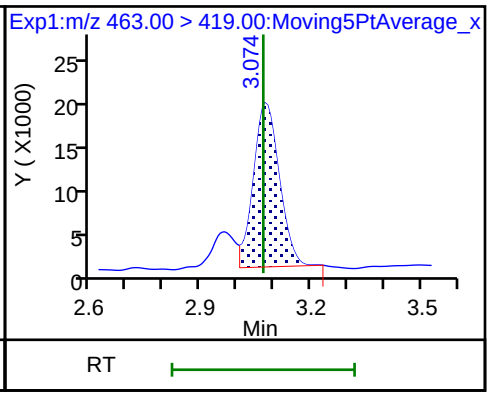
17 Perfluorooctane sulfonic acid



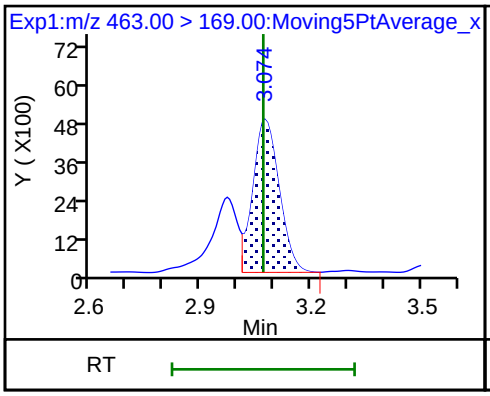
17 Perfluorooctane sulfonic acid



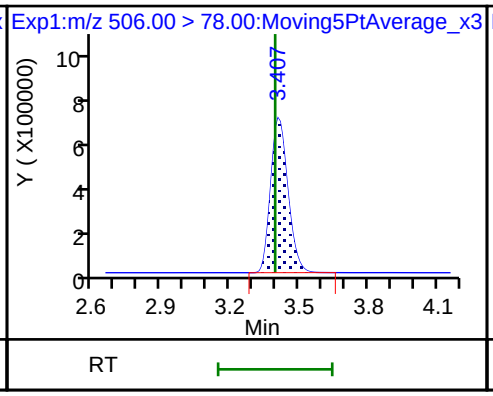
20 Perfluorononanoic acid



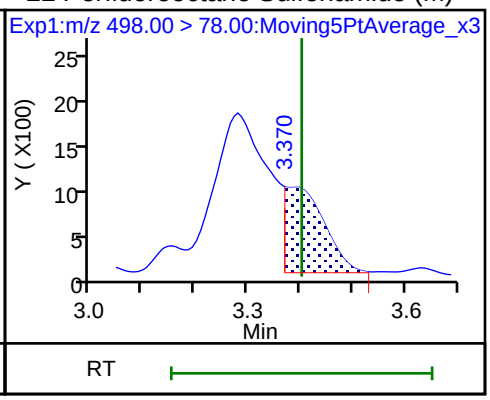
20 Perfluorononanoic acid



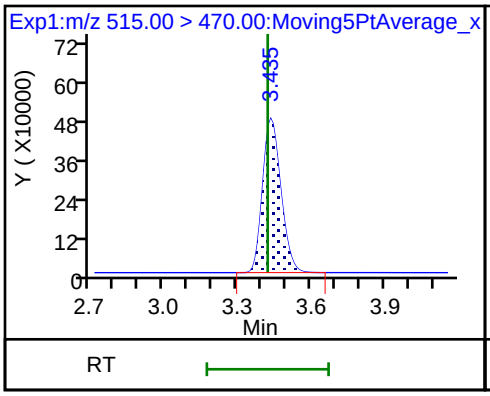
D 21 13C8 FOSA



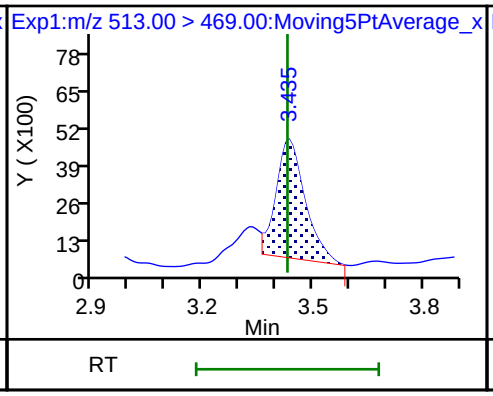
22 Perfluorooctane Sulfonamide (M)



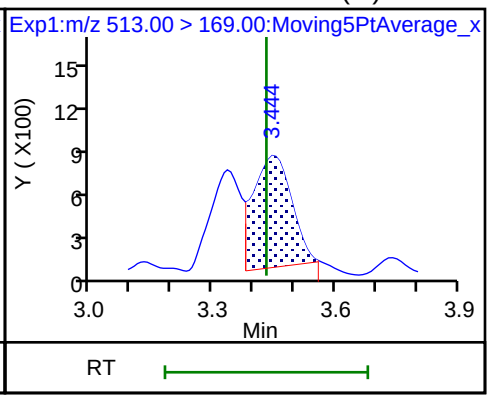
D 23 13C2 PFDA



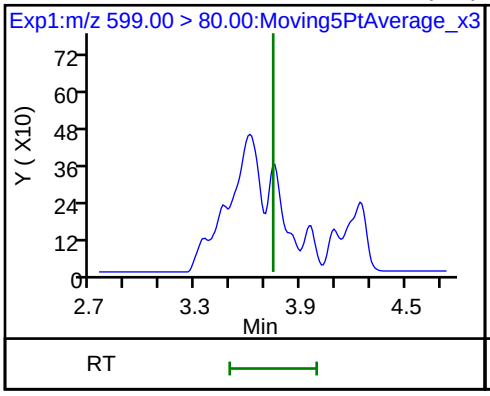
24 Perfluorodecanoic acid



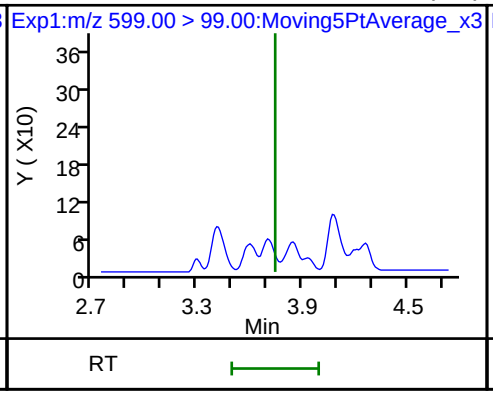
24 Perfluorodecanoic acid (M)



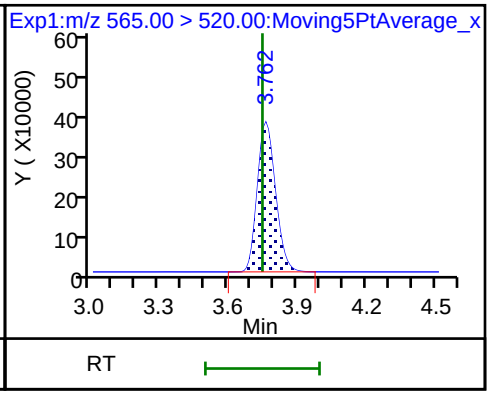
29 Perfluorodecane Sulfonic acid (ND)



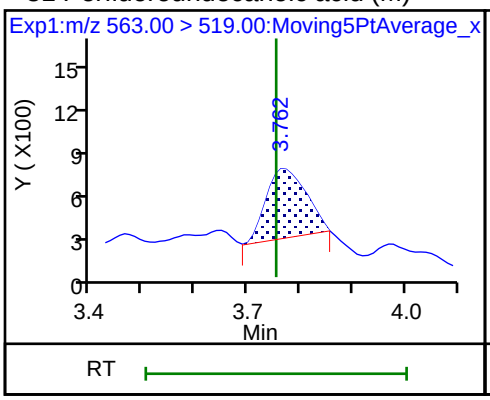
29 Perfluorodecane Sulfonic acid (ND)



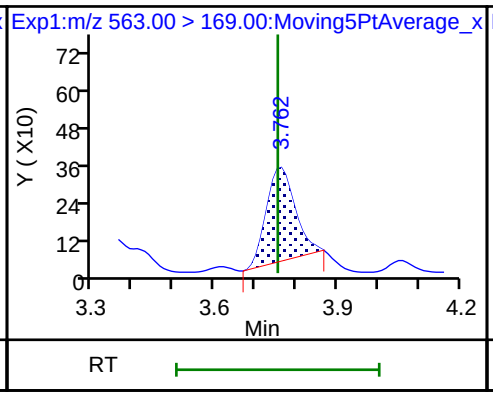
D 30 13C2 PFUnA



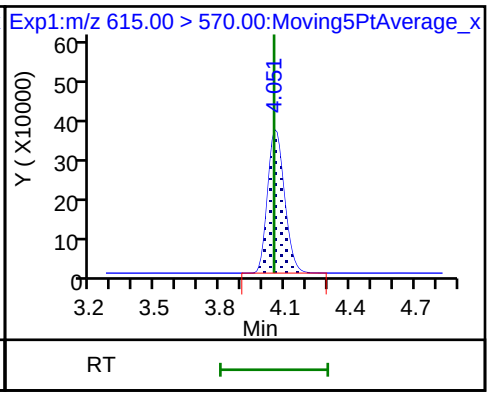
31 Perfluoroundecanoic acid (M)



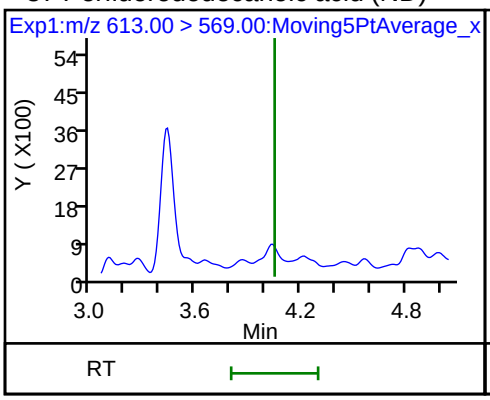
31 Perfluoroundecanoic acid



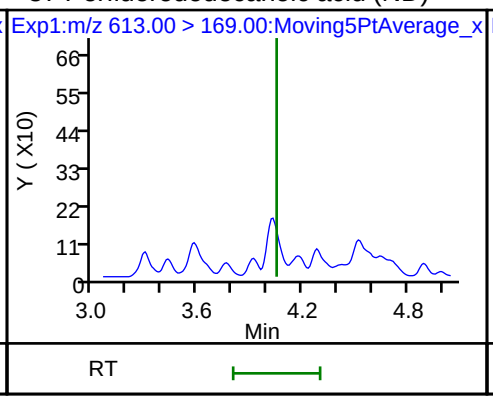
D 36 13C2 PFDoA



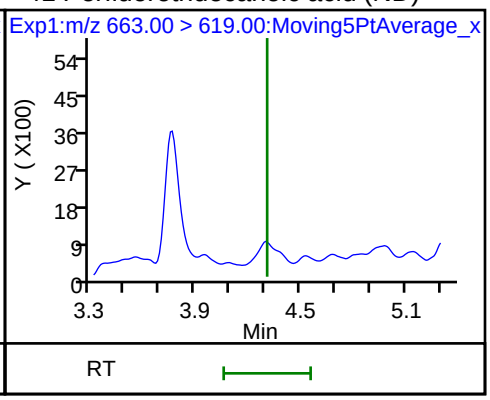
37 Perfluorododecanoic acid (ND)



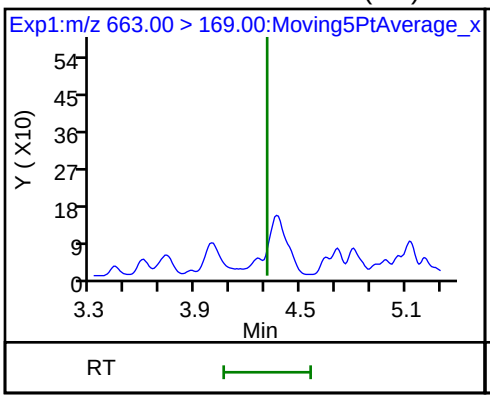
37 Perfluorododecanoic acid (ND)



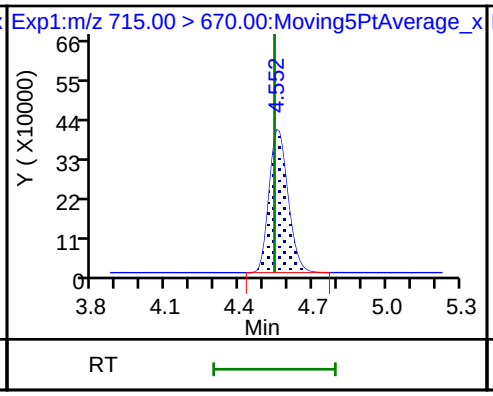
41 Perfluorotridecanoic acid (ND)



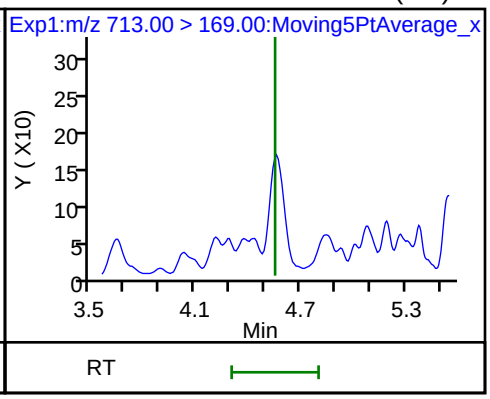
41 Perfluorotridecanoic acid (ND)



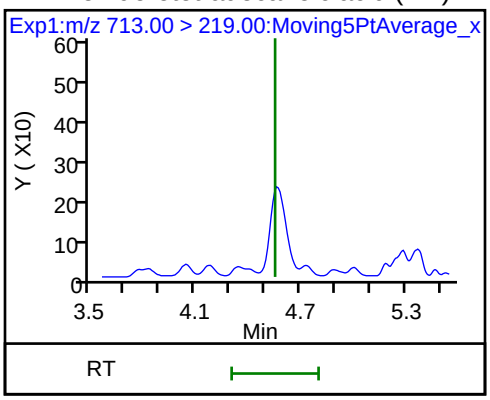
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

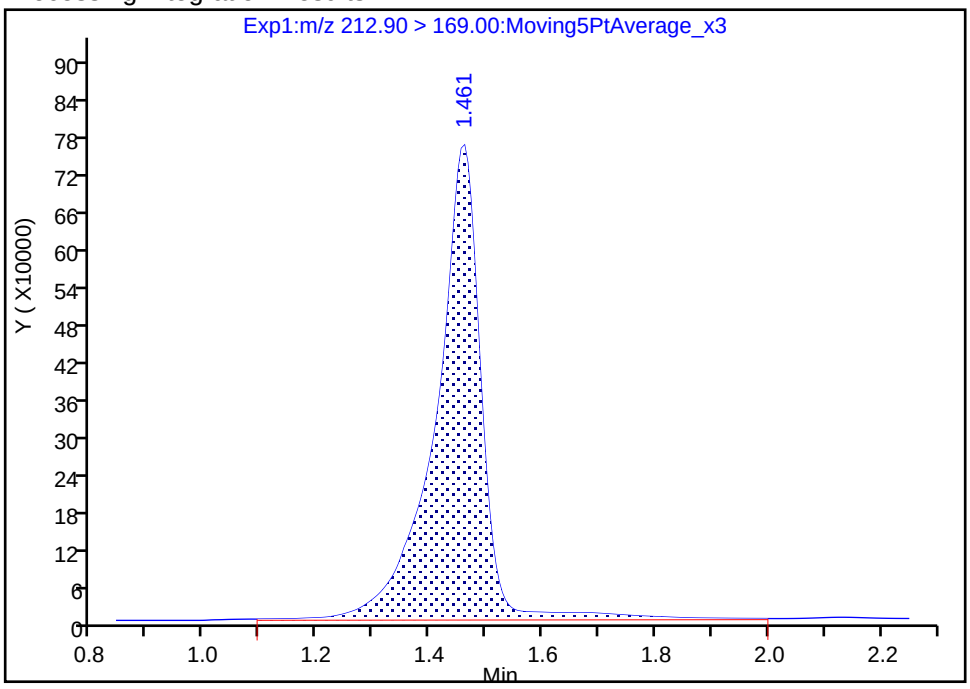
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d				
Injection Date:	28-May-2018 07:39:26	Instrument ID:	A8_N		
Lims ID:	320-38875-A-1-A	Lab Sample ID:	320-38875-1		
Client ID:	TP-PFC-029-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	3	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

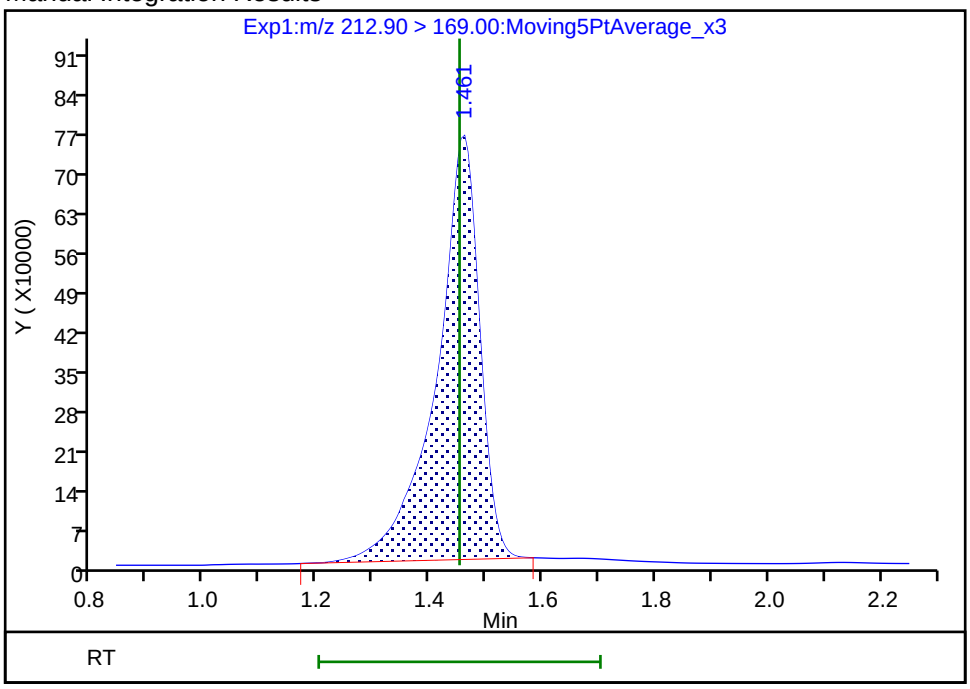
Processing Integration Results

RT: 1.46
Area: 4323660
Amount: 2.337276
Amount Units: ng/ml



Manual Integration Results

RT: 1.46
Area: 3964404
Amount: 2.143070
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:02:04

Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

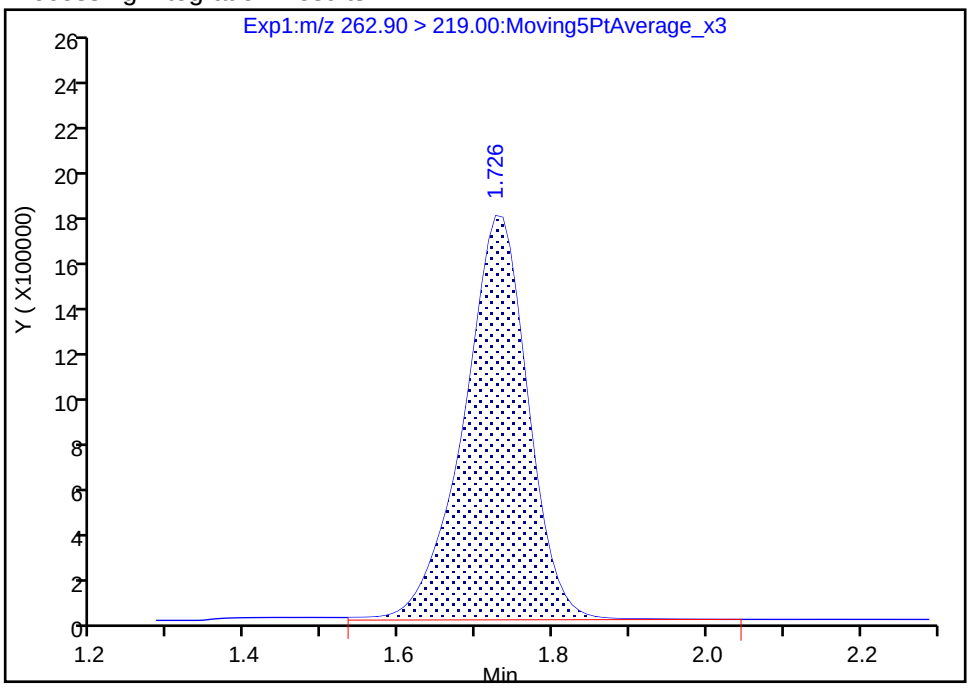
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d
Injection Date: 28-May-2018 07:39:26 Instrument ID: A8_N
Lims ID: 320-38875-A-1-A Lab Sample ID: 320-38875-1
Client ID: TP-PFC-029-TPI
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

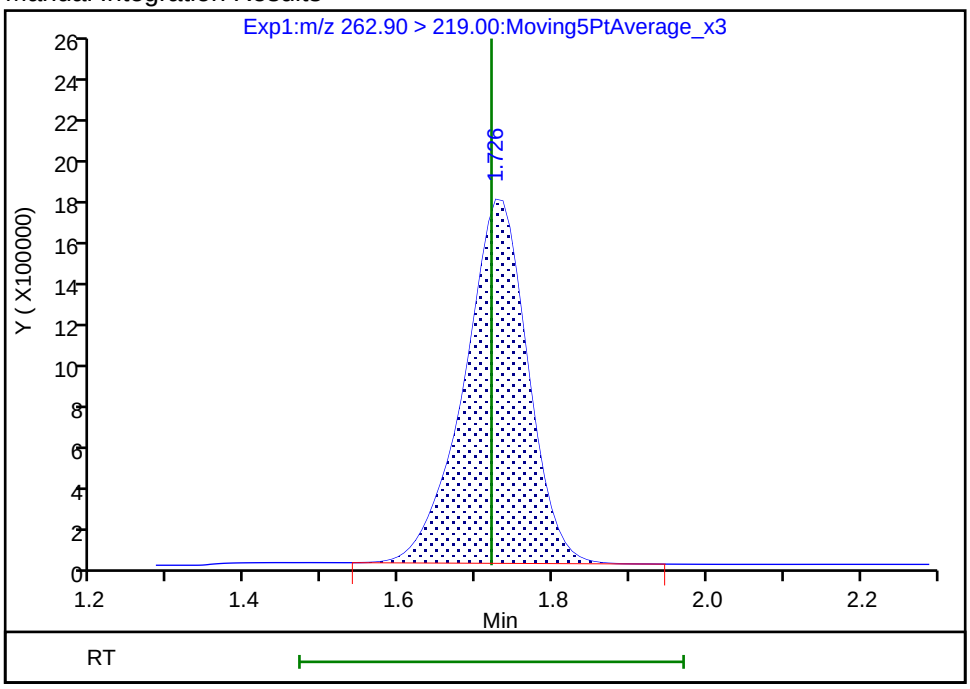
Processing Integration Results

RT: 1.73
Area: 10224040
Amount: 5.792621
Amount Units: ng/ml



Manual Integration Results

RT: 1.73
Area: 10058089
Amount: 5.698599
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:02:14
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

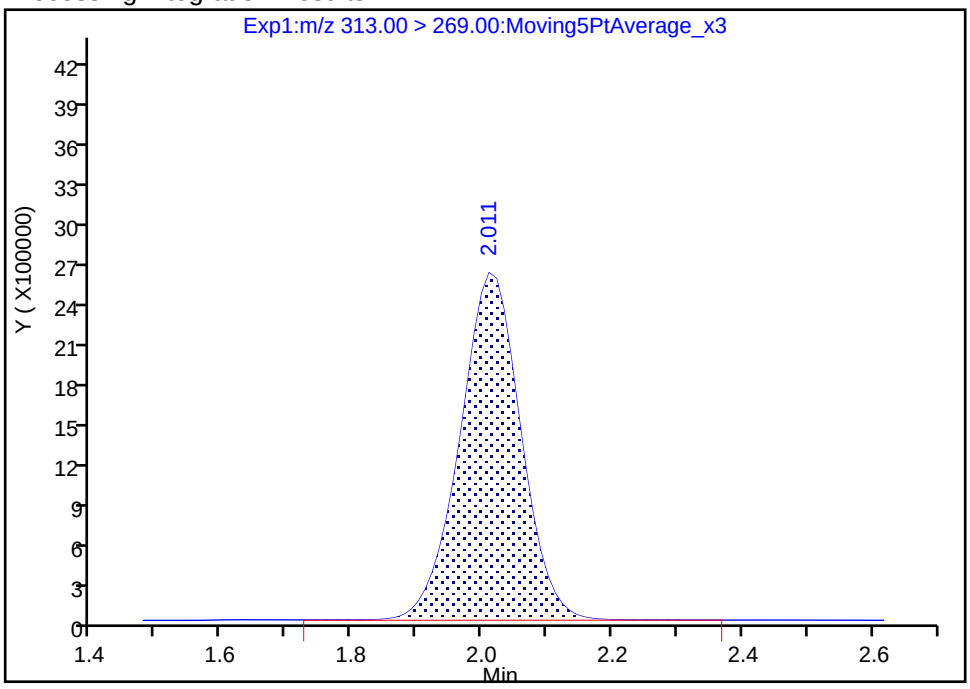
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d				
Injection Date:	28-May-2018 07:39:26	Instrument ID:	A8_N		
Lims ID:	320-38875-A-1-A	Lab Sample ID:	320-38875-1		
Client ID:	TP-PFC-029-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	3	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

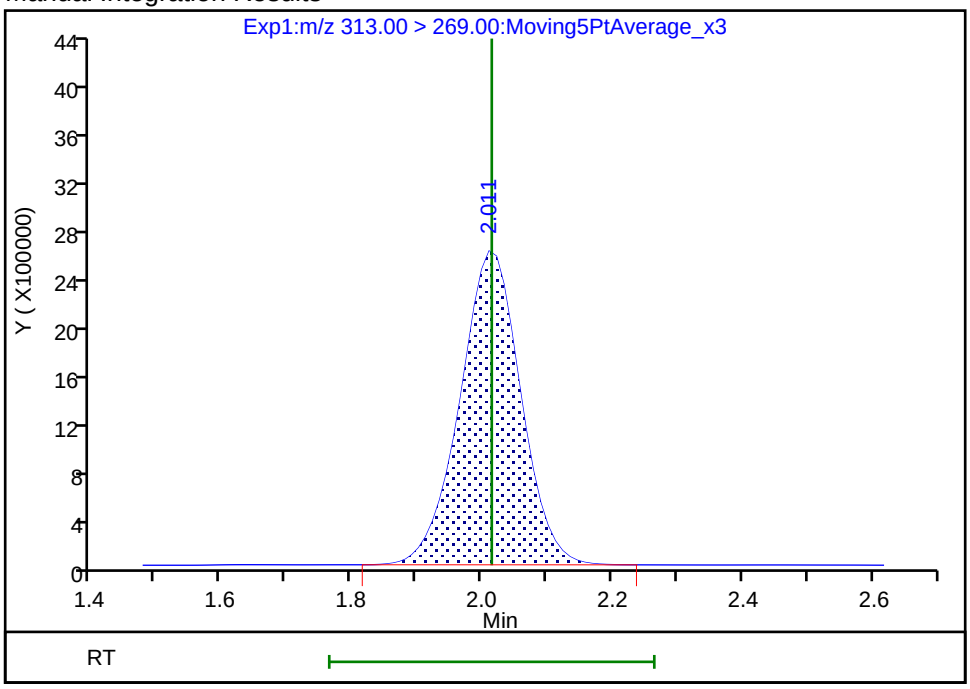
Processing Integration Results

RT: 2.01
Area: 16889018
Amount: 10.586014
Amount Units: ng/ml



Manual Integration Results

RT: 2.01
Area: 16805071
Amount: 10.533396
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:02:36

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

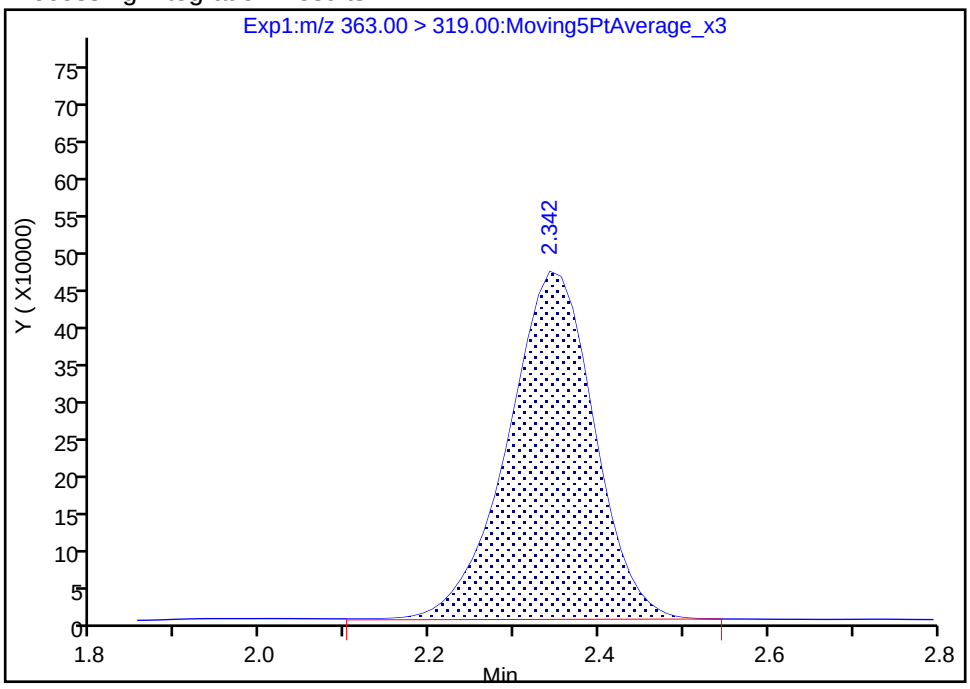
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d				
Injection Date:	28-May-2018 07:39:26	Instrument ID:	A8_N		
Lims ID:	320-38875-A-1-A	Lab Sample ID:	320-38875-1		
Client ID:	TP-PFC-029-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	3	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

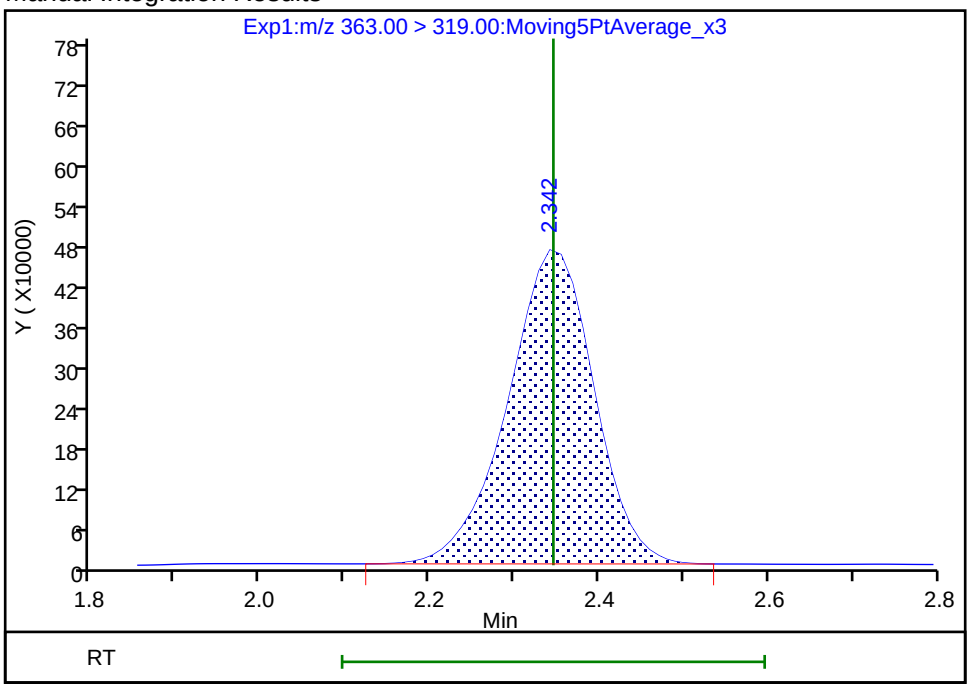
Processing Integration Results

RT: 2.34
Area: 3345829
Amount: 2.206951
Amount Units: ng/ml



Manual Integration Results

RT: 2.34
Area: 3326820
Amount: 2.194413
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:02:46

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

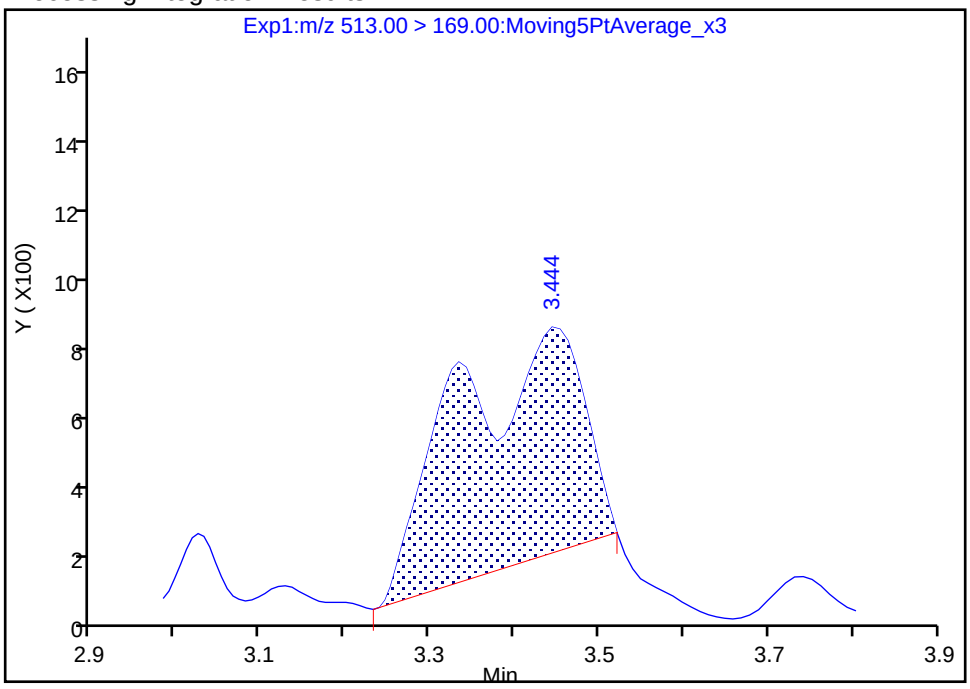
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d				
Injection Date:	28-May-2018 07:39:26	Instrument ID:	A8_N		
Lims ID:	320-38875-A-1-A	Lab Sample ID:	320-38875-1		
Client ID:	TP-PFC-029-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	3	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

24 Perfluorodecanoic acid, CAS: 335-76-2

Signal: 2

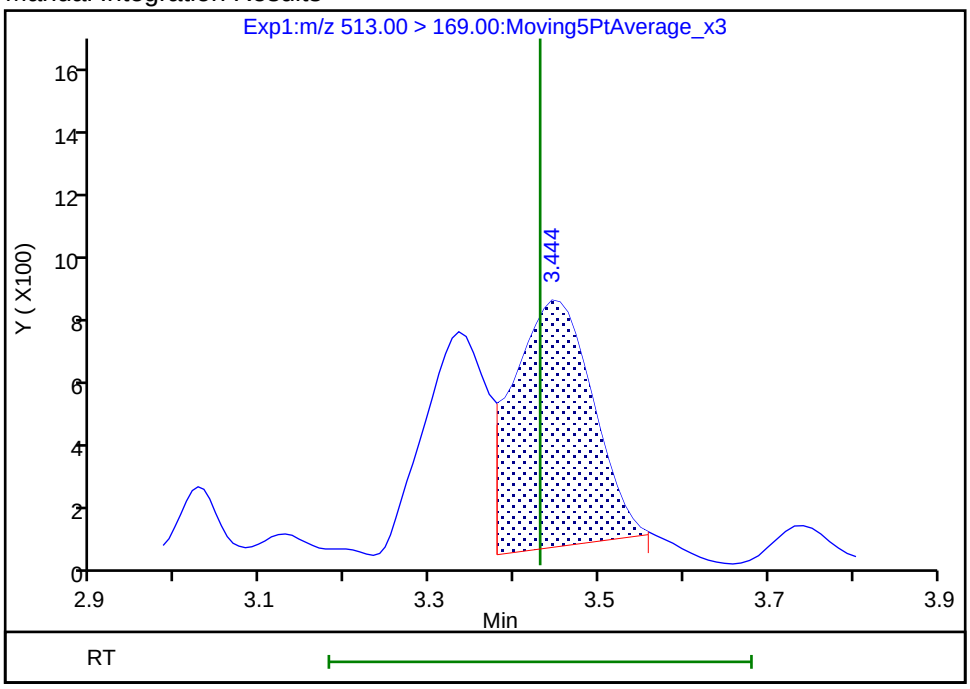
Processing Integration Results

RT: 3.44
Area: 6816
Amount: 0.023961
Amount Units: ng/ml



Manual Integration Results

RT: 3.44
Area: 4998
Amount: 0.023961
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:03:32

Audit Action: Manually Integrated Audit Reason: Split Peak

TestAmerica Sacramento

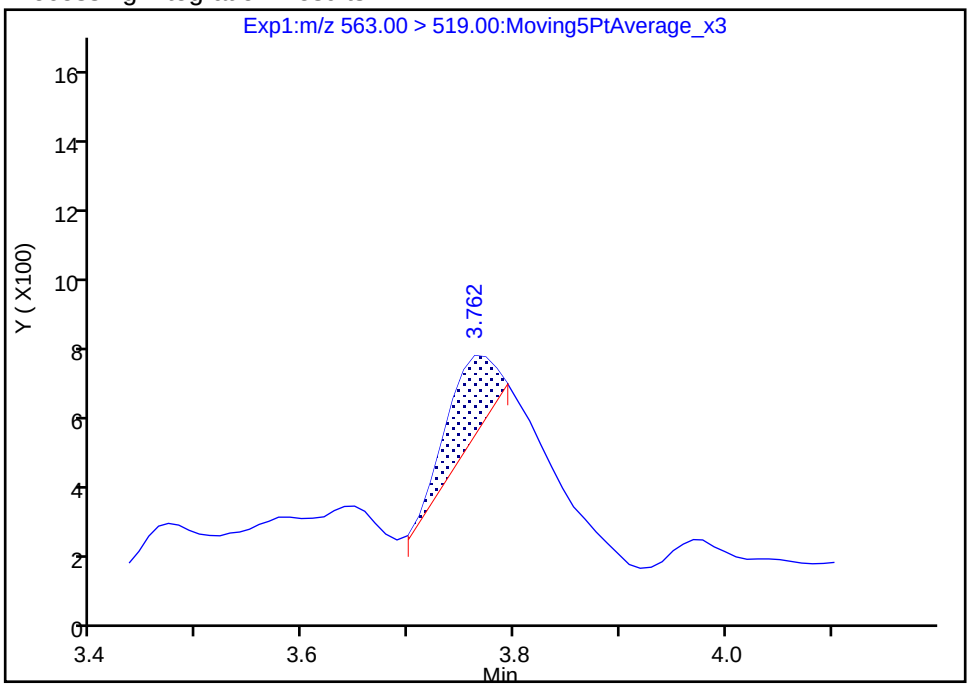
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d
Injection Date: 28-May-2018 07:39:26 Instrument ID: A8_N
Lims ID: 320-38875-A-1-A Lab Sample ID: 320-38875-1
Client ID: TP-PFC-029-TPI
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 1

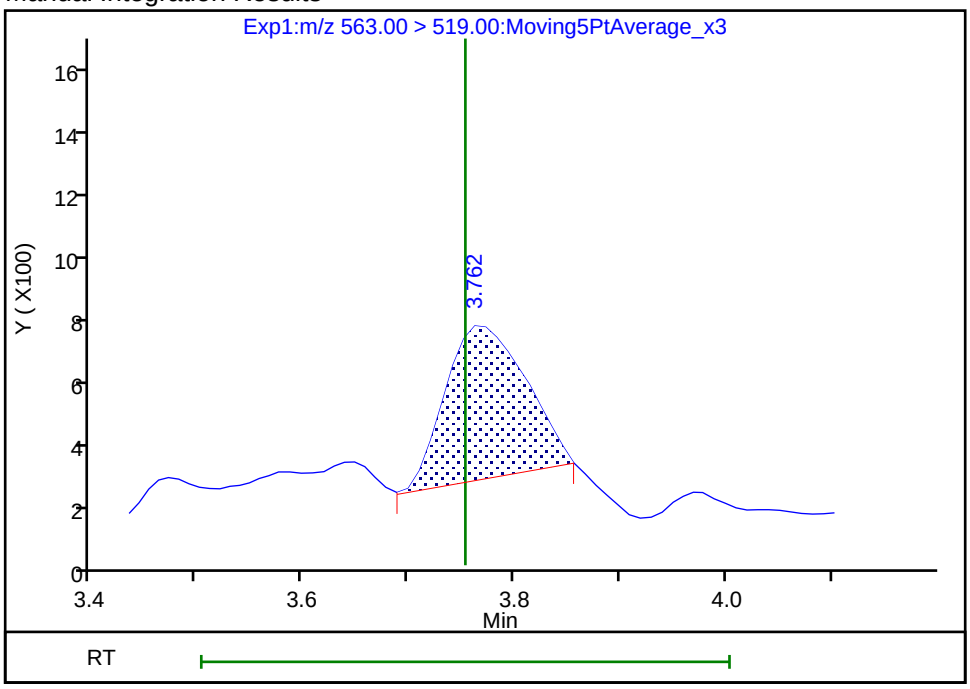
Processing Integration Results

RT: 3.76
Area: 733
Amount: 0.001057
Amount Units: ng/ml



Manual Integration Results

RT: 3.76
Area: 2605
Amount: 0.003756
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:03:48
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

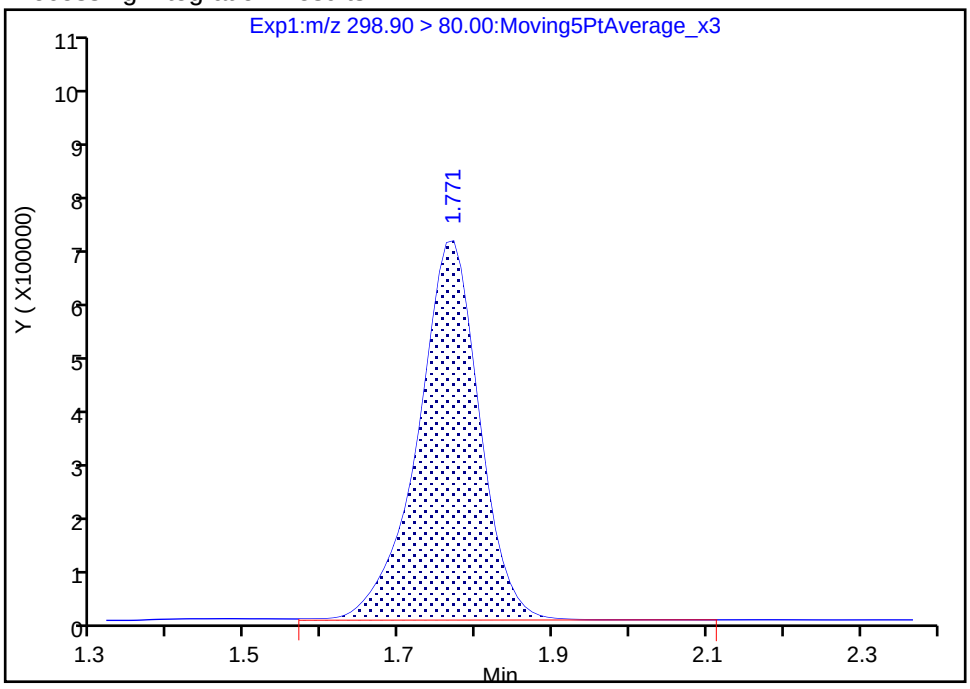
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d				
Injection Date:	28-May-2018 07:39:26	Instrument ID:	A8_N		
Lims ID:	320-38875-A-1-A	Lab Sample ID:	320-38875-1		
Client ID:	TP-PFC-029-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	3	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

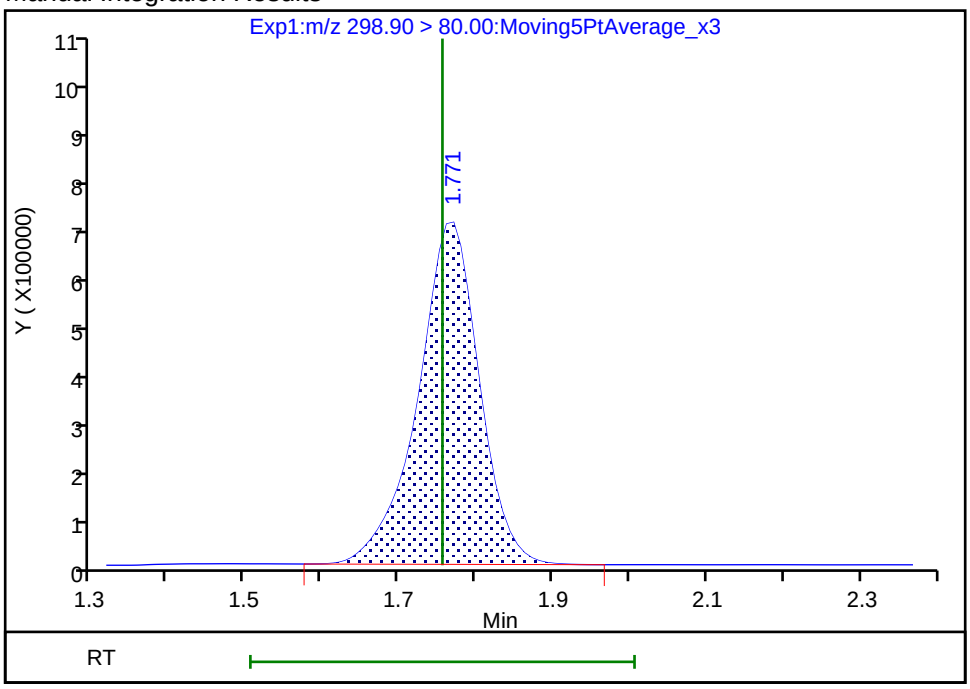
Processing Integration Results

RT: 1.77
Area: 3675805
Amount: 1.429191
Amount Units: ng/ml



Manual Integration Results

RT: 1.77
Area: 3645364
Amount: 1.417355
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:02:25

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

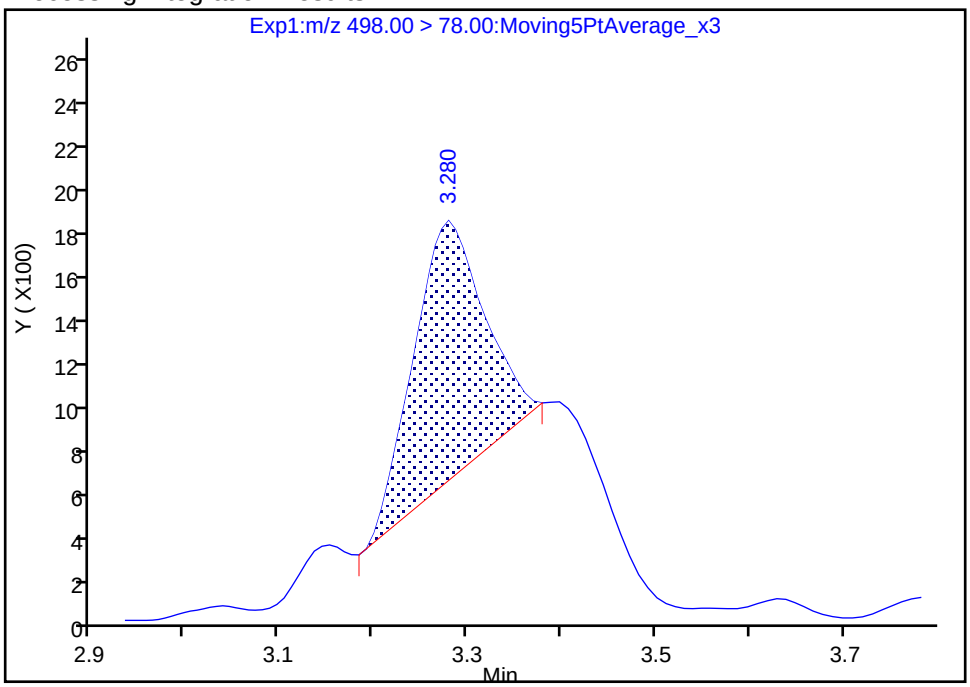
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_006.d				
Injection Date:	28-May-2018 07:39:26	Instrument ID:	A8_N		
Lims ID:	320-38875-A-1-A	Lab Sample ID:	320-38875-1		
Client ID:	TP-PFC-029-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	3	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

22 Perfluorooctane Sulfonamide, CAS: 754-91-6

Signal: 1

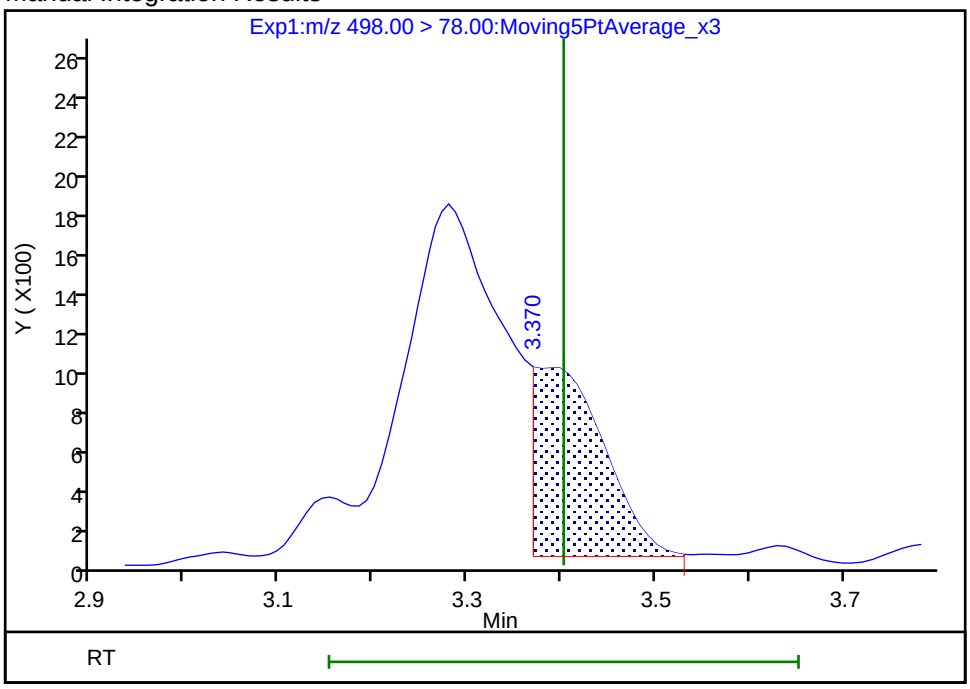
Processing Integration Results

RT: 3.28
Area: 6138
Amount: 0.004483
Amount Units: ng/ml



Manual Integration Results

RT: 3.37
Area: 4766
Amount: 0.003481
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:03:16

Audit Action: Manually Integrated Audit Reason: Wrong peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPI DL | Lab Sample ID: 320-38875-1 DL

Matrix: Water | Lab File ID: 2018.05.28LLA_056.d

Analysis Method: EPA 537 (Mod) | Date Collected: 05/03/2018 09:20

Extraction Method: 3535 | Date Extracted: 05/16/2018 14:51

Sample wt/vol: 290.5(mL) | Date Analyzed: 05/29/2018 00:09

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

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

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

Analysis Batch No.: 225884 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	*Perfluorobutanoic acid (PFBA)*	*81*	*D*	*17*	13	*5.1*
2706-90-3	*Perfluoropentanoic acid (PFPeA)*	*200*	*D*	*17*	8.6	*3.7*
307-24-4	Perfluorohexanoic acid (PFHxA)	380	D	17	8.6	4.0
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*73*	*D*	*17*	13	*5.2*
335-67-1	Perfluorooctanoic acid (PFOA)	1700	D	17	13	4.6
375-95-1	*Perfluorononanoic acid (PFNA)*	*13*	*U*	*17*	13	*4.5*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*8.6*	*U*	*17*	8.6	*4.1*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*13*	*U*	*17*	13	*6.2*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*13*	*U*	*17*	13	*4.5*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*26*	*U*	*34*	26	*6.5*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*26*	*U*	*34*	26	*7.1*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*50*	*D*	*17*	8.6	*4.0*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	410	D	17	8.6	3.3
375-92-8	*Perfluoroheptanesulfonic Acid (PFHpS)*	*8.7*	*J D*	*17*	8.6	*3.2*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	330	D	34	26	9.5
335-77-3	*Perfluorodecanesulfonic acid (PFDS)*	*13*	*U*	*17*	13	*4.8*
754-91-6	*Perfluorooctane Sulfonamide (FOSA)*	*26*	*U*	*34*	26	*11*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPI DL Lab Sample ID: 320-38875-1 DL

Matrix: Water Lab File ID: 2018.05.28LLA_056.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:20

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 290.5(mL) Date Analyzed: 05/29/2018 00:09

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

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

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

Analysis Batch No.: 225884 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	73		50-150
STL00992	13C4 PFBA	78		50-150
STL01893	13C5 PFPeA	84		50-150
STL00993	13C2 PFHxA	81		50-150
STL01892	13C4-PFHpA	81		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	86		50-150
STL00996	13C2 PFDA	83		50-150
STL00997	13C2 PFUnA	90		50-150
STL00998	13C2 PFDoA	87		50-150
STL00994	18O2 PFHxS	80		50-150
STL02116	13C2-PFTeDA	69		50-150
STL00991	13C4 PFOS	75		50-150
STL02337	13C3-PFBS	76		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_056.d
Lims ID: 320-38875-A-1-A
Client ID: TP-PFC-029-TPI
Sample Type: Client
Inject. Date: 29-May-2018 00:09:41 ALS Bottle#: 39 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-38875-a-1-a 10X (#223615)
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-May-2018 13:11:52 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 13:12:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.463	1.458	0.005	1.000	510148	0.1960		78.4	3528	
2 Perfluorobutyric acid										
212.90 > 169.00	1.463	1.461	0.002	1.000	443786	0.2339			194	
D 3 13C5-PFPeA										
267.90 > 223.00	1.737	1.730	0.007	0.563	348559	0.2089		83.6	5310	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.737	1.734	0.003	1.000	950047	0.5772			541	
D 47 13C3-PFBS										
301.90 > 83.00	1.773	1.766	0.007	1.000	6644	0.1762		75.8	65.6	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.773	1.770	0.003	1.000	326750	0.1464			1291	
298.90 > 99.00	1.773	1.770	0.003	1.000	141213		2.31(1.25-3.74)		1019	
D 7 13C2 PFHxA										
315.00 > 270.00	2.025	2.016	0.009	1.000	360061	0.2024		81.0	8842	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.025	2.022	0.003	1.000	1641512	1.11			2527	
313.00 > 119.00	2.025	2.022	0.003	1.000	130014		12.63(5.03-15.10)		1850	
D 9 13C4-PFHpA										
367.00 > 322.00	2.358	2.347	0.011	1.000	345963	0.2030		81.2	8041	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.358	2.355	0.003	1.000	311364	0.2130			395	
363.00 > 169.00	2.358	2.355	0.003	1.000	128082		2.43(1.13-3.40)		764	
D 11 18O2 PFHxS										
403.00 > 84.00	2.371	2.360	0.011	1.000	397005	0.1885		79.7	9407	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.371	2.368	0.003	1.000	2225980	1.18			7347	
399.00 > 99.00	2.371	2.368	0.003	1.000	708688		3.14(1.50-4.49)		3134	

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	2.712	2.706	0.006	1.000	350956	0.2177		87.1	8255	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.712	2.711	0.001	1.000	8390762	5.08			3247	
413.00 > 169.00	2.712	2.711	0.001	1.000	4826560		1.74(0.84-2.52)		15312	
* 62 13C2-PFOA										
415.00 > 370.00	2.712	2.711	0.001		425723	0.2500			9942	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.719	2.718	0.001	1.000	36400	0.0253			118	
449.00 > 99.00	2.719	2.718	0.001	1.000	13104		2.78(1.94-5.82)		155	
D 19 13C5 PFNA										
468.00 > 423.00	3.084	3.076	0.008	1.000	282433	0.2142		85.7	8409	
D 18 13C4 PFOS										
503.00 > 80.00	3.084	3.076	0.008	1.000	258620	0.1786		74.7	2661	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.084	3.079	0.005	1.000	1225321	0.9631			4427	
499.00 > 99.00	3.084	3.079	0.005	1.000	281337		4.36(2.31-6.93)		2912	
20 Perfluorononanoic acid										R
463.00 > 419.00	3.084	3.079	0.005	1.000	11744	0.009814			26.6	R
463.00 > 169.00	3.084	3.079	0.005	1.000	1105		10.63(1.90-5.69)		22.6	
D 21 13C8 FOSA										
506.00 > 78.00	3.420	3.411	0.009	1.000	346362	0.1828		73.1	6753	
D 23 13C2 PFDA										
515.00 > 470.00	3.448	3.439	0.009	1.000	232085	0.2069		82.8	7540	
D 30 13C2 PFUnA										
565.00 > 520.00	3.774	3.763	0.011	1.000	199622	0.2247		89.9	7504	
D 36 13C2 PFDoA										
615.00 > 570.00	4.061	4.051	0.010	1.000	208972	0.2186		87.4	2498	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.562	4.553	0.009	1.000	201434	0.1717		68.7	1412	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Report Date: 30-May-2018 13:12:41 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_056.d

Injection Date: 29-May-2018 00:09:41 Instrument ID: A8_N

Lims ID: 320-38875-A-1-A Lab Sample ID: 320-38875-1

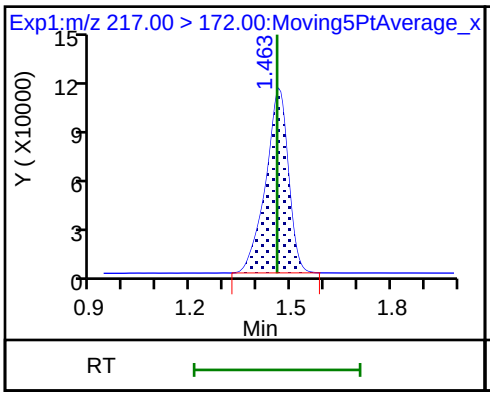
Client ID: TP-PFC-029-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 39 Worklist Smp#: 2

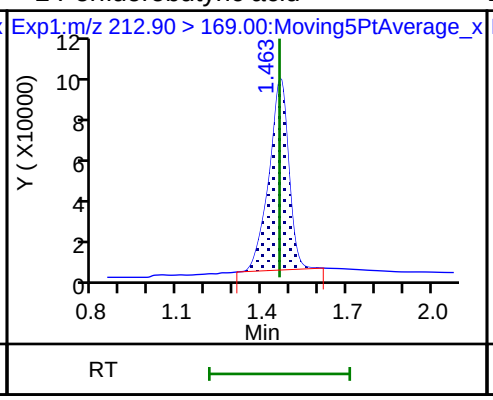
Injection Vol: 2.0 ul Dil. Factor: 10.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

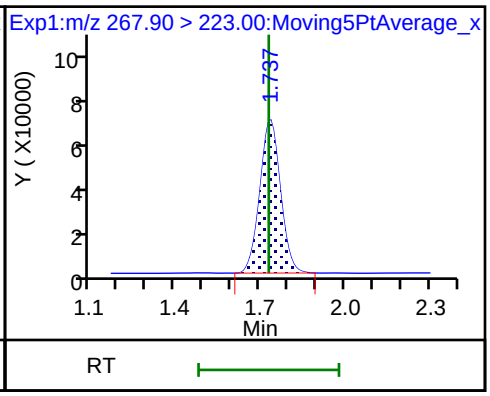
D 1 13C4 PFBA



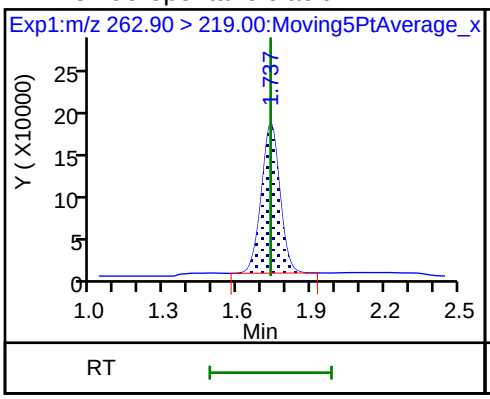
2 Perfluorobutyric acid



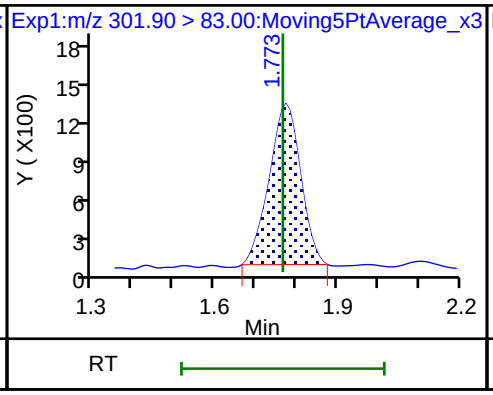
D 3 13C5-PFPeA



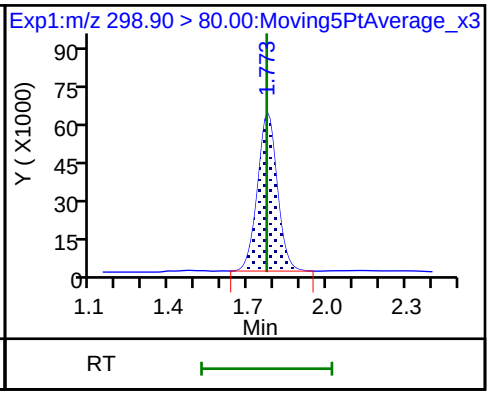
4 Perfluoropentanoic acid



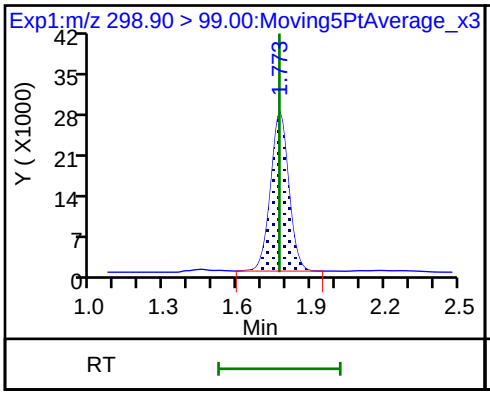
D 47 13C3-PFBS



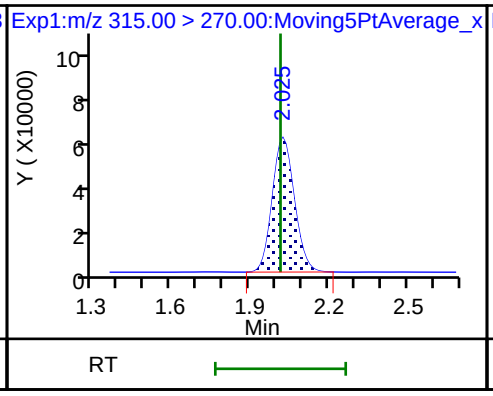
5 Perfluorobutanesulfonic acid



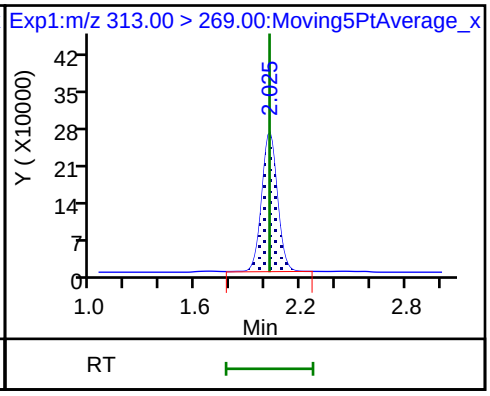
5 Perfluorobutanesulfonic acid



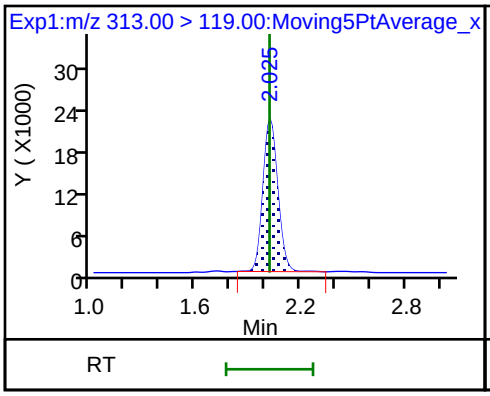
D 7 13C2 PFHxA



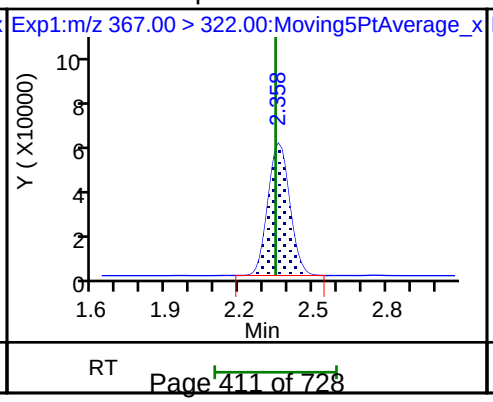
6 Perfluorohexanoic acid



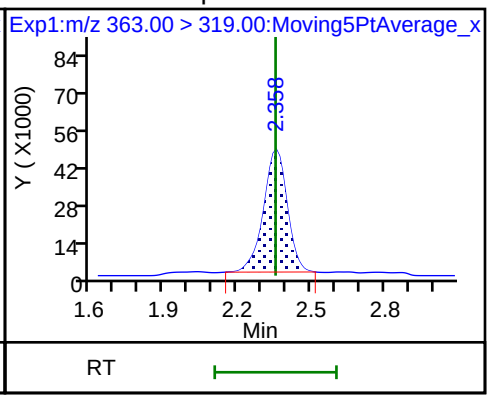
6 Perfluorohexanoic acid



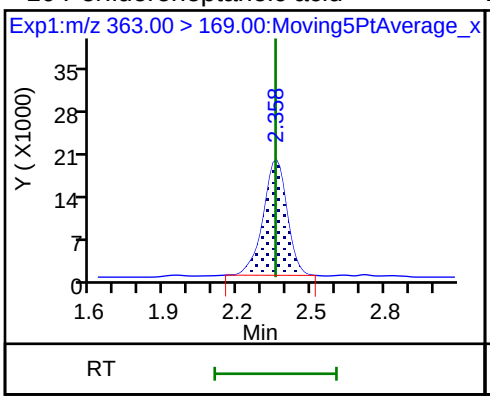
D 9 13C4-PFHpA



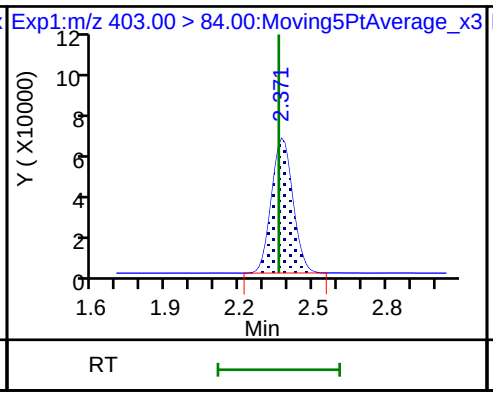
10 Perfluoroheptanoic acid



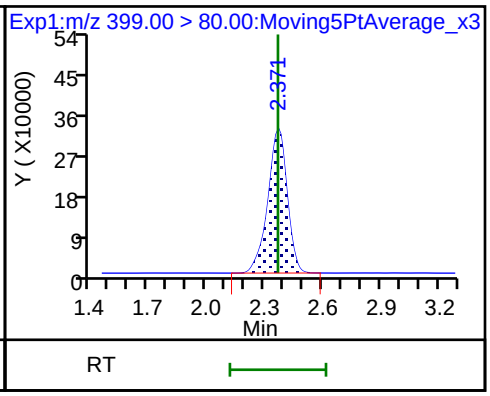
10 Perfluoroheptanoic acid



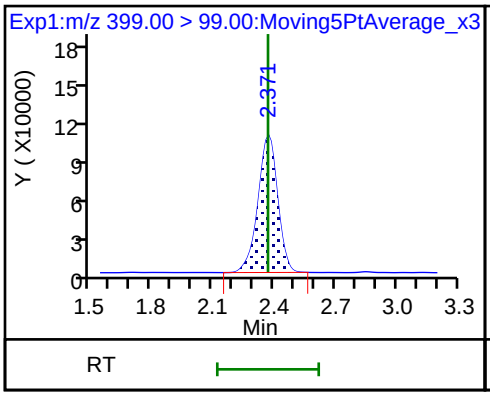
D 11 18O2 PFHxS



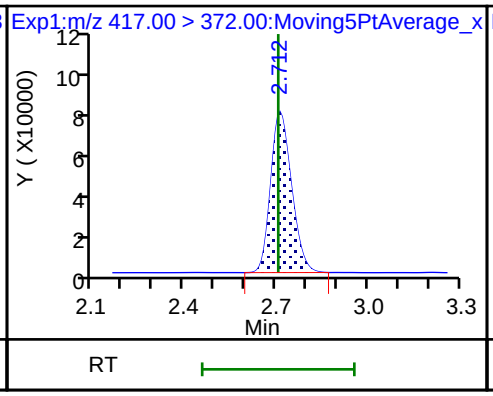
8 Perfluorohexanesulfonic acid



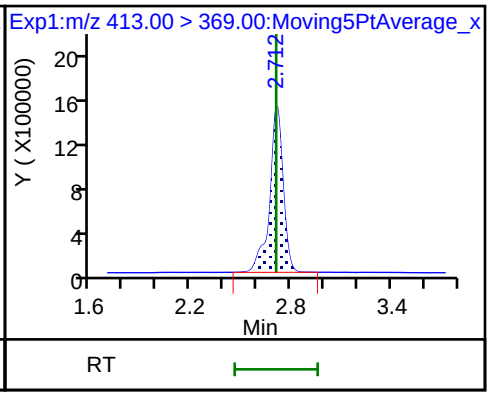
8 Perfluorohexanesulfonic acid



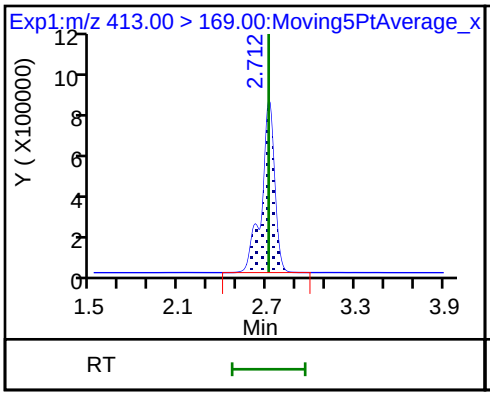
D 14 13C4 PFOA



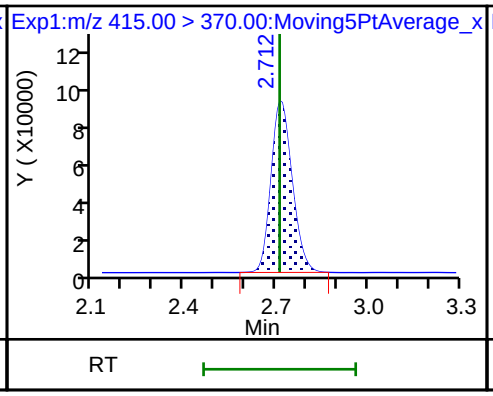
15 Perfluorooctanoic acid



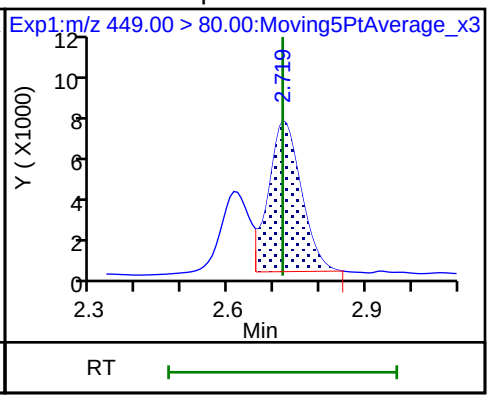
15 Perfluorooctanoic acid



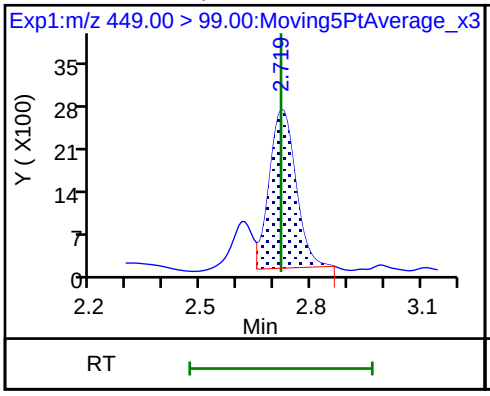
* 62 13C2-PFOA



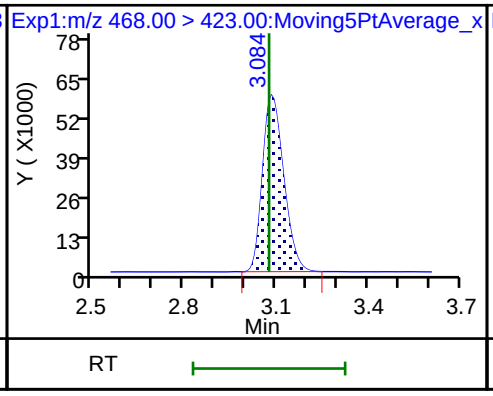
16 Perfluoroheptanesulfonic acid



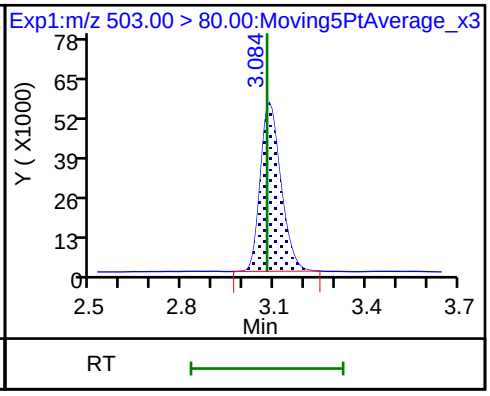
16 Perfluoroheptanesulfonic acid



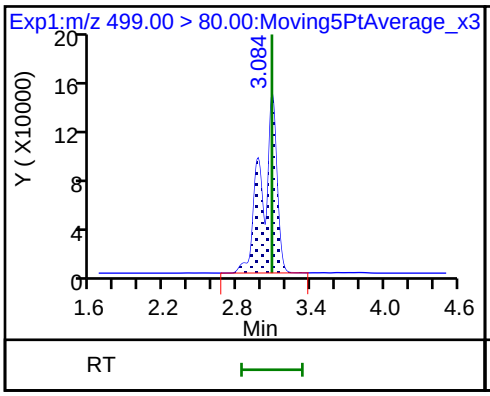
D 19 13C5 PFNA



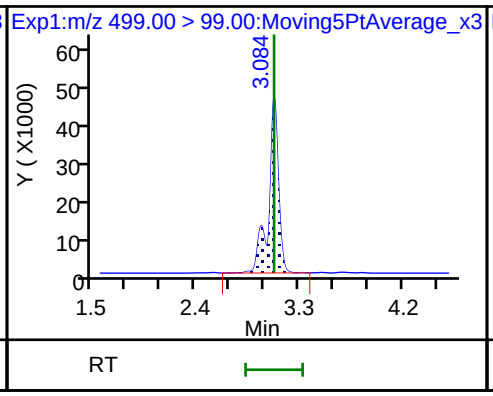
D 18 13C4 PFOS



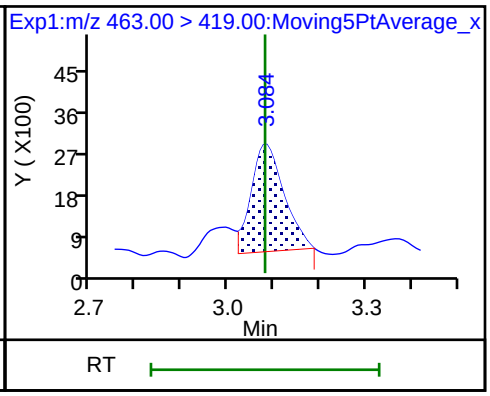
17 Perfluorooctane sulfonic acid



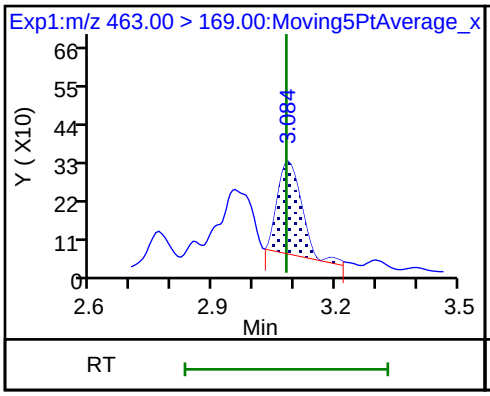
17 Perfluorooctane sulfonic acid



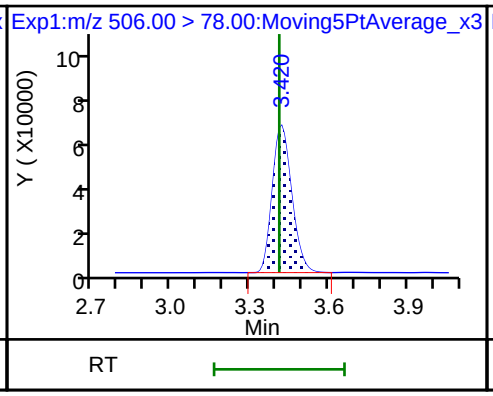
20 Perfluorononanoic acid



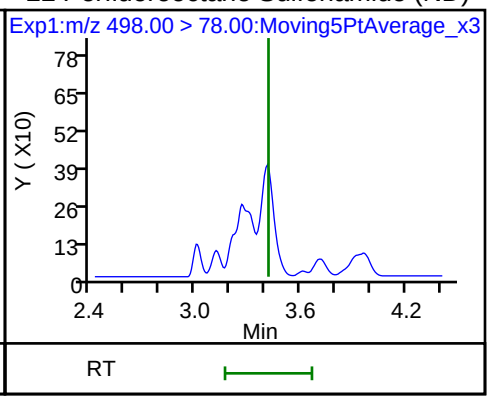
20 Perfluorononanoic acid



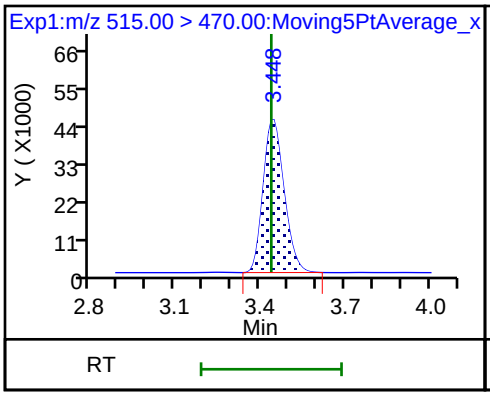
D 21 13C8 FOSA



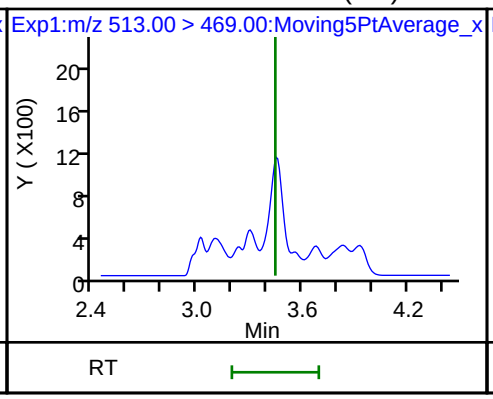
22 Perfluorooctane Sulfonamide (ND)



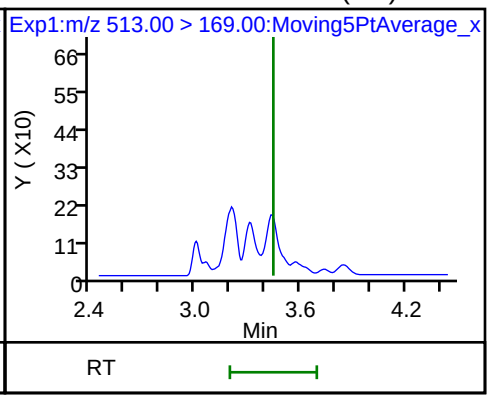
D 23 13C2 PFDA



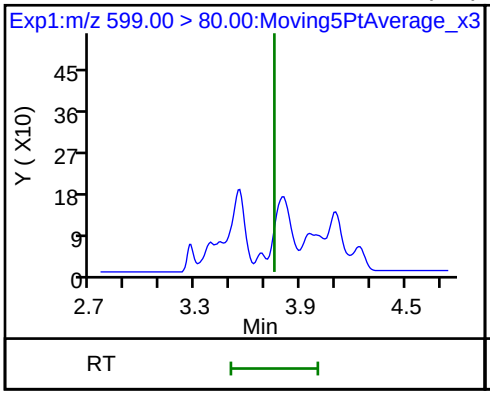
24 Perfluorodecanoic acid (ND)



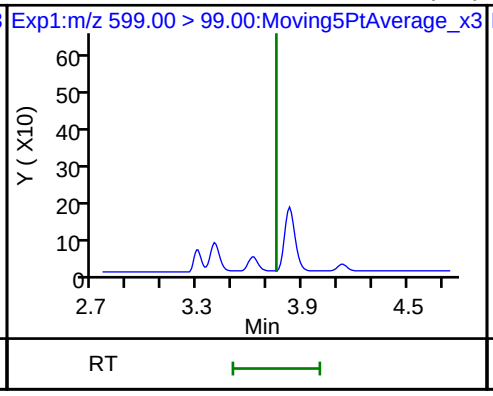
24 Perfluorodecanoic acid (ND)



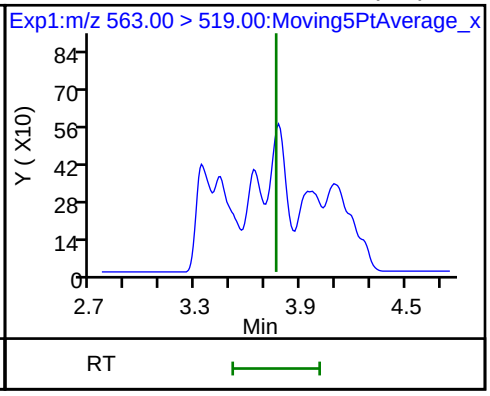
29 Perfluorodecane Sulfonic acid (ND)



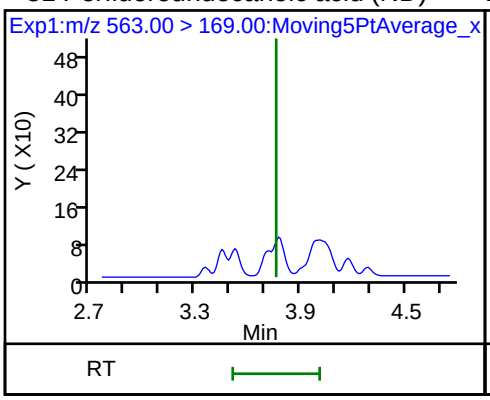
29 Perfluorodecane Sulfonic acid (ND)



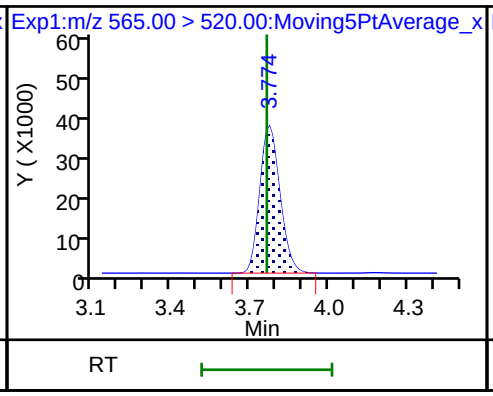
31 Perfluoroundecanoic acid (ND)



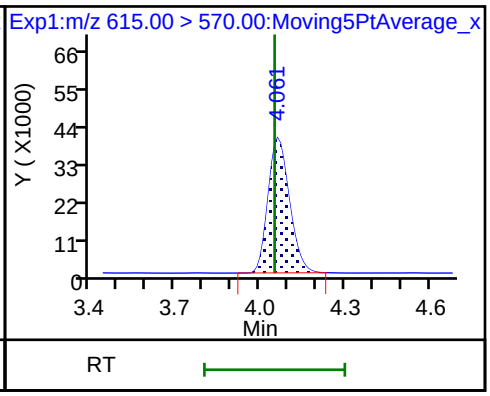
31 Perfluoroundecanoic acid (ND)



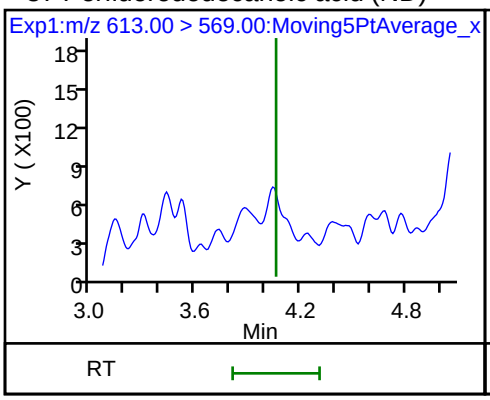
D 30 13C2 PFUnA



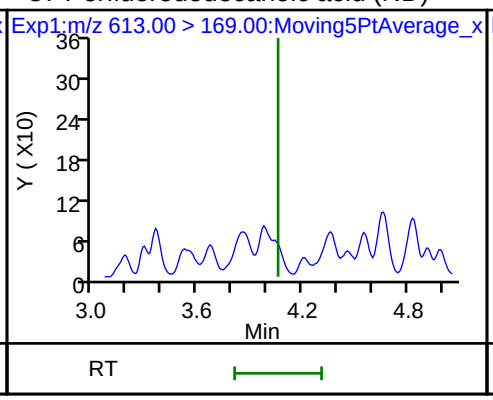
D 36 13C2 PFDoA



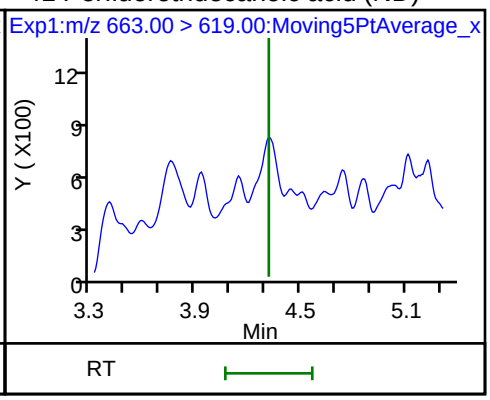
37 Perfluorododecanoic acid (ND)



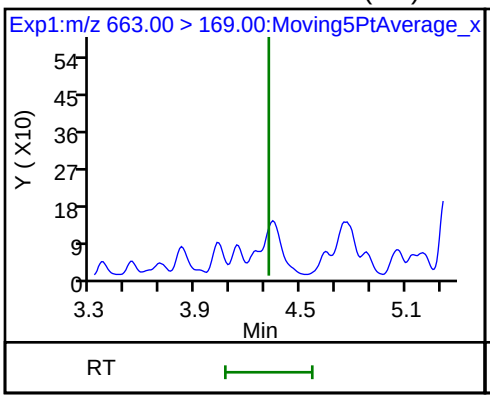
37 Perfluorododecanoic acid (ND)



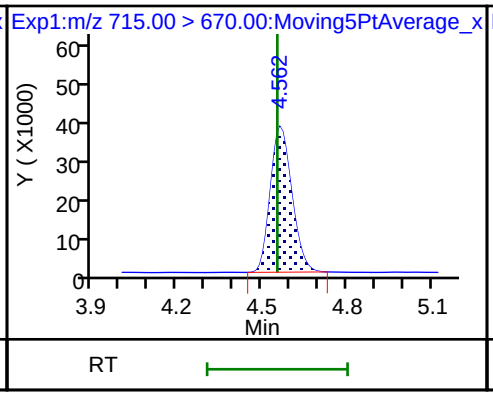
41 Perfluorotridecanoic acid (ND)



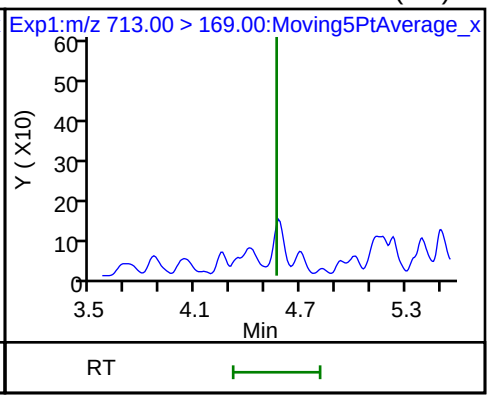
41 Perfluorotridecanoic acid (ND)



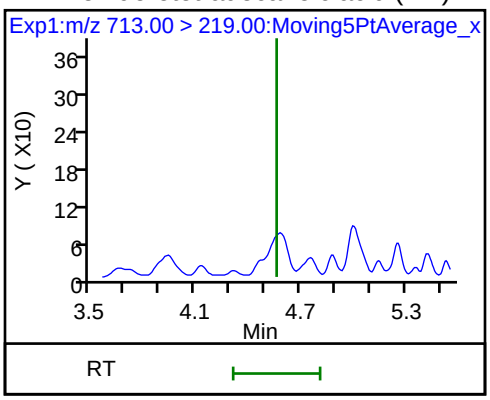
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-MIDCARBON | Lab Sample ID: 320-38875-2

Matrix: Water | Lab File ID: 2018.05.27LLADX_007.d

Analysis Method: EPA 537 (Mod) | Date Collected: 05/03/2018 09:25

Extraction Method: 3535 | Date Extracted: 05/16/2018 14:51

Sample wt/vol: 292.8(mL) | Date Analyzed: 05/28/2018 07:47

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

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

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

Analysis Batch No.: 225818 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.7	1.3	0.50
2706-90-3	Perfluoropentanoic acid (PFPeA)	240	M	1.7	0.85	0.37
307-24-4	Perfluorohexanoic acid (PFHxA)	160	M	1.7	0.85	0.40
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.8		1.7	1.3	0.52
335-67-1	Perfluorooctanoic acid (PFOA)	39	M	1.7	1.3	0.46
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.7	1.3	0.44
335-76-2	Perfluorodecanoic acid (PFDA)	0.85	U	1.7	0.85	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	1.3	0.61
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.44
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	2.6	0.65
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.4	2.6	0.71
375-73-5	Perfluorobutanesulfonic acid (PFBS)	5.5		1.7	0.85	0.39
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.5		1.7	0.85	0.32
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.85	U	1.7	0.85	0.32
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	U M	3.4	2.6	0.94
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.48
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.4	2.6	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-MIDCARBON Lab Sample ID: 320-38875-2

Matrix: Water Lab File ID: 2018.05.27LLADX_007.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:25

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 292.8(mL) Date Analyzed: 05/28/2018 07:47

Con. Extract Vol.: 10(mL) Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	67		50-150
STL00992	13C4 PFBA	73		50-150
STL01893	13C5 PFPeA	76		50-150
STL00993	13C2 PFHxA	78		50-150
STL01892	13C4-PFHpA	75		50-150
STL00990	13C4 PFOA	78		50-150
STL00995	13C5 PFNA	82		50-150
STL00996	13C2 PFDA	77		50-150
STL00997	13C2 PFUnA	74		50-150
STL00998	13C2 PFDoA	66		50-150
STL00994	18O2 PFHxS	77		50-150
STL02116	13C2-PFTeDA	60		50-150
STL00991	13C4 PFOS	73		50-150
STL02337	13C3-PFBS	72		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_007.d
Lims ID: 320-38875-A-2-A
Client ID: TP-PFC-029-MIDCARBON
Sample Type: Client
Inject. Date: 28-May-2018 07:47:16 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-38875-a-2-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-May-2018 11:07:14 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 11:07:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.455	1.452	0.003	1.000	7410550	3.72			3460	
D 1 13C4 PFBA										
217.00 > 172.00	1.455	1.455	0.0	1.000	5356174	1.82		72.7	33115	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.725	1.720	0.005	1.000	12044749	7.14			7484	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.725	1.725	0.0	0.561	3571036	1.89		75.6	41636	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.770	1.756	0.014	1.005	388995	0.1613			2119	
298.90 > 99.00	1.761	1.756	0.005	1.000	182540		2.13(1.25-3.74)		1946	
D 47 13C3-PFBS										
301.90 > 83.00	1.761	1.761	0.0	1.000	71798	1.68		72.4	627	
D 7 13C2 PFHxA										
315.00 > 270.00	2.022	2.011	0.011	1.000	3930160	1.95		78.1	79178	
6 Perfluorohexanoic acid										M
313.00 > 269.00	2.010	2.015	-0.005	0.994	7386047	4.57			11803	M
313.00 > 119.00	2.022	2.015	0.007	1.000	515060		14.34(5.03-15.10)		5509	
D 9 13C4-PFHpA										
367.00 > 322.00	2.355	2.342	0.013	1.000	3622705	1.88		75.1	60085	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.342	2.346	-0.004	0.994	306721	0.2004			355	
363.00 > 169.00	2.342	2.346	-0.004	0.994	124433		2.46(1.13-3.40)		478	
D 11 18O2 PFHxS										
403.00 > 84.00	2.368	2.355	0.013	1.000	4354232	1.83		77.2	82258	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.355	2.359	-0.004	0.994	154309	0.0744			726	
399.00 > 99.00	2.355	2.359	-0.004	0.994	46222		3.34(1.50-4.49)		321	

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	2.703	2.695	0.008	1.000	3553006	1.95		77.9	51728	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.703	2.698	0.005	1.000	1904959	1.14			468	M
413.00 > 169.00	2.703	2.698	0.005	1.000	1281257		1.49(0.84-2.52)		2476	
* 62 13C2-PFOA										
415.00 > 370.00	2.703	2.698	0.005		4817889	2.50			65421	
D 19 13C5 PFNA										
468.00 > 423.00	3.073	3.063	0.010	1.000	3069445	2.06		82.3	67768	
D 18 13C4 PFOS										
503.00 > 80.00	3.073	3.063	0.010	1.000	2860842	1.75		73.1	23775	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.951	3.070	-0.119	0.960	31021	0.0220			115	M
499.00 > 99.00	3.066	3.070	-0.004	0.998	7385		4.20(2.31-6.93)		64.2	M
D 21 13C8 FOSA										
506.00 > 78.00	3.407	3.395	0.012	1.000	3597538	1.68		67.1	51353	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.407	3.402	0.005	1.000	3263	0.002329			73.5	
D 23 13C2 PFDA										
515.00 > 470.00	3.435	3.422	0.013	1.000	2429082	1.91		76.5	40350	
D 30 13C2 PFUnA										
565.00 > 520.00	3.760	3.748	0.012	1.000	1864328	1.85		74.2	49729	
D 36 13C2 PFDoA										
615.00 > 570.00	4.060	4.048	0.012	1.000	1781483	1.65		65.9	15025	
37 Perfluorododecanoic acid										R
613.00 > 569.00	4.060	4.051	0.009	1.000	2204	0.002964			3.2	R
613.00 > 169.00	4.060	4.051	0.009	1.000	1504		1.47(2.13-6.40)		20.9	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.552	4.542	0.010	1.000	2000859	1.51		60.3	12665	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 30-May-2018 11:07:15 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_007.d

Injection Date: 28-May-2018 07:47:16 Instrument ID: A8_N

Lims ID: 320-38875-A-2-A Lab Sample ID: 320-38875-2

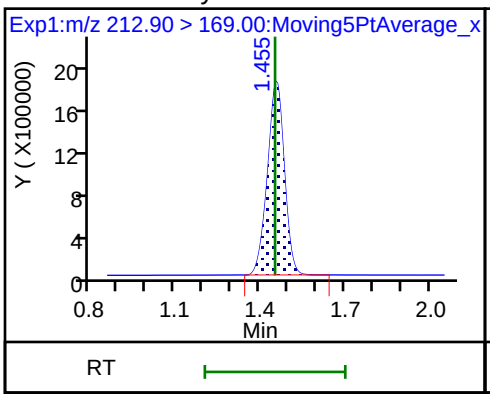
Client ID: TP-PFC-029-MIDCARBON

Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7

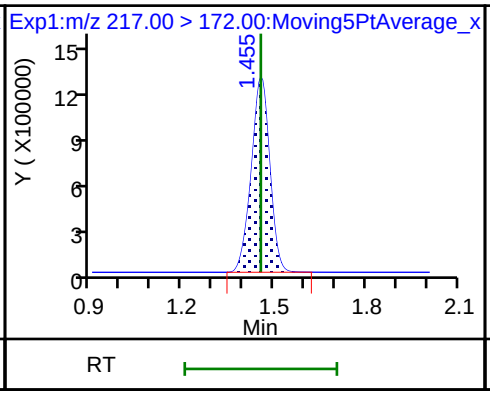
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

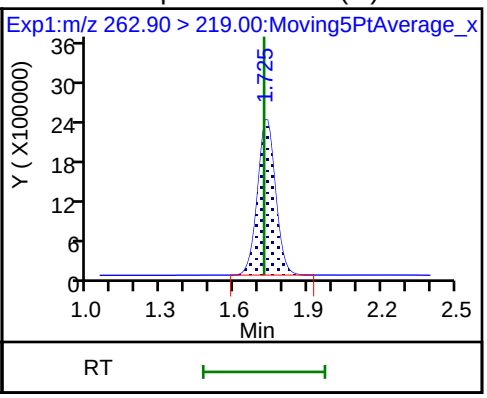
2 Perfluorobutyric acid



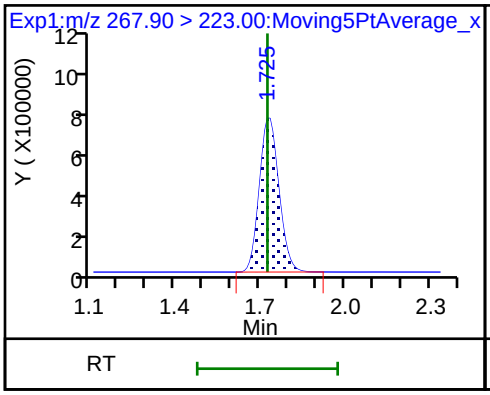
D 1 13C4 PFBA



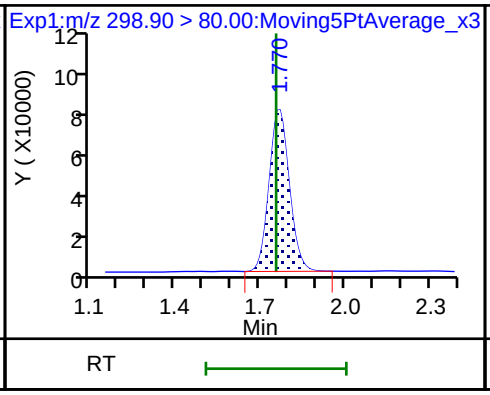
4 Perfluoropentanoic acid (M)



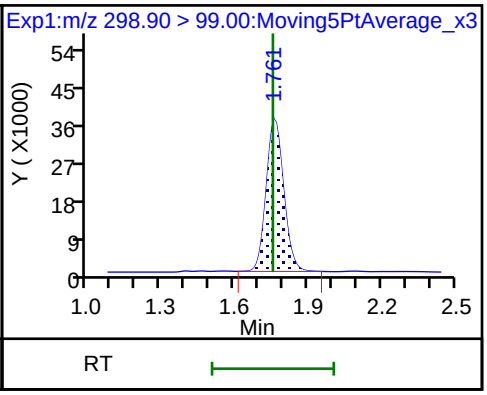
D 3 13C5-PFPeA



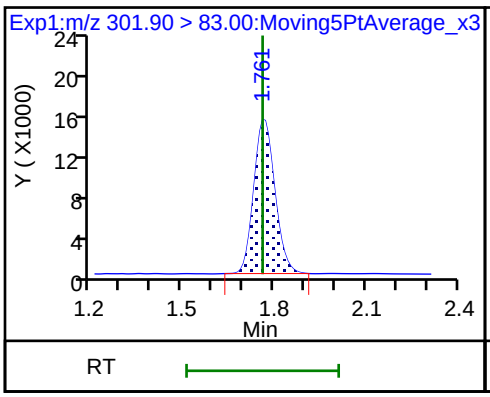
5 Perfluorobutanesulfonic acid



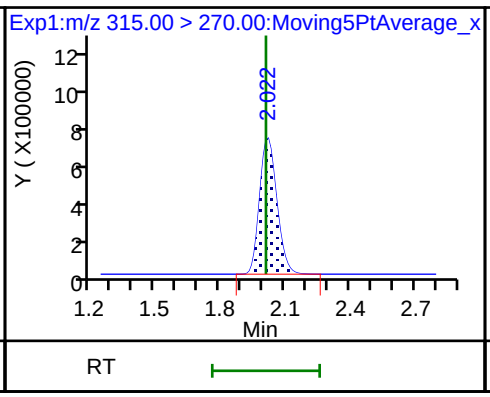
5 Perfluorobutanesulfonic acid



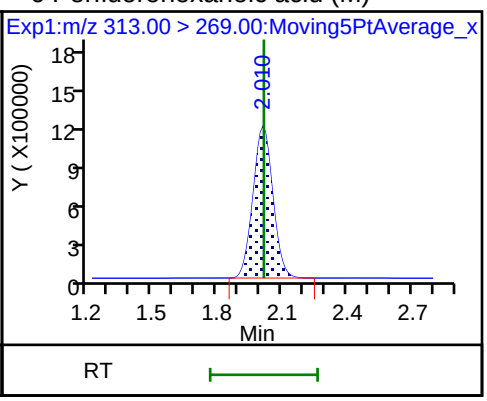
D 47 13C3-PFBS



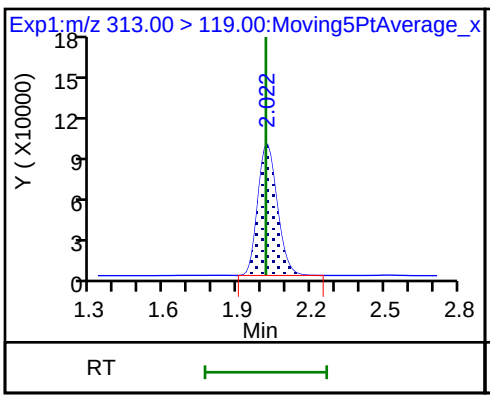
D 7 13C2 PFHxA



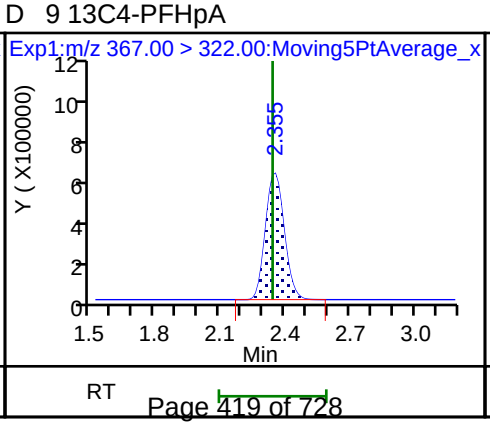
6 Perfluorohexanoic acid (M)



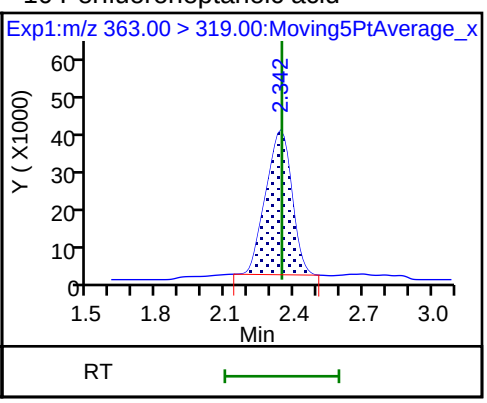
6 Perfluorohexanoic acid



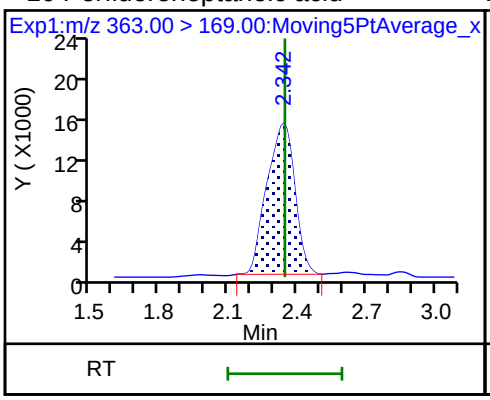
D 9 13C4-PFHpA



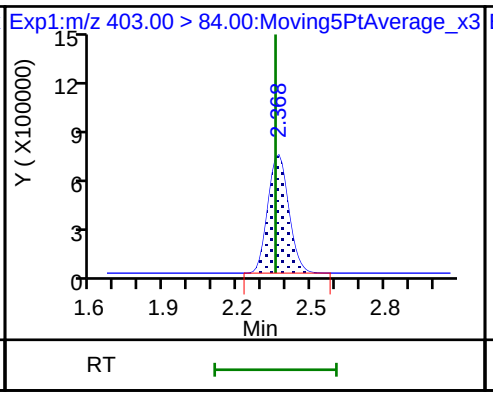
10 Perfluoroheptanoic acid



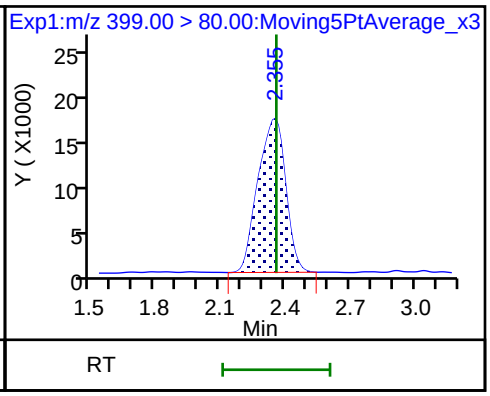
10 Perfluoroheptanoic acid



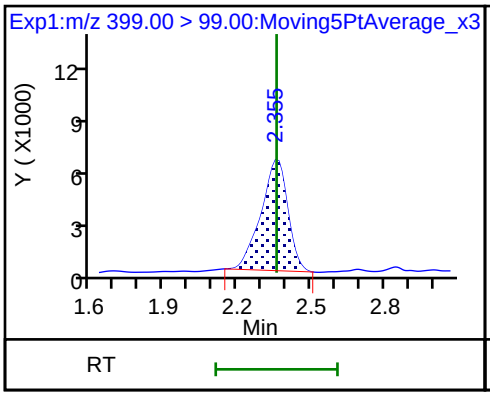
D 11 18O2 PFHxS



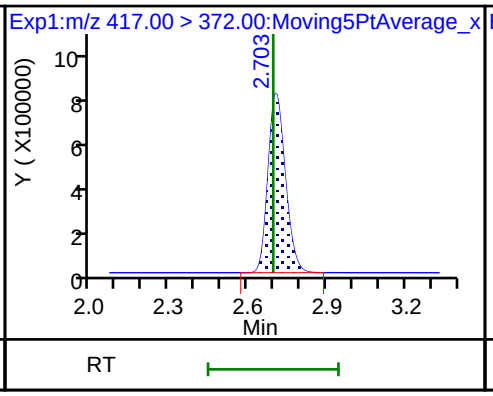
8 Perfluorohexanesulfonic acid



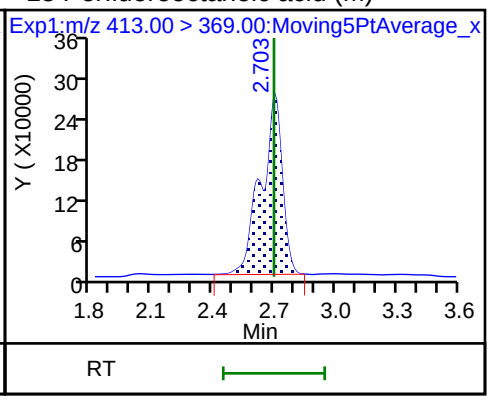
8 Perfluorohexanesulfonic acid



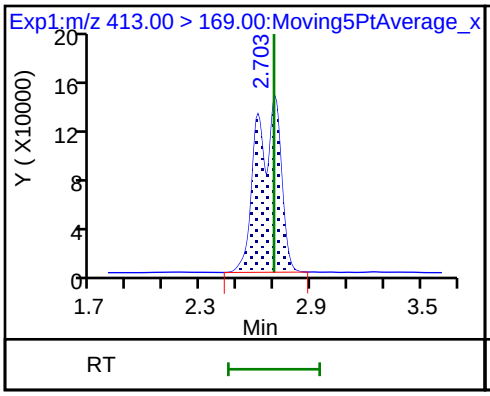
D 14 13C4 PFOA



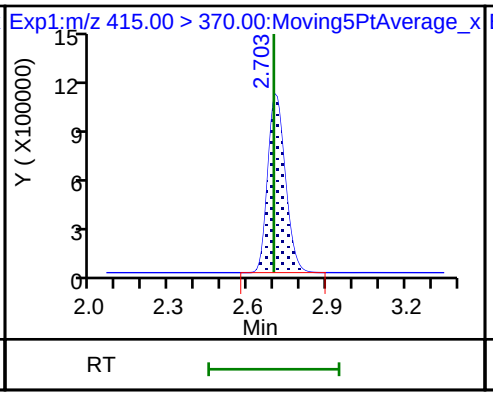
15 Perfluorooctanoic acid (M)



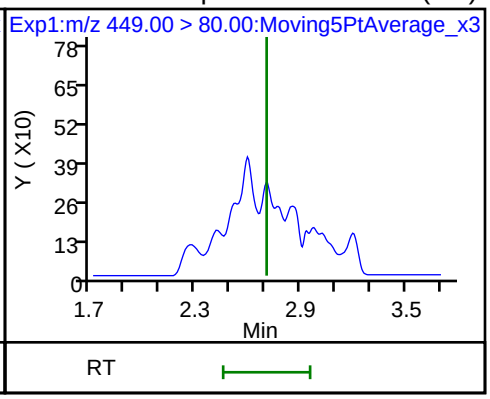
15 Perfluorooctanoic acid



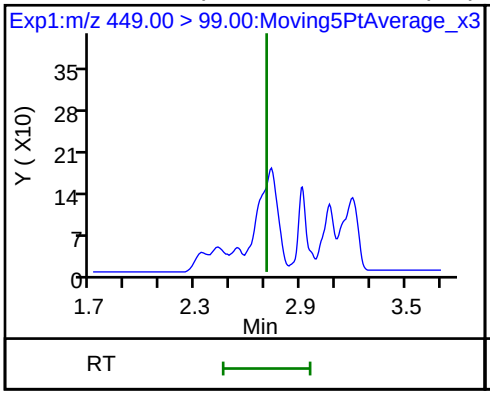
* 62 13C2-PFOA



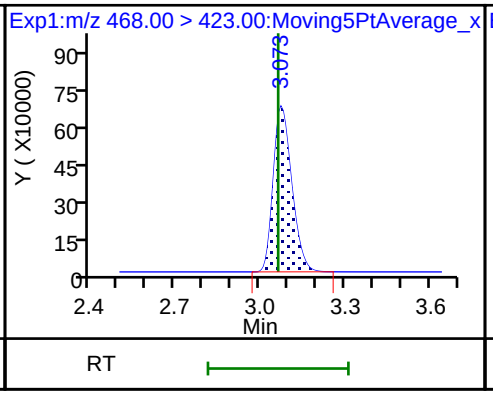
16 Perfluoroheptanesulfonic acid (ND)



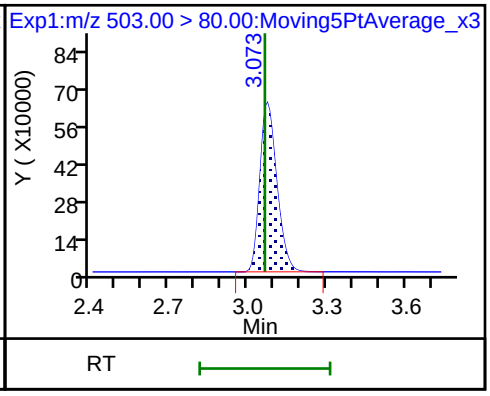
16 Perfluoroheptanesulfonic acid (ND)



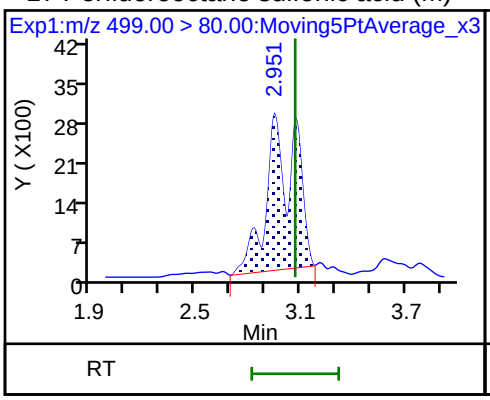
D 19 13C5 PFNA



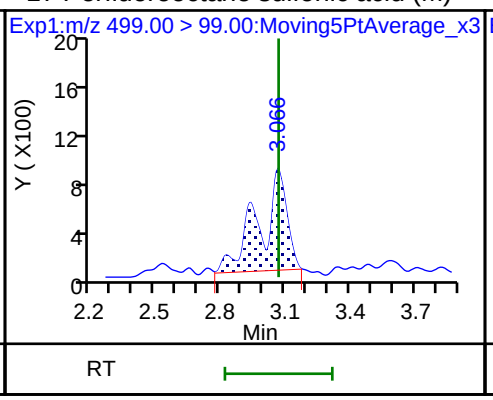
D 18 13C4 PFOS



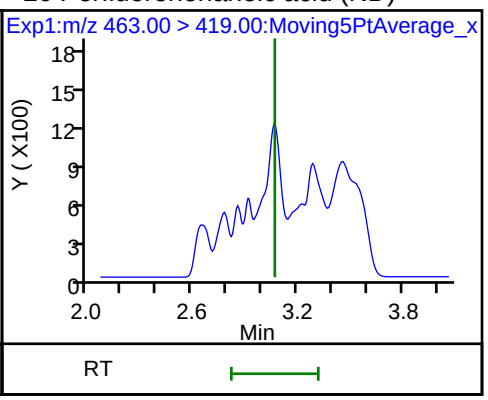
17 Perfluorooctane sulfonic acid (M)



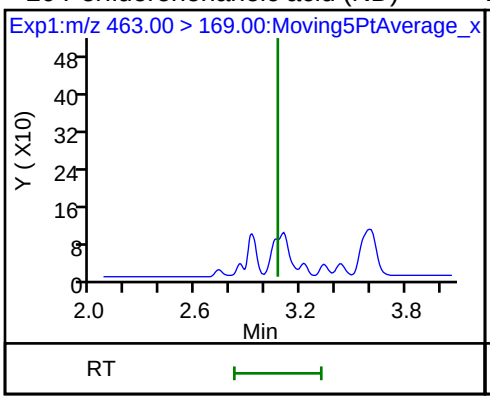
17 Perfluorooctane sulfonic acid (M)



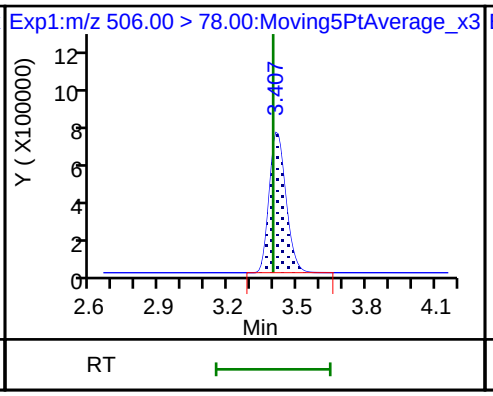
20 Perfluorononanoic acid (ND)



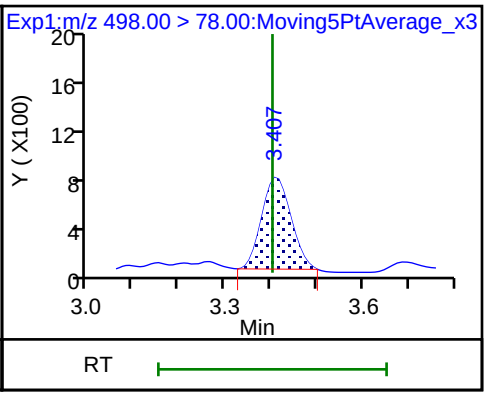
20 Perfluorononanoic acid (ND)



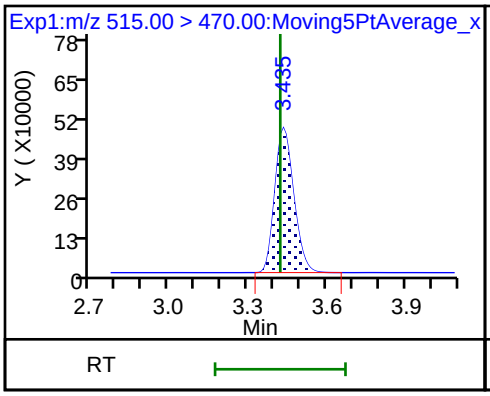
D 21 13C8 FOSA



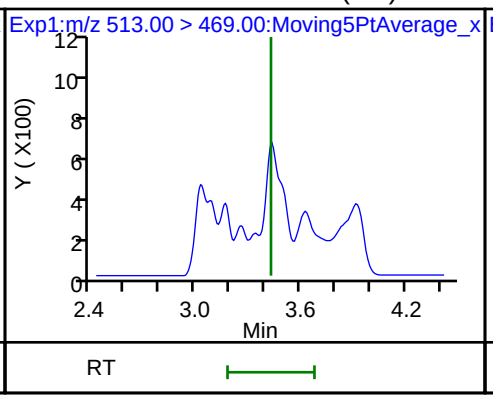
22 Perfluorooctane Sulfonamide



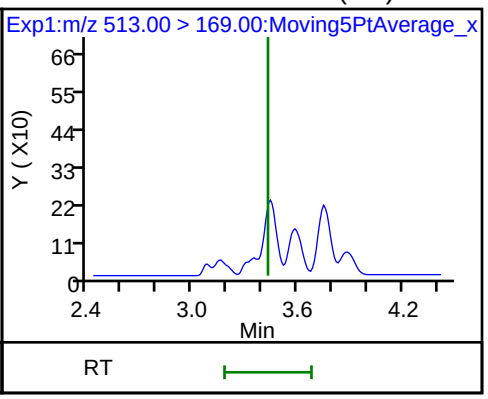
D 23 13C2 PFDA



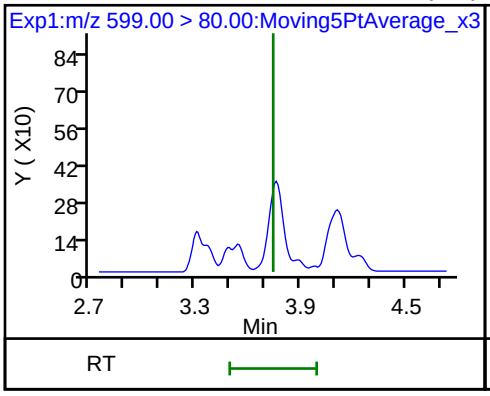
24 Perfluorodecanoic acid (ND)



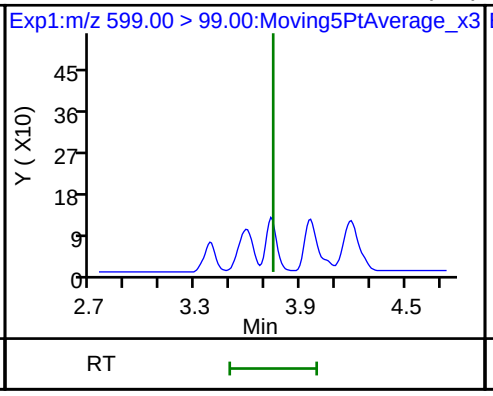
24 Perfluorodecanoic acid (ND)



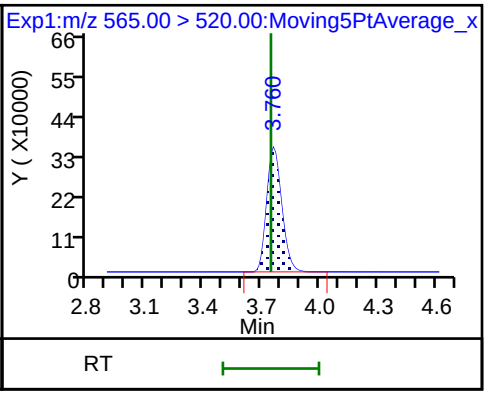
29 Perfluorodecane Sulfonic acid (ND)



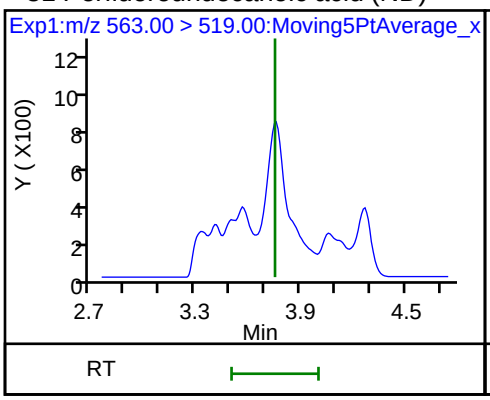
29 Perfluorodecane Sulfonic acid (ND)



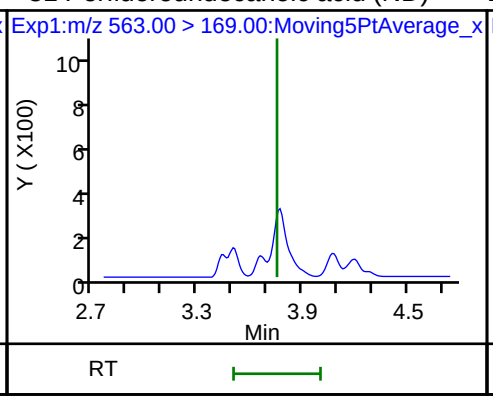
D 30 13C2 PFUnA



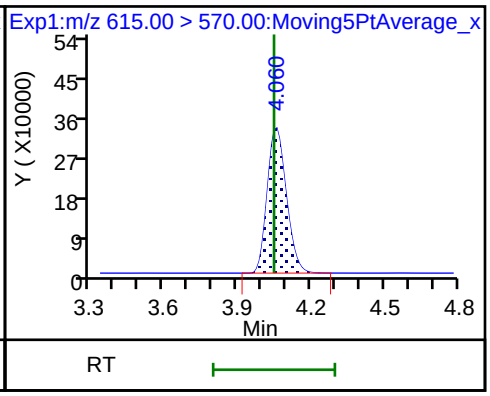
31 Perfluoroundecanoic acid (ND)



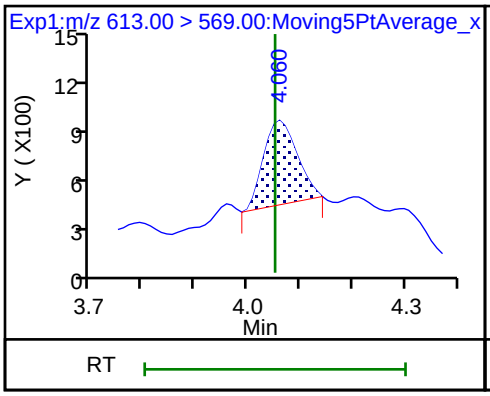
31 Perfluoroundecanoic acid (ND)



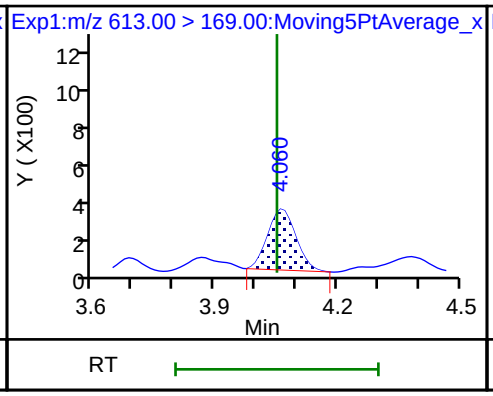
D 36 13C2 PFDoA



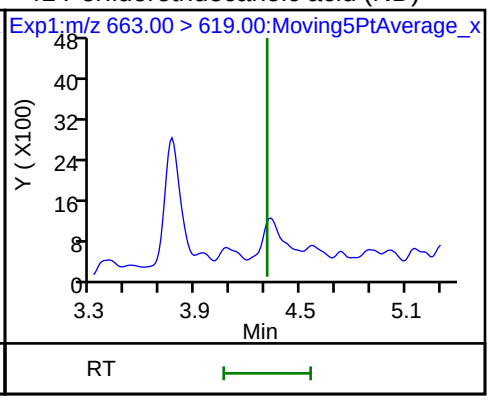
37 Perfluorododecanoic acid



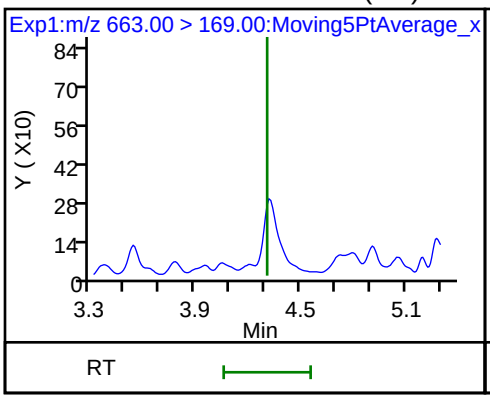
37 Perfluorododecanoic acid



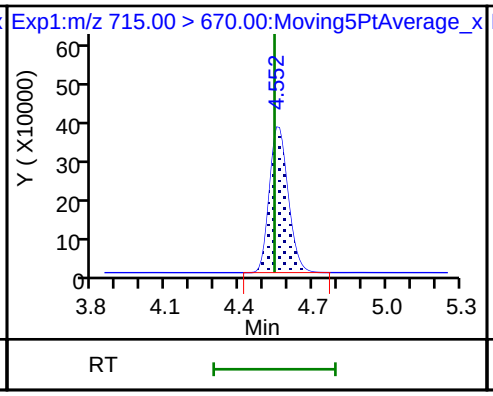
41 Perfluorotridecanoic acid (ND)



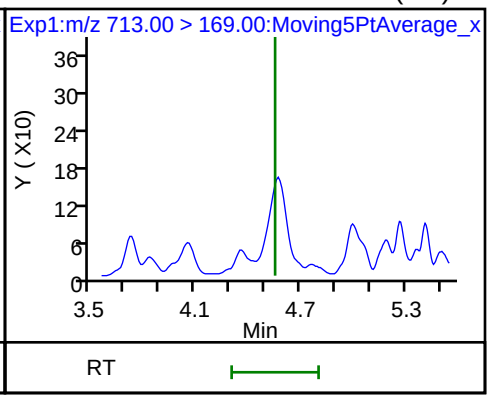
41 Perfluorotridecanoic acid (ND)



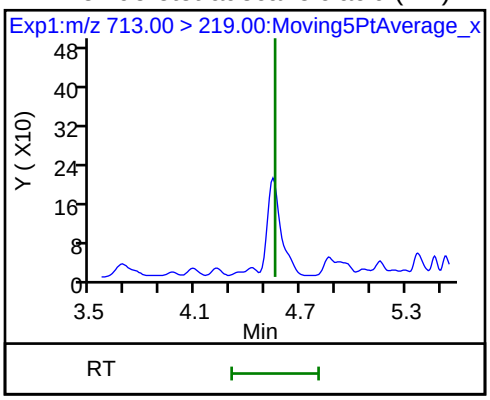
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



TestAmerica Sacramento

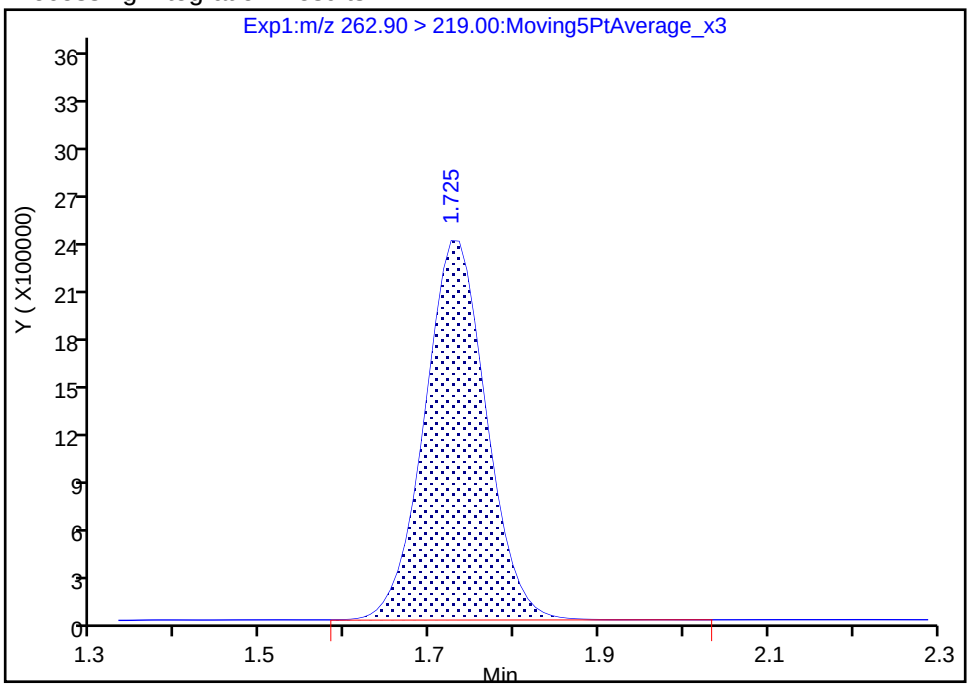
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_007.d
Injection Date: 28-May-2018 07:47:16 Instrument ID: A8_N
Lims ID: 320-38875-A-2-A Lab Sample ID: 320-38875-2
Client ID: TP-PFC-029-MIDCARBON
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

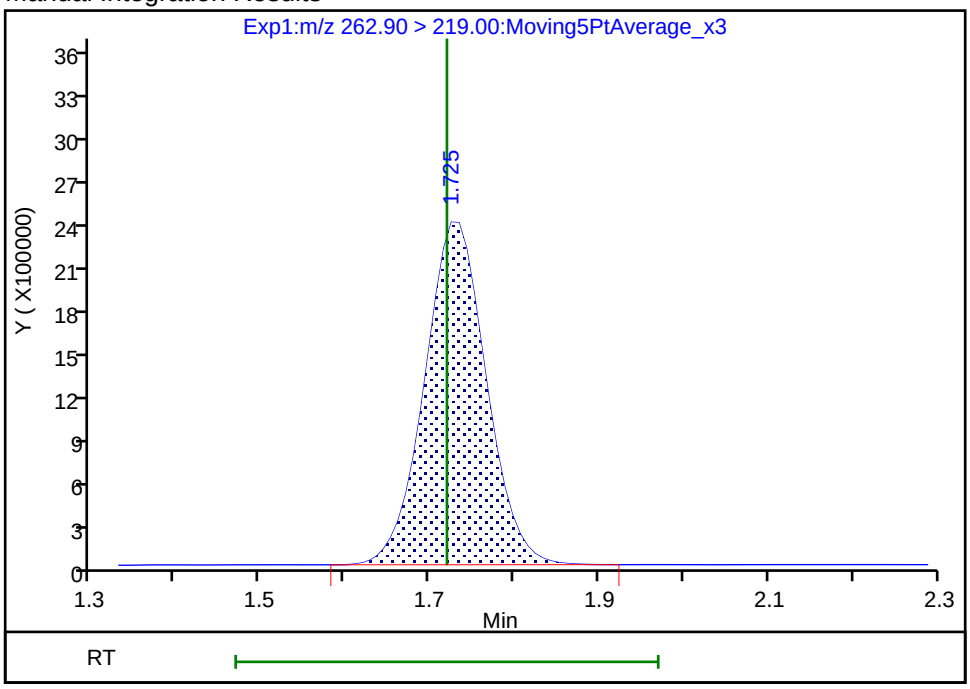
Processing Integration Results

RT: 1.73
Area: 12076036
Amount: 7.161467
Amount Units: ng/ml



Manual Integration Results

RT: 1.73
Area: 12044749
Amount: 7.142912
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:05:27
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

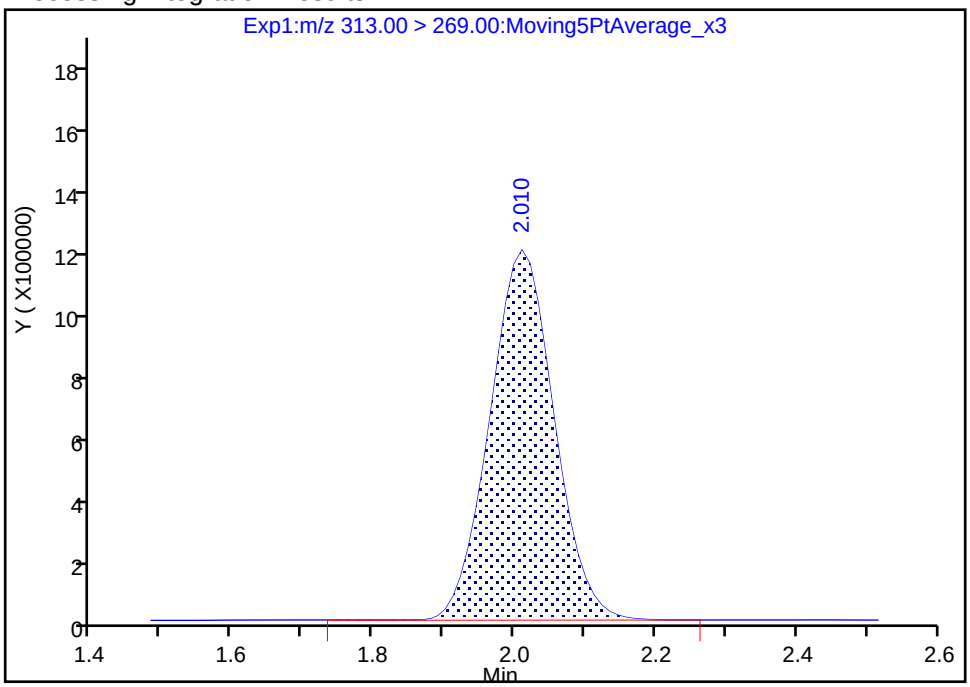
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_007.d				
Injection Date:	28-May-2018 07:47:16	Instrument ID:	A8_N		
Lims ID:	320-38875-A-2-A	Lab Sample ID:	320-38875-2		
Client ID:	TP-PFC-029-MIDCARBON				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

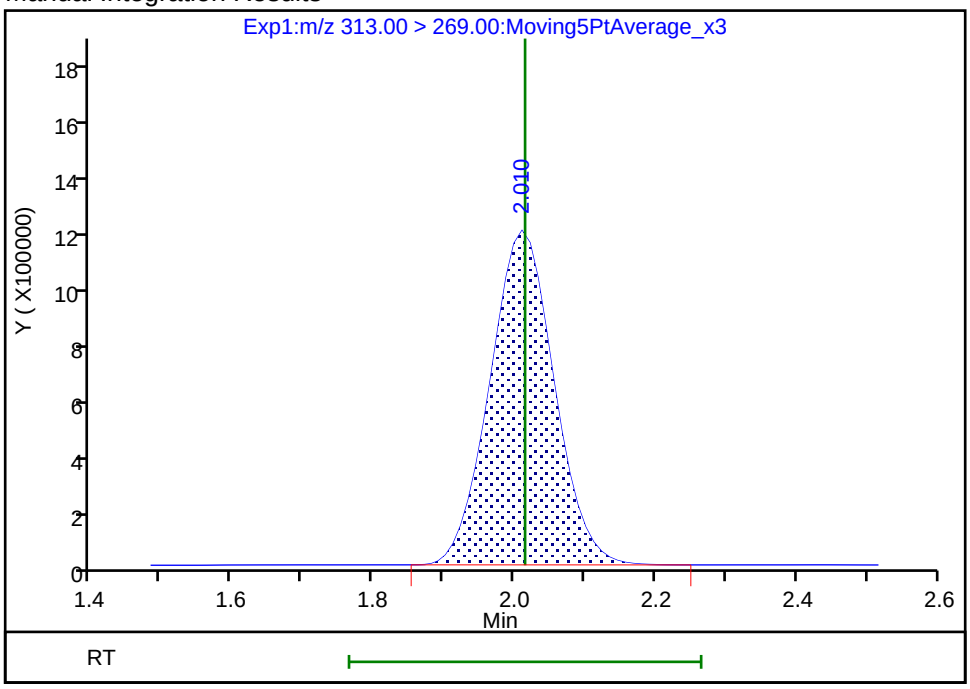
Processing Integration Results

RT: 2.01
Area: 7403512
Amount: 4.580493
Amount Units: ng/ml



Manual Integration Results

RT: 2.01
Area: 7386047
Amount: 4.569687
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:05:42
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

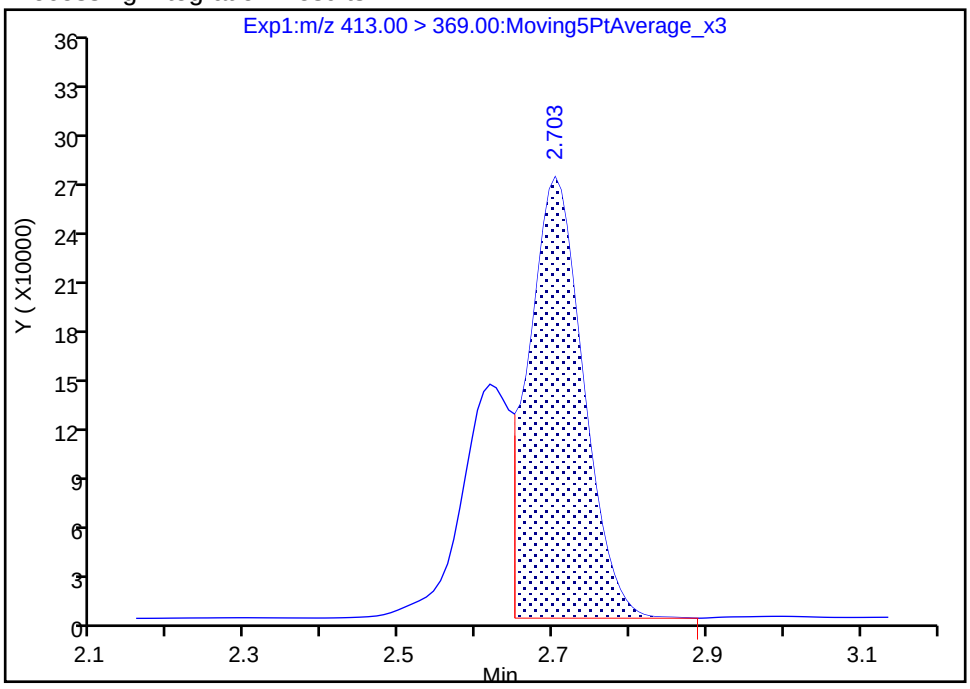
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_007.d
Injection Date: 28-May-2018 07:47:16 Instrument ID: A8_N
Lims ID: 320-38875-A-2-A Lab Sample ID: 320-38875-2
Client ID: TP-PFC-029-MIDCARBON
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

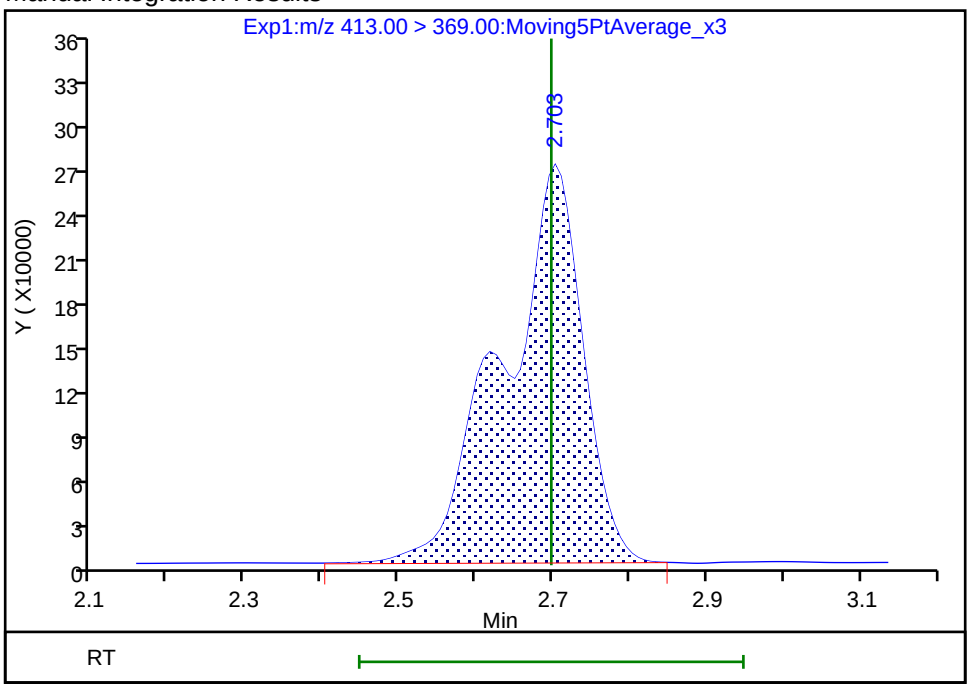
Processing Integration Results

RT: 2.70
Area: 1283939
Amount: 0.767540
Amount Units: ng/ml



Manual Integration Results

RT: 2.70
Area: 1904959
Amount: 1.138786
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:05:59
Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento

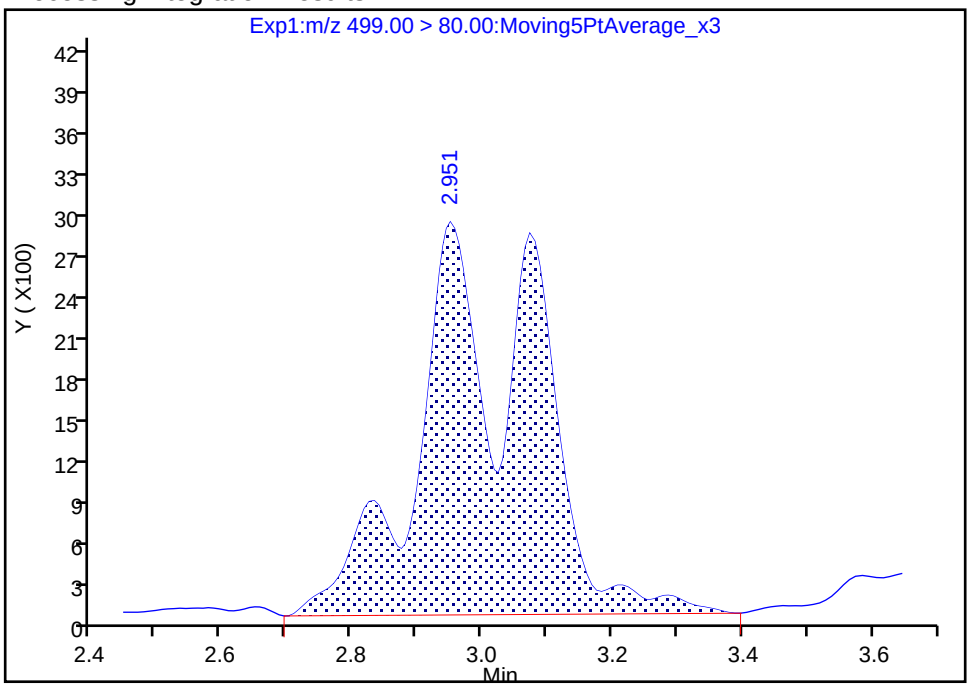
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_007.d				
Injection Date:	28-May-2018 07:47:16	Instrument ID:	A8_N		
Lims ID:	320-38875-A-2-A	Lab Sample ID:	320-38875-2		
Client ID:	TP-PFC-029-MIDCARBON				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

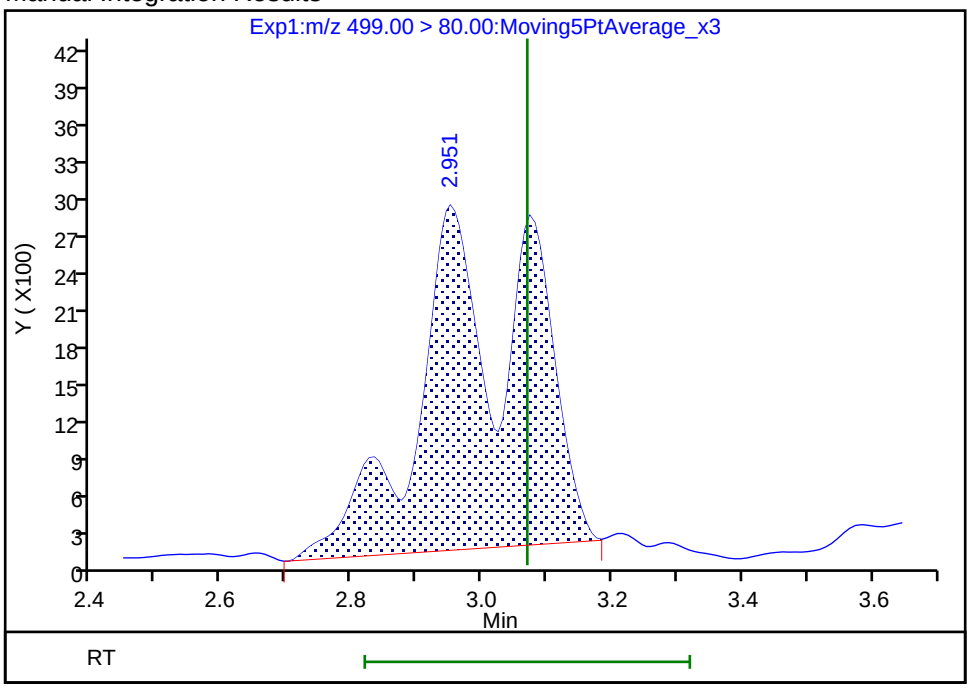
Processing Integration Results

RT: 2.95
Area: 34559
Amount: 0.024555
Amount Units: ng/ml



Manual Integration Results

RT: 2.95
Area: 31021
Amount: 0.022041
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:06:18
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

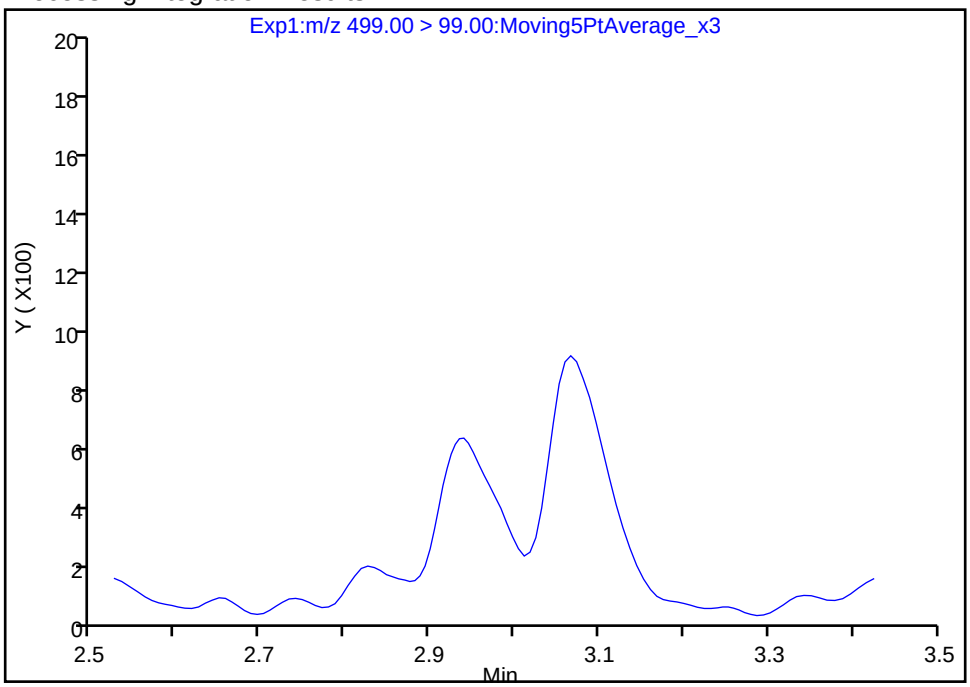
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_007.d
Injection Date: 28-May-2018 07:47:16 Instrument ID: A8_N
Lims ID: 320-38875-A-2-A Lab Sample ID: 320-38875-2
Client ID: TP-PFC-029-MIDCARBON
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 2

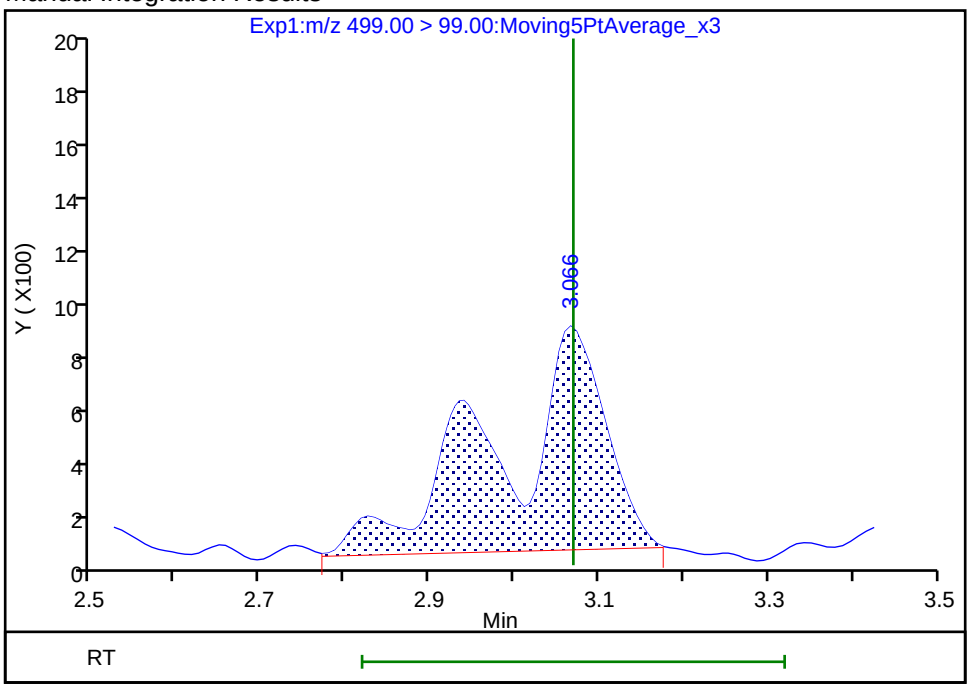
Processing Integration Results

RT: 3.07
Area: 0
Amount: 0.024555
Amount Units: ng/ml



Manual Integration Results

RT: 3.07
Area: 7385
Amount: 0.022041
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:06:26
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPE | Lab Sample ID: 320-38875-3

Matrix: Water | Lab File ID: 2018.05.27LLADX_008.d

Analysis Method: EPA 537 (Mod) | Date Collected: 05/03/2018 09:30

Extraction Method: 3535 | Date Extracted: 05/16/2018 14:51

Sample wt/vol: 272.9(mL) | Date Analyzed: 05/28/2018 07:55

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

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

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

Analysis Batch No.: 225818 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.8	1.4	0.54
2706-90-3	Perfluoropentanoic acid (PFPeA)	190	M	1.8	0.92	0.39
307-24-4	Perfluorohexanoic acid (PFHxA)	78		1.8	0.92	0.43
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.3	J	1.8	1.4	0.56
335-67-1	Perfluorooctanoic acid (PFOA)	2.6	M	1.8	1.4	0.49
375-95-1	Perfluorononanoic acid (PFNA)	1.4	U	1.8	1.4	0.48
335-76-2	Perfluorodecanoic acid (PFDA)	0.92	U	1.8	0.92	0.44
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.4	U	1.8	1.4	0.66
307-55-1	Perfluorododecanoic acid (PFDoA)	1.4	U	1.8	1.4	0.48
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.7	U	3.7	2.7	0.70
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.7	U	3.7	2.7	0.76
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.4	J	1.8	0.92	0.42
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.68	J	1.8	0.92	0.35
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.92	U	1.8	0.92	0.34
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	J M	3.7	2.7	1.0
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.4	U	1.8	1.4	0.51
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.7	U	3.7	2.7	1.2

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPE | Lab Sample ID: 320-38875-3

Matrix: Water | Lab File ID: 2018.05.27LLADX_008.d

Analysis Method: EPA 537 (Mod) | Date Collected: 05/03/2018 09:30

Extraction Method: 3535 | Date Extracted: 05/16/2018 14:51

Sample wt/vol: 272.9(mL) | Date Analyzed: 05/28/2018 07:55

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

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

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

Analysis Batch No.: 225818 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	64		50-150
STL00992	13C4 PFBA	72		50-150
STL01893	13C5 PFPeA	76		50-150
STL00993	13C2 PFHxA	74		50-150
STL01892	13C4-PFHpA	74		50-150
STL00990	13C4 PFOA	79		50-150
STL00995	13C5 PFNA	81		50-150
STL00996	13C2 PFDA	72		50-150
STL00997	13C2 PFUnA	78		50-150
STL00998	13C2 PFDoA	69		50-150
STL00994	18O2 PFHxS	73		50-150
STL02116	13C2-PFTeDA	60		50-150
STL00991	13C4 PFOS	73		50-150
STL02337	13C3-PFBS	72		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_008.d
Lims ID: 320-38875-A-3-A
Client ID: TP-PFC-029-TPE
Sample Type: Client
Inject. Date: 28-May-2018 07:55:06 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-38875-a-3-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-May-2018 11:09:04 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 11:09:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.452	1.452	0.0	1.000	7812741	3.63			3920	
D 1 13C4 PFBA										
217.00 > 172.00	1.452	1.455	-0.003	1.000	5793990	1.80		72.0	31649	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.729	1.720	0.009	1.000	9526856	5.15			6272	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.729	1.725	0.004	0.563	3915452	1.90		75.9	52708	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.756	1.756	0.0	1.000	102294	0.0389			549	
298.90 > 99.00	1.756	1.756	0.0	1.000	51850		1.97(1.25-3.74)		416	
D 47 13C3-PFBS										
301.90 > 83.00	1.756	1.761	-0.005	1.000	78366	1.68		72.3	835	
D 7 13C2 PFHxA										
315.00 > 270.00	2.014	2.011	0.003	1.000	4069089	1.85		74.0	65929	
6 Perfluorohexanoic acid										R
313.00 > 269.00	2.003	2.015	-0.012	0.994	3550551	2.12			6288	R
313.00 > 119.00	2.014	2.015	-0.001	1.000	197568		17.97(5.03-15.10)		2922	
D 9 13C4-PFHpA										
367.00 > 322.00	2.345	2.342	0.003	1.000	3884067	1.84		73.7	58259	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.306	2.346	-0.040	0.983	56629	0.0345			49.5	
363.00 > 169.00	2.267	2.346	-0.079	0.967	24429		2.32(1.13-3.40)		88.9	
D 11 18O2 PFHxS										
403.00 > 84.00	2.358	2.355	0.003	1.000	4467450	1.71		72.5	92832	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.358	2.359	-0.001	1.000	39572	0.0186			185	
399.00 > 99.00	2.345	2.359	-0.014	0.994	10664		3.71(1.50-4.49)		61.3	

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	2.697	2.695	0.002	1.000	3952940	1.98		79.3	94476	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.612	2.698	-0.086	0.968	131672	0.0707			23.4	M
413.00 > 169.00	2.596	2.698	-0.102	0.963	98328		1.34(0.84-2.52)		194	M
* 62 13C2-PFOA										
415.00 > 370.00	2.697	2.698	-0.001		5264580	2.50			54431	
D 19 13C5 PFNA										
468.00 > 423.00	3.070	3.063	0.007	1.000	3297817	2.02		80.9	60236	
D 18 13C4 PFOS										
503.00 > 80.00	3.063	3.063	0.0	1.000	3109593	1.74		72.7	21016	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.063	3.070	-0.007	1.000	108954	0.0712			642	
499.00 > 99.00	3.070	3.070	0.0	1.002	27407		3.98(2.31-6.93)		349	M
D 21 13C8 FOSA										
506.00 > 78.00	3.402	3.395	0.007	1.000	3760370	1.60		64.2	37254	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.412	3.402	0.010	1.003	3305	0.002257			72.7	
D 23 13C2 PFDA										
515.00 > 470.00	3.430	3.422	0.008	1.000	2495297	1.80		72.0	54536	
D 30 13C2 PFUnA										
565.00 > 520.00	3.753	3.748	0.005	1.000	2149223	1.96		78.3	50205	
31 Perfluoroundecanoic acid										R
563.00 > 519.00	3.753	3.753	0.0	1.000	3080	0.004290			17.9	R
563.00 > 169.00	3.785	3.753	0.032	1.008	1620		1.90(2.12-6.36)		45.1	
D 36 13C2 PFDoA										
615.00 > 570.00	4.051	4.048	0.003	1.000	2025849	1.71		68.6	16732	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.552	4.542	0.010	1.000	2187528	1.51		60.3	15458	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 30-May-2018 11:09:04 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_008.d

Injection Date: 28-May-2018 07:55:06 Instrument ID: A8_N

Lims ID: 320-38875-A-3-A Lab Sample ID: 320-38875-3

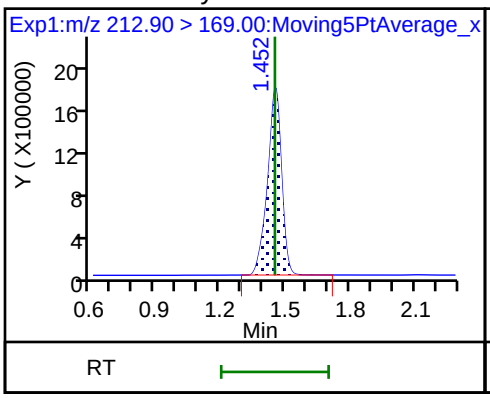
Client ID: TP-PFC-029-TPE

Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8

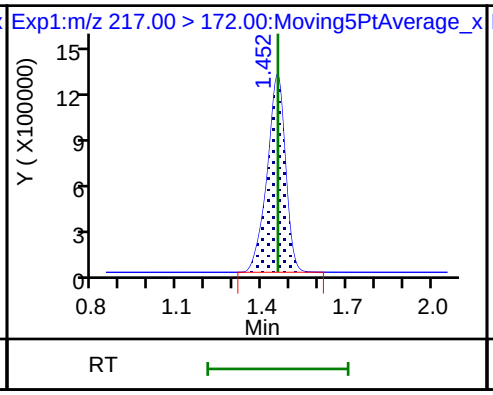
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

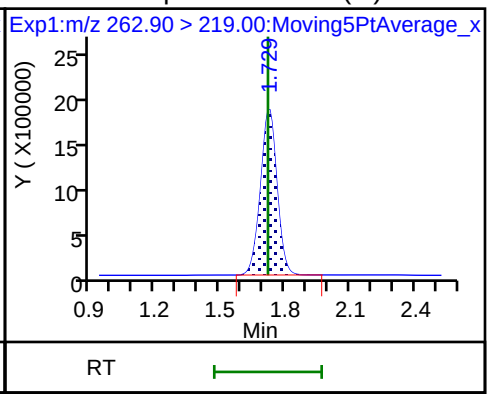
2 Perfluorobutyric acid



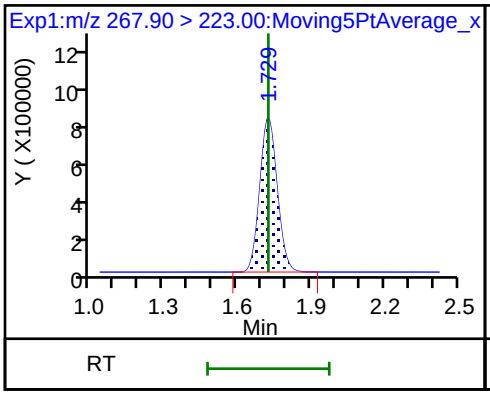
D 1 13C4 PFBA



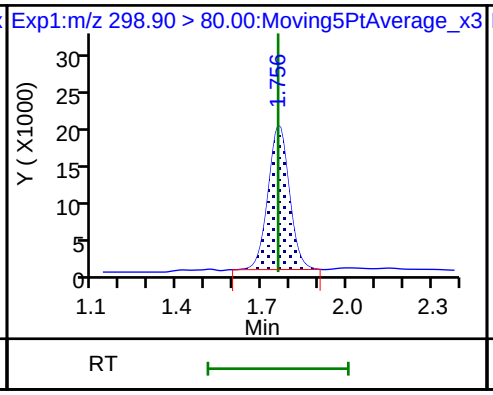
4 Perfluoropentanoic acid (M)



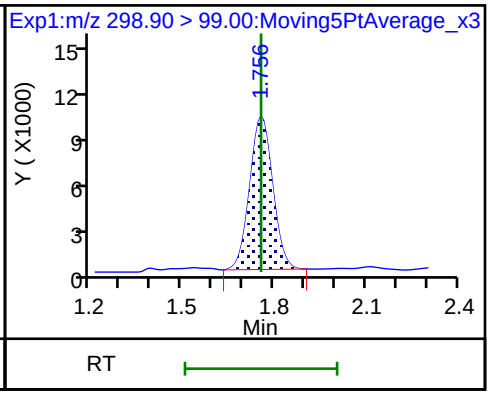
D 3 13C5-PFPeA



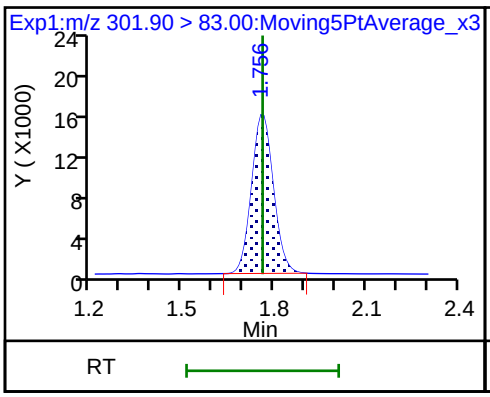
5 Perfluorobutanesulfonic acid



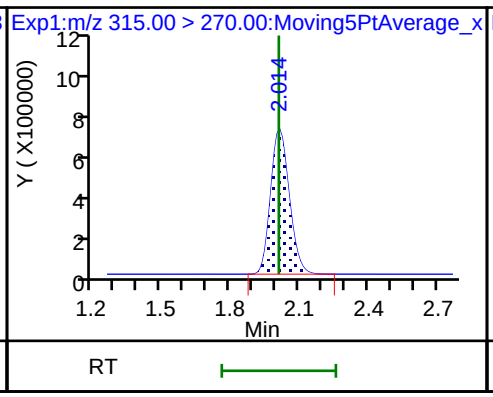
5 Perfluorobutanesulfonic acid



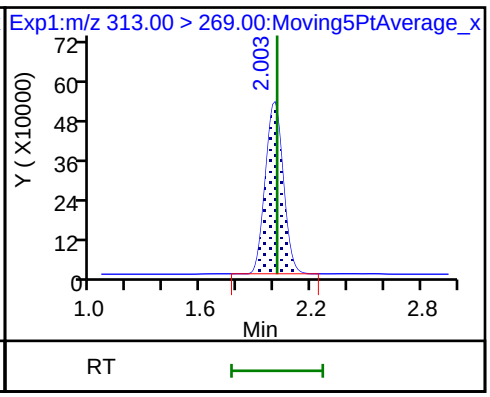
D 47 13C3-PFBS



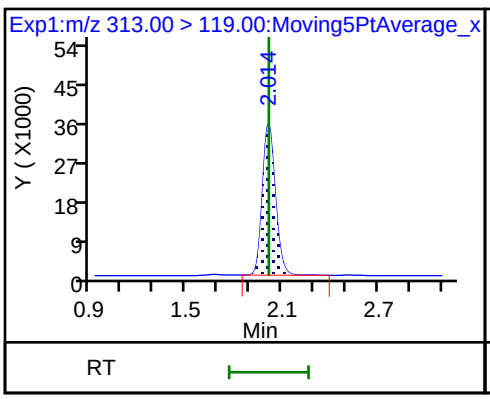
D 7 13C2 PFHxA



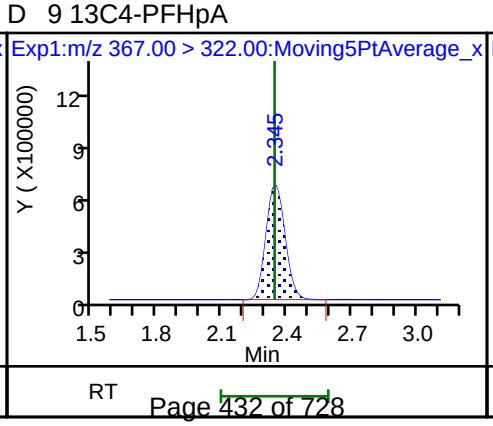
6 Perfluorohexanoic acid



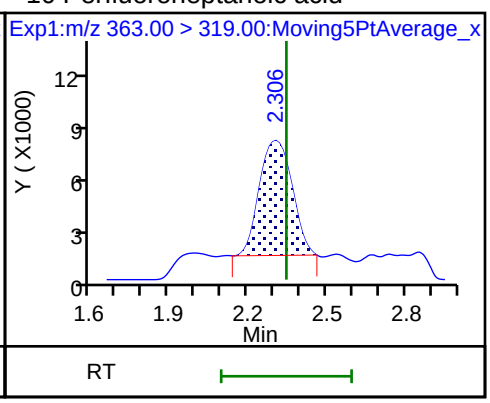
6 Perfluorohexanoic acid



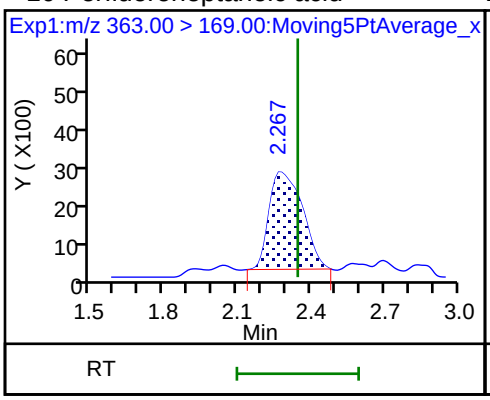
D 9 13C4-PFHpA



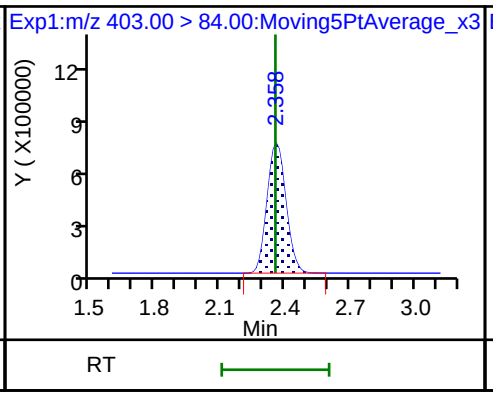
10 Perfluoroheptanoic acid



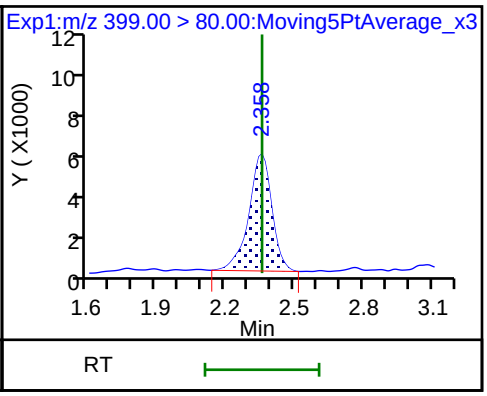
10 Perfluoroheptanoic acid



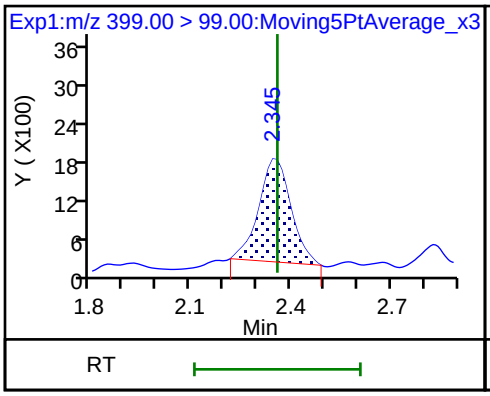
D 11 18O2 PFHxS



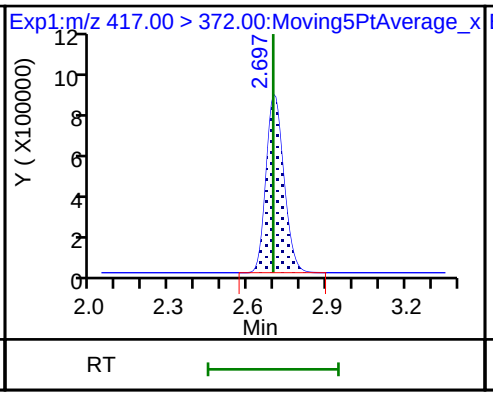
8 Perfluorohexanesulfonic acid



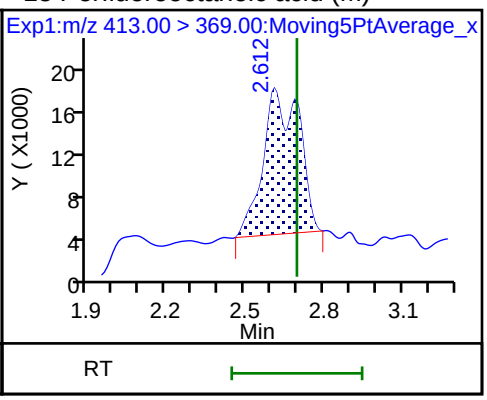
8 Perfluorohexanesulfonic acid



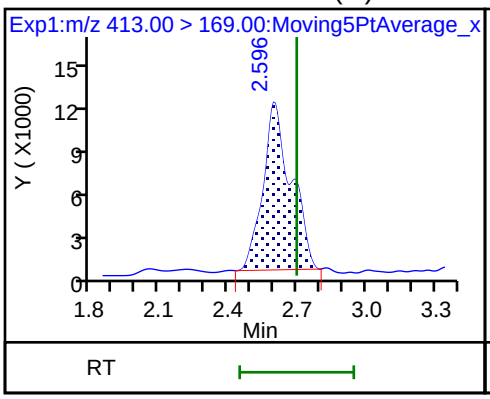
D 14 13C4 PFOA



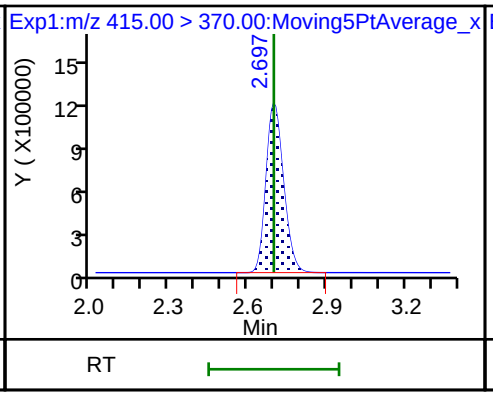
15 Perfluorooctanoic acid (M)



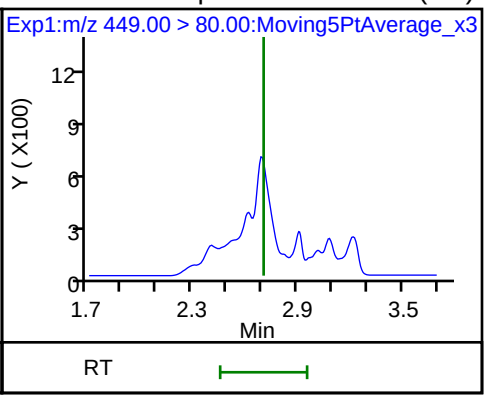
15 Perfluorooctanoic acid (M)



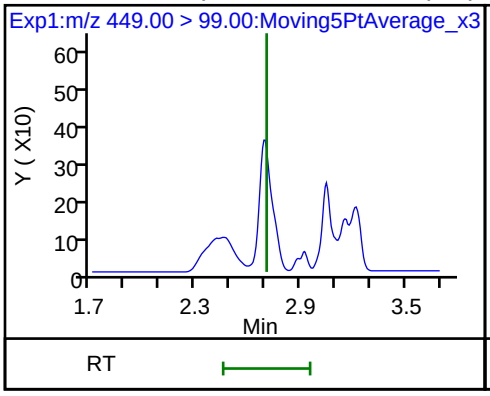
* 62 13C2-PFOA



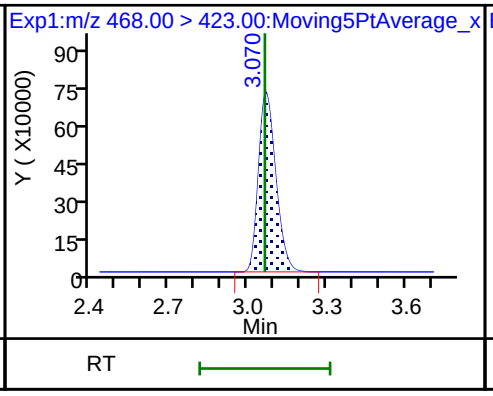
16 Perfluoroheptanesulfonic acid (ND)



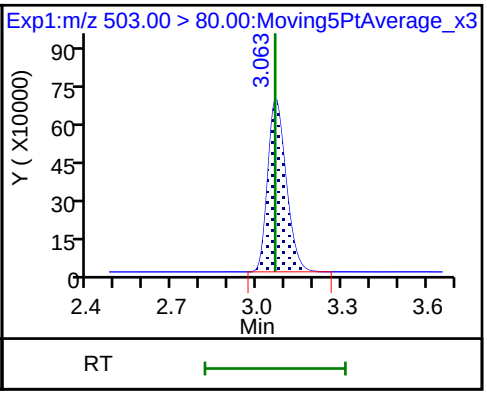
16 Perfluoroheptanesulfonic acid (ND)



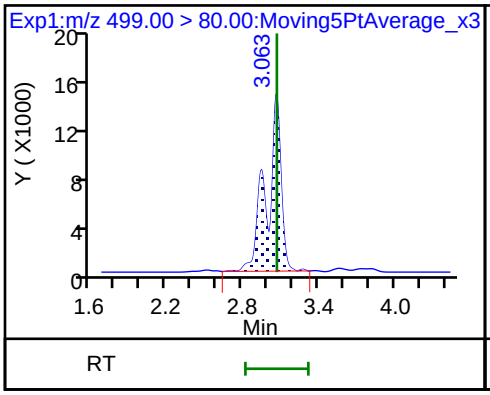
D 19 13C5 PFNA



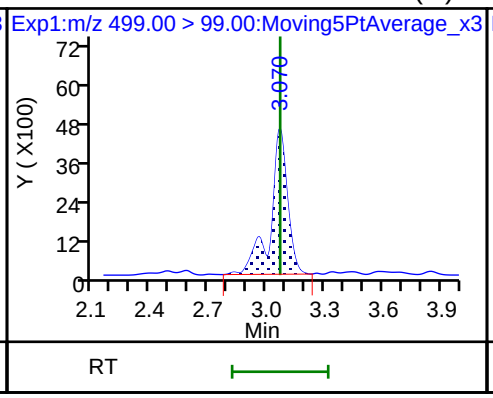
D 18 13C4 PFOS



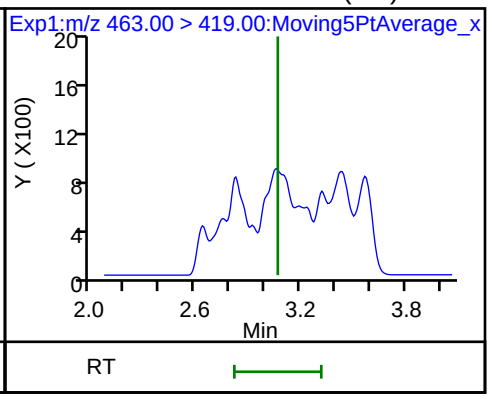
17 Perfluorooctane sulfonic acid



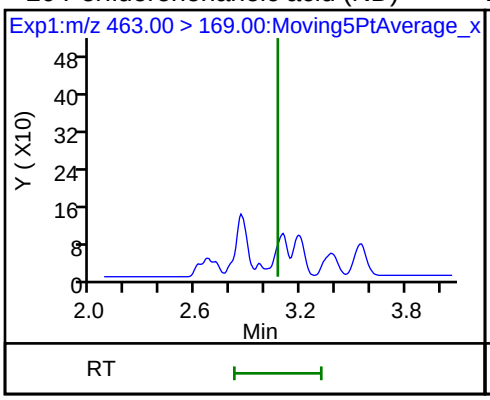
17 Perfluorooctane sulfonic acid (M)



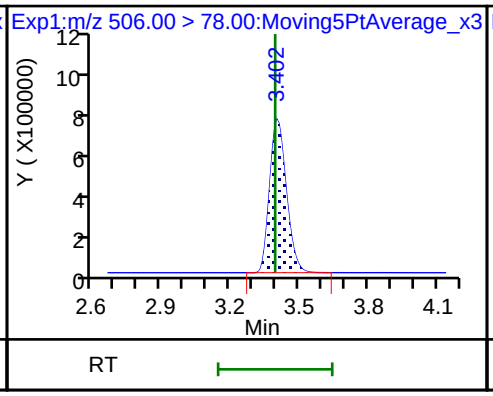
20 Perfluorononanoic acid (ND)



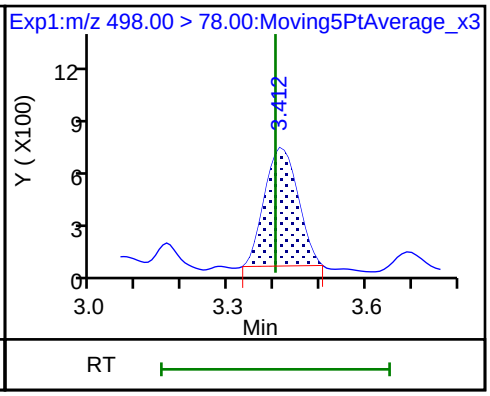
20 Perfluorononanoic acid (ND)



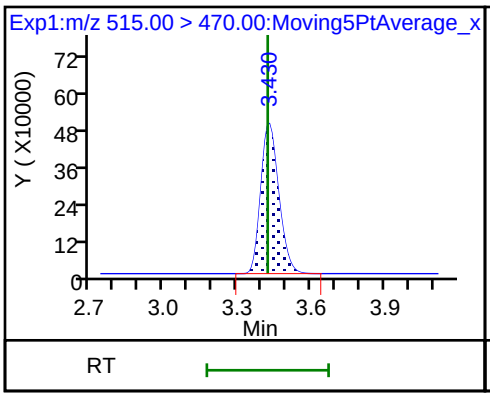
D 21 13C8 FOSA



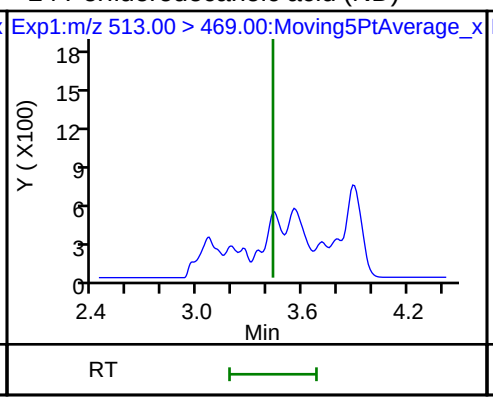
22 Perfluorooctane Sulfonamide



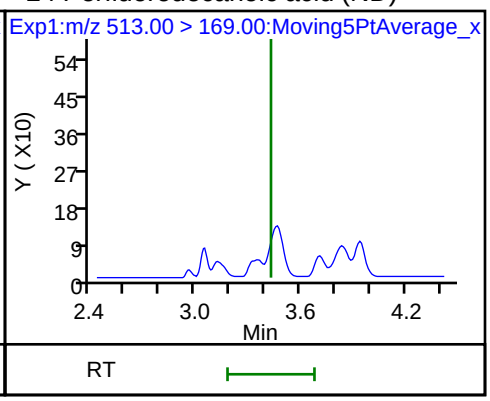
D 23 13C2 PFDA



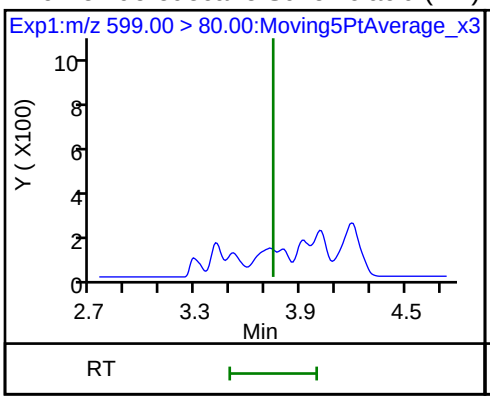
24 Perfluorodecanoic acid (ND)



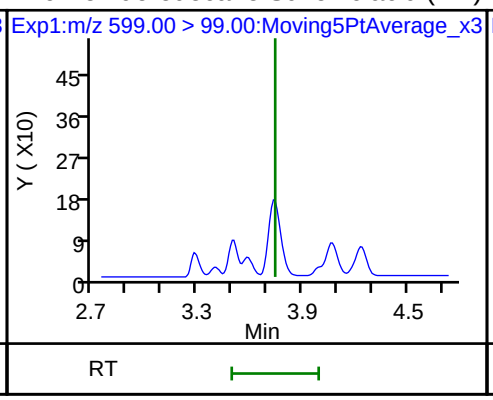
24 Perfluorodecanoic acid (ND)



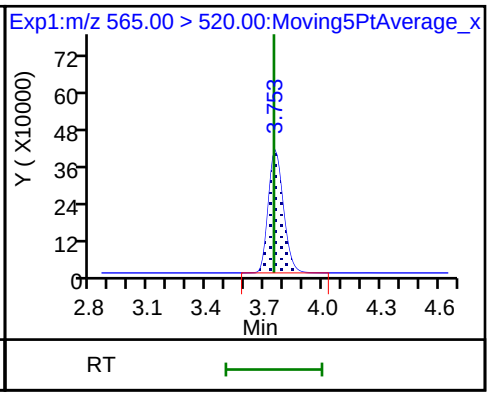
29 Perfluorodecane Sulfonic acid (ND)



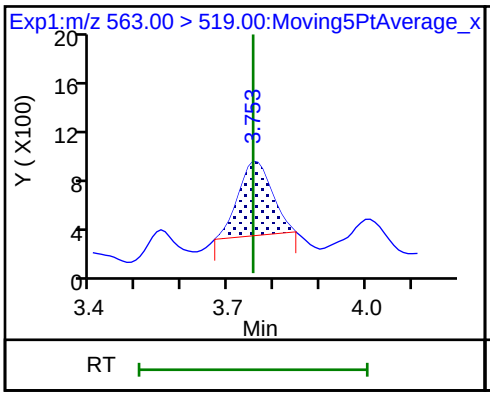
29 Perfluorodecane Sulfonic acid (ND)



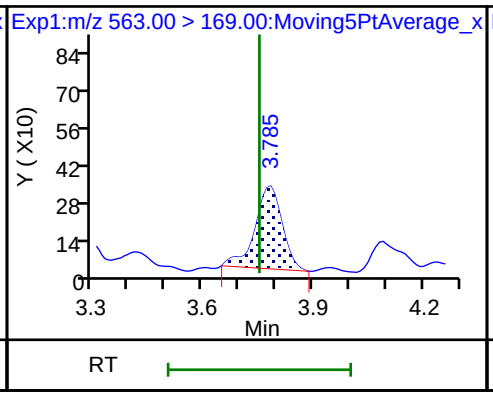
D 30 13C2 PFUnA



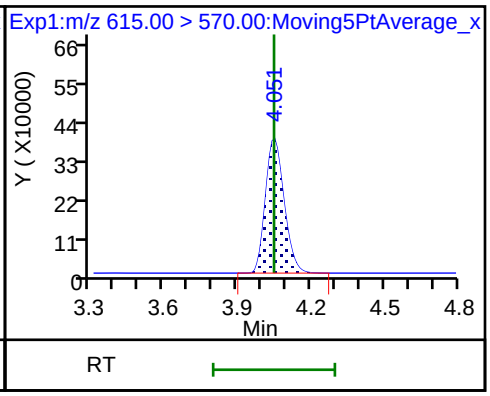
31 Perfluoroundecanoic acid



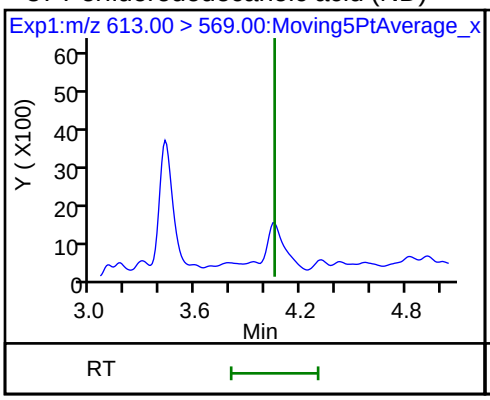
31 Perfluoroundecanoic acid



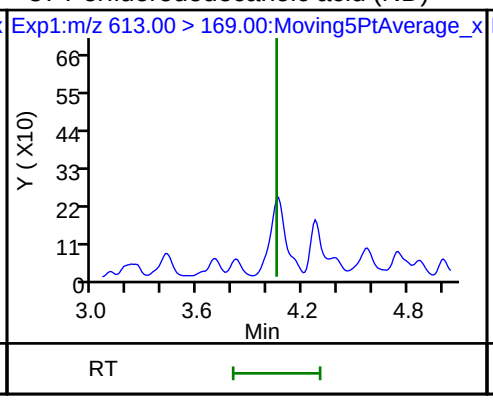
D 36 13C2 PFDoA



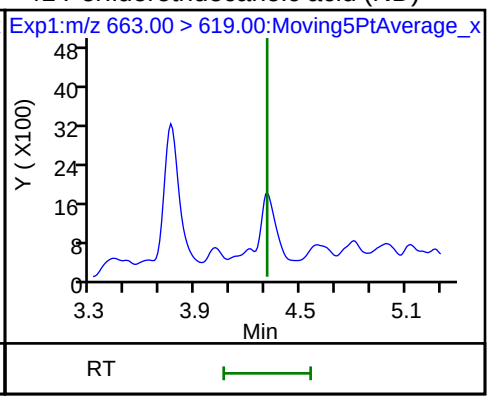
37 Perfluorododecanoic acid (ND)



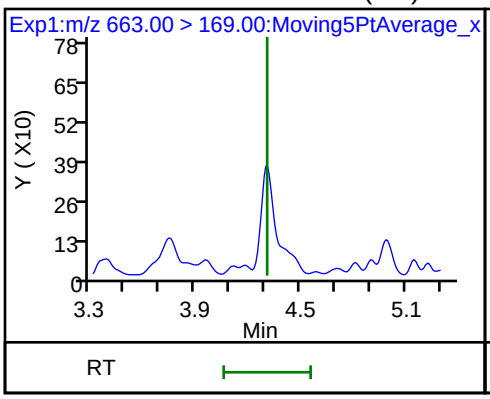
37 Perfluorododecanoic acid (ND)



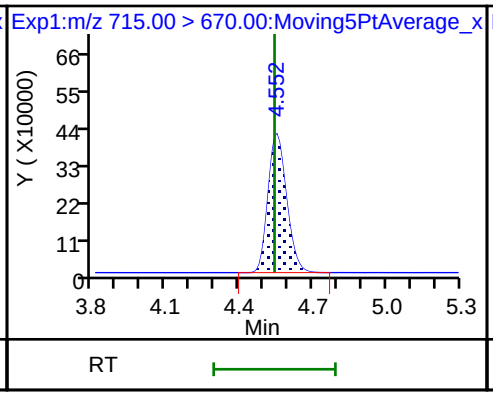
41 Perfluorotridecanoic acid (ND)



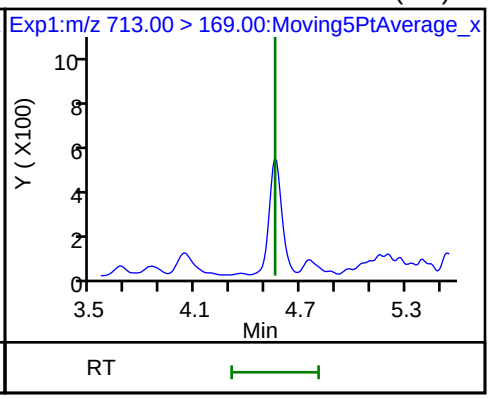
41 Perfluorotridecanoic acid (ND)



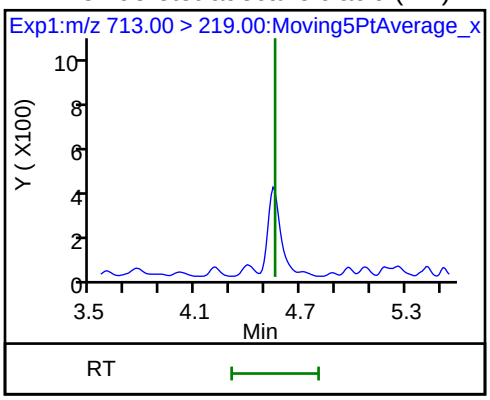
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



TestAmerica Sacramento

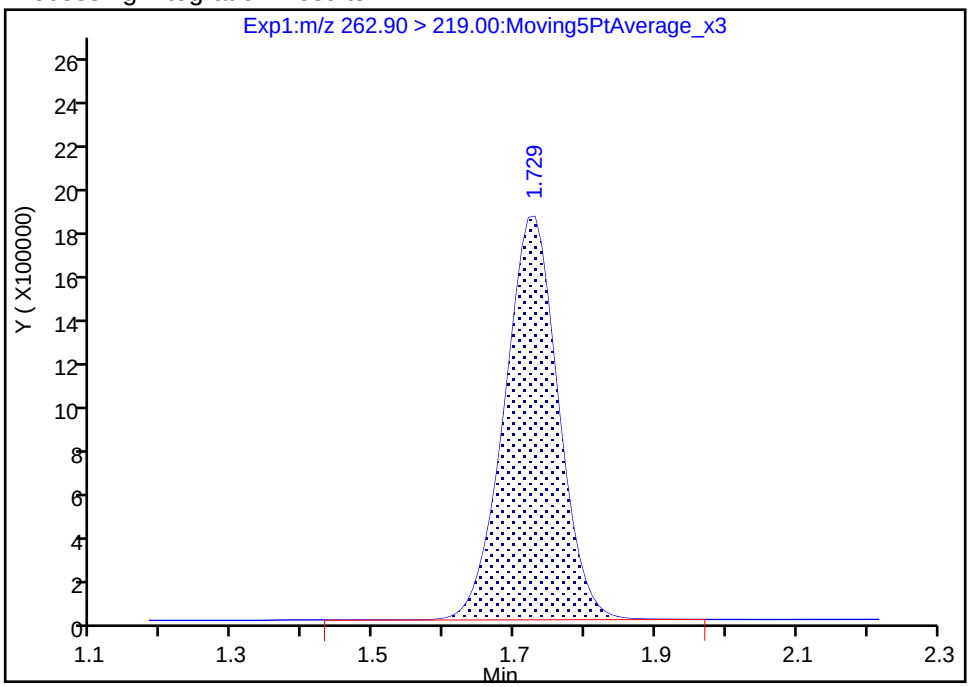
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_008.d
Injection Date: 28-May-2018 07:55:06 Instrument ID: A8_N
Lims ID: 320-38875-A-3-A Lab Sample ID: 320-38875-3
Client ID: TP-PFC-029-TPE
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

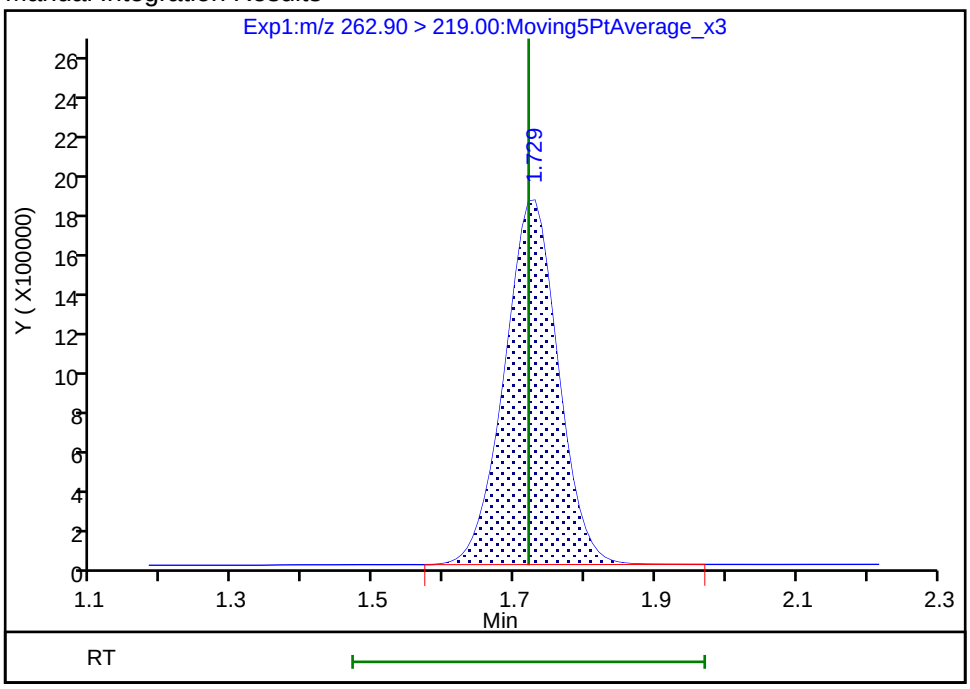
Processing Integration Results

RT: 1.73
Area: 9558839
Amount: 5.170053
Amount Units: ng/ml



Manual Integration Results

RT: 1.73
Area: 9526856
Amount: 5.152755
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:07:42
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

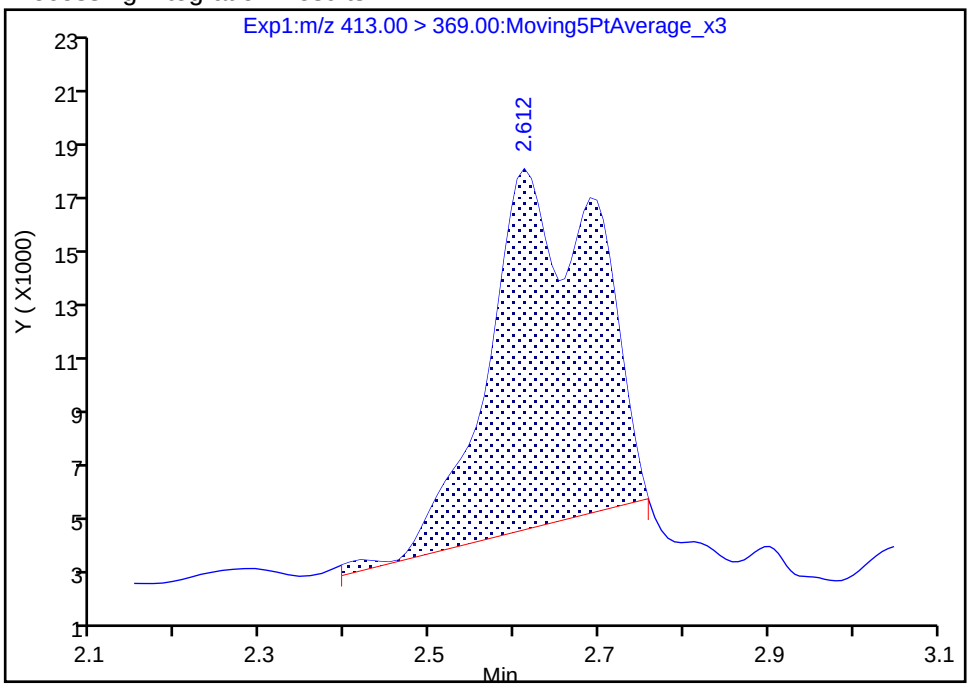
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_008.d				
Injection Date:	28-May-2018 07:55:06	Instrument ID:	A8_N		
Lims ID:	320-38875-A-3-A	Lab Sample ID:	320-38875-3		
Client ID:	TP-PFC-029-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	5	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

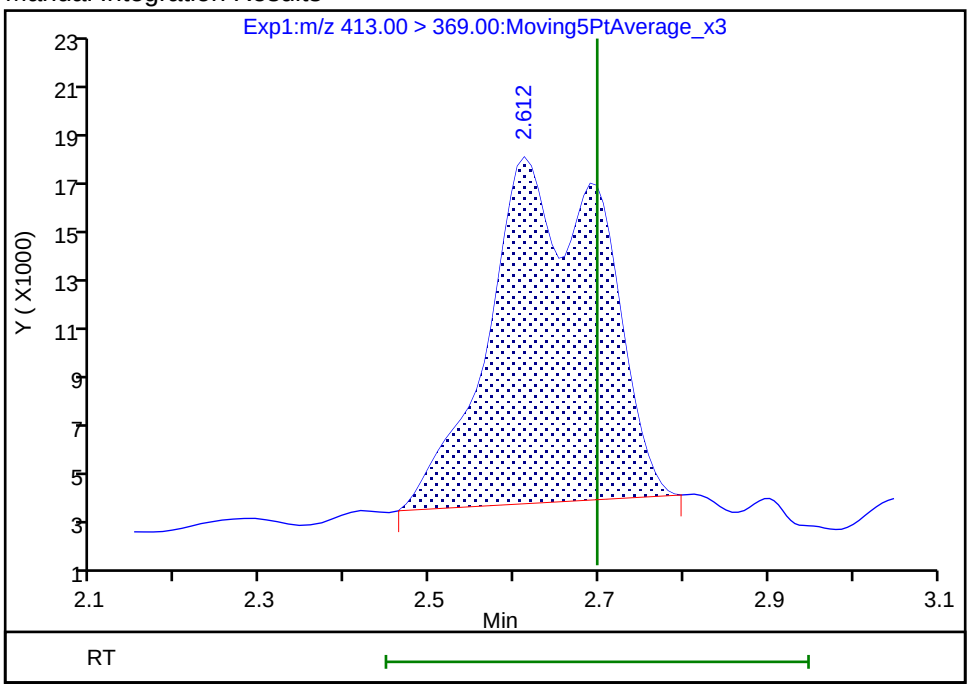
Processing Integration Results

RT: 2.61
Area: 117089
Amount: 0.062914
Amount Units: ng/ml



Manual Integration Results

RT: 2.61
Area: 131672
Amount: 0.070750
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:08:04
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_008.d

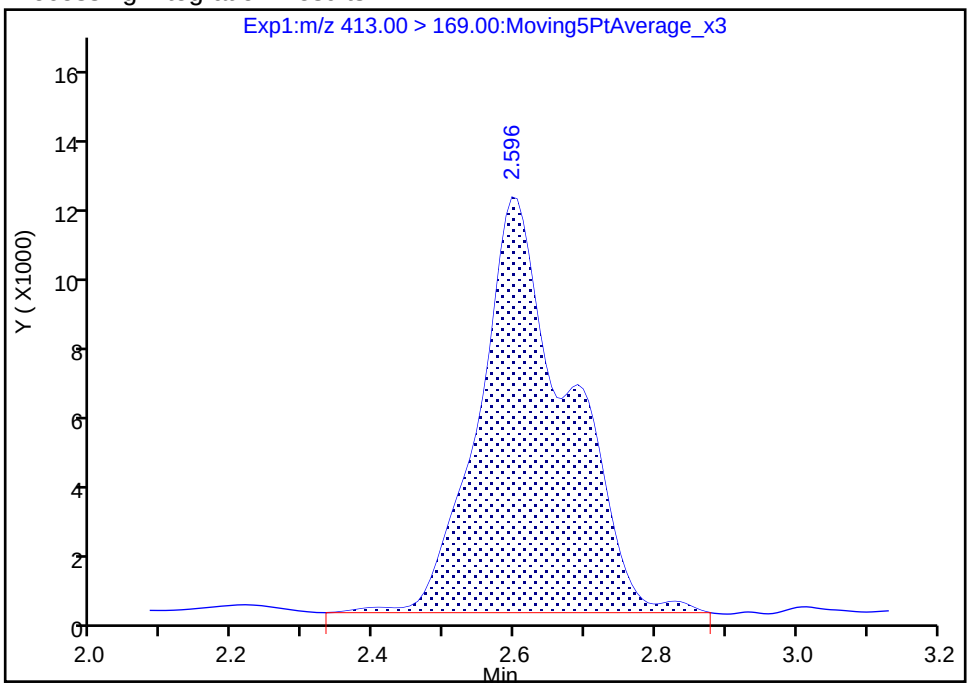
Injection Date:	28-May-2018 07:55:06	Instrument ID:	A8_N		
Lims ID:	320-38875-A-3-A	Lab Sample ID:	320-38875-3		
Client ID:	TP-PFC-029-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	5	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

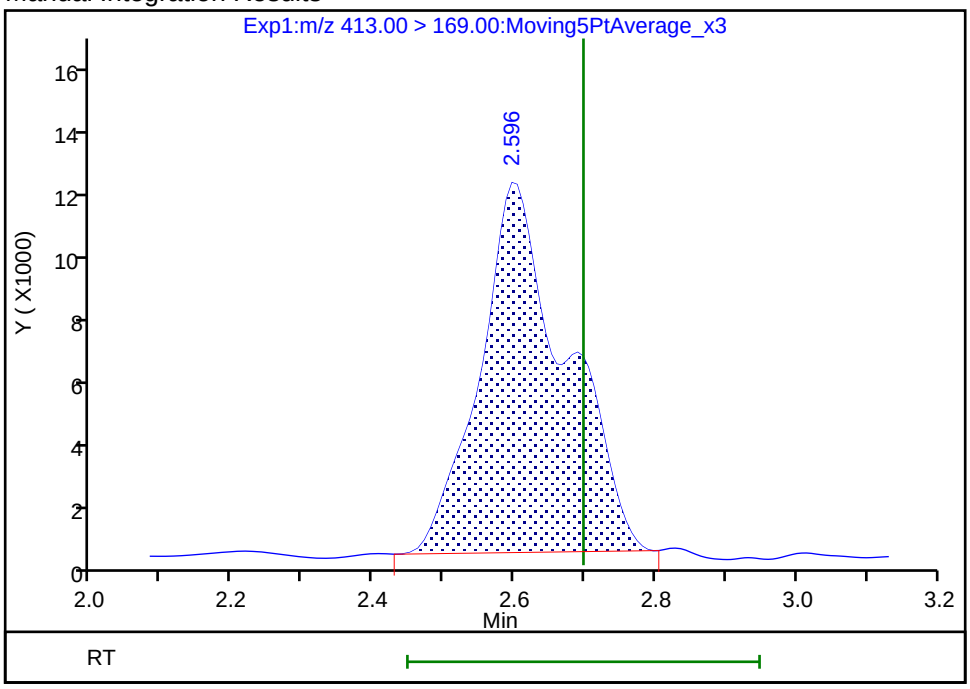
Processing Integration Results

RT: 2.60
Area: 103925
Amount: 0.062914
Amount Units: ng/ml



Manual Integration Results

RT: 2.60
Area: 98328
Amount: 0.070750
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:08:11

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

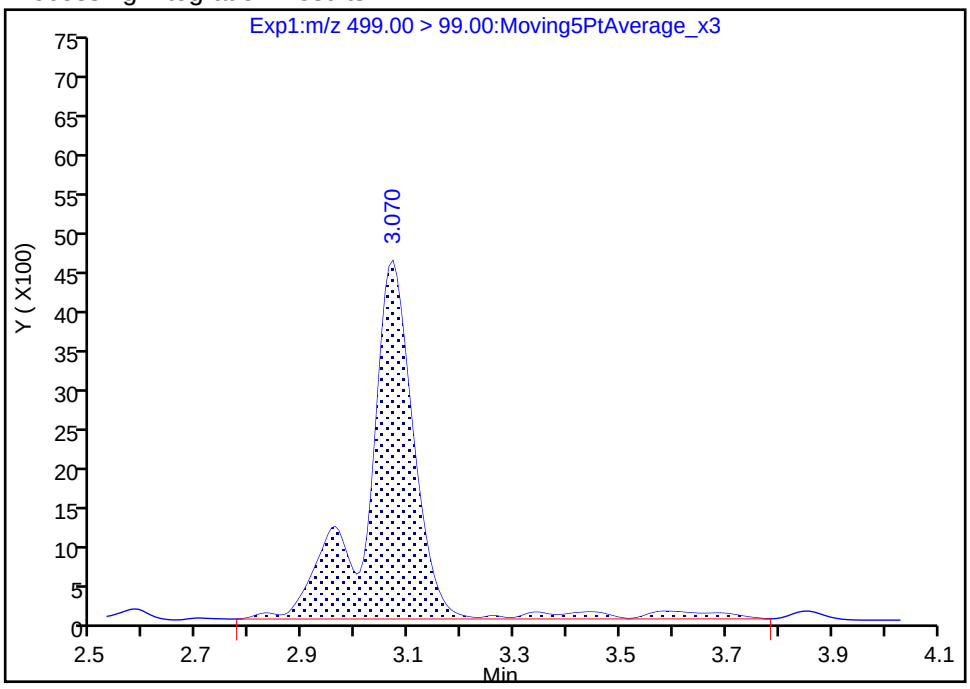
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_008.d				
Injection Date:	28-May-2018 07:55:06	Instrument ID:	A8_N		
Lims ID:	320-38875-A-3-A	Lab Sample ID:	320-38875-3		
Client ID:	TP-PFC-029-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	5	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

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

Signal: 2

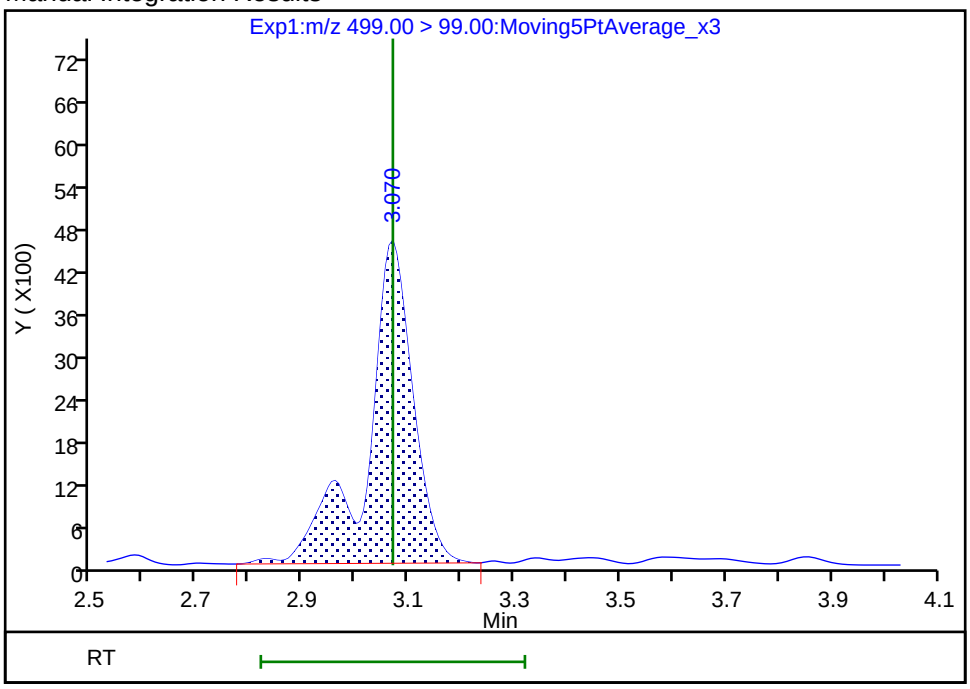
Processing Integration Results

RT: 3.07
Area: 29414
Amount: 0.071221
Amount Units: ng/ml



Manual Integration Results

RT: 3.07
Area: 27407
Amount: 0.071221
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:08:24

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPE-D | Lab Sample ID: 320-38875-4

Matrix: Water | Lab File ID: 2018.05.27LLADX_009.d

Analysis Method: EPA 537 (Mod) | Date Collected: 05/03/2018 00:00

Extraction Method: 3535 | Date Extracted: 05/16/2018 14:51

Sample wt/vol: 264.2(mL) | Date Analyzed: 05/28/2018 08:02

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

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

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

Analysis Batch No.: 225818 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.9	1.4	0.56
2706-90-3	Perfluoropentanoic acid (PFPeA)	190	M	1.9	0.95	0.41
307-24-4	Perfluorohexanoic acid (PFHxA)	80		1.9	0.95	0.44
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.0		1.9	1.4	0.58
335-67-1	Perfluorooctanoic acid (PFOA)	3.5	M	1.9	1.4	0.51
375-95-1	Perfluorononanoic acid (PFNA)	1.4	U	1.9	1.4	0.49
335-76-2	Perfluorodecanoic acid (PFDA)	0.95	U	1.9	0.95	0.45
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.4	U	1.9	1.4	0.68
307-55-1	Perfluorododecanoic acid (PFDoA)	1.4	U	1.9	1.4	0.49
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.8	U	3.8	2.8	0.72
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.8	U	3.8	2.8	0.79
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.2		1.9	0.95	0.44
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.0		1.9	0.95	0.36
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.95	U M	1.9	0.95	0.35
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.2		3.8	2.8	1.0
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.4	U	1.9	1.4	0.53
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.8	U	3.8	2.8	1.2

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPE-D Lab Sample ID: 320-38875-4

Matrix: Water Lab File ID: 2018.05.27LLADX_009.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 00:00

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 264.2(mL) Date Analyzed: 05/28/2018 08:02

Con. Extract Vol.: 10(mL) Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	67		50-150
STL00992	13C4 PFBA	75		50-150
STL01893	13C5 PFPeA	80		50-150
STL00993	13C2 PFHxA	76		50-150
STL01892	13C4-PFHpA	78		50-150
STL00990	13C4 PFOA	84		50-150
STL00995	13C5 PFNA	91		50-150
STL00996	13C2 PFDA	79		50-150
STL00997	13C2 PFUnA	86		50-150
STL00998	13C2 PFDoA	76		50-150
STL00994	18O2 PFHxS	78		50-150
STL02116	13C2-PFTeDA	70		50-150
STL00991	13C4 PFOS	78		50-150
STL02337	13C3-PFBS	78		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_009.d
Lims ID: 320-38875-A-4-A
Client ID: TP-PFC-029-TPE-D
Sample Type: Client
Inject. Date: 28-May-2018 08:02:55 ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-38875-a-4-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-May-2018 11:10:54 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 11:10:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.452	1.452	0.0	1.000	7127207	3.52			3621	
D 1 13C4 PFBA										
217.00 > 172.00	1.452	1.455	-0.003	1.000	5451422	1.88		75.2	31314	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.719	1.720	-0.001	1.000	8881503	5.03			5476	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.719	1.725	-0.006	0.561	3736306	2.01		80.4	46081	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.755	1.756	-0.001	1.000	151298	0.0594			779	
298.90 > 99.00	1.755	1.756	-0.001	1.000	69010		2.19(1.25-3.74)		543	
D 47 13C3-PFBS										
301.90 > 83.00	1.755	1.761	-0.006	1.000	75861	1.81		77.7	598	
D 7 13C2 PFHxA										
315.00 > 270.00	2.014	2.011	0.003	1.000	3766333	1.90		76.0	65529	
6 Perfluorohexanoic acid										R
313.00 > 269.00	1.991	2.015	-0.024	0.989	3284613	2.12			4591	R
313.00 > 119.00	2.014	2.015	-0.001	1.000	171804		19.12(5.03-15.10)		2278	
D 9 13C4-PFHpA										
367.00 > 322.00	2.345	2.342	0.003	1.000	3714272	1.96		78.3	60084	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.332	2.346	-0.014	0.994	84446	0.0538			83.6	
363.00 > 169.00	2.332	2.346	-0.014	0.994	29559		2.86(1.13-3.40)		148	
D 11 18O2 PFHxS										
403.00 > 84.00	2.358	2.355	0.003	1.000	4351901	1.85		78.4	71027	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.358	2.359	-0.001	1.000	385704	0.1860			1877	
399.00 > 99.00	2.358	2.359	-0.001	1.000	119320		3.23(1.50-4.49)		882	

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	2.696	2.695	0.001	1.000	3772836	2.10		84.0	80493	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.689	2.698	-0.009	0.997	162468	0.0915			33.2	M
413.00 > 169.00	2.596	2.698	-0.102	0.963	120406		1.35(0.84-2.52)		257	
* 62 13C2-PFOA										
415.00 > 370.00	2.696	2.698	-0.002		4741331	2.50			67409	
16 Perfluoroheptanesulfonic acid										M
449.00 > 80.00	2.704	2.705	-0.001	1.000	11962	0.007185			85.6	
449.00 > 99.00	2.704	2.705	-0.001	1.000	3275		3.65(1.94-5.82)		67.6	M
D 19 13C5 PFNA										
468.00 > 423.00	3.062	3.063	-0.001	1.000	3345013	2.28		91.1	82323	
D 18 13C4 PFOS										
503.00 > 80.00	3.062	3.063	-0.001	1.000	2987333	1.85		77.5	28851	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.062	3.070	-0.008	1.000	357770	0.2434			1900	
499.00 > 99.00	3.062	3.070	-0.008	1.000	80347		4.45(2.31-6.93)		1113	
20 Perfluorononanoic acid										
463.00 > 419.00	3.062	3.070	-0.008	1.000	1393	0.000983			4.4	
463.00 > 169.00	3.041	3.070	-0.029	0.993	351		3.97(1.90-5.69)		14.9	
D 21 13C8 FOSA										
506.00 > 78.00	3.402	3.395	0.007	1.000	3549577	1.68		67.3	33071	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.402	3.402	0.0	1.000	3955	0.002861			62.4	
D 23 13C2 PFDA										
515.00 > 470.00	3.420	3.422	-0.002	1.000	2464015	1.97		78.9	36498	
D 30 13C2 PFUnA										
565.00 > 520.00	3.753	3.748	0.005	1.000	2127015	2.15		86.0	39532	
31 Perfluoroundecanoic acid										R
563.00 > 519.00	3.753	3.753	0.0	1.000	5095	0.007170			28.2	R
563.00 > 169.00	3.742	3.753	-0.011	0.997	2518		2.02(2.12-6.36)		107	
D 36 13C2 PFDoA										
615.00 > 570.00	4.051	4.048	0.003	1.000	2018355	1.90		75.8	15450	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.552	4.542	0.010	1.000	2281575	1.75		69.8	15231	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 30-May-2018 11:10:54 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_009.d

Injection Date: 28-May-2018 08:02:55 Instrument ID: A8_N

Lims ID: 320-38875-A-4-A Lab Sample ID: 320-38875-4

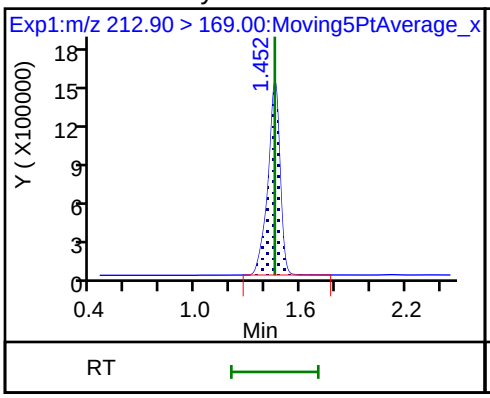
Client ID: TP-PFC-029-TPE-D

Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 9

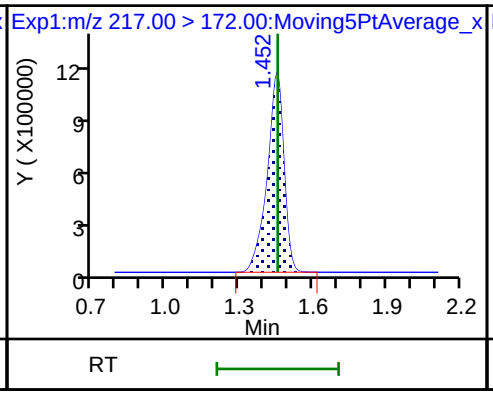
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

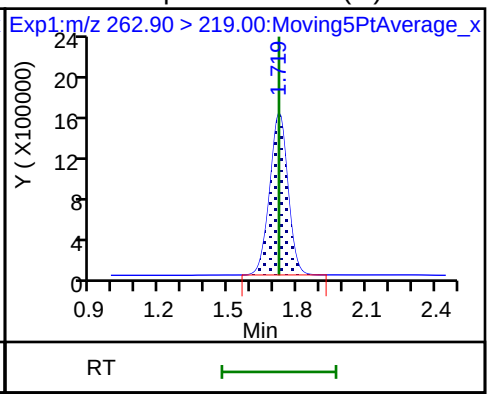
2 Perfluorobutyric acid



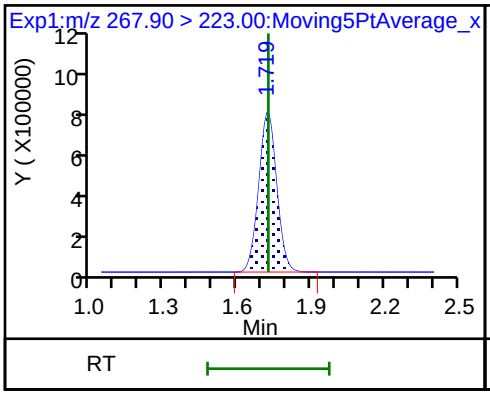
D 1 13C4 PFBA



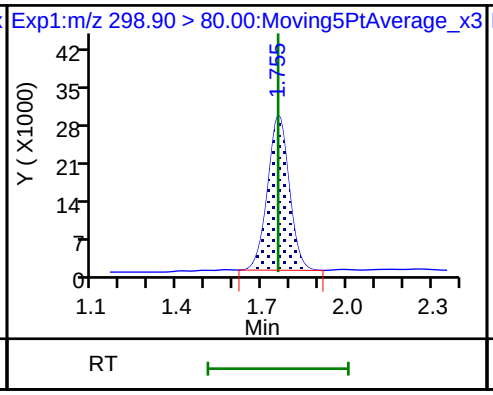
4 Perfluoropentanoic acid (M)



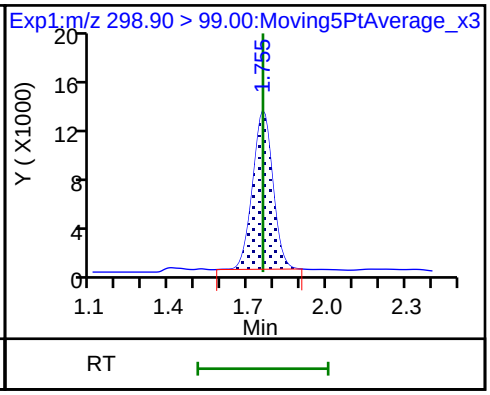
D 3 13C5-PFPeA



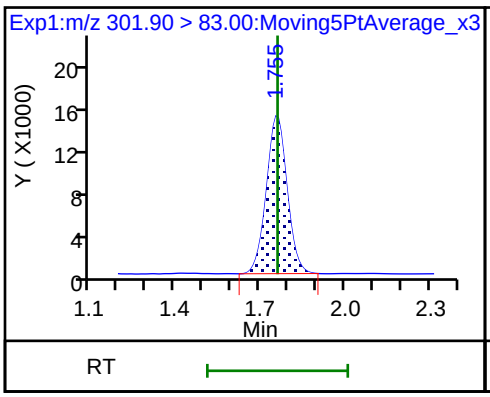
5 Perfluorobutanesulfonic acid



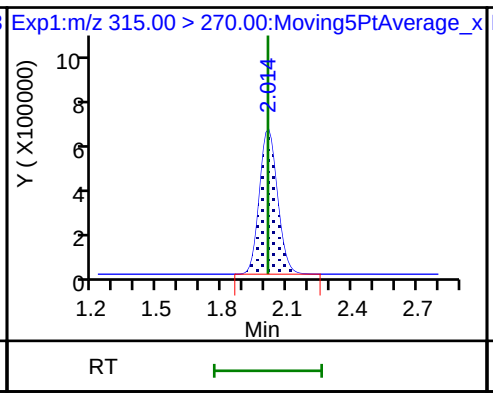
5 Perfluorobutanesulfonic acid



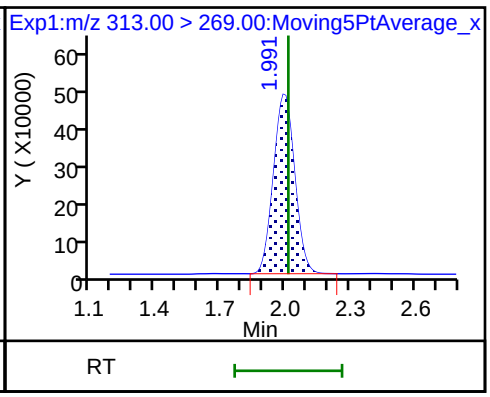
D 47 13C3-PFBS



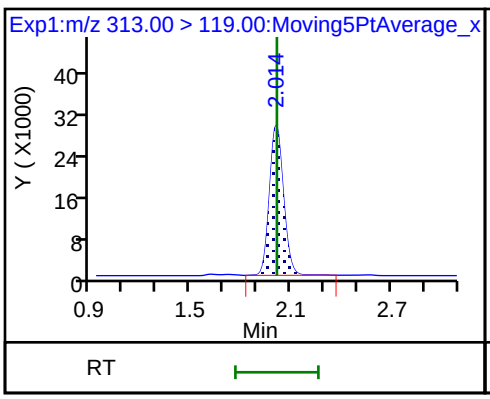
D 7 13C2 PFHxA



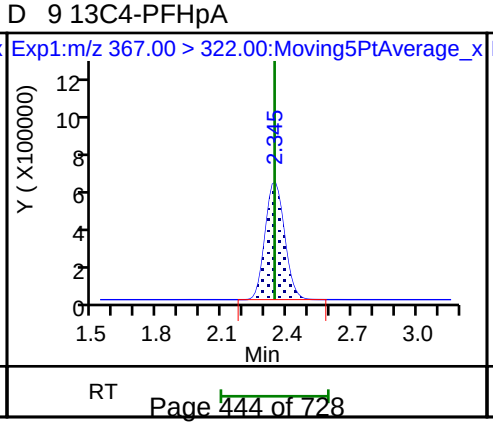
6 Perfluorohexanoic acid



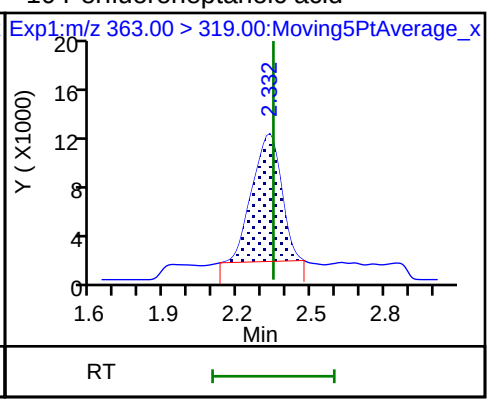
6 Perfluorohexanoic acid



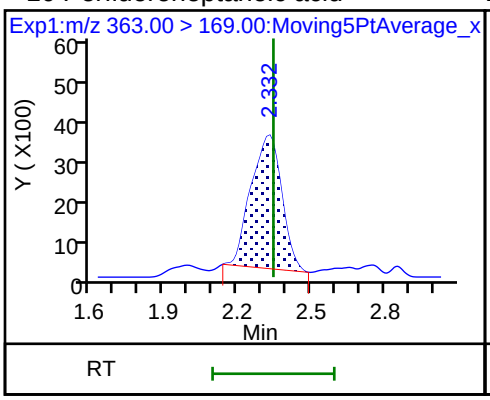
D 9 13C4-PFHpA



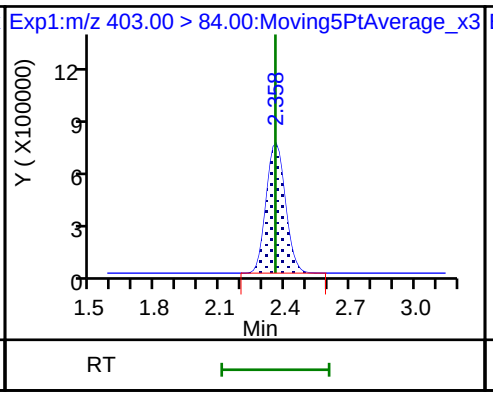
10 Perfluoroheptanoic acid



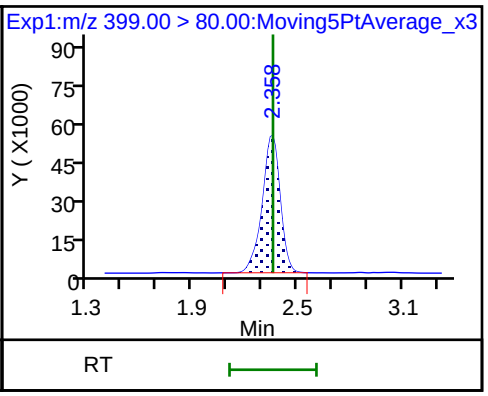
10 Perfluoroheptanoic acid



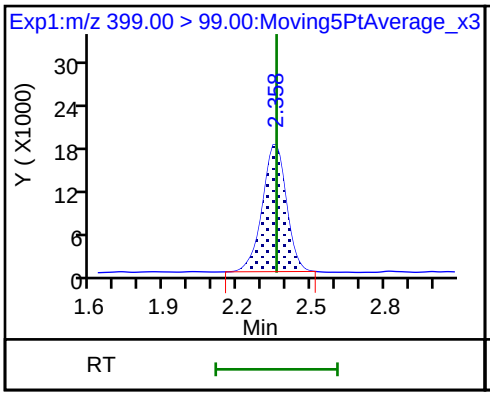
D 11 18O2 PFHxS



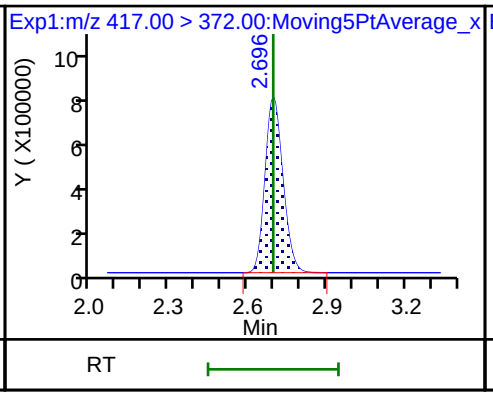
8 Perfluorohexanesulfonic acid



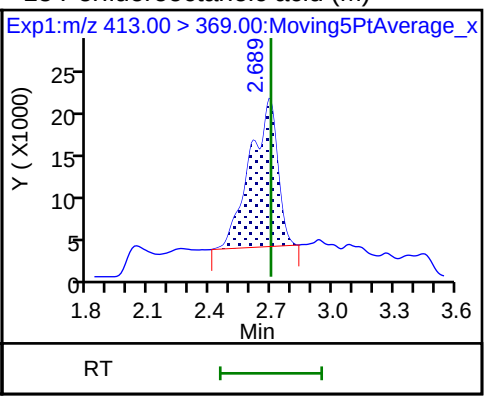
8 Perfluorohexanesulfonic acid



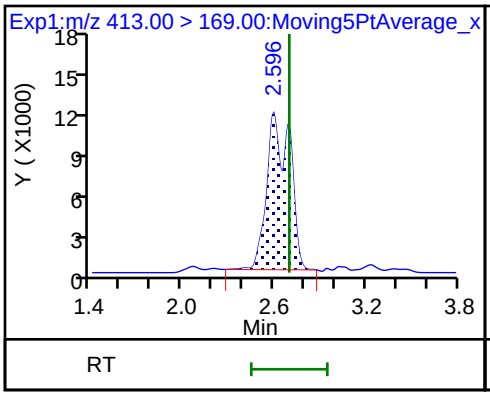
D 14 13C4 PFOA



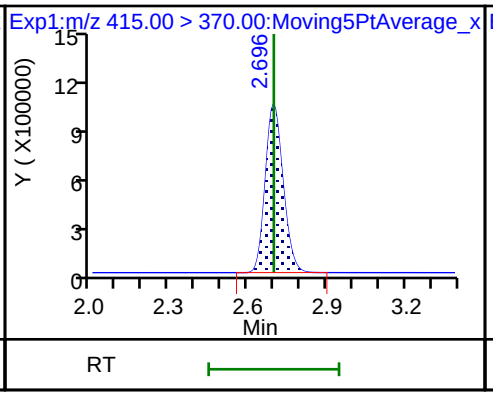
15 Perfluorooctanoic acid (M)



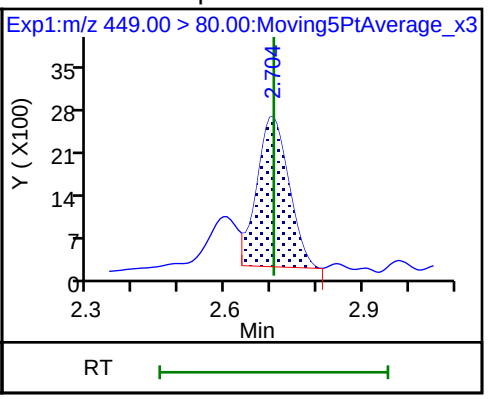
15 Perfluorooctanoic acid



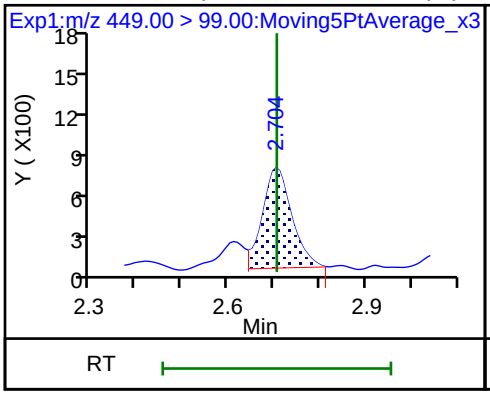
* 62 13C2-PFOA



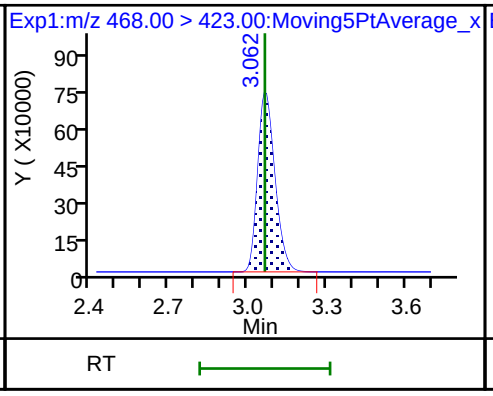
16 Perfluoroheptanesulfonic acid



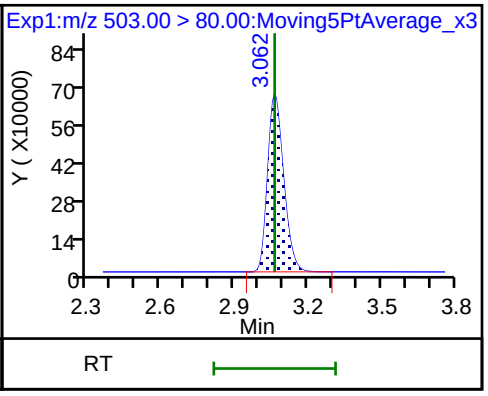
16 Perfluoroheptanesulfonic acid (M)



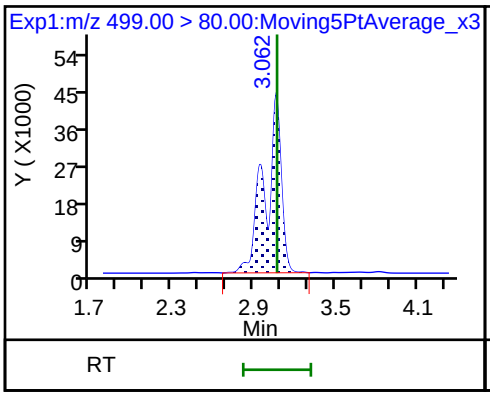
D 19 13C5 PFNA



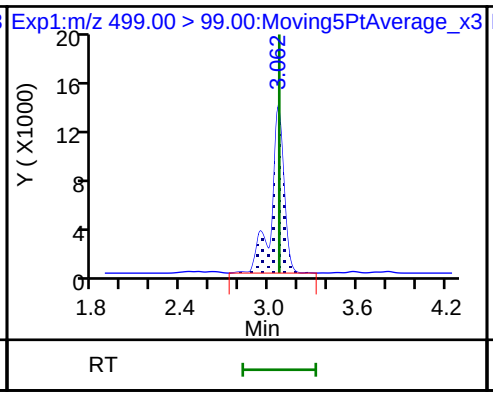
D 18 13C4 PFOS



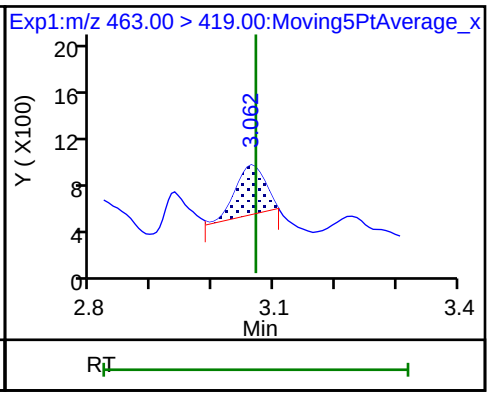
17 Perfluorooctane sulfonic acid



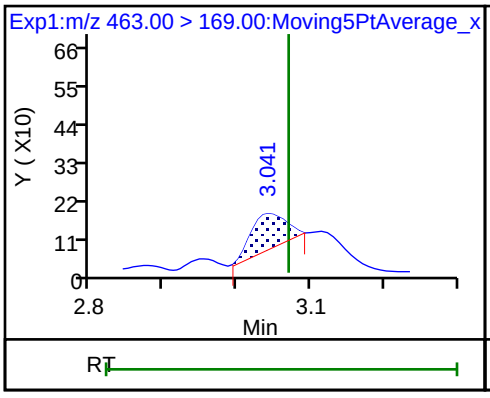
17 Perfluorooctane sulfonic acid



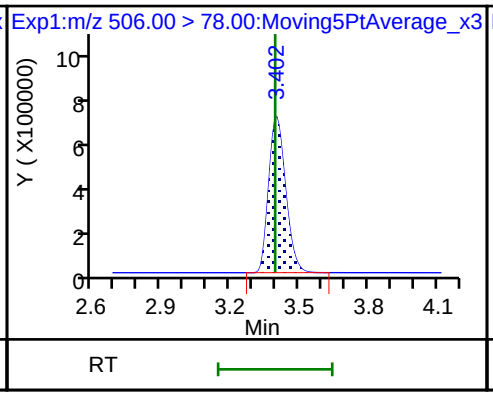
20 Perfluorononanoic acid



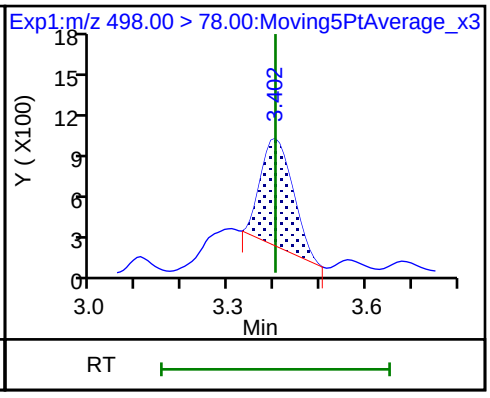
20 Perfluorononanoic acid



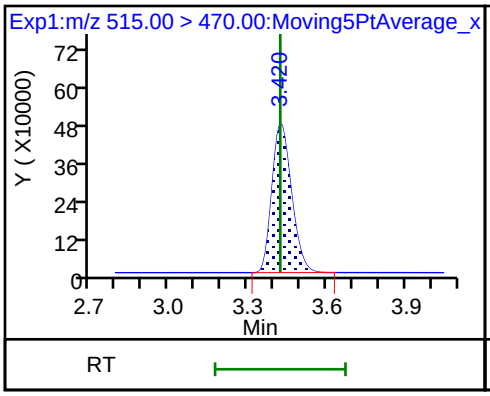
D 21 13C8 FOSA



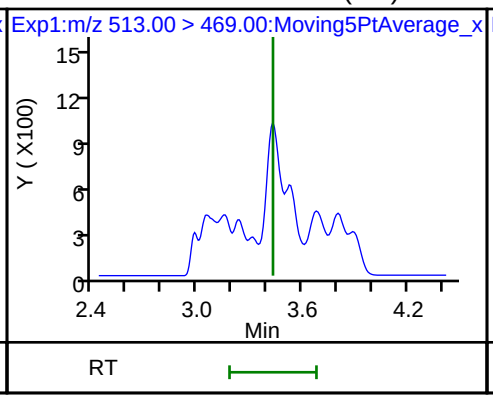
22 Perfluorooctane Sulfonamide



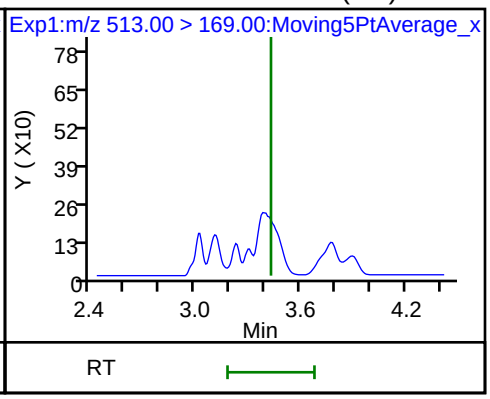
D 23 13C2 PFDA



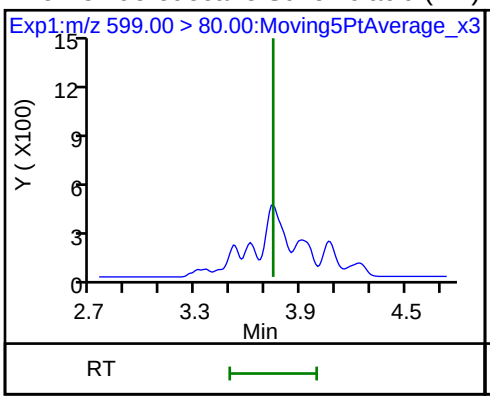
24 Perfluorodecanoic acid (ND)



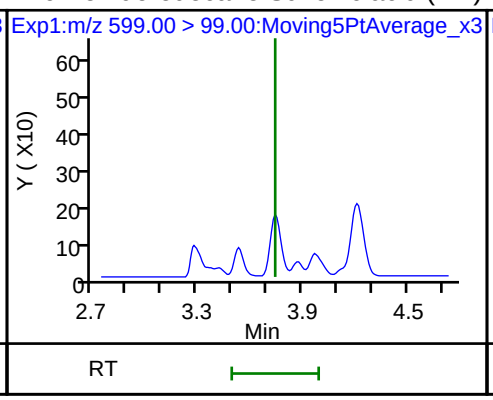
24 Perfluorodecanoic acid (ND)



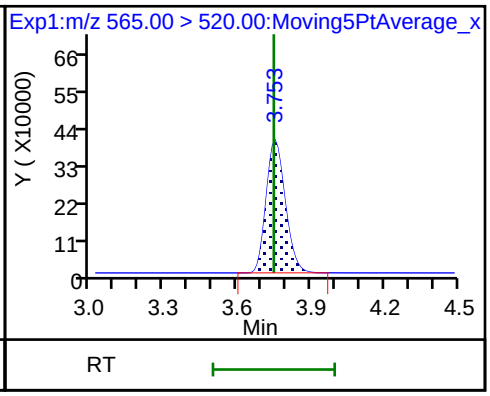
29 Perfluorodecane Sulfonic acid (ND)



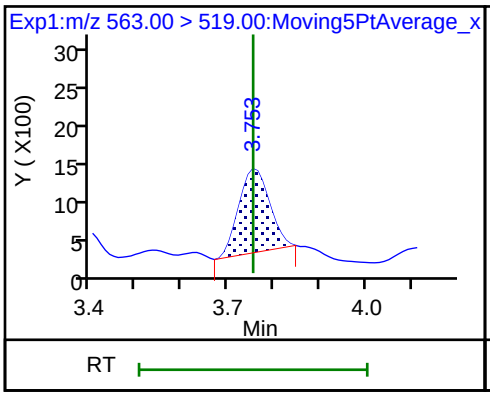
29 Perfluorodecane Sulfonic acid (ND)



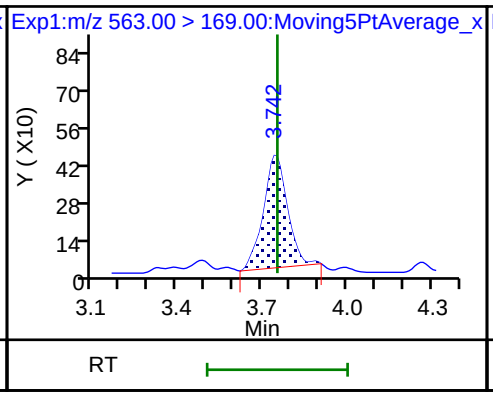
D 30 13C2 PFUnA



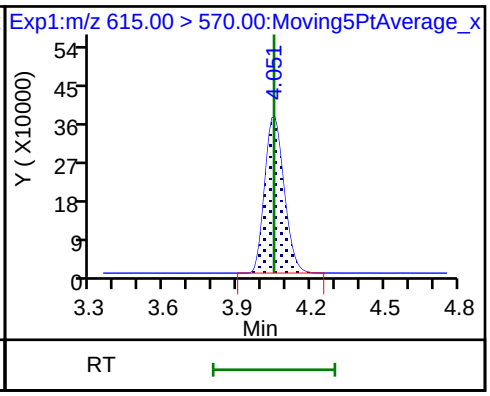
31 Perfluoroundecanoic acid



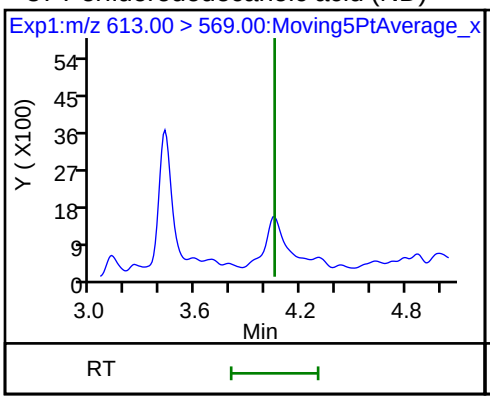
31 Perfluoroundecanoic acid



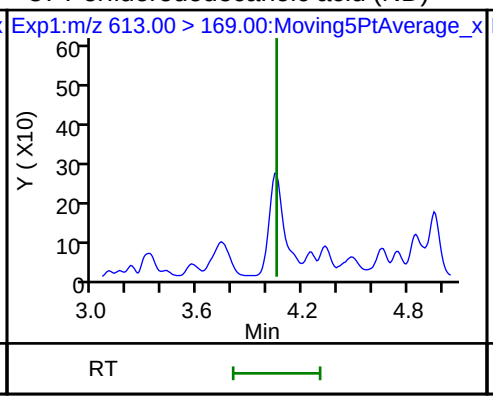
D 36 13C2 PFDoA



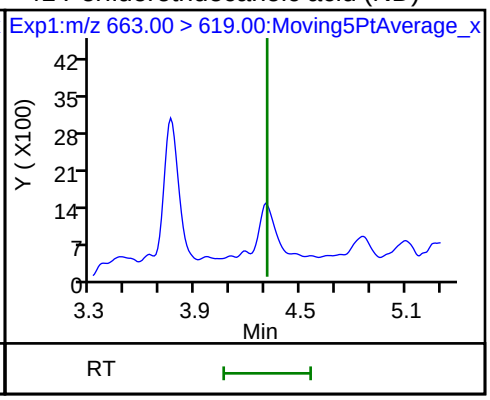
37 Perfluorododecanoic acid (ND)



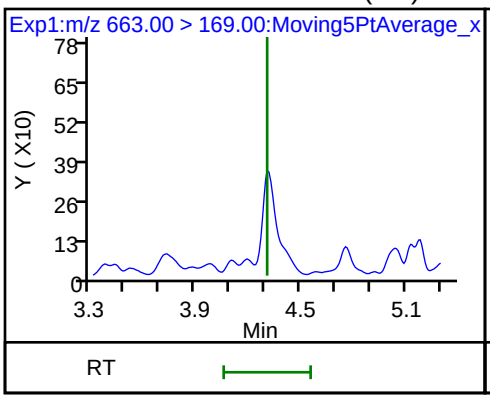
37 Perfluorododecanoic acid (ND)



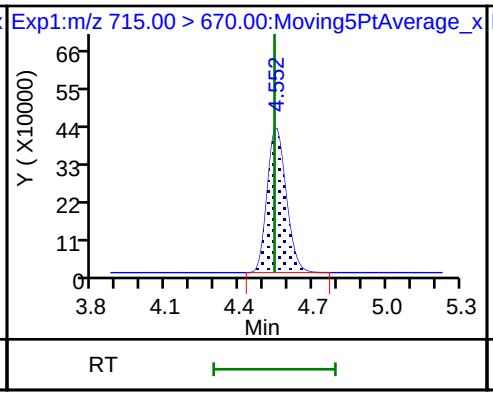
41 Perfluorotridecanoic acid (ND)



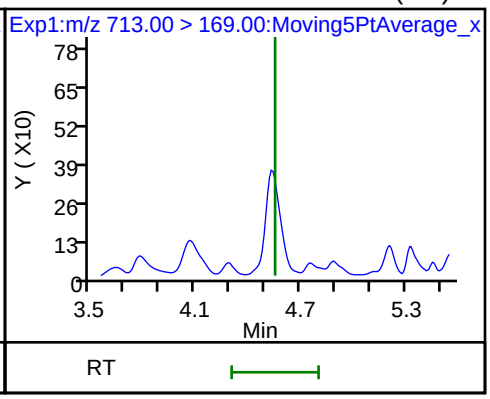
41 Perfluorotridecanoic acid (ND)



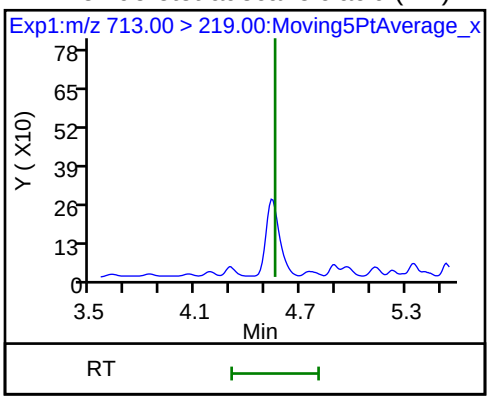
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



TestAmerica Sacramento

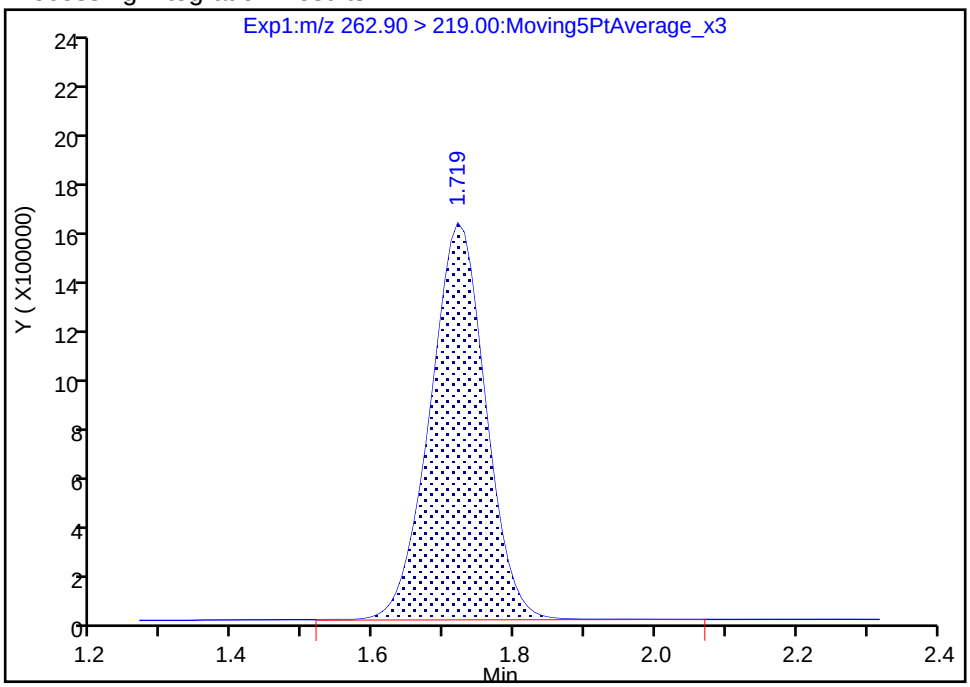
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_009.d				
Injection Date:	28-May-2018 08:02:55	Instrument ID:	A8_N		
Lims ID:	320-38875-A-4-A	Lab Sample ID:	320-38875-4		
Client ID:	TP-PFC-029-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

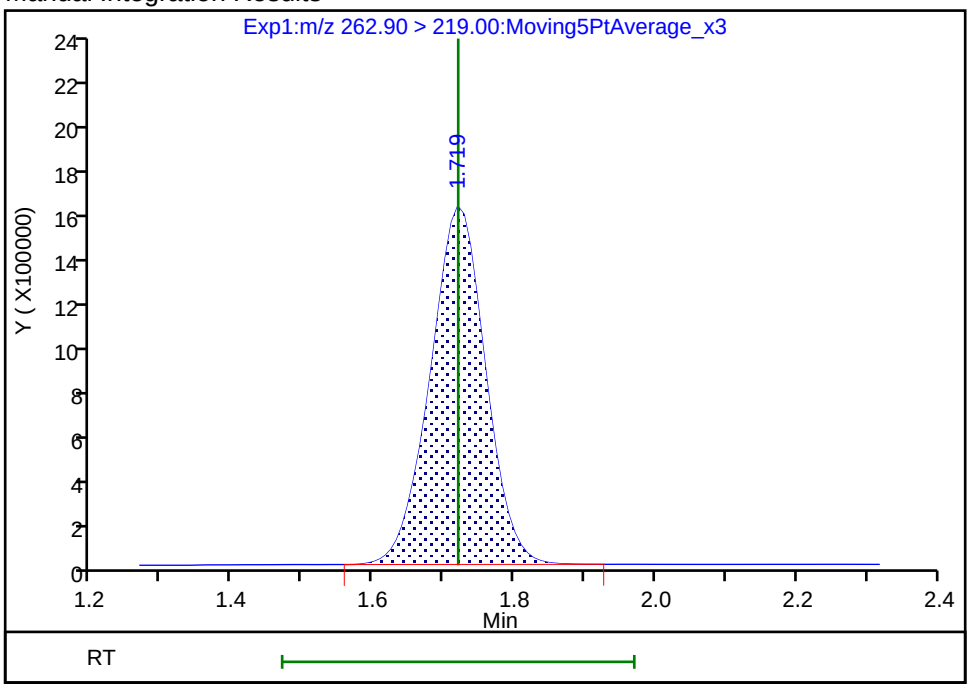
Processing Integration Results

RT: 1.72
Area: 8926118
Amount: 5.059318
Amount Units: ng/ml



Manual Integration Results

RT: 1.72
Area: 8881503
Amount: 5.034030
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:09:33
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

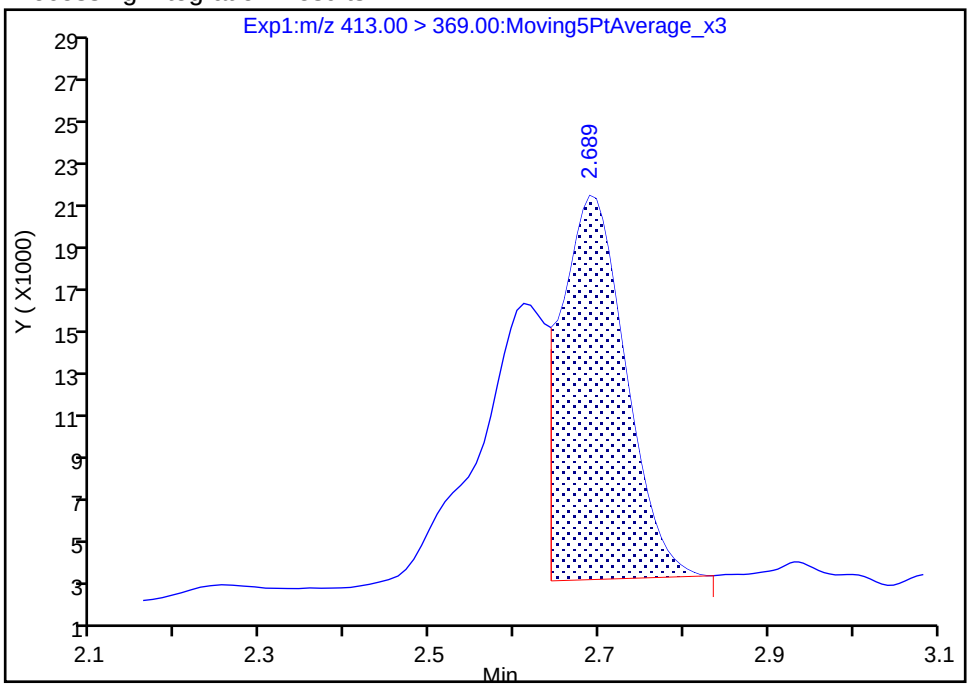
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_009.d
Injection Date: 28-May-2018 08:02:55 Instrument ID: A8_N
Lims ID: 320-38875-A-4-A Lab Sample ID: 320-38875-4
Client ID: TP-PFC-029-TPE-D
Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

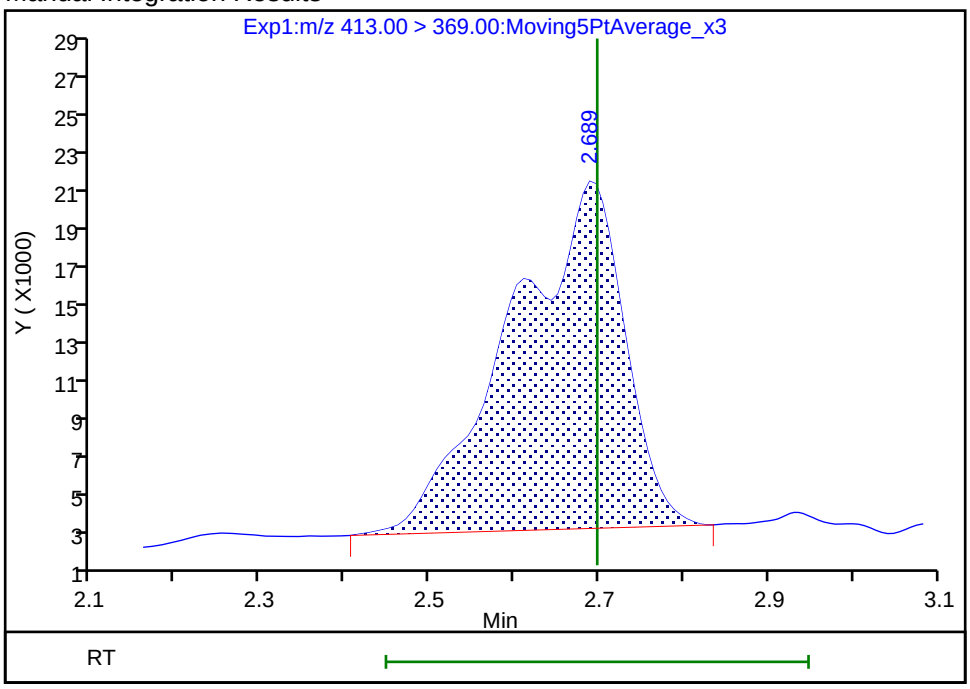
Processing Integration Results

RT: 2.69
Area: 90478
Amount: 0.050936
Amount Units: ng/ml



Manual Integration Results

RT: 2.69
Area: 162468
Amount: 0.091464
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:10:00
Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento

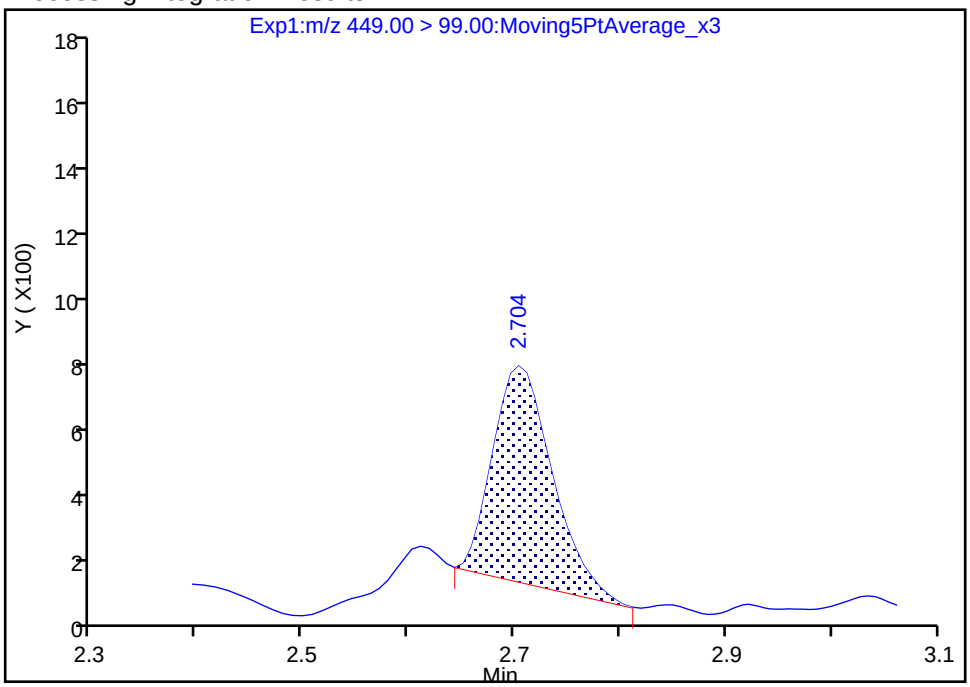
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_009.d				
Injection Date:	28-May-2018 08:02:55	Instrument ID:	A8_N		
Lims ID:	320-38875-A-4-A	Lab Sample ID:	320-38875-4		
Client ID:	TP-PFC-029-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

16 Perfluoroheptanesulfonic acid, CAS: 375-92-8

Signal: 2

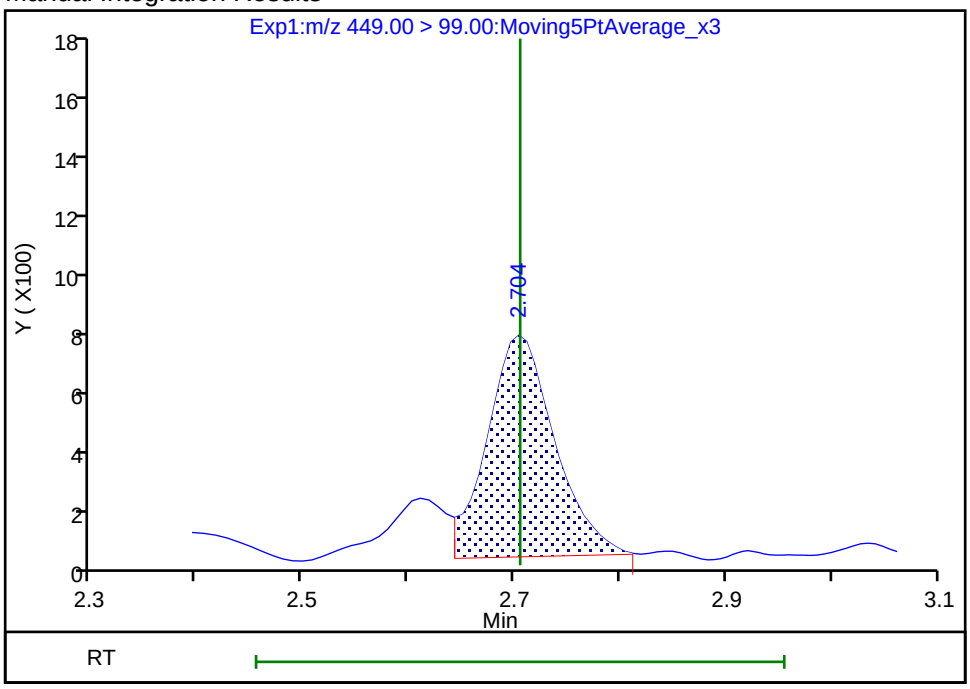
Processing Integration Results

RT: 2.70
Area: 2583
Amount: 0.007185
Amount Units: ng/ml



Manual Integration Results

RT: 2.70
Area: 3275
Amount: 0.007185
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 11:10:15
Audit Action: Manually Integrated Audit Reason: Baseline

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

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-223413/2	2017.05.15LLB_ICAL_002.d
Level 2	IC 320-223413/3	2017.05.15LLB_ICAL_003.d
Level 3	IC 320-223413/4	2017.05.15LLB_ICAL_004.d
Level 4	IC 320-223413/5	2017.05.15LLB_ICAL_005.d
Level 5	IC 320-223413/7	2017.05.15LLB_ICAL_007.d
Level 6	IC 320-223413/8	2017.05.15LLB_ICAL_008.d
Level 7	IC 320-223413/11	2018.05.15LLC_ICAL_006.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 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	0.9241 0.8957	0.9313 0.9561	0.9225	0.9212	0.9579	AveID		0.9298				2.3		20.0			
Perfluoropentanoic acid (PFPeA)	1.2625 1.1540	1.2317 1.1953	1.1470	1.1005	1.1726	AveID		1.1805				4.6		20.0			
Perfluorobutanesulfonic acid (PFBS)	73.379 74.326	78.361 80.657	79.854	76.421	83.642	AveID		78.092				4.7		20.0			
4:2 FTS	16.107 15.923	17.745 16.756	15.595	16.119	17.773	AveID		16.574				5.3		20.0			
Perfluorohexanoic acid (PFHxA)	1.0080 1.0775	1.1481 0.9470	0.9804	0.9949	1.0411	AveID		1.0281				6.6		20.0			
Perfluoropentanesulfonic acid	70.536 63.954	69.604 69.356	70.709	68.100	74.560	AveID		69.545				4.6		20.0			
Perfluoroheptanoic acid (PFHpA)	1.1170 1.0467	1.0612 1.0839	1.0572	0.9754	1.0529	AveID		1.0563				4.1		20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.2868 1.0806	1.1929 1.0961	1.1199	1.0451	1.0663	AveID		1.1268				7.6		20.0			
6:2FTS	2.5480 1.8029	2.0146 1.7196	2.1352	1.5658	1.7441	L2ID	0.0180	1.7550							0.9900		0.9900
Perfluorooctanoic acid (PFOA)	1.2824 1.1018	1.3066 1.0898	1.1380	1.1380	1.1826	AveID		1.1770				7.3		20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.1977 1.2900	1.4162 1.3580	1.3092	1.3585	1.3942	AveID		1.3320				5.5		20.0			
Perfluorooctanesulfonic acid (PFOS)	1.3297 1.1063	1.2627 1.0707	1.2157	1.0803	1.1653	AveID		1.1758				8.4		20.0			
Perfluorononanoic acid (PFNA)	1.1029 1.0898	1.0209 1.0772	1.0536	1.0094	1.0606	AveID		1.0592				3.3		20.0			
Perfluorooctane Sulfonamide (FOSA)	0.8770 0.9485	0.9364 1.0373	1.0064	0.9683	1.0413	AveID		0.9736				6.1		20.0			

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.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorononanesulfonic acid	0.7875 0.7778	0.6822 0.7530	0.7467	0.7538	0.8013	AveID		0.7575				5.1		20.0			
8:2FTS	1.3186 1.2726	1.3858 1.3389	1.3462	1.3265	1.4577	AveID		1.3495				4.3		20.0			
Perfluorodecanoic acid (PFDA)	0.8867 0.9744	0.9628 1.0102	0.9707	0.9794	1.0214	AveID		0.9722				4.5		20.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9856 1.0154	0.9342 1.0822	0.9935	1.0424	1.0502	AveID		1.0148				4.8		20.0			
Perfluorodecanesulfonic acid (PFDS)	0.6317 0.6583	0.7078 0.6826	0.6836	0.6304	0.7056	AveID		0.6714				4.8		20.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	1.0524 0.9642	0.7682 0.8944	0.9620	0.9003	1.0388	AveID		0.9400				10.3		20.0			
Perfluoroundecanoic acid (PFUnA)	0.9516 0.9130	0.9138 0.7363	0.7790	0.7312	0.8215	AveID		0.8352				10.9		20.0			
Perfluorododecanoic acid (PFDoA)	1.0219 1.0283	1.0040 1.0645	1.1136	1.0306	1.0427	AveID		1.0436				3.4		20.0			
Perfluorotridecanoic Acid (PFTriA)	1.1692 1.0949	1.0844 1.1930	1.1780	1.1305	1.1573	AveID		1.1439				3.7		20.0			
Perfluorotetradecanoic acid (PFTeA)	0.2622 0.2644	0.2565 0.2614	0.2270	0.2438	0.2525	AveID		0.2525				5.3		20.0			
13C4 PFBA	1.4654 1.5642	1.5722 1.4829	1.5804	1.4802	1.5540	Ave		1.5285				3.3		20.0			
13C5 PFPeA	0.9578 0.9717	0.9914 0.9536	0.9991	0.9890	0.9962	Ave		0.9798				1.9		20.0			
13C3-PFBS	0.0218 0.0222	0.0228 0.0217	0.0227	0.0222	0.0216	Ave		0.0221				2.1		20.0			
13C2 PFHxA	1.0307 0.9826	1.0663 1.0766	1.0830	1.0193	1.0550	Ave		1.0448				3.4		20.0			
13C4-PFHpA	1.0218 0.9433	1.0396 0.9531	1.0651	0.9899	0.9939	Ave		1.0010				4.4		20.0			
18O2 PFHxS	1.2582 1.1763	1.2526 1.2049	1.2691	1.2355	1.2631	Ave		1.2371				2.8		20.0			
M2-6:2FTS	0.2275 0.2007	0.2278 0.2142	0.2391	0.2273	0.2103	Ave		0.2210				5.9		20.0			
13C4 PFOA	0.9457 0.9318	0.9493 0.9514	0.9743	0.9365	0.9390	Ave		0.9468				1.5		20.0			
13C4 PFOS	0.8656 0.8371	0.8315 0.8519	0.8880	0.8302	0.8476	Ave		0.8503				2.4		20.0			
13C5 PFNA	0.7820 0.7385	0.8107 0.7553	0.8055	0.7560	0.7732	Ave		0.7745				3.5		20.0			

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.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
13C8 FOSA	1.0913 1.1170	1.0548 1.1055	1.1529	1.1228	1.1455	Ave		1.1128				3.0		20.0			
M2-8:2FTS	0.2728 0.2412	0.2681 0.2427	0.2615	0.2403	0.2336	Ave		0.2515				6.2		20.0			
13C2 PFDA	0.6586 0.6466	0.6755 0.6399	0.6955	0.6477	0.6472	Ave		0.6587				3.0		20.0			
d3-NMeFOSAA	0.3554 0.3833	0.3709 0.3334	0.3911	0.3502	0.3593	Ave		0.3634				5.5		20.0			
d5-NEtFOSAA	0.3882 0.3379	0.3862 0.3795	0.3918	0.3798	0.3469	Ave		0.3729				5.8		20.0			
13C2 PFUnA	0.5204 0.4762	0.5248 0.5225	0.5435	0.5432	0.5208	Ave		0.5216				4.3		20.0			
13C2 PFDoA	0.5424 0.5733	0.5507 0.5366	0.5780	0.5627	0.5857	Ave		0.5613				3.3		20.0			
13C2-PFTeDA	0.6921 0.6818	0.5915 0.6707	0.7584	0.7128	0.7166	Ave		0.6891				7.5		20.0			
13C2-PFHxDA	1.2461 1.2600	0.8066 1.2373	1.2363	1.2369	1.1633	Ave		1.1695				13.9		20.0			

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.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-223413/2	2017.05.15LLB_ICAL_002.d
Level 2	IC 320-223413/3	2017.05.15LLB_ICAL_003.d
Level 3	IC 320-223413/4	2017.05.15LLB_ICAL_004.d
Level 4	IC 320-223413/5	2017.05.15LLB_ICAL_005.d
Level 5	IC 320-223413/7	2017.05.15LLB_ICAL_007.d
Level 6	IC 320-223413/8	2017.05.15LLB_ICAL_008.d
Level 7	IC 320-223413/11	2018.05.15LLC_ICAL_006.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	73922 26861072	162647 6642110	691256	2597444	12934647	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluoropentanoic acid (PFPeA)		AveID	66005 21497034	135647 5339518	543378	2073422	10150448	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorobutanesulfonic acid (PFBS)		AveID	77106 28014178	175383 7259728	758816	2858265	13863265	0.0221 8.84	0.0442 2.21	0.221	0.884	4.42
4:2 FTS		AveID	17882 6341030	41962 1593481	156576	636977	3112425	0.0234 9.34	0.0467 2.34	0.234	0.934	4.67
Perfluorohexanoic acid (PFHxA)		AveID	56711 20297289	135987 4776223	503450	1931731	9544553	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluoropentanesulfonic acid		AveID	78646 25577332	165299 6623884	712963	2702610	13112812	0.0235 9.38	0.0469 2.35	0.235	0.938	4.69
Perfluoroheptanoic acid (PFHpA)		AveID	62298 18928350	122556 4839723	533908	1839273	9093863	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorohexanesulfonic acid (PFHxS)		AveID	80424 22174743	151043 5630297	613254	2238132	10650638	0.0228 9.10	0.0455 2.28	0.228	0.910	4.55
6:2FTS		L2ID	29994 6574970	48326 1635620	229440	642687	3021313	0.0237 9.48	0.0474 2.37	0.237	0.948	4.74
Perfluorooctanoic acid (PFOA)		AveID	66199 19682065	137784 4857127	525683	2030259	9649258	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	53872 19707477	124538 5160059	524732	2045093	9775395	0.0238 9.52	0.0476 2.38	0.238	0.952	4.76
Perfluorooctanesulfonic acid (PFOS)		AveID	58301 16474463	108239 3965534	474971	1585297	7964833	0.0232 9.28	0.0464 2.32	0.232	0.928	4.64
Perfluorononanoic acid (PFNA)		AveID	47076 15430529	91933 3811509	402423	1453651	7125949	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorooctane Sulfonamide (FOSA)		AveID	52238 20311842	109720 5372059	550166	2070950	10364812	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorononanesulfonic acid		AveID	35719 11982938	60494 2885064	301811	1144412	5665707	0.0240 9.60	0.0480 2.40	0.240	0.960	4.80

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
8:2FTS		AveID	18812 5636776	39540 1458360	159889	581733	2834764	0.0240 9.58	0.0479 2.40	0.240	0.958	4.79
Perfluorodecanoic acid (PFDA)		AveID	31877 12079263	72253 3028523	320077	1208399	5744357	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	19122 7460336	38494 1690352	184250	695308	3278986	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorodecanesulfonic acid (PFDS)		AveID	28773 10184141	63027 2626191	277428	961059	5009746	0.0241 9.64	0.0482 2.41	0.241	0.964	4.82
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	22302 6246594	32956 1590051	178736	651368	3130989	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluoroundecanoic acid (PFUnA)		AveID	27031 8334466	53273 1802433	200746	756677	3717634	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorododecanoic acid (PFDoA)		AveID	30254 11301274	61418 2676169	305166	1104651	5307128	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorotridecanoic Acid (PFTriA)		AveID	34616 12033356	66337 2999335	322826	1211735	5890114	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorotetradecanoic acid (PFTeA)		AveID	9904 3455816	16854 821303	81619	331048	1571970	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
13C4 PFBA	13PF OA	Ave	7998943 7496989	8732721 6946962	7493234	7049149	6751655	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5 PFPeA	13PF OA	Ave	5228218 4657025	5506602 4467248	4737268	4710025	4328345	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	110547 99131	117730 94691	99970	98369	87185	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	5626147 4709249	5922451 5043564	5134906	4854075	4583820	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	5577473 4521122	5774309 4465208	5050240	4714171	4318388	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	6497213 5333305	6581524 5339851	5692452	5565884	5191664	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	1179634 913641	1201925 953169	1076802	1028277	867962	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	5162191 4465836	5272655 4456920	4619416	4460027	4079623	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	4516956 3835347	4415247 3815593	4024927	3779459	3520558	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	4268517 3539647	4502703 3538499	3819382	3600246	3359491	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C8 FOSA	13PF OA	Ave	5956672 5353791	5858621 5178962	5466463	5346931	4976852	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	1426703 1107332	1426640 1089191	1187676	1096366	972368	2.40 2.40	2.40 2.40	2.40	2.40	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
13C2 PFDA	13PF OA	Ave	3594922 3099083	3752181 2997952	3297462	3084670	2812041	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	1940146 1836867	2060337 1561957	1854527	1667566	1561125	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	2119254 1619647	2144987 1777821	1857905	1808821	1507014	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	2840675 2282286	2914989 2447962	2576940	2587053	2262574	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	2960567 2747572	3058640 2514089	2740425	2679695	2544838	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	3777870 3267831	3285420 3141974	3595983	3394312	3113223	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	6801656 6039184	4480419 5796576	5862077	5890266	5054291	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution
L2ID = Linear 1/conc^2 IsoDil

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-223413/2	2017.05.15LLB_ICAL_002.d
Level 2	IC 320-223413/3	2017.05.15LLB_ICAL_003.d
Level 3	IC 320-223413/4	2017.05.15LLB_ICAL_004.d
Level 4	IC 320-223413/5	2017.05.15LLB_ICAL_005.d
Level 5	IC 320-223413/7	2017.05.15LLB_ICAL_007.d
Level 6	IC 320-223413/8	2017.05.15LLB_ICAL_008.d
Level 7	IC 320-223413/11	2018.05.15LLC_ICAL_006.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanoic acid (PFBA)	-0.6 2.8	0.2	-0.8	-0.9	3.0	-3.7	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	6.9 1.2	4.3	-2.8	-6.8	-0.7	-2.2	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	-6.0 3.3	0.3	2.3	-2.1	7.1	-4.8	30 30	30	30	30	30	30
4:2 FTS	-2.8 1.1	7.1	-5.9	-2.7	7.2	-3.9	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	-2.0 -7.9	11.7	-4.6	-3.2	1.3	4.8	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	1.4 -0.3	0.1	1.7	-2.1	7.2	-8.0	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	5.7 2.6	0.5	0.1	-7.7	-0.3	-0.9	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	14.2 -2.7	5.9	-0.6	-7.3	-5.4	-4.1	30 30	30	30	30	30	30
6:2FTS	2.0 -2.5	-6.8	17.3	-11.9	-0.8	2.6	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	9.0 -7.4	11.0	-3.3	-3.3	0.5	-6.4	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	-10.1 2.0	6.3	-1.7	2.0	4.7	-3.2	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	13.1 -8.9	7.4	3.4	-8.1	-0.9	-5.9	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	4.1 1.7	-3.6	-0.5	-4.7	0.1	2.9	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (FOSA)	-9.9 6.5	-3.8	3.4	-0.5	7.0	-2.6	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	4.0 -0.6	-9.9	-1.4	-0.5	5.8	2.7	30 30	30	30	30	30	30

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
8:2FTS	-2.3 -0.8	2.7	-0.2	-1.7	8.0	-5.7	30 30	30	30	30	30	30
Perfluorodecanoic acid (PFDA)	-8.8 3.9	-1.0	-0.2	0.7	5.1	0.2	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	-2.9 6.6	-7.9	-2.1	2.7	3.5	0.1	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	-5.9 1.7	5.4	1.8	-6.1	5.1	-2.0	30 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	11.9 -4.9	-18.3	2.3	-4.2	10.5	2.6	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	13.9 -11.8	9.4	-6.7	-12.4	-1.6	9.3	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	-2.1 2.0	-3.8	6.7	-1.3	-0.1	-1.5	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	2.2 4.3	-5.2	3.0	-1.2	1.2	-4.3	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	3.8 3.5	1.6	-10.1	-3.4	0.0	4.7	30 30	30	30	30	30	30

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_002.d
Lims ID: IC L1 Full
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 15-May-2018 15:13:31 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*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 16-May-2018 09:19:50 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK037

First Level Reviewer: hannigana Date: 16-May-2018 08:31:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.461	1.462	-0.001	1.000	73922	0.0248		99.4	28.8	
D 1 13C4 PFBA										
217.00 > 172.00	1.461	1.462	-0.001	1.000	7998943	2.40		95.9	49727	
D 3 13C5-PFPeA										
267.90 > 223.00	1.743	1.744	-0.001	0.560	5228218	2.44		97.8	84850	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.743	1.745	-0.002	1.000	66005	0.0267		107	33.2	
D 47 13C3-PFBS										
301.90 > 83.00	1.779	1.780	-0.001	1.000	110547	2.29		98.3	732	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.788	1.783	0.005	1.005	77106	0.0208		94.0	369	
298.90 > 99.00	1.788	1.783	0.005	1.005	35336		2.18(1.25-3.74)	94.0	183	
D 60 M2-4:2FTS										
329.00 > 81.00	1.999	1.999	0.0	1.000	858664	NC			9883	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.999	2.000	-0.001	1.000	17882	0.0227		97.2	804	
D 7 13C2 PFHxA										
315.00 > 270.00	2.045	2.037	0.008	1.000	5626147	2.47		98.7	120947	
6 Perfluorohexanoic acid										M
313.00 > 269.00	2.045	2.037	0.008	1.000	56711	0.0245		98.0	74.3	
313.00 > 119.00	2.045	2.037	0.008	1.000	4387		12.93(5.03-15.10)	98.0	58.7	M
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.067	2.059	0.008	1.000	78646	0.0238		101	963	
349.00 > 99.00	2.067	2.059	0.008	1.000	30425		2.58(1.36-4.07)	101	298	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.146	2.134	0.012	1.000	272111	NC			4220	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.146	2.134	0.012	1.000	6740	NC			44.3	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.381	2.374	0.007	1.000	62298	0.0264		106	88.9	
363.00 > 169.00	2.381	2.374	0.007	1.000	26606		2.34(1.13-3.40)	106	147	
D 9 13C4-PFHpA										
367.00 > 322.00	2.381	2.374	0.007	1.000	5577473	2.55		102	93695	
D 11 18O2 PFHxS										
403.00 > 84.00	2.392	2.386	0.006	1.000	6497213	2.41		102	91954	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.392	2.386	0.006	1.000	80424	0.0260		114	621	
399.00 > 99.00	2.392	2.386	0.006	1.000	26456		3.04(1.50-4.49)	114	109	
65 Adona										
377.00 > 251.00	2.426	2.418	0.008	1.000	151478	NC			3788	
377.00 > 85.00	2.426	2.418	0.008	1.000	90196		1.68(0.84-2.53)		1217	
D 12 M2-6:2FTS										
429.00 > 81.00	2.711	2.707	0.004	1.000	1179634	2.45		103	15821	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.711	2.707	0.004	1.000	29994	0.0242		102	323	
D 14 13C4 PFOA										
417.00 > 372.00	2.741	2.731	0.010	1.000	5162191	2.50		99.9	49724	
* 62 13C2-PFOA										
415.00 > 370.00	2.741	2.734	0.007		5458542	2.50			68226	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.741	2.734	0.007	1.000	66199	0.0272		109	24.6	
413.00 > 169.00	2.741	2.734	0.007	1.000	38085		1.74(0.84-2.52)	109	123	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.749	2.739	0.010	1.000	53872	0.0214		89.9	1195	
449.00 > 99.00	2.749	2.739	0.010	1.000	16570		3.25(1.94-5.82)	89.9	211	
D 18 13C4 PFOS										
503.00 > 80.00	3.114	3.104	0.010	1.000	4516956	2.43		102	46480	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.114	3.105	0.009	1.000	58301	0.0262		113	426	
499.00 > 99.00	3.114	3.105	0.009	1.000	13705		4.25(2.31-6.93)	113	145	
D 19 13C5 PFNA										
468.00 > 423.00	3.114	3.107	0.007	1.000	4268517	2.52		101	101008	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.114	3.107	0.007	1.000	47076	0.0260		104	62.4	M
463.00 > 169.00	3.114	3.107	0.007	1.000	10259		4.59(1.90-5.69)	104	219	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.325	3.316	0.009	1.000	71678	NC			897	
D 21 13C8 FOSA										
506.00 > 78.00	3.424	3.420	0.004	1.000	5956672	2.45		98.1	62035	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.424	3.422	0.002	1.000	52238	0.0225		90.1	1147	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.461	3.455	0.006	1.000	35719	0.0250		104	1022	
549.00 > 99.00	3.471	3.455	0.016	1.003	12559		2.84(1.33-3.97)	104	198	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.461	3.458	0.003	0.997	18812	0.0234		97.7	268	
D 26 M2-8:2FTS										
529.00 > 81.00	3.471	3.459	0.012	1.000	1426703	2.60		108	21876	
D 23 13C2 PFDA										
515.00 > 470.00	3.480	3.468	0.012	1.000	3594922	2.50		100.0	47114	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.480	3.468	0.012	1.000	31877	0.0228		91.2	175	
513.00 > 169.00	3.471	3.468	0.003	0.997	5046		6.32(2.36-7.09)	91.2	103	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.637	3.624	0.013	1.000	1940146	2.45		97.8	44718	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.637	3.631	0.006	1.000	19122	0.0243		97.1	205	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.791	3.781	0.010	1.000	28773	0.0227		94.1	551	
599.00 > 99.00	3.791	3.781	0.010	1.000	9859		2.92(1.39-4.16)	94.1	266	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.802	3.794	0.008	1.000	2119254	2.60		104	14171	
D 30 13C2 PFUnA										
565.00 > 520.00	3.812	3.800	0.012	1.000	2840675	2.49		99.8	58088	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.812	3.800	0.012	1.000	27031	0.0285		114	108	
563.00 > 169.00	3.802	3.800	0.002	0.997	5801		4.66(2.12-6.36)	114	153	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.812	3.800	0.012	1.003	22302	0.0280		112	444	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.968	3.958	0.010	1.000	111283	NC			1681	
D 36 13C2 PFDoA										
615.00 > 570.00	4.112	4.099	0.013	1.000	2960567	2.42		96.6	20988	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.112	4.100	0.012	1.000	30254	0.0245		97.9	24.6	
613.00 > 169.00	4.102	4.100	0.002	0.997	7125		4.25(2.13-6.40)	97.9	113	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.383	4.368	0.015	1.000	34616	0.0256		102	19.2	
663.00 > 169.00	4.383	4.368	0.015	1.000	9792		3.54(1.25-3.76)	102	109	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.623	4.608	0.015	1.000	3777870	2.51		100	19057	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.623	4.608	0.015	1.000	9904	0.0260		104	117	
713.00 > 219.00	4.613	4.608	0.005	0.998	7478		1.32(0.71-2.13)	104	135	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.043	5.030	0.013	1.000	6801656	2.66		107	18783	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.043	5.031	0.012	1.000	121507	NC			29.9	
813.00 > 169.00	5.043	5.031	0.012	1.000	19020		6.39(2.86-8.58)		156	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.429	5.408	0.021	1.000	69164	NC			12.6	
913.00 > 169.00	5.429	5.408	0.021	1.000	9204		7.51(3.83-11.48)		107	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL1_00005 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:19:52 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_002.d

Injection Date: 15-May-2018 15:13:31 Instrument ID: A8_N

Lims ID: IC L1 Full

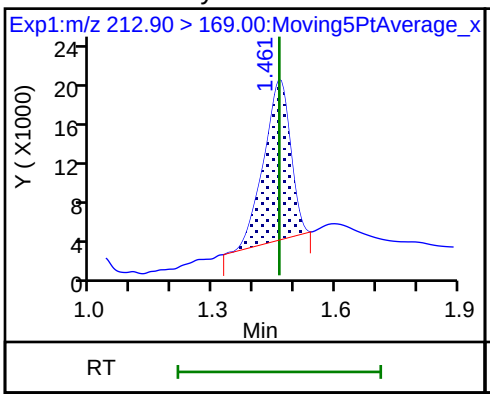
Client ID:

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

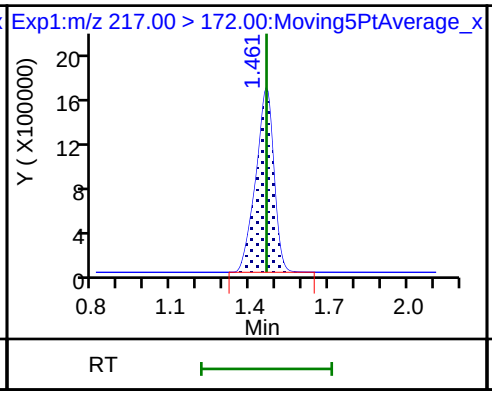
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

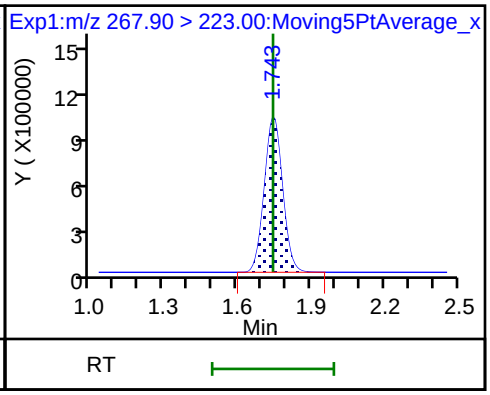
2 Perfluorobutyric acid



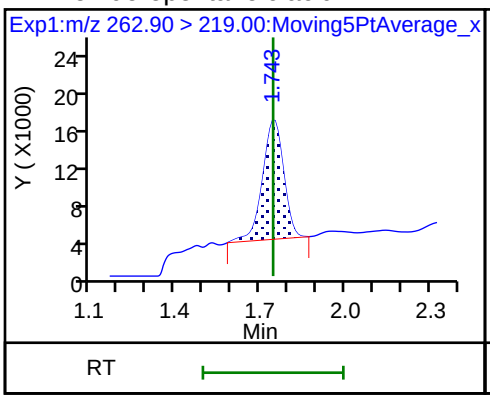
D 1 13C4 PFBA



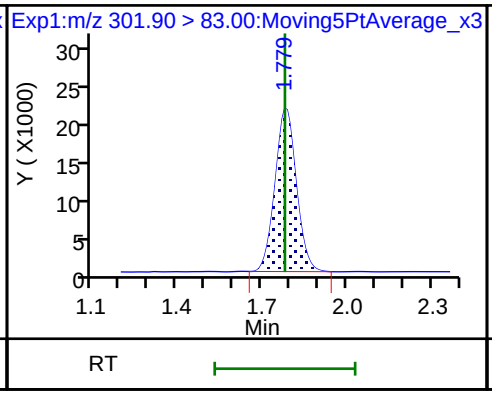
D 3 13C5-PFPeA



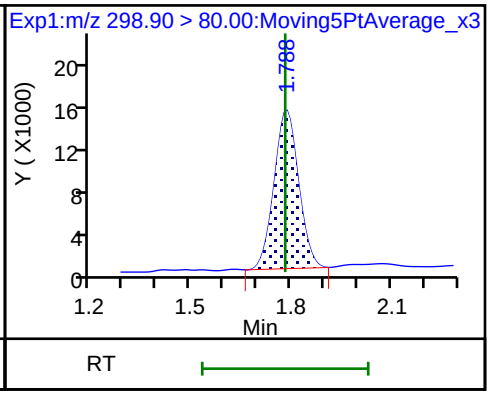
4 Perfluoropentanoic acid



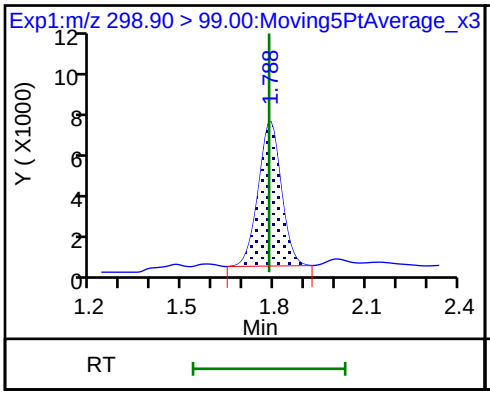
D 47 13C3-PFBS



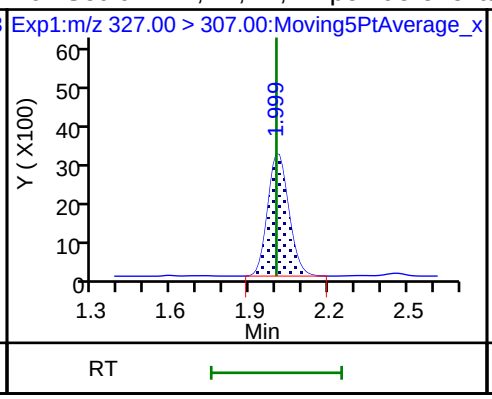
5 Perfluorobutanesulfonic acid



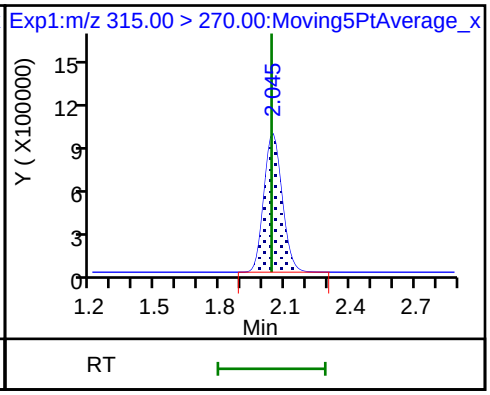
5 Perfluorobutanesulfonic acid



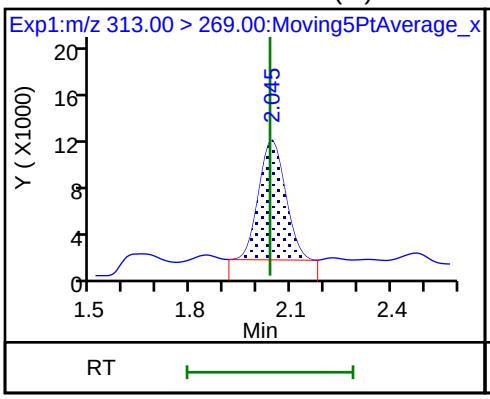
61 Sodium 1H,1H,2H,2H-perfluorohexa



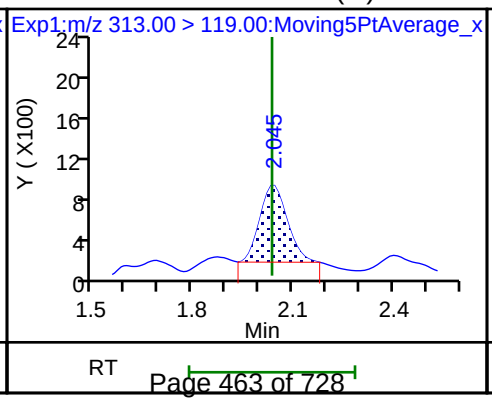
D 7 13C2 PFHxA



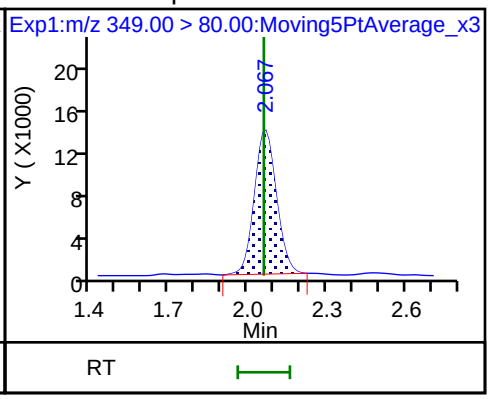
6 Perfluorohexanoic acid (M)



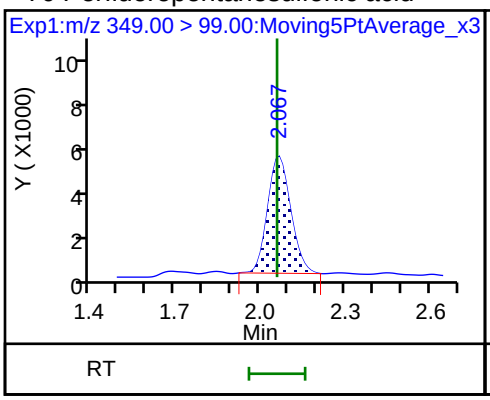
6 Perfluorohexanoic acid (M)



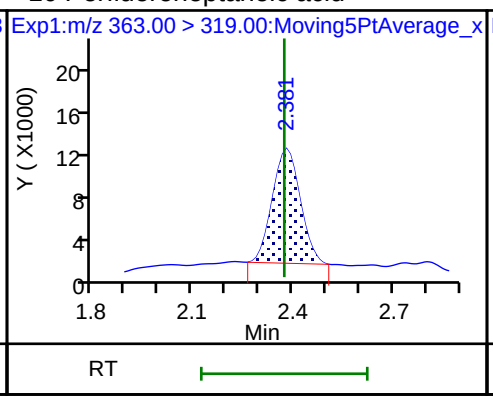
70 Perfluoropentanesulfonic acid



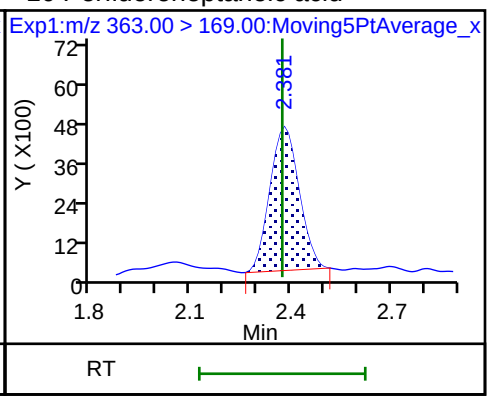
70 Perfluoropentanesulfonic acid



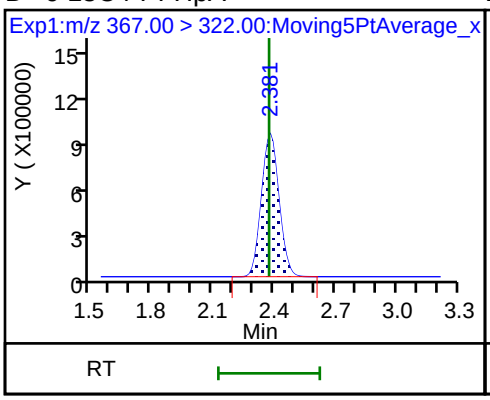
10 Perfluoroheptanoic acid



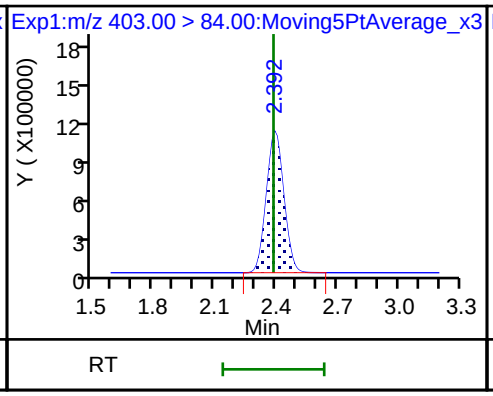
10 Perfluoroheptanoic acid



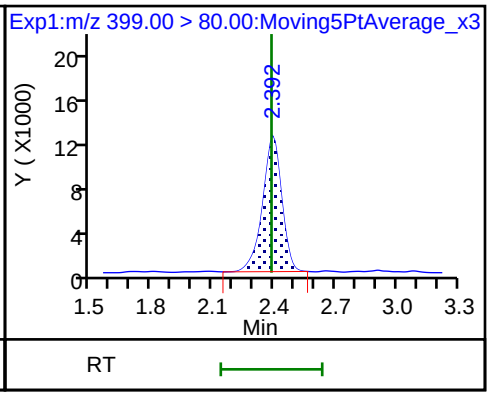
D 9 13C4-PFHpA



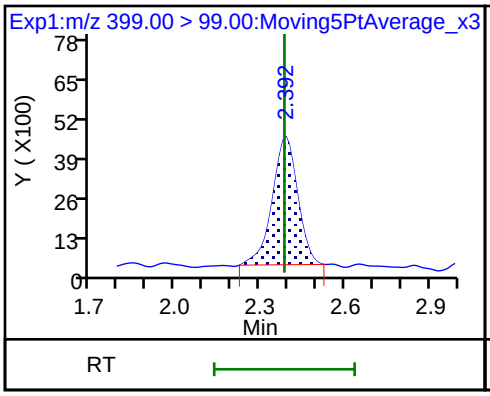
D 11 18O2 PFHxS



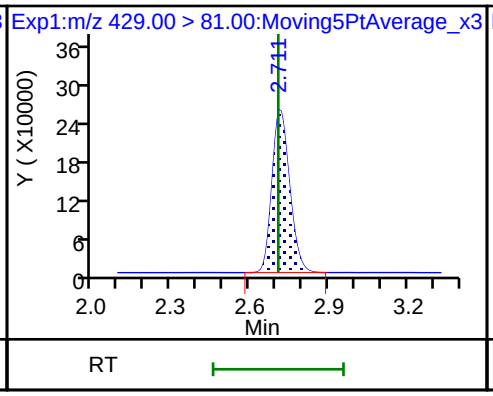
8 Perfluorohexanesulfonic acid



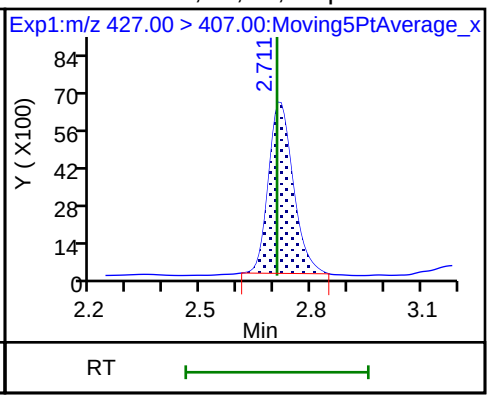
8 Perfluorohexanesulfonic acid



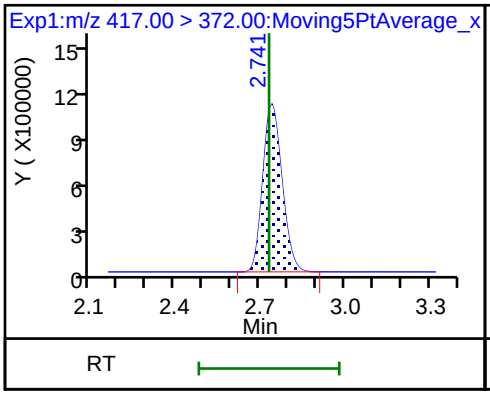
D 12 M2-6:2FTS



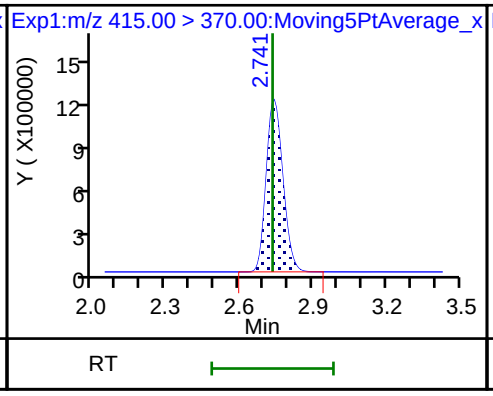
13 Sodium 1H,1H,2H,2H-perfluorooctane



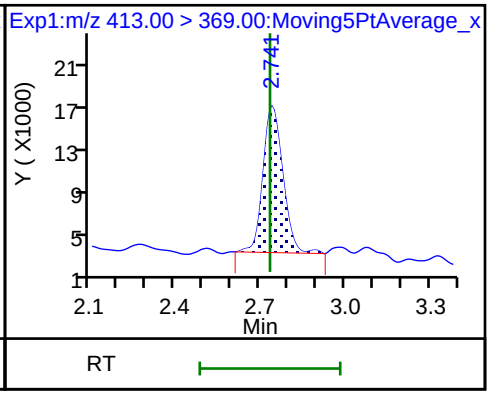
D 14 13C4 PFOA



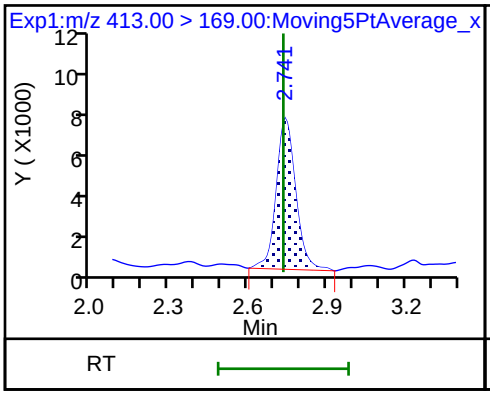
* 62 13C2-PFOA



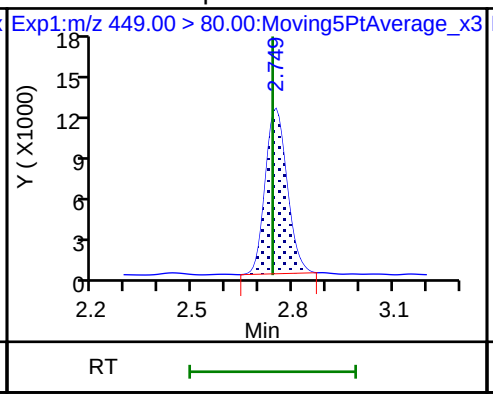
15 Perfluorooctanoic acid



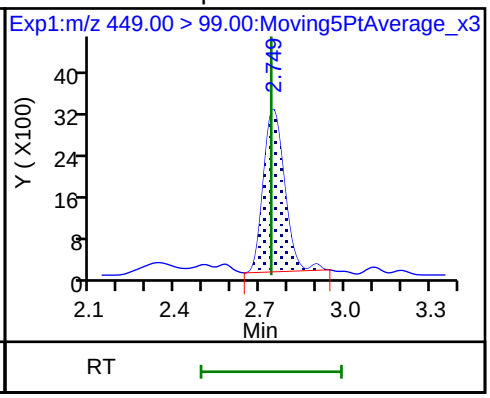
15 Perfluorooctanoic acid



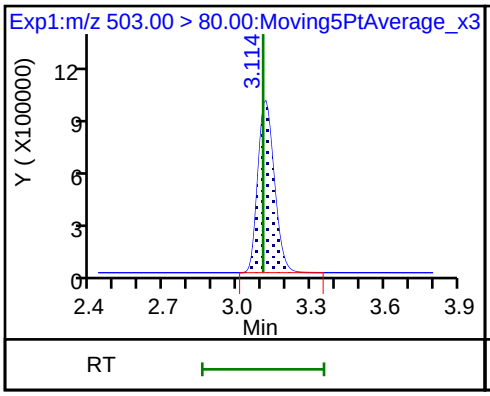
16 Perfluoroheptanesulfonic acid



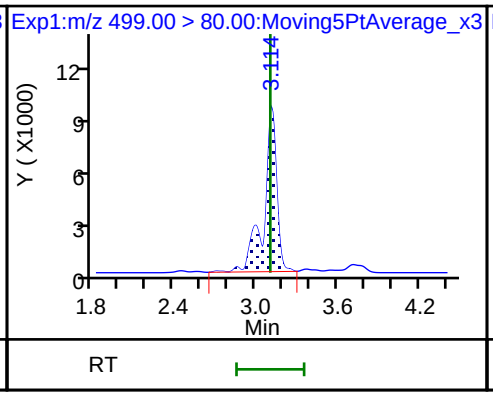
16 Perfluoroheptanesulfonic acid



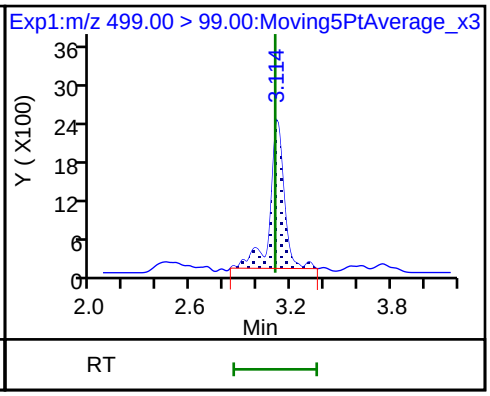
D 18 13C4 PFOS



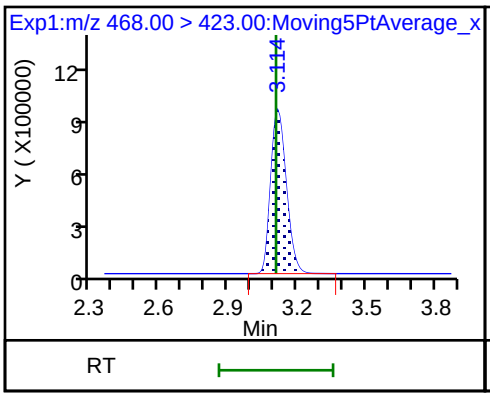
17 Perfluorooctane sulfonic acid



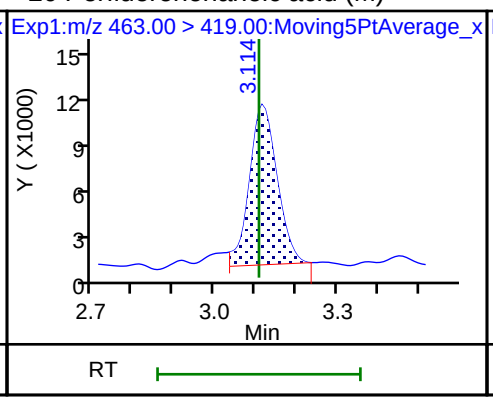
17 Perfluorooctane sulfonic acid



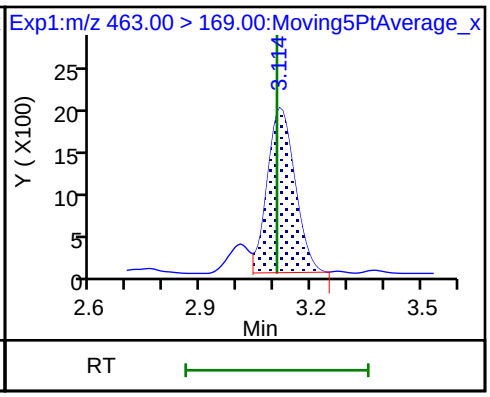
D 19 13C5 PFNA



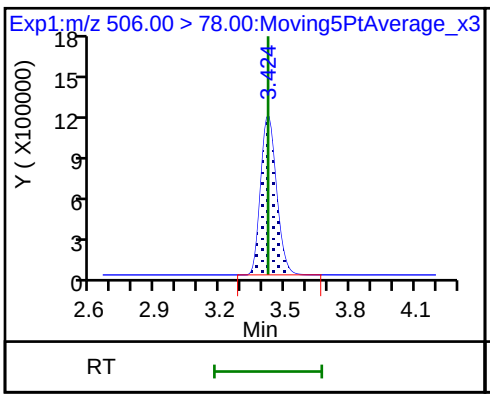
20 Perfluorononanoic acid (M)



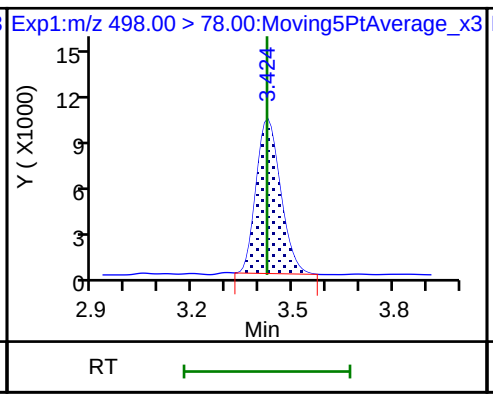
20 Perfluorononanoic acid



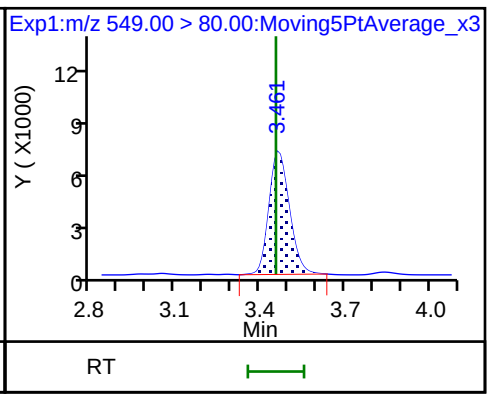
D 21 13C8 FOSA



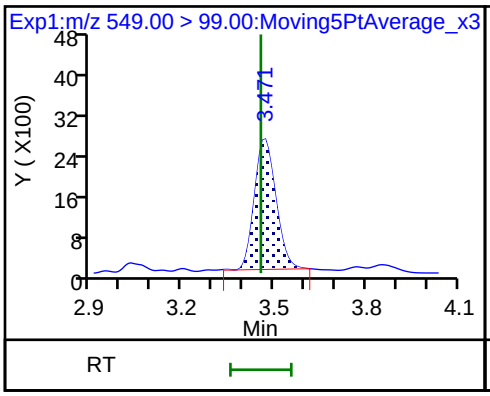
22 Perfluorooctane Sulfonamide



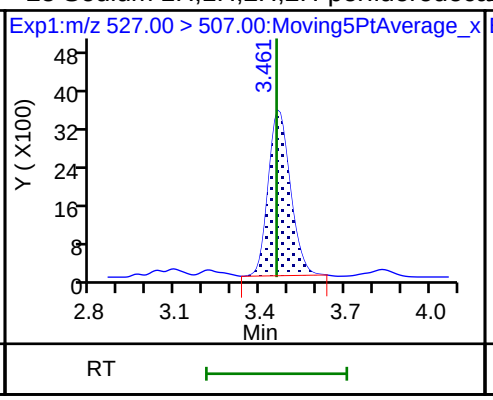
68 Perfluorononanesulfonic acid



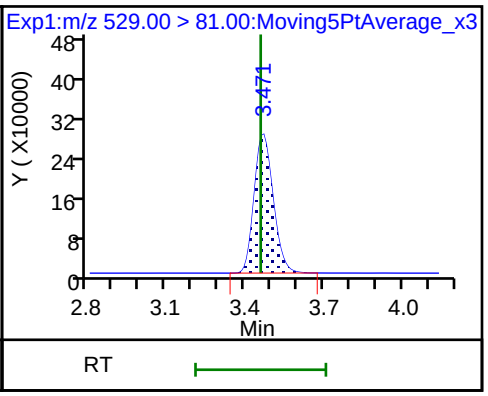
68 Perfluorononanesulfonic acid



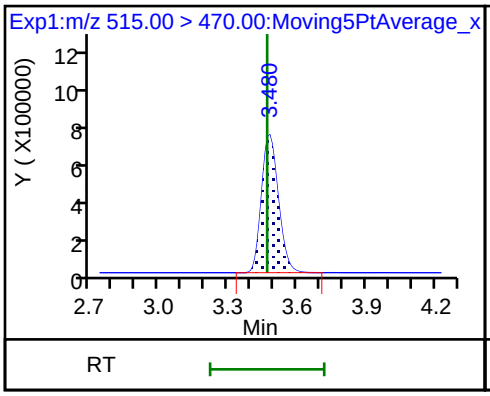
25 Sodium 1H,1H,2H,2H-perfluorodecane



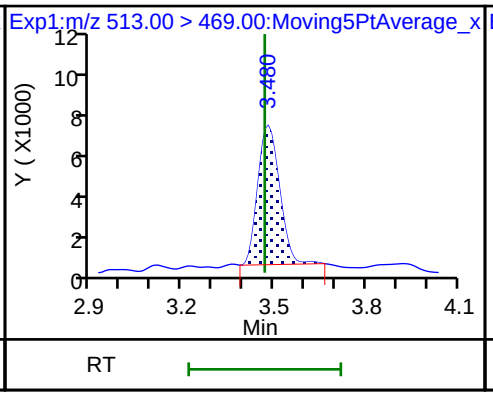
D 26 M2-8:2FTS



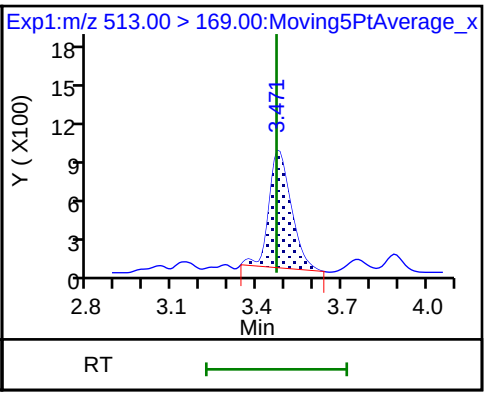
D 23 13C2 PFDA



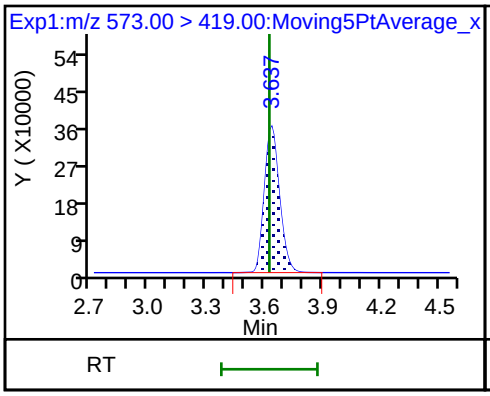
24 Perfluorodecanoic acid



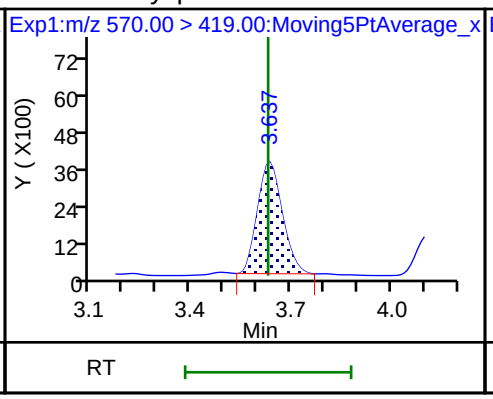
24 Perfluorodecanoic acid



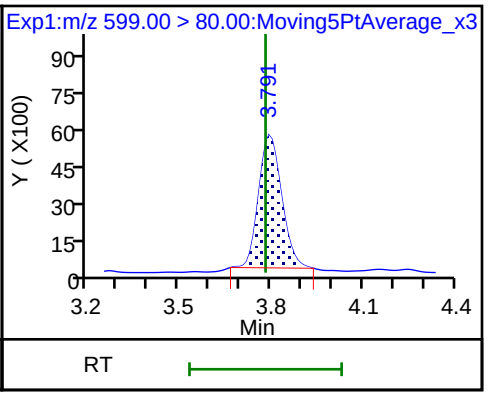
D 27 d3-NMeFOSAA



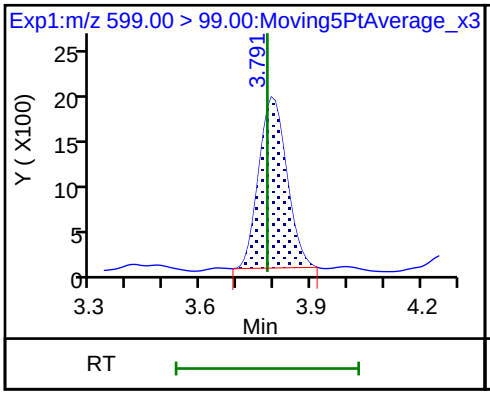
28 N-methyl perfluorooctane sulfonami



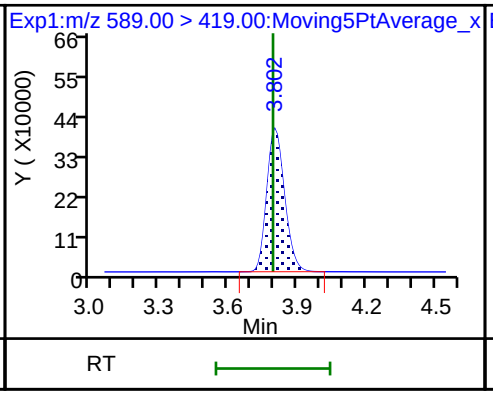
29 Perfluorodecane Sulfonic acid



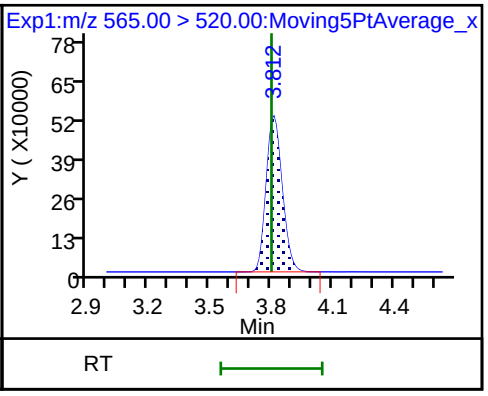
29 Perfluorodecane Sulfonic acid



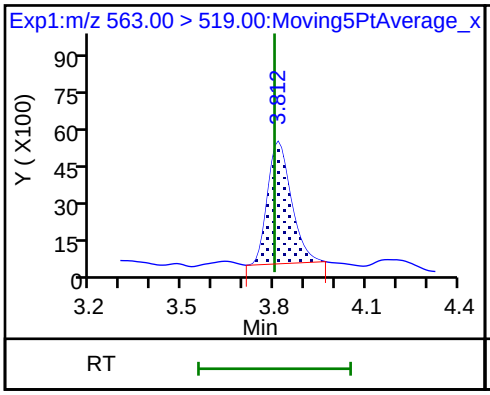
D 32 d5-NEtFOSAA



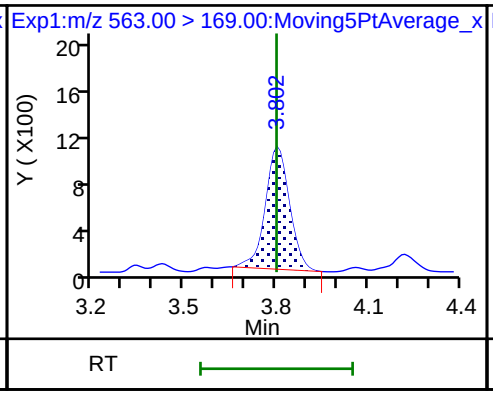
D 30 13C2 PFUnA



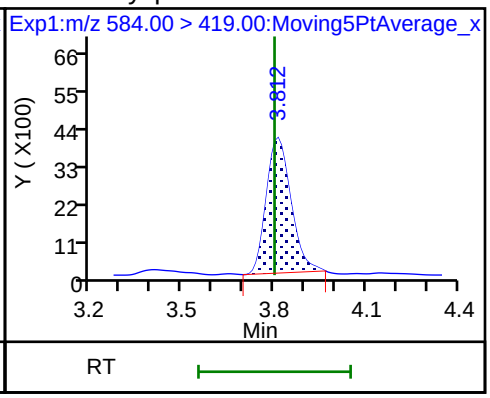
31 Perfluoroundecanoic acid



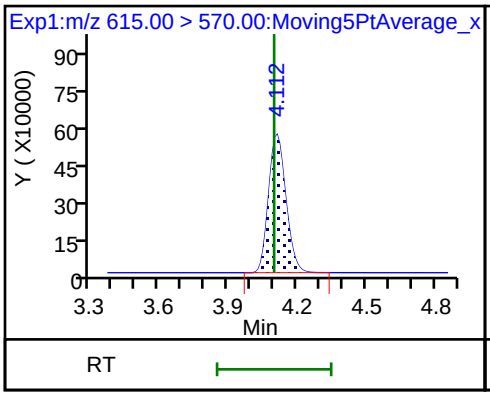
31 Perfluoroundecanoic acid



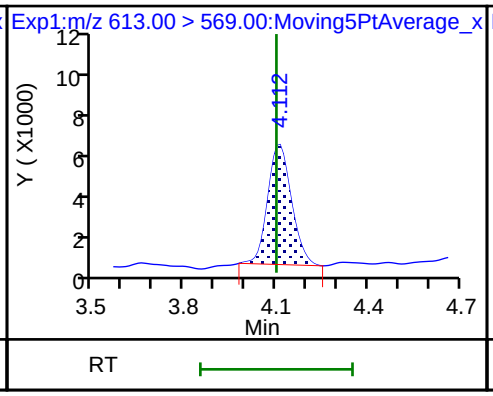
33 N-ethyl perfluorooctane sulfonamid



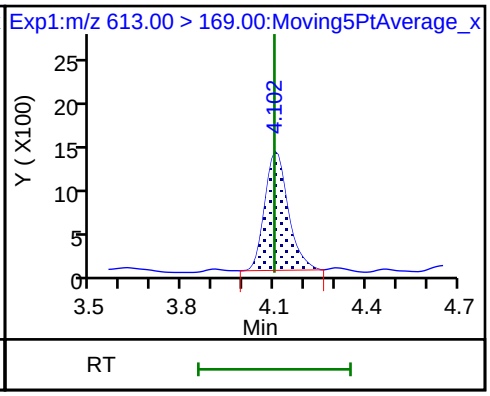
D 36 13C2 PFDoA



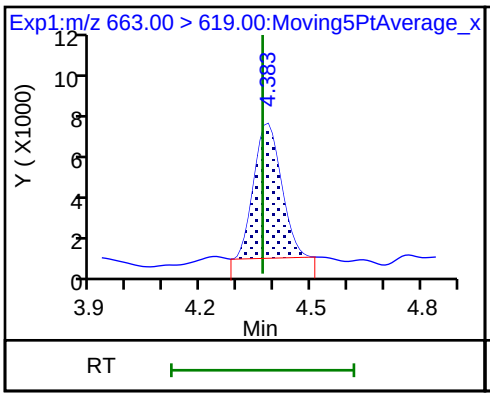
37 Perfluorododecanoic acid



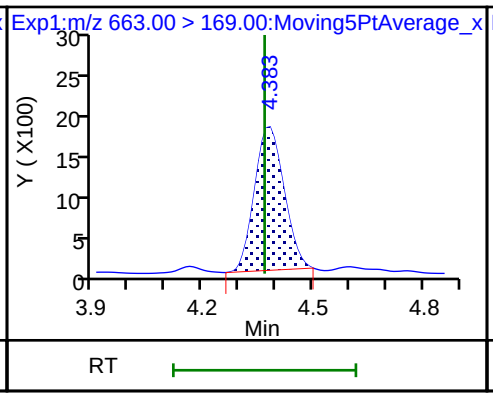
37 Perfluorododecanoic acid



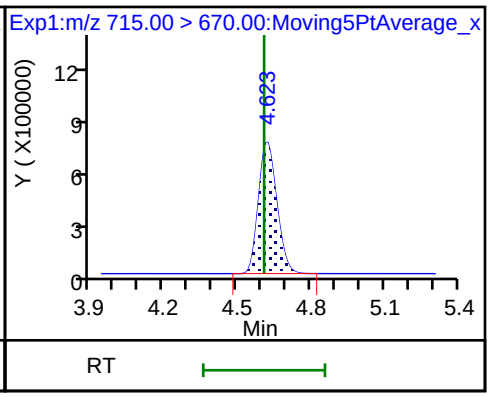
41 Perfluorotridecanoic acid



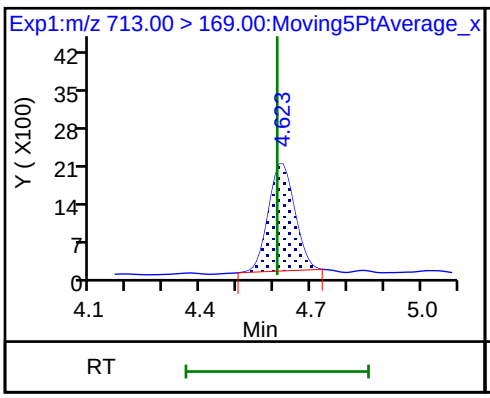
41 Perfluorotridecanoic acid



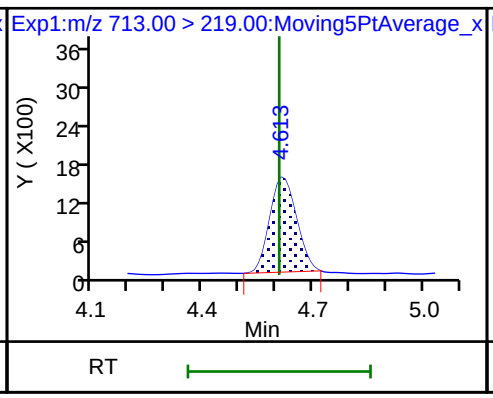
D 43 13C2-PFTeDA



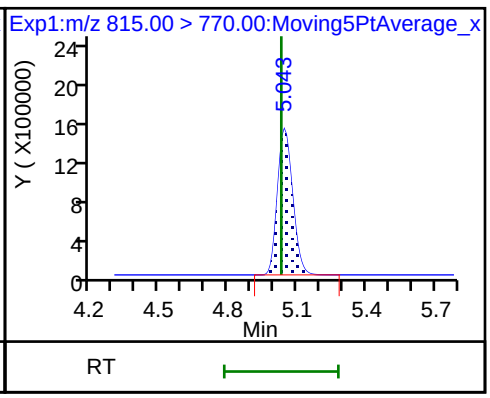
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

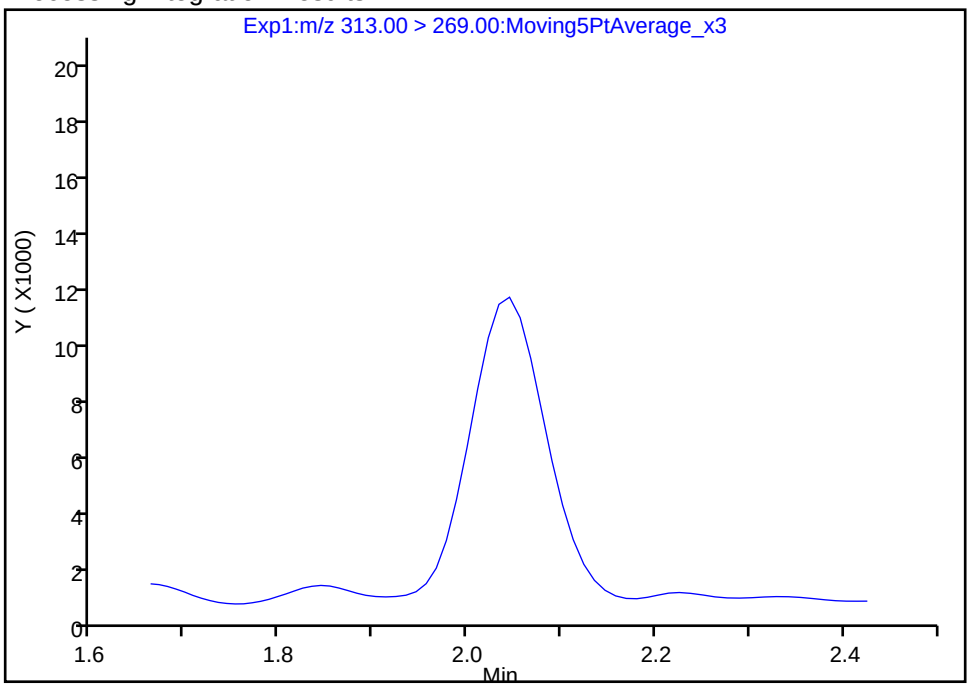
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_002.d
Injection Date: 15-May-2018 15:13:31 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

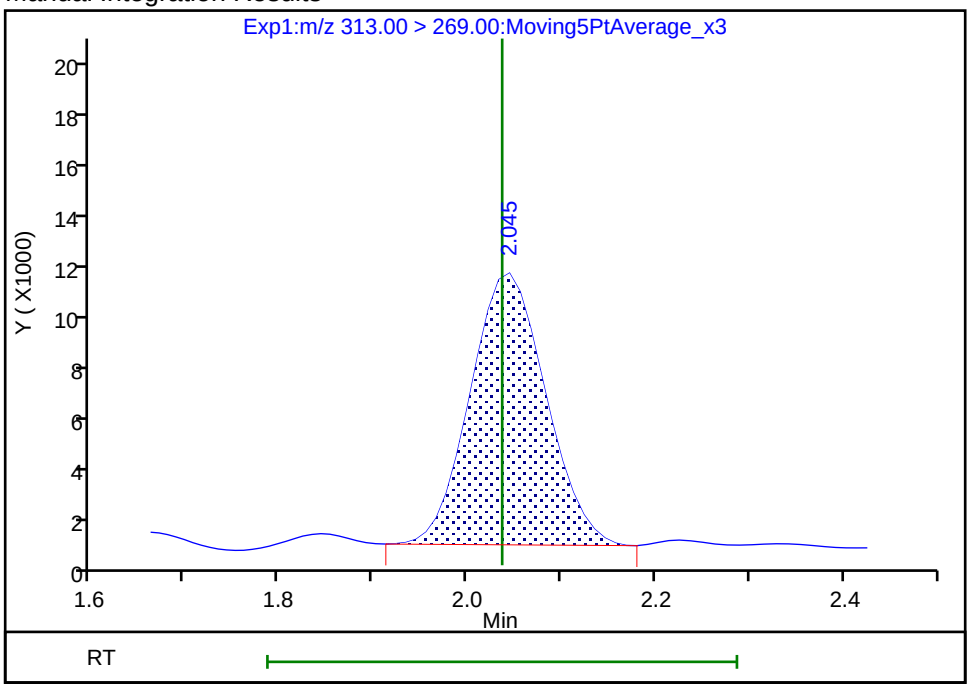
Not Detected
Expected RT: 2.04

Processing Integration Results



Manual Integration Results

RT: 2.04
Area: 56711
Amount: 0.024510
Amount Units: ng/ml



Reviewer: westendorfc, 15-May-2018 16:30:15
Audit Action: Assigned Compound ID Audit Reason: Peak assignment corrected

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

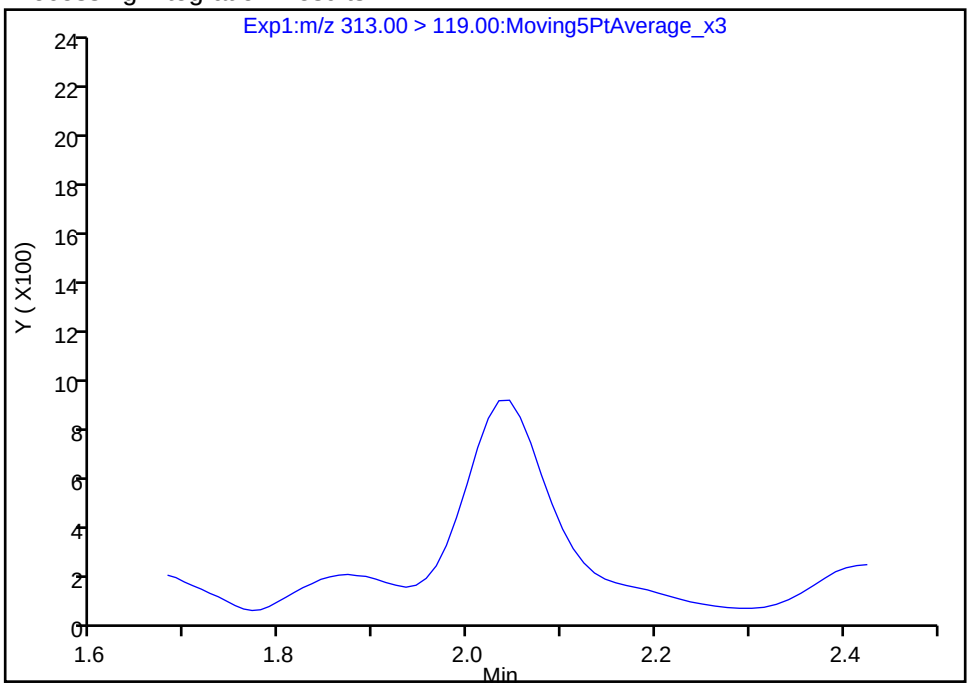
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_002.d
Injection Date: 15-May-2018 15:13:31 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

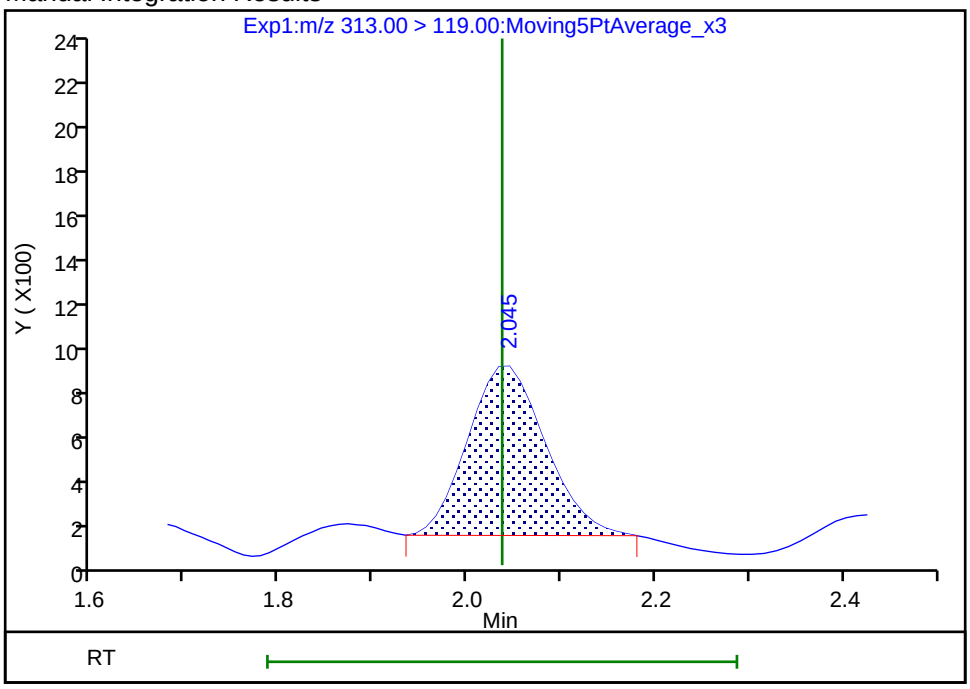
Not Detected
Expected RT: 2.04

Processing Integration Results



Manual Integration Results

RT: 2.04
Area: 4387
Amount: 0.024510
Amount Units: ng/ml



Reviewer: westendorfc, 15-May-2018 16:30:21
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

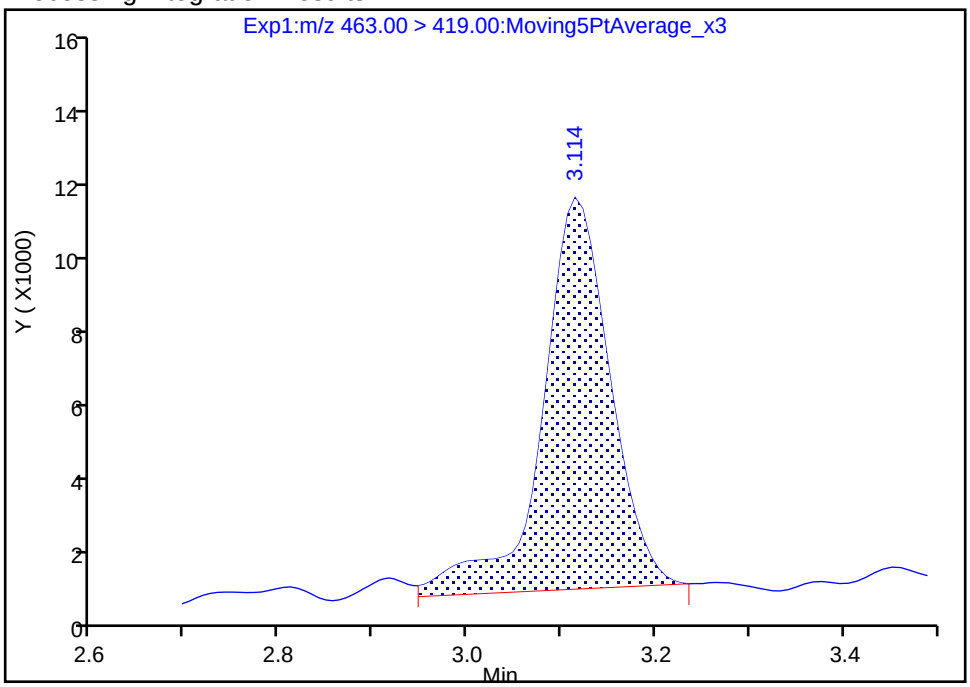
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_002.d
Injection Date: 15-May-2018 15:13:31 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

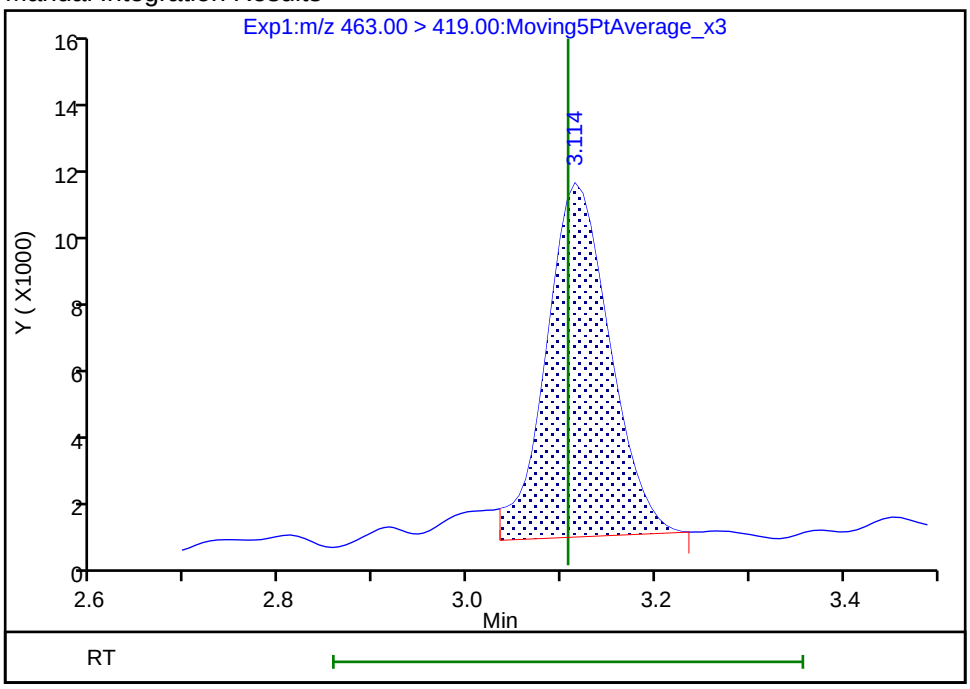
Processing Integration Results

RT: 3.11
Area: 50653
Amount: 0.027722
Amount Units: ng/ml



Manual Integration Results

RT: 3.11
Area: 47076
Amount: 0.026031
Amount Units: ng/ml



Reviewer: westendorfc, 15-May-2018 16:30:34
Audit Action: Manually Integrated Audit Reason: Split Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_003.d
Lims ID: IC L2 Full
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 15-May-2018 15:21:19 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*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 16-May-2018 09:19:54 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK037

First Level Reviewer: westendorfc Date: 15-May-2018 16:29:16

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	1.463	1.462	0.001	1.000	8732721	2.57		103	57344	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.463	1.462	0.001	1.000	162647	0.0501		100	65.4	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.746	1.744	0.002	0.561	5506602	2.53		101	97404	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.746	1.745	0.001	1.000	135647	0.0522		104	65.4	M
D 47 13C3-PFBS										
301.90 > 83.00	1.782	1.780	0.002	1.000	117730	2.39		103	2547	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.782	1.783	-0.001	1.000	175383	0.0444		100	775	
298.90 > 99.00	1.782	1.783	-0.001	1.000	76550		2.29(1.25-3.74)	100	467	
D 60 M2-4:2FTS										
329.00 > 81.00	2.002	1.999	0.003	1.000	848063	NC			10296	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	2.002	2.000	0.002	1.000	41962	0.0500		107	2461	
6 Perfluorohexanoic acid										M
313.00 > 269.00	2.036	2.037	-0.001	1.000	135987	0.0558		112	199	M
313.00 > 119.00	2.036	2.037	-0.001	1.000	11233		12.11(5.03-15.10)	112	137	
D 7 13C2 PFHxA										
315.00 > 270.00	2.036	2.037	-0.001	1.000	5922451	2.55		102	127595	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.059	2.059	0.0	1.000	165299	0.0469		100	2551	
349.00 > 99.00	2.059	2.059	0.0	1.000	64244		2.57(1.36-4.07)	100	692	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.138	2.134	0.004	0.995	18129	NC			131	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.149	2.134	0.015	1.000	290745	NC			6092	
D 9 13C4-PFHpA										
367.00 > 322.00	2.383	2.374	0.009	1.000	5774309	2.60		104	73220	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.383	2.374	0.009	1.000	122556	0.0502		100	194	
363.00 > 169.00	2.383	2.374	0.009	1.000	52048		2.35(1.13-3.40)	100	301	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.395	2.386	0.009	1.000	151043	0.0482		106	916	
399.00 > 99.00	2.395	2.386	0.009	1.000	49925		3.03(1.50-4.49)	106	207	
D 11 18O2 PFHxS										
403.00 > 84.00	2.395	2.386	0.009	1.000	6581524	2.39		101	55650	
65 Adona										
377.00 > 251.00	2.417	2.418	-0.001	1.000	351664	NC			8730	
377.00 > 85.00	2.417	2.418	-0.001	1.000	188630		1.86(0.84-2.53)		2054	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.712	2.707	0.005	1.000	48326	0.0442		93.2	358	
D 12 M2-6:2FTS										
429.00 > 81.00	2.712	2.707	0.005	1.000	1201925	2.45		103	16809	
D 14 13C4 PFOA										
417.00 > 372.00	2.734	2.731	0.003	1.000	5272655	2.51		100	53605	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.742	2.734	0.008	1.003	137784	0.0555		111	49.4	
413.00 > 169.00	2.742	2.734	0.008	1.003	70311		1.96(0.84-2.52)	111	252	
* 62 13C2-PFOA										
415.00 > 370.00	2.742	2.734	0.008		5554381	2.50			58494	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.742	2.739	0.003	1.000	124538	0.0506		106	2139	
449.00 > 99.00	2.742	2.739	0.003	1.000	34411		3.62(1.94-5.82)	106	369	
D 18 13C4 PFOS										
503.00 > 80.00	3.107	3.104	0.003	1.000	4415247	2.34		97.8	28897	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.107	3.105	0.002	1.000	108239	0.0498		107	943	
499.00 > 99.00	3.115	3.105	0.010	1.002	22995		4.71(2.31-6.93)	107	171	M
20 Perfluorononanoic acid										
463.00 > 419.00	3.115	3.107	0.008	1.000	91933	0.0482		96.4	143	
463.00 > 169.00	3.115	3.107	0.008	1.000	22431		4.10(1.90-5.69)	96.4	461	
D 19 13C5 PFNA										
468.00 > 423.00	3.115	3.107	0.008	1.000	4502703	2.62		105	106819	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.325	3.316	0.009	1.000	153727	NC			2147	
D 21 13C8 FOSA										
506.00 > 78.00	3.415	3.420	-0.005	1.000	5858621	2.37		94.8	55649	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.424	3.422	0.002	1.003	109720	0.0481		96.2	2692	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.462	3.455	0.007	1.000	60494	0.0432		90.1	1653	
549.00 > 99.00	3.462	3.455	0.007	1.000	27746		2.18(1.33-3.97)	90.1	427	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.462	3.458	0.004	1.000	39540	0.0492		103	808	
D 26 M2-8:2FTS										
529.00 > 81.00	3.462	3.459	0.003	1.000	1426640	2.55		107	16789	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.471	3.468	0.003	1.000	72253	0.0495		99.0	348	
513.00 > 169.00	3.481	3.468	0.013	1.003	14509		4.98(2.36-7.09)	99.0	293	
D 23 13C2 PFDA										
515.00 > 470.00	3.471	3.468	0.003	1.000	3752181	2.56		103	53196	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.627	3.624	0.003	1.000	2060337	2.55		102	42793	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.636	3.631	0.005	1.003	38494	0.0460		92.1	315	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.791	3.781	0.010	1.000	63027	0.0508		105	830	
599.00 > 99.00	3.791	3.781	0.010	1.000	17448		3.61(1.39-4.16)	105	404	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.802	3.794	0.008	1.000	2144987	2.59		104	10654	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.812	3.800	0.012	1.003	32956	0.0409		81.7	755	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.812	3.800	0.012	1.000	53273	0.0547		109	249	
563.00 > 169.00	3.802	3.800	0.002	0.997	11551		4.61(2.12-6.36)	109	528	
D 30 13C2 PFUnA										
565.00 > 520.00	3.812	3.800	0.012	1.000	2914989	2.52		101	41631	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.967	3.958	0.009	1.000	235156	NC			4558	
D 36 13C2 PFDoA										
615.00 > 570.00	4.102	4.099	0.003	1.000	3058640	2.45		98.1	25211	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.102	4.100	0.002	1.000	61418	0.0481		96.2	48.0	
613.00 > 169.00	4.102	4.100	0.002	1.000	16003		3.84(2.13-6.40)	96.2	234	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.372	4.368	0.004	1.000	66337	0.0474		94.8	33.3	
663.00 > 169.00	4.372	4.368	0.004	1.000	21987		3.02(1.25-3.76)	94.8	323	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.613	4.608	0.005	1.000	16854	0.0508		102	219	
713.00 > 219.00	4.613	4.608	0.005	1.000	13370		1.26(0.71-2.13)	102	243	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.613	4.608	0.005	1.000	3285420	2.15		85.8	16076	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.043	5.030	0.013	1.000	4480419	1.72		69.0	12223	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.043	5.031	0.012	1.000	125967	NC			34.8	
813.00 > 169.00	5.043	5.031	0.012	1.000	20431		6.17(2.86-8.58)		163	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.416	5.408	0.008	1.000	84461	NC			21.5	
913.00 > 169.00	5.416	5.408	0.008	1.000	10263		8.23(3.83-11.48)		114	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00004 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:19:56 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_003.d

Injection Date: 15-May-2018 15:21:19 Instrument ID: A8_N

Lims ID: IC L2 Full

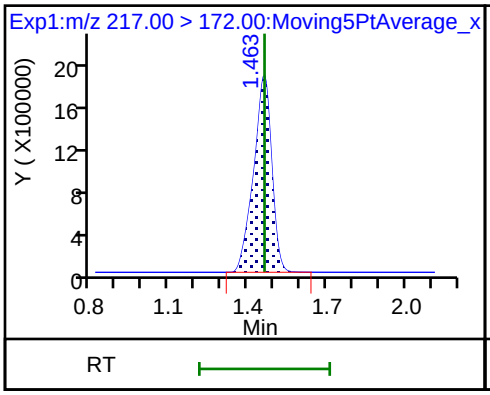
Client ID:

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

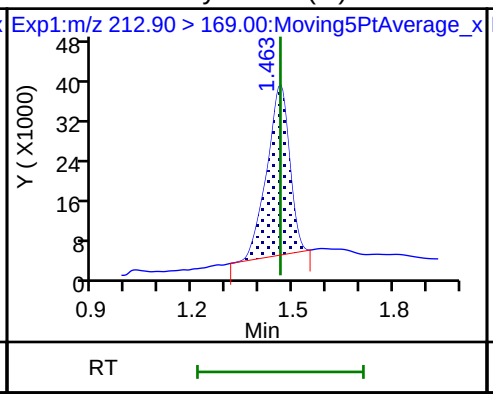
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

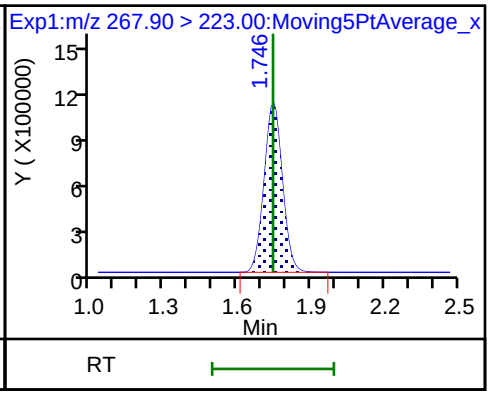
D 1 13C4 PFBA



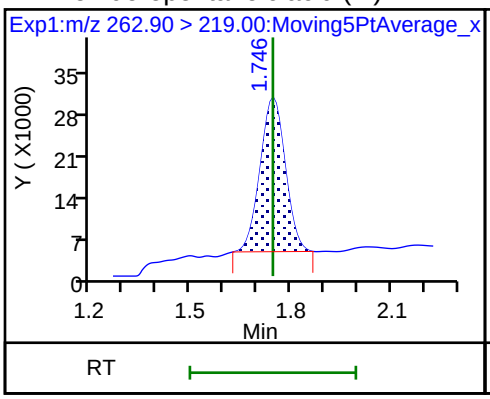
2 Perfluorobutyric acid (M)



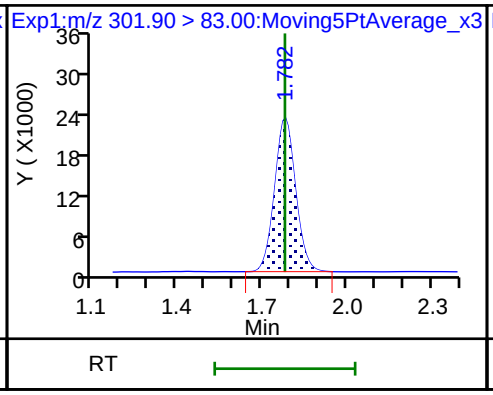
D 3 13C5-PFPeA



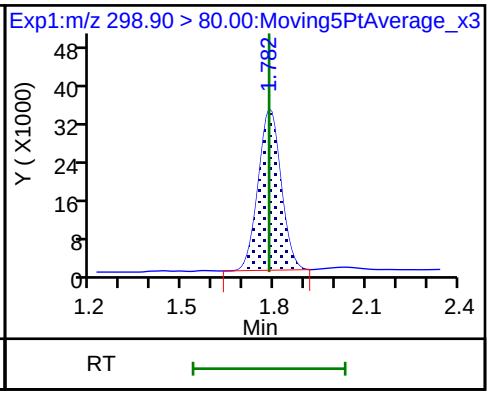
4 Perfluoropentanoic acid (M)



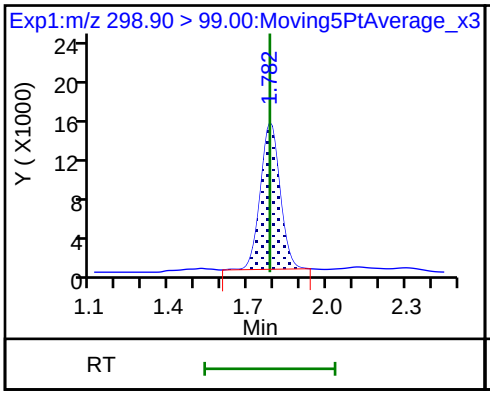
D 47 13C3-PFBS



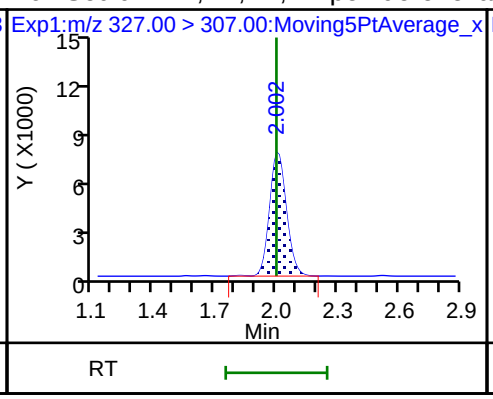
5 Perfluorobutanesulfonic acid



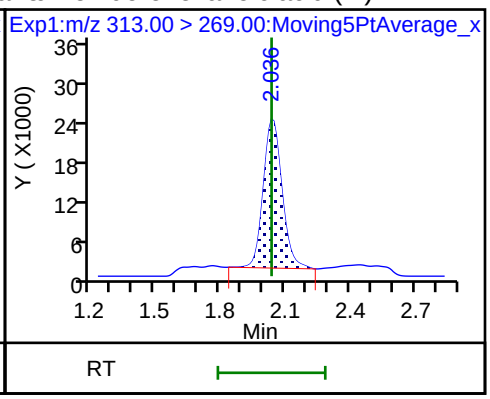
5 Perfluorobutanesulfonic acid



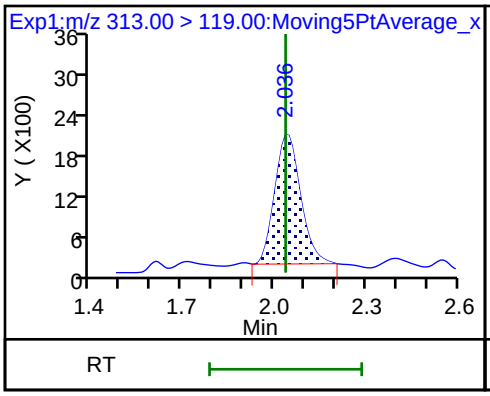
61 Sodium 1H,1H,2H,2H-perfluorohexane



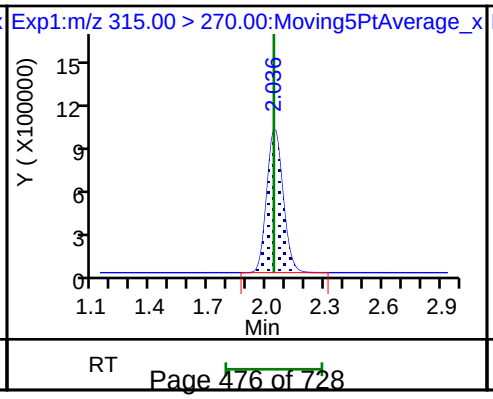
6 Perfluorohexanoic acid (M)



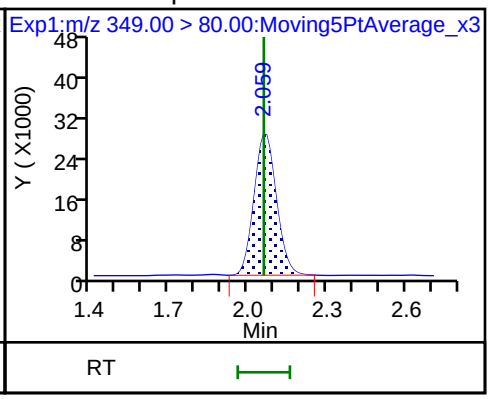
6 Perfluorohexanoic acid



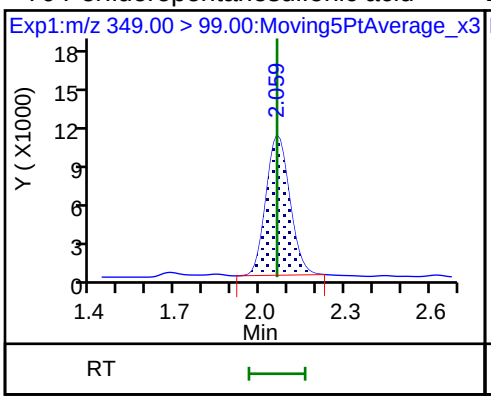
D 7 13C2 PFHxA



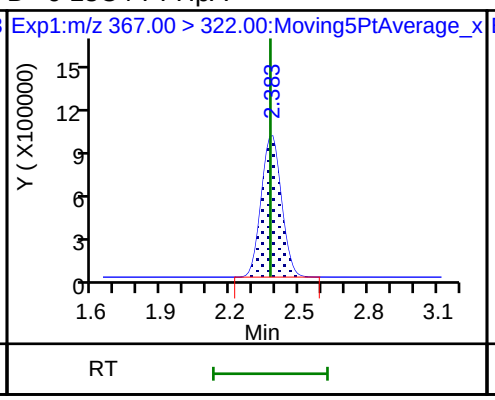
70 Perfluoropentanesulfonic acid



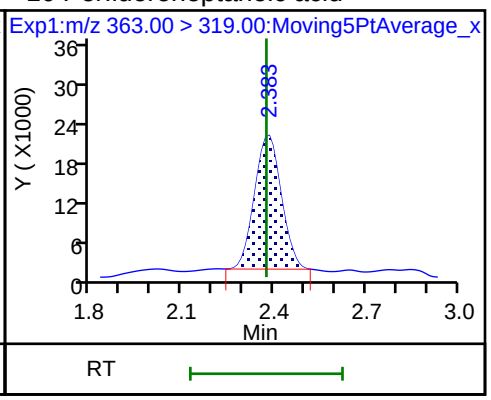
70 Perfluoropentanesulfonic acid



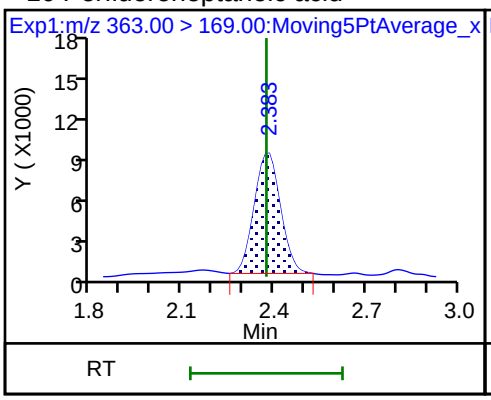
D 9 13C4-PFHpA



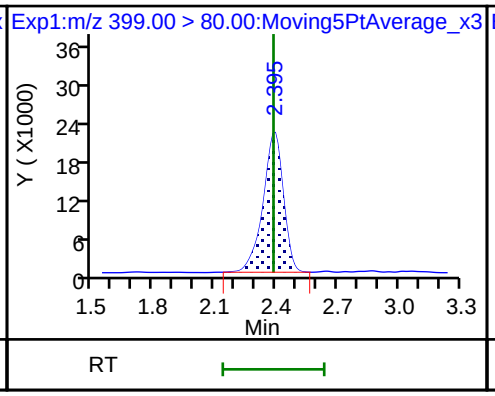
10 Perfluoroheptanoic acid



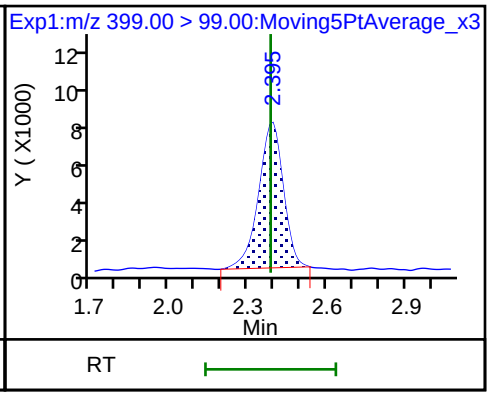
10 Perfluoroheptanoic acid



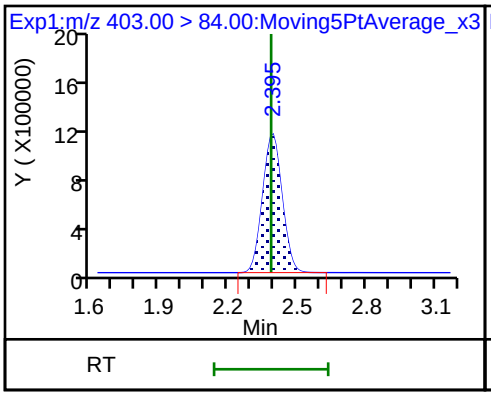
8 Perfluorohexanesulfonic acid



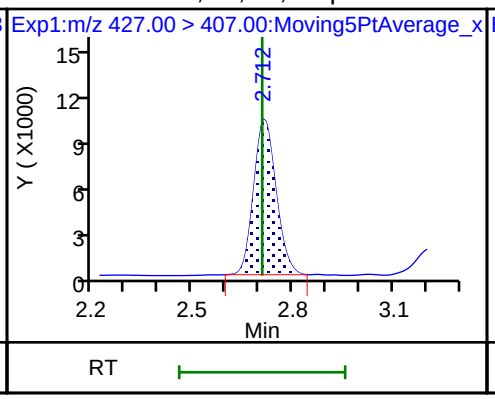
8 Perfluorohexanesulfonic acid



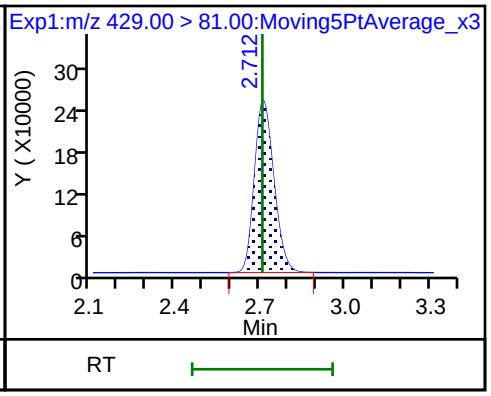
D 11 18O2 PFHxS



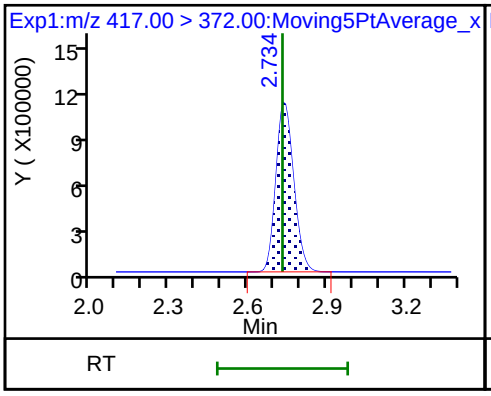
13 Sodium 1H,1H,2H,2H-perfluorooctane



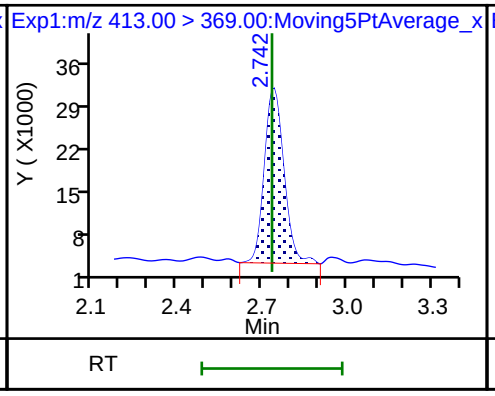
D 12 M2-6:2FTS



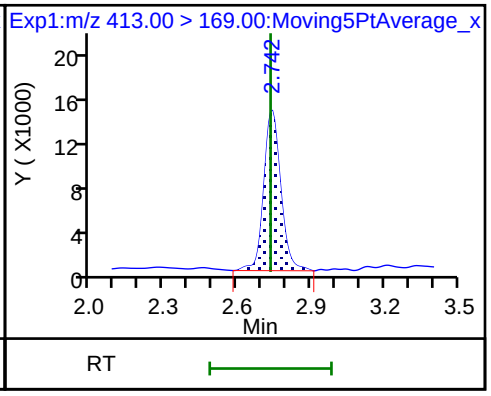
D 14 13C4 PFOA



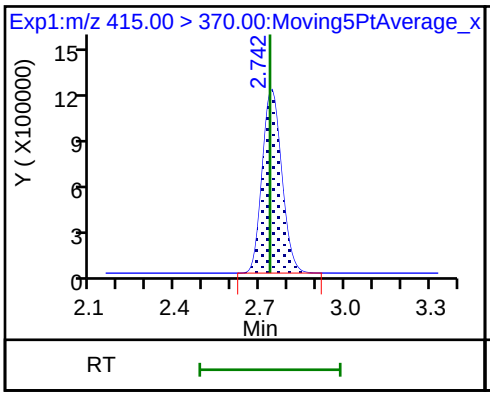
15 Perfluorooctanoic acid



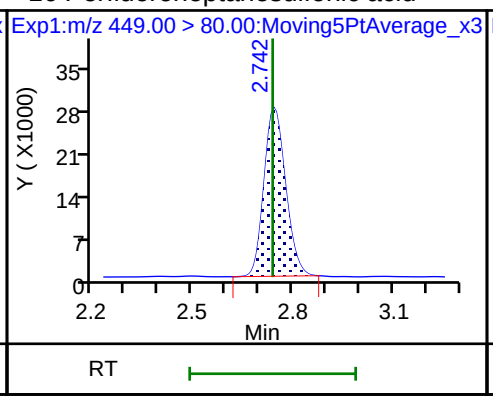
15 Perfluorooctanoic acid



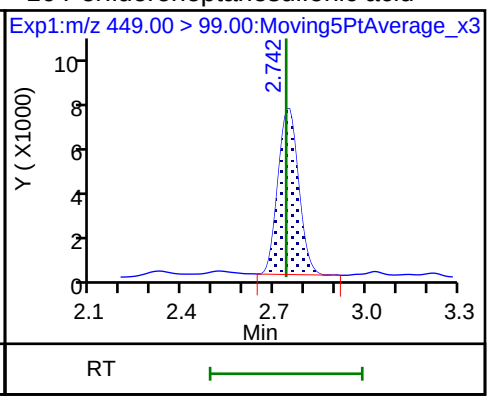
* 62 13C2-PFOA



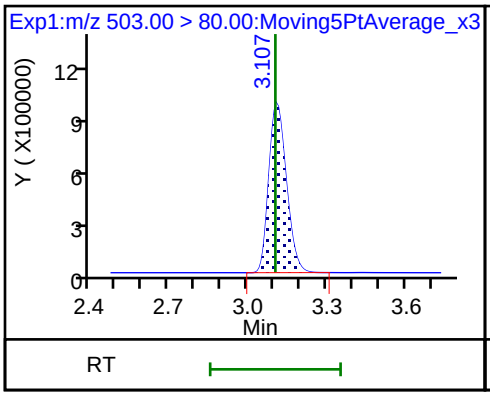
16 Perfluoroheptanesulfonic acid



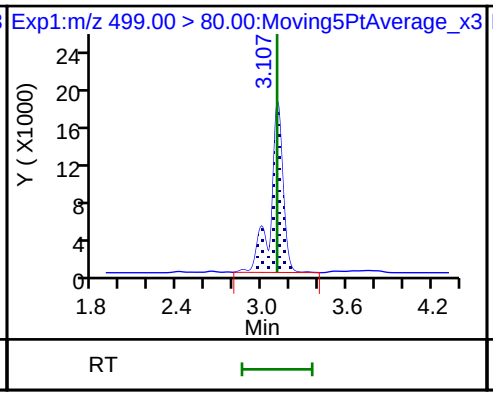
16 Perfluoroheptanesulfonic acid



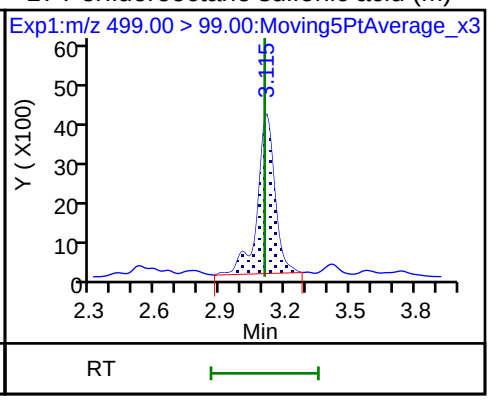
D 18 13C4 PFOS



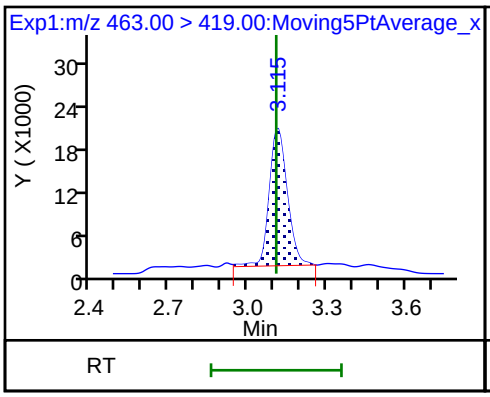
17 Perfluorooctane sulfonic acid



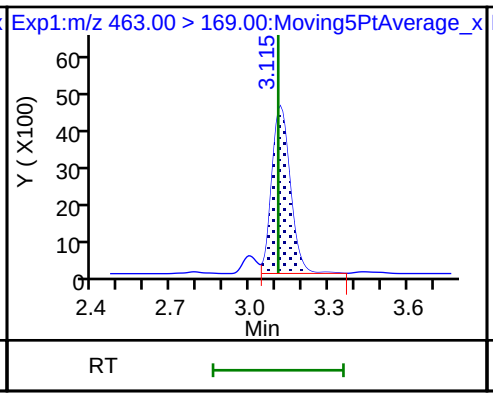
17 Perfluorooctane sulfonic acid (M)



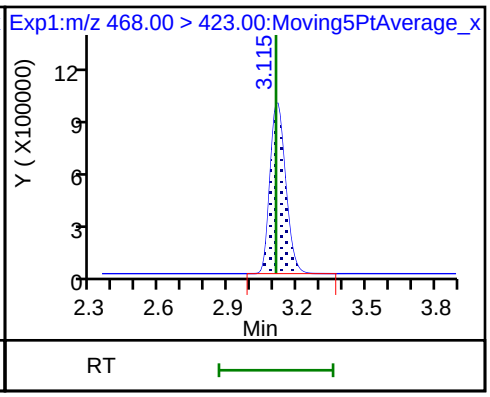
20 Perfluorononanoic acid



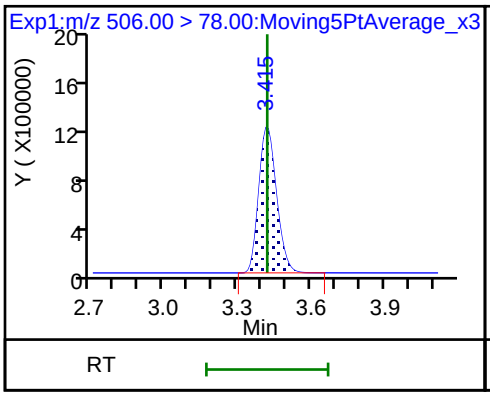
20 Perfluorononanoic acid



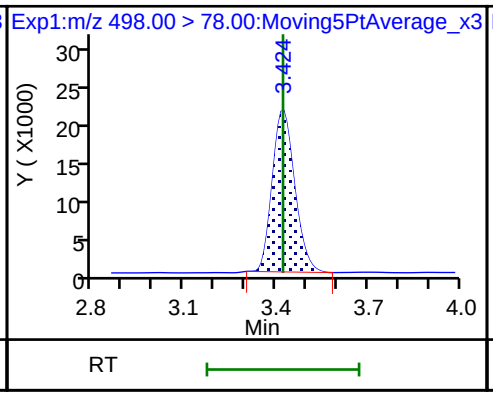
D 19 13C5 PFNA



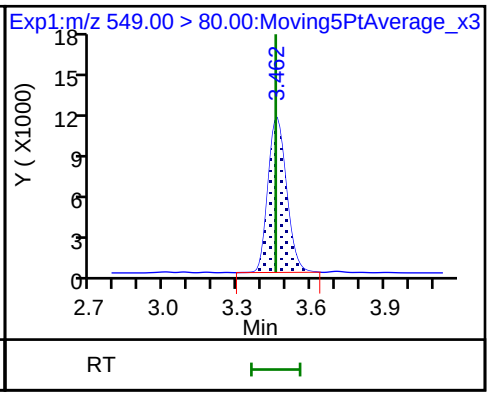
D 21 13C8 FOSA



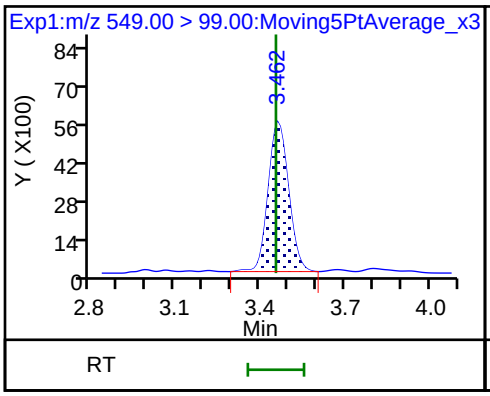
22 Perfluorooctane Sulfonamide



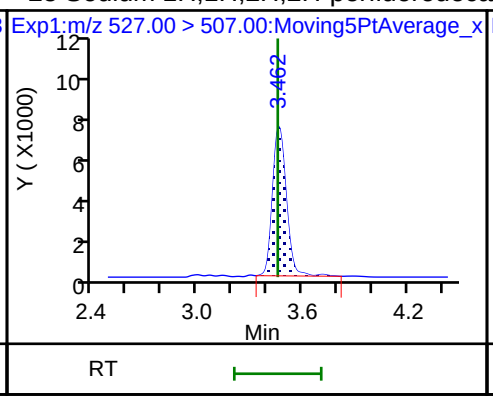
68 Perfluorononanesulfonic acid



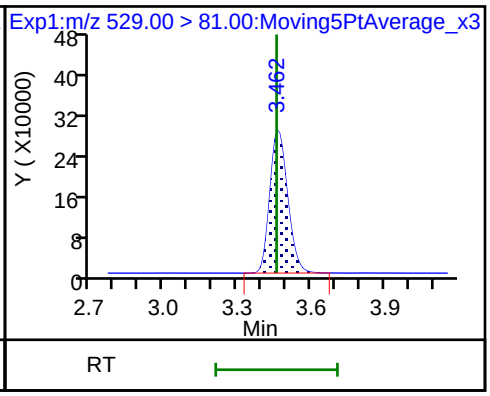
68 Perfluorononanesulfonic acid



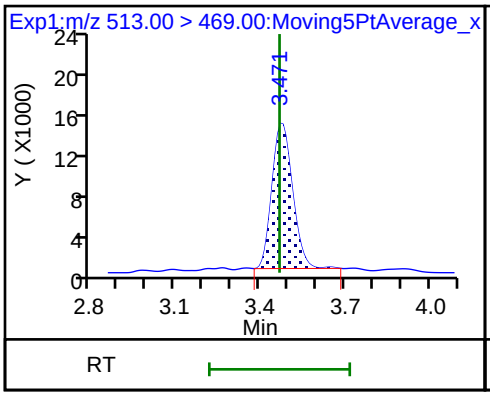
25 Sodium 1H,1H,2H,2H-perfluorodecan



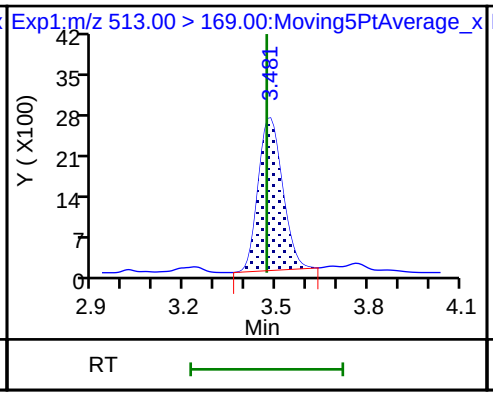
D 26 M2-8:2FTS



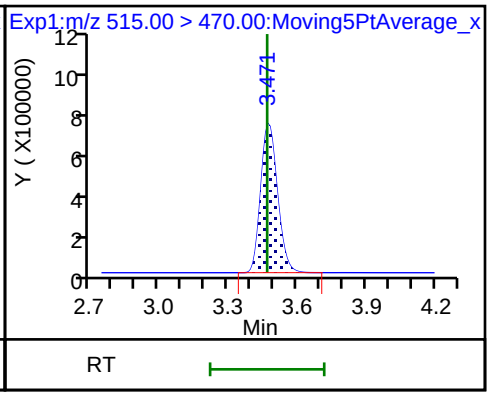
24 Perfluorodecanoic acid



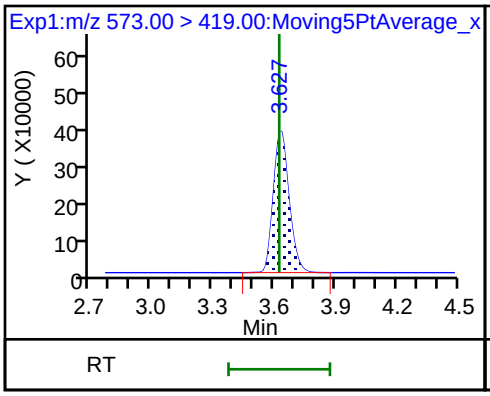
24 Perfluorodecanoic acid



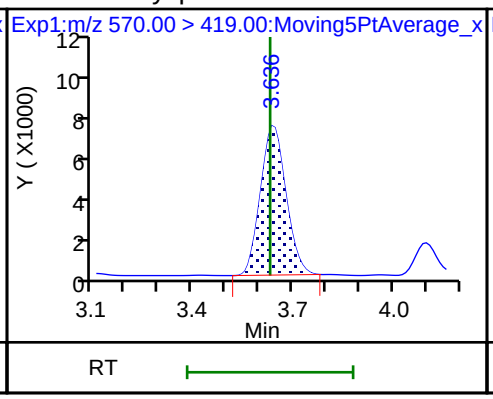
D 23 13C2 PFDA



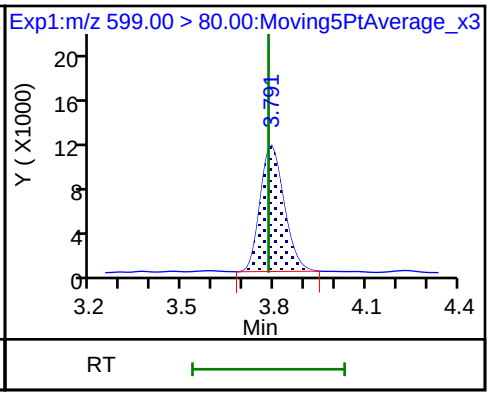
D 27 d3-NMeFOSAA



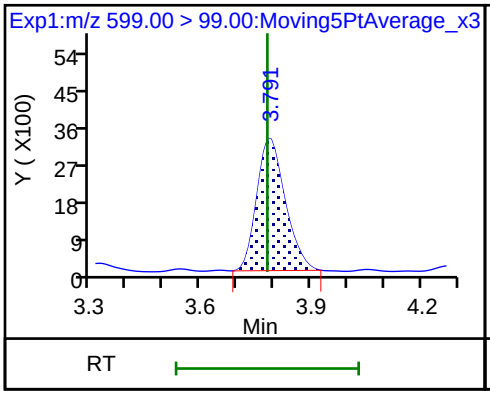
28 N-methyl perfluorooctane sulfonami



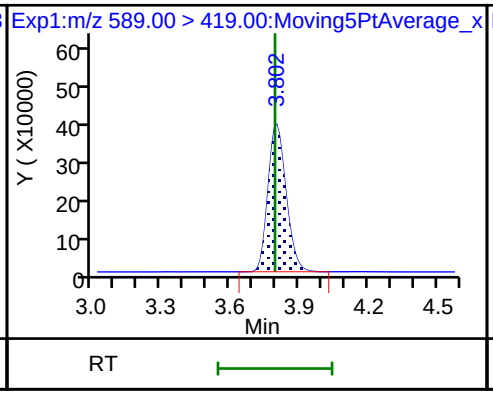
29 Perfluorodecane Sulfonic acid



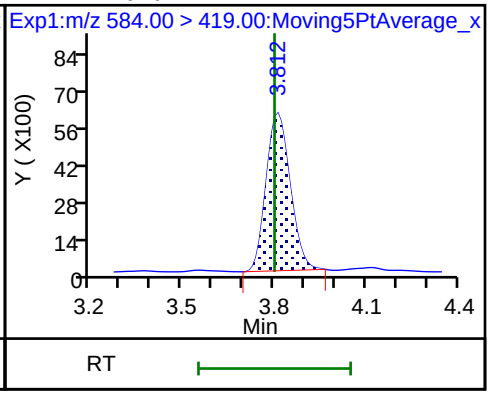
29 Perfluorodecane Sulfonic acid



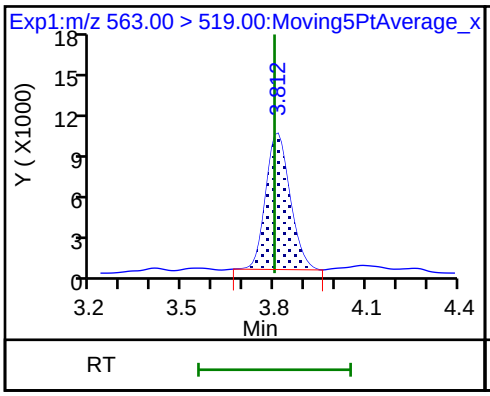
D 32 d5-NEtFOSAA



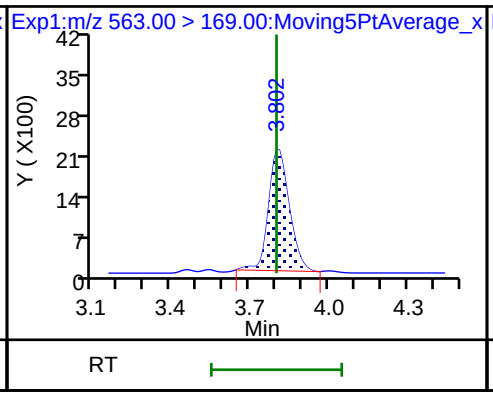
33 N-ethyl perfluorooctane sulfonamid



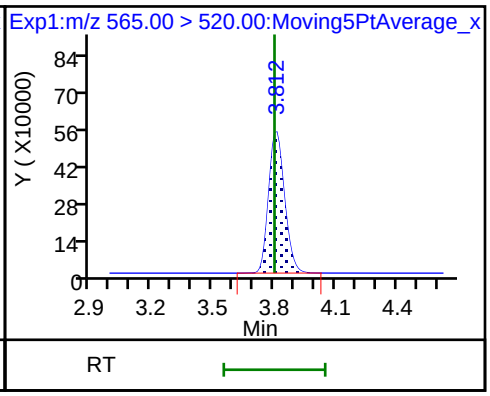
31 Perfluoroundecanoic acid



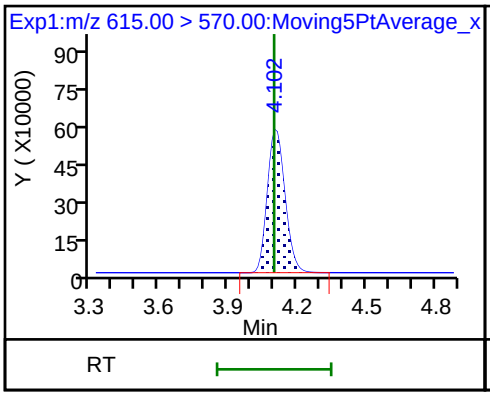
31 Perfluoroundecanoic acid



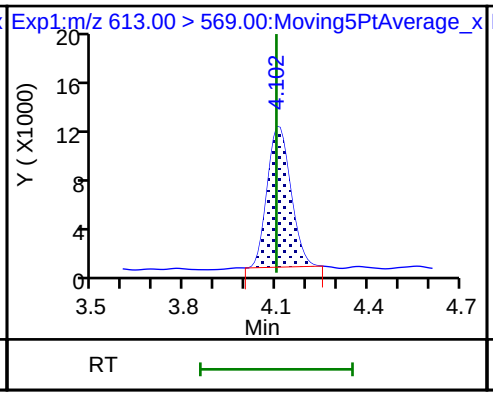
D 30 13C2 PFUnA



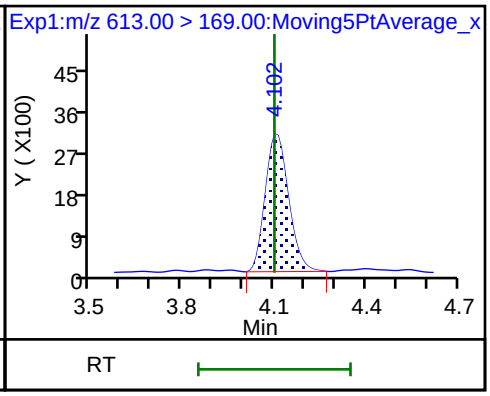
D 36 13C2 PFDoA



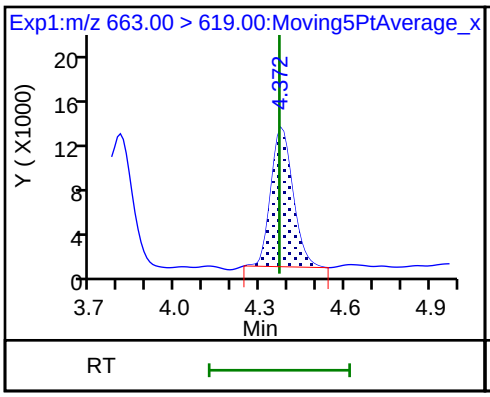
37 Perfluorododecanoic acid



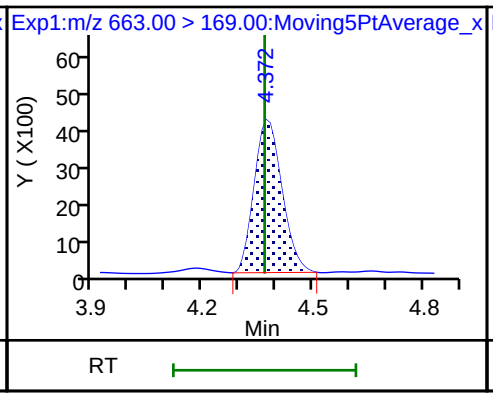
37 Perfluorododecanoic acid



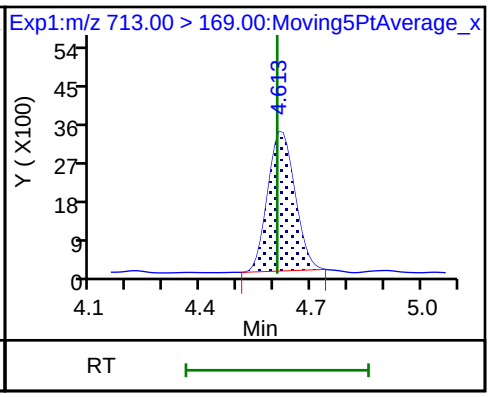
41 Perfluorotridecanoic acid



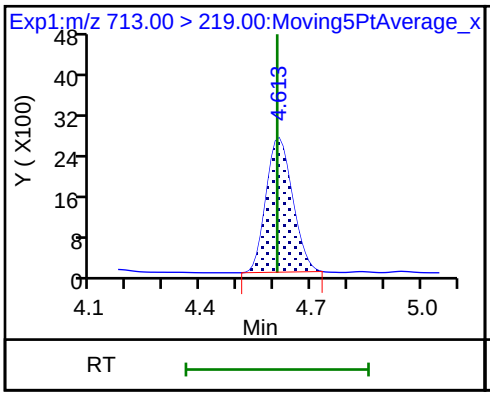
41 Perfluorotridecanoic acid



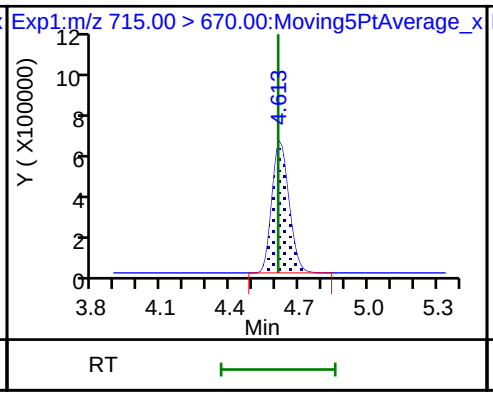
42 Perfluorotetradecanoic acid



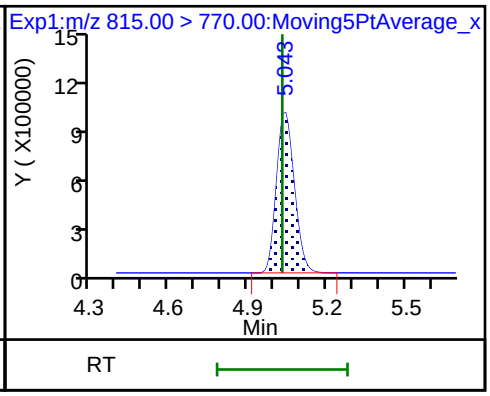
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

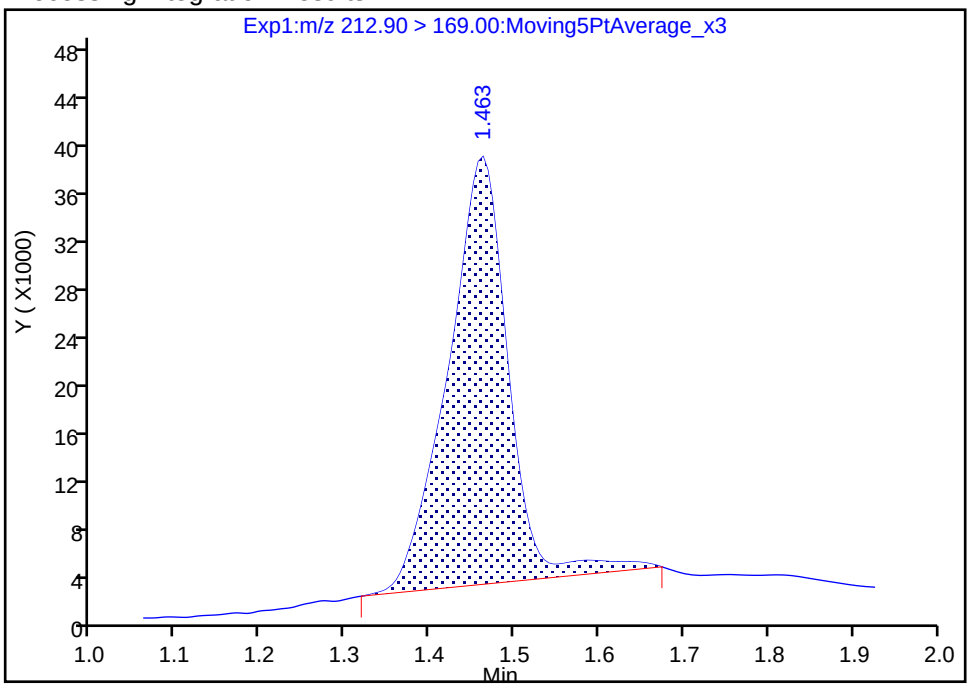
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_003.d
Injection Date: 15-May-2018 15:21:19 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

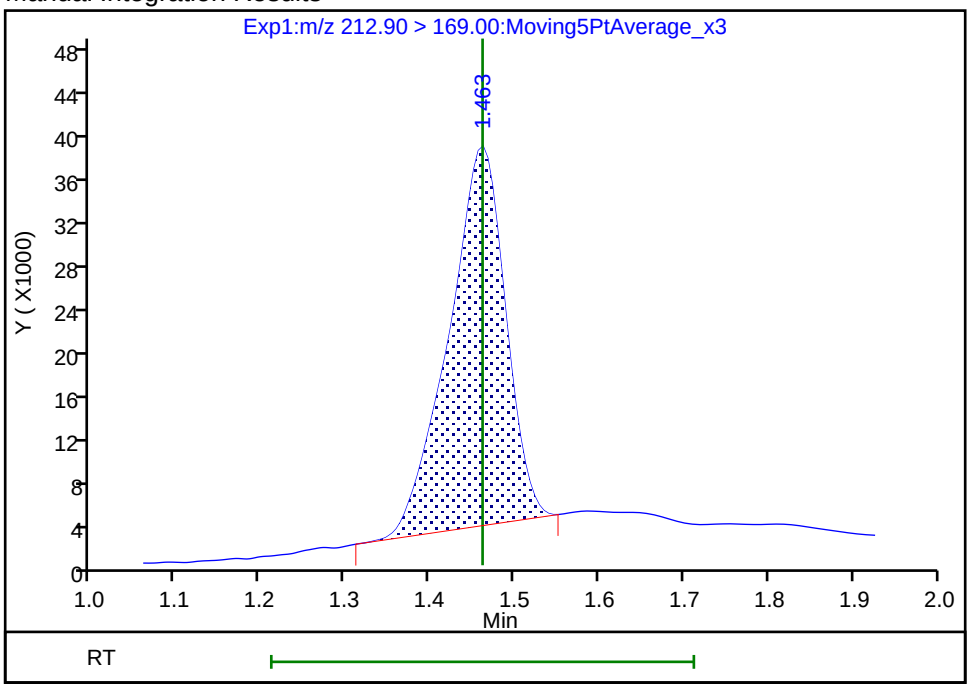
Processing Integration Results

RT: 1.46
Area: 175954
Amount: 0.053585
Amount Units: ng/ml



Manual Integration Results

RT: 1.46
Area: 162647
Amount: 0.050076
Amount Units: ng/ml



Reviewer: westendorfc, 15-May-2018 16:30:59
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

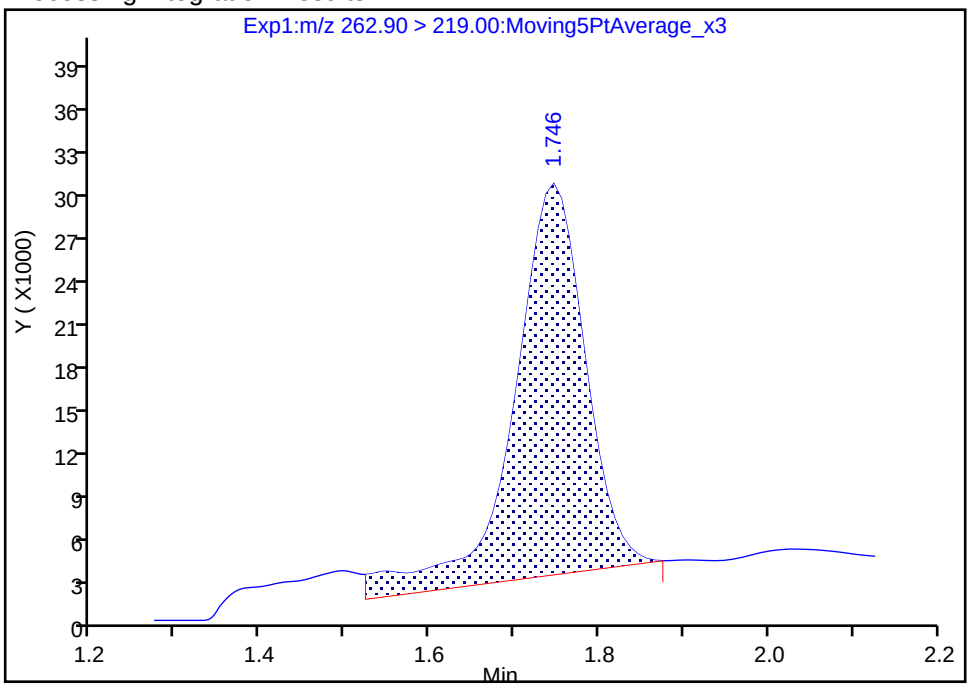
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_003.d
Injection Date: 15-May-2018 15:21:19 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

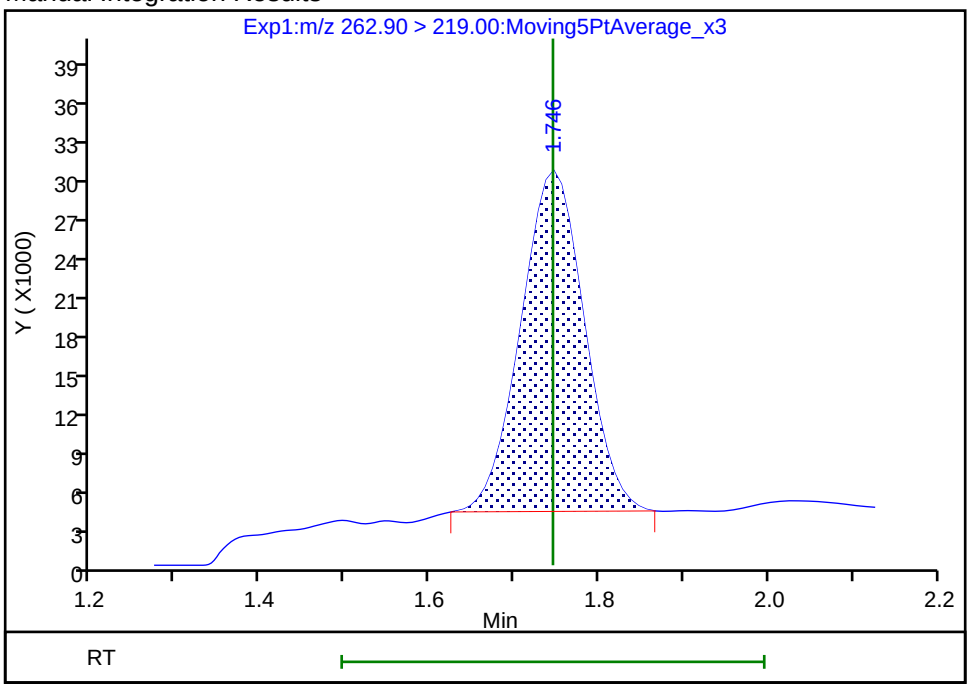
Processing Integration Results

RT: 1.75
Area: 159724
Amount: 0.060141
Amount Units: ng/ml



Manual Integration Results

RT: 1.75
Area: 135647
Amount: 0.052167
Amount Units: ng/ml



Reviewer: westendorfc, 15-May-2018 16:31:05
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

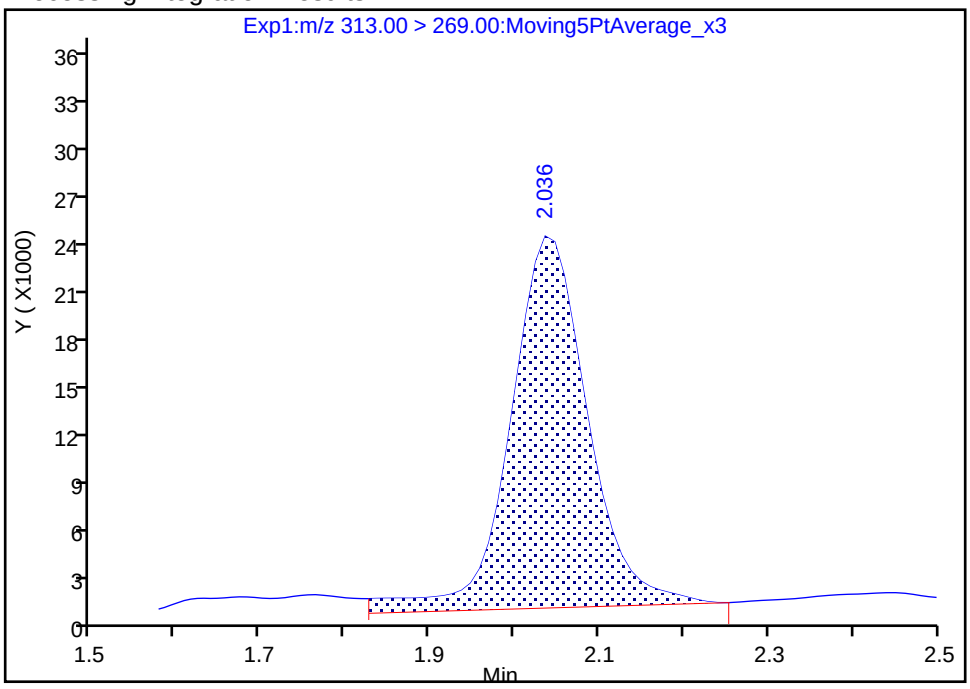
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_003.d
Injection Date: 15-May-2018 15:21:19 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

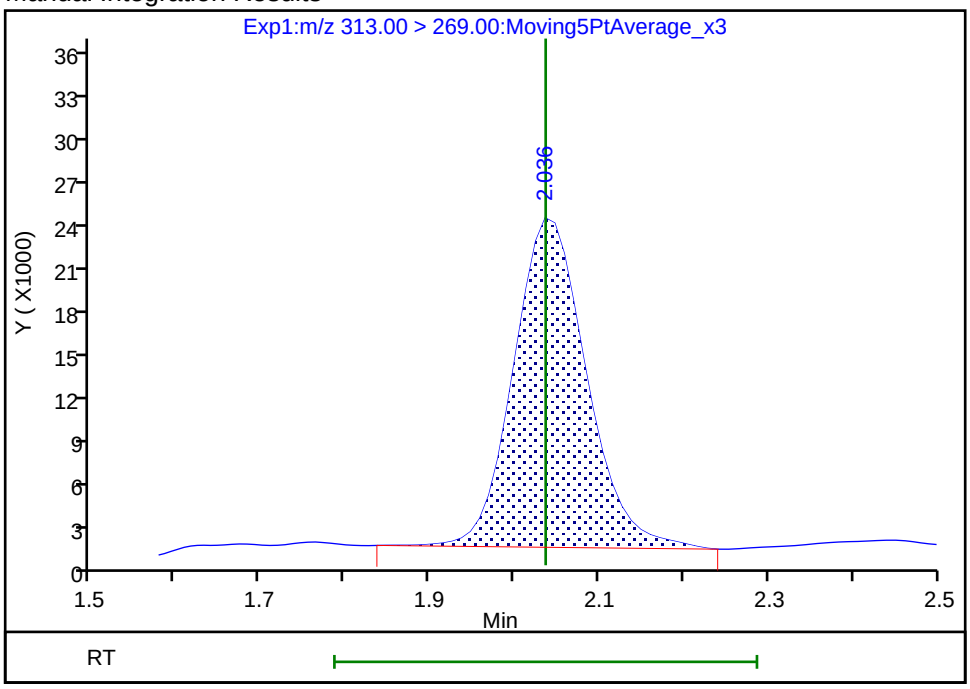
Processing Integration Results

RT: 2.04
Area: 147805
Amount: 0.059147
Amount Units: ng/ml



Manual Integration Results

RT: 2.04
Area: 135987
Amount: 0.055832
Amount Units: ng/ml



Reviewer: westendorfc, 15-May-2018 16:31:10
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

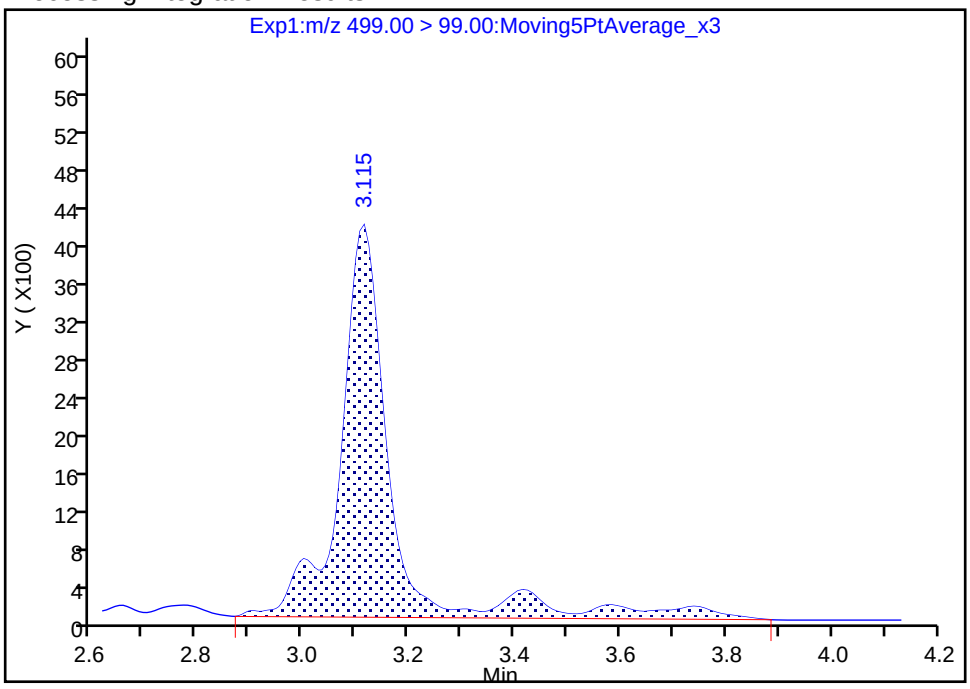
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_003.d
Injection Date: 15-May-2018 15:21:19 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 2

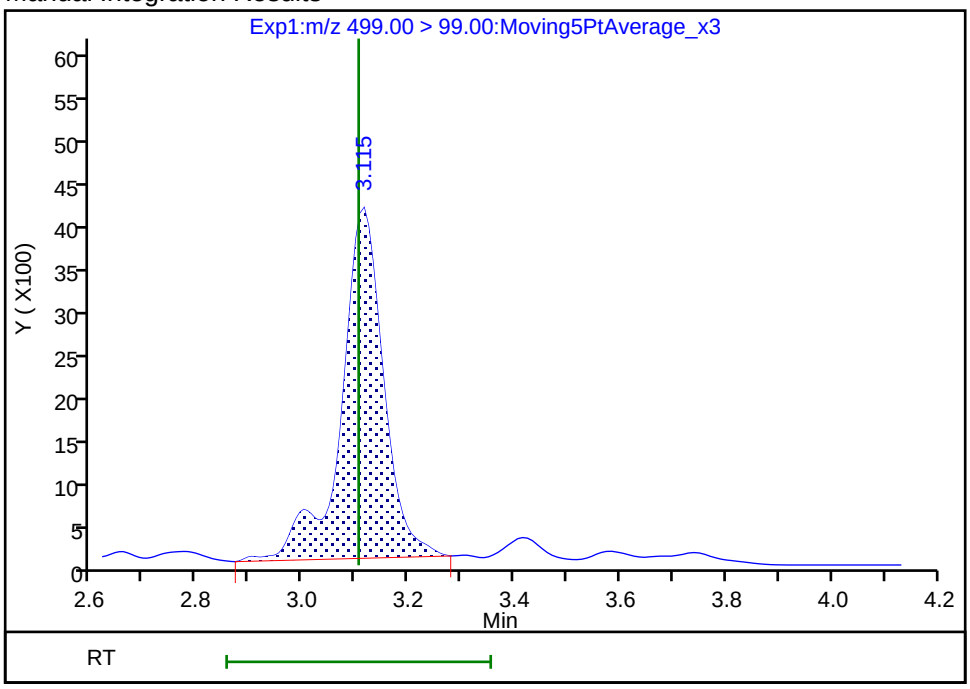
Processing Integration Results

RT: 3.12
Area: 27789
Amount: 0.049099
Amount Units: ng/ml



Manual Integration Results

RT: 3.12
Area: 22995
Amount: 0.049830
Amount Units: ng/ml



Reviewer: westendorfc, 15-May-2018 16:31:21
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_004.d
Lims ID: IC L3 Full
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 15-May-2018 15:29:08 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*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 16-May-2018 09:19:58 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK037

First Level Reviewer: westendorfc Date: 15-May-2018 16:31:49

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.463	1.462	0.001	1.000	691256	0.2480		99.2	322	
D 1 13C4 PFBA										
217.00 > 172.00	1.463	1.462	0.001	1.000	7493234	2.58		103	50123	
D 3 13C5-PFPeA										
267.90 > 223.00	1.748	1.744	0.004	0.562	4737268	2.55		102	69659	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.748	1.745	0.003	1.000	543378	0.2429		97.2	275	
D 47 13C3-PFBS										
301.90 > 83.00	1.784	1.780	0.004	1.000	99970	2.38		102	619	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.784	1.783	0.001	1.000	758816	0.2260		102	3639	
298.90 > 99.00	1.784	1.783	0.001	1.000	311895		2.43(1.25-3.74)	102	2331	
D 60 M2-4:2FTS										
329.00 > 81.00	2.004	1.999	0.005	1.000	706801	NC			8517	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	2.004	2.000	0.004	1.000	156576	0.2197		94.1	6561	
D 7 13C2 PFHxA										
315.00 > 270.00	2.038	2.037	0.001	1.000	5134906	2.59		104	125259	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.038	2.037	0.001	1.000	503450	0.2384		95.4	778	
313.00 > 119.00	2.038	2.037	0.001	1.000	47401		10.62(5.03-15.10)	95.4	559	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.061	2.059	0.002	1.000	712963	0.2384		102	9397	
349.00 > 99.00	2.061	2.059	0.002	1.000	264857		2.69(1.36-4.07)	102	2639	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.140	2.134	0.006	1.000	260002	NC			4919	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.140	2.134	0.006	1.000	75752	NC			658	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.373	2.374	-0.001	1.000	533908	0.2502		100	871	
363.00 > 169.00	2.373	2.374	-0.001	1.000	205760		2.59(1.13-3.40)	100	1440	
D 9 13C4-PFHpA										
367.00 > 322.00	2.373	2.374	-0.001	1.000	5050240	2.66		106	104242	
D 11 18O2 PFHxS										
403.00 > 84.00	2.385	2.386	-0.001	1.000	5692452	2.43		103	49448	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.385	2.386	-0.001	1.000	613254	0.2261		99.4	3758	
399.00 > 99.00	2.385	2.386	-0.001	1.000	206507		2.97(1.50-4.49)	99.4	799	
65 Adona										
377.00 > 251.00	2.419	2.418	0.001	1.000	1414956	NC			40535	
377.00 > 85.00	2.419	2.418	0.001	1.000	889140		1.59(0.84-2.53)		9606	
D 12 M2-6:2FTS										
429.00 > 81.00	2.714	2.707	0.007	1.000	1076802	2.57		108	20482	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.714	2.707	0.007	1.000	229440	0.2781		117	1932	
D 14 13C4 PFOA										
417.00 > 372.00	2.737	2.731	0.006	1.000	4619416	2.57		103	75506	
* 62 13C2-PFOA										
415.00 > 370.00	2.737	2.734	0.003		4741445	2.50			54856	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.737	2.734	0.003	1.000	525683	0.2417		96.7	189	
413.00 > 169.00	2.737	2.734	0.003	1.000	266346		1.97(0.84-2.52)	96.7	902	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.744	2.739	0.005	1.000	524732	0.2339		98.3	7416	
449.00 > 99.00	2.744	2.739	0.005	1.000	144198		3.64(1.94-5.82)	98.3	1659	
D 18 13C4 PFOS										
503.00 > 80.00	3.110	3.104	0.006	1.000	4024927	2.50		104	31109	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.110	3.105	0.005	1.000	474971	0.2399		103	4702	
499.00 > 99.00	3.110	3.105	0.005	1.000	113620		4.18(2.31-6.93)	103	2518	
D 19 13C5 PFNA										
468.00 > 423.00	3.110	3.107	0.003	1.000	3819382	2.60		104	57297	
20 Perfluorononanoic acid										
463.00 > 419.00	3.110	3.107	0.003	1.000	402423	0.2487		99.5	651	
463.00 > 169.00	3.110	3.107	0.003	1.000	98302		4.09(1.90-5.69)	99.5	1897	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.318	3.316	0.002	1.000	687137	NC			9753	
D 21 13C8 FOSA										
506.00 > 78.00	3.416	3.420	-0.004	1.000	5466463	2.59		104	44835	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.416	3.422	-0.006	1.000	550166	0.2584		103	15371	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.463	3.455	0.008	1.000	301811	0.2366		98.6	5939	
549.00 > 99.00	3.463	3.455	0.008	1.000	113569		2.66(1.33-3.97)	98.6	1592	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.463	3.458	0.005	1.000	159889	0.2389		99.8	2540	
D 26 M2-8:2FTS										
529.00 > 81.00	3.463	3.459	0.004	1.000	1187676	2.49		104	17819	
D 23 13C2 PFDA										
515.00 > 470.00	3.472	3.468	0.004	1.000	3297462	2.64		106	36473	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.472	3.468	0.004	1.000	320077	0.2496		99.8	1743	
513.00 > 169.00	3.472	3.468	0.004	1.000	65839		4.86(2.36-7.09)	99.8	1158	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.627	3.624	0.003	1.000	1854527	2.69		108	58327	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.637	3.631	0.006	1.003	184250	0.2448		97.9	1723	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.782	3.781	0.001	1.000	277428	0.2454		102	4027	
599.00 > 99.00	3.792	3.781	0.011	1.003	86380		3.21(1.39-4.16)	102	2334	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.802	3.794	0.008	1.000	1857905	2.63		105	12991	
D 30 13C2 PFUnA										
565.00 > 520.00	3.802	3.800	0.002	1.000	2576940	2.60		104	59924	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.802	3.800	0.002	1.000	200746	0.2332		93.3	918	
563.00 > 169.00	3.802	3.800	0.002	1.000	51912		3.87(2.12-6.36)	93.3	1560	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.802	3.800	0.002	1.000	178736	0.2558		102	3652	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.959	3.958	0.001	1.000	1057887	NC			20496	
D 36 13C2 PFDoA										
615.00 > 570.00	4.102	4.099	0.003	1.000	2740425	2.57		103	24900	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.102	4.100	0.002	1.000	305166	0.2667		107	260	
613.00 > 169.00	4.102	4.100	0.002	1.000	69161		4.41(2.13-6.40)	107	929	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.372	4.368	0.004	1.000	322826	0.2575		103	180	
663.00 > 169.00	4.372	4.368	0.004	1.000	114369		2.82(1.25-3.76)	103	1366	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.613	4.608	0.005	1.000	3595983	2.75		110	17498	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.613	4.608	0.005	1.000	81619	0.2247		89.9	939	
713.00 > 219.00	4.603	4.608	-0.005	0.998	63777		1.28(0.71-2.13)	89.9	1518	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.035	5.030	0.005	1.000	5862077	2.64		106	14450	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.035	5.031	0.004	1.000	592774	NC			150	
813.00 > 169.00	5.035	5.031	0.004	1.000	95796		6.19(2.86-8.58)		795	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.417	5.408	0.009	1.000	647584	NC			124	
913.00 > 169.00	5.417	5.408	0.009	1.000	84829		7.63(3.83-11.48)		912	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL3_00004 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:20:01 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_004.d

Injection Date: 15-May-2018 15:29:08 Instrument ID: A8_N

Lims ID: IC L3 Full

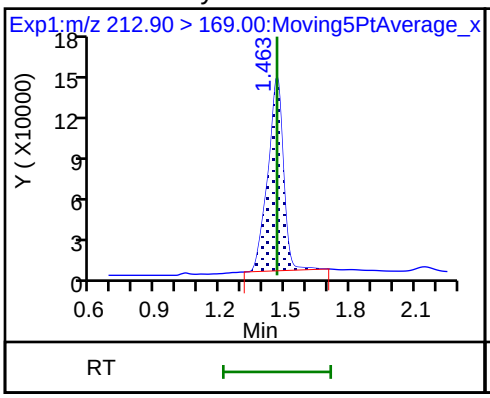
Client ID:

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

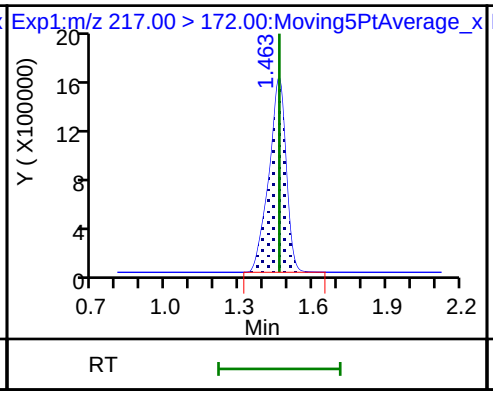
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

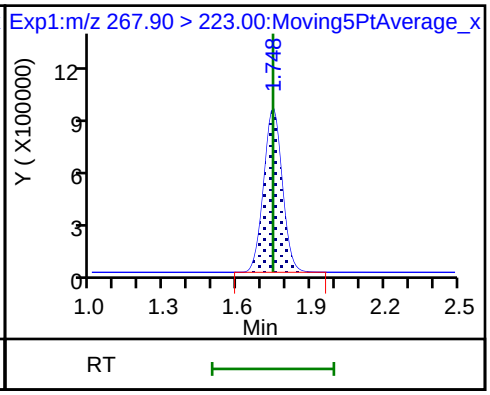
2 Perfluorobutyric acid



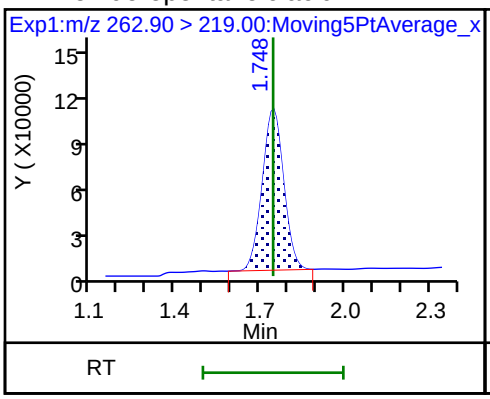
D 1 13C4 PFBA



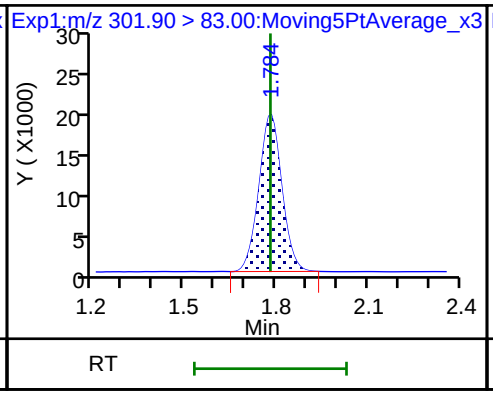
D 3 13C5-PFPeA



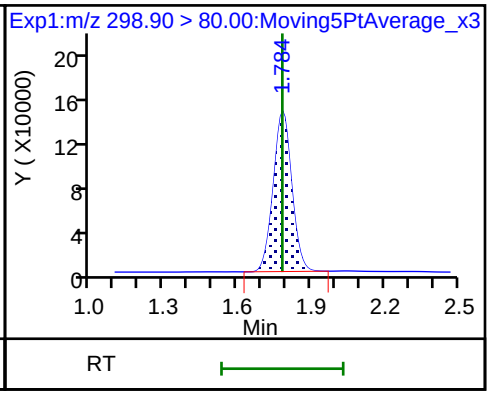
4 Perfluoropentanoic acid



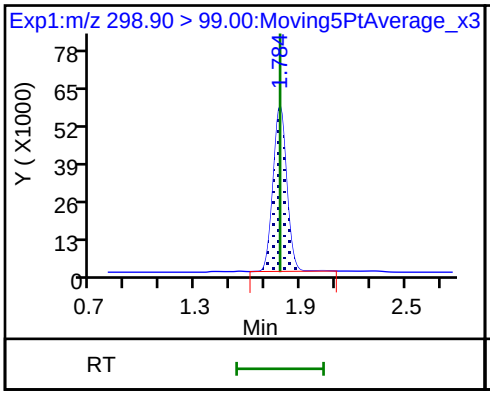
D 47 13C3-PFBS



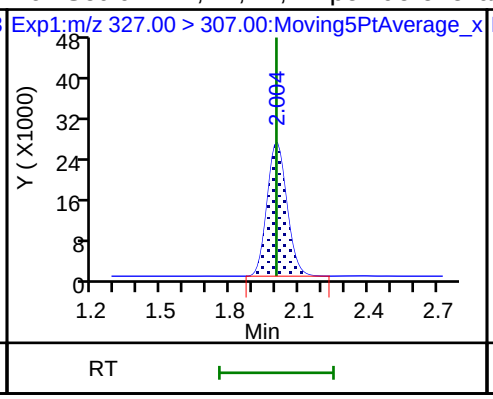
5 Perfluorobutanesulfonic acid



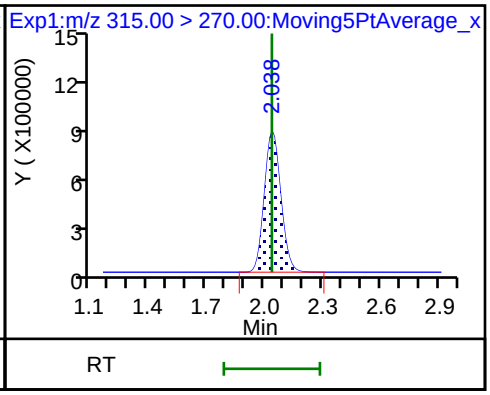
5 Perfluorobutanesulfonic acid



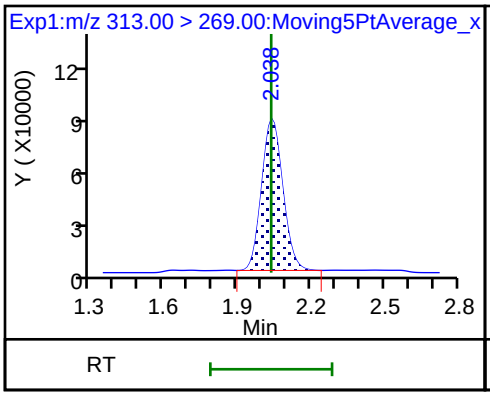
61 Sodium 1H,1H,2H,2H-perfluorohexa



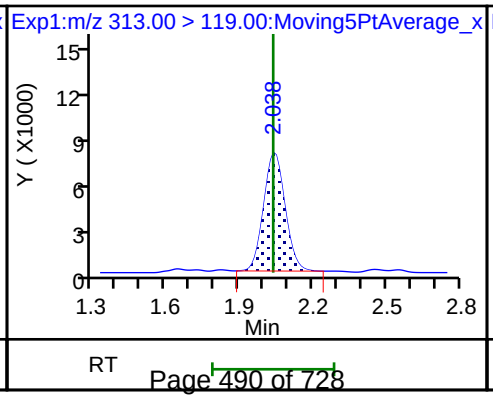
D 7 13C2 PFHxA



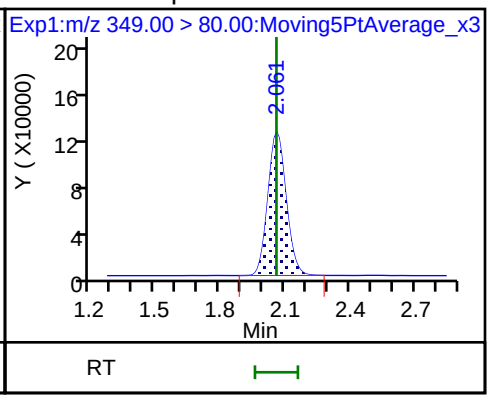
6 Perfluorohexanoic acid



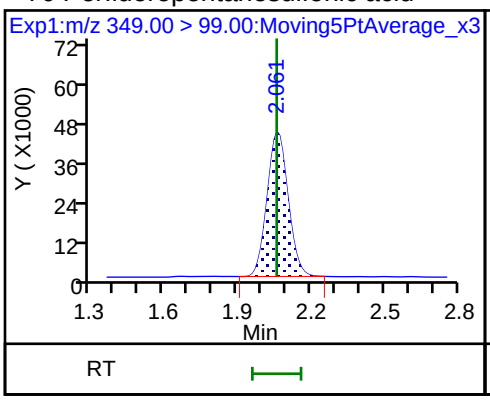
6 Perfluorohexanoic acid



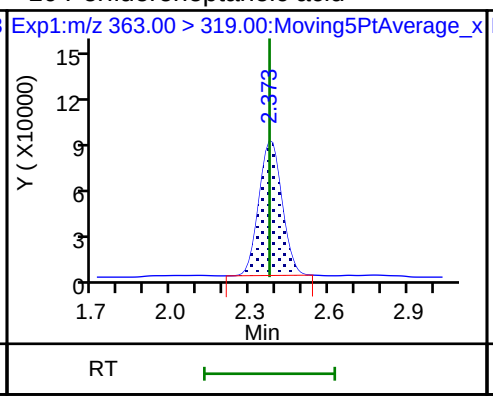
70 Perfluoropentanesulfonic acid



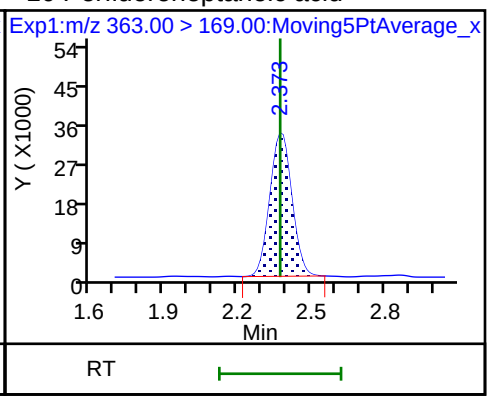
70 Perfluoropentanesulfonic acid



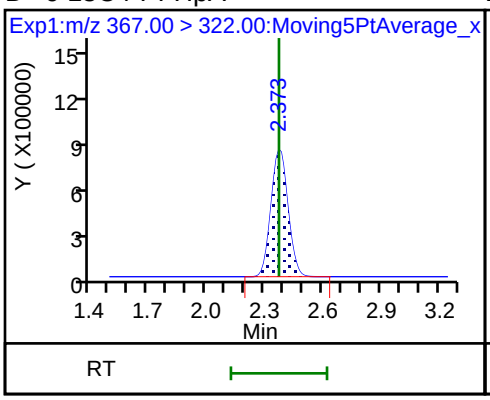
10 Perfluoroheptanoic acid



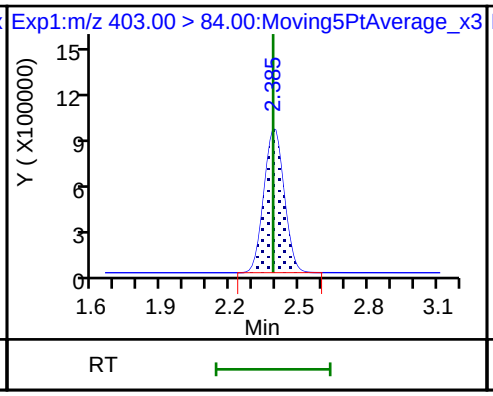
10 Perfluoroheptanoic acid



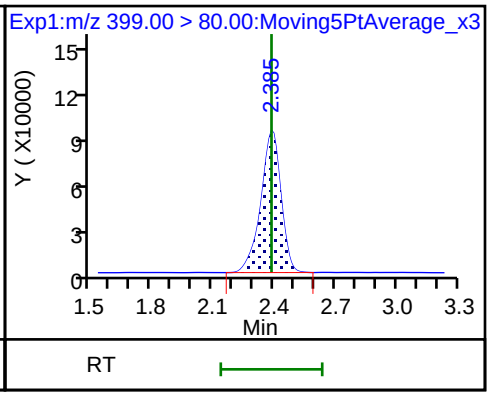
D 9 13C4-PFHpA



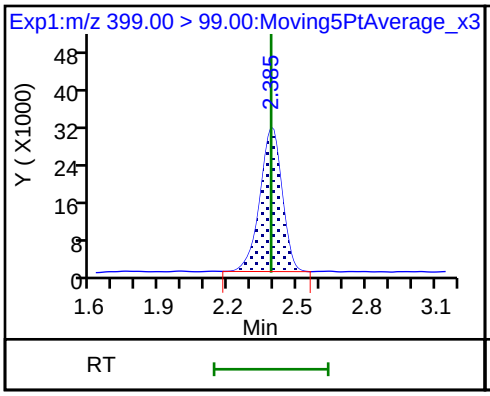
D 11 18O2 PFHxS



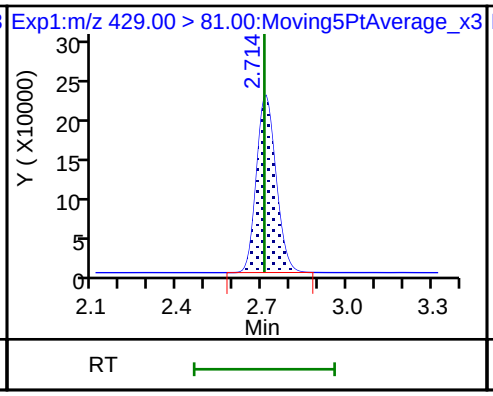
8 Perfluorohexanesulfonic acid



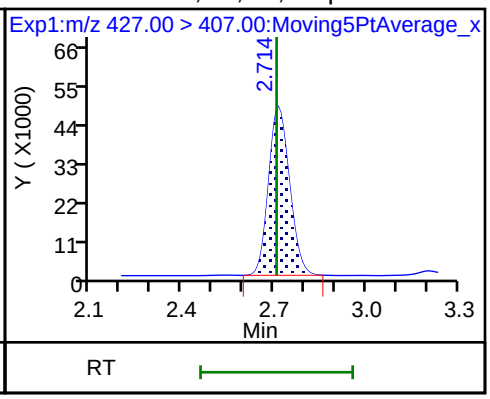
8 Perfluorohexanesulfonic acid



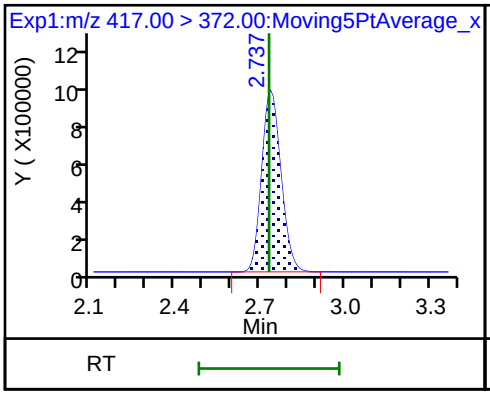
D 12 M2-6:2FTS



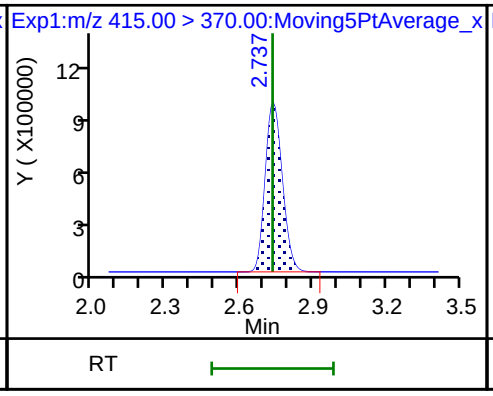
13 Sodium 1H,1H,2H,2H-perfluorooctane



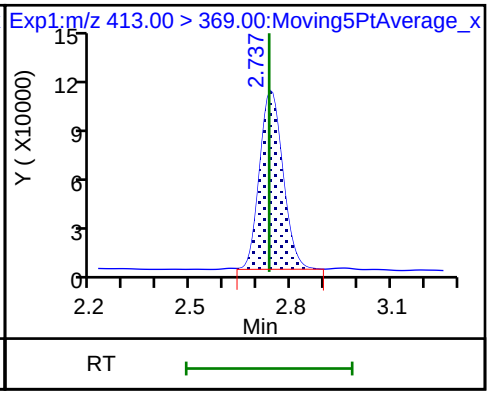
D 14 13C4 PFOA



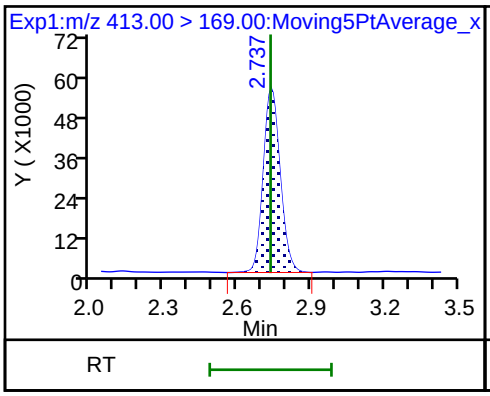
* 62 13C2-PFOA



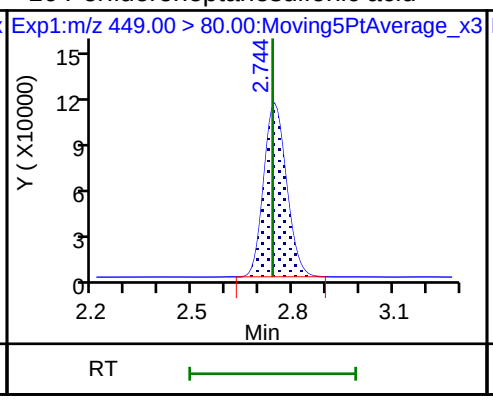
15 Perfluorooctanoic acid



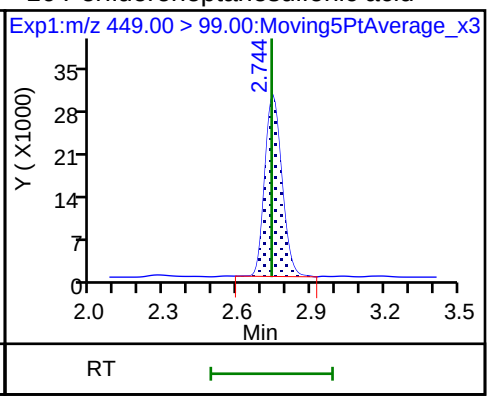
15 Perfluorooctanoic acid



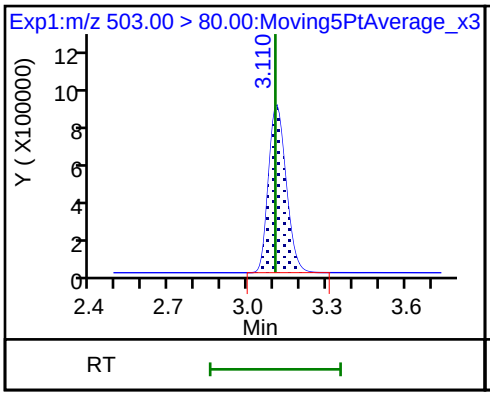
16 Perfluoroheptanesulfonic acid



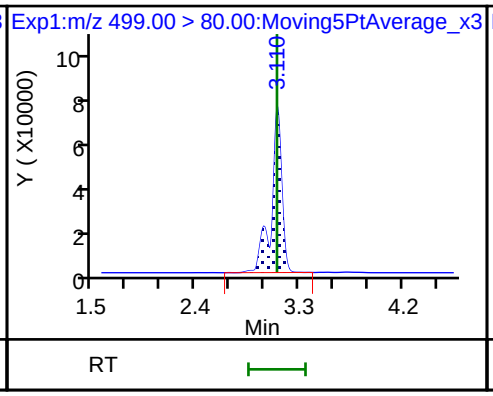
16 Perfluoroheptanesulfonic acid



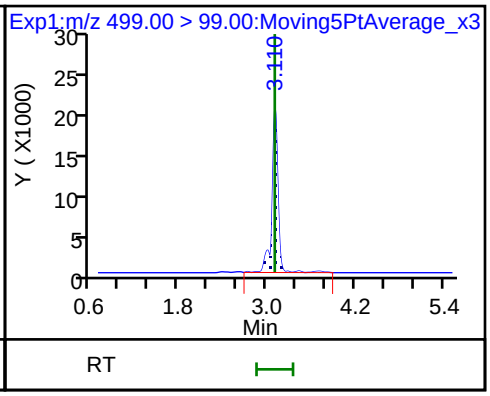
D 18 13C4 PFOS



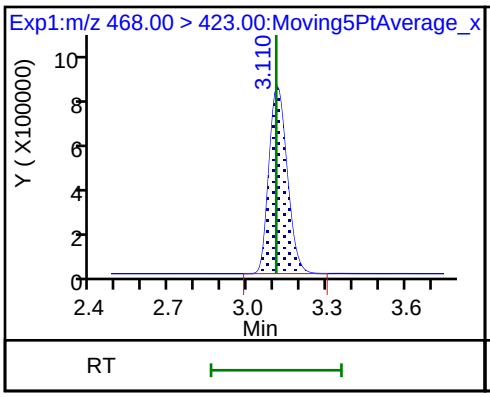
17 Perfluorooctane sulfonic acid



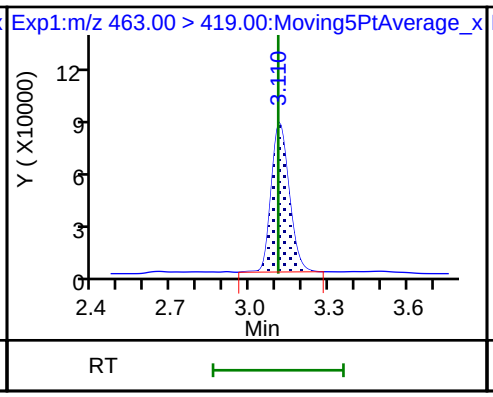
17 Perfluorooctane sulfonic acid



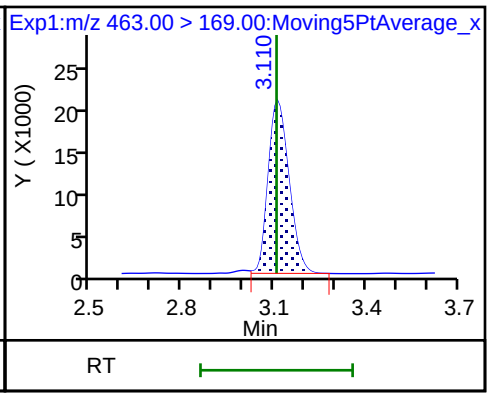
D 19 13C5 PFNA



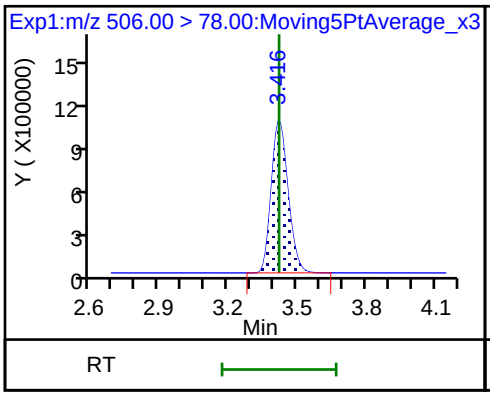
20 Perfluorononanoic acid



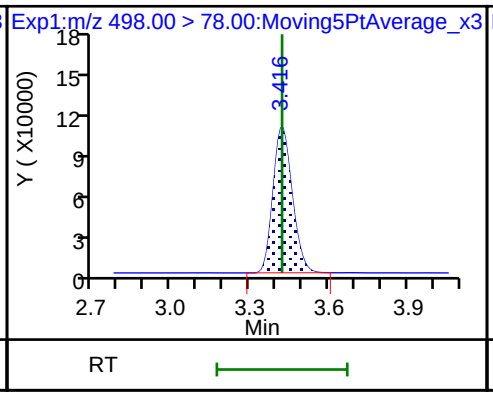
20 Perfluorononanoic acid



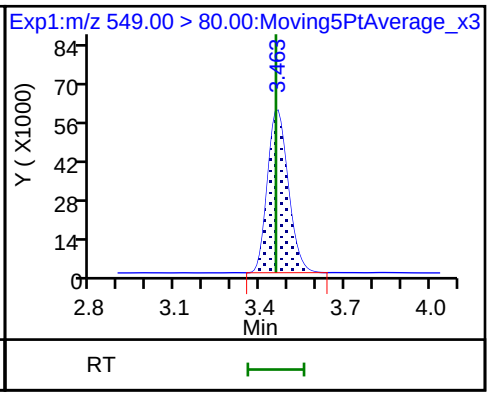
D 21 13C8 FOSA



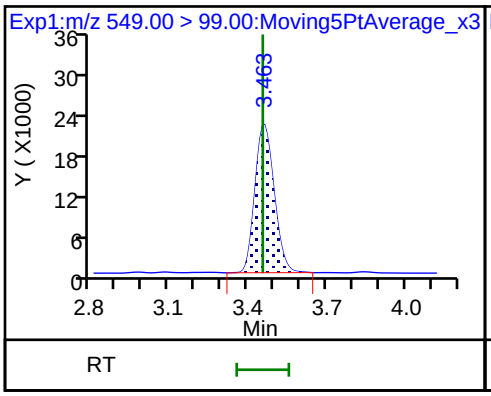
22 Perfluorooctane Sulfonamide



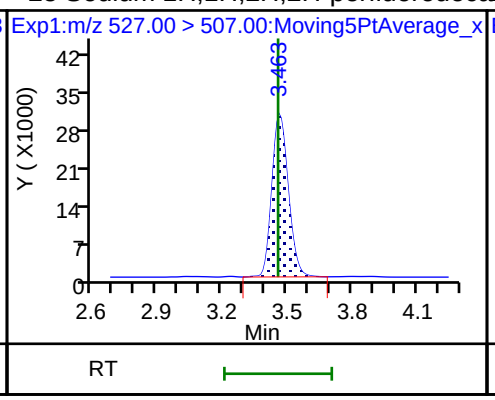
68 Perfluorononanesulfonic acid



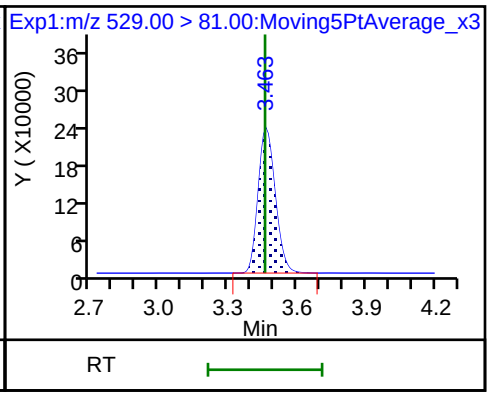
68 Perfluorononanesulfonic acid



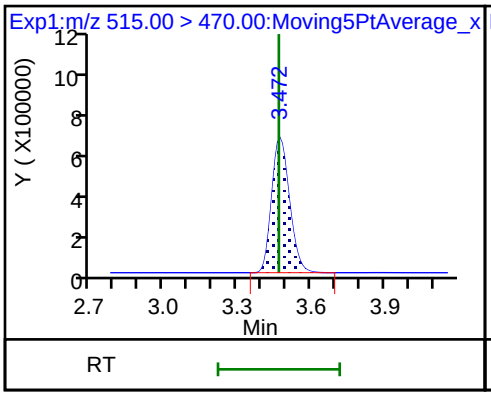
25 Sodium 1H,1H,2H,2H-perfluorodecan



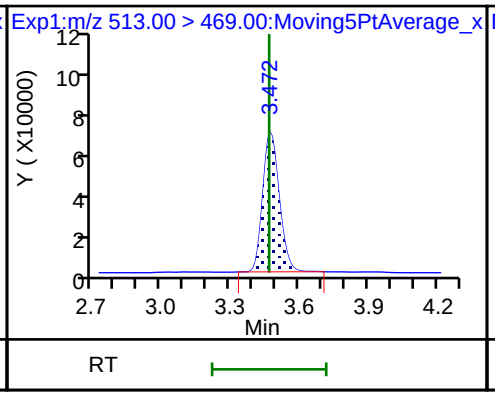
D 26 M2-8:2FTS



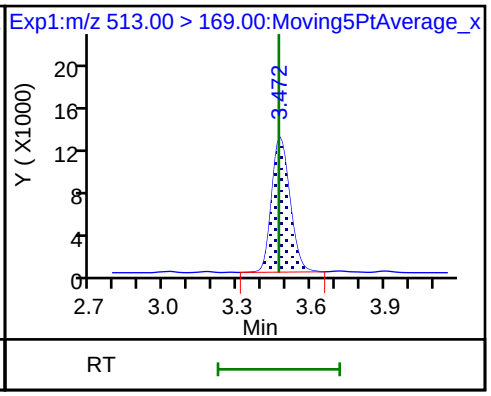
D 23 13C2 PFDA



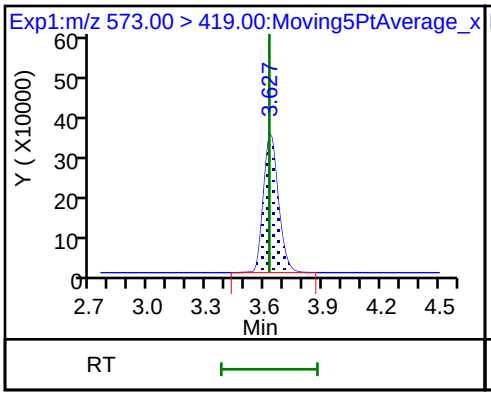
24 Perfluorodecanoic acid



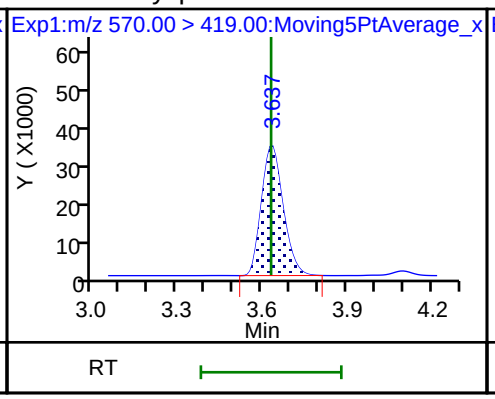
24 Perfluorodecanoic acid



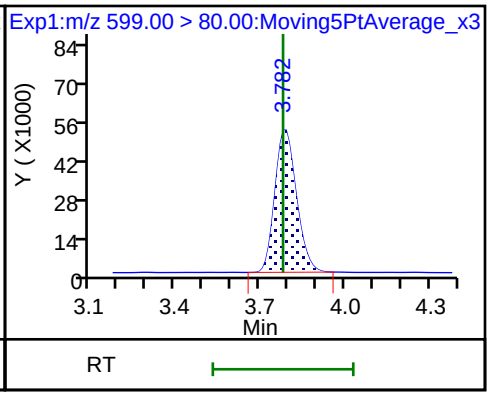
D 27 d3-NMeFOSAA



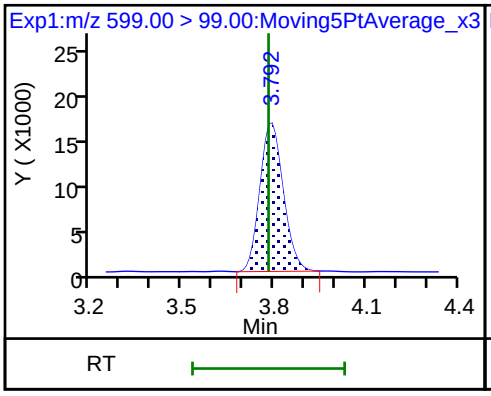
28 N-methyl perfluorooctane sulfonami



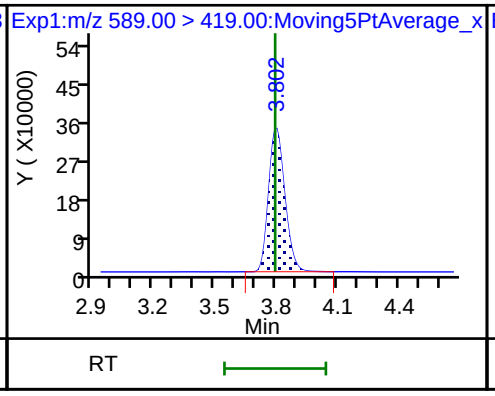
29 Perfluorodecane Sulfonic acid



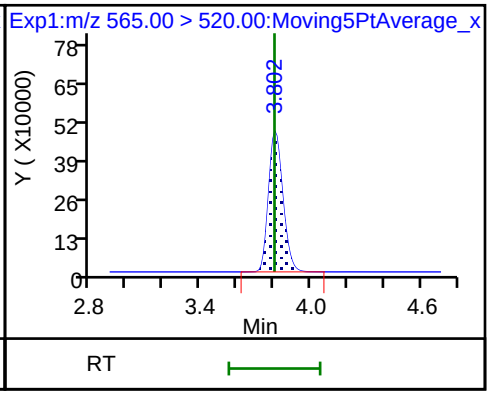
29 Perfluorodecane Sulfonic acid



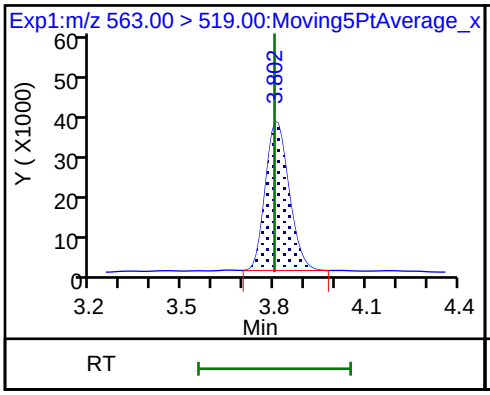
D 32 d5-NEtFOSAA



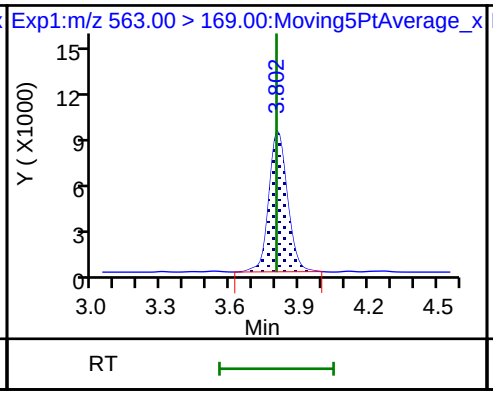
D 30 13C2 PFUnA



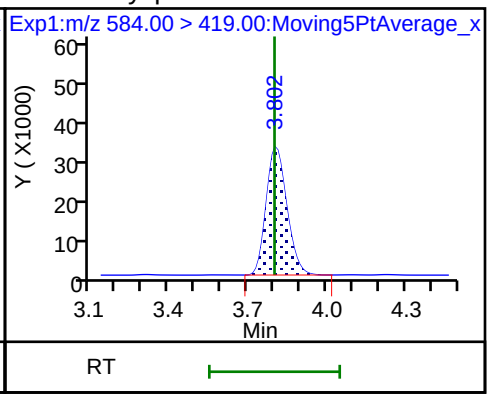
31 Perfluoroundecanoic acid



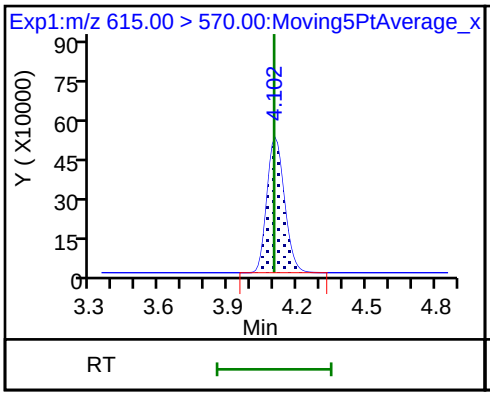
31 Perfluoroundecanoic acid



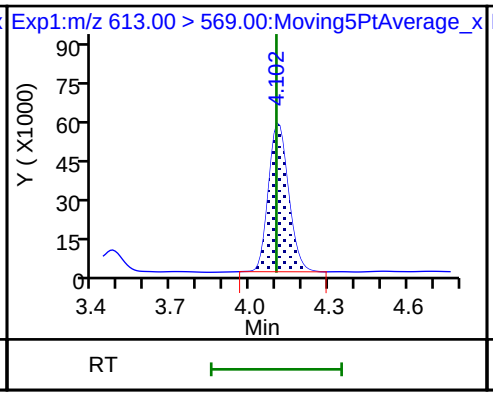
33 N-ethyl perfluorooctane sulfonamid



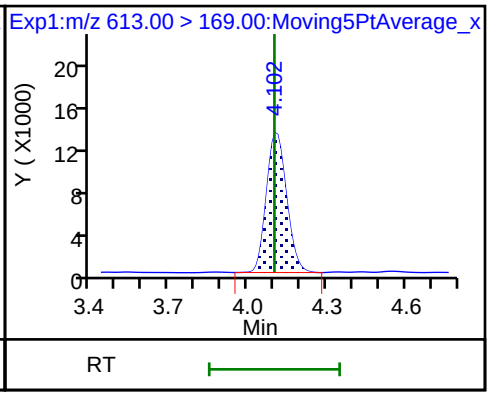
D 36 13C2 PFDoA



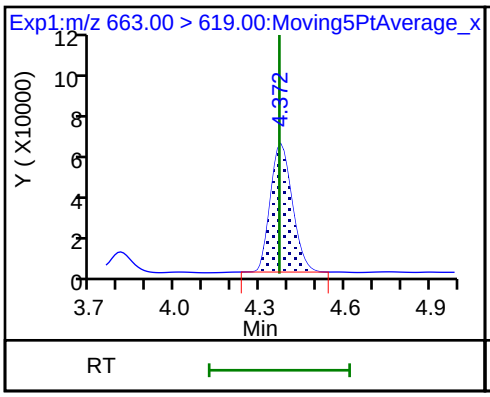
37 Perfluorododecanoic acid



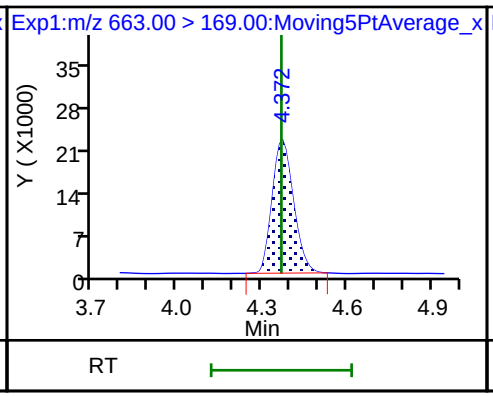
37 Perfluorododecanoic acid



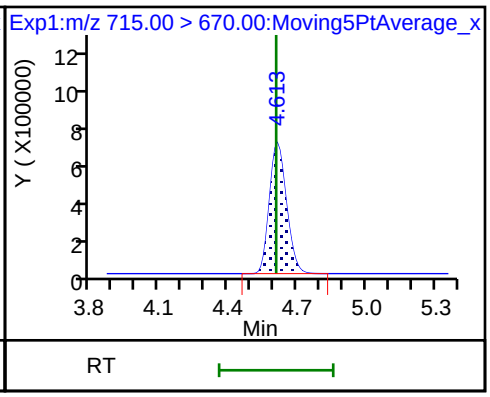
41 Perfluorotridecanoic acid



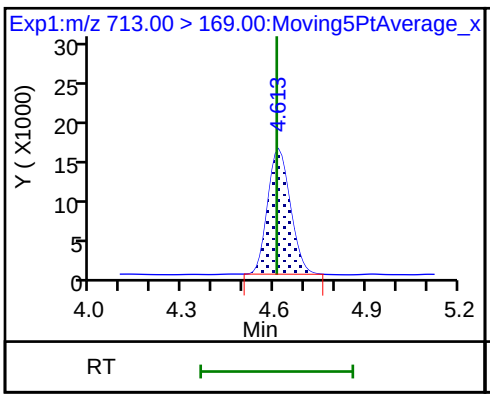
41 Perfluorotridecanoic acid



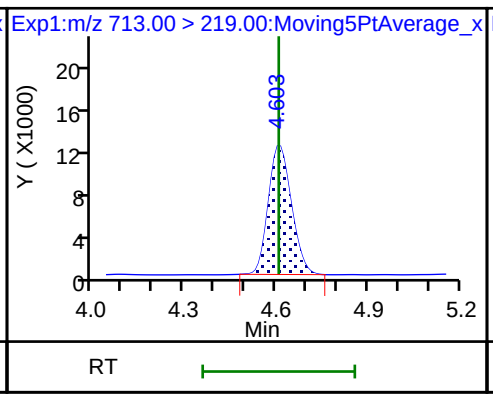
D 43 13C2-PFTeDA



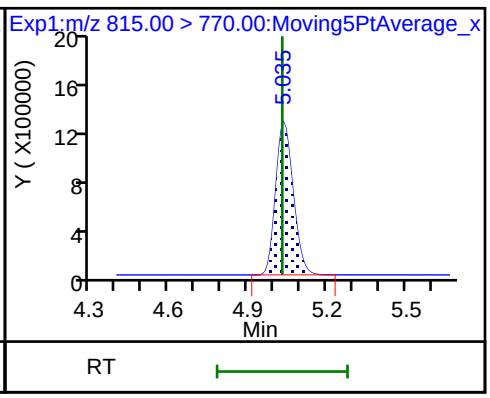
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_005.d
Lims ID: IC L4 Full
Client ID:
Sample Type: ICIS Calib Level: 4
Inject. Date: 15-May-2018 15:36:58 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*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 16-May-2018 09:20:03 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK037

First Level Reviewer: hannigana Date: 16-May-2018 08:01:39

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	1.461	1.462	-0.001	1.000	7049149	2.42		96.8	46136	
2 Perfluorobutyric acid										
212.90 > 169.00	1.461	1.462	-0.001	1.000	2597444	0.99		99.1	1318	
D 3 13C5-PFPeA										
267.90 > 223.00	1.743	1.744	-0.001	0.561	4710025	2.52		101	87673	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.743	1.745	-0.002	1.000	2073422	0.9323		93.2	1140	
D 47 13C3-PFBS										
301.90 > 83.00	1.779	1.780	-0.001	1.000	98369	2.33		100	653	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.779	1.783	-0.004	1.000	2858265	0.8651		97.9	14624	
298.90 > 99.00	1.779	1.783	-0.004	1.000	1207235		2.37(1.25-3.74)	97.9	7612	
D 60 M2-4:2FTS										
329.00 > 81.00	1.999	1.999	0.0	1.000	757382	NC			9845	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.999	2.000	-0.001	1.000	636977	0.9084		97.3	35258	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.033	2.037	-0.004	1.000	1931731	0.9677		96.8	2942	
313.00 > 119.00	2.033	2.037	-0.004	1.000	169446		11.40(5.03-15.10)	96.8	2297	
D 7 13C2 PFHxA										
315.00 > 270.00	2.033	2.037	-0.004	1.000	4854075	2.44		97.6	80326	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.056	2.059	-0.003	1.000	2702610	0.9185		97.9	30039	
349.00 > 99.00	2.056	2.059	-0.003	1.000	1001761		2.70(1.36-4.07)	97.9	9135	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.135	2.134	0.001	1.000	301290	NC			2693	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.135	2.134	0.001	1.000	238512	NC			4336	
D 9 13C4-PFHpA										
367.00 > 322.00	2.368	2.374	-0.006	1.000	4714171	2.47		98.9	75030	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.368	2.374	-0.006	1.000	1839273	0.9234		92.3	2776	
363.00 > 169.00	2.368	2.374	-0.006	1.000	750283		2.45(1.13-3.40)	92.3	4821	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.381	2.386	-0.006	1.000	2238132	0.8440		92.7	14277	
399.00 > 99.00	2.381	2.386	-0.006	1.000	758974		2.95(1.50-4.49)	92.7	2596	
D 11 18O2 PFHxS										
403.00 > 84.00	2.381	2.386	-0.006	1.000	5565884	2.36		99.9	50235	
65 Adona										
377.00 > 251.00	2.414	2.418	-0.004	1.000	6019764	NC			85325	
377.00 > 85.00	2.414	2.418	-0.004	1.000	3416928		1.76(0.84-2.53)		41481	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.703	2.707	-0.004	1.000	642687	0.8356		88.1	4840	
D 12 M2-6:2FTS										
429.00 > 81.00	2.703	2.707	-0.004	1.000	1028277	2.44		103	17698	
D 14 13C4 PFOA										
417.00 > 372.00	2.726	2.731	-0.005	1.000	4460027	2.47		98.9	53300	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.733	2.734	-0.001	1.003	2030259	0.9669		96.7	774	
413.00 > 169.00	2.733	2.734	-0.001	1.003	1016402		2.00(0.84-2.52)	96.7	3648	
* 62 13C2-PFOA										
415.00 > 370.00	2.733	2.734	-0.001		4762237	2.50			57613	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.733	2.739	-0.006	1.000	2045093	0.9709		102	23753	
449.00 > 99.00	2.733	2.739	-0.006	1.000	547456		3.74(1.94-5.82)	102	6229	
D 18 13C4 PFOS										
503.00 > 80.00	3.097	3.104	-0.007	1.000	3779459	2.33		97.6	24139	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.105	3.105	0.0	1.002	1585297	0.8526		91.9	11307	
499.00 > 99.00	3.105	3.105	0.0	1.002	364451		4.35(2.31-6.93)	91.9	4761	
20 Perfluorononanoic acid										
463.00 > 419.00	3.105	3.107	-0.002	1.000	1453651	0.9530		95.3	2199	
463.00 > 169.00	3.105	3.107	-0.002	1.000	348207		4.17(1.90-5.69)	95.3	7960	
D 19 13C5 PFNA										
468.00 > 423.00	3.105	3.107	-0.002	1.000	3600246	2.44		97.6	50324	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.313	3.316	-0.003	1.000	2728187	NC			29405	
D 21 13C8 FOSA										
506.00 > 78.00	3.419	3.420	-0.001	1.000	5346931	2.52		101	38654	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.419	3.422	-0.003	1.000	2070950	0.99		99.5	25217	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.456	3.455	0.001	1.000	1144412	0.9554		99.5	17278	
549.00 > 99.00	3.447	3.455	-0.008	0.997	454699		2.52(1.33-3.97)	99.5	8974	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.456	3.458	-0.002	1.000	581733	0.9417		98.3	11450	
D 26 M2-8:2FTS										
529.00 > 81.00	3.456	3.459	-0.003	1.000	1096366	2.29		95.6	13992	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.465	3.468	-0.003	1.000	1208399	1.01		101	5917	
513.00 > 169.00	3.465	3.468	-0.003	1.000	230921		5.23(2.36-7.09)	101	5650	
D 23 13C2 PFDA										
515.00 > 470.00	3.465	3.468	-0.003	1.000	3084670	2.46		98.3	75429	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.620	3.624	-0.004	1.000	1667566	2.41		96.4	23781	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.630	3.631	-0.001	1.003	695308	1.03		103	6776	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.784	3.781	0.003	1.000	961059	0.9051		93.9	13697	
599.00 > 99.00	3.784	3.781	0.003	1.000	339652		2.83(1.39-4.16)	93.9	7908	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.794	3.794	0.0	1.000	1808821	2.55		102	9758	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.794	3.800	-0.006	1.000	651368	0.9577		95.8	11982	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.794	3.800	-0.006	1.000	756677	0.8755		87.6	4657	
563.00 > 169.00	3.794	3.800	-0.006	1.000	202483		3.74(2.12-6.36)	87.6	7412	
D 30 13C2 PFUnA										
565.00 > 520.00	3.794	3.800	-0.006	1.000	2587053	2.60		104	43529	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.960	3.958	0.002	1.000	4159140	NC			44374	
D 36 13C2 PFDoA										
615.00 > 570.00	4.092	4.099	-0.007	1.000	2679695	2.51		100	17510	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.102	4.100	0.002	1.003	1104651	0.9875		98.7	918	
613.00 > 169.00	4.092	4.100	-0.008	1.000	275338		4.01(2.13-6.40)	98.7	2899	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.362	4.368	-0.006	1.000	1211735	0.9883		98.8	636	
663.00 > 169.00	4.362	4.368	-0.006	1.000	378967		3.20(1.25-3.76)	98.8	5472	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.605	4.608	-0.003	1.000	331048	0.9655		96.6	4238	
713.00 > 219.00	4.595	4.608	-0.013	0.998	234322		1.41(0.71-2.13)	96.6	3434	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.605	4.608	-0.003	1.000	3394312	2.59		103	16978	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.028	5.030	-0.002	1.000	5890266	2.64		106	15198	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.028	5.031	-0.003	1.000	2236578	NC			560	
813.00 > 169.00	5.028	5.031	-0.003	1.000	371148		6.03(2.86-8.58)		2763	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.406	5.408	-0.002	1.000	2576884	NC			454	
913.00 > 169.00	5.406	5.408	-0.002	1.000	319419		8.07(3.83-11.48)		2706	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00004 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:20:05 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_005.d

Injection Date: 15-May-2018 15:36:58 Instrument ID: A8_N

Lims ID: IC L4 Full

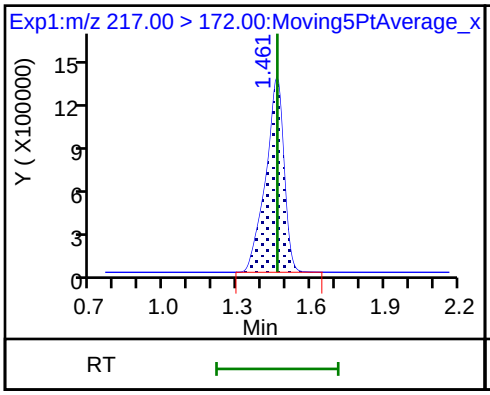
Client ID:

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

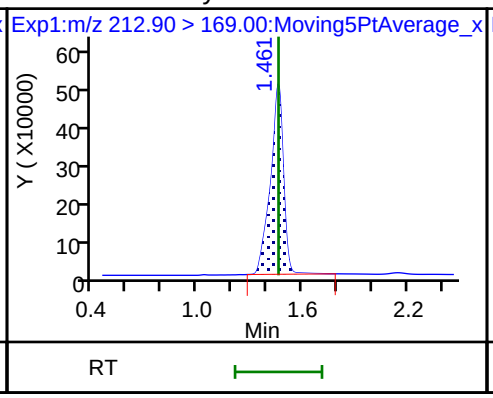
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

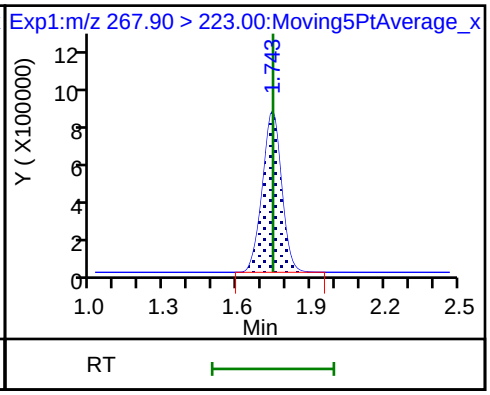
D 1 13C4 PFBA



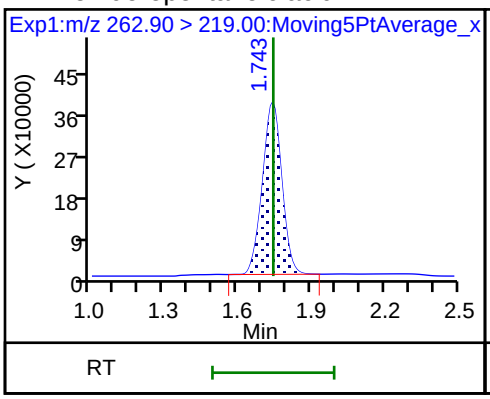
2 Perfluorobutyric acid



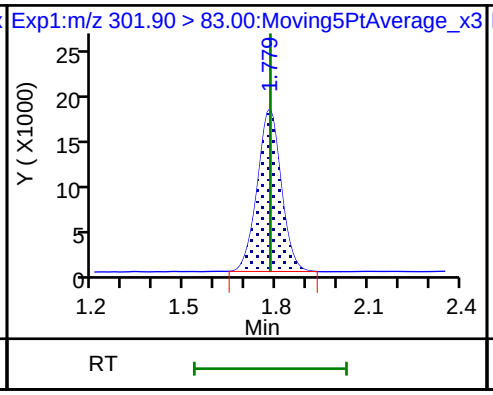
D 3 13C5-PFPeA



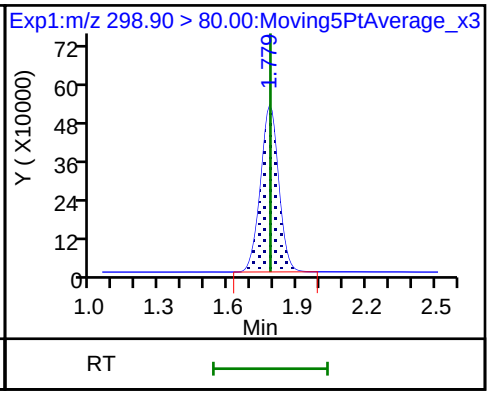
4 Perfluoropentanoic acid



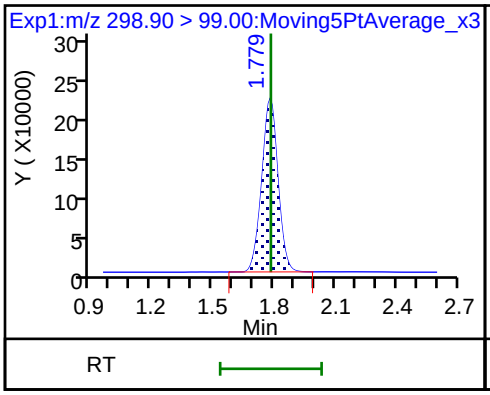
D 47 13C3-PFBS



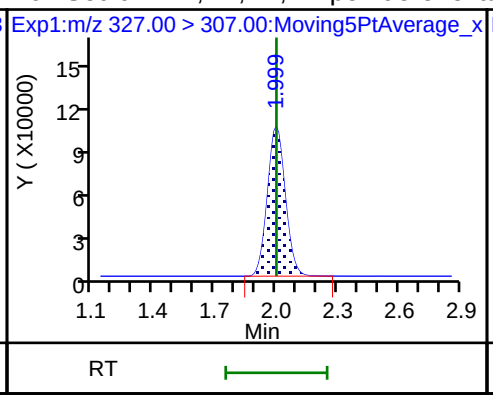
5 Perfluorobutanesulfonic acid



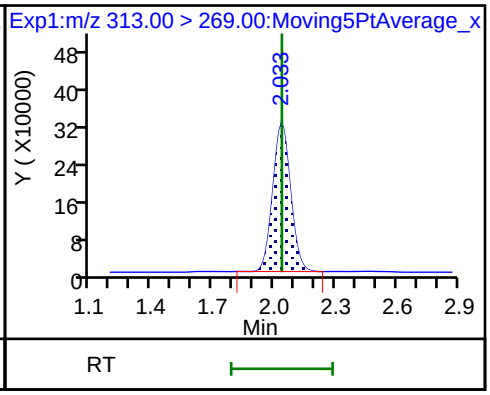
5 Perfluorobutanesulfonic acid



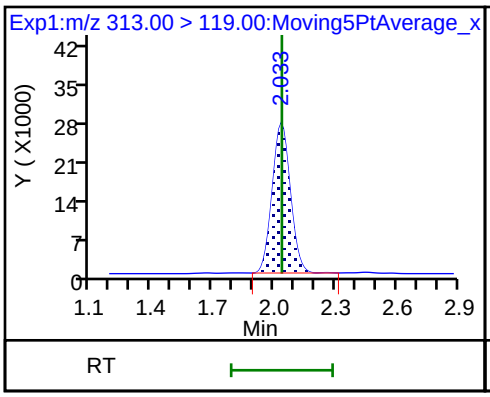
61 Sodium 1H,1H,2H,2H-perfluorohexane



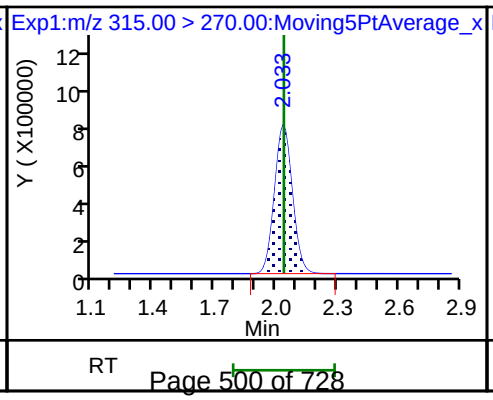
6 Perfluorohexanoic acid



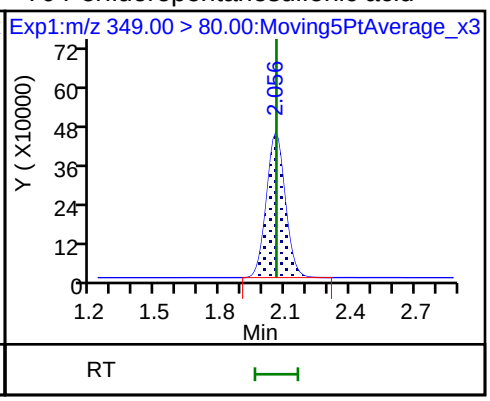
6 Perfluorohexanoic acid



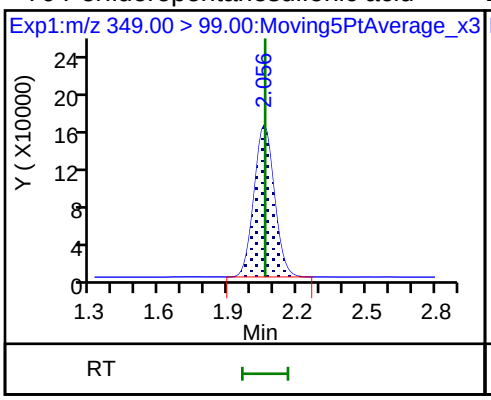
D 7 13C2 PFHxA



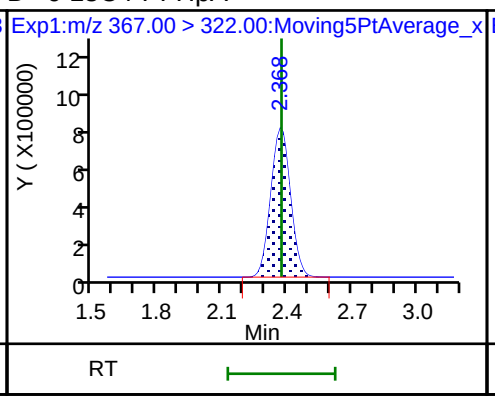
70 Perfluoropentanesulfonic acid



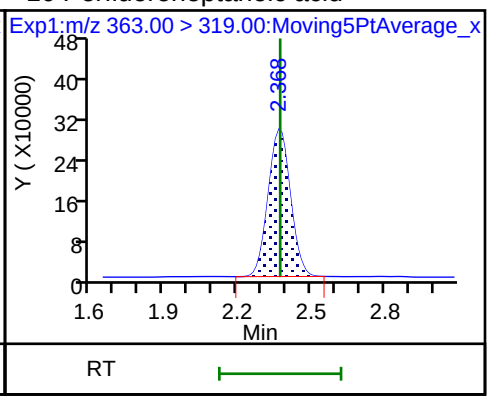
70 Perfluoropentanesulfonic acid



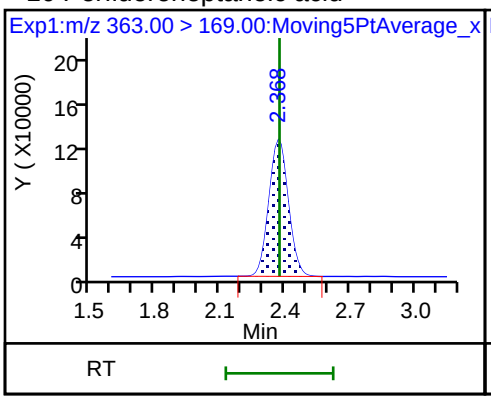
D 9 13C4-PFHpA



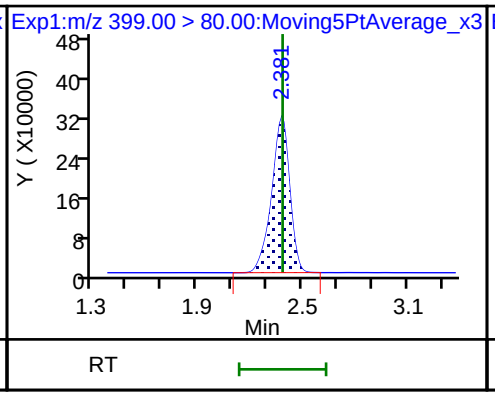
10 Perfluoroheptanoic acid



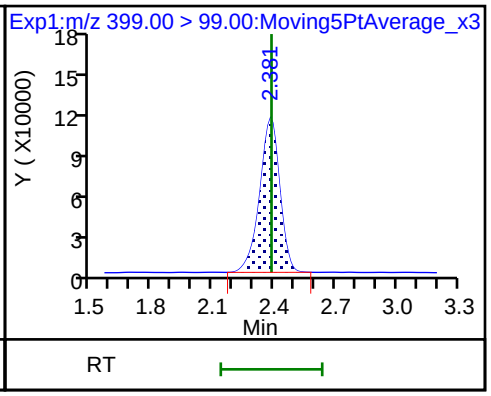
10 Perfluoroheptanoic acid



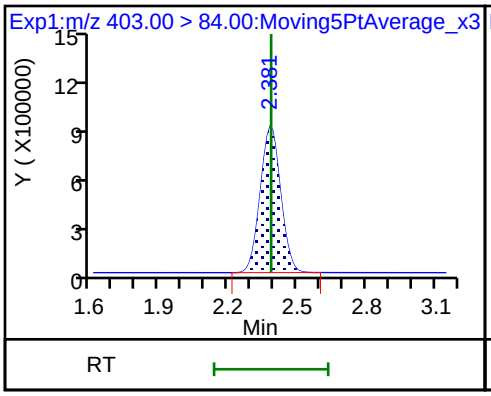
8 Perfluorohexanesulfonic acid



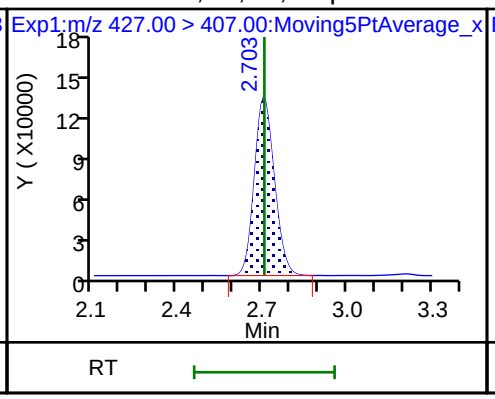
8 Perfluorohexanesulfonic acid



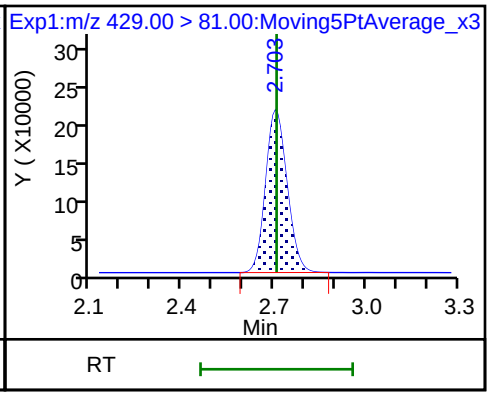
D 11 18O2 PFHxS



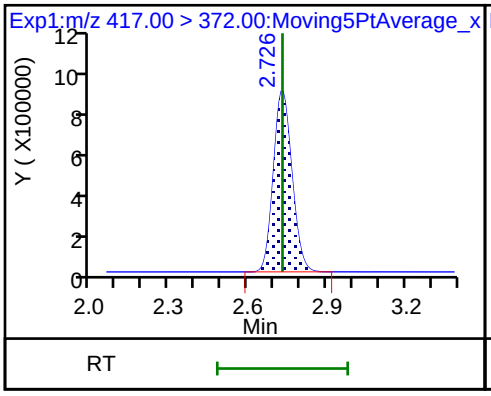
13 Sodium 1H,1H,2H,2H-perfluorooctane



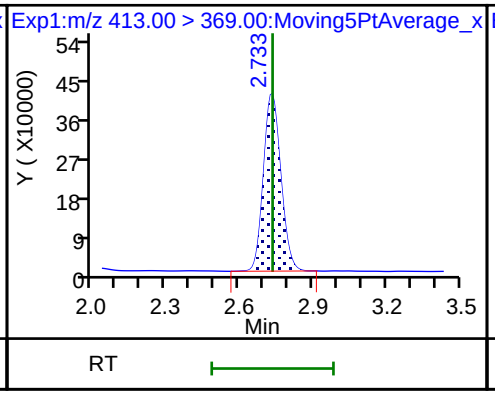
D 12 M2-6:2FTS



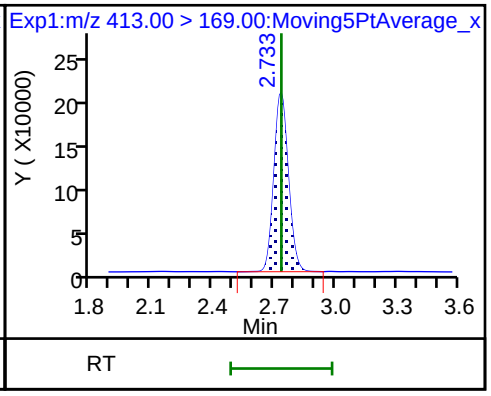
D 14 13C4 PFOA



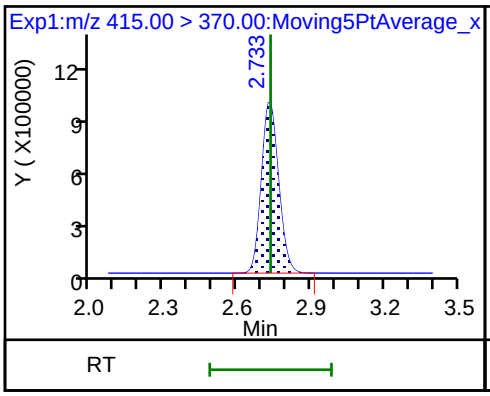
15 Perfluorooctanoic acid



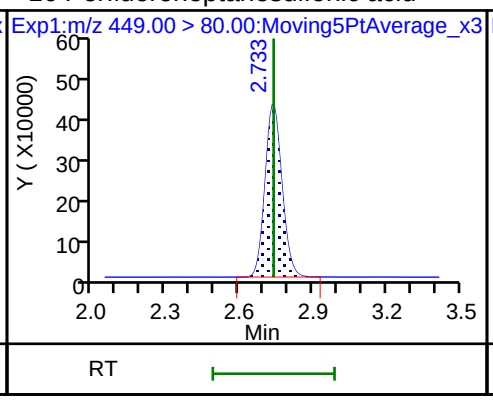
15 Perfluorooctanoic acid



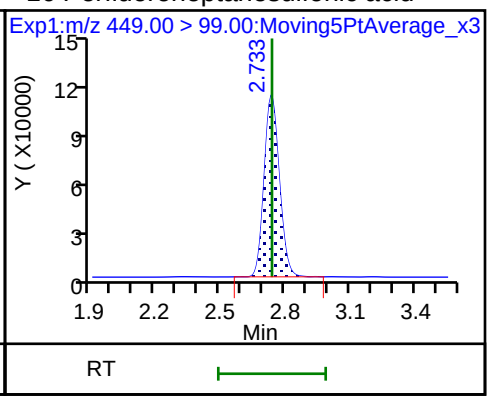
* 62 13C2-PFOA



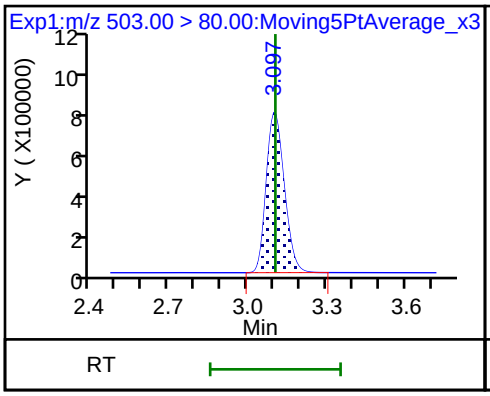
16 Perfluoroheptanesulfonic acid



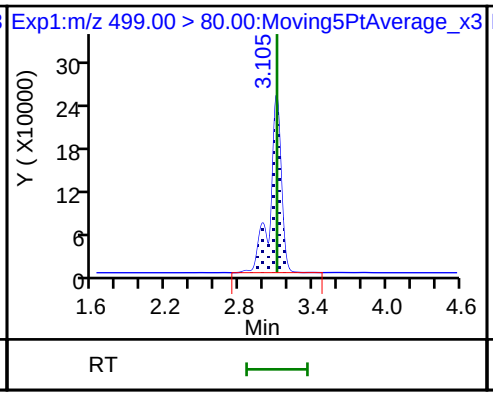
16 Perfluoroheptanesulfonic acid



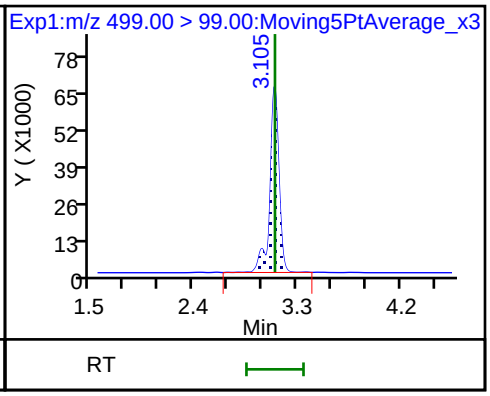
D 18 13C4 PFOS



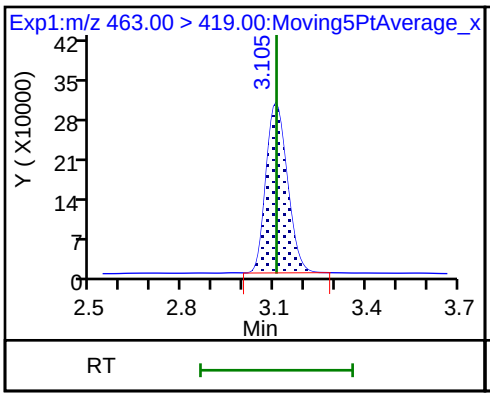
17 Perfluorooctane sulfonic acid



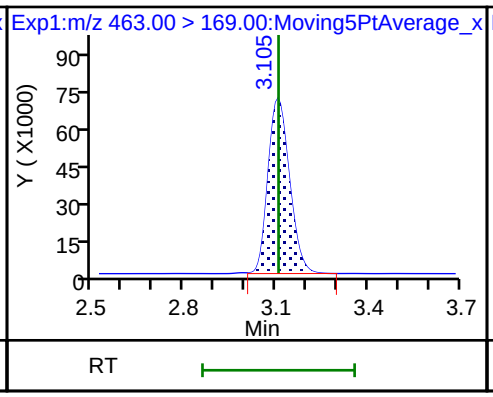
17 Perfluorooctane sulfonic acid



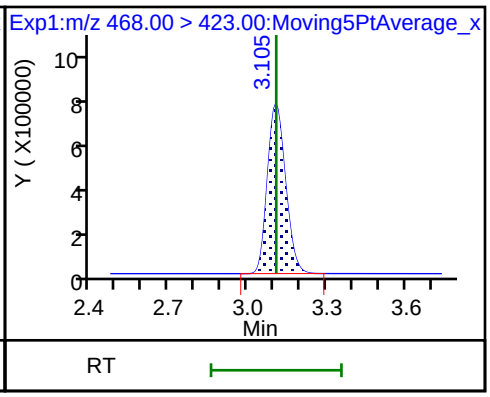
20 Perfluorononanoic acid



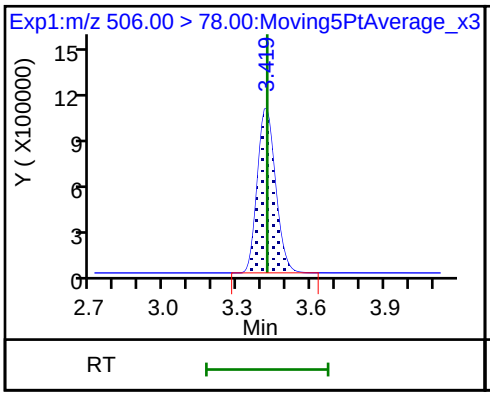
20 Perfluorononanoic acid



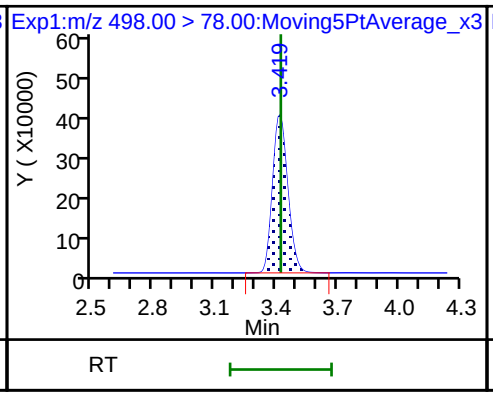
D 19 13C5 PFNA



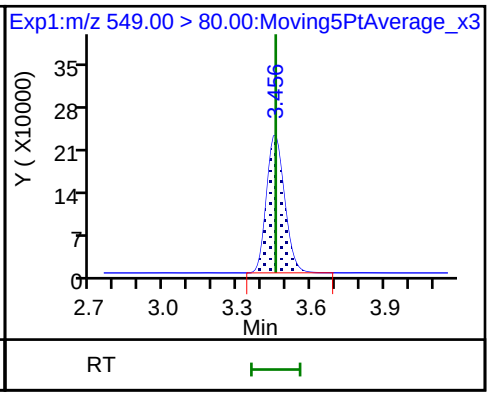
D 21 13C8 FOSA



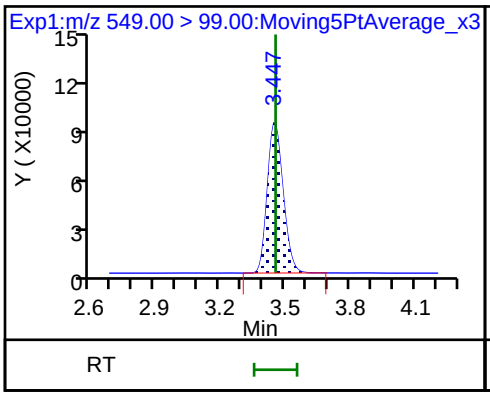
22 Perfluorooctane Sulfonamide



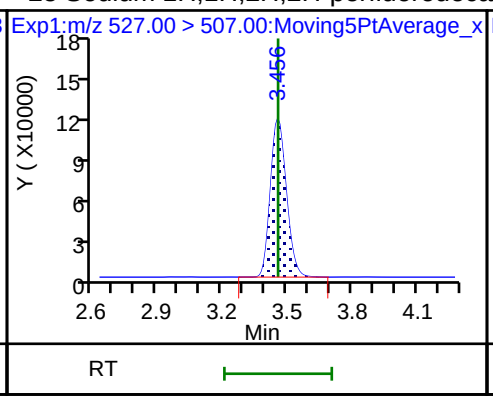
68 Perfluorononanesulfonic acid



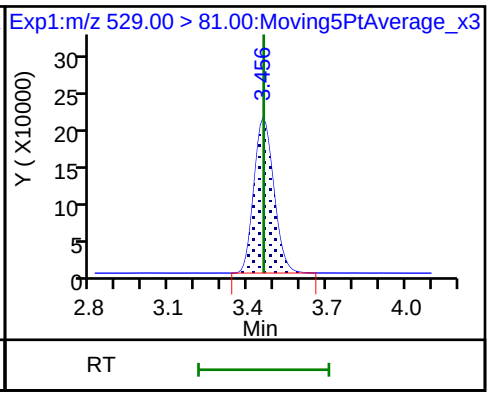
68 Perfluorononanesulfonic acid



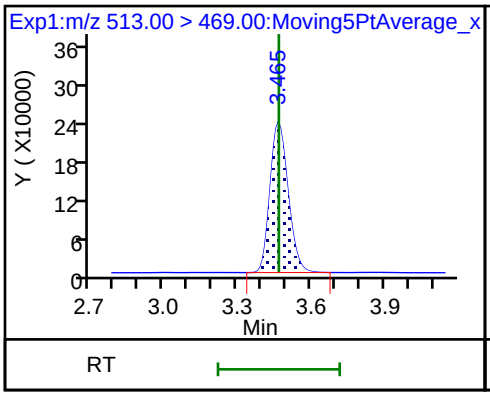
25 Sodium 1H,1H,2H,2H-perfluorodecan



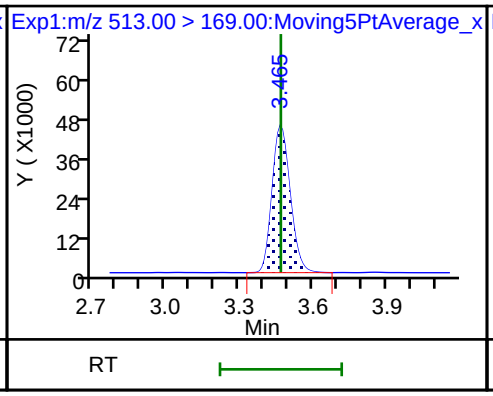
D 26 M2-8:2FTS



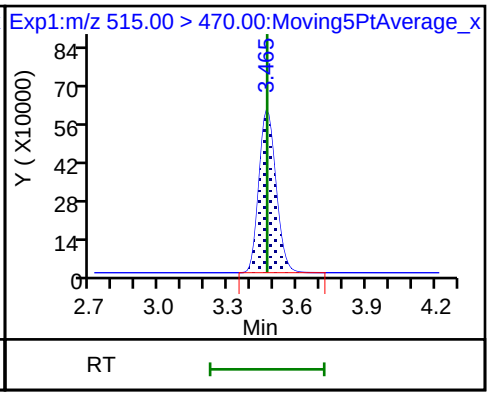
24 Perfluorodecanoic acid



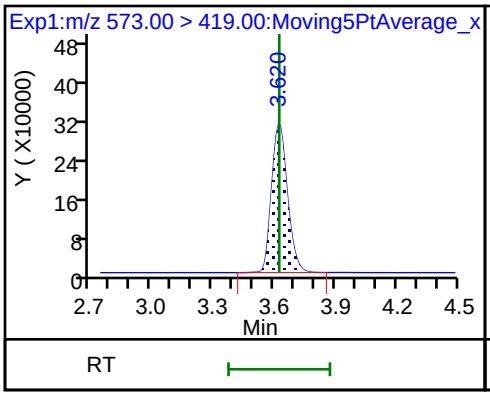
24 Perfluorodecanoic acid



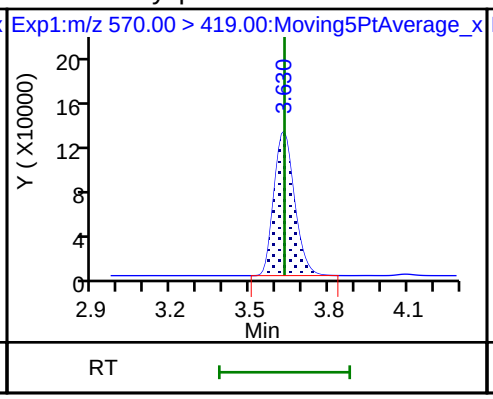
D 23 13C2 PFDA



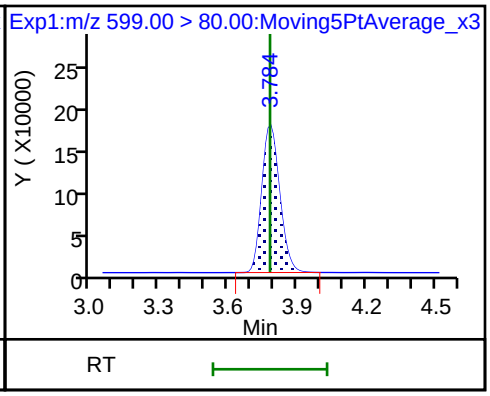
D 27 d3-NMeFOSAA



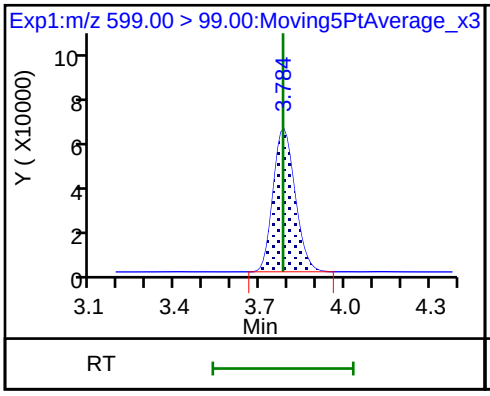
28 N-methyl perfluorooctane sulfonami



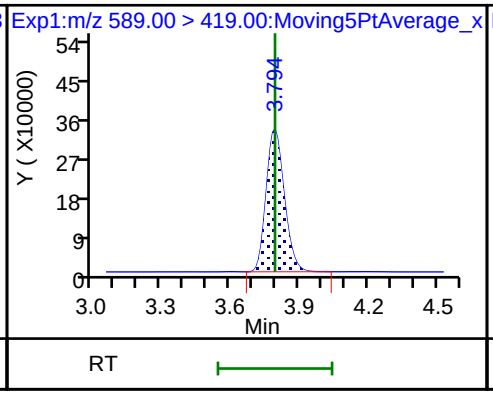
29 Perfluorodecane Sulfonic acid



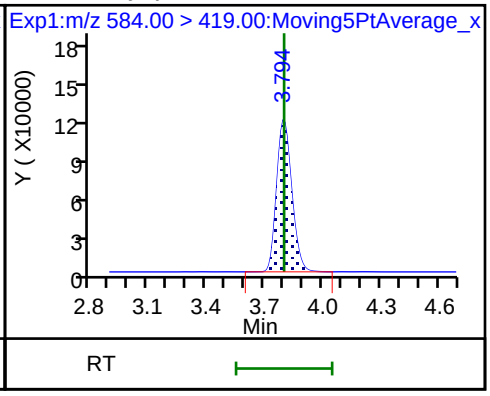
29 Perfluorodecane Sulfonic acid



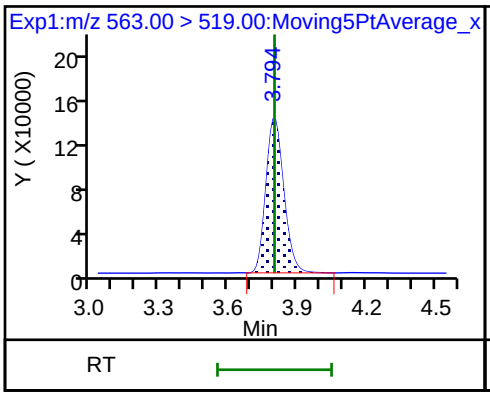
D 32 d5-NEtFOSAA



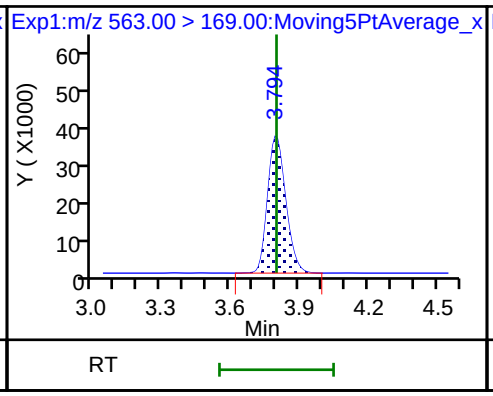
33 N-ethyl perfluorooctane sulfonamid



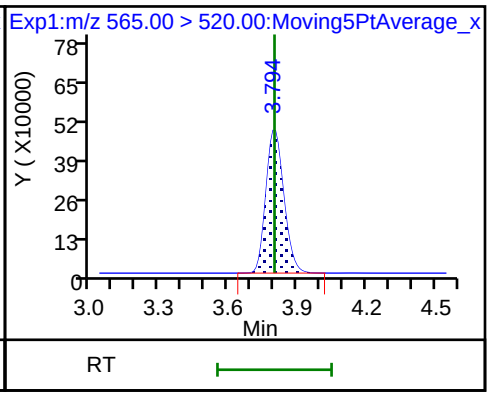
31 Perfluoroundecanoic acid



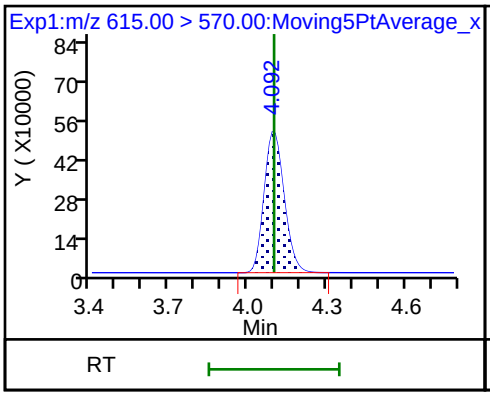
31 Perfluoroundecanoic acid



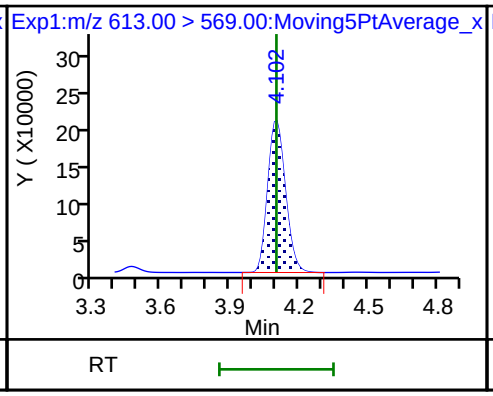
D 30 13C2 PFUnA



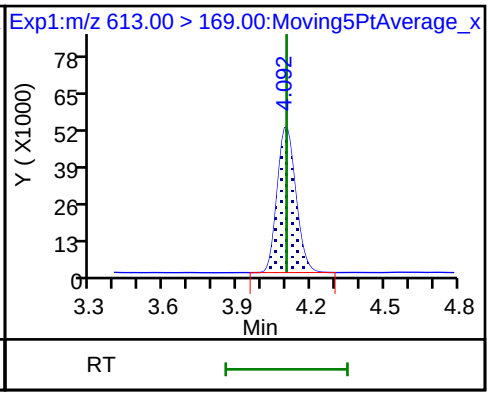
D 36 13C2 PFDoA



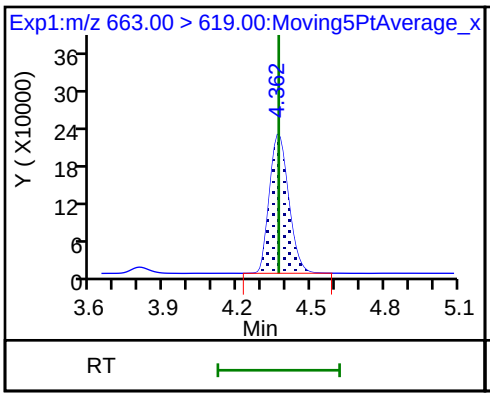
37 Perfluorododecanoic acid



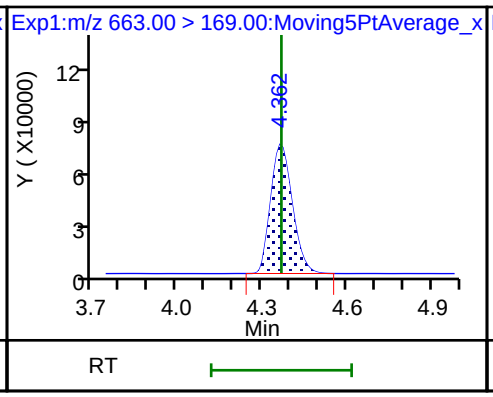
37 Perfluorododecanoic acid



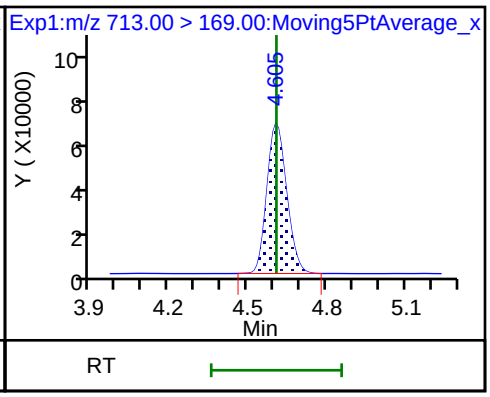
41 Perfluorotridecanoic acid



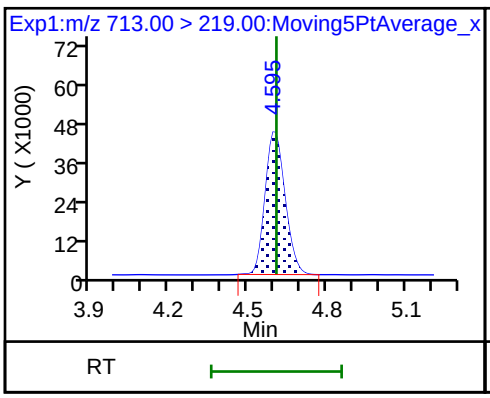
41 Perfluorotridecanoic acid



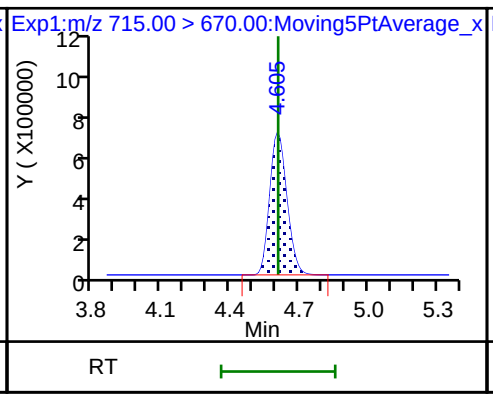
42 Perfluorotetradecanoic acid



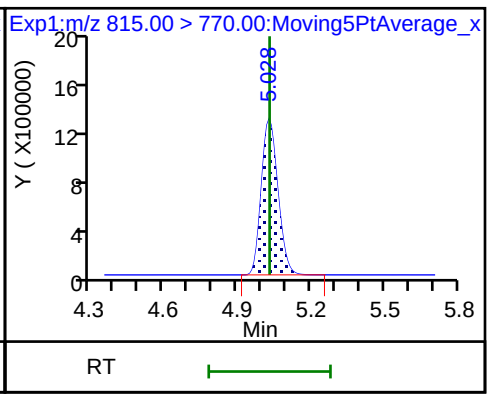
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_007.d
Lims ID: IC L6 Full
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 15-May-2018 15:52:36 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*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 16-May-2018 09:20:14 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK037

First Level Reviewer: hannigana Date: 16-May-2018 08:02:38

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.463	1.462	0.001	1.000	12934647	5.15		103	7697	
D 1 13C4 PFBA										
217.00 > 172.00	1.463	1.462	0.001	1.000	6751655	2.54		102	43716	
D 3 13C5-PFPeA										
267.90 > 223.00	1.747	1.744	0.003	0.563	4328345	2.54		102	61811	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.747	1.745	0.002	1.000	10150448	4.97		99.3	5494	
D 47 13C3-PFBS										
301.90 > 83.00	1.783	1.780	0.003	1.000	87185	2.27		97.4	537	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.783	1.783	0.0	1.000	13863265	4.73		107	62707	
298.90 > 99.00	1.783	1.783	0.0	1.000	5921678		2.34(1.25-3.74)	107	33570	
D 60 M2-4:2FTS										
329.00 > 81.00	2.003	1.999	0.004	1.000	667183	NC			8785	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	2.003	2.000	0.003	1.000	3112425	5.01		107	179105	
D 7 13C2 PFHxA										
315.00 > 270.00	2.037	2.037	0.0	1.000	4583820	2.52		101	77348	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.037	2.037	0.0	1.000	9544553	5.06		101	17429	
313.00 > 119.00	2.037	2.037	0.0	1.000	864980		11.03(5.03-15.10)	101	12137	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.060	2.059	0.001	1.000	13112812	5.03		107	135793	
349.00 > 99.00	2.060	2.059	0.001	1.000	4899363		2.68(1.36-4.07)	107	39200	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.139	2.134	0.005	1.000	229197	NC			4744	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.139	2.134	0.005	1.000	1471265	NC			11755	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.372	2.374	-0.002	1.000	9093863	4.98		99.7	11594	
363.00 > 169.00	2.372	2.374	-0.002	1.000	3608375		2.52(1.13-3.40)	99.7	18118	
D 9 13C4-PFHpA										
367.00 > 322.00	2.372	2.374	-0.002	1.000	4318388	2.48		99.3	70096	
D 11 18O2 PFHxS										
403.00 > 84.00	2.385	2.386	-0.001	1.000	5191664	2.41		102	44906	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.385	2.386	-0.001	1.000	10650638	4.31		94.6	33451	
399.00 > 99.00	2.385	2.386	-0.001	1.000	3614555		2.95(1.50-4.49)	94.6	11846	
65 Adona										
377.00 > 251.00	2.418	2.418	0.0	1.000	25273614	NC			98920	
377.00 > 85.00	2.418	2.418	0.0	1.000	15668730		1.61(0.84-2.53)		80776	
D 12 M2-6:2FTS										
429.00 > 81.00	2.705	2.707	-0.002	1.000	867962	2.26		95.2	14854	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.705	2.707	-0.002	1.000	3021313	4.70		99.2	17776	
D 14 13C4 PFOA										
417.00 > 372.00	2.728	2.731	-0.003	1.000	4079623	2.48		99.2	69266	
* 62 13C2-PFOA										
415.00 > 370.00	2.736	2.734	0.002		4344720	2.50			52764	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.736	2.734	0.002	1.003	9649258	5.02		100	3647	
413.00 > 169.00	2.728	2.734	-0.006	1.000	4988335		1.93(0.84-2.52)	100	15918	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.736	2.739	-0.003	1.000	9775395	4.98		105	59538	
449.00 > 99.00	2.736	2.739	-0.003	1.000	2650153		3.69(1.94-5.82)	105	23801	
D 18 13C4 PFOS										
503.00 > 80.00	3.100	3.104	-0.004	1.000	3520558	2.38		99.7	21492	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.100	3.105	-0.005	1.000	7964833	4.60		99.1	40574	
499.00 > 99.00	3.100	3.105	-0.005	1.000	1714762		4.64(2.31-6.93)	99.1	16094	
D 19 13C5 PFNA										
468.00 > 423.00	3.100	3.107	-0.007	1.000	3359491	2.50		99.8	58281	
20 Perfluorononanoic acid										
463.00 > 419.00	3.100	3.107	-0.007	1.000	7125949	5.01		100	9626	
463.00 > 169.00	3.100	3.107	-0.007	1.000	1697389		4.20(1.90-5.69)	100	38936	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.310	3.316	-0.006	1.000	13260701	NC			75928	
D 21 13C8 FOSA										
506.00 > 78.00	3.415	3.420	-0.005	1.000	4976852	2.57		103	44899	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.415	3.422	-0.007	1.000	10364812	5.35		107	72768	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.452	3.455	-0.003	1.000	5665707	5.08		106	58348	
549.00 > 99.00	3.452	3.455	-0.003	1.000	2073279		2.73(1.33-3.97)	106	26932	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.452	3.458	-0.006	1.000	2834764	5.17		108	68462	
D 26 M2-8:2FTS										
529.00 > 81.00	3.452	3.459	-0.007	1.000	972368	2.23		92.9	15318	
D 23 13C2 PFDA										
515.00 > 470.00	3.462	3.468	-0.006	1.000	2812041	2.46		98.3	45289	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.462	3.468	-0.006	1.000	5744357	5.25		105	23436	
513.00 > 169.00	3.462	3.468	-0.006	1.000	1030600		5.57(2.36-7.09)	105	28166	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.618	3.624	-0.006	1.000	1561125	2.47		98.9	24281	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.628	3.631	-0.003	1.003	3278986	5.17		103	22410	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.772	3.781	-0.009	1.000	5009746	5.07		105	48361	
599.00 > 99.00	3.772	3.781	-0.009	1.000	1665176		3.01(1.39-4.16)	105	27808	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.783	3.794	-0.011	1.000	1507014	2.33		93.0	7190	
D 30 13C2 PFUnA										
565.00 > 520.00	3.794	3.800	-0.006	1.000	2262574	2.50		99.8	34652	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.794	3.800	-0.006	1.000	3717634	4.92		98.4	15246	
563.00 > 169.00	3.794	3.800	-0.006	1.000	938877		3.96(2.12-6.36)	98.4	21508	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.794	3.800	-0.006	1.003	3130989	5.53		111	62545	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.952	3.958	-0.006	1.000	20326205	NC			133460	
D 36 13C2 PFDoA										
615.00 > 570.00	4.097	4.099	-0.002	1.000	2544838	2.61		104	17180	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.097	4.100	-0.003	1.000	5307128	5.00		99.9	4236	
613.00 > 169.00	4.097	4.100	-0.003	1.000	1355731		3.91(2.13-6.40)	99.9	14317	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.360	4.368	-0.008	1.000	5890114	5.06		101	3241	
663.00 > 169.00	4.360	4.368	-0.008	1.000	1785642		3.30(1.25-3.76)	101	15812	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.604	4.608	-0.004	1.000	3113223	2.60		104	13682	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.604	4.608	-0.004	1.000	1571970	5.00		100.0	14331	
713.00 > 219.00	4.593	4.608	-0.015	0.998	1080602		1.45(0.71-2.13)	100.0	15785	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.027	5.030	-0.003	1.000	5054291	2.49		99.5	12467	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.027	5.031	-0.004	1.000	9889936	NC			2174	
813.00 > 169.00	5.027	5.031	-0.004	1.000	1647631		6.00(2.86-8.58)		8949	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.402	5.408	-0.006	1.000	10791279	NC			1744	
913.00 > 169.00	5.402	5.408	-0.006	1.000	1312233		8.22(3.83-11.48)		6453	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL6_00005 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:20:16 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_007.d

Injection Date: 15-May-2018 15:52:36 Instrument ID: A8_N

Lims ID: IC L6 Full

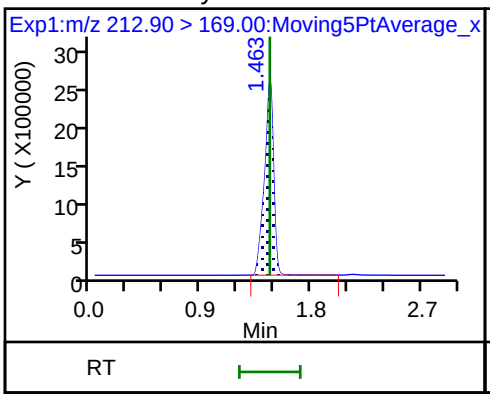
Client ID:

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

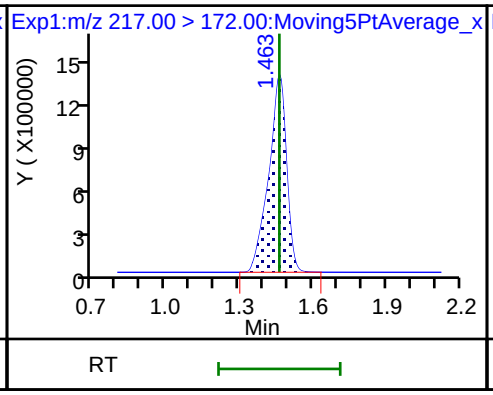
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

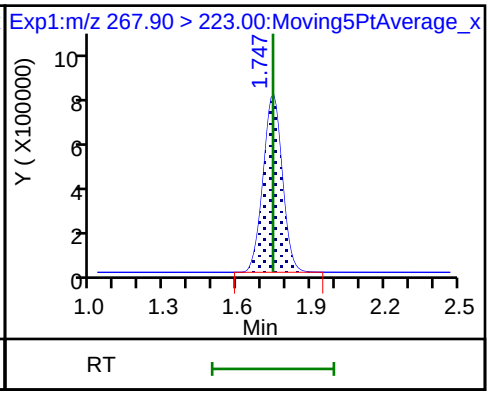
2 Perfluorobutyric acid



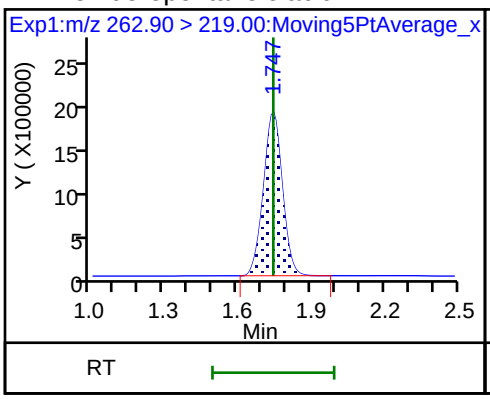
D 1 13C4 PFBA



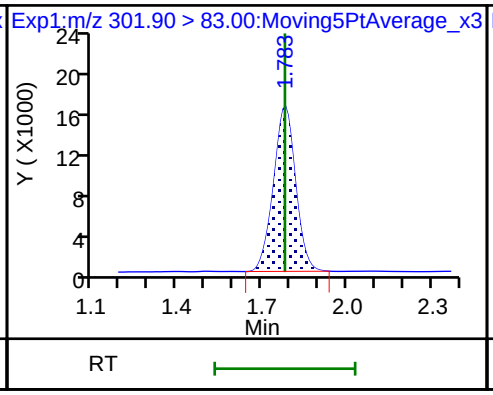
D 3 13C5-PFPeA



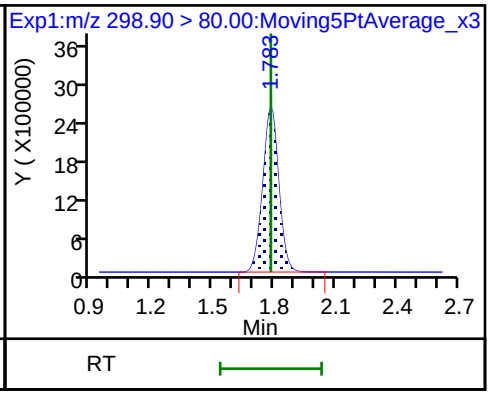
4 Perfluoropentanoic acid



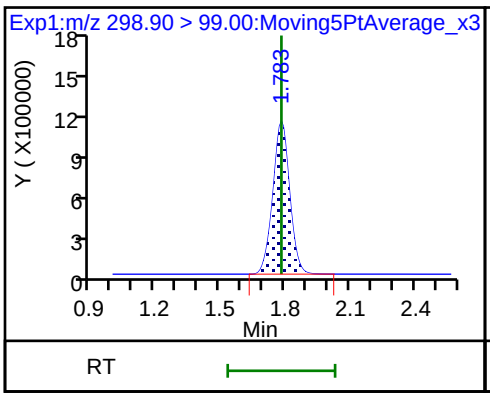
D 47 13C3-PFBS



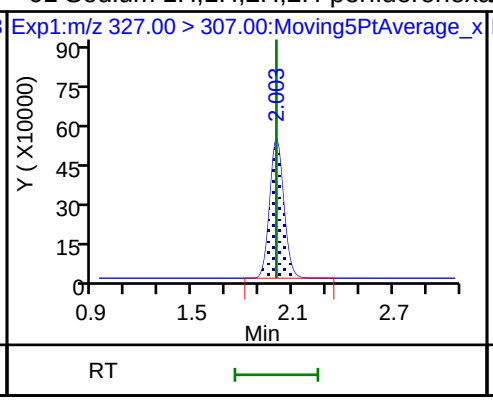
5 Perfluorobutanesulfonic acid



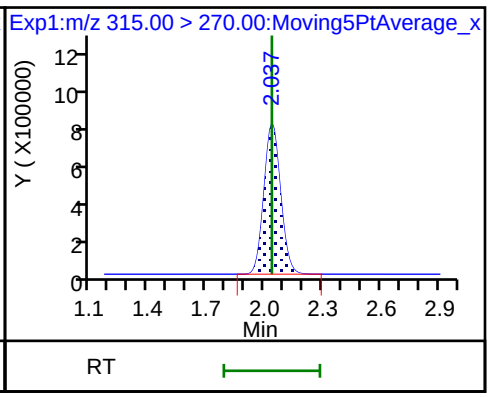
5 Perfluorobutanesulfonic acid



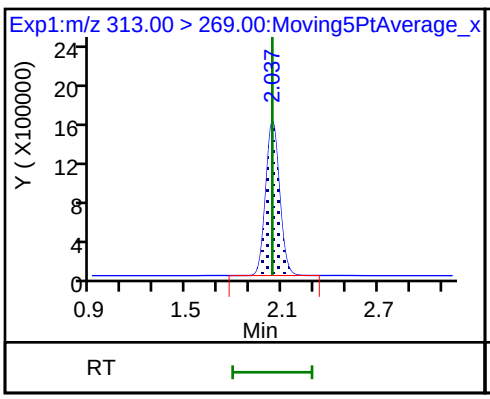
61 Sodium 1H,1H,2H,2H-perfluorohexa



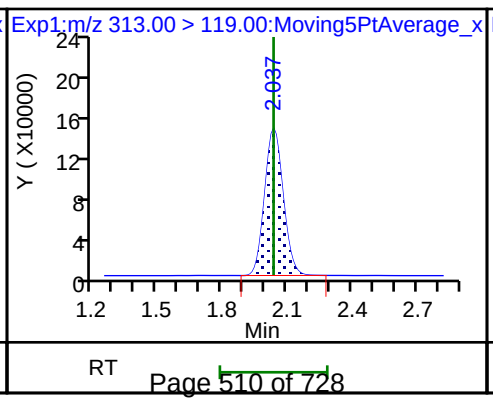
D 7 13C2 PFHxA



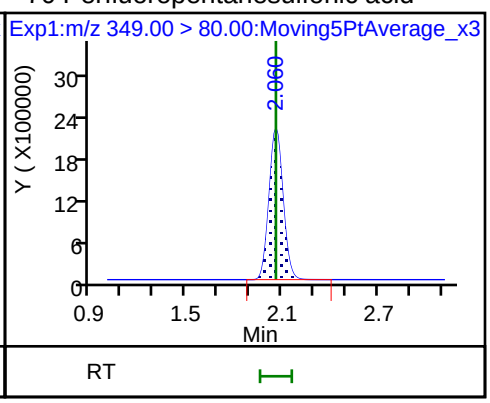
6 Perfluorohexanoic acid



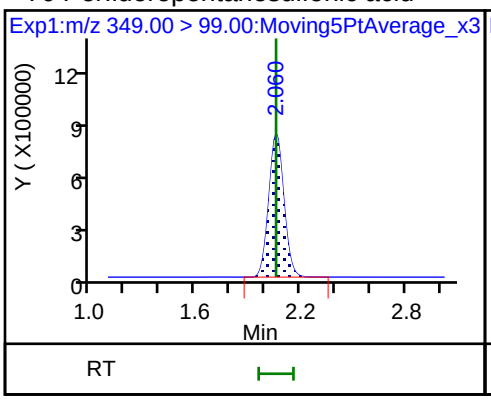
6 Perfluorohexanoic acid



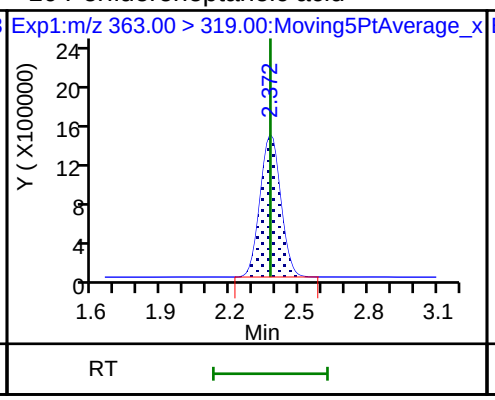
70 Perfluoropentanesulfonic acid



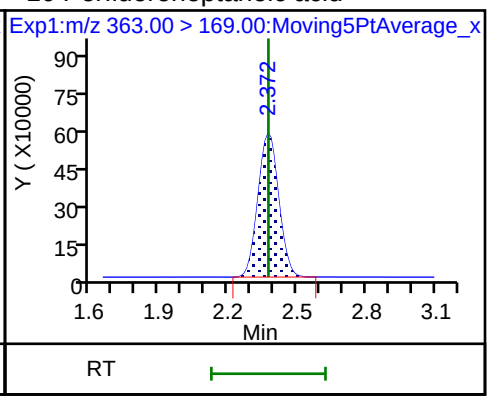
70 Perfluoropentanesulfonic acid



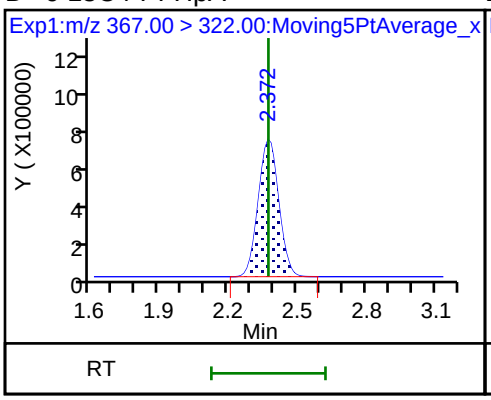
10 Perfluoroheptanoic acid



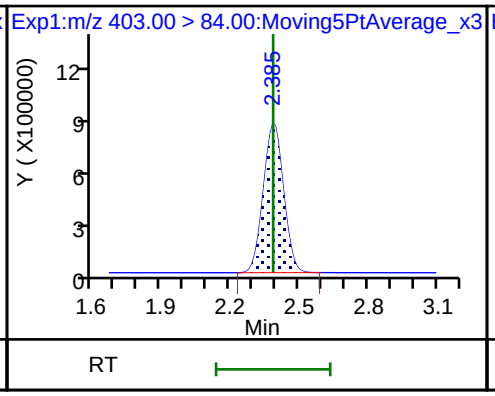
10 Perfluoroheptanoic acid



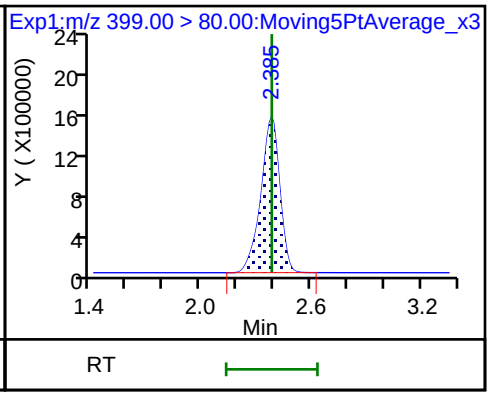
D 9 13C4-PFHpA



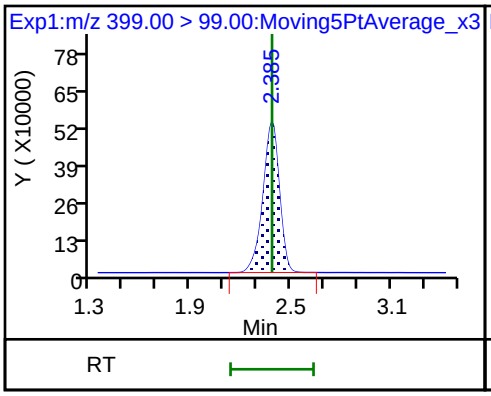
D 11 18O2 PFHxS



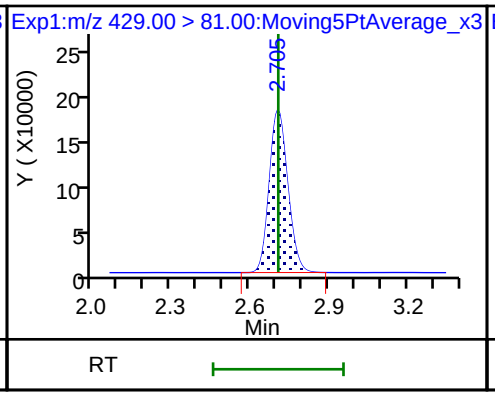
8 Perfluorohexanesulfonic acid



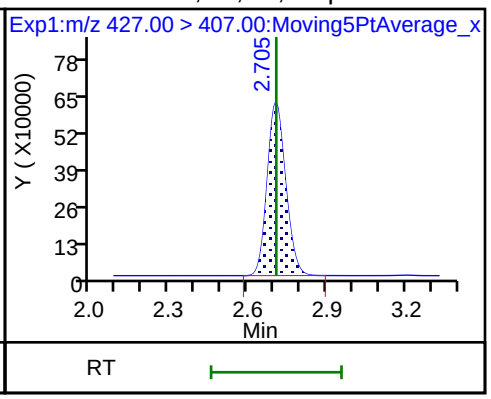
8 Perfluorohexanesulfonic acid



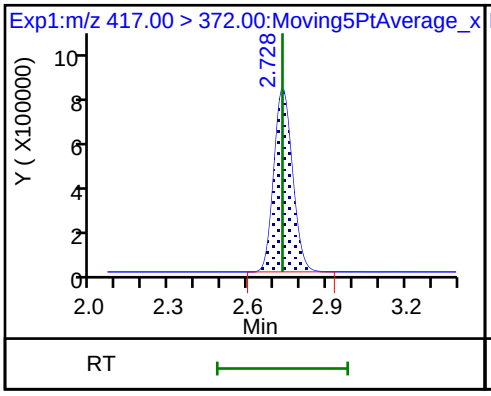
D 12 M2-6:2FTS



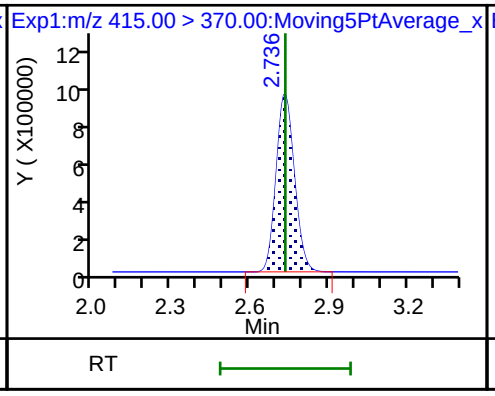
13 Sodium 1H,1H,2H,2H-perfluorooctane



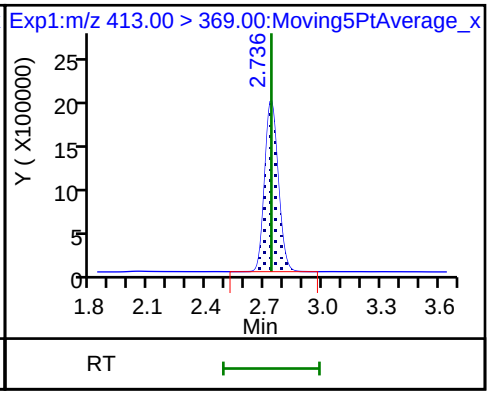
D 14 13C4 PFOA



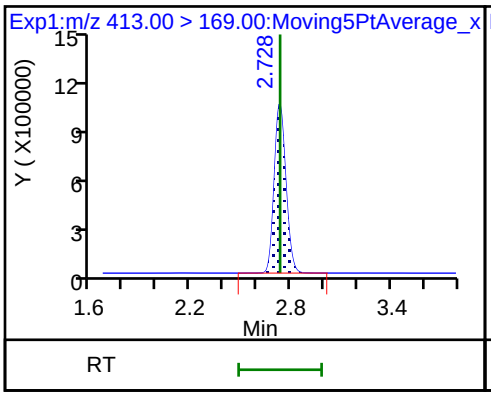
* 62 13C2-PFOA



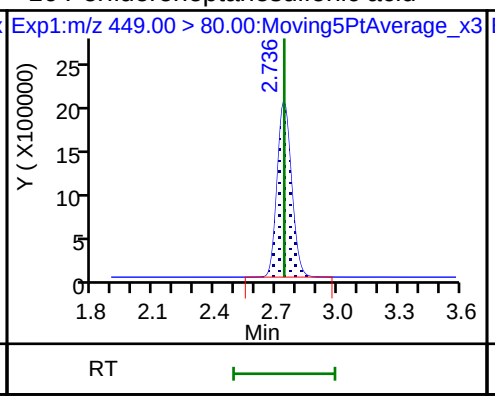
15 Perfluorooctanoic acid



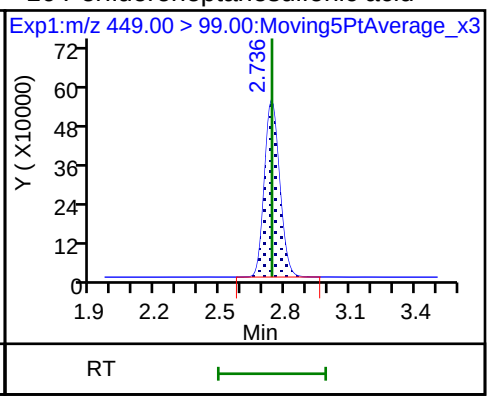
15 Perfluorooctanoic acid



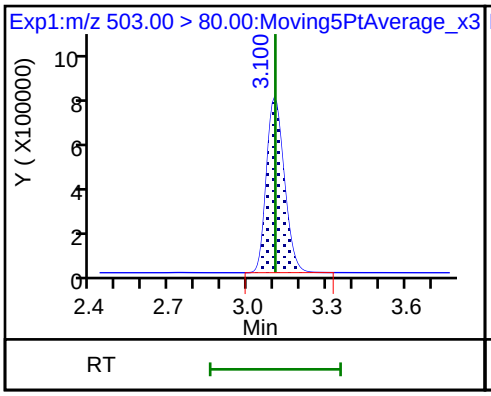
16 Perfluoroheptanesulfonic acid



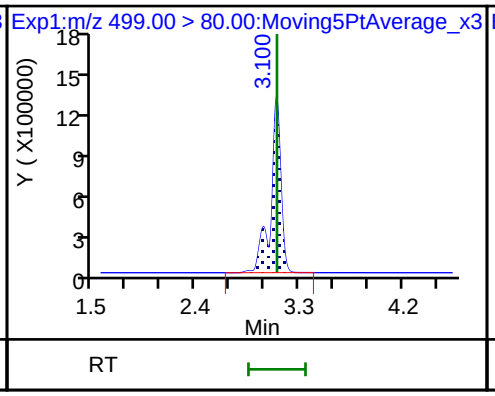
16 Perfluoroheptanesulfonic acid



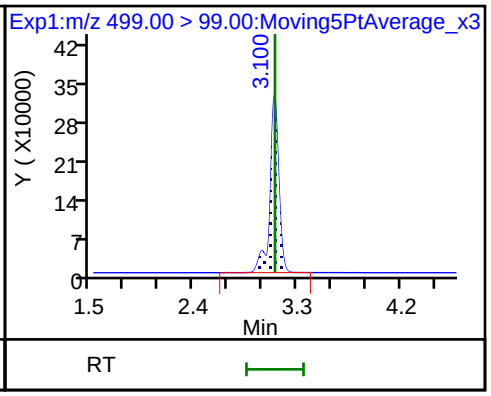
D 18 13C4 PFOS



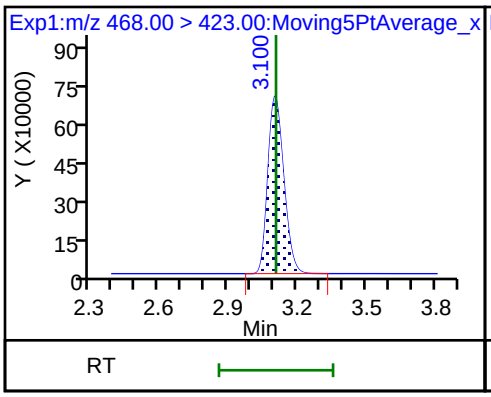
17 Perfluorooctane sulfonic acid



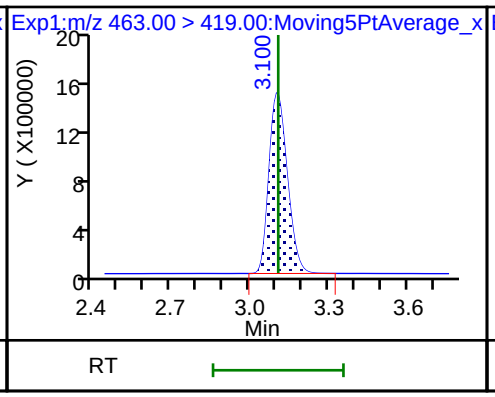
17 Perfluorooctane sulfonic acid



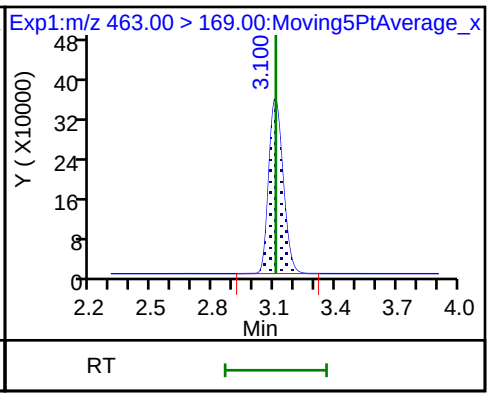
D 19 13C5 PFNA



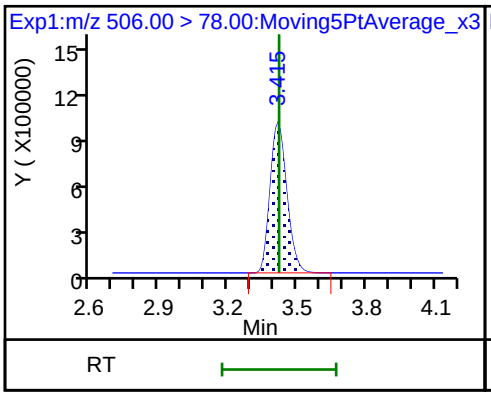
20 Perfluorononanoic acid



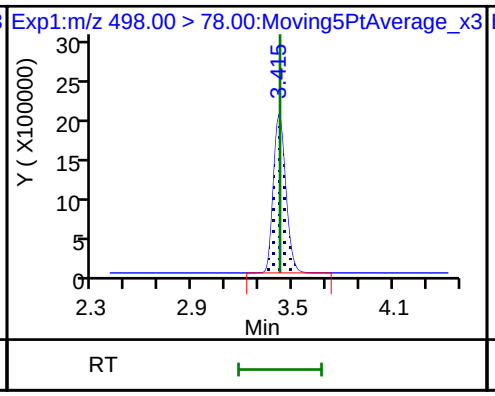
20 Perfluorononanoic acid



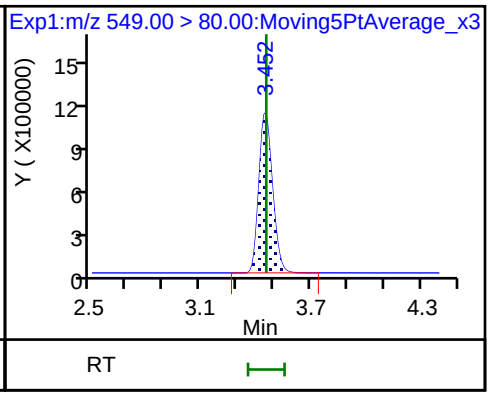
D 21 13C8 FOSA



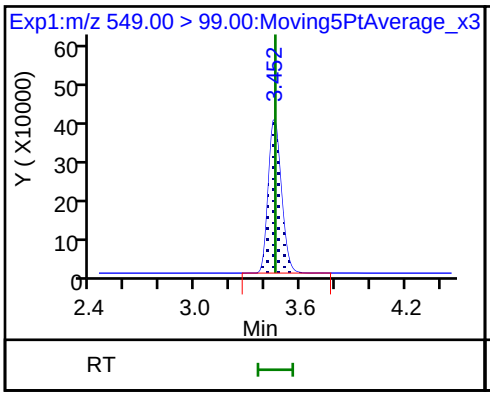
22 Perfluorooctane Sulfonamide



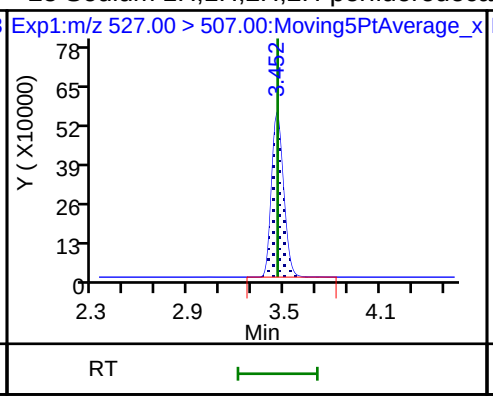
68 Perfluorononanesulfonic acid



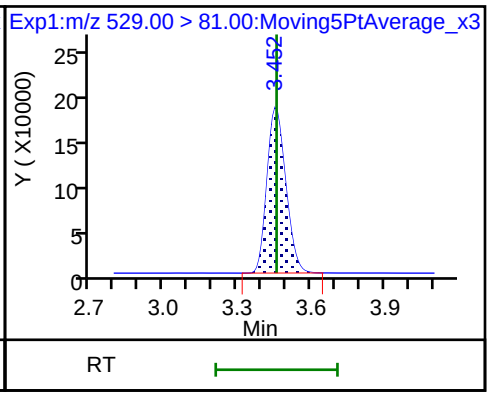
68 Perfluorononanesulfonic acid



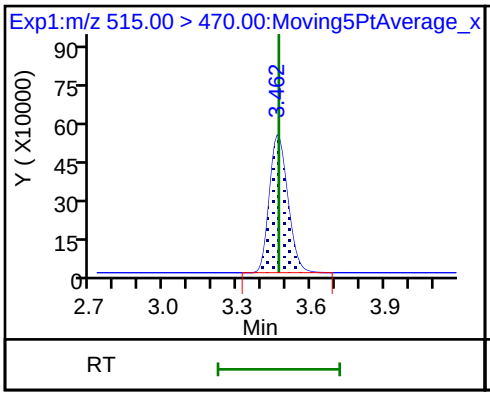
25 Sodium 1H,1H,2H,2H-perfluorodecan



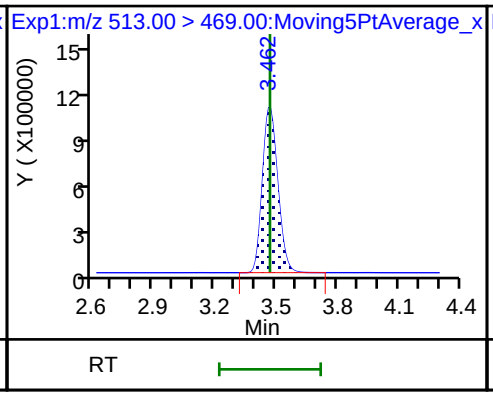
D 26 M2-8:2FTS



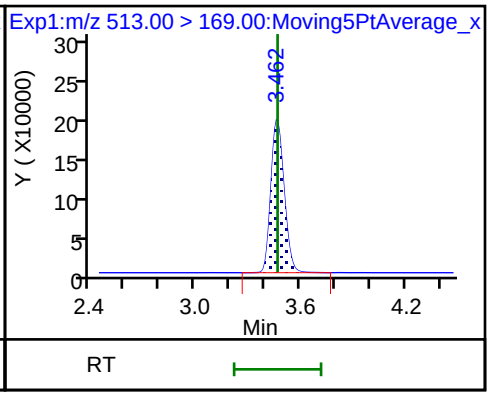
D 23 13C2 PFDA



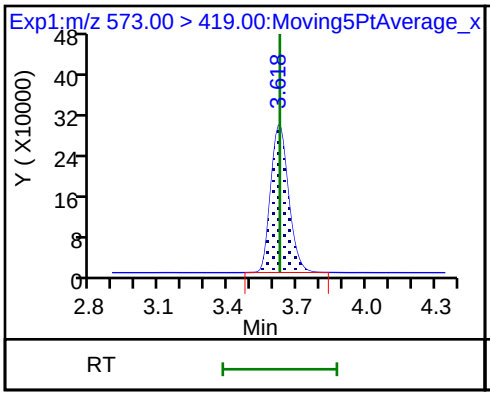
24 Perfluorodecanoic acid



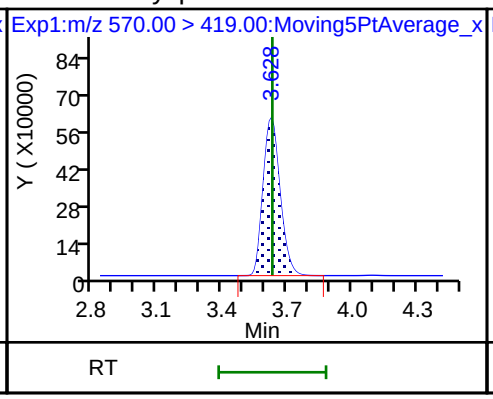
24 Perfluorodecanoic acid



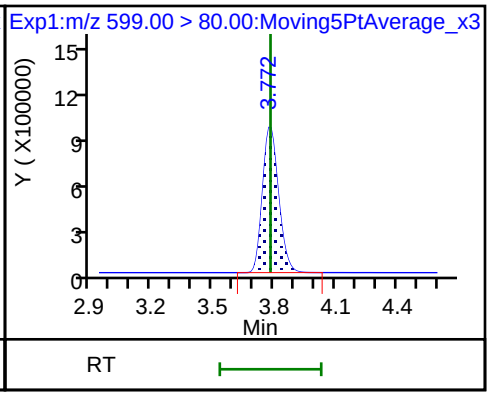
D 27 d3-NMeFOSAA



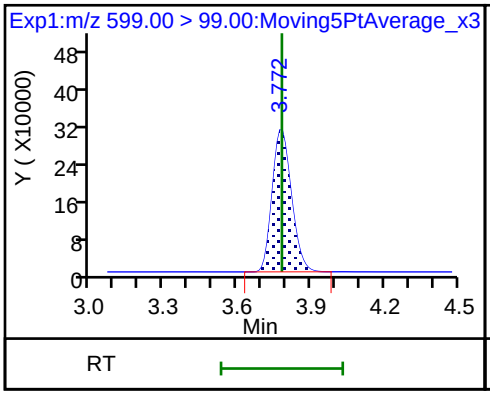
28 N-methyl perfluorooctane sulfonami



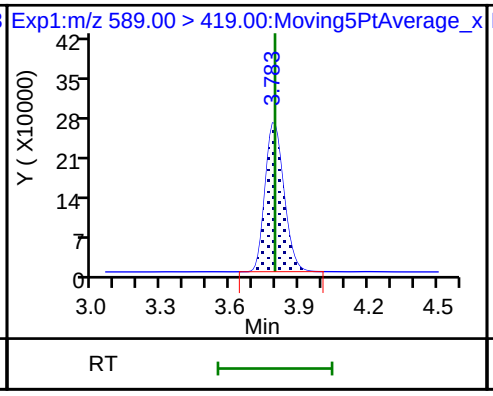
29 Perfluorodecane Sulfonic acid



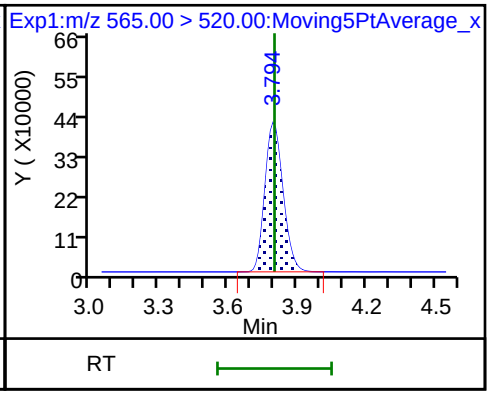
29 Perfluorodecane Sulfonic acid



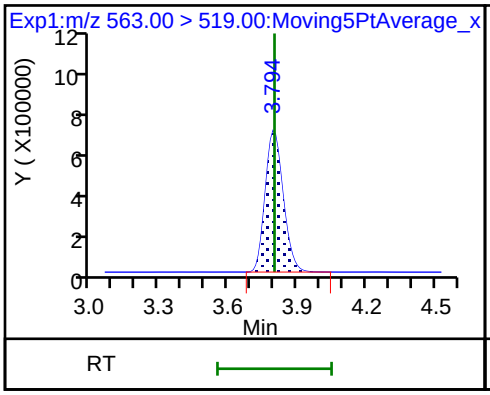
D 32 d5-NEtFOSAA



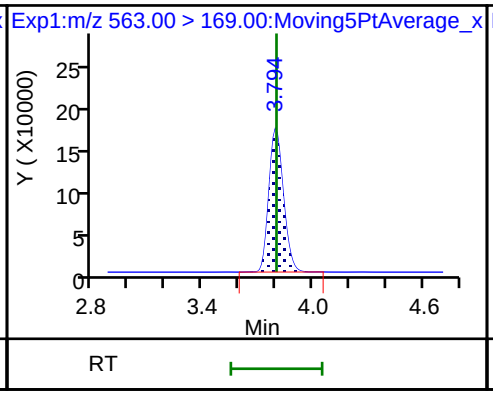
D 30 13C2 PFUnA



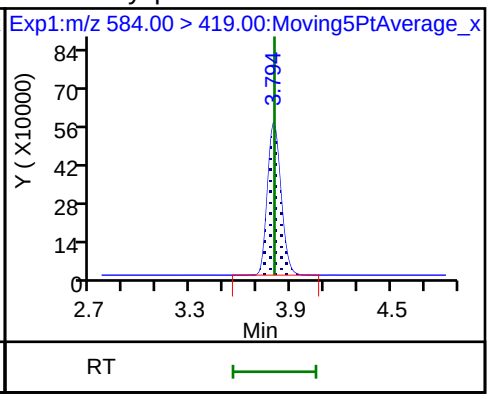
31 Perfluoroundecanoic acid



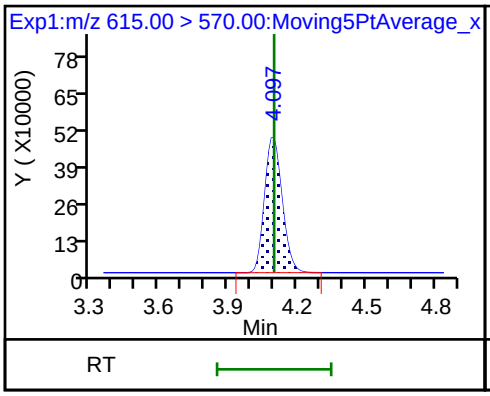
31 Perfluoroundecanoic acid



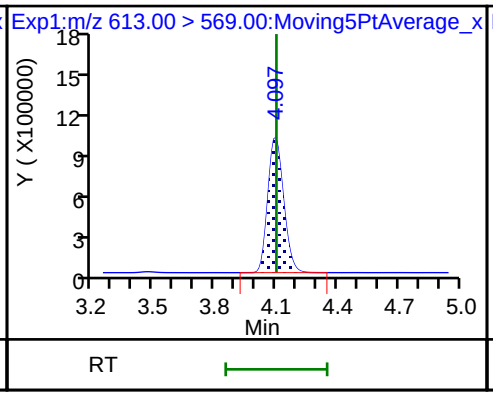
33 N-ethyl perfluorooctane sulfonamid



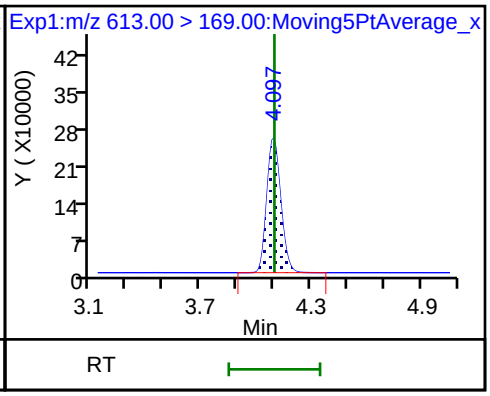
D 36 13C2 PFDoA



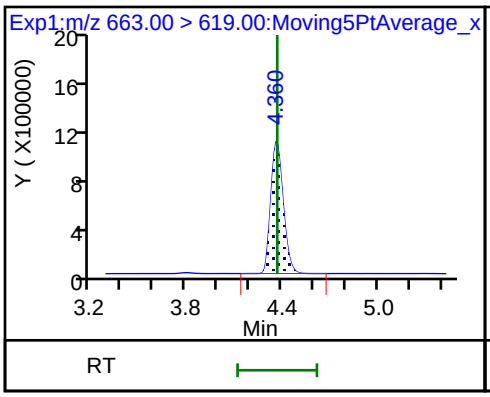
37 Perfluorododecanoic acid



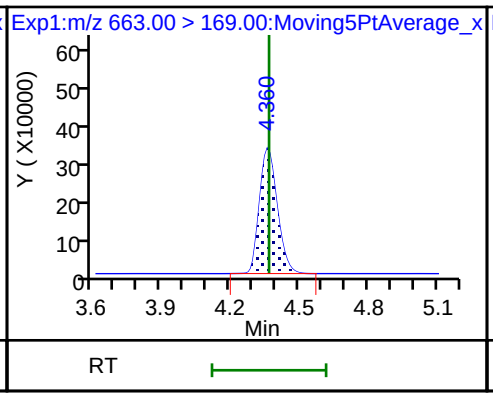
37 Perfluorododecanoic acid



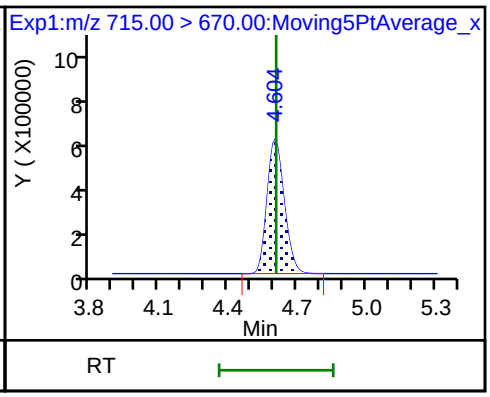
41 Perfluorotridecanoic acid



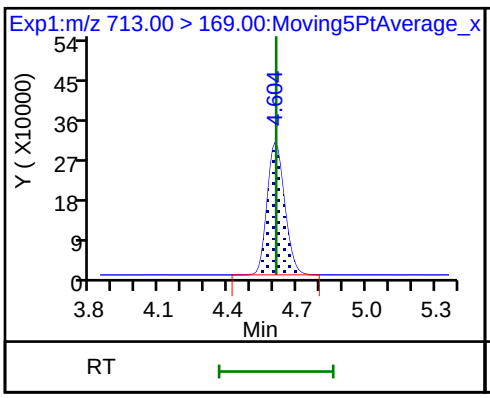
41 Perfluorotridecanoic acid



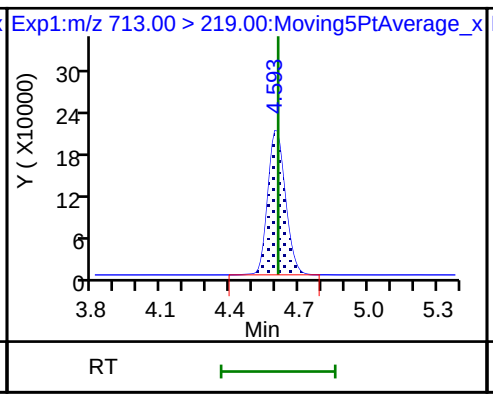
D 43 13C2-PFTeDA



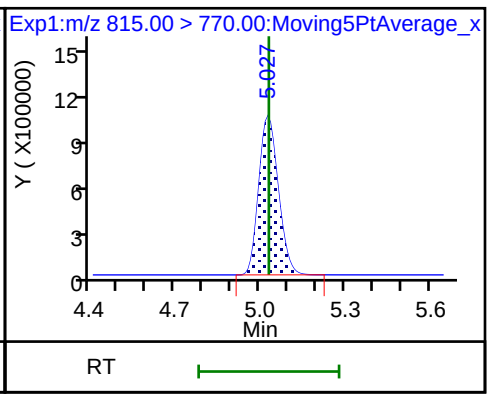
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_008.d
Lims ID: IC L7 Full
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 15-May-2018 16:00:25 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*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 16-May-2018 09:20:17 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK037

First Level Reviewer: hannigana Date: 16-May-2018 08:03:15

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	1.463	1.462	0.001	1.000	7496989	2.56		102	45156	
2 Perfluorobutyric acid										
212.90 > 169.00	1.463	1.462	0.001	1.000	26861072	9.63		96.3	10837	
D 3 13C5-PFPeA										
267.90 > 223.00	1.747	1.744	0.003	0.563	4657025	2.48		99.2	88540	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.747	1.745	0.002	1.000	21497034	9.78		97.8	12049	
D 47 13C3-PFBS										
301.90 > 83.00	1.783	1.780	0.003	1.000	99131	2.34		100	680	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.783	1.783	0.0	1.000	28014178	8.41		95.2	105824	
298.90 > 99.00	1.783	1.783	0.0	1.000	12761331		2.20(1.25-3.74)	95.2	86489	
D 60 M2-4:2FTS										
329.00 > 81.00	1.991	1.999	-0.008	1.000	711767	NC			9363	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.991	2.000	-0.009	1.000	6341030	8.97		96.1	269024	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.037	2.037	0.0	1.000	20297289	10.5		105	27327	
313.00 > 119.00	2.037	2.037	0.0	1.000	1901738		10.67(5.03-15.10)	105	32214	
D 7 13C2 PFHxA										
315.00 > 270.00	2.037	2.037	0.0	1.000	4709249	2.35		94.0	113102	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.059	2.059	0.0	1.000	25577332	8.63		92.0	129323	
349.00 > 99.00	2.059	2.059	0.0	1.000	10408450		2.46(1.36-4.07)	92.0	84074	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.138	2.134	0.004	1.005	3404733	NC			25152	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.127	2.134	-0.007	1.000	259760	NC			4872	
D 9 13C4-PFHpA										
367.00 > 322.00	2.372	2.374	-0.002	1.000	4521122	2.36		94.2	103832	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.372	2.374	-0.002	1.000	18928350	9.91		99.1	24502	
363.00 > 169.00	2.372	2.374	-0.002	1.000	7698081		2.46(1.13-3.40)	99.1	38789	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.384	2.386	-0.002	1.000	22174743	8.73		95.9	50739	
399.00 > 99.00	2.384	2.386	-0.002	1.000	7625236		2.91(1.50-4.49)	95.9	19325	
D 11 18O2 PFHxS										
403.00 > 84.00	2.384	2.386	-0.002	1.000	5333305	2.25		95.1	51552	
65 Adona										
377.00 > 251.00	2.418	2.418	0.0	1.000	45699176	NC			247060	
377.00 > 85.00	2.418	2.418	0.0	1.000	30434458		1.50(0.84-2.53)		136808	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.704	2.707	-0.003	1.000	6574970	9.73		103	33349	
D 12 M2-6:2FTS										
429.00 > 81.00	2.704	2.707	-0.003	1.000	913641	2.16		90.8	12419	
D 14 13C4 PFOA										
417.00 > 372.00	2.727	2.731	-0.004	1.000	4465836	2.46		98.4	66165	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.727	2.734	-0.007	1.000	19682065	9.36		93.6	6951	
413.00 > 169.00	2.727	2.734	-0.007	1.000	10699568		1.84(0.84-2.52)	93.6	26447	
* 62 13C2-PFOA										
415.00 > 370.00	2.727	2.734	-0.007		4792823	2.50			55635	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.735	2.739	-0.004	1.000	19707477	9.22		96.8	154276	
449.00 > 99.00	2.735	2.739	-0.004	1.000	5631991		3.50(1.94-5.82)	96.8	51101	
D 18 13C4 PFOS										
503.00 > 80.00	3.102	3.104	-0.002	1.000	3835347	2.35		98.4	14077	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.102	3.105	-0.003	1.000	16474463	8.73		94.1	62171	
499.00 > 99.00	3.102	3.105	-0.003	1.000	3644418		4.52(2.31-6.93)	94.1	38943	
20 Perfluorononanoic acid										
463.00 > 419.00	3.102	3.107	-0.005	1.000	15430529	10.3		103	35152	
463.00 > 169.00	3.102	3.107	-0.005	1.000	3742679		4.12(1.90-5.69)	103	86988	
D 19 13C5 PFNA										
468.00 > 423.00	3.102	3.107	-0.005	1.000	3539647	2.38		95.4	67016	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.313	3.316	-0.003	1.000	27038736	NC			151536	
D 21 13C8 FOSA										
506.00 > 78.00	3.419	3.420	-0.001	1.000	5353791	2.51		100	42855	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.419	3.422	-0.003	1.000	20311842	9.74		97.4	92159	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.447	3.455	-0.008	1.000	11982938	9.86		103	129081	
549.00 > 99.00	3.447	3.455	-0.008	1.000	4517536		2.65(1.33-3.97)	103	36734	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.456	3.458	-0.002	1.000	5636776	9.03		94.3	96836	
D 26 M2-8:2FTS										
529.00 > 81.00	3.456	3.459	-0.003	1.000	1107332	2.30		95.9	17230	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.465	3.468	-0.003	1.000	12079263	10.0		100	50962	
513.00 > 169.00	3.465	3.468	-0.003	1.000	2195345		5.50(2.36-7.09)	100	53198	
D 23 13C2 PFDA										
515.00 > 470.00	3.465	3.468	-0.003	1.000	3099083	2.45		98.2	75403	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.621	3.624	-0.003	1.000	1836867	2.64		105	26085	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.631	3.631	0.0	1.003	7460336	10.0		100	34337	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.776	3.781	-0.005	1.000	10184141	9.45		98.0	62249	
599.00 > 99.00	3.776	3.781	-0.005	1.000	3433819		2.97(1.39-4.16)	98.0	52416	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.787	3.794	-0.007	1.000	1619647	2.27		90.6	6610	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.797	3.800	-0.003	1.003	6246594	10.3		103	48696	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.797	3.800	-0.003	1.000	8334466	10.9		109	30519	
563.00 > 169.00	3.797	3.800	-0.003	1.000	2023681		4.12(2.12-6.36)	109	46537	
D 30 13C2 PFUnA										
565.00 > 520.00	3.797	3.800	-0.003	1.000	2282286	2.28		91.3	46508	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.956	3.958	-0.002	1.000	37717270	NC			230708	
D 36 13C2 PFDoA										
615.00 > 570.00	4.092	4.099	-0.007	1.000	2747572	2.55		102	16845	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.092	4.100	-0.008	1.000	11301274	9.85		98.5	8337	
613.00 > 169.00	4.092	4.100	-0.008	1.000	2859090		3.95(2.13-6.40)	98.5	24321	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.369	4.368	0.001	1.000	12033356	9.57		95.7	5602	
663.00 > 169.00	4.369	4.368	0.001	1.000	3833274		3.14(1.25-3.76)	95.7	21634	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.602	4.608	-0.006	1.000	3455816	10.5		105	20553	
713.00 > 219.00	4.602	4.608	-0.006	1.000	2590223		1.33(0.71-2.13)	105	24606	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.602	4.608	-0.006	1.000	3267831	2.47		98.9	13292	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.026	5.030	-0.004	1.000	6039184	2.69		108	15019	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.026	5.031	-0.005	1.000	20254827	NC			4013	
813.00 > 169.00	5.026	5.031	-0.005	1.000	3770206		5.37(2.86-8.58)		15174	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.404	5.408	-0.004	1.000	24654923	NC			3137	
913.00 > 169.00	5.397	5.408	-0.011	0.999	3221223		7.65(3.83-11.48)		9462	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL7_00004 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:20:19 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_008.d

Injection Date: 15-May-2018 16:00:25 Instrument ID: A8_N

Lims ID: IC L7 Full

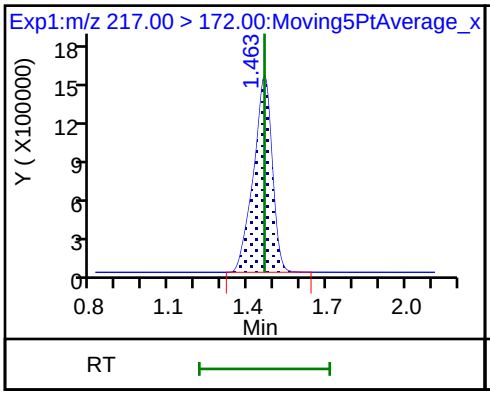
Client ID:

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

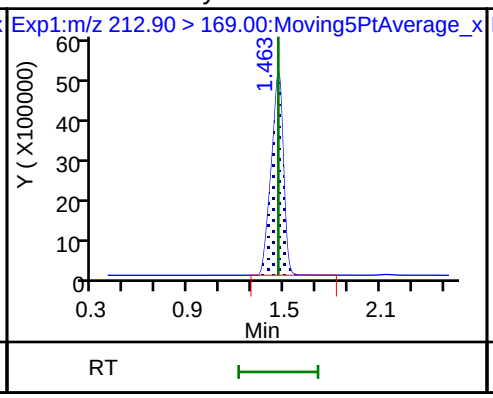
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA



2 Perfluorobutyric acid



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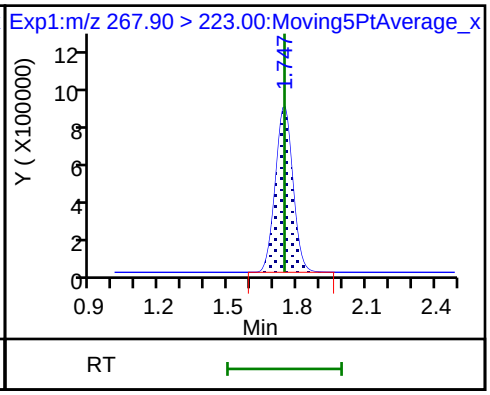
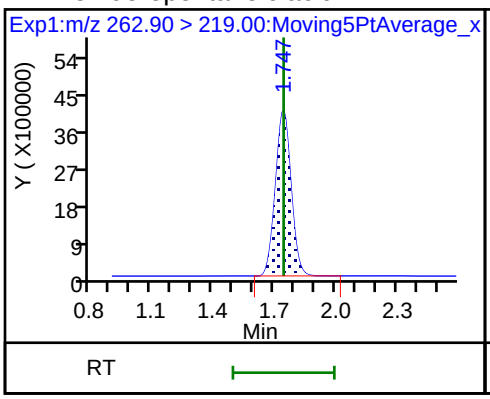
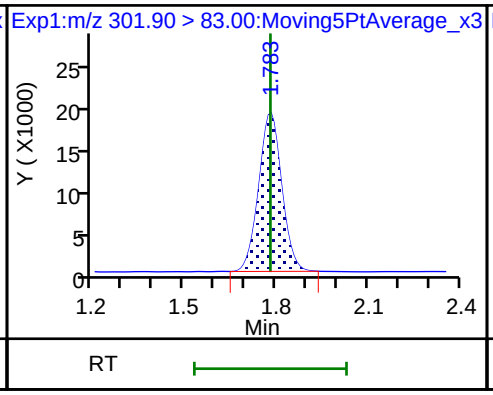


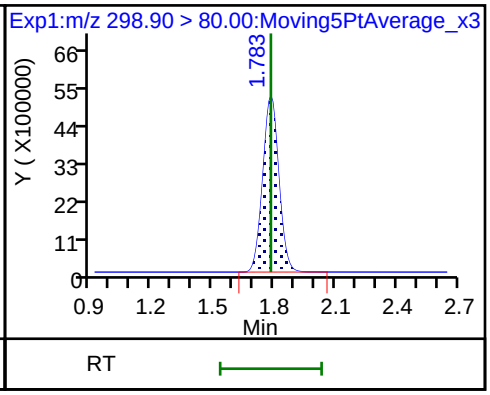
4 Perfluoropentanoic acid



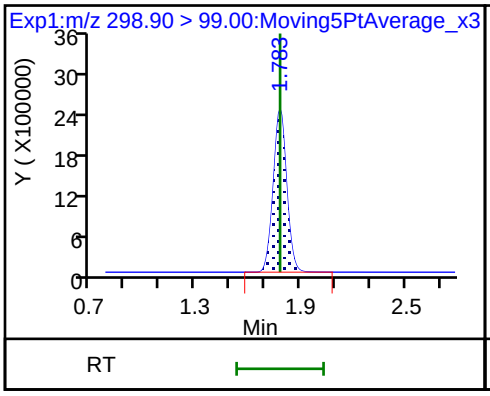
D 47 13C3-PFBS



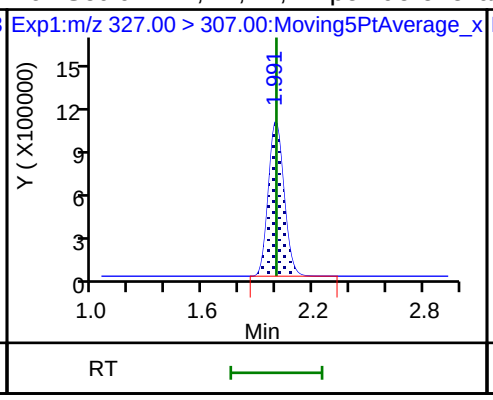
5 Perfluorobutanesulfonic acid



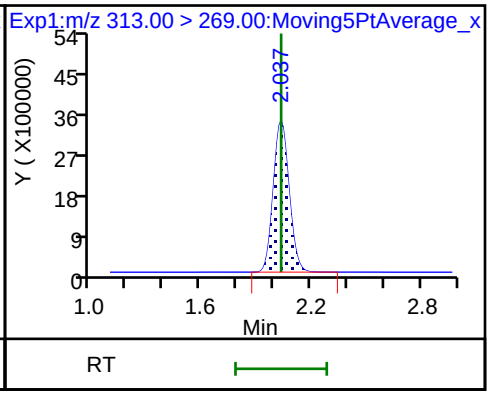
5 Perfluorobutanesulfonic acid



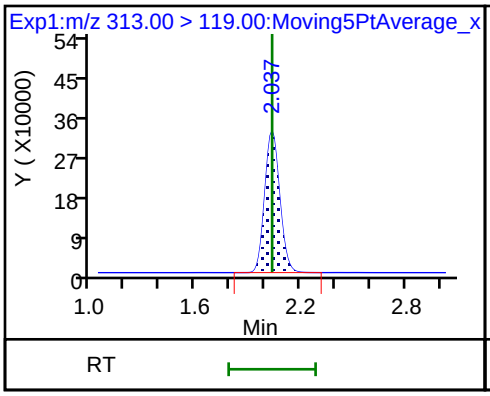
61 Sodium 1H,1H,2H,2H-perfluorohexane



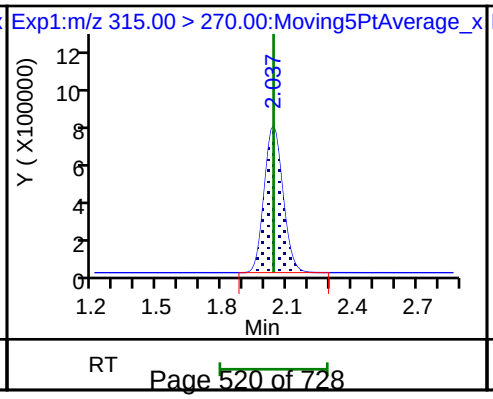
6 Perfluorohexanoic acid



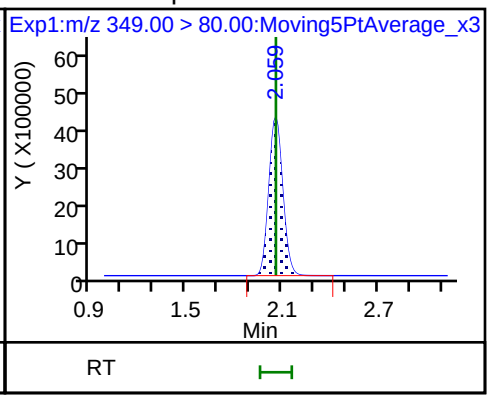
6 Perfluorohexanoic acid



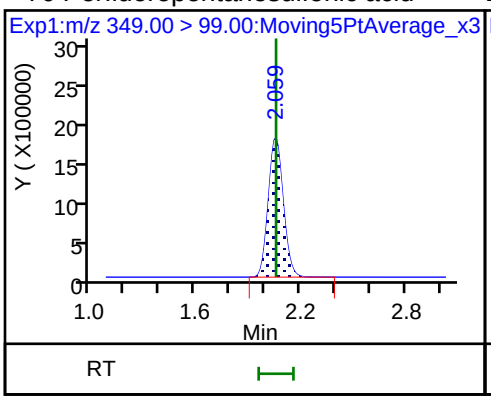
D 7 13C2 PFHxA



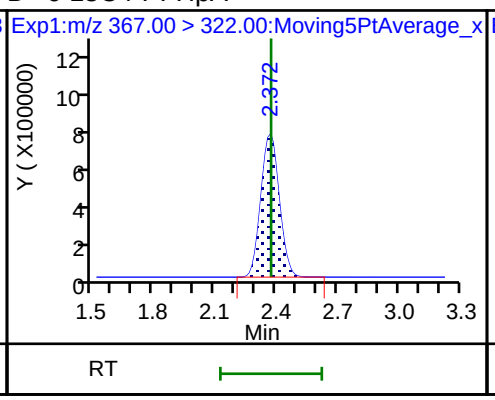
70 Perfluoropentanesulfonic acid



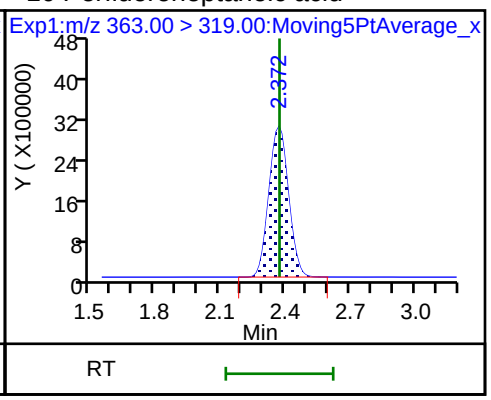
70 Perfluoropentanesulfonic acid



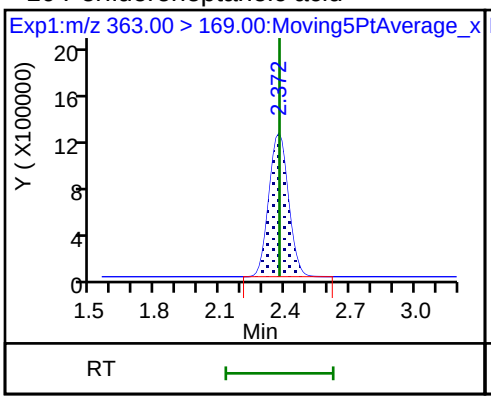
D 9 13C4-PFHpA



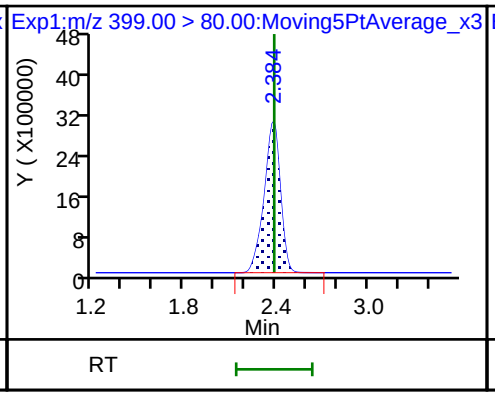
10 Perfluoroheptanoic acid



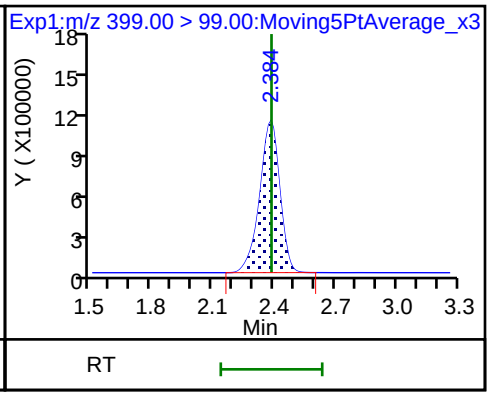
10 Perfluoroheptanoic acid



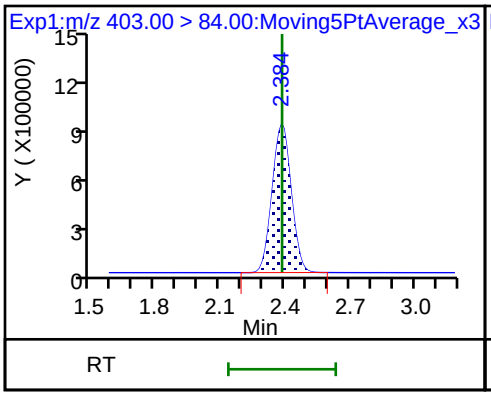
8 Perfluorohexanesulfonic acid



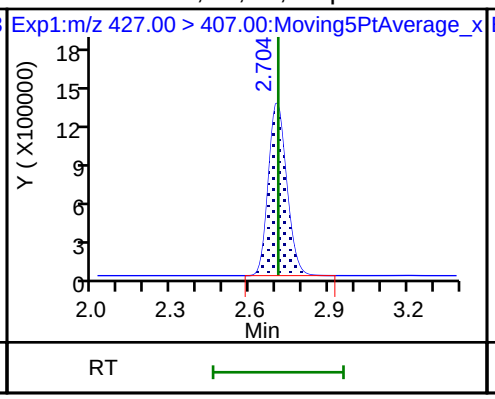
8 Perfluorohexanesulfonic acid



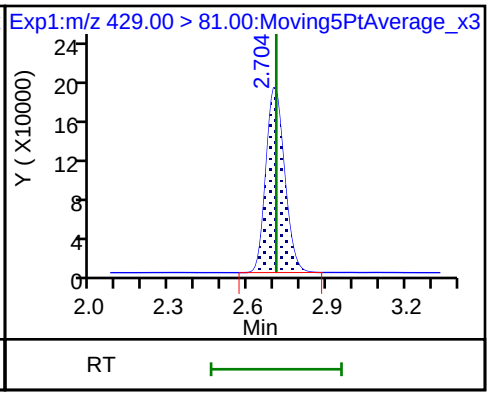
D 11 18O2 PFHxS



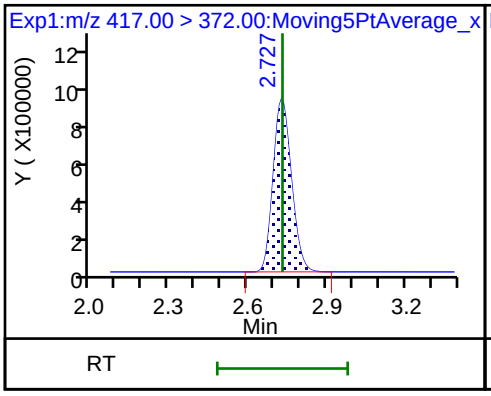
13 Sodium 1H,1H,2H,2H-perfluorooctane



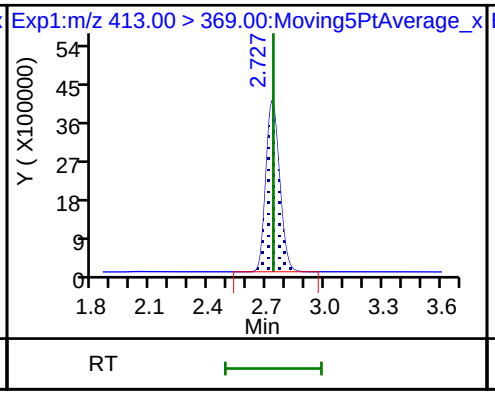
D 12 M2-6:2FTS



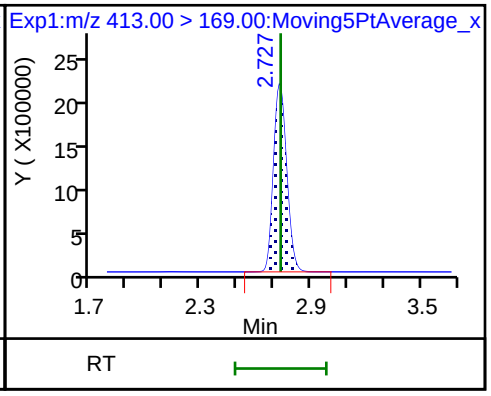
D 14 13C4 PFOA



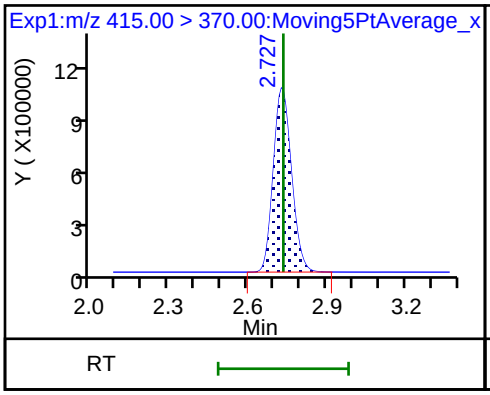
15 Perfluorooctanoic acid



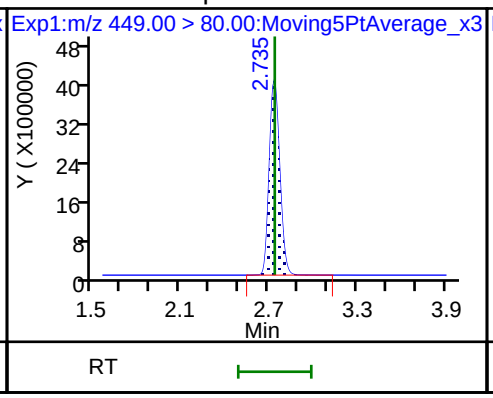
15 Perfluorooctanoic acid



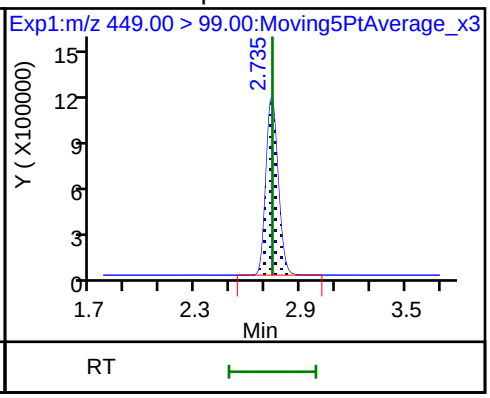
* 62 13C2-PFOA



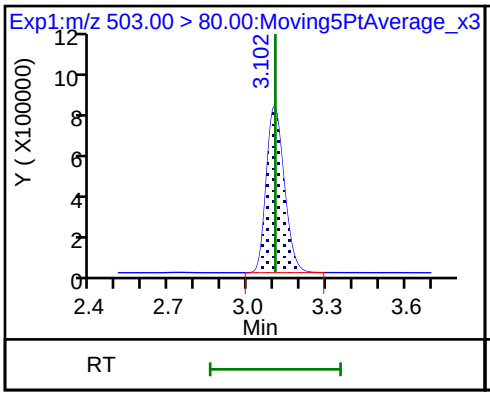
16 Perfluoroheptanesulfonic acid



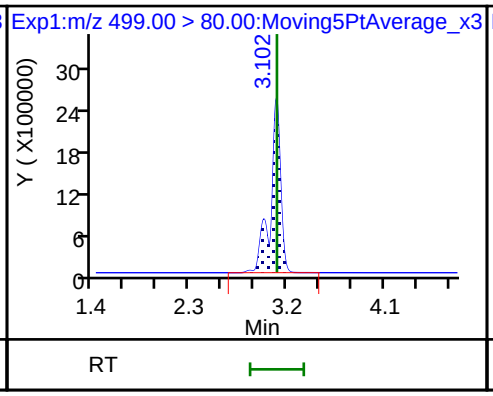
16 Perfluoroheptanesulfonic acid



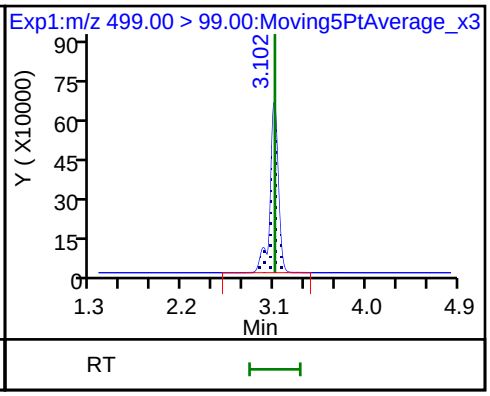
D 18 13C4 PFOS



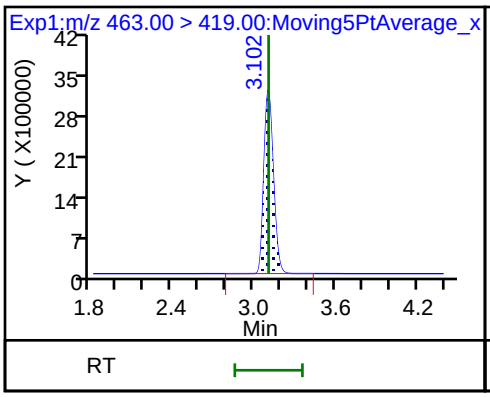
17 Perfluorooctane sulfonic acid



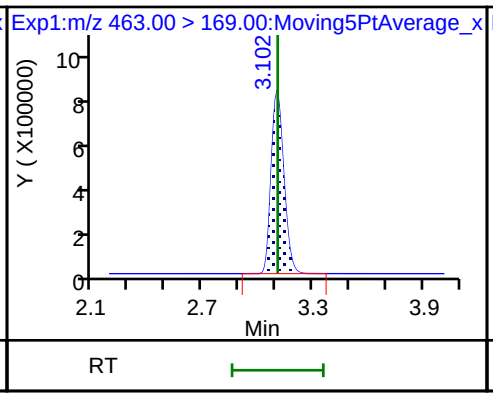
17 Perfluorooctane sulfonic acid



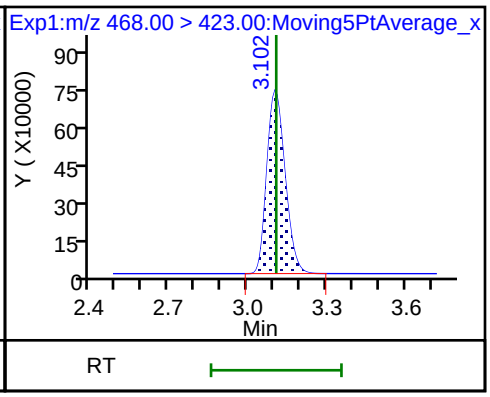
20 Perfluorononanoic acid



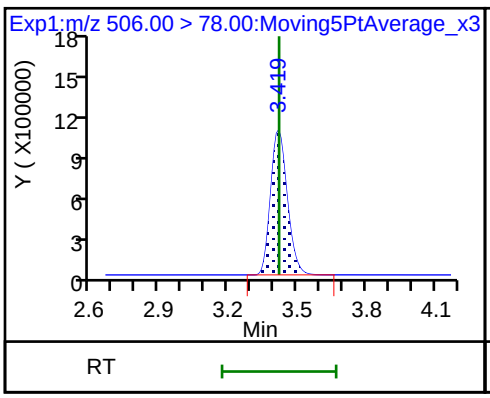
20 Perfluorononanoic acid



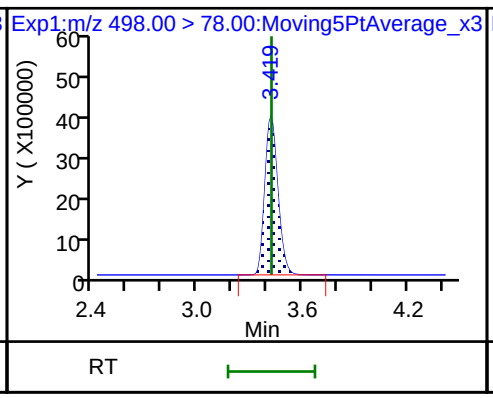
D 19 13C5 PFNA



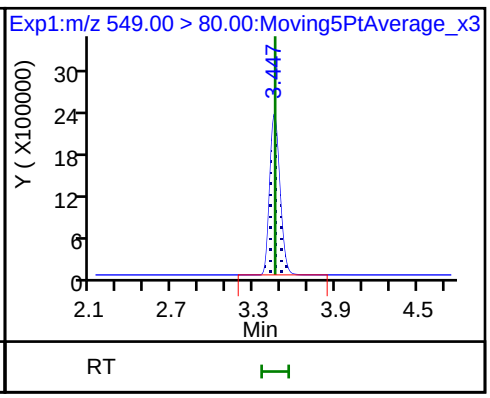
D 21 13C8 FOSA



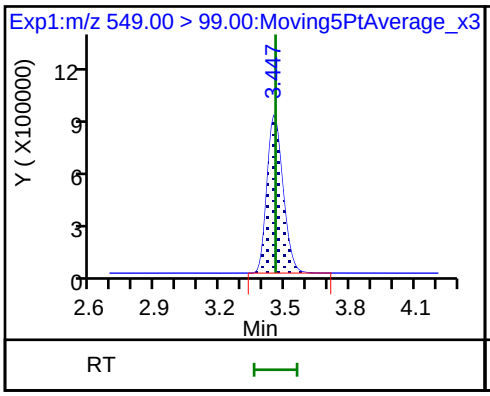
22 Perfluorooctane Sulfonamide



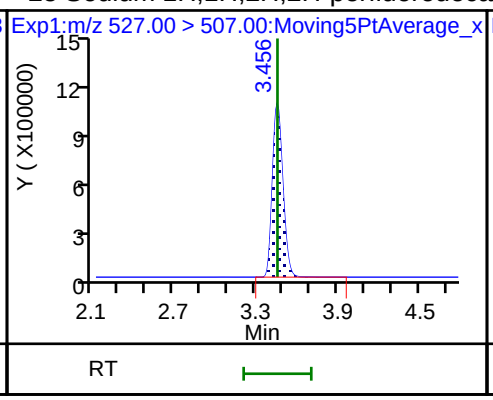
68 Perfluorononanesulfonic acid



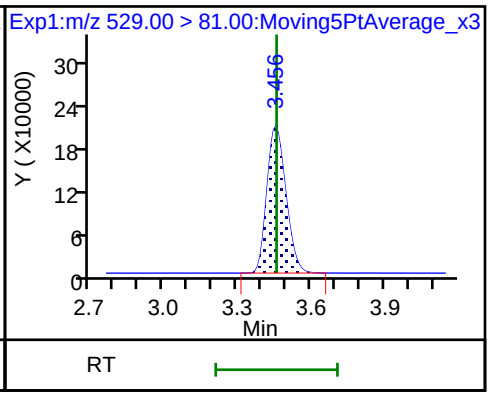
68 Perfluorononanesulfonic acid



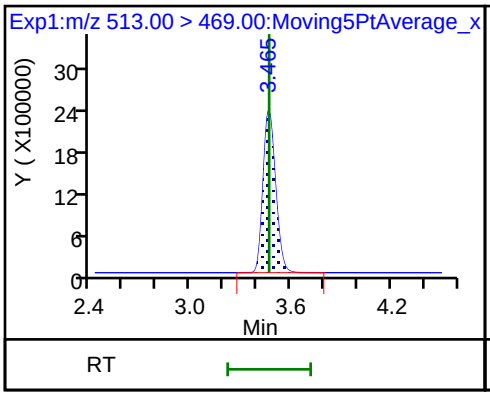
25 Sodium 1H,1H,2H,2H-perfluorodecan



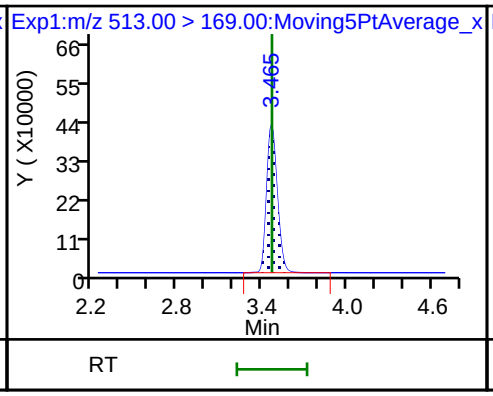
D 26 M2-8:2FTS



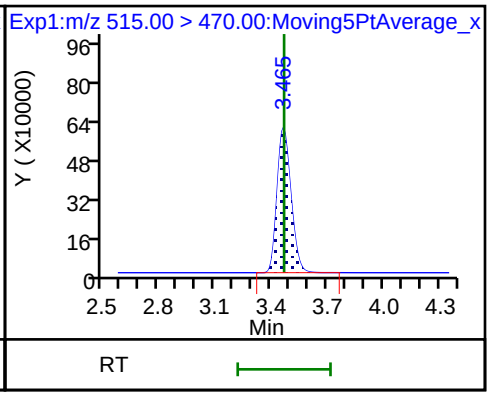
24 Perfluorodecanoic acid



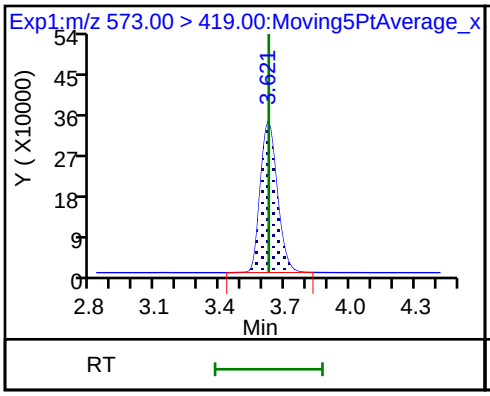
24 Perfluorodecanoic acid



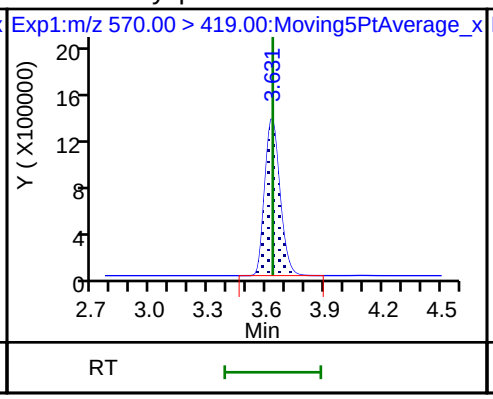
D 23 13C2 PFDA



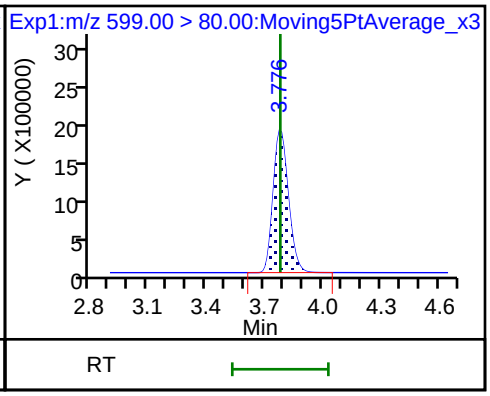
D 27 d3-NMeFOSAA



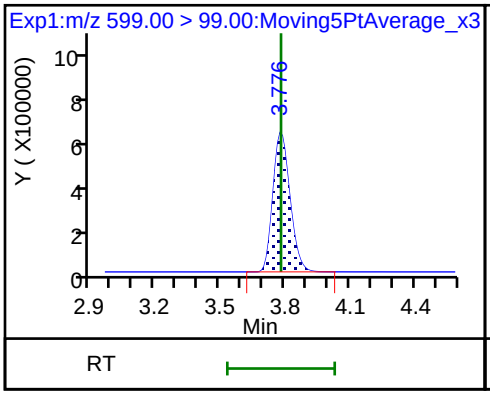
28 N-methyl perfluorooctane sulfonami



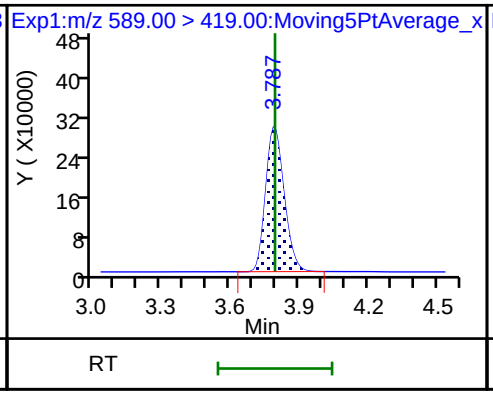
29 Perfluorodecane Sulfonic acid



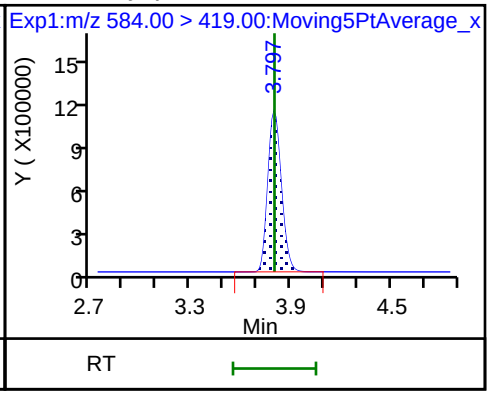
29 Perfluorodecane Sulfonic acid



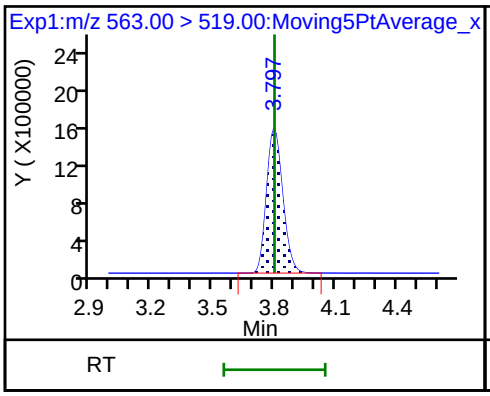
D 32 d5-NEtFOSAA



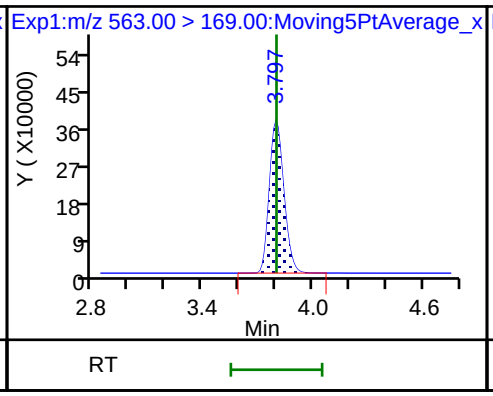
33 N-ethyl perfluorooctane sulfonamid



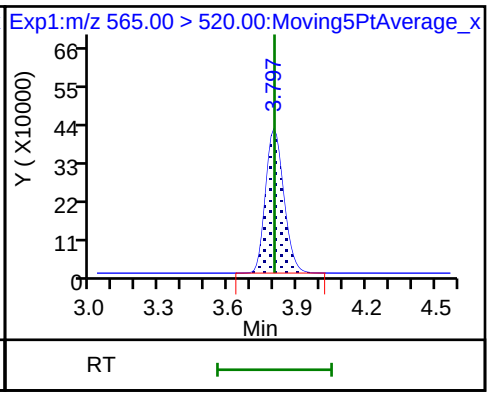
31 Perfluoroundecanoic acid



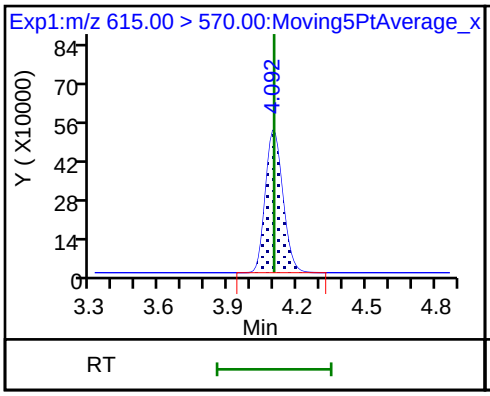
31 Perfluoroundecanoic acid



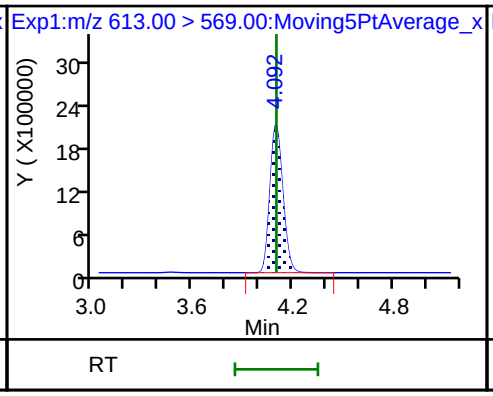
D 30 13C2 PFUnA



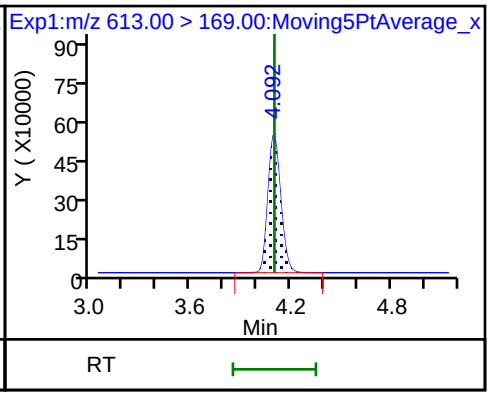
D 36 13C2 PFDoA



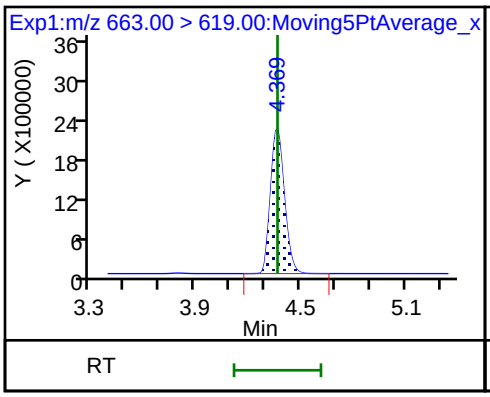
37 Perfluorododecanoic acid



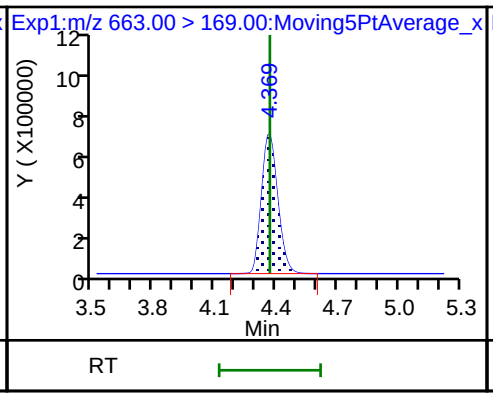
37 Perfluorododecanoic acid



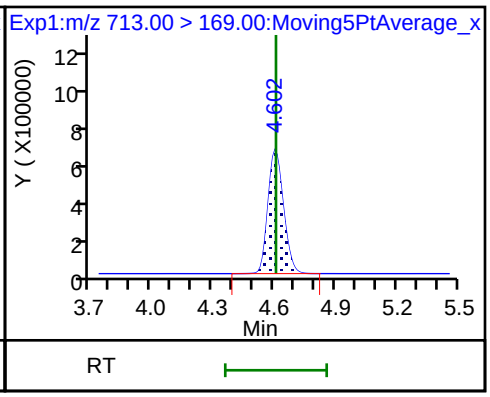
41 Perfluorotridecanoic acid



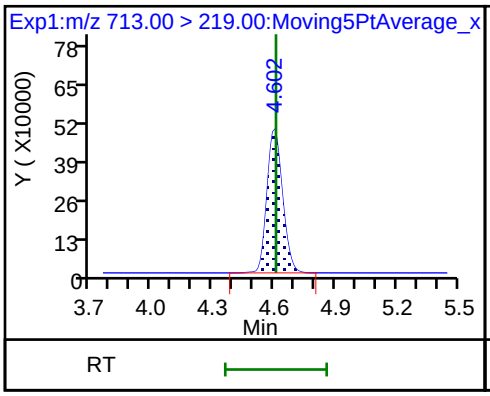
41 Perfluorotridecanoic acid



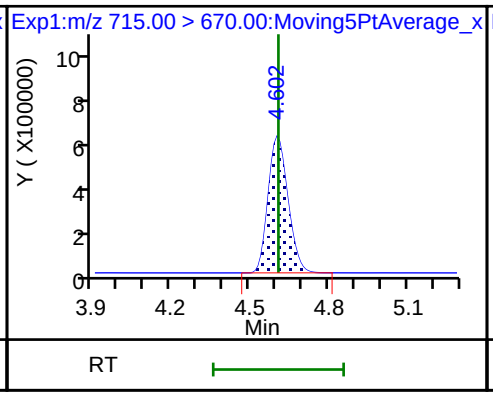
42 Perfluorotetradecanoic acid



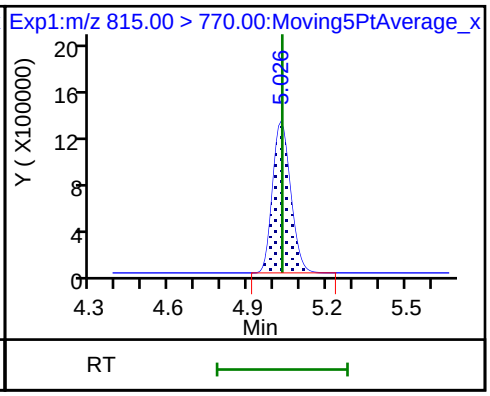
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d
Lims ID: IC L5 Full
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 15-May-2018 16:39:20 ALS Bottle#: 14 Worklist Smp#: 11
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*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 16-May-2018 09:20:21 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK037

First Level Reviewer: hannigana Date: 15-May-2018 17:02:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.460	1.462	-0.002	1.000	6642110	2.57		103	3522	
D 1 13C4 PFBA										
217.00 > 172.00	1.460	1.462	-0.002	1.000	6946962	2.43		97.0	48779	
D 3 13C5-PFPeA										
267.90 > 223.00	1.742	1.744	-0.002	0.562	4467248	2.43		97.3	62925	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.742	1.745	-0.003	1.000	5339518	2.53		101	2721	
D 47 13C3-PFBS										
301.90 > 83.00	1.769	1.780	-0.011	1.000	94691	2.28		98.2	560	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.778	1.783	-0.005	1.005	7259728	2.28		103	29926	
298.90 > 99.00	1.778	1.783	-0.005	1.005	2969623		2.44(1.25-3.74)	103	17715	
D 60 M2-4:2FTS										
329.00 > 81.00	1.997	1.999	-0.002	1.000	671442	NC			7829	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.997	2.000	-0.003	1.000	1593481	2.36		101	66177	
D 7 13C2 PFHxA										
315.00 > 270.00	2.031	2.037	-0.006	1.000	5043564	2.58		103	120426	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.031	2.037	-0.006	1.000	4776223	2.30		92.1	8080	
313.00 > 119.00	2.031	2.037	-0.006	1.000	454875		10.50(5.03-15.10)	92.1	5745	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.054	2.059	-0.005	1.000	6623884	2.34		99.7	60833	
349.00 > 99.00	2.054	2.059	-0.005	1.000	2517632		2.63(1.36-4.07)	99.7	18835	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.133	2.134	-0.001	1.000	223493	NC			4741	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.133	2.134	-0.001	1.000	725223	NC			6005	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.366	2.374	-0.008	1.000	4839723	2.57		103	7018	
363.00 > 169.00	2.366	2.374	-0.008	1.000	1886033		2.57(1.13-3.40)	103	9727	
D 9 13C4-PFHpA										
367.00 > 322.00	2.366	2.374	-0.008	1.000	4465208	2.38		95.2	79790	
D 11 18O2 PFHxS										
403.00 > 84.00	2.378	2.386	-0.008	1.000	5339851	2.30		97.4	57465	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.378	2.386	-0.008	1.000	5630297	2.21		97.3	22030	
399.00 > 99.00	2.378	2.386	-0.008	1.000	1904888		2.96(1.50-4.49)	97.3	6814	
65 Adona										
377.00 > 251.00	2.413	2.418	-0.005	1.000	14089104	NC			89697	
377.00 > 85.00	2.413	2.418	-0.005	1.000	8375544		1.68(0.84-2.53)		55492	
D 12 M2-6:2FTS										
429.00 > 81.00	2.701	2.707	-0.006	1.000	953169	2.30		96.9	17534	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.701	2.707	-0.006	1.000	1635620	2.31		97.5	9167	
D 14 13C4 PFOA										
417.00 > 372.00	2.724	2.731	-0.007	1.000	4456920	2.51		100	62304	
* 62 13C2-PFOA										
415.00 > 370.00	2.724	2.734	-0.010		4684803	2.50			69393	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.724	2.734	-0.010	1.000	4857127	2.31		92.6	1728	
413.00 > 169.00	2.724	2.734	-0.010	1.000	2639966		1.84(0.84-2.52)	92.6	10891	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.731	2.739	-0.008	1.000	5160059	2.43		102	33696	
449.00 > 99.00	2.731	2.739	-0.008	1.000	1350563		3.82(1.94-5.82)	102	21055	
D 18 13C4 PFOS										
503.00 > 80.00	3.094	3.104	-0.010	1.000	3815593	2.39		100	27877	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.094	3.105	-0.011	1.000	3965534	2.11		91.1	24321	
499.00 > 99.00	3.094	3.105	-0.011	1.000	911395		4.35(2.31-6.93)	91.1	8420	
D 19 13C5 PFNA										
468.00 > 423.00	3.102	3.107	-0.005	1.000	3538499	2.44		97.5	67448	
20 Perfluorononanoic acid										
463.00 > 419.00	3.102	3.107	-0.005	1.000	3811509	2.54		102	5907	
463.00 > 169.00	3.102	3.107	-0.005	1.000	903128		4.22(1.90-5.69)	102	31191	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.310	3.316	-0.006	1.000	6694592	NC			42297	
D 21 13C8 FOSA										
506.00 > 78.00	3.415	3.420	-0.005	1.000	5178962	2.48		99.3	42716	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.415	3.422	-0.007	1.000	5372059	2.66		107	66457	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.443	3.455	-0.012	1.000	2885064	2.39		99.4	38099	
549.00 > 99.00	3.443	3.455	-0.012	1.000	1131430		2.55(1.33-3.97)	99.4	20200	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.452	3.458	-0.006	1.000	1458360	2.38		99.2	28234	
D 26 M2-8:2FTS										
529.00 > 81.00	3.452	3.459	-0.007	1.000	1089191	2.31		96.5	19371	
D 23 13C2 PFDA										
515.00 > 470.00	3.462	3.468	-0.006	1.000	2997952	2.43		97.1	44831	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.462	3.468	-0.006	1.000	3028523	2.60		104	16268	
513.00 > 169.00	3.462	3.468	-0.006	1.000	523942		5.78(2.36-7.09)	104	12814	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.616	3.624	-0.008	1.000	1561957	2.29		91.8	35761	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.626	3.631	-0.005	1.003	1690352	2.67		107	9358	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.771	3.781	-0.010	1.000	2626191	2.45		102	48906	
599.00 > 99.00	3.771	3.781	-0.010	1.000	877720		2.99(1.39-4.16)	102	16087	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.792	3.794	-0.002	1.000	1777821	2.54		102	10004	
D 30 13C2 PFUnA										
565.00 > 520.00	3.792	3.800	-0.008	1.000	2447962	2.50		100	55931	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.792	3.800	-0.008	1.000	1802433	2.20		88.2	8412	
563.00 > 169.00	3.792	3.800	-0.008	1.000	494938		3.64(2.12-6.36)	88.2	22587	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.792	3.800	-0.008	1.000	1590051	2.38		95.1	28778	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.950	3.958	-0.008	1.000	11086572	NC			67521	
D 36 13C2 PFDoA										
615.00 > 570.00	4.093	4.099	-0.006	1.000	2514089	2.39		95.6	19064	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.093	4.100	-0.007	1.000	2676169	2.55		102	2268	
613.00 > 169.00	4.093	4.100	-0.007	1.000	658572		4.06(2.13-6.40)	102	10193	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.363	4.368	-0.005	1.000	2999335	2.61		104	1572	
663.00 > 169.00	4.363	4.368	-0.005	1.000	941505		3.19(1.25-3.76)	104	10269	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.596	4.608	-0.012	1.000	3141974	2.43		97.3	13003	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.596	4.608	-0.012	1.000	821303	2.59		104	8787	
713.00 > 219.00	4.596	4.608	-0.012	1.000	611068		1.34(0.71-2.13)	104	11665	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.012	5.030	-0.018	1.000	5796576	2.64		106	14652	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.021	5.031	-0.010	1.002	5252895	NC			1229	
813.00 > 169.00	5.021	5.031	-0.010	1.002	870423		6.03(2.86-8.58)		5354	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.389	5.408	-0.019	1.000	6240519	NC			1014	
913.00 > 169.00	5.389	5.408	-0.019	1.000	788129		7.92(3.83-11.48)		4740	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00004 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:20:24 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Injection Date: 15-May-2018 16:39:20 Instrument ID: A8_N

Lims ID: IC L5 Full

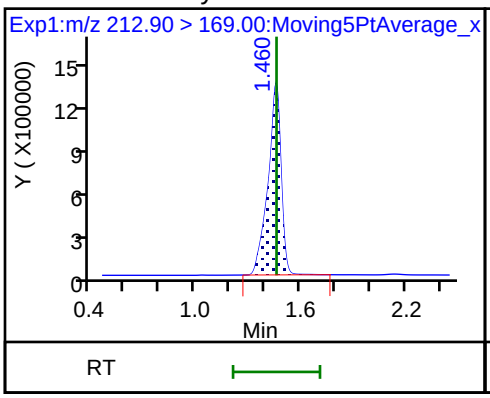
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 11

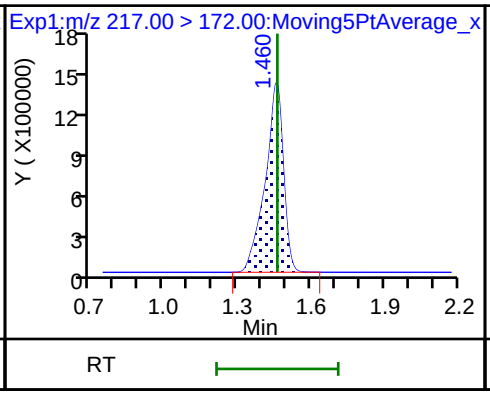
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

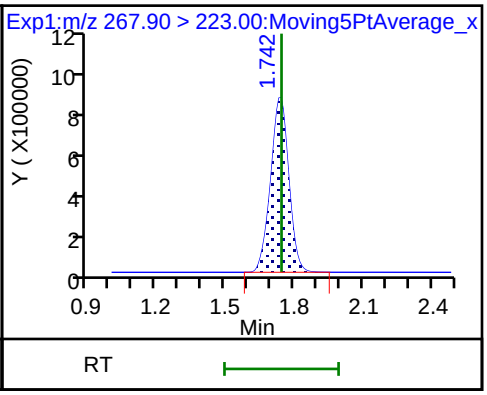
2 Perfluorobutyric acid



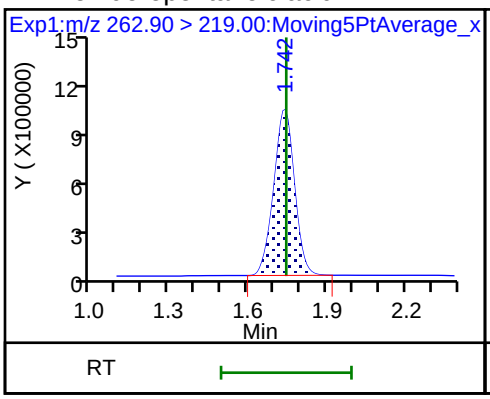
D 1 13C4 PFBA



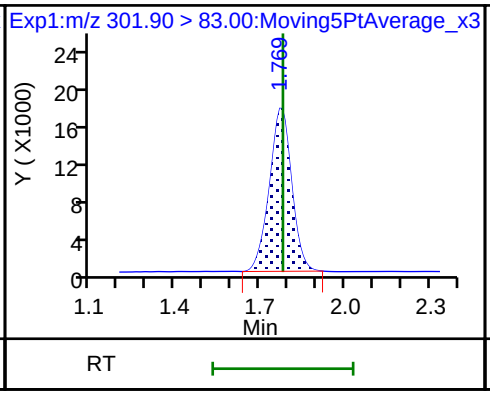
D 3 13C5-PFPeA



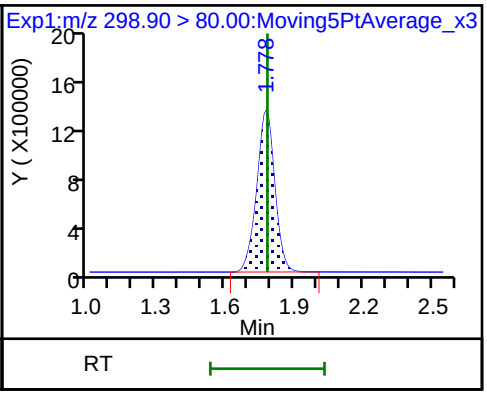
4 Perfluoropentanoic acid



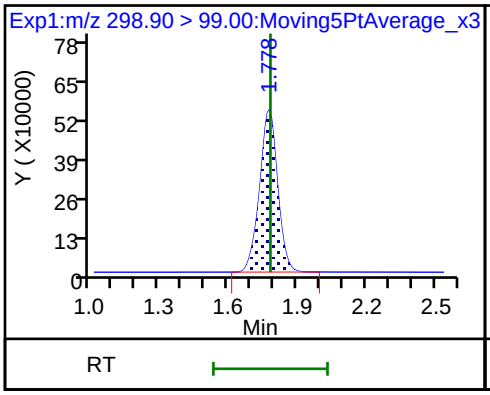
D 47 13C3-PFBS



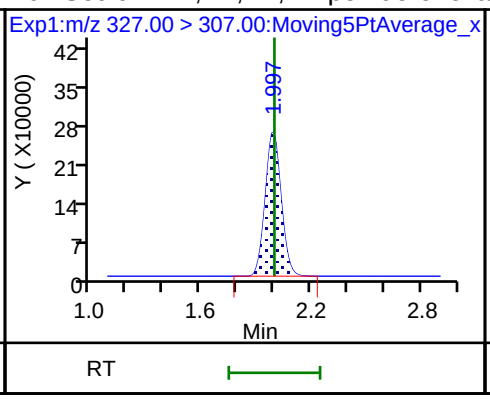
5 Perfluorobutanesulfonic acid



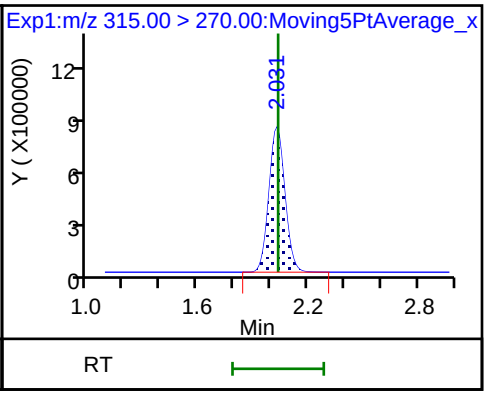
5 Perfluorobutanesulfonic acid



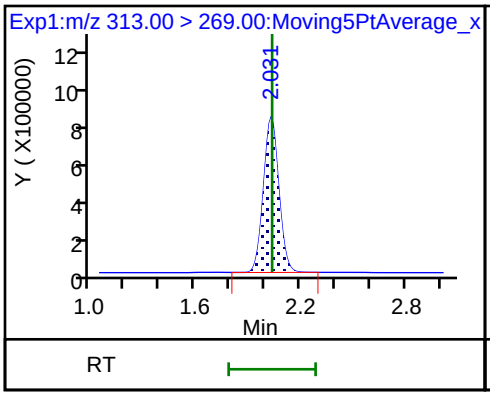
61 Sodium 1H,1H,2H,2H-perfluorohexa



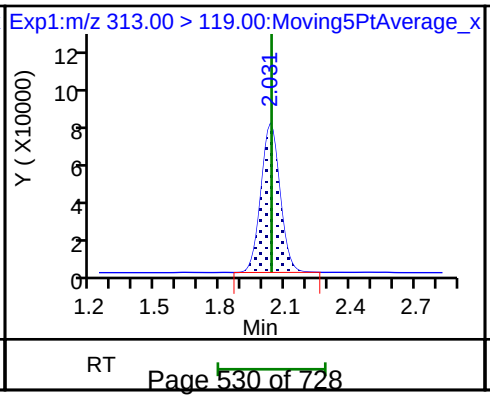
D 7 13C2 PFHxA



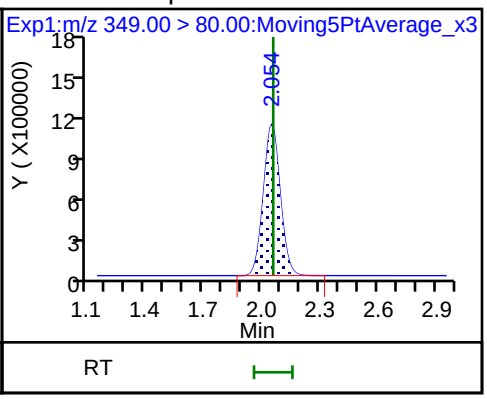
6 Perfluorohexanoic acid



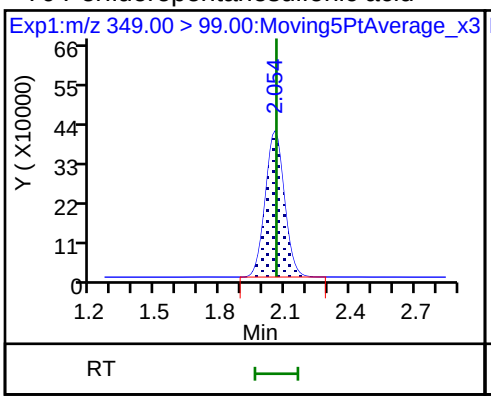
6 Perfluorohexanoic acid



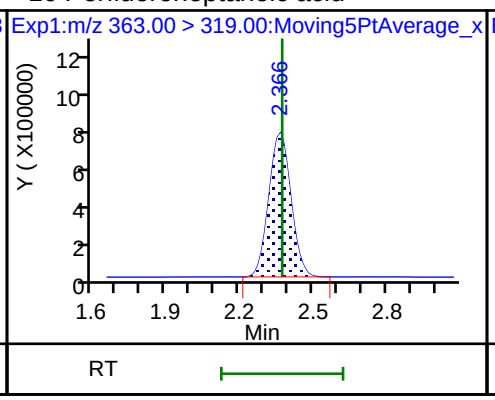
70 Perfluoropentanesulfonic acid



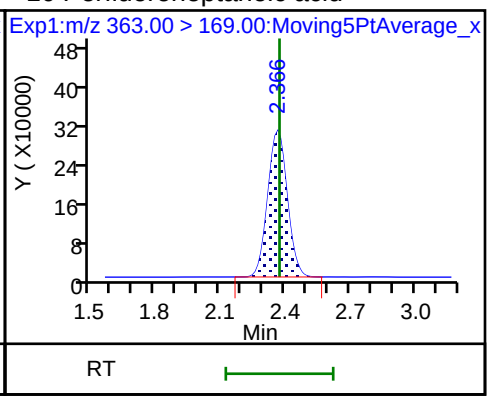
70 Perfluoropentanesulfonic acid



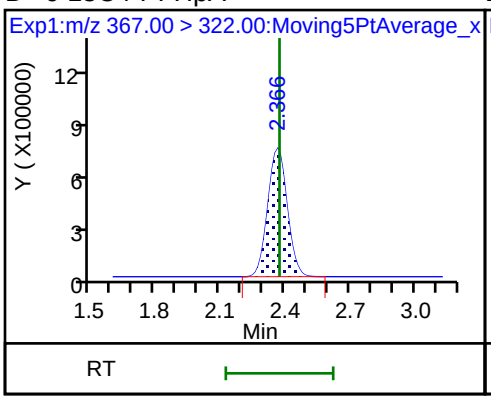
10 Perfluoroheptanoic acid



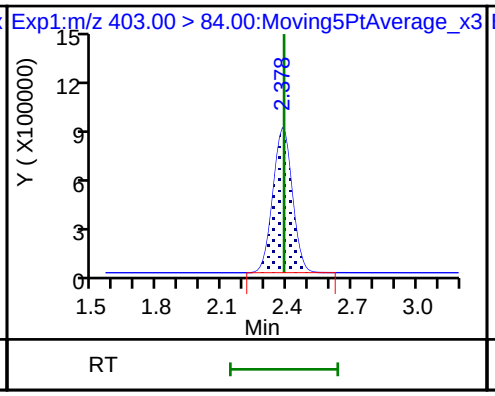
10 Perfluoroheptanoic acid



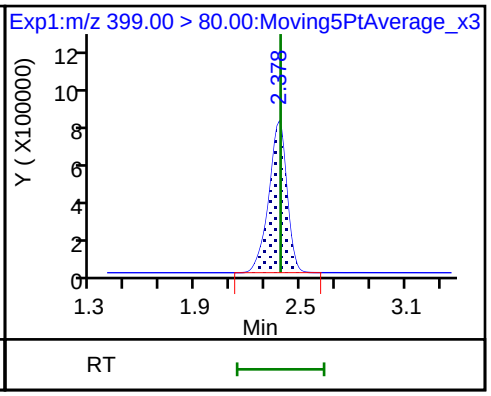
D 9 13C4-PFHpA



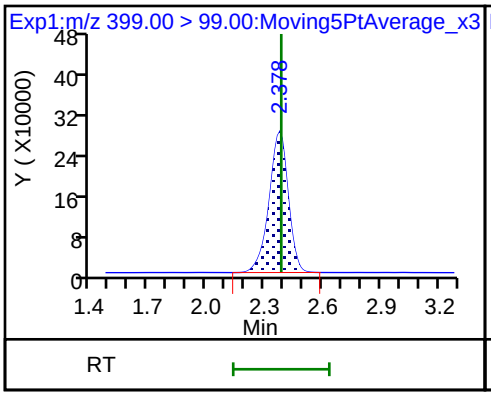
D 11 18O2 PFHxS



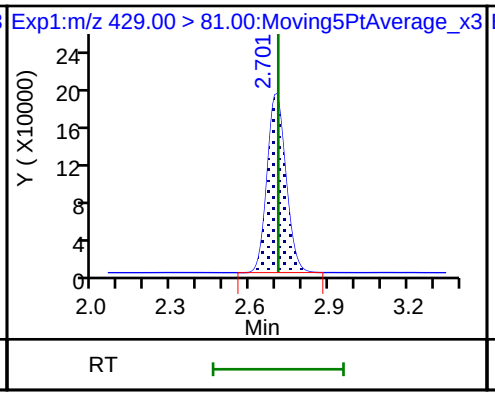
8 Perfluorohexanesulfonic acid



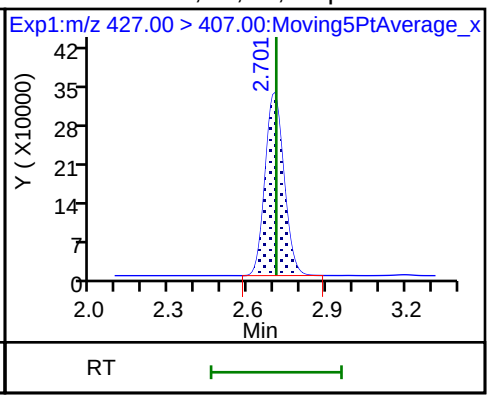
8 Perfluorohexanesulfonic acid



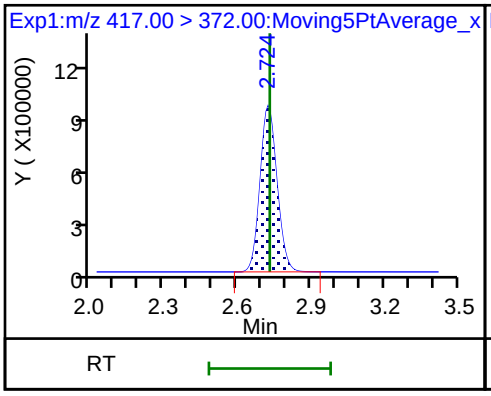
D 12 M2-6:2FTS



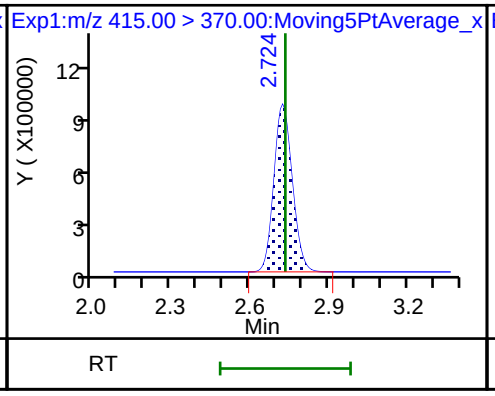
13 Sodium 1H,1H,2H,2H-perfluorooctane



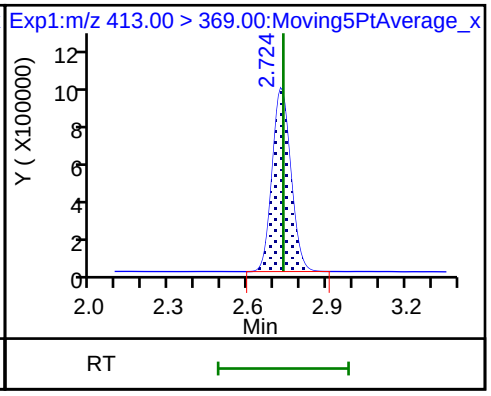
D 14 13C4 PFOA



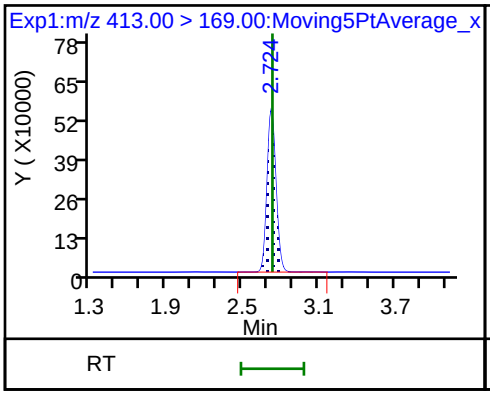
* 62 13C2-PFOA



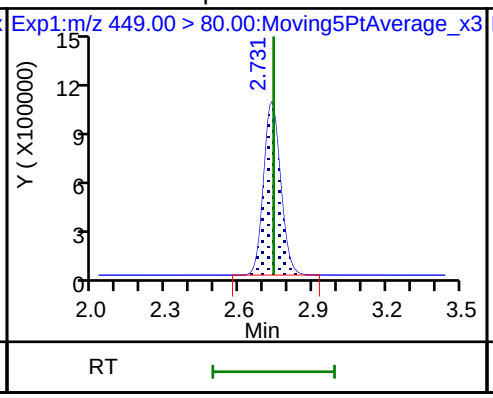
15 Perfluorooctanoic acid



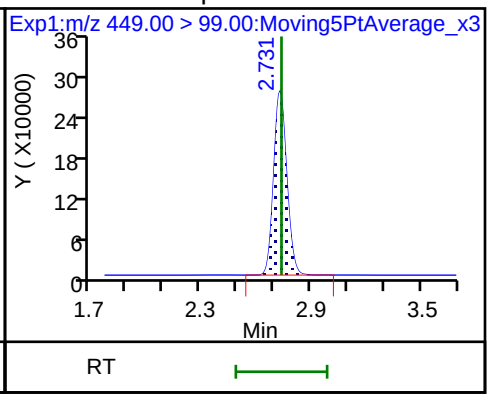
15 Perfluorooctanoic acid



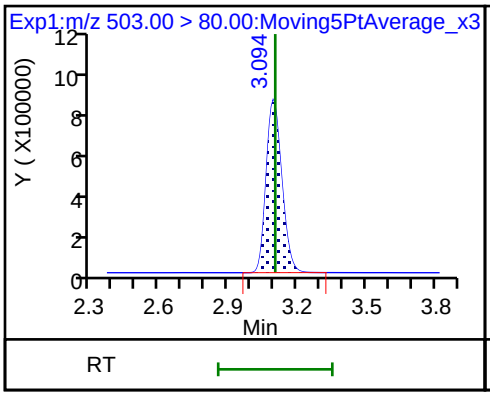
16 Perfluoroheptanesulfonic acid



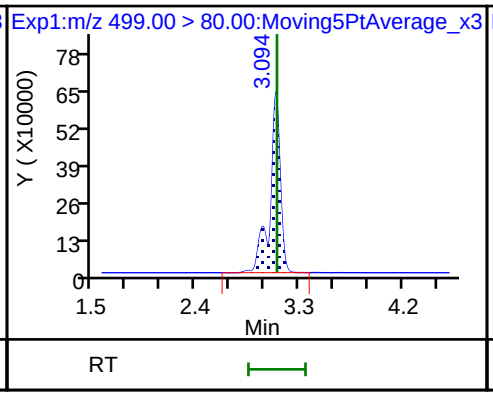
16 Perfluoroheptanesulfonic acid



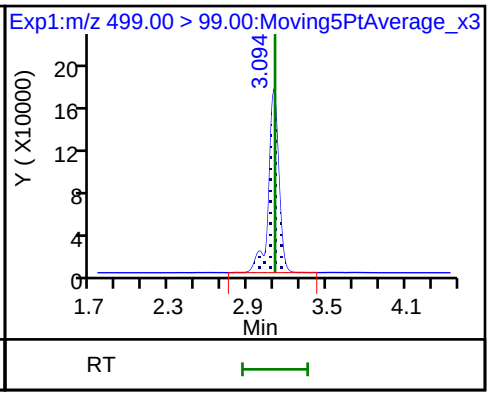
D 18 13C4 PFOS



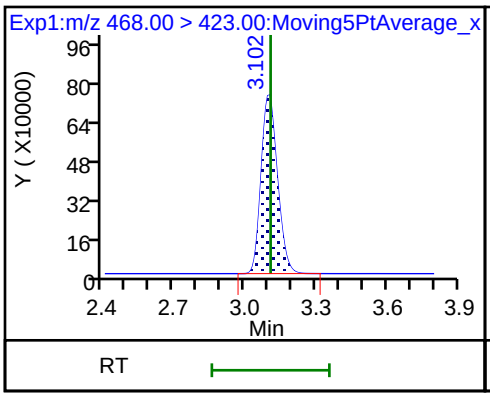
17 Perfluorooctane sulfonic acid



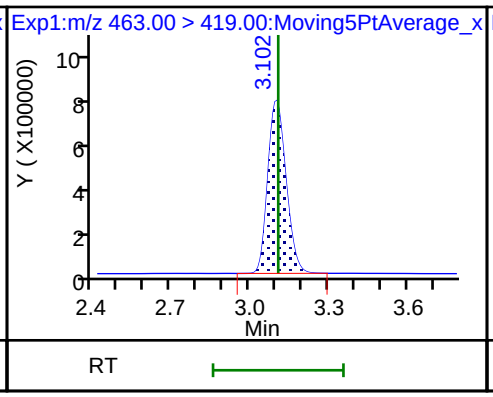
17 Perfluorooctane sulfonic acid



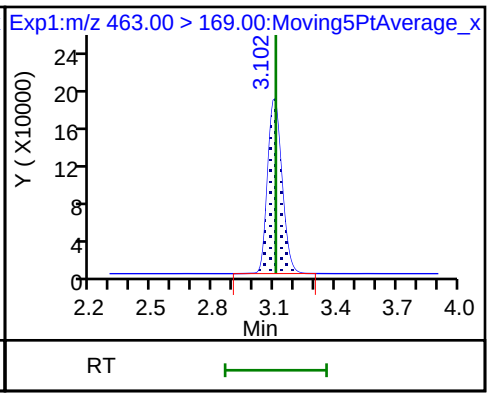
D 19 13C5 PFNA



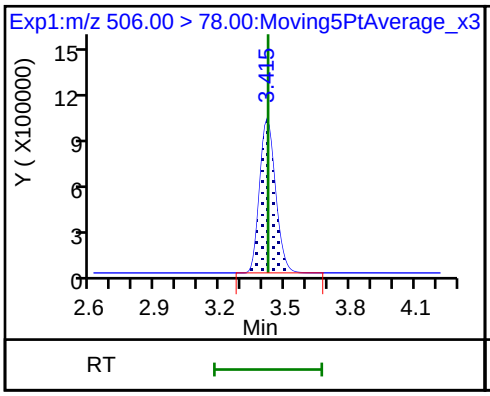
20 Perfluorononanoic acid



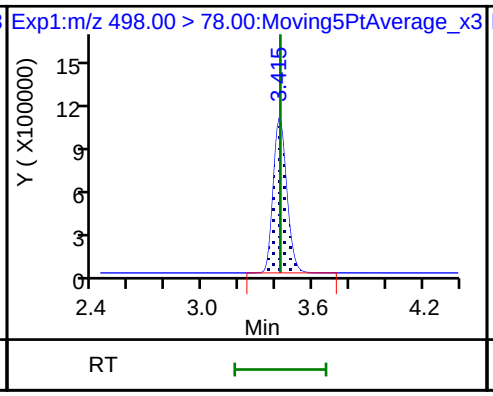
20 Perfluorononanoic acid



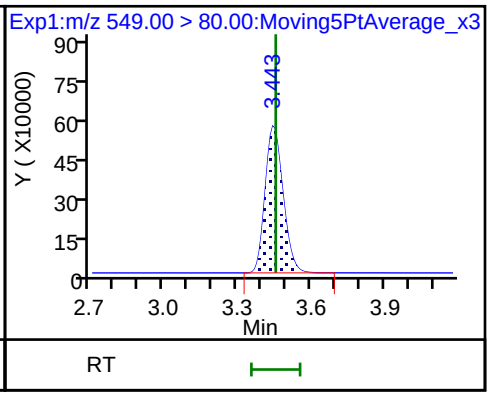
D 21 13C8 FOSA



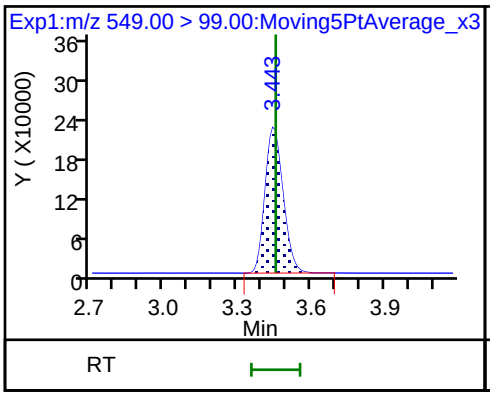
22 Perfluorooctane Sulfonamide



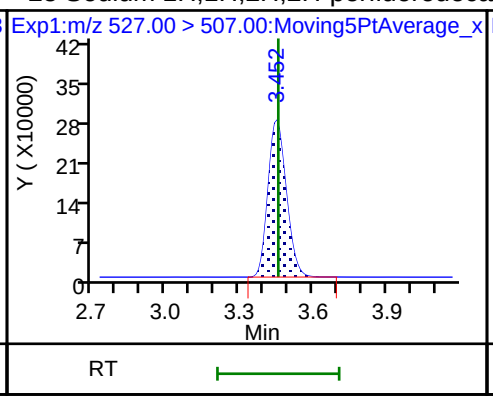
68 Perfluorononanesulfonic acid



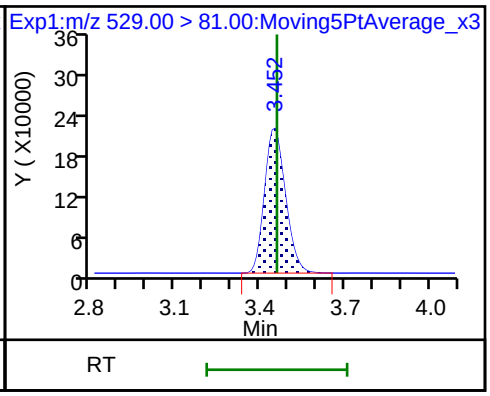
68 Perfluorononanesulfonic acid



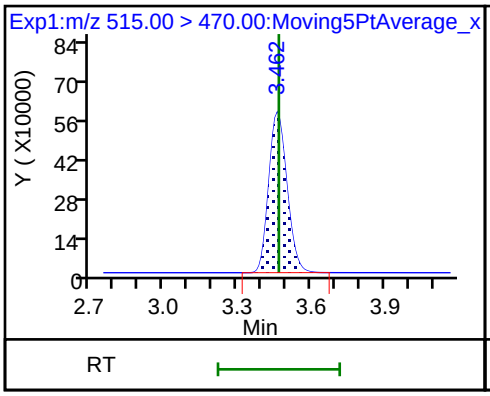
25 Sodium 1H,1H,2H,2H-perfluorodecane



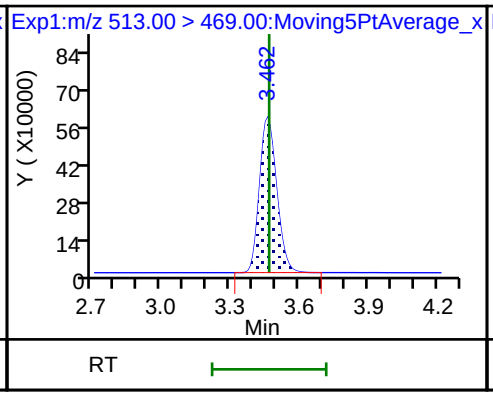
D 26 M2-8:2FTS



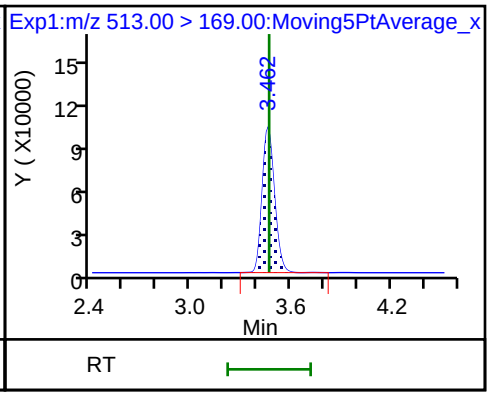
D 23 13C2 PFDA



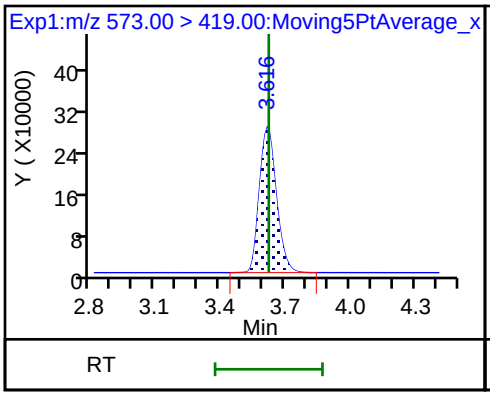
24 Perfluorodecanoic acid



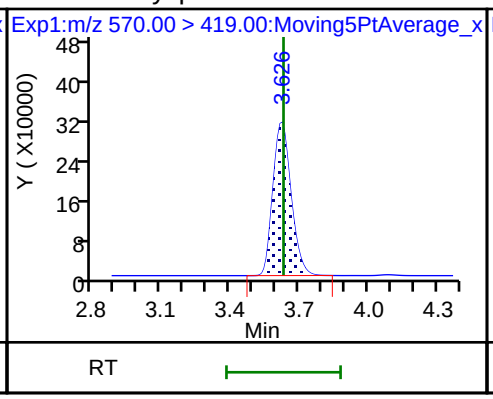
24 Perfluorodecanoic acid



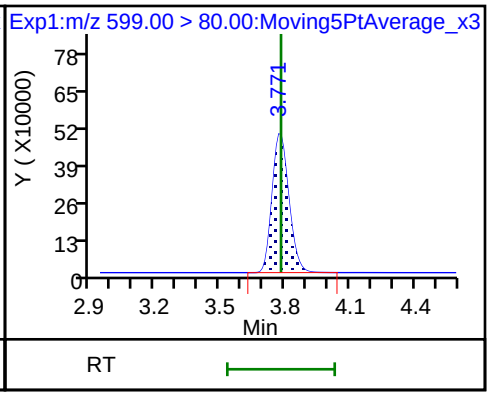
D 27 d3-NMeFOSAA



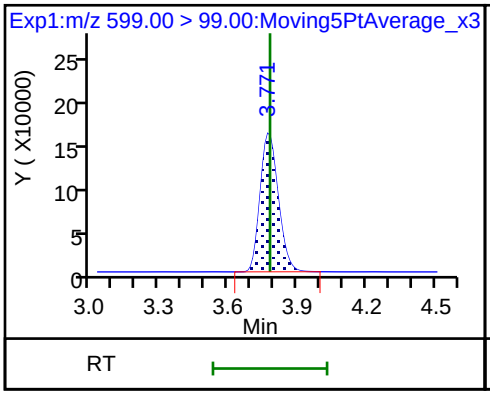
28 N-methyl perfluorooctane sulfonami



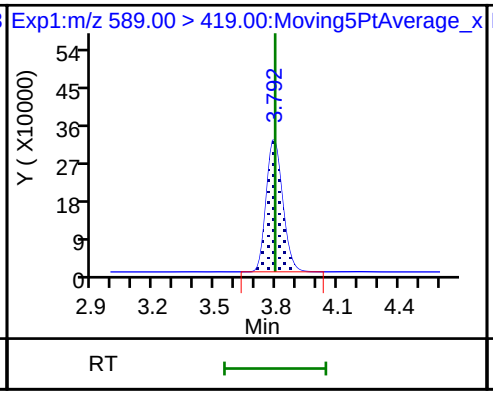
29 Perfluorodecane Sulfonic acid



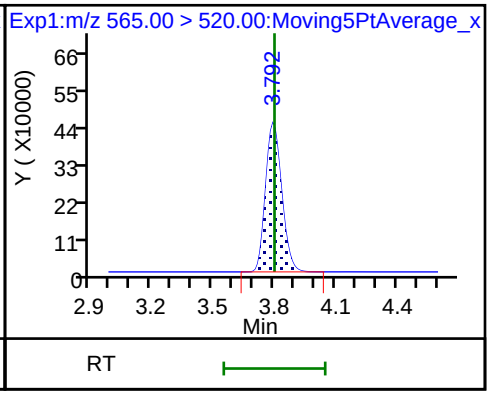
29 Perfluorodecane Sulfonic acid



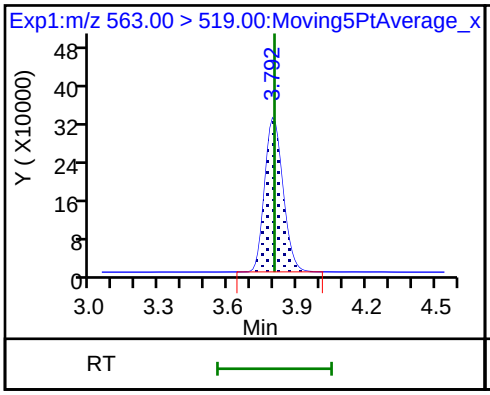
D 32 d5-NEtFOSAA



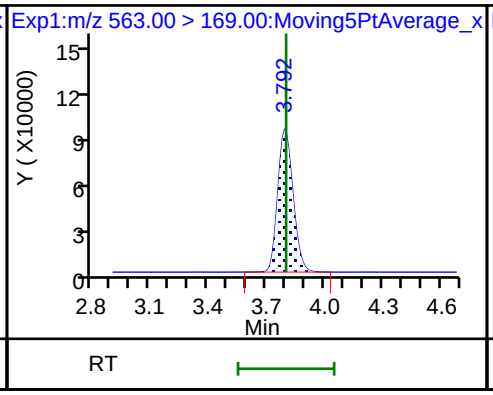
D 30 13C2 PFUnA



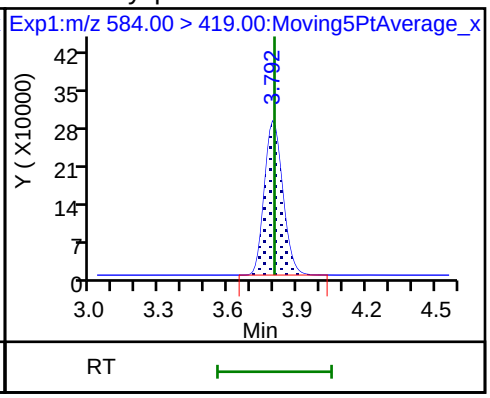
31 Perfluoroundecanoic acid



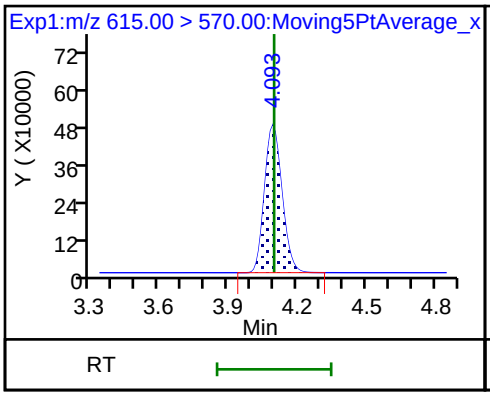
31 Perfluoroundecanoic acid



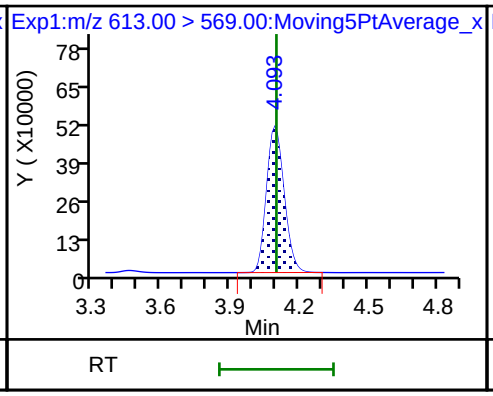
33 N-ethyl perfluorooctane sulfonamid



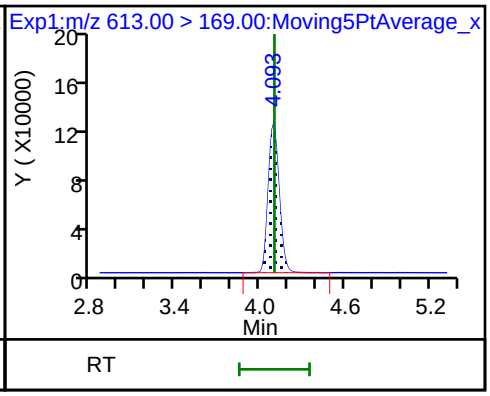
D 36 13C2 PFDoA



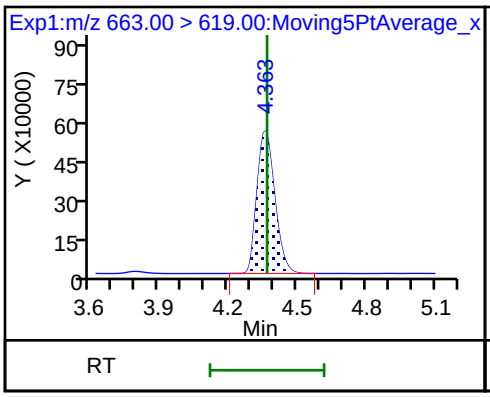
37 Perfluorododecanoic acid



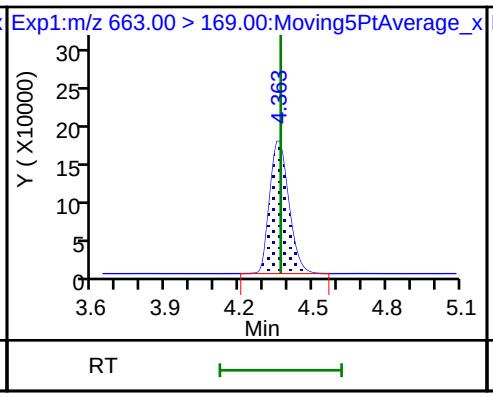
37 Perfluorododecanoic acid



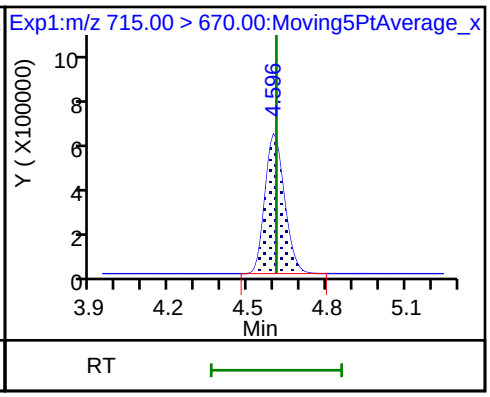
41 Perfluorotridecanoic acid



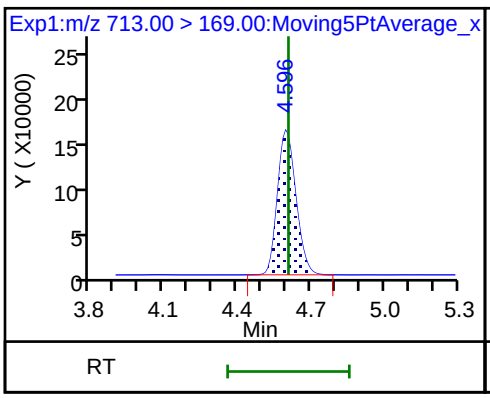
41 Perfluorotridecanoic acid



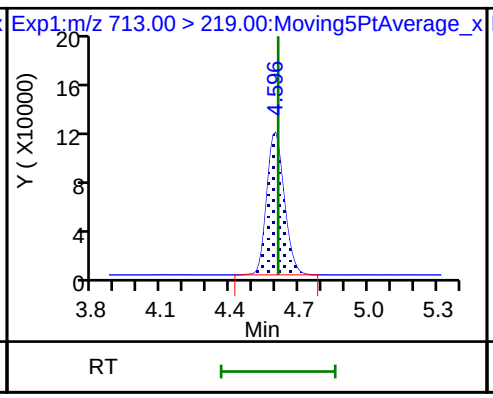
D 43 13C2-PFTeDA



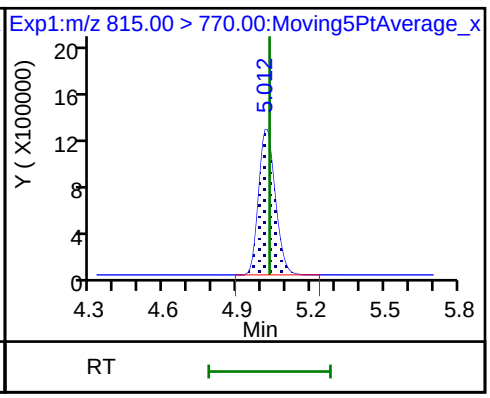
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Calibration / Perfluorobutyric acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

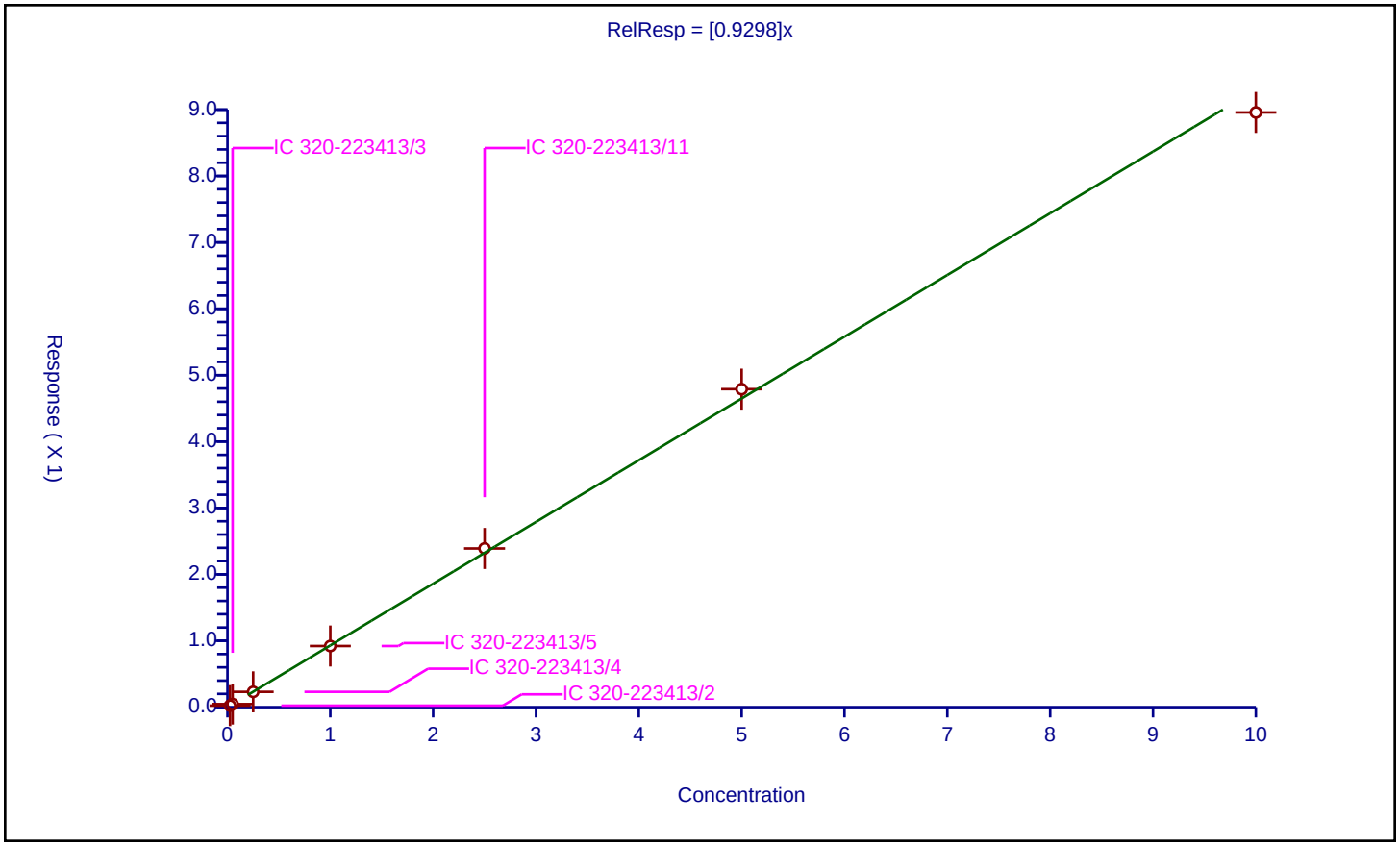
Curve Coefficients

Intercept:	0
Slope:	0.9298

Error Coefficients

Standard Error:	12500000
Relative Standard Error:	2.3
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.023104	2.5	7998943.0	0.924147	Y
2	IC 320-223413/3	0.05	0.046563	2.5	8732721.0	0.93125	Y
3	IC 320-223413/4	0.25	0.230627	2.5	7493234.0	0.922507	Y
4	IC 320-223413/5	1.0	0.921191	2.5	7049149.0	0.921191	Y
5	IC 320-223413/11	2.5	2.390293	2.5	6946962.0	0.956117	Y
6	IC 320-223413/7	5.0	4.789436	2.5	6751655.0	0.957887	Y
7	IC 320-223413/8	10.0	8.957287	2.5	7496989.0	0.895729	Y



Calibration / Perfluoropentanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

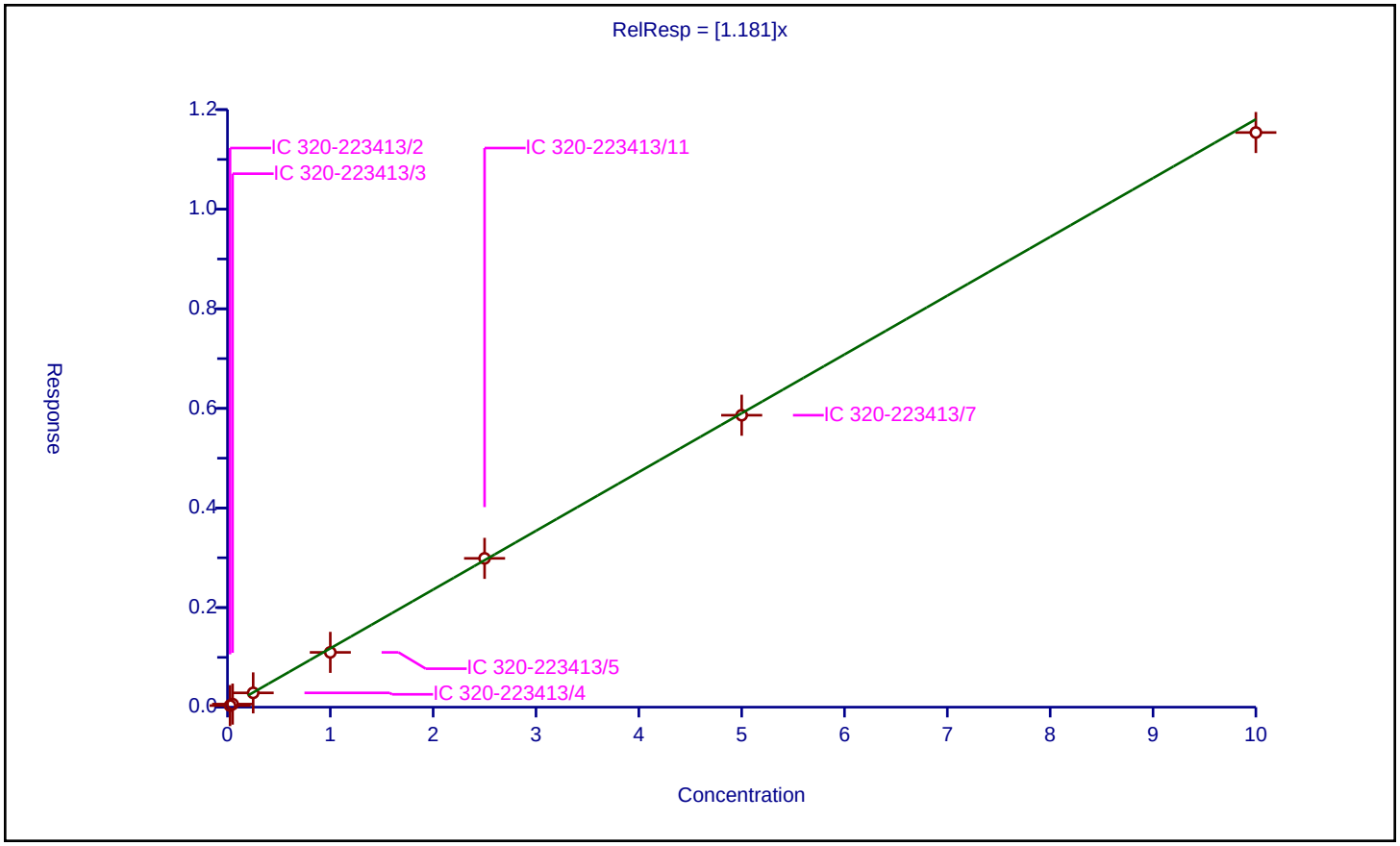
Curve Coefficients

Intercept:	0
Slope:	1.181

Error Coefficients

Standard Error:	9990000
Relative Standard Error:	4.6
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.031562	2.5	5228218.0	1.262476	Y
2	IC 320-223413/3	0.05	0.061584	2.5	5506602.0	1.231676	Y
3	IC 320-223413/4	0.25	0.286757	2.5	4737268.0	1.147028	Y
4	IC 320-223413/5	1.0	1.100537	2.5	4710025.0	1.100537	Y
5	IC 320-223413/11	2.5	2.988147	2.5	4467248.0	1.195259	Y
6	IC 320-223413/7	5.0	5.862777	2.5	4328345.0	1.172555	Y
7	IC 320-223413/8	10.0	11.540111	2.5	4657025.0	1.154011	Y



Calibration / Perfluorobutanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

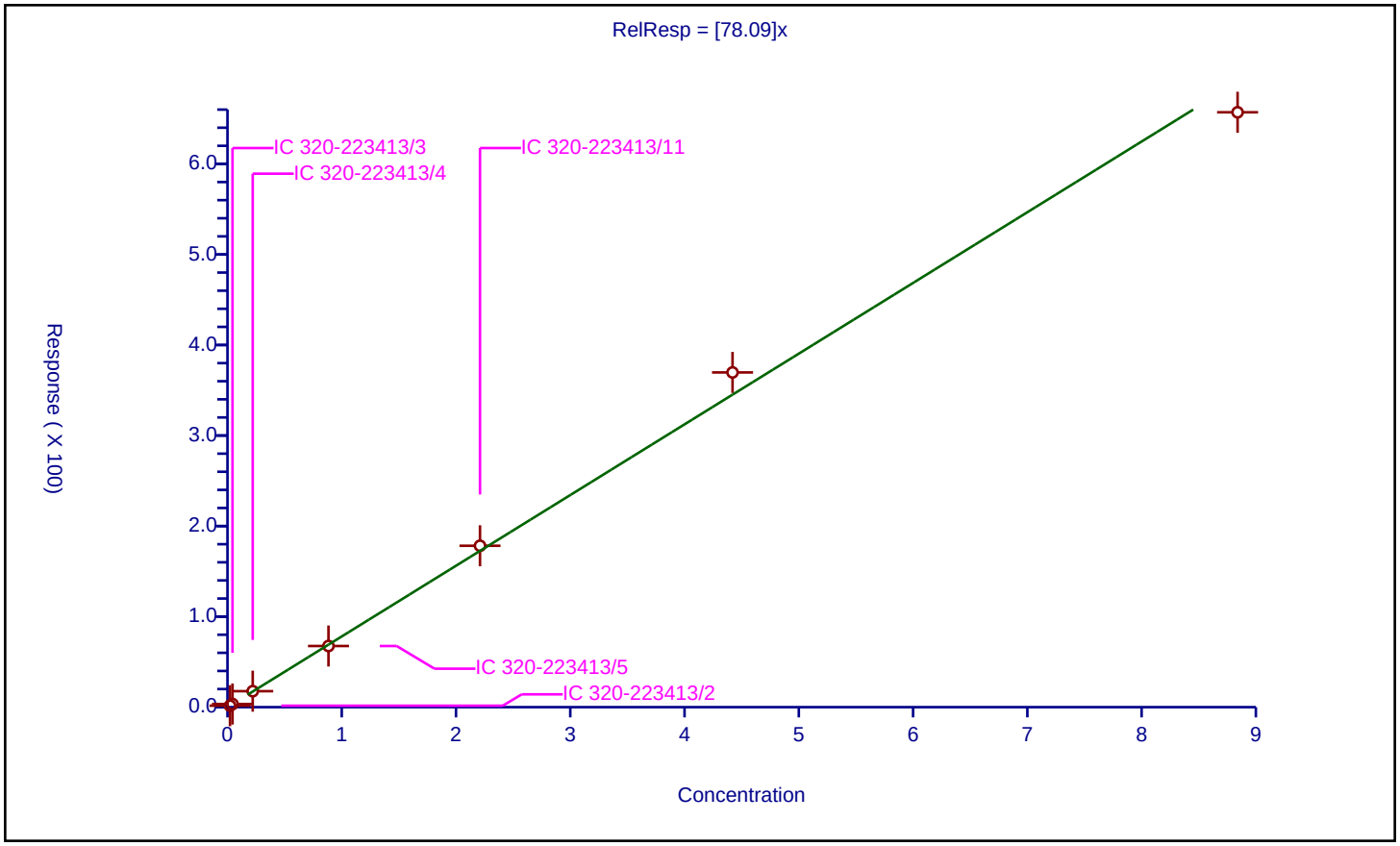
Curve Coefficients

Intercept:	0
Slope:	78.09

Error Coefficients

Standard Error:	13200000
Relative Standard Error:	4.7
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0221	1.621676	2.325	110547.0	73.379018	Y
2	IC 320-223413/3	0.0442	3.463565	2.325	117730.0	78.361193	Y
3	IC 320-223413/4	0.221	17.647766	2.325	99970.0	79.854146	Y
4	IC 320-223413/5	0.884	67.556508	2.325	98369.0	76.421389	Y
5	IC 320-223413/11	2.21	178.252079	2.325	94691.0	80.657049	Y
6	IC 320-223413/7	4.42	369.697667	2.325	87185.0	83.642006	Y
7	IC 320-223413/8	8.84	657.03931	2.325	99131.0	74.325714	Y



Calibration / Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

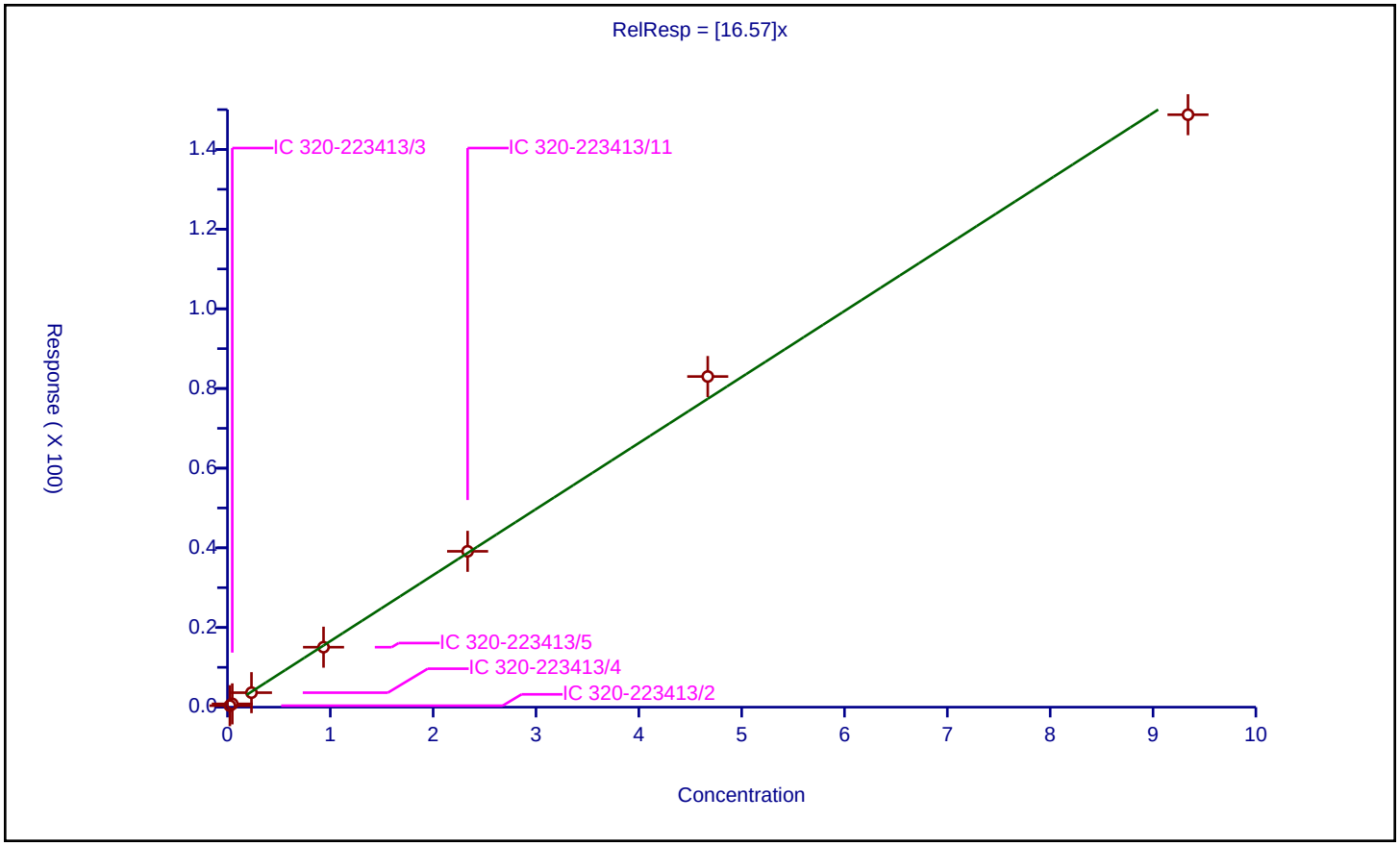
Curve Coefficients

Intercept:	0
Slope:	16.57

Error Coefficients

Standard Error:	2970000
Relative Standard Error:	5.3
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.02335	0.37609	2.325	110547.0	16.106649	Y
2	IC 320-223413/3	0.0467	0.82869	2.325	117730.0	17.744964	Y
3	IC 320-223413/4	0.2335	3.641484	2.325	99970.0	15.595222	Y
4	IC 320-223413/5	0.934	15.055267	2.325	98369.0	16.119129	Y
5	IC 320-223413/11	2.335	39.125612	2.325	94691.0	16.756151	Y
6	IC 320-223413/7	4.67	83.00038	2.325	87185.0	17.773101	Y
7	IC 320-223413/8	9.34	148.721336	2.325	99131.0	15.923055	Y



Calibration / Perfluorohexanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

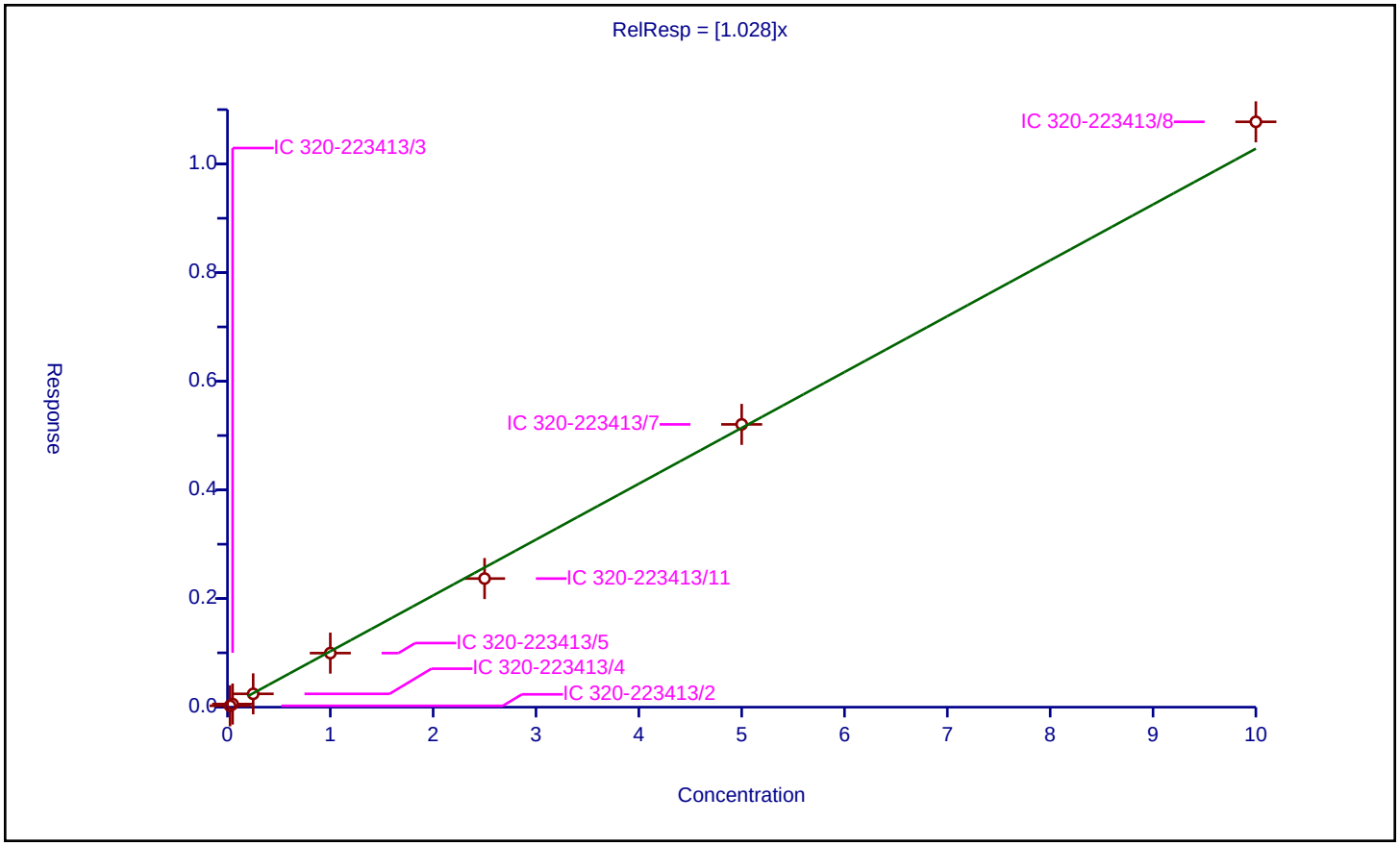
Curve Coefficients

Intercept:	0
Slope:	1.028

Error Coefficients

Standard Error:	9400000
Relative Standard Error:	6.6
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.0252	2.5	5626147.0	1.00799	Y
2	IC 320-223413/3	0.05	0.057403	2.5	5922451.0	1.148064	Y
3	IC 320-223413/4	0.25	0.245112	2.5	5134906.0	0.980446	Y
4	IC 320-223413/5	1.0	0.994902	2.5	4854075.0	0.994902	Y
5	IC 320-223413/11	2.5	2.367484	2.5	5043564.0	0.946994	Y
6	IC 320-223413/7	5.0	5.205567	2.5	4583820.0	1.041113	Y
7	IC 320-223413/8	10.0	10.775226	2.5	4709249.0	1.077523	Y



Calibration / Perfluoropentanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

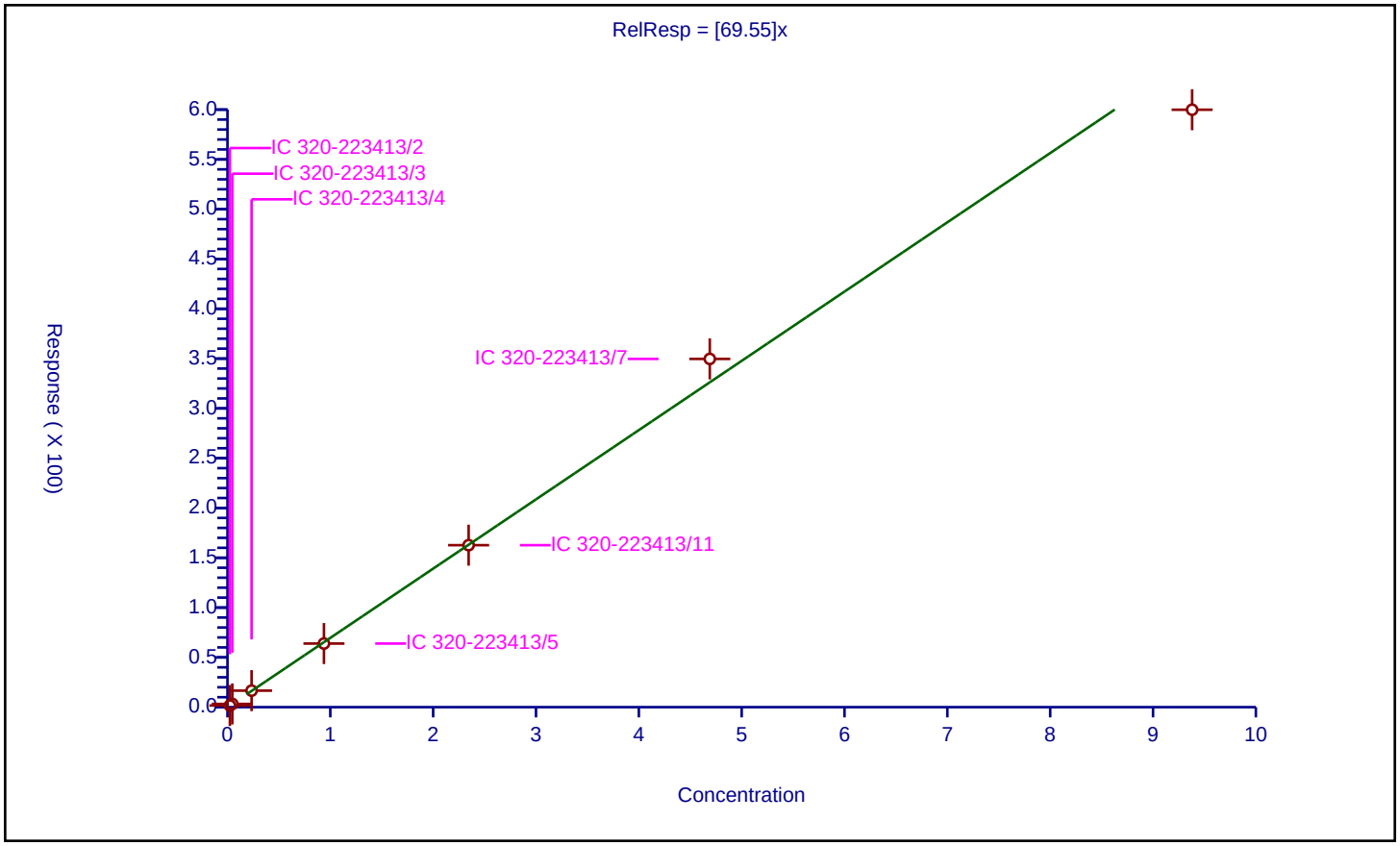
Curve Coefficients

Intercept:	0
Slope:	69.55

Error Coefficients

Standard Error:	12100000
Relative Standard Error:	4.6
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.02345	1.654065	2.325	110547.0	70.535831	Y
2	IC 320-223413/3	0.0469	3.26442	2.325	117730.0	69.603839	Y
3	IC 320-223413/4	0.2345	16.581364	2.325	99970.0	70.709442	Y
4	IC 320-223413/5	0.938	63.877525	2.325	98369.0	68.099707	Y
5	IC 320-223413/11	2.345	162.639853	2.325	94691.0	69.356014	Y
6	IC 320-223413/7	4.69	349.685013	2.325	87185.0	74.559704	Y
7	IC 320-223413/8	9.38	599.885978	2.325	99131.0	63.953729	Y



Calibration / Perfluoroheptanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

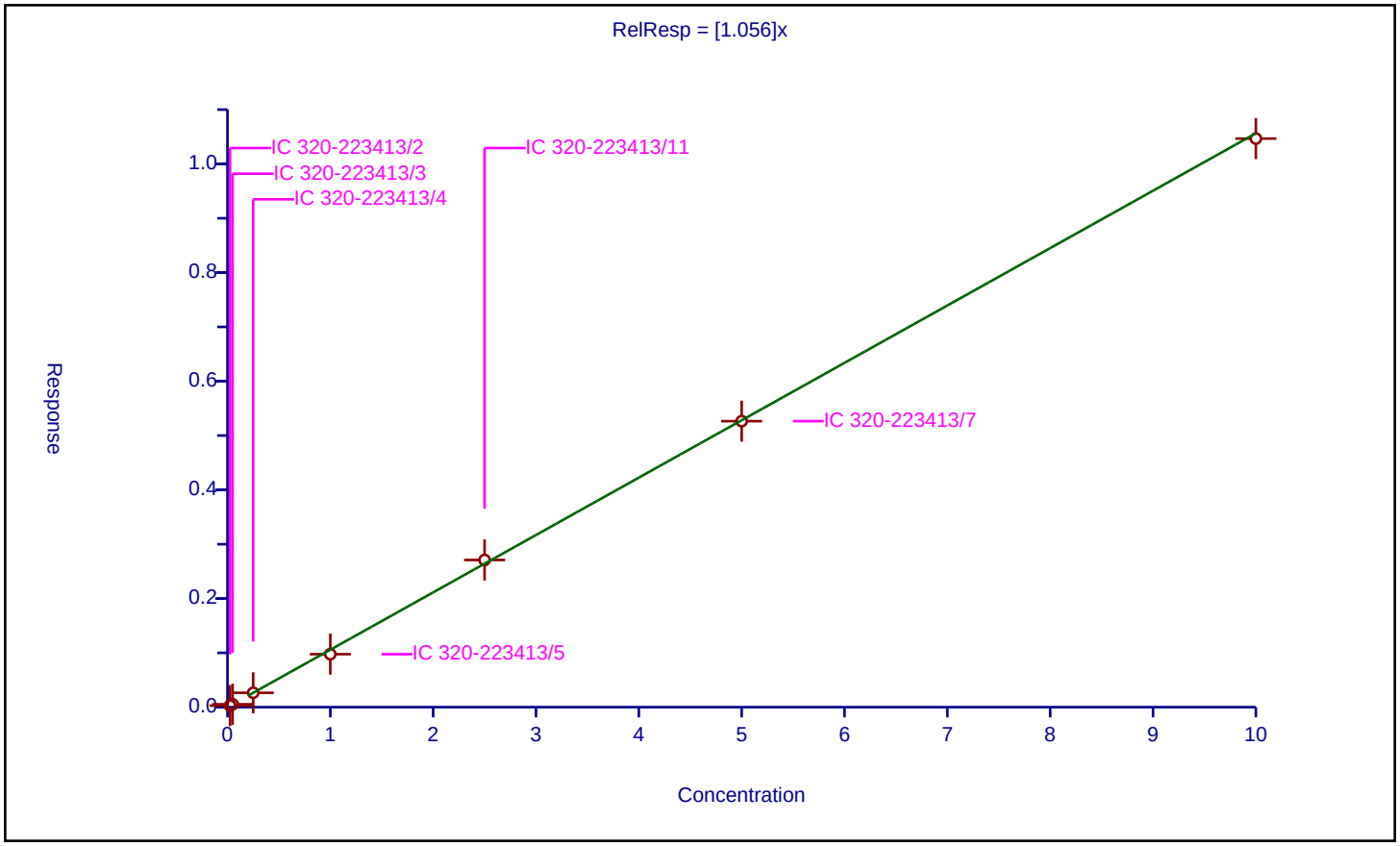
Curve Coefficients

Intercept:	0
Slope:	1.056

Error Coefficients

Standard Error:	8830000
Relative Standard Error:	4.1
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.027924	2.5	5577473.0	1.116957	Y
2	IC 320-223413/3	0.05	0.053061	2.5	5774309.0	1.061218	Y
3	IC 320-223413/4	0.25	0.264298	2.5	5050240.0	1.057193	Y
4	IC 320-223413/5	1.0	0.975396	2.5	4714171.0	0.975396	Y
5	IC 320-223413/11	2.5	2.709685	2.5	4465208.0	1.083874	Y
6	IC 320-223413/7	5.0	5.264617	2.5	4318388.0	1.052923	Y
7	IC 320-223413/8	10.0	10.466622	2.5	4521122.0	1.046662	Y



Calibration / Perfluorohexanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

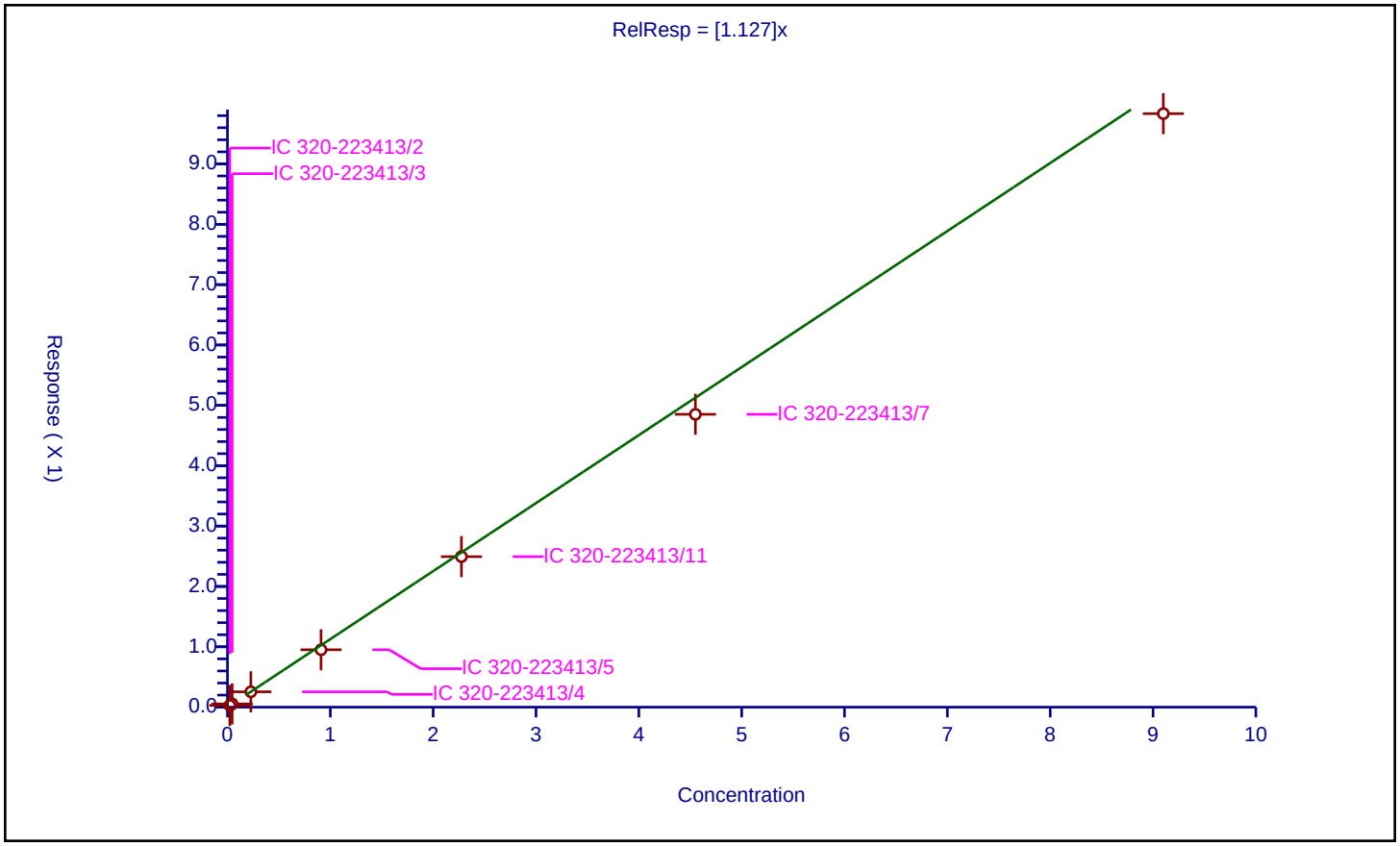
Curve Coefficients

Intercept:	0
Slope:	1.127

Error Coefficients

Standard Error:	10300000
Relative Standard Error:	7.6
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.02275	0.029275	2.365	6497213.0	1.286792	Y
2	IC 320-223413/3	0.0455	0.054276	2.365	6581524.0	1.192872	Y
3	IC 320-223413/4	0.2275	0.254784	2.365	5692452.0	1.11993	Y
4	IC 320-223413/5	0.91	0.951005	2.365	5565884.0	1.04506	Y
5	IC 320-223413/11	2.275	2.493637	2.365	5339851.0	1.096104	Y
6	IC 320-223413/7	4.55	4.85177	2.365	5191664.0	1.066323	Y
7	IC 320-223413/8	9.1	9.833165	2.365	5333305.0	1.080568	Y



Calibration / Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)

Curve Type:	Linear
Weighting:	Conc_Sq
Origin:	None
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

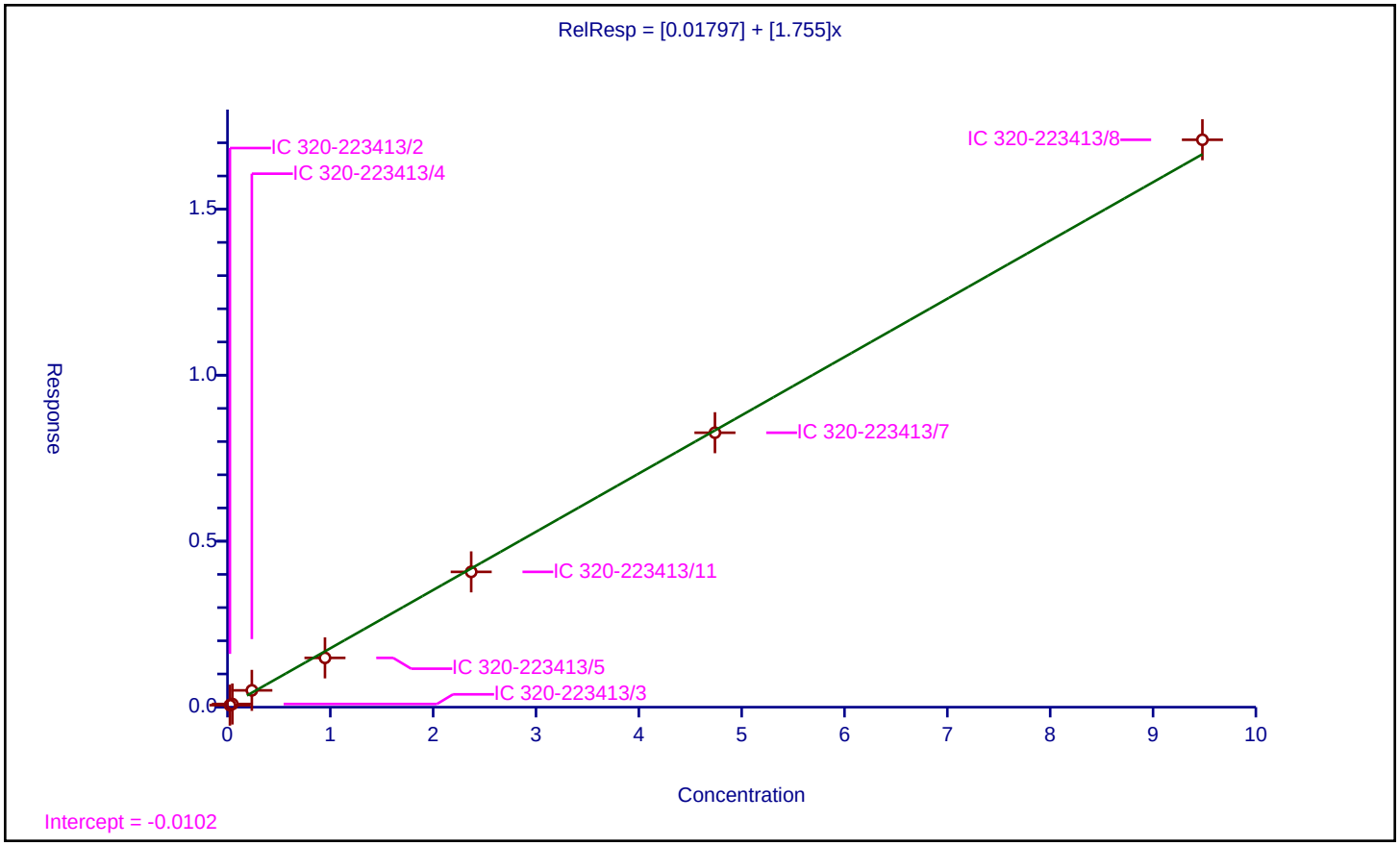
Curve Coefficients

Intercept:	0.01797
Slope:	1.755

Error Coefficients

Standard Error:	3330000
Relative Standard Error:	10.1
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.990

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0237	0.060388	2.375	1179634.0	2.548017	Y
2	IC 320-223413/3	0.0474	0.095492	2.375	1201925.0	2.0146	Y
3	IC 320-223413/4	0.237	0.506054	2.375	1076802.0	2.135249	Y
4	IC 320-223413/5	0.948	1.484407	2.375	1028277.0	1.56583	Y
5	IC 320-223413/11	2.37	4.075455	2.375	953169.0	1.719601	Y
6	IC 320-223413/7	4.74	8.267203	2.375	867962.0	1.744136	Y
7	IC 320-223413/8	9.48	17.091564	2.375	913641.0	1.802908	Y



Calibration / Perfluorooctanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

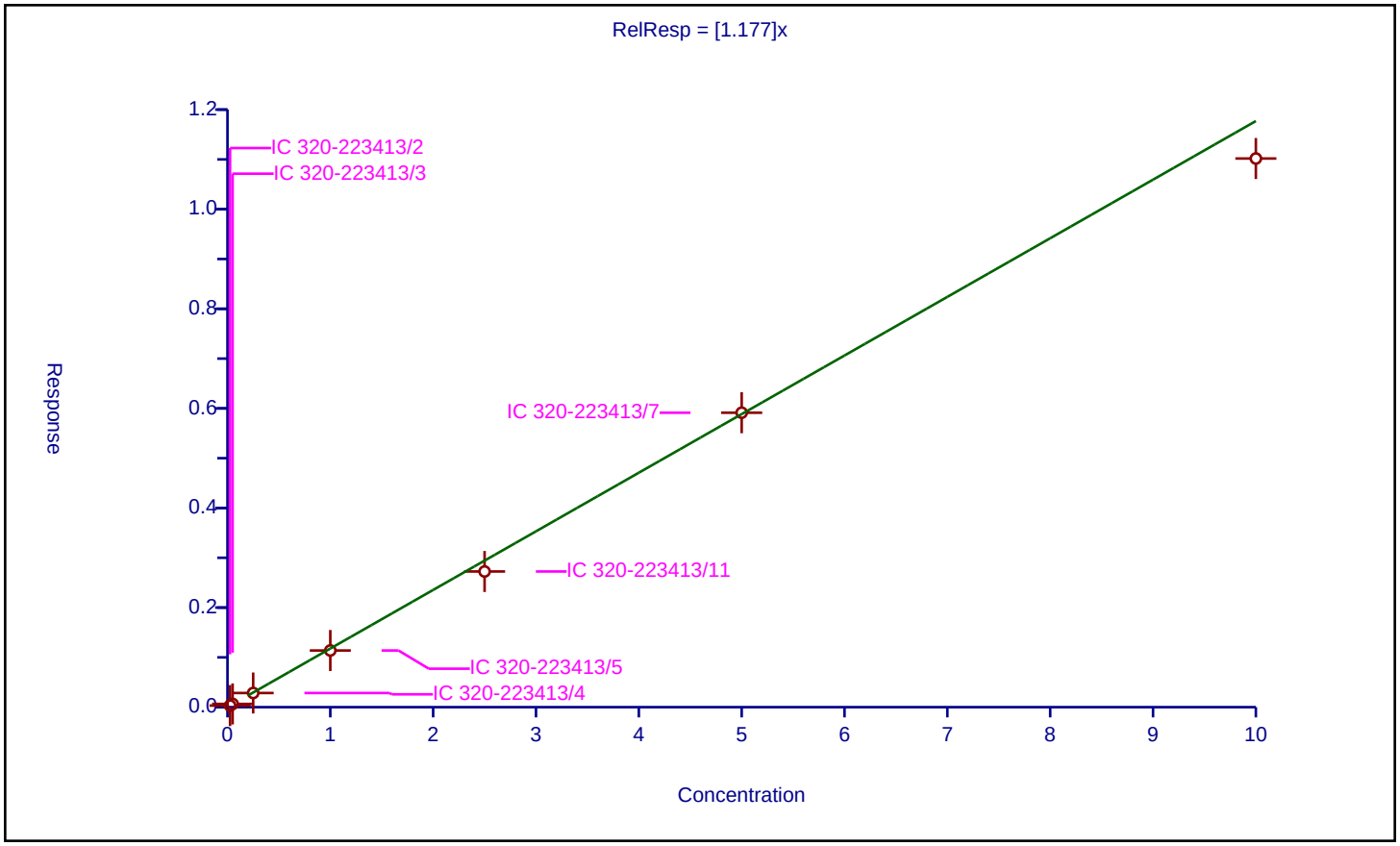
Curve Coefficients

Intercept:	0
Slope:	1.177

Error Coefficients

Standard Error:	9210000
Relative Standard Error:	7.3
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.03206	2.5	5162191.0	1.282382	Y
2	IC 320-223413/3	0.05	0.06533	2.5	5272655.0	1.30659	Y
3	IC 320-223413/4	0.25	0.284496	2.5	4619416.0	1.137986	Y
4	IC 320-223413/5	1.0	1.138031	2.5	4460027.0	1.138031	Y
5	IC 320-223413/11	2.5	2.724486	2.5	4456920.0	1.089795	Y
6	IC 320-223413/7	5.0	5.913082	2.5	4079623.0	1.182616	Y
7	IC 320-223413/8	10.0	11.01813	2.5	4465836.0	1.101813	Y



Calibration / Perfluoroheptanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

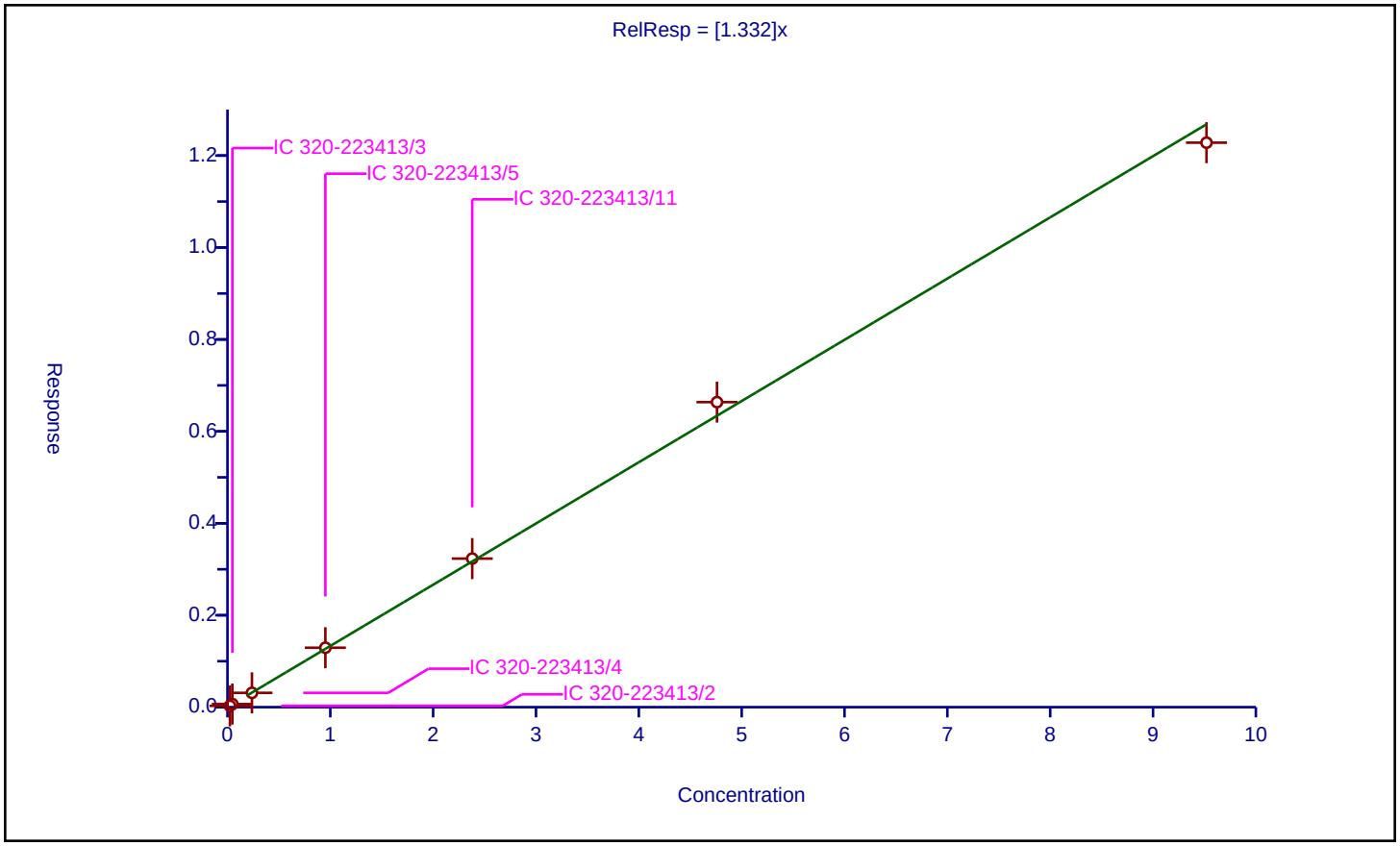
Curve Coefficients

Intercept:	0
Slope:	1.332

Error Coefficients

Standard Error:	9270000
Relative Standard Error:	5.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0238	0.028505	2.39	4516956.0	1.197673	Y
2	IC 320-223413/3	0.0476	0.067413	2.39	4415247.0	1.416243	Y
3	IC 320-223413/4	0.238	0.311586	2.39	4024927.0	1.309183	Y
4	IC 320-223413/5	0.952	1.293247	2.39	3779459.0	1.358452	Y
5	IC 320-223413/11	2.38	3.232143	2.39	3815593.0	1.358043	Y
6	IC 320-223413/7	4.76	6.636219	2.39	3520558.0	1.394164	Y
7	IC 320-223413/8	9.52	12.280732	2.39	3835347.0	1.289993	Y



Calibration / Perfluorooctane sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

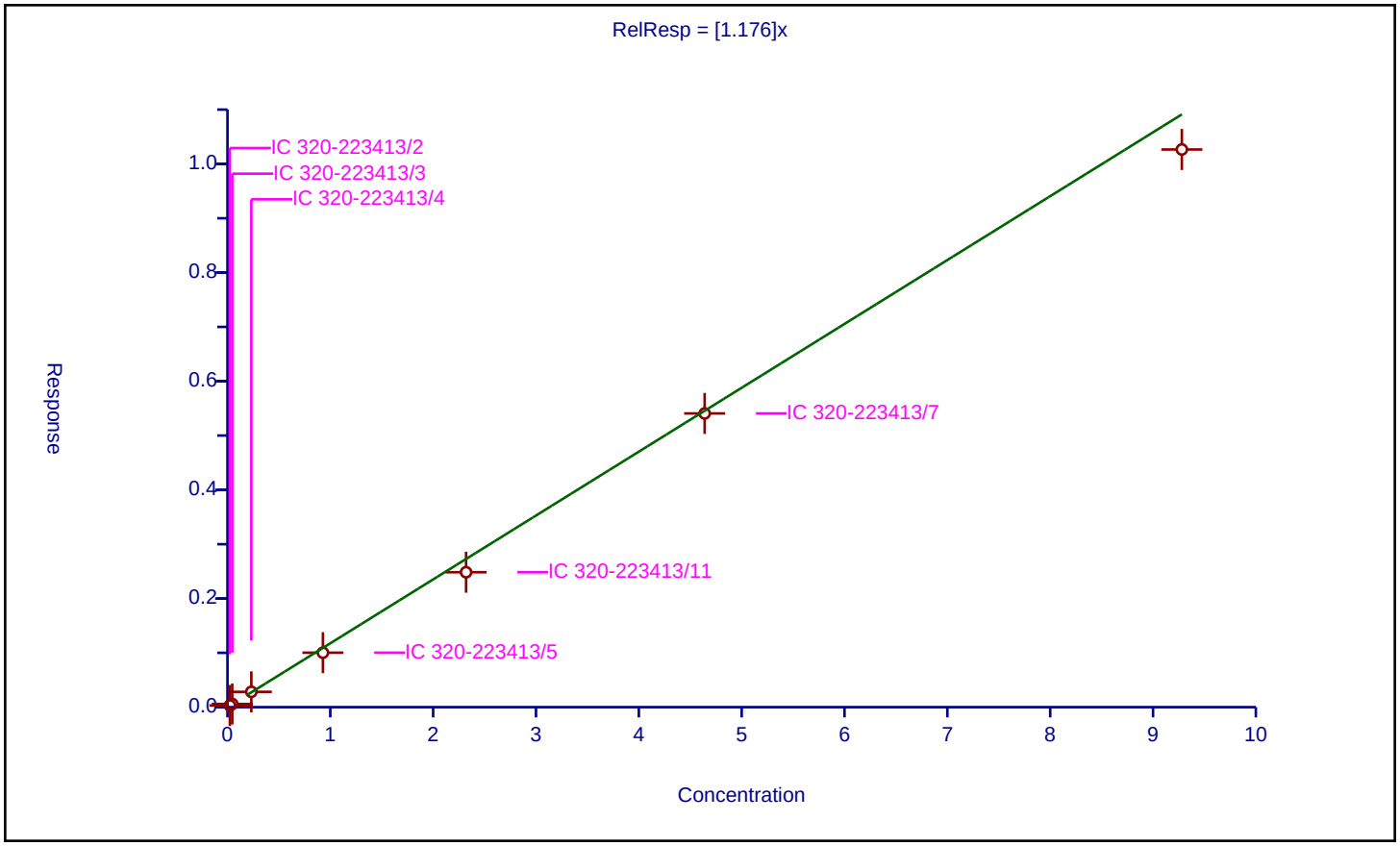
Curve Coefficients

Intercept:	0
Slope:	1.176

Error Coefficients

Standard Error:	7670000
Relative Standard Error:	8.4
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0232	0.030848	2.39	4516956.0	1.329658	Y
2	IC 320-223413/3	0.0464	0.05859	2.39	4415247.0	1.262725	Y
3	IC 320-223413/4	0.232	0.282038	2.39	4024927.0	1.215679	Y
4	IC 320-223413/5	0.928	1.002487	2.39	3779459.0	1.080267	Y
5	IC 320-223413/11	2.32	2.48392	2.39	3815593.0	1.070655	Y
6	IC 320-223413/7	4.64	5.407083	2.39	3520558.0	1.16532	Y
7	IC 320-223413/8	9.28	10.266077	2.39	3835347.0	1.106258	Y



Calibration / Perfluorononanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

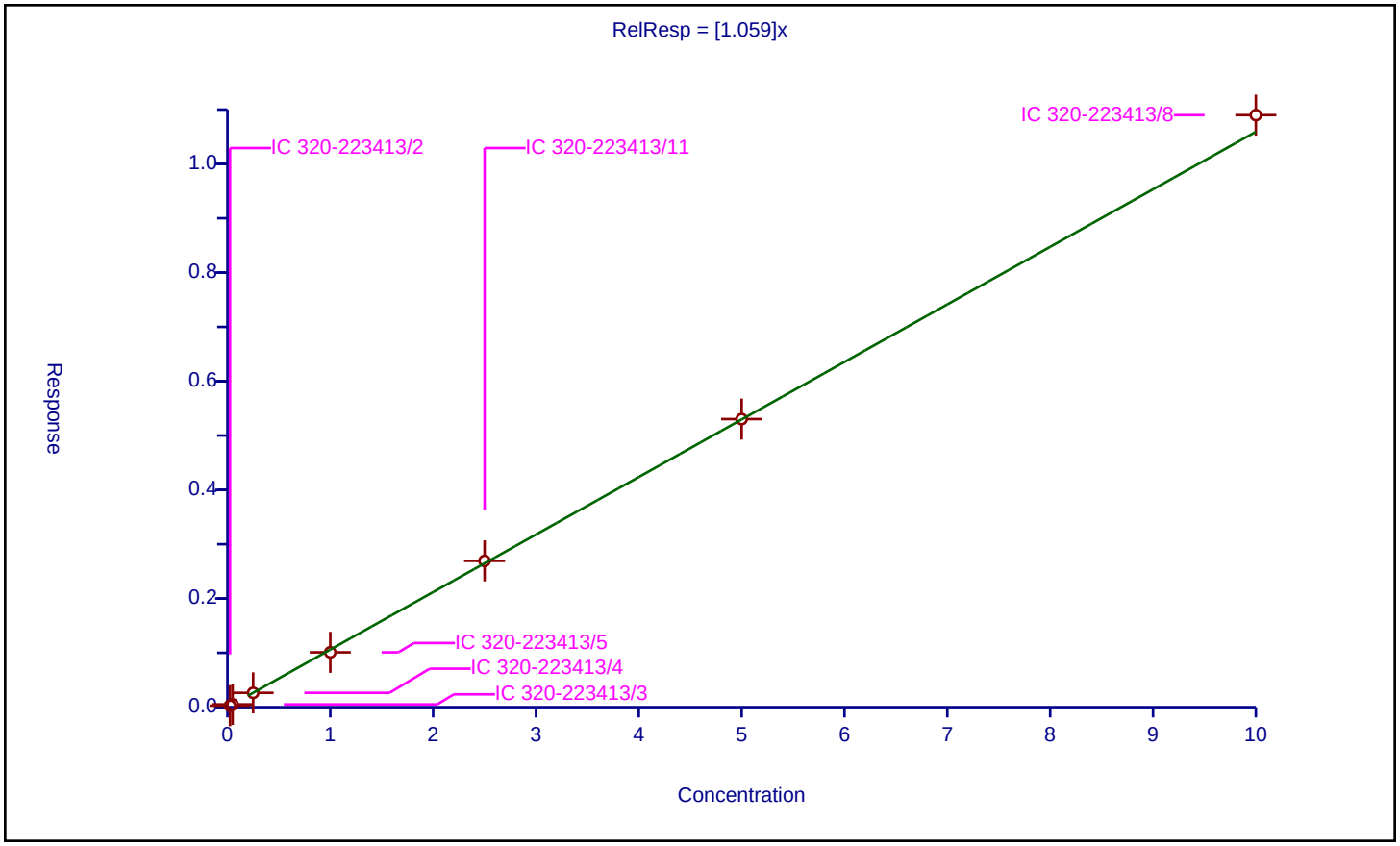
Curve Coefficients

Intercept:	0
Slope:	1.059

Error Coefficients

Standard Error:	7140000
Relative Standard Error:	3.3
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.027572	2.5	4268517.0	1.102865	Y
2	IC 320-223413/3	0.05	0.051043	2.5	4502703.0	1.020865	Y
3	IC 320-223413/4	0.25	0.263408	2.5	3819382.0	1.053634	Y
4	IC 320-223413/5	1.0	1.009411	2.5	3600246.0	1.009411	Y
5	IC 320-223413/11	2.5	2.692885	2.5	3538499.0	1.077154	Y
6	IC 320-223413/7	5.0	5.302849	2.5	3359491.0	1.06057	Y
7	IC 320-223413/8	10.0	10.898353	2.5	3539647.0	1.089835	Y



Calibration / Perfluorooctane Sulfonamide

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

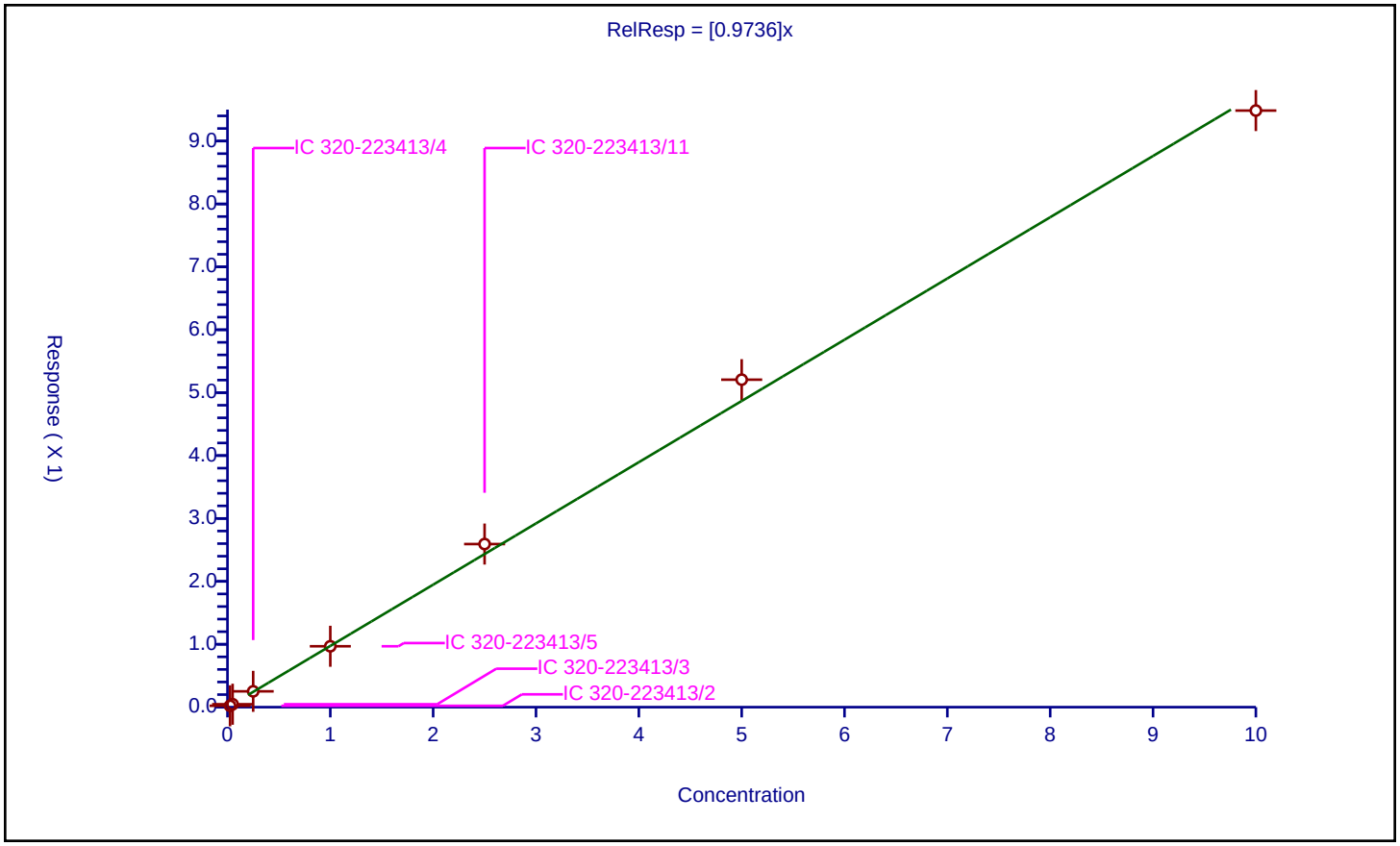
Curve Coefficients

Intercept:	0
Slope:	0.9736

Error Coefficients

Standard Error:	9600000
Relative Standard Error:	6.1
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.021924	2.5	5956672.0	0.876966	Y
2	IC 320-223413/3	0.05	0.04682	2.5	5858621.0	0.936398	Y
3	IC 320-223413/4	0.25	0.25161	2.5	5466463.0	1.006439	Y
4	IC 320-223413/5	1.0	0.968289	2.5	5346931.0	0.968289	Y
5	IC 320-223413/11	2.5	2.593212	2.5	5178962.0	1.037285	Y
6	IC 320-223413/7	5.0	5.20651	2.5	4976852.0	1.041302	Y
7	IC 320-223413/8	10.0	9.484794	2.5	5353791.0	0.948479	Y



Calibration / Perfluorononanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

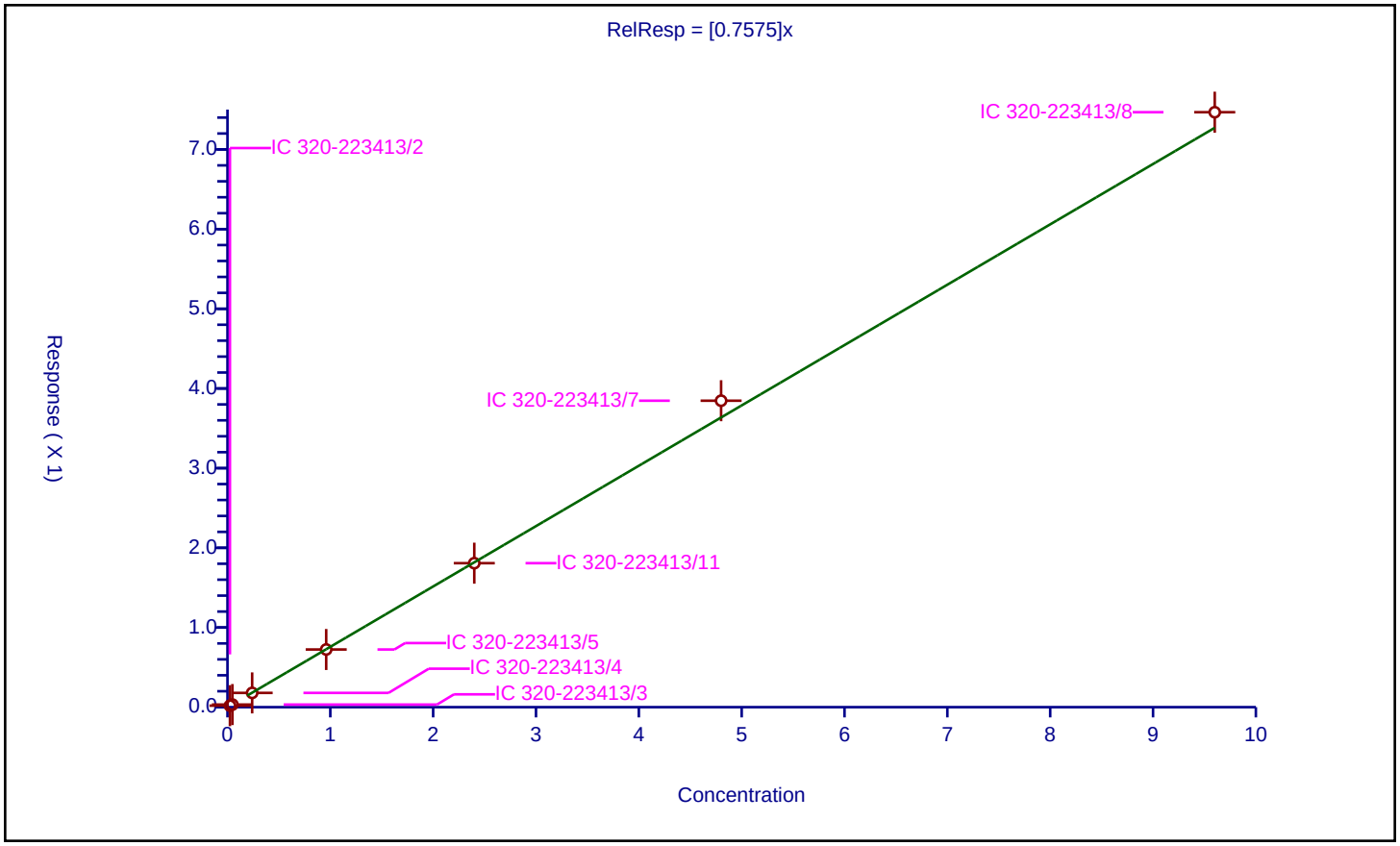
Curve Coefficients

Intercept:	0
Slope:	0.7575

Error Coefficients

Standard Error:	5560000
Relative Standard Error:	5.1
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.024	0.0189	2.39	4516956.0	0.787481	Y
2	IC 320-223413/3	0.048	0.032746	2.39	4415247.0	0.682204	Y
3	IC 320-223413/4	0.24	0.179215	2.39	4024927.0	0.74673	Y
4	IC 320-223413/5	0.96	0.723687	2.39	3779459.0	0.75384	Y
5	IC 320-223413/11	2.4	1.807138	2.39	3815593.0	0.752974	Y
6	IC 320-223413/7	4.8	3.846277	2.39	3520558.0	0.801308	Y
7	IC 320-223413/8	9.6	7.467179	2.39	3835347.0	0.777831	Y



Calibration / Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

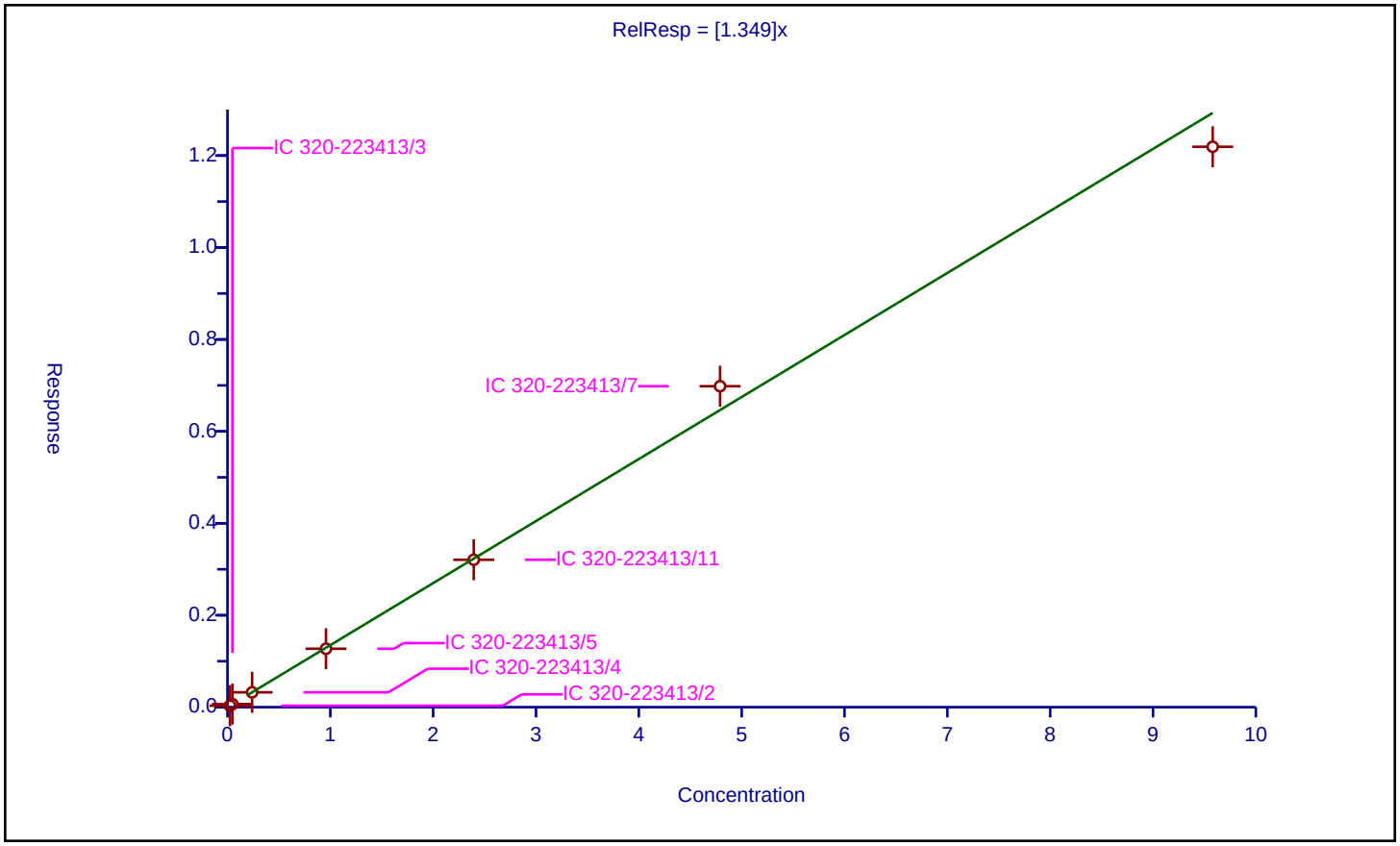
Curve Coefficients

Intercept:	0
Slope:	1.349

Error Coefficients

Standard Error:	2660000
Relative Standard Error:	4.3
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.02395	0.03158	2.395	1426703.0	1.318565	Y
2	IC 320-223413/3	0.0479	0.066379	2.395	1426640.0	1.385774	Y
3	IC 320-223413/4	0.2395	0.322423	2.395	1187676.0	1.346234	Y
4	IC 320-223413/5	0.958	1.27079	2.395	1096366.0	1.326503	Y
5	IC 320-223413/11	2.395	3.206758	2.395	1089191.0	1.338939	Y
6	IC 320-223413/7	4.79	6.982192	2.395	972368.0	1.45766	Y
7	IC 320-223413/8	9.58	12.191537	2.395	1107332.0	1.272603	Y



Calibration / Perfluorodecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

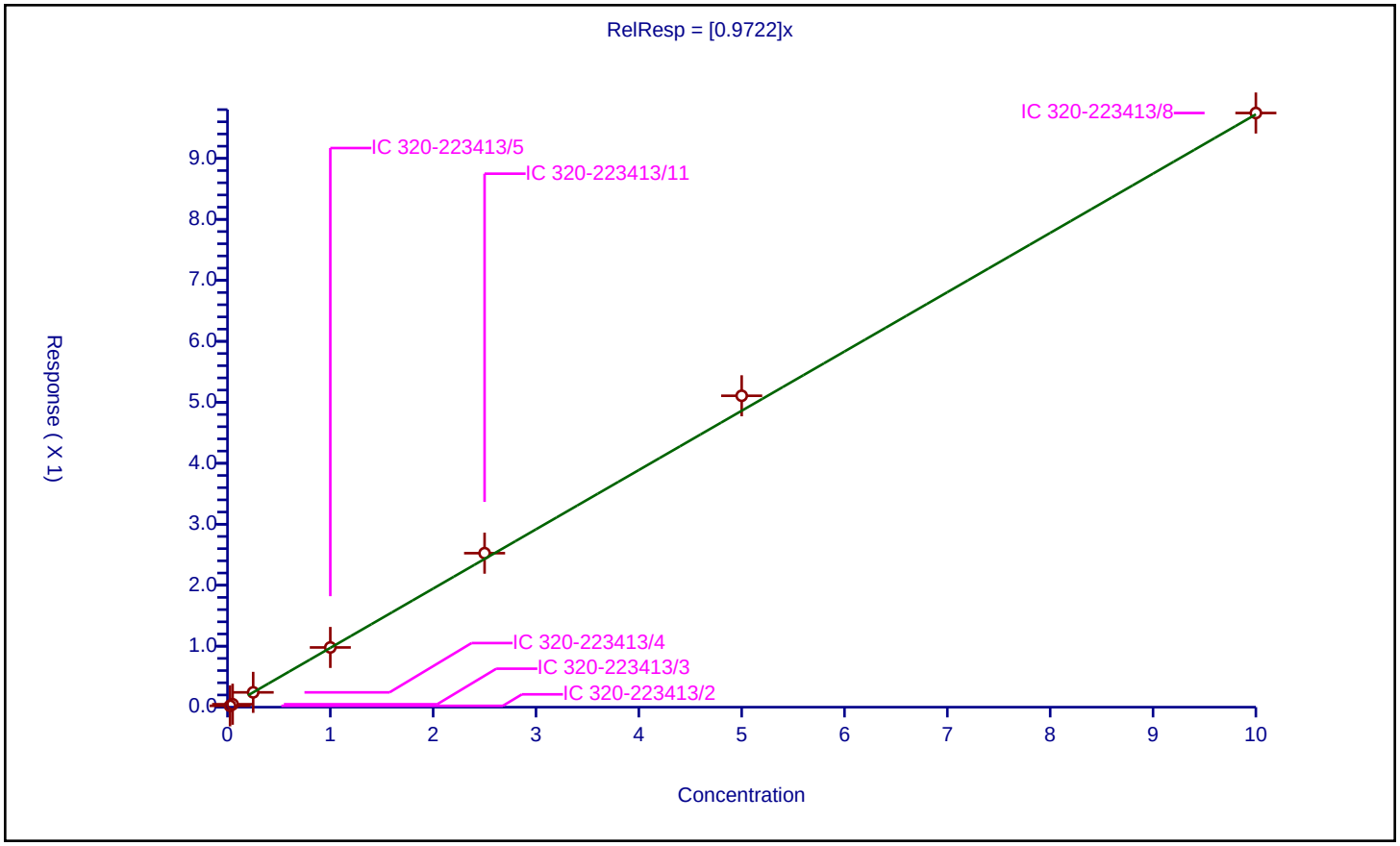
Curve Coefficients

Intercept:	0
Slope:	0.9722

Error Coefficients

Standard Error:	5620000
Relative Standard Error:	4.5
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.022168	2.5	3594922.0	0.886723	Y
2	IC 320-223413/3	0.05	0.048141	2.5	3752181.0	0.962813	Y
3	IC 320-223413/4	0.25	0.242669	2.5	3297462.0	0.970677	Y
4	IC 320-223413/5	1.0	0.979358	2.5	3084670.0	0.979358	Y
5	IC 320-223413/11	2.5	2.525493	2.5	2997952.0	1.010197	Y
6	IC 320-223413/7	5.0	5.106929	2.5	2812041.0	1.021386	Y
7	IC 320-223413/8	10.0	9.744224	2.5	3099083.0	0.974422	Y



Calibration / N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

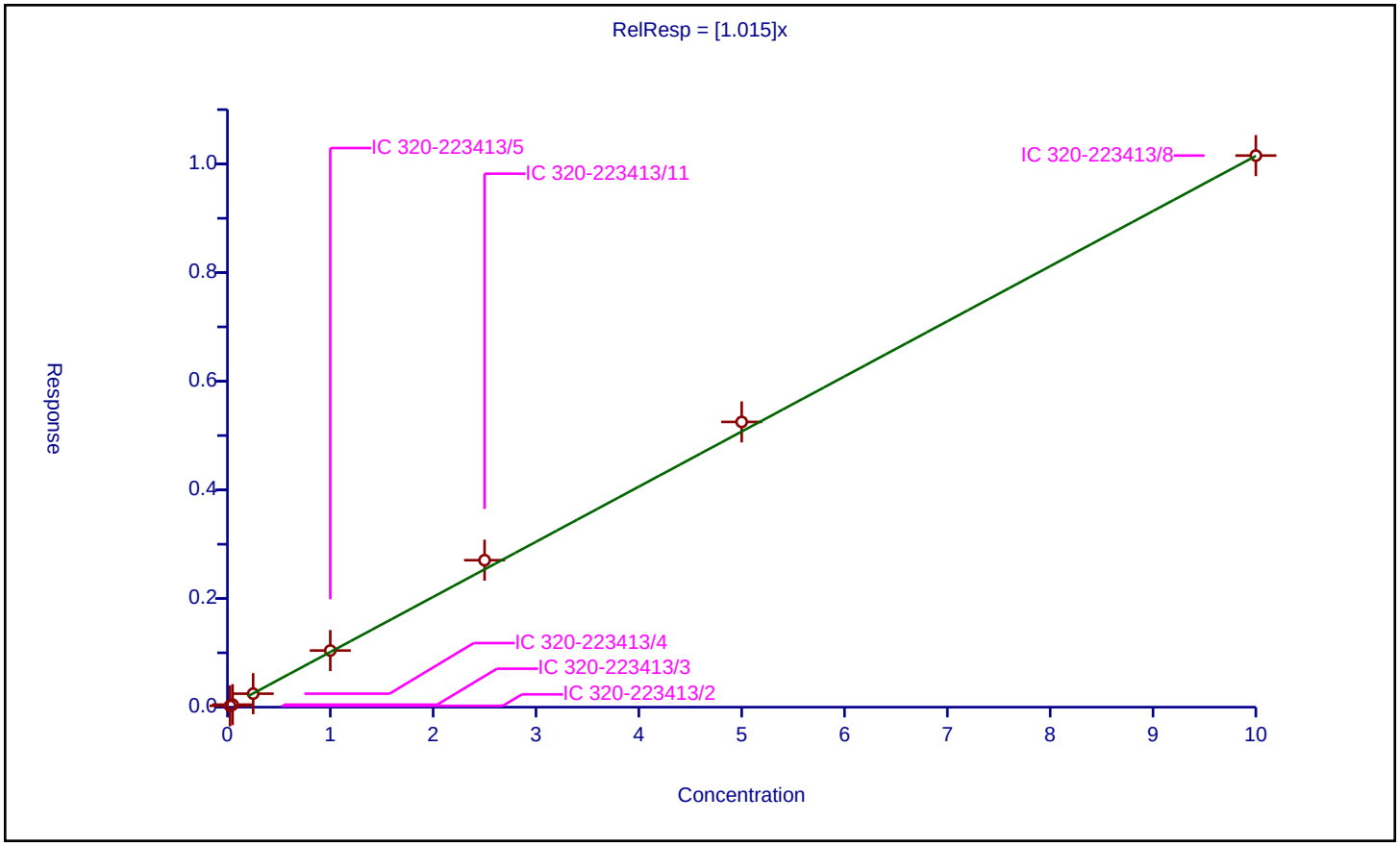
Curve Coefficients

Intercept:	0
Slope:	1.015

Error Coefficients

Standard Error:	3410000
Relative Standard Error:	4.8
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.02464	2.5	1940146.0	0.985596	Y
2	IC 320-223413/3	0.05	0.046708	2.5	2060337.0	0.934168	Y
3	IC 320-223413/4	0.25	0.248379	2.5	1854527.0	0.993515	Y
4	IC 320-223413/5	1.0	1.0424	2.5	1667566.0	1.0424	Y
5	IC 320-223413/11	2.5	2.705503	2.5	1561957.0	1.082201	Y
6	IC 320-223413/7	5.0	5.250998	2.5	1561125.0	1.0502	Y
7	IC 320-223413/8	10.0	10.153615	2.5	1836867.0	1.015361	Y



Calibration / Perfluorodecane Sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

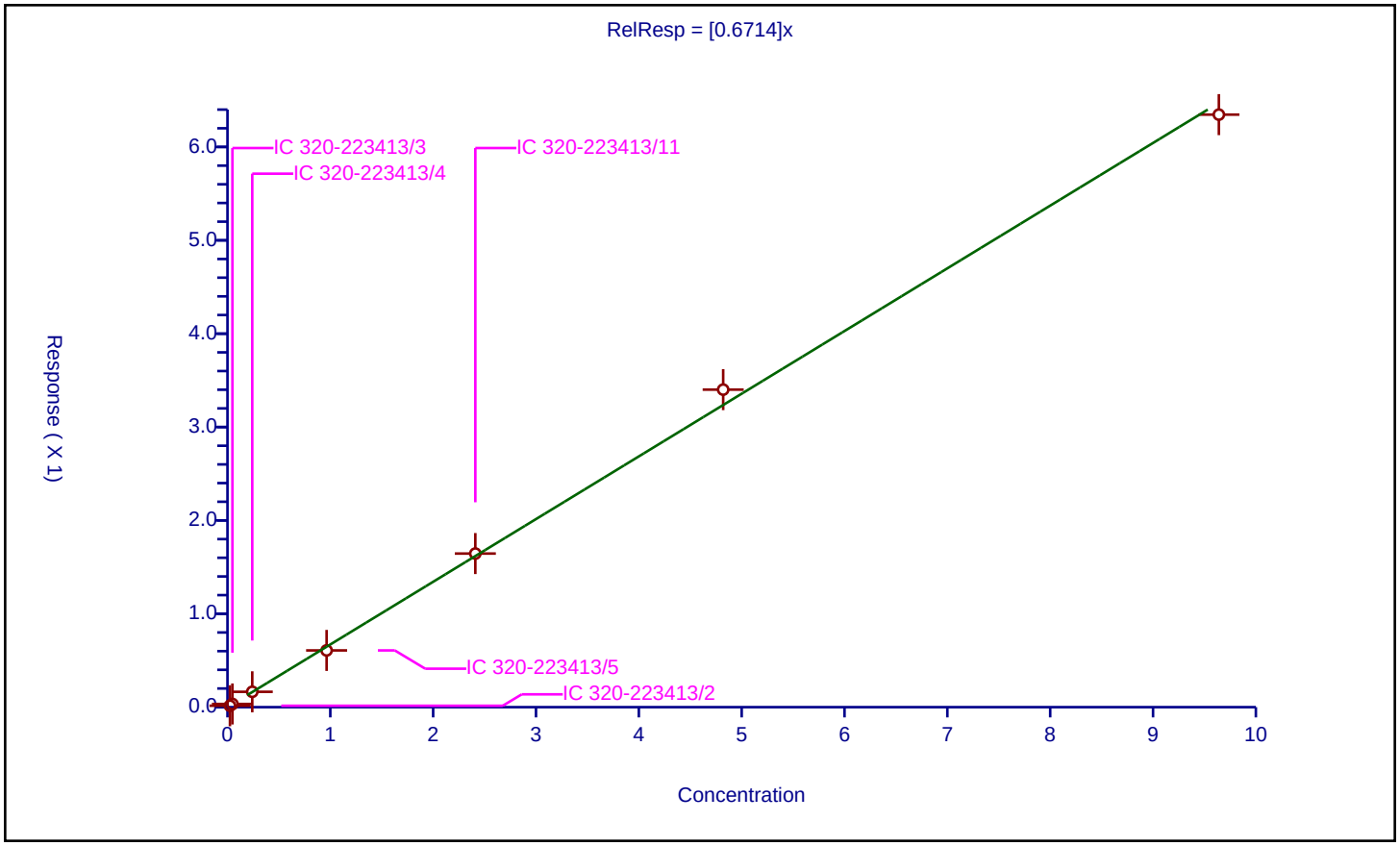
Curve Coefficients

Intercept:	0
Slope:	0.6714

Error Coefficients

Standard Error:	4770000
Relative Standard Error:	4.8
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0241	0.015224	2.39	4516956.0	0.631713	Y
2	IC 320-223413/3	0.0482	0.034117	2.39	4415247.0	0.707819	Y
3	IC 320-223413/4	0.241	0.164737	2.39	4024927.0	0.683554	Y
4	IC 320-223413/5	0.964	0.607741	2.39	3779459.0	0.630436	Y
5	IC 320-223413/11	2.41	1.644986	2.39	3815593.0	0.682567	Y
6	IC 320-223413/7	4.82	3.400965	2.39	3520558.0	0.705594	Y
7	IC 320-223413/8	9.64	6.346257	2.39	3835347.0	0.658325	Y



Calibration / Perfluoroundecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

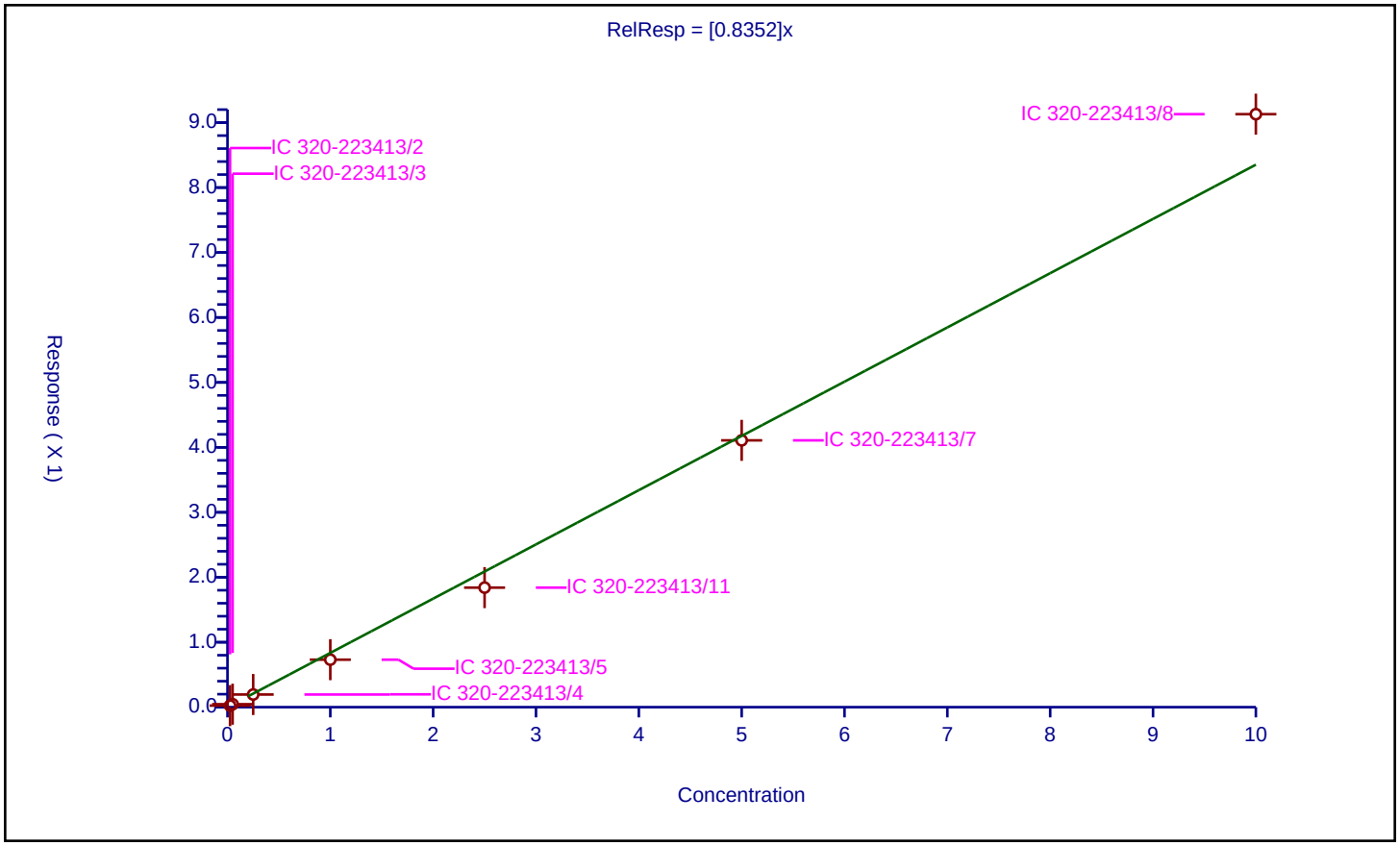
Curve Coefficients

Intercept:	0
Slope:	0.8352

Error Coefficients

Standard Error:	3810000
Relative Standard Error:	10.9
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.984

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.023789	2.5	2840675.0	0.95157	Y
2	IC 320-223413/3	0.05	0.045689	2.5	2914989.0	0.913777	Y
3	IC 320-223413/4	0.25	0.194752	2.5	2576940.0	0.779009	Y
4	IC 320-223413/5	1.0	0.731215	2.5	2587053.0	0.731215	Y
5	IC 320-223413/11	2.5	1.840749	2.5	2447962.0	0.736299	Y
6	IC 320-223413/7	5.0	4.107749	2.5	2262574.0	0.82155	Y
7	IC 320-223413/8	10.0	9.129515	2.5	2282286.0	0.912952	Y



Calibration / N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

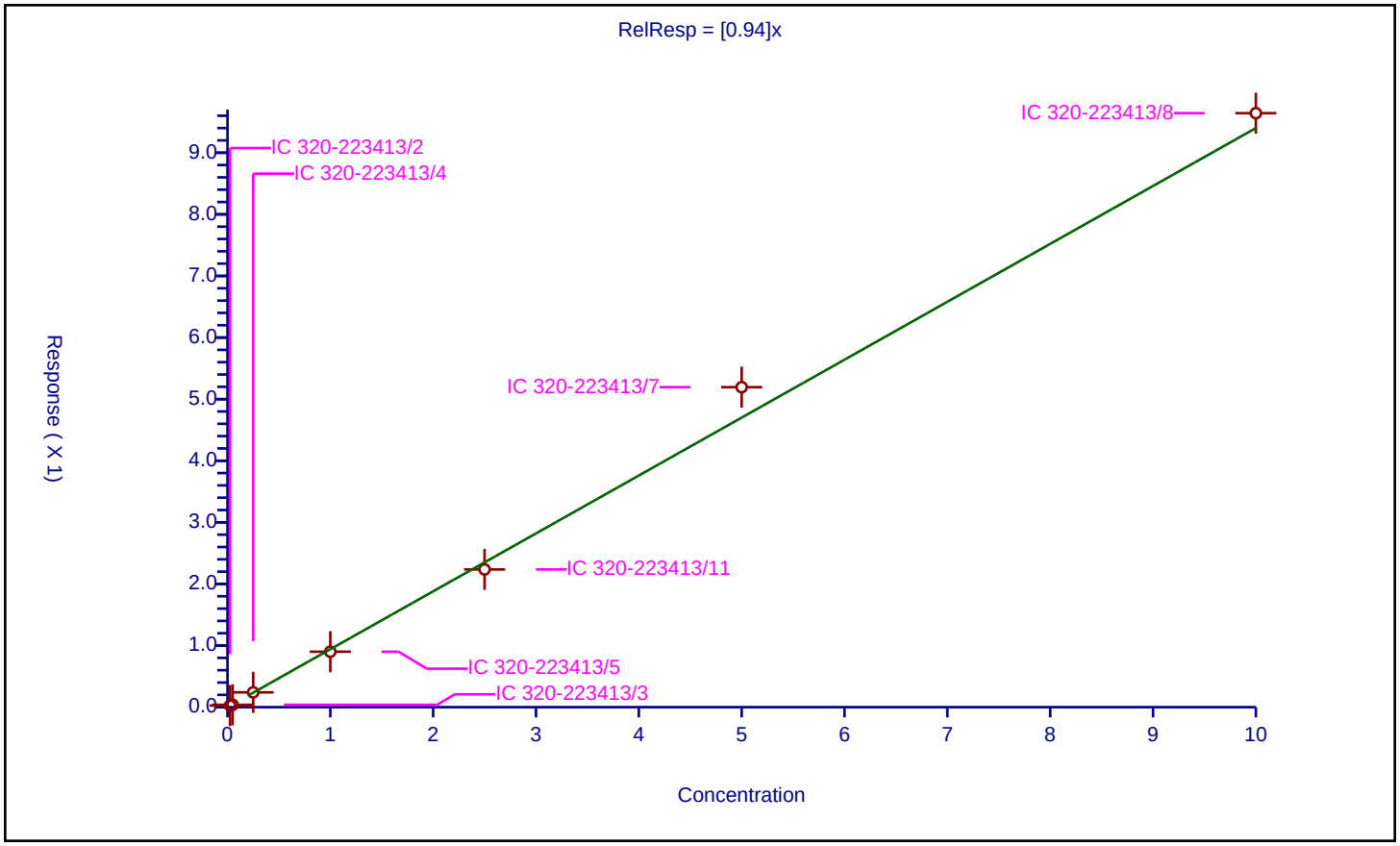
Curve Coefficients

Intercept:	0
Slope:	0.94

Error Coefficients

Standard Error:	2940000
Relative Standard Error:	10.3
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.987

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.026309	2.5	2119254.0	1.052351	Y
2	IC 320-223413/3	0.05	0.03841	2.5	2144987.0	0.76821	Y
3	IC 320-223413/4	0.25	0.240507	2.5	1857905.0	0.96203	Y
4	IC 320-223413/5	1.0	0.900266	2.5	1808821.0	0.900266	Y
5	IC 320-223413/11	2.5	2.235955	2.5	1777821.0	0.894382	Y
6	IC 320-223413/7	5.0	5.194028	2.5	1507014.0	1.038806	Y
7	IC 320-223413/8	10.0	9.641907	2.5	1619647.0	0.964191	Y



Calibration / Perfluorododecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

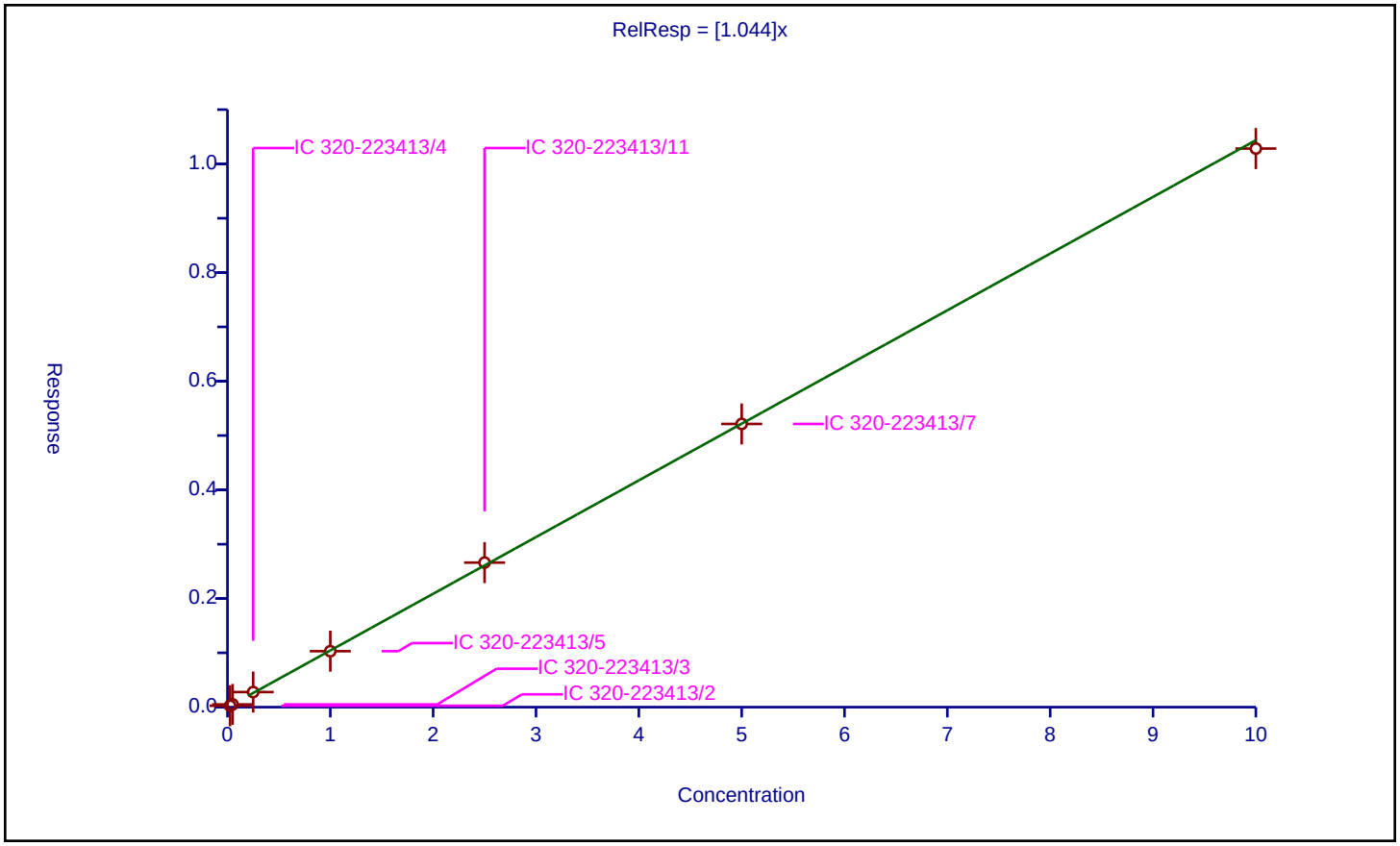
Curve Coefficients

Intercept:	0
Slope:	1.044

Error Coefficients

Standard Error:	5230000
Relative Standard Error:	3.4
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.025547	2.5	2960567.0	1.021899	Y
2	IC 320-223413/3	0.05	0.0502	2.5	3058640.0	1.004008	Y
3	IC 320-223413/4	0.25	0.278393	2.5	2740425.0	1.113572	Y
4	IC 320-223413/5	1.0	1.030575	2.5	2679695.0	1.030575	Y
5	IC 320-223413/11	2.5	2.661172	2.5	2514089.0	1.064469	Y
6	IC 320-223413/7	5.0	5.213621	2.5	2544838.0	1.042724	Y
7	IC 320-223413/8	10.0	10.282964	2.5	2747572.0	1.028296	Y



Calibration / Perfluorotridecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

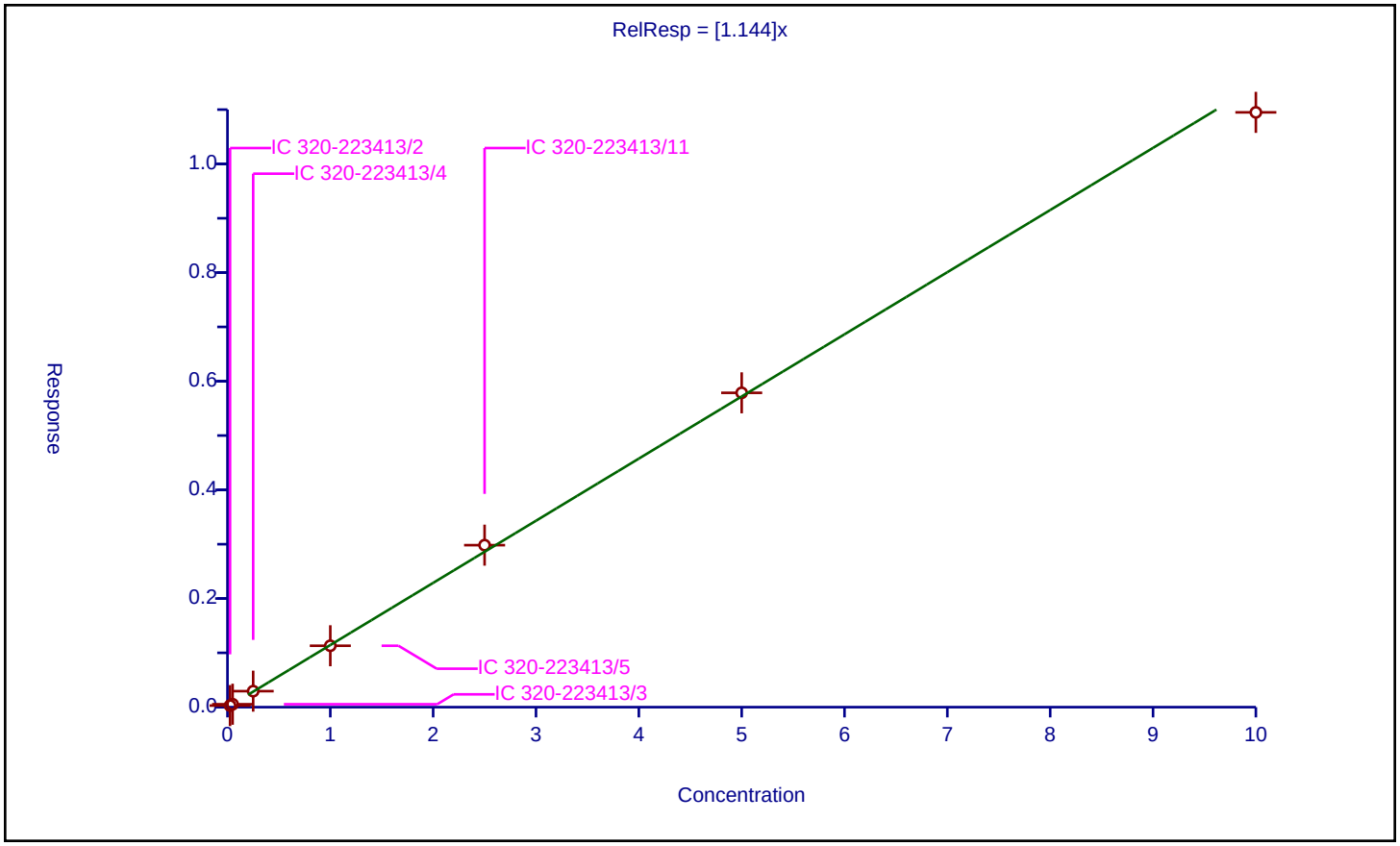
Curve Coefficients

Intercept:	0
Slope:	1.144

Error Coefficients

Standard Error:	5630000
Relative Standard Error:	3.7
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.029231	2.5	2960567.0	1.169235	Y
2	IC 320-223413/3	0.05	0.054221	2.5	3058640.0	1.08442	Y
3	IC 320-223413/4	0.25	0.294504	2.5	2740425.0	1.178014	Y
4	IC 320-223413/5	1.0	1.130478	2.5	2679695.0	1.130478	Y
5	IC 320-223413/11	2.5	2.982527	2.5	2514089.0	1.193011	Y
6	IC 320-223413/7	5.0	5.786335	2.5	2544838.0	1.157267	Y
7	IC 320-223413/8	10.0	10.949082	2.5	2747572.0	1.094908	Y



Calibration / Perfluorotetradecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

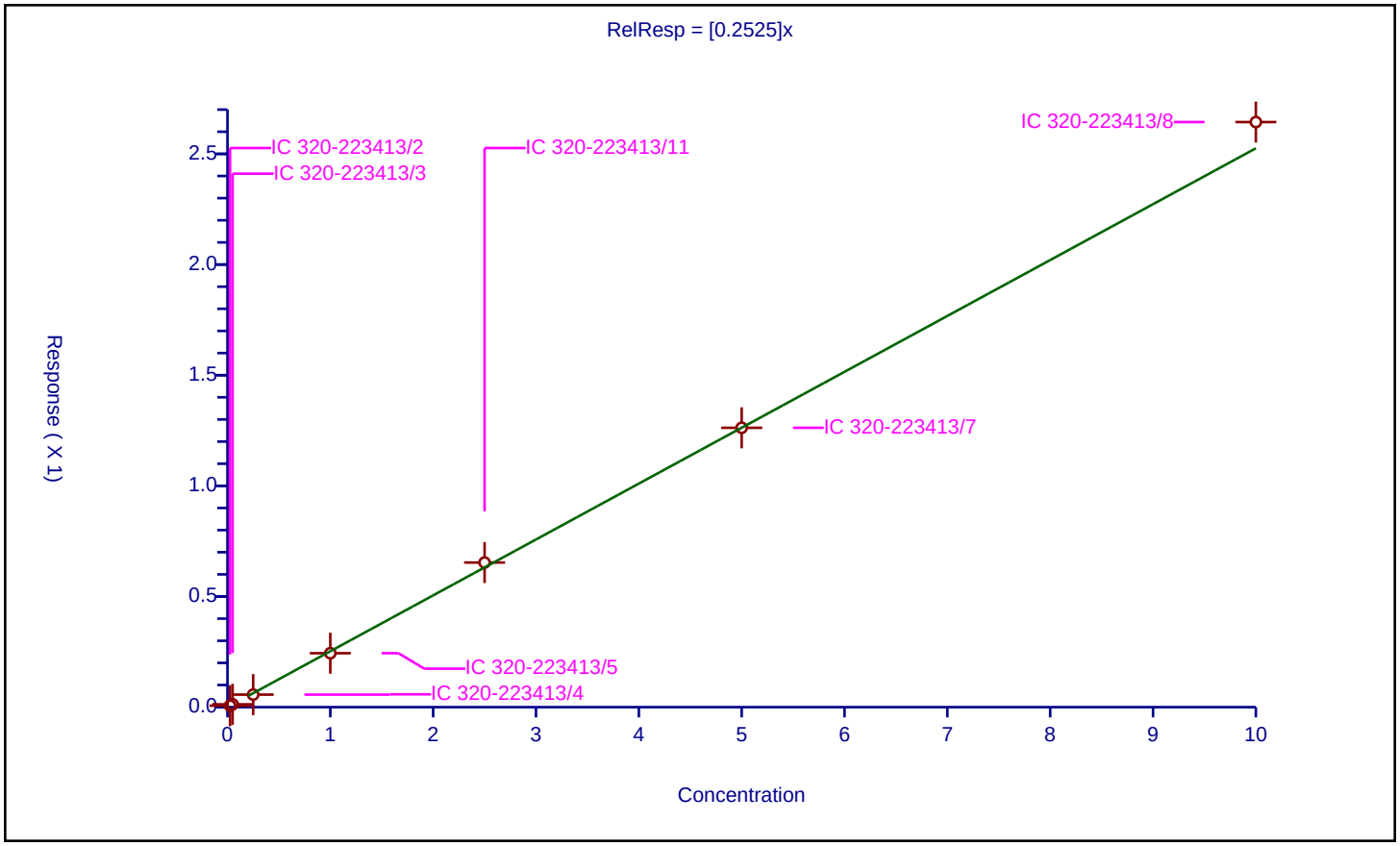
Curve Coefficients

Intercept:	0
Slope:	0.2525

Error Coefficients

Standard Error:	1590000
Relative Standard Error:	5.3
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.006554	2.5	3777870.0	0.262158	Y
2	IC 320-223413/3	0.05	0.012825	2.5	3285420.0	0.256497	Y
3	IC 320-223413/4	0.25	0.056743	2.5	3595983.0	0.226973	Y
4	IC 320-223413/5	1.0	0.243826	2.5	3394312.0	0.243826	Y
5	IC 320-223413/11	2.5	0.653493	2.5	3141974.0	0.261397	Y
6	IC 320-223413/7	5.0	1.262333	2.5	3113223.0	0.252467	Y
7	IC 320-223413/8	10.0	2.643815	2.5	3267831.0	0.264381	Y



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: ICV 320-223413/13 Calibration Date: 05/15/2018 17:23

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.15LLCC_ICAL_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	0.9298	0.9503		2.55	2.50	2.2	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.167		2.47	2.50	-1.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	82.15		2.33	2.21	5.2	30.0
4:2 FTS	AveID	16.57	18.05		2.55	2.34	8.9	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.004		2.44	2.50	-2.3	30.0
Perfluoropentanesulfonic acid	AveID	69.55	71.81		2.43	2.35	3.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.142		2.70	2.50	8.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.055		2.14	2.28	-6.3	30.0
6:2FTS	L2ID		1.554		2.09	2.38	-11.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.151		2.44	2.50	-2.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.351		2.41	2.38	1.4	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.072		2.53	2.50	1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.149		2.26	2.31	-2.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9902		2.54	2.50	1.7	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7598		2.41	2.40	0.3	30.0
8:2FTS	AveID	1.349	1.309		2.33	2.40	-3.0	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.037		2.67	2.50	6.7	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.021		2.52	2.50	0.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.7025		2.52	2.41	4.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9652		2.57	2.50	2.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.7177		2.15	2.50	-14.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	0.996		2.39	2.50	-4.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.104		2.41	2.50	-3.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2469		2.44	2.50	-2.2	30.0
13C4 PFBA	Ave	1.528	1.462		2.39	2.50	-4.3	30.0
13C5 PFPeA	Ave	0.9798	0.9296		2.37	2.50	-5.1	30.0
13C3-PFBS	Ave	0.0221	0.0208		2.18	2.33	-6.0	30.0
13C2 PFHxA	Ave	1.045	0.998		2.39	2.50	-4.5	30.0
13C4-PFHpA	Ave	1.001	0.9156		2.29	2.50	-8.5	30.0
18O2 PFHxS	Ave	1.237	1.175		2.25	2.37	-5.0	30.0
M2-6:2FTS	Ave	0.2210	0.2207		2.37	2.38	-0.1	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: ICV 320-223413/13 Calibration Date: 05/15/2018 17:23

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.15LLCC_ICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.8898		2.35	2.50	-6.0	30.0
13C4 PFOS	Ave	0.8503	0.8094		2.28	2.39	-4.8	30.0
13C5 PFNA	Ave	0.7745	0.7379		2.38	2.50	-4.7	30.0
13C8 FOSA	Ave	1.113	1.119		2.51	2.50	0.6	30.0
M2-8:2FTS	Ave	0.2515	0.2407		2.29	2.40	-4.3	30.0
13C2 PFDA	Ave	0.6587	0.6073		2.30	2.50	-7.8	30.0
d3-NMeFOSAA	Ave	0.3634	0.3568		2.45	2.50	-1.8	30.0
d5-NEtFOSAA	Ave	0.3729	0.3488		2.34	2.50	-6.5	30.0
13C2 PFUnA	Ave	0.5216	0.4944		2.37	2.50	-5.2	30.0
13C2 PFDoA	Ave	0.5613	0.5571		2.48	2.50	-0.8	30.0
13C2-PFTeDA	Ave	0.6891	0.6919		2.51	2.50	0.4	30.0
13C2-PFHxDA	Ave	1.170	1.171		2.50	2.50	0.1	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLCC_ICAL_010.d
Lims ID: ICV Full
Client ID:
Sample Type: ICV
Inject. Date: 15-May-2018 17:23:06 ALS Bottle#: 18 Worklist Smp#: 13
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\20180515-58217.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 16-May-2018 09:20:42 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK037

First Level Reviewer: hannigana Date: 15-May-2018 17:33:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.452	1.462	-0.010	1.000	6558644	2.39		95.7	44583	
2 Perfluorobutyric acid										
212.90 > 169.00	1.458	1.462	-0.004	1.004	6232384	2.55			3830	
D 3 13C5-PFPeA										
267.90 > 223.00	1.730	1.744	-0.014	0.560	4169955	2.37		94.9	71064	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.739	1.745	-0.006	1.005	4867541	2.47			2619	
D 47 13C3-PFBS										
301.90 > 83.00	1.766	1.780	-0.014	1.000	86804	2.18		94.0	672	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.775	1.783	-0.008	1.005	6786179	2.33			32587	
298.90 > 99.00	1.775	1.783	-0.008	1.005	2714789		2.50(1.25-3.74)		20109	
D 60 M2-4:2FTS										
329.00 > 81.00	1.982	1.999	-0.017	1.000	647709	NC			9057	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.993	2.000	-0.007	1.000	1575421	2.55			89480	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.027	2.037	-0.010	1.000	4497390	2.44			7112	
313.00 > 119.00	2.027	2.037	-0.010	1.000	434640		10.35(5.03-15.10)		6592	
D 7 13C2 PFHxA										
315.00 > 270.00	2.027	2.037	-0.010	1.000	4477812	2.39		95.5	93567	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.049	2.059	-0.010	1.000	6300178	2.43			66597	
349.00 > 99.00	2.049	2.059	-0.010	1.000	2290834		2.75(1.36-4.07)		32182	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.129	2.134	-0.005	1.000	637807	NC			5920	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.129	2.134	-0.005	1.000	203771	NC			3726	
D 9 13C4-PFHpA										
367.00 > 322.00	2.360	2.374	-0.014	1.000	4107005	2.29		91.5	82212	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.360	2.374	-0.014	1.000	4689174	2.70			6790	
363.00 > 169.00	2.360	2.374	-0.014	1.000	1789663		2.62(1.13-3.40)		10179	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.373	2.386	-0.013	1.000	5072324	2.14			23515	
399.00 > 99.00	2.373	2.386	-0.013	1.000	1702243		2.98(1.50-4.49)		6349	
D 11 18O2 PFHxS										
403.00 > 84.00	2.373	2.386	-0.013	1.000	4985793	2.25		95.0	50631	
65 Adona										
377.00 > 251.00	2.408	2.418	-0.010	1.000	12919348	NC			166549	
377.00 > 85.00	2.408	2.418	-0.010	1.000	7441901		1.74(0.84-2.53)		56906	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.691	2.707	-0.016	1.000	1461549	2.09			9568	
D 12 M2-6:2FTS										
429.00 > 81.00	2.691	2.707	-0.016	1.000	940677	2.37		99.9	19507	
D 14 13C4 PFOA										
417.00 > 372.00	2.721	2.731	-0.010	1.000	3991539	2.35		94.0	60154	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.721	2.734	-0.013	1.000	4593918	2.44			2031	
413.00 > 169.00	2.721	2.734	-0.013	1.000	2532726		1.81(0.84-2.52)		10558	
* 62 13C2-PFOA										
415.00 > 370.00	2.721	2.734	-0.013		4485749	2.50			73224	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.729	2.739	-0.010	1.000	4660030	2.41			28740	
449.00 > 99.00	2.721	2.739	-0.018	0.997	1234090		3.78(1.94-5.82)		21469	
D 18 13C4 PFOS										
503.00 > 80.00	3.091	3.104	-0.013	1.000	3470981	2.28		95.2	22643	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.091	3.105	-0.014	1.000	3860176	2.26			30403	
499.00 > 99.00	3.091	3.105	-0.014	1.000	819041		4.71(2.31-6.93)		8926	
20 Perfluorononanoic acid										
463.00 > 419.00	3.091	3.107	-0.016	1.000	3549673	2.53			6315	
463.00 > 169.00	3.091	3.107	-0.016	1.000	831344		4.27(1.90-5.69)		24932	
D 19 13C5 PFNA										
468.00 > 423.00	3.091	3.107	-0.016	1.000	3310210	2.38		95.3	54117	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.299	3.316	-0.017	1.000	6187168	NC			45851	
D 21 13C8 FOSA										
506.00 > 78.00	3.411	3.420	-0.009	1.000	5020010	2.51		101	47676	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.411	3.422	-0.011	1.000	4970983	2.54			51844	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.439	3.455	-0.016	1.000	2648226	2.41			40237	
549.00 > 99.00	3.439	3.455	-0.016	1.000	1029286		2.57(1.33-3.97)		18505	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.449	3.458	-0.009	1.000	1356197	2.33			23529	
D 26 M2-8:2FTS										
529.00 > 81.00	3.449	3.459	-0.010	1.000	1034203	2.29		95.7	24982	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.458	3.468	-0.010	1.000	2825404	2.67			13587	
513.00 > 169.00	3.458	3.468	-0.010	1.000	488632		5.78(2.36-7.09)		13700	
D 23 13C2 PFDA										
515.00 > 470.00	3.458	3.468	-0.010	1.000	2724371	2.30		92.2	41092	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.611	3.624	-0.013	1.000	1600454	2.45		98.2	21404	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.611	3.631	-0.020	1.000	1634540	2.52			10505	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.764	3.781	-0.017	1.000	2461174	2.52			34940	
599.00 > 99.00	3.764	3.781	-0.017	1.000	854811		2.88(1.39-4.16)		19804	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.775	3.794	-0.019	1.000	1564712	2.34		93.5	7242	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.786	3.800	-0.014	1.003	1510273	2.57			19551	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.786	3.800	-0.014	1.000	1591556	2.15			6601	
563.00 > 169.00	3.786	3.800	-0.014	1.000	437354		3.64(2.12-6.36)		16106	
D 30 13C2 PFUnA										
565.00 > 520.00	3.786	3.800	-0.014	1.000	2217674	2.37		94.8	41351	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.943	3.958	-0.015	1.000	9764129	NC			81201	
D 36 13C2 PFDoA										
615.00 > 570.00	4.086	4.099	-0.013	1.000	2498767	2.48		99.2	20633	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.086	4.100	-0.014	1.000	2489518	2.39			2192	
613.00 > 169.00	4.086	4.100	-0.014	1.000	660158		3.77(2.13-6.40)		9524	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.347	4.368	-0.021	1.000	2757903	2.41			1498	
663.00 > 169.00	4.347	4.368	-0.021	1.000	830586		3.32(1.25-3.76)		8581	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.592	4.608	-0.016	1.000	766392	2.44			8270	
713.00 > 219.00	4.582	4.608	-0.026	0.998	552064		1.39(0.71-2.13)		8171	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.592	4.608	-0.016	1.000	3103625	2.51		100	14331	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.008	5.030	-0.022	1.000	5251192	2.50		100	12649	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.008	5.031	-0.023	1.000	5155170	NC			1223	
813.00 > 169.00	5.008	5.031	-0.023	1.000	844334		6.11(2.86-8.58)		6207	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.386	5.408	-0.022	1.000	5286159	NC			935	
913.00 > 169.00	5.386	5.408	-0.022	1.000	634791		8.33(3.83-11.48)		4660	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_FULL_00011 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:20:44 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLCC_ICAL_010.d

Injection Date: 15-May-2018 17:23:06 Instrument ID: A8_N

Lims ID: ICV Full

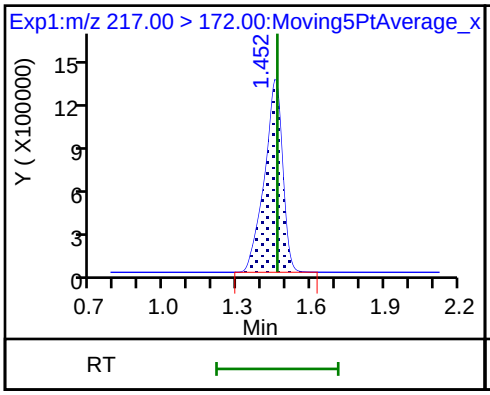
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 18 Worklist Smp#: 13

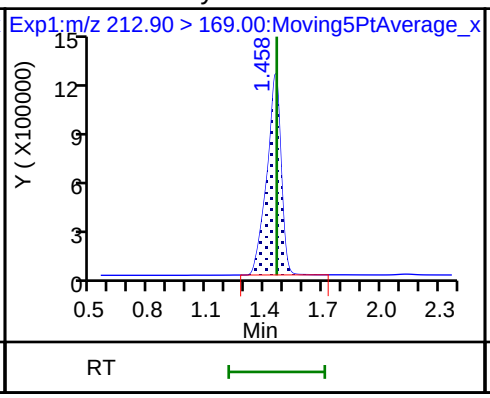
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

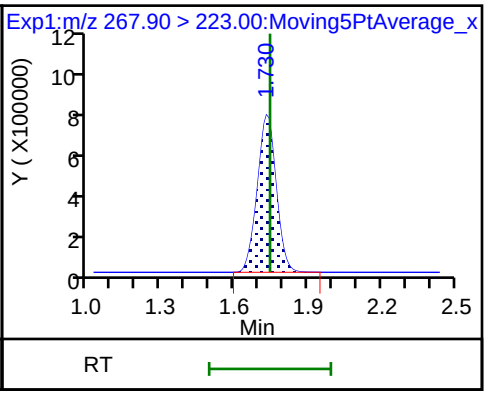
D 1 13C4 PFBA



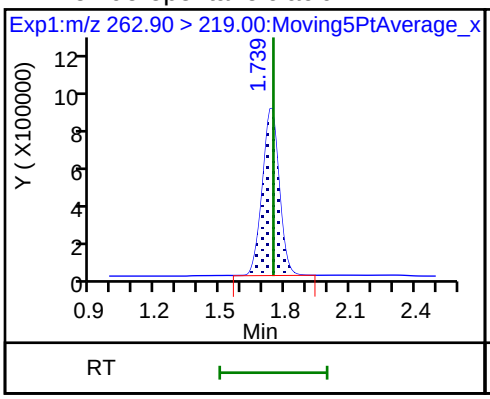
2 Perfluorobutyric acid



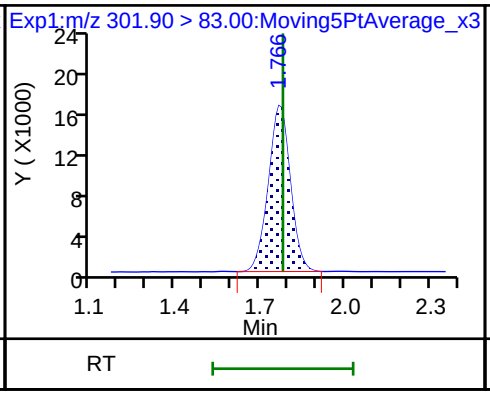
D 3 13C5-PFPeA



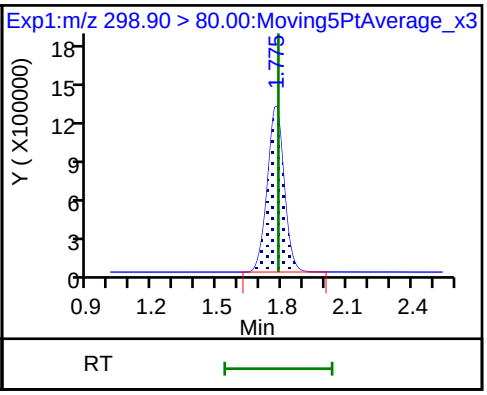
4 Perfluoropentanoic acid



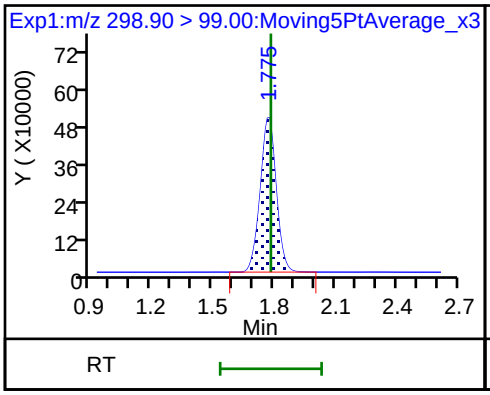
D 47 13C3-PFBS



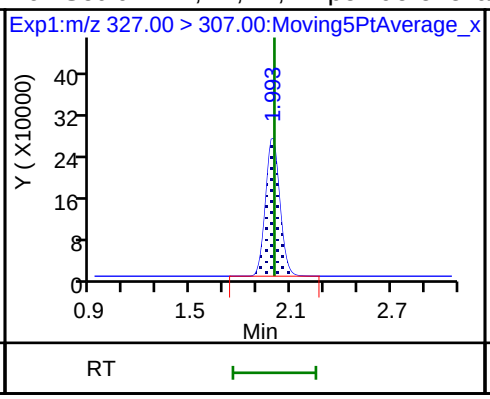
5 Perfluorobutanesulfonic acid



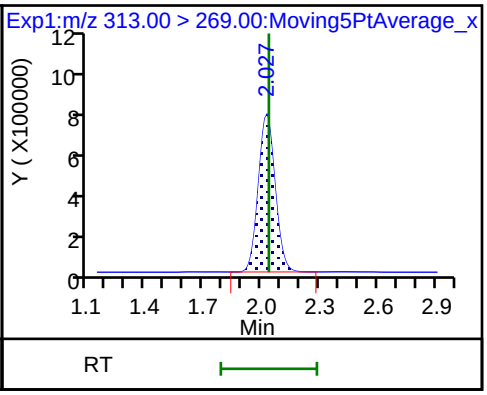
5 Perfluorobutanesulfonic acid



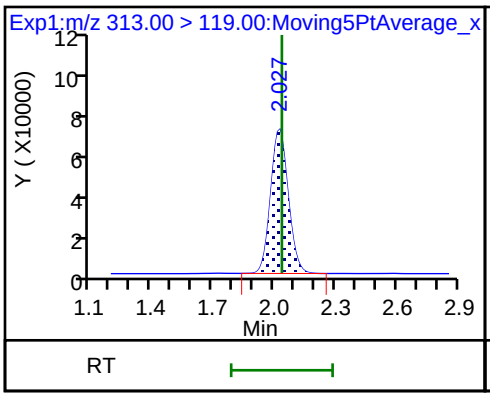
61 Sodium 1H,1H,2H,2H-perfluorohexane



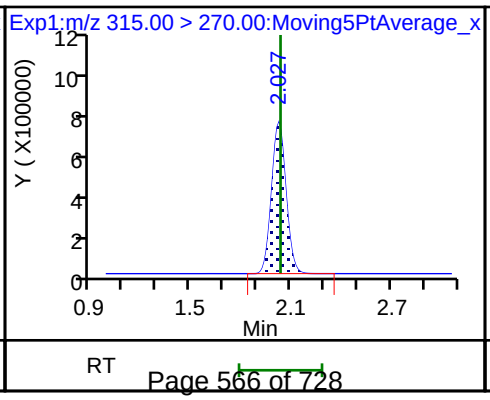
6 Perfluorohexanoic acid



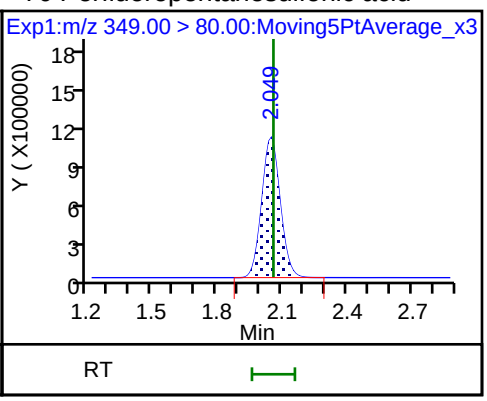
6 Perfluorohexanoic acid



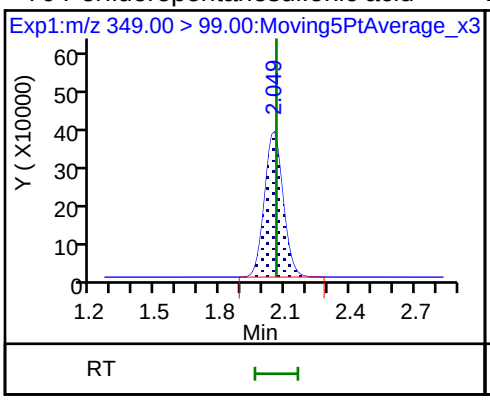
D 7 13C2 PFHxA



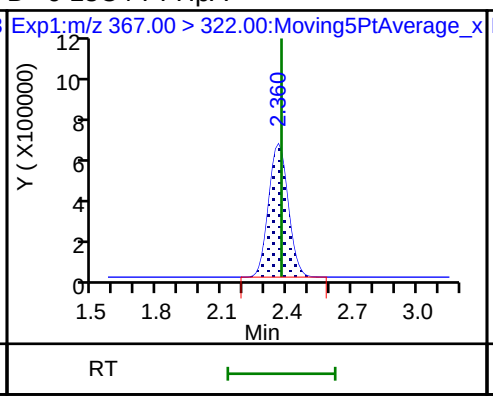
70 Perfluoropentanesulfonic acid



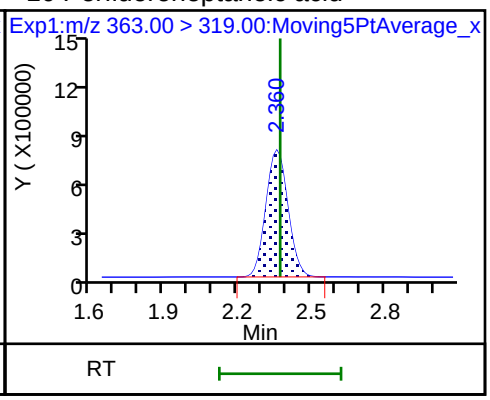
70 Perfluoropentanesulfonic acid



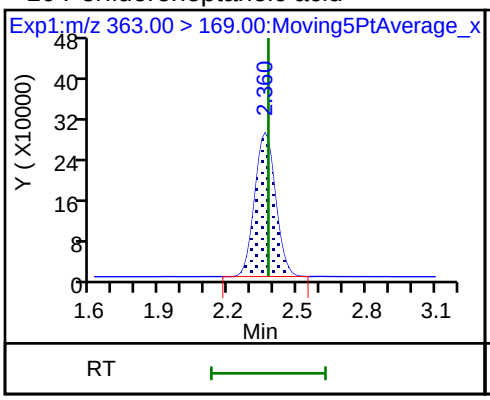
D 9 13C4-PFHpA



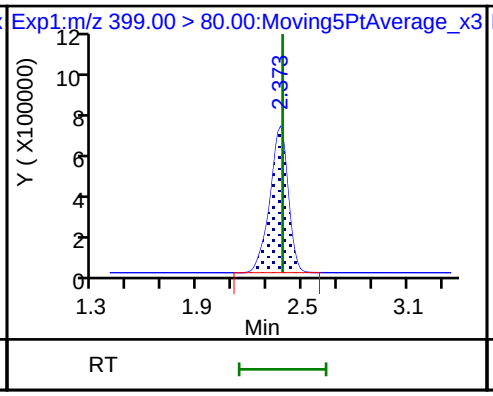
10 Perfluoroheptanoic acid



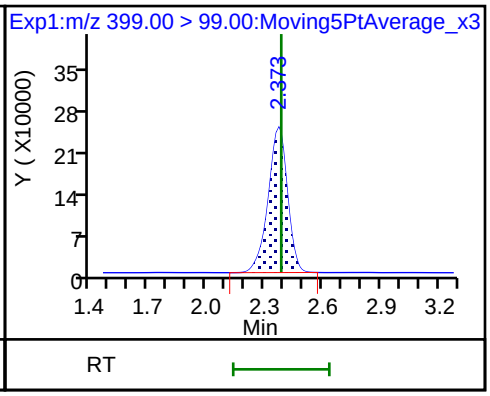
10 Perfluoroheptanoic acid



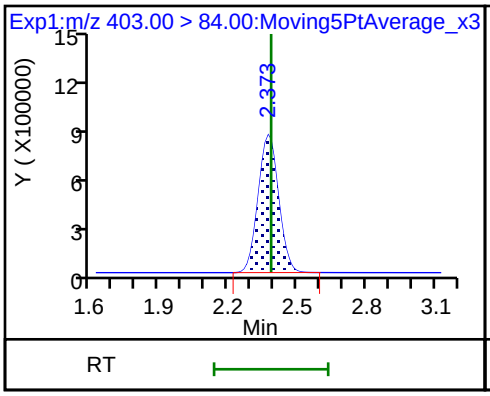
8 Perfluorohexanesulfonic acid



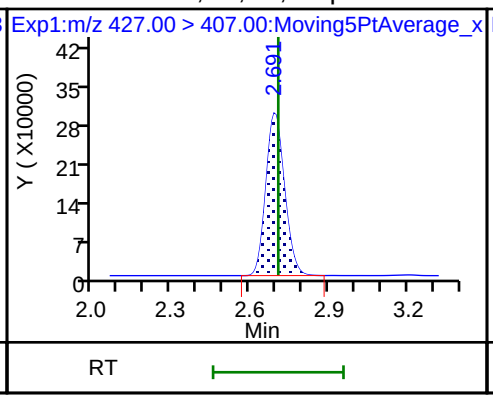
8 Perfluorohexanesulfonic acid



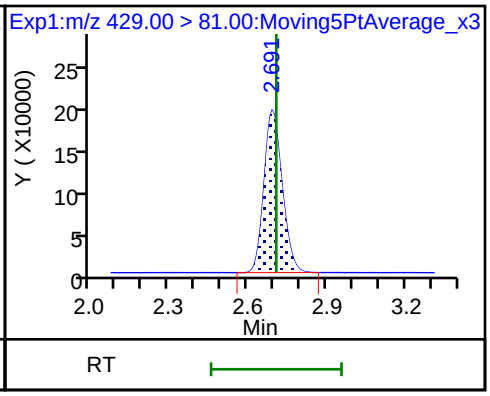
D 11 18O2 PFHxS



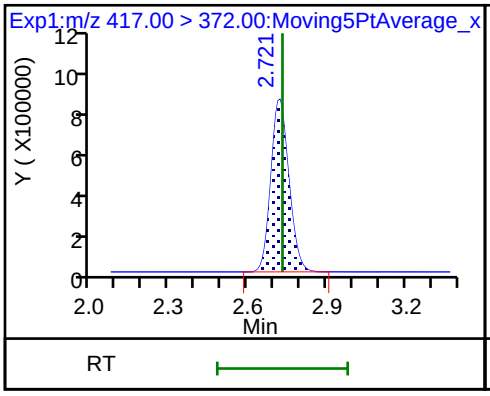
13 Sodium 1H,1H,2H,2H-perfluorooctane



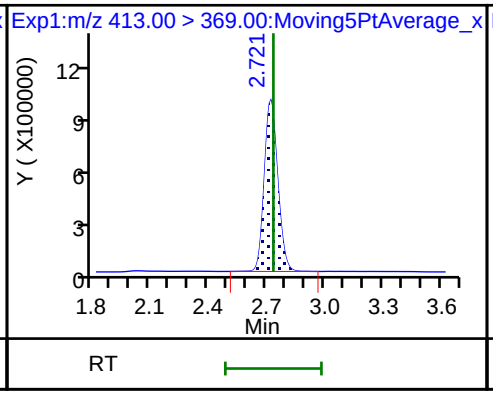
D 12 M2-6:2FTS



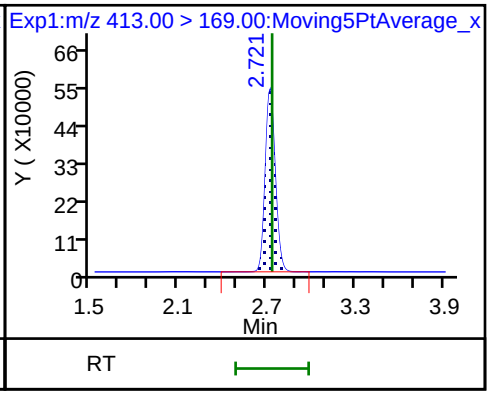
D 14 13C4 PFOA



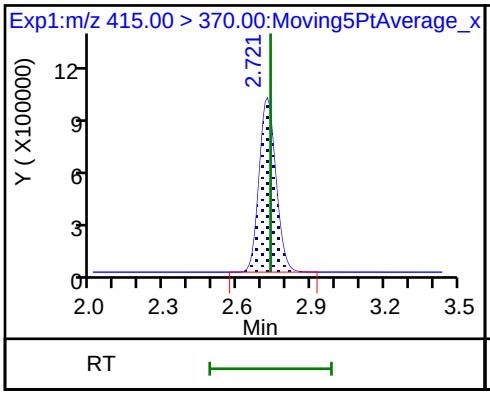
15 Perfluorooctanoic acid



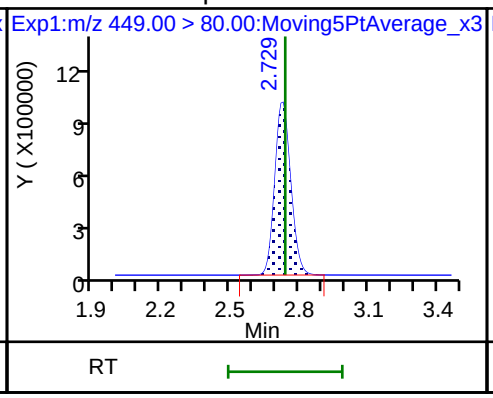
15 Perfluorooctanoic acid



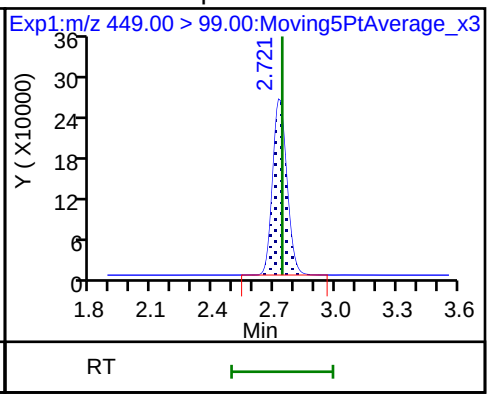
* 62 13C2-PFOA



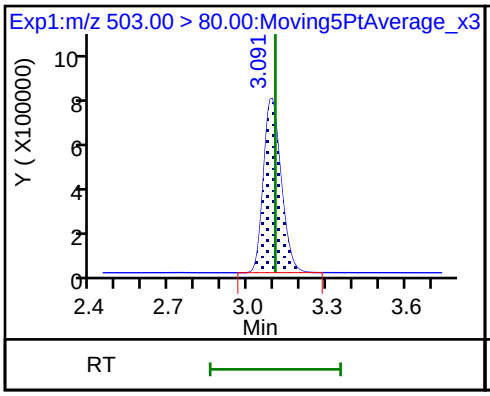
16 Perfluoroheptanesulfonic acid



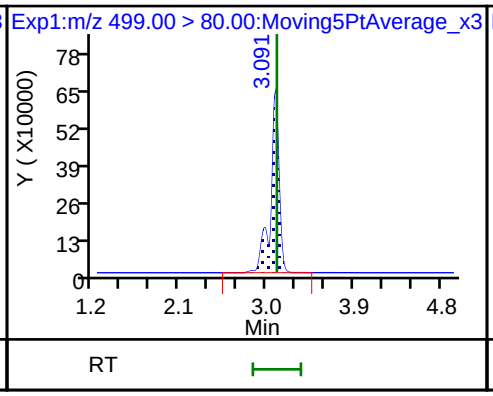
16 Perfluoroheptanesulfonic acid



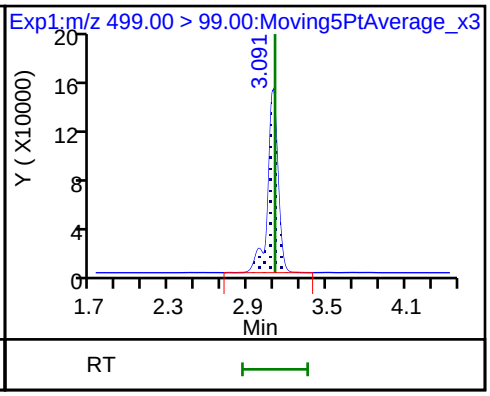
D 18 13C4 PFOS



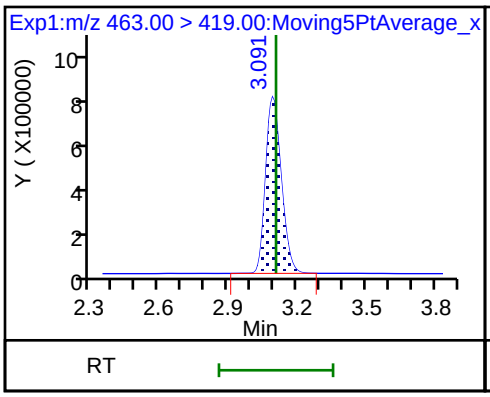
17 Perfluorooctane sulfonic acid



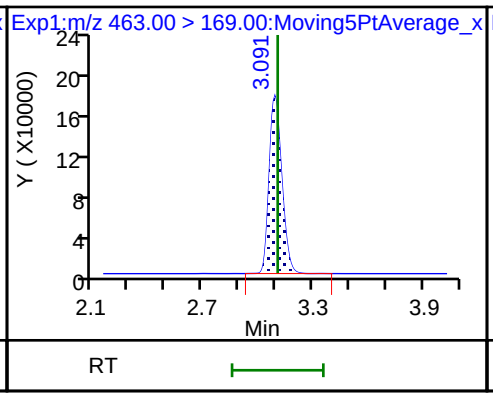
17 Perfluorooctane sulfonic acid



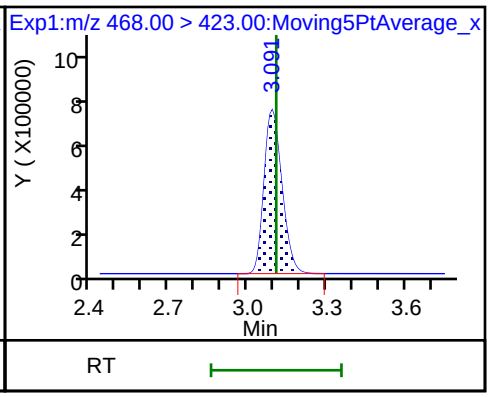
20 Perfluorononanoic acid



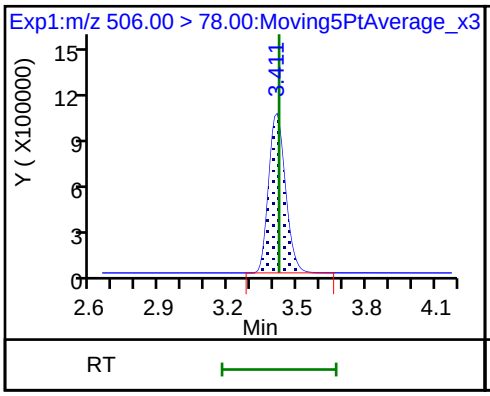
20 Perfluorononanoic acid



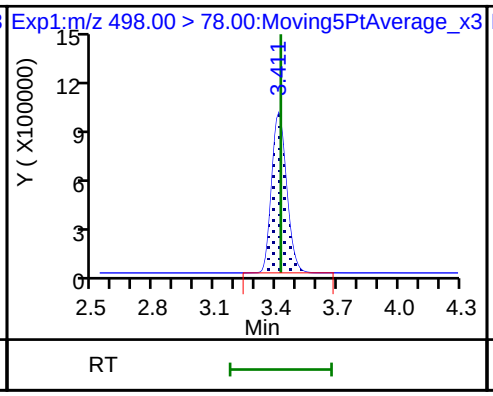
D 19 13C5 PFNA



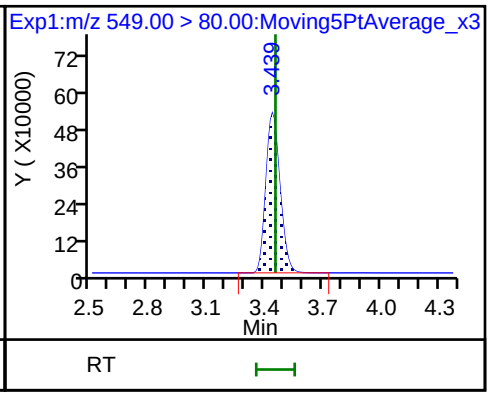
D 21 13C8 FOSA



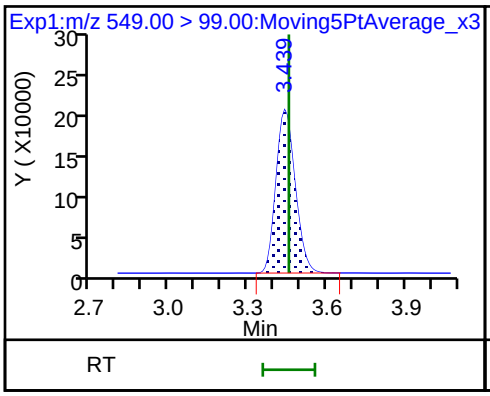
22 Perfluorooctane Sulfonamide



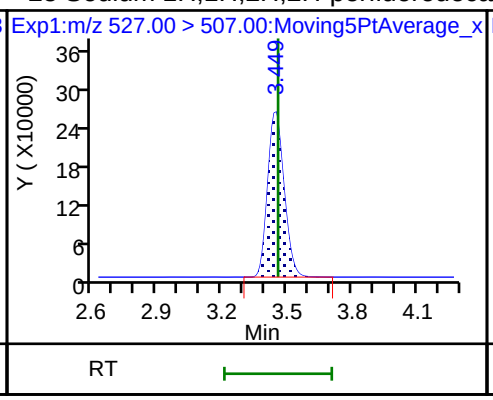
68 Perfluorononanesulfonic acid



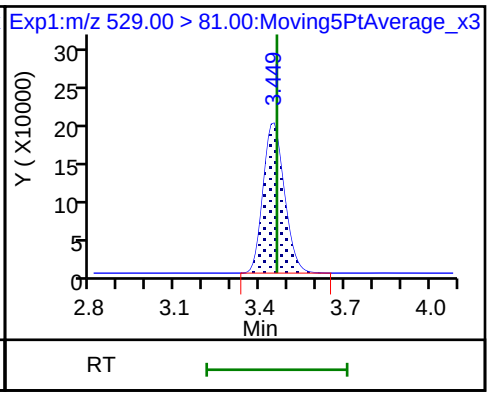
68 Perfluorononanesulfonic acid



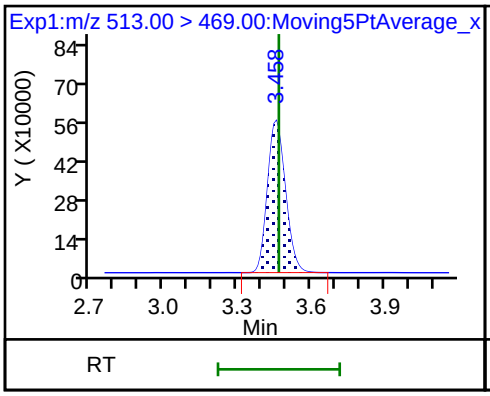
25 Sodium 1H,1H,2H,2H-perfluorodecan



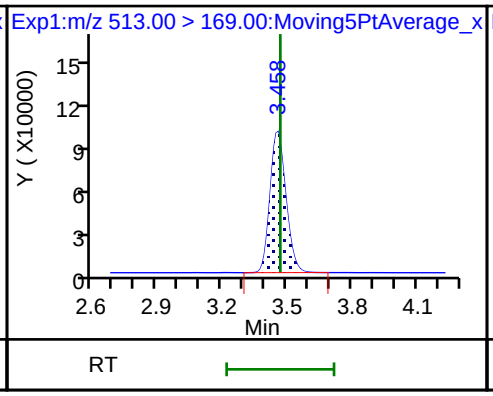
D 26 M2-8:2FTS



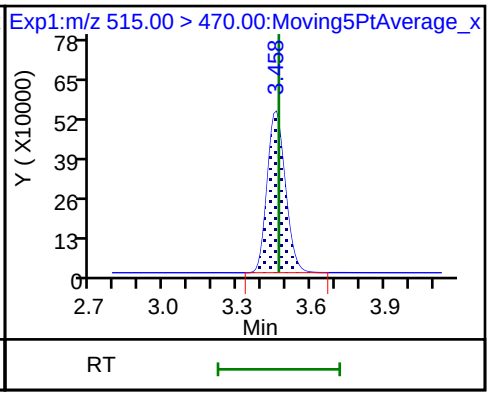
24 Perfluorodecanoic acid



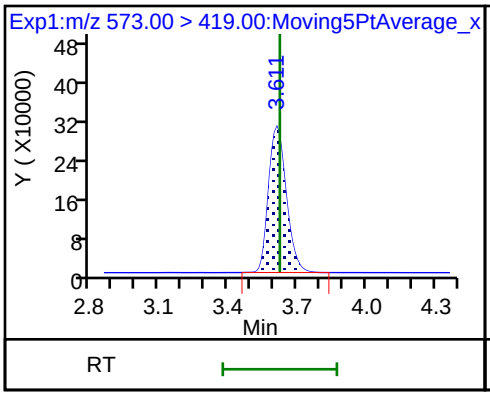
24 Perfluorodecanoic acid



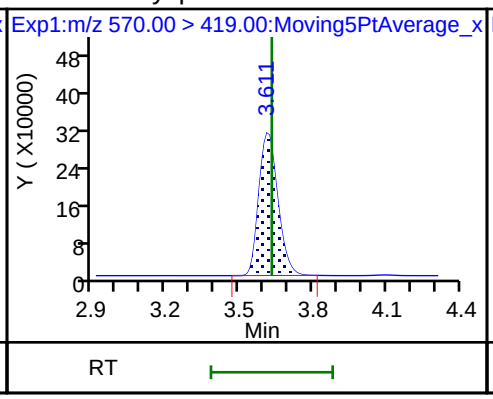
D 23 13C2 PFDA



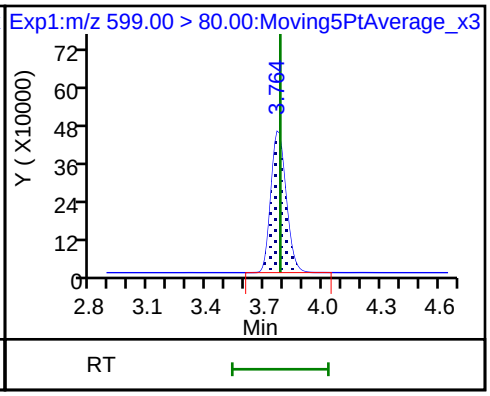
D 27 d3-NMeFOSAA



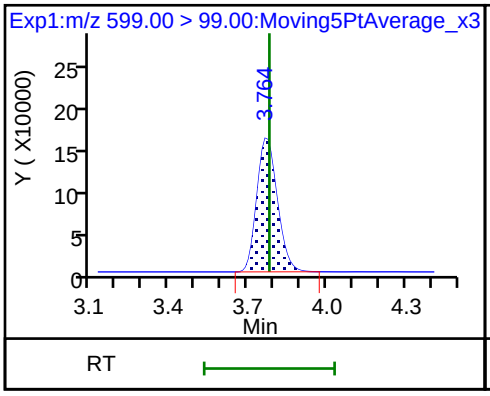
28 N-methyl perfluorooctane sulfonami



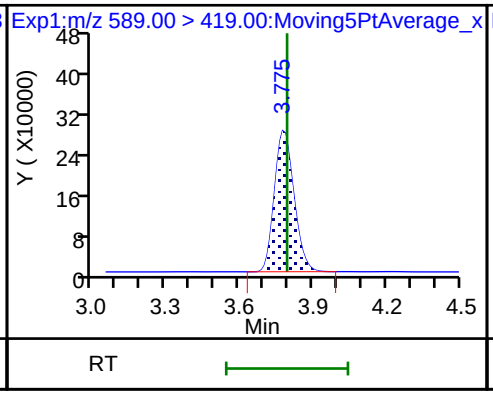
29 Perfluorodecane Sulfonic acid



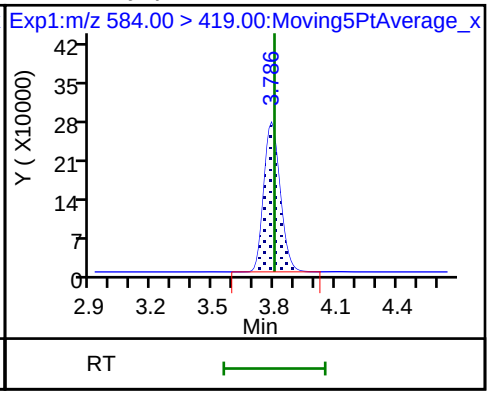
29 Perfluorodecane Sulfonic acid



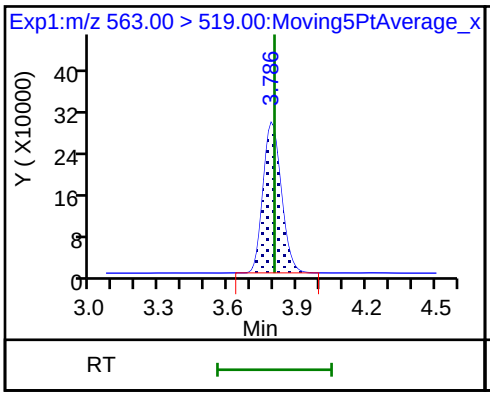
D 32 d5-NEtFOSAA



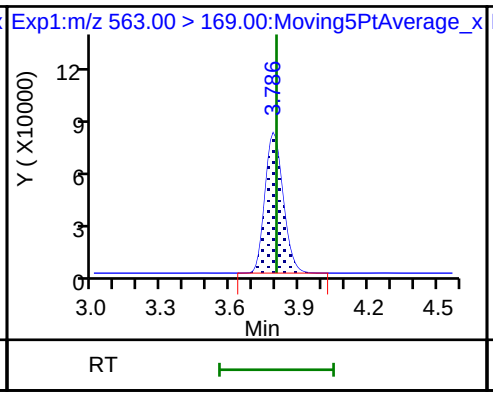
33 N-ethyl perfluorooctane sulfonamid



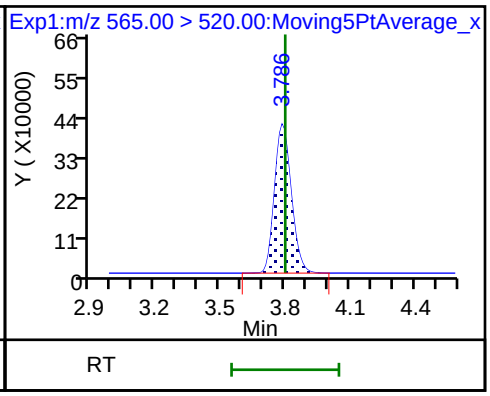
31 Perfluoroundecanoic acid



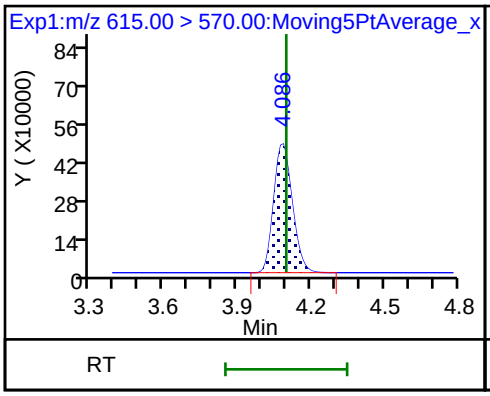
31 Perfluoroundecanoic acid



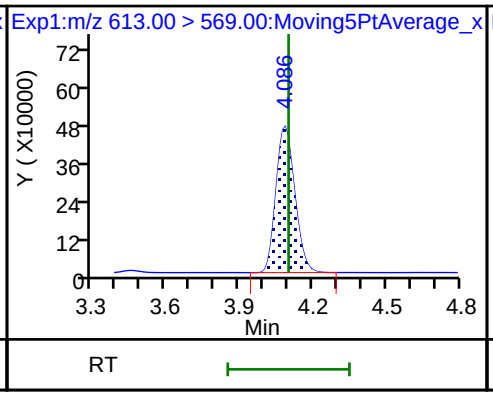
D 30 13C2 PFUnA



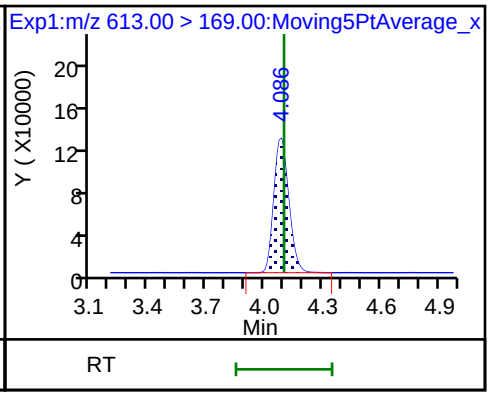
D 36 13C2 PFDoA



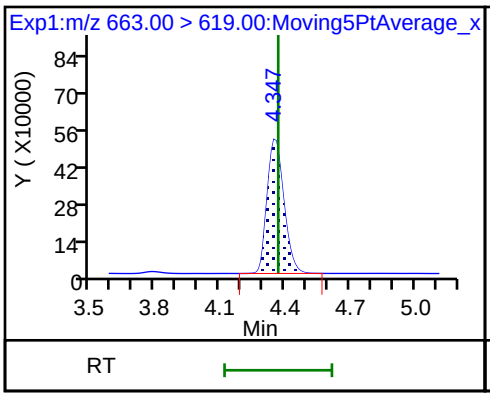
37 Perfluorododecanoic acid



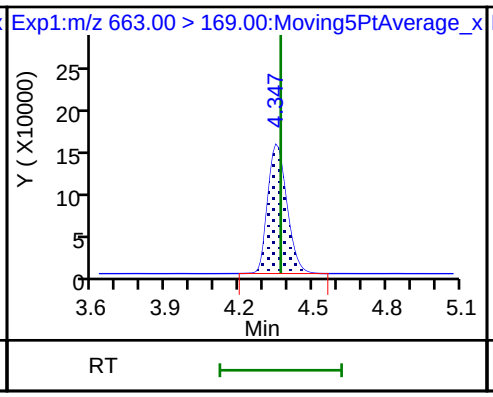
37 Perfluorododecanoic acid



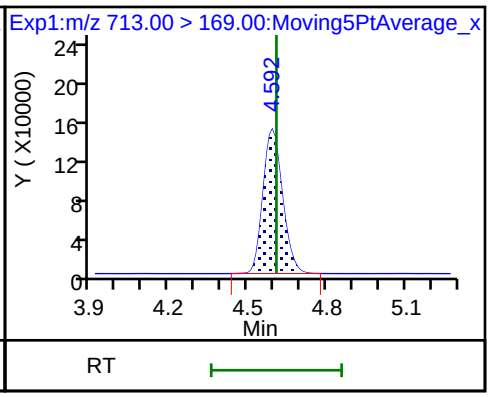
41 Perfluorotridecanoic acid



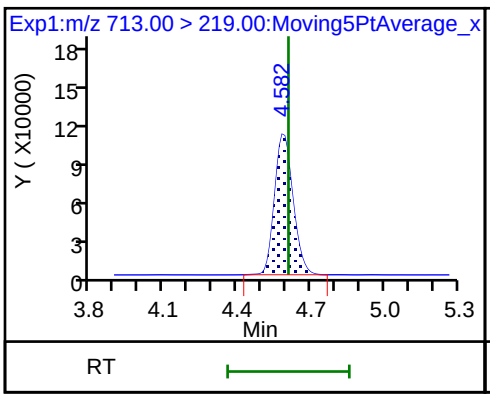
41 Perfluorotridecanoic acid



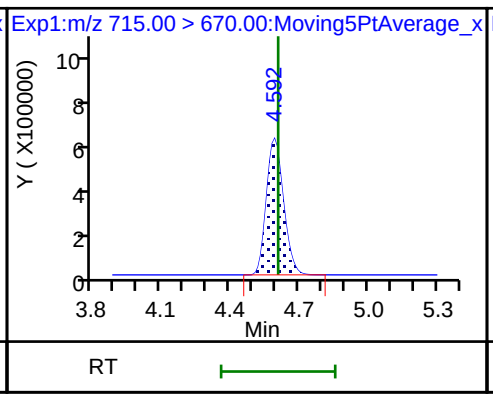
42 Perfluorotetradecanoic acid



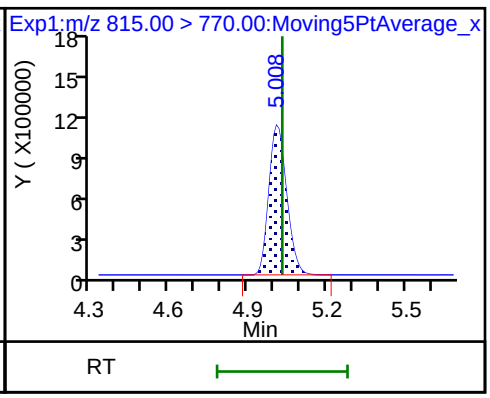
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCVL 320-225818/2 Calibration Date: 05/28/2018 07:08

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_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	0.9298	1.012		0.0544	0.0500	8.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.288		0.0545	0.0500	9.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	79.49		0.0450	0.0442	1.8	30.0
4:2 FTS	AveID	16.57	19.27		0.400	0.0467	16.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.040		0.0506	0.0500	1.2	30.0
Perfluoropentanesulfonic acid	AveID	69.55	70.14		0.0473	0.0469	0.9	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.146		0.0543	0.0500	8.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.182		0.0477	0.0455	4.9	30.0
6:2FTS	L2ID		1.719		0.400	0.0474	-23.7	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.274		0.0541	0.0500	8.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.308		0.0468	0.0476	-1.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	0.9395		0.0444	0.0500	-11.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.117		0.0441	0.0464	-5.0	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.030		0.0529	0.0500	5.8	30.0
8:2FTS	AveID	1.349	1.417		0.0503	0.0479	5.0	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7926		0.0502	0.0480	4.6	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.103		0.0567	0.0500	13.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.056		0.400	0.0500	4.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.7927		0.0569	0.0482	18.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9911		0.0527	0.0500	5.4	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.8276		0.0495	0.0500	-0.9	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.031		0.0494	0.0500	-1.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.310		0.0573	0.0500	14.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2293		0.0454	0.0500	-9.2	30.0
13C4 PFBA	Ave	1.528	1.372		2.24	2.50	-10.2	30.0
13C5 PFPeA	Ave	0.9798	0.9936		2.54	2.50	1.4	30.0
13C3-PFBS	Ave	0.0221	0.0202		2.12	2.33	-8.8	30.0
13C2 PFHxA	Ave	1.045	1.043		2.50	2.50	-0.1	30.0
13C4-PFHpA	Ave	1.001	0.9269		2.31	2.50	-7.4	30.0
18O2 PFHxS	Ave	1.237	1.166		2.23	2.37	-5.7	30.0
M2-6:2FTS	Ave	0.2210	0.2443		2.63	2.38	10.5	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCVL 320-225818/2 Calibration Date: 05/28/2018 07:08

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9576		2.53	2.50	1.1	30.0
13C4 PFOS	Ave	0.8503	0.7883		2.22	2.39	-7.3	30.0
13C5 PFNA	Ave	0.7745	0.8026		2.59	2.50	3.6	30.0
13C8 FOSA	Ave	1.113	0.999		2.24	2.50	-10.2	30.0
M2-8:2FTS	Ave	0.2515	0.2504		2.39	2.40	-0.4	30.0
13C2 PFDA	Ave	0.6587	0.6778		2.57	2.50	2.9	30.0
d3-NMeFOSAA	Ave	0.3634	0.4035		2.78	2.50	11.0	30.0
d5-NEtFOSAA	Ave	0.3729	0.4189		2.81	2.50	12.3	30.0
13C2 PFUnA	Ave	0.5216	0.5244		2.51	2.50	0.5	30.0
13C2 PFDoA	Ave	0.5613	0.5893		2.62	2.50	5.0	30.0
13C2-PFTeDA	Ave	0.6891	0.7280		2.64	2.50	5.6	30.0
13C2-PFHxDA	Ave	1.170	1.325		2.83	2.50	13.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_002.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 28-May-2018 07:08:03 ALS Bottle#: 21 Worklist Smp#: 2
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*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-May-2018 10:57:42 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 10:57:42

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	1.452	1.455	-0.003	1.000	6826300	2.24		89.8	36220	
2 Perfluorobutyric acid										
212.90 > 169.00	1.452	1.463	-0.011	1.000	138212	0.0544		109	66.8	
D 3 13C5-PFPeA										
267.90 > 223.00	1.720	1.725	-0.005	0.562	4942428	2.54		101	56013	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.729	1.728	0.001	1.005	127310	0.0545		109	85.0	
D 47 13C3-PFBS										
301.90 > 83.00	1.756	1.761	-0.005	1.000	93435	2.12		91.2	884	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.756	1.764	-0.008	1.000	141197	0.0450		102	694	
298.90 > 99.00	1.756	1.764	-0.008	1.000	62282		2.27(1.25-3.74)		734	
D 60 M2-4:2FTS										
329.00 > 81.00	1.970	1.977	-0.007	1.000	801467	NC			8721	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.970	1.980	-0.010	1.000	36163	0.0543		116	2176	
D 7 13C2 PFHxA										
315.00 > 270.00	2.003	2.011	-0.008	1.000	5190130	2.50		99.9	88393	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.014	2.014	0.0	1.006	107959	0.0506		101	229	
313.00 > 119.00	2.014	2.014	0.0	1.006	11706		9.22(5.03-15.10)		135	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.025	2.036	-0.011	1.000	132196	0.0473		101	1492	
349.00 > 99.00	2.025	2.036	-0.011	1.000	52946		2.50(1.36-4.07)		1014	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.105	2.112	-0.007	1.000	229443	NC			4753	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.116	2.115	0.001	1.005	16918	NC			99.3	
D 9 13C4-PFHpA										
367.00 > 322.00	2.345	2.342	0.003	1.000	4610526	2.31		92.6	51749	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.345	2.345	0.0	1.000	105700	0.0543		109	141	
363.00 > 169.00	2.332	2.345	-0.013	0.994	41185		2.57(1.13-3.40)		225	
D 11 18O2 PFHxS										
403.00 > 84.00	2.358	2.355	0.003	1.000	5488462	2.23		94.3	55166	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.345	2.358	-0.013	0.994	124834	0.0477		105	604	
399.00 > 99.00	2.358	2.358	0.0	1.000	40438		3.09(1.50-4.49)		248	
65 Adona										
377.00 > 251.00	2.384	2.395	-0.011	1.000	301463	NC			4969	
377.00 > 85.00	2.384	2.395	-0.011	1.000	174376		1.73(0.84-2.53)		3225	
D 12 M2-6:2FTS										
429.00 > 81.00	2.667	2.665	0.002	1.000	1154234	2.63		111	16033	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.667	2.682	-0.015	1.000	39596	0.0362		76.3	1217	
D 14 13C4 PFOA										
417.00 > 372.00	2.697	2.695	0.002	1.000	4763005	2.53		101	47496	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.697	2.704	-0.007	1.000	121325	0.0541		108	39.9	
413.00 > 169.00	2.697	2.704	-0.007	1.000	57885		2.10(0.84-2.52)		212	
* 62 13C2-PFOA										
415.00 > 370.00	2.697	2.704	-0.007		4974159	2.50			57719	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.705	2.712	-0.007	1.000	97676	0.0468		98.2	1318	
449.00 > 99.00	2.697	2.712	-0.015	0.997	27914		3.50(1.94-5.82)		615	
D 19 13C5 PFNA										
468.00 > 423.00	3.063	3.063	0.0	1.000	3992452	2.59		104	57713	
D 18 13C4 PFOS										
503.00 > 80.00	3.063	3.063	0.0	1.000	3748344	2.22		92.7	22009	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.063	3.069	-0.006	1.000	81296	0.0441		95.0	640	
499.00 > 99.00	3.063	3.069	-0.006	1.000	19013		4.28(2.31-6.93)		295	
20 Perfluorononanoic acid										
463.00 > 419.00	3.063	3.076	-0.013	1.000	75021	0.0444		88.7	206	
463.00 > 169.00	3.063	3.076	-0.013	1.000	22506		3.33(1.90-5.69)		418	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.276	3.283	-0.007	1.000	133551	NC			2416	
D 21 13C8 FOSA										
506.00 > 78.00	3.393	3.395	-0.002	1.000	4968127	2.24		89.8	36041	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.402	3.411	-0.009	1.003	102392	0.0529		106	1846	
D 26 M2-8:2FTS										
529.00 > 81.00	3.412	3.413	-0.001	1.000	1193319	2.39		99.6	16574	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.412	3.421	-0.009	1.000	59665	0.0502		105	1178	
549.00 > 99.00	3.412	3.421	-0.009	1.000	20980		2.84(1.33-3.97)		613	
D 23 13C2 PFDA										
515.00 > 470.00	3.421	3.422	-0.001	1.000	3371365	2.57		103	47058	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.412	3.430	-0.018	1.000	33830	0.0503		105	1450	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.421	3.439	-0.018	1.000	74372	0.0567		113	357	
513.00 > 169.00	3.430	3.439	-0.009	1.003	11171		6.66(2.36-7.09)		407	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.579	3.572	0.007	1.000	2006970	2.78		111	33636	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.579	3.590	-0.011	1.000	42401	0.0520		104	423	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.733	3.743	-0.010	1.000	59926	0.0569		118	598	
599.00 > 99.00	3.733	3.743	-0.010	1.000	21221		2.82(1.39-4.16)		828	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.743	3.748	-0.005	1.000	2083653	2.81		112	23564	
D 30 13C2 PFUnA										
565.00 > 520.00	3.753	3.748	0.005	1.000	2608525	2.51		101	43446	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.753	3.764	-0.011	1.003	41304	0.0527		105	937	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.753	3.764	-0.011	1.000	43178	0.0495		99.1	286	
563.00 > 169.00	3.753	3.764	-0.011	1.000	12141		3.56(2.12-6.36)		287	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.910	3.920	-0.010	1.000	215695	NC			4478	
D 36 13C2 PFDoA										
615.00 > 570.00	4.041	4.048	-0.007	1.000	2931279	2.62		105	23784	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.041	4.061	-0.020	1.000	60433	0.0494		98.8	74.9	
613.00 > 169.00	4.051	4.061	-0.010	1.003	13931		4.34(2.13-6.40)		234	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.308	4.319	-0.011	1.000	76787	0.0573		115	78.1	
663.00 > 169.00	4.308	4.319	-0.011	1.000	20723		3.71(1.25-3.76)		326	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.542	4.542	0.0	1.000	3621313	2.64		106	18015	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.552	4.554	-0.002	1.002	16610	0.0454		90.8	207	
713.00 > 219.00	4.542	4.554	-0.012	1.000	14295		1.16(0.71-2.13)		306	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.965	4.966	-0.001	1.000	6591601	2.83		113	14420	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.965	4.976	-0.011	1.000	176830	NC			74.9	
813.00 > 169.00	4.965	4.976	-0.011	1.000	30342		5.83(2.86-8.58)		262	

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	5.320	5.336	-0.016	1.000	145803	NC			43.7	
913.00 > 169.00	5.320	5.336	-0.016	1.000	17864		8.16(3.83-11.48)		243	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL2_00004 Amount Added: 1.00 Units: mL

Report Date: 30-May-2018 10:57:43 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_002.d

Injection Date: 28-May-2018 07:08:03 Instrument ID: A8_N

Lims ID: CCVL

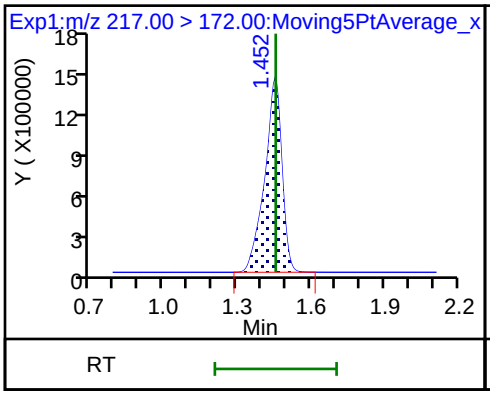
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2

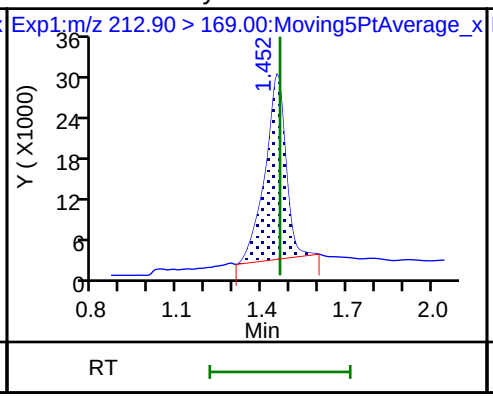
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

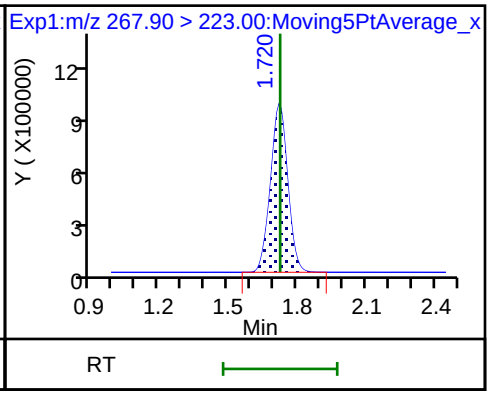
D 1 13C4 PFBA



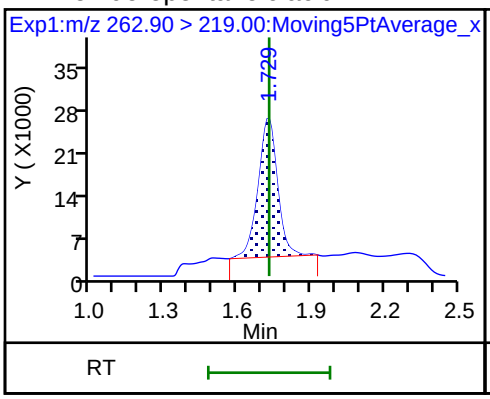
2 Perfluorobutyric acid



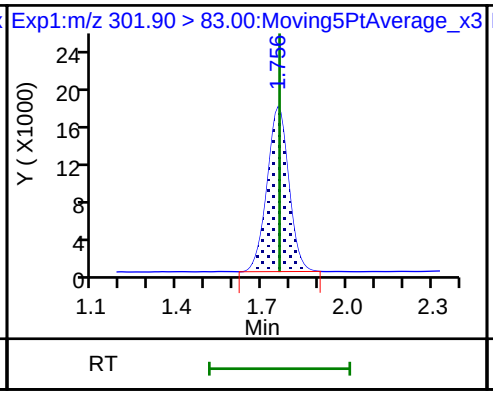
D 3 13C5-PFPeA



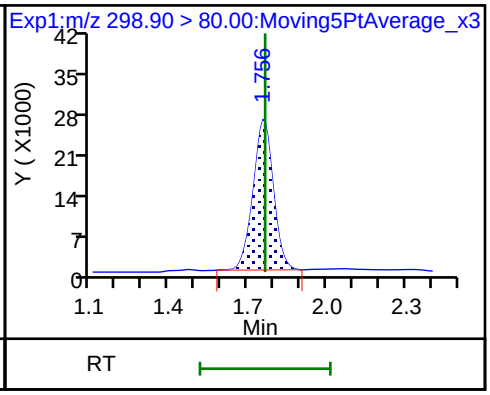
4 Perfluoropentanoic acid



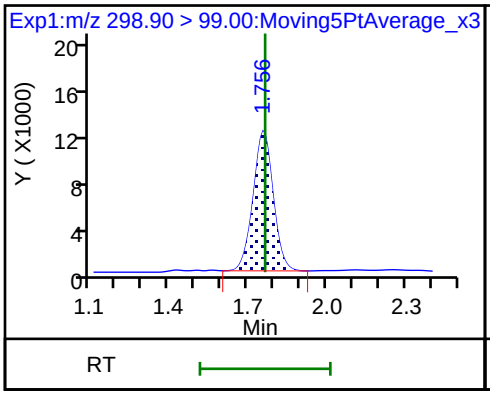
D 47 13C3-PFBS



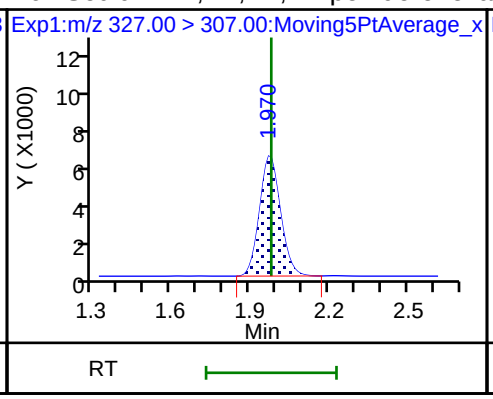
5 Perfluorobutanesulfonic acid



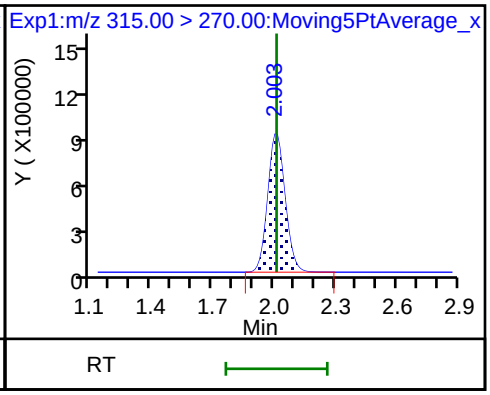
5 Perfluorobutanesulfonic acid



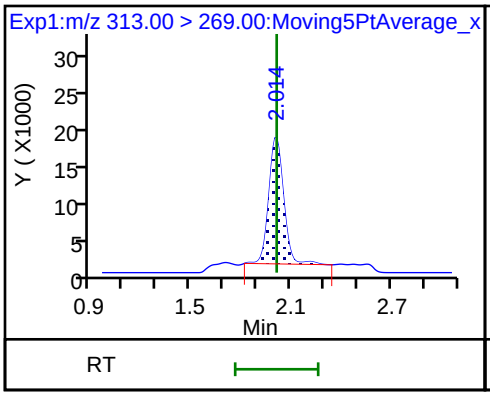
61 Sodium 1H,1H,2H,2H-perfluorohexa



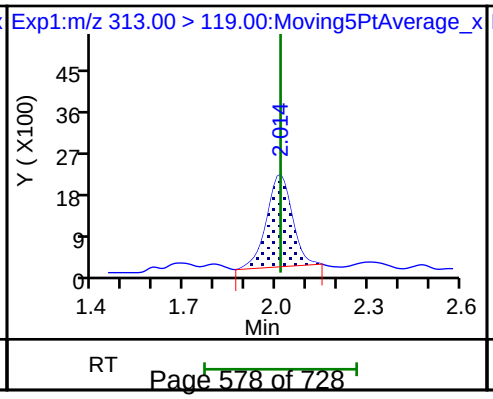
D 7 13C2 PFHxA



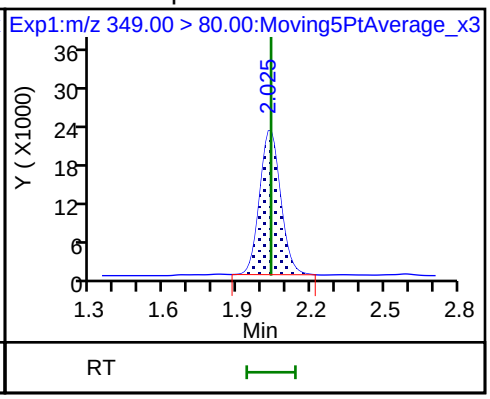
6 Perfluorohexanoic acid



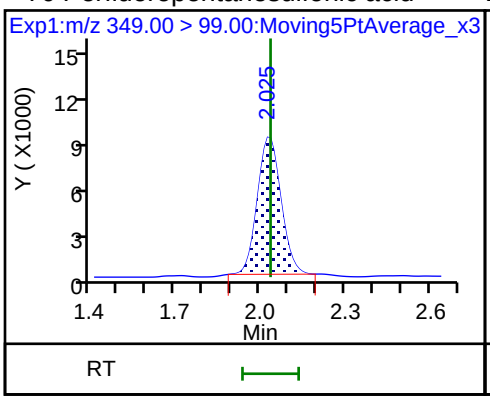
6 Perfluorohexanoic acid



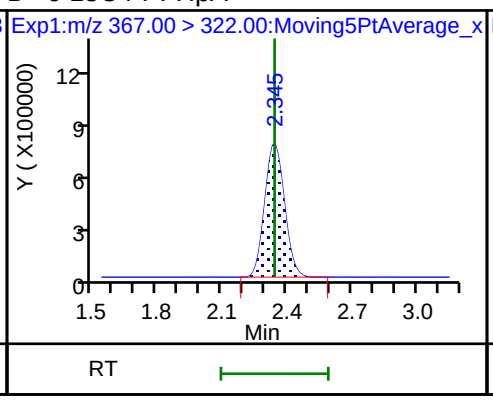
70 Perfluoropentanesulfonic acid



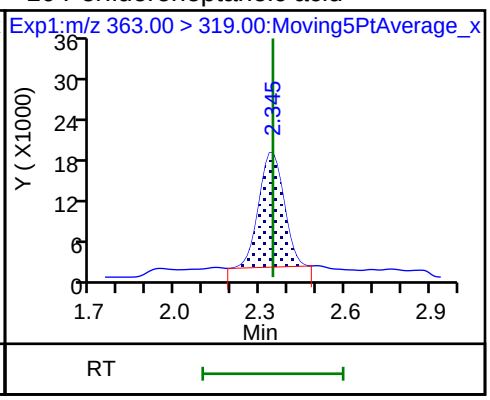
70 Perfluoropentanesulfonic acid



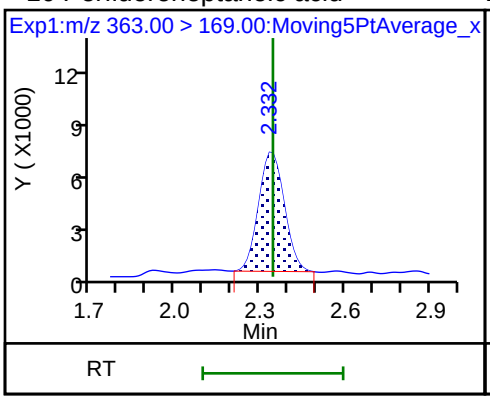
D 9 13C4-PFHpA



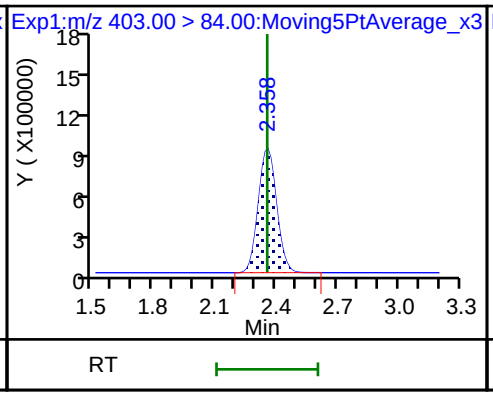
10 Perfluoroheptanoic acid



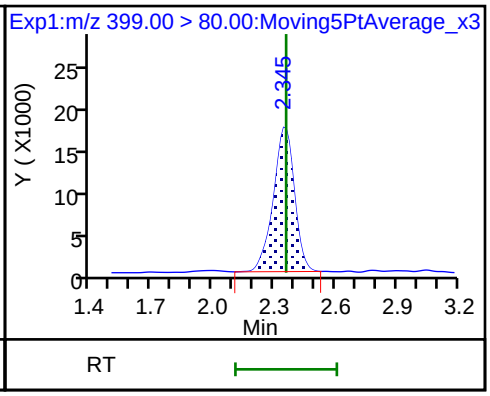
10 Perfluoroheptanoic acid



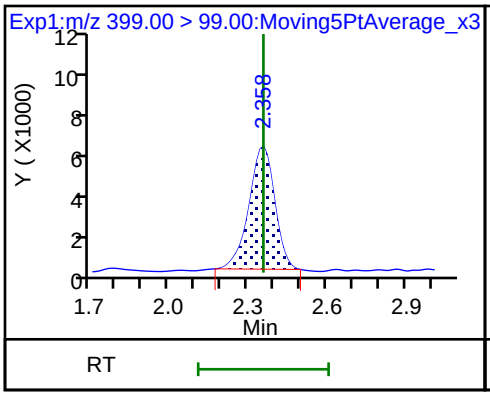
D 11 18O2 PFHxS



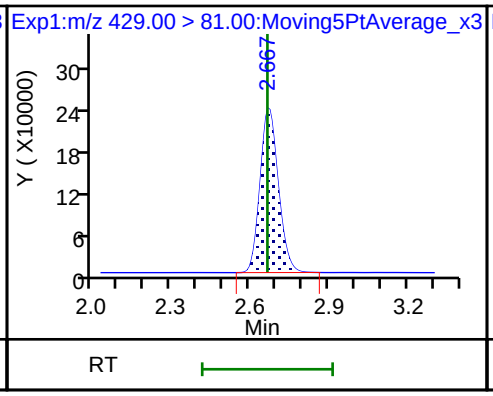
8 Perfluorohexanesulfonic acid



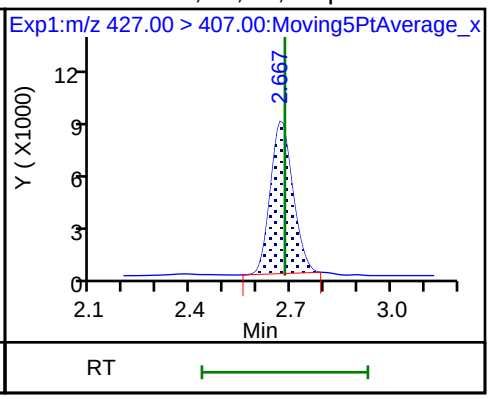
8 Perfluorohexanesulfonic acid



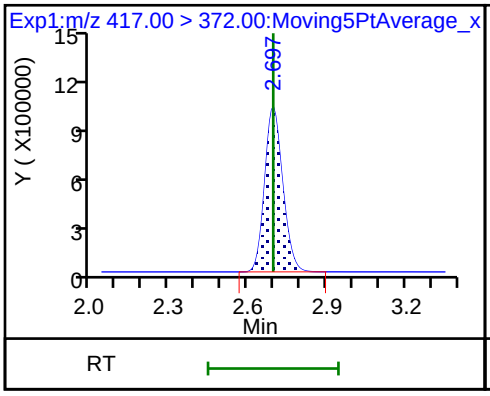
D 12 M2-6:2FTS



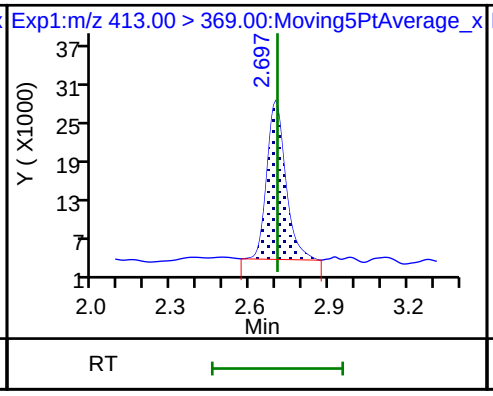
13 Sodium 1H,1H,2H,2H-perfluorooctane



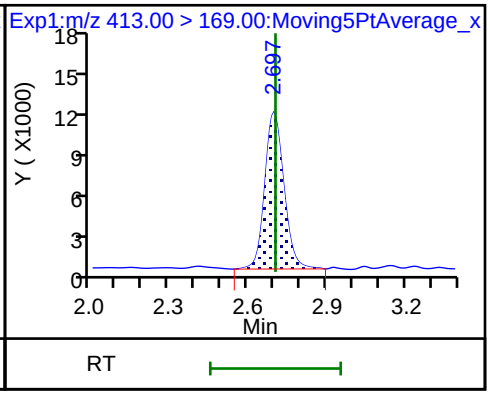
D 14 13C4 PFOA



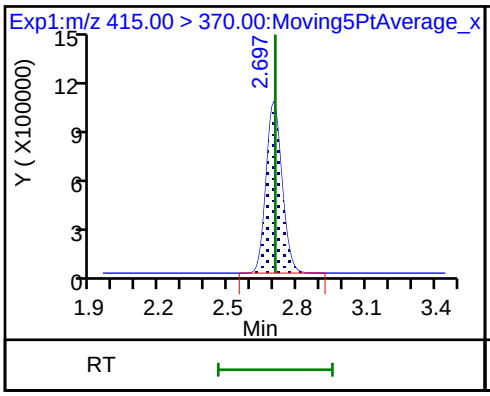
15 Perfluorooctanoic acid



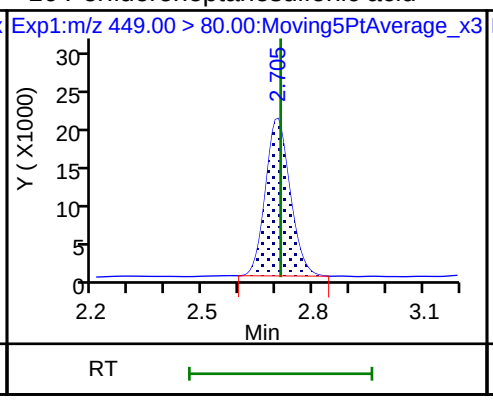
15 Perfluorooctanoic acid



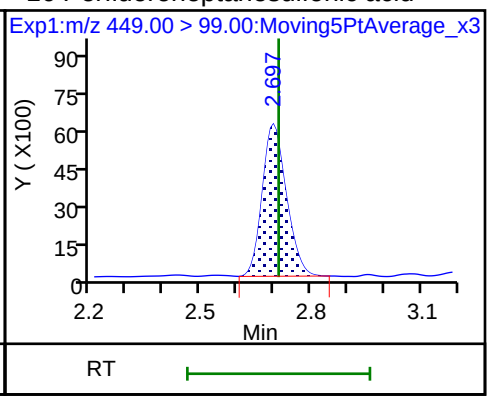
* 62 13C2-PFOA



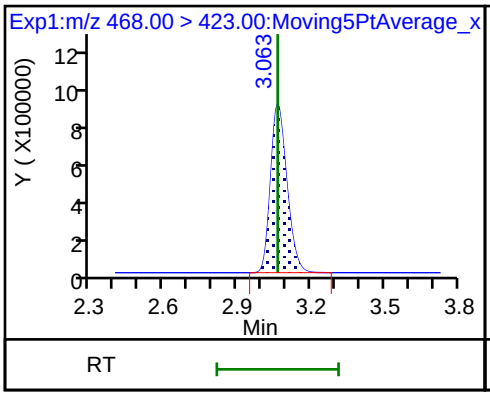
16 Perfluoroheptanesulfonic acid



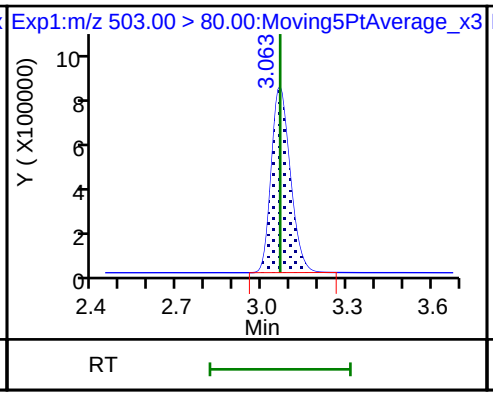
16 Perfluoroheptanesulfonic acid



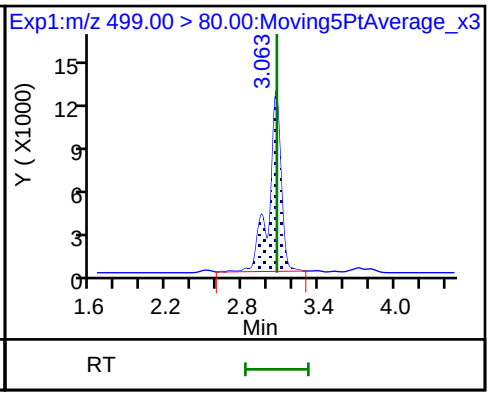
D 19 13C5 PFNA



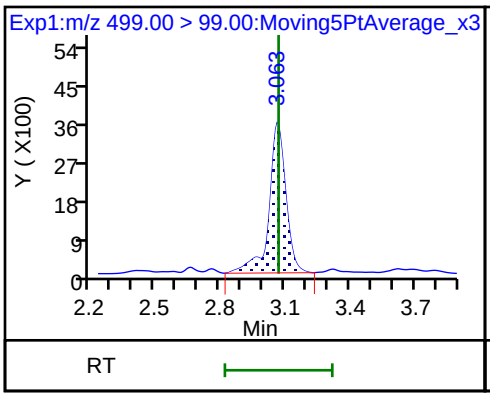
D 18 13C4 PFOS



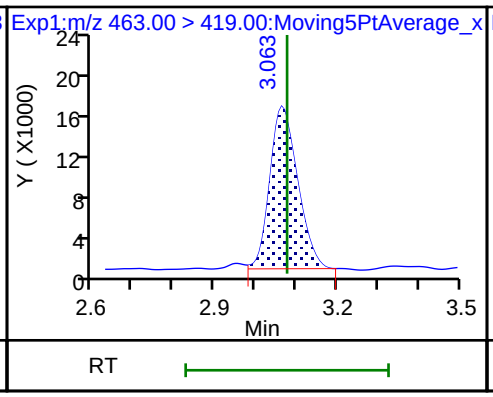
17 Perfluorooctane sulfonic acid



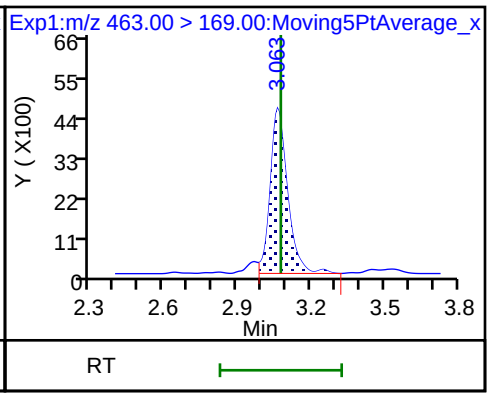
17 Perfluorooctane sulfonic acid



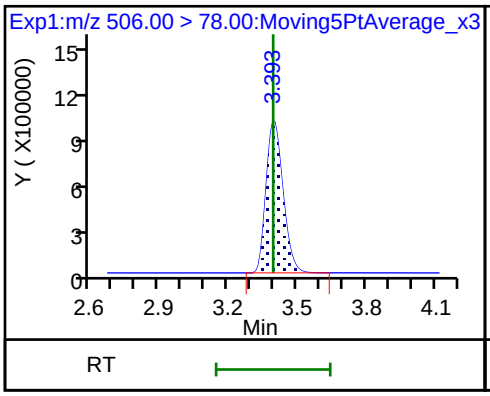
20 Perfluorononanoic acid



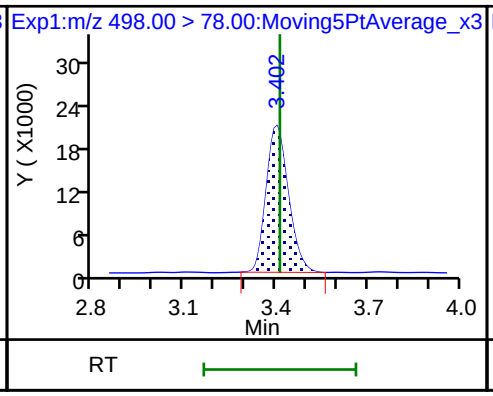
20 Perfluorononanoic acid



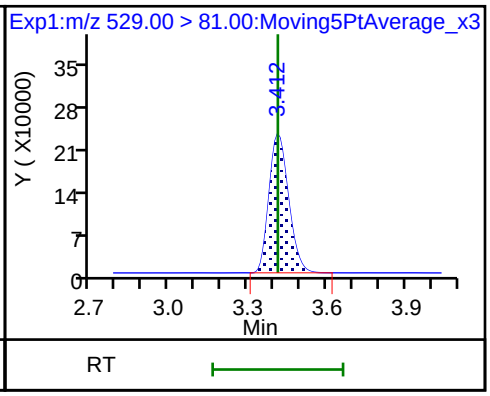
D 21 13C8 FOSA



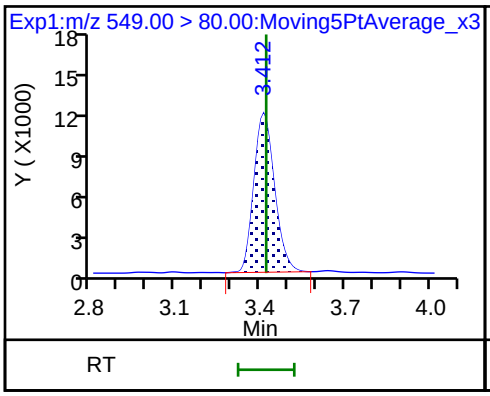
22 Perfluorooctane Sulfonamide



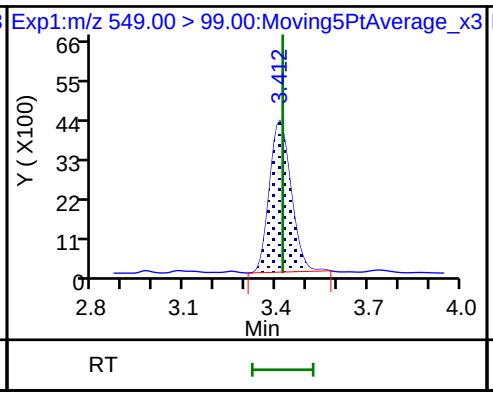
D 26 M2-8:2FTS



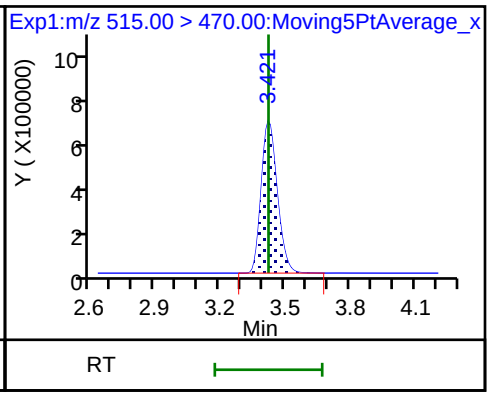
68 Perfluorononanesulfonic acid



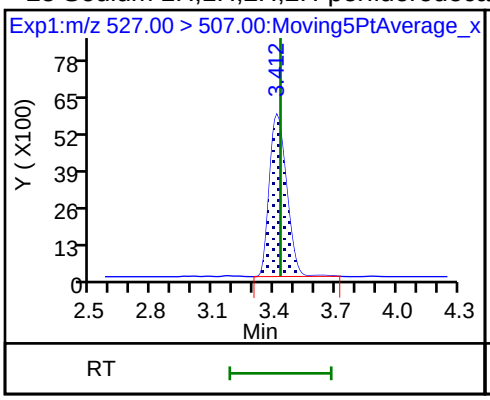
68 Perfluorononanesulfonic acid



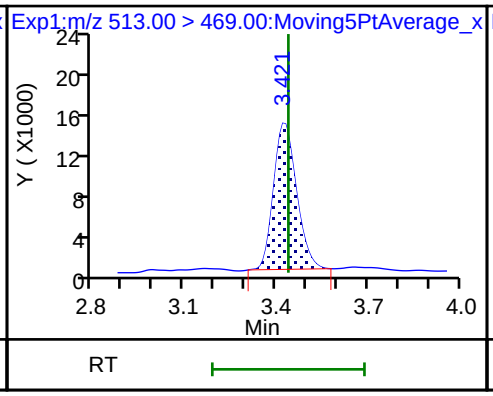
D 23 13C2 PFDA



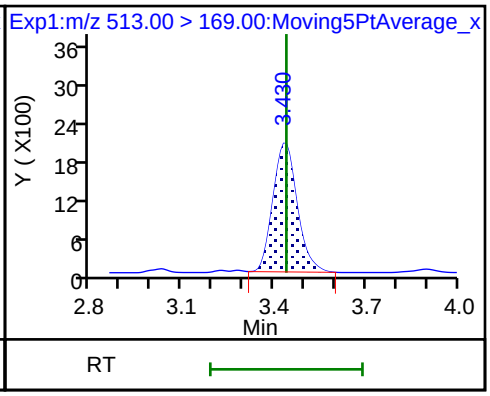
25 Sodium 1H,1H,2H,2H-perfluorodecane



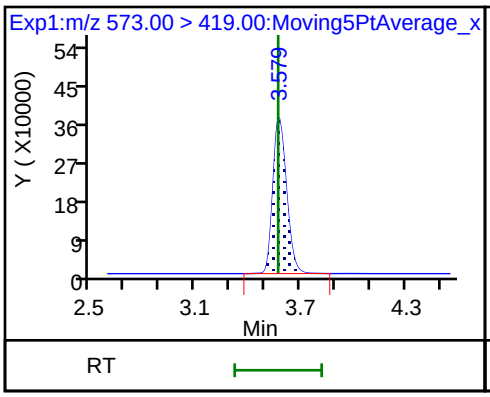
24 Perfluorodecanoic acid



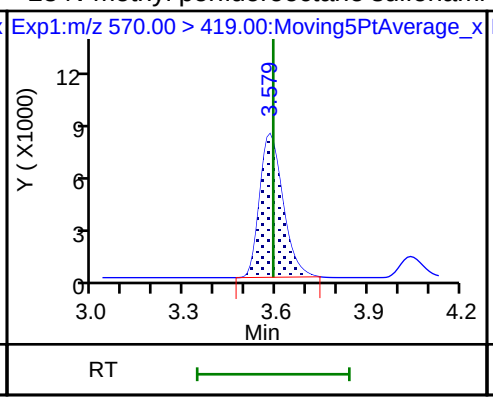
24 Perfluorodecanoic acid



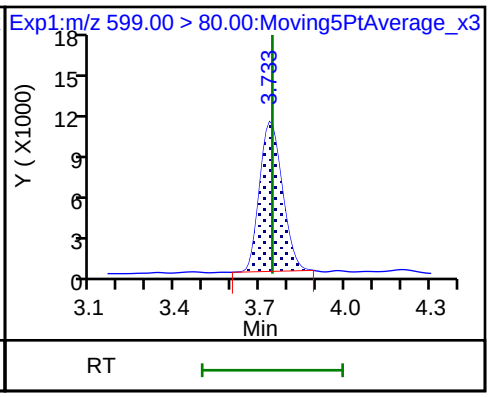
D 27 d3-NMeFOSAA



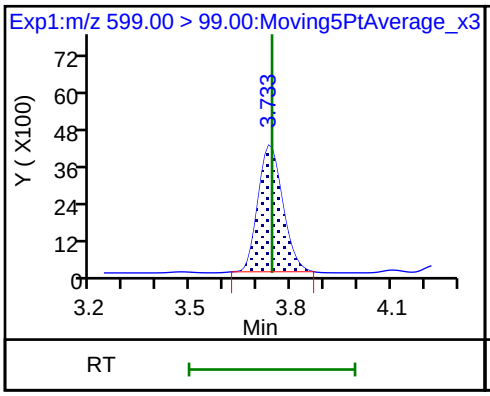
28 N-methyl perfluorooctane sulfonami



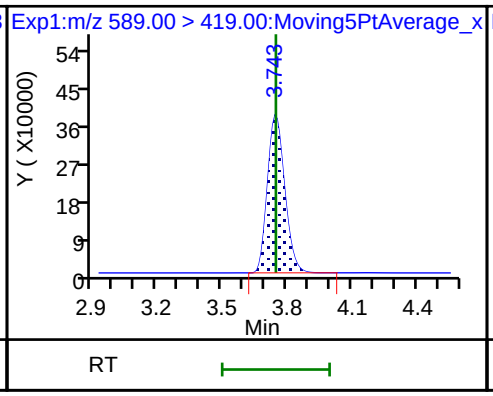
29 Perfluorodecane Sulfonic acid



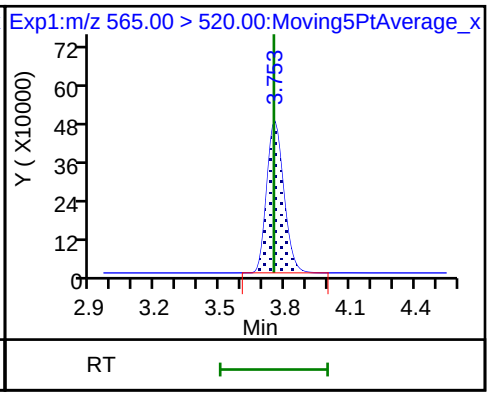
29 Perfluorodecane Sulfonic acid



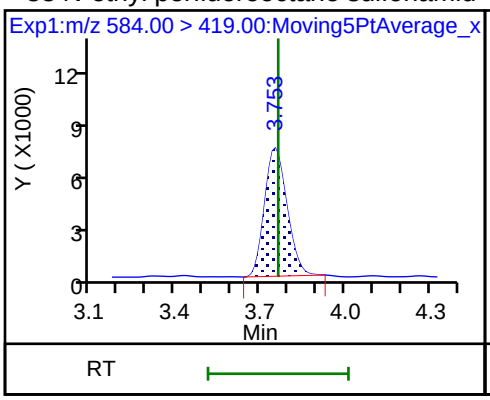
D 32 d5-NEtFOSAA



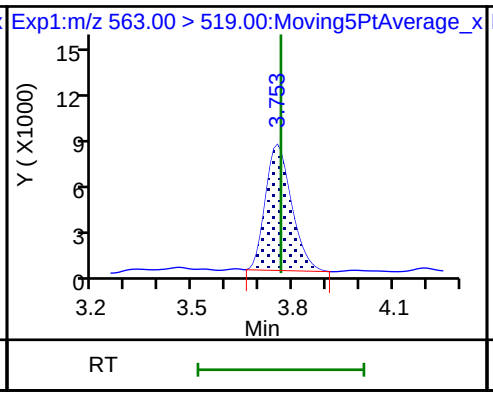
D 30 13C2 PFUnA



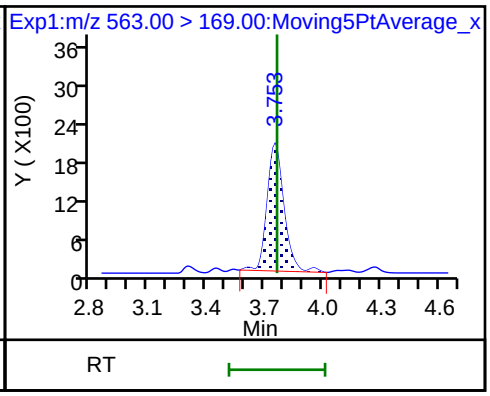
33 N-ethyl perfluorooctane sulfonamid



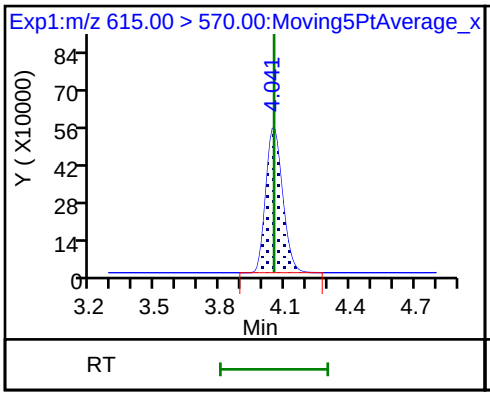
31 Perfluoroundecanoic acid



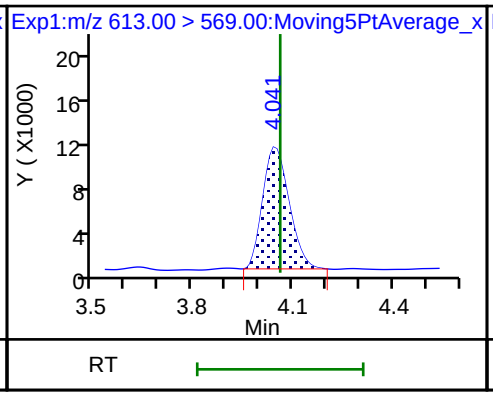
31 Perfluoroundecanoic acid



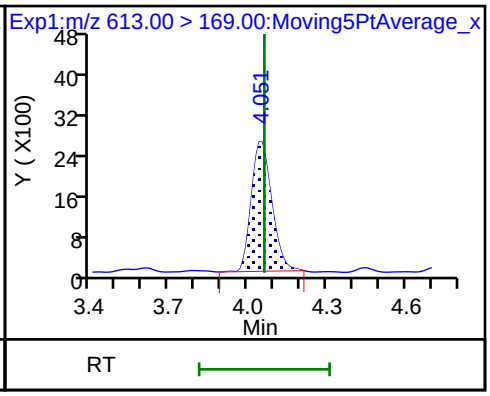
D 36 13C2 PFDoA



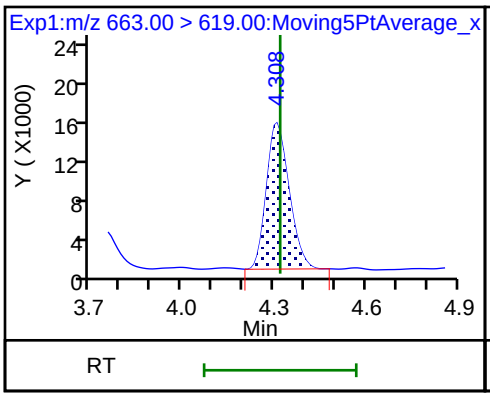
37 Perfluorododecanoic acid



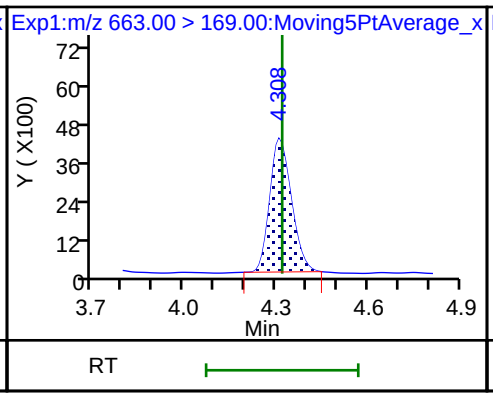
37 Perfluorododecanoic acid



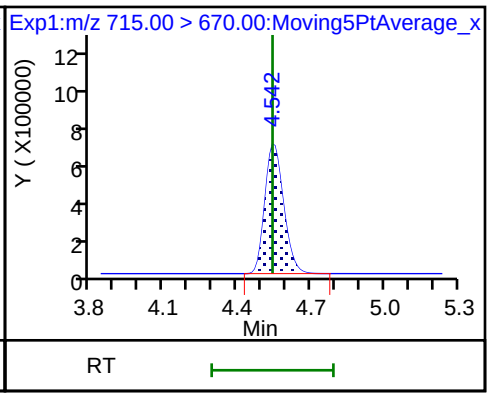
41 Perfluorotridecanoic acid



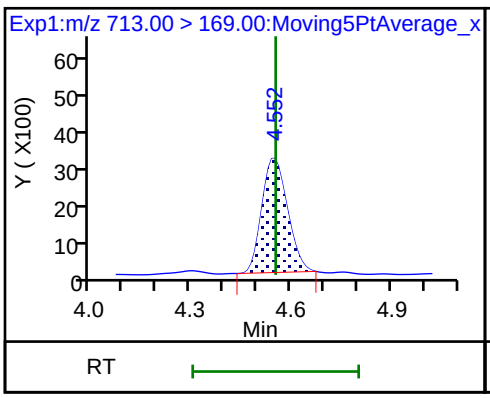
41 Perfluorotridecanoic acid



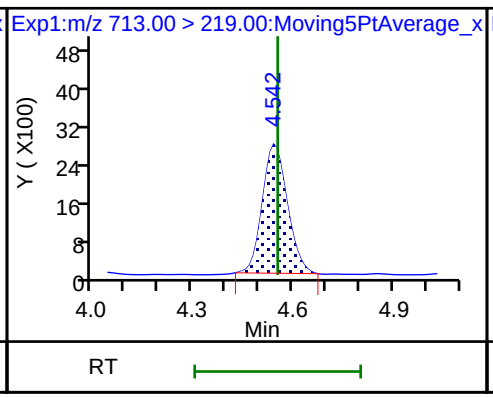
D 43 13C2-PFTeDA



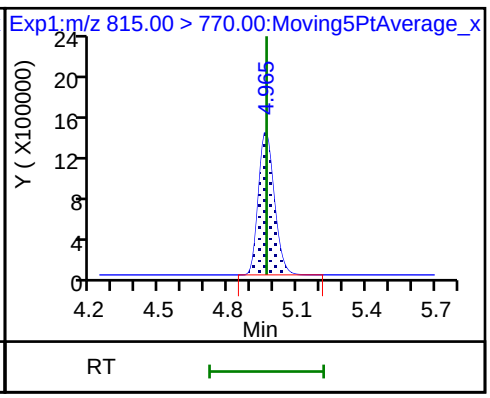
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225818/3 Calibration Date: 05/28/2018 07:15

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	0.9291		0.999	1.00	-0.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.119		0.948	1.00	-5.2	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	76.60		0.867	0.884	-1.9	30.0
4:2 FTS	AveID	16.57	18.15		1.02	0.934	9.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.019		0.991	1.00	-0.9	30.0
Perfluoropentanesulfonic acid	AveID	69.55	69.26		0.934	0.938	-0.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.035		0.980	1.00	-2.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.042		0.841	0.910	-7.6	30.0
6:2FTS	L2ID		1.642		0.877	0.948	-7.5	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.048		0.891	1.00	-10.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.298		0.928	0.952	-2.5	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	0.9653		0.911	1.00	-8.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.061		0.838	0.928	-9.7	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9937		1.02	1.00	2.1	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7865		0.997	0.960	3.8	30.0
8:2FTS	AveID	1.349	1.230		0.873	0.958	-8.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.011		1.04	1.00	4.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.011		0.996	1.00	-0.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.6428		0.923	0.964	-4.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9432		1.00	1.00	0.3	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.7734		0.926	1.00	-7.4	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.048		1.00	1.00	0.4	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.210		1.06	1.00	5.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2496		0.988	1.00	-1.2	30.0
13C4 PFBA	Ave	1.528	1.354		2.21	2.50	-11.4	30.0
13C5 PFPeA	Ave	0.9798	0.9501		2.42	2.50	-3.0	30.0
13C3-PFBS	Ave	0.0221	0.0199		2.09	2.33	-10.0	30.0
13C2 PFHxA	Ave	1.045	0.996		2.38	2.50	-4.6	30.0
13C4-PFHpA	Ave	1.001	0.9333		2.33	2.50	-6.8	30.0
18O2 PFHxS	Ave	1.237	1.097		2.10	2.37	-11.3	30.0
M2-6:2FTS	Ave	0.2210	0.2283		2.45	2.38	3.3	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225818/3 Calibration Date: 05/28/2018 07:15

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9588		2.53	2.50	1.3	30.0
13C4 PFOS	Ave	0.8503	0.7852		2.21	2.39	-7.6	30.0
13C5 PFNA	Ave	0.7745	0.8005		2.58	2.50	3.4	30.0
13C8 FOSA	Ave	1.113	0.9489		2.13	2.50	-14.7	30.0
M2-8:2FTS	Ave	0.2515	0.2409		2.29	2.40	-4.2	30.0
13C2 PFDA	Ave	0.6587	0.6306		2.39	2.50	-4.3	30.0
d3-NMeFOSAA	Ave	0.3634	0.4027		2.77	2.50	10.8	30.0
13C2 PFUnA	Ave	0.5216	0.5248		2.51	2.50	0.6	30.0
d5-NEtFOSAA	Ave	0.3729	0.3926		2.63	2.50	5.3	30.0
13C2 PFDoA	Ave	0.5613	0.5473		2.44	2.50	-2.5	30.0
13C2-PFTeDA	Ave	0.6891	0.6769		2.46	2.50	-1.8	30.0
13C2-PFHxDA	Ave	1.170	1.212		2.59	2.50	3.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_003.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 28-May-2018 07:15:55 ALS Bottle#: 37 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-May-2018 10:58:18 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 10:58:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.452	1.455	-0.003	1.000	6974118	2.21		88.6	34206	
2 Perfluorobutyric acid										
212.90 > 169.00	1.452	1.452	0.0	1.000	2591838	1.00		99.9	1500	
D 3 13C5-PFPeA										
267.90 > 223.00	1.720	1.725	-0.005	0.560	4894111	2.42		97.0	67211	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.720	1.720	0.0	1.000	2189779	0.9475		94.8	1420	
D 47 13C3-PFBS										
301.90 > 83.00	1.756	1.761	-0.005	1.000	95437	2.09		90.0	955	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.756	1.756	0.0	1.000	2779725	0.8672		98.1	13003	
298.90 > 99.00	1.756	1.756	0.0	1.000	1165470		2.39(1.25-3.74)		14882	
D 60 M2-4:2FTS										
329.00 > 81.00	1.970	1.977	-0.007	1.000	779142	NC			8008	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.970	1.970	0.0	1.000	695708	1.02		109	40243	
D 7 13C2 PFHxA										
315.00 > 270.00	2.004	2.011	-0.007	1.000	5132156	2.38		95.4	96461	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.015	2.015	0.0	1.006	2091143	0.99		99.1	3831	
313.00 > 119.00	2.004	2.015	-0.011	1.000	191022		10.95(5.03-15.10)		2330	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.026	2.026	0.0	1.000	2666587	0.9341		99.6	25260	
349.00 > 99.00	2.026	2.026	0.0	1.000	991133		2.69(1.36-4.07)		18576	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.105	2.112	-0.007	1.000	281722	NC			6870	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.105	2.105	0.0	1.000	299591	NC			1755	
D 9 13C4-PFHpA										
367.00 > 322.00	2.346	2.342	0.004	1.000	4807564	2.33		93.2	54193	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.346	2.346	0.0	1.000	1989745	0.9795		98.0	2567	
363.00 > 169.00	2.346	2.346	0.0	1.000	783489		2.54(1.13-3.40)		4831	
D 11 18O2 PFHxS										
403.00 > 84.00	2.359	2.355	0.004	1.000	5345335	2.10		88.7	45086	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.359	2.359	0.0	1.000	2142296	0.8412		92.4	8191	
399.00 > 99.00	2.359	2.359	0.0	1.000	737456		2.90(1.50-4.49)		4506	
65 Adona										
377.00 > 251.00	2.385	2.385	0.0	1.000	6062609	NC			56027	
377.00 > 85.00	2.385	2.385	0.0	1.000	3439303		1.76(0.84-2.53)		38028	
D 12 M2-6:2FTS										
429.00 > 81.00	2.675	2.665	0.010	1.000	1117005	2.45		103	17882	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.675	2.675	0.0	1.000	732093	0.8767		92.5	17139	
D 14 13C4 PFOA										
417.00 > 372.00	2.698	2.695	0.003	1.000	4938707	2.53		101	49367	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.698	2.698	0.0	1.000	2071167	0.8907		89.1	857	
413.00 > 169.00	2.698	2.698	0.0	1.000	1072996		1.93(0.84-2.52)		4839	
* 62 13C2-PFOA										
415.00 > 370.00	2.698	2.698	0.0		5150922	2.50			57320	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.705	2.705	0.0	1.000	1999338	0.9278		97.5	15785	
449.00 > 99.00	2.705	2.705	0.0	1.000	538940		3.71(1.94-5.82)		8819	
D 19 13C5 PFNA										
468.00 > 423.00	3.070	3.063	0.007	1.000	4123402	2.58		103	98138	
D 18 13C4 PFOS										
503.00 > 80.00	3.070	3.063	0.007	1.000	3866673	2.21		92.4	18810	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.070	3.070	0.0	1.000	1593564	0.8377		90.3	8891	
499.00 > 99.00	3.070	3.070	0.0	1.000	348538		4.57(2.31-6.93)		5679	
20 Perfluorononanoic acid										
463.00 > 419.00	3.070	3.070	0.0	1.000	1592127	0.9114		91.1	4865	
463.00 > 169.00	3.070	3.070	0.0	1.000	387123		4.11(1.90-5.69)		13791	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.276	3.276	0.0	1.000	2710849	NC			49626	
D 21 13C8 FOSA										
506.00 > 78.00	3.402	3.395	0.007	1.000	4887724	2.13		85.3	35503	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.402	3.402	0.0	1.000	1942707	1.02		102	47920	
D 26 M2-8:2FTS										
529.00 > 81.00	3.421	3.413	0.008	1.000	1188741	2.29		95.8	17641	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.412	3.412	0.0	1.000	1221497	1.00		104	21708	
549.00 > 99.00	3.412	3.412	0.0	1.000	457909		2.67(1.33-3.97)		11198	
D 23 13C2 PFDA										
515.00 > 470.00	3.430	3.422	0.008	1.000	3247997	2.39		95.7	42049	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.421	3.421	0.0	1.000	585008	0.8734		91.2	15891	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.430	3.430	0.0	1.000	1313904	1.04		104	6225	
513.00 > 169.00	3.430	3.430	0.0	1.000	219405		5.99(2.36-7.09)		5299	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.579	3.572	0.007	1.000	2074054	2.77		111	16324	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.590	3.590	0.0	1.003	838929	1.00		99.6	5187	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.743	3.743	0.0	1.000	1002506	0.9229		95.7	14103	
599.00 > 99.00	3.743	3.743	0.0	1.000	351550		2.85(1.39-4.16)		10896	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.753	3.748	0.005	1.000	2022109	2.63		105	19051	
D 30 13C2 PFUnA										
565.00 > 520.00	3.753	3.748	0.005	1.000	2702997	2.51		101	45103	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.753	3.753	0.0	1.000	762926	1.00		100	15240	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.753	3.753	0.0	1.000	836165	0.9260		92.6	4569	
563.00 > 169.00	3.753	3.753	0.0	1.000	207308		4.03(2.12-6.36)		7407	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.910	3.910	0.0	1.000	4197243	NC			46675	
D 36 13C2 PFDoA										
615.00 > 570.00	4.051	4.048	0.003	1.000	2819291	2.44		97.5	20984	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.051	4.051	0.0	1.000	1181822	1.00		100	1500	
613.00 > 169.00	4.051	4.051	0.0	1.000	282809		4.18(2.13-6.40)		4109	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.308	4.308	0.0	1.000	1364274	1.06		106	1299	
663.00 > 169.00	4.308	4.308	0.0	1.000	409249		3.33(1.25-3.76)		5954	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.554	4.542	0.012	1.000	3486518	2.46		98.2	16886	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.554	4.554	0.0	1.000	348018	0.9882		98.8	4105	
713.00 > 219.00	4.544	4.554	-0.010	0.998	254835		1.37(0.71-2.13)		5379	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.967	4.966	0.001	1.000	6242783	2.59		104	12879	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.967	4.967	0.0	1.000	2264676	NC			878	
813.00 > 169.00	4.967	4.967	0.0	1.000	380452		5.95(2.86-8.58)		2890	

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	5.329	5.329	0.0	1.000	2568923	NC			725	
913.00 > 169.00	5.329	5.329	0.0	1.000	303213		8.47(3.83-11.48)		2544	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00004 Amount Added: 1.00 Units: mL

Report Date: 30-May-2018 10:58:18 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_003.d

Injection Date: 28-May-2018 07:15:55 Instrument ID: A8_N

Lims ID: CCV L4

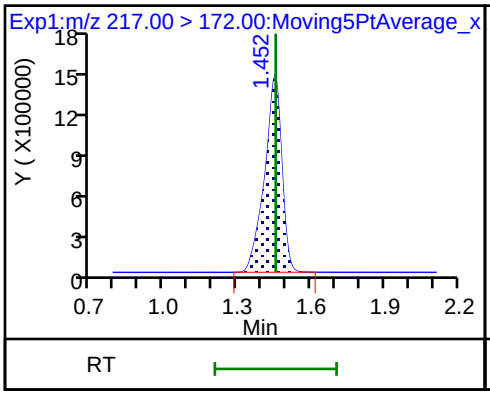
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 37 Worklist Smp#: 3

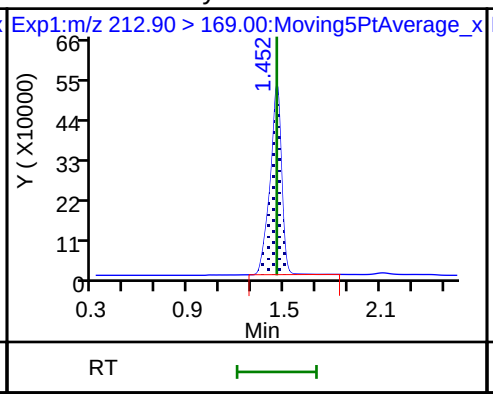
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

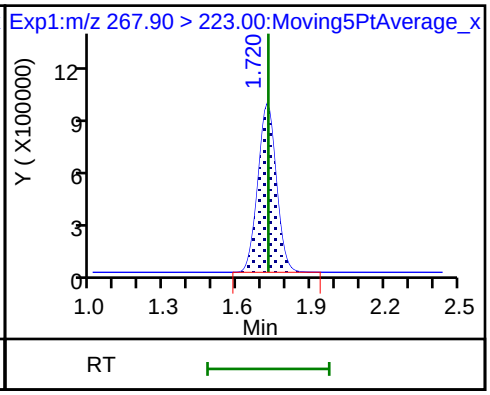
D 1 13C4 PFBA



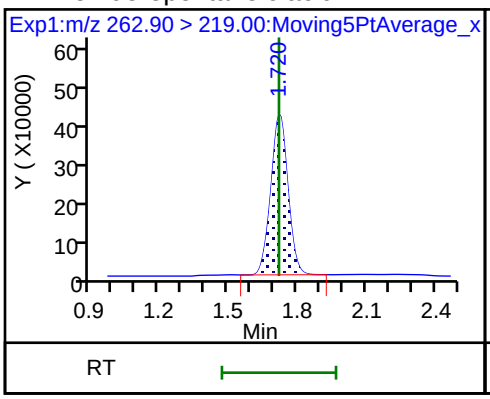
2 Perfluorobutyric acid



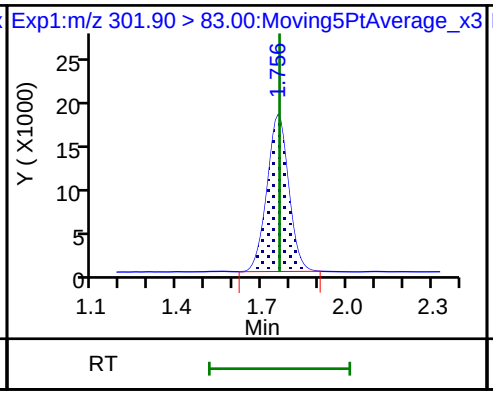
D 3 13C5-PFPeA



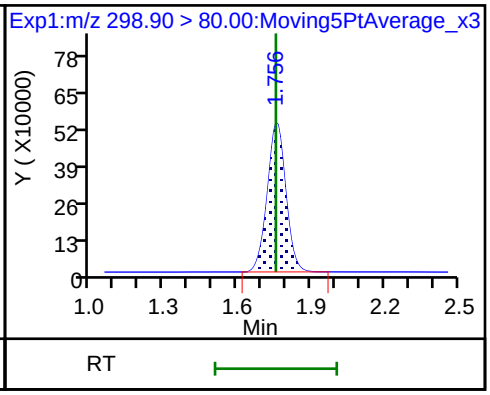
4 Perfluoropentanoic acid



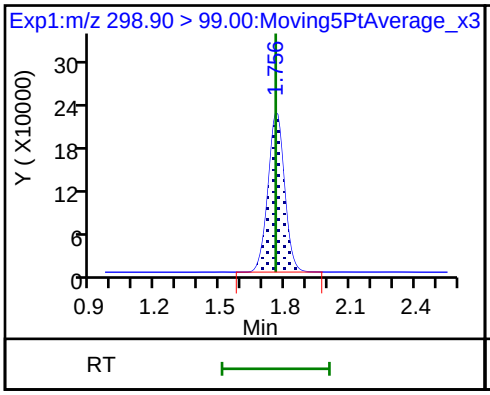
D 47 13C3-PFBS



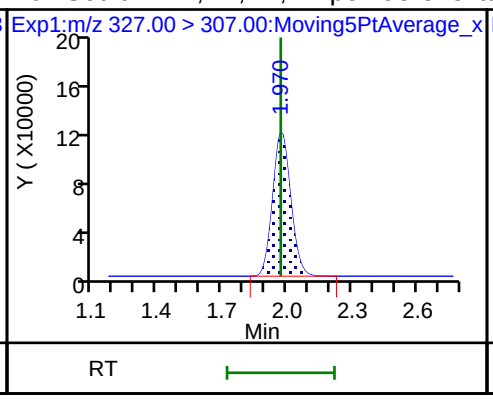
5 Perfluorobutanesulfonic acid



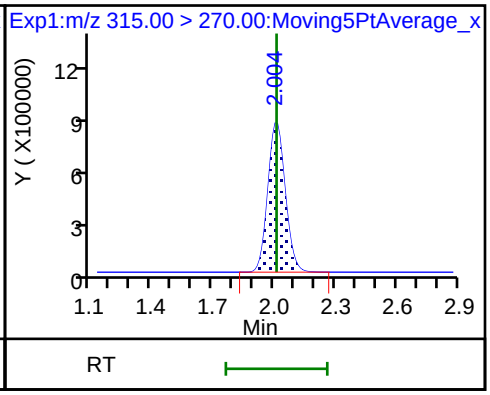
5 Perfluorobutanesulfonic acid



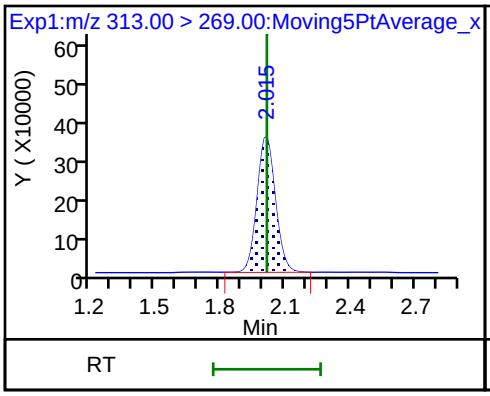
61 Sodium 1H,1H,2H,2H-perfluorohexa



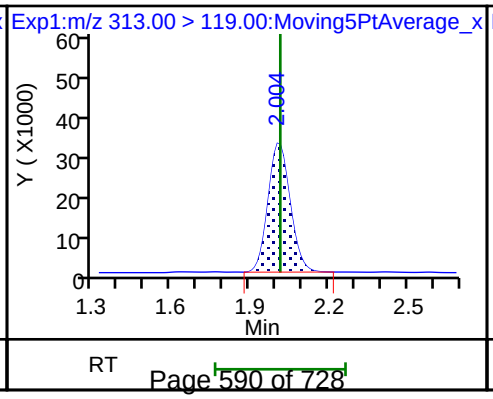
D 7 13C2 PFHxA



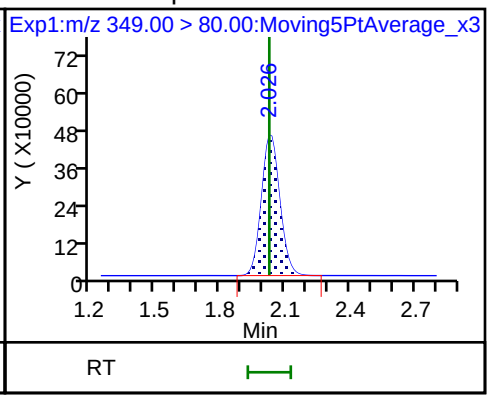
6 Perfluorohexanoic acid



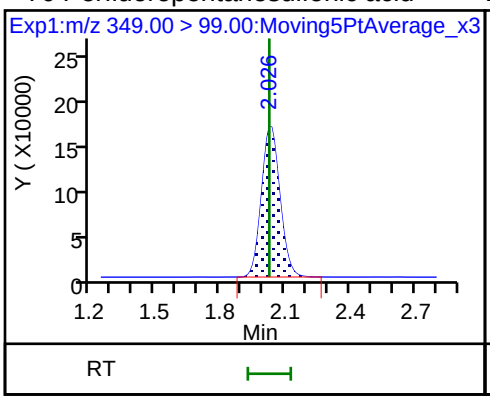
6 Perfluorohexanoic acid



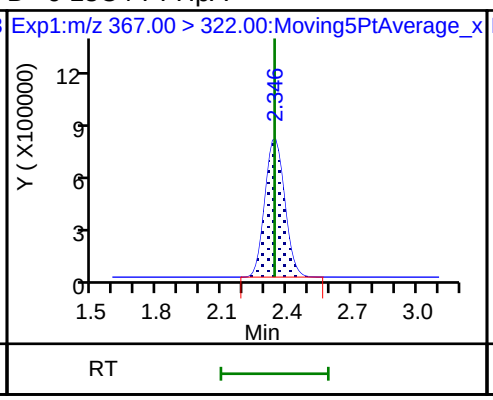
70 Perfluoropentanesulfonic acid



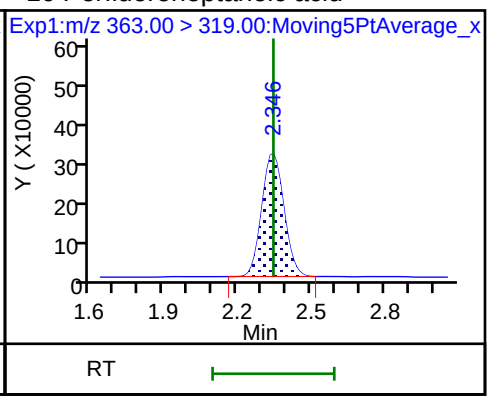
70 Perfluoropentanesulfonic acid



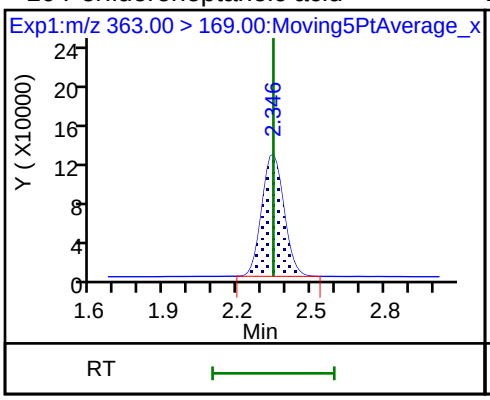
D 9 13C4-PFHpA



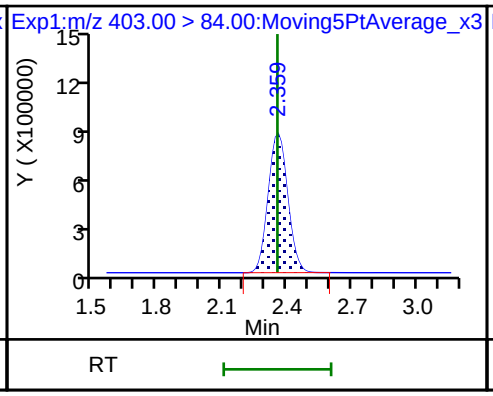
10 Perfluoroheptanoic acid



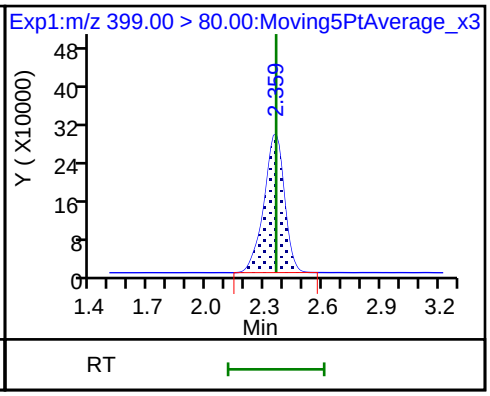
10 Perfluoroheptanoic acid



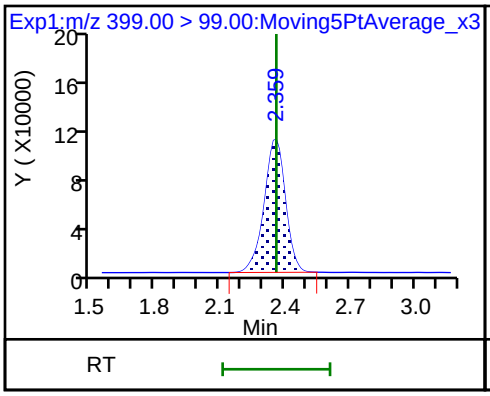
D 11 18O2 PFHxS



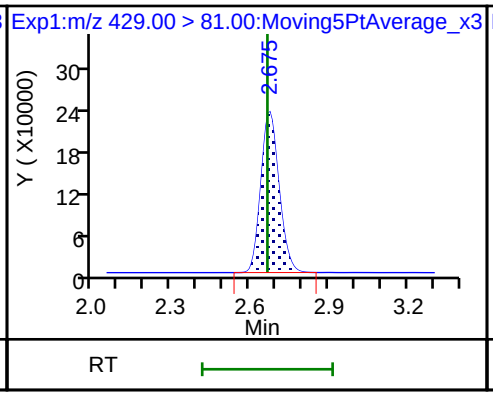
8 Perfluorohexanesulfonic acid



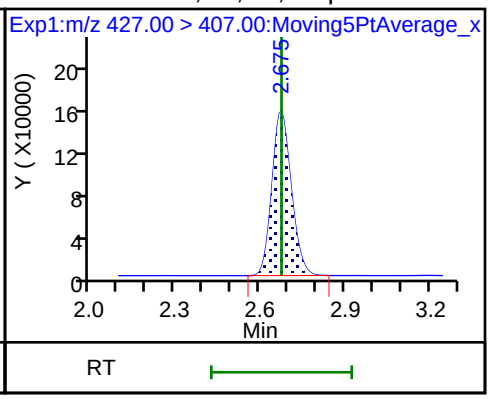
8 Perfluorohexanesulfonic acid



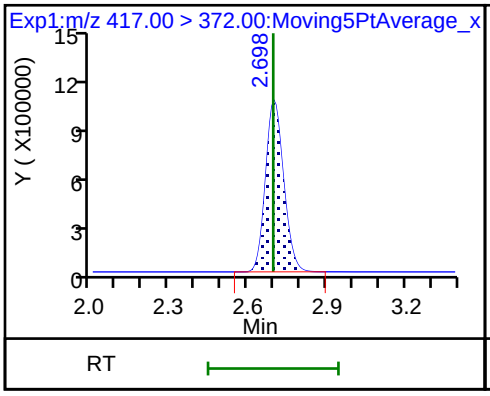
D 12 M2-6:2FTS



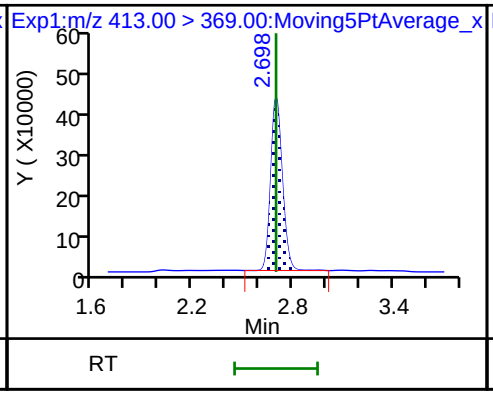
13 Sodium 1H,1H,2H,2H-perfluorooctane



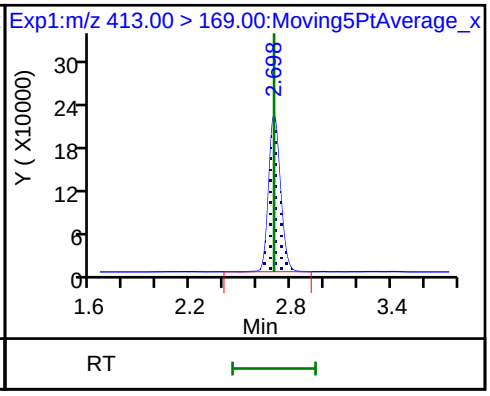
D 14 13C4 PFOA



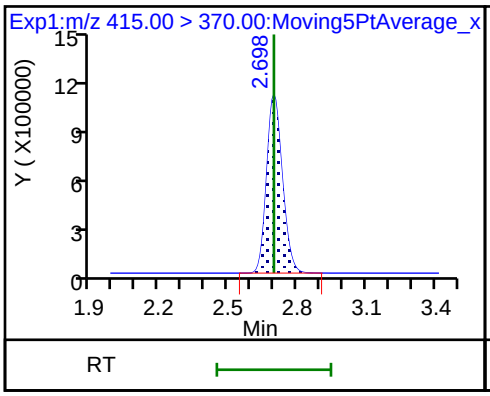
15 Perfluorooctanoic acid



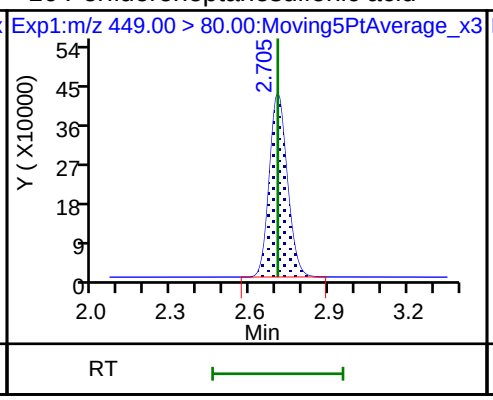
15 Perfluorooctanoic acid



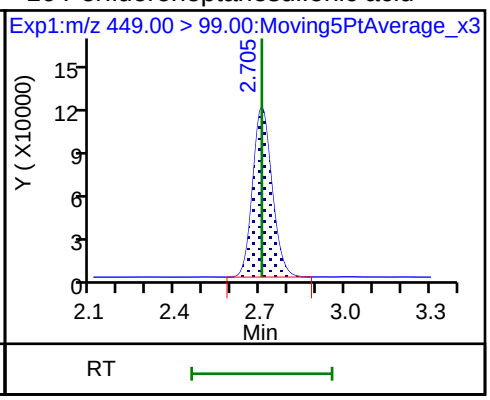
* 62 13C2-PFOA



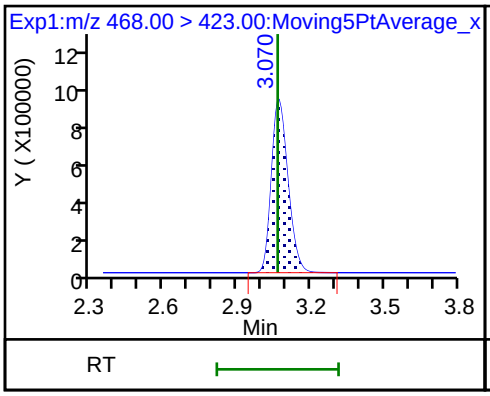
16 Perfluoroheptanesulfonic acid



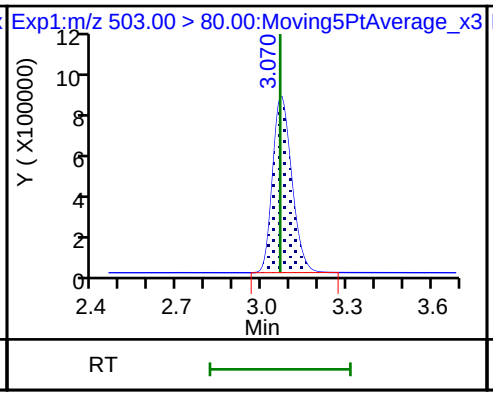
16 Perfluoroheptanesulfonic acid



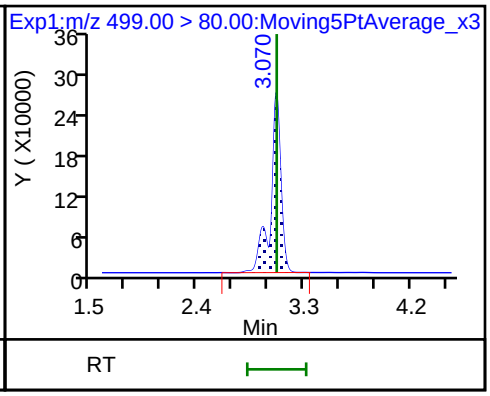
D 19 13C5 PFNA



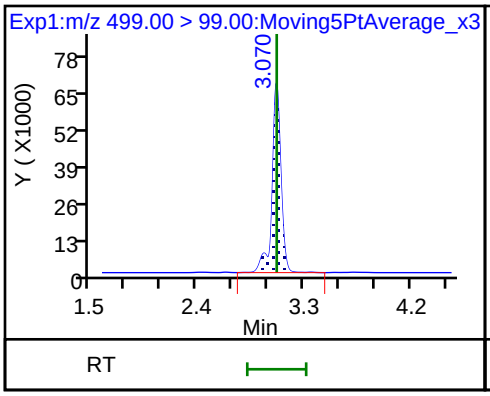
D 18 13C4 PFOS



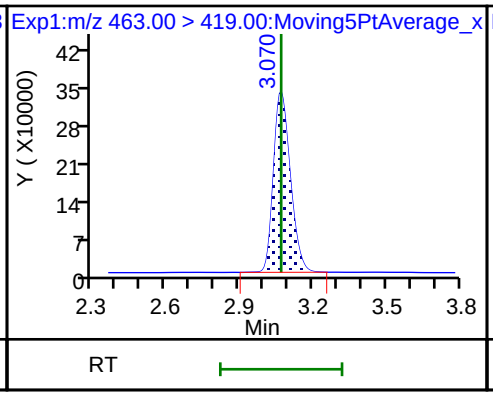
17 Perfluorooctane sulfonic acid



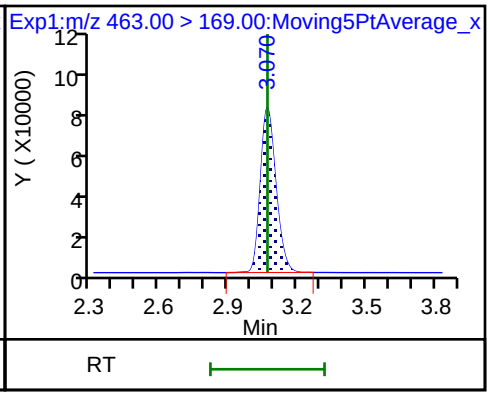
17 Perfluorooctane sulfonic acid



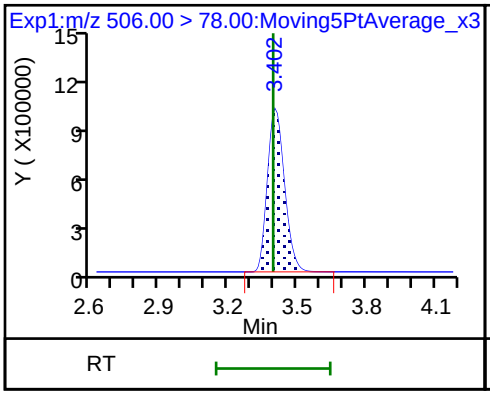
20 Perfluorononanoic acid



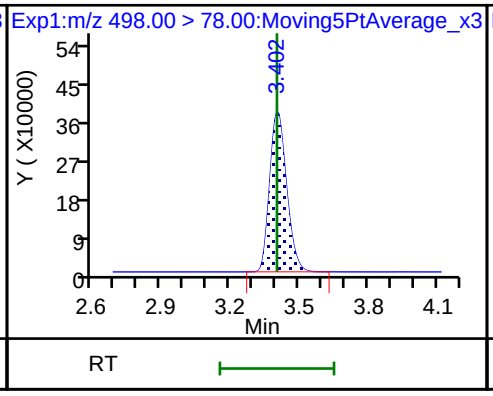
20 Perfluorononanoic acid



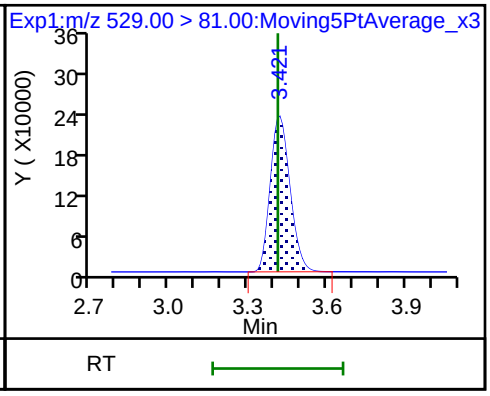
D 21 13C8 FOSA



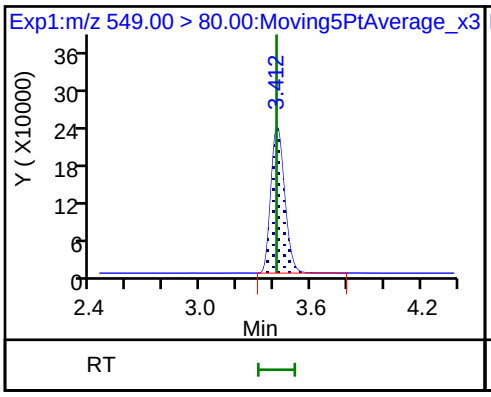
22 Perfluorooctane Sulfonamide



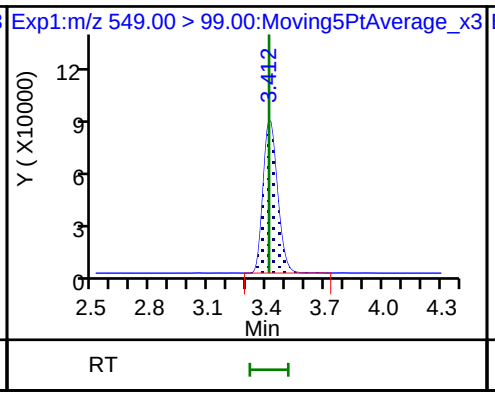
D 26 M2-8:2FTS



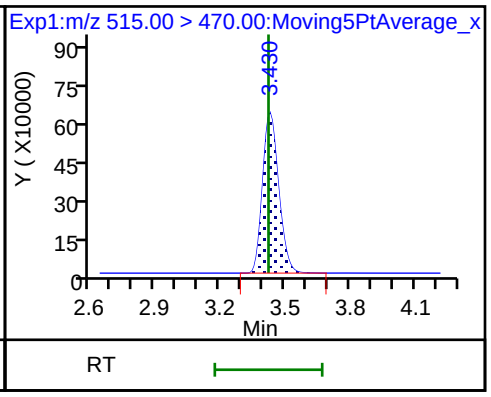
68 Perfluorononanesulfonic acid



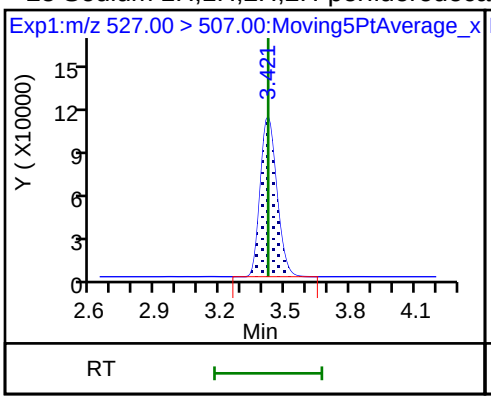
68 Perfluorononanesulfonic acid



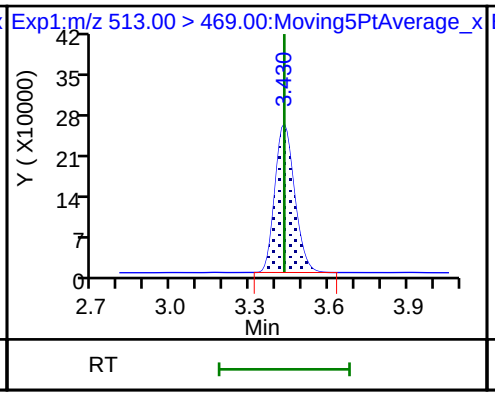
D 23 13C2 PFDA



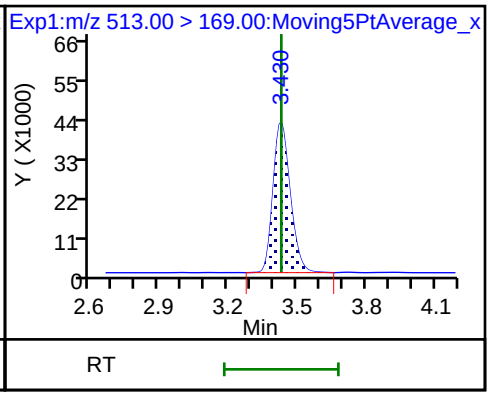
25 Sodium 1H,1H,2H,2H-perfluorodecane



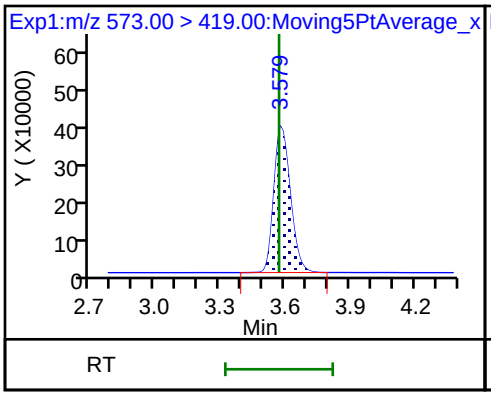
24 Perfluorodecanoic acid



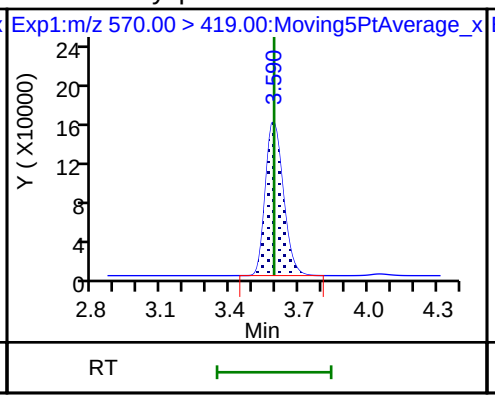
24 Perfluorodecanoic acid



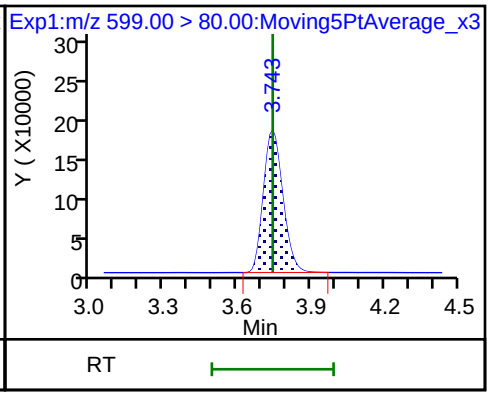
D 27 d3-NMeFOSAA



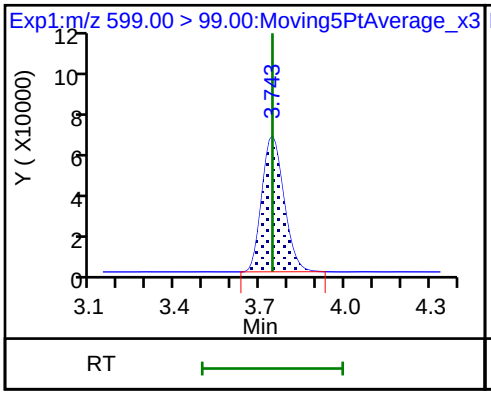
28 N-methyl perfluorooctane sulfonami



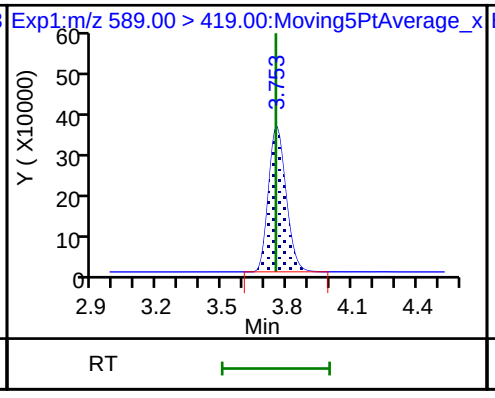
29 Perfluorodecane Sulfonic acid



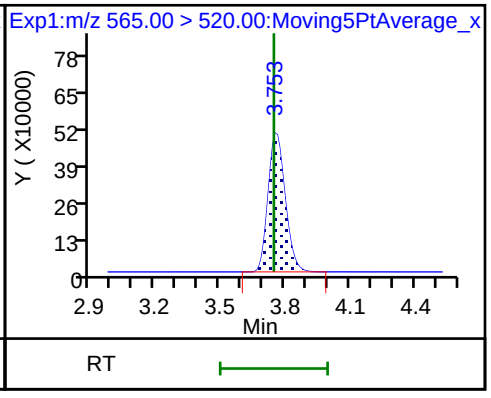
29 Perfluorodecane Sulfonic acid



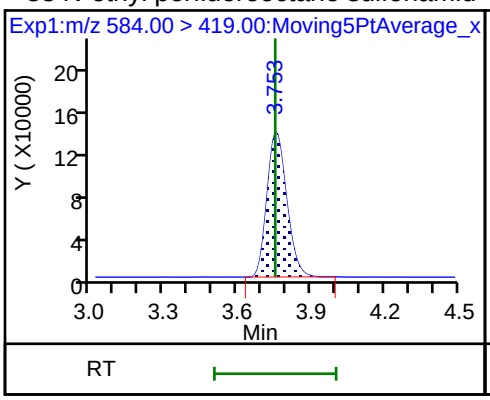
D 32 d5-NEtFOSAA



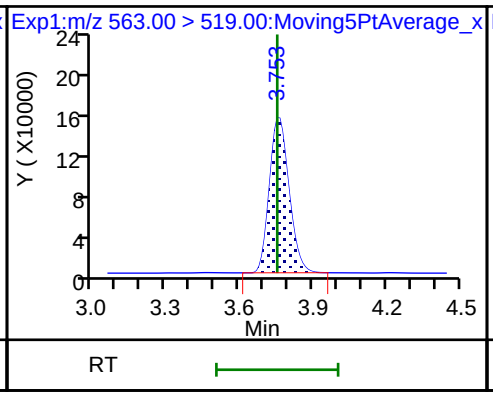
D 30 13C2 PFUnA



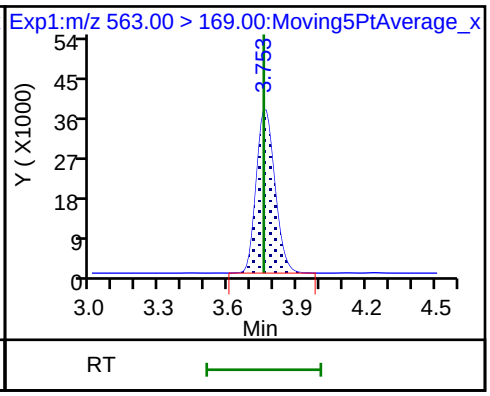
33 N-ethyl perfluorooctane sulfonamid



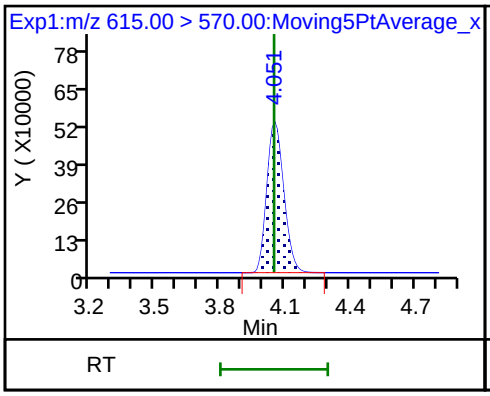
31 Perfluoroundecanoic acid



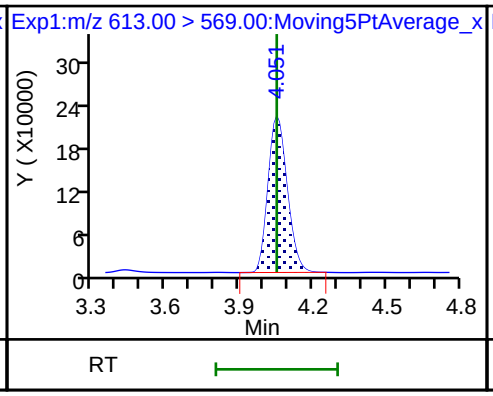
31 Perfluoroundecanoic acid



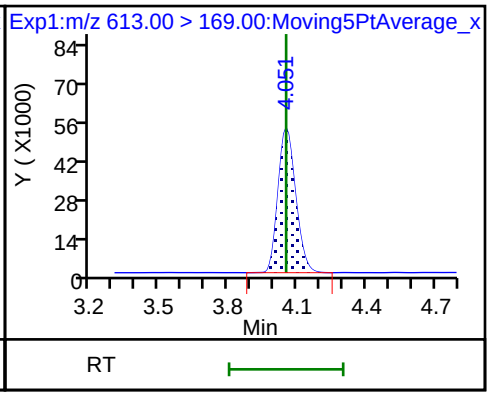
D 36 13C2 PFDoA



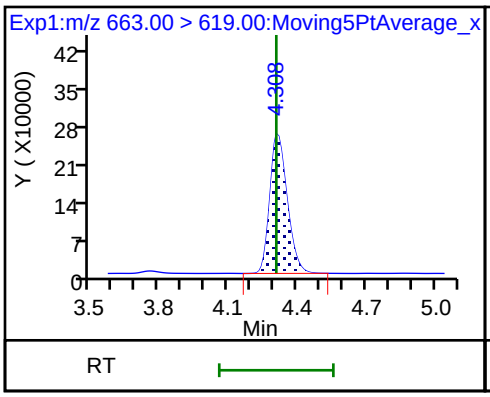
37 Perfluorododecanoic acid



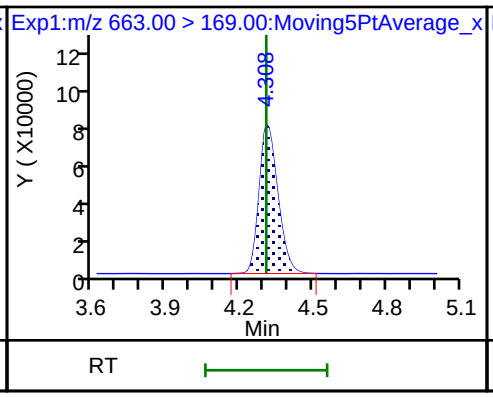
37 Perfluorododecanoic acid



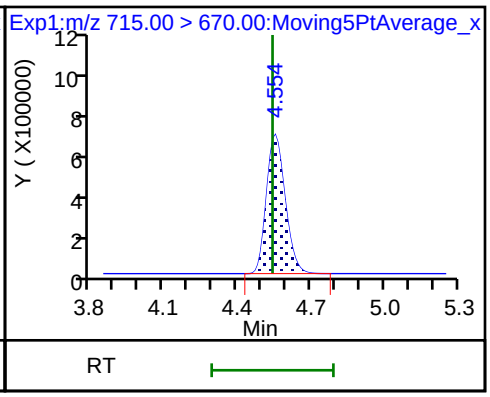
41 Perfluorotridecanoic acid



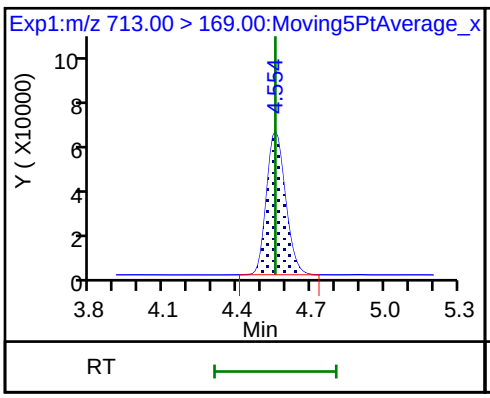
41 Perfluorotridecanoic acid



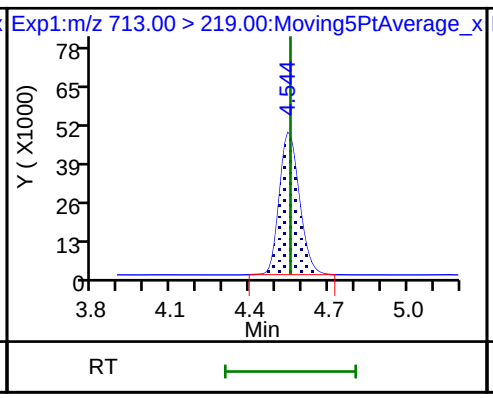
D 43 13C2-PFTeDA



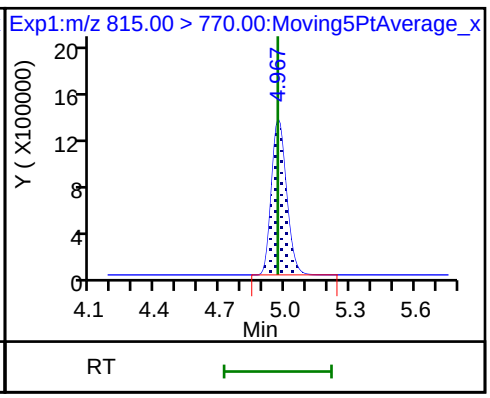
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225818/14 Calibration Date: 05/28/2018 08:42

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	0.9726		2.61	2.50	4.6	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.175		2.49	2.50	-0.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	80.78		2.29	2.21	3.4	30.0
4:2 FTS	AveID	16.57	18.52		2.61	2.34	11.7	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.016		2.47	2.50	-1.2	30.0
Perfluoropentanesulfonic acid	AveID	69.55	72.10		2.43	2.35	3.7	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.031		2.44	2.50	-2.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.047		2.11	2.28	-7.1	30.0
6:2FTS	L2ID		1.633		2.19	2.37	-7.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.131		2.40	2.50	-3.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.349		2.41	2.38	1.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.047		2.47	2.50	-1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.111		2.19	2.32	-5.5	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.048		2.69	2.50	7.7	30.0
8:2FTS	AveID	1.349	1.223		2.17	2.40	-9.4	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.8135		2.58	2.40	7.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	0.9761		2.51	2.50	0.4	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.071		2.64	2.50	5.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.6547		2.35	2.41	-2.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9594		2.55	2.50	2.1	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.8086		2.42	2.50	-3.2	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.043		2.50	2.50	-0.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.164		2.54	2.50	1.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2482		2.46	2.50	-1.7	30.0
13C4 PFBA	Ave	1.528	1.383		2.26	2.50	-9.5	30.0
13C5 PFPeA	Ave	0.9798	0.9537		2.43	2.50	-2.7	30.0
13C3-PFBS	Ave	0.0221	0.0203		2.13	2.33	-8.3	30.0
13C2 PFHxA	Ave	1.045	1.035		2.48	2.50	-1.0	30.0
13C4-PFHpA	Ave	1.001	0.9774		2.44	2.50	-2.4	30.0
18O2 PFHxS	Ave	1.237	1.160		2.22	2.37	-6.2	30.0
M2-6:2FTS	Ave	0.2210	0.2320		2.49	2.38	5.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225818/14 Calibration Date: 05/28/2018 08:42

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9508		2.51	2.50	0.4	30.0
13C4 PFOS	Ave	0.8503	0.7945		2.23	2.39	-6.6	30.0
13C5 PFNA	Ave	0.7745	0.7916		2.56	2.50	2.2	30.0
13C8 FOSA	Ave	1.113	0.9755		2.19	2.50	-12.3	30.0
M2-8:2FTS	Ave	0.2515	0.2576		2.45	2.40	2.4	30.0
13C2 PFDA	Ave	0.6587	0.6660		2.53	2.50	1.1	30.0
d3-NMeFOSAA	Ave	0.3634	0.4033		2.77	2.50	11.0	30.0
13C2 PFUnA	Ave	0.5216	0.5372		2.57	2.50	3.0	30.0
d5-NEtFOSAA	Ave	0.3729	0.3995		2.68	2.50	7.1	30.0
13C2 PFDoA	Ave	0.5613	0.5817		2.59	2.50	3.6	30.0
13C2-PFTeDA	Ave	0.6891	0.7079		2.57	2.50	2.7	30.0
13C2-PFHxDA	Ave	1.170	1.392		2.98	2.50	19.0	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_014.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 28-May-2018 08:42:10 ALS Bottle#: 38 Worklist Smp#: 14
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*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-May-2018 11:15:35 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 11:15:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.457	1.457	0.0	1.000	6989458	2.61		105	4321	
D 1 13C4 PFBA										
217.00 > 172.00	1.457	1.455	0.002	1.000	7186475	2.26		90.5	36124	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.728	1.728	0.0	1.000	5823630	2.49		99.6	4314	
D 3 13C5-PFPeA										
267.90 > 223.00	1.728	1.725	0.003	0.564	4954961	2.43		97.3	59648	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.765	1.765	0.0	1.000	7536460	2.29		103	41645	
298.90 > 99.00	1.765	1.765	0.0	1.000	3155802		2.39(1.25-3.74)		35878	
D 47 13C3-PFBS										
301.90 > 83.00	1.765	1.761	0.004	1.000	98150	2.13		91.7	900	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.980	1.980	0.0	1.000	1825366	2.61		112	79263	
D 60 M2-4:2FTS										
329.00 > 81.00	1.980	1.977	0.003	1.000	761400	NC			6904	
D 7 13C2 PFHxA										
315.00 > 270.00	2.014	2.011	0.003	1.000	5375250	2.48		99.0	84963	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.014	2.014	0.0	1.000	5462587	2.47		98.8	10059	
313.00 > 119.00	2.014	2.014	0.0	1.000	484961		11.26(5.03-15.10)		6354	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.036	2.036	0.0	1.000	7137208	2.43		104	55944	
349.00 > 99.00	2.036	2.036	0.0	1.000	2615194		2.73(1.36-4.07)		37262	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.115	2.115	0.0	1.000	865450	NC			4935	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.115	2.112	0.003	1.000	288714	NC			5541	
D 9 13C4-PFHpA										
367.00 > 322.00	2.345	2.342	0.003	1.000	5078118	2.44		97.6	63006	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.345	2.345	0.0	1.000	5237348	2.44		97.6	6579	
363.00 > 169.00	2.345	2.345	0.0	1.000	2051281		2.55(1.13-3.40)		11770	
D 11 18O2 PFHxS										
403.00 > 84.00	2.358	2.355	0.003	1.000	5703440	2.22		93.8	57697	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.358	2.358	0.0	1.000	5741524	2.11		92.9	16263	
399.00 > 99.00	2.358	2.358	0.0	1.000	1906077		3.01(1.50-4.49)		9180	
65 Adona										
377.00 > 251.00	2.384	2.384	0.0	1.000	15531381	NC			113014	
377.00 > 85.00	2.384	2.384	0.0	1.000	9811723		1.58(0.84-2.53)		91227	
D 12 M2-6:2FTS										
429.00 > 81.00	2.674	2.665	0.009	1.000	1144904	2.49		105	16047	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.674	2.674	0.0	1.000	1865662	2.19		92.6	35940	
D 14 13C4 PFOA										
417.00 > 372.00	2.697	2.695	0.002	1.000	4939823	2.51		100	48053	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.697	2.697	0.0	1.000	5587606	2.40		96.1	2050	
413.00 > 169.00	2.697	2.697	0.0	1.000	2861512		1.95(0.84-2.52)		10088	
* 62 13C2-PFOA										
415.00 > 370.00	2.697	2.697	0.0		5195418	2.50			47874	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.704	2.704	0.0	1.000	5300300	2.41		101	24747	
449.00 > 99.00	2.704	2.704	0.0	1.000	1455705		3.64(1.94-5.82)		30653	
D 19 13C5 PFNA										
468.00 > 423.00	3.064	3.063	0.001	1.000	4112817	2.56		102	63909	
D 18 13C4 PFOS										
503.00 > 80.00	3.064	3.063	0.001	1.000	3946255	2.23		93.4	20385	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.064	3.064	0.0	1.000	4255349	2.19		94.5	28089	
499.00 > 99.00	3.064	3.064	0.0	1.000	929782		4.58(2.31-6.93)		28913	
20 Perfluorononanoic acid										
463.00 > 419.00	3.064	3.064	0.0	1.000	4304613	2.47		98.8	10330	
463.00 > 169.00	3.064	3.064	0.0	1.000	995680		4.32(1.90-5.69)		19322	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.271	3.271	0.0	1.000	7212139	NC			56208	
D 21 13C8 FOSA										
506.00 > 78.00	3.396	3.395	0.001	1.000	5068186	2.19		87.7	41396	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.405	3.405	0.0	1.003	5313503	2.69		108	45390	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.415	3.415	0.0	1.000	3223652	2.58		107	25121	
549.00 > 99.00	3.415	3.415	0.0	1.000	1152682		2.80(1.33-3.97)		18860	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 26 M2-8:2FTS										
529.00 > 81.00	3.415	3.413	0.002	1.000	1282109	2.45		102	20721	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.415	3.415	0.0	1.000	1567718	2.17		90.6	37185	
D 23 13C2 PFDA										
515.00 > 470.00	3.424	3.422	0.002	1.000	3460096	2.53		101	48308	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.424	3.424	0.0	1.000	3377242	2.51		100	13070	
513.00 > 169.00	3.424	3.424	0.0	1.000	605819		5.57(2.36-7.09)		11671	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.573	3.572	0.001	1.000	2095239	2.77		111	22819	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.584	3.584	0.0	1.003	2243093	2.64		105	13436	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.738	3.738	0.0	1.000	2605356	2.35		97.5	27964	
599.00 > 99.00	3.738	3.738	0.0	1.000	847119		3.08(1.39-4.16)		17044	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.749	3.748	0.001	1.000	2075734	2.68		107	20740	
D 30 13C2 PFUnA										
565.00 > 520.00	3.749	3.748	0.001	1.000	2791162	2.57		103	31080	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.749	3.749	0.0	1.000	1991457	2.55		102	32117	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.749	3.749	0.0	1.000	2256849	2.42		96.8	10313	
563.00 > 169.00	3.749	3.749	0.0	1.000	546497		4.13(2.12-6.36)		12579	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.907	3.907	0.0	1.000	11051134	NC			62881	
D 36 13C2 PFDoA										
615.00 > 570.00	4.050	4.048	0.002	1.000	3021973	2.59		104	19610	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.050	4.050	0.0	1.000	3151432	2.50		99.9	3584	
613.00 > 169.00	4.050	4.050	0.0	1.000	713614		4.42(2.13-6.40)		9407	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.307	4.307	0.0	1.000	3518728	2.54		102	3376	
663.00 > 169.00	4.307	4.307	0.0	1.000	1076002		3.27(1.25-3.76)		10199	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.552	4.542	0.010	1.000	3677976	2.57		103	14923	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.552	4.552	0.0	1.000	912725	2.46		98.3	9493	
713.00 > 219.00	4.542	4.552	-0.010	0.998	653194		1.40(0.71-2.13)		10190	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.966	4.966	0.0	1.000	7232730	2.98		119	15297	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.966	4.966	0.0	1.000	6725362	NC			2460	
813.00 > 169.00	4.966	4.966	0.0	1.000	1090785		6.17(2.86-8.58)		6584	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.328	5.328	0.0	1.000	7656217	NC			1765	
913.00 > 169.00	5.328	5.328	0.0	1.000	903674		8.47(3.83-11.48)		4983	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00004 Amount Added: 1.00 Units: mL

Report Date: 30-May-2018 11:15:36 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_014.d

Injection Date: 28-May-2018 08:42:10 Instrument ID: A8_N

Lims ID: CCV L5

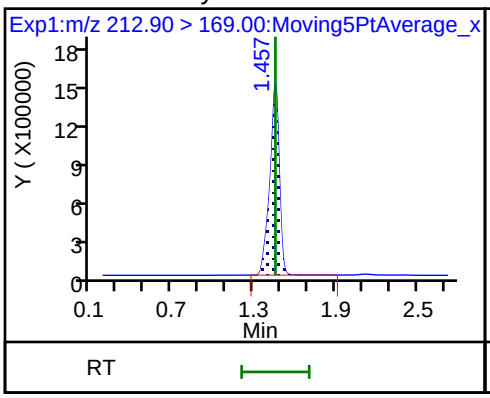
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 38 Worklist Smp#: 14

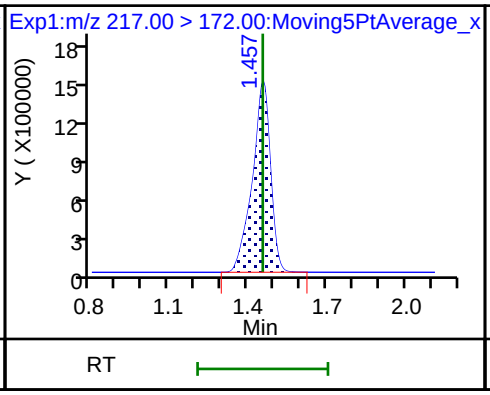
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

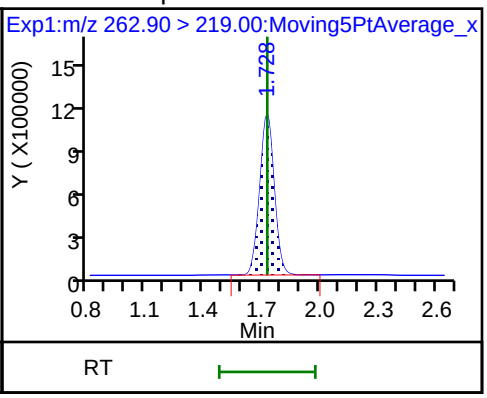
2 Perfluorobutyric acid



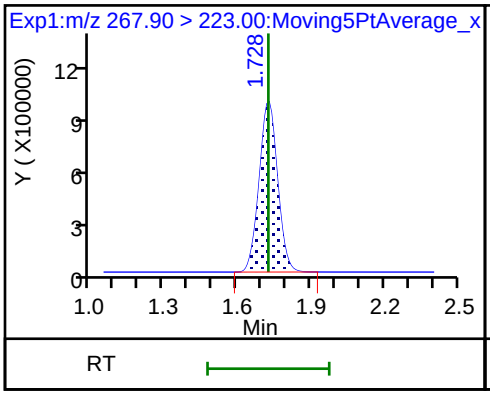
D 1 13C4 PFBA



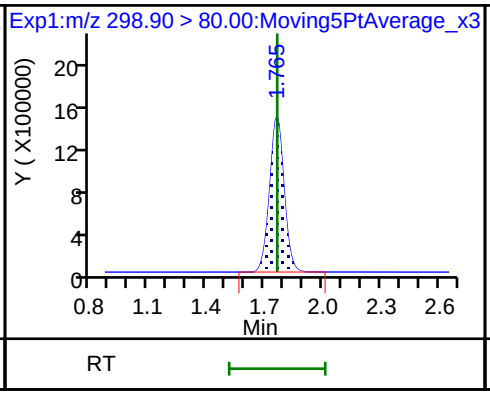
4 Perfluoropentanoic acid



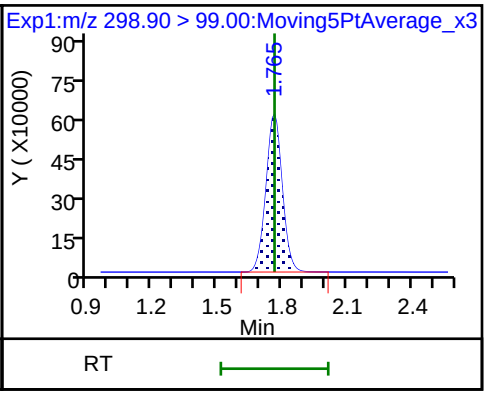
D 3 13C5-PFPeA



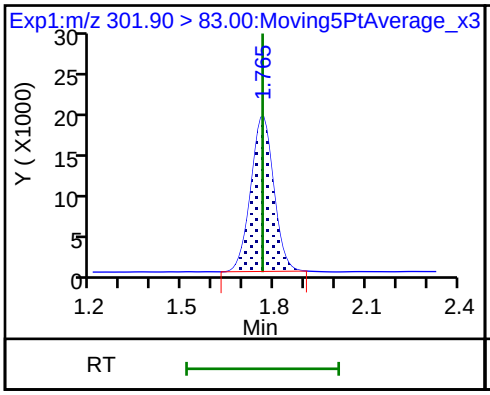
5 Perfluorobutanesulfonic acid



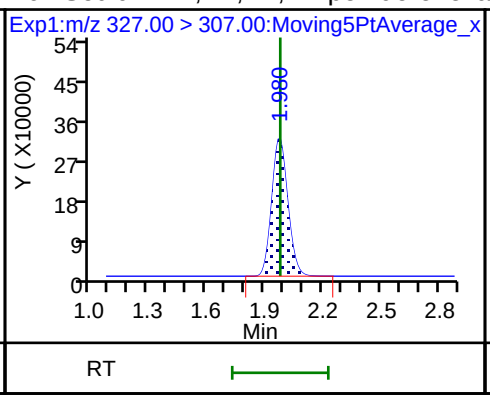
5 Perfluorobutanesulfonic acid



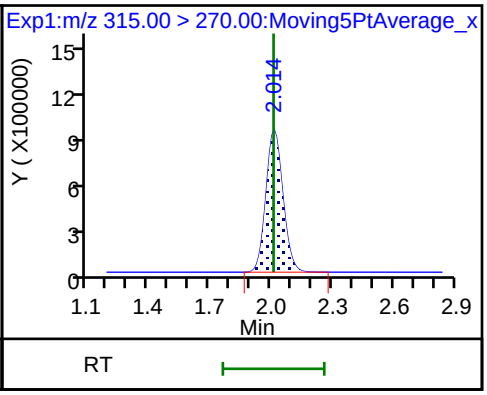
D 47 13C3-PFBS



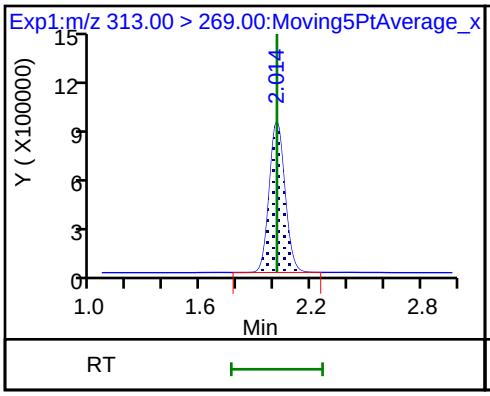
61 Sodium 1H,1H,2H,2H-perfluorohexa



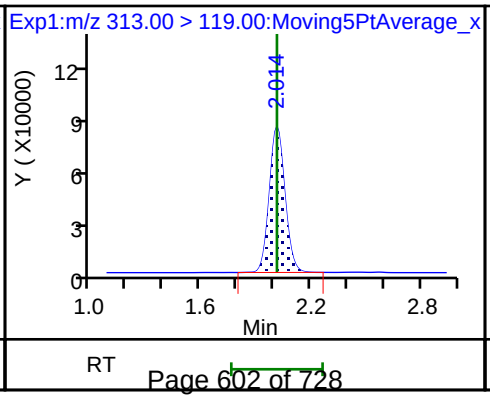
De 7 13C2 PFHxA



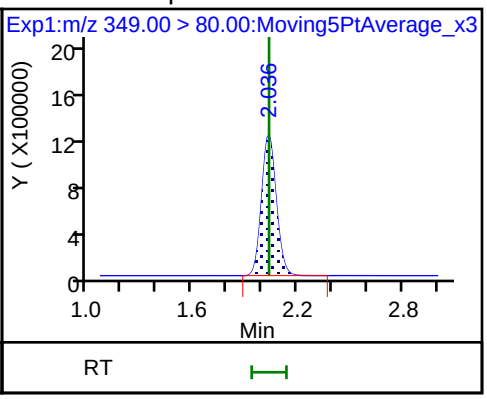
6 Perfluorohexanoic acid



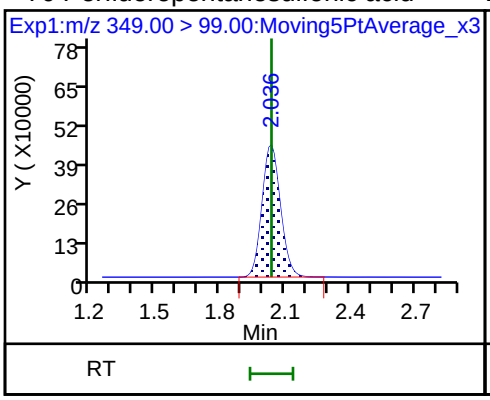
6 Perfluorohexanoic acid



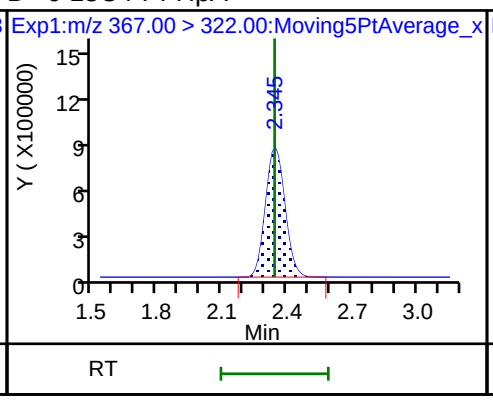
70 Perfluoropentanesulfonic acid



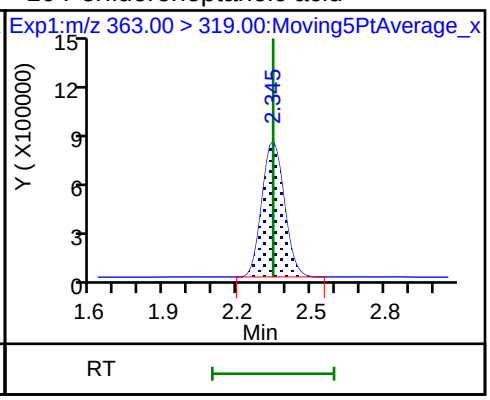
70 Perfluoropentanesulfonic acid



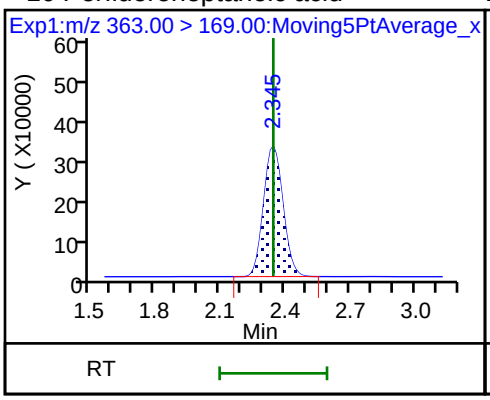
D 9 13C4-PFHpA



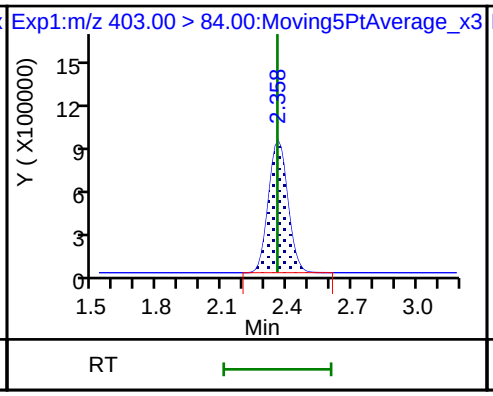
10 Perfluoroheptanoic acid



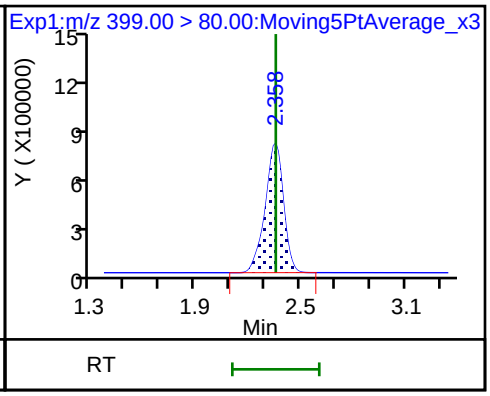
10 Perfluoroheptanoic acid



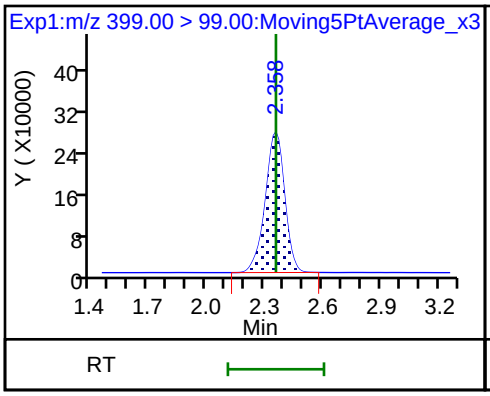
D 11 18O2 PFHxS



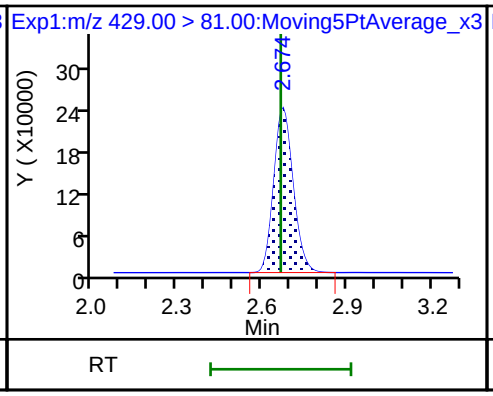
8 Perfluorohexanesulfonic acid



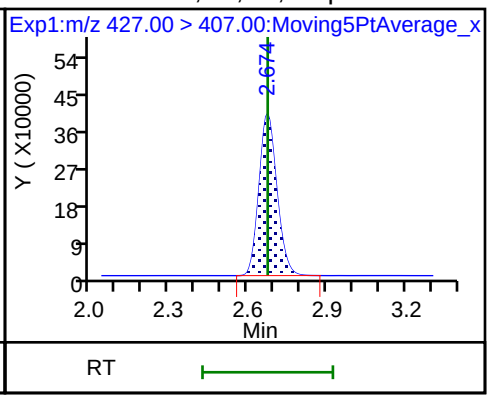
8 Perfluorohexanesulfonic acid



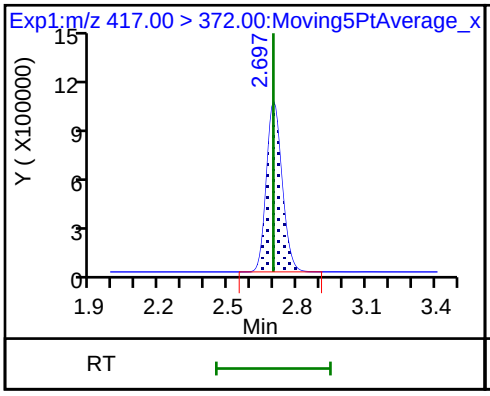
D 12 M2-6:2FTS



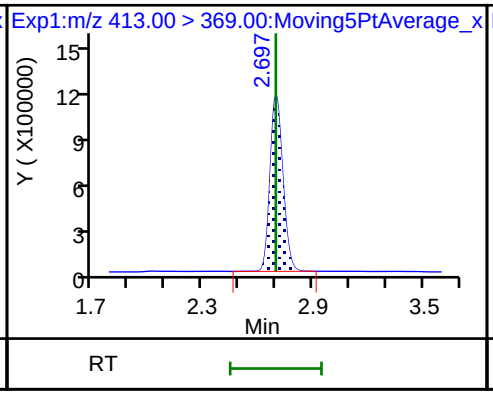
13 Sodium 1H,1H,2H,2H-perfluorooctane



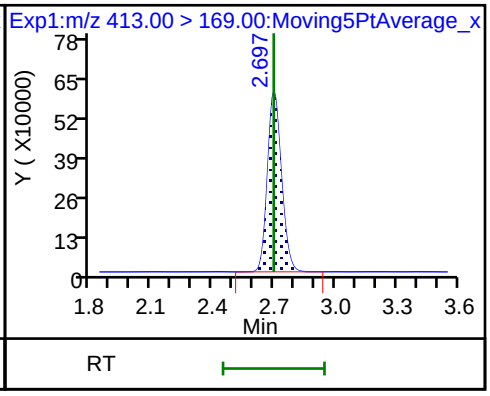
D 14 13C4 PFOA



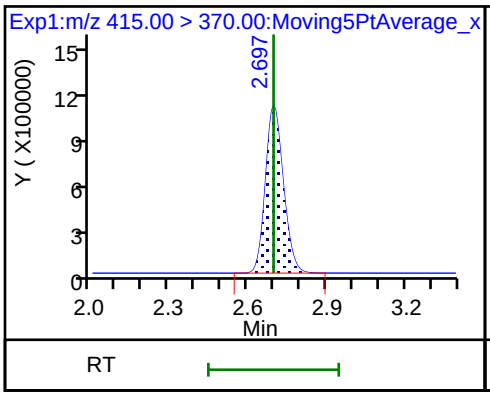
15 Perfluorooctanoic acid



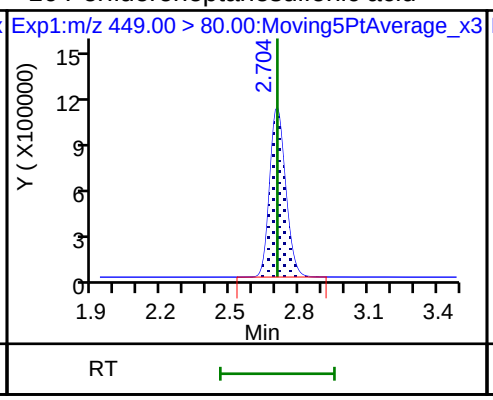
15 Perfluorooctanoic acid



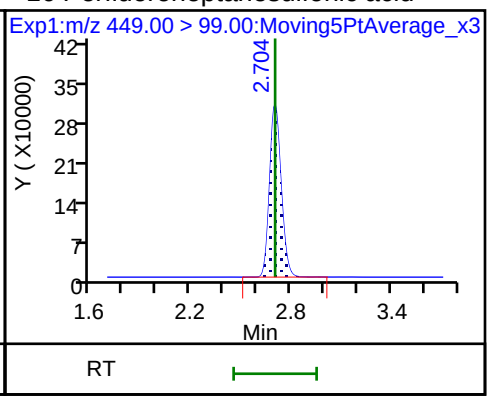
* 62 13C2-PFOA



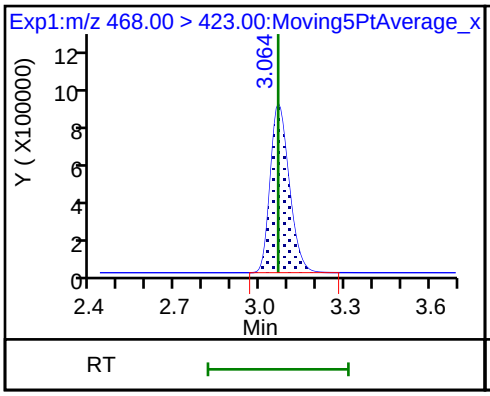
16 Perfluoroheptanesulfonic acid



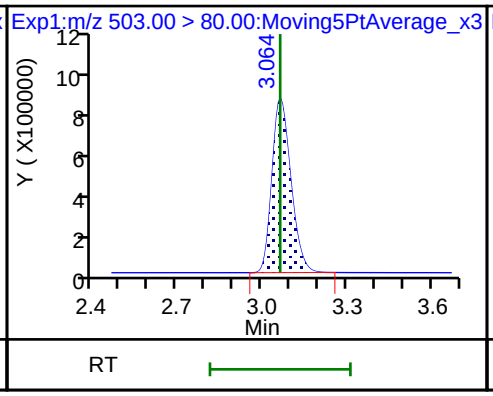
16 Perfluoroheptanesulfonic acid



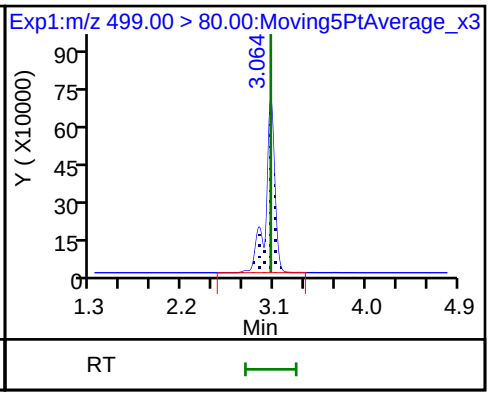
D 19 13C5 PFNA



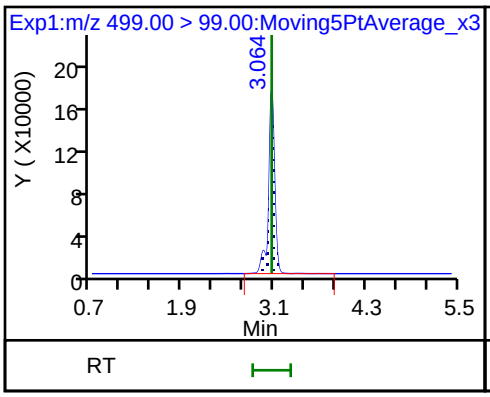
D 18 13C4 PFOS



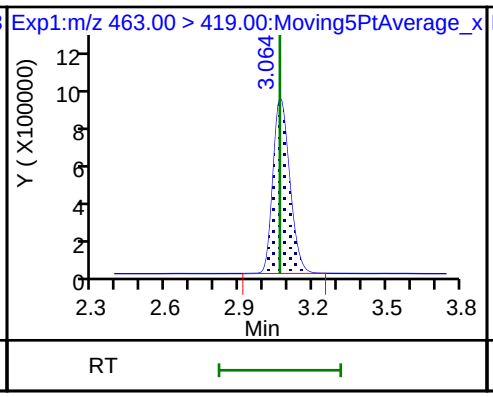
17 Perfluorooctane sulfonic acid



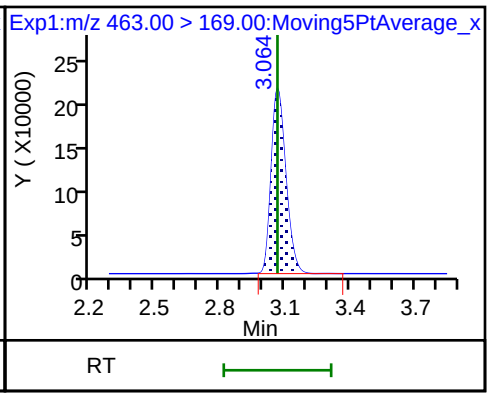
17 Perfluorooctane sulfonic acid



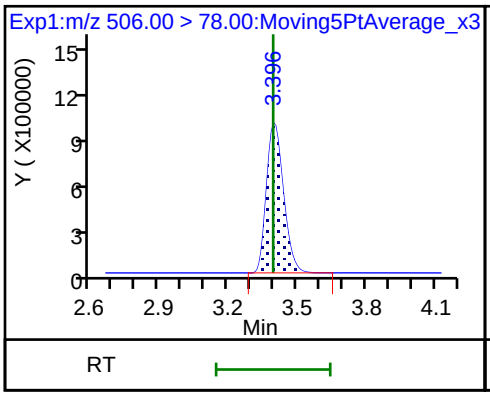
20 Perfluorononanoic acid



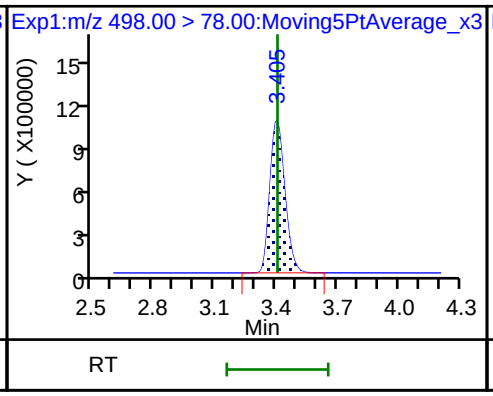
20 Perfluorononanoic acid



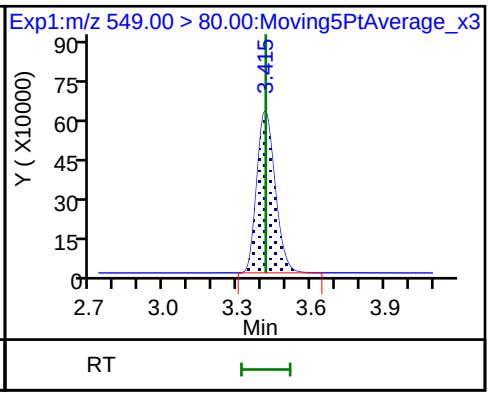
D 21 13C8 FOSA



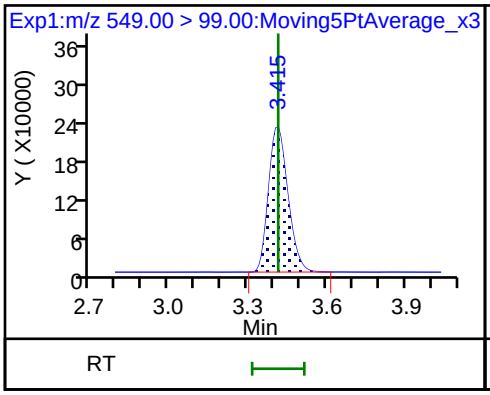
22 Perfluorooctane Sulfonamide



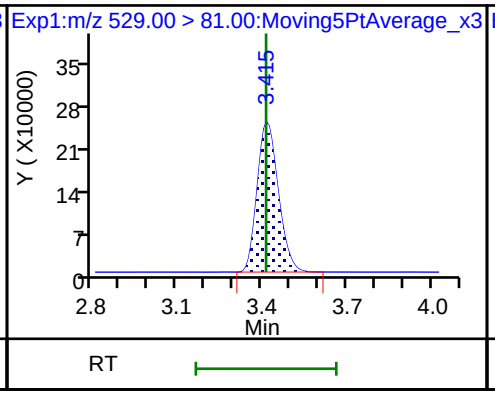
68 Perfluorononanesulfonic acid



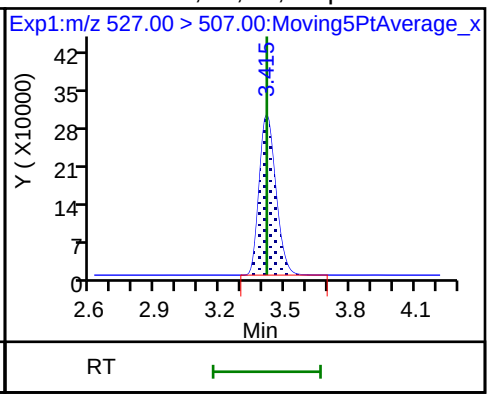
68 Perfluorononanesulfonic acid



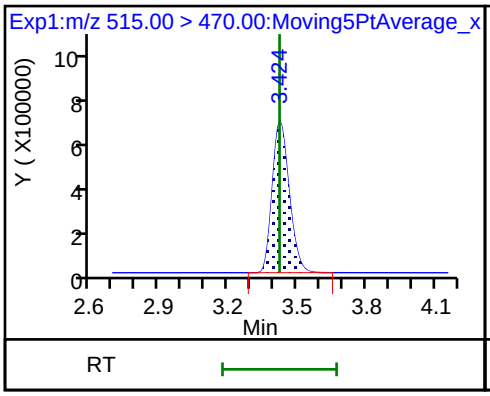
D 26 M2-8:2FTS



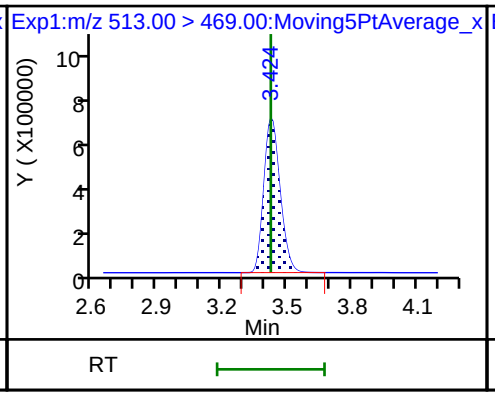
25 Sodium 1H,1H,2H,2H-perfluorodecane



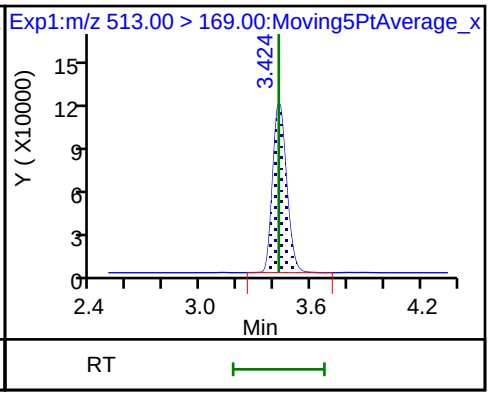
D 23 13C2 PFDA



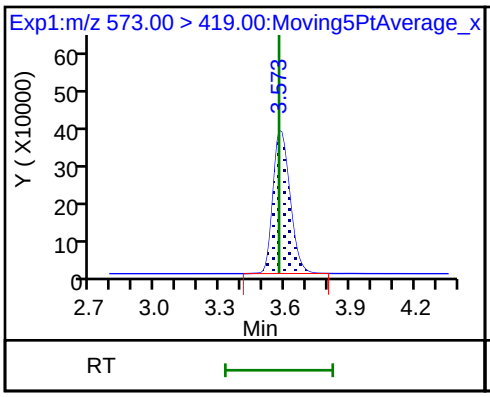
24 Perfluorodecanoic acid



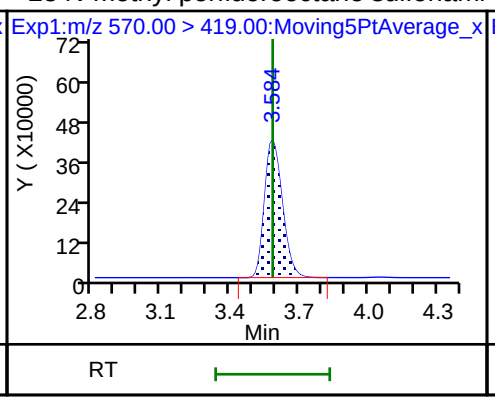
24 Perfluorodecanoic acid



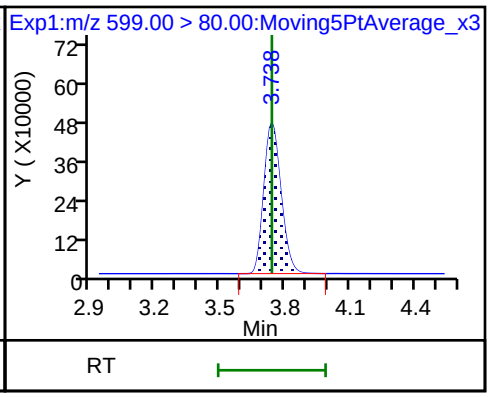
D 27 d3-NMeFOSAA



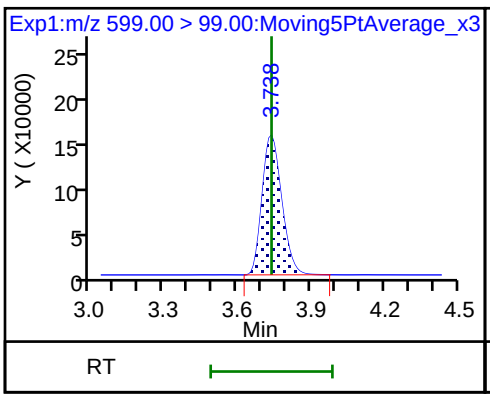
28 N-methyl perfluorooctane sulfonami



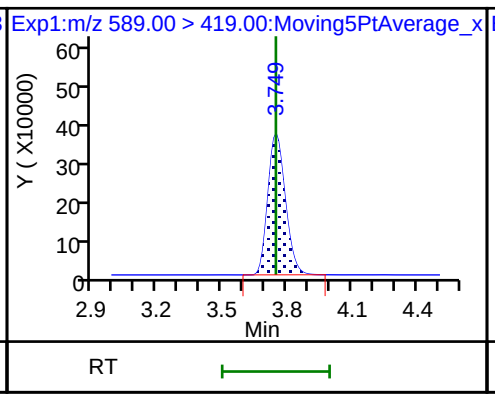
29 Perfluorodecane Sulfonic acid



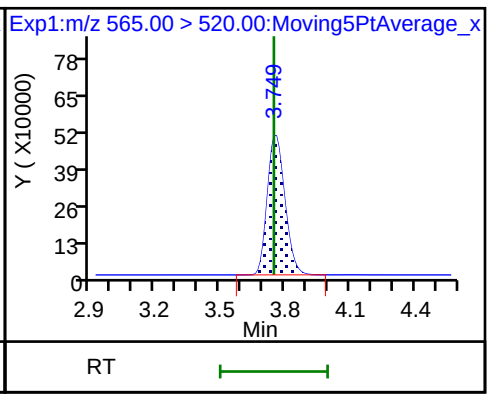
29 Perfluorodecane Sulfonic acid



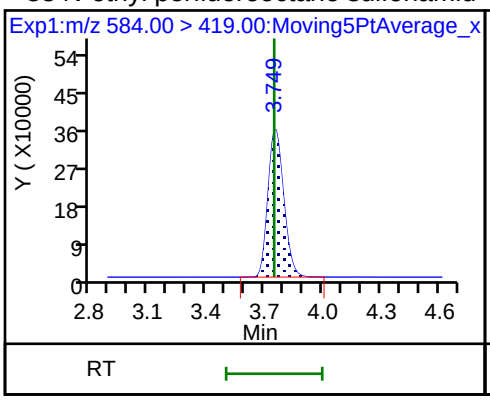
D 32 d5-NEtFOSAA



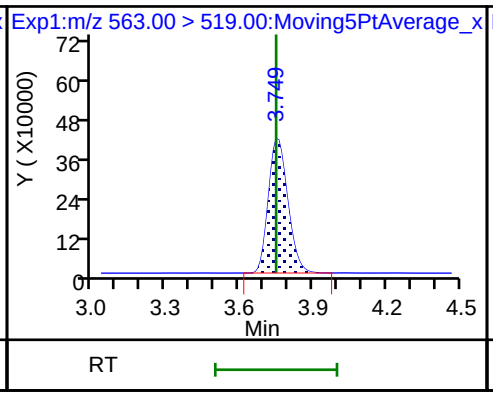
D 30 13C2 PFUnA



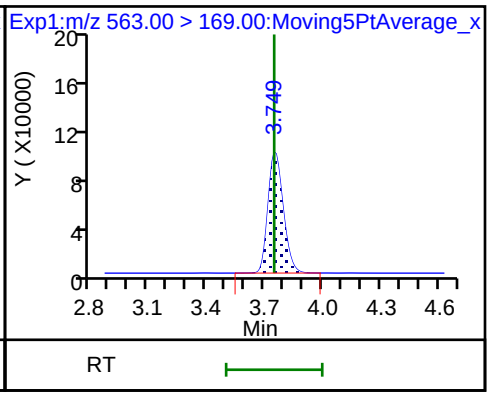
33 N-ethyl perfluorooctane sulfonamid



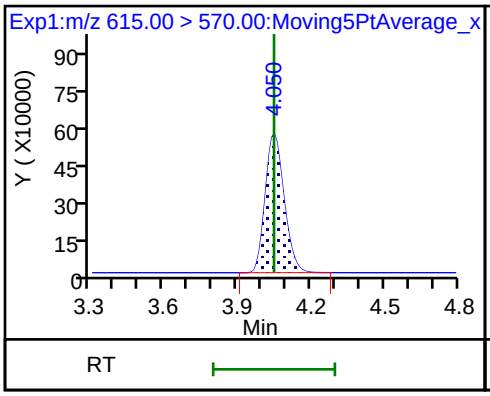
31 Perfluoroundecanoic acid



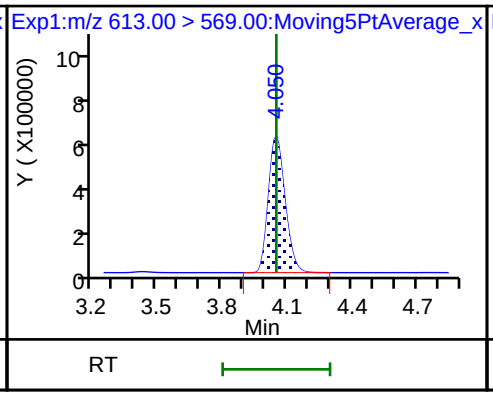
31 Perfluoroundecanoic acid



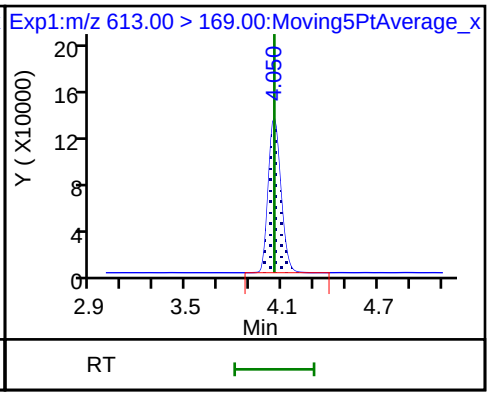
D 36 13C2 PFDoA



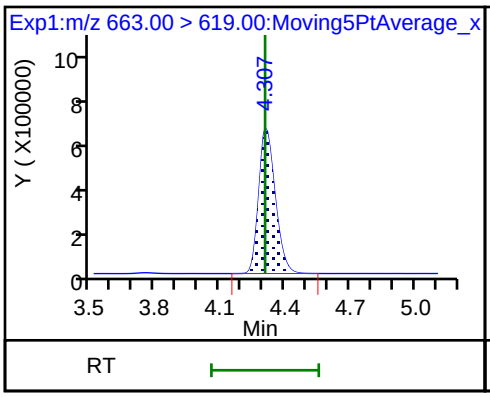
37 Perfluorododecanoic acid



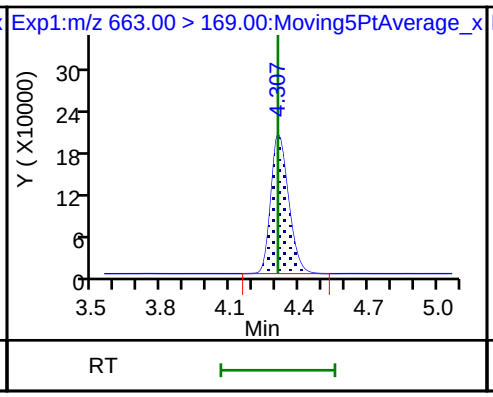
37 Perfluorododecanoic acid



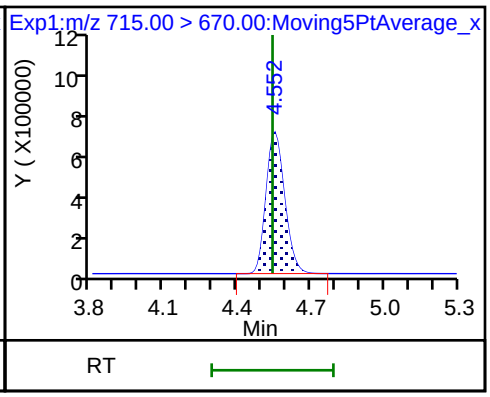
41 Perfluorotridecanoic acid



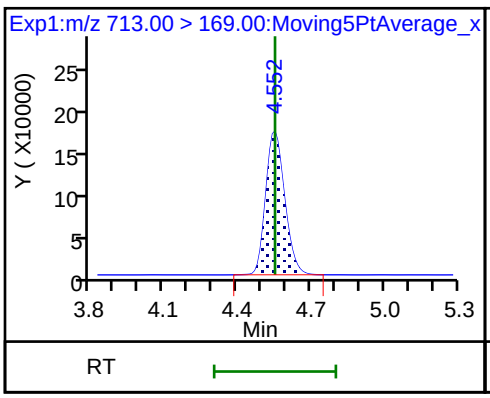
41 Perfluorotridecanoic acid



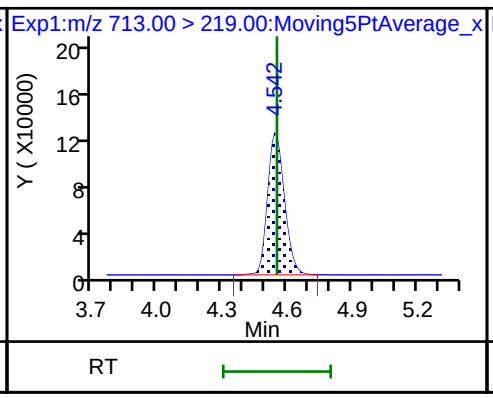
D 43 13C2-PFTeDA



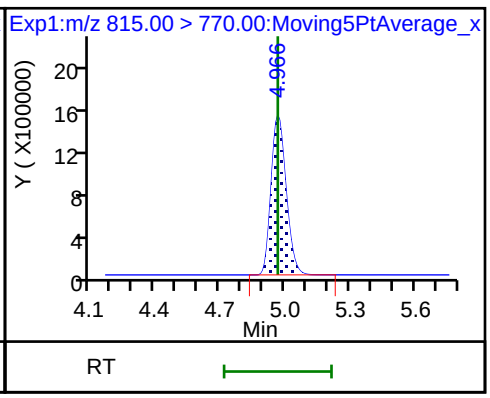
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCVL 320-225873/2 Calibration Date: 05/28/2018 17:22

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	1.009		0.0543	0.0500	8.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.249		0.0529	0.0500	5.8	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	82.26		0.0466	0.0442	5.3	30.0
4:2 FTS	AveID	16.57	18.32		0.400	0.0467	10.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.025		0.0498	0.0500	-0.3	30.0
Perfluoropentanesulfonic acid	AveID	69.55	69.25		0.0467	0.0469	-0.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	0.9483		0.0449	0.0500	-10.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.249		0.0504	0.0455	10.8	30.0
6:2FTS	L2ID		1.655		0.400	0.0474	-27.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.275		0.0456	0.0476	-4.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.261		0.0536	0.0500	7.1	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.097		0.0518	0.0500	3.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.130		0.0446	0.0464	-3.9	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7594		0.0481	0.0480	0.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9560		0.0491	0.0500	-1.8	30.0
8:2FTS	AveID	1.349	1.380		0.400	0.0479	2.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.048		0.0539	0.0500	7.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	0.9473		0.400	0.0500	-6.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.5872		0.0422	0.0482	-12.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9778		0.0520	0.0500	4.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.9397		0.0563	0.0500	12.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.182		0.0566	0.0500	13.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.300		0.0568	0.0500	13.7	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2783		0.0551	0.0500	10.2	30.0
13C4 PFBA	Ave	1.528	1.350		2.21	2.50	-11.7	30.0
13C5 PFPeA	Ave	0.9798	0.9386		2.39	2.50	-4.2	30.0
13C3-PFBS	Ave	0.0221	0.0196		2.06	2.33	-11.6	30.0
13C2 PFHxA	Ave	1.045	1.023		2.45	2.50	-2.1	30.0
13C4-PFHpA	Ave	1.001	0.9885		2.47	2.50	-1.2	30.0
18O2 PFHxS	Ave	1.237	1.153		2.20	2.37	-6.8	30.0
M2-6:2FTS	Ave	0.2210	0.2325		2.50	2.38	5.2	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCVL 320-225873/2 Calibration Date: 05/28/2018 17:22

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9417		2.49	2.50	-0.5	30.0
13C4 PFOS	Ave	0.8503	0.8013		2.25	2.39	-5.8	30.0
13C5 PFNA	Ave	0.7745	0.7749		2.50	2.50	0.0	30.0
13C8 FOSA	Ave	1.113	0.9836		2.21	2.50	-11.6	30.0
M2-8:2FTS	Ave	0.2515	0.2452		2.34	2.40	-2.5	30.0
13C2 PFDA	Ave	0.6587	0.6390		2.42	2.50	-3.0	30.0
d3-NMeFOSAA	Ave	0.3634	0.4219		2.90	2.50	16.1	30.0
13C2 PFUnA	Ave	0.5216	0.5307		2.54	2.50	1.7	30.0
d5-NEtFOSAA	Ave	0.3729	0.4045		2.71	2.50	8.5	30.0
13C2 PFDoA	Ave	0.5613	0.5296		2.36	2.50	-5.7	30.0
13C2-PFTeDA	Ave	0.6891	0.6803		2.47	2.50	-1.3	30.0
13C2-PFHxDA	Ave	1.170	1.257		2.69	2.50	7.5	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 28-May-2018 17:22:11 ALS Bottle#: 21 Worklist Smp#: 2
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*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-May-2018 09:32:27 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 30-May-2018 09:32:27

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	1.450	1.458	-0.008	1.000	6643975	2.21		88.3	39175	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.456	1.464	-0.008	1.004	134081	0.0543		109	60.0	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.716	1.730	-0.014	0.561	4619488	2.39		95.8	73967	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.725	1.739	-0.014	1.005	115421	0.0529		106	71.4	
D 47 13C3-PFBS										
301.90 > 83.00	1.753	1.766	-0.013	1.000	89626	2.06		88.4	767	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.762	1.775	-0.013	1.005	140159	0.0466		105	829	
298.90 > 99.00	1.762	1.775	-0.013	1.005	59342		2.36(1.25-3.74)		483	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.970	1.982	-0.012	1.000	32979	0.0516		111	1953	
D 60 M2-4:2FTS										
329.00 > 81.00	1.970	1.982	-0.012	1.000	754406	NC			8155	
D 7 13C2 PFHxA										
315.00 > 270.00	2.003	2.015	-0.012	1.000	5032671	2.45		97.9	86273	
6 Perfluorohexanoic acid										M
313.00 > 269.00	2.014	2.027	-0.013	1.006	103162	0.0498		99.7	148	M
313.00 > 119.00	2.014	2.027	-0.013	1.006	10090		10.22(5.03-15.10)		89.5	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.025	2.049	-0.024	1.000	125191	0.0467		99.6	1528	
349.00 > 99.00	2.025	2.049	-0.024	1.000	51132		2.45(1.36-4.07)		788	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.116	2.117	-0.001	1.000	233089	NC			3867	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.104	2.117	-0.013	0.995	14040	NC			82.0	
D 9 13C4-PFHpA										
367.00 > 322.00	2.332	2.347	-0.015	1.000	4865020	2.47		98.8	70196	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.345	2.360	-0.015	1.006	92273	0.0449		89.8	118	
363.00 > 169.00	2.345	2.360	-0.015	1.006	35638		2.59(1.13-3.40)		211	
D 11 18O2 PFHxS										
403.00 > 84.00	2.358	2.360	-0.002	1.000	5366037	2.20		93.2	50271	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.345	2.373	-0.028	0.994	128925	0.0504		111	461	
399.00 > 99.00	2.345	2.373	-0.028	0.994	39957		3.23(1.50-4.49)		197	
65 Adona										
377.00 > 251.00	2.384	2.397	-0.013	1.000	289867	NC			4378	
377.00 > 85.00	2.384	2.397	-0.013	1.000	159105		1.82(0.84-2.53)		3755	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.674	2.683	-0.009	1.003	35918	0.0345		72.7	734	
D 12 M2-6:2FTS										
429.00 > 81.00	2.667	2.683	-0.016	1.000	1087163	2.50		105	20542	
D 14 13C4 PFOA										
417.00 > 372.00	2.689	2.706	-0.017	1.000	4634918	2.49		99.5	53963	
* 62 13C2-PFOA										
415.00 > 370.00	2.697	2.713	-0.016		4921629	2.50			45281	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.697	2.713	-0.016	1.003	116905	0.0536		107	41.5	
413.00 > 169.00	2.697	2.713	-0.016	1.003	58580		2.00(0.84-2.52)		178	M
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.697	2.721	-0.024	1.000	95767	0.0456		95.8	1356	
449.00 > 99.00	2.704	2.721	-0.017	1.003	24126		3.97(1.94-5.82)		427	
D 19 13C5 PFNA										
468.00 > 423.00	3.062	3.074	-0.012	1.000	3813830	2.50		100	63430	
D 18 13C4 PFOS										
503.00 > 80.00	3.062	3.074	-0.012	1.000	3770022	2.25		94.2	26768	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.062	3.076	-0.014	1.000	82675	0.0446		96.1	313	M
499.00 > 99.00	3.062	3.076	-0.014	1.000	17296		4.78(2.31-6.93)		161	M
20 Perfluorononanoic acid										M
463.00 > 419.00	3.062	3.084	-0.022	1.000	83703	0.0518		104	199	M
463.00 > 169.00	3.062	3.084	-0.022	1.000	20826		4.02(1.90-5.69)		380	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.269	3.291	-0.022	1.000	137652	NC			3097	
D 21 13C8 FOSA										
506.00 > 78.00	3.402	3.412	-0.010	1.000	4841027	2.21		88.4	45479	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.402	3.420	-0.018	1.000	92559	0.0491		98.2	1195	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.402	3.430	-0.028	1.000	57502	0.0481		100	1130	
549.00 > 99.00	3.411	3.430	-0.019	1.003	17670		3.25(1.33-3.97)		437	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.411	3.430	-0.019	1.000	31907	0.0490		102	905	
D 26 M2-8:2FTS										
529.00 > 81.00	3.411	3.430	-0.019	1.000	1155950	2.34		97.5	16076	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.421	3.439	-0.018	1.000	65931	0.0539		108	319	
513.00 > 169.00	3.421	3.439	-0.018	1.000	10860		6.07(2.36-7.09)		209	
D 23 13C2 PFDA										
515.00 > 470.00	3.421	3.439	-0.018	1.000	3144729	2.42		97.0	47491	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.570	3.590	-0.020	1.000	2076286	2.90		116	20469	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.579	3.600	-0.021	1.003	39338	0.0467		93.4	302	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.732	3.753	-0.021	1.000	44644	0.0422		87.5	688	
599.00 > 99.00	3.732	3.753	-0.021	1.000	14907		2.99(1.39-4.16)		483	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.743	3.754	-0.011	1.000	1990962	2.71		108	23854	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.743	3.764	-0.021	1.000	49088	0.0563		113	267	
563.00 > 169.00	3.753	3.764	-0.011	1.003	12872		3.81(2.12-6.36)		398	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.743	3.764	-0.021	1.000	38934	0.0520		104	695	
D 30 13C2 PFUnA										
565.00 > 520.00	3.743	3.765	-0.022	1.000	2611946	2.54		102	48708	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.899	3.922	-0.023	1.000	219253	NC			4229	
D 36 13C2 PFDoA										
615.00 > 570.00	4.041	4.055	-0.014	1.000	2606447	2.36		94.3	20282	
37 Perfluorododecanoic acid										M
613.00 > 569.00	4.041	4.065	-0.024	1.000	61630	0.0566		113	72.2	
613.00 > 169.00	4.041	4.065	-0.024	1.000	13082		4.71(2.13-6.40)		170	M
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.299	4.325	-0.026	1.000	67780	0.0568		114	67.8	
663.00 > 169.00	4.299	4.325	-0.026	1.000	21846		3.10(1.25-3.76)		284	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.531	4.550	-0.019	1.000	3348355	2.47		98.7	16370	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.531	4.560	-0.029	1.000	18638	0.0551		110	250	
713.00 > 219.00	4.531	4.560	-0.029	1.000	11517		1.62(0.71-2.13)		333	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.948	4.964	-0.016	1.000	6187658	2.69		108	12992	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.948	4.972	-0.024	1.000	173769	NC			72.9	
813.00 > 169.00	4.948	4.972	-0.024	1.000	27203		6.39(2.86-8.58)		345	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.298	5.326	-0.028	1.000	127008	NC			39.8	
913.00 > 169.00	5.298	5.326	-0.028	1.000	15733		8.07(3.83-11.48)		234	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00004 Amount Added: 1.00 Units: mL

Report Date: 30-May-2018 09:32:29 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d

Injection Date: 28-May-2018 17:22:11 Instrument ID: A8_N

Lims ID: CCVL

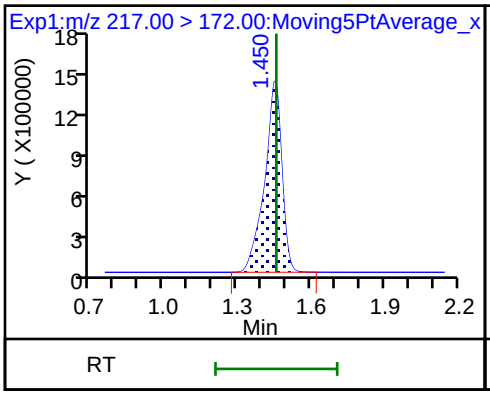
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2

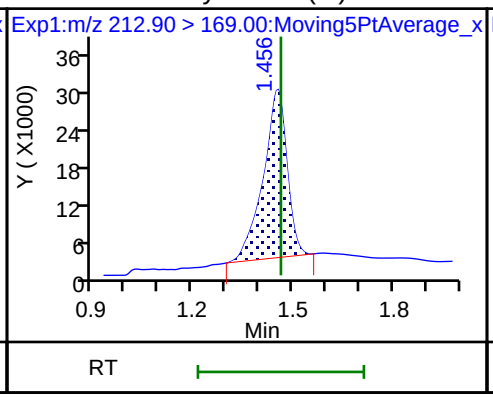
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

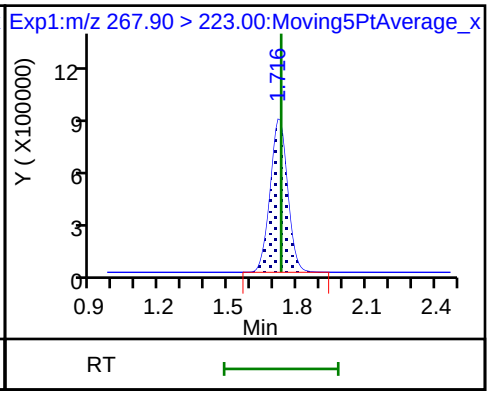
D 1 13C4 PFBA



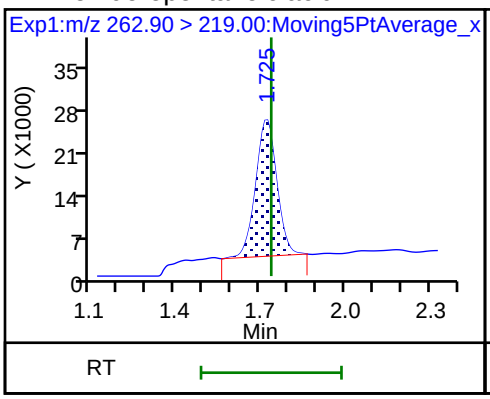
2 Perfluorobutyric acid (M)



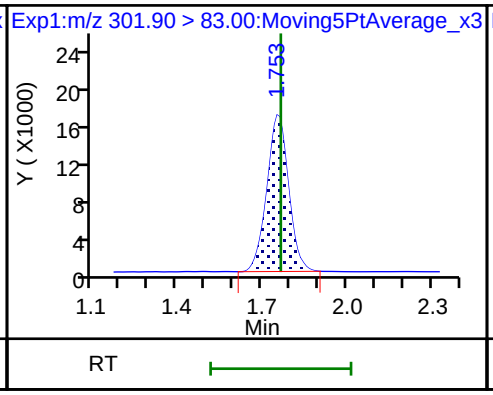
D 3 13C5-PFPeA



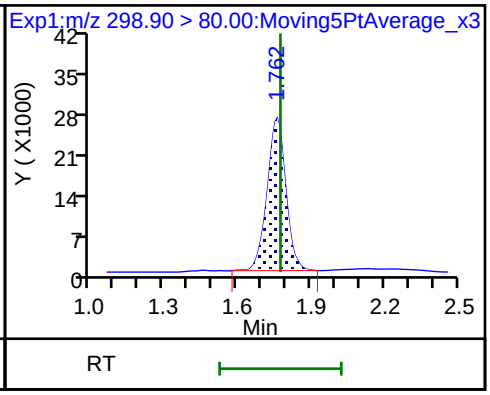
4 Perfluoropentanoic acid



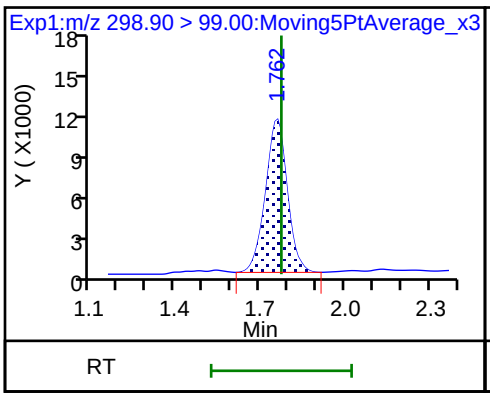
D 47 13C3-PFBS



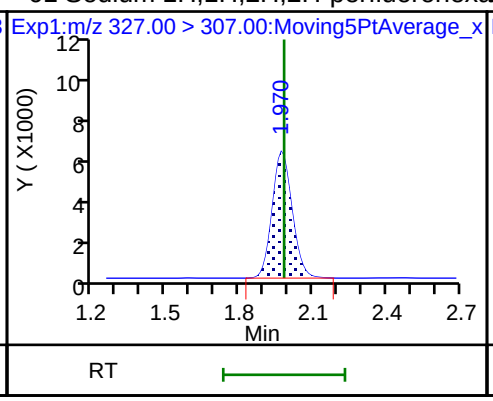
5 Perfluorobutanesulfonic acid



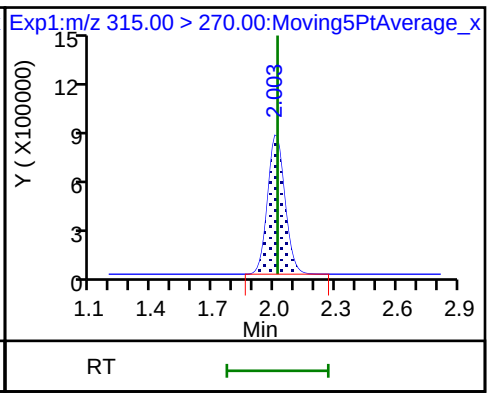
5 Perfluorobutanesulfonic acid



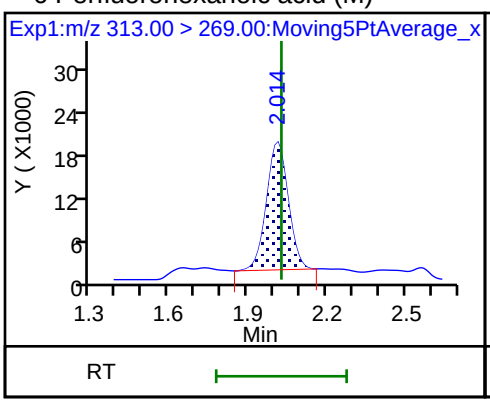
61 Sodium 1H,1H,2H,2H-perfluorohexa



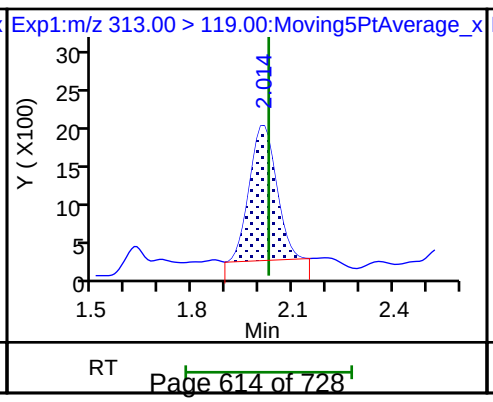
D 7 13C2 PFHxA



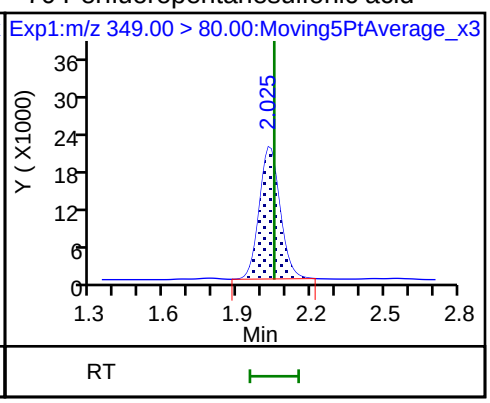
6 Perfluorohexanoic acid (M)



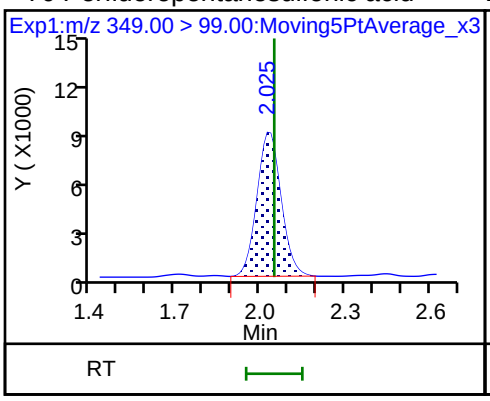
6 Perfluorohexanoic acid



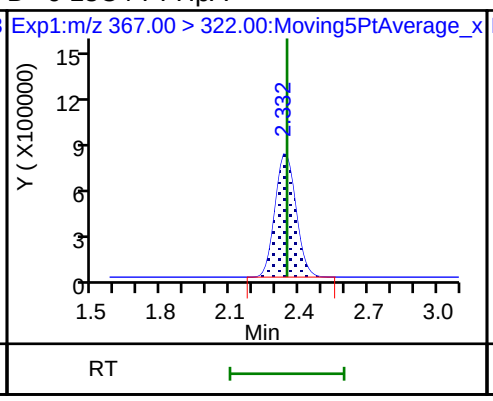
70 Perfluoropentanesulfonic acid



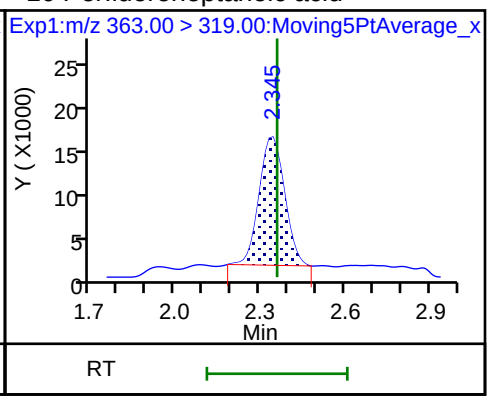
70 Perfluoropentanesulfonic acid



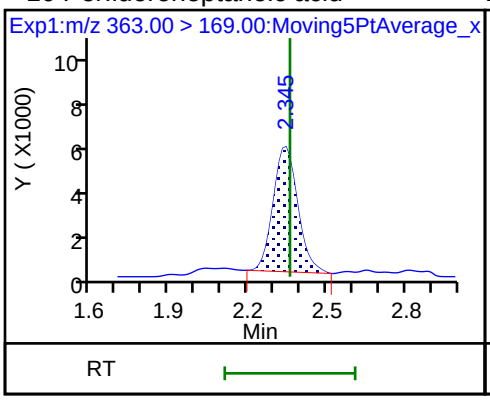
D 9 13C4-PFHpA



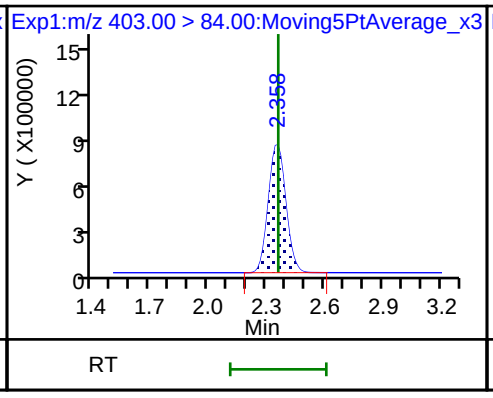
10 Perfluoroheptanoic acid



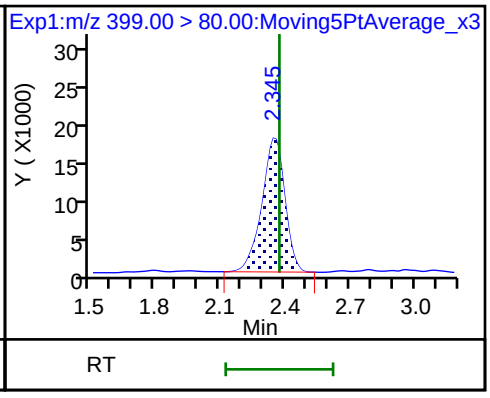
10 Perfluoroheptanoic acid



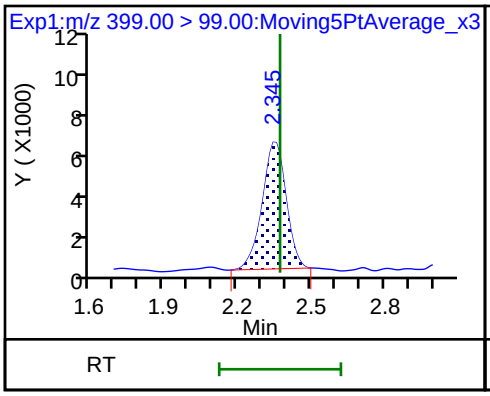
D 11 18O2 PFHxS



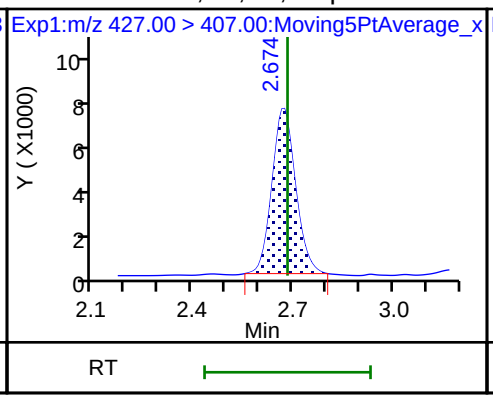
8 Perfluorohexanesulfonic acid



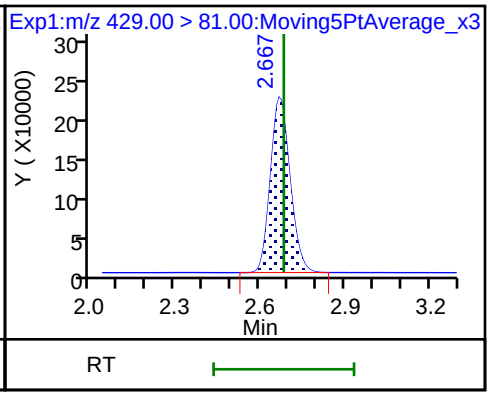
8 Perfluorohexanesulfonic acid



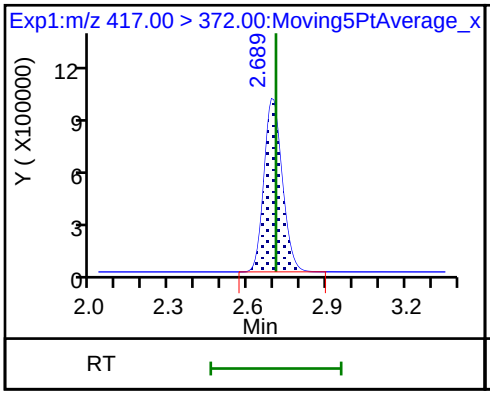
13 Sodium 1H,1H,2H,2H-perfluorooctane



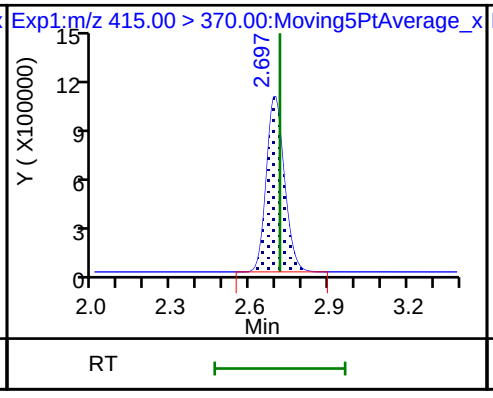
D 12 M2-6:2FTS



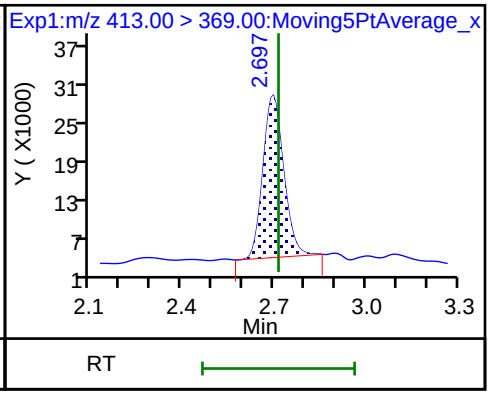
D 14 13C4 PFOA



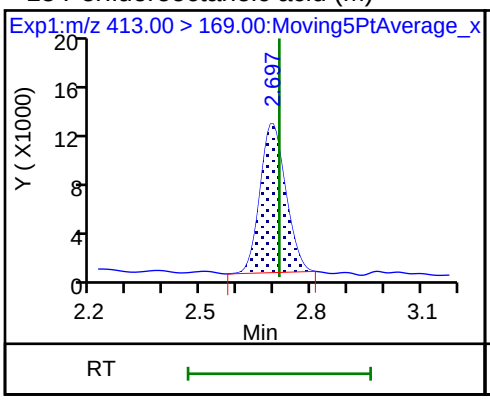
* 62 13C2-PFOA



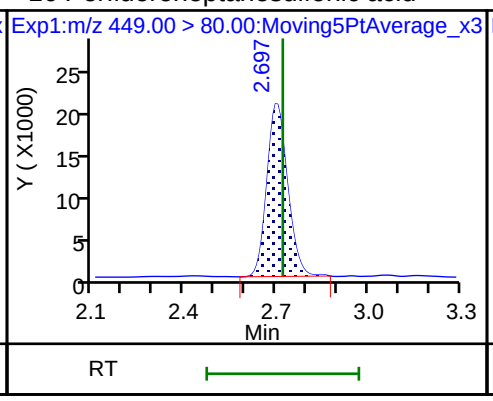
15 Perfluorooctanoic acid



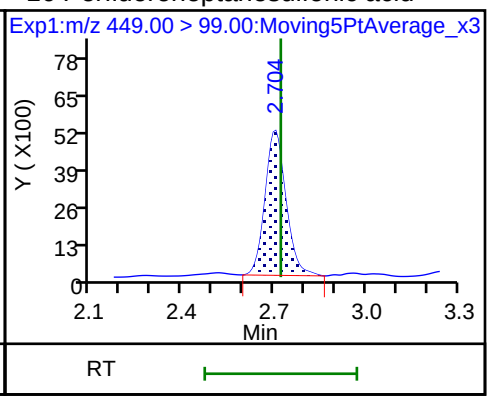
15 Perfluorooctanoic acid (M)



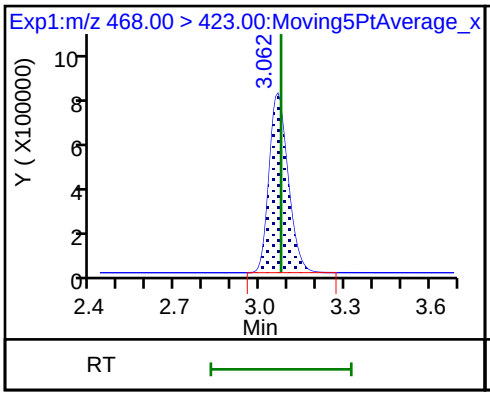
16 Perfluoroheptanesulfonic acid



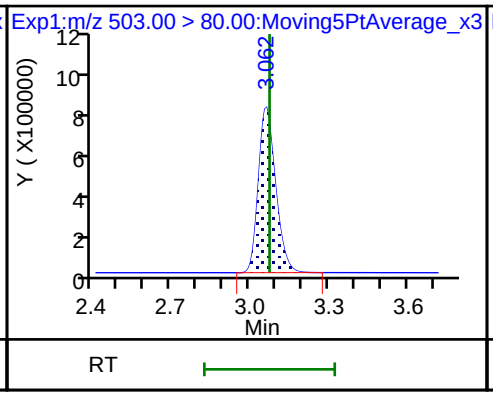
16 Perfluoroheptanesulfonic acid



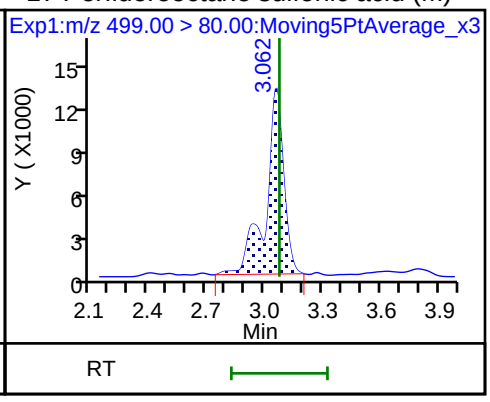
D 19 13C5 PFNA



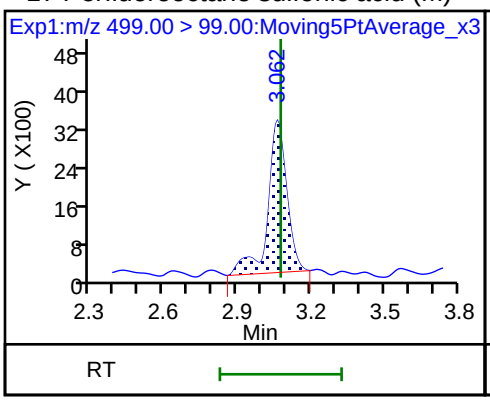
D 18 13C4 PFOS



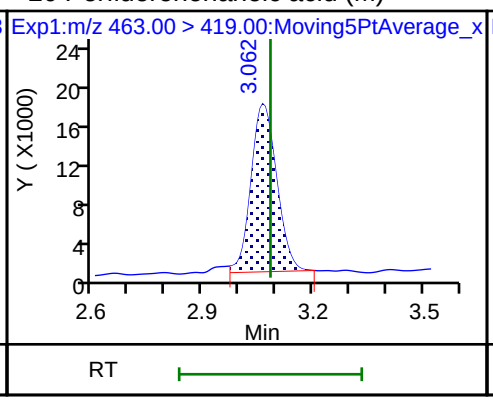
17 Perfluorooctane sulfonic acid (M)



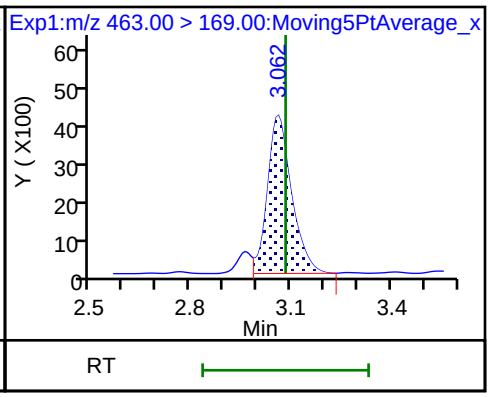
17 Perfluorooctane sulfonic acid (M)



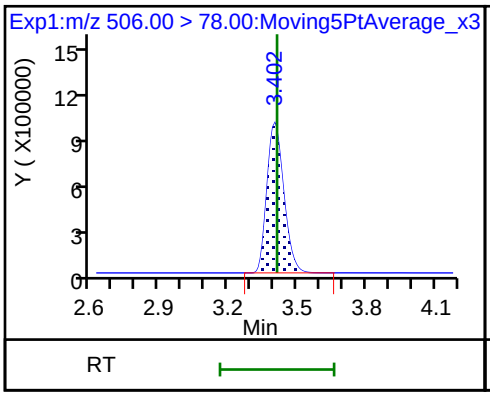
20 Perfluorononanoic acid (M)



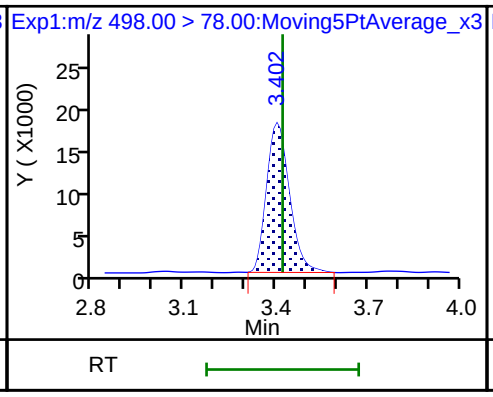
20 Perfluorononanoic acid



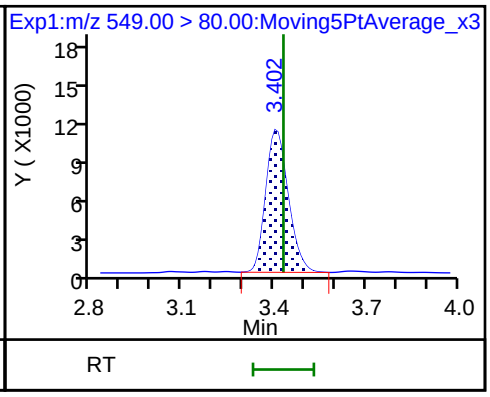
D 21 13C8 FOSA



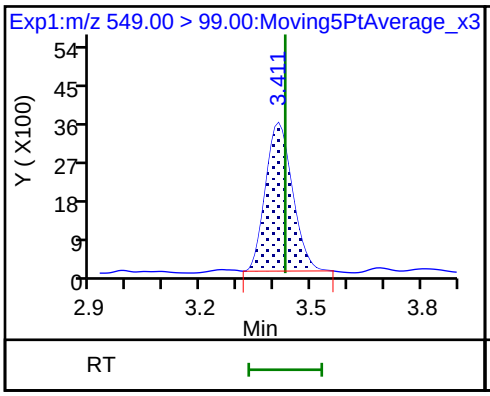
22 Perfluorooctane Sulfonamide



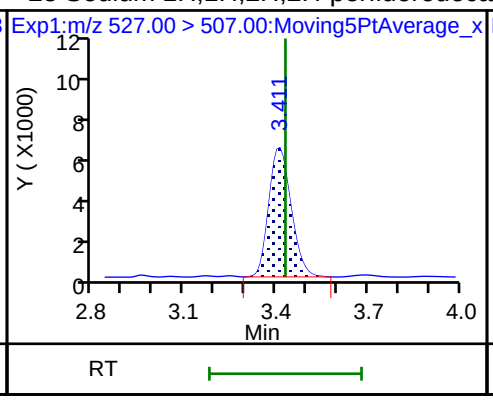
68 Perfluorononanesulfonic acid



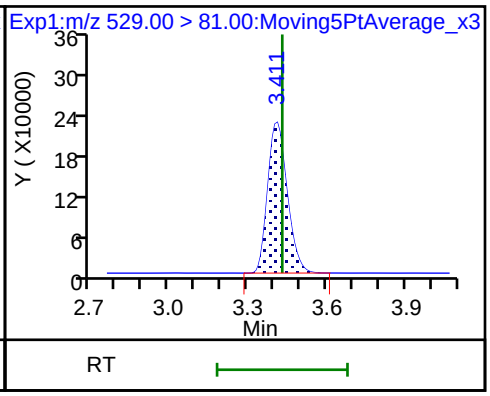
68 Perfluorononanesulfonic acid



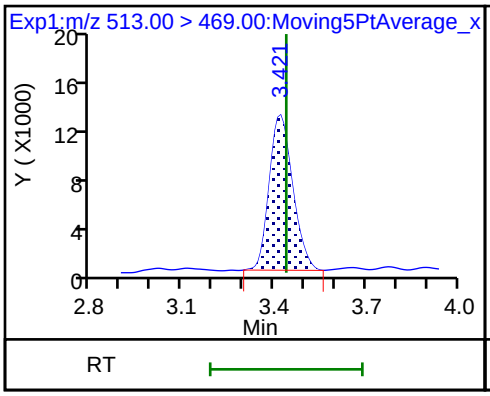
25 Sodium 1H,1H,2H,2H-perfluorodecan



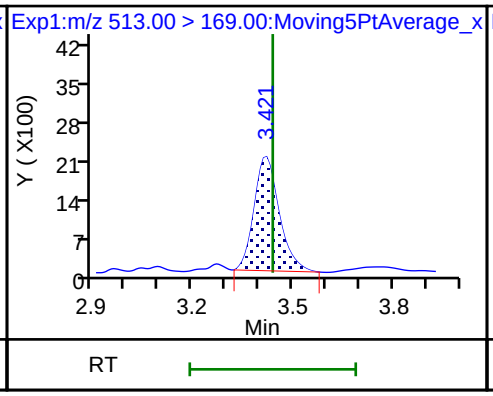
D 26 M2-8:2FTS



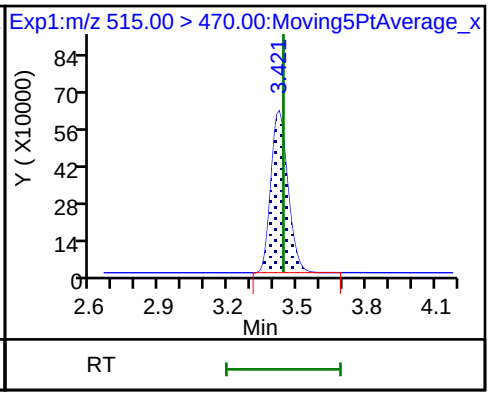
24 Perfluorodecanoic acid



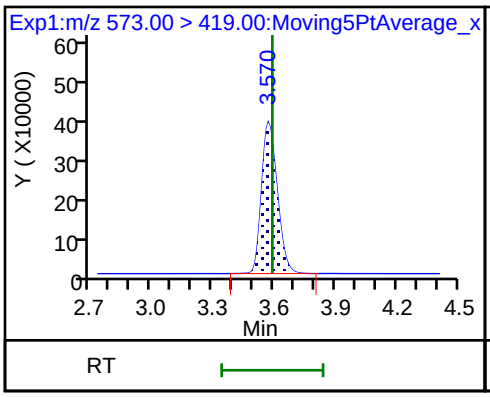
24 Perfluorodecanoic acid



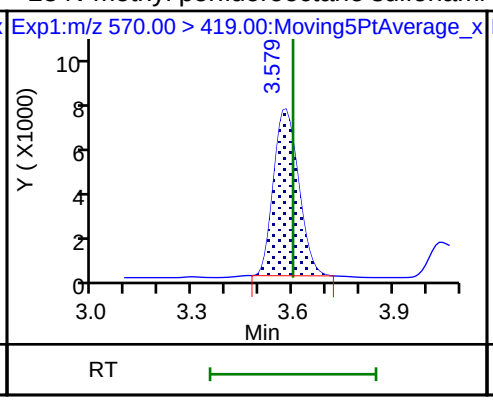
D 23 13C2 PFDA



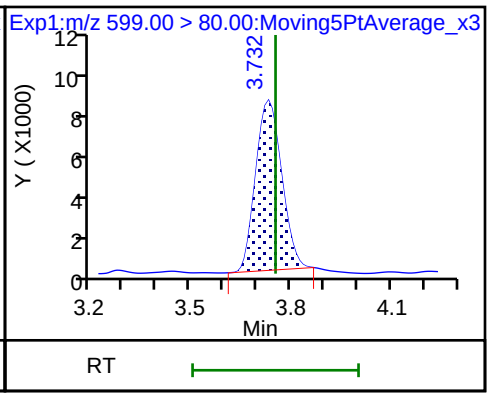
D 27 d3-NMeFOSAA



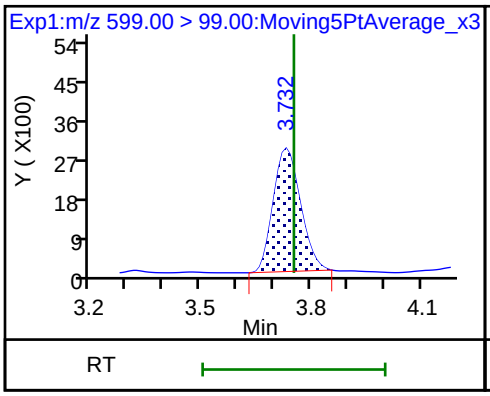
28 N-methyl perfluorooctane sulfonami



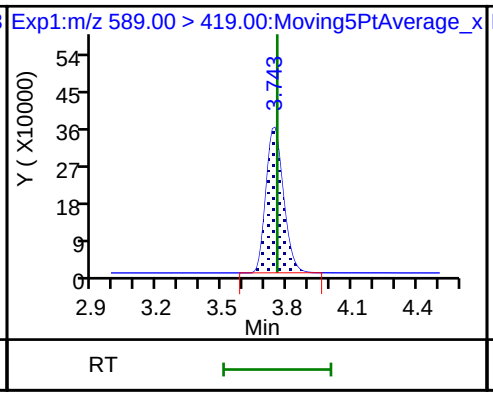
29 Perfluorodecane Sulfonic acid



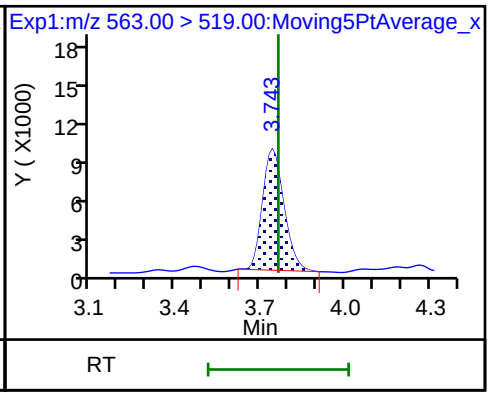
29 Perfluorodecane Sulfonic acid



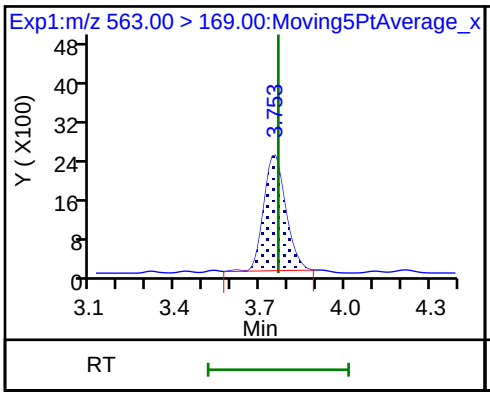
D 32 d5-NEtFOSAA



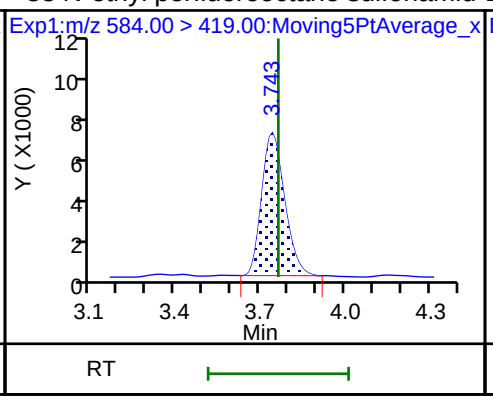
31 Perfluoroundecanoic acid



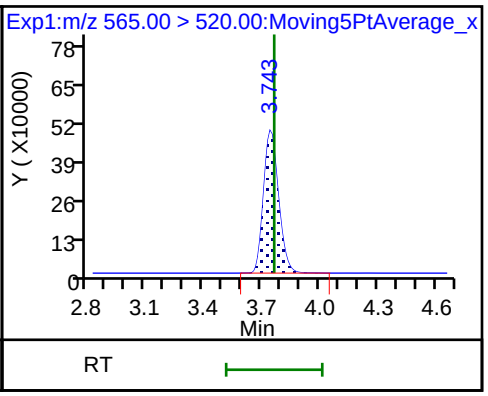
31 Perfluoroundecanoic acid



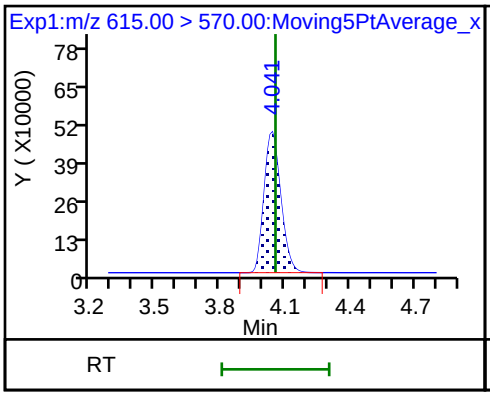
33 N-ethyl perfluorooctane sulfonamid



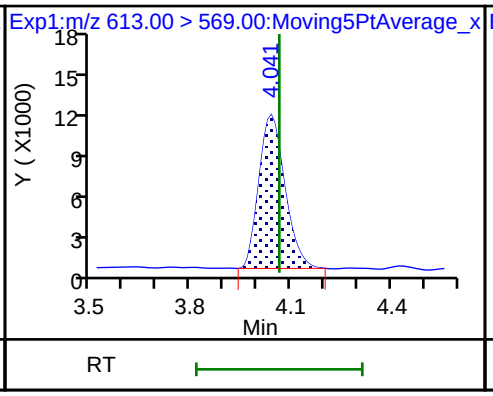
D 30 13C2 PFUnA



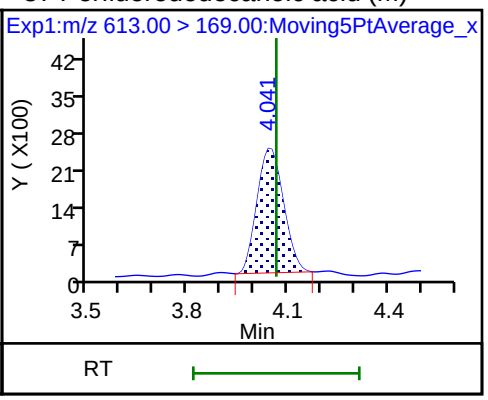
D 36 13C2 PFDoA



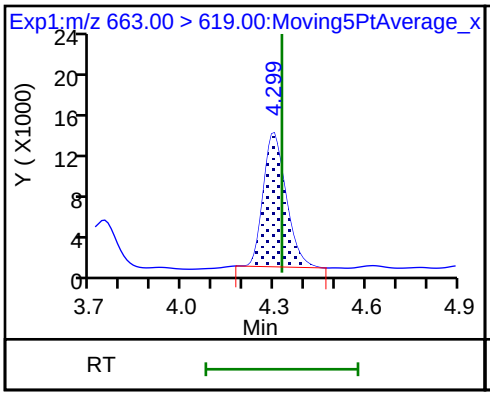
37 Perfluorododecanoic acid



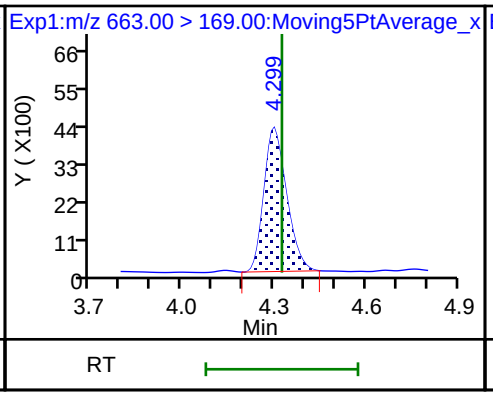
37 Perfluorododecanoic acid (M)



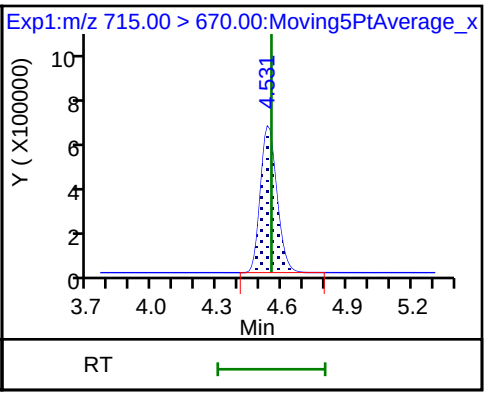
41 Perfluorotridecanoic acid



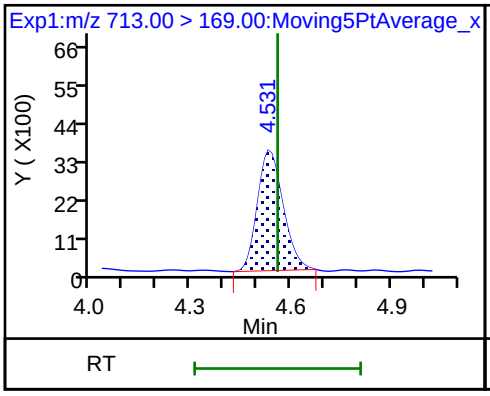
41 Perfluorotridecanoic acid



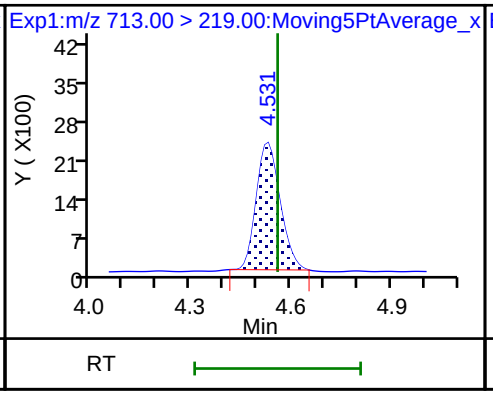
D 43 13C2-PFTeDA



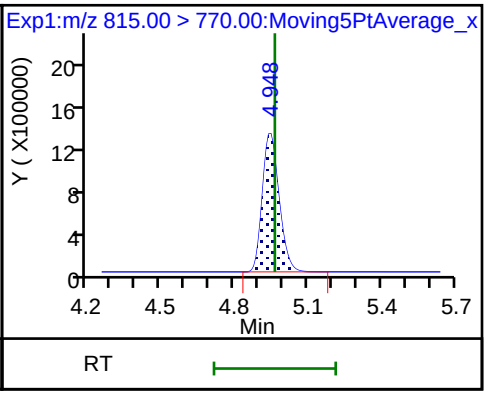
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

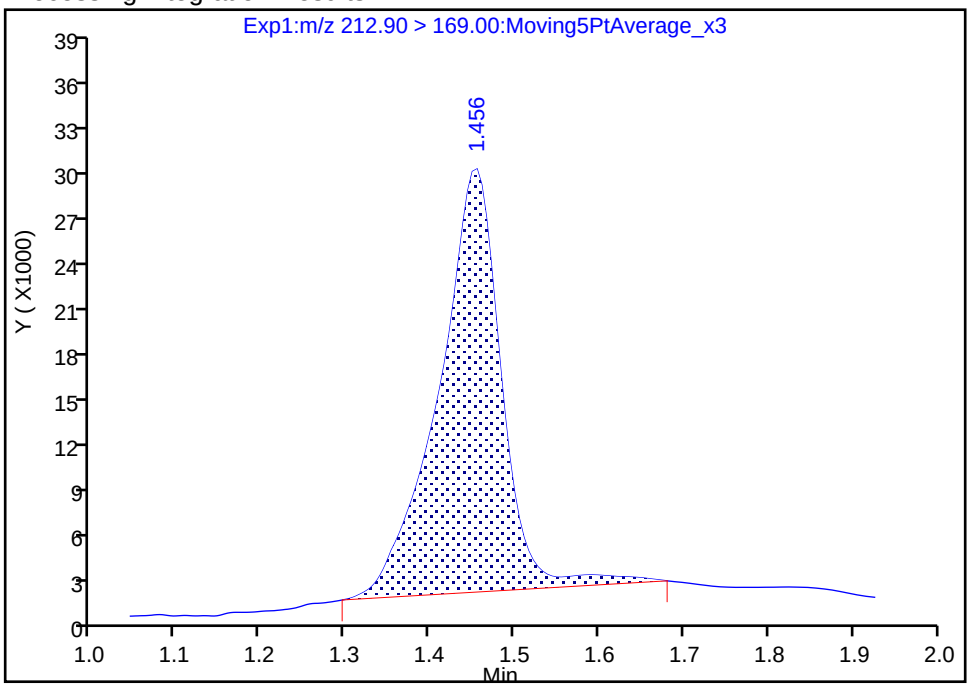
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d
Injection Date: 28-May-2018 17:22:11 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

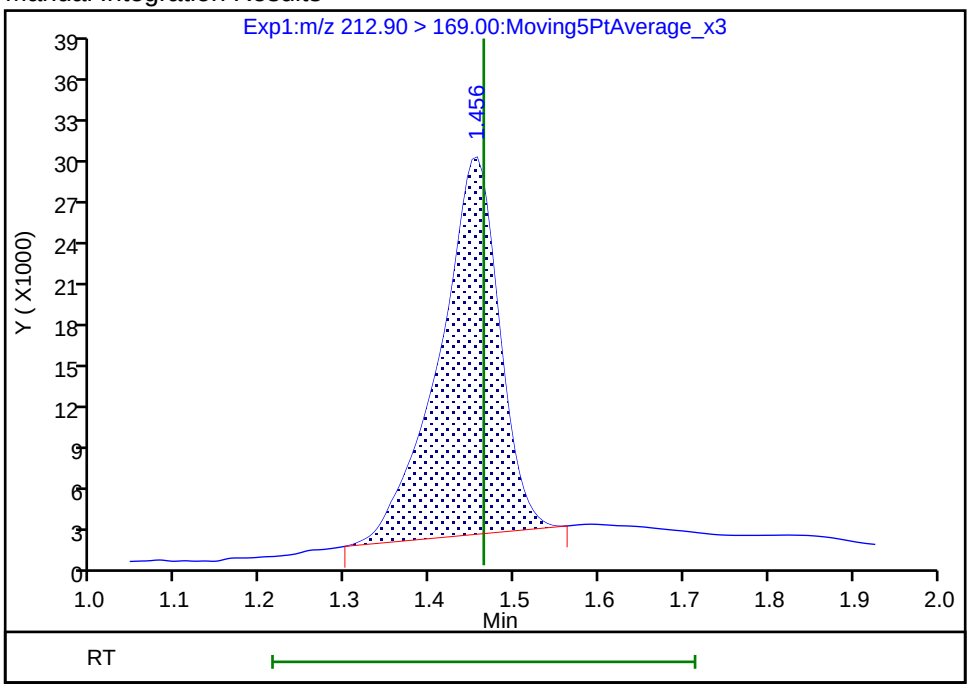
Processing Integration Results

RT: 1.46
Area: 142442
Amount: 0.057643
Amount Units: ng/ml



Manual Integration Results

RT: 1.46
Area: 134081
Amount: 0.054259
Amount Units: ng/ml



Reviewer: mongkols, 30-May-2018 09:30:15
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

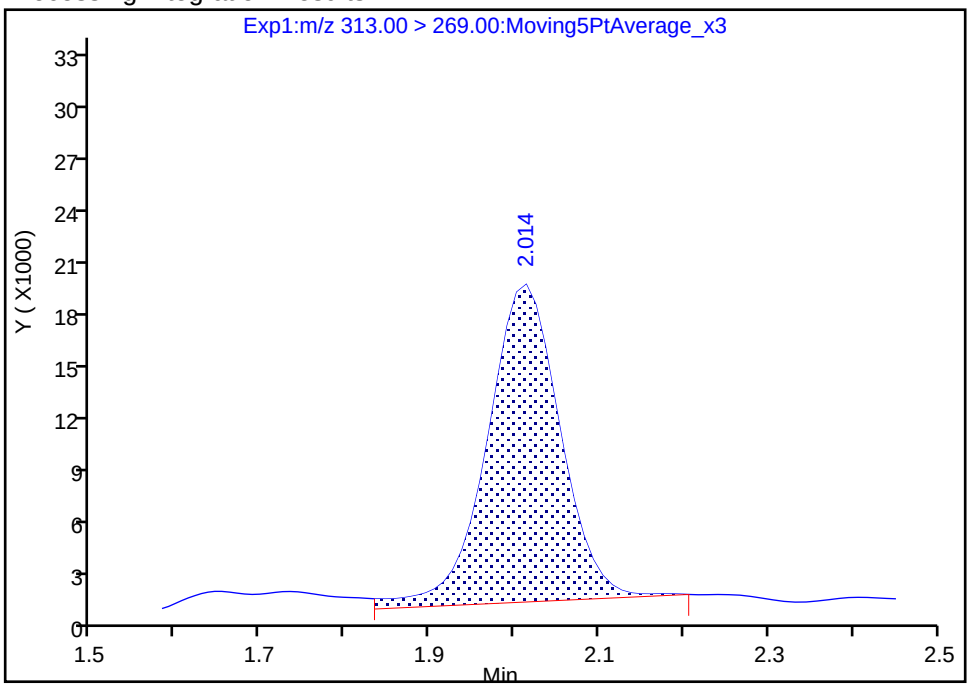
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d				
Injection Date:	28-May-2018 17:22:11	Instrument ID:	A8_N		
Lims ID:	CCVL				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	21	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

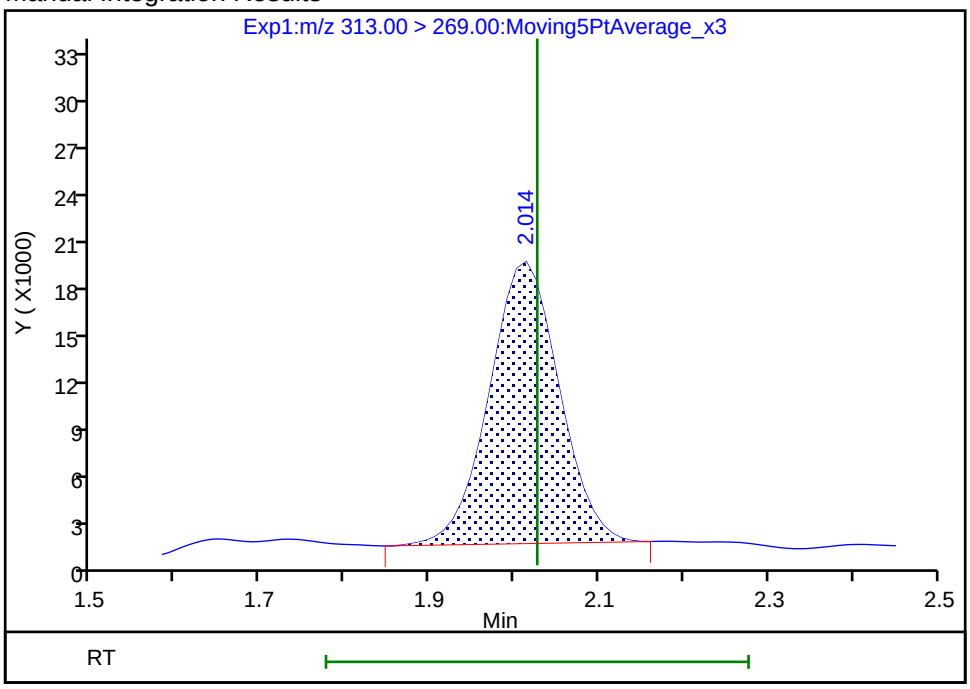
Processing Integration Results

RT: 2.01
Area: 110046
Amount: 0.053169
Amount Units: ng/ml



Manual Integration Results

RT: 2.01
Area: 103162
Amount: 0.049843
Amount Units: ng/ml



Reviewer: mongkols, 30-May-2018 09:30:25

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

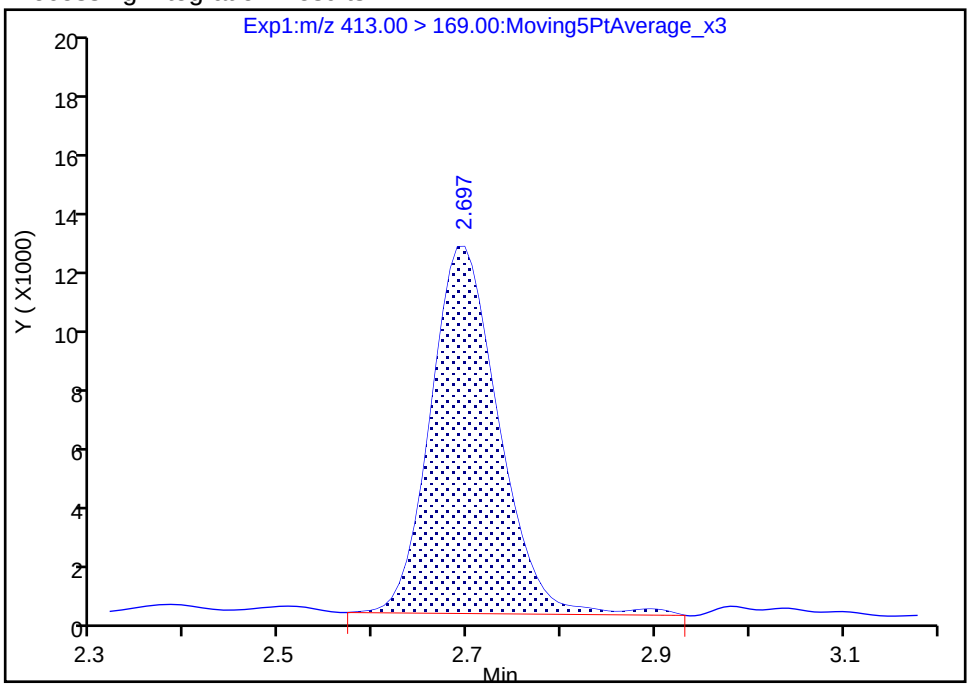
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d
Injection Date: 28-May-2018 17:22:11 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

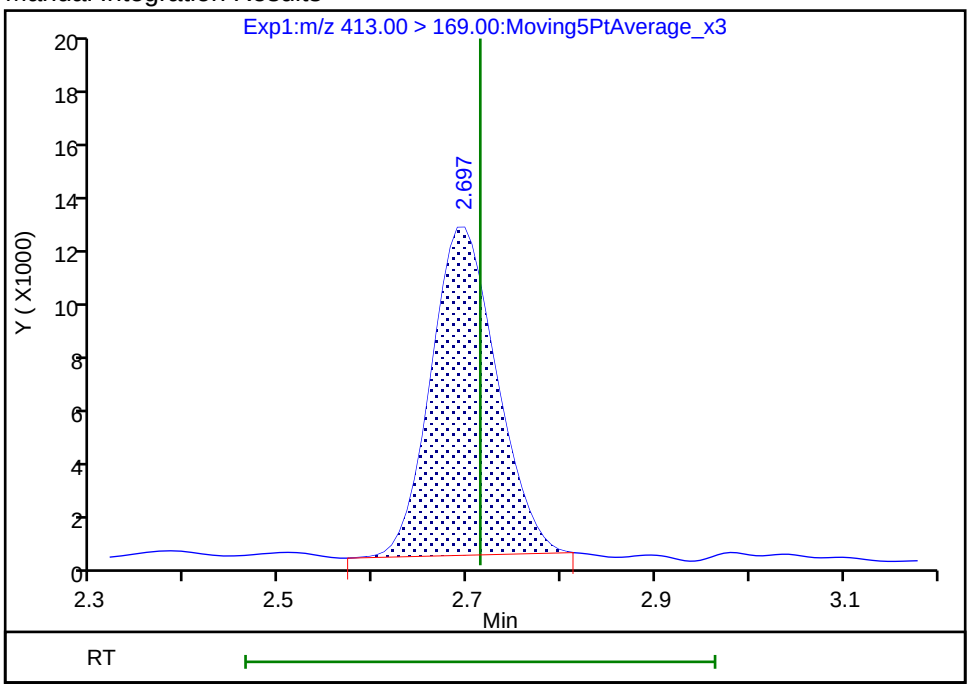
Processing Integration Results

RT: 2.70
Area: 61619
Amount: 0.053573
Amount Units: ng/ml



Manual Integration Results

RT: 2.70
Area: 58580
Amount: 0.053573
Amount Units: ng/ml



Reviewer: mongkols, 30-May-2018 09:30:42
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

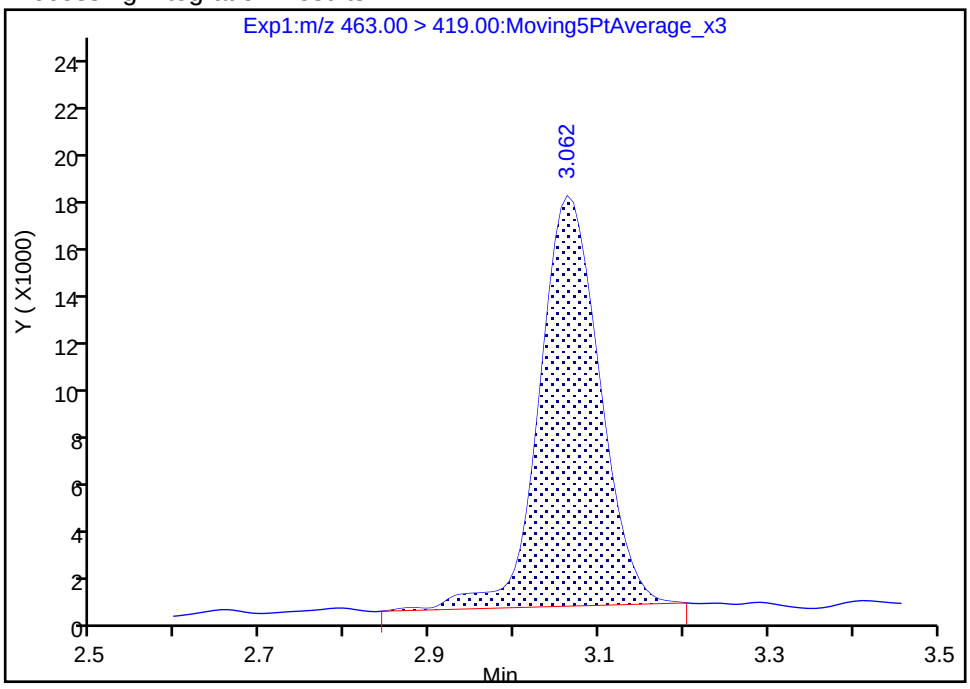
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d
Injection Date: 28-May-2018 17:22:11 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

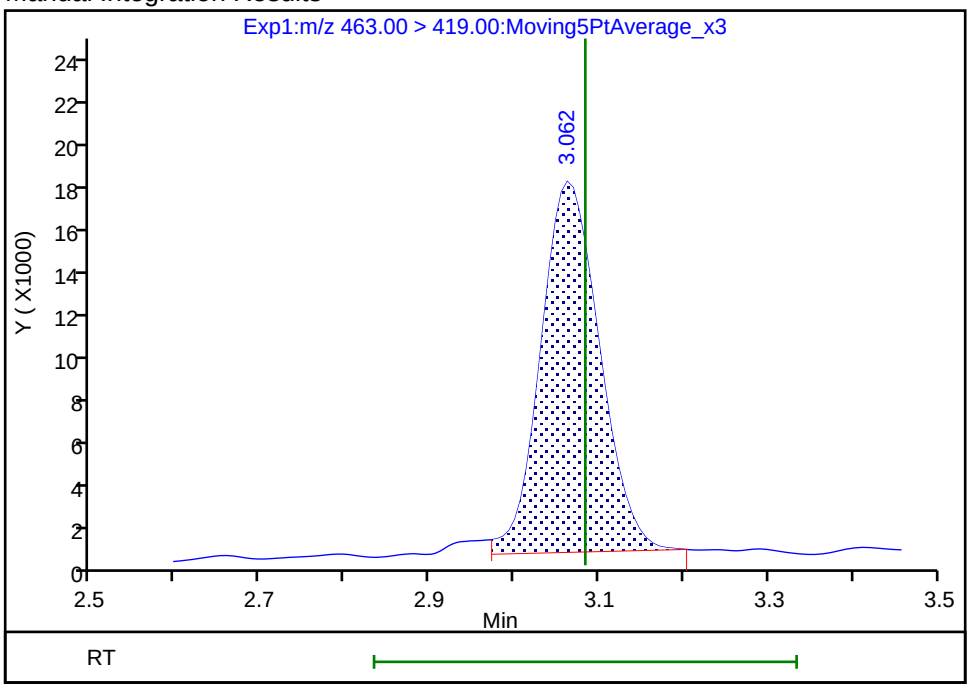
Processing Integration Results

RT: 3.06
Area: 86156
Amount: 0.053320
Amount Units: ng/ml



Manual Integration Results

RT: 3.06
Area: 83703
Amount: 0.051802
Amount Units: ng/ml



Reviewer: mongkols, 30-May-2018 09:31:22
Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

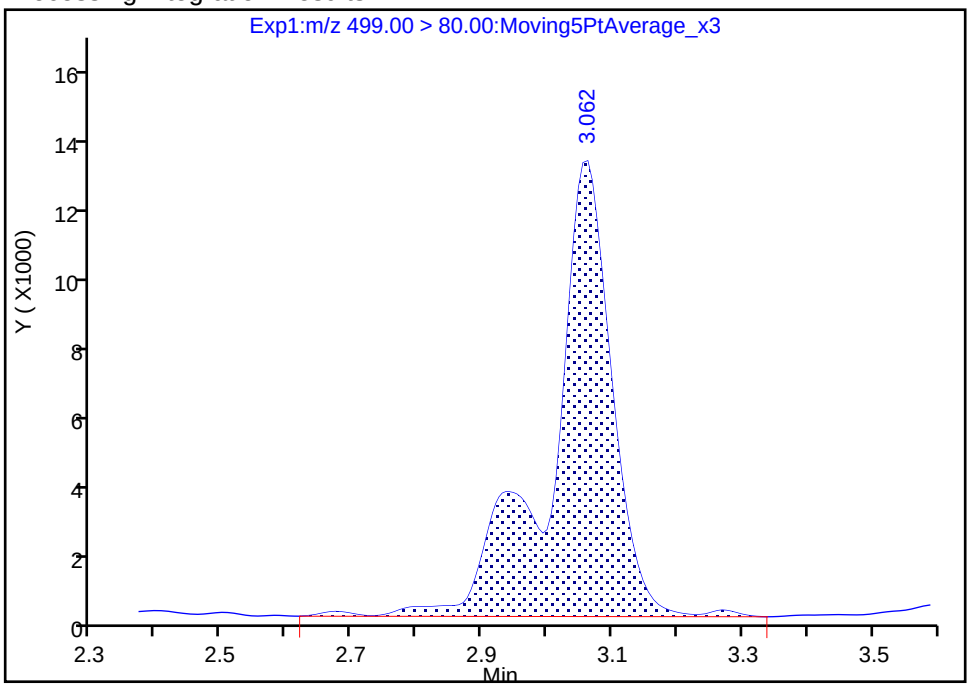
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d
Injection Date: 28-May-2018 17:22:11 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 1

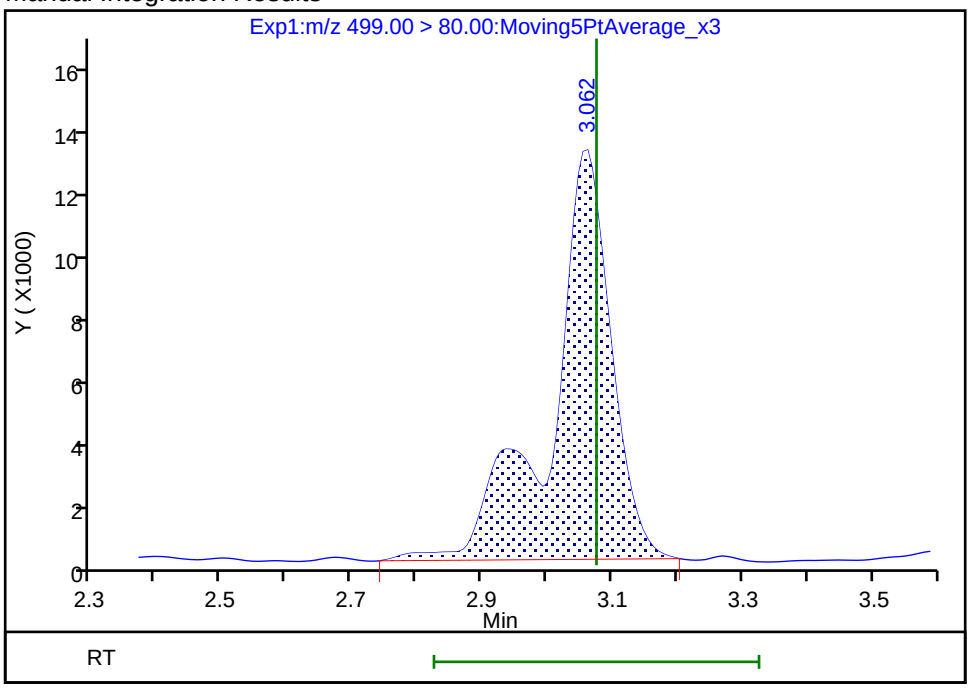
Processing Integration Results

RT: 3.06
Area: 85540
Amount: 0.046120
Amount Units: ng/ml



Manual Integration Results

RT: 3.06
Area: 82675
Amount: 0.044576
Amount Units: ng/ml



Reviewer: mongkols, 30-May-2018 09:30:51
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

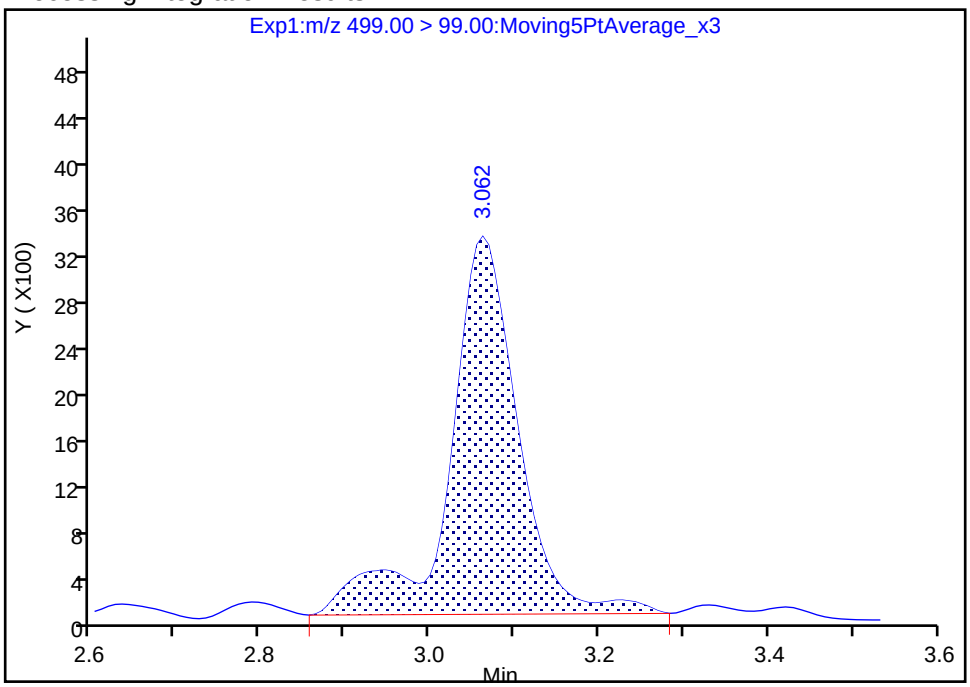
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d
Injection Date: 28-May-2018 17:22:11 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 2

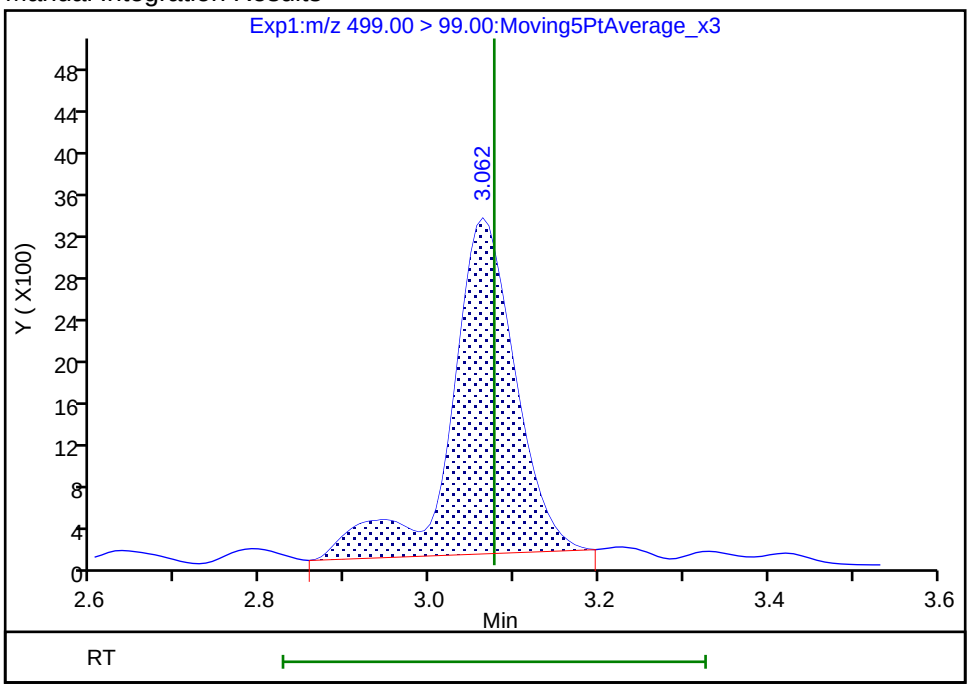
Processing Integration Results

RT: 3.06
Area: 18650
Amount: 0.046120
Amount Units: ng/ml



Manual Integration Results

RT: 3.06
Area: 17296
Amount: 0.044576
Amount Units: ng/ml



Reviewer: mongkols, 30-May-2018 09:31:10
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

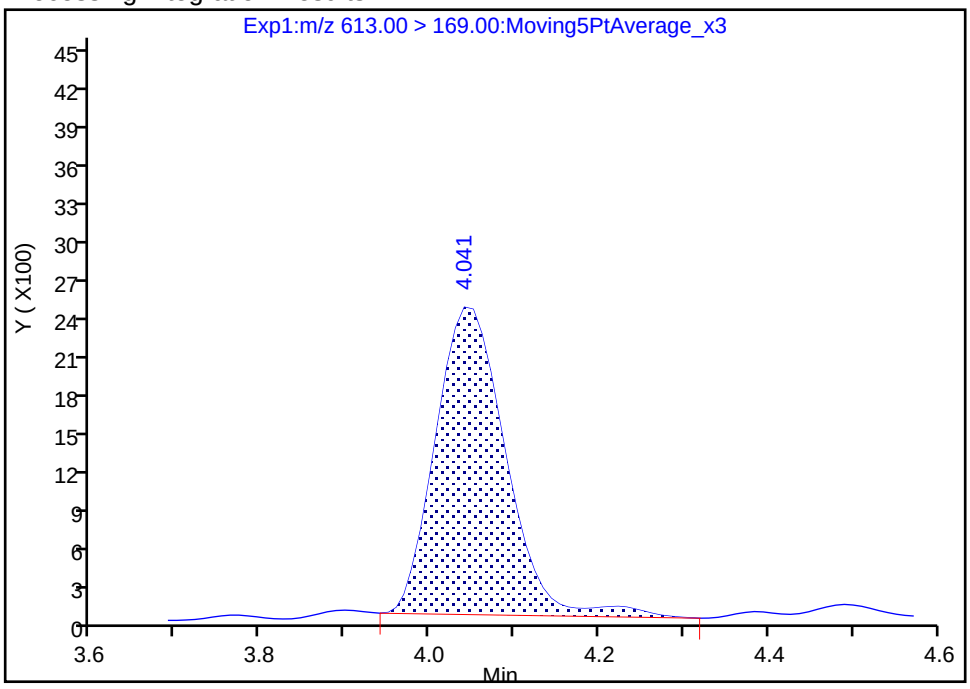
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_004.d
Injection Date: 28-May-2018 17:22:11 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

37 Perfluorododecanoic acid, CAS: 307-55-1

Signal: 2

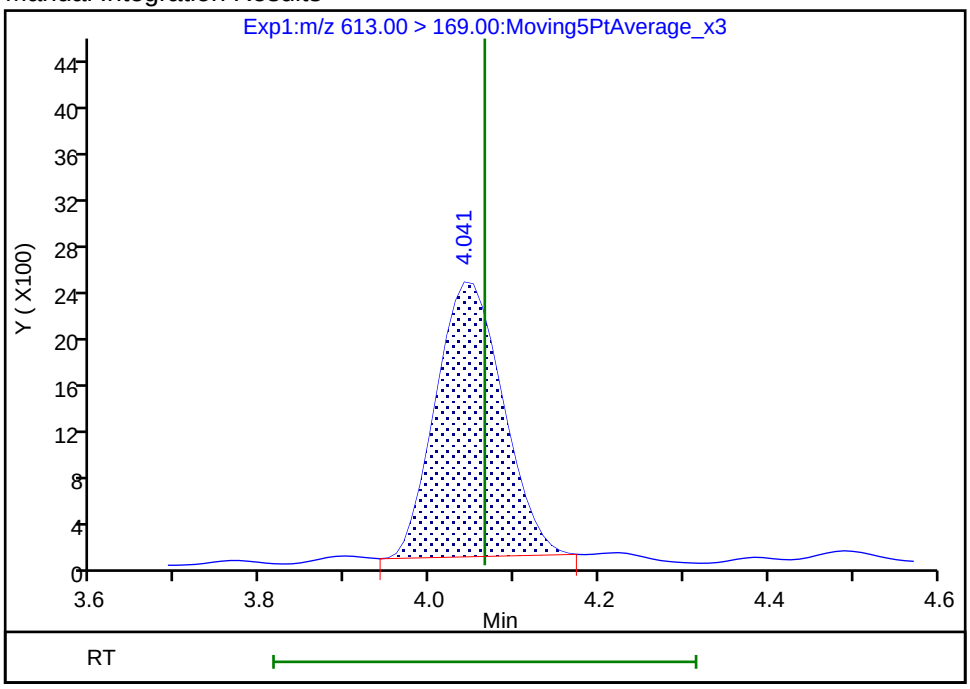
Processing Integration Results

RT: 4.04
Area: 13902
Amount: 0.056641
Amount Units: ng/ml



Manual Integration Results

RT: 4.04
Area: 13082
Amount: 0.056641
Amount Units: ng/ml



Reviewer: mongkols, 30-May-2018 09:31:48
Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225873/3 Calibration Date: 05/28/2018 17:30

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_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	0.9298	0.9419		1.01	1.00	1.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.125		0.953	1.00	-4.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	78.42		0.888	0.884	0.4	30.0
4:2 FTS	AveID	16.57	18.56		1.05	0.934	12.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	0.997		0.970	1.00	-3.0	30.0
Perfluoropentanesulfonic acid	AveID	69.55	67.96		0.917	0.938	-2.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.039		0.984	1.00	-1.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.043		0.842	0.910	-7.4	30.0
6:2FTS	L2ID		1.647		0.879	0.948	-7.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.057		0.898	1.00	-10.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.295		0.926	0.952	-2.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.055		0.996	1.00	-0.4	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.048		0.827	0.928	-10.9	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7578		0.960	0.960	0.0	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9707		0.997	1.00	-0.3	30.0
8:2FTS	AveID	1.349	1.236		0.878	0.958	-8.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	0.9747		1.00	1.00	0.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.055		1.04	1.00	4.0	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.6091		0.874	0.964	-9.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9258		0.985	1.00	-1.5	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.7741		0.927	1.00	-7.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.077		1.03	1.00	3.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.288		1.13	1.00	12.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2313		0.916	1.00	-8.4	30.0
13C4 PFBA	Ave	1.528	1.413		2.31	2.50	-7.6	30.0
13C5 PFPeA	Ave	0.9798	0.9888		2.52	2.50	0.9	30.0
13C3-PFBS	Ave	0.0221	0.0206		2.16	2.33	-7.0	30.0
13C2 PFHxA	Ave	1.045	1.053		2.52	2.50	0.8	30.0
13C4-PFHpA	Ave	1.001	0.9608		2.40	2.50	-4.0	30.0
18O2 PFHxS	Ave	1.237	1.167		2.23	2.37	-5.6	30.0
M2-6:2FTS	Ave	0.2210	0.2323		2.50	2.38	5.1	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225873/3 Calibration Date: 05/28/2018 17:30

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9838		2.60	2.50	3.9	30.0
13C4 PFOS	Ave	0.8503	0.8097		2.28	2.39	-4.8	30.0
13C5 PFNA	Ave	0.7745	0.8005		2.58	2.50	3.4	30.0
13C8 FOSA	Ave	1.113	1.014		2.28	2.50	-8.9	30.0
M2-8:2FTS	Ave	0.2515	0.2620		2.50	2.40	4.2	30.0
13C2 PFDA	Ave	0.6587	0.6601		2.51	2.50	0.2	30.0
d3-NMeFOSAA	Ave	0.3634	0.3955		2.72	2.50	8.8	30.0
d5-NEtFOSAA	Ave	0.3729	0.4156		2.79	2.50	11.4	30.0
13C2 PFUnA	Ave	0.5216	0.5467		2.62	2.50	4.8	30.0
13C2 PFDoA	Ave	0.5613	0.5482		2.44	2.50	-2.3	30.0
13C2-PFTeDA	Ave	0.6891	0.7248		2.63	2.50	5.2	30.0
13C2-PFHxDA	Ave	1.170	1.213		2.59	2.50	3.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_005.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 28-May-2018 17:30:02 ALS Bottle#: 13 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-May-2018 09:33:11 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 30-May-2018 09:33:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.457	1.458	-0.001	1.000	6827808	2.31		92.4	38154	
2 Perfluorobutyric acid										
212.90 > 169.00	1.457	1.457	0.0	1.000	2572522	1.01		101	1289	
D 3 13C5-PFPeA										
267.90 > 223.00	1.728	1.730	-0.002	0.563	4779432	2.52		101	76809	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.728	1.728	0.0	1.000	2150619	0.9529		95.3	1368	
D 47 13C3-PFBS										
301.90 > 83.00	1.755	1.766	-0.011	1.000	92543	2.16		93.0	847	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.764	1.764	0.0	1.005	2759239	0.8877		100	15237	
298.90 > 99.00	1.764	1.764	0.0	1.005	1134064		2.43(1.25-3.74)		9456	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.970	1.970	0.0	1.000	690010	1.05		112	29668	
D 60 M2-4:2FTS										
329.00 > 81.00	1.970	1.982	-0.012	1.000	799629	NC			8150	
D 7 13C2 PFHxA										
315.00 > 270.00	2.014	2.015	-0.001	1.000	5091151	2.52		101	79485	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.014	2.014	0.0	1.000	2030297	0.9697		97.0	3597	
313.00 > 119.00	2.014	2.014	0.0	1.000	185451		10.95(5.03-15.10)		2377	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.036	2.036	0.0	1.000	2537180	0.9166		97.7	28997	
349.00 > 99.00	2.036	2.036	0.0	1.000	967884		2.62(1.36-4.07)		13736	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.104	2.117	-0.013	1.000	242918	NC			5108	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.104	2.104	0.0	1.000	323920	NC			1744	
D 9 13C4-PFHpA										
367.00 > 322.00	2.345	2.347	-0.002	1.000	4644037	2.40		96.0	57061	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.345	2.345	0.0	1.000	1930601	0.9839		98.4	2768	
363.00 > 169.00	2.345	2.345	0.0	1.000	749041		2.58(1.13-3.40)		5002	
D 11 18O2 PFHxS										
403.00 > 84.00	2.358	2.360	-0.002	1.000	5336916	2.23		94.4	57080	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.358	2.358	0.0	1.000	2141728	0.8423		92.6	6573	
399.00 > 99.00	2.358	2.358	0.0	1.000	730067		2.93(1.50-4.49)		3685	
65 Adona										
377.00 > 251.00	2.383	2.383	0.0	1.000	5756713	NC			68115	
377.00 > 85.00	2.383	2.383	0.0	1.000	3446016		1.67(0.84-2.53)		44428	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.674	2.674	0.0	1.000	701116	0.8793		92.8	13156	
D 12 M2-6:2FTS										
429.00 > 81.00	2.674	2.683	-0.009	1.000	1066622	2.50		105	14684	
D 14 13C4 PFOA										
417.00 > 372.00	2.697	2.706	-0.009	1.000	4755028	2.60		104	52989	
* 62 13C2-PFOA										
415.00 > 370.00	2.697	2.697	0.0		4833381	2.50			53307	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.697	2.697	0.0	1.000	2010729	0.8982		89.8	764	
413.00 > 169.00	2.697	2.697	0.0	1.000	1058378		1.90(0.84-2.52)		3483	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.704	2.704	0.0	1.000	1929987	0.9256		97.2	17549	
449.00 > 99.00	2.704	2.704	0.0	1.000	523743		3.68(1.94-5.82)		9102	
D 19 13C5 PFNA										
468.00 > 423.00	3.069	3.074	-0.005	1.000	3869198	2.58		103	52873	
D 18 13C4 PFOS										
503.00 > 80.00	3.062	3.074	-0.012	1.000	3741444	2.28		95.2	24065	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.069	3.069	0.0	1.002	1522193	0.8270		89.1	7139	
499.00 > 99.00	3.062	3.069	-0.007	1.000	348134		4.37(2.31-6.93)		3996	
20 Perfluorononanoic acid										
463.00 > 419.00	3.069	3.069	0.0	1.000	1632987	1.00		99.6	4536	
463.00 > 169.00	3.069	3.069	0.0	1.000	378569		4.31(1.90-5.69)		9153	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.276	3.276	0.0	1.000	2617428	NC			27622	
D 21 13C8 FOSA										
506.00 > 78.00	3.411	3.412	-0.001	1.000	4900493	2.28		91.1	50730	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.411	3.411	0.0	1.000	1902843	1.00		99.7	18644	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.411	3.411	0.0	1.000	1138899	0.9604		100	22417	
549.00 > 99.00	3.411	3.411	0.0	1.000	421640		2.70(1.33-3.97)		7522	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.420	3.420	0.0	1.003	599899	0.8777		91.6	16466	
D 26 M2-8:2FTS										
529.00 > 81.00	3.411	3.430	-0.019	1.000	1213076	2.50		104	16586	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.430	3.430	0.0	1.000	1243818	1.00		100	6493	
513.00 > 169.00	3.430	3.430	0.0	1.000	208117		5.98(2.36-7.09)		3598	
D 23 13C2 PFDA										
515.00 > 470.00	3.430	3.439	-0.009	1.000	3190268	2.51		100	34451	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.578	3.590	-0.012	1.000	1911393	2.72		109	18679	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.578	3.578	0.0	1.000	806713	1.04		104	8410	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.732	3.732	0.0	1.000	919131	0.8745		90.7	9978	
599.00 > 99.00	3.732	3.732	0.0	1.000	344722		2.67(1.39-4.16)		9042	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.742	3.754	-0.012	1.000	2008526	2.79		111	15766	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.753	3.753	0.0	1.000	818060	0.9268		92.7	4761	
563.00 > 169.00	3.753	3.753	0.0	1.000	200856		4.07(2.12-6.36)		7438	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.753	3.753	0.0	1.003	743801	0.9849		98.5	13660	
D 30 13C2 PFUnA										
565.00 > 520.00	3.753	3.765	-0.012	1.000	2642154	2.62		105	48919	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.909	3.909	0.0	1.000	4095519	NC			51780	
D 36 13C2 PFDoA										
615.00 > 570.00	4.040	4.055	-0.015	1.000	2649868	2.44		97.7	20786	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.040	4.040	0.0	1.000	1141175	1.03		103	1196	
613.00 > 169.00	4.040	4.040	0.0	1.000	277090		4.12(2.13-6.40)		4779	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.299	4.299	0.0	1.000	1364928	1.13		113	1322	
663.00 > 169.00	4.299	4.299	0.0	1.000	404751		3.37(1.25-3.76)		5981	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.543	4.550	-0.007	1.000	3503125	2.63		105	16732	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.543	4.543	0.0	1.000	324081	0.9159		91.6	3577	
713.00 > 219.00	4.533	4.543	-0.010	0.998	231668		1.40(0.71-2.13)		5523	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.949	4.964	-0.015	1.000	5861738	2.59		104	13990	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.949	4.949	0.0	1.000	2271567	NC			883	
813.00 > 169.00	4.949	4.949	0.0	1.000	345920		6.57(2.86-8.58)		3425	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.307	5.307	0.0	1.000	2308953	NC			628	
913.00 > 169.00	5.307	5.307	0.0	1.000	283754		8.14(3.83-11.48)		2557	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00004 Amount Added: 1.00 Units: mL

Report Date: 30-May-2018 09:33:13 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_005.d

Injection Date: 28-May-2018 17:30:02 Instrument ID: A8_N

Lims ID: CCV L4

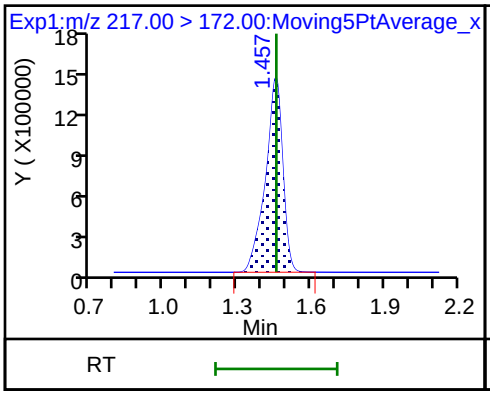
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 3

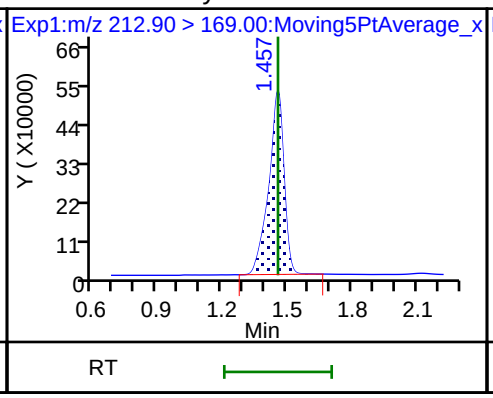
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

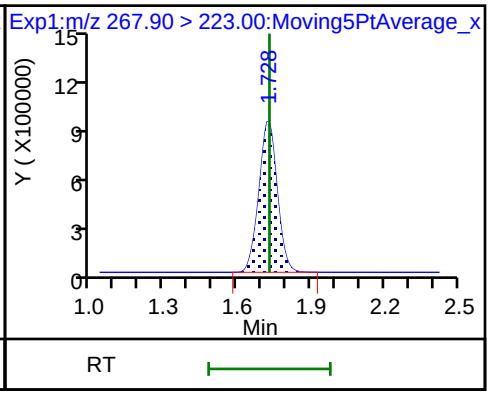
D 1 13C4 PFBA



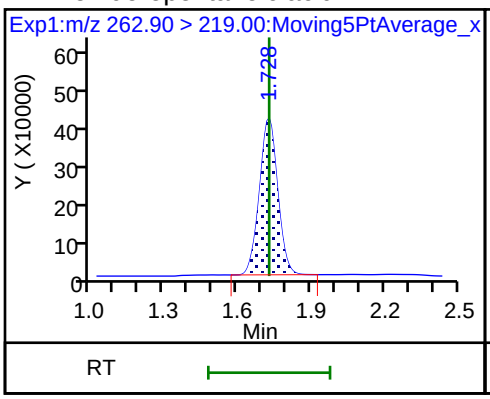
2 Perfluorobutyric acid



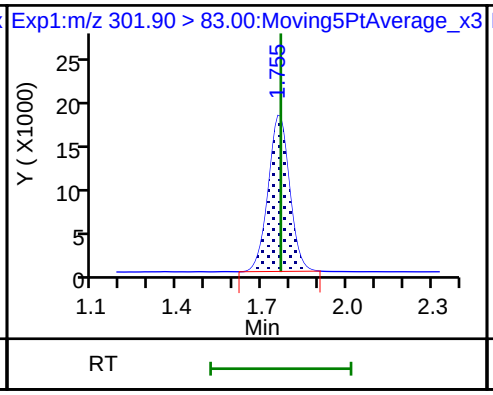
D 3 13C5-PFPeA



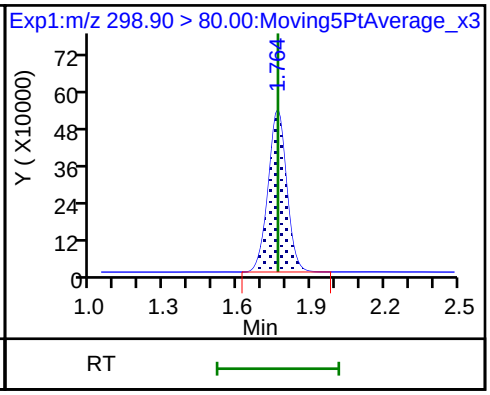
4 Perfluoropentanoic acid



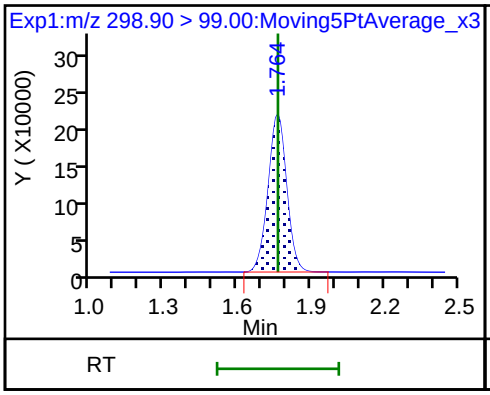
D 47 13C3-PFBS



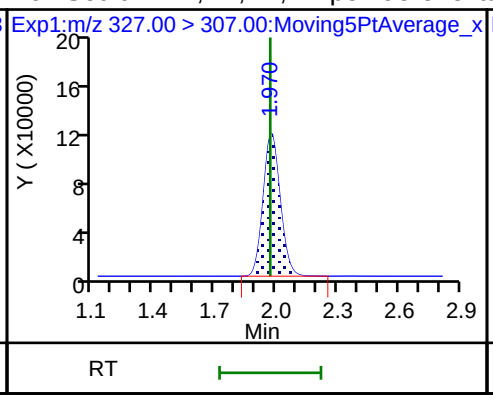
5 Perfluorobutanesulfonic acid



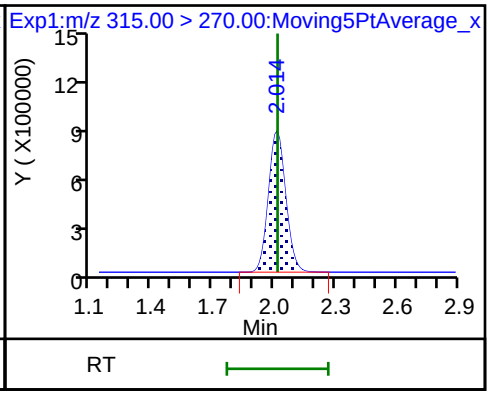
5 Perfluorobutanesulfonic acid



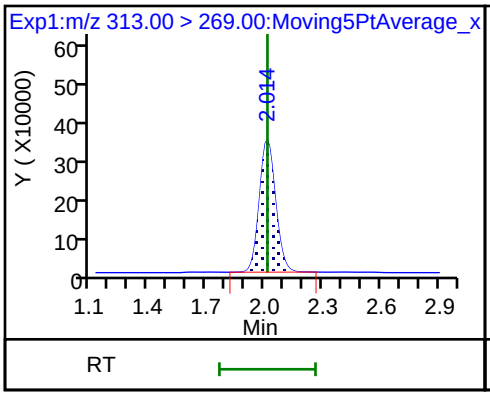
61 Sodium 1H,1H,2H,2H-perfluorohexa



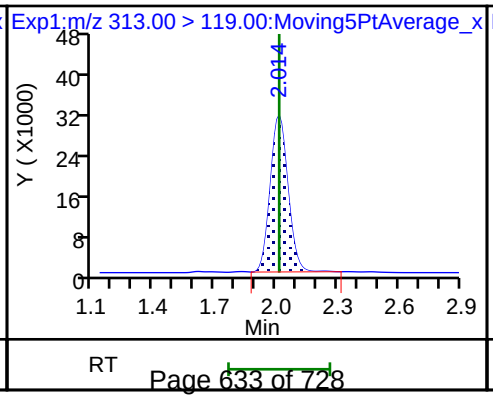
D 7 13C2 PFHxA



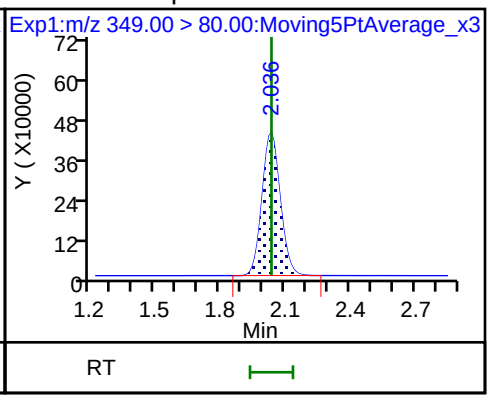
6 Perfluorohexanoic acid



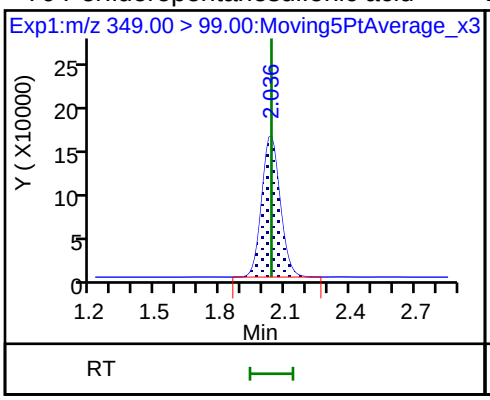
6 Perfluorohexanoic acid



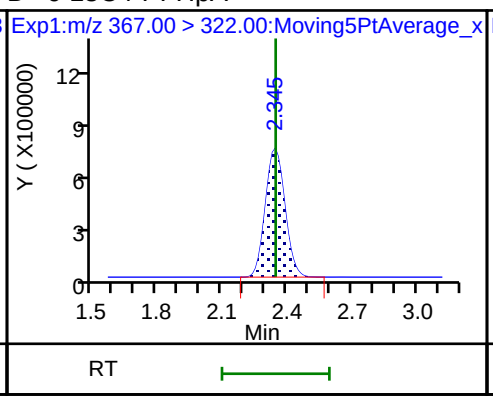
70 Perfluoropentanesulfonic acid



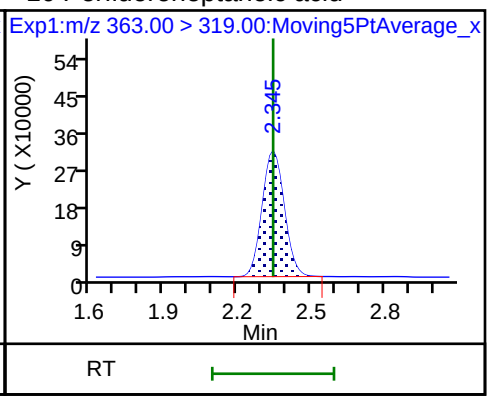
70 Perfluoropentanesulfonic acid



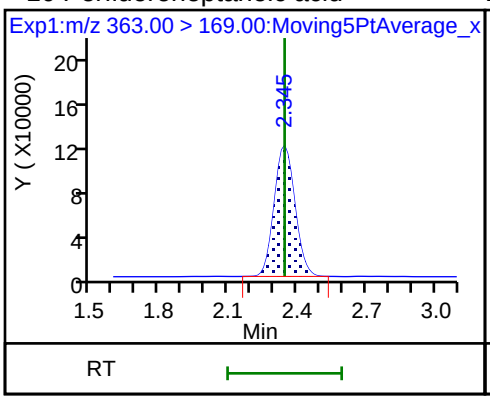
D 9 13C4-PFHpA



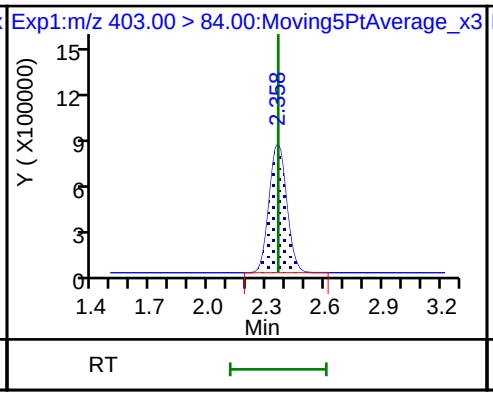
10 Perfluoroheptanoic acid



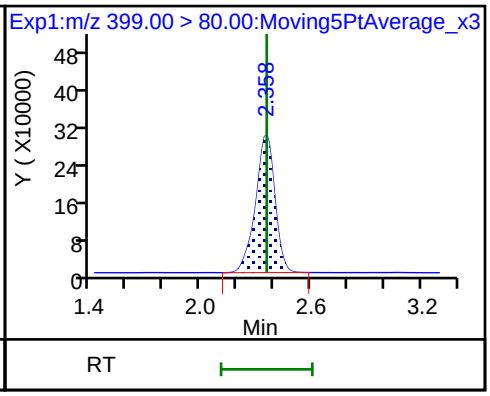
10 Perfluoroheptanoic acid



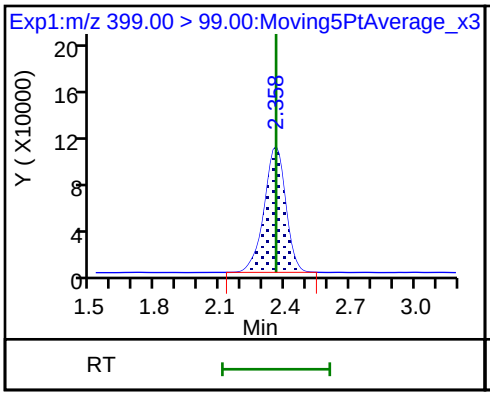
D 11 18O2 PFHxS



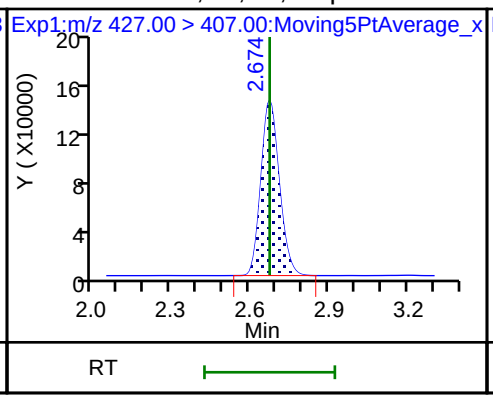
8 Perfluorohexanesulfonic acid



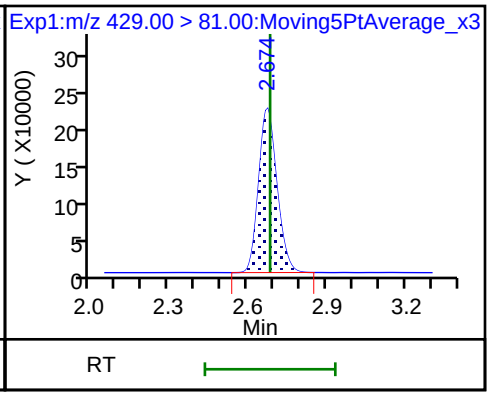
8 Perfluorohexanesulfonic acid



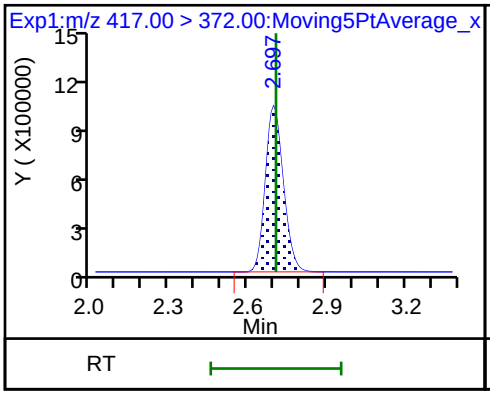
13 Sodium 1H,1H,2H,2H-perfluorooctane



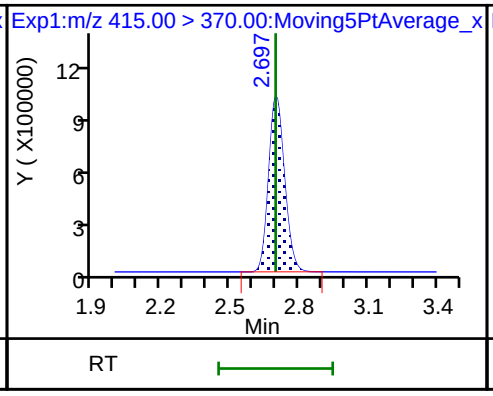
D 12 M2-6:2FTS



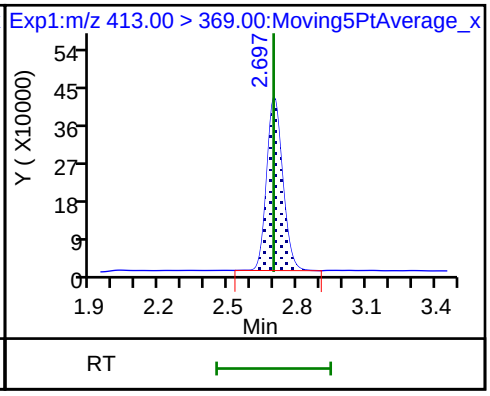
D 14 13C4 PFOA



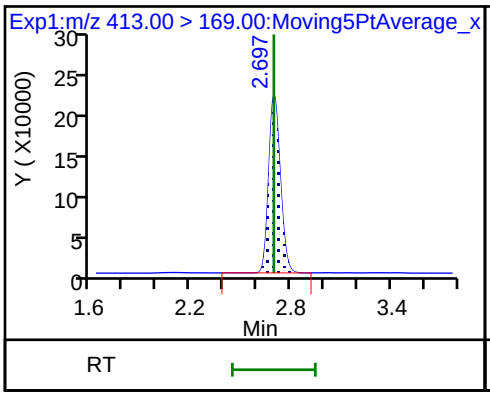
* 62 13C2-PFOA



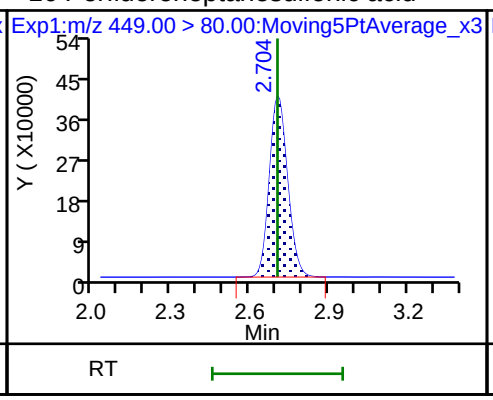
15 Perfluorooctanoic acid



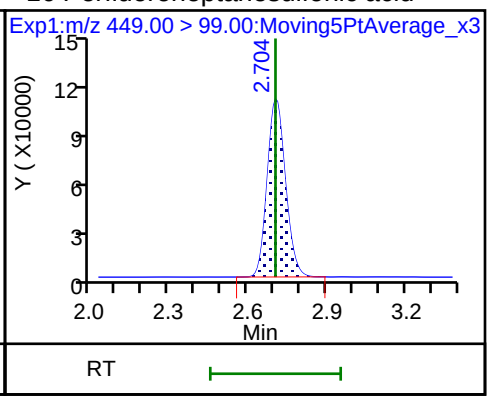
15 Perfluorooctanoic acid



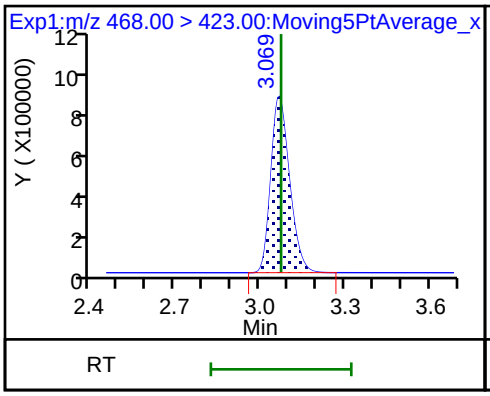
16 Perfluoroheptanesulfonic acid



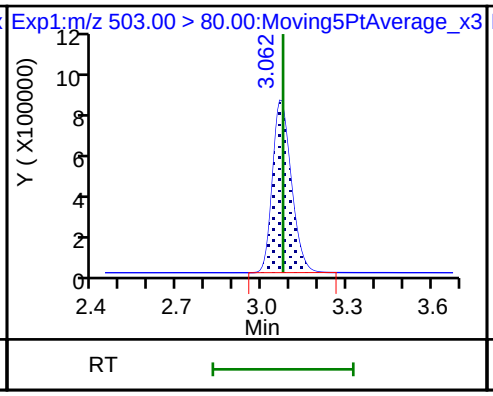
16 Perfluoroheptanesulfonic acid



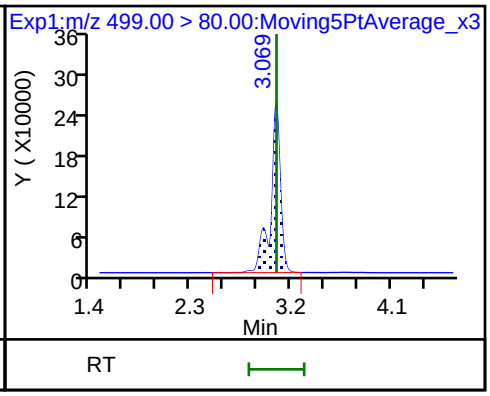
D 19 13C5 PFNA



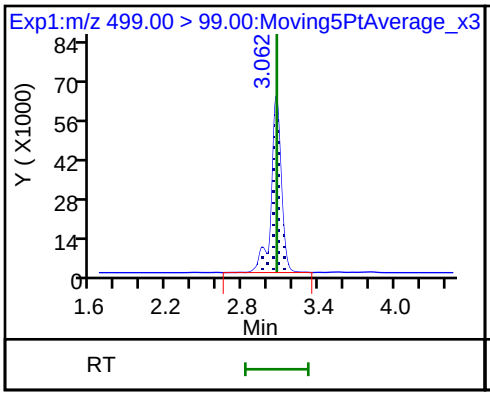
D 18 13C4 PFOS



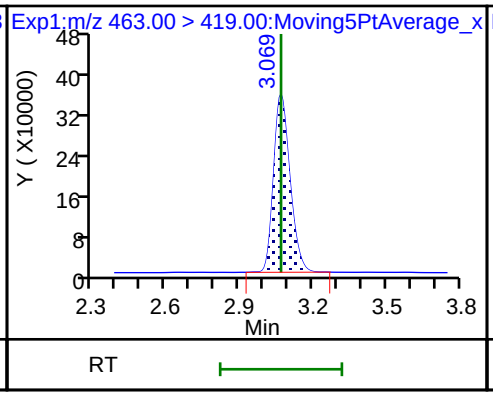
17 Perfluorooctane sulfonic acid



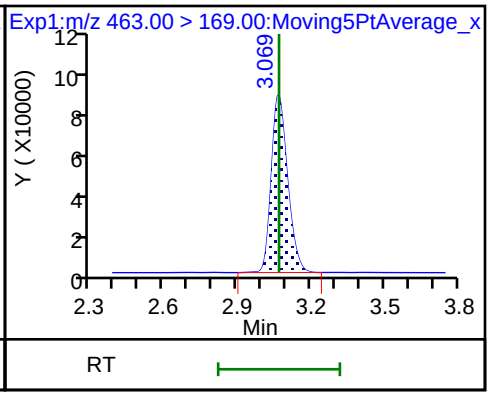
17 Perfluorooctane sulfonic acid



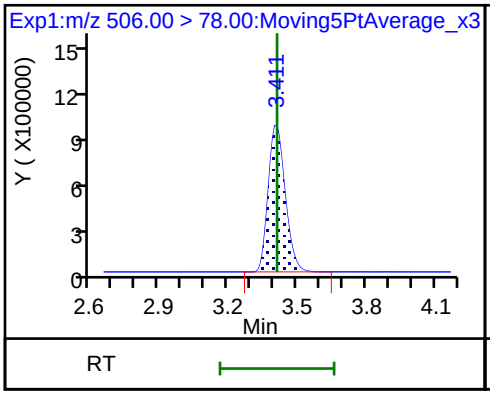
20 Perfluorononanoic acid



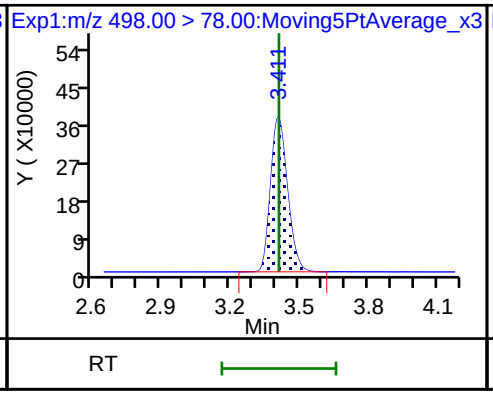
20 Perfluorononanoic acid



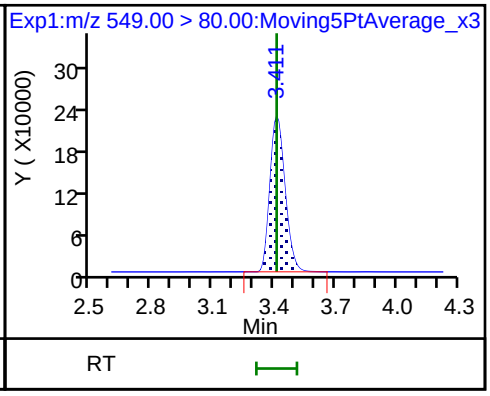
D 21 13C8 FOSA



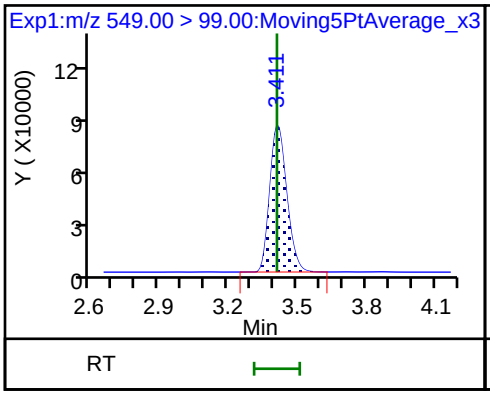
22 Perfluorooctane Sulfonamide



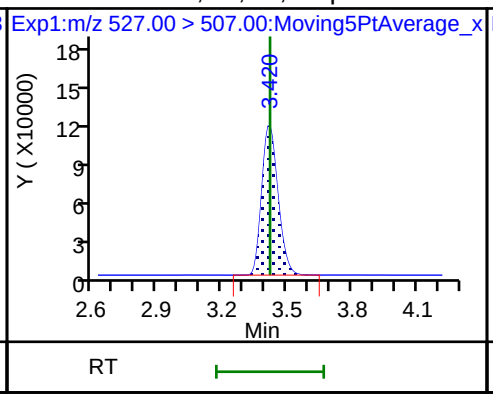
68 Perfluorononanesulfonic acid



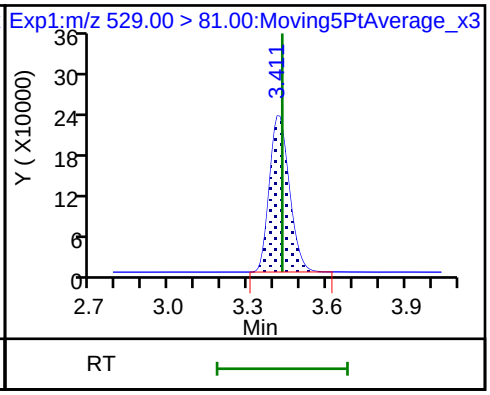
68 Perfluorononanesulfonic acid



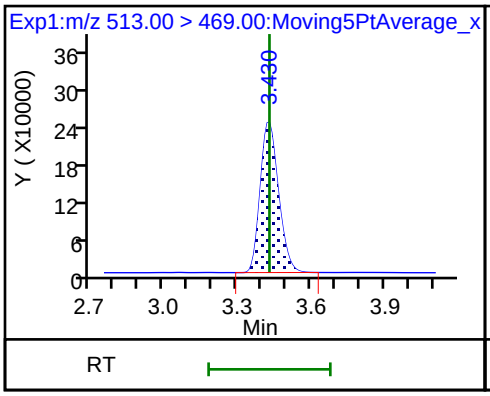
25 Sodium 1H,1H,2H,2H-perfluorodecane



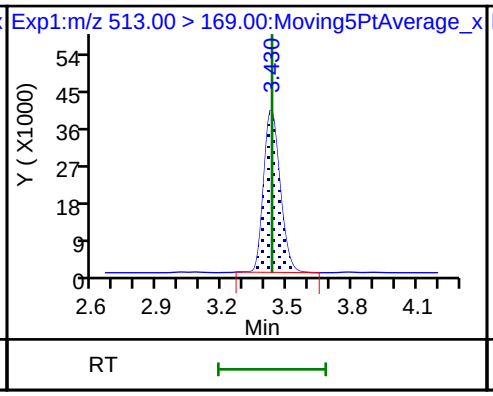
D 26 M2-8:2FTS



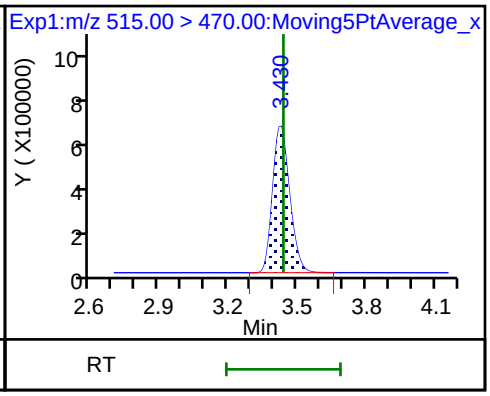
24 Perfluorodecanoic acid



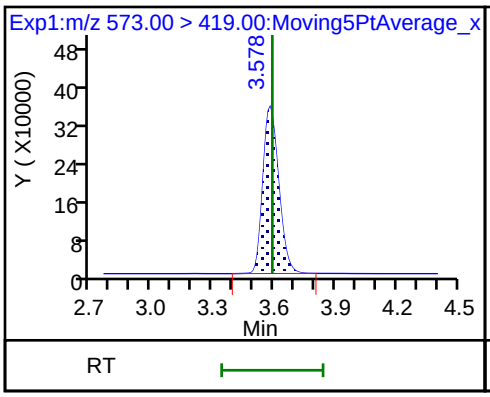
24 Perfluorodecanoic acid



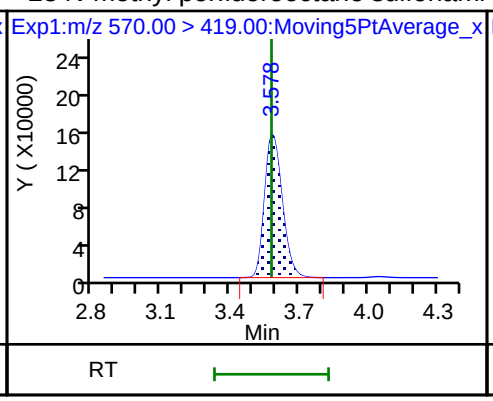
D 23 13C2 PFDA



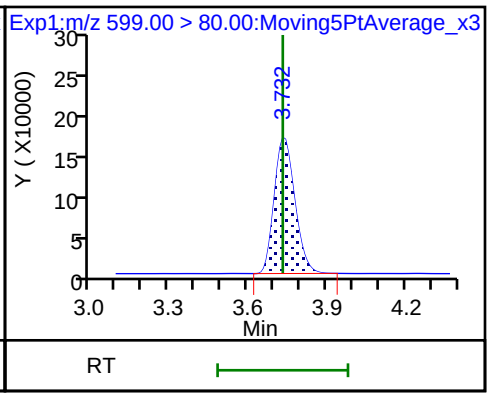
D 27 d3-NMeFOSAA



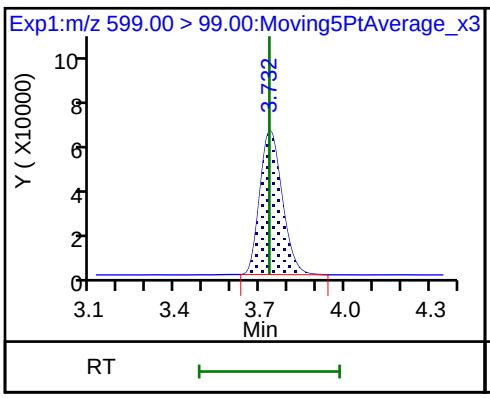
28 N-methyl perfluorooctane sulfonami



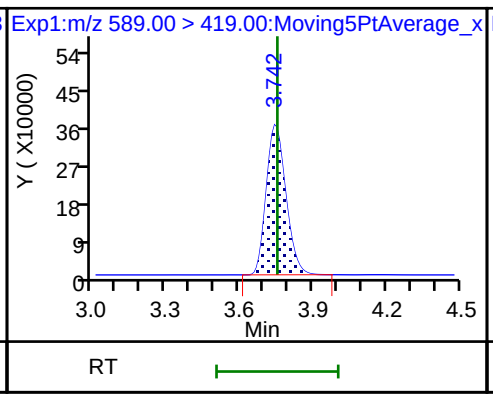
29 Perfluorodecane Sulfonic acid



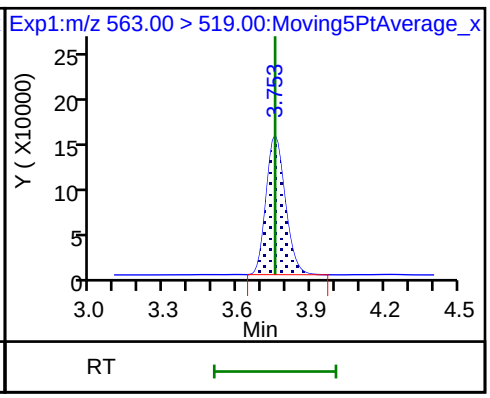
29 Perfluorodecane Sulfonic acid



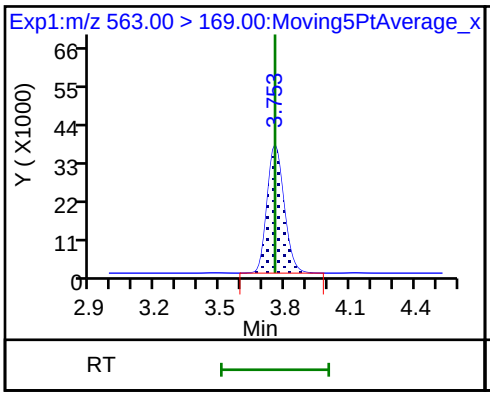
D 32 d5-NEtFOSAA



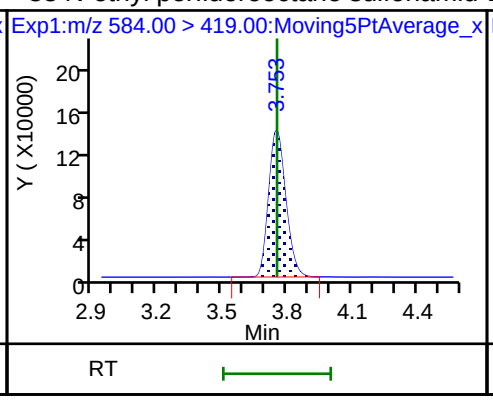
31 Perfluoroundecanoic acid



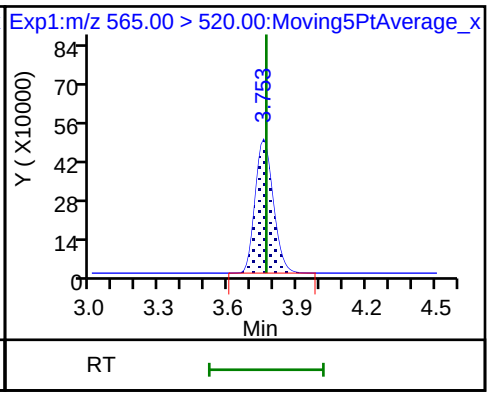
31 Perfluoroundecanoic acid



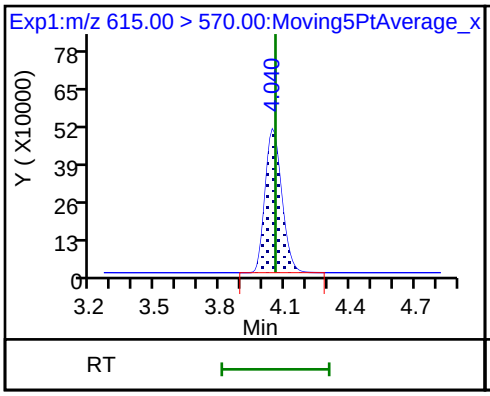
33 N-ethyl perfluorooctane sulfonamid



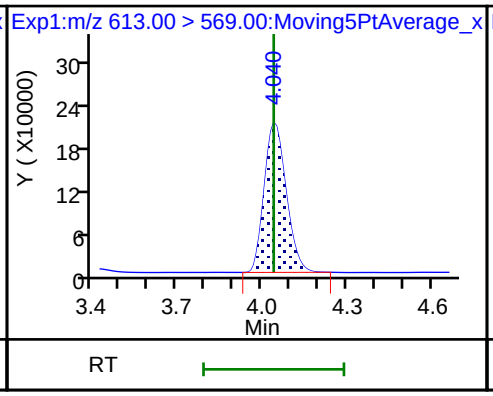
D 30 13C2 PFUnA



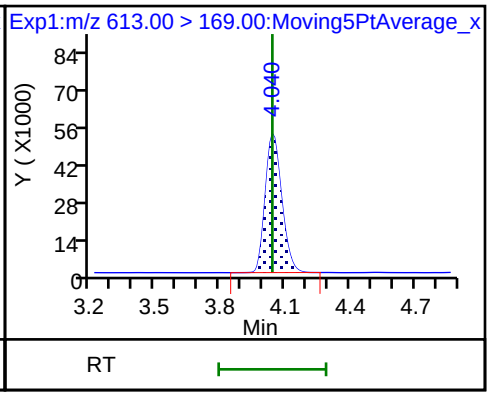
D 36 13C2 PFDoA



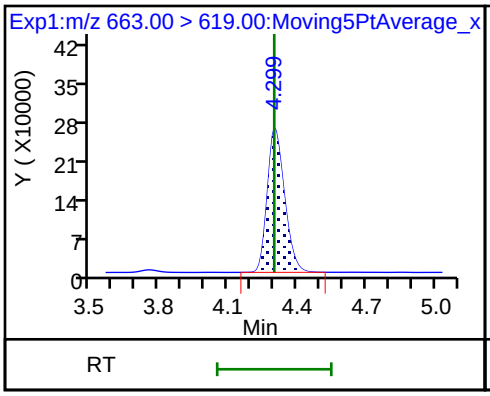
37 Perfluorododecanoic acid



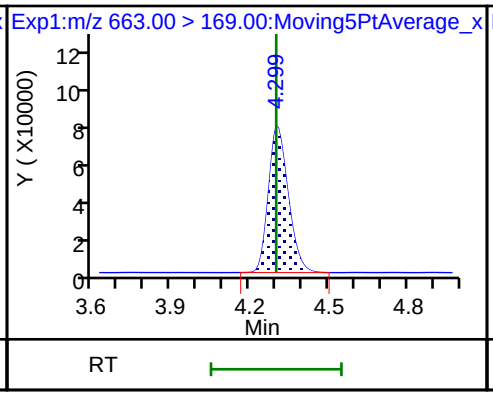
37 Perfluorododecanoic acid



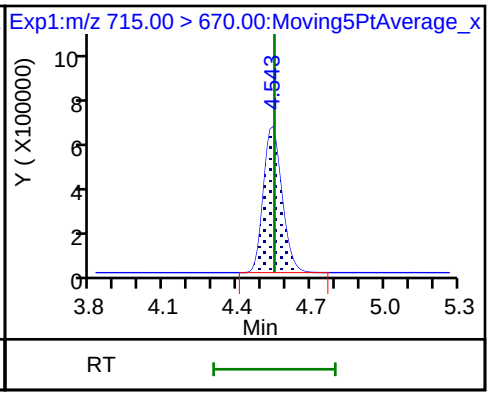
41 Perfluorotridecanoic acid



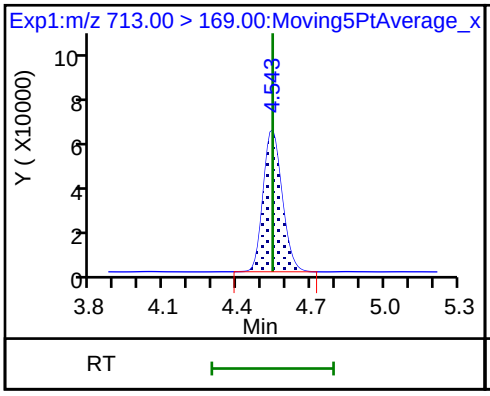
41 Perfluorotridecanoic acid



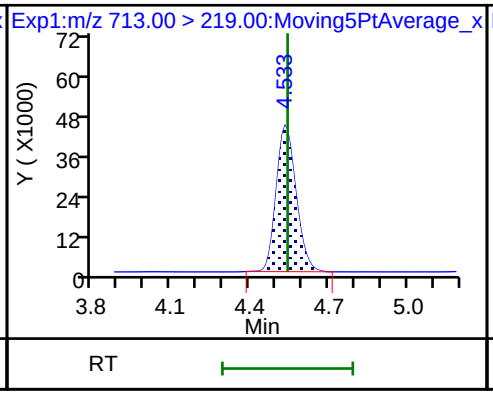
D 43 13C2-PFTeDA



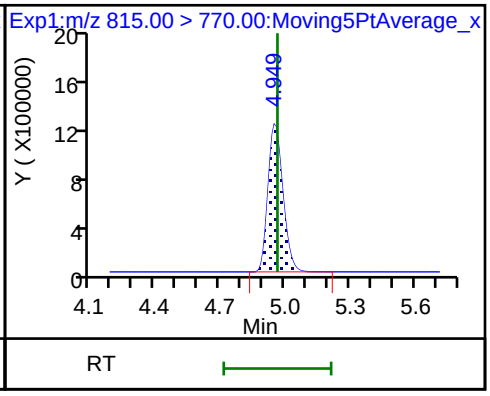
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225884/1 Calibration Date: 05/29/2018 00:01

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_055.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	0.9565		1.03	1.00	2.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.147		0.971	1.00	-2.9	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	73.68		0.834	0.884	-5.6	30.0
4:2 FTS	AveID	16.57	19.15		1.08	0.934	15.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	0.9800		0.953	1.00	-4.7	30.0
Perfluoropentanesulfonic acid	AveID	69.55	69.76		0.941	0.938	0.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.049		0.993	1.00	-0.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.002		0.809	0.910	-11.1	30.0
6:2FTS	L2ID		1.642		0.877	0.948	-7.5	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.113		0.946	1.00	-5.4	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.308		0.935	0.952	-1.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	0.9645		0.911	1.00	-8.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.076		0.849	0.928	-8.5	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.009		1.04	1.00	3.7	30.0
8:2FTS	AveID	1.349	1.249		0.887	0.958	-7.4	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7708		0.977	0.960	1.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	0.9118		0.938	1.00	-6.2	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.034		1.02	1.00	1.9	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.6548		0.940	0.964	-2.5	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.8038		0.962	1.00	-3.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9143		0.973	1.00	-2.7	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.055		1.01	1.00	1.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.156		1.01	1.00	1.0	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2414		0.956	1.00	-4.4	30.0
13C4 PFBA	Ave	1.528	1.377		2.25	2.50	-9.9	30.0
13C5 PFPeA	Ave	0.9798	0.9409		2.40	2.50	-4.0	30.0
13C3-PFBS	Ave	0.0221	0.0203		2.13	2.33	-8.4	30.0
13C2 PFHxA	Ave	1.045	1.017		2.43	2.50	-2.7	30.0
13C4-PFHpA	Ave	1.001	0.9614		2.40	2.50	-4.0	30.0
18O2 PFHxS	Ave	1.237	1.175		2.25	2.37	-5.0	30.0
M2-6:2FTS	Ave	0.2210	0.2395		2.57	2.38	8.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225884/1 Calibration Date: 05/29/2018 00:01

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_055.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9386		2.48	2.50	-0.9	30.0
13C4 PFOS	Ave	0.8503	0.7858		2.21	2.39	-7.6	30.0
13C5 PFNA	Ave	0.7745	0.8153		2.63	2.50	5.3	30.0
13C8 FOSA	Ave	1.113	0.9580		2.15	2.50	-13.9	30.0
M2-8:2FTS	Ave	0.2515	0.2458		2.34	2.40	-2.3	30.0
13C2 PFDA	Ave	0.6587	0.6764		2.57	2.50	2.7	30.0
d3-NMeFOSAA	Ave	0.3634	0.3927		2.70	2.50	8.1	30.0
d5-NEtFOSAA	Ave	0.3729	0.3996		2.68	2.50	7.2	30.0
13C2 PFUnA	Ave	0.5216	0.5328		2.55	2.50	2.1	30.0
13C2 PFDoA	Ave	0.5613	0.5535		2.47	2.50	-1.4	30.0
13C2-PFTeDA	Ave	0.6891	0.6894		2.50	2.50	0.0	30.0
13C2-PFHxDA	Ave	1.170	1.238		2.65	2.50	5.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_055.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 29-May-2018 00:01:52 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*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-May-2018 13:11:52 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 13:11:52

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	1.461	1.458	0.003	1.000	6808272	2.25		90.1	39049	
2 Perfluorobutyric acid										
212.90 > 169.00	1.461	1.461	0.0	1.000	2604755	1.03		103	1349	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.734	1.734	0.0	1.000	2134251	0.9713		97.1	1461	
D 3 13C5-PFPeA										
267.90 > 223.00	1.734	1.730	0.004	0.563	4653193	2.40		96.0	63750	
D 47 13C3-PFBS										
301.90 > 83.00	1.770	1.766	0.004	1.000	93299	2.13		91.6	841	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.770	1.770	0.0	1.000	2613858	0.8341		94.4	13117	
298.90 > 99.00	1.770	1.770	0.0	1.000	1096532		2.38(1.25-3.74)		9497	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.988	1.988	0.0	1.000	717824	1.08		116	30924	
D 60 M2-4:2FTS										
329.00 > 81.00	1.988	1.982	0.006	1.000	766148	NC			7751	
D 7 13C2 PFHxA										
315.00 > 270.00	2.022	2.016	0.006	1.000	5027977	2.43		97.3	86309	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.022	2.022	0.0	1.000	1970994	0.9532		95.3	3474	
313.00 > 119.00	2.022	2.022	0.0	1.000	178443		11.05(5.03-15.10)		2550	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.045	2.045	0.0	1.000	2625755	0.9409		100	24949	
349.00 > 99.00	2.045	2.045	0.0	1.000	956084		2.75(1.36-4.07)		16209	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.124	2.117	0.007	1.000	294004	NC			5578	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.124	2.124	0.0	1.000	307284	NC			2161	
D 9 13C4-PFHpA										
367.00 > 322.00	2.355	2.347	0.008	1.000	4754752	2.40		96.0	76864	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.355	2.355	0.0	1.000	1994713	0.99		99.3	2805	
363.00 > 169.00	2.355	2.355	0.0	1.000	769272		2.59(1.13-3.40)		3888	
D 11 18O2 PFHxS										
403.00 > 84.00	2.368	2.360	0.008	1.000	5497098	2.25		95.0	47408	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.368	2.368	0.0	1.000	2119256	0.8092		88.9	8360	
399.00 > 99.00	2.368	2.368	0.0	1.000	727179		2.91(1.50-4.49)		3697	
65 Adona										
377.00 > 251.00	2.403	2.403	0.0	1.000	5741970	NC			48040	
377.00 > 85.00	2.403	2.403	0.0	1.000	3506476		1.64(0.84-2.53)		49032	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.688	2.688	0.0	1.000	737661	0.8768		92.5	17062	
D 12 M2-6:2FTS										
429.00 > 81.00	2.688	2.684	0.004	1.000	1125410	2.57		108	19800	
D 14 13C4 PFOA										
417.00 > 372.00	2.711	2.706	0.005	1.000	4642112	2.48		99.1	75065	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.711	2.711	0.0	1.000	2067132	0.9458		94.6	712	
413.00 > 169.00	2.711	2.711	0.0	1.000	1094334		1.89(0.84-2.52)		4540	
* 62 13C2-PFOA										
415.00 > 370.00	2.711	2.711	0.0		4945573	2.50			47596	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.718	2.718	0.0	1.000	1936300	0.9352		98.2	16321	
449.00 > 99.00	2.718	2.718	0.0	1.000	516311		3.75(1.94-5.82)		9754	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.079	3.079	0.0	1.000	1552710	0.8495		91.5	7247	
499.00 > 99.00	3.079	3.079	0.0	1.000	329107		4.72(2.31-6.93)		5086	
D 19 13C5 PFNA										
468.00 > 423.00	3.079	3.076	0.003	1.000	4032071	2.63		105	56049	
D 18 13C4 PFOS										
503.00 > 80.00	3.079	3.076	0.003	1.000	3715300	2.21		92.4	20131	
20 Perfluorononanoic acid										
463.00 > 419.00	3.079	3.079	0.0	1.000	1555517	0.9106		91.1	4480	
463.00 > 169.00	3.079	3.079	0.0	1.000	369102		4.21(1.90-5.69)		12595	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.286	3.286	0.0	1.000	2692693	NC			35091	
D 21 13C8 FOSA										
506.00 > 78.00	3.416	3.411	0.005	1.000	4737854	2.15		86.1	46144	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.416	3.416	0.0	1.000	1912734	1.04		104	26587	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.425	3.425	0.0	1.000	581972	0.8870		92.6	12361	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.425	3.425	0.0	1.000	1150241	0.9768		102	14148	
549.00 > 99.00	3.425	3.425	0.0	1.000	429761		2.68(1.33-3.97)		14156	
D 26 M2-8:2FTS										
529.00 > 81.00	3.425	3.430	-0.005	1.000	1164451	2.34		97.7	18354	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.444	3.444	0.0	1.000	1220073	0.9378		93.8	6547	
513.00 > 169.00	3.444	3.444	0.0	1.000	212785		5.73(2.36-7.09)		5181	
D 23 13C2 PFDA										
515.00 > 470.00	3.444	3.439	0.005	1.000	3345399	2.57		103	59277	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.596	3.589	0.007	1.000	1941966	2.70		108	23509	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.596	3.596	0.0	1.000	803200	1.02		102	6677	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.750	3.750	0.0	1.000	981230	0.9401		97.5	16515	
599.00 > 99.00	3.750	3.750	0.0	1.000	321894		3.05(1.39-4.16)		6634	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.760	3.753	0.007	1.000	1976246	2.68		107	16263	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.771	3.771	0.0	1.003	722754	0.9726		97.3	14787	
D 30 13C2 PFUnA										
565.00 > 520.00	3.771	3.763	0.007	1.000	2635220	2.55		102	53476	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.760	3.760	0.0	0.997	847301	0.9624		96.2	5328	
563.00 > 169.00	3.771	3.760	0.010	1.000	205447		4.12(2.12-6.36)		6258	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.917	3.917	0.0	1.000	3960347	NC			41126	
D 36 13C2 PFDoA										
615.00 > 570.00	4.060	4.051	0.009	1.000	2737282	2.47		98.6	22075	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.060	4.060	0.0	1.000	1155469	1.01		101	1281	
613.00 > 169.00	4.060	4.060	0.0	1.000	264416		4.37(2.13-6.40)		4495	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.318	4.318	0.0	1.000	1265443	1.01		101	1199	
663.00 > 169.00	4.318	4.318	0.0	1.000	380706		3.32(1.25-3.76)		5092	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.563	4.563	0.0	1.000	329182	0.9558		95.6	4450	
713.00 > 219.00	4.553	4.563	-0.010	0.998	224208		1.47(0.71-2.13)		4262	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.563	4.553	0.010	1.000	3409395	2.50		100	17348	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.974	4.967	0.007	1.000	6123706	2.65		106	13418	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.974	4.974	0.0	1.000	2365433	NC			943	
813.00 > 169.00	4.974	4.974	0.0	1.000	382866		6.18(2.86-8.58)		3396	

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	5.336	5.336	0.0	1.000	2453320	NC			730	
913.00 > 169.00	5.328	5.336	-0.008	0.999	288188		8.51(3.83-11.48)		2869	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00004 Amount Added: 1.00 Units: mL

Report Date: 30-May-2018 13:11:54 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_055.d

Injection Date: 29-May-2018 00:01:52 Instrument ID: A8_N

Lims ID: CCV L4

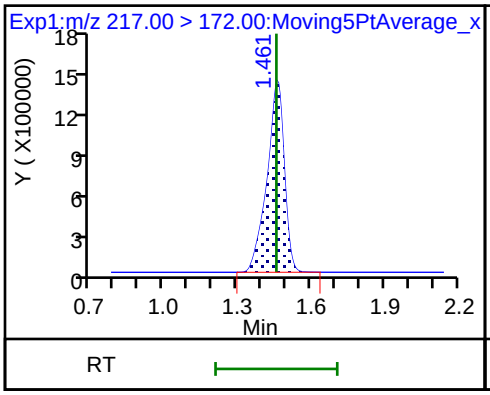
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 1

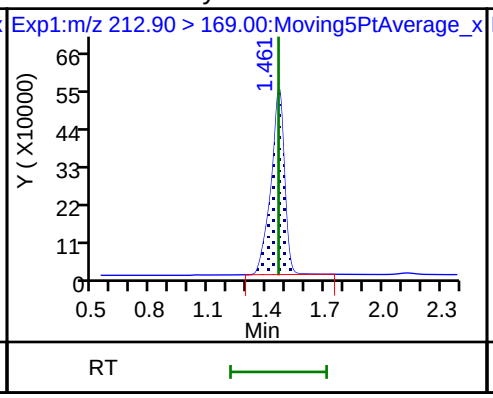
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

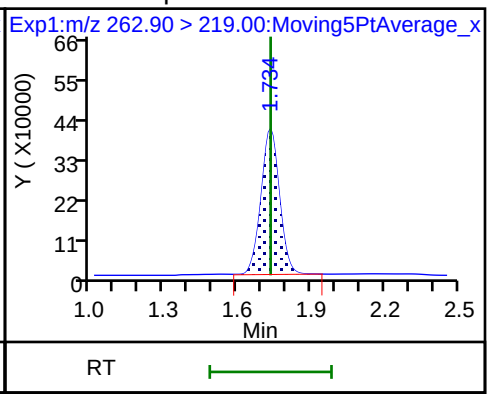
D 1 13C4 PFBA



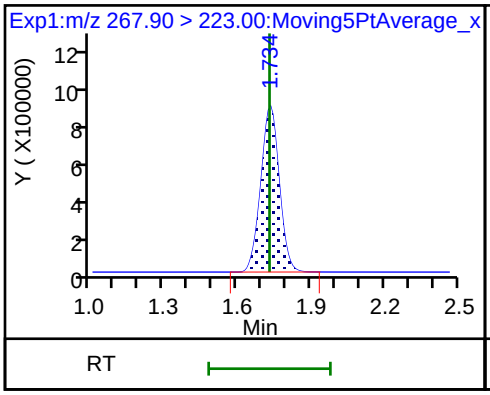
2 Perfluorobutyric acid



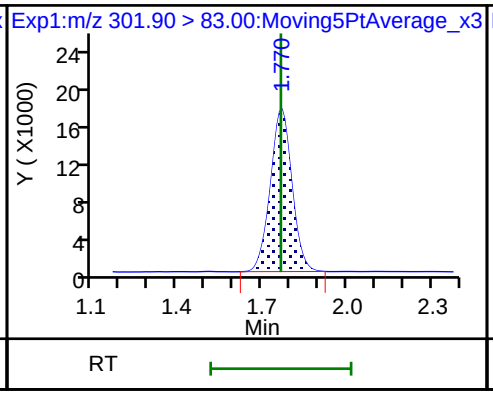
4 Perfluoropentanoic acid



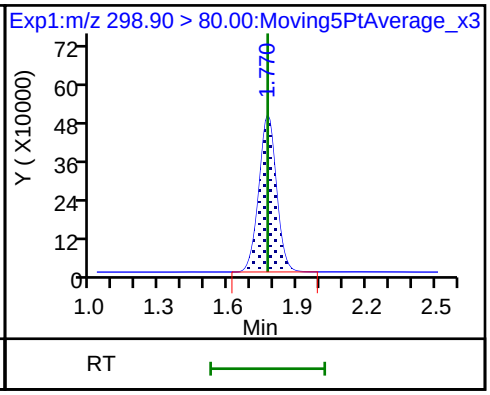
D 3 13C5-PFPeA



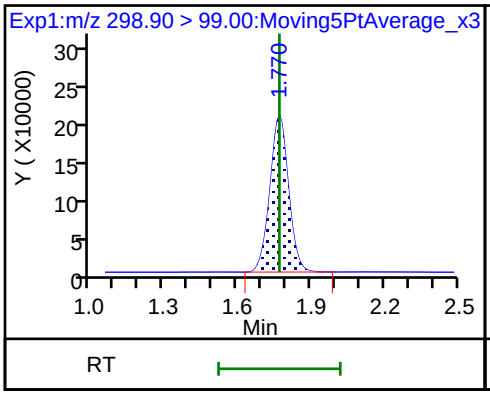
D 47 13C3-PFBS



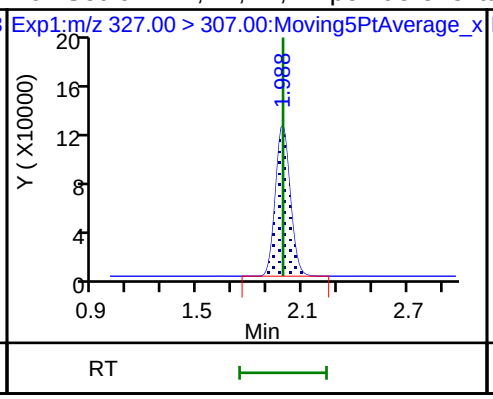
5 Perfluorobutanesulfonic acid



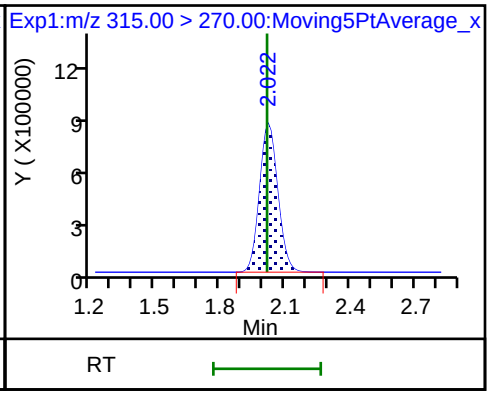
5 Perfluorobutanesulfonic acid



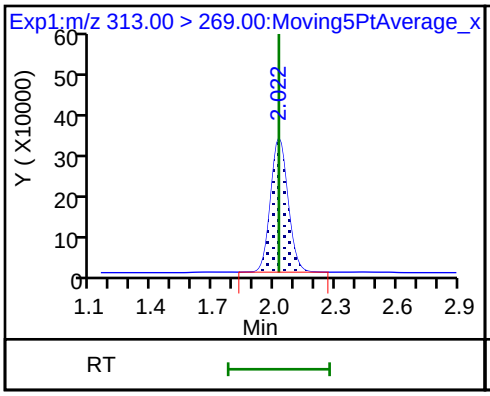
61 Sodium 1H,1H,2H,2H-perfluorohexa



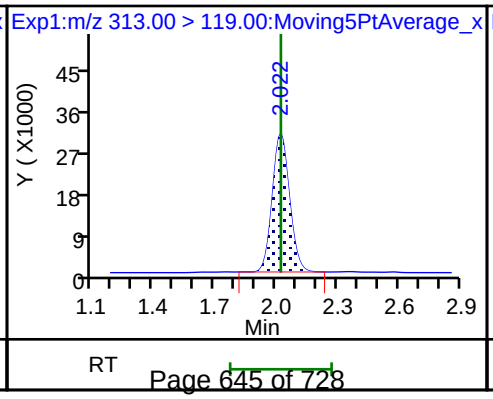
D 7 13C2 PFHxA



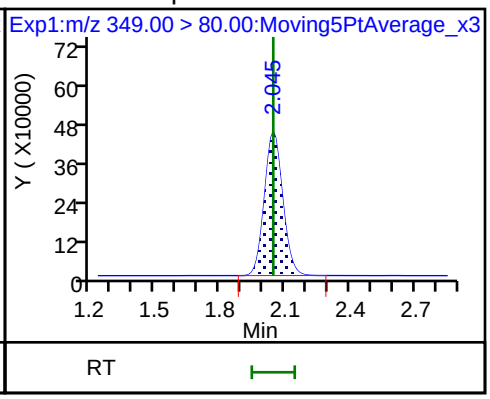
6 Perfluorohexanoic acid



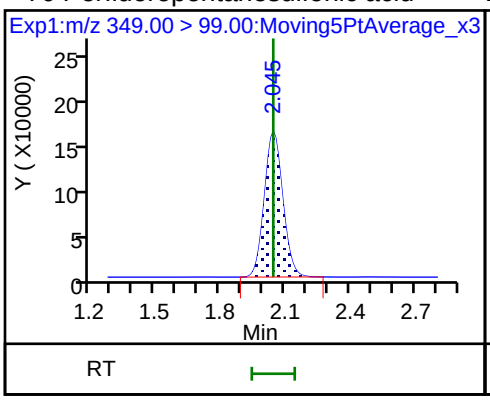
6 Perfluorohexanoic acid



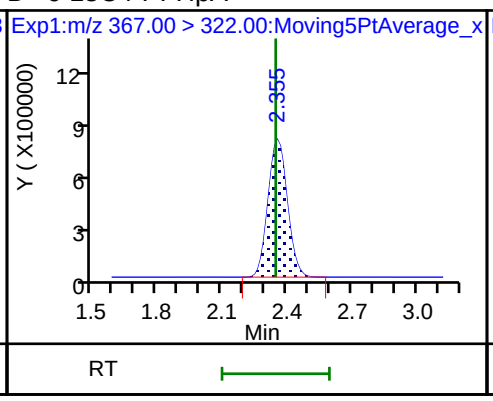
70 Perfluoropentanesulfonic acid



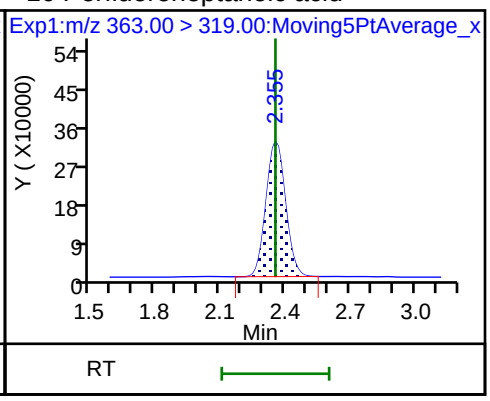
70 Perfluoropentanesulfonic acid



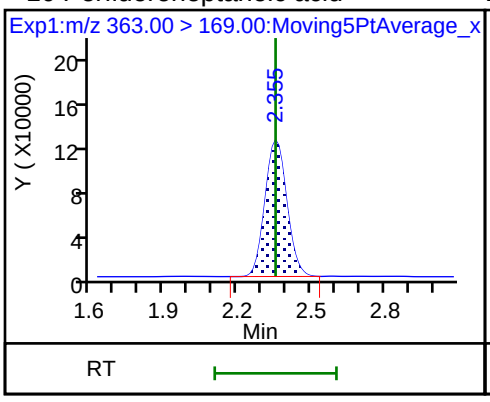
D 9 13C4-PFHpA



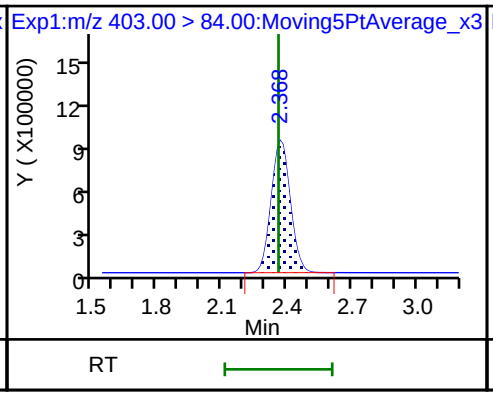
10 Perfluoroheptanoic acid



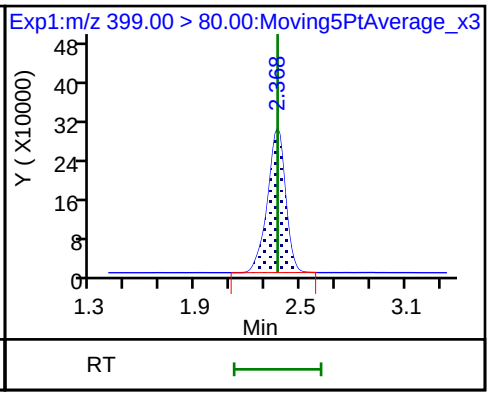
10 Perfluoroheptanoic acid



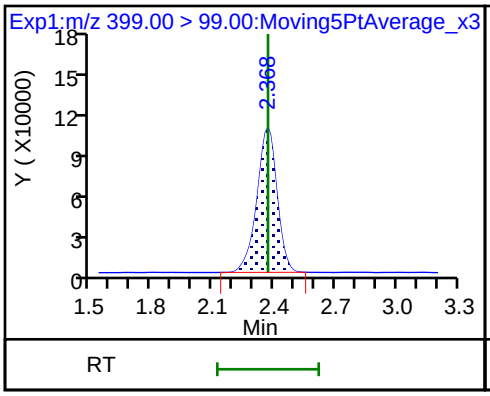
D 11 18O2 PFHxS



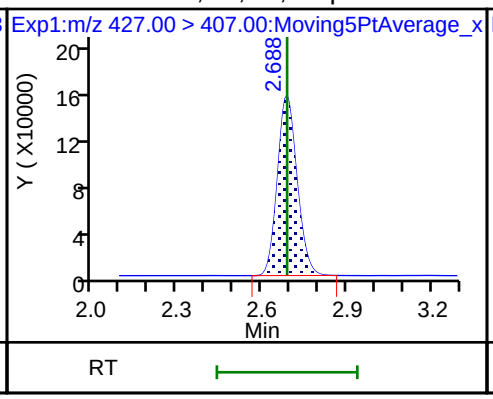
8 Perfluorohexanesulfonic acid



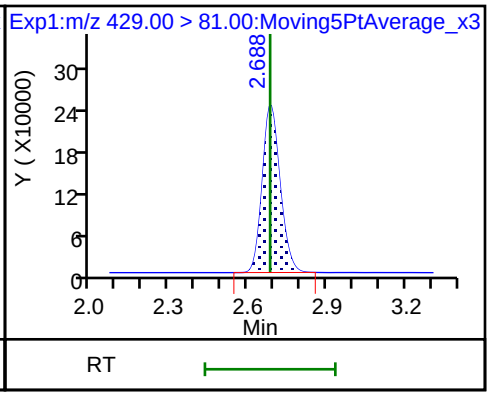
8 Perfluorohexanesulfonic acid



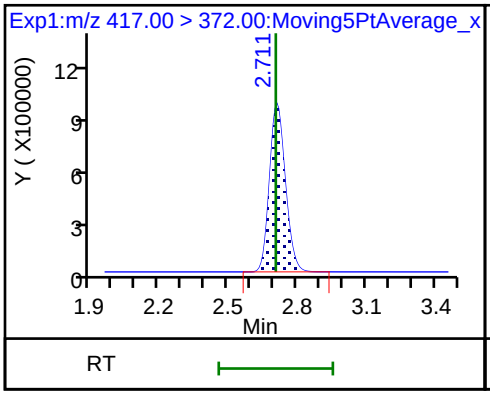
13 Sodium 1H,1H,2H,2H-perfluorooctane



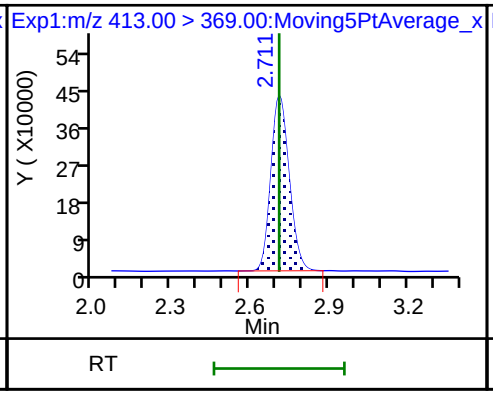
D 12 M2-6:2FTS



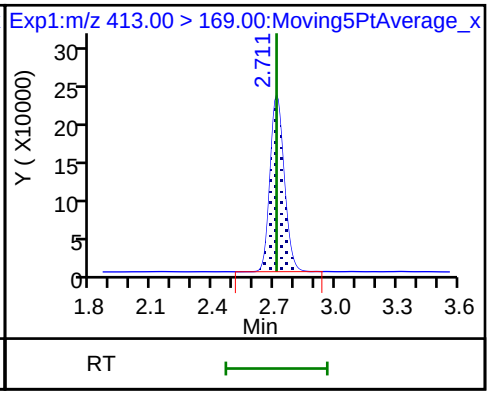
D 14 13C4 PFOA



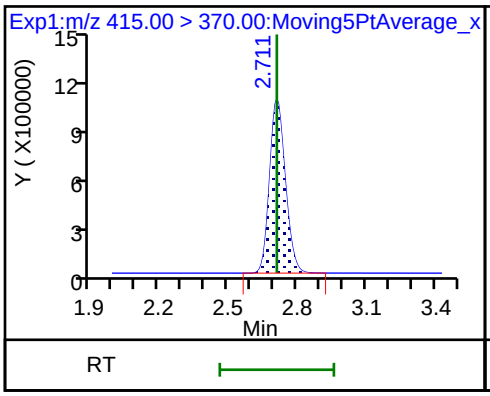
15 Perfluorooctanoic acid



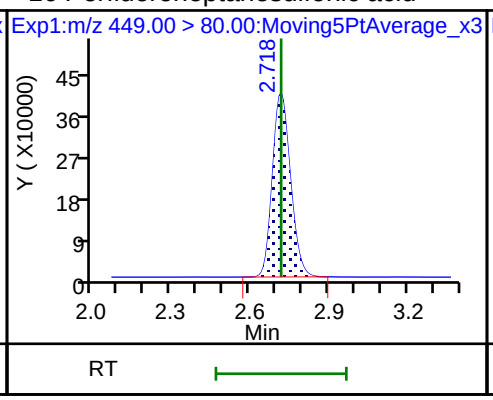
15 Perfluorooctanoic acid



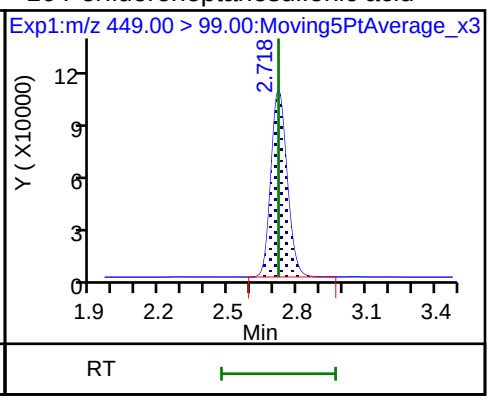
* 62 13C2-PFOA



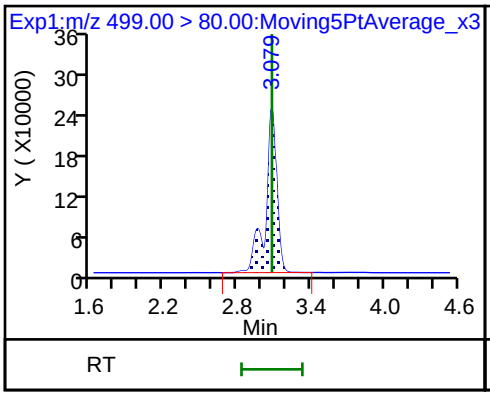
16 Perfluoroheptanesulfonic acid



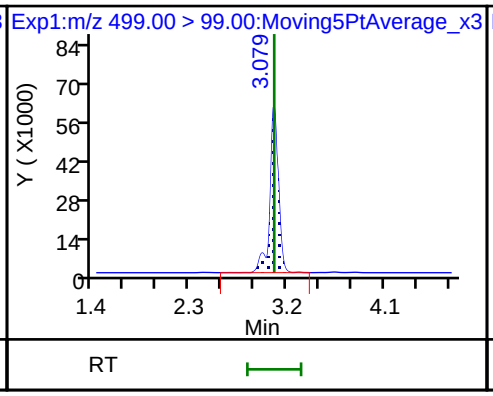
16 Perfluoroheptanesulfonic acid



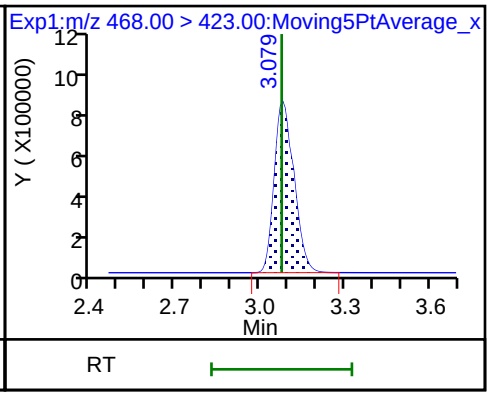
17 Perfluorooctane sulfonic acid



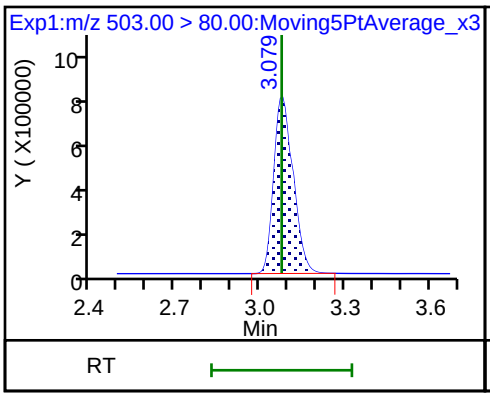
17 Perfluorooctane sulfonic acid



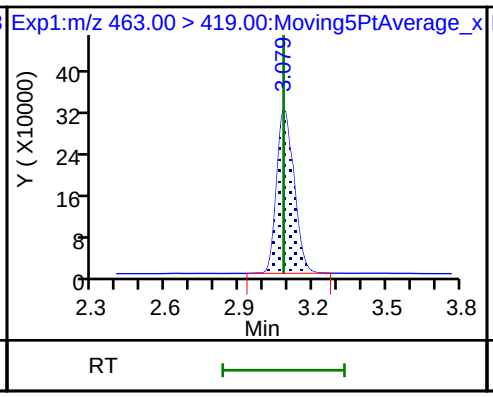
D 19 13C5 PFNA



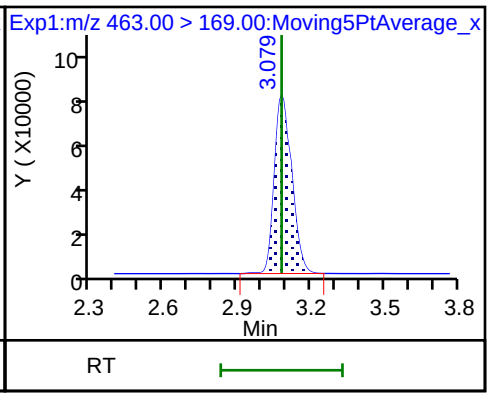
D 18 13C4 PFOS



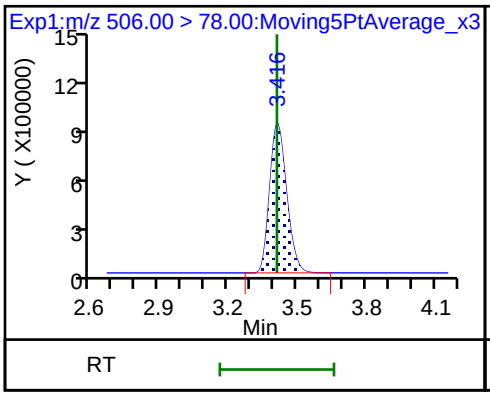
20 Perfluorononanoic acid



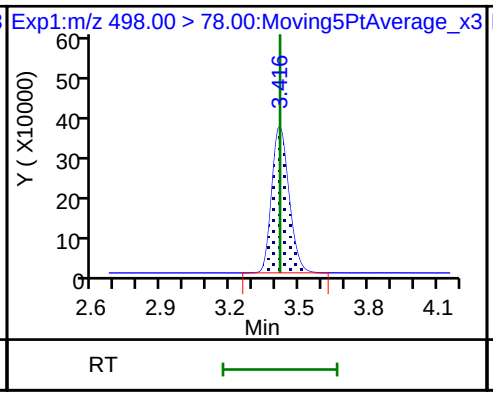
20 Perfluorononanoic acid



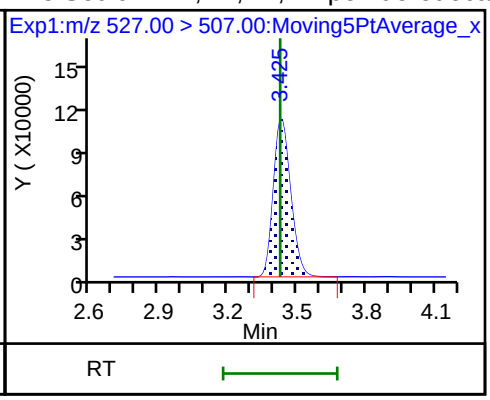
D 21 13C8 FOSA



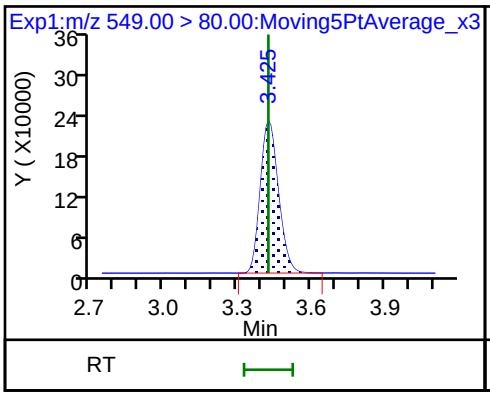
22 Perfluorooctane Sulfonamide



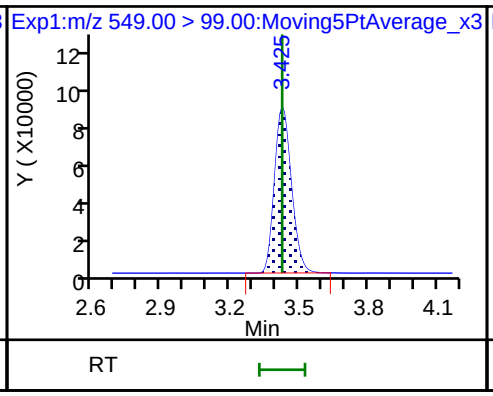
25 Sodium 1H,1H,2H,2H-perfluorodecane



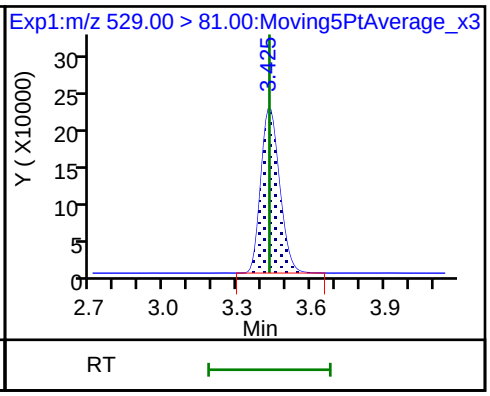
68 Perfluorononanesulfonic acid



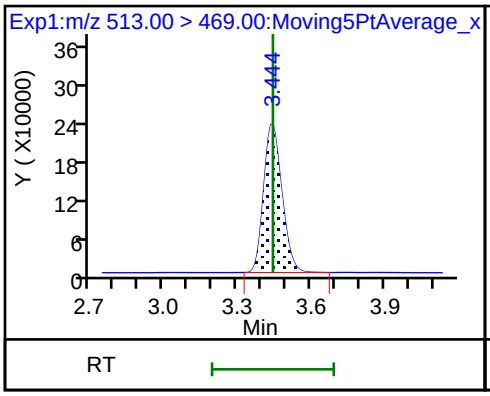
68 Perfluorononanesulfonic acid



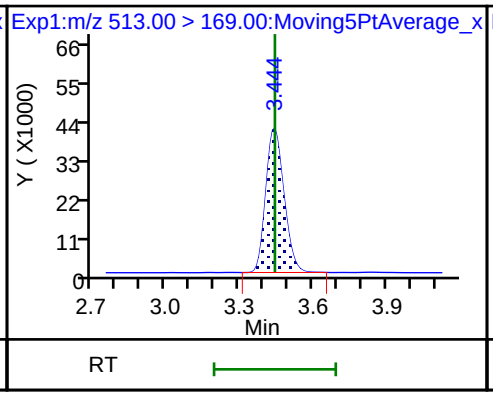
D 26 M2-8:2FTS



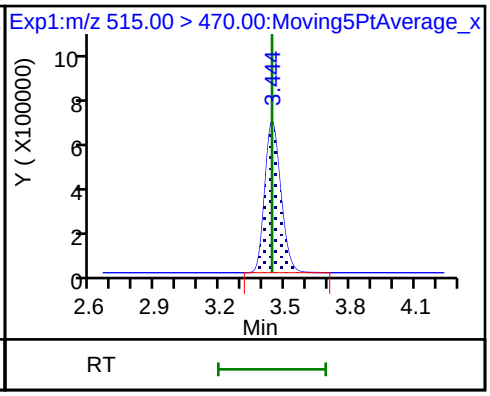
24 Perfluorodecanoic acid



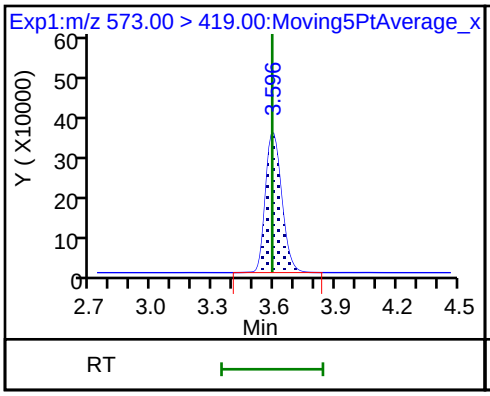
24 Perfluorodecanoic acid



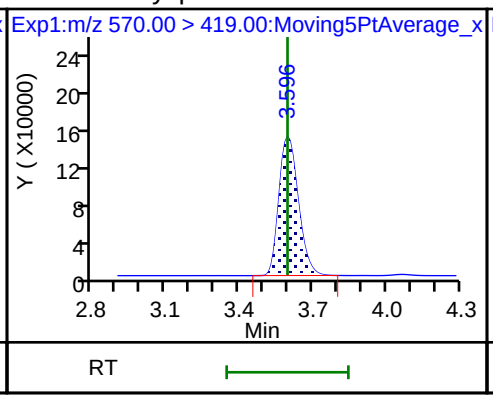
D 23 13C2 PFDA



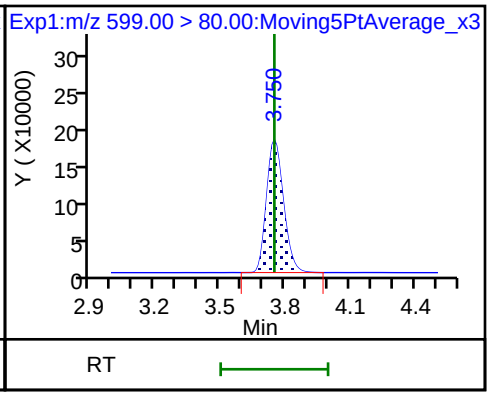
D 27 d3-NMeFOSAA



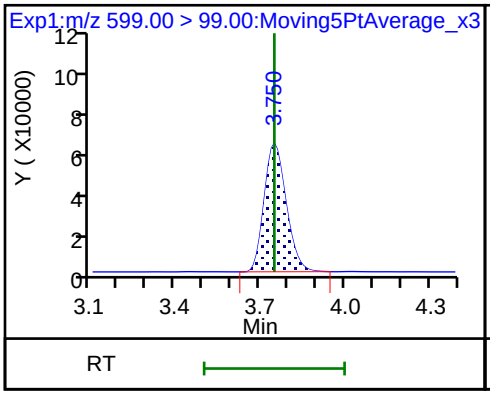
28 N-methyl perfluorooctane sulfonami



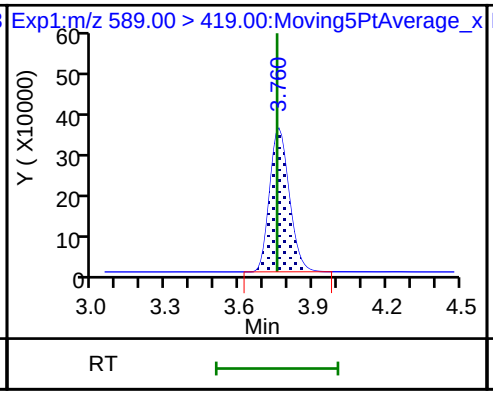
29 Perfluorodecane Sulfonic acid



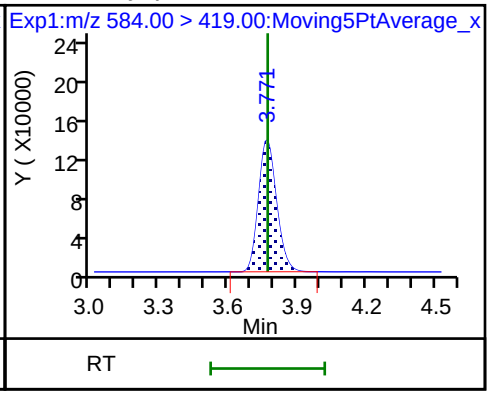
29 Perfluorodecane Sulfonic acid



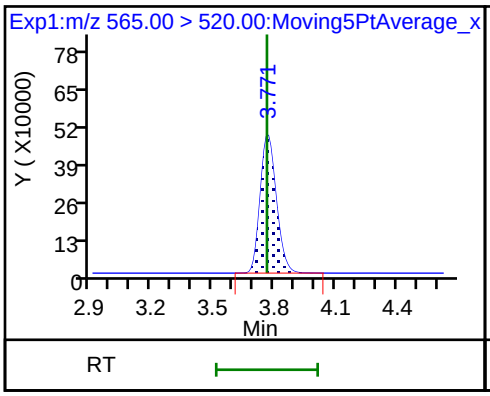
D 32 d5-NEtFOSAA



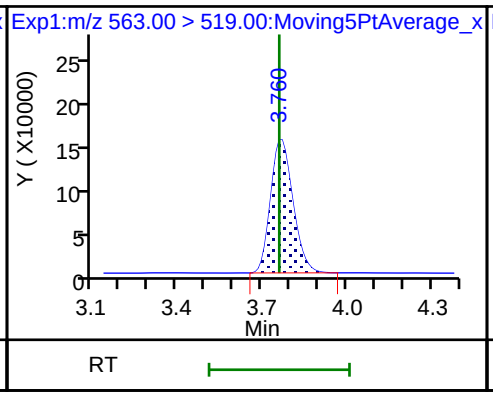
33 N-ethyl perfluorooctane sulfonamid



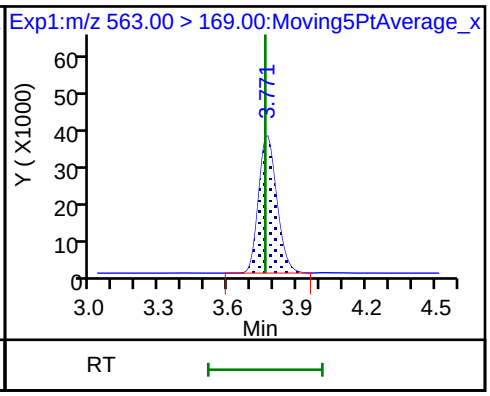
D 30 13C2 PFUnA



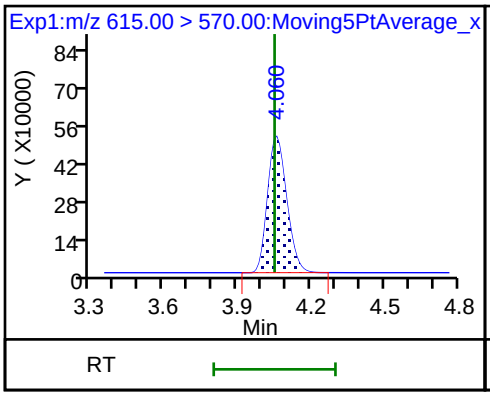
31 Perfluoroundecanoic acid



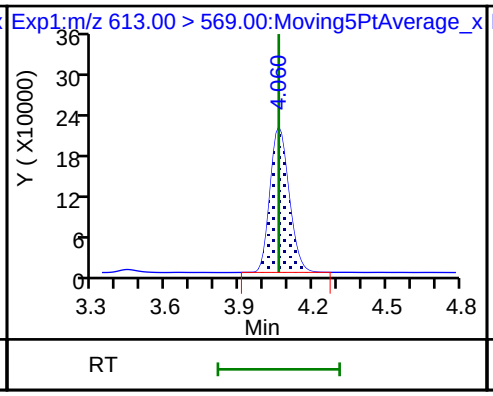
31 Perfluoroundecanoic acid



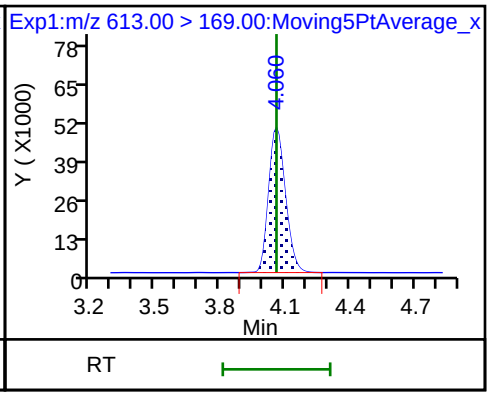
D 36 13C2 PFDoA



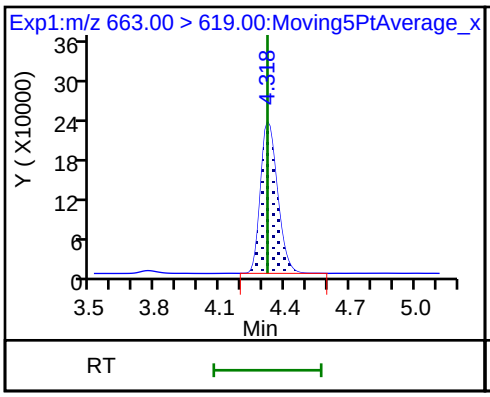
37 Perfluorododecanoic acid



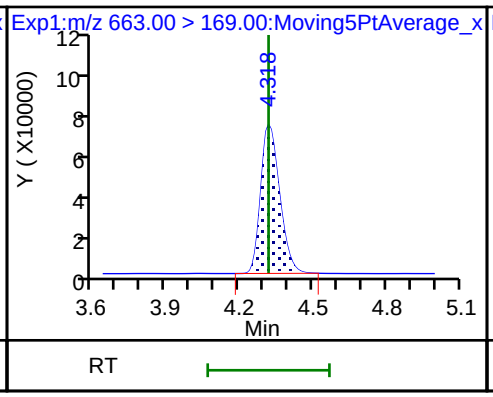
37 Perfluorododecanoic acid



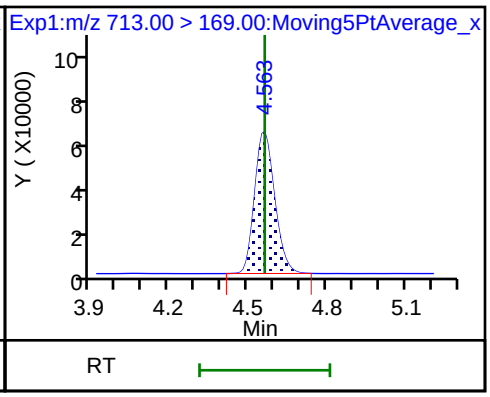
41 Perfluorotridecanoic acid



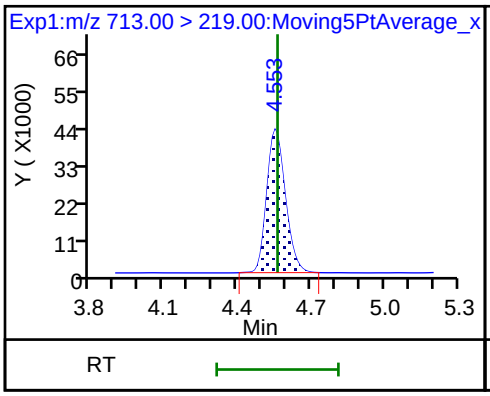
41 Perfluorotridecanoic acid



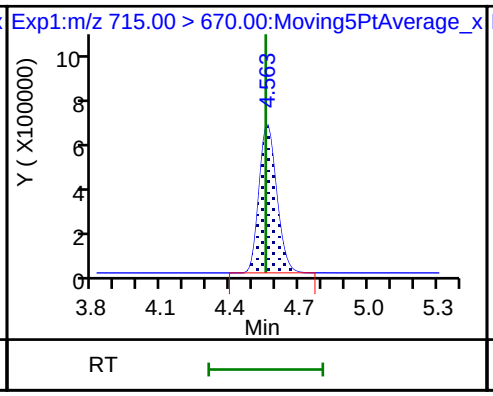
42 Perfluorotetradecanoic acid



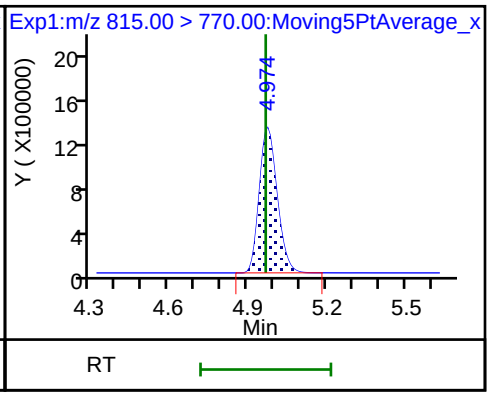
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225884/11 Calibration Date: 05/29/2018 01:27

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_066.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	0.9792		2.63	2.50	5.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.153		2.44	2.50	-2.3	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	81.38		2.30	2.21	4.2	30.0
4:2 FTS	AveID	16.57	18.34		2.58	2.34	10.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.024		2.49	2.50	-0.4	30.0
Perfluoropentanesulfonic acid	AveID	69.55	72.75		2.45	2.35	4.6	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.058		2.50	2.50	0.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.073		2.17	2.28	-4.8	30.0
6:2FTS	L2ID		1.644		2.21	2.37	-6.8	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.195		2.54	2.50	1.6	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.389		2.48	2.38	4.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.123		2.22	2.32	-4.5	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.047		2.47	2.50	-1.2	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.039		2.67	2.50	6.7	30.0
8:2FTS	AveID	1.349	1.235		2.19	2.40	-8.5	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.8107		2.57	2.40	7.0	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.096		2.82	2.50	12.7	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.009		2.49	2.50	-0.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.7001		2.51	2.41	4.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9396		2.50	2.50	-0.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.8391		2.51	2.50	0.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.056		2.53	2.50	1.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.171		2.56	2.50	2.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2391		2.37	2.50	-5.3	30.0
13C4 PFBA	Ave	1.528	1.376		2.25	2.50	-10.0	30.0
13C5 PFPeA	Ave	0.9798	0.9493		2.42	2.50	-3.1	30.0
13C3-PFBS	Ave	0.0221	0.0195		2.05	2.33	-12.0	30.0
13C2 PFHxA	Ave	1.045	1.004		2.40	2.50	-3.9	30.0
13C4-PFHpA	Ave	1.001	0.9637		2.41	2.50	-3.7	30.0
18O2 PFHxS	Ave	1.237	1.140		2.18	2.37	-7.9	30.0
M2-6:2FTS	Ave	0.2210	0.2280		2.45	2.38	3.2	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225884/11 Calibration Date: 05/29/2018 01:27

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_066.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9013		2.38	2.50	-4.8	30.0
13C4 PFOS	Ave	0.8503	0.7672		2.16	2.39	-9.8	30.0
13C5 PFNA	Ave	0.7745	0.7702		2.49	2.50	-0.5	30.0
13C8 FOSA	Ave	1.113	0.9678		2.17	2.50	-13.0	30.0
M2-8:2FTS	Ave	0.2515	0.2453		2.34	2.40	-2.5	30.0
13C2 PFDA	Ave	0.6587	0.6107		2.32	2.50	-7.3	30.0
d3-NMeFOSAA	Ave	0.3634	0.3927		2.70	2.50	8.1	30.0
13C2 PFUnA	Ave	0.5216	0.5033		2.41	2.50	-3.5	30.0
d5-NEtFOSAA	Ave	0.3729	0.3922		2.63	2.50	5.2	30.0
13C2 PFDoA	Ave	0.5613	0.5486		2.44	2.50	-2.3	30.0
13C2-PFTeDA	Ave	0.6891	0.6997		2.54	2.50	1.5	30.0
13C2-PFHxDA	Ave	1.170	1.218		2.60	2.50	4.1	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_066.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 29-May-2018 01:27:44 ALS Bottle#: 14 Worklist Smp#: 11
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*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-May-2018 13:20:49 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 13:20:49

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	1.461	1.458	0.003	1.000	6521458	2.25		90.0	37878	
2 Perfluorobutyric acid										
212.90 > 169.00	1.461	1.461	0.0	1.000	6385838	2.63		105	4168	
D 3 13C5-PFPeA										
267.90 > 223.00	1.725	1.730	-0.005	0.560	4500685	2.42		96.9	61188	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.725	1.725	0.0	1.000	5189816	2.44		97.7	3631	
D 47 13C3-PFBS										
301.90 > 83.00	1.761	1.766	-0.005	1.000	85890	2.05		88.0	706	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.770	1.770	0.0	1.005	6644383	2.30		104	33011	
298.90 > 99.00	1.770	1.770	0.0	1.005	2727269		2.44(1.25-3.74)		23185	
D 60 M2-4:2FTS										
329.00 > 81.00	1.977	1.982	-0.005	1.000	722812	NC			7240	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.977	1.977	0.0	1.000	1581606	2.58		111	89292	
D 7 13C2 PFHxA										
315.00 > 270.00	2.022	2.016	0.006	1.000	4759314	2.40		96.1	80807	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.022	2.022	0.0	1.000	4873940	2.49		99.6	13401	
313.00 > 119.00	2.022	2.022	0.0	1.000	433262		11.25(5.03-15.10)		6096	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.044	2.044	0.0	1.000	6302680	2.45		105	43964	
349.00 > 99.00	2.044	2.044	0.0	1.000	2375629		2.65(1.36-4.07)		33253	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.112	2.117	-0.005	1.000	219395	NC			4530	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.123	2.123	0.0	1.005	750702	NC			4634	
D 9 13C4-PFHpA										
367.00 > 322.00	2.354	2.347	0.007	1.000	4569170	2.41		96.3	55672	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.354	2.354	0.0	1.000	4833952	2.50		100	6400	
363.00 > 169.00	2.354	2.354	0.0	1.000	1805913		2.68(1.13-3.40)		11541	
D 11 18O2 PFHxS										
403.00 > 84.00	2.368	2.360	0.008	1.000	5112884	2.18		92.1	45880	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.368	2.368	0.0	1.000	5278657	2.17		95.2	15474	
399.00 > 99.00	2.368	2.368	0.0	1.000	1775174		2.97(1.50-4.49)		8653	
65 Adona										
377.00 > 251.00	2.392	2.392	0.0	1.000	14162253	NC			91197	
377.00 > 85.00	2.392	2.392	0.0	1.000	8333623		1.70(0.84-2.53)		77526	
D 12 M2-6:2FTS										
429.00 > 81.00	2.680	2.684	-0.004	1.000	1026767	2.45		103	21210	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.680	2.680	0.0	1.000	1684338	2.21		93.2	28867	
D 14 13C4 PFOA										
417.00 > 372.00	2.710	2.706	0.004	1.000	4272909	2.38		95.2	39430	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.710	2.710	0.0	1.000	5107560	2.54		102	1812	
413.00 > 169.00	2.710	2.710	0.0	1.000	2576255		1.98(0.84-2.52)		9640	
* 62 13C2-PFOA										
415.00 > 370.00	2.710	2.710	0.0		4741080	2.50			54274	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.718	2.718	0.0	1.000	4809475	2.48		104	29656	
449.00 > 99.00	2.718	2.718	0.0	1.000	1311141		3.67(1.94-5.82)		18087	
D 19 13C5 PFNA										
468.00 > 423.00	3.079	3.076	0.003	1.000	3651618	2.49		99.5	59282	
D 18 13C4 PFOS										
503.00 > 80.00	3.071	3.076	-0.005	1.000	3477407	2.16		90.2	19056	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.071	3.071	0.0	1.000	3790824	2.22		95.5	17374	
499.00 > 99.00	3.071	3.071	0.0	1.000	828097		4.58(2.31-6.93)		11754	
20 Perfluorononanoic acid										
463.00 > 419.00	3.079	3.079	0.0	1.000	3822272	2.47		98.8	11629	
463.00 > 169.00	3.079	3.079	0.0	1.000	900446		4.24(1.90-5.69)		46763	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.286	3.286	0.0	1.000	6532915	NC			71510	
D 21 13C8 FOSA										
506.00 > 78.00	3.415	3.411	0.004	1.000	4588424	2.17		87.0	63333	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.415	3.415	0.0	1.000	4768664	2.67		107	34300	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.424	3.424	0.0	1.000	1376215	2.19		91.5	43046	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.424	3.424	0.0	1.000	2831081	2.57		107	26493	
549.00 > 99.00	3.424	3.424	0.0	1.000	1031578		2.74(1.33-3.97)		25150	
D 26 M2-8:2FTS										
529.00 > 81.00	3.424	3.430	-0.006	1.000	1114116	2.34		97.5	16492	
D 23 13C2 PFDA										
515.00 > 470.00	3.433	3.439	-0.006	1.000	2895204	2.32		92.7	32593	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.433	3.433	0.0	1.000	3172262	2.82		113	16693	
513.00 > 169.00	3.433	3.433	0.0	1.000	557303		5.69(2.36-7.09)		11957	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.595	3.589	0.006	1.000	1861994	2.70		108	22674	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.595	3.595	0.0	1.000	1879152	2.49		99.5	11124	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.749	3.749	0.0	1.000	2454950	2.51		104	32170	
599.00 > 99.00	3.749	3.749	0.0	1.000	807337		3.04(1.39-4.16)		14792	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.760	3.753	0.007	1.000	1859293	2.63		105	23633	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.770	3.770	0.0	1.003	2002450	2.51		100	8822	
563.00 > 169.00	3.760	3.770	-0.010	1.000	474996		4.22(2.12-6.36)		17081	
D 30 13C2 PFUnA										
565.00 > 520.00	3.760	3.763	-0.003	1.000	2386311	2.41		96.5	48118	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.760	3.760	0.0	1.000	1746935	2.50		100.0	25747	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.918	3.918	0.0	1.000	9983733	NC			81896	
D 36 13C2 PFDoA										
615.00 > 570.00	4.061	4.051	0.010	1.000	2600908	2.44		97.7	21695	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.061	4.061	0.0	1.000	2746796	2.53		101	3265	
613.00 > 169.00	4.061	4.061	0.0	1.000	653860		4.20(2.13-6.40)		6712	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.318	4.318	0.0	1.000	3046189	2.56		102	2843	
663.00 > 169.00	4.318	4.318	0.0	1.000	987950		3.08(1.25-3.76)		11678	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.553	4.553	0.0	1.000	3317479	2.54		102	19748	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.553	4.553	0.0	1.000	793241	2.37		94.7	8288	
713.00 > 219.00	4.553	4.553	0.0	1.000	593369		1.34(0.71-2.13)		10253	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.966	4.967	-0.001	1.000	5773780	2.60		104	13746	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.975	4.975	0.0	1.002	5776493	NC			2212	
813.00 > 169.00	4.966	4.975	-0.009	1.000	951041		6.07(2.86-8.58)		6915	

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	5.329	5.329	0.0	1.000	6432979	NC			1689	
913.00 > 169.00	5.329	5.329	0.0	1.000	766120		8.40(3.83-11.48)		5159	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00004 Amount Added: 1.00 Units: mL

Report Date: 30-May-2018 13:20:50 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_066.d

Injection Date: 29-May-2018 01:27:44 Instrument ID: A8_N

Lims ID: CCV L5

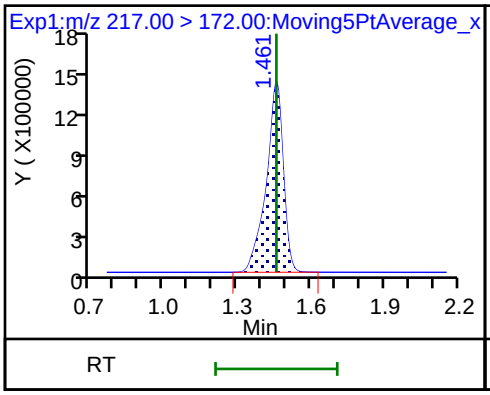
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 11

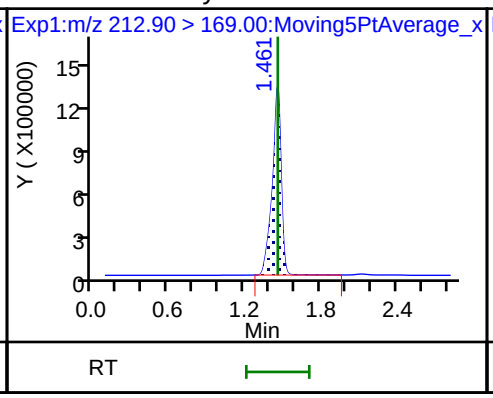
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

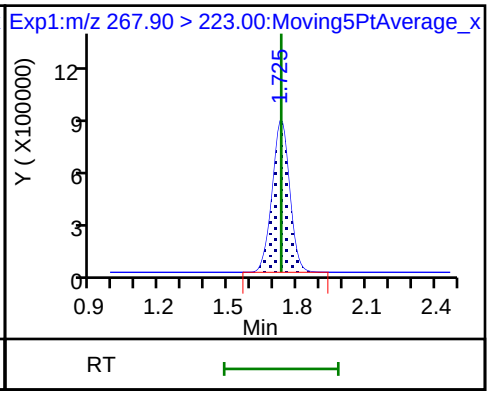
D 1 13C4 PFBA



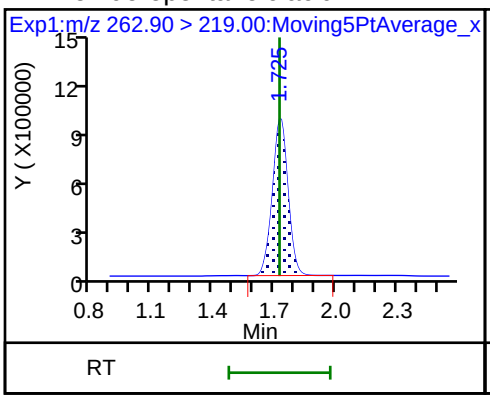
2 Perfluorobutyric acid



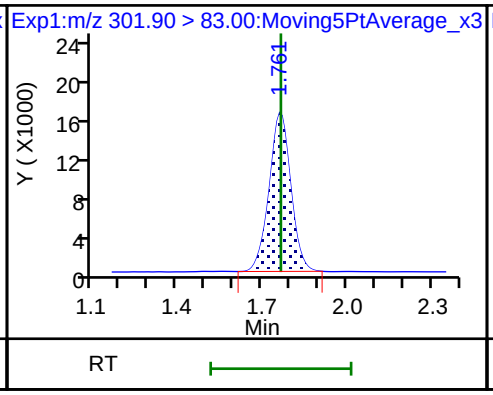
D 3 13C5-PFPeA



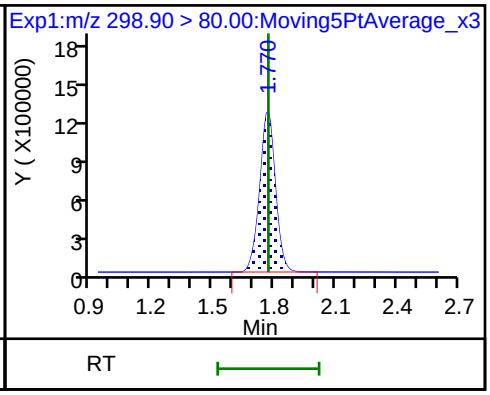
4 Perfluoropentanoic acid



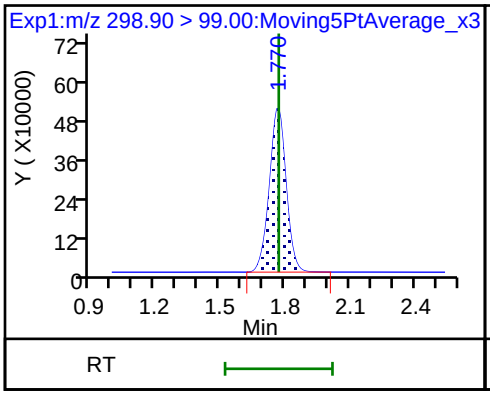
D 47 13C3-PFBS



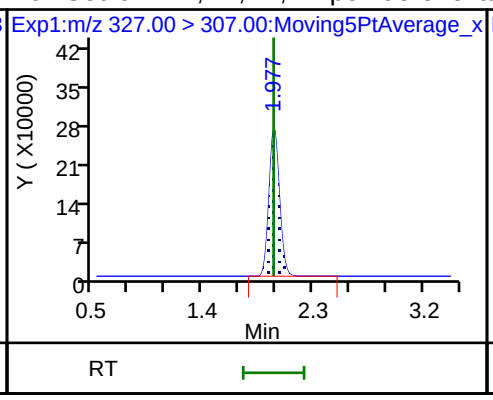
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid



61 Sodium 1H,1H,2H,2H-perfluorohexa



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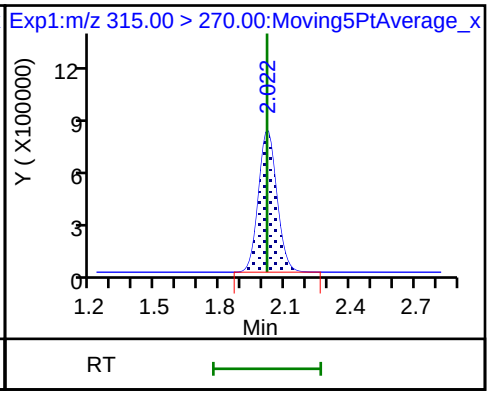
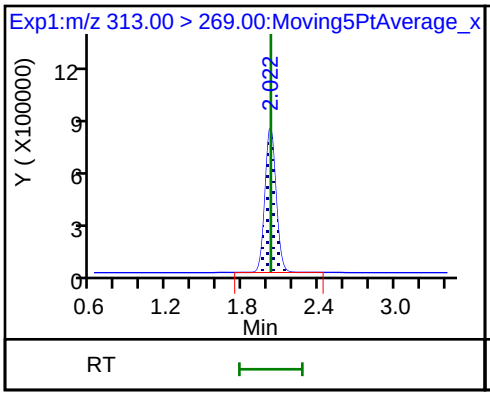
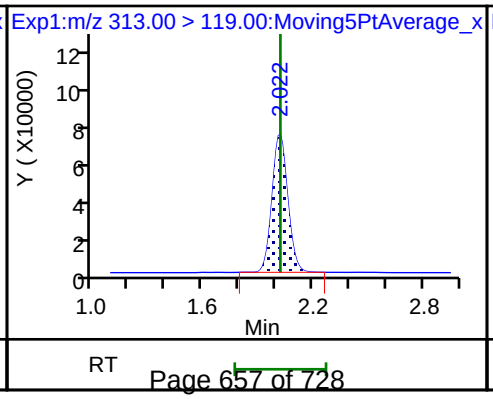


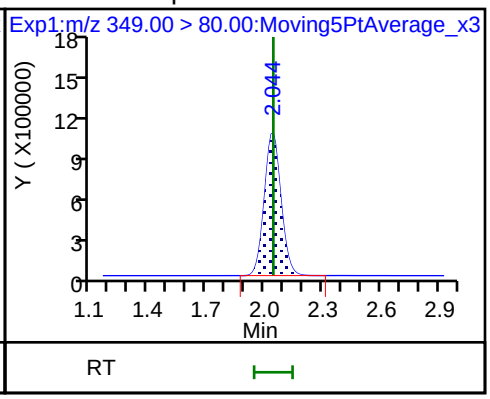
6 Perfluorohexanoic acid



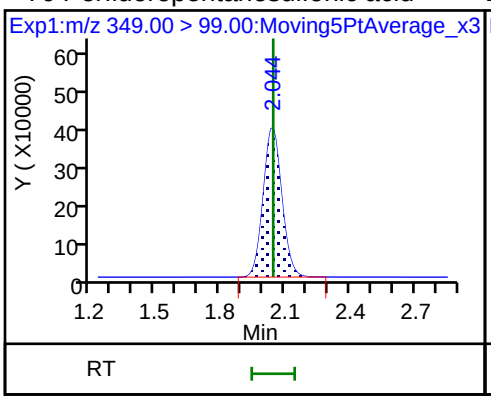
6 Perfluorohexanoic acid



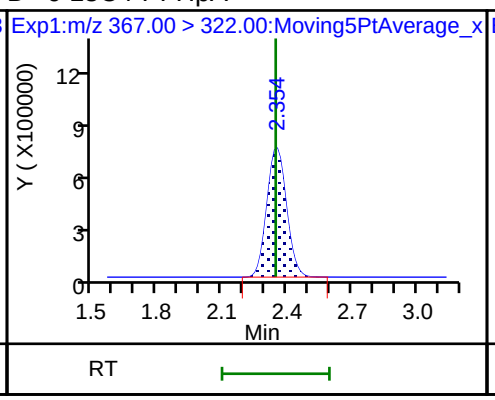
70 Perfluoropentanesulfonic acid



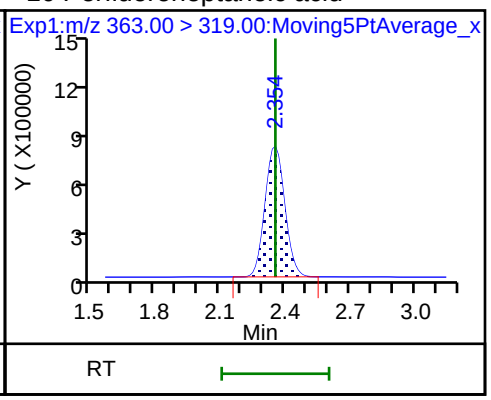
70 Perfluoropentanesulfonic acid



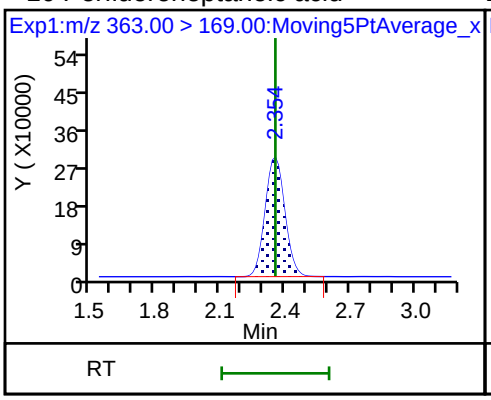
D 9 13C4-PFHpA



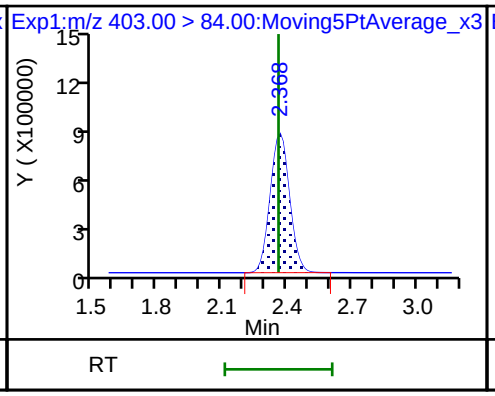
10 Perfluoroheptanoic acid



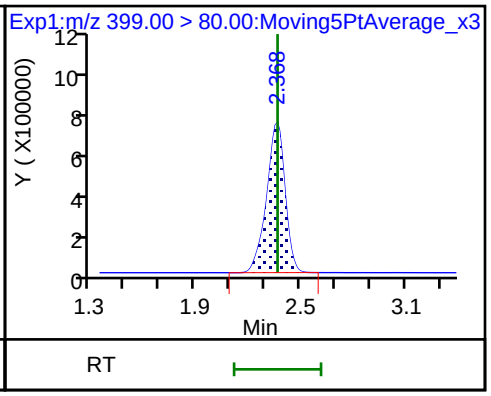
10 Perfluoroheptanoic acid



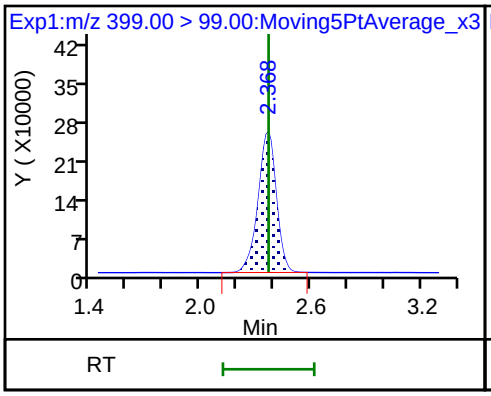
D 11 18O2 PFHxS



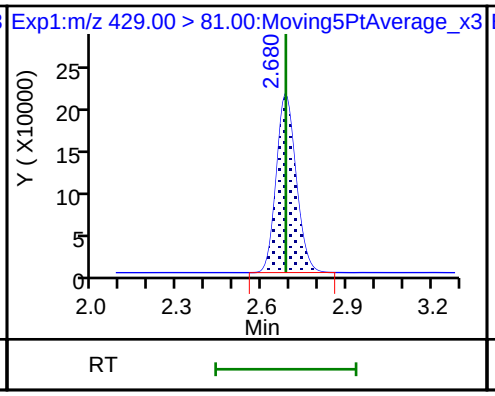
8 Perfluorohexanesulfonic acid



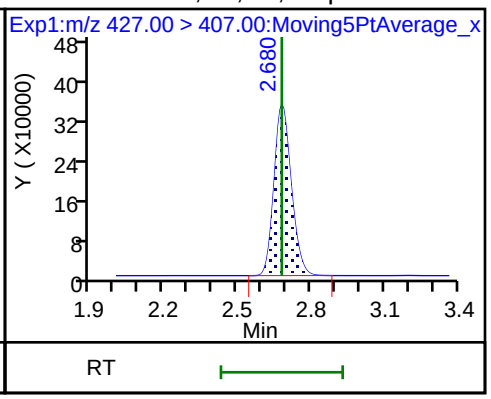
8 Perfluorohexanesulfonic acid



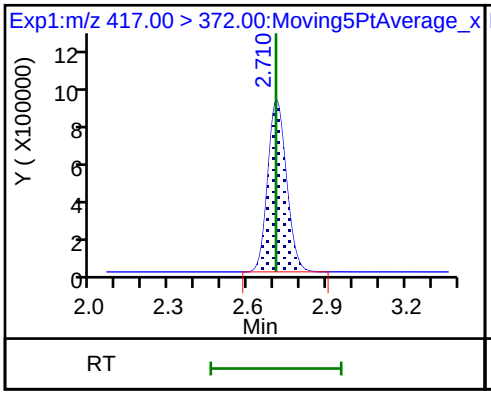
D 12 M2-6:2FTS



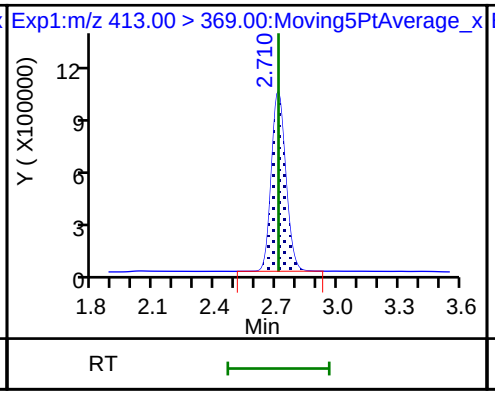
13 Sodium 1H,1H,2H,2H-perfluorooctane



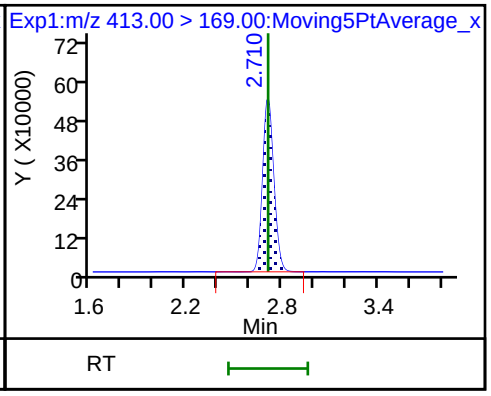
D 14 13C4 PFOA



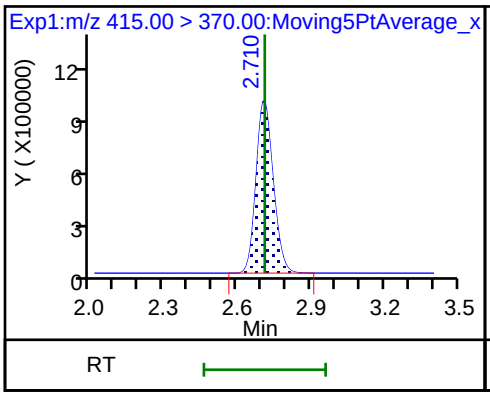
15 Perfluorooctanoic acid



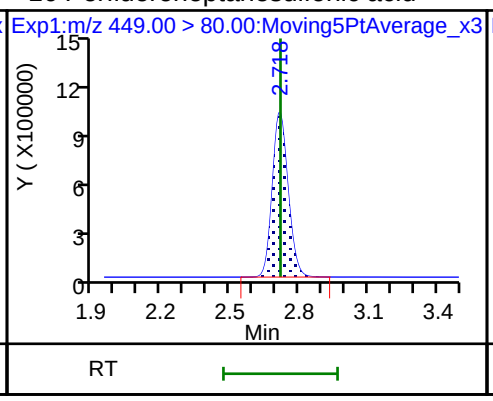
15 Perfluorooctanoic acid



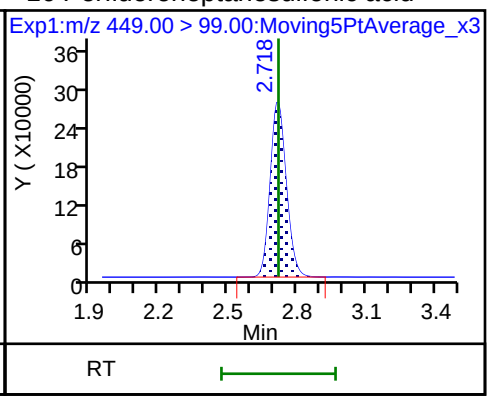
* 62 13C2-PFOA



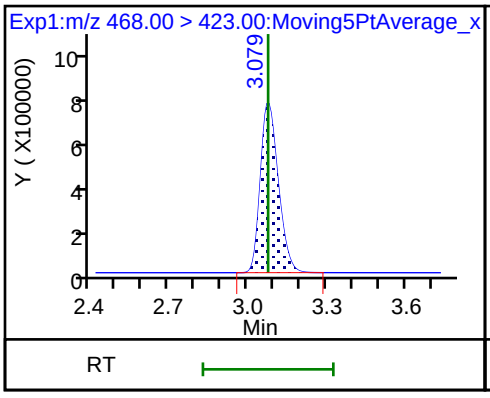
16 Perfluoroheptanesulfonic acid



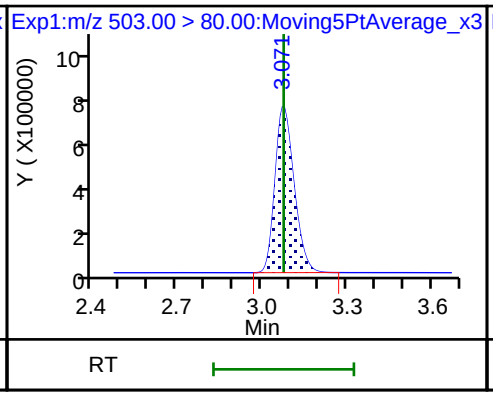
16 Perfluoroheptanesulfonic acid



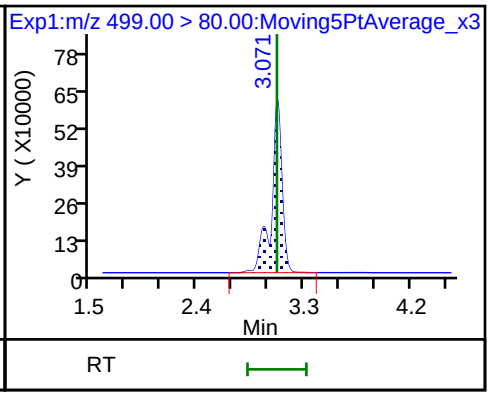
D 19 13C5 PFNA



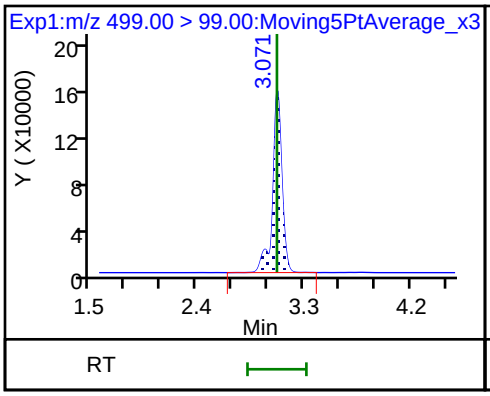
D 18 13C4 PFOS



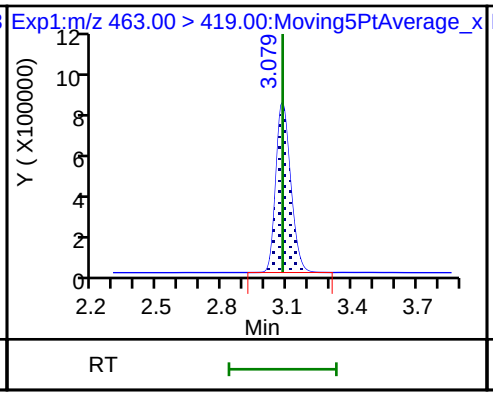
17 Perfluorooctane sulfonic acid



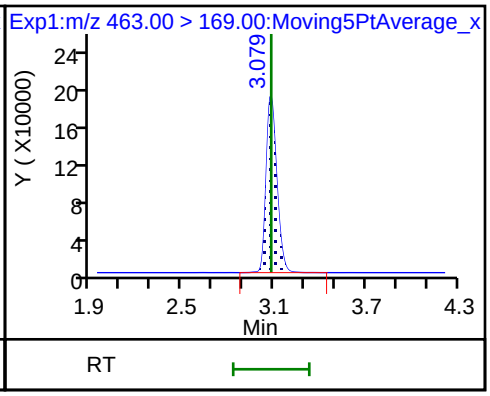
17 Perfluorooctane sulfonic acid



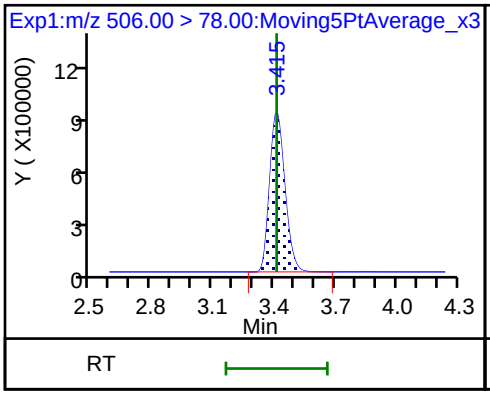
20 Perfluorononanoic acid



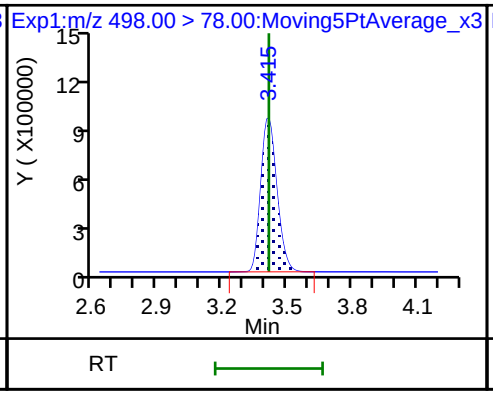
20 Perfluorononanoic acid



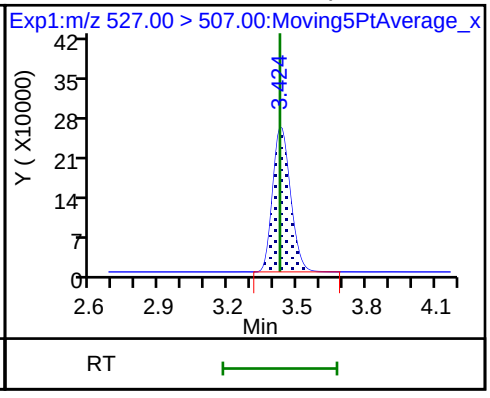
D 21 13C8 FOSA



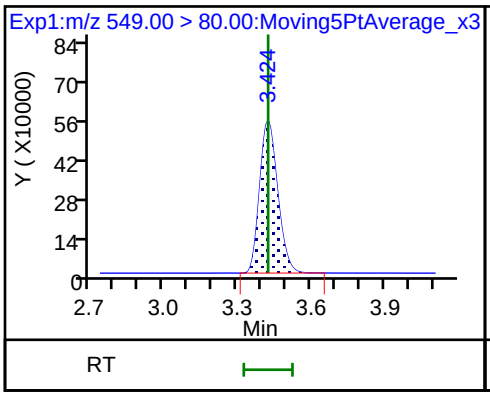
22 Perfluorooctane Sulfonamide



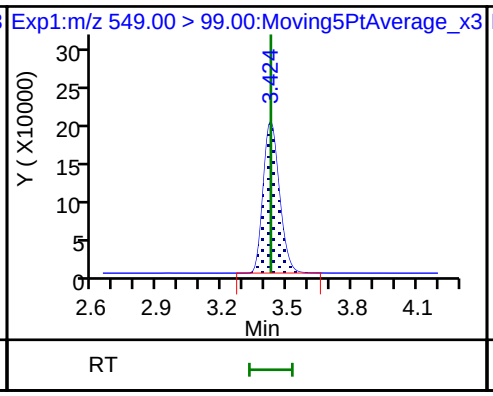
25 Sodium 1H,1H,2H,2H-perfluorodecane



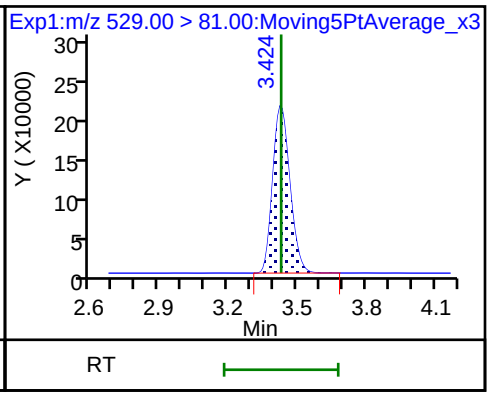
68 Perfluorononanesulfonic acid



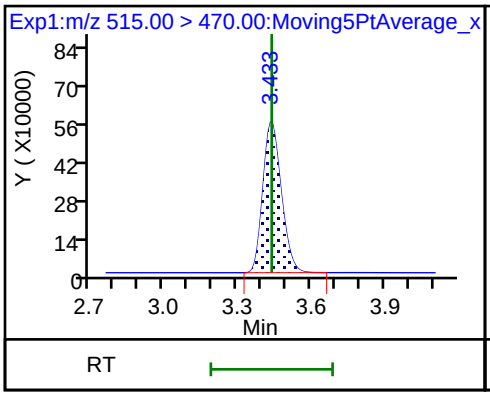
68 Perfluorononanesulfonic acid



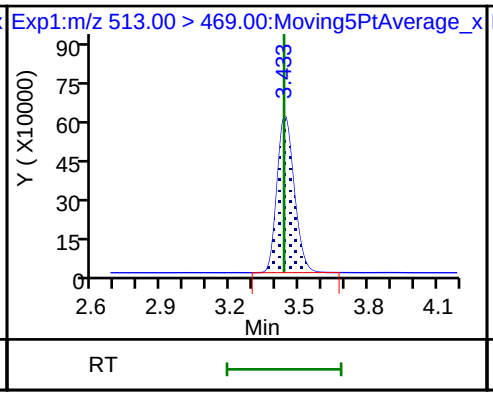
D 26 M2-8:2FTS



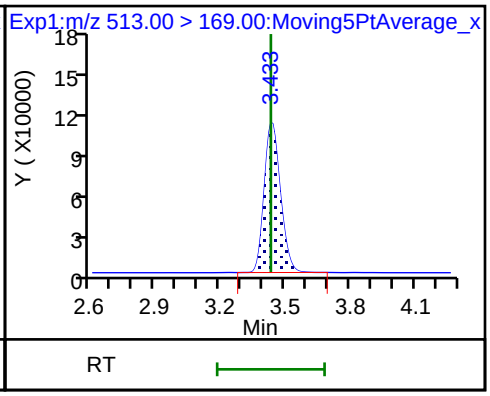
D 23 13C2 PFDA



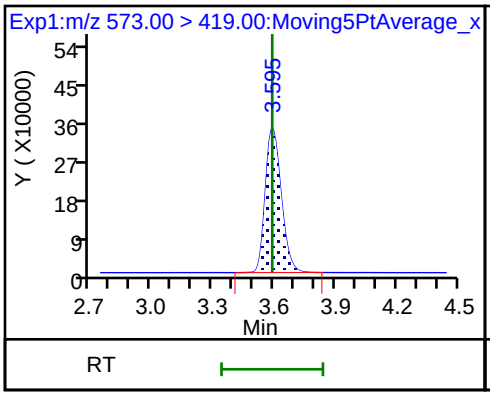
24 Perfluorodecanoic acid



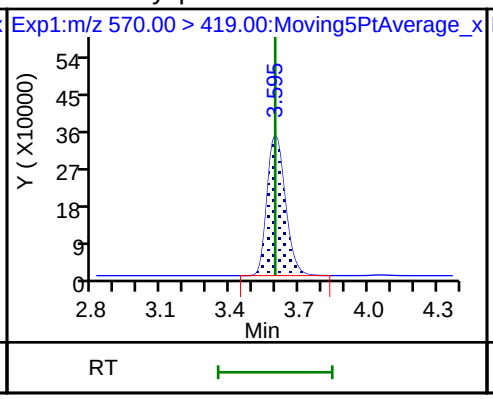
24 Perfluorodecanoic acid



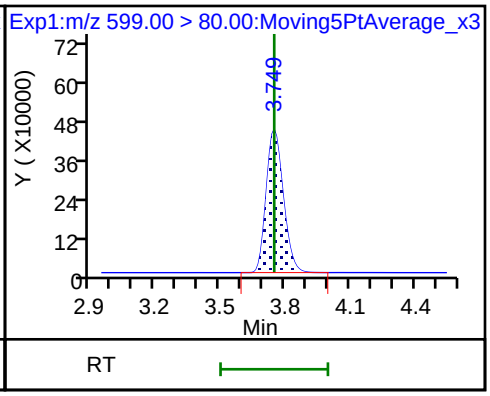
D 27 d3-NMeFOSAA



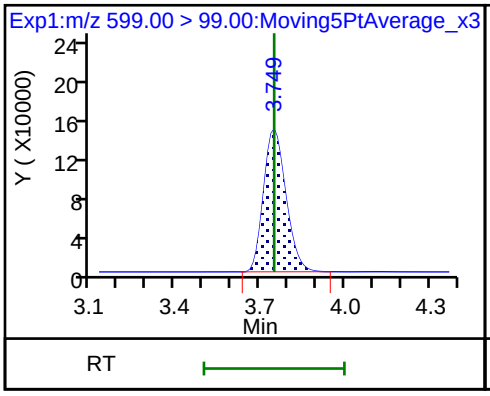
28 N-methyl perfluorooctane sulfonami



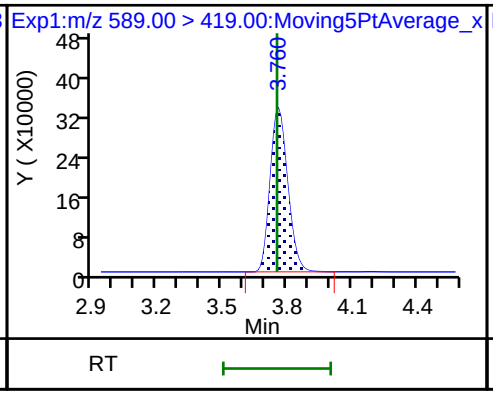
29 Perfluorodecane Sulfonic acid



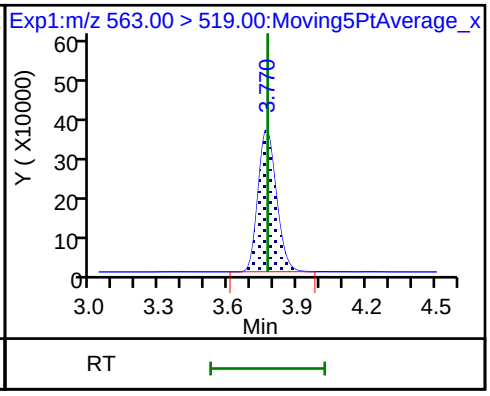
29 Perfluorodecane Sulfonic acid



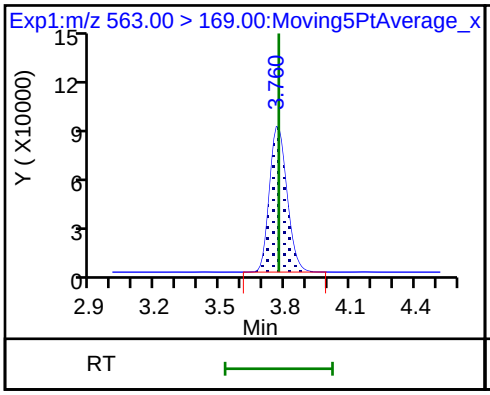
D 32 d5-NEtFOSAA



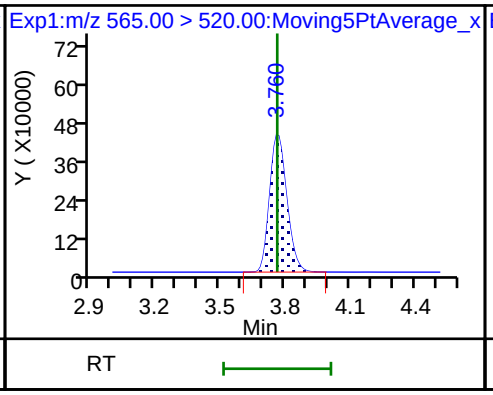
31 Perfluoroundecanoic acid



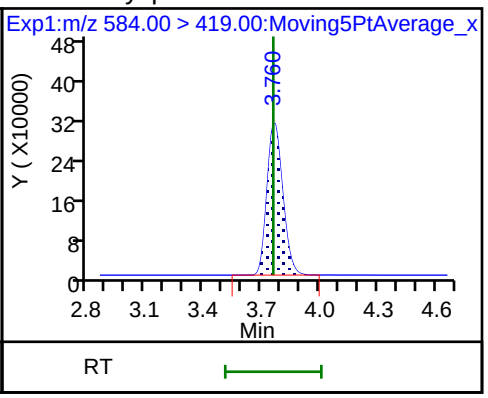
31 Perfluoroundecanoic acid



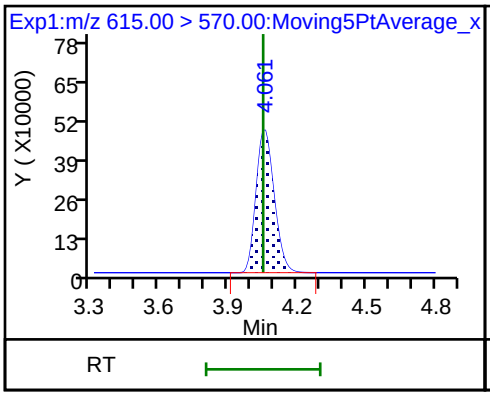
D 30 13C2 PFUnA



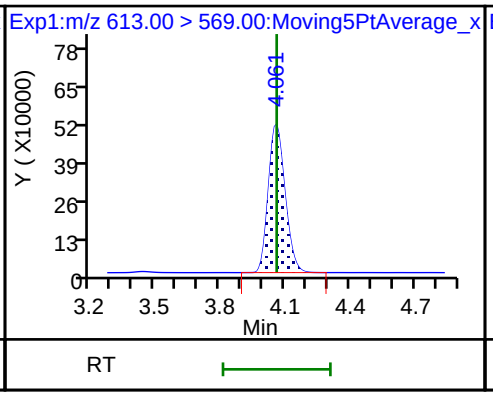
33 N-ethyl perfluorooctane sulfonamid



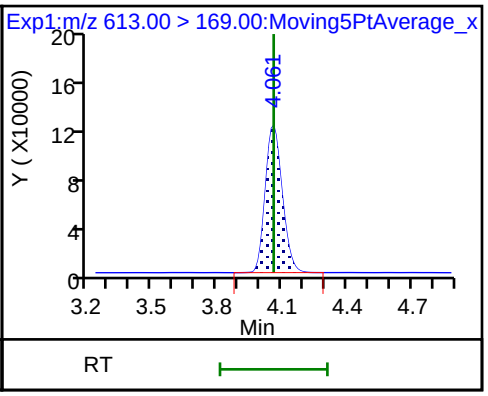
D 36 13C2 PFDoA



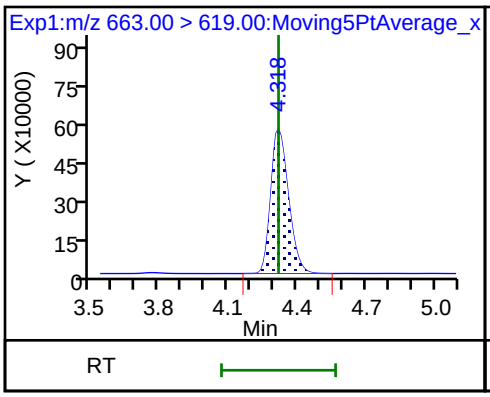
37 Perfluorododecanoic acid



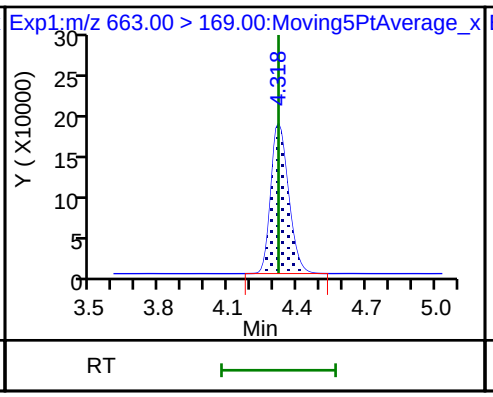
37 Perfluorododecanoic acid



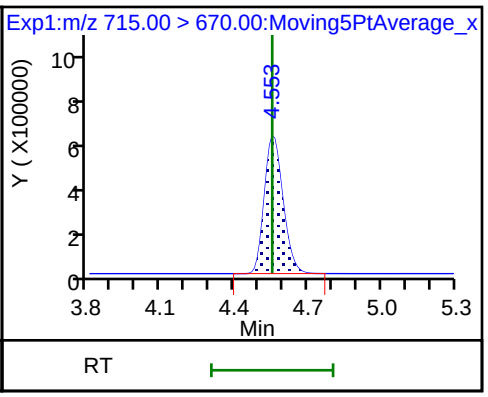
41 Perfluorotridecanoic acid



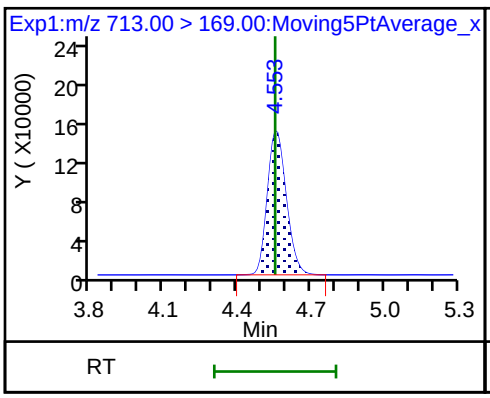
41 Perfluorotridecanoic acid



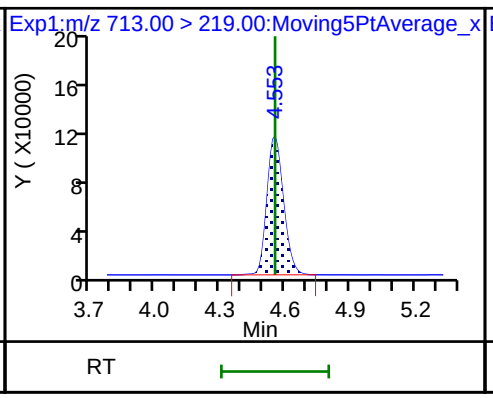
D 43 13C2-PFTeDA



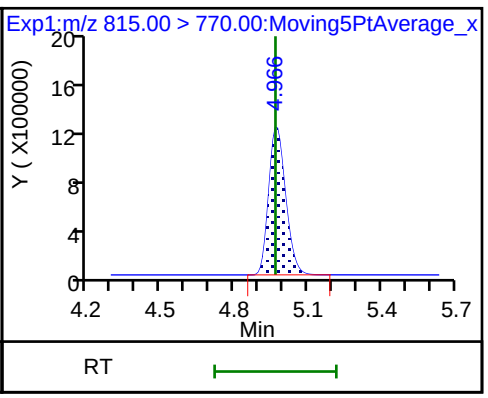
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-223615/1-A

Matrix: Water | Lab File ID: 2018.05.27LLADX_004.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: 3535 | Date Extracted: 05/16/2018 14:51

Sample wt/vol: 250(mL) | Date Analyzed: 05/28/2018 07:23

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

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

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

Analysis Batch No.: 225818 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	1.5	U	2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	1.0	U	2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.5	U	2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	1.5	U M	2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	1.5	U	2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	U	2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.5	U	2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	1.5	U	2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	3.0	U	4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.5	U	2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	3.0	U	4.0	3.0	1.3

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-223615/1-A

Matrix: Water Lab File ID: 2018.05.27LLADX_004.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 250(mL) Date Analyzed: 05/28/2018 07:23

Con. Extract Vol.: 10(mL) Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	71		50-150
STL00992	13C4 PFBA	79		50-150
STL01893	13C5 PFPeA	85		50-150
STL00993	13C2 PFHxA	85		50-150
STL01892	13C4-PFHpA	84		50-150
STL00990	13C4 PFOA	93		50-150
STL00995	13C5 PFNA	94		50-150
STL00996	13C2 PFDA	86		50-150
STL00997	13C2 PFUnA	90		50-150
STL00998	13C2 PFDoA	85		50-150
STL00994	18O2 PFHxS	85		50-150
STL02116	13C2-PFTeDA	84		50-150
STL00991	13C4 PFOS	81		50-150
STL02337	13C3-PFBS	80		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_004.d
Lims ID: MB 320-223615/1-A
Client ID:
Sample Type: MB
Inject. Date: 28-May-2018 07:23:46 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-223615/1-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-May-2018 10:59:36 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 10:59:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.463	1.452	0.011	1.004	29821	0.0147			11.7	
D 1 13C4 PFBA										
217.00 > 172.00	1.458	1.455	0.003	1.000	5446526	1.97		78.7	28350	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.738	1.720	0.018	1.005	10871	0.006141			4.1	
D 3 13C5-PFPeA										
267.90 > 223.00	1.729	1.725	0.004	0.563	3748838	2.11		84.5	37599	
D 47 13C3-PFBS										
301.90 > 83.00	1.765	1.761	0.004	1.000	74788	1.87		80.3	840	
D 7 13C2 PFHxA										
315.00 > 270.00	2.015	2.011	0.004	1.000	4009692	2.12		84.8	76016	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.117	2.112	0.005	1.000	199498	NC			4104	
D 9 13C4-PFHpA										
367.00 > 322.00	2.346	2.342	0.004	1.000	3785753	2.09		83.6	60854	
D 11 18O2 PFHxS										
403.00 > 84.00	2.359	2.355	0.004	1.000	4507323	2.01		85.1	91466	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.359	2.359	0.0	1.000	17519	0.008158			93.9	
399.00 > 99.00	2.359	2.359	0.0	1.000	5314		3.30(1.50-4.49)		34.8	
D 12 M2-6:2FTS										
429.00 > 81.00	2.675	2.665	0.010	1.000	978985	2.45		103	14567	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.675	2.675	0.0	1.000	4109	-0.004558			146	
D 14 13C4 PFOA										
417.00 > 372.00	2.698	2.695	0.003	1.000	3979429	2.32		92.9	76933	

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	2.705	2.698	0.007	1.003	11374	0.006071			2.8	M
413.00 > 169.00	2.698	2.698	0.0	1.000	6506		1.75(0.84-2.52)		21.7	
* 62 13C2-PFOA										
415.00 > 370.00	2.698	2.698	0.0		4525357	2.50			58203	
D 19 13C5 PFNA										
468.00 > 423.00	3.070	3.063	0.007	1.000	3277082	2.34		93.5	102219	
D 18 13C4 PFOS										
503.00 > 80.00	3.070	3.063	0.007	1.000	2993992	1.95		81.4	23297	
D 21 13C8 FOSA										
506.00 > 78.00	3.404	3.395	0.009	1.000	3590420	1.78		71.3	37045	
D 26 M2-8:2FTS										
529.00 > 81.00	3.422	3.413	0.009	1.000	924759	2.03		84.8	25929	
D 23 13C2 PFDA										
515.00 > 470.00	3.432	3.422	0.010	1.000	2571191	2.16		86.3	55931	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.582	3.572	0.010	1.000	1392614	2.12		84.7	18390	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.747	3.748	-0.001	1.000	1467729	2.17		87.0	18902	
D 30 13C2 PFUnA										
565.00 > 520.00	3.757	3.748	0.009	1.000	2117558	2.24		89.7	39149	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.757	3.753	0.004	1.003	1532	0.002776			51.0	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.914	3.910	0.004	1.000	1885	NC			36.8	
D 36 13C2 PFDoA										
615.00 > 570.00	4.047	4.048	-0.001	1.000	2155347	2.12		84.8	17383	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.550	4.542	0.008	1.000	2623175	2.10		84.1	14303	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.964	4.966	-0.002	1.000	3463314	1.64		65.4	9434	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.972	4.967	0.005	1.002	34450	NC			16.3	
813.00 > 169.00	4.972	4.967	0.005	1.002	5849		5.89(2.86-8.58)		56.0	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 30-May-2018 10:59:37 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_004.d

Injection Date: 28-May-2018 07:23:46 Instrument ID: A8_N

Lims ID: MB 320-223615/1-A

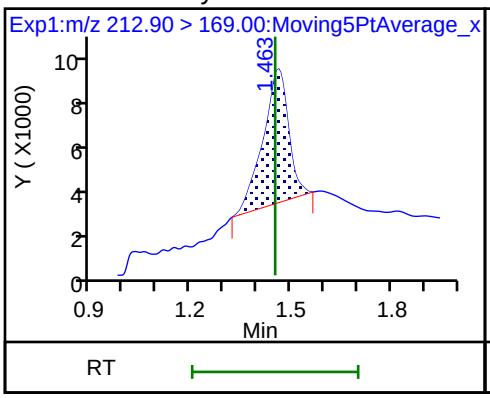
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4

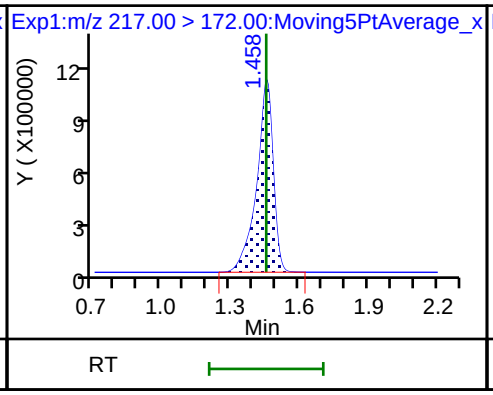
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

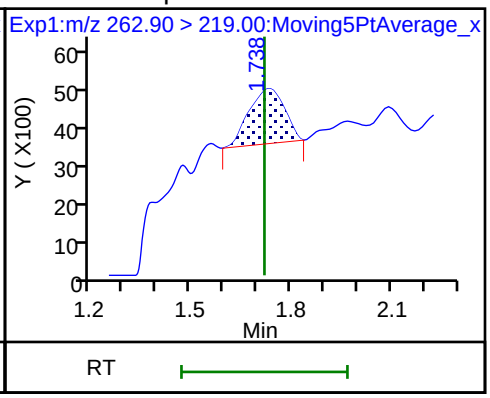
2 Perfluorobutyric acid



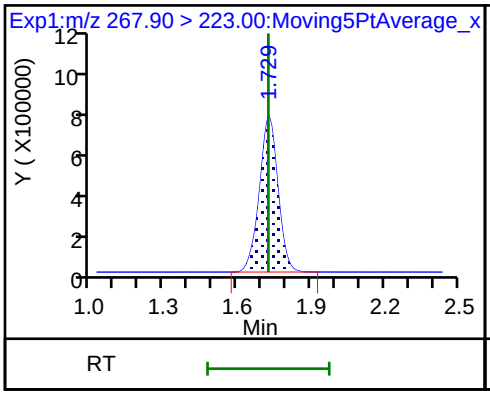
D 1 13C4 PFBA



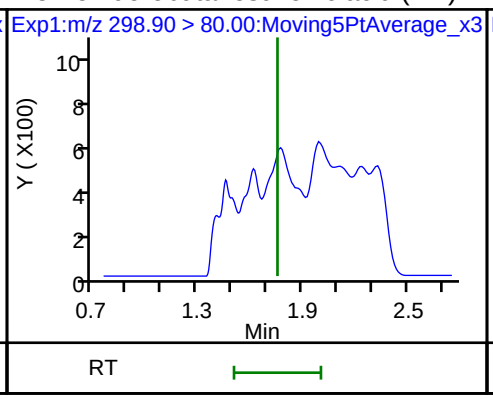
4 Perfluoropentanoic acid



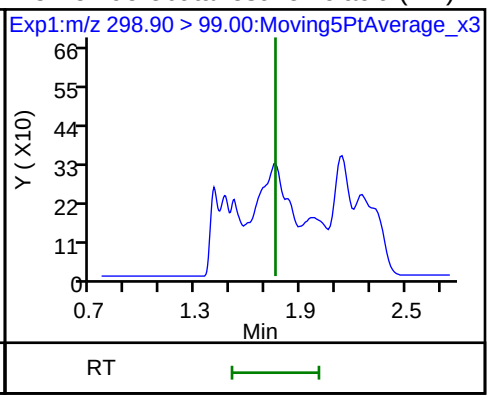
D 3 13C5-PFPeA



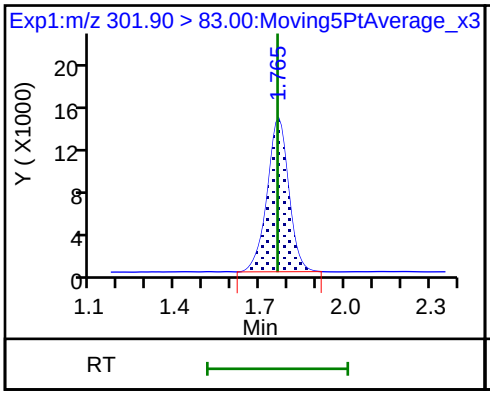
5 Perfluorobutanesulfonic acid (ND)



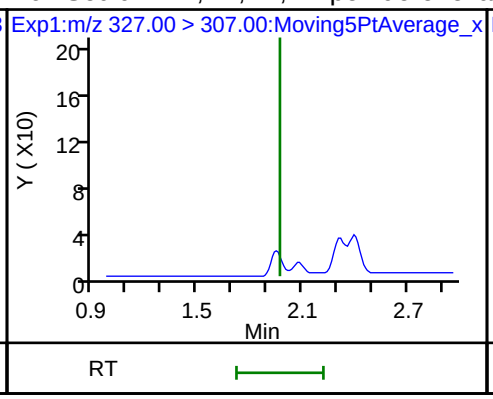
5 Perfluorobutanesulfonic acid (ND)



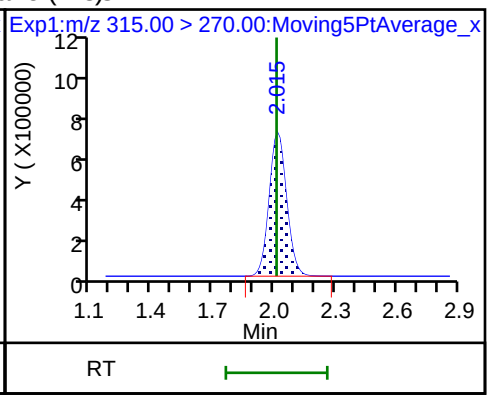
D 47 13C3-PFBS



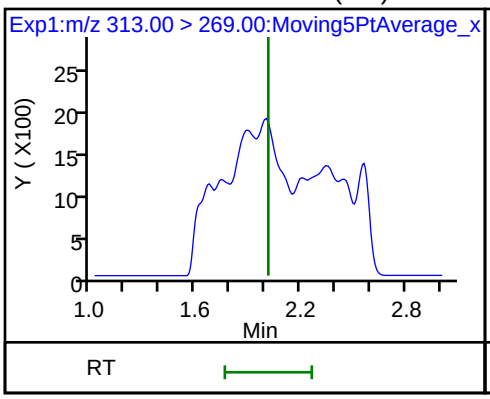
61 Sodium 1H,1H,2H,2H-perfluorohexane (ND)



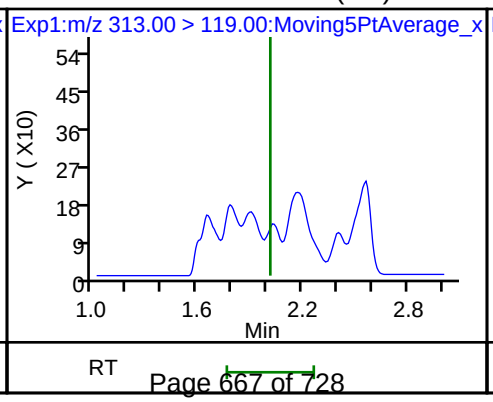
D 13C2 PFHxA



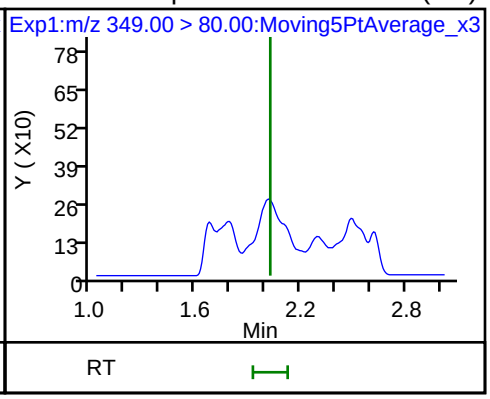
6 Perfluorohexanoic acid (ND)



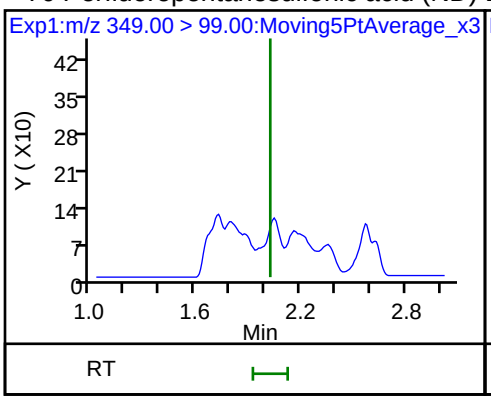
6 Perfluorohexanoic acid (ND)



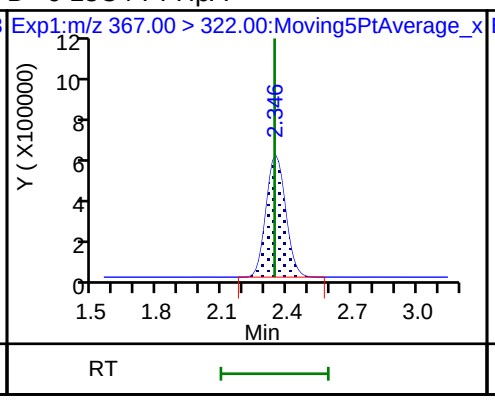
70 Perfluoropentanesulfonic acid (ND)



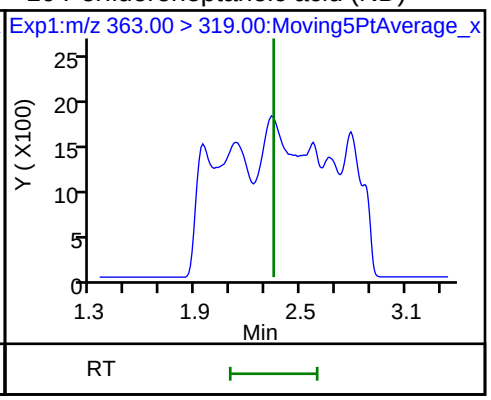
70 Perfluoropentanesulfonic acid (ND)



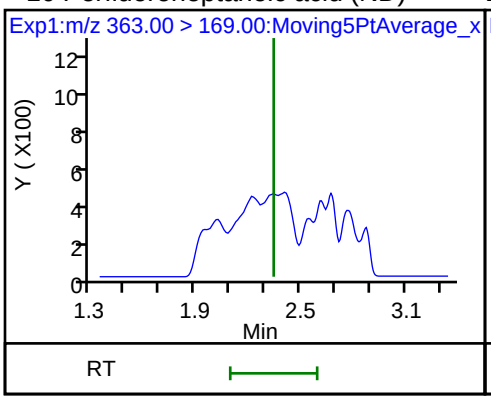
D 9 13C4-PFHpA



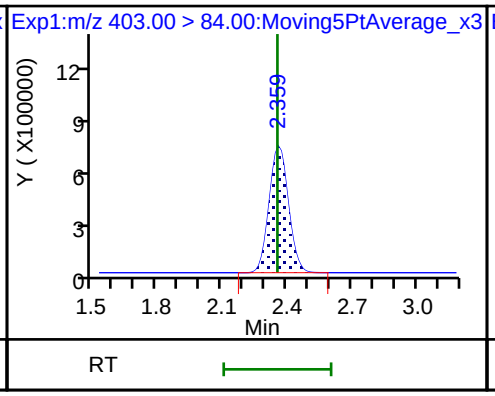
10 Perfluoroheptanoic acid (ND)



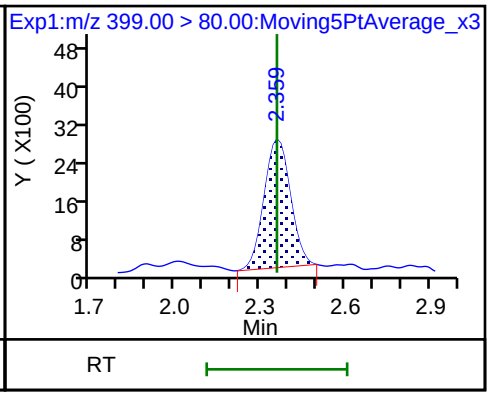
10 Perfluoroheptanoic acid (ND)



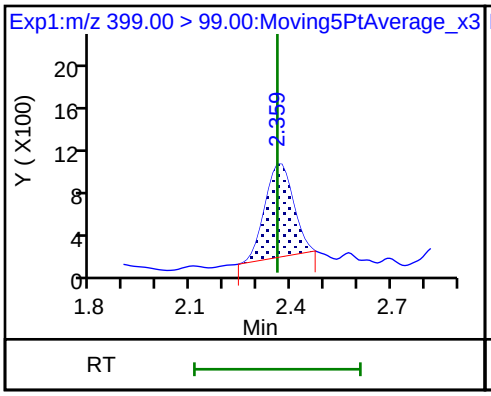
D 11 18O2 PFHxS



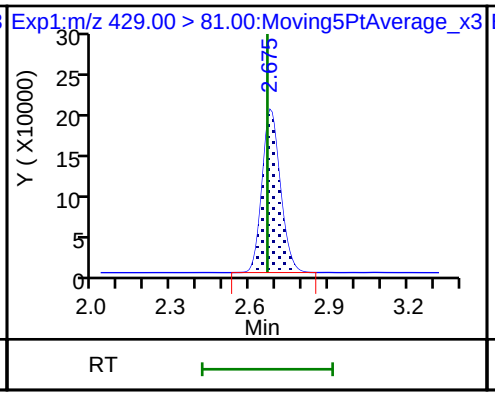
8 Perfluorohexanesulfonic acid



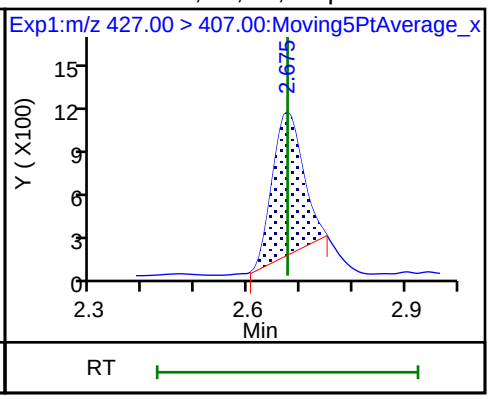
8 Perfluorohexanesulfonic acid



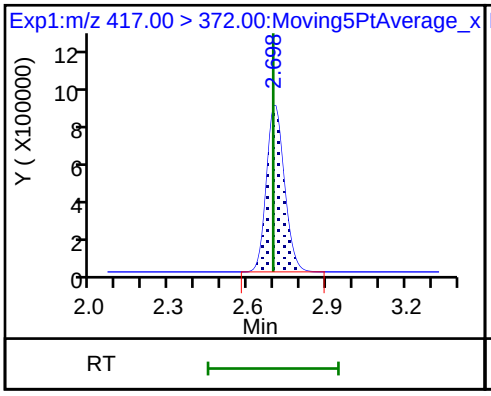
D 12 M2-6:2FTS



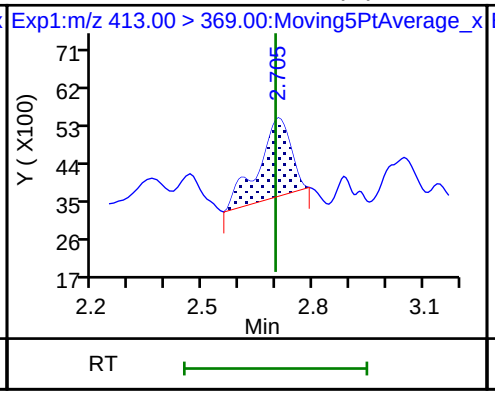
13 Sodium 1H,1H,2H,2H-perfluorooctane



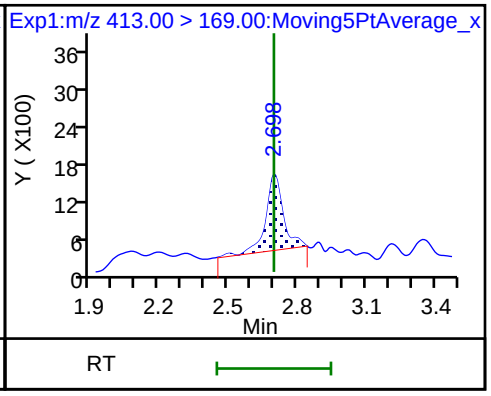
D 14 13C4 PFOA



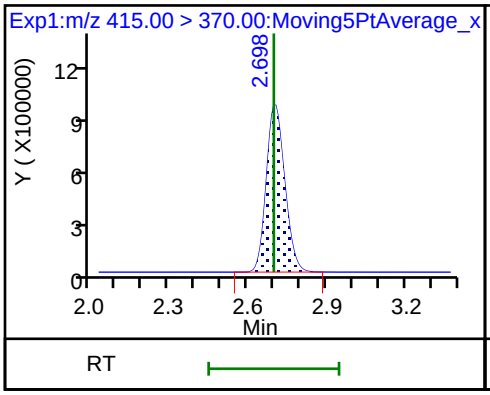
15 Perfluorooctanoic acid (M)



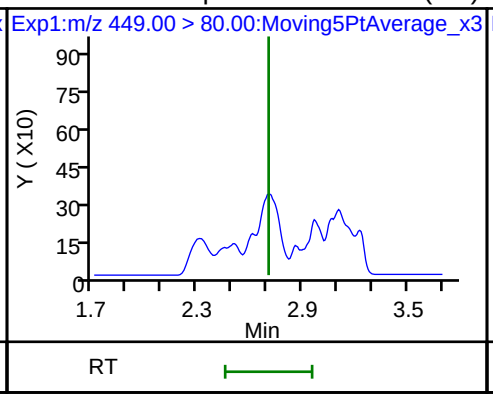
15 Perfluorooctanoic acid



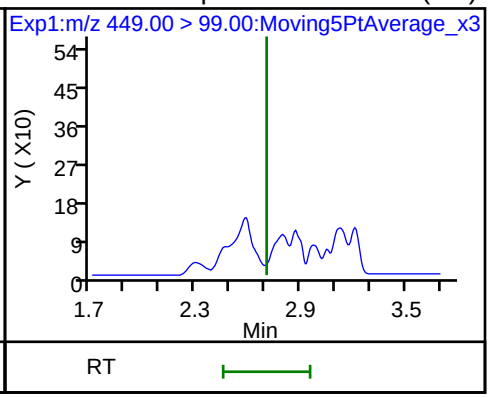
* 62 13C2-PFOA



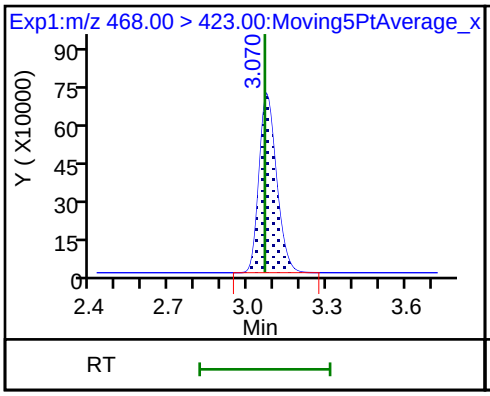
16 Perfluoroheptanesulfonic acid (ND)



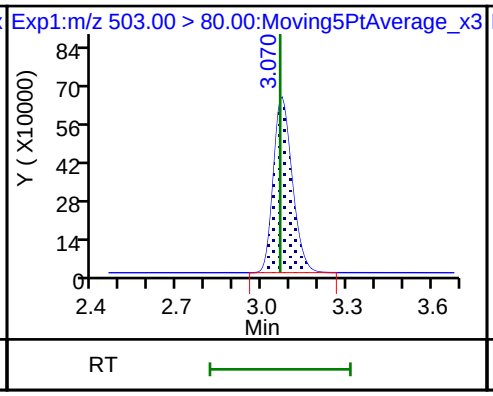
16 Perfluoroheptanesulfonic acid (ND)



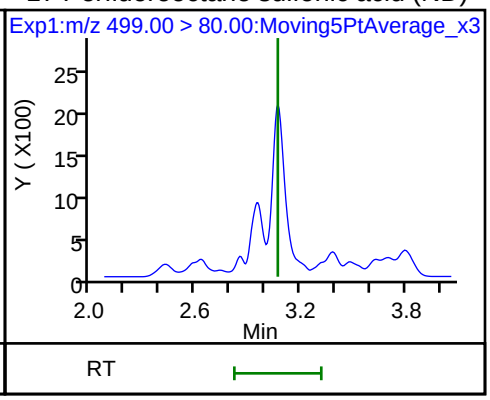
D 19 13C5 PFNA



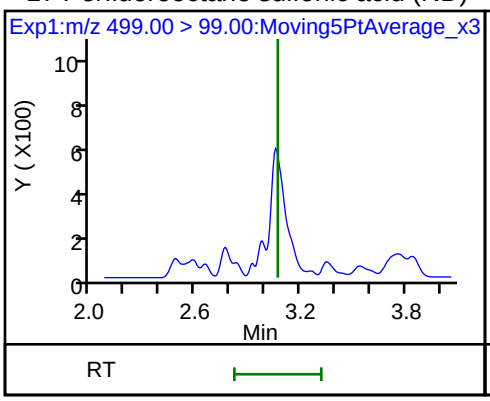
D 18 13C4 PFOS



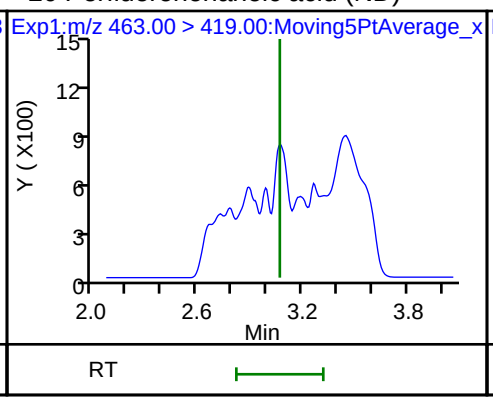
17 Perfluorooctane sulfonic acid (ND)



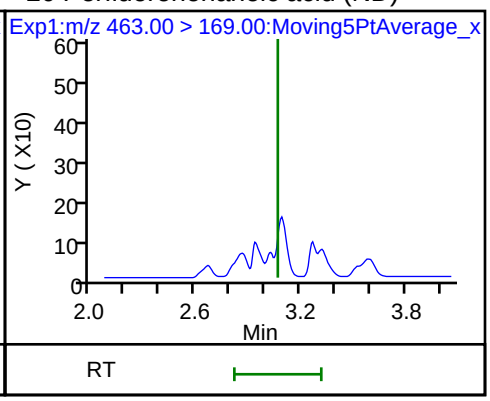
17 Perfluorooctane sulfonic acid (ND)



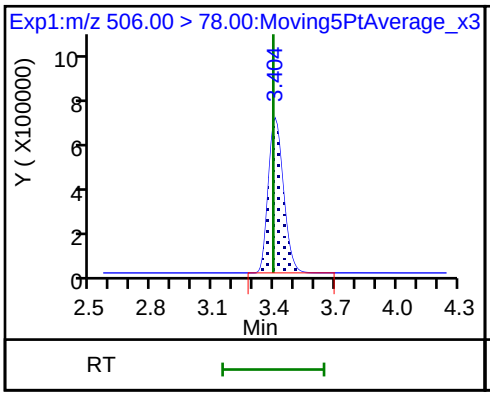
20 Perfluorononanoic acid (ND)



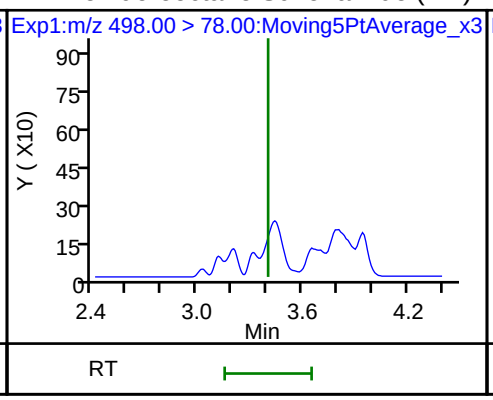
20 Perfluorononanoic acid (ND)



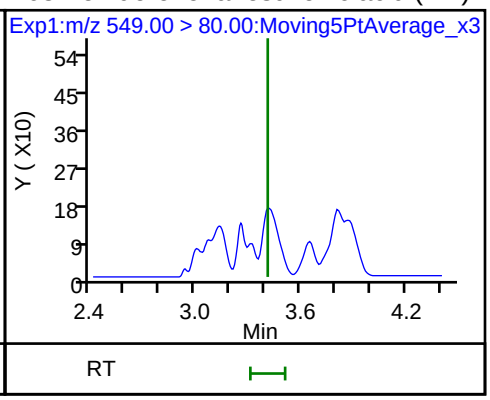
D 21 13C8 FOSA



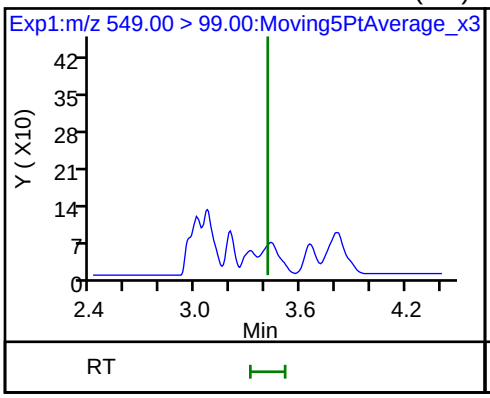
22 Perfluorooctane Sulfonamide (ND)



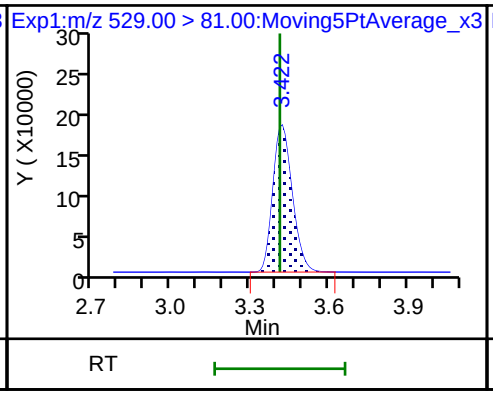
68 Perfluorononanesulfonic acid (ND)



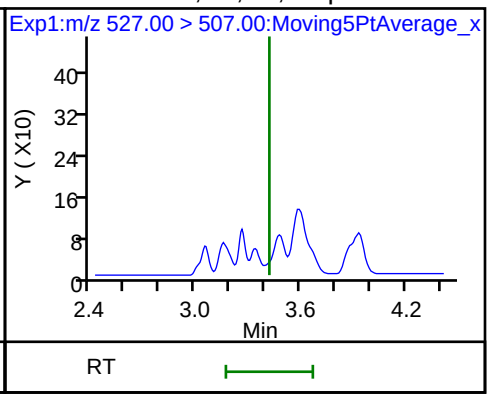
68 Perfluorononanesulfonic acid (ND)



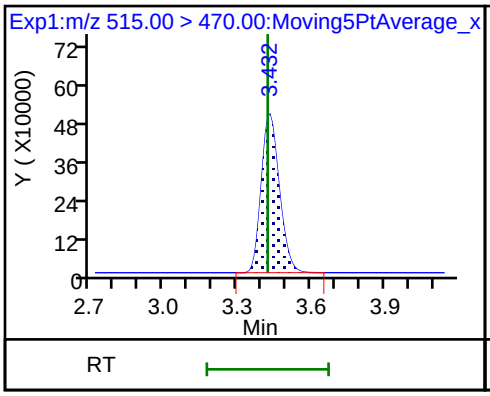
D 26 M2-8:2FTS



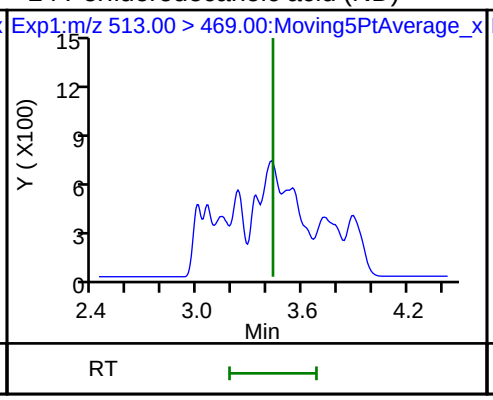
25 Sodium 1H,1H,2H,2H-perfluorodecane (ND)



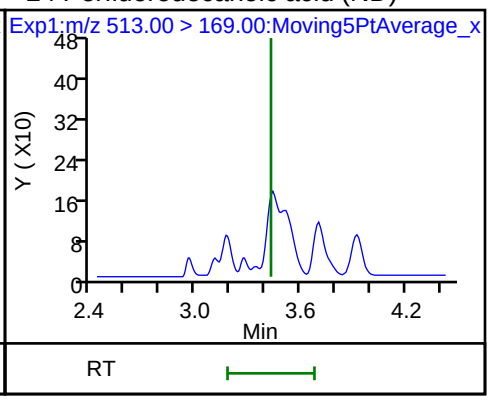
D 23 13C2 PFDA



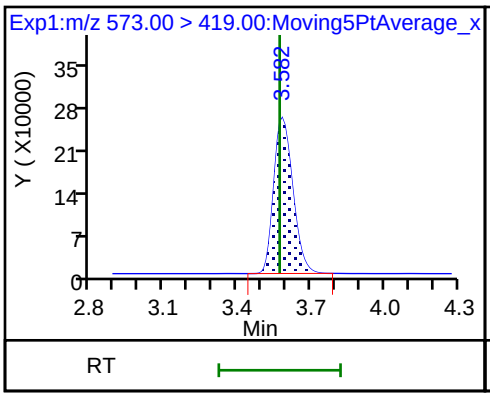
24 Perfluorodecanoic acid (ND)



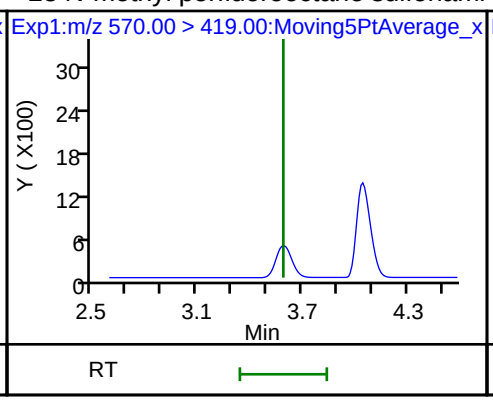
24 Perfluorodecanoic acid (ND)



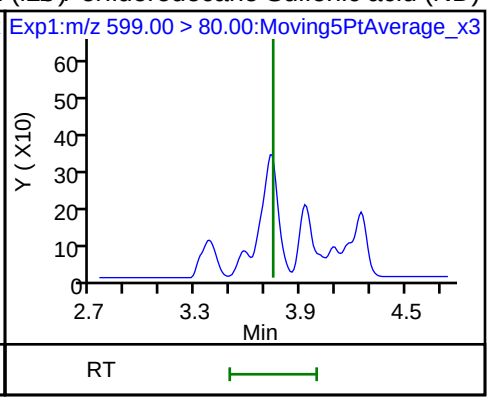
D 27 d3-NMeFOSAA



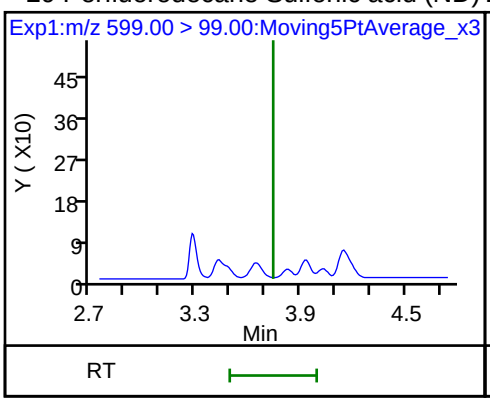
28 N-methyl perfluorooctane sulfonami (ND)



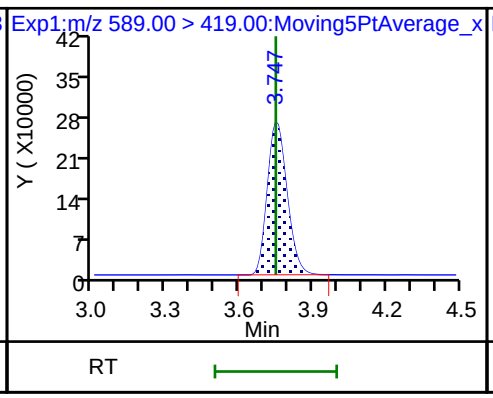
29 Perfluorodecane Sulfonic acid (ND)



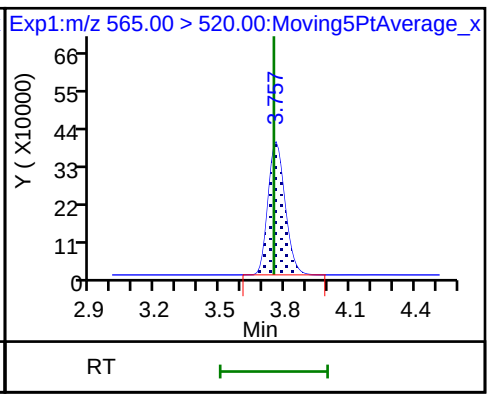
29 Perfluorodecane Sulfonic acid (ND)



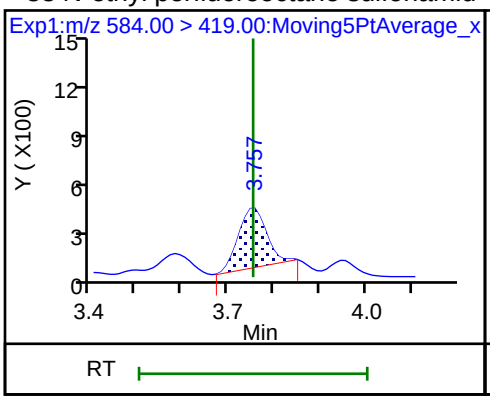
D 32 d5-NEtFOSAA



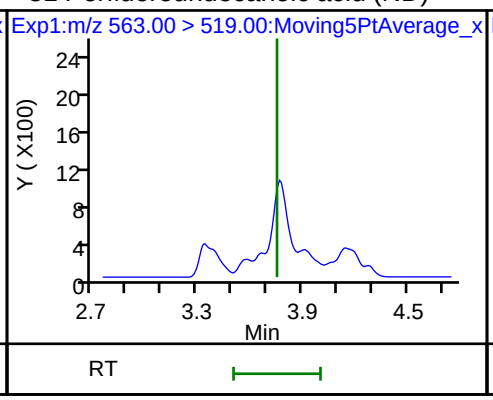
D 30 13C2 PFUnA



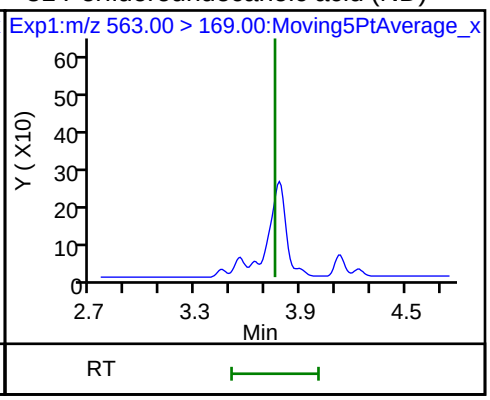
33 N-ethyl perfluorooctane sulfonamid



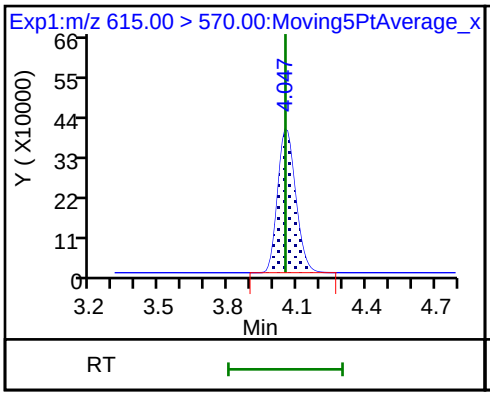
31 Perfluoroundecanoic acid (ND)



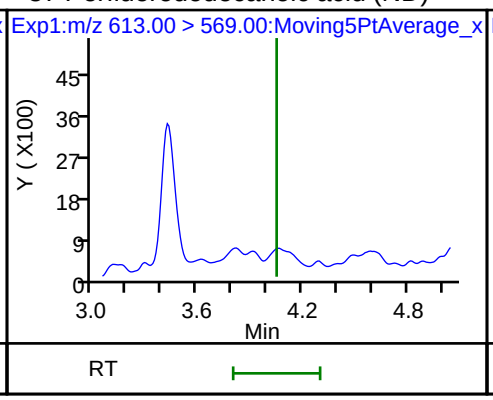
31 Perfluoroundecanoic acid (ND)



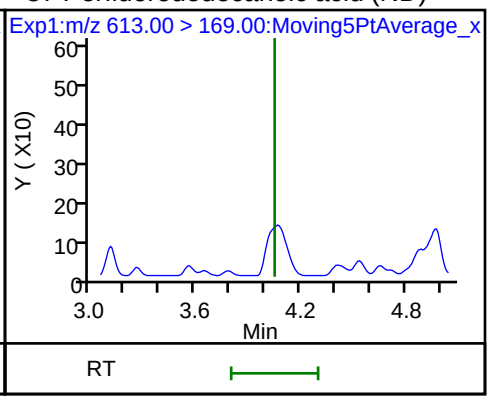
D 36 13C2 PFDoA



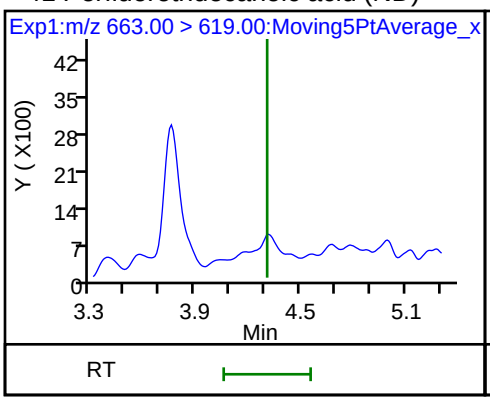
37 Perfluorododecanoic acid (ND)



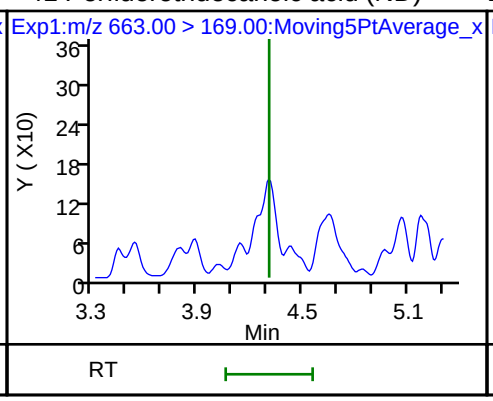
37 Perfluorododecanoic acid (ND)



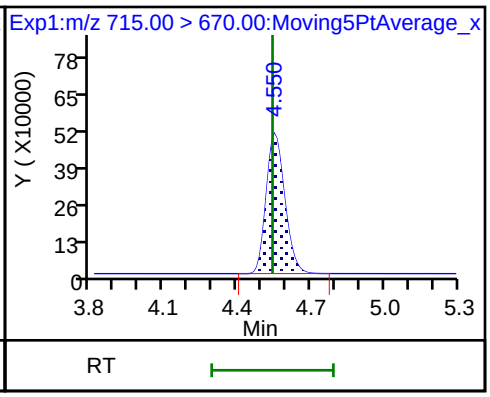
41 Perfluorotridecanoic acid (ND)



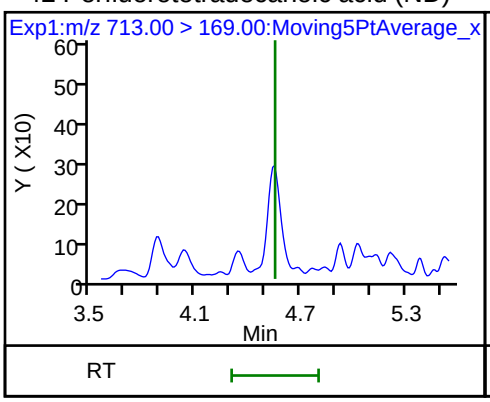
41 Perfluorotridecanoic acid (ND)



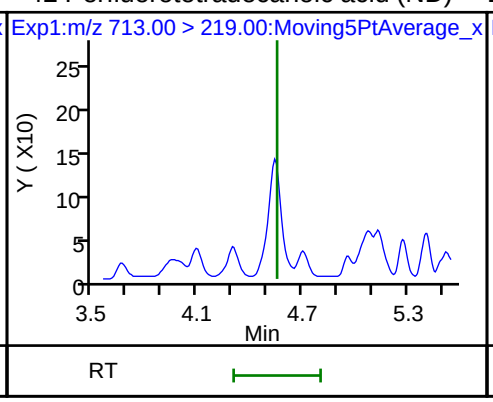
D 43 13C2-PFTeDA



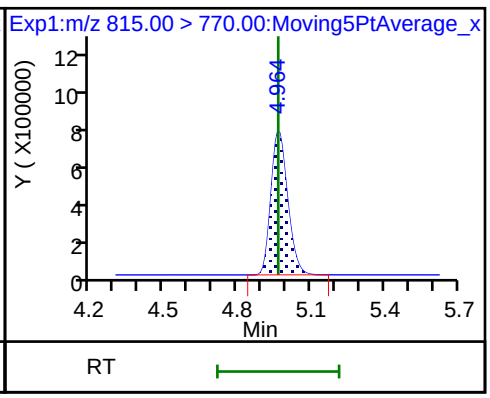
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

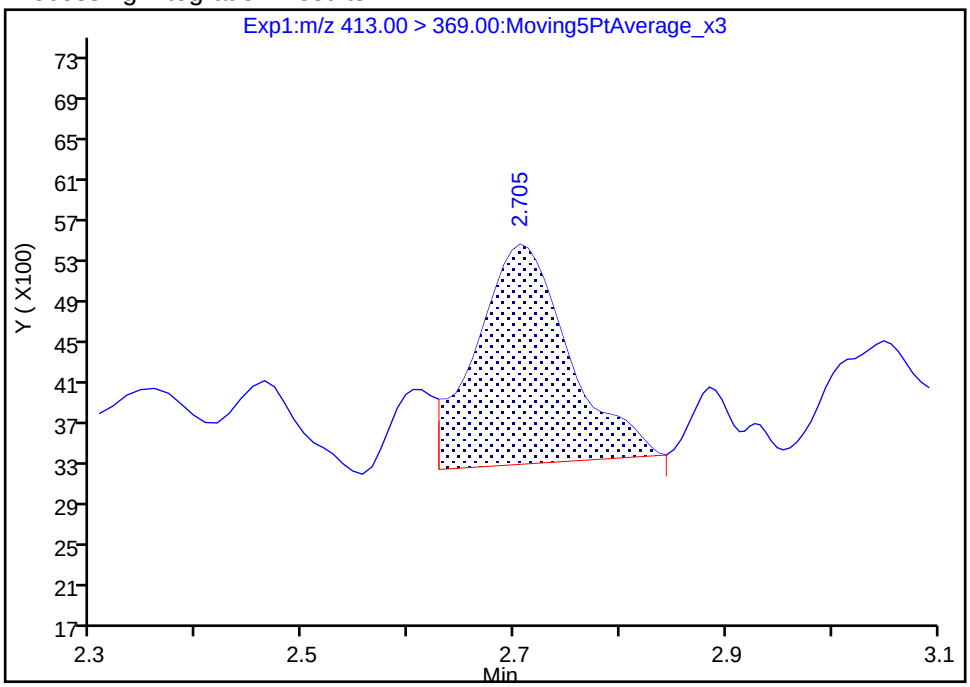
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_004.d
Injection Date: 28-May-2018 07:23:46 Instrument ID: A8_N
Lims ID: MB 320-223615/1-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

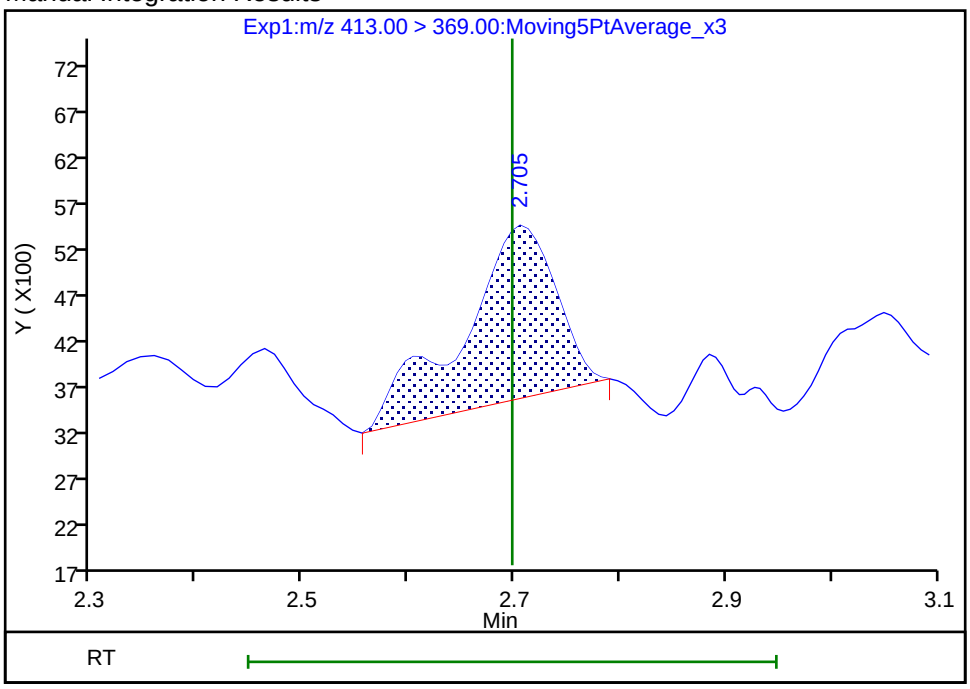
Processing Integration Results

RT: 2.71
Area: 12892
Amount: 0.006881
Amount Units: ng/ml



Manual Integration Results

RT: 2.71
Area: 11374
Amount: 0.006071
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 10:59:10
Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: | Lab Sample ID: CCB 320-225818/1

Matrix: Water | Lab File ID: 2018.05.27LLADX_001.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: | Date Extracted:

Sample wt/vol: 1(mL) | Date Analyzed: 05/28/2018 07:00

Con. Extract Vol.: | Dilution Factor: 1

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

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

Analysis Batch No.: 225818 | Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U M	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U M	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	U	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00664	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 320-225818/1

Matrix: Water Lab File ID: 2018.05.27LLADX_001.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 05/28/2018 07:00

Con. Extract Vol.: Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	87		50-150
STL00992	13C4 PFBA	90		50-150
STL01893	13C5 PFPeA	98		50-150
STL00993	13C2 PFHxA	95		50-150
STL01892	13C4-PFHpA	96		50-150
STL00990	13C4 PFOA	101		50-150
STL00995	13C5 PFNA	100		50-150
STL00996	13C2 PFDA	98		50-150
STL00997	13C2 PFUnA	97		50-150
STL00998	13C2 PFDoA	97		50-150
STL00994	18O2 PFHxS	92		50-150
STL02116	13C2-PFTeDA	99		50-150
STL00991	13C4 PFOS	92		50-150
STL02337	13C3-PFBS	92		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_001.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 28-May-2018 07:00:13 ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-May-2018 10:56:57 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 10:56:57

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	1.457	1.455	0.002	1.000	6789729	2.24		89.8	33546	
2 Perfluorobutyric acid										
212.90 > 169.00	1.463	1.463	0.0	1.004	6151	0.002436			2.7	
D 3 13C5-PFPeA										
267.90 > 223.00	1.729	1.725	0.004	0.563	4745420	2.45		97.9	57286	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.729	1.728	0.001	1.000	5819	0.002597			3.3	
D 47 13C3-PFBS										
301.90 > 83.00	1.765	1.761	0.004	1.000	93713	2.14		92.0	894	
D 60 M2-4:2FTS										
329.00 > 81.00	1.980	1.977	0.003	1.000	771982	NC			7061	
D 7 13C2 PFHxA										
315.00 > 270.00	2.014	2.011	0.003	1.000	4892166	2.37		94.6	84058	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.115	2.112	0.003	1.000	258797	NC			5700	
D 9 13C4-PFHpA										
367.00 > 322.00	2.345	2.342	0.003	1.000	4771178	2.41		96.3	63959	
D 11 18O2 PFHxS										
403.00 > 84.00	2.358	2.355	0.003	1.000	5325795	2.18		92.0	45402	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.358	2.358	0.0	1.000	16851	0.006641			92.7	
399.00 > 99.00	2.358	2.358	0.0	1.000	5748		2.93(1.50-4.49)		41.5	
D 12 M2-6:2FTS										
429.00 > 81.00	2.682	2.665	0.017	1.000	1126259	2.58		108	18147	
D 14 13C4 PFOA										
417.00 > 372.00	2.704	2.695	0.009	1.000	4719368	2.52		101	58239	

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	2.704	2.704	0.0	1.000	9792	0.004407			2.9	
413.00 > 169.00	2.697	2.704	-0.007	0.997	2116		4.63(0.84-2.52)		9.7	M
* 62 13C2-PFOA										
415.00 > 370.00	2.704	2.704	0.0		4948330	2.50			41670	
D 19 13C5 PFNA										
468.00 > 423.00	3.069	3.063	0.006	1.000	3820313	2.49		99.7	53887	
D 18 13C4 PFOS										
503.00 > 80.00	3.069	3.063	0.006	1.000	3705227	2.20		92.1	25095	
D 21 13C8 FOSA										
506.00 > 78.00	3.411	3.395	0.016	1.000	4807546	2.18		87.3	41098	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.402	3.411	-0.009	0.997	2664	0.001423			53.4	
D 26 M2-8:2FTS										
529.00 > 81.00	3.420	3.413	0.007	1.000	1176486	2.36		98.7	17617	
D 23 13C2 PFDA										
515.00 > 470.00	3.430	3.422	0.008	1.000	3208441	2.46		98.4	56815	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.579	3.572	0.007	1.000	2037250	2.83		113	20933	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.753	3.748	0.005	1.000	2054569	2.78		111	21879	
D 30 13C2 PFUnA										
565.00 > 520.00	3.763	3.748	0.015	1.000	2506391	2.43		97.1	50866	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.763	3.764	-0.001	1.003	1440	0.001864			28.1	
D 36 13C2 PFDoA										
615.00 > 570.00	4.051	4.048	0.003	1.000	2700937	2.43		97.2	19389	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.552	4.542	0.010	1.000	3384862	2.48		99.3	12591	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.965	4.966	-0.001	1.000	6276492	2.71		108	12749	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.965	4.976	-0.011	1.000	54340	NC			22.7	
813.00 > 169.00	4.974	4.976	-0.002	1.002	9124		5.96(2.86-8.58)		77.8	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00006 Amount Added: 1.00 Units: mL

Report Date: 30-May-2018 10:56:58 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_001.d

Injection Date: 28-May-2018 07:00:13 Instrument ID: A8_N

Lims ID: CCB

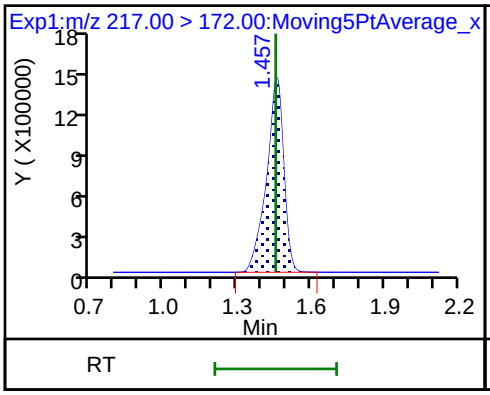
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 1

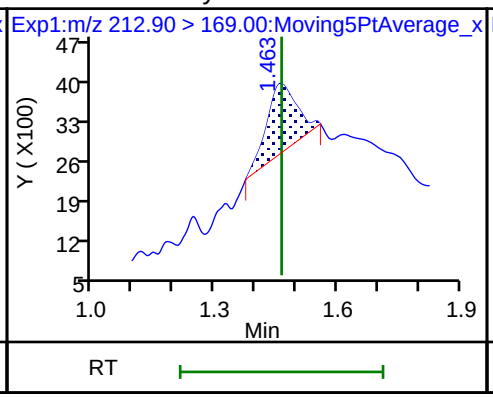
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

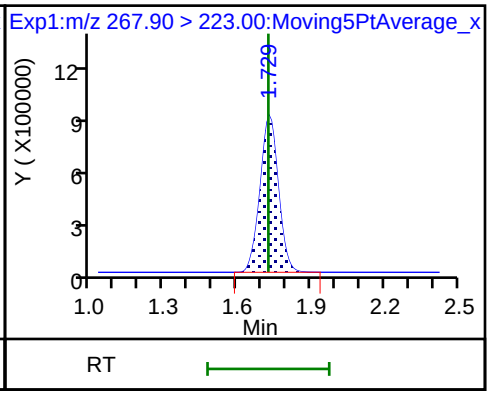
D 1 13C4 PFBA



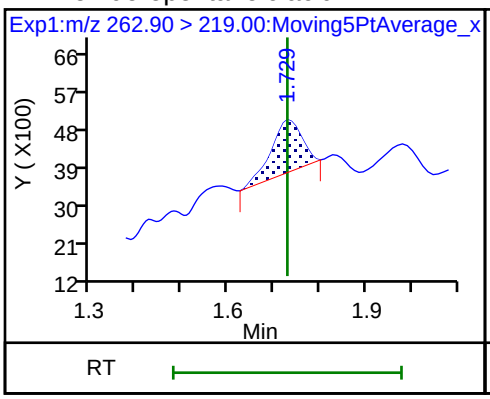
2 Perfluorobutyric acid



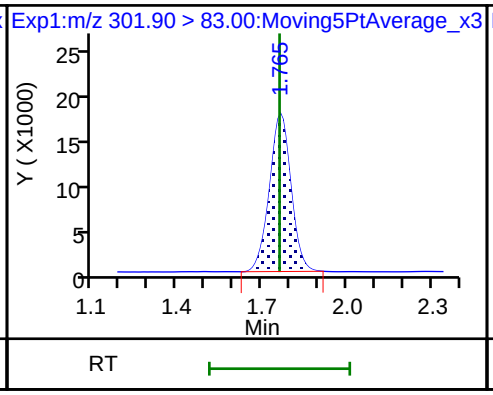
D 3 13C5-PFPeA



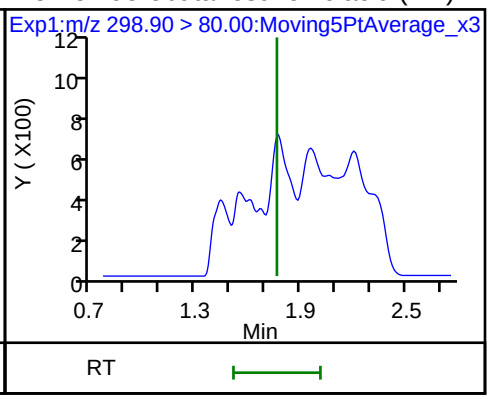
4 Perfluoropentanoic acid



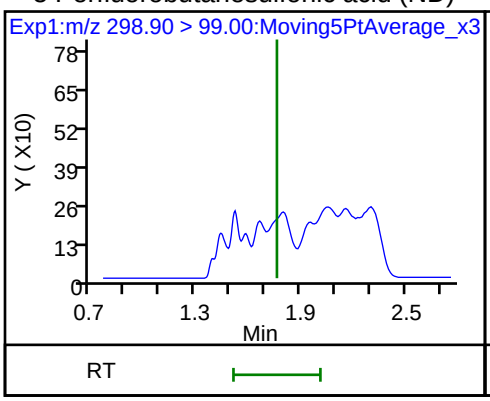
D 47 13C3-PFBS



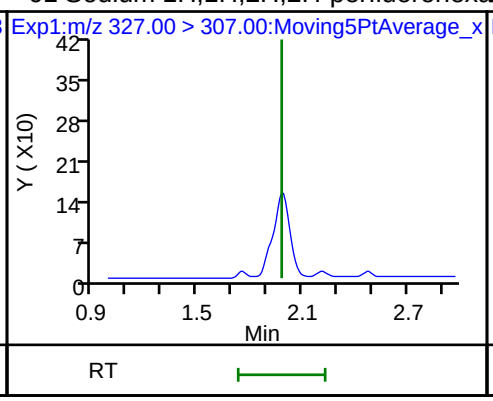
5 Perfluorobutanesulfonic acid (ND)



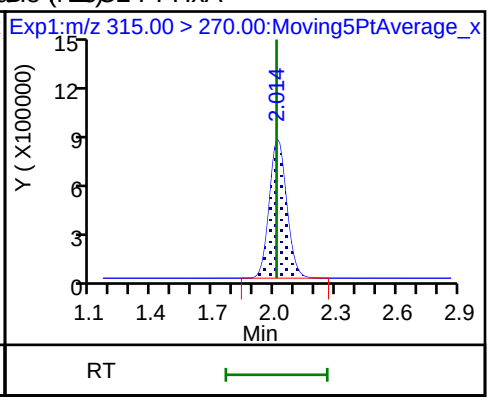
5 Perfluorobutanesulfonic acid (ND)



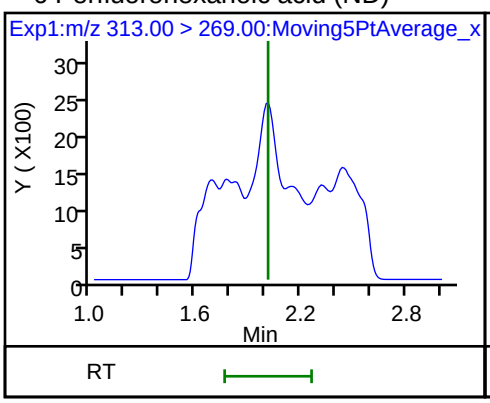
61 Sodium 1H,1H,2H,2H-perfluorohexane (ND)



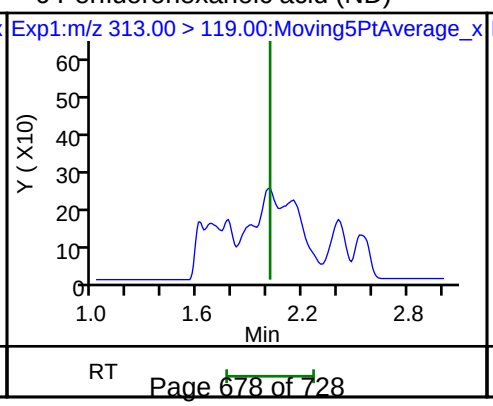
D 13C2 PFHxA



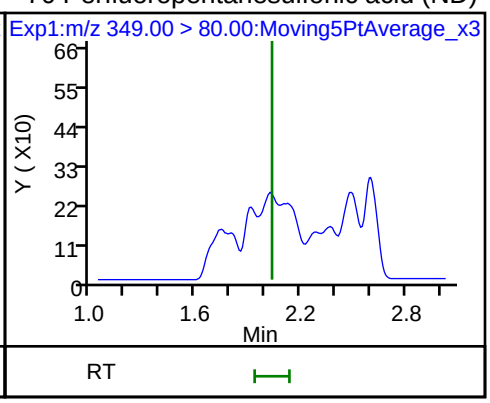
6 Perfluorohexanoic acid (ND)



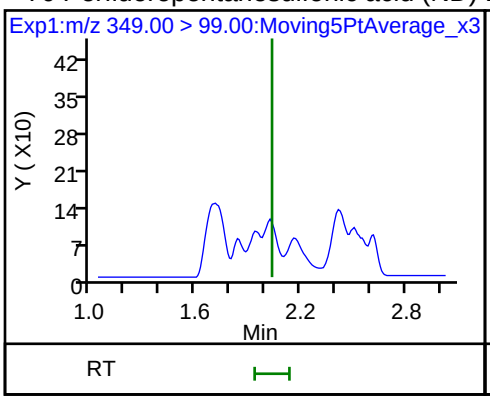
6 Perfluorohexanoic acid (ND)



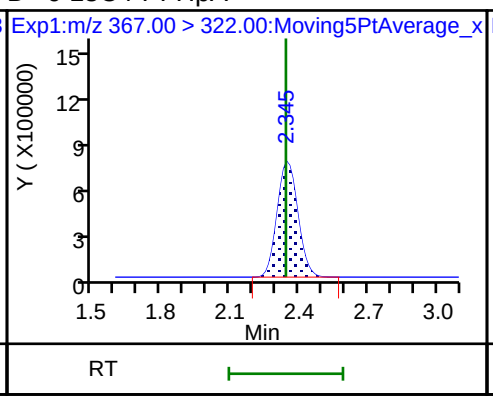
70 Perfluoropentanesulfonic acid (ND)



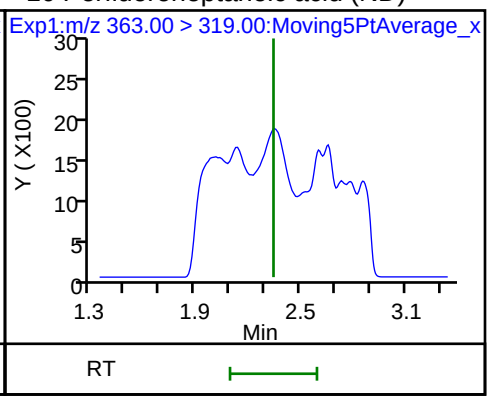
70 Perfluoropentanesulfonic acid (ND)



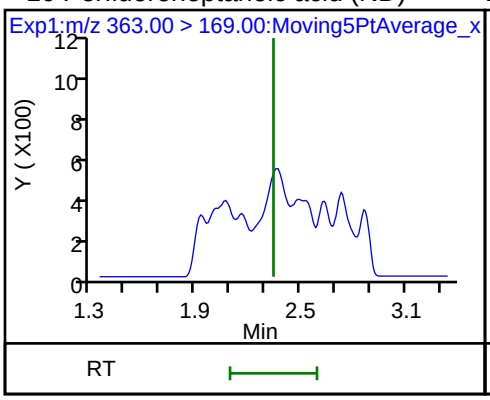
D 9 13C4-PFHpA



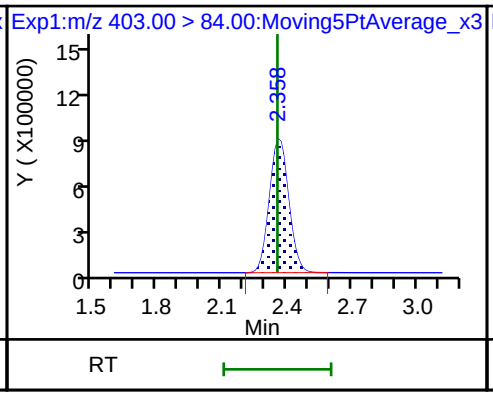
10 Perfluoroheptanoic acid (ND)



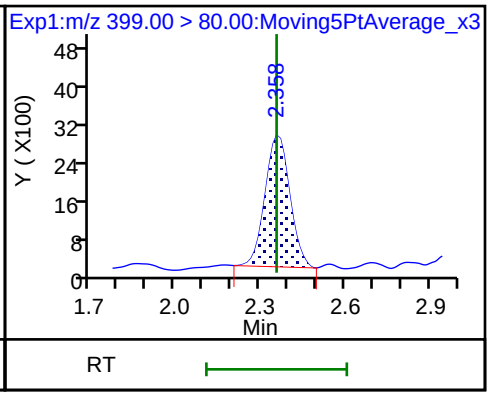
10 Perfluoroheptanoic acid (ND)



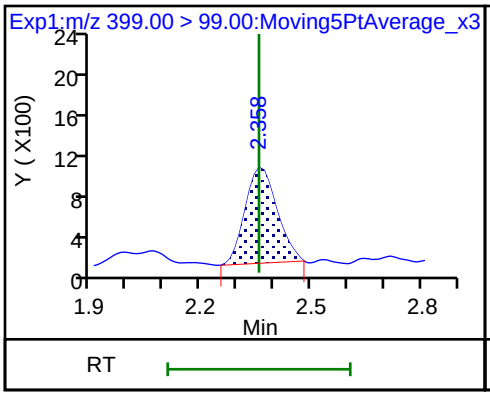
D 11 18O2 PFHxS



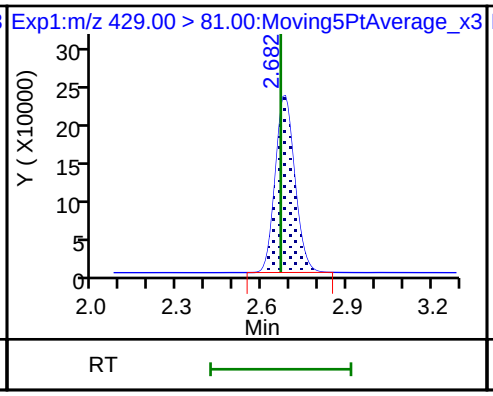
8 Perfluorohexanesulfonic acid



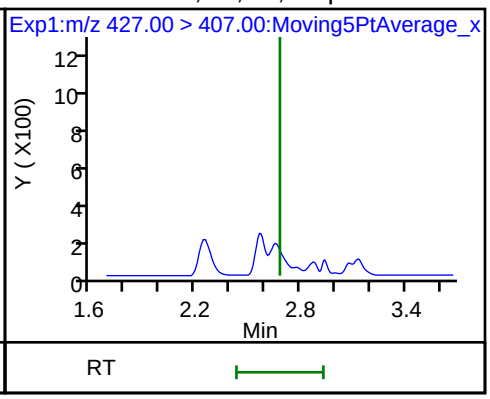
8 Perfluorohexanesulfonic acid



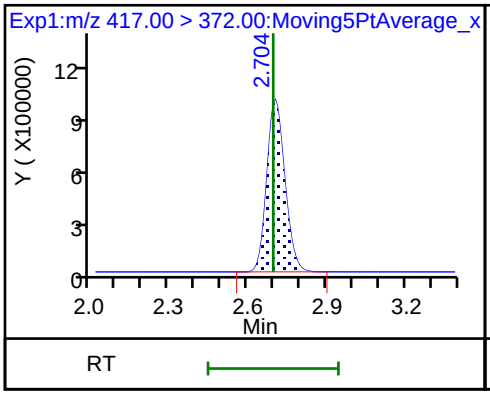
D 12 M2-6:2FTS



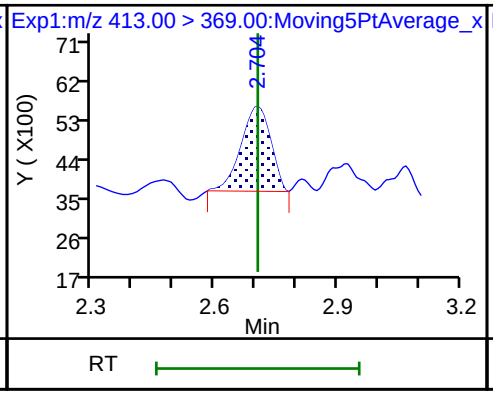
13 Sodium 1H,1H,2H,2H-perfluorooctane (ND)



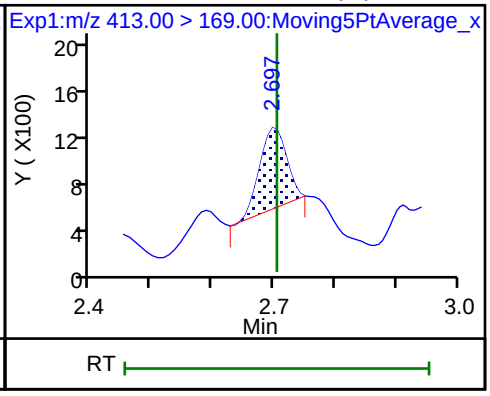
D 14 13C4 PFOA



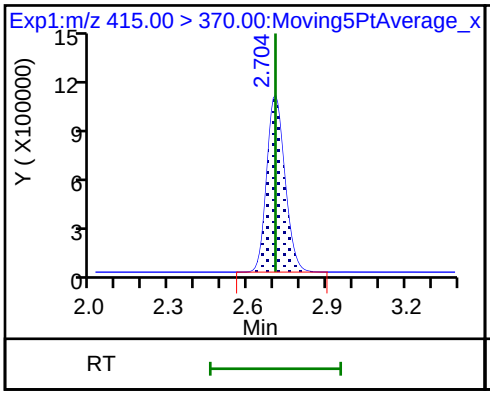
15 Perfluorooctanoic acid



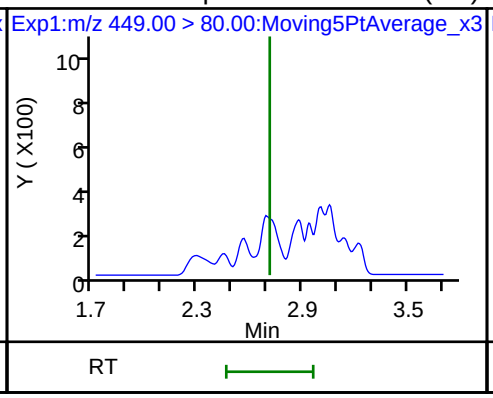
15 Perfluorooctanoic acid (M)



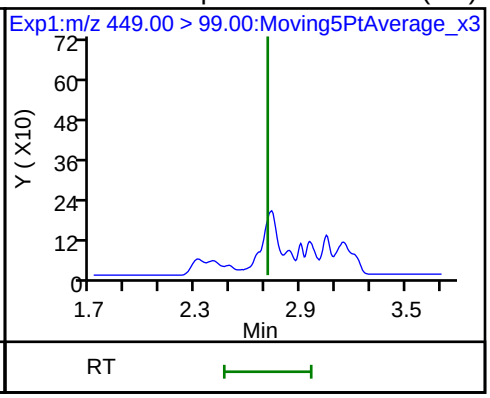
* 62 13C2-PFOA



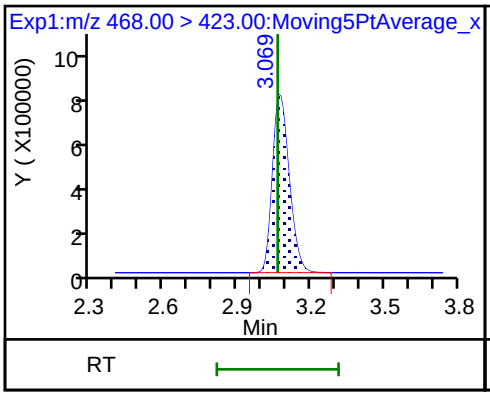
16 Perfluoroheptanesulfonic acid (ND)



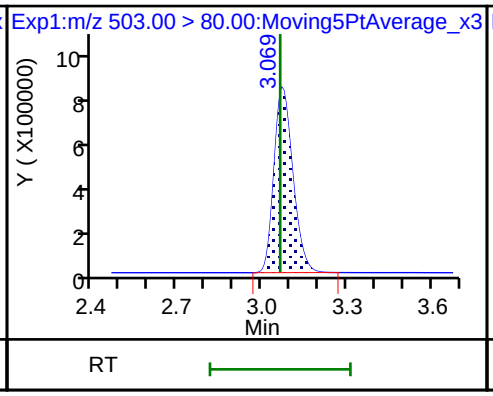
16 Perfluoroheptanesulfonic acid (ND)



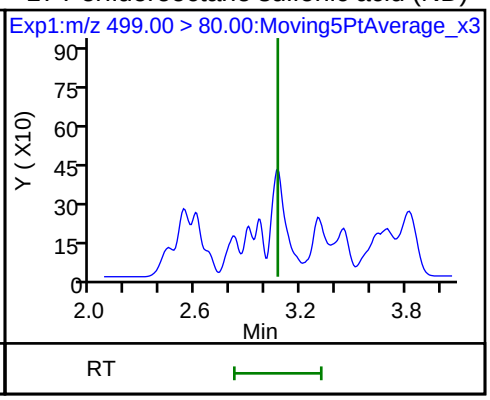
D 19 13C5 PFNA



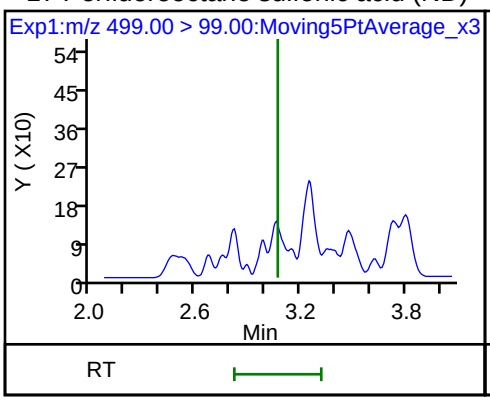
D 18 13C4 PFOS



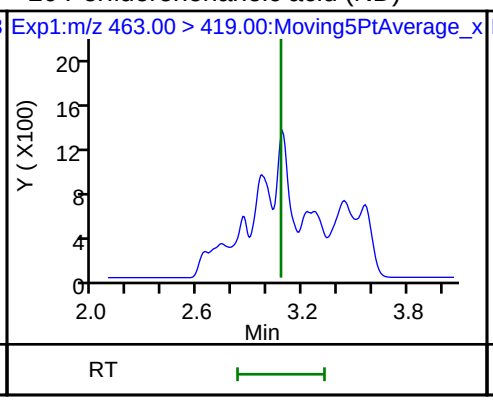
17 Perfluorooctane sulfonic acid (ND)



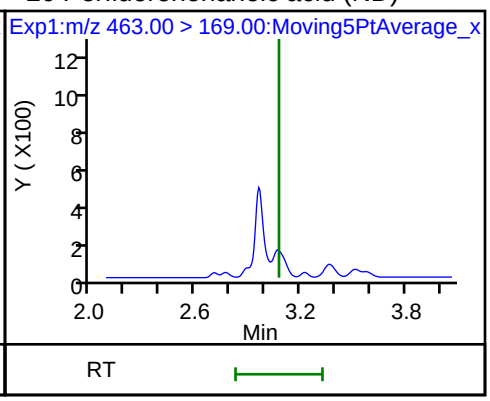
17 Perfluorooctane sulfonic acid (ND)



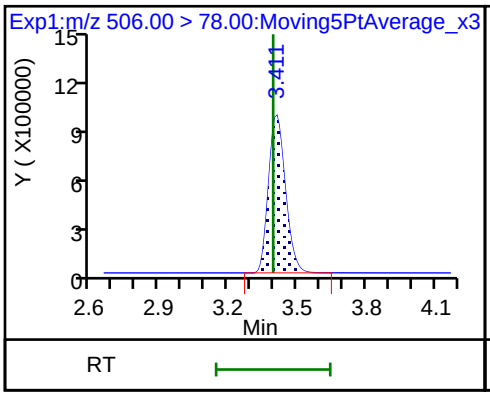
20 Perfluorononanoic acid (ND)



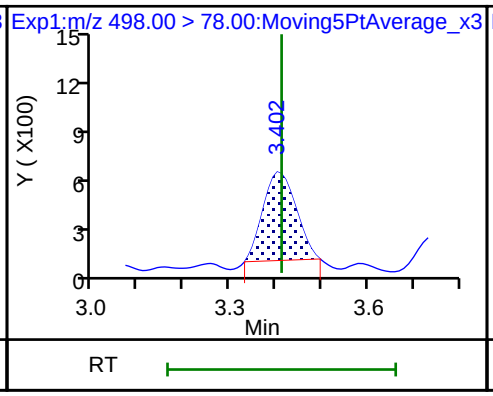
20 Perfluorononanoic acid (ND)



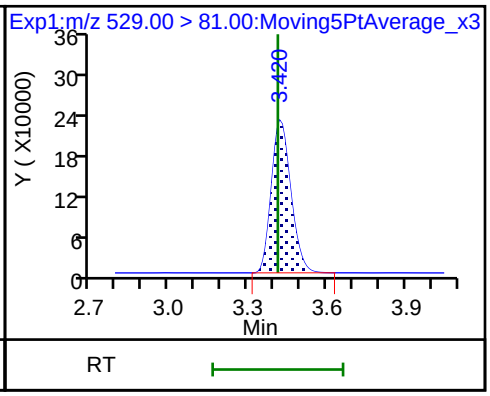
D 21 13C8 FOSA



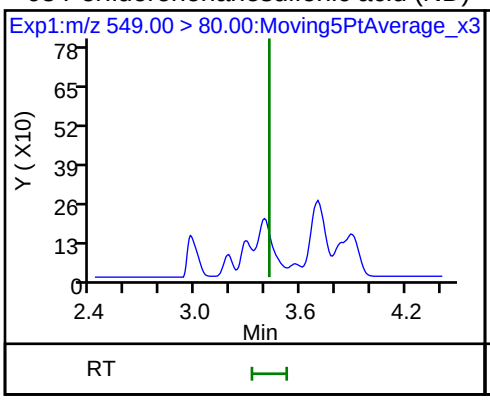
22 Perfluorooctane Sulfonamide



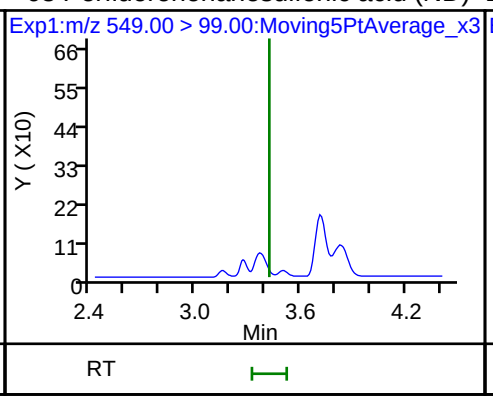
D 26 M2-8:2FTS



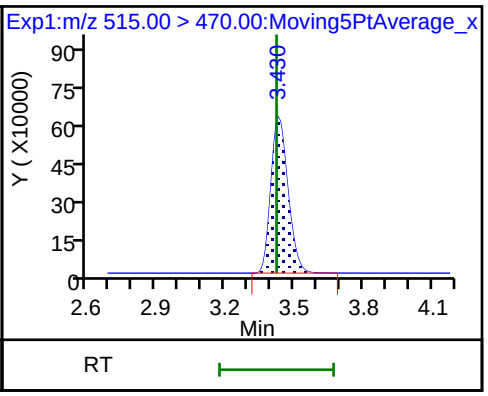
68 Perfluorononanesulfonic acid (ND)



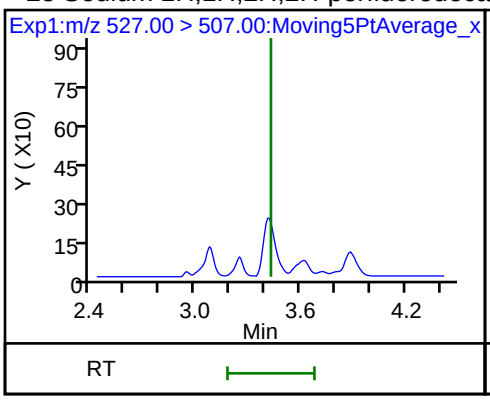
68 Perfluorononanesulfonic acid (ND)



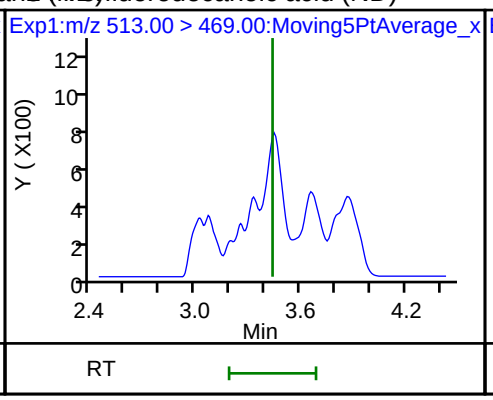
D 23 13C2 PFDA



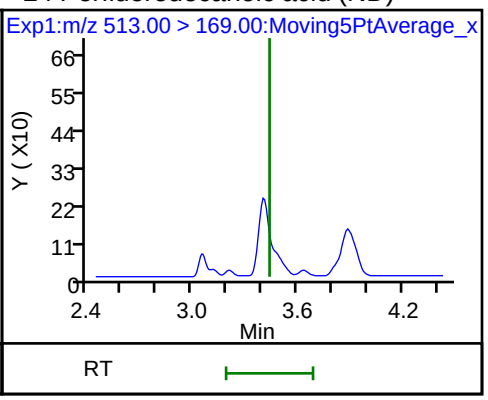
25 Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (ND)



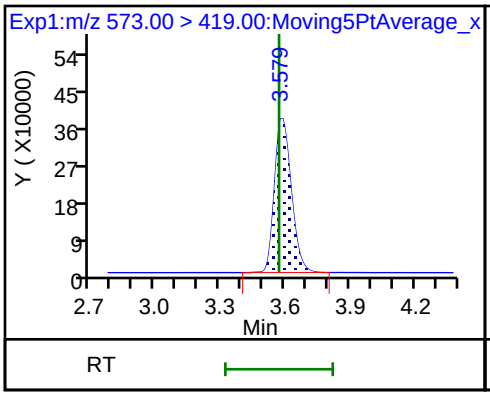
24 Perfluorodecanoic acid (ND)



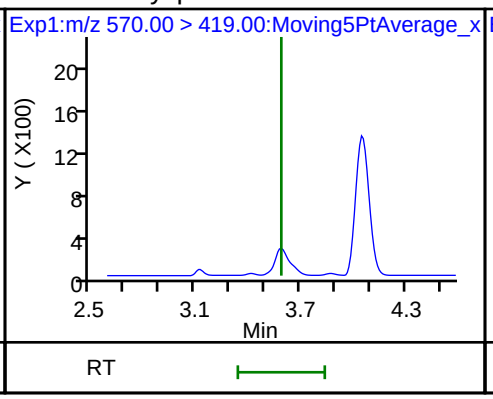
24 Perfluorodecanoic acid (ND)



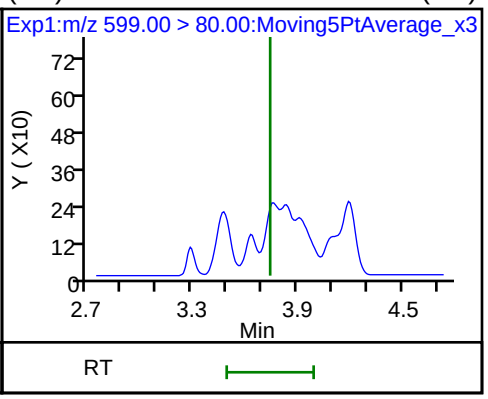
D 27 d3-NMeFOSAA



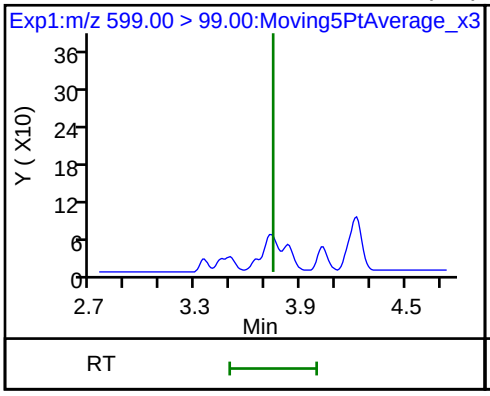
28 N-methyl perfluorooctane sulfonami (ND)



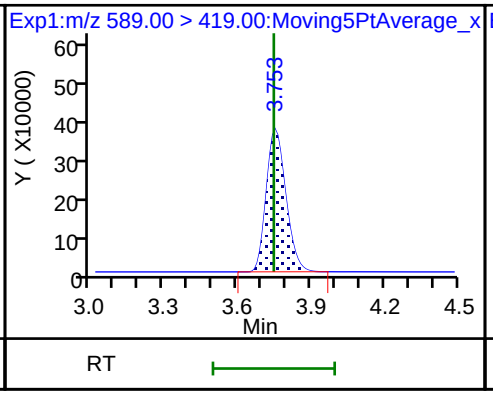
29 Perfluorodecane Sulfonic acid (ND)



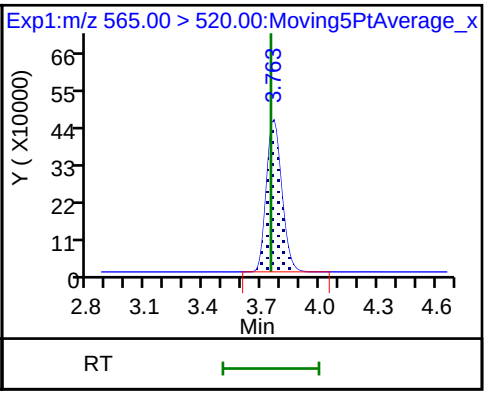
29 Perfluorodecane Sulfonic acid (ND)



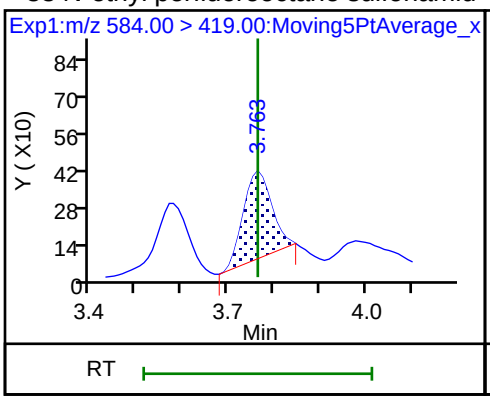
D 32 d5-NEtFOSAA



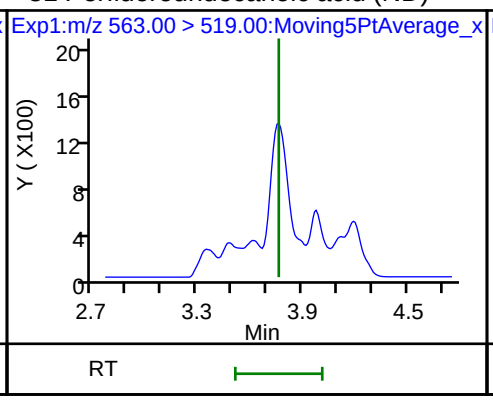
D 30 13C2 PFUnA



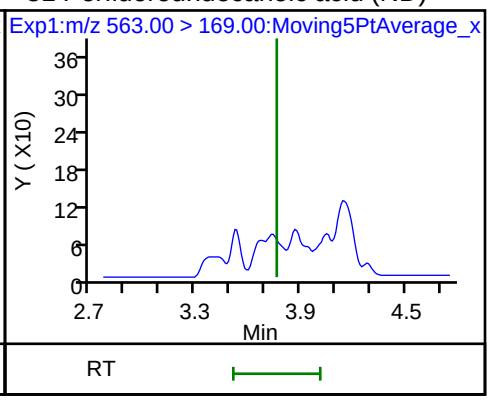
33 N-ethyl perfluorooctane sulfonamid



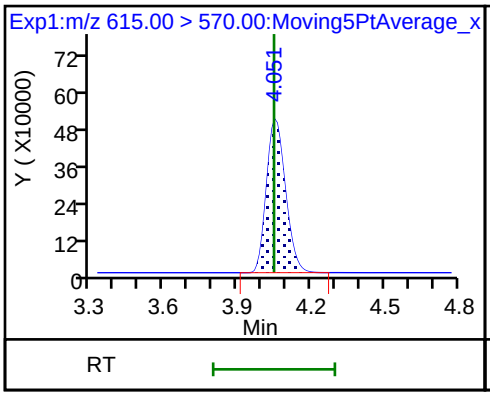
31 Perfluoroundecanoic acid (ND)



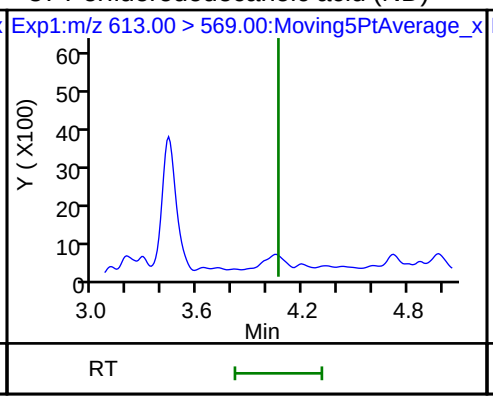
31 Perfluoroundecanoic acid (ND)



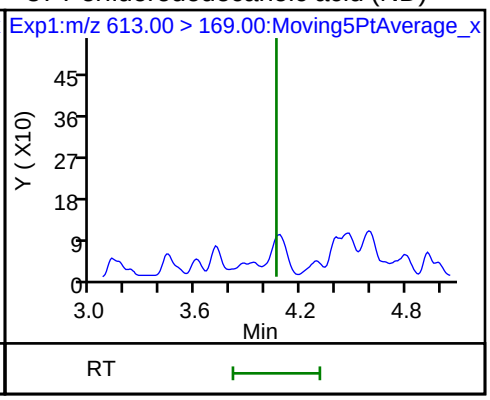
D 36 13C2 PFDoA



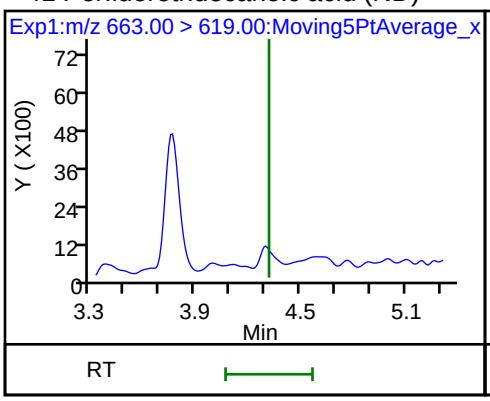
37 Perfluorododecanoic acid (ND)



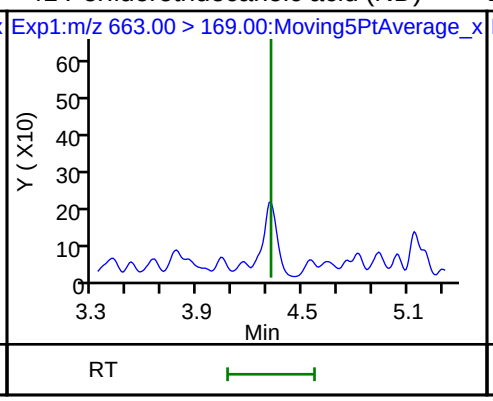
37 Perfluorododecanoic acid (ND)



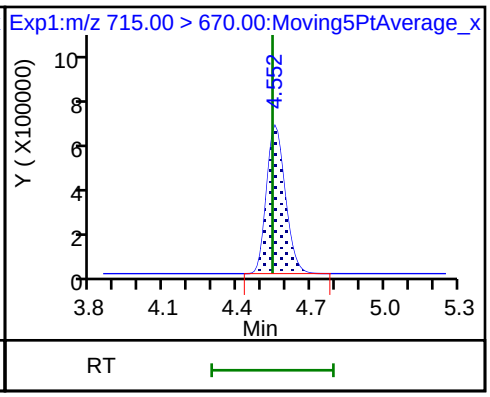
41 Perfluorotridecanoic acid (ND)



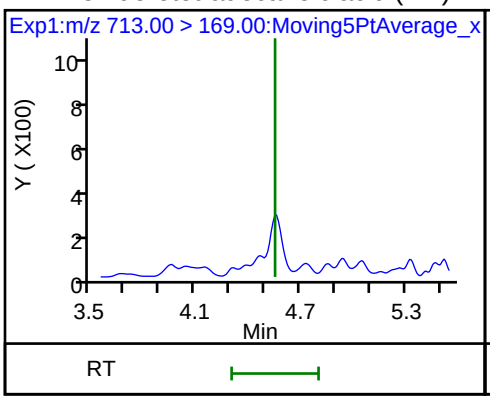
41 Perfluorotridecanoic acid (ND)



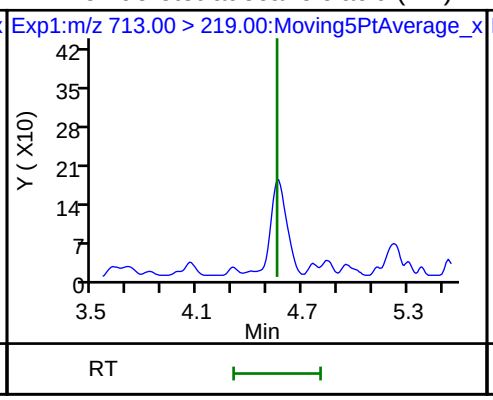
D 43 13C2-PFTeDA



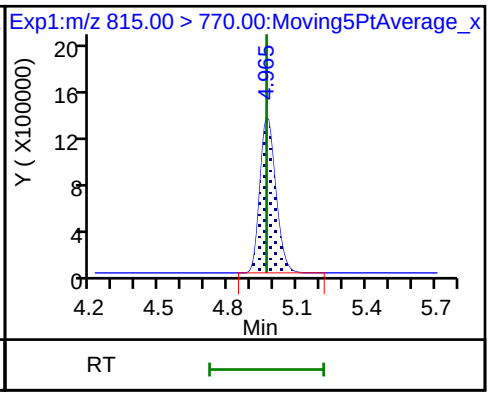
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

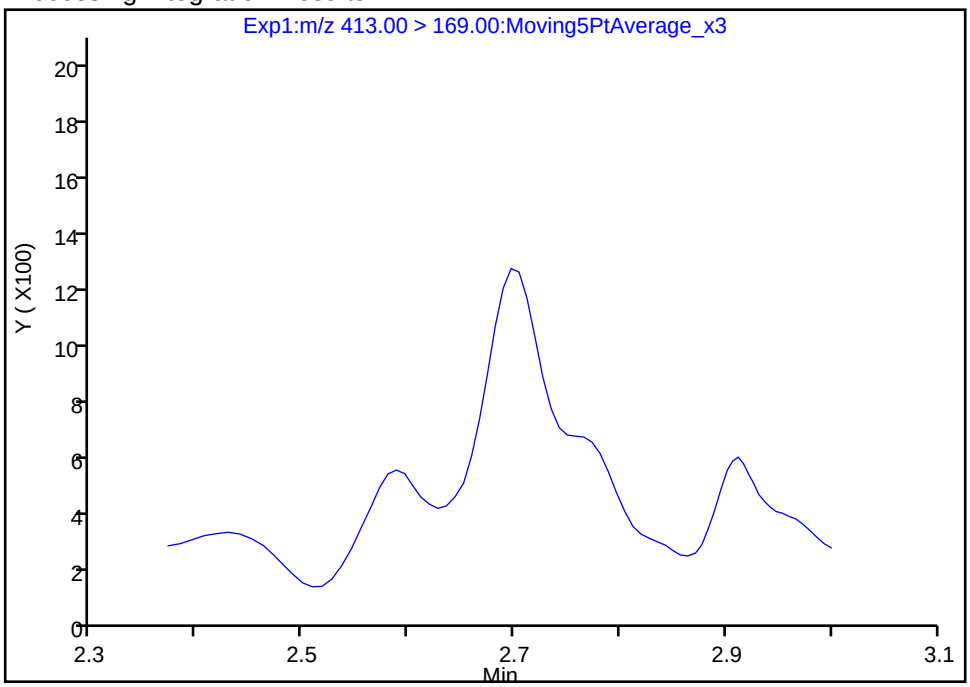
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_001.d
Injection Date: 28-May-2018 07:00:13 Instrument ID: A8_N
Lims ID: CCB
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

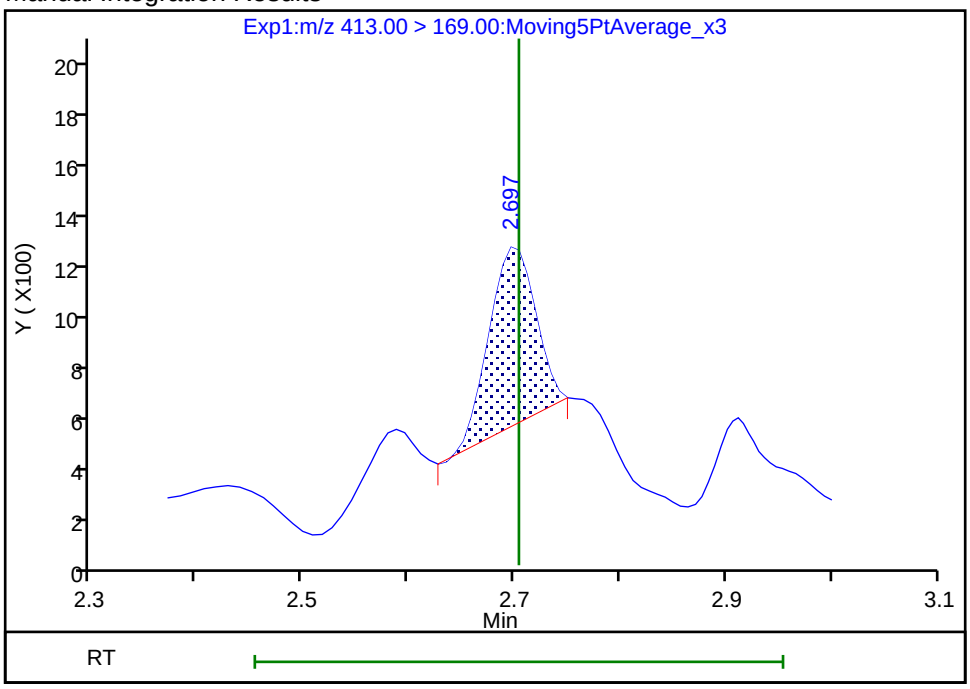
Processing Integration Results

RT: 2.70
Area: 0
Amount: 0.004407
Amount Units: ng/ml



Manual Integration Results

RT: 2.70
Area: 2116
Amount: 0.004407
Amount Units: ng/ml



Reviewer: ruangyotsakuld, 30-May-2018 10:55:04
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: | Lab Sample ID: CCB 320-225873/1

Matrix: Water | Lab File ID: 2018.05.28LLA_003.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: | Date Extracted:

Sample wt/vol: 1(mL) | Date Analyzed: 05/28/2018 17:14

Con. Extract Vol.: | Dilution Factor: 1

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

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

Analysis Batch No.: 225873 | Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U M	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	U	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00671	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: | Lab Sample ID: CCB 320-225873/1

Matrix: Water | Lab File ID: 2018.05.28LLA_003.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: | Date Extracted:

Sample wt/vol: 1(mL) | Date Analyzed: 05/28/2018 17:14

Con. Extract Vol.: | Dilution Factor: 1

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

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

Analysis Batch No.: 225873 | Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	91		50-150
STL00992	13C4 PFBA	92		50-150
STL01893	13C5 PFPeA	102		50-150
STL00993	13C2 PFHxA	98		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	104		50-150
STL00995	13C5 PFNA	104		50-150
STL00996	13C2 PFDA	102		50-150
STL00997	13C2 PFUnA	103		50-150
STL00998	13C2 PFDoA	105		50-150
STL00994	18O2 PFHxS	98		50-150
STL02116	13C2-PFTeDA	101		50-150
STL00991	13C4 PFOS	95		50-150
STL02337	13C3-PFBS	89		50-150

Report Date: 30-May-2018 09:29:53 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_003.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 28-May-2018 17:14:20 ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-May-2018 09:29:52 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 30-May-2018 09:29:52

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	1.450	1.458	-0.008	1.000	6623088	2.29		91.7	35908	
2 Perfluorobutyric acid										
212.90 > 169.00	1.450	1.464	-0.014	1.000	3722	0.001511			1.5	
D 3 13C5-PFPeA										
267.90 > 223.00	1.716	1.730	-0.014	0.562	4719436	2.55		102	65588	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.707	1.739	-0.032	0.995	5660	0.002540			3.1	
D 47 13C3-PFBS										
301.90 > 83.00	1.752	1.766	-0.014	1.000	86157	2.06		88.5	714	
D 60 M2-4:2FTS										
329.00 > 81.00	1.967	1.982	-0.015	1.000	772053	NC			8943	
D 7 13C2 PFHxA										
315.00 > 270.00	2.011	2.015	-0.004	1.000	4825710	2.44		97.8	117484	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.101	2.117	-0.016	1.000	226766	NC			3802	
D 9 13C4-PFHpA										
367.00 > 322.00	2.329	2.347	-0.018	1.000	4705920	2.49		99.5	62242	
D 11 18O2 PFHxS										
403.00 > 84.00	2.355	2.360	-0.005	1.000	5401518	2.31		97.7	45376	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.355	2.373	-0.018	1.000	17257	0.006705			64.9	
399.00 > 99.00	2.355	2.373	-0.018	1.000	4789		3.60(1.50-4.49)		25.9	
D 12 M2-6:2FTS										
429.00 > 81.00	2.665	2.683	-0.018	1.000	1129938	2.71		114	15729	
D 14 13C4 PFOA										
417.00 > 372.00	2.688	2.706	-0.018	1.000	4650909	2.60		104	62361	
* 62 13C2-PFOA										
415.00 > 370.00	2.688	2.713	-0.025		4725130	2.50			47727	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.680	2.713	-0.033	0.997	12741	0.005819			4.9	
413.00 > 169.00	2.695	2.713	-0.018	1.003	6150		2.07(0.84-2.52)		18.2	
D 19 13C5 PFNA										
468.00 > 423.00	3.053	3.074	-0.021	1.000	3806995	2.60		104	68907	
D 18 13C4 PFOS										
503.00 > 80.00	3.053	3.074	-0.021	1.000	3630380	2.26		94.5	28456	
D 21 13C8 FOSA										
506.00 > 78.00	3.398	3.412	-0.014	1.000	4802336	2.28		91.3	47786	
D 26 M2-8:2FTS										
529.00 > 81.00	3.407	3.430	-0.023	1.000	1218459	2.56		107	18380	
D 23 13C2 PFDA										
515.00 > 470.00	3.416	3.439	-0.023	1.000	3183003	2.56		102	41692	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.565	3.590	-0.025	1.000	1930964	2.81		112	24483	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.729	3.754	-0.025	1.000	2014117	2.86		114	15763	
31 Perfluoroundecanoic acid										R
563.00 > 519.00	3.750	3.764	-0.014	1.003	3099	0.003649			18.2	R
563.00 > 169.00	3.750	3.764	-0.014	1.003	2869		1.08(2.12-6.36)		64.3	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.729	3.764	-0.035	1.000	1758	0.002321			36.3	
D 30 13C2 PFUnA										
565.00 > 520.00	3.740	3.765	-0.025	1.000	2542433	2.58		103	52042	
D 36 13C2 PFDoA										
615.00 > 570.00	4.029	4.055	-0.026	1.000	2783322	2.62		105	19313	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.531	4.550	-0.019	1.000	3279832	2.52		101	19970	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.939	4.964	-0.025	1.000	6102863	2.76		110	14996	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.939	4.972	-0.033	1.000	51325	NC			22.1	
813.00 > 169.00	4.947	4.972	-0.025	1.002	7838		6.55(2.86-8.58)		90.8	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL0_00006 Amount Added: 1.00 Units: mL

Report Date: 30-May-2018 09:29:53 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58844.b\2018.05.28LLA_003.d

Injection Date: 28-May-2018 17:14:20 Instrument ID: A8_N

Lims ID: CCB

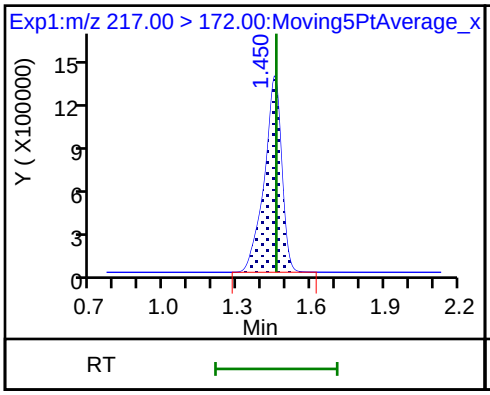
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 1

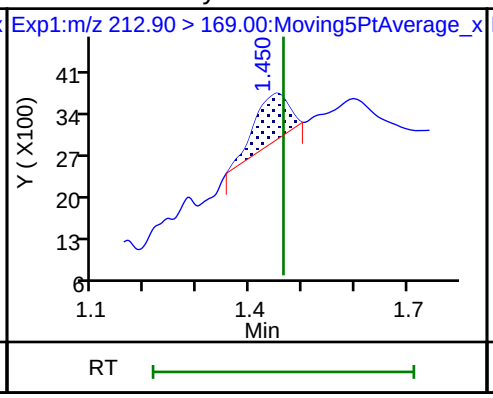
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

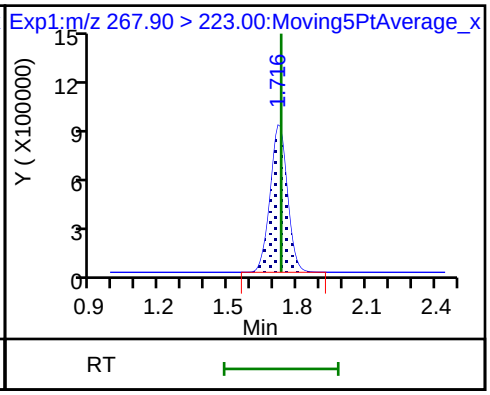
D 1 13C4 PFBA



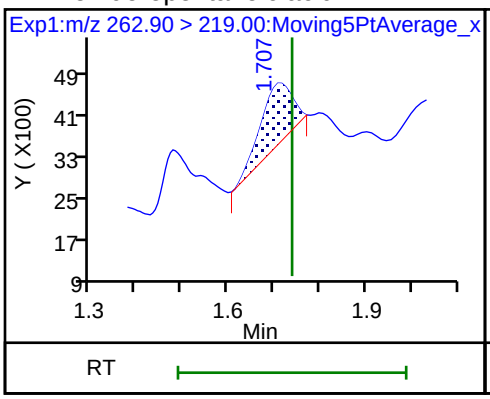
2 Perfluorobutyric acid



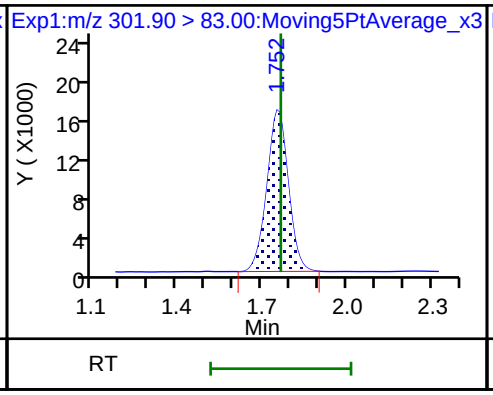
D 3 13C5-PFPeA



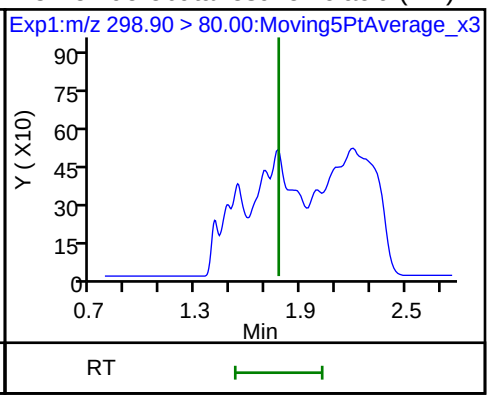
4 Perfluoropentanoic acid



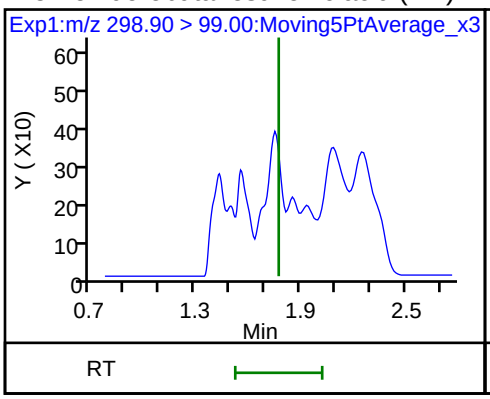
D 47 13C3-PFBS



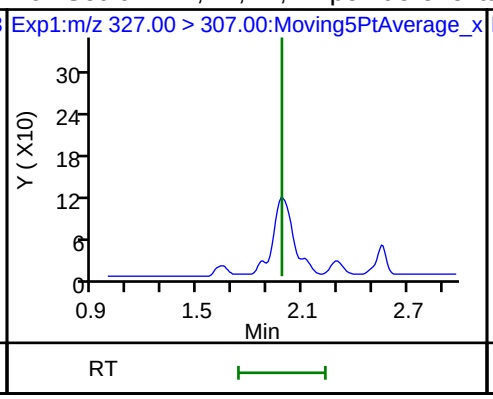
5 Perfluorobutanesulfonic acid (ND)



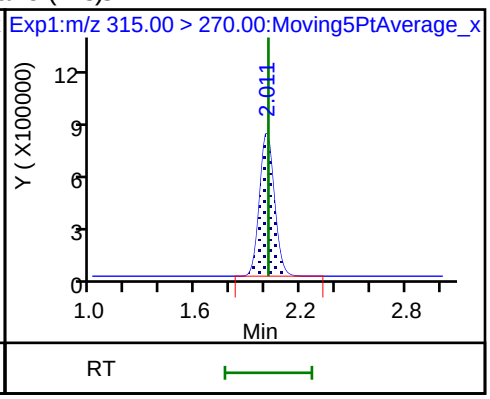
5 Perfluorobutanesulfonic acid (ND)



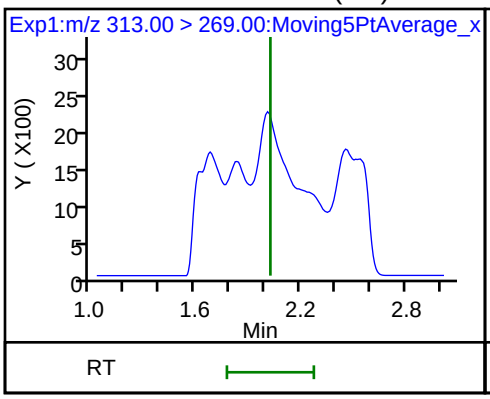
61 Sodium 1H,1H,2H,2H-perfluorohexane (ND)



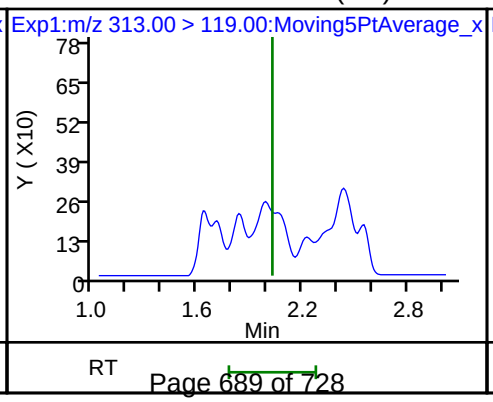
D 13C2 PFHxA



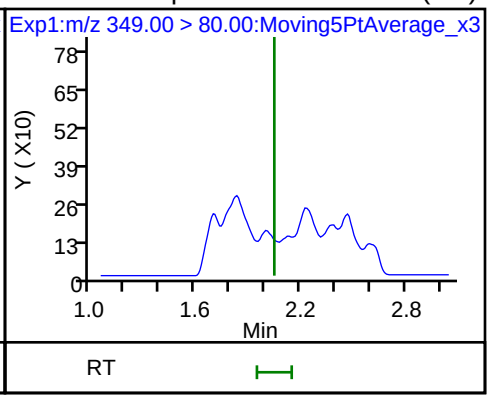
6 Perfluorohexanoic acid (ND)



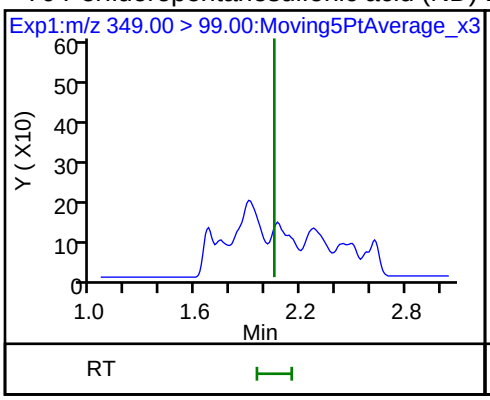
6 Perfluorohexanoic acid (ND)



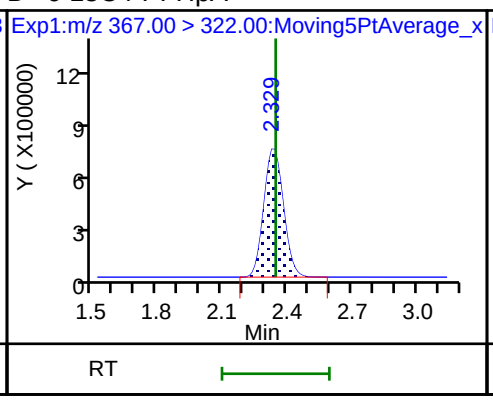
70 Perfluoropentanesulfonic acid (ND)



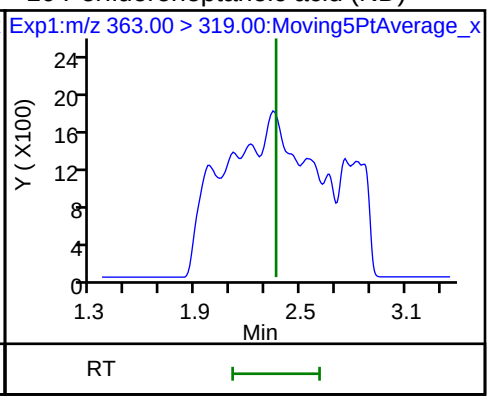
70 Perfluoropentanesulfonic acid (ND)



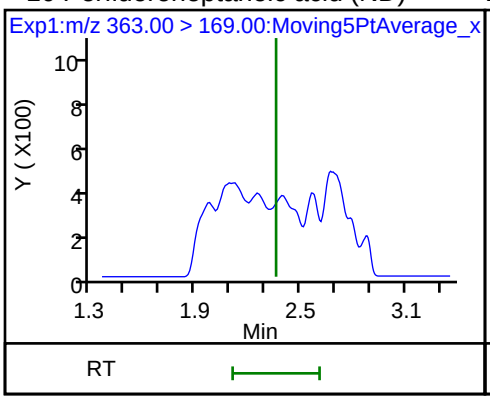
D 9 13C4-PFHpA



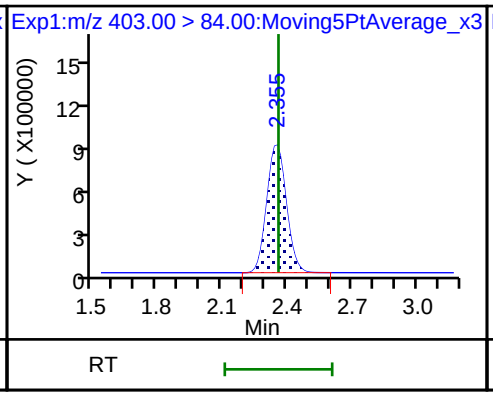
10 Perfluoroheptanoic acid (ND)



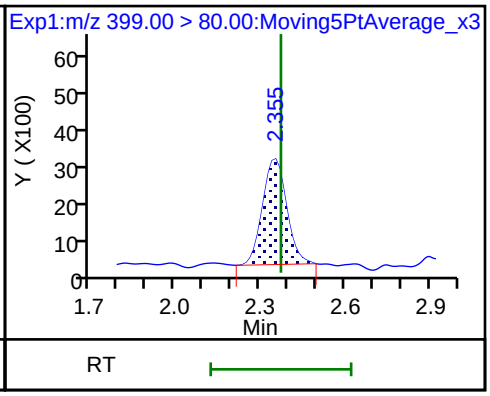
10 Perfluoroheptanoic acid (ND)



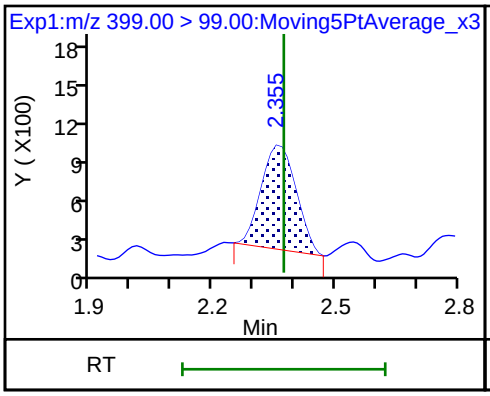
D 11 18O2 PFHxS



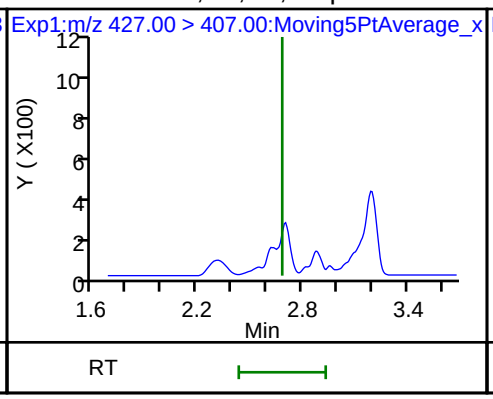
8 Perfluorohexanesulfonic acid



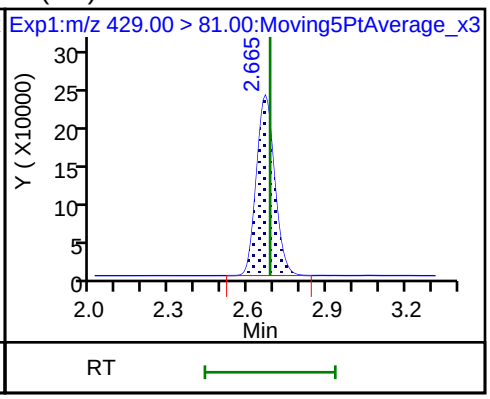
8 Perfluorohexanesulfonic acid



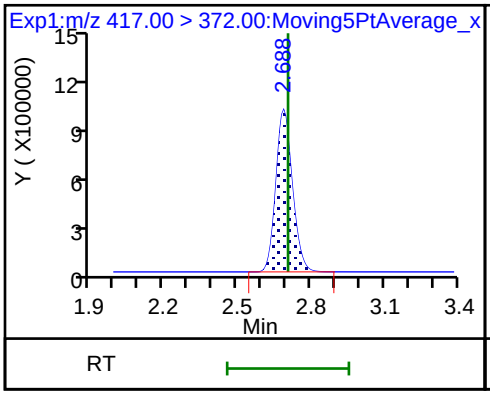
13 Sodium 1H,1H,2H,2H-perfluorooctane [X]



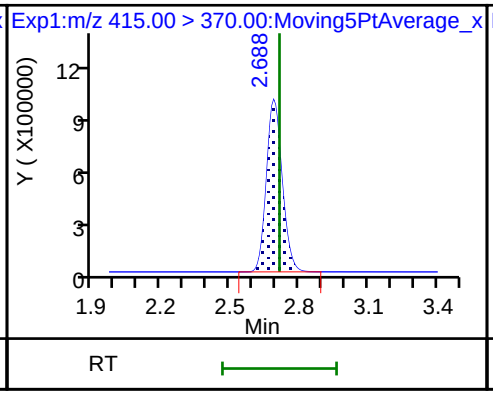
D (X) 2-6:2FTS



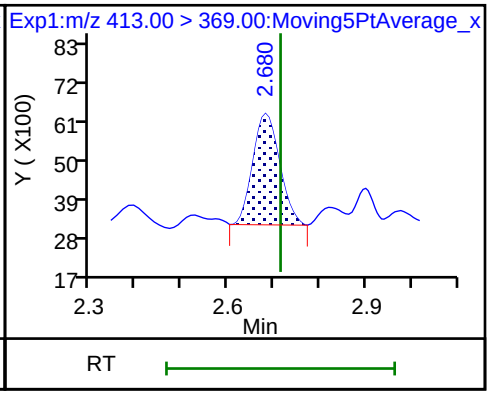
D 14 13C4 PFOA



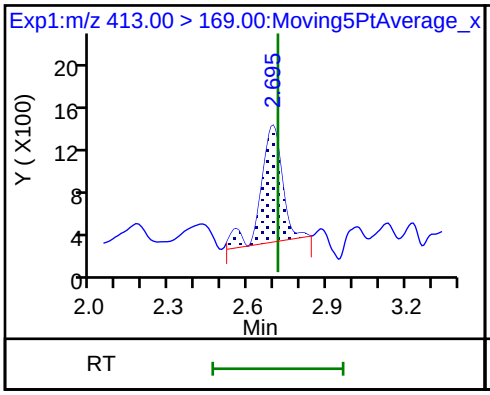
* 62 13C2-PFOA



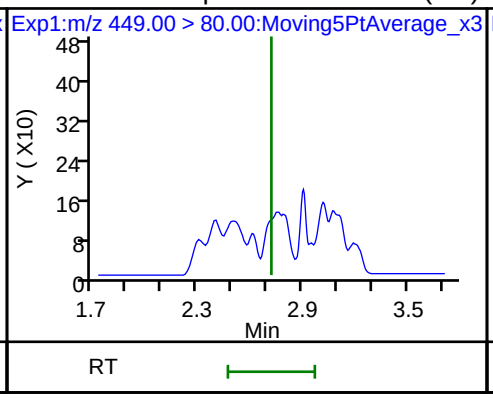
15 Perfluorooctanoic acid



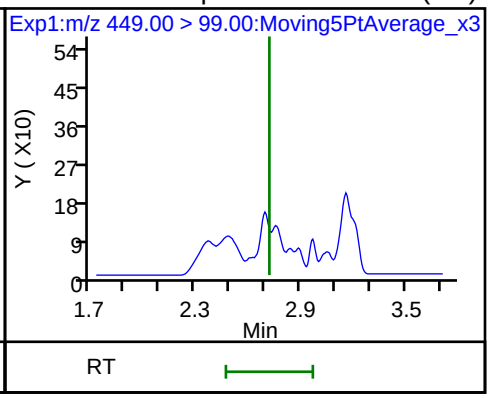
15 Perfluorooctanoic acid



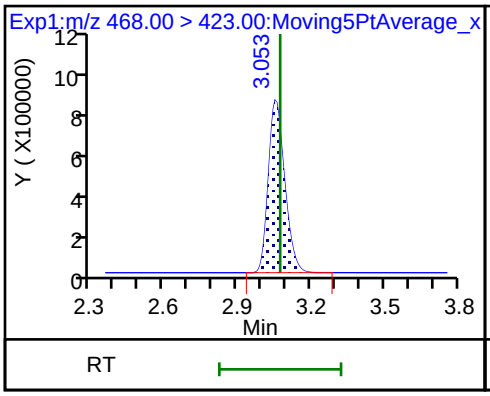
16 Perfluoroheptanesulfonic acid (ND)



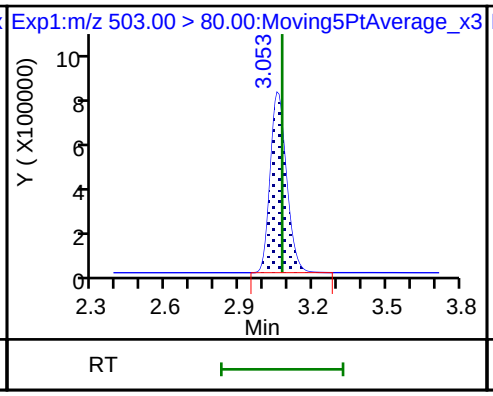
16 Perfluoroheptanesulfonic acid (ND)



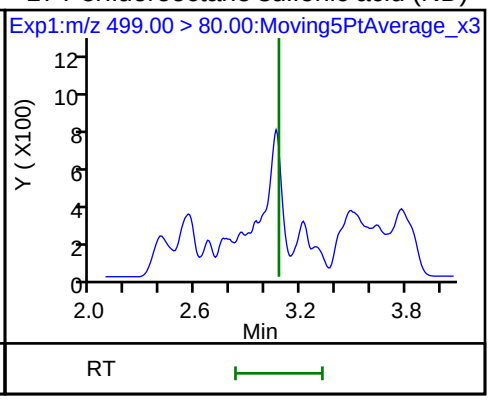
D 19 13C5 PFNA



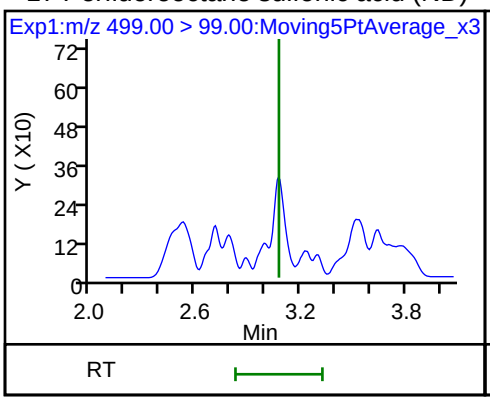
D 18 13C4 PFOS



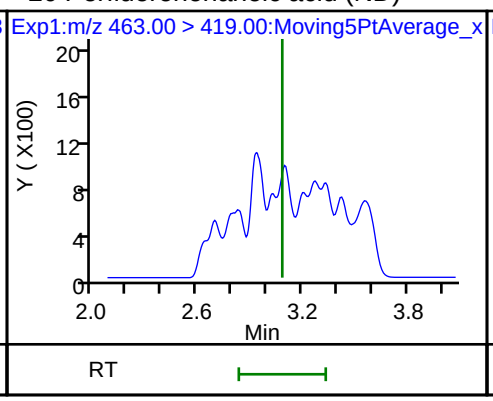
17 Perfluorooctane sulfonic acid (ND)



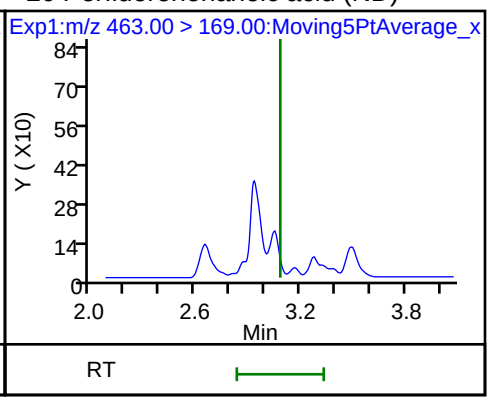
17 Perfluorooctane sulfonic acid (ND)



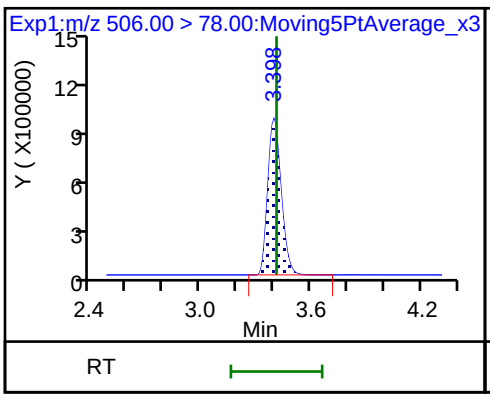
20 Perfluorononanoic acid (ND)



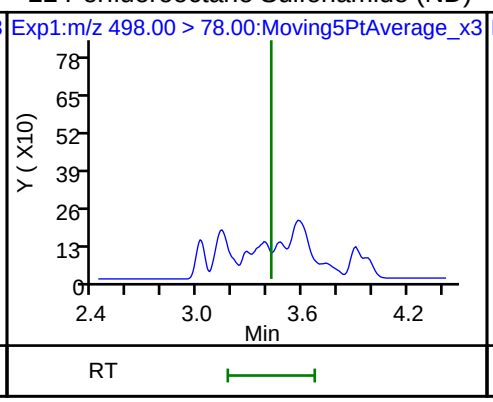
20 Perfluorononanoic acid (ND)



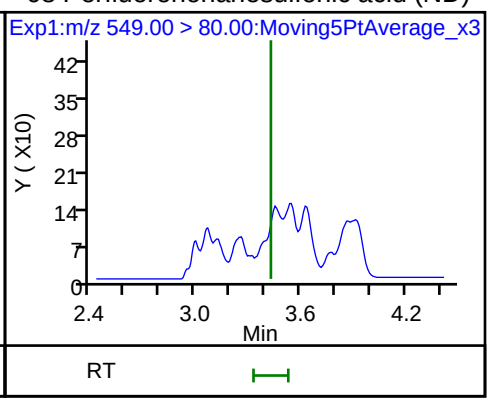
D 21 13C8 FOSA



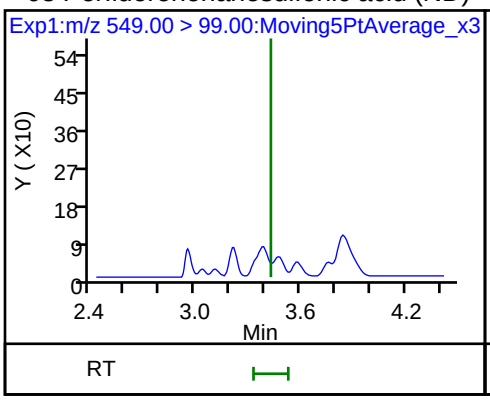
22 Perfluorooctane Sulfonamide (ND)



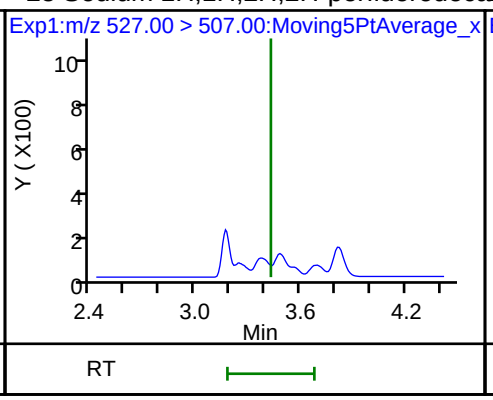
68 Perfluorononanesulfonic acid (ND)



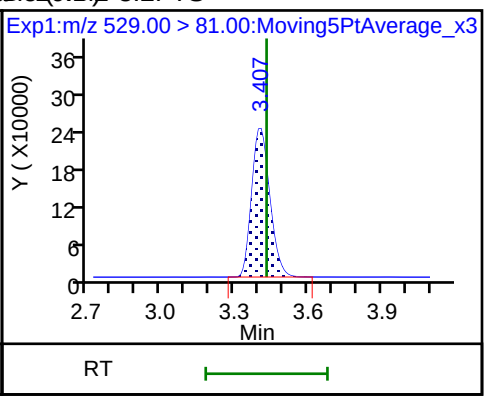
68 Perfluorononanesulfonic acid (ND)



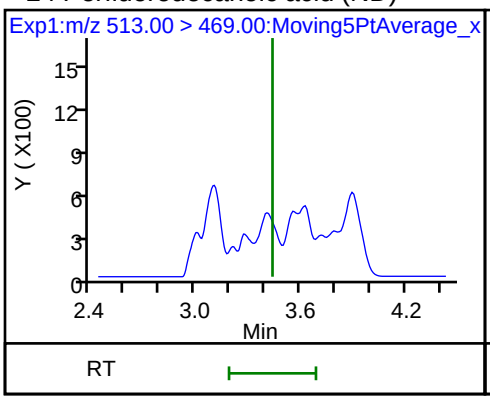
25 Sodium 1H,1H,2H,2H-perfluorodecanesulfonate (ND)



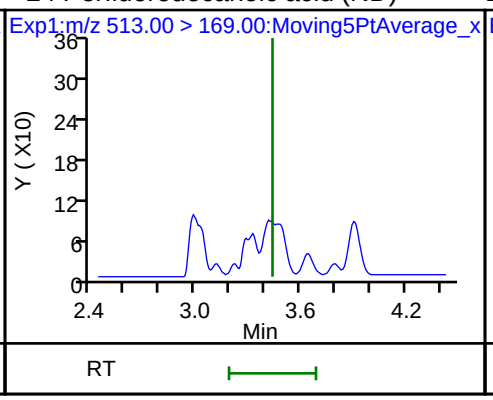
D 26 M2-8:2FTS



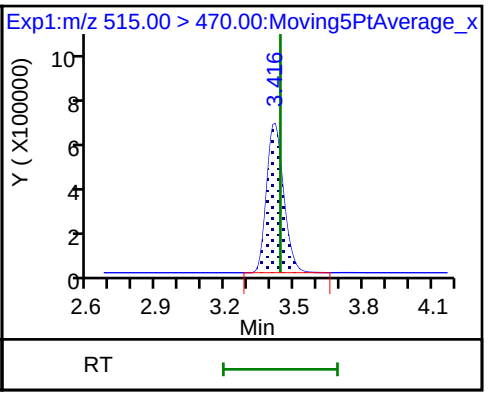
24 Perfluorodecanoic acid (ND)



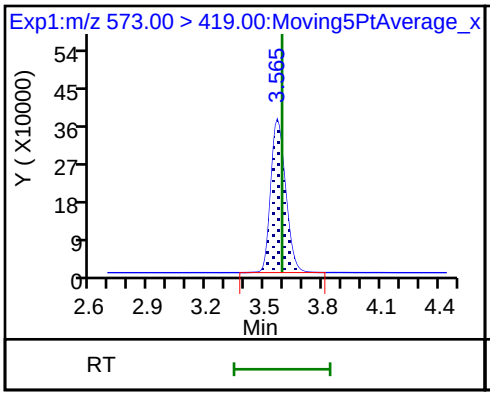
24 Perfluorodecanoic acid (ND)



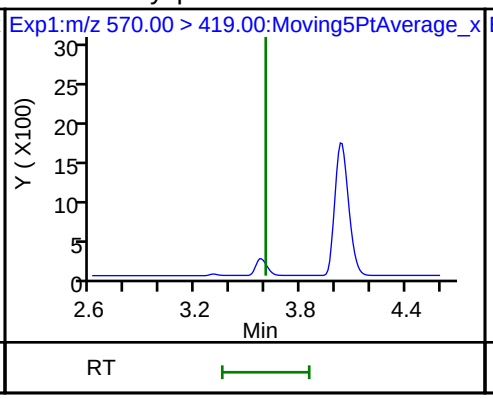
D 23 13C2 PFDA



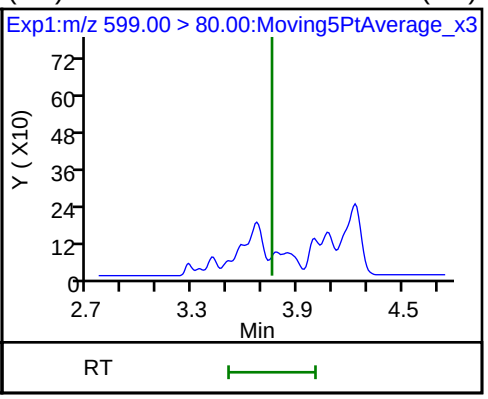
D 27 d3-NMeFOSAA



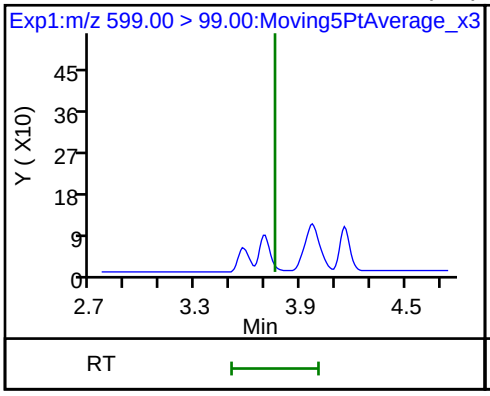
28 N-methyl perfluorooctane sulfonami (ND)



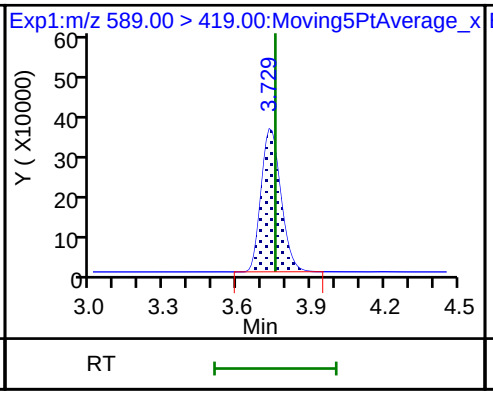
29 Perfluorodecane Sulfonic acid (ND)



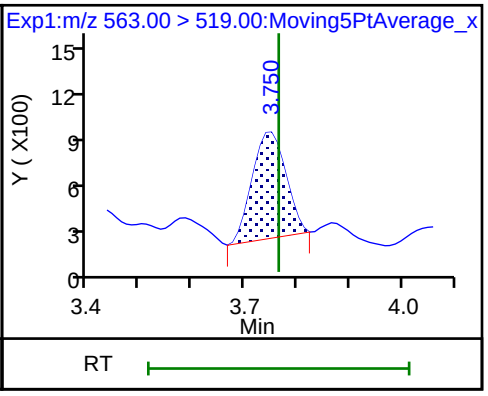
29 Perfluorodecane Sulfonic acid (ND)



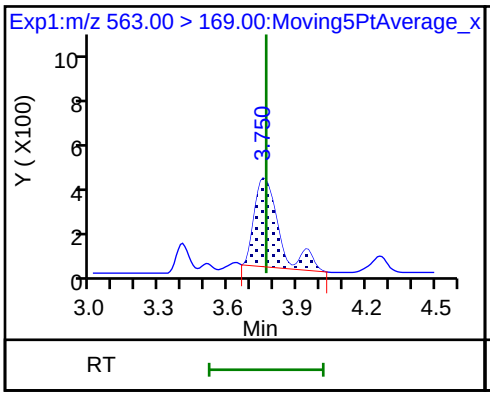
D 32 d5-NEtFOSAA



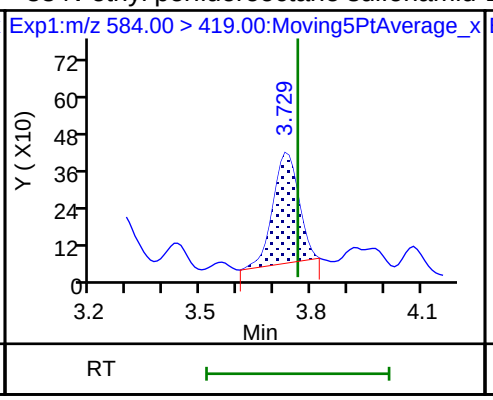
31 Perfluoroundecanoic acid



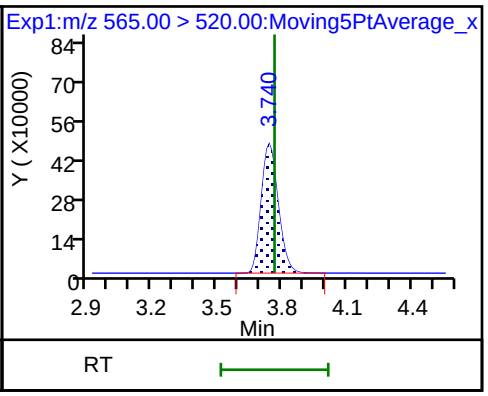
31 Perfluoroundecanoic acid



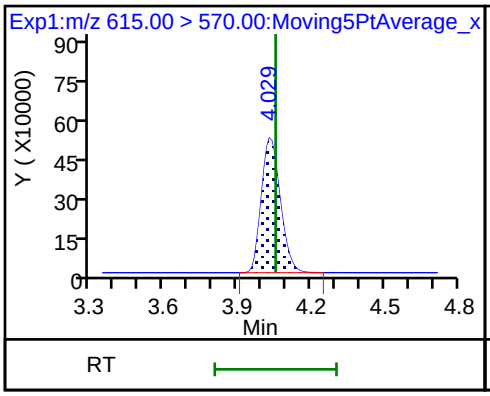
33 N-ethyl perfluorooctane sulfonamid



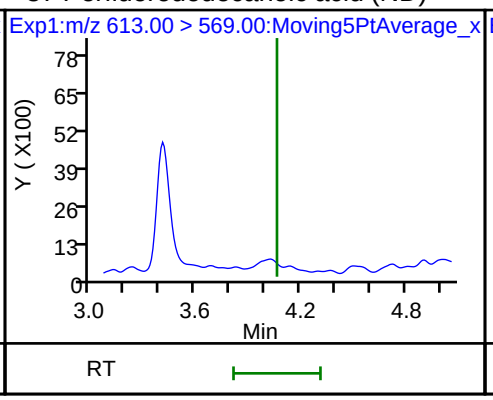
D 30 13C2 PFUnA



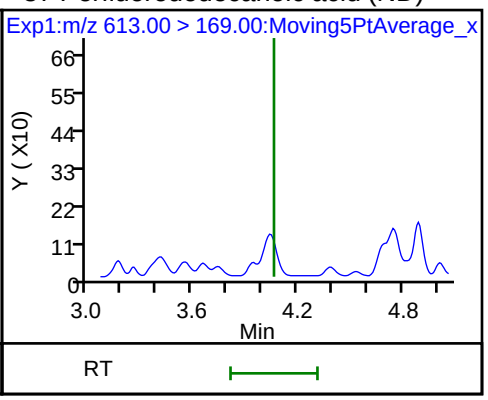
D 36 13C2 PFDoA



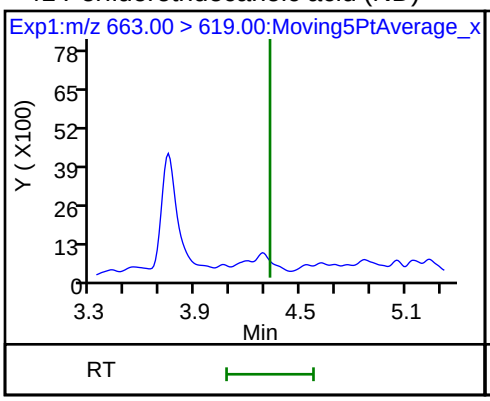
37 Perfluorododecanoic acid (ND)



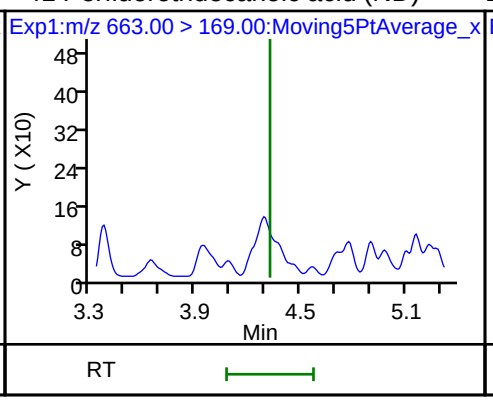
37 Perfluorododecanoic acid (ND)



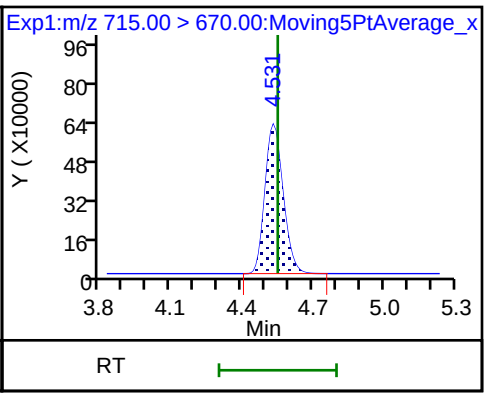
41 Perfluorotridecanoic acid (ND)



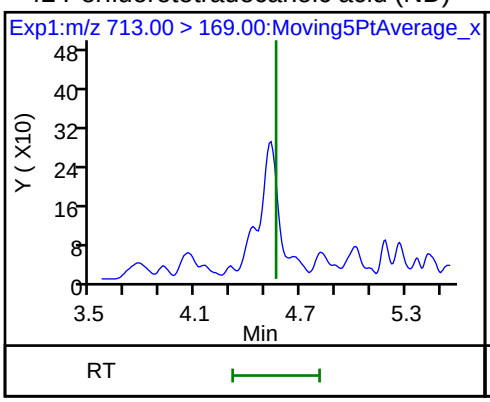
41 Perfluorotridecanoic acid (ND)



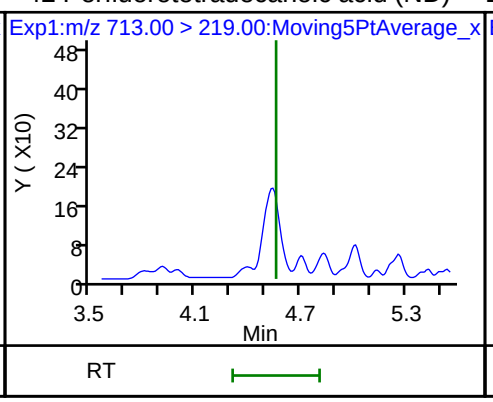
D 43 13C2-PFTeDA



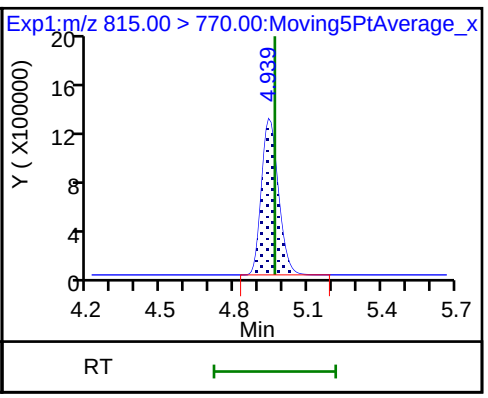
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: | Lab Sample ID: ICB 320-223413/12

Matrix: Water | Lab File ID: 2018.05.15LLCC_ICAL_009.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: | Date Extracted:

Sample wt/vol: 1(mL) | Date Analyzed: 05/15/2018 17:15

Con. Extract Vol.: | Dilution Factor: 1

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

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

Analysis Batch No.: 223413 | Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U M	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U M	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U M	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	U	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00611	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: Lab Sample ID: ICB 320-223413/12

Matrix: Water Lab File ID: 2018.05.15LLCC_ICAL_009.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 05/15/2018 17:15

Con. Extract Vol.: Dilution Factor: 1

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

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

Analysis Batch No.: 223413 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	99		50-150
STL00992	13C4 PFBA	93		50-150
STL01893	13C5 PFPeA	97		50-150
STL00993	13C2 PFHxA	97		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	97		50-150
STL00995	13C5 PFNA	96		50-150
STL00996	13C2 PFDA	98		50-150
STL00997	13C2 PFUnA	101		50-150
STL00998	13C2 PFDoA	98		50-150
STL00994	18O2 PFHxS	99		50-150
STL02116	13C2-PFTeDA	102		50-150
STL00991	13C4 PFOS	95		50-150
STL02337	13C3-PFBS	93		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLCC_ICAL_009.d
Lims ID: ICB
Client ID:
Sample Type: ICB
Inject. Date: 15-May-2018 17:15:15 ALS Bottle#: 20 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 16-May-2018 09:20:35 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK037

First Level Reviewer: hannigana Date: 15-May-2018 17:27:45

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	1.461	1.462	-0.001	1.000	6834002	2.32		92.9	44424	
2 Perfluorobutyric acid										
212.90 > 169.00	1.428	1.462	-0.034	0.977	1934	0.000761			1.1	
D 3 13C5-PFPeA										
267.90 > 223.00	1.735	1.744	-0.009	0.560	4554901	2.42		96.6	70172	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.753	1.745	0.008	1.010	3325	0.001546			2.0	M
D 47 13C3-PFBS										
301.90 > 83.00	1.771	1.780	-0.009	1.000	91731	2.15		92.6	637	
D 60 M2-4:2FTS										
329.00 > 81.00	1.988	1.999	-0.011	1.000	682133	NC			10323	
D 7 13C2 PFHxA										
315.00 > 270.00	2.034	2.037	-0.003	1.000	4878847	2.43		97.0	80794	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.135	2.134	0.001	1.000	218558	NC			3998	
D 9 13C4-PFHpA										
367.00 > 322.00	2.369	2.374	-0.005	1.000	4755233	2.47		98.7	85391	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.381	2.386	-0.005	1.000	16271	0.006109			134	
399.00 > 99.00	2.392	2.386	0.006	1.005	5655		2.88(1.50-4.49)		29.1	
D 11 18O2 PFHxS										
403.00 > 84.00	2.381	2.386	-0.005	1.000	5590477	2.35		99.3	65287	
D 12 M2-6:2FTS										
429.00 > 81.00	2.703	2.707	-0.004	1.000	956734	2.25		94.7	16650	
D 14 13C4 PFOA										
417.00 > 372.00	2.726	2.731	-0.005	1.000	4440901	2.44		97.5	70177	

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	2.726	2.734	-0.008	1.000	10716	0.005125			3.8	
413.00 > 169.00	2.734	2.734	0.0	1.003	4691		2.28(0.84-2.52)		17.4	M
* 62 13C2-PFOA										
415.00 > 370.00	2.726	2.734	-0.008		4812155	2.50			53339	
D 18 13C4 PFOS										
503.00 > 80.00	3.098	3.104	-0.006	1.000	3706216	2.26		94.8	31694	
D 19 13C5 PFNA										
468.00 > 423.00	3.098	3.107	-0.009	1.000	3591643	2.41		96.4	63691	
D 21 13C8 FOSA										
506.00 > 78.00	3.418	3.420	-0.002	1.000	5286237	2.47		98.7	45431	
D 26 M2-8:2FTS										
529.00 > 81.00	3.455	3.459	-0.004	1.000	1260135	2.60		109	22405	
D 23 13C2 PFDA										
515.00 > 470.00	3.464	3.468	-0.004	1.000	3105206	2.45		98.0	43198	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.619	3.624	-0.005	1.000	1696051	2.42		97.0	26254	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.783	3.794	-0.011	1.000	1827491	2.55		102	9869	
D 30 13C2 PFUnA										
565.00 > 520.00	3.793	3.800	-0.007	1.000	2538884	2.53		101	59716	
D 36 13C2 PFDoA										
615.00 > 570.00	4.092	4.099	-0.007	1.000	2646709	2.45		98.0	20316	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.604	4.608	-0.004	1.000	3368294	2.54		102	17469	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.018	5.030	-0.012	1.000	5921904	2.63		105	13794	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.018	5.031	-0.013	1.000	54017	NC			13.7	
813.00 > 169.00	5.018	5.031	-0.013	1.000	8963		6.03(2.86-8.58)		81.6	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00006 Amount Added: 1.00 Units: mL

Report Date: 16-May-2018 09:20:40 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLCC_ICAL_009.d

Injection Date: 15-May-2018 17:15:15 Instrument ID: A8_N

Lims ID: ICB

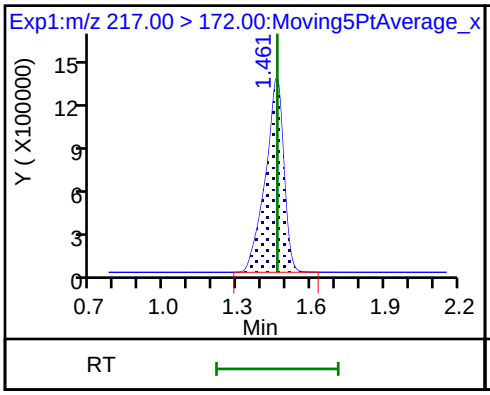
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 12

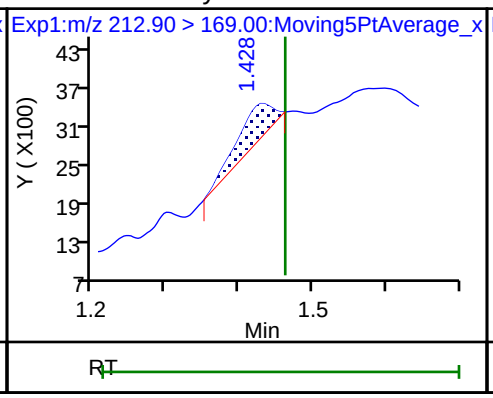
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

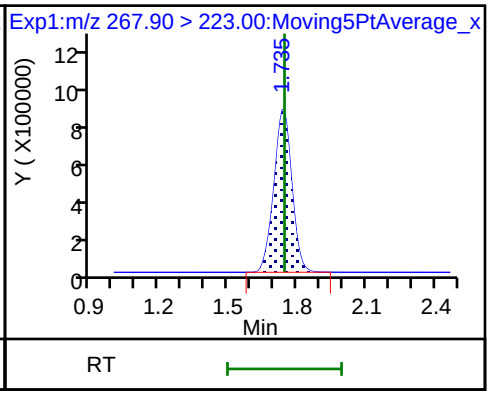
D 1 13C4 PFBA



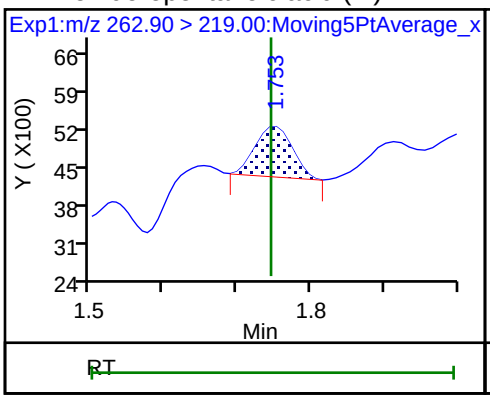
2 Perfluorobutyric acid



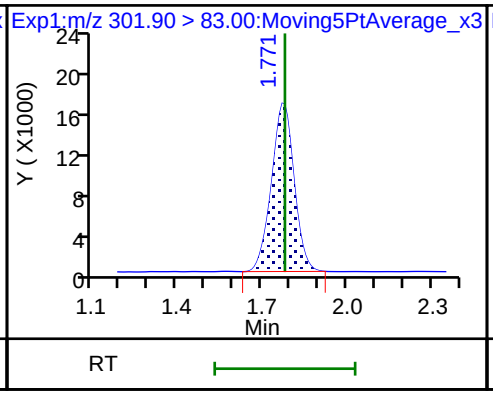
D 3 13C5-PFPeA



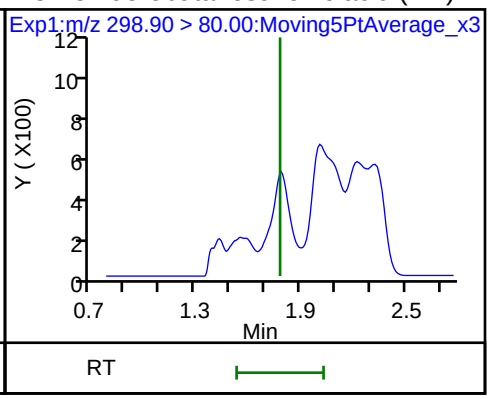
4 Perfluoropentanoic acid (M)



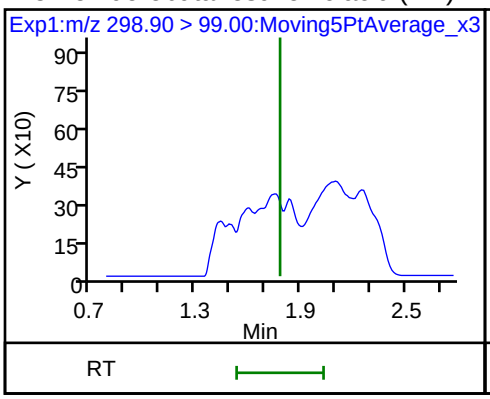
D 47 13C3-PFBS



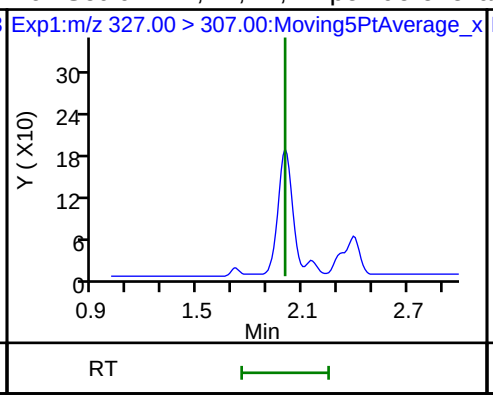
5 Perfluorobutanesulfonic acid (ND)



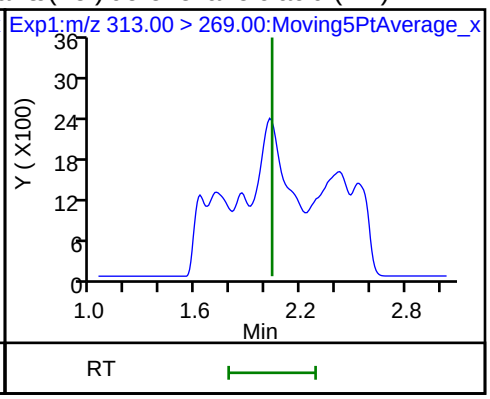
5 Perfluorobutanesulfonic acid (ND)



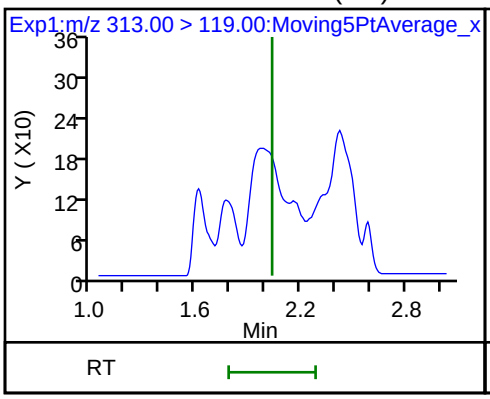
61 Sodium 1H,1H,2H,2H-perfluorohexane6(ND)



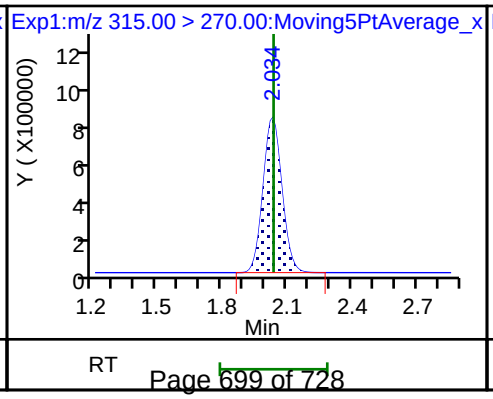
6 Perfluorohexanoic acid (ND)



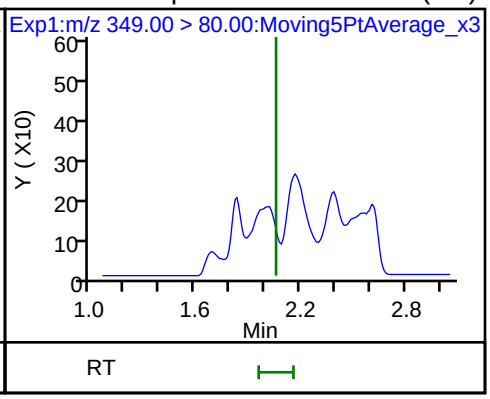
6 Perfluorohexanoic acid (ND)



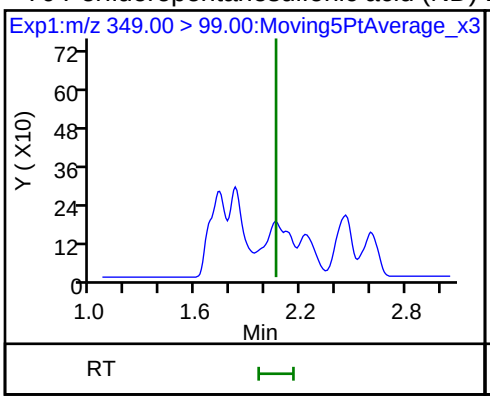
D 7 13C2 PFHxA



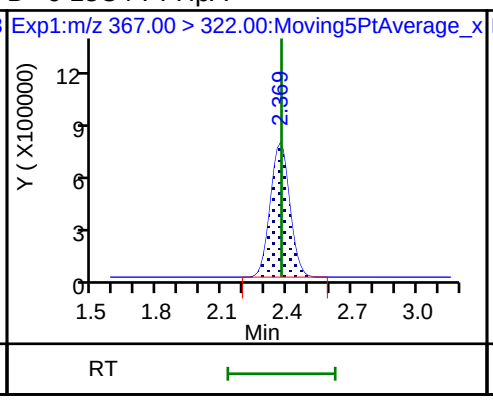
70 Perfluoropentanesulfonic acid (ND)



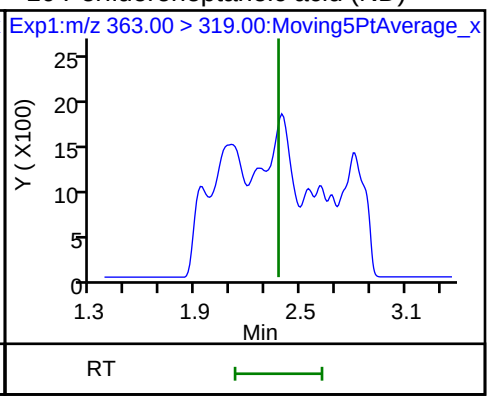
70 Perfluoropentanesulfonic acid (ND)



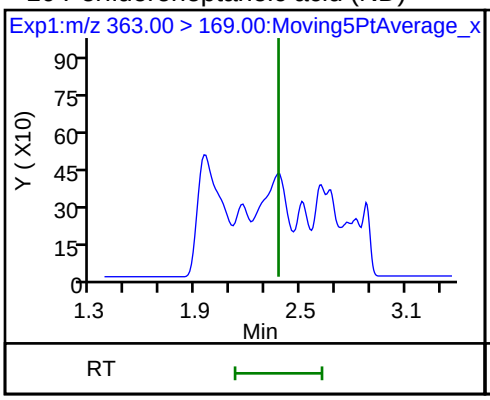
D 9 13C4-PFHpA



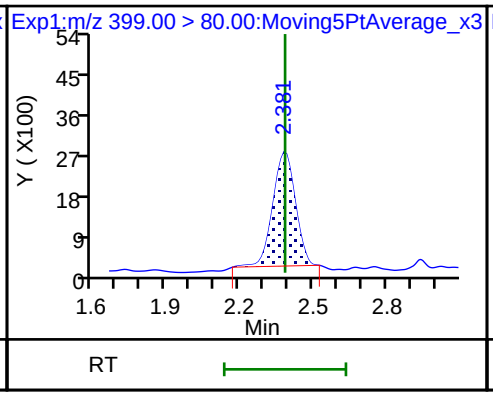
10 Perfluoroheptanoic acid (ND)



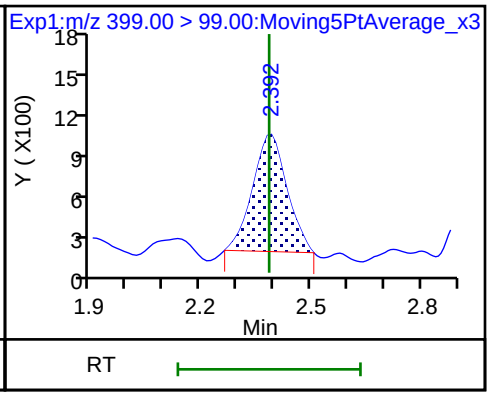
10 Perfluoroheptanoic acid (ND)



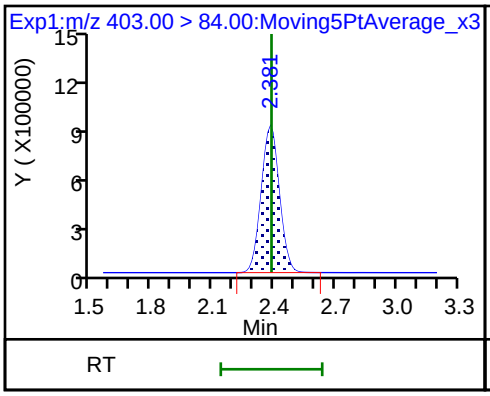
8 Perfluorohexanesulfonic acid



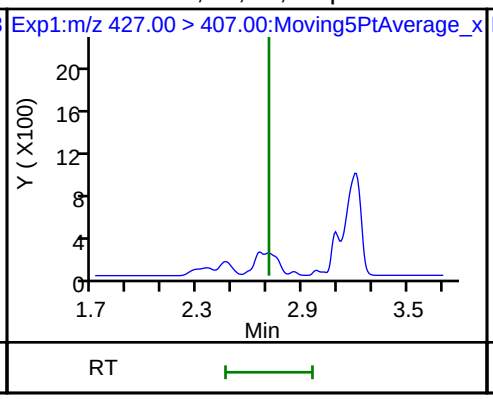
8 Perfluorohexanesulfonic acid



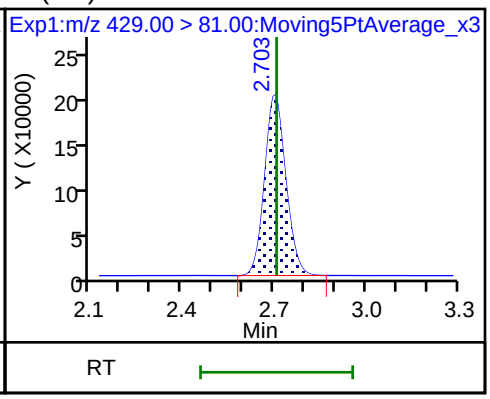
D 11 18O2 PFHxS



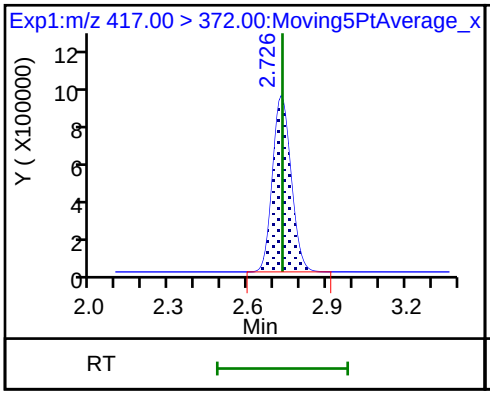
13 Sodium 1H,1H,2H,2H-perfluorooctane [(M)



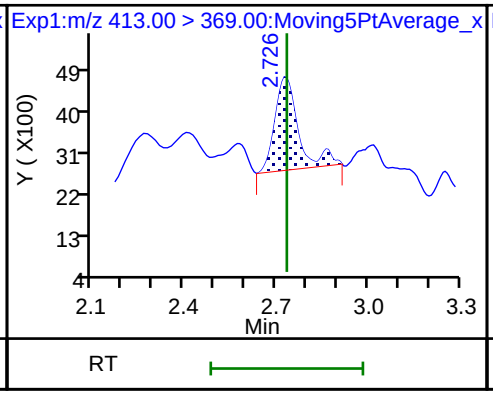
D 12 D2-6:2FTS



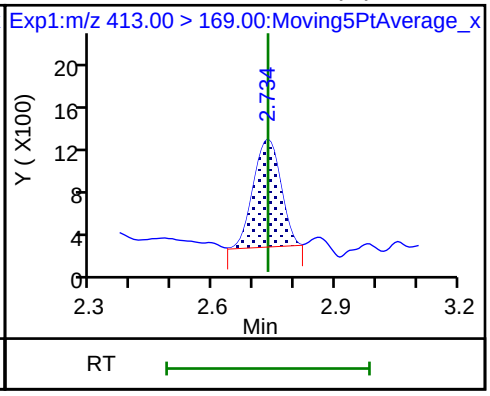
D 14 13C4 PFOA



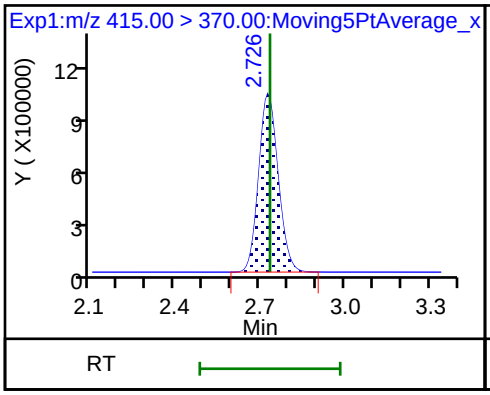
15 Perfluorooctanoic acid



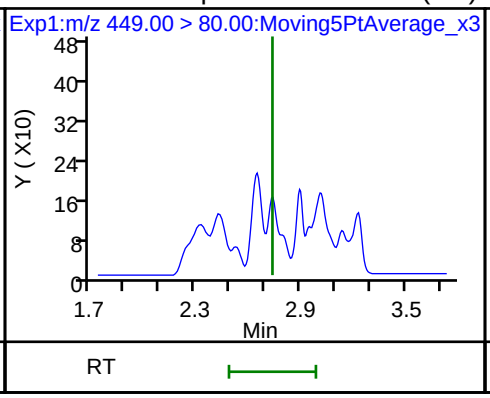
15 Perfluorooctanoic acid (M)



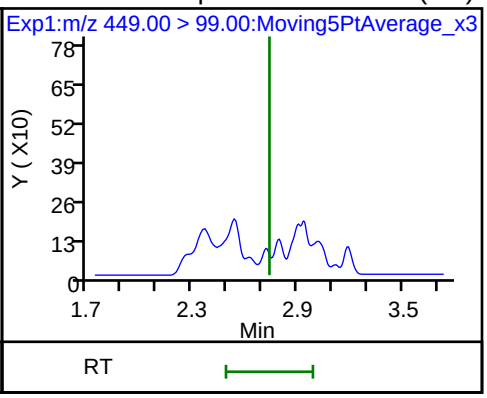
* 62 13C2-PFOA



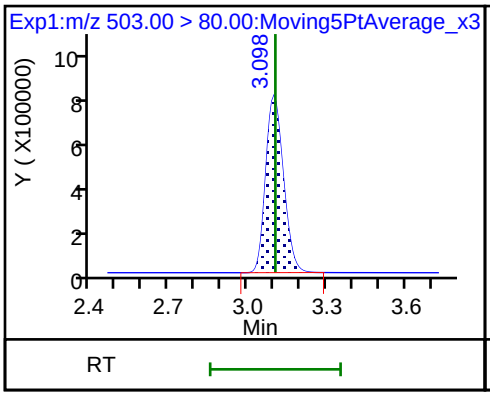
16 Perfluoroheptanesulfonic acid (ND)



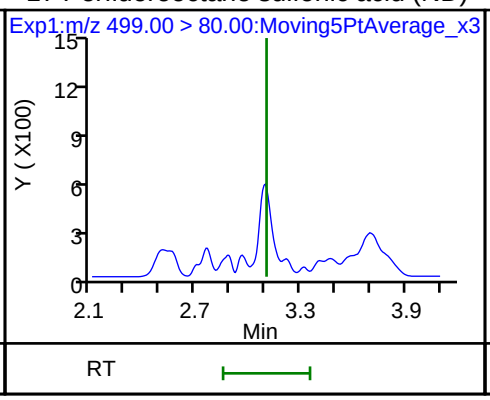
16 Perfluoroheptanesulfonic acid (ND)



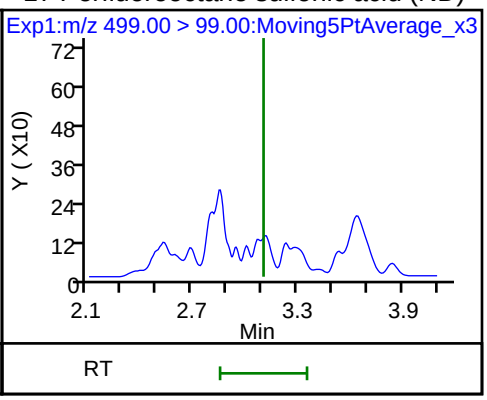
D 18 13C4 PFOS



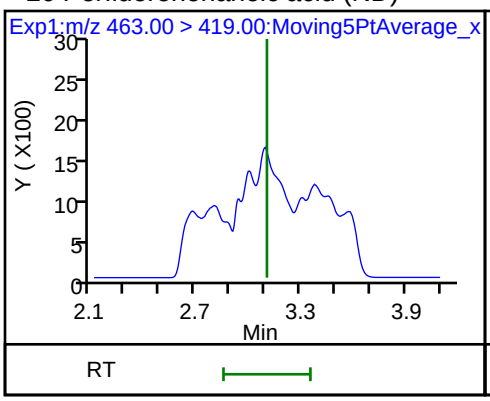
17 Perfluorooctane sulfonic acid (ND)



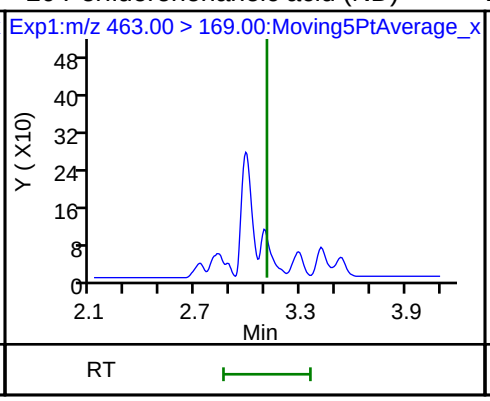
17 Perfluorooctane sulfonic acid (ND)



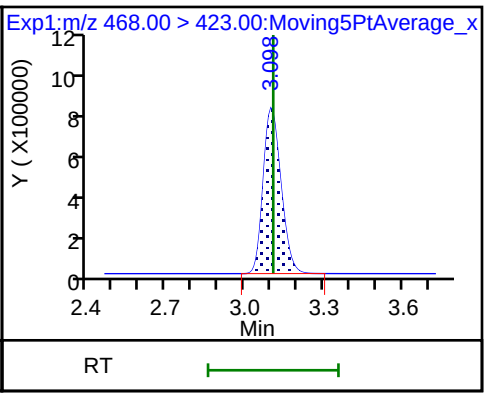
20 Perfluorononanoic acid (ND)



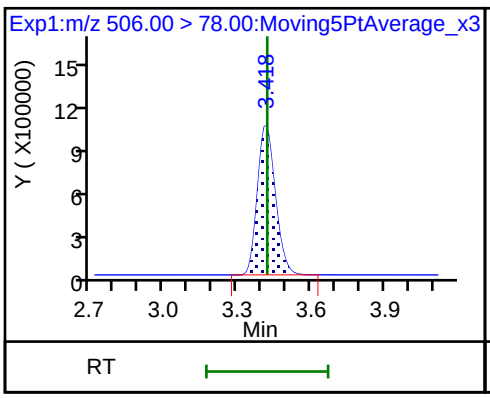
20 Perfluorononanoic acid (ND)



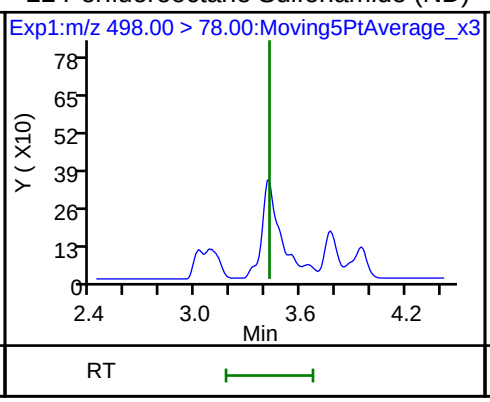
D 19 13C5 PFNA



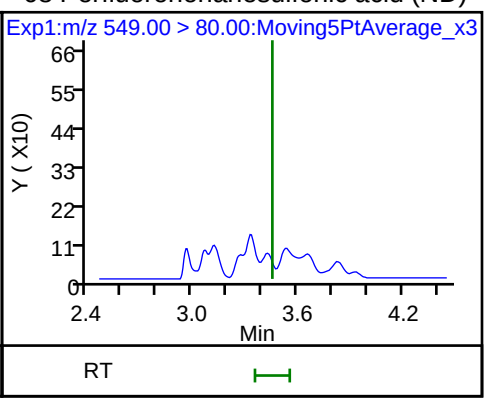
D 21 13C8 FOSA



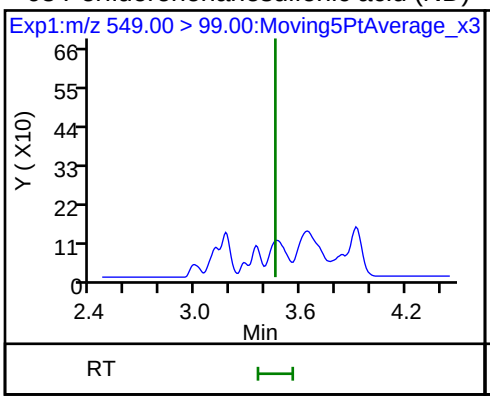
22 Perfluorooctane Sulfonamide (ND)



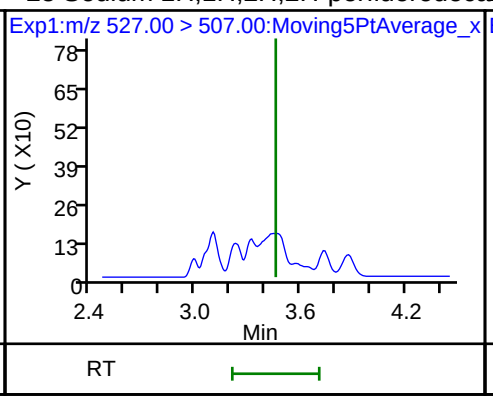
68 Perfluorononanesulfonic acid (ND)



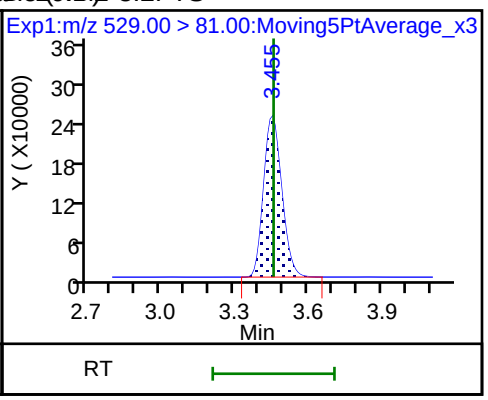
68 Perfluorononanesulfonic acid (ND)



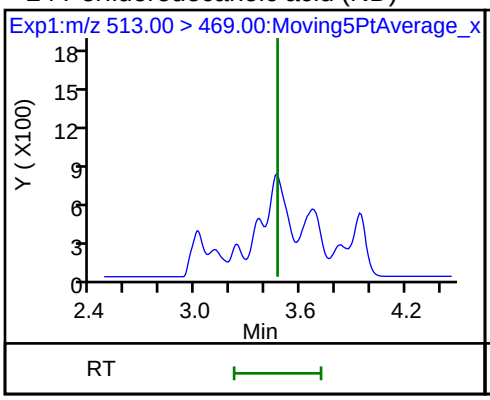
25 Sodium 1H,1H,2H,2H-perfluorodecane2(ND)



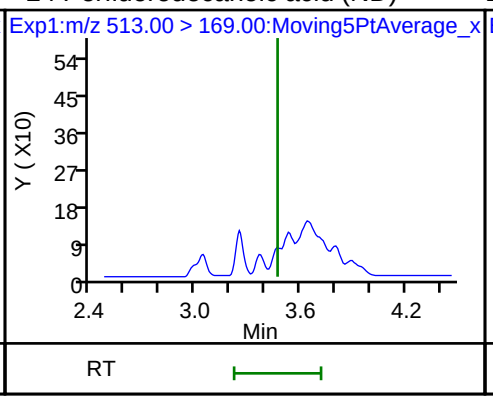
D 26 M2-8:2FTS



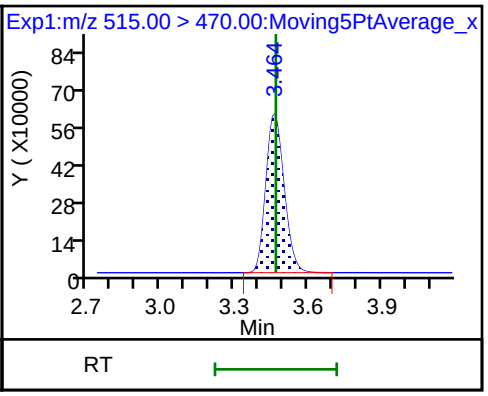
24 Perfluorodecanoic acid (ND)



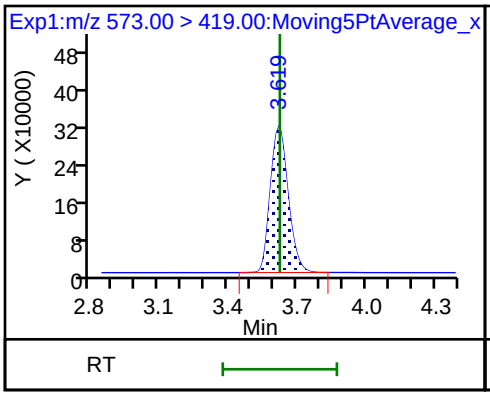
24 Perfluorodecanoic acid (ND)



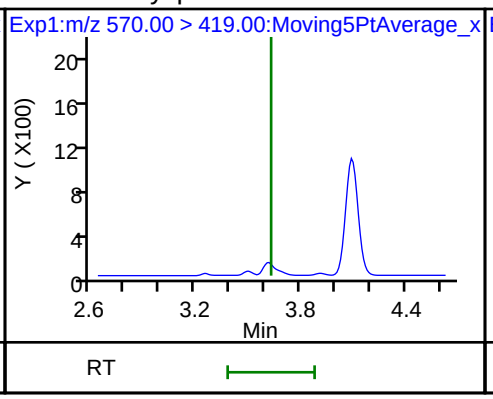
D 23 13C2 PFDA



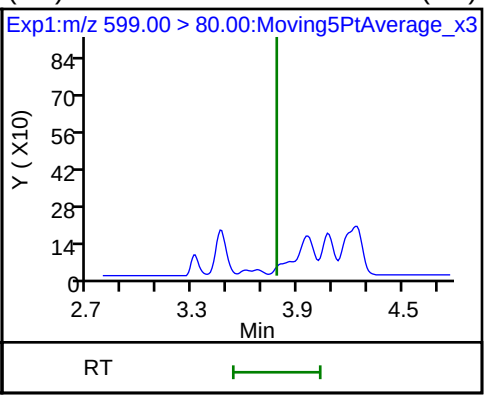
D 27 d3-NMeFOSAA



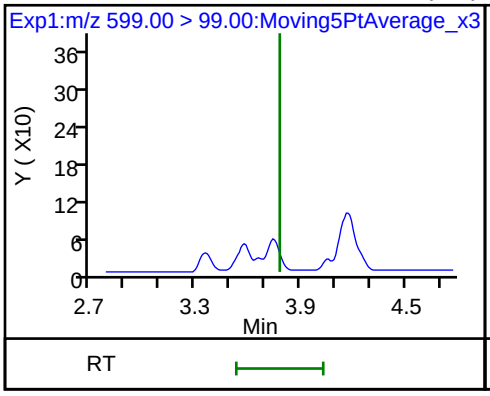
28 N-methyl perfluorooctane sulfonami (ND)



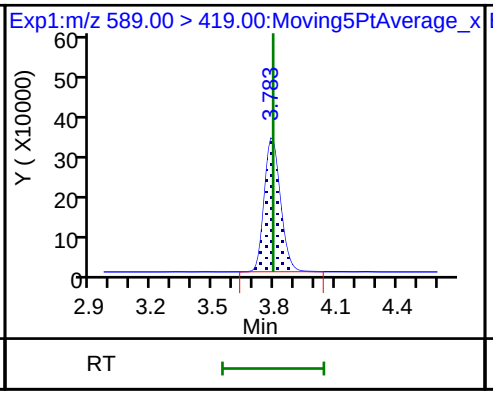
29 Perfluorodecane Sulfonic acid (ND)



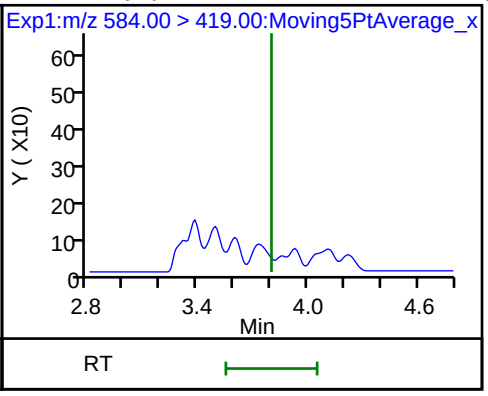
29 Perfluorodecane Sulfonic acid (ND)



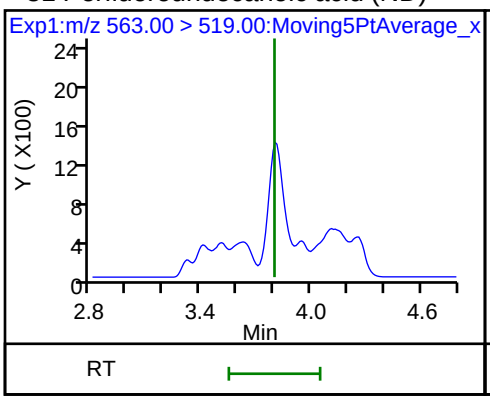
D 32 d5-NEtFOSAA



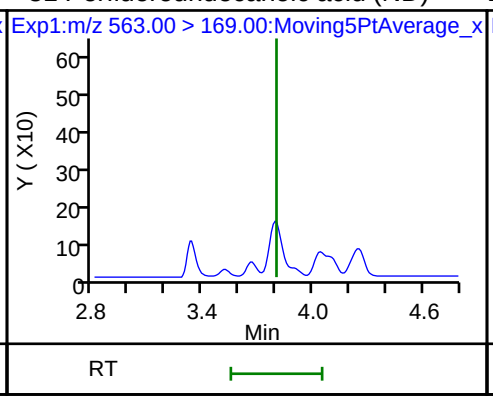
33 N-ethyl perfluorooctane sulfonamid (ND)



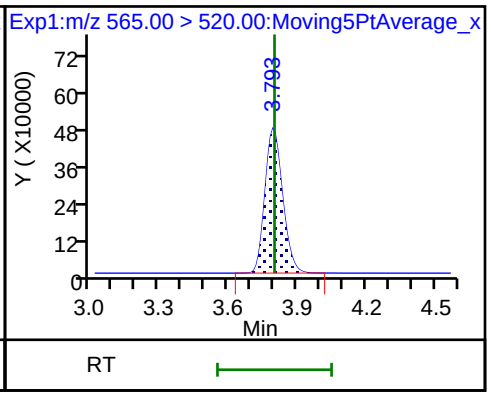
31 Perfluoroundecanoic acid (ND)



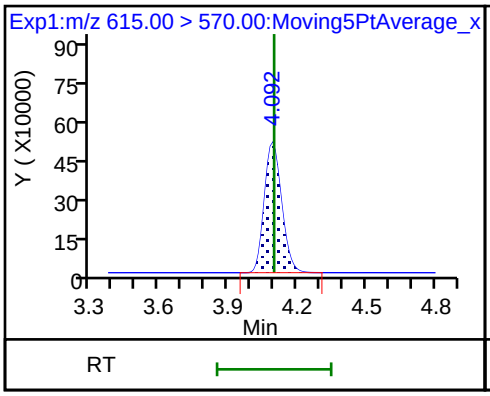
31 Perfluoroundecanoic acid (ND)



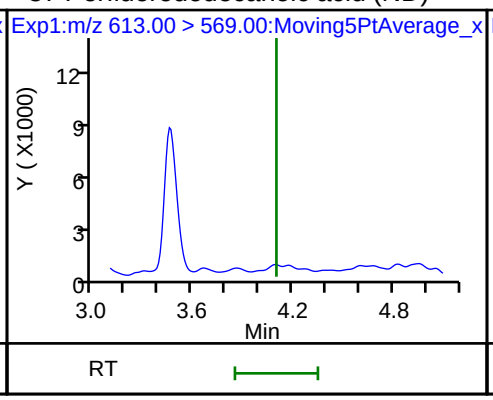
D 30 13C2 PFUnA



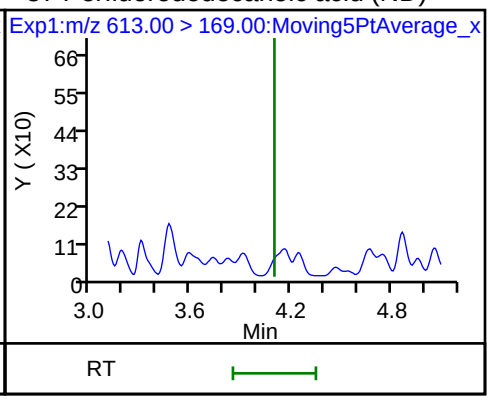
D 36 13C2 PFDoA



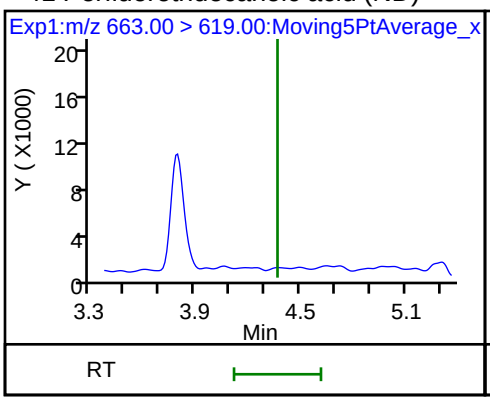
37 Perfluorododecanoic acid (ND)



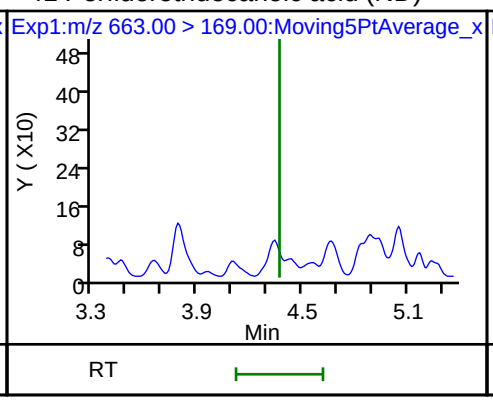
37 Perfluorododecanoic acid (ND)



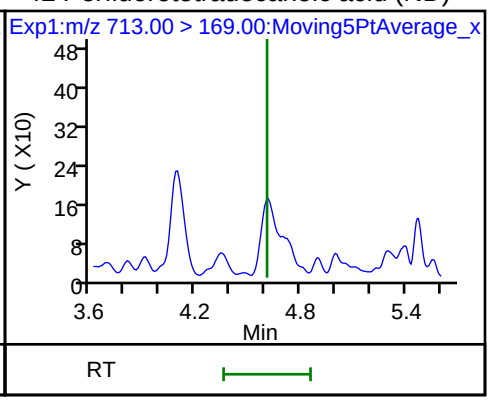
41 Perfluorotridecanoic acid (ND)



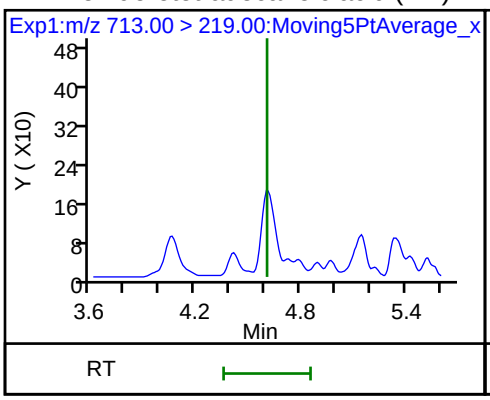
41 Perfluorotridecanoic acid (ND)



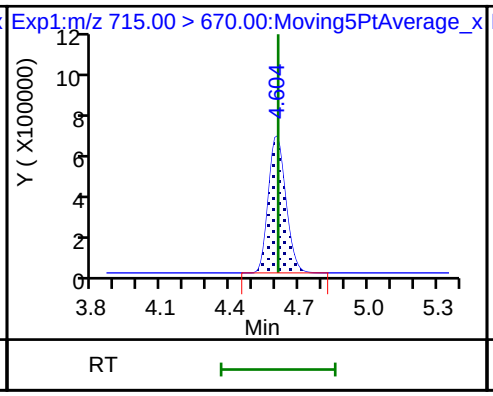
42 Perfluorotetradecanoic acid (ND)



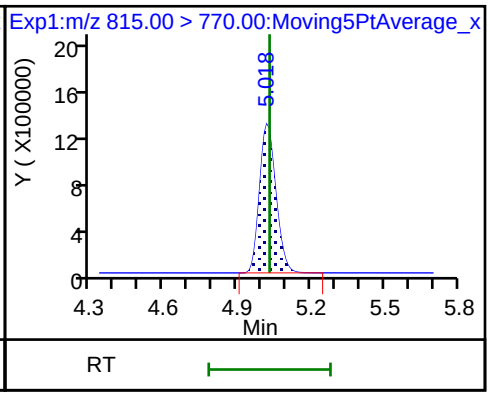
42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

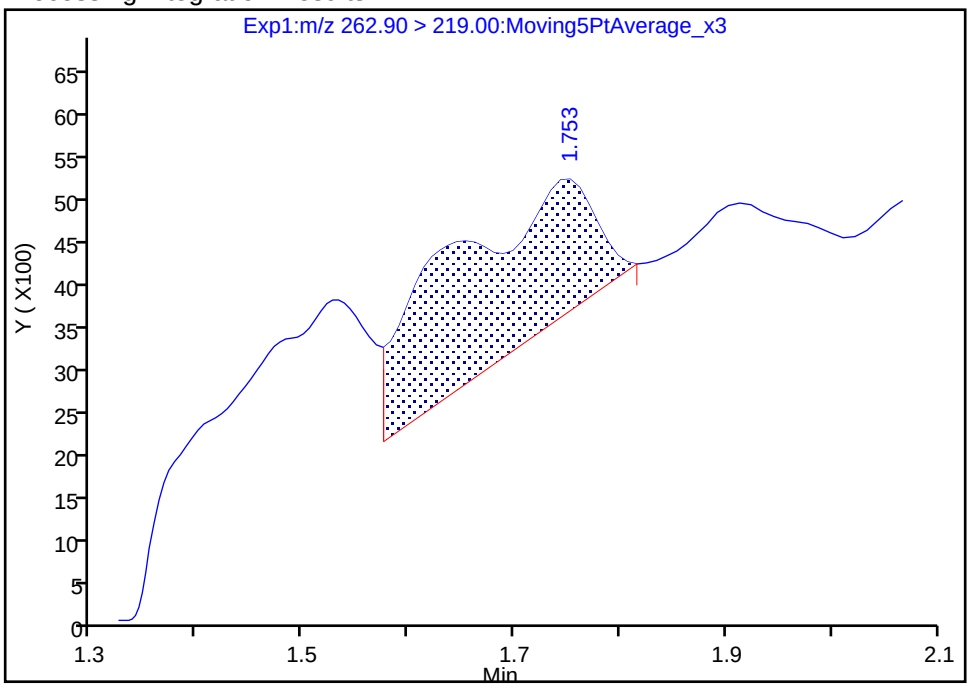
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLCC_ICAL_009.d
Injection Date: 15-May-2018 17:15:15 Instrument ID: A8_N
Lims ID: ICB
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

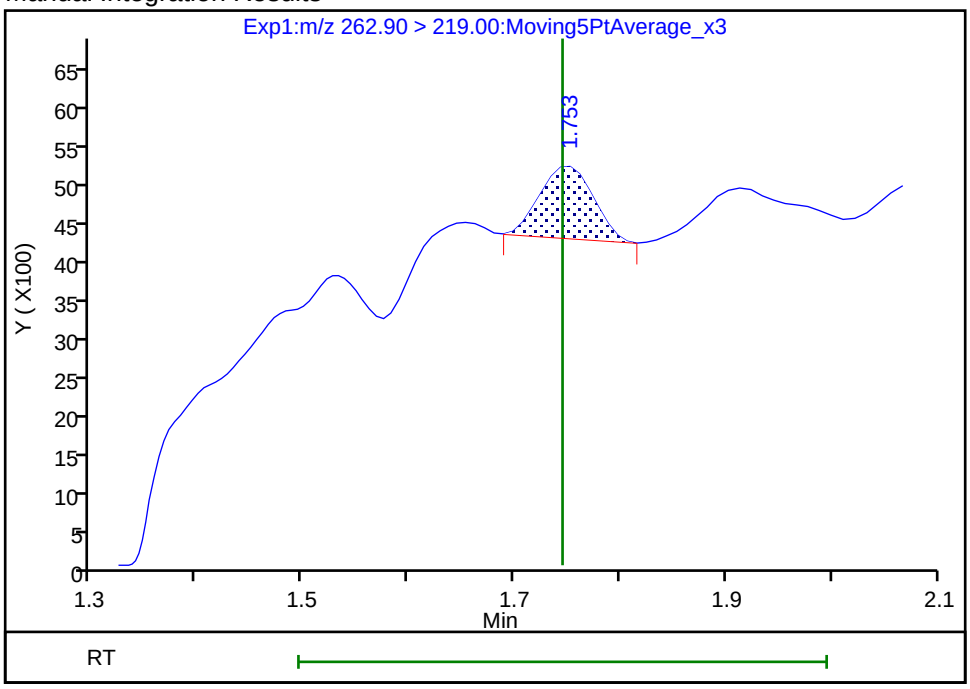
Processing Integration Results

RT: 1.75
Area: 18320
Amount: 0.008518
Amount Units: ng/ml



Manual Integration Results

RT: 1.75
Area: 3325
Amount: 0.001546
Amount Units: ng/ml



Reviewer: hannigana, 16-May-2018 08:05:33
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

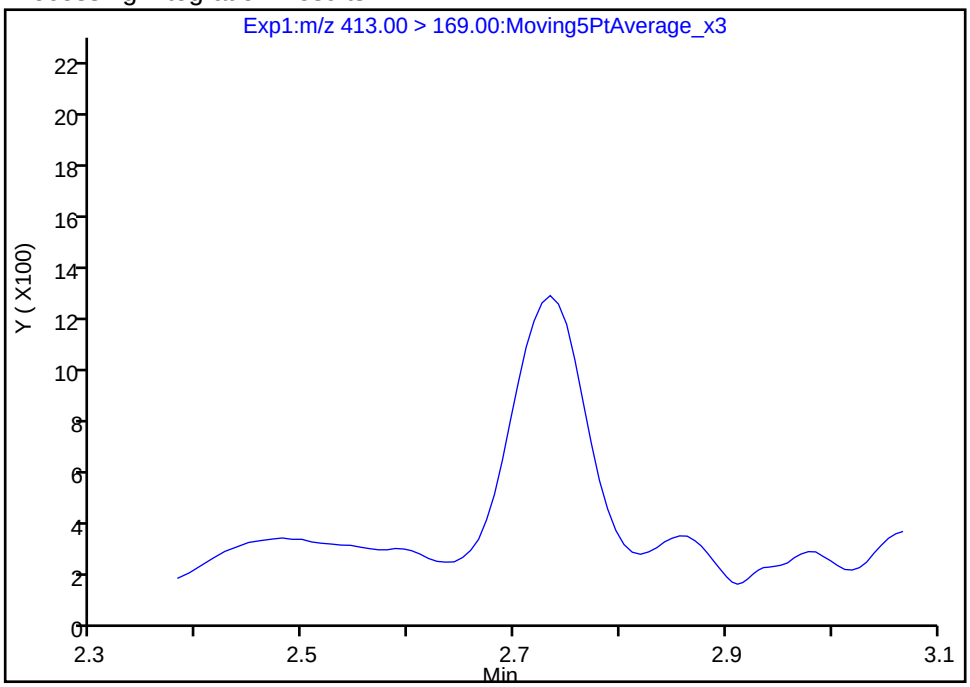
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLCC_ICAL_009.d
Injection Date: 15-May-2018 17:15:15 Instrument ID: A8_N
Lims ID: ICB
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

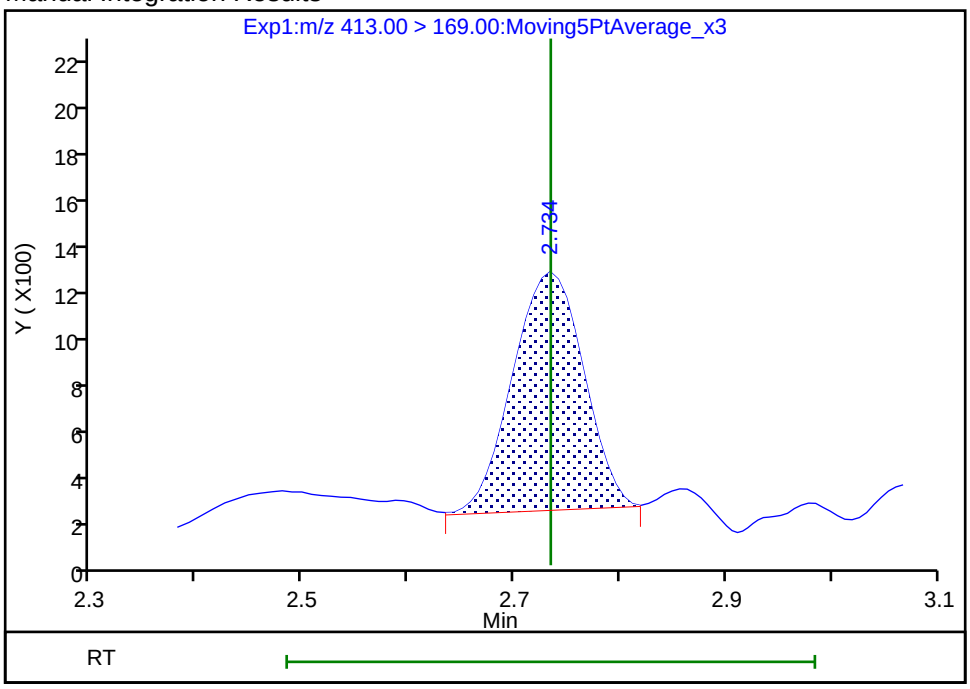
Processing Integration Results

RT: 2.73
Area: 0
Amount: 0.005125
Amount Units: ng/ml



Manual Integration Results

RT: 2.73
Area: 4691
Amount: 0.005125
Amount Units: ng/ml



Reviewer: hannigana, 16-May-2018 08:05:49
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-223615/2-A

Matrix: Water | Lab File ID: 2018.05.27LLADX_005.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: 3535 | Date Extracted: 05/16/2018 14:51

Sample wt/vol: 250(mL) | Date Analyzed: 05/28/2018 07:31

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

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

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

Analysis Batch No.: 225818 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	41.6		2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	36.7		2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	39.4		2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	39.6		2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	35.7		2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	37.6		2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	42.6		2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	36.2		2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	40.9		2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	39.3		4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	36.7		4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36.3		2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	35.0		2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	34.4		2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	33.5		4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	35.3		2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	40.5		4.0	3.0	1.3

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-223615/2-A

Matrix: Water | Lab File ID: 2018.05.27LLADX_005.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: 3535 | Date Extracted: 05/16/2018 14:51

Sample wt/vol: 250(mL) | Date Analyzed: 05/28/2018 07:31

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

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

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

Analysis Batch No.: 225818 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	69		50-150
STL00992	13C4 PFBA	80		50-150
STL01893	13C5 PFPeA	87		50-150
STL00993	13C2 PFHxA	86		50-150
STL01892	13C4-PFHpA	85		50-150
STL00990	13C4 PFOA	90		50-150
STL00995	13C5 PFNA	90		50-150
STL00996	13C2 PFDA	86		50-150
STL00997	13C2 PFUnA	94		50-150
STL00998	13C2 PFDoA	82		50-150
STL00994	18O2 PFHxS	80		50-150
STL02116	13C2-PFTeDA	82		50-150
STL00991	13C4 PFOS	86		50-150
STL02337	13C3-PFBS	78		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_005.d
Lims ID: LCS 320-223615/2-A
Client ID:
Sample Type: LCS
Inject. Date: 28-May-2018 07:31:36 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-223615/2-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 01-Jun-2018 12:10:13 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK040

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 12:53:57

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	1.458	1.455	0.003	1.000	6184751	2.00		80.1	33462	
2 Perfluorobutyric acid										
212.90 > 169.00	1.463	1.456	0.007	1.004	2393097	1.04		104	1220	
D 3 13C5-PFPeA										
267.90 > 223.00	1.730	1.725	0.005	0.563	4302905	2.17		86.9	51735	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.730	1.725	0.005	1.000	1863912	0.9174		91.7	1220	
D 47 13C3-PFBS										
301.90 > 83.00	1.766	1.761	0.005	1.000	81646	1.83		78.5	1045	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.775	1.761	0.014	1.005	2490362	0.9081		103	13305	
298.90 > 99.00	1.766	1.761	0.005	1.000	1028710		2.42(1.25-3.74)		10893	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.982	1.977	0.005	1.000	627526	1.08		115	37532	
D 7 13C2 PFHxA										
315.00 > 270.00	2.027	2.011	0.016	1.000	4560037	2.16		86.4	89406	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.027	2.011	0.016	1.000	1845682	0.9842		98.4	3273	
313.00 > 119.00	2.027	2.011	0.016	1.000	171631		10.75(5.03-15.10)		2533	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.038	2.033	0.005	1.000	2356667	0.9650		103	24674	
349.00 > 99.00	2.038	2.033	0.005	1.000	897037		2.63(1.36-4.07)		17767	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.117	2.112	0.005	1.000	209076	NC			5364	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.117	2.112	0.005	1.000	282185	NC			1931	
D 9 13C4-PFHpA										
367.00 > 322.00	2.346	2.342	0.004	1.000	4319401	2.14		85.4	71243	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.346	2.342	0.004	1.000	1806467	0.9898		99.0	2361	
363.00 > 169.00	2.346	2.342	0.004	1.000	698183		2.59(1.13-3.40)		4616	
D 11 18O2 PFHxS										
403.00 > 84.00	2.373	2.355	0.018	1.000	4726614	1.89		80.0	70878	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.360	2.355	0.005	0.994	1972515	0.8759		96.3	8542	
399.00 > 99.00	2.360	2.355	0.005	0.994	655694		3.01(1.50-4.49)		5455	
65 Adona										
377.00 > 251.00	2.397	2.392	0.005	1.000	5449573	NC			59288	
377.00 > 85.00	2.397	2.392	0.005	1.000	3283038		1.66(0.84-2.53)		57122	
D 12 M2-6:2FTS										
429.00 > 81.00	2.683	2.665	0.018	1.000	980081	2.20		92.4	16329	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.676	2.680	-0.004	0.997	646545	0.8825		93.1	14137	
D 14 13C4 PFOA										
417.00 > 372.00	2.706	2.695	0.011	1.000	4317464	2.26		90.3	103696	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.706	2.703	0.003	1.000	1813677	0.8922		89.2	688	
413.00 > 169.00	2.706	2.703	0.003	1.000	991733		1.83(0.84-2.52)		3890	
* 62 13C2-PFOA										
415.00 > 370.00	2.706	2.703	0.003		5050927	2.50			77040	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.713	2.711	0.003	1.000	1685141	0.8604		90.4	19092	
449.00 > 99.00	2.713	2.711	0.003	1.000	452417		3.72(1.94-5.82)		9711	
D 19 13C5 PFNA										
468.00 > 423.00	3.074	3.063	0.011	1.000	3519957	2.25		90.0	54144	
D 18 13C4 PFOS										
503.00 > 80.00	3.067	3.063	0.004	1.000	3514259	2.05		85.6	25513	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.067	3.072	-0.005	1.000	1448509	0.8378		90.3	8771	
499.00 > 99.00	3.067	3.072	-0.005	1.000	330014		4.39(2.31-6.93)		6268	
20 Perfluorononanoic acid										
463.00 > 419.00	3.074	3.079	-0.005	1.000	1400459	0.9391		93.9	4290	
463.00 > 169.00	3.074	3.079	-0.005	1.000	350272		4.00(1.90-5.69)		7492	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.280	3.286	-0.006	1.000	2222338	NC			40927	
D 21 13C8 FOSA										
506.00 > 78.00	3.408	3.395	0.013	1.000	3903222	1.74		69.4	38587	
D 26 M2-8:2FTS										
529.00 > 81.00	3.417	3.413	0.004	1.000	1013035	1.99		83.3	12541	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.408	3.415	-0.007	1.000	1538119	1.01		101	27662	
D 23 13C2 PFDA										
515.00 > 470.00	3.426	3.422	0.004	1.000	2854366	2.14		85.8	55808	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.417	3.424	-0.007	1.000	1000385	0.8982		93.6	15354	
549.00 > 99.00	3.417	3.424	-0.007	1.000	380497		2.63(1.33-3.97)		9320	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.417	3.424	-0.007	1.000	546497	0.9574		99.9	13160	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.426	3.434	-0.008	1.000	1182892	1.07		107	6406	
513.00 > 169.00	3.436	3.434	0.002	1.003	212243		5.57(2.36-7.09)		2273	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.586	3.572	0.014	1.000	1610238	2.19		87.7	12860	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.586	3.595	-0.009	1.000	618005	0.9455		94.6	4053	M
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.751	3.748	0.003	1.000	1632063	2.17		86.6	15578	
D 30 13C2 PFUnA										
565.00 > 520.00	3.761	3.748	0.013	1.000	2472751	2.35		93.9	50471	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.740	3.749	-0.009	1.000	870816	0.8820		91.5	12590	
599.00 > 99.00	3.740	3.749	-0.009	1.000	294873		2.95(1.39-4.16)		6833	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.761	3.760	0.001	1.003	543683	0.8859		88.6	10235	M
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.761	3.760	0.001	1.000	748469	0.9060		90.6	4070	
563.00 > 169.00	3.751	3.760	-0.009	0.997	181540		4.12(2.12-6.36)		6623	
35 MeFOSA										
512.00 > 169.00	3.907	3.875	0.032		265628	NC			1403	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.918	3.918	0.0	1.000	3562228	NC			67359	
D 36 13C2 PFDoA										
615.00 > 570.00	4.050	4.048	0.002	1.000	2335857	2.06		82.4	17969	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.050	4.061	-0.011	1.000	997972	1.02		102	1287	
613.00 > 169.00	4.050	4.061	-0.011	1.000	242607		4.11(2.13-6.40)		4492	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.307	4.318	-0.011	1.000	1050111	0.9825		98.3	1104	
663.00 > 169.00	4.307	4.318	-0.011	1.000	313780		3.35(1.25-3.76)		3907	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.553	4.542	0.011	1.000	2853866	2.05		82.0	15472	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.553	4.559	-0.006	1.000	264556	0.9177		91.8	3088	
713.00 > 219.00	4.542	4.559	-0.017	0.998	196982		1.34(0.71-2.13)		6197	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.966	4.966	0.0	1.000	3483700	1.47		59.0	9316	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.966	4.971	-0.005	1.000	1339208	NC			611	
813.00 > 169.00	4.966	4.971	-0.005	1.000	221697		6.04(2.86-8.58)		1721	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.328	5.333	-0.005	1.000	802928	NC			335	
913.00 > 169.00	5.328	5.333	-0.005	1.000	100065		8.02(3.83-11.48)		1145	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 01-Jun-2018 12:10:14 Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180527-58835.b\2018.05.27LLADX_005.d

Injection Date: 28-May-2018 07:31:36 Instrument ID: A8_N

Lims ID: LCS 320-223615/2-A

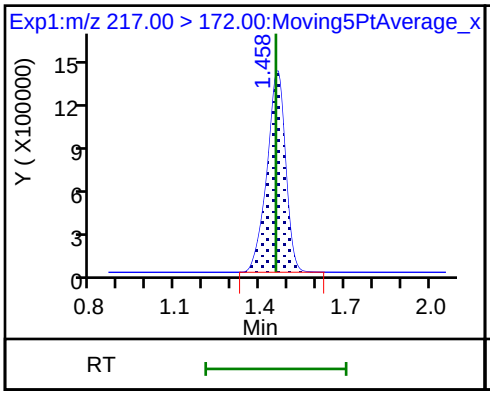
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5

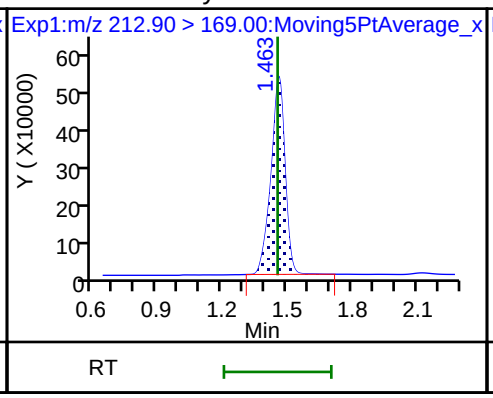
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

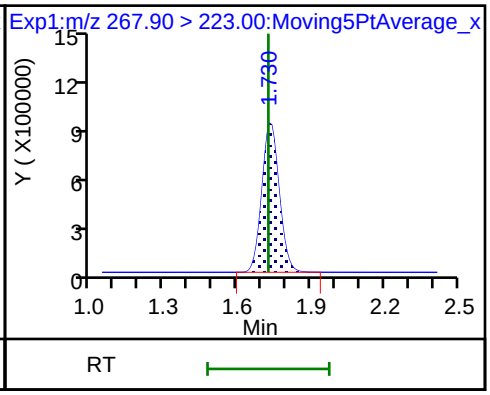
D 1 13C4 PFBA



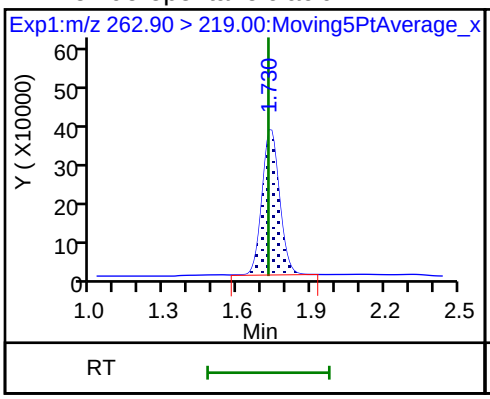
2 Perfluorobutyric acid



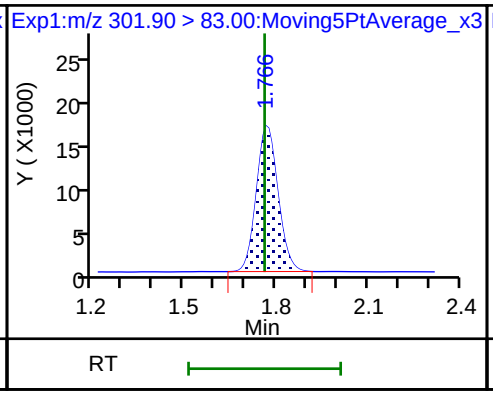
D 3 13C5-PFPeA



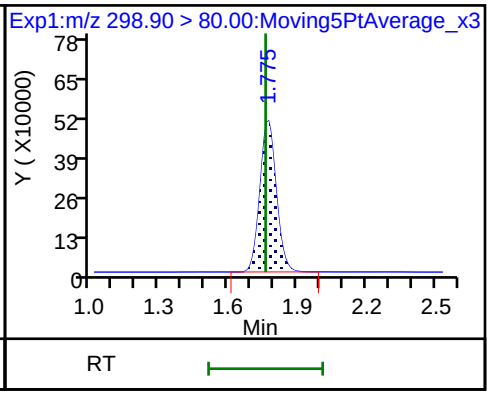
4 Perfluoropentanoic acid



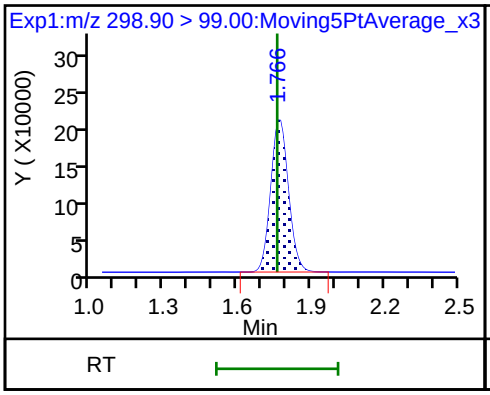
D 47 13C3-PFBS



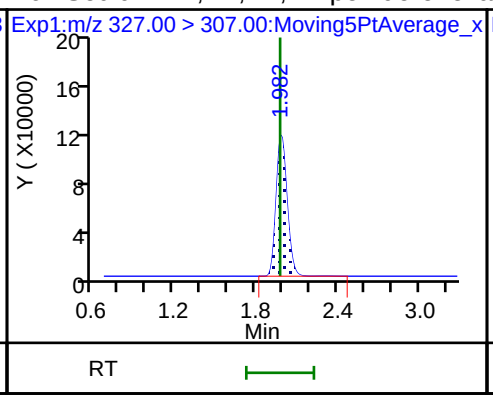
5 Perfluorobutanesulfonic acid



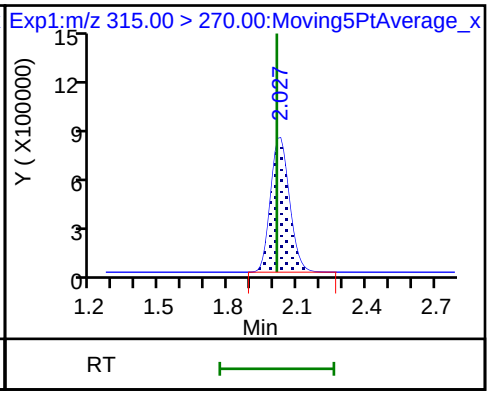
5 Perfluorobutanesulfonic acid



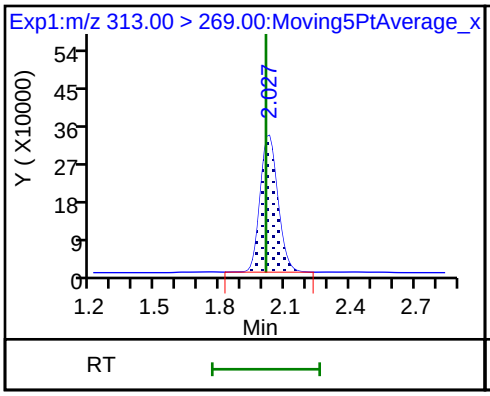
61 Sodium 1H,1H,2H,2H-perfluorohexa



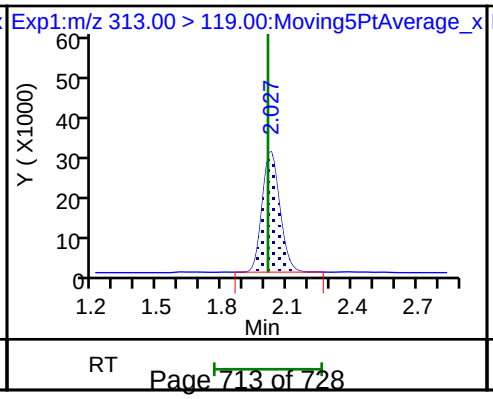
De 7 13C2 PFHxA



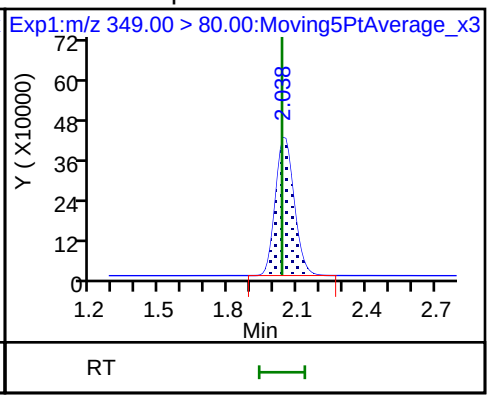
6 Perfluorohexanoic acid



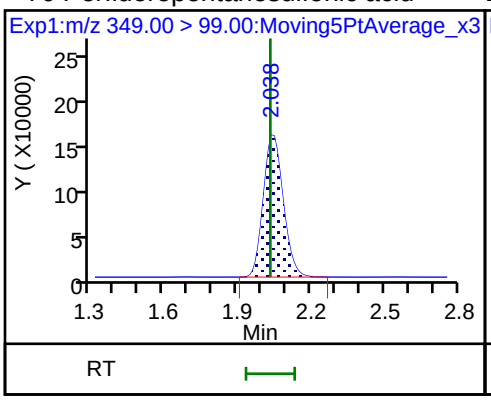
6 Perfluorohexanoic acid



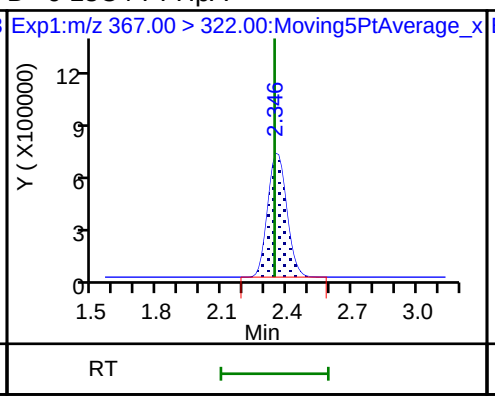
70 Perfluoropentanesulfonic acid



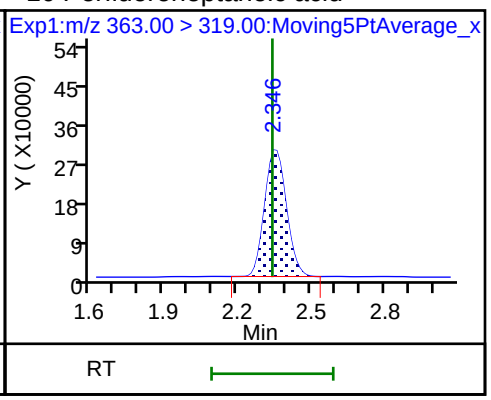
70 Perfluoropentanesulfonic acid



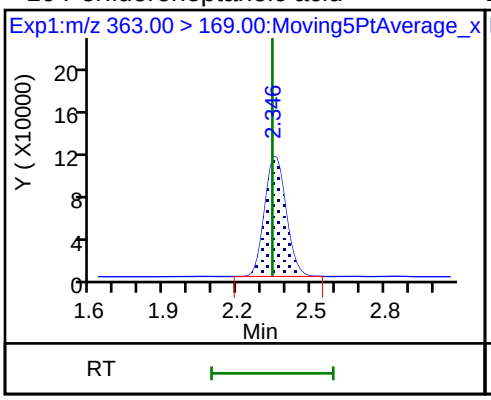
D 9 13C4-PFHpA



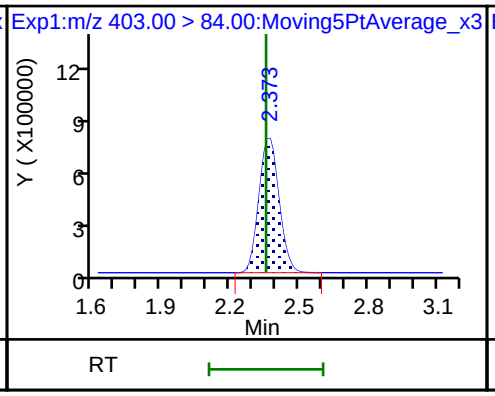
10 Perfluoroheptanoic acid



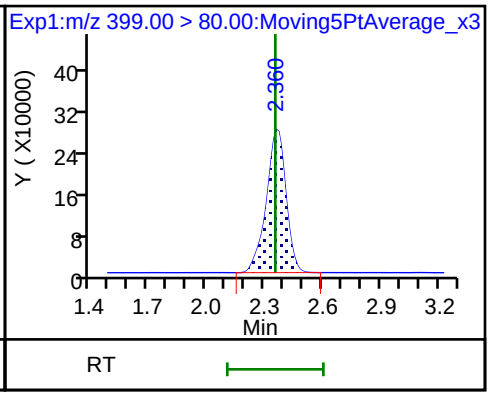
10 Perfluoroheptanoic acid



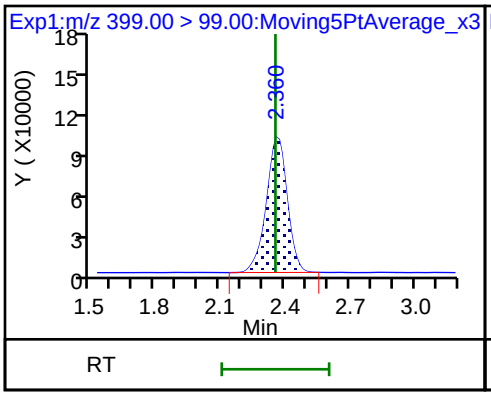
D 11 18O2 PFHxS



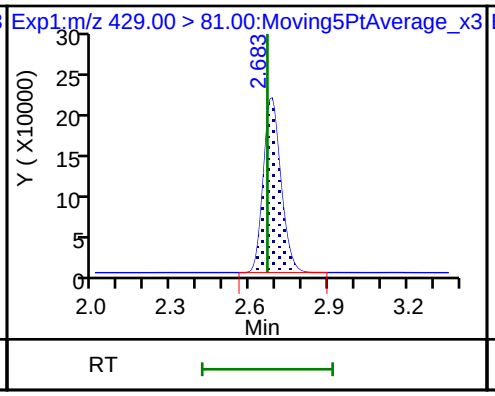
8 Perfluorohexanesulfonic acid



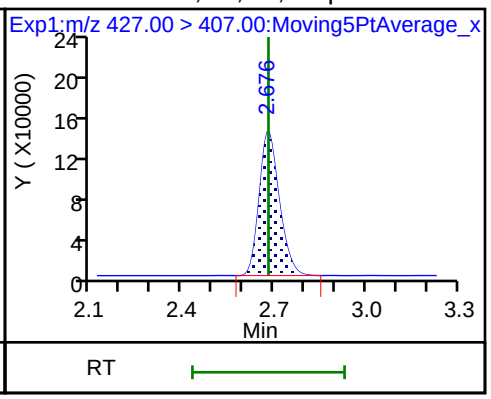
8 Perfluorohexanesulfonic acid



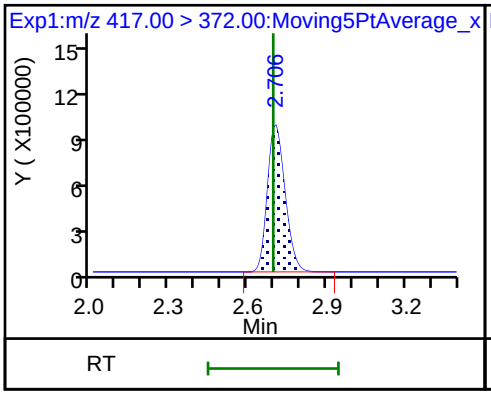
D 12 M2-6:2FTS



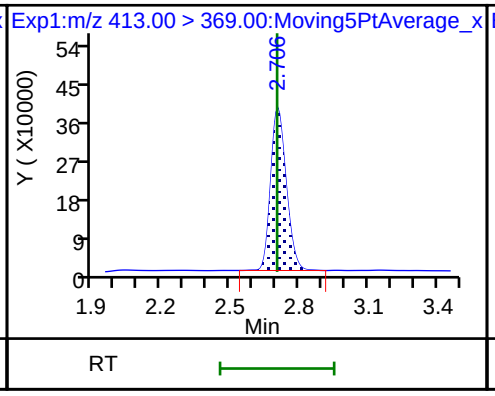
13 Sodium 1H,1H,2H,2H-perfluorooctane



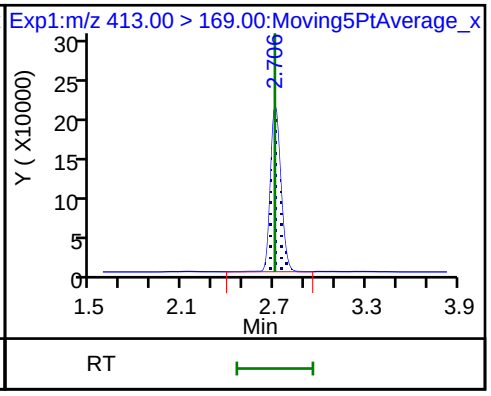
D 14 13C4 PFOA



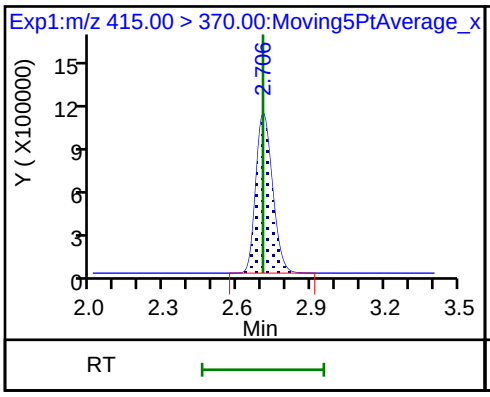
15 Perfluorooctanoic acid



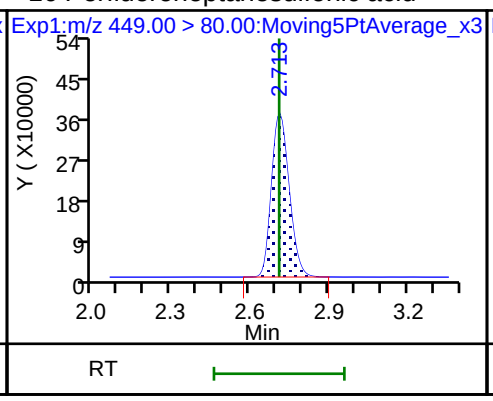
15 Perfluorooctanoic acid



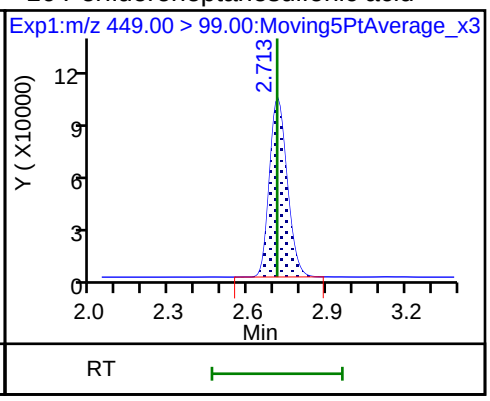
* 62 13C2-PFOA



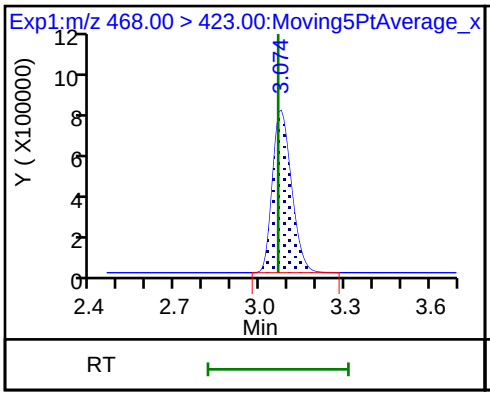
16 Perfluoroheptanesulfonic acid



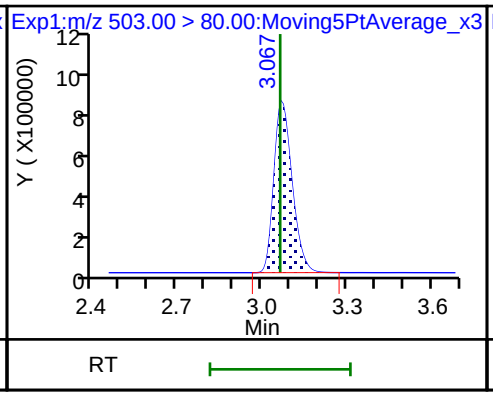
16 Perfluoroheptanesulfonic acid



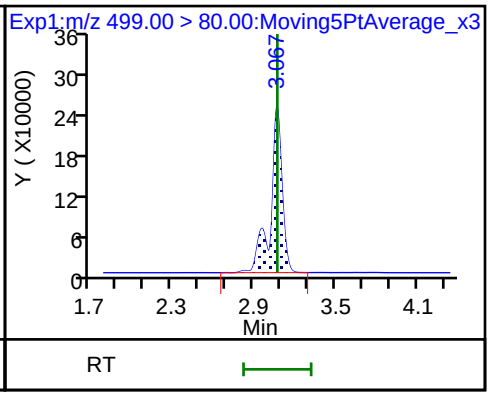
D 19 13C5 PFNA



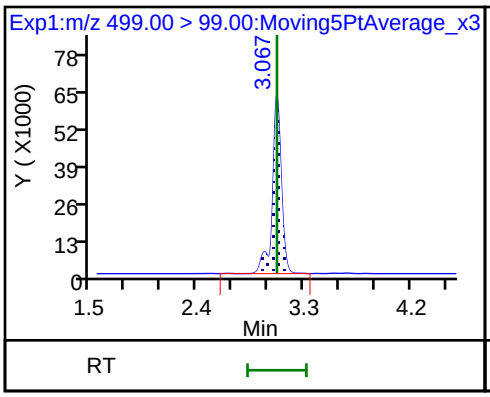
D 18 13C4 PFOS



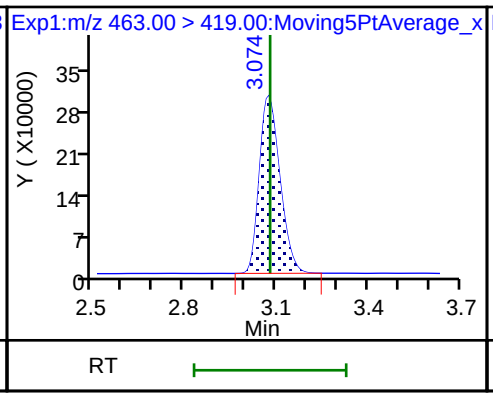
17 Perfluorooctane sulfonic acid



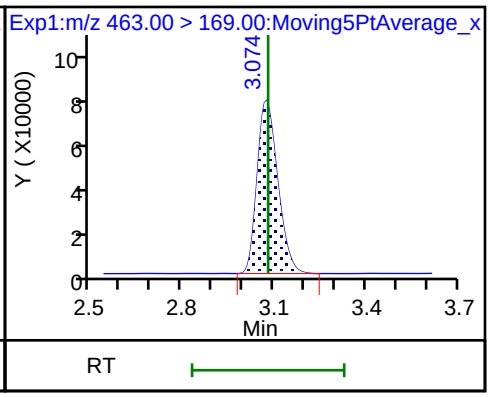
17 Perfluorooctane sulfonic acid



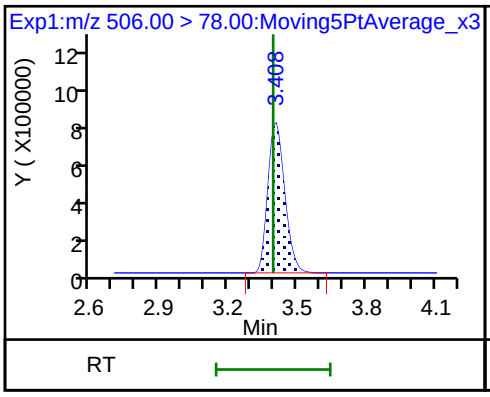
20 Perfluorononanoic acid



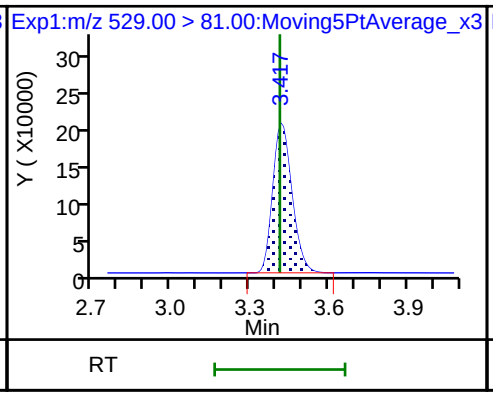
20 Perfluorononanoic acid



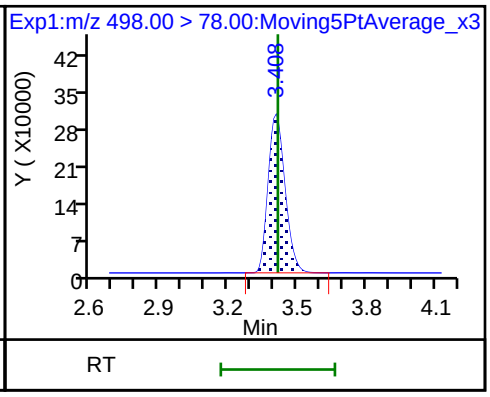
D 21 13C8 FOSA



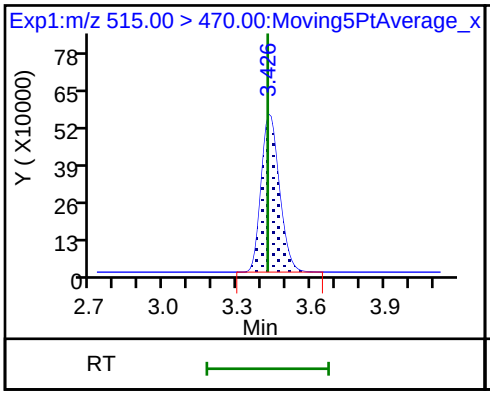
D 26 M2-8:2FTS



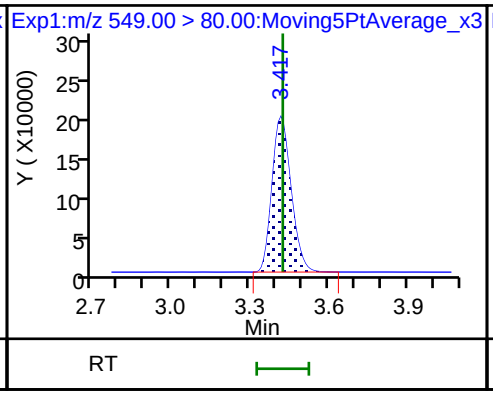
22 Perfluorooctane Sulfonamide



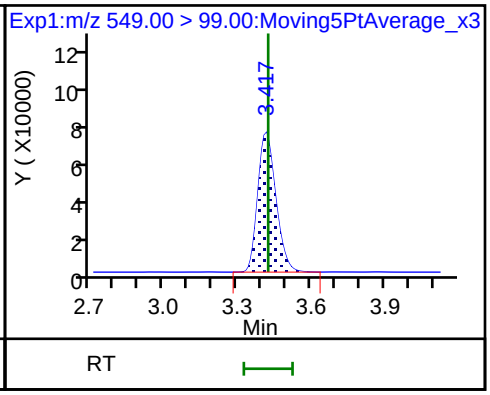
D 23 13C2 PFDA



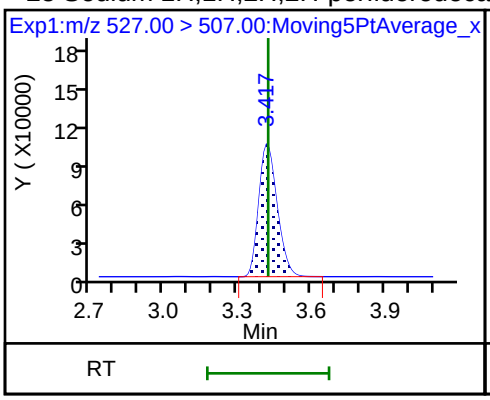
68 Perfluorononanesulfonic acid



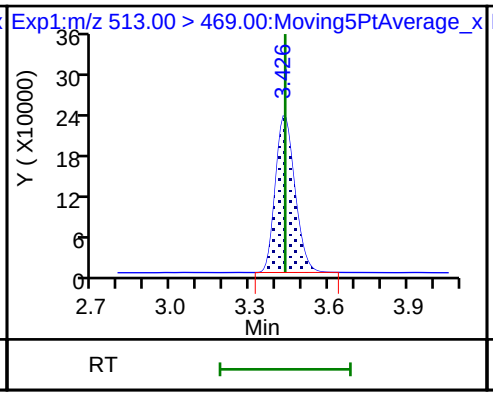
68 Perfluorononanesulfonic acid



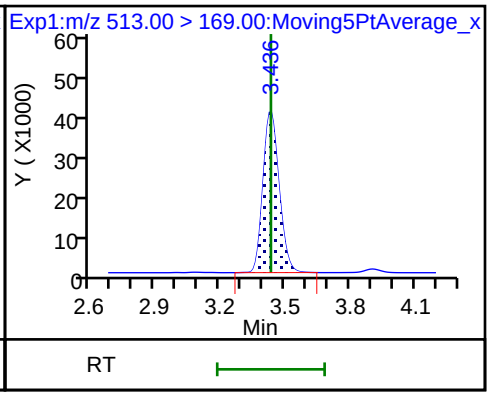
25 Sodium 1H,1H,2H,2H-perfluorodecane



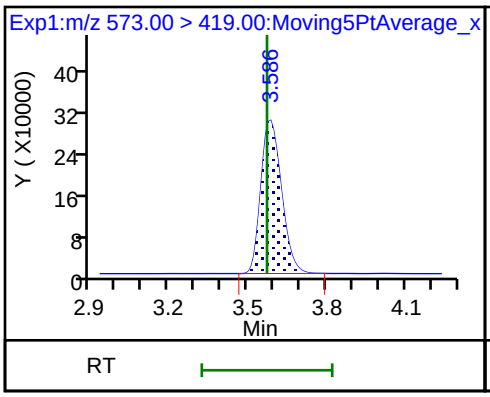
24 Perfluorodecanoic acid



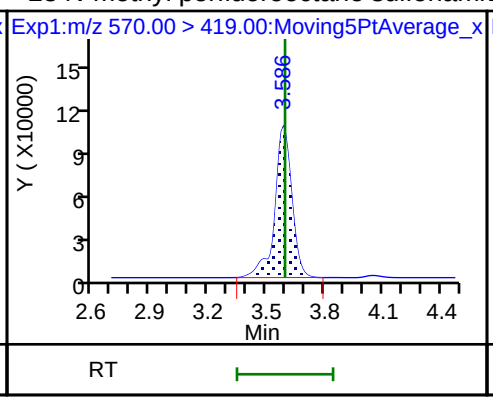
24 Perfluorodecanoic acid



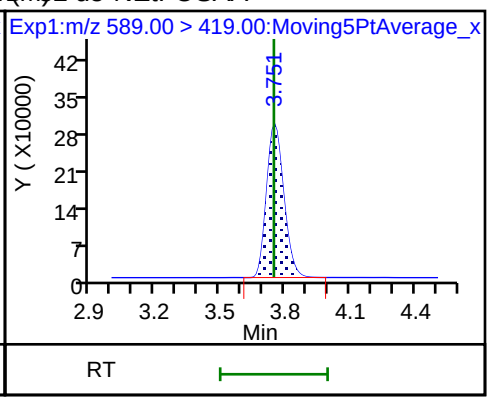
D 27 d3-NMeFOSAA



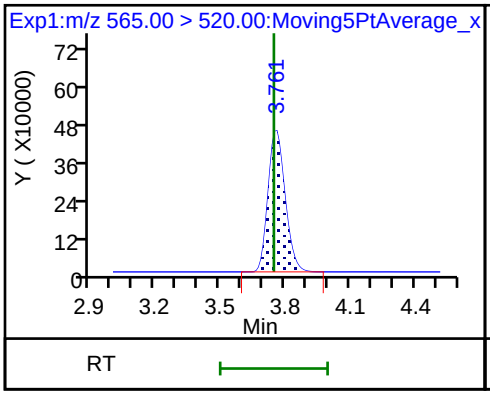
28 N-methyl perfluorooctane sulfonamid



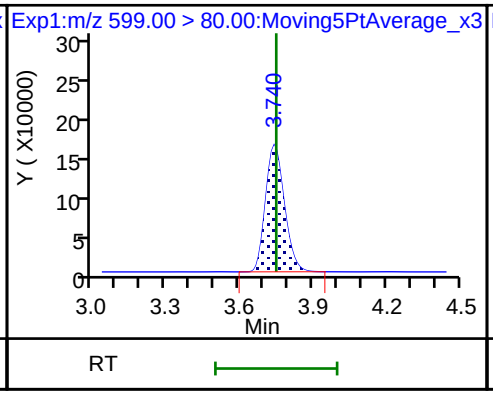
D 32 d5-NEtFOSAA



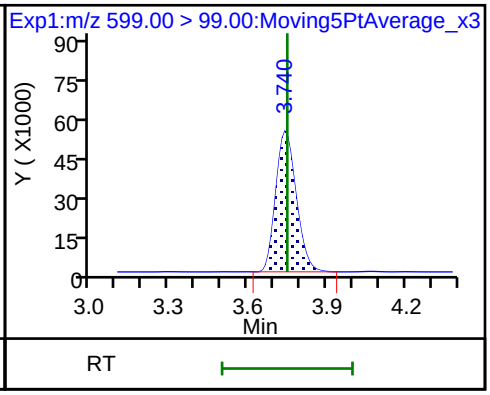
D 30 13C2 PFUnA



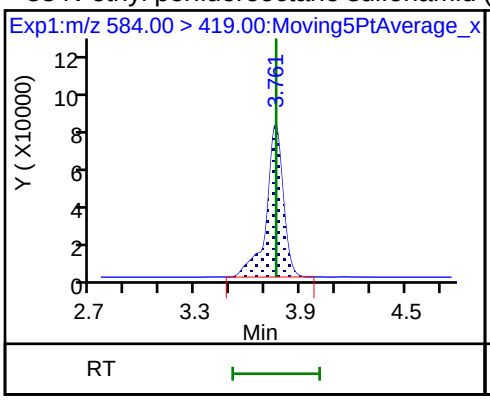
29 Perfluorodecane Sulfonic acid



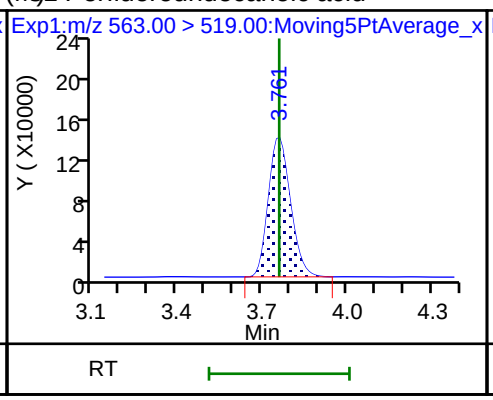
29 Perfluorodecane Sulfonic acid



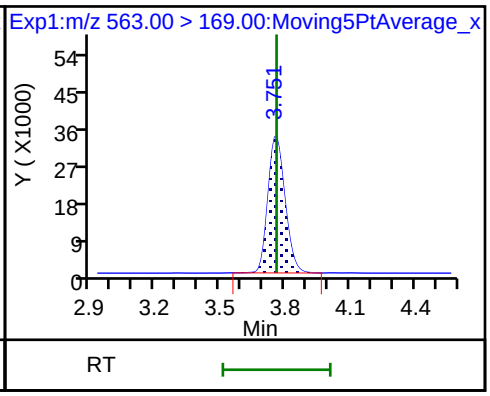
33 N-ethyl perfluorooctane sulfonamid (MA)



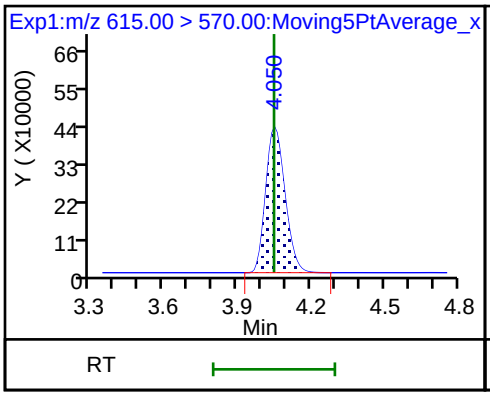
31 Perfluoroundecanoic acid



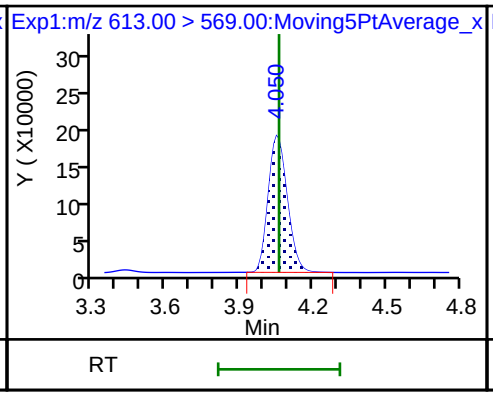
31 Perfluoroundecanoic acid



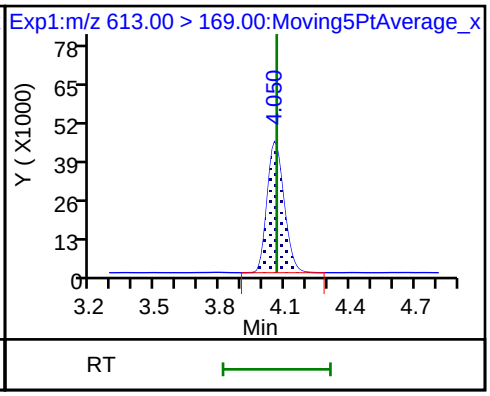
D 36 13C2 PFDoA



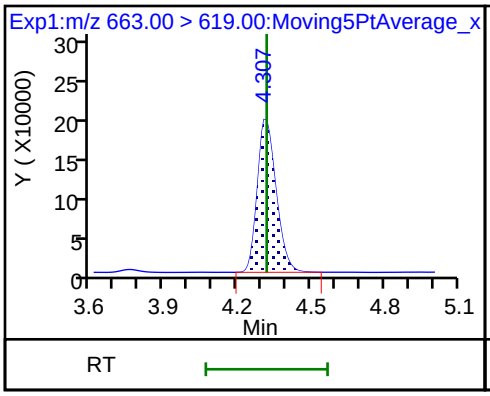
37 Perfluorododecanoic acid



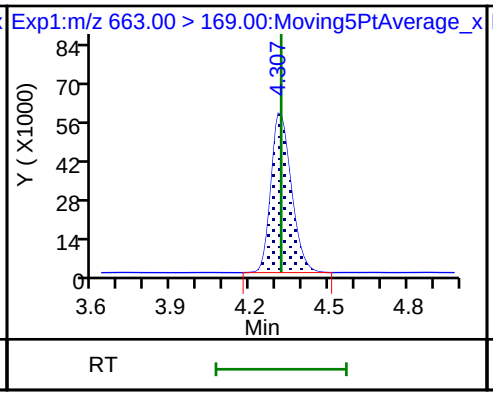
37 Perfluorododecanoic acid



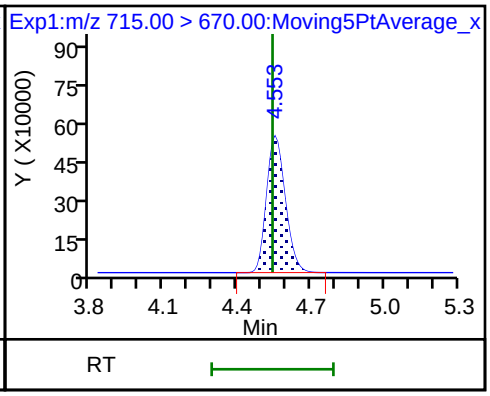
41 Perfluorotridecanoic acid



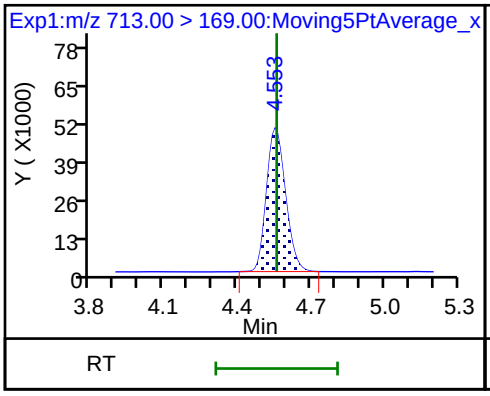
41 Perfluorotridecanoic acid



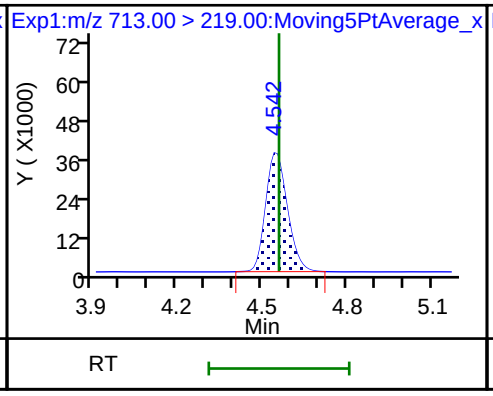
D 43 13C2-PFTeDA



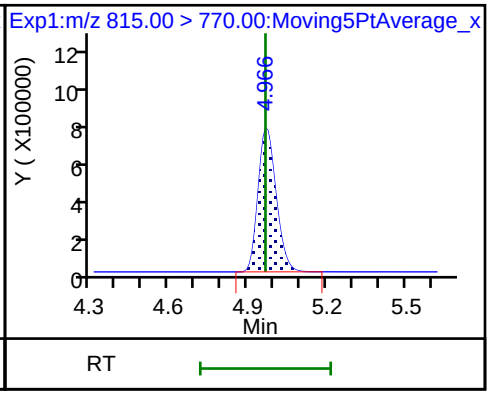
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Instrument ID: A8_N Start Date: 05/15/2018 15:13

Analysis Batch Number: 223413 End Date: 05/15/2018 17:23

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-223413/2		05/15/2018 15:13	1	2017.05.15LLB_ICAL 002.d	GeminiC18 3x100 3(mm)
IC 320-223413/3		05/15/2018 15:21	1	2017.05.15LLB_ICAL 003.d	GeminiC18 3x100 3(mm)
IC 320-223413/4		05/15/2018 15:29	1	2017.05.15LLB_ICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-223413/5 ICIS		05/15/2018 15:36	1	2017.05.15LLB_ICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-223413/7		05/15/2018 15:52	1	2017.05.15LLB_ICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-223413/8		05/15/2018 16:00	1	2017.05.15LLB_ICAL 008.d	GeminiC18 3x100 3(mm)
IC 320-223413/11		05/15/2018 16:39	1	2018.05.15LLC_ICAL 006.d	GeminiC18 3x100 3(mm)
ICB 320-223413/12		05/15/2018 17:15	1	2018.05.15LLCC_ICAL 009.d	GeminiC18 3x100 3(mm)
ICV 320-223413/13		05/15/2018 17:23	1	2018.05.15LLCC_ICAL 010.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Instrument ID: A8_N Start Date: 05/28/2018 07:00

Analysis Batch Number: 225818 End Date: 05/28/2018 10:47

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-225818/1		05/28/2018 07:00	1	2018.05.27LLADX 001.d	GeminiC18 3x100 3(mm)
CCVL 320-225818/2		05/28/2018 07:08	1	2018.05.27LLADX 002.d	GeminiC18 3x100 3(mm)
CCV 320-225818/3 CCVIS		05/28/2018 07:15	1	2018.05.27LLADX 003.d	GeminiC18 3x100 3(mm)
MB 320-223615/1-A		05/28/2018 07:23	1	2018.05.27LLADX 004.d	GeminiC18 3x100 3(mm)
LCS 320-223615/2-A		05/28/2018 07:31	1	2018.05.27LLADX 005.d	GeminiC18 3x100 3(mm)
320-38875-1		05/28/2018 07:39	1	2018.05.27LLADX 006.d	GeminiC18 3x100 3(mm)
320-38875-2		05/28/2018 07:47	1	2018.05.27LLADX 007.d	GeminiC18 3x100 3(mm)
320-38875-3		05/28/2018 07:55	1	2018.05.27LLADX 008.d	GeminiC18 3x100 3(mm)
320-38875-4		05/28/2018 08:02	1	2018.05.27LLADX 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:10	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:18	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:26	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:34	1		GeminiC18 3x100 3(mm)
CCV 320-225818/14		05/28/2018 08:42	1	2018.05.27LLADX 014.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:50	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:57	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:05	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:13	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:21	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:29	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:37	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:44	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:52	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:00	1		GeminiC18 3x100 3(mm)
CCV 320-225818/25		05/28/2018 10:08	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:16	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:24	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:31	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:39	1		GeminiC18 3x100 3(mm)
CCV 320-225818/30		05/28/2018 10:47	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Instrument ID: A8_N Start Date: 05/28/2018 17:14

Analysis Batch Number: 225873 End Date: 05/28/2018 20:22

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-225873/1		05/28/2018 17:14	1	2018.05.28LLA_003.d	GeminiC18 3x100 3(mm)
CCVL 320-225873/2		05/28/2018 17:22	1	2018.05.28LLA_004.d	GeminiC18 3x100 3(mm)
CCV 320-225873/3 CCVIS		05/28/2018 17:30	1	2018.05.28LLA_005.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 17:37	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 17:45	50		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 17:53	50		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 18:01	20		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 18:09	100		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 18:16	100		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 18:24	100		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 18:32	5		GeminiC18 3x100 3(mm)
CCV 320-225873/14		05/28/2018 18:56	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:03	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:11	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:19	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:27	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:35	5		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:43	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:51	50		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:58	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 20:06	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 20:14	1		GeminiC18 3x100 3(mm)
CCV 320-225873/25		05/28/2018 20:22	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Instrument ID: A8_N Start Date: 05/29/2018 00:01

Analysis Batch Number: 225884 End Date: 05/29/2018 02:06

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-225884/1		05/29/2018 00:01	1	2018.05.28LLA_055.d	GeminiC18 3x100 3(mm)
320-38875-1 DL		05/29/2018 00:09	10	2018.05.28LLA_056.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:17	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:25	5		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:33	5		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:40	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:48	100		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:04	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:12	20		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:19	20		GeminiC18 3x100 3(mm)
CCV 320-225884/11		05/29/2018 01:27	1	2018.05.28LLA_066.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:35	20		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:43	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:51	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:58	1		GeminiC18 3x100 3(mm)
CCV 320-225884/16		05/29/2018 02:06	1		GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Batch Number: 223615 Batch Start Date: 05/16/18 14:50 Batch Analyst: Epstein, Anya M

Batch Method: 3535 Batch End Date: 05/17/18 18:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00065	LCPFC-IS 00050
MB 320-223615/1		3535, EPA 537 (Mod)				250 mL	10 mL	500 uL	500 uL
LCS 320-223615/2		3535, EPA 537 (Mod)				250 mL	10 mL	500 uL	500 uL
320-38875-A-1	TP-PFC-029-TPI	3535, EPA 537 (Mod)	T	319.27 g	28.82 g	290.5 mL	10 mL	500 uL	500 uL
320-38875-A-2	TP-PFC-029-MIDCARBON	3535, EPA 537 (Mod)	T	321.32 g	28.50 g	292.8 mL	10 mL	500 uL	500 uL
320-38875-A-3	TP-PFC-029-TPE	3535, EPA 537 (Mod)	T	302.29 g	29.37 g	272.9 mL	10 mL	500 uL	500 uL
320-38875-A-4	TP-PFC-029-TPE-D	3535, EPA 537 (Mod)	T	292.05 g	27.82 g	264.2 mL	10 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00144					
MB 320-223615/1		3535, EPA 537 (Mod)							
LCS 320-223615/2		3535, EPA 537 (Mod)		500 uL					
320-38875-A-1	TP-PFC-029-TPI	3535, EPA 537 (Mod)	T						
320-38875-A-2	TP-PFC-029-MIDCARBON	3535, EPA 537 (Mod)	T						
320-38875-A-3	TP-PFC-029-TPE	3535, EPA 537 (Mod)	T						
320-38875-A-4	TP-PFC-029-TPE-D	3535, EPA 537 (Mod)	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.: 320-38875-1

SDG No.:

Batch Number: 223615 Batch Start Date: 05/16/18 14:50 Batch Analyst: Epstein, Anya M

Batch Method: 3535 Batch End Date: 05/17/18 18:00

Batch Notes	
Analyst ID - Aliquot Step	VPM
Balance ID	QA-078
Batch Comment	Sample labels match client IDs: AME. Envi-Carb: 97225.
Analyst ID - Final Volume Step	AME -Water/VPM
H2O ID	5/14/18
Hexane ID	1242583
Internal Standard ID#	1245322
Manifold ID	10, 21
Methanol ID	1236570
Sodium Hydroxide ID	1241145
Pipette ID	I46345G
Analyst ID - Reagent Drop	TWL
Analyst ID - IS Reagent Drop	VPM
Analyst ID - IS Reagent Drop Witness	ER
Analyst ID - SU Reagent Drop	TWL
Analyst ID - SU Reagent Drop Witness	KMK
Solvent Lot #	1237547
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003337157A

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TestAmerica
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Test America – Sacramento

Sample Dilution Record

Method ID PFC-IDA

Analyst (Print Name) Amari Royce **Reagent ID** LC-80:20_0005

Date 5/28/18

	Job #	Sample #	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
8	320-38871	6	10,000	60	300	5x
	↓	7		15		20x
14	320-39043	8		30		10x
29	480-135867	1		60		5x
18	320-38935	3		↓		5x
		11		15		↓
		13		↓		20x
		13MS				↓
		13 MSD		60		5x
		14				↓
		15		↓		
		16		30		10x
		24		60		5x
12	320-38875	1		↓		↓
	320-38935	18		15	1500	100x
	↓	19		30	300	10x
	320-38935	30		15		20x
	↓	31		↓	↓	↓
		32				
		32MS				
		32MSD	↓	↓	↓	↓
			done 5/28/18			

Comments:

Shipping and Receiving Documents

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record

228168

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: JEFFORIENT	Site Contact: DAN GRIGER	Date: 5/3/18	COC No: 228168
Company Name: TETRATECH	Tel/Fax: 412-921-8650	Lab Contact: DAVID AIKEN	Carrier: FEDEX	1 of 1 COCs
Address: 661 ANDERSON DR, FOSTER PL,	Analysis Turnaround Time			Sampler:
City/State/Zip: PITTSBURGH/PA/15220	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: 412-921-8650	TAT if different from Below			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: BRUNSWICK GWETS	☐ 1 week			
Site: FORMER NAS BRUNSWICK	☐ 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)	Sample Specific Notes:
TP-PFC-029-TPI	5/3/18	0920	G	W	4	N	N	X	
TP-PFC-029-MIDCARBON		0925	G	W	4	N	N	X	
TP-PFC-029-TPE		0930	G	W	4	N	N	X	
TP-PFC-029-TPE-D		0000	G	W	4	N	N	X	

320-38875 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: 7.1 Corr'd: 7.1 | Therm ID No.: AL-5 no Hot ice

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
DAN	T+	1430 4/5/18		TA-SAC	5-4-18 0930
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: 320-38875-1

Login Number: 38875
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	Water present in cooler; indicates evidence of melted ice.
Cooler Temperature is acceptable.	False	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","330","ng/L","D","9.5","DL","","TRG","","","34","LOQ","YES","-99","","290.5","10","26",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","13","ng/L","U","6.2","DL","","TRG","","","17","LOQ","NO","-99","","290.5","10","13",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","200","ng/L","D","3.7","DL","","TRG","","","17","LOQ","NO","-99","","290.5","10","8.6",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","380","ng/L","D","4.0","DL","","TRG","","","17","LOQ","YES","-99","","290.5","10","8.6",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","13","ng/L","U","4.5","DL","","TRG","","","17","LOQ","NO","-99","","290.5","10","13",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","1700","ng/L","D","4.6","DL","","TRG","","","17","LOQ","YES","-99","","290.5","10","13",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","8.6","ng/L","U","4.1","DL","","TRG","","","17","LOQ","NO","-99","","290.5","10","8.6",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","13","ng/L","U","4.8","DL","","TRG","","","17","LOQ","NO","-99","","290.5","10","13",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","410","ng/L","D","3.3","DL","","TRG","","","17","LOQ","YES","-99","","290.5","10","8.6",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","81","ng/L","D","5.1","DL","","TRG","","","17","LOQ","NO","-99","","290.5","10","13",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","50","ng/L","D","4.0","DL","","TRG","","","17","LOQ","NO","-99","","290.5","10","8.6",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","73","ng/L","D","5.2","DL","","TRG","","","17","LOQ","NO","-99","","290.5","10","13",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","8.7","ng/L","J D","3.2","DL","","TRG","","","17","LOQ","NO","-99","","290.5","10","8.6",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","13","ng/L","U","4.5","DL","","TRG","","","17","LOQ","NO","-99","","290.5","10","13",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","26","ng/L","U","7.1","DL","","TRG","","","34","LOQ","NO","-99","","290.5","10","26",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","26","ng/L","U","6.5","DL","","TRG","","","34","LOQ","NO","-99","","290.5","10","26",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","26","ng/L","U","11","DL","","TRG","","","34","LOQ","NO","-99","","290.5","10","26",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","STL00990","13C4 PFOA","75","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","STL00991","13C4 PFOS","61","ng/L","","-99","DL","","TRG","75","","-99","LOQ","YES","82.3","","290.5","10","860",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","STL00992","13C4 PFBA","67","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","STL00993","13C2 PFHxA","70","ng/L","","-99","DL","","TRG","81","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","STL00994","18O2 PFHxS","65","ng/L","","-99","DL","","TRG","80","","-99","LOQ","YES","81.4","","290.5","10","860",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","STL00995","13C5 PFNA","74","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","STL00996","13C2 PFDA","71","ng/L","","-99","DL","","TRG","83","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","STL00997","13C2 PFUnA","77","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","STL00998","13C2 PFDoA","75","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","STL01056","13C8

FOSA","63","ng/L","","-99","DL","","TRG","73","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","STL01892","13C4-
PFHpA","70","ng/L","","-99","DL","","TRG","81","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","STL01893","13C5
PFPeA","72","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","STL02116","13C2-
PFTeDA","59","ng/L","","-99","DL","","TRG","69","","-99","LOQ","YES","86.1","","290.5","10","860",""
"TP-PFC-029-TPI","EPA 537 (Mod)","DL","320-38875-1","TALSAC","STL02337","13C3-
PFBS","61","ng/L","","-99","DL","","TRG","76","","-99","LOQ","YES","80.0","","290.5","10","860",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","330","ng/L","E","0.95","DL","","TRG","","","3.4","LOQ","NO","-99","","290.5","10","2.6",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA)","1.3","ng/L","U M","0.62","DL","","TRG","","","1.7","LOQ","YES","-99","","290.5","10","1.3",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA)","200","ng/L","M","0.37","DL","","TRG","","","1.7","LOQ","YES","-99","","290.5","10","0.86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","360","ng/L","E M","0.40","DL","","TRG","","","1.7","LOQ","NO","-99","","290.5","10","0.86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDoA)","1.3","ng/L","U","0.45","DL","","TRG","","","1.7","LOQ","YES","-99","","290.5","10","1.3",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","1500","ng/L","E","0.46","DL","","TRG","","","1.7","LOQ","NO","-99","","290.5","10","1.3",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","335-76-2","Perfluorodecanoic acid
(PFDA)","0.82","ng/L","J M","0.41","DL","","TRG","","","1.7","LOQ","YES","-99","","290.5","10","0.86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","1.3","ng/L","U","0.48","DL","","TRG","","","1.7","LOQ","YES","-99","","290.5","10","1.3",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","400","ng/L","E","0.33","DL","","TRG","","","1.7","LOQ","NO","-99","","290.5","10","0.86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","74","ng/L","M","0.51","DL","","TRG","","","1.7","LOQ","YES","-99","","290.5","10","1.3",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","49","ng/L","M","0.40","DL","","TRG","","","1.7","LOQ","YES","-99","","290.5","10","0.86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","76","ng/L","M","0.52","DL","","TRG","","","1.7","LOQ","YES","-99","","290.5","10","1.3",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","7.7","ng/L","","0.32","DL","","TRG","","","1.7","LOQ","YES","-99","","290.5","10","0.86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","2.4","ng/L","","0.45","DL","","TRG","","","1.7","LOQ","YES","-99","","290.5","10","1.3",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","2.6","ng/L","U","0.71","DL","","TRG","","","3.4","LOQ","YES","-99","","290.5","10","2.6",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","2.6","ng/L","U","0.65","DL","","TRG","","","3.4","LOQ","YES","-99","","290.5","10","2.6",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA)","2.6","ng/L","U M","1.1","DL","","TRG","","","3.4","LOQ","YES","-99","","290.5","10","2.6",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","STL00990","13C4
PFOA","74","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","STL00991","13C4
PFOS","72","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","82.3","","290.5","10","86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","STL00992","13C4
PFBA","71","ng/L","","-99","DL","","TRG","83","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","STL00993","13C2
PFHxA","81","ng/L","","-99","DL","","TRG","95","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","STL00994","18O2
PFHxS","73","ng/L","","-99","DL","","TRG","89","","-99","LOQ","YES","81.4","","290.5","10","86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","STL00995","13C5

PFNA","88","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","STL00996","13C2
PFDA","83","ng/L","","-99","DL","","TRG","96","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","STL00997","13C2
PFUnA","87","ng/L","","-99","DL","","TRG","101","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","STL00998","13C2
PFDoA","77","ng/L","","-99","DL","","TRG","89","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","STL01056","13C8
FOSA","69","ng/L","","-99","DL","","TRG","81","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","STL01892","13C4-
PFHpA","79","ng/L","","-99","DL","","TRG","91","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","STL01893","13C5
PFPeA","84","ng/L","","-99","DL","","TRG","97","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","STL02116","13C2-
PFTeDA","68","ng/L","","-99","DL","","TRG","79","","-99","LOQ","YES","86.1","","290.5","10","86",""
"TP-PFC-029-TPI","EPA 537 (Mod)","RES","320-38875-1","TALSAC","STL02337","13C3-
PFBS","76","ng/L","","-99","DL","","TRG","95","","-99","LOQ","YES","80.0","","290.5","10","86",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","1763-23-
1","Perfluorooctanesulfonic acid (PFOS)","2.6","ng/L","U
M","0.94","DL","","TRG","","","3.4","LOQ","YES","-99","","292.8","10","2.6",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","2058-94-8","Perfluoroundecanoic
acid (PFUnA)","1.3","ng/L","U","0.61","DL","","TRG","","","1.7","LOQ","YES","-99","","292.8","10","1.3",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","2706-90-3","Perfluoropentanoic
acid (PFPeA)","240","ng/L","M","0.37","DL","","TRG","","","1.7","LOQ","YES","-99","","292.8","10","0.85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","307-24-4","Perfluorohexanoic
acid (PFHxA)","160","ng/L","M","0.40","DL","","TRG","","","1.7","LOQ","YES","-99","","292.8","10","0.85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","307-55-1","Perfluorododecanoic
acid (PFDoA)","1.3","ng/L","U","0.44","DL","","TRG","","","1.7","LOQ","YES","-99","","292.8","10","1.3",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","335-67-1","Perfluorooctanoic
acid (PFOA)","39","ng/L","M","0.46","DL","","TRG","","","1.7","LOQ","YES","-99","","292.8","10","1.3",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","335-76-2","Perfluorodecanoic
acid (PFDA)","0.85","ng/L","U","0.41","DL","","TRG","","","1.7","LOQ","YES","-99","","292.8","10","0.85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","335-77-
3","Perfluorodecanesulfonic acid
(PFDS)","1.3","ng/L","U","0.48","DL","","TRG","","","1.7","LOQ","YES","-99","","292.8","10","1.3",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","355-46-
4","Perfluorohexanesulfonic acid
(PFHxS)","2.5","ng/L","","0.32","DL","","TRG","","","1.7","LOQ","YES","-99","","292.8","10","0.85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","375-22-4","Perfluorobutanoic
acid (PFBA)","130","ng/L","","0.50","DL","","TRG","","","1.7","LOQ","YES","-99","","292.8","10","1.3",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","375-73-
5","Perfluorobutanesulfonic acid
(PFBS)","5.5","ng/L","","0.39","DL","","TRG","","","1.7","LOQ","YES","-99","","292.8","10","0.85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","375-85-9","Perfluoroheptanoic
acid (PFHpA)","6.8","ng/L","","0.52","DL","","TRG","","","1.7","LOQ","YES","-99","","292.8","10","1.3",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","375-92-
8","Perfluoroheptanesulfonic Acid
(PFHpS)","0.85","ng/L","U","0.32","DL","","TRG","","","1.7","LOQ","YES","-99","","292.8","10","0.85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","375-95-1","Perfluorononanoic
acid (PFNA)","1.3","ng/L","U","0.44","DL","","TRG","","","1.7","LOQ","YES","-99","","292.8","10","1.3",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","376-06-
7","Perfluorotetradecanoic acid
(PFTeA)","2.6","ng/L","U","0.71","DL","","TRG","","","3.4","LOQ","YES","-99","","292.8","10","2.6",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","72629-94-

8","Perfluorotridecanoic Acid
(PFTriA)","2.6","ng/L","U","0.65","DL","","TRG","","","3.4","LOQ","YES","-99","","292.8","10","2.6",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","754-91-6","Perfluorooctane
Sulfonamide (FOSA)","2.6","ng/L","U","1.1","DL","","TRG","","","3.4","LOQ","YES","-99","","292.8","10","2.6",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","STL00990","13C4
PFOA","67","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","85.4","","292.8","10","85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","STL00991","13C4
PFOS","60","ng/L","","-99","DL","","TRG","73","","-99","LOQ","YES","81.6","","292.8","10","85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","STL00992","13C4
PFBA","62","ng/L","","-99","DL","","TRG","73","","-99","LOQ","YES","85.4","","292.8","10","85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","STL00993","13C2
PFHxA","67","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","85.4","","292.8","10","85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","STL00994","18O2
PFHxS","62","ng/L","","-99","DL","","TRG","77","","-99","LOQ","YES","80.8","","292.8","10","85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","STL00995","13C5
PFNA","70","ng/L","","-99","DL","","TRG","82","","-99","LOQ","YES","85.4","","292.8","10","85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","STL00996","13C2
PFDA","65","ng/L","","-99","DL","","TRG","77","","-99","LOQ","YES","85.4","","292.8","10","85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","STL00997","13C2
PFUnA","63","ng/L","","-99","DL","","TRG","74","","-99","LOQ","YES","85.4","","292.8","10","85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","STL00998","13C2
PFDoA","56","ng/L","","-99","DL","","TRG","66","","-99","LOQ","YES","85.4","","292.8","10","85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","STL01056","13C8
FOSA","57","ng/L","","-99","DL","","TRG","67","","-99","LOQ","YES","85.4","","292.8","10","85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","STL01892","13C4-
PFHpA","64","ng/L","","-99","DL","","TRG","75","","-99","LOQ","YES","85.4","","292.8","10","85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","STL01893","13C5
PFPeA","65","ng/L","","-99","DL","","TRG","76","","-99","LOQ","YES","85.4","","292.8","10","85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","STL02116","13C2-
PFTeDA","51","ng/L","","-99","DL","","TRG","60","","-99","LOQ","YES","85.4","","292.8","10","85",""
"TP-PFC-029-MIDCARBON","EPA 537 (Mod)","RES","320-38875-2","TALSAC","STL02337","13C3-
PFBS","57","ng/L","","-99","DL","","TRG","72","","-99","LOQ","YES","79.4","","292.8","10","85",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.6","ng/L","J M","1.0","DL","","TRG","","","3.7","LOQ","YES","-99","","272.9","10","2.7",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA)","1.4","ng/L","U","0.66","DL","","TRG","","","1.8","LOQ","YES","-99","","272.9","10","1.4",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA)","190","ng/L","M","0.39","DL","","TRG","","","1.8","LOQ","YES","-99","","272.9","10","0.92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","78","ng/L","","0.43","DL","","TRG","","","1.8","LOQ","YES","-99","","272.9","10","0.92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDoA)","1.4","ng/L","U","0.48","DL","","TRG","","","1.8","LOQ","YES","-99","","272.9","10","1.4",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","2.6","ng/L","M","0.49","DL","","TRG","","","1.8","LOQ","YES","-99","","272.9","10","1.4",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","335-76-2","Perfluorodecanoic acid
(PFDA)","0.92","ng/L","U","0.44","DL","","TRG","","","1.8","LOQ","YES","-99","","272.9","10","0.92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","1.4","ng/L","U","0.51","DL","","TRG","","","1.8","LOQ","YES","-99","","272.9","10","1.4",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","0.68","ng/L","J","0.35","DL","","TRG","","","1.8","LOQ","YES","-99","","272.9","10","0.92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","130","ng/L","","0.54","DL","","TRG","","","1.8","LOQ","YES","-99","","272.9","10","1.4",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","1.4","ng/L","J","0.42","DL","","TRG","","","1.8","LOQ","YES","-99","","272.9","10","0.92",""

"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","1.3","ng/L","J","0.56","DL","","TRG","","","1.8","LOQ","YES","-99","","272.9","10","1.4",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","0.92","ng/L","U","0.34","DL","","TRG","","","1.8","LOQ","YES","-99","","272.9","10","0.92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","1.4","ng/L","U","0.48","DL","","TRG","","","1.8","LOQ","YES","-99","","272.9","10","1.4",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","2.7","ng/L","U","0.76","DL","","TRG","","","3.7","LOQ","YES","-99","","272.9","10","2.7",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","2.7","ng/L","U","0.70","DL","","TRG","","","3.7","LOQ","YES","-99","","272.9","10","2.7",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","2.7","ng/L","U","1.2","DL","","TRG","","","3.7","LOQ","YES","-99","","272.9","10","2.7",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","STL00990","13C4 PFOA","73","ng/L","","-99","DL","","TRG","79","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","STL00991","13C4 PFOS","64","ng/L","","-99","DL","","TRG","73","","-99","LOQ","YES","87.6","","272.9","10","92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","STL00992","13C4 PFBA","66","ng/L","","-99","DL","","TRG","72","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","STL00993","13C2 PFHxA","68","ng/L","","-99","DL","","TRG","74","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","STL00994","18O2 PFHxS","63","ng/L","","-99","DL","","TRG","73","","-99","LOQ","YES","86.7","","272.9","10","92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","STL00995","13C5 PFNA","74","ng/L","","-99","DL","","TRG","81","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","STL00996","13C2 PFDA","66","ng/L","","-99","DL","","TRG","72","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","STL00997","13C2 PFUnA","72","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","STL00998","13C2 PFDoA","63","ng/L","","-99","DL","","TRG","69","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","STL01056","13C8 FOSA","59","ng/L","","-99","DL","","TRG","64","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","STL01892","13C4-PFHpA","68","ng/L","","-99","DL","","TRG","74","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","STL01893","13C5 PFPeA","70","ng/L","","-99","DL","","TRG","76","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","STL02116","13C2-PFTeDA","55","ng/L","","-99","DL","","TRG","60","","-99","LOQ","YES","91.6","","272.9","10","92",""
"TP-PFC-029-TPE","EPA 537 (Mod)","RES","320-38875-3","TALSAC","STL02337","13C3-PFBS","62","ng/L","","-99","DL","","TRG","72","","-99","LOQ","YES","85.2","","272.9","10","92",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","9.2","ng/L","","1.0","DL","","TRG","","","3.8","LOQ","YES","-99","","264.2","10","2.8",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","1.4","ng/L","U","0.68","DL","","TRG","","","1.9","LOQ","YES","-99","","264.2","10","1.4",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","190","ng/L","M","0.41","DL","","TRG","","","1.9","LOQ","YES","-99","","264.2","10","0.95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","80","ng/L","","0.44","DL","","TRG","","","1.9","LOQ","YES","-99","","264.2","10","0.95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","1.4","ng/L","U","0.49","DL","","TRG","","","1.9","LOQ","YES","-99","","264.2","10","1.4",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","3.5","ng/L","M","0.51","DL","","TRG","","","1.9","LOQ","YES","-99","","264.2","10","1.4",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","0.95","ng/L","U","0.45","DL","","TRG","","","1.9","LOQ","YES","-99","","264.2","10","0.95",""

"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","1.4","ng/L","U","0.53","DL","","TRG","","","1.9","LOQ","YES","-99","","264.2","10","1.4",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","7.0","ng/L","","0.36","DL","","TRG","","","1.9","LOQ","YES","-99","","264.2","10","0.95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","130","ng/L","","0.56","DL","","TRG","","","1.9","LOQ","YES","-99","","264.2","10","1.4",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","2.2","ng/L","","0.44","DL","","TRG","","","1.9","LOQ","YES","-99","","264.2","10","0.95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","2.0","ng/L","","0.58","DL","","TRG","","","1.9","LOQ","YES","-99","","264.2","10","1.4",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","0.95","ng/L","U M","0.35","DL","","TRG","","","1.9","LOQ","YES","-99","","264.2","10","0.95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","1.4","ng/L","U","0.49","DL","","TRG","","","1.9","LOQ","YES","-99","","264.2","10","1.4",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","2.8","ng/L","U","0.79","DL","","TRG","","","3.8","LOQ","YES","-99","","264.2","10","2.8",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","2.8","ng/L","U","0.72","DL","","TRG","","","3.8","LOQ","YES","-99","","264.2","10","2.8",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","2.8","ng/L","U","1.2","DL","","TRG","","","3.8","LOQ","YES","-99","","264.2","10","2.8",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","STL00990","13C4 PFOA","80","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","94.6","","264.2","10","95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","STL00991","13C4 PFOS","70","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","90.5","","264.2","10","95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","STL00992","13C4 PFBA","71","ng/L","","-99","DL","","TRG","75","","-99","LOQ","YES","94.6","","264.2","10","95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","STL00993","13C2 PFHxA","72","ng/L","","-99","DL","","TRG","76","","-99","LOQ","YES","94.6","","264.2","10","95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","STL00994","18O2 PFHxS","70","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","89.5","","264.2","10","95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","STL00995","13C5 PFNA","86","ng/L","","-99","DL","","TRG","91","","-99","LOQ","YES","94.6","","264.2","10","95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","STL00996","13C2 PFDA","75","ng/L","","-99","DL","","TRG","79","","-99","LOQ","YES","94.6","","264.2","10","95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","STL00997","13C2 PFUnA","81","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","94.6","","264.2","10","95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","STL00998","13C2 PFDoA","72","ng/L","","-99","DL","","TRG","76","","-99","LOQ","YES","94.6","","264.2","10","95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","STL01056","13C8 FOSA","64","ng/L","","-99","DL","","TRG","67","","-99","LOQ","YES","94.6","","264.2","10","95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","STL01892","13C4-PFHpA","74","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","94.6","","264.2","10","95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","STL01893","13C5 PFPeA","76","ng/L","","-99","DL","","TRG","80","","-99","LOQ","YES","94.6","","264.2","10","95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","STL02116","13C2-PFTeDA","66","ng/L","","-99","DL","","TRG","70","","-99","LOQ","YES","94.6","","264.2","10","95",""
"TP-PFC-029-TPE-D","EPA 537 (Mod)","RES","320-38875-4","TALSAC","STL02337","13C3-PFBS","68","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","88.0","","264.2","10","95",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","33.5","ng/L","","1.1","DL","","SPK","90","","4.0","LOQ","YES","37.1","","250","10","3.0",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","36.2","ng/L","","0.72","DL","","SPK","91","","2.0","LOQ","YES","40.0","","250","10","1.5",""

"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","36.7","ng/L","","0.43","DL","","SPK","92","","2.0","LOQ","YES","40.0","","250","10","1.0",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","39.4","ng/L","","0.47","DL","","SPK","98","","2.0","LOQ","YES","40.0","","250","10","1.0",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","40.9","ng/L","","0.52","DL","","SPK","102","","2.0","LOQ","YES","40.0","","250","10","1.5",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","35.7","ng/L","","0.54","DL","","SPK","89","","2.0","LOQ","YES","40.0","","250","10","1.5",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","42.6","ng/L","","0.48","DL","","SPK","107","","2.0","LOQ","YES","40.0","","250","10","1.0",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","35.3","ng/L","","0.56","DL","","SPK","91","","2.0","LOQ","YES","38.6","","250","10","1.5",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","35.0","ng/L","","0.38","DL","","SPK","96","","2.0","LOQ","YES","36.4","","250","10","1.0",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","41.6","ng/L","","0.59","DL","","SPK","104","","2.0","LOQ","YES","40.0","","250","10","1.5",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36.3","ng/L","","0.46","DL","","SPK","103","","2.0","LOQ","YES","35.4","","250","10","1.0",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","39.6","ng/L","","0.61","DL","","SPK","99","","2.0","LOQ","YES","40.0","","250","10","1.5",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","34.4","ng/L","","0.37","DL","","SPK","90","","2.0","LOQ","YES","38.1","","250","10","1.0",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","37.6","ng/L","","0.52","DL","","SPK","94","","2.0","LOQ","YES","40.0","","250","10","1.5",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","36.7","ng/L","","0.83","DL","","SPK","92","","4.0","LOQ","YES","40.0","","250","10","3.0",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","39.3","ng/L","","0.76","DL","","SPK","98","","4.0","LOQ","YES","40.0","","250","10","3.0",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","40.5","ng/L","","1.3","DL","","SPK","101","","4.0","LOQ","YES","40.0","","250","10","3.0",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","STL00990","13C4 PFOA","90.3","ng/L","","-99","DL","","SPK","90","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","STL00991","13C4 PFOS","81.8","ng/L","","-99","DL","","SPK","86","","-99","LOQ","YES","95.6","","250","10","100",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","STL00992","13C4 PFBA","80.1","ng/L","","-99","DL","","SPK","80","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","STL00993","13C2 PFHxA","86.4","ng/L","","-99","DL","","SPK","86","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","STL00994","18O2 PFHxS","75.6","ng/L","","-99","DL","","SPK","80","","-99","LOQ","YES","94.6","","250","10","100",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","STL00995","13C5 PFNA","90.0","ng/L","","-99","DL","","SPK","90","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","STL00996","13C2 PFDA","85.8","ng/L","","-99","DL","","SPK","86","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","STL00997","13C2 PFUnA","93.9","ng/L","","-99","DL","","SPK","94","","-99","LOQ","YES","100","","250","10","100",""

"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","STL00998","13C2 PFDoA","82.4","ng/L","","-99","DL","","SPK","82","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","STL01056","13C8 FOSA","69.4","ng/L","","-99","DL","","SPK","69","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","STL01892","13C4-PFHpA","85.4","ng/L","","-99","DL","","SPK","85","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","STL01893","13C5 PFPeA","86.9","ng/L","","-99","DL","","SPK","87","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","STL02116","13C2-PFTeDA","82.0","ng/L","","-99","DL","","SPK","82","","-99","LOQ","YES","100","","250","10","100",""
"LCS 320-223615/2-A","EPA 537 (Mod)","RES","LCS 320-223615/2-A","TALSAC","STL02337","13C3-PFBS","73.0","ng/L","","-99","DL","","SPK","78","","-99","LOQ","YES","93.0","","250","10","100",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","3.0","ng/L","U","1.1","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10","3.0",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","1.5","ng/L","U","0.72","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.5",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","1.0","ng/L","U","0.43","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.0",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","1.0","ng/L","U","0.47","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.0",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","1.5","ng/L","U","0.52","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.5",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","1.5","ng/L","U M","0.54","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.5",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","1.0","ng/L","U","0.48","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.0",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","1.5","ng/L","U","0.56","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.5",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","1.0","ng/L","U","0.38","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.0",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","1.5","ng/L","U","0.59","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.5",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","1.0","ng/L","U","0.46","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.0",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","1.5","ng/L","U","0.61","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.5",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","1.0","ng/L","U","0.37","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.0",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","1.5","ng/L","U","0.52","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10","1.5",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","3.0","ng/L","U","0.83","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10","3.0",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","3.0","ng/L","U","0.76","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10","3.0",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","3.0","ng/L","U","1.3","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10","3.0",""

"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","STL00990","13C4
PFOA","92.9","ng/L","","-99","DL","","TRG","93","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","STL00991","13C4
PFOS","77.8","ng/L","","-99","DL","","TRG","81","","-99","LOQ","YES","95.6","","250","10","100",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","STL00992","13C4
PFBA","78.7","ng/L","","-99","DL","","TRG","79","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","STL00993","13C2
PFHxA","84.8","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","STL00994","18O2
PFHxS","80.5","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","94.6","","250","10","100",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","STL00995","13C5
PFNA","93.5","ng/L","","-99","DL","","TRG","94","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","STL00996","13C2
PFDA","86.3","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","STL00997","13C2
PFUnA","89.7","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","STL00998","13C2
PFDoA","84.8","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","STL01056","13C8
FOSA","71.3","ng/L","","-99","DL","","TRG","71","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","STL01892","13C4-
PFHpA","83.6","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","STL01893","13C5
PFPeA","84.5","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","STL02116","13C2-
PFTeDA","84.1","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","100","","250","10","100",""
"MB 320-223615/1-A","EPA 537 (Mod)","RES","MB 320-223615/1-A","TALSAC","STL02337","13C3-
PFBS","74.6","ng/L","","-99","DL","","TRG","80","","-99","LOQ","YES","93.0","","250","10","100",""
"Unknown","Unknown","TP-PFC-029-TPI","05/03/2018 09:20","AQ","320-38875-1","NM","","7.10","EPA 537
(Mod)","3535","RES","05/16/2018 14:51","05/28/2018
07:39","TALSAC","COA","WET","NA","1","NA","NA","","100","320-223615","320-223615","NA","320-
225818","320-38875-1","05/04/2018 09:30","05/07/2018 08:45",""
"Unknown","Unknown","TP-PFC-029-TPI","05/03/2018 09:20","AQ","320-38875-1","NM","","7.10","EPA 537
(Mod)","3535","DL","05/16/2018 14:51","05/29/2018
00:09","TALSAC","COA","WET","NA","10","NA","NA","","100","320-223615","320-223615","NA","320-
225884","320-38875-1","05/04/2018 09:30","05/07/2018 08:45",""
"Unknown","Unknown","TP-PFC-029-MIDCARBON","05/03/2018 09:25","AQ","320-38875-
2","NM","","7.10","EPA 537 (Mod)","3535","RES","05/16/2018 14:51","05/28/2018
07:47","TALSAC","COA","WET","NA","1","NA","NA","","100","320-223615","320-223615","NA","320-
225818","320-38875-1","05/04/2018 09:30","05/07/2018 08:45",""
"Unknown","Unknown","TP-PFC-029-TPE","05/03/2018 09:30","AQ","320-38875-3","NM","","7.10","EPA 537
(Mod)","3535","RES","05/16/2018 14:51","05/28/2018
07:55","TALSAC","COA","WET","NA","1","NA","NA","","100","320-223615","320-223615","NA","320-
225818","320-38875-1","05/04/2018 09:30","05/07/2018 08:45",""
"Unknown","Unknown","TP-PFC-029-TPE-D","05/03/2018 00:00","AQ","320-38875-4","FD","","7.10","EPA 537
(Mod)","3535","RES","05/16/2018 14:51","05/28/2018
08:02","TALSAC","COA","WET","NA","1","NA","NA","","100","320-223615","320-223615","NA","320-
225818","320-38875-1","05/04/2018 09:30","05/07/2018 08:45",""
"Unknown","Unknown","LCS 320-223615/2-A","","AQ","LCS 320-223615/2-A","LCS","","-99","EPA 537
(Mod)","3535","RES","05/16/2018 14:51","05/28/2018
07:31","TALSAC","COA","WET","NA","1","NA","NA","","100","320-223615","320-223615","NA","320-
225818","320-38875-1","05/16/2018 14:51","05/07/2018 08:45",""
"Unknown","Unknown","MB 320-223615/1-A","","AQ","MB 320-223615/1-A","MB","","-99","EPA 537
(Mod)","3535","RES","05/16/2018 14:51","05/28/2018

07:23","TALSAC","COA","WET","NA","1","NA","NA","","100","320-223615","320-223615","NA","320-225818","320-38875-1","05/16/2018 14:51","05/07/2018 08:45",""

TETRA TECH **INTERNAL CORRESPONDENCE**

TO: **J. ORIENT** **DATE:** **JULY 11, 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) 320-38875-1

SAMPLES: 4/Aqueous/PFAS

TP-PFC-029-MIDCARBON TP-PFC-029-TPE TP-PFC-029-TPE-D
TP-PFC-029-TPI

Overview

The sample set for former NAS Brunswick, SDG 320-38875-1 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 these Sample Delivery Groups (SDGs): TP-PFC-029-TPE/TP-PFC-029-TPE-D.

The samples were collected by Tetra Tech, Inc. on May 3, 2018 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
* • Hold times/Sample Preservation
* • Mass Calibration
* • LC/MS/MS System Tuning and Performance
* • Mass Spectral Acquisition Rate
* • Instrument Sensitivity Check
* • Ion Transition Check
* • Initial/Continuing Calibrations
• Laboratory Method/Preparation Blank Results
* • Extraction Internal Standard (Surrogate) Recoveries
• Injection Internal Standard Recoveries
* • Laboratory Control Sample Recoveries
• Field Duplicate Precision
* • Compound Identification
* • Compound Quantitation
* • Detection Limits

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.

PFAS

The following compound was detected in the Initial/Continuing Calibration Blanks (ICB/CCBs) at the following maximum concentration affecting all samples:

Analyte	Maximum Concentration (ng/ml)	Action Level Limit of Quantitation (LOQ) > or <
Perfluorohexanesulfonic acid (PFHxS)	0.00671	< LOQ

The detected result reported for PFHxS reported below the Limit of Detection (LOD) was raised to LOD and qualified as non-detected, (U).

The difference between the detected and non-detected results reported for PFHxS in the field duplicate pair, TP-PFC-029-TPE/TP-PFC-029-TPE-D, exceeded 2X the LOQ. The detected result reported for this compound in the duplicate sample was qualified as estimated, (J). No action was taken for the non-detected result in the original sample because this result was qualified for blank contamination.

The injected internal standard compound, 13C2-perfluorooctanoic acid (13C2-PFOA), had an area below the 50% quality control limit in the diluted analysis of sample TP-PFC-029-TPI. Detected results in the affected dilution analysis were qualified as estimated, (J).

NOTES

The samples were received at the laboratory above 6°C (7.1°C) but less than 10.0º C. Evidence of melted ice was in the cooler. No action was taken.

Field Reagent Blanks (FRBs) were not provided with the environmental samples.

The concentrations of pentadecafluorooctanoic acid (perfluorooctanoic acid (PFOA)), perfluorohexanoic acid (PFHxA), perfluorohexanesulfonic acid (PFHxS), and perfluorooctanesulfonic acid (PFOS) exceeded the instrument calibration range in sample TP-PFC-029-TPI. The sample was reanalyzed at a 10X dilution. The results for these compounds from the dilution were 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 LOD.

EXECUTIVE SUMMARY

Laboratory Performance: A contaminant was detected in the ICB and CCBs. The injected internal standard area was low in the diluted sample.

Other Factors Affecting Data Quality: Field duplicate imprecision was noted for one compound. One sample was further diluted. Detected results below the LOQ were estimated.

The data for these analyses were reviewed with reference to the EPA New England Environmental Data Review Supplement for Regional Data Review Elements Superfund Guidance/Procedures (April 2013), National Functional Guidelines for Organic Data Validation (January 2017), and the Department of Defense (DoD) document entitled, "Quality Systems Manual (QSM) for Environmental Laboratories" (July 2013). The text of this report has been formulated to address only those areas affecting data quality.

Michelle L. Woeber

Tetra Tech, Inc.
Michelle L. Woeber
Environmental Chemist

Joseph A. Samchuck

Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:

Appendix A - Qualified Analytical Results
Appendix B - Results as reported by the Laboratory
Appendix C - Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.
J	The result is an estimated quantity. 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.
NJ	The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.
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.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

APPENDIX A

QUALIFIED LABORATORY RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE21	NSAMPLE	TP-PFC-029-MIDCARBON			TP-PFC-029-TPE			TP-PFC-029-TPE-D			TP-PFC-029-TPI		
SDG: 320-38875-1	LAB_ID	320-38875-2			320-38875-3			320-38875-4			320-38875-1		
FRACTION: PFAS	SAMP_DATE	5/3/2018			5/3/2018			5/3/2018			5/3/2018		
MEDIA: WATER	QC_TYPE	NM			NM			FD			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF							TP-PFC-029-TPE					
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		39			2.6			3.5					
PERFLUOROBUTANESULFONIC ACID (PFBS)		5.5			1.4	J	P	2.2			49		
PERFLUOROBUTANOIC ACID (PFBA)		130			130			130			74		
PERFLUORODECANESULFONIC ACID (PFDS)		1.3	U		1.4	U		1.4	U		1.3	U	
PERFLUORODECANOIC ACID (PFDA)		0.85	U		0.92	U		0.95	U		0.82	J	P
PERFLUORODODECANOIC ACID (PFDOA)		1.3	U		1.4	U		1.4	U		1.3	U	
PERFLUOROHEPTANESULFONIC ACID		0.85	U		0.92	U		0.95	U		7.7		
PERFLUOROHEPTANOIC ACID (PFHPA)		6.8			1.3	J	P	2			76		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		2.5			0.92	U	A	7	J	G			
PERFLUOROHEXANOIC ACID (PFHXA)		160			78			80					
PERFLUORONONANOIC ACID (PFNA)		1.3	U		1.4	U		1.4	U		2.4		
PERFLUOROOCTANE SULFONAMIDE (FOSA)		2.6	U		2.7	U		2.8	U		2.6	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		2.6	U		2.6	J	P	9.2					
PERFLUOROPENTANOIC ACID (PFPEA)		240			190			190			200		
PERFLUOROTETRADECANOIC ACID (PFTEA)		2.6	U		2.7	U		2.8	U		2.6	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		2.6	U		2.7	U		2.8	U		2.6	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.3	U		1.4	U		1.4	U		1.3	U	

PROJ_NO: 08005-WE21	NSAMPLE	TP-PFC-029-TPI-DL		
SDG: 320-38875-1	LAB_ID	320-38875-1		
FRACTION: PFAS	SAMP_DATE	5/3/2018		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		1700	J	N
PERFLUOROBUTANESULFONIC ACID (PFBS)				
PERFLUOROBUTANOIC ACID (PFBA)				
PERFLUORODECANESULFONIC ACID (PFDS)				
PERFLUORODECANOIC ACID (PFDA)				
PERFLUORODODECANOIC ACID (PFDOA)				
PERFLUOROHEPTANESULFONIC ACID				
PERFLUOROHEPTANOIC ACID (PFHPA)				
PERFLUOROHEXANESULFONIC ACID (PFHXS)		410	J	N
PERFLUOROHEXANOIC ACID (PFHXA)		380	J	N
PERFLUORONONANOIC ACID (PFNA)				
PERFLUOROOCTANE SULFONAMIDE (FOSA)				
PERFLUOROOCTANESULFONIC ACID (PFOS)		330	J	N
PERFLUOROPENTANOIC ACID (PFPEA)				
PERFLUOROTETRADECANOIC ACID (PFTEA)				
PERFLUOROTRIDECANOIC ACID (PFTRIA)				
PERFLUOROUNDECANOIC ACID (PFUNA)				

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPI | Lab Sample ID: 320-38875-1

Matrix: Water | Lab File ID: 2018.05.27LLADX_006.d

Analysis Method: EPA 537 (Mod) | Date Collected: 05/03/2018 09:20

Extraction Method: 3535 | Date Extracted: 05/16/2018 14:51

Sample wt/vol: 290.5(mL) | Date Analyzed: 05/28/2018 07:39

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

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

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

Analysis Batch No.: 225818 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	74	M	1.7	1.3	0.51
2706-90-3	Perfluoropentanoic acid (PFPeA)	200	M	1.7	0.86	0.37
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*360*	*E M*	*1.7*	0.86	*0.40*
375-85-9	Perfluoroheptanoic acid (PFHpA)	76	M	1.7	1.3	0.52
335-67-1	*Perfluorooctanoic acid (PFOA)*	*1500*	*E*	*1.7*	1.3	*0.46*
375-95-1	Perfluorononanoic acid (PFNA)	2.4		1.7	1.3	0.45
335-76-2	Perfluorodecanoic acid (PFDA)	0.82	J M	1.7	0.86	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U M	1.7	1.3	0.62
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.45
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	2.6	0.65
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.4	2.6	0.71
375-73-5	Perfluorobutanesulfonic acid (PFBS)	49	M	1.7	0.86	0.40
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*400*	*E*	*1.7*	0.86	*0.33*
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	7.7		1.7	0.86	0.32
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*330*	*E*	*3.4*	2.6	*0.95*
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.48
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U M	3.4	2.6	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPI Lab Sample ID: 320-38875-1

Matrix: Water Lab File ID: 2018.05.27LLADX_006.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:20

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 290.5(mL) Date Analyzed: 05/28/2018 07:39

Con. Extract Vol.: 10(mL) Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	81		50-150
STL00992	13C4 PFBA	83		50-150
STL01893	13C5 PFPeA	97		50-150
STL00993	13C2 PFHxA	95		50-150
STL01892	13C4-PFHpA	91		50-150
STL00990	13C4 PFOA	85		50-150
STL00995	13C5 PFNA	102		50-150
STL00996	13C2 PFDA	96		50-150
STL00997	13C2 PFUnA	101		50-150
STL00998	13C2 PFDoA	89		50-150
STL00994	18O2 PFHxS	89		50-150
STL02116	13C2-PFTeDA	79		50-150
STL00991	13C4 PFOS	87		50-150
STL02337	13C3-PFBS	95		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPI DL | Lab Sample ID: 320-38875-1 DL

Matrix: Water | Lab File ID: 2018.05.28LLA_056.d

Analysis Method: EPA 537 (Mod) | Date Collected: 05/03/2018 09:20

Extraction Method: 3535 | Date Extracted: 05/16/2018 14:51

Sample wt/vol: 290.5(mL) | Date Analyzed: 05/29/2018 00:09

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

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

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

Analysis Batch No.: 225884 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	*Perfluorobutanoic acid (PFBA)*	*81*	*D*	*17*	13	*5.1*
2706-90-3	*Perfluoropentanoic acid (PFPeA)*	*200*	*D*	*17*	8.6	*3.7*
307-24-4	Perfluorohexanoic acid (PFHxA)	380	D	17	8.6	4.0
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*73*	*D*	*17*	13	*5.2*
335-67-1	Perfluorooctanoic acid (PFOA)	1700	D	17	13	4.6
375-95-1	*Perfluorononanoic acid (PFNA)*	*13*	*U*	*17*	13	*4.5*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*8.6*	*U*	*17*	8.6	*4.1*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*13*	*U*	*17*	13	*6.2*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*13*	*U*	*17*	13	*4.5*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*26*	*U*	*34*	26	*6.5*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*26*	*U*	*34*	26	*7.1*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*50*	*D*	*17*	8.6	*4.0*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	410	D	17	8.6	3.3
375-92-8	*Perfluoroheptanesulfonic Acid (PFHpS)*	*8.7*	*J D*	*17*	8.6	*3.2*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	330	D	34	26	9.5
335-77-3	*Perfluorodecanesulfonic acid (PFDS)*	*13*	*U*	*17*	13	*4.8*
754-91-6	*Perfluorooctane Sulfonamide (FOSA)*	*26*	*U*	*34*	26	*11*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPI DL Lab Sample ID: 320-38875-1 DL

Matrix: Water Lab File ID: 2018.05.28LLA_056.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:20

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 290.5(mL) Date Analyzed: 05/29/2018 00:09

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

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

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

Analysis Batch No.: 225884 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	73		50-150
STL00992	13C4 PFBA	78		50-150
STL01893	13C5 PFPeA	84		50-150
STL00993	13C2 PFHxA	81		50-150
STL01892	13C4-PFHpA	81		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	86		50-150
STL00996	13C2 PFDA	83		50-150
STL00997	13C2 PFUnA	90		50-150
STL00998	13C2 PFDoA	87		50-150
STL00994	18O2 PFHxS	80		50-150
STL02116	13C2-PFTeDA	69		50-150
STL00991	13C4 PFOS	75		50-150
STL02337	13C3-PFBS	76		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-MIDCARBON | Lab Sample ID: 320-38875-2

Matrix: Water | Lab File ID: 2018.05.27LLADX_007.d

Analysis Method: EPA 537 (Mod) | Date Collected: 05/03/2018 09:25

Extraction Method: 3535 | Date Extracted: 05/16/2018 14:51

Sample wt/vol: 292.8(mL) | Date Analyzed: 05/28/2018 07:47

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

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

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

Analysis Batch No.: 225818 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.7	1.3	0.50
2706-90-3	Perfluoropentanoic acid (PFPeA)	240	M	1.7	0.85	0.37
307-24-4	Perfluorohexanoic acid (PFHxA)	160	M	1.7	0.85	0.40
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.8		1.7	1.3	0.52
335-67-1	Perfluorooctanoic acid (PFOA)	39	M	1.7	1.3	0.46
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.7	1.3	0.44
335-76-2	Perfluorodecanoic acid (PFDA)	0.85	U	1.7	0.85	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	1.3	0.61
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.44
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	2.6	0.65
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.4	2.6	0.71
375-73-5	Perfluorobutanesulfonic acid (PFBS)	5.5		1.7	0.85	0.39
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.5		1.7	0.85	0.32
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.85	U	1.7	0.85	0.32
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	U M	3.4	2.6	0.94
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.48
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.4	2.6	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-MIDCARBON Lab Sample ID: 320-38875-2

Matrix: Water Lab File ID: 2018.05.27LLADX_007.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 09:25

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 292.8(mL) Date Analyzed: 05/28/2018 07:47

Con. Extract Vol.: 10(mL) Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	67		50-150
STL00992	13C4 PFBA	73		50-150
STL01893	13C5 PFPeA	76		50-150
STL00993	13C2 PFHxA	78		50-150
STL01892	13C4-PFHpA	75		50-150
STL00990	13C4 PFOA	78		50-150
STL00995	13C5 PFNA	82		50-150
STL00996	13C2 PFDA	77		50-150
STL00997	13C2 PFUnA	74		50-150
STL00998	13C2 PFDoA	66		50-150
STL00994	18O2 PFHxS	77		50-150
STL02116	13C2-PFTeDA	60		50-150
STL00991	13C4 PFOS	73		50-150
STL02337	13C3-PFBS	72		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPE | Lab Sample ID: 320-38875-3

Matrix: Water | Lab File ID: 2018.05.27LLADX_008.d

Analysis Method: EPA 537 (Mod) | Date Collected: 05/03/2018 09:30

Extraction Method: 3535 | Date Extracted: 05/16/2018 14:51

Sample wt/vol: 272.9(mL) | Date Analyzed: 05/28/2018 07:55

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

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

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

Analysis Batch No.: 225818 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.8	1.4	0.54
2706-90-3	Perfluoropentanoic acid (PFPeA)	190	M	1.8	0.92	0.39
307-24-4	Perfluorohexanoic acid (PFHxA)	78		1.8	0.92	0.43
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.3	J	1.8	1.4	0.56
335-67-1	Perfluorooctanoic acid (PFOA)	2.6	M	1.8	1.4	0.49
375-95-1	Perfluorononanoic acid (PFNA)	1.4	U	1.8	1.4	0.48
335-76-2	Perfluorodecanoic acid (PFDA)	0.92	U	1.8	0.92	0.44
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.4	U	1.8	1.4	0.66
307-55-1	Perfluorododecanoic acid (PFDoA)	1.4	U	1.8	1.4	0.48
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.7	U	3.7	2.7	0.70
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.7	U	3.7	2.7	0.76
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.4	J	1.8	0.92	0.42
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.68	J	1.8	0.92	0.35
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.92	U	1.8	0.92	0.34
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	J M	3.7	2.7	1.0
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.4	U	1.8	1.4	0.51
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.7	U	3.7	2.7	1.2

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPE | Lab Sample ID: 320-38875-3

Matrix: Water | Lab File ID: 2018.05.27LLADX_008.d

Analysis Method: EPA 537 (Mod) | Date Collected: 05/03/2018 09:30

Extraction Method: 3535 | Date Extracted: 05/16/2018 14:51

Sample wt/vol: 272.9(mL) | Date Analyzed: 05/28/2018 07:55

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

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

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

Analysis Batch No.: 225818 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	64		50-150
STL00992	13C4 PFBA	72		50-150
STL01893	13C5 PFPeA	76		50-150
STL00993	13C2 PFHxA	74		50-150
STL01892	13C4-PFHpA	74		50-150
STL00990	13C4 PFOA	79		50-150
STL00995	13C5 PFNA	81		50-150
STL00996	13C2 PFDA	72		50-150
STL00997	13C2 PFUnA	78		50-150
STL00998	13C2 PFDoA	69		50-150
STL00994	18O2 PFHxS	73		50-150
STL02116	13C2-PFTeDA	60		50-150
STL00991	13C4 PFOS	73		50-150
STL02337	13C3-PFBS	72		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPE-D | Lab Sample ID: 320-38875-4

Matrix: Water | Lab File ID: 2018.05.27LLADX_009.d

Analysis Method: EPA 537 (Mod) | Date Collected: 05/03/2018 00:00

Extraction Method: 3535 | Date Extracted: 05/16/2018 14:51

Sample wt/vol: 264.2(mL) | Date Analyzed: 05/28/2018 08:02

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

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

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

Analysis Batch No.: 225818 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.9	1.4	0.56
2706-90-3	Perfluoropentanoic acid (PFPeA)	190	M	1.9	0.95	0.41
307-24-4	Perfluorohexanoic acid (PFHxA)	80		1.9	0.95	0.44
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.0		1.9	1.4	0.58
335-67-1	Perfluorooctanoic acid (PFOA)	3.5	M	1.9	1.4	0.51
375-95-1	Perfluorononanoic acid (PFNA)	1.4	U	1.9	1.4	0.49
335-76-2	Perfluorodecanoic acid (PFDA)	0.95	U	1.9	0.95	0.45
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.4	U	1.9	1.4	0.68
307-55-1	Perfluorododecanoic acid (PFDoA)	1.4	U	1.9	1.4	0.49
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.8	U	3.8	2.8	0.72
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.8	U	3.8	2.8	0.79
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.2		1.9	0.95	0.44
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.0		1.9	0.95	0.36
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.95	U M	1.9	0.95	0.35
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.2		3.8	2.8	1.0
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.4	U	1.9	1.4	0.53
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.8	U	3.8	2.8	1.2

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: TP-PFC-029-TPE-D Lab Sample ID: 320-38875-4

Matrix: Water Lab File ID: 2018.05.27LLADX_009.d

Analysis Method: EPA 537 (Mod) Date Collected: 05/03/2018 00:00

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 264.2(mL) Date Analyzed: 05/28/2018 08:02

Con. Extract Vol.: 10(mL) Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	67		50-150
STL00992	13C4 PFBA	75		50-150
STL01893	13C5 PFPeA	80		50-150
STL00993	13C2 PFHxA	76		50-150
STL01892	13C4-PFHpA	78		50-150
STL00990	13C4 PFOA	84		50-150
STL00995	13C5 PFNA	91		50-150
STL00996	13C2 PFDA	79		50-150
STL00997	13C2 PFUnA	86		50-150
STL00998	13C2 PFDoA	76		50-150
STL00994	18O2 PFHxS	78		50-150
STL02116	13C2-PFTeDA	70		50-150
STL00991	13C4 PFOS	78		50-150
STL02337	13C3-PFBS	78		50-150

APPENDIX C

SUPPORT DOCUMENTATION

NAS BRUNSWICK
SDG 320-38875-1

SAMPLE IDENTIFICATION	TP-PFC-029-TPI	
COMPOUND	PENTADECAFLUOROOCTANOIC ACID	
COMPOUND AREA	1225321	
INTERNAL STANDARD AMOUNT (ng/ml)	2.39	
DILUTION FACTOR	10	
INTERNAL STANDARD AREA	258620	
AVERAGE RRF	1.1758	
SAMPLE VOLUME (ml)	290.5	
VOLUME EXTRACT (ml)	10	
VOLUME INJECTED (µl)	2	
ml to L	1000	
CONCENTRATION =	1657.59	ng/L

1225321 x 2.39ng/ml x 1000ml x 10ml x 10/(258620 x 1.1758 x 290.5ml x 2µl x 1L)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\2018.05.28LLA_056.d
Lims ID: 320-38875-A-1-A
Client ID: TP-PFC-029-TPI
Sample Type: Client
Inject. Date: 29-May-2018 00:09:41 ALS Bottle#: 39 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-38875-a-1-a 10X (#223615)
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180529-58849.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 30-May-2018 13:11:52 Calib Date: 15-May-2018 16:39:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1 : Det: EXP1
Process Host: XAWRK030

First Level Reviewer: ruangyotsakuld Date: 30-May-2018 13:12:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.463	1.458	0.005	1.000	510148	0.1960		78.4	3528	
2 Perfluorobutyric acid										
212.90 > 169.00	1.463	1.461	0.002	1.000	443786	0.2339			194	
D 3 13C5-PFPeA										
267.90 > 223.00	1.737	1.730	0.007	0.563	348559	0.2089		83.6	5310	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.737	1.734	0.003	1.000	950047	0.5772			541	
D 47 13C3-PFBS										
301.90 > 83.00	1.773	1.766	0.007	1.000	6644	0.1762		75.8	65.6	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.773	1.770	0.003	1.000	326750	0.1464			1291	
298.90 > 99.00	1.773	1.770	0.003	1.000	141213		2.31(1.25-3.74)		1019	
D 7 13C2 PFHxA										
315.00 > 270.00	2.025	2.016	0.009	1.000	360061	0.2024		81.0	8842	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.025	2.022	0.003	1.000	1641512	1.11			2527	
313.00 > 119.00	2.025	2.022	0.003	1.000	130014		12.63(5.03-15.10)		1850	
D 9 13C4-PFHpA										
367.00 > 322.00	2.358	2.347	0.011	1.000	345963	0.2030		81.2	8041	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.358	2.355	0.003	1.000	311364	0.2130			395	
363.00 > 169.00	2.358	2.355	0.003	1.000	128082		2.43(1.13-3.40)		764	
D 11 18O2 PFHxS										
403.00 > 84.00	2.371	2.360	0.011	1.000	397005	0.1885		79.7	9407	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.371	2.368	0.003	1.000	2225980	1.18			7347	
399.00 > 99.00	2.371	2.368	0.003	1.000	708688		3.14(1.50-4.49)		3134	

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	2.712	2.706	0.006	1.000	350956	0.2177		87.1	8255	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.712	2.711	0.001	1.000	8390762	5.08			3247	
413.00 > 169.00	2.712	2.711	0.001	1.000	4826560		1.74(0.84-2.52)		15312	
* 62 13C2-PFOA										
415.00 > 370.00	2.712	2.711	0.001		425723	0.2500			9942	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.719	2.718	0.001	1.000	36400	0.0253			118	
449.00 > 99.00	2.719	2.718	0.001	1.000	13104		2.78(1.94-5.82)		155	
D 19 13C5 PFNA										
468.00 > 423.00	3.084	3.076	0.008	1.000	282433	0.2142		85.7	8409	
D 18 13C4 PFOS										
503.00 > 80.00	3.084	3.076	0.008	1.000	258620	0.1786		74.7	2661	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.084	3.079	0.005	1.000	1225321	0.9631			4427	
499.00 > 99.00	3.084	3.079	0.005	1.000	281337		4.36(2.31-6.93)		2912	
20 Perfluorononanoic acid										R
463.00 > 419.00	3.084	3.079	0.005	1.000	11744	0.009814			26.6	R
463.00 > 169.00	3.084	3.079	0.005	1.000	1105		10.63(1.90-5.69)		22.6	
D 21 13C8 FOSA										
506.00 > 78.00	3.420	3.411	0.009	1.000	346362	0.1828		73.1	6753	
D 23 13C2 PFDA										
515.00 > 470.00	3.448	3.439	0.009	1.000	232085	0.2069		82.8	7540	
D 30 13C2 PFUnA										
565.00 > 520.00	3.774	3.763	0.011	1.000	199622	0.2247		89.9	7504	
D 36 13C2 PFDoA										
615.00 > 570.00	4.061	4.051	0.010	1.000	208972	0.2186		87.4	2498	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.562	4.553	0.009	1.000	201434	0.1717		68.7	1412	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

ANALYTE	ORIGINAL	DUPLICATE	RL	RPD	RPD > 30%	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2xRL
PENTADECAFLUOROOCTANOIC ACID (PFOA)	2.6	3.5	1.9	29.51	FALSE	FALSE	FALSE	FALSE
PERFLUOROBUTANESULFONIC ACID (PFBS)	1.4	2.2	1.9	44.44	TRUE	FALSE	FALSE	FALSE
PERFLUOROBUTANOIC ACID (PFBA)	130	130	1.9	0.00	FALSE	TRUE	TRUE	FALSE
PERFLUOROHEPTANOIC ACID (PFHPA)	1.3	2	1.9	42.42	TRUE	FALSE	FALSE	FALSE
PERFLUOROHEXANESULFONIC ACID (PFHXS)	0.92	7	1.9	153.54	TRUE	FALSE	TRUE	TRUE
PERFLUOROHEXANOIC ACID (PFHXA)	78	80	1.9	2.53	FALSE	TRUE	TRUE	FALSE
PERFLUOROOCTANESULFONIC ACID (PFOS)	2.6	9.2	3.8	111.86	TRUE	FALSE	TRUE	FALSE
PERFLUOROPENTANOIC ACID (PFPEA)	190	190	1.9	0.00	FALSE	TRUE	TRUE	FALSE

SDG 320-378938-1

TP-PFC-029-TPE/TP-PFC-029-TPE-D

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record

228168

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: JEFFORIENT	Site Contact: DAN GRIGER	Date: 5/3/18	COC No: 228168
Company Name: TETRATECH	Tel/Fax: 412-921-8650	Lab Contact: DAVID AIKEN	Carrier: FEDEX	1 of 1 COCs
Address: 661 ANDERSON DR, FOSTER PL,	Analysis Turnaround Time			Sampler:
City/State/Zip: PITTSBURGH/PA/15220	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: 412-921-8650	TAT if different from Below			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: BRUNSWICK GWETS	☐ 1 week			
Site: FORMER NAS BRUNSWICK	☐ 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)	Sample Specific Notes:
TP-PFC-029-TPI	5/3/18	0920	G	W	4	N	N	X	
TP-PFC-029-MIDCARBON		0925	G	W	4	N	N	X	
TP-PFC-029-TPE		0930	G	W	4	N	N	X	
TP-PFC-029-TPE-D		0000	G	W	4	N	N	X	

320-38875 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: 7.1 Corr'd: 7.1 | Therm ID No.: AL-5 no Hot ice

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	T+	1430 4/5/18	[signature]	TA-SAC	5-4-18 0930
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: 320-38875-1

Login Number: 38875
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	Water present in cooler; indicates evidence of melted ice.
Cooler Temperature is acceptable.	False	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Narrative
320-38875-1

Receipt
The samples were received on 5/4/2018 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 7.1º C.

Receipt Exceptions

The following samples were received at the laboratory outside the required temperature criteria at 7.1C, but under method 537's requiremtn that samples be received by the laboratoy at 10.0º C or less. TP-PFC-029-TPI (320-38875-1), TP-PFC-029-MIDCARBON (320-38875-2), TP-PFC-029-TPE (320-38875-3) and TP-PFC-029-TPE-D (320-38875-4). The cooler was received with melted ice.

LCMS
Method(s) 537 (modified), EPA 537 (Mod), EPA 537(Mod): 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) EPA 537 (Mod): The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit for 13C4 PFOS and 18O2 PFHxS: (320-38935-A-32-B MS). Matrix interference is suspected because these samples were diluted due to high target analytes and the IDA recoveries in the analysis of the diluted extract were within method recommended limits. Both sets of data have been reported. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample.

Method(s) EPA 537 (Mod): The concentration of several analytes associated with the following samples exceeded the instrument calibration range: TP-PFC-029-TPI (320-38875-1). These analytes have been qualified; however, the peaks did not saturate the instrument detector. The samples were diluted to bring the concentrations of these analytes within the instrument calibration range and both sets of data have been reported.

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

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

Qualifiers

LCMS

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

Glossary

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

Sample Summary

Client: Tetra Tech, Inc.
Project/Site: Brunswick GWETS

TestAmerica Job ID: 320-38875-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-38875-1	TP-PFC-029-TPI	Water	05/03/18 09:20	05/04/18 09:30
320-38875-2	TP-PFC-029-MIDCARBON	Water	05/03/18 09:25	05/04/18 09:30
320-38875-3	TP-PFC-029-TPE	Water	05/03/18 09:30	05/04/18 09:30
320-38875-4	TP-PFC-029-TPE-D	Water	05/03/18 00:00	05/04/18 09:30

Method Summary

Client: Tetra Tech, Inc.
Project/Site: Brunswick GWETS

TestAmerica Job ID: 320-38875-1

Method	Method Description	Protocol	Laboratory
EPA 537 (Mod)	PFAS for QSM 5.1, Table B-15	DOD 5.1	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC

Protocol References:

DOD 5.1 = Department of Defense Quality Systems Manual V5.1

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

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

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

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-029-TPI	320-38875-1	83	97	95	95	91	89	85	102
TP-PFC-029-TPI DL	320-38875-1 DL	78	84	76	81	81	80	87	86
TP-PFC-029-MIDCARB ON	320-38875-2	73	76	72	78	75	77	78	82
TP-PFC-029-TPE	320-38875-3	72	76	72	74	74	73	79	81
TP-PFC-029-TPE-D	320-38875-4	75	80	78	76	78	78	84	91
	MB 320-223615/1-A	79	85	80	85	84	85	93	94
	LCS 320-223615/2-A	80	87	78	86	85	80	90	90

	QC LIMITS
PFBA = 13C4 PFBA	50-150
PFPeA = 13C5 PFPeA	50-150
PFBS = 13C3-PFBS	50-150
PFHxA = 13C2 PFHxA	50-150
PFHpA = 13C4-PFHpA	50-150
PFHxS = 18O2 PFHxS	50-150
PFOA = 13C4 PFOA	50-150
PFNA = 13C5 PFNA	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

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-029-TPI	320-38875-1	87	81	96	101	89	79
TP-PFC-029-TPI DL	320-38875-1 DL	75	73	83	90	87	69
TP-PFC-029-MIDCARB ON	320-38875-2	73	67	77	74	66	60
TP-PFC-029-TPE	320-38875-3	73	64	72	78	69	60
TP-PFC-029-TPE-D	320-38875-4	78	67	79	86	76	70
	MB 320-223615/1-A	81	71	86	90	85	84
	LCS 320-223615/2-A	86	69	86	94	82	82

	QC LIMITS
PFOS = 13C4 PFOS	50-150
PFOSA = 13C8 FOSA	50-150
PFDA = 13C2 PFDA	50-150
PFUnA = 13C2 PFUnA	50-150
PFDoA = 13C2 PFDoA	50-150
PFTDA = 13C2-PFTeDA	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Sample No.: IC 320-223413/5 Date Analyzed: 05/15/2018 15:36

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2017.05.15LLB_ICAL_ Heated Purge: (Y/N) N

Calibration ID: 39198

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		4762237	2.73				
UPPER LIMIT		7143356	2.93				
LOWER LIMIT		2381119	2.53				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-223413/12		4812155	2.73				
ICV 320-223413/13		4485749	2.72				
CCV 320-225818/3 CCVIS		5150922	2.70				
CCV 320-225873/3 CCVIS		4833381	2.70				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Sample No.: CCV 320-225818/3 Date Analyzed: 05/28/2018 07:15

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.05.27LLADX_003 Heated Purge: (Y/N) N

Calibration ID: 39198

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		5150922	2.70				
UPPER LIMIT		7726383	2.90				
LOWER LIMIT		2575461	2.50				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-225818/1		4948330	2.70				
CCVL 320-225818/2		4974159	2.70				
MB 320-223615/1-A		4525357	2.70				
LCS 320-223615/2-A		5050927	2.71				
320-38875-1	TP-PFC-029-TPI	3924419	2.70				
320-38875-2	TP-PFC-029-MIDCARBON	4817889	2.70				
320-38875-3	TP-PFC-029-TPE	5264580	2.70				
320-38875-4	TP-PFC-029-TPE-D	4741331	2.70				
CCV 320-225818/14		5195418	2.70				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Sample No.: CCV 320-225873/3 Date Analyzed: 05/28/2018 17:30

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.05.28LLA_005.d Heated Purge: (Y/N) N

Calibration ID: 39198

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		4833381	2.70				
UPPER LIMIT		7250072	2.90				
LOWER LIMIT		2416691	2.50				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-225873/1		4725130	2.69				
CCVL 320-225873/2		4921629	2.70				
CCV 320-225884/1		4945573	2.71				
320-38875-1 DL	TP-PFC-029-TPI DL	425723Q	2.71				
CCV 320-225884/11		4741080	2.71				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab File ID: 2018.05.27LLADX_004.d Lab Sample ID: MB 320-223615/1-A

Matrix: Water Date Extracted: 05/16/2018 14:51

Instrument ID: A8_N Date Analyzed: 05/28/2018 07:23

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-223615/2-A	2018.05.27LLADX_005.d	05/28/2018 07:31
TP-PFC-029-TPI	320-38875-1	2018.05.27LLADX_006.d	05/28/2018 07:39
TP-PFC-029-MIDCARBON	320-38875-2	2018.05.27LLADX_007.d	05/28/2018 07:47
TP-PFC-029-TPE	320-38875-3	2018.05.27LLADX_008.d	05/28/2018 07:55
TP-PFC-029-TPE-D	320-38875-4	2018.05.27LLADX_009.d	05/28/2018 08:02
TP-PFC-029-TPI DL	320-38875-1 DL	2018.05.28LLA_056.d	05/29/2018 00:09

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-223615/1-A

Matrix: Water | Lab File ID: 2018.05.27LLADX_004.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: 3535 | Date Extracted: 05/16/2018 14:51

Sample wt/vol: 250(mL) | Date Analyzed: 05/28/2018 07:23

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

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

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

Analysis Batch No.: 225818 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	1.5	U	2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	1.0	U	2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.5	U	2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	1.5	U M	2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	1.5	U	2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	U	2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.5	U	2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	1.5	U	2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	3.0	U	4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.5	U	2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	3.0	U	4.0	3.0	1.3

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-223615/1-A

Matrix: Water Lab File ID: 2018.05.27LLADX_004.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: 3535 Date Extracted: 05/16/2018 14:51

Sample wt/vol: 250(mL) Date Analyzed: 05/28/2018 07:23

Con. Extract Vol.: 10(mL) Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	71		50-150
STL00992	13C4 PFBA	79		50-150
STL01893	13C5 PFPeA	85		50-150
STL00993	13C2 PFHxA	85		50-150
STL01892	13C4-PFHpA	84		50-150
STL00990	13C4 PFOA	93		50-150
STL00995	13C5 PFNA	94		50-150
STL00996	13C2 PFDA	86		50-150
STL00997	13C2 PFUnA	90		50-150
STL00998	13C2 PFDoA	85		50-150
STL00994	18O2 PFHxS	85		50-150
STL02116	13C2-PFTeDA	84		50-150
STL00991	13C4 PFOS	81		50-150
STL02337	13C3-PFBS	80		50-150

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.05.27LLADX_005.d

Lab ID: LCS 320-223615/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	41.6	104	83-118	
Perfluoropentanoic acid (PFPeA)	40.0	36.7	92	83-108	
Perfluorohexanoic acid (PFHxA)	40.0	39.4	98	83-109	
Perfluoroheptanoic acid (PFHpA)	40.0	39.6	99	80-113	
Perfluorooctanoic acid (PFOA)	40.0	35.7	89	80-107	
Perfluorononanoic acid (PFNA)	40.0	37.6	94	83-113	
Perfluorodecanoic acid (PFDA)	40.0	42.6	107	85-113	
Perfluoroundecanoic acid (PFUnA)	40.0	36.2	91	76-105	
Perfluorododecanoic acid (PFDoA)	40.0	40.9	102	87-116	
Perfluorotridecanoic Acid (PFTriA)	40.0	39.3	98	75-129	
Perfluorotetradecanoic acid (PFTeA)	40.0	36.7	92	82-115	
Perfluorobutanesulfonic acid (PFBS)	35.4	36.3	103	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.0	96	81-106	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	34.4	90	80-117	
Perfluorooctanesulfonic acid (PFOS)	37.1	33.5	90	82-112	
Perfluorodecanesulfonic acid (PFDS)	38.6	35.3	91	81-114	
Perfluorooctane Sulfonamide (FOSA)	40.0	40.5	101	85-114	
13C8 FOSA	100	69.4	69	50-150	
13C4 PFBA	100	80.1	80	50-150	
13C5 PFPeA	100	86.9	87	50-150	
13C2 PFHxA	100	86.4	86	50-150	
13C4-PFHpA	100	85.4	85	50-150	
13C4 PFOA	100	90.3	90	50-150	
13C5 PFNA	100	90.0	90	50-150	
13C2 PFDA	100	85.8	86	50-150	
13C2 PFUnA	100	93.9	94	50-150	
13C2 PFDoA	100	82.4	82	50-150	
18O2 PFHxS	94.6	75.6	80	50-150	
13C2-PFTeDA	100	82.0	82	50-150	
13C4 PFOS	95.6	81.8	86	50-150	
13C3-PFBS	93.0	73.0	78	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Instrument ID: A8_N Start Date: 05/15/2018 15:13

Analysis Batch Number: 223413 End Date: 05/15/2018 17:23

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-223413/2		05/15/2018 15:13	1	2017.05.15LLB_ICAL 002.d	GeminiC18 3x100 3(mm)
IC 320-223413/3		05/15/2018 15:21	1	2017.05.15LLB_ICAL 003.d	GeminiC18 3x100 3(mm)
IC 320-223413/4		05/15/2018 15:29	1	2017.05.15LLB_ICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-223413/5 ICIS		05/15/2018 15:36	1	2017.05.15LLB_ICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-223413/7		05/15/2018 15:52	1	2017.05.15LLB_ICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-223413/8		05/15/2018 16:00	1	2017.05.15LLB_ICAL 008.d	GeminiC18 3x100 3(mm)
IC 320-223413/11		05/15/2018 16:39	1	2018.05.15LLC_ICAL 006.d	GeminiC18 3x100 3(mm)
ICB 320-223413/12		05/15/2018 17:15	1	2018.05.15LLCC_ICAL 009.d	GeminiC18 3x100 3(mm)
ICV 320-223413/13		05/15/2018 17:23	1	2018.05.15LLCC_ICAL 010.d	GeminiC18 3x100 3(mm)

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

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-223413/2	2017.05.15LLB_ICAL_002.d
Level 2	IC 320-223413/3	2017.05.15LLB_ICAL_003.d
Level 3	IC 320-223413/4	2017.05.15LLB_ICAL_004.d
Level 4	IC 320-223413/5	2017.05.15LLB_ICAL_005.d
Level 5	IC 320-223413/7	2017.05.15LLB_ICAL_007.d
Level 6	IC 320-223413/8	2017.05.15LLB_ICAL_008.d
Level 7	IC 320-223413/11	2018.05.15LLC_ICAL_006.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 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	0.9241 0.8957	0.9313 0.9561	0.9225	0.9212	0.9579	AveID		0.9298				2.3		20.0			
Perfluoropentanoic acid (PFPeA)	1.2625 1.1540	1.2317 1.1953	1.1470	1.1005	1.1726	AveID		1.1805				4.6		20.0			
Perfluorobutanesulfonic acid (PFBS)	73.379 74.326	78.361 80.657	79.854	76.421	83.642	AveID		78.092				4.7		20.0			
4:2 FTS	16.107 15.923	17.745 16.756	15.595	16.119	17.773	AveID		16.574				5.3		20.0			
Perfluorohexanoic acid (PFHxA)	1.0080 1.0775	1.1481 0.9470	0.9804	0.9949	1.0411	AveID		1.0281				6.6		20.0			
Perfluoropentanesulfonic acid	70.536 63.954	69.604 69.356	70.709	68.100	74.560	AveID		69.545				4.6		20.0			
Perfluoroheptanoic acid (PFHpA)	1.1170 1.0467	1.0612 1.0839	1.0572	0.9754	1.0529	AveID		1.0563				4.1		20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.2868 1.0806	1.1929 1.0961	1.1199	1.0451	1.0663	AveID		1.1268				7.6		20.0			
6:2FTS	2.5480 1.8029	2.0146 1.7196	2.1352	1.5658	1.7441	L2ID	0.0180	1.7550							0.9900		0.9900
Perfluorooctanoic acid (PFOA)	1.2824 1.1018	1.3066 1.0898	1.1380	1.1380	1.1826	AveID		1.1770				7.3		20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.1977 1.2900	1.4162 1.3580	1.3092	1.3585	1.3942	AveID		1.3320				5.5		20.0			
Perfluorooctanesulfonic acid (PFOS)	1.3297 1.1063	1.2627 1.0707	1.2157	1.0803	1.1653	AveID		1.1758				8.4		20.0			
Perfluorononanoic acid (PFNA)	1.1029 1.0898	1.0209 1.0772	1.0536	1.0094	1.0606	AveID		1.0592				3.3		20.0			
Perfluorooctane Sulfonamide (FOSA)	0.8770 0.9485	0.9364 1.0373	1.0064	0.9683	1.0413	AveID		0.9736				6.1		20.0			

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.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorononanesulfonic acid	0.7875 0.7778	0.6822 0.7530	0.7467	0.7538	0.8013	AveID		0.7575				5.1		20.0			
8:2FTS	1.3186 1.2726	1.3858 1.3389	1.3462	1.3265	1.4577	AveID		1.3495				4.3		20.0			
Perfluorodecanoic acid (PFDA)	0.8867 0.9744	0.9628 1.0102	0.9707	0.9794	1.0214	AveID		0.9722				4.5		20.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9856 1.0154	0.9342 1.0822	0.9935	1.0424	1.0502	AveID		1.0148				4.8		20.0			
Perfluorodecanesulfonic acid (PFDS)	0.6317 0.6583	0.7078 0.6826	0.6836	0.6304	0.7056	AveID		0.6714				4.8		20.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	1.0524 0.9642	0.7682 0.8944	0.9620	0.9003	1.0388	AveID		0.9400				10.3		20.0			
Perfluoroundecanoic acid (PFUnA)	0.9516 0.9130	0.9138 0.7363	0.7790	0.7312	0.8215	AveID		0.8352				10.9		20.0			
Perfluorododecanoic acid (PFDoA)	1.0219 1.0283	1.0040 1.0645	1.1136	1.0306	1.0427	AveID		1.0436				3.4		20.0			
Perfluorotridecanoic Acid (PFTriA)	1.1692 1.0949	1.0844 1.1930	1.1780	1.1305	1.1573	AveID		1.1439				3.7		20.0			
Perfluorotetradecanoic acid (PFTeA)	0.2622 0.2644	0.2565 0.2614	0.2270	0.2438	0.2525	AveID		0.2525				5.3		20.0			
13C4 PFBA	1.4654 1.5642	1.5722 1.4829	1.5804	1.4802	1.5540	Ave		1.5285				3.3		20.0			
13C5 PFPeA	0.9578 0.9717	0.9914 0.9536	0.9991	0.9890	0.9962	Ave		0.9798				1.9		20.0			
13C3-PFBS	0.0218 0.0222	0.0228 0.0217	0.0227	0.0222	0.0216	Ave		0.0221				2.1		20.0			
13C2 PFHxA	1.0307 0.9826	1.0663 1.0766	1.0830	1.0193	1.0550	Ave		1.0448				3.4		20.0			
13C4-PFHpA	1.0218 0.9433	1.0396 0.9531	1.0651	0.9899	0.9939	Ave		1.0010				4.4		20.0			
18O2 PFHxS	1.2582 1.1763	1.2526 1.2049	1.2691	1.2355	1.2631	Ave		1.2371				2.8		20.0			
M2-6:2FTS	0.2275 0.2007	0.2278 0.2142	0.2391	0.2273	0.2103	Ave		0.2210				5.9		20.0			
13C4 PFOA	0.9457 0.9318	0.9493 0.9514	0.9743	0.9365	0.9390	Ave		0.9468				1.5		20.0			
13C4 PFOS	0.8656 0.8371	0.8315 0.8519	0.8880	0.8302	0.8476	Ave		0.8503				2.4		20.0			
13C5 PFNA	0.7820 0.7385	0.8107 0.7553	0.8055	0.7560	0.7732	Ave		0.7745				3.5		20.0			

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.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
13C8 FOSA	1.0913 1.1170	1.0548 1.1055	1.1529	1.1228	1.1455	Ave		1.1128				3.0		20.0			
M2-8:2FTS	0.2728 0.2412	0.2681 0.2427	0.2615	0.2403	0.2336	Ave		0.2515				6.2		20.0			
13C2 PFDA	0.6586 0.6466	0.6755 0.6399	0.6955	0.6477	0.6472	Ave		0.6587				3.0		20.0			
d3-NMeFOSAA	0.3554 0.3833	0.3709 0.3334	0.3911	0.3502	0.3593	Ave		0.3634				5.5		20.0			
d5-NEtFOSAA	0.3882 0.3379	0.3862 0.3795	0.3918	0.3798	0.3469	Ave		0.3729				5.8		20.0			
13C2 PFUnA	0.5204 0.4762	0.5248 0.5225	0.5435	0.5432	0.5208	Ave		0.5216				4.3		20.0			
13C2 PFDoA	0.5424 0.5733	0.5507 0.5366	0.5780	0.5627	0.5857	Ave		0.5613				3.3		20.0			
13C2-PFTeDA	0.6921 0.6818	0.5915 0.6707	0.7584	0.7128	0.7166	Ave		0.6891				7.5		20.0			
13C2-PFHxDA	1.2461 1.2600	0.8066 1.2373	1.2363	1.2369	1.1633	Ave		1.1695				13.9		20.0			

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.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-223413/2	2017.05.15LLB_ICAL_002.d
Level 2	IC 320-223413/3	2017.05.15LLB_ICAL_003.d
Level 3	IC 320-223413/4	2017.05.15LLB_ICAL_004.d
Level 4	IC 320-223413/5	2017.05.15LLB_ICAL_005.d
Level 5	IC 320-223413/7	2017.05.15LLB_ICAL_007.d
Level 6	IC 320-223413/8	2017.05.15LLB_ICAL_008.d
Level 7	IC 320-223413/11	2018.05.15LLC_ICAL_006.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	73922 26861072	162647 6642110	691256	2597444	12934647	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluoropentanoic acid (PFPeA)		AveID	66005 21497034	135647 5339518	543378	2073422	10150448	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorobutanesulfonic acid (PFBS)		AveID	77106 28014178	175383 7259728	758816	2858265	13863265	0.0221 8.84	0.0442 2.21	0.221	0.884	4.42
4:2 FTS		AveID	17882 6341030	41962 1593481	156576	636977	3112425	0.0234 9.34	0.0467 2.34	0.234	0.934	4.67
Perfluorohexanoic acid (PFHxA)		AveID	56711 20297289	135987 4776223	503450	1931731	9544553	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluoropentanesulfonic acid		AveID	78646 25577332	165299 6623884	712963	2702610	13112812	0.0235 9.38	0.0469 2.35	0.235	0.938	4.69
Perfluoroheptanoic acid (PFHpA)		AveID	62298 18928350	122556 4839723	533908	1839273	9093863	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorohexanesulfonic acid (PFHxS)		AveID	80424 22174743	151043 5630297	613254	2238132	10650638	0.0228 9.10	0.0455 2.28	0.228	0.910	4.55
6:2FTS		L2ID	29994 6574970	48326 1635620	229440	642687	3021313	0.0237 9.48	0.0474 2.37	0.237	0.948	4.74
Perfluorooctanoic acid (PFOA)		AveID	66199 19682065	137784 4857127	525683	2030259	9649258	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	53872 19707477	124538 5160059	524732	2045093	9775395	0.0238 9.52	0.0476 2.38	0.238	0.952	4.76
Perfluorooctanesulfonic acid (PFOS)		AveID	58301 16474463	108239 3965534	474971	1585297	7964833	0.0232 9.28	0.0464 2.32	0.232	0.928	4.64
Perfluorononanoic acid (PFNA)		AveID	47076 15430529	91933 3811509	402423	1453651	7125949	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorooctane Sulfonamide (FOSA)		AveID	52238 20311842	109720 5372059	550166	2070950	10364812	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorononanesulfonic acid		AveID	35719 11982938	60494 2885064	301811	1144412	5665707	0.0240 9.60	0.0480 2.40	0.240	0.960	4.80

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
8:2FTS		AveID	18812 5636776	39540 1458360	159889	581733	2834764	0.0240 9.58	0.0479 2.40	0.240	0.958	4.79
Perfluorodecanoic acid (PFDA)		AveID	31877 12079263	72253 3028523	320077	1208399	5744357	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	19122 7460336	38494 1690352	184250	695308	3278986	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorodecanesulfonic acid (PFDS)		AveID	28773 10184141	63027 2626191	277428	961059	5009746	0.0241 9.64	0.0482 2.41	0.241	0.964	4.82
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	22302 6246594	32956 1590051	178736	651368	3130989	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluoroundecanoic acid (PFUnA)		AveID	27031 8334466	53273 1802433	200746	756677	3717634	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorododecanoic acid (PFDoA)		AveID	30254 11301274	61418 2676169	305166	1104651	5307128	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorotridecanoic Acid (PFTriA)		AveID	34616 12033356	66337 2999335	322826	1211735	5890114	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
Perfluorotetradecanoic acid (PFTeA)		AveID	9904 3455816	16854 821303	81619	331048	1571970	0.0250 10.0	0.0500 2.50	0.250	1.00	5.00
13C4 PFBA	13PF OA	Ave	7998943 7496989	8732721 6946962	7493234	7049149	6751655	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5 PFPeA	13PF OA	Ave	5228218 4657025	5506602 4467248	4737268	4710025	4328345	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	110547 99131	117730 94691	99970	98369	87185	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	5626147 4709249	5922451 5043564	5134906	4854075	4583820	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	5577473 4521122	5774309 4465208	5050240	4714171	4318388	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	6497213 5333305	6581524 5339851	5692452	5565884	5191664	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	1179634 913641	1201925 953169	1076802	1028277	867962	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	5162191 4465836	5272655 4456920	4619416	4460027	4079623	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	4516956 3835347	4415247 3815593	4024927	3779459	3520558	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	4268517 3539647	4502703 3538499	3819382	3600246	3359491	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C8 FOSA	13PF OA	Ave	5956672 5353791	5858621 5178962	5466463	5346931	4976852	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	1426703 1107332	1426640 1089191	1187676	1096366	972368	2.40 2.40	2.40 2.40	2.40	2.40	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
13C2 PFDA	13PF OA	Ave	3594922 3099083	3752181 2997952	3297462	3084670	2812041	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	1940146 1836867	2060337 1561957	1854527	1667566	1561125	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	2119254 1619647	2144987 1777821	1857905	1808821	1507014	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	2840675 2282286	2914989 2447962	2576940	2587053	2262574	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	2960567 2747572	3058640 2514089	2740425	2679695	2544838	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	3777870 3267831	3285420 3141974	3595983	3394312	3113223	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	6801656 6039184	4480419 5796576	5862077	5890266	5054291	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution
L2ID = Linear 1/conc^2 IsoDil

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-223413/2	2017.05.15LLB_ICAL_002.d
Level 2	IC 320-223413/3	2017.05.15LLB_ICAL_003.d
Level 3	IC 320-223413/4	2017.05.15LLB_ICAL_004.d
Level 4	IC 320-223413/5	2017.05.15LLB_ICAL_005.d
Level 5	IC 320-223413/7	2017.05.15LLB_ICAL_007.d
Level 6	IC 320-223413/8	2017.05.15LLB_ICAL_008.d
Level 7	IC 320-223413/11	2018.05.15LLC_ICAL_006.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanoic acid (PFBA)	-0.6 2.8	0.2	-0.8	-0.9	3.0	-3.7	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	6.9 1.2	4.3	-2.8	-6.8	-0.7	-2.2	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	-6.0 3.3	0.3	2.3	-2.1	7.1	-4.8	30 30	30	30	30	30	30
4:2 FTS	-2.8 1.1	7.1	-5.9	-2.7	7.2	-3.9	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	-2.0 -7.9	11.7	-4.6	-3.2	1.3	4.8	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	1.4 -0.3	0.1	1.7	-2.1	7.2	-8.0	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	5.7 2.6	0.5	0.1	-7.7	-0.3	-0.9	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	14.2 -2.7	5.9	-0.6	-7.3	-5.4	-4.1	30 30	30	30	30	30	30
6:2FTS	2.0 -2.5	-6.8	17.3	-11.9	-0.8	2.6	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	9.0 -7.4	11.0	-3.3	-3.3	0.5	-6.4	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	-10.1 2.0	6.3	-1.7	2.0	4.7	-3.2	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	13.1 -8.9	7.4	3.4	-8.1	-0.9	-5.9	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	4.1 1.7	-3.6	-0.5	-4.7	0.1	2.9	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (FOSA)	-9.9 6.5	-3.8	3.4	-0.5	7.0	-2.6	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	4.0 -0.6	-9.9	-1.4	-0.5	5.8	2.7	30 30	30	30	30	30	30

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1 Analy Batch No.: 223413

SDG No.:

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

Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39198

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
8:2FTS	-2.3 -0.8	2.7	-0.2	-1.7	8.0	-5.7	30 30	30	30	30	30	30
Perfluorodecanoic acid (PFDA)	-8.8 3.9	-1.0	-0.2	0.7	5.1	0.2	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	-2.9 6.6	-7.9	-2.1	2.7	3.5	0.1	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	-5.9 1.7	5.4	1.8	-6.1	5.1	-2.0	30 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	11.9 -4.9	-18.3	2.3	-4.2	10.5	2.6	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	13.9 -11.8	9.4	-6.7	-12.4	-1.6	9.3	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	-2.1 2.0	-3.8	6.7	-1.3	-0.1	-1.5	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	2.2 4.3	-5.2	3.0	-1.2	1.2	-4.3	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	3.8 3.5	1.6	-10.1	-3.4	0.0	4.7	30 30	30	30	30	30	30

Calibration / Perfluorobutyric acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

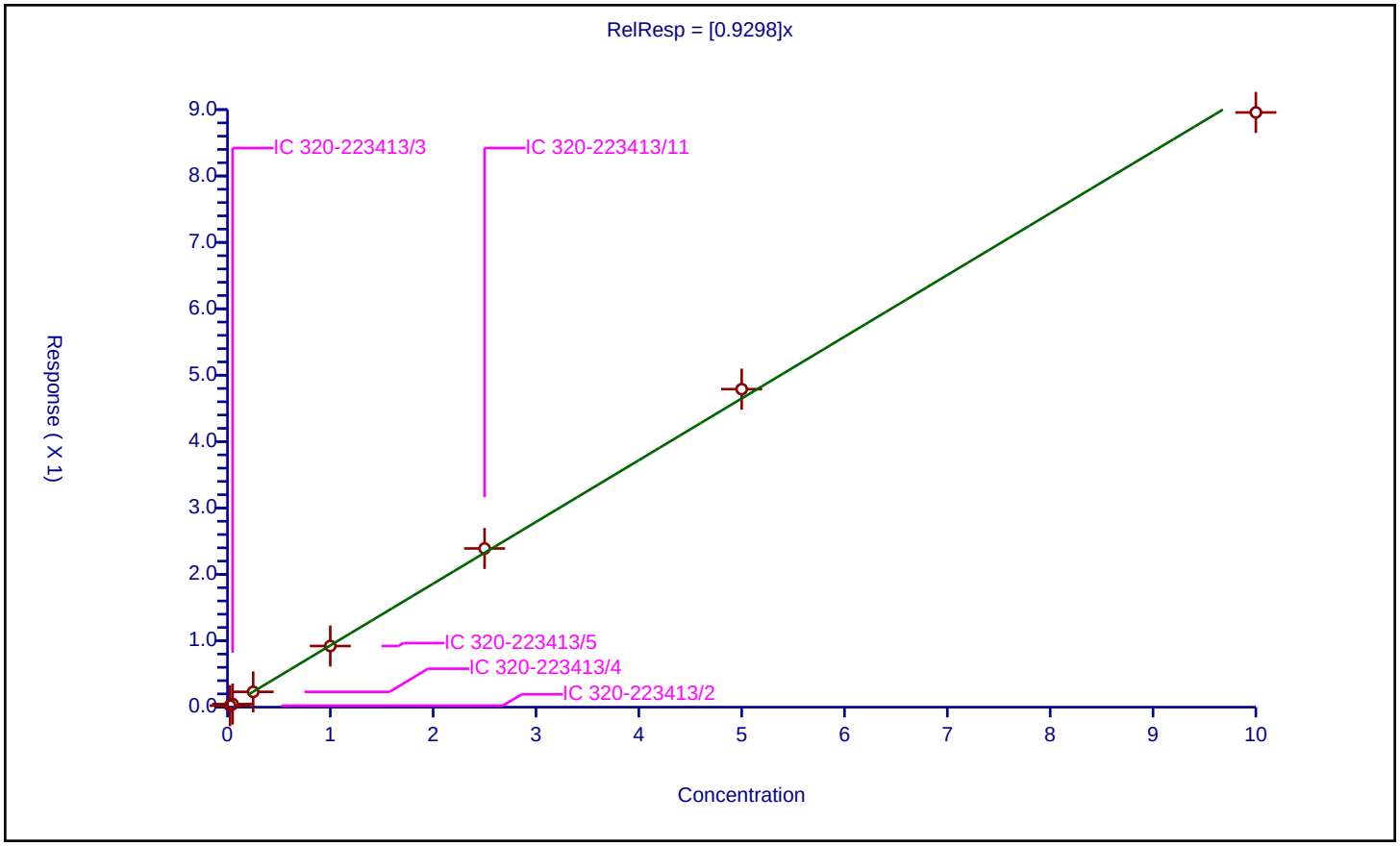
Curve Coefficients

Intercept:	0
Slope:	0.9298

Error Coefficients

Standard Error:	12500000
Relative Standard Error:	2.3
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.023104	2.5	7998943.0	0.924147	Y
2	IC 320-223413/3	0.05	0.046563	2.5	8732721.0	0.93125	Y
3	IC 320-223413/4	0.25	0.230627	2.5	7493234.0	0.922507	Y
4	IC 320-223413/5	1.0	0.921191	2.5	7049149.0	0.921191	Y
5	IC 320-223413/11	2.5	2.390293	2.5	6946962.0	0.956117	Y
6	IC 320-223413/7	5.0	4.789436	2.5	6751655.0	0.957887	Y
7	IC 320-223413/8	10.0	8.957287	2.5	7496989.0	0.895729	Y



Calibration / Perfluoropentanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

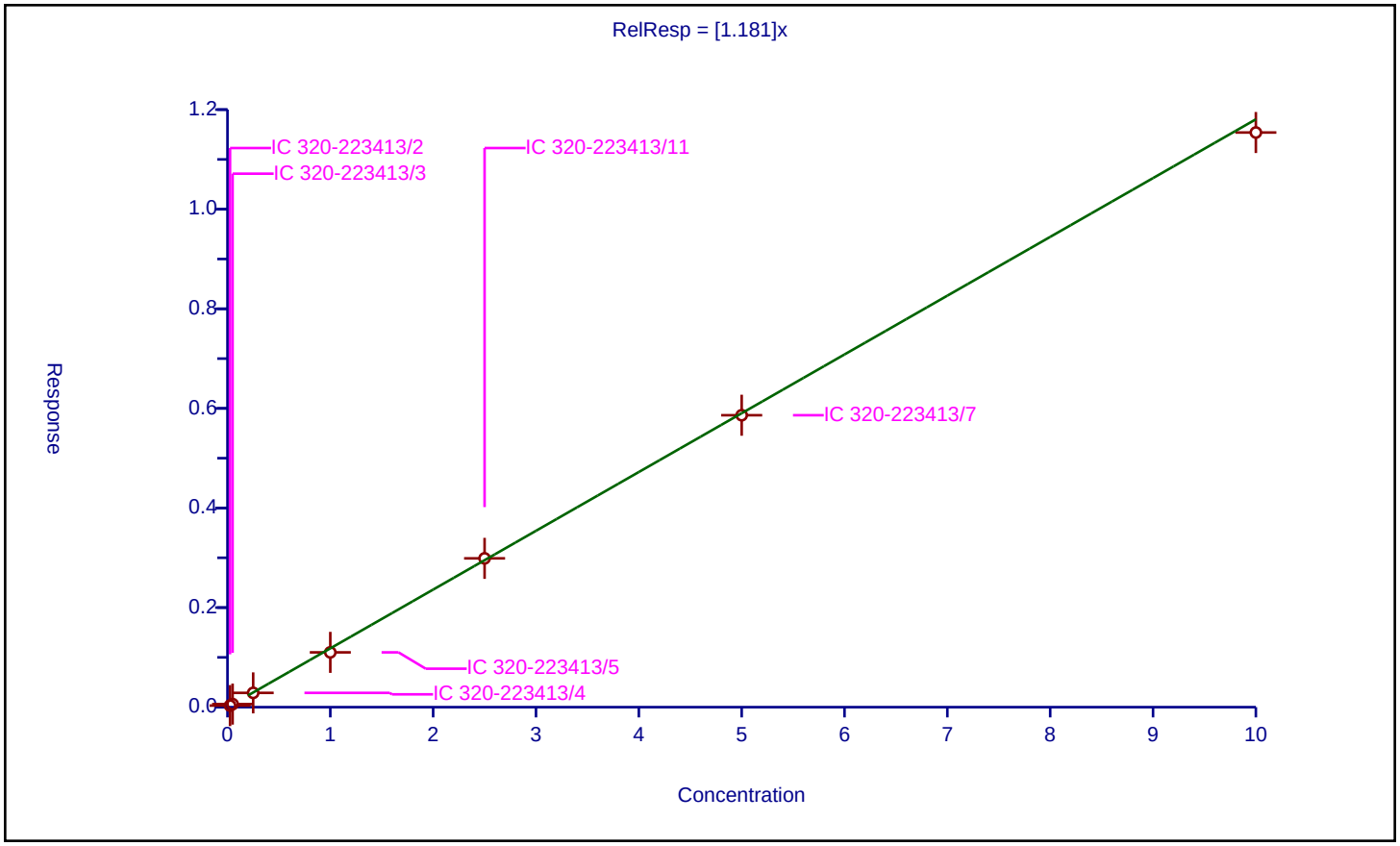
Curve Coefficients

Intercept:	0
Slope:	1.181

Error Coefficients

Standard Error:	9990000
Relative Standard Error:	4.6
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.031562	2.5	5228218.0	1.262476	Y
2	IC 320-223413/3	0.05	0.061584	2.5	5506602.0	1.231676	Y
3	IC 320-223413/4	0.25	0.286757	2.5	4737268.0	1.147028	Y
4	IC 320-223413/5	1.0	1.100537	2.5	4710025.0	1.100537	Y
5	IC 320-223413/11	2.5	2.988147	2.5	4467248.0	1.195259	Y
6	IC 320-223413/7	5.0	5.862777	2.5	4328345.0	1.172555	Y
7	IC 320-223413/8	10.0	11.540111	2.5	4657025.0	1.154011	Y



Calibration / Perfluorobutanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

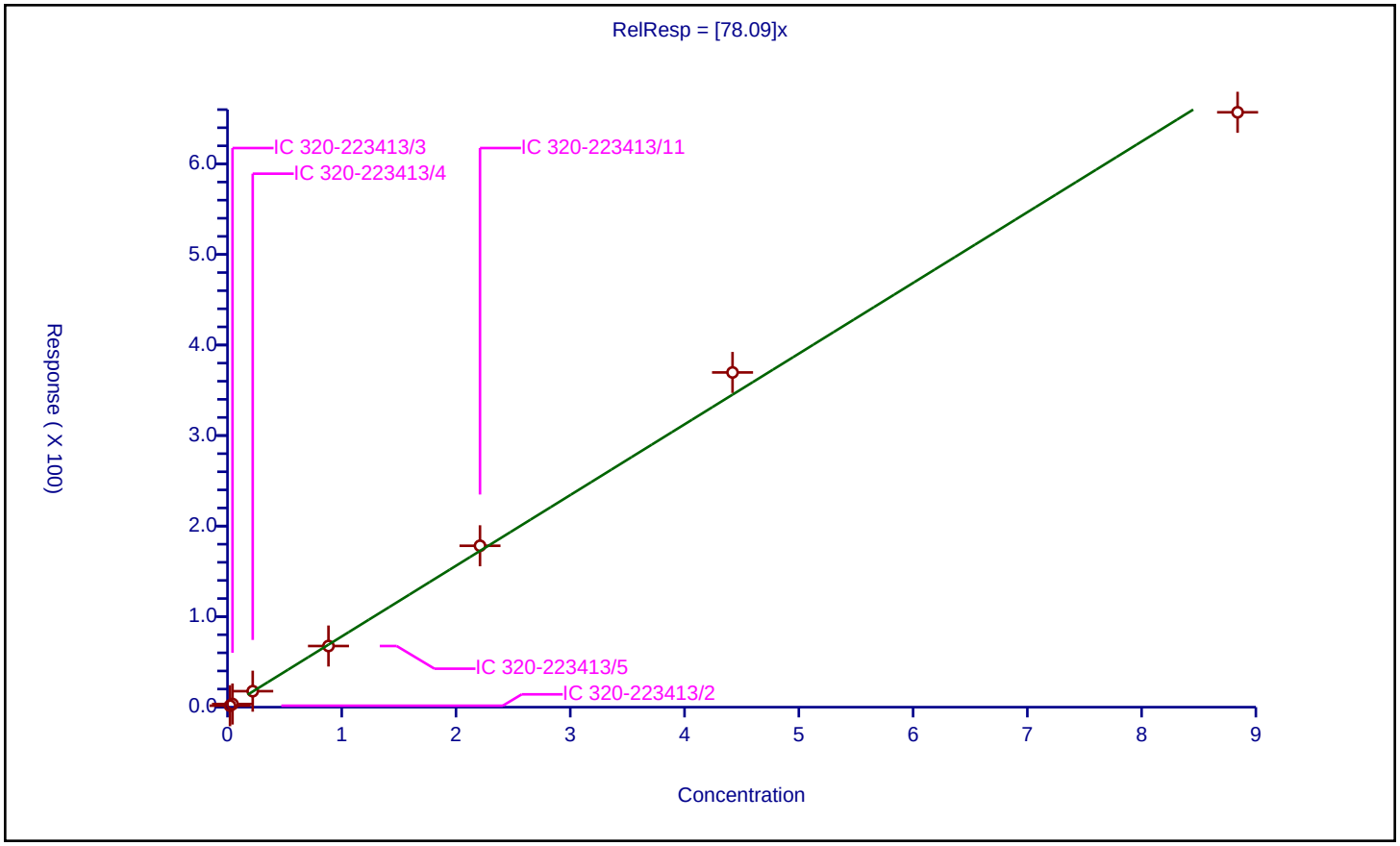
Curve Coefficients

Intercept:	0
Slope:	78.09

Error Coefficients

Standard Error:	13200000
Relative Standard Error:	4.7
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0221	1.621676	2.325	110547.0	73.379018	Y
2	IC 320-223413/3	0.0442	3.463565	2.325	117730.0	78.361193	Y
3	IC 320-223413/4	0.221	17.647766	2.325	99970.0	79.854146	Y
4	IC 320-223413/5	0.884	67.556508	2.325	98369.0	76.421389	Y
5	IC 320-223413/11	2.21	178.252079	2.325	94691.0	80.657049	Y
6	IC 320-223413/7	4.42	369.697667	2.325	87185.0	83.642006	Y
7	IC 320-223413/8	8.84	657.03931	2.325	99131.0	74.325714	Y



Calibration / Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

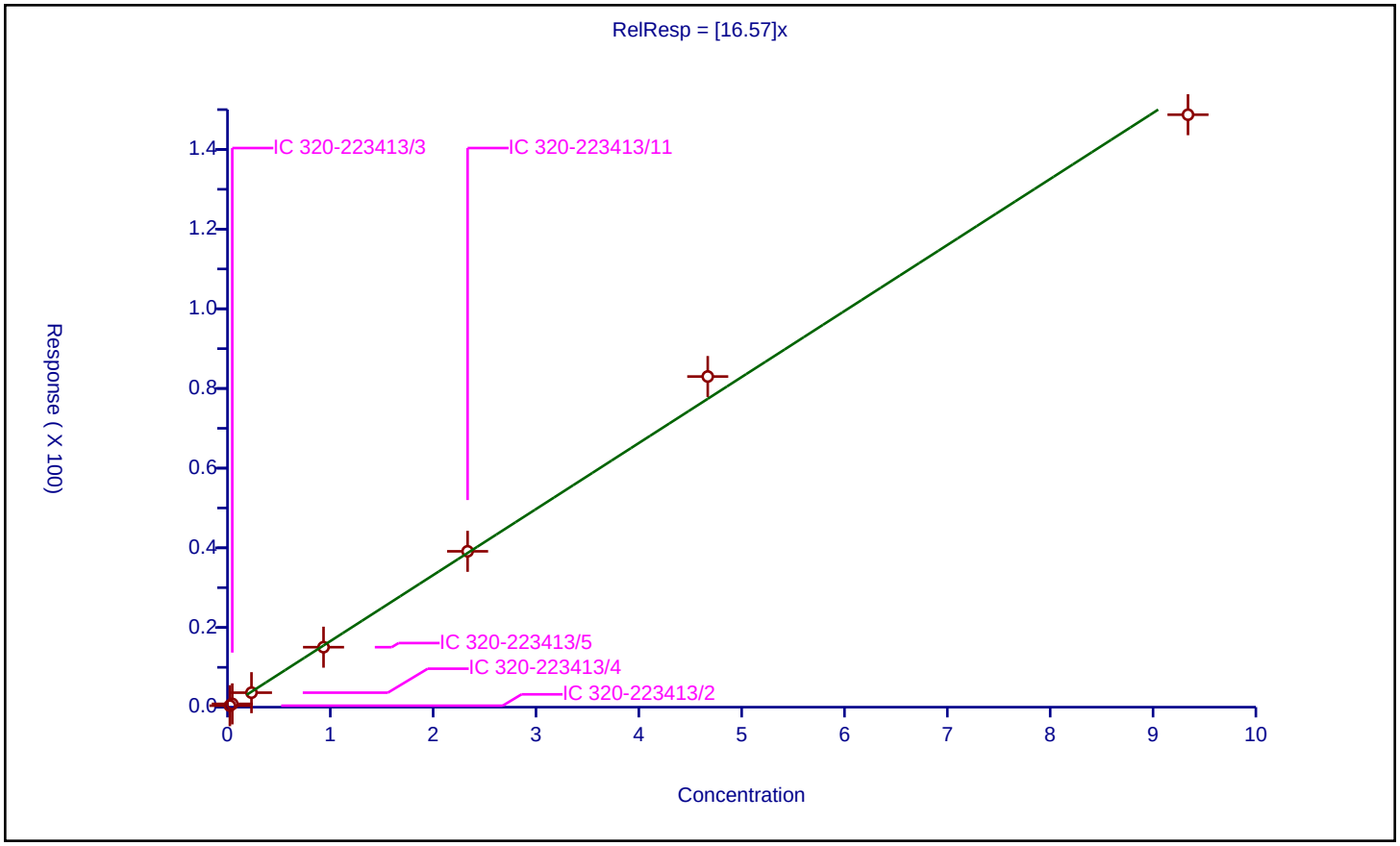
Curve Coefficients

Intercept:	0
Slope:	16.57

Error Coefficients

Standard Error:	2970000
Relative Standard Error:	5.3
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.02335	0.37609	2.325	110547.0	16.106649	Y
2	IC 320-223413/3	0.0467	0.82869	2.325	117730.0	17.744964	Y
3	IC 320-223413/4	0.2335	3.641484	2.325	99970.0	15.595222	Y
4	IC 320-223413/5	0.934	15.055267	2.325	98369.0	16.119129	Y
5	IC 320-223413/11	2.335	39.125612	2.325	94691.0	16.756151	Y
6	IC 320-223413/7	4.67	83.00038	2.325	87185.0	17.773101	Y
7	IC 320-223413/8	9.34	148.721336	2.325	99131.0	15.923055	Y



Calibration / Perfluorohexanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

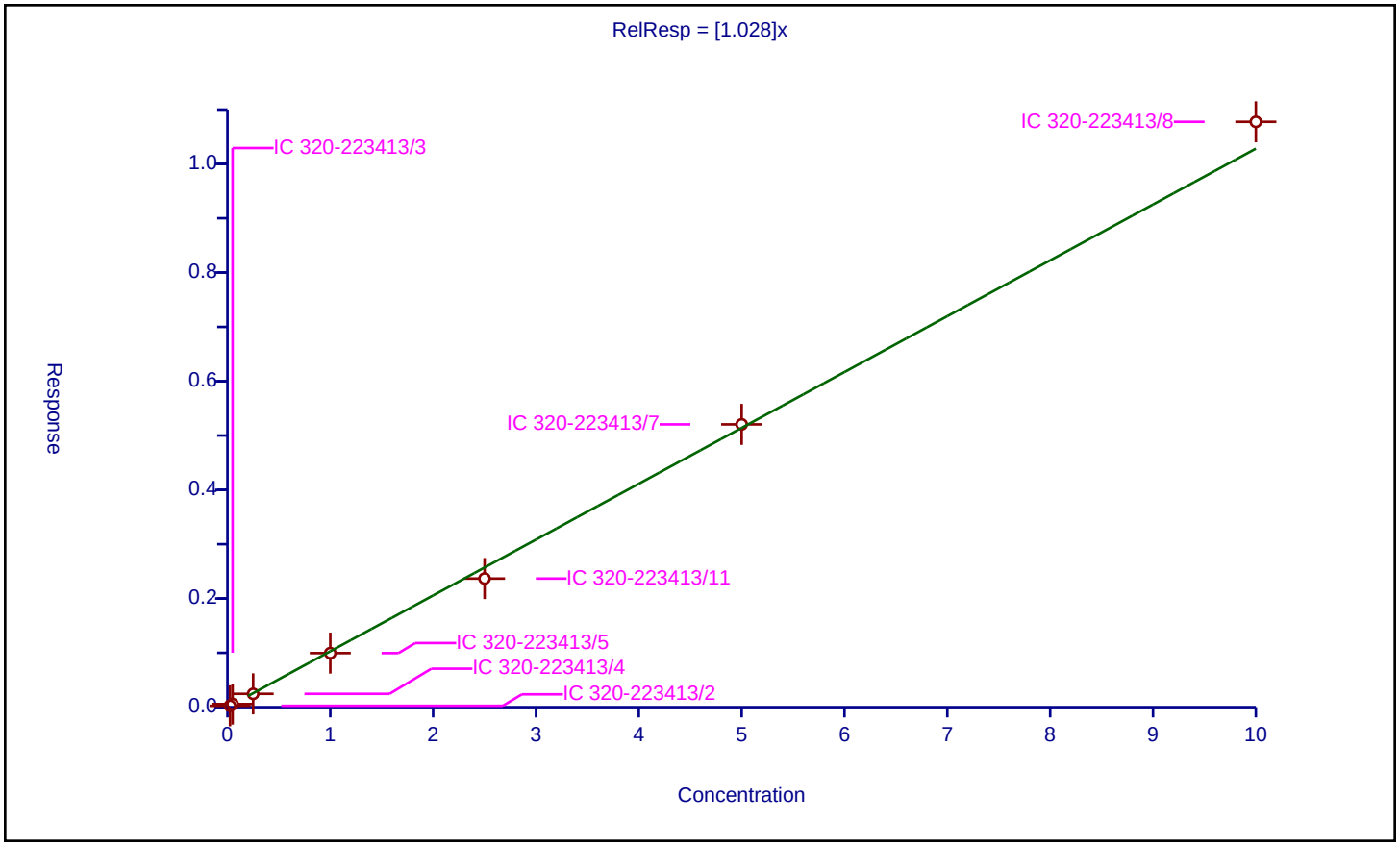
Curve Coefficients

Intercept:	0
Slope:	1.028

Error Coefficients

Standard Error:	9400000
Relative Standard Error:	6.6
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.0252	2.5	5626147.0	1.00799	Y
2	IC 320-223413/3	0.05	0.057403	2.5	5922451.0	1.148064	Y
3	IC 320-223413/4	0.25	0.245112	2.5	5134906.0	0.980446	Y
4	IC 320-223413/5	1.0	0.994902	2.5	4854075.0	0.994902	Y
5	IC 320-223413/11	2.5	2.367484	2.5	5043564.0	0.946994	Y
6	IC 320-223413/7	5.0	5.205567	2.5	4583820.0	1.041113	Y
7	IC 320-223413/8	10.0	10.775226	2.5	4709249.0	1.077523	Y



Calibration / Perfluoropentanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

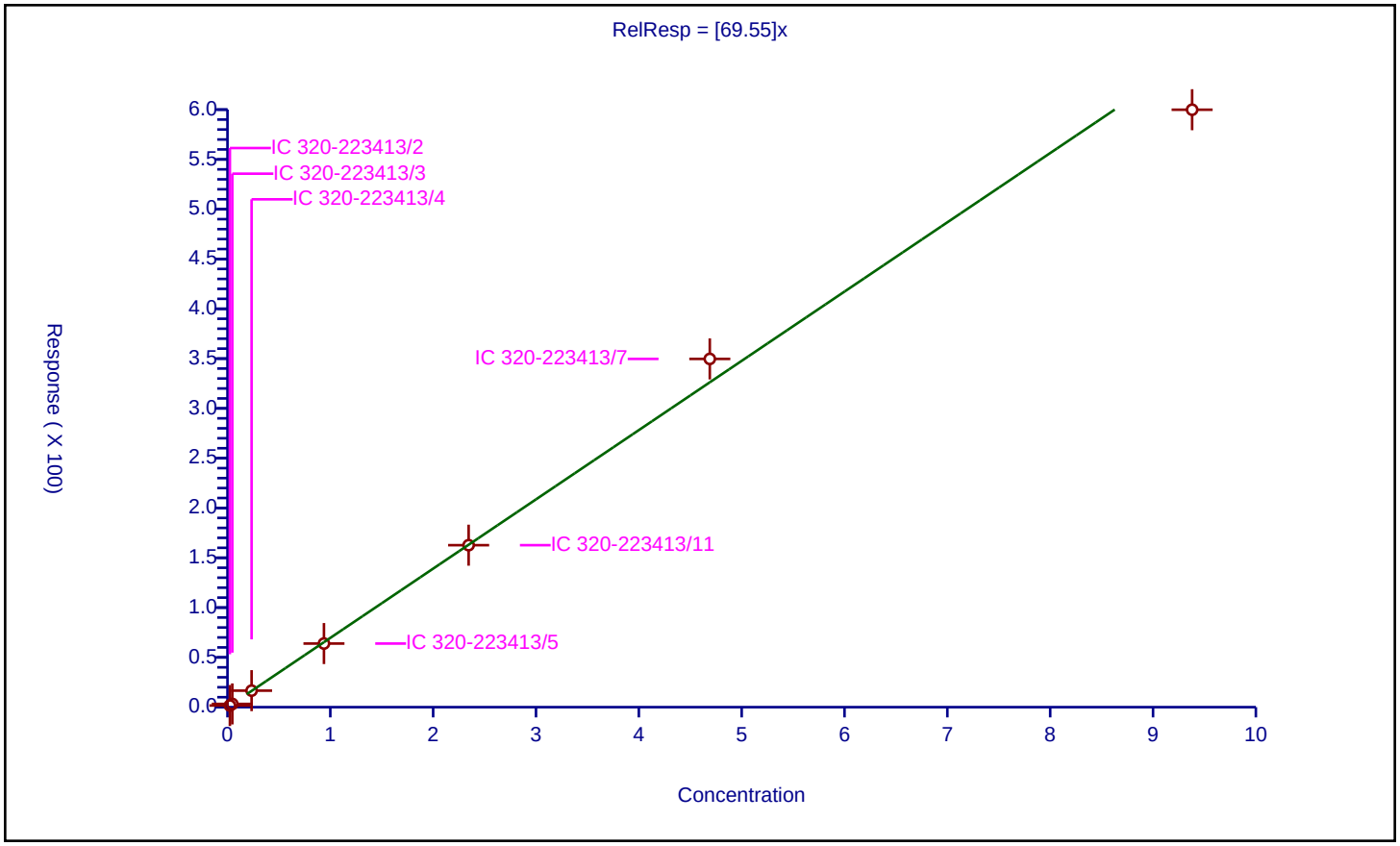
Curve Coefficients

Intercept:	0
Slope:	69.55

Error Coefficients

Standard Error:	12100000
Relative Standard Error:	4.6
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.02345	1.654065	2.325	110547.0	70.535831	Y
2	IC 320-223413/3	0.0469	3.26442	2.325	117730.0	69.603839	Y
3	IC 320-223413/4	0.2345	16.581364	2.325	99970.0	70.709442	Y
4	IC 320-223413/5	0.938	63.877525	2.325	98369.0	68.099707	Y
5	IC 320-223413/11	2.345	162.639853	2.325	94691.0	69.356014	Y
6	IC 320-223413/7	4.69	349.685013	2.325	87185.0	74.559704	Y
7	IC 320-223413/8	9.38	599.885978	2.325	99131.0	63.953729	Y



Calibration / Perfluoroheptanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

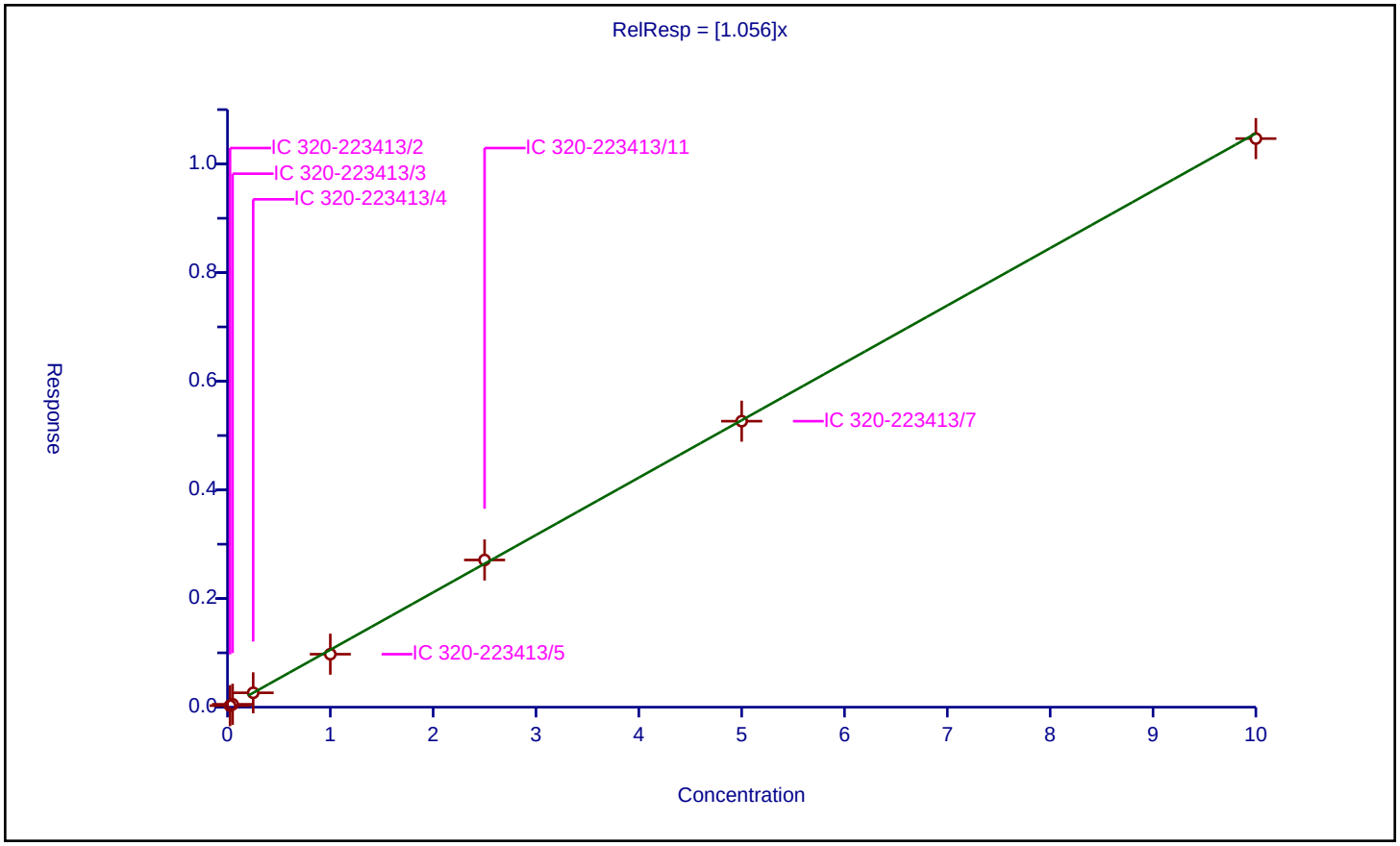
Curve Coefficients

Intercept:	0
Slope:	1.056

Error Coefficients

Standard Error:	8830000
Relative Standard Error:	4.1
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.027924	2.5	5577473.0	1.116957	Y
2	IC 320-223413/3	0.05	0.053061	2.5	5774309.0	1.061218	Y
3	IC 320-223413/4	0.25	0.264298	2.5	5050240.0	1.057193	Y
4	IC 320-223413/5	1.0	0.975396	2.5	4714171.0	0.975396	Y
5	IC 320-223413/11	2.5	2.709685	2.5	4465208.0	1.083874	Y
6	IC 320-223413/7	5.0	5.264617	2.5	4318388.0	1.052923	Y
7	IC 320-223413/8	10.0	10.466622	2.5	4521122.0	1.046662	Y



Calibration / Perfluorohexanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

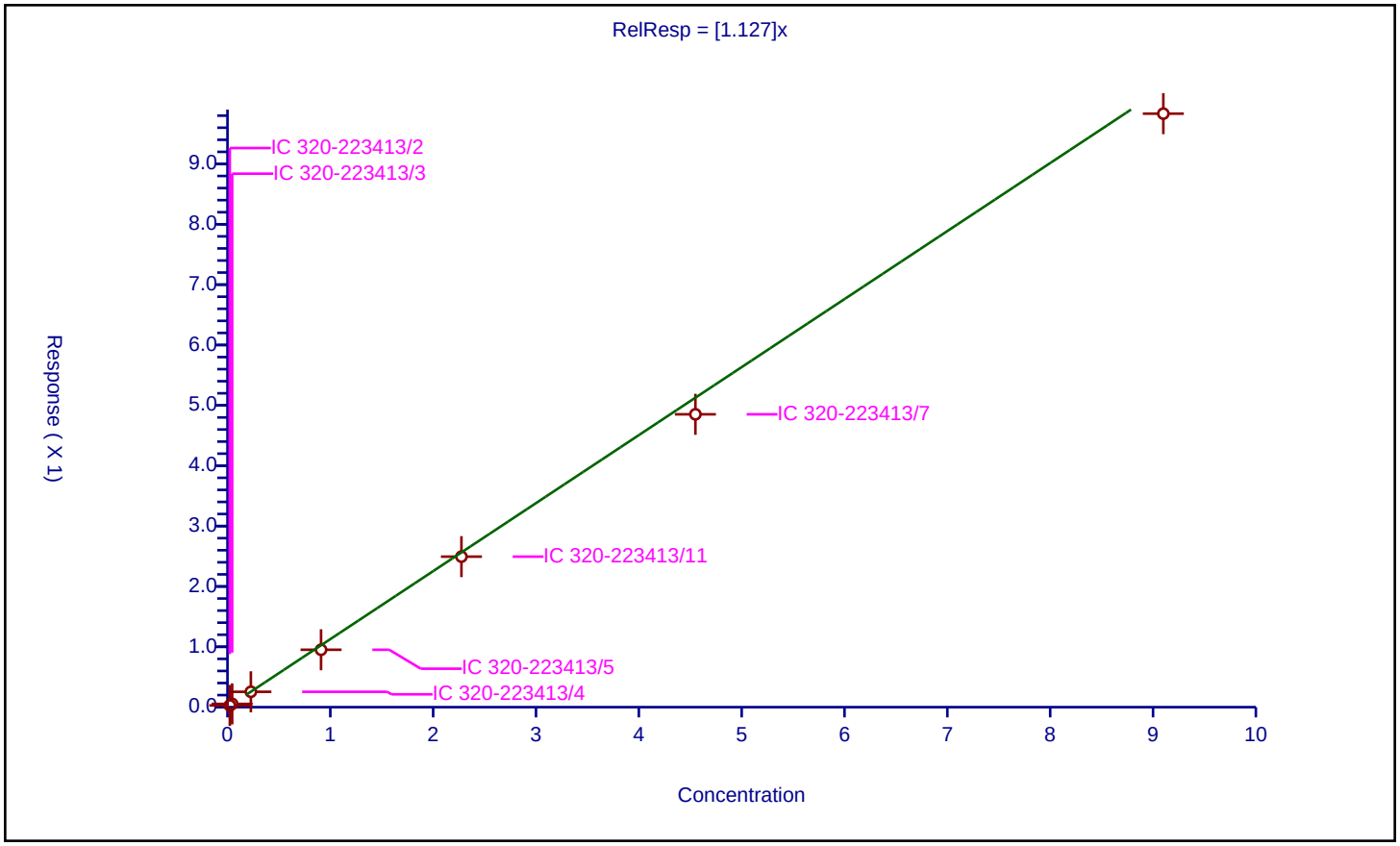
Curve Coefficients

Intercept:	0
Slope:	1.127

Error Coefficients

Standard Error:	10300000
Relative Standard Error:	7.6
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.02275	0.029275	2.365	6497213.0	1.286792	Y
2	IC 320-223413/3	0.0455	0.054276	2.365	6581524.0	1.192872	Y
3	IC 320-223413/4	0.2275	0.254784	2.365	5692452.0	1.11993	Y
4	IC 320-223413/5	0.91	0.951005	2.365	5565884.0	1.04506	Y
5	IC 320-223413/11	2.275	2.493637	2.365	5339851.0	1.096104	Y
6	IC 320-223413/7	4.55	4.85177	2.365	5191664.0	1.066323	Y
7	IC 320-223413/8	9.1	9.833165	2.365	5333305.0	1.080568	Y



Calibration / Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)

Curve Type:	Linear
Weighting:	Conc_Sq
Origin:	None
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

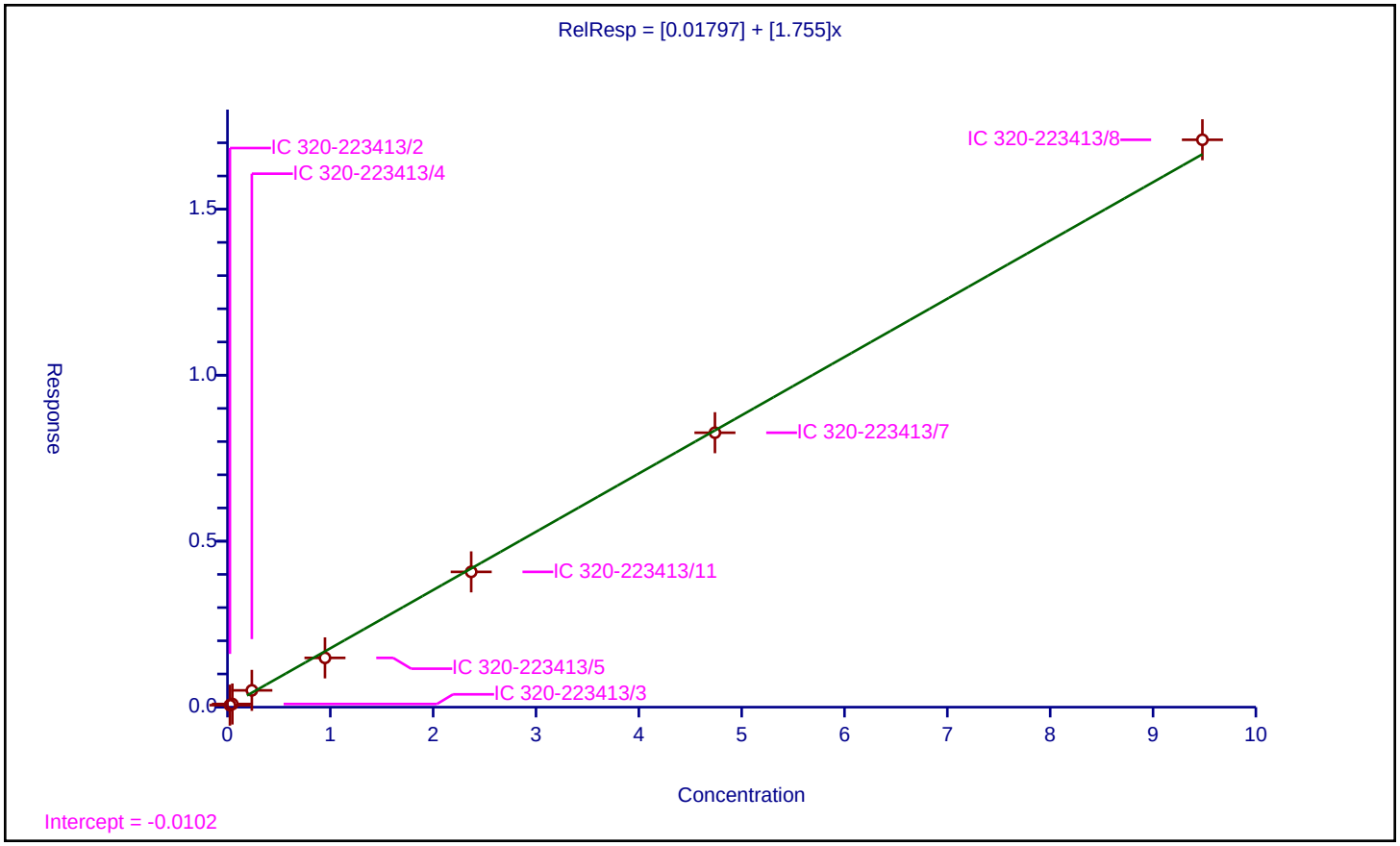
Curve Coefficients

Intercept:	0.01797
Slope:	1.755

Error Coefficients

Standard Error:	3330000
Relative Standard Error:	10.1
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.990

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0237	0.060388	2.375	1179634.0	2.548017	Y
2	IC 320-223413/3	0.0474	0.095492	2.375	1201925.0	2.0146	Y
3	IC 320-223413/4	0.237	0.506054	2.375	1076802.0	2.135249	Y
4	IC 320-223413/5	0.948	1.484407	2.375	1028277.0	1.56583	Y
5	IC 320-223413/11	2.37	4.075455	2.375	953169.0	1.719601	Y
6	IC 320-223413/7	4.74	8.267203	2.375	867962.0	1.744136	Y
7	IC 320-223413/8	9.48	17.091564	2.375	913641.0	1.802908	Y



Calibration / Perfluorooctanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

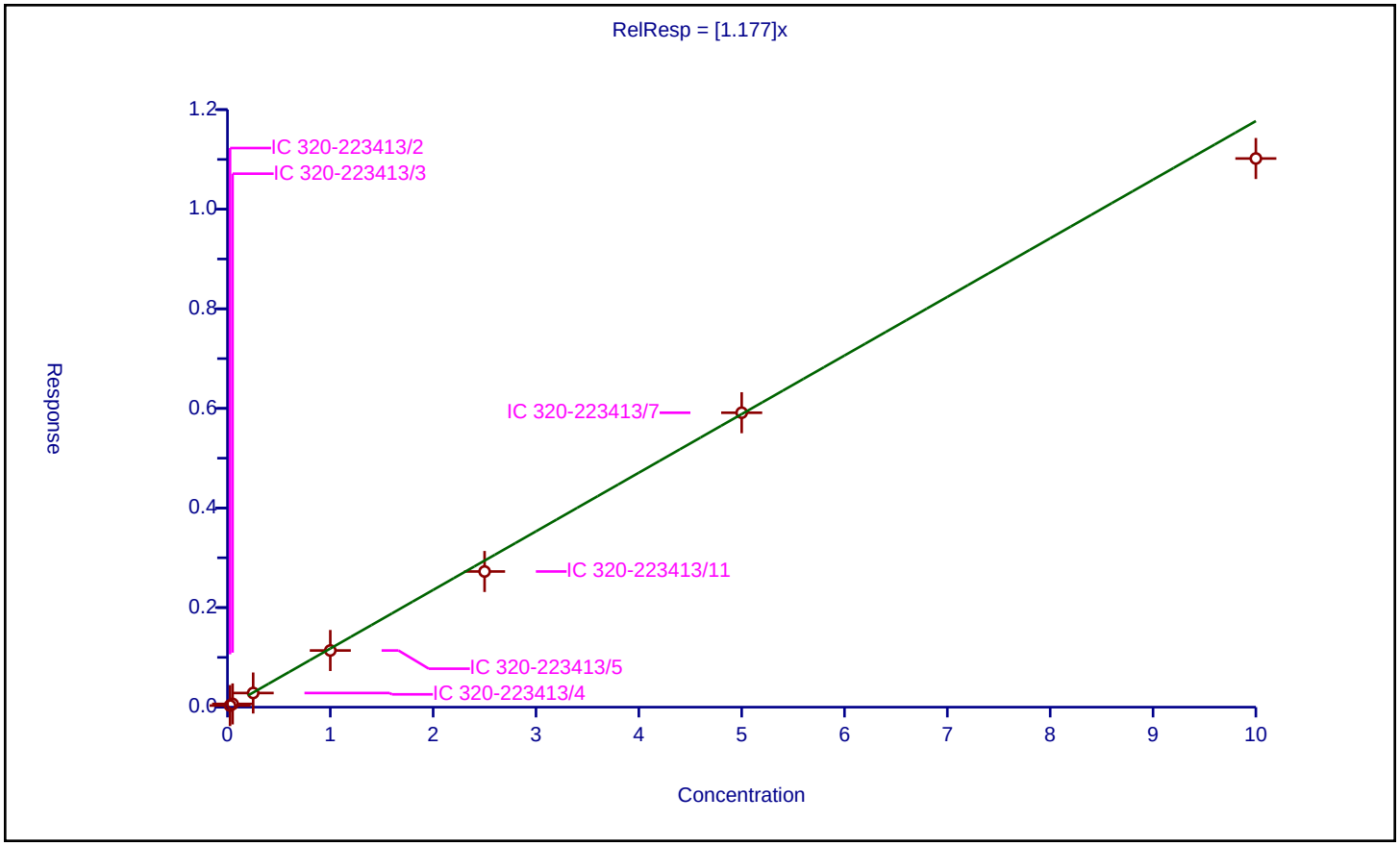
Curve Coefficients

Intercept:	0
Slope:	1.177

Error Coefficients

Standard Error:	9210000
Relative Standard Error:	7.3
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.03206	2.5	5162191.0	1.282382	Y
2	IC 320-223413/3	0.05	0.06533	2.5	5272655.0	1.30659	Y
3	IC 320-223413/4	0.25	0.284496	2.5	4619416.0	1.137986	Y
4	IC 320-223413/5	1.0	1.138031	2.5	4460027.0	1.138031	Y
5	IC 320-223413/11	2.5	2.724486	2.5	4456920.0	1.089795	Y
6	IC 320-223413/7	5.0	5.913082	2.5	4079623.0	1.182616	Y
7	IC 320-223413/8	10.0	11.01813	2.5	4465836.0	1.101813	Y



Calibration / Perfluoroheptanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

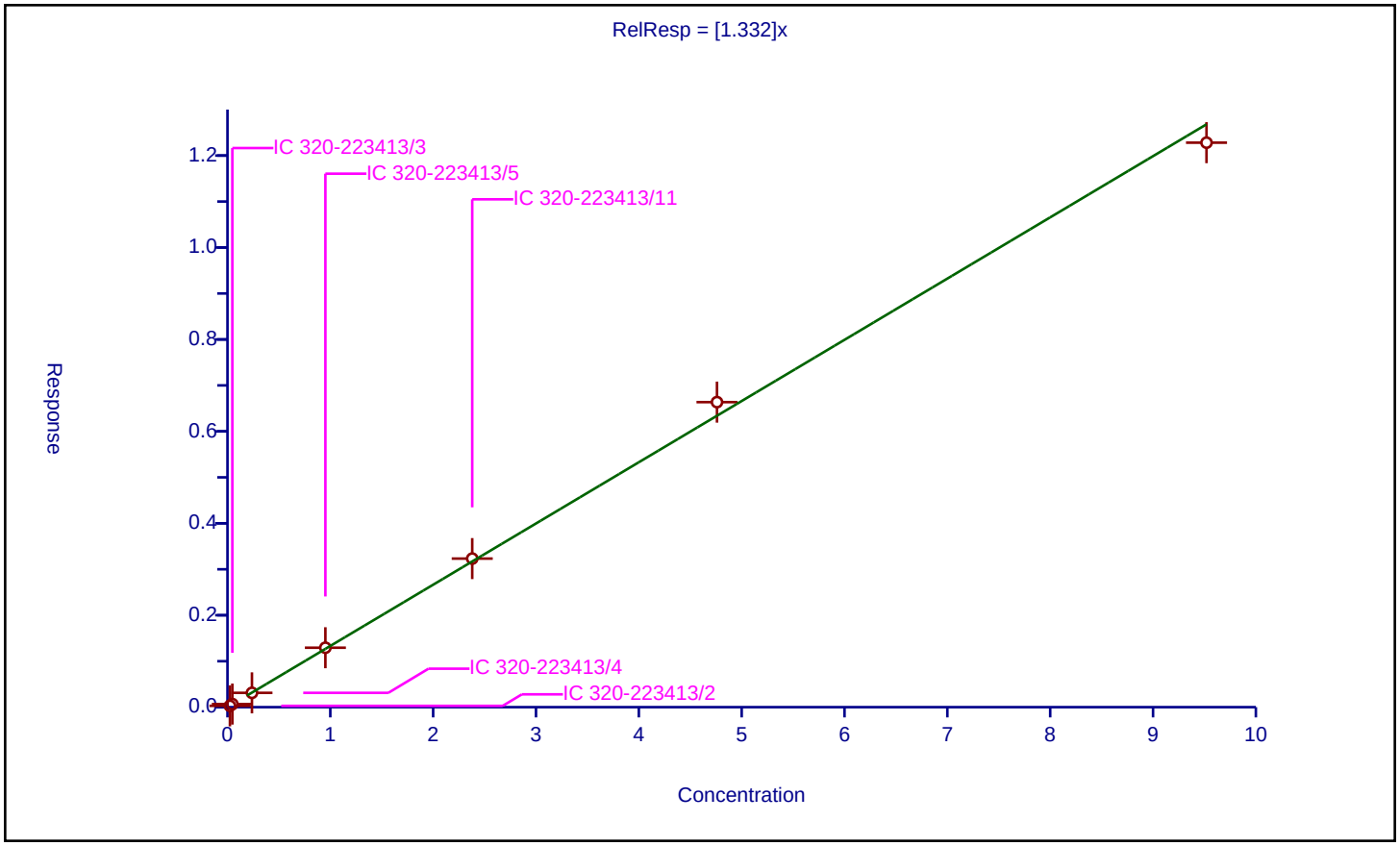
Curve Coefficients

Intercept:	0
Slope:	1.332

Error Coefficients

Standard Error:	9270000
Relative Standard Error:	5.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0238	0.028505	2.39	4516956.0	1.197673	Y
2	IC 320-223413/3	0.0476	0.067413	2.39	4415247.0	1.416243	Y
3	IC 320-223413/4	0.238	0.311586	2.39	4024927.0	1.309183	Y
4	IC 320-223413/5	0.952	1.293247	2.39	3779459.0	1.358452	Y
5	IC 320-223413/11	2.38	3.232143	2.39	3815593.0	1.358043	Y
6	IC 320-223413/7	4.76	6.636219	2.39	3520558.0	1.394164	Y
7	IC 320-223413/8	9.52	12.280732	2.39	3835347.0	1.289993	Y



Calibration / Perfluorooctane sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

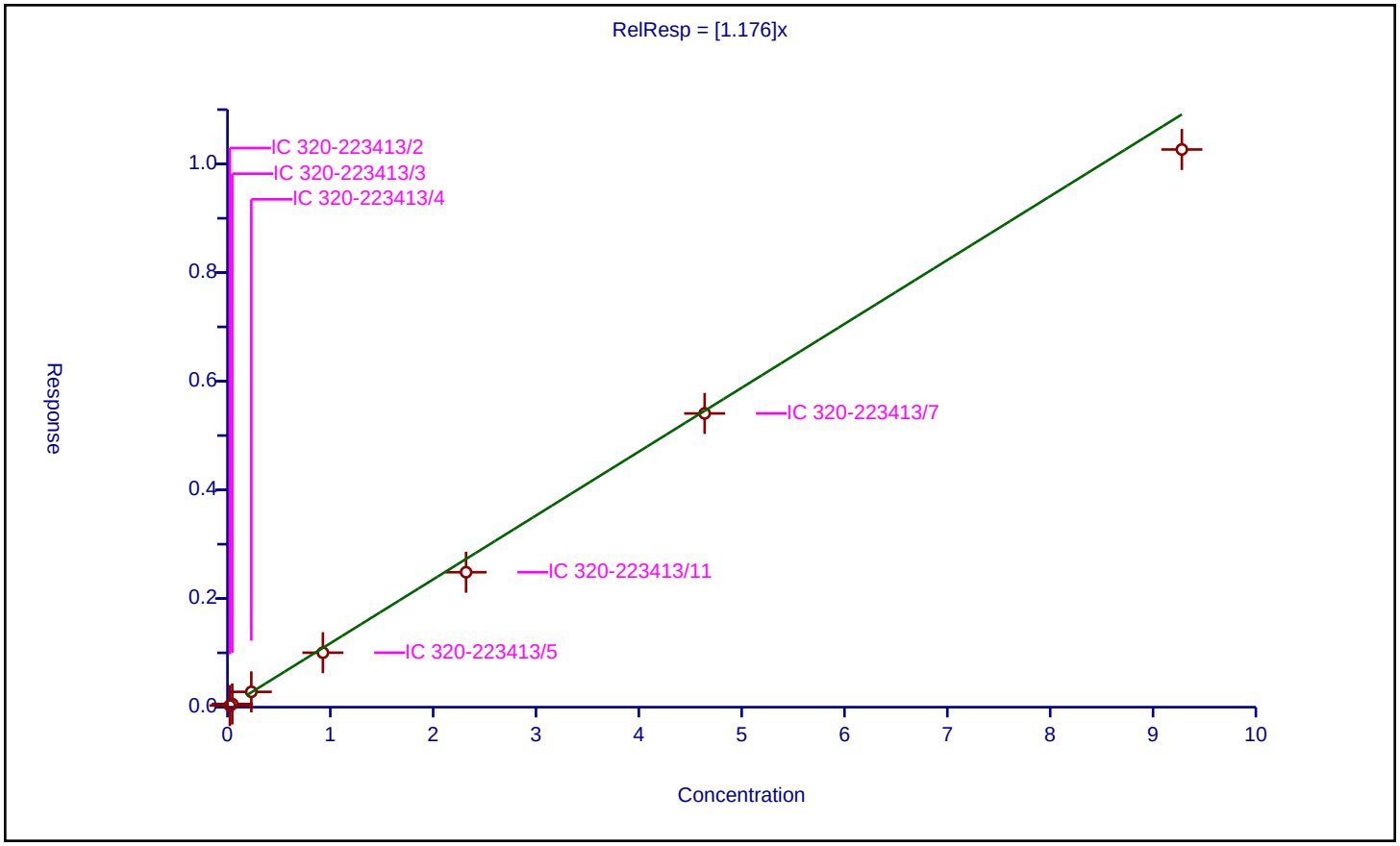
Curve Coefficients

Intercept:	0
Slope:	1.176

Error Coefficients

Standard Error:	7670000
Relative Standard Error:	8.4
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0232	0.030848	2.39	4516956.0	1.329658	Y
2	IC 320-223413/3	0.0464	0.05859	2.39	4415247.0	1.262725	Y
3	IC 320-223413/4	0.232	0.282038	2.39	4024927.0	1.215679	Y
4	IC 320-223413/5	0.928	1.002487	2.39	3779459.0	1.080267	Y
5	IC 320-223413/11	2.32	2.48392	2.39	3815593.0	1.070655	Y
6	IC 320-223413/7	4.64	5.407083	2.39	3520558.0	1.16532	Y
7	IC 320-223413/8	9.28	10.266077	2.39	3835347.0	1.106258	Y



Calibration / Perfluorononanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

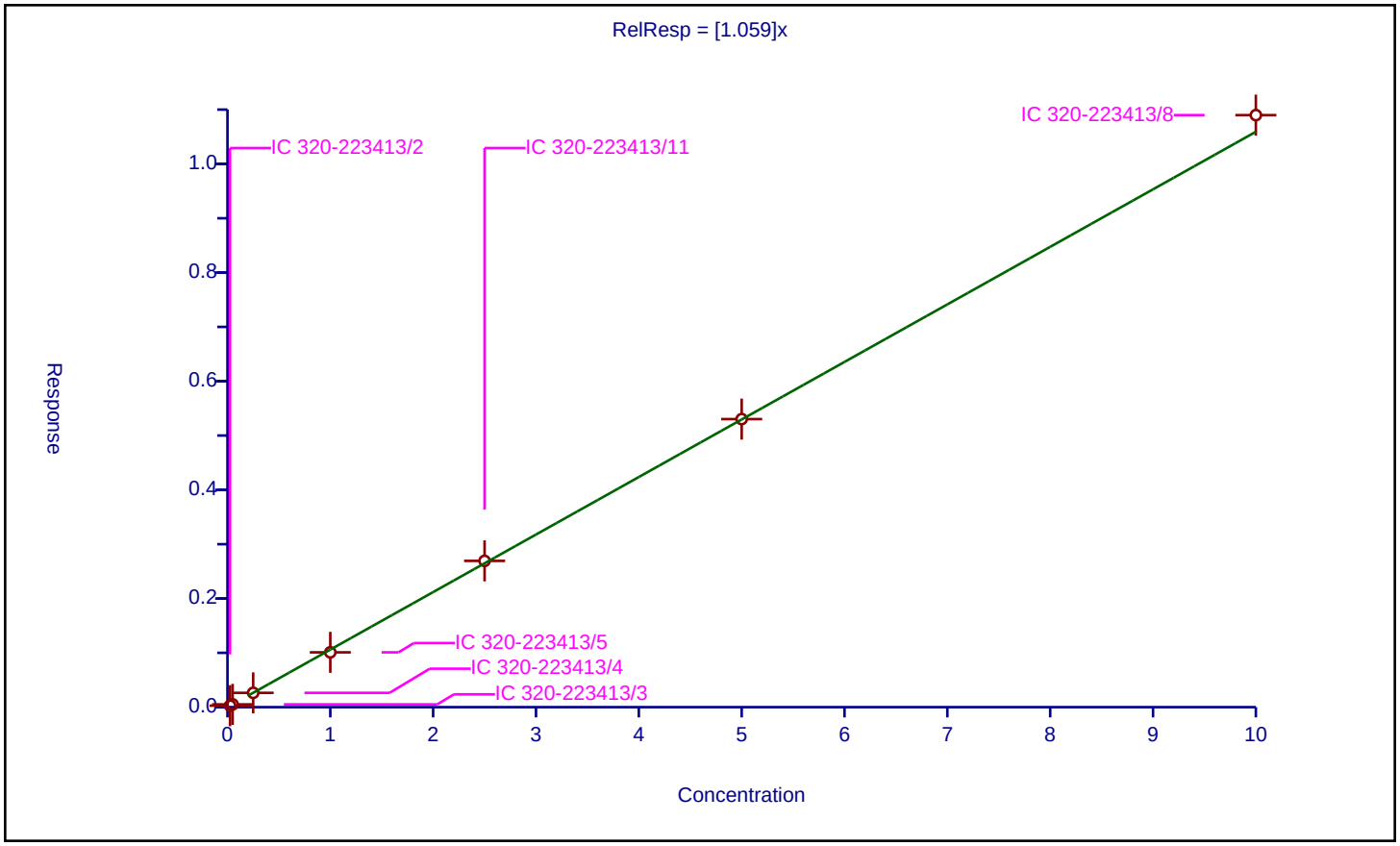
Curve Coefficients

Intercept:	0
Slope:	1.059

Error Coefficients

Standard Error:	7140000
Relative Standard Error:	3.3
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.027572	2.5	4268517.0	1.102865	Y
2	IC 320-223413/3	0.05	0.051043	2.5	4502703.0	1.020865	Y
3	IC 320-223413/4	0.25	0.263408	2.5	3819382.0	1.053634	Y
4	IC 320-223413/5	1.0	1.009411	2.5	3600246.0	1.009411	Y
5	IC 320-223413/11	2.5	2.692885	2.5	3538499.0	1.077154	Y
6	IC 320-223413/7	5.0	5.302849	2.5	3359491.0	1.06057	Y
7	IC 320-223413/8	10.0	10.898353	2.5	3539647.0	1.089835	Y



Calibration / Perfluorooctane Sulfonamide

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

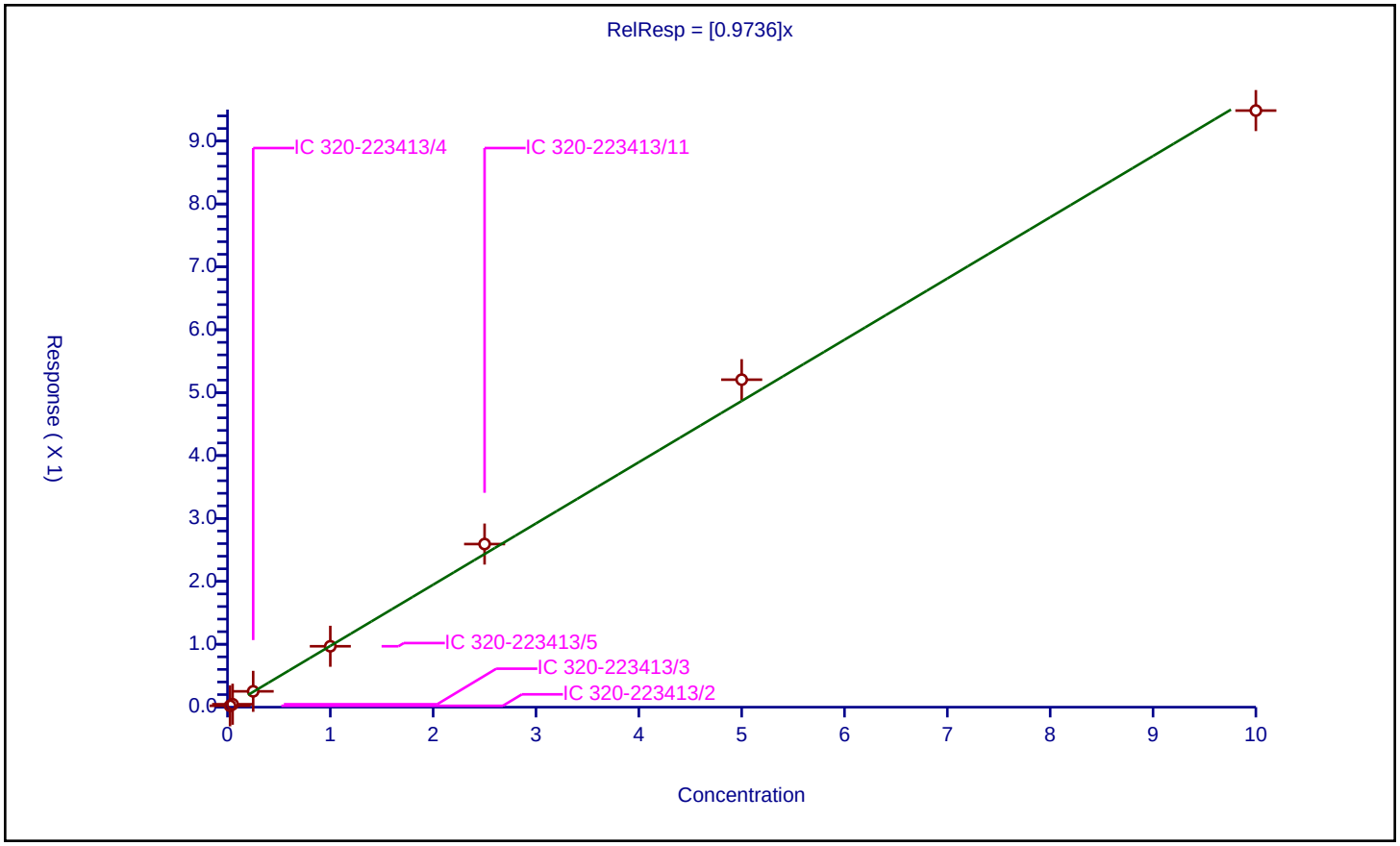
Curve Coefficients

Intercept:	0
Slope:	0.9736

Error Coefficients

Standard Error:	9600000
Relative Standard Error:	6.1
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.021924	2.5	5956672.0	0.876966	Y
2	IC 320-223413/3	0.05	0.04682	2.5	5858621.0	0.936398	Y
3	IC 320-223413/4	0.25	0.25161	2.5	5466463.0	1.006439	Y
4	IC 320-223413/5	1.0	0.968289	2.5	5346931.0	0.968289	Y
5	IC 320-223413/11	2.5	2.593212	2.5	5178962.0	1.037285	Y
6	IC 320-223413/7	5.0	5.20651	2.5	4976852.0	1.041302	Y
7	IC 320-223413/8	10.0	9.484794	2.5	5353791.0	0.948479	Y



Calibration / Perfluorononanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

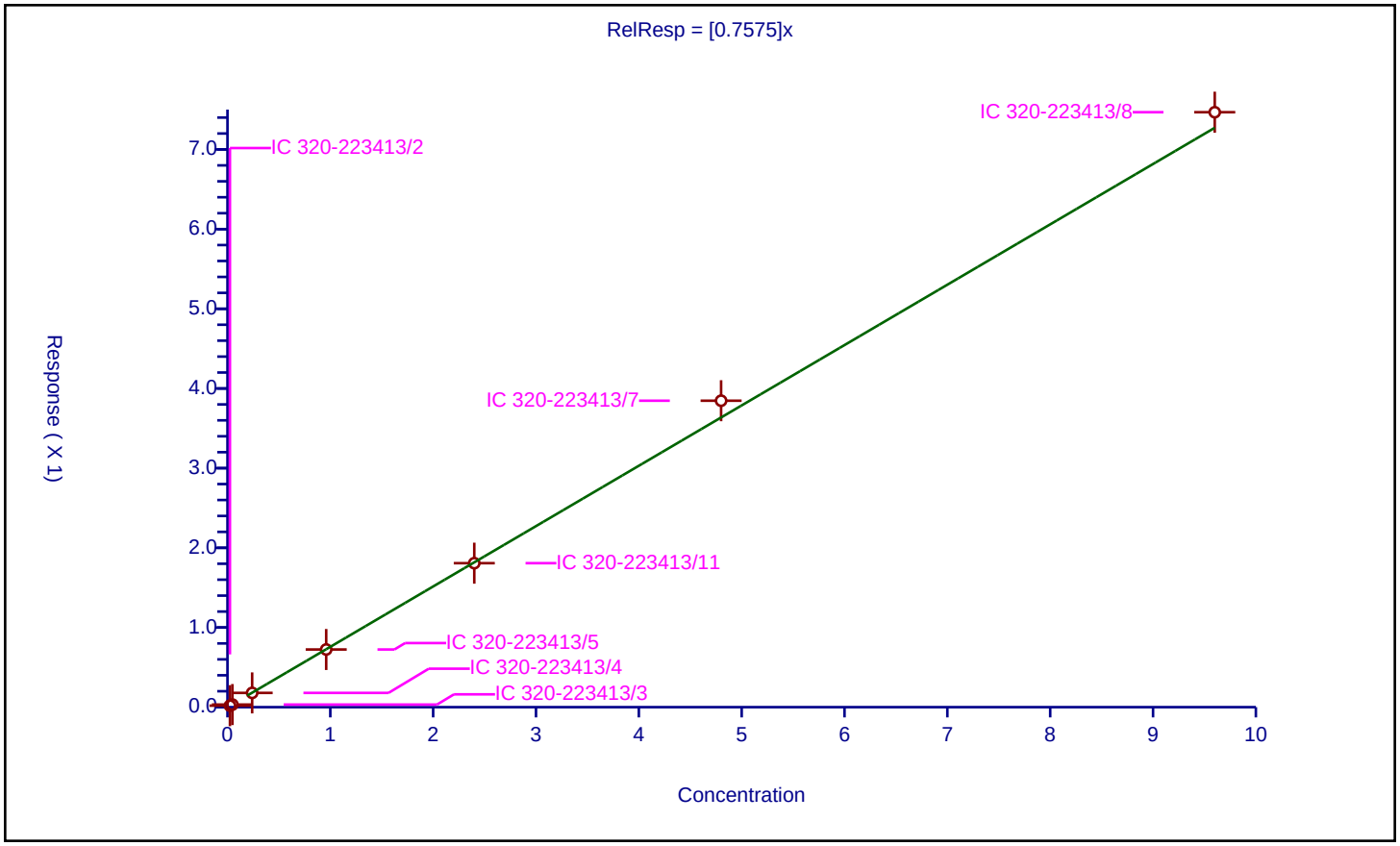
Curve Coefficients

Intercept:	0
Slope:	0.7575

Error Coefficients

Standard Error:	5560000
Relative Standard Error:	5.1
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.024	0.0189	2.39	4516956.0	0.787481	Y
2	IC 320-223413/3	0.048	0.032746	2.39	4415247.0	0.682204	Y
3	IC 320-223413/4	0.24	0.179215	2.39	4024927.0	0.74673	Y
4	IC 320-223413/5	0.96	0.723687	2.39	3779459.0	0.75384	Y
5	IC 320-223413/11	2.4	1.807138	2.39	3815593.0	0.752974	Y
6	IC 320-223413/7	4.8	3.846277	2.39	3520558.0	0.801308	Y
7	IC 320-223413/8	9.6	7.467179	2.39	3835347.0	0.777831	Y



Calibration / Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

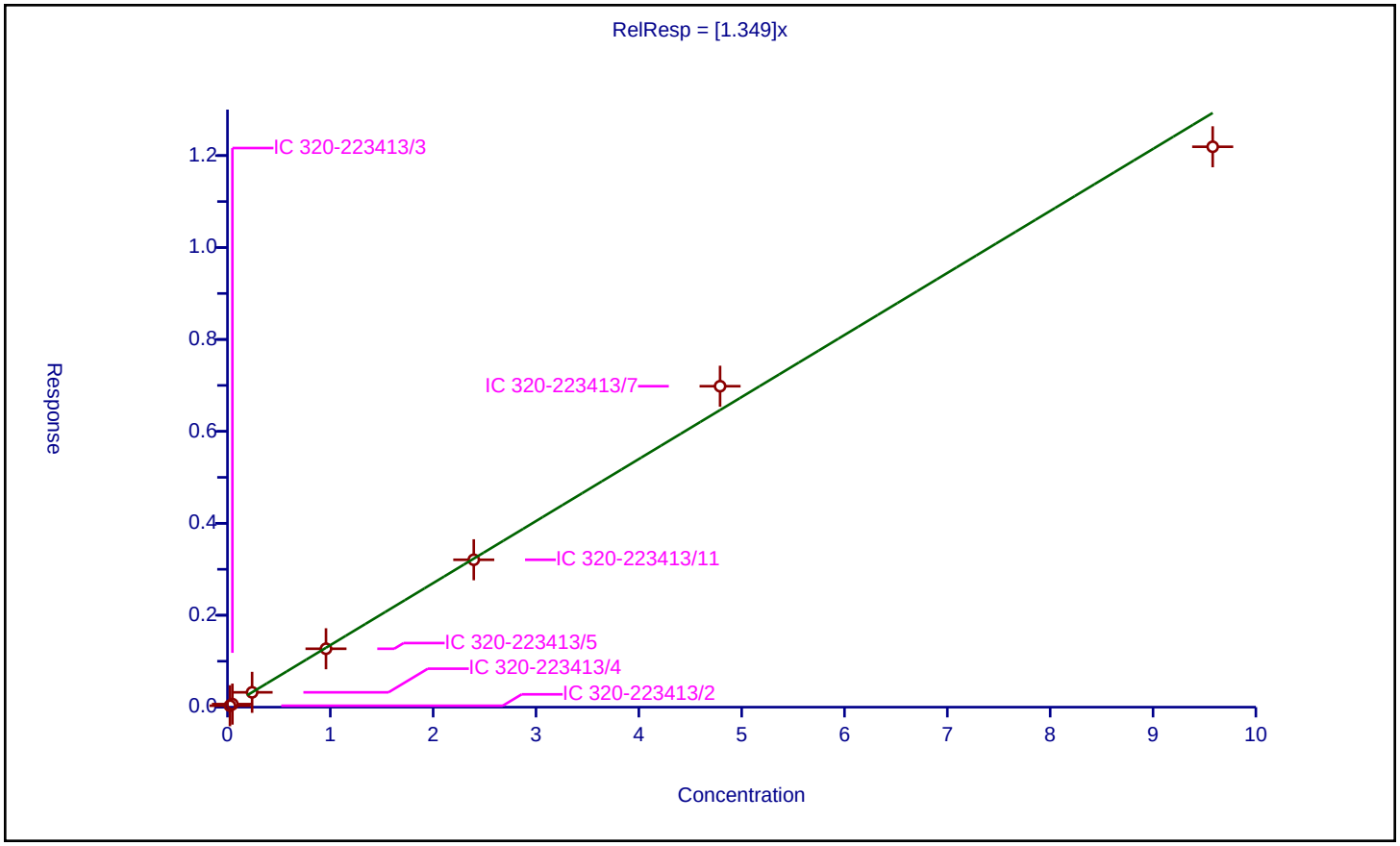
Curve Coefficients

Intercept:	0
Slope:	1.349

Error Coefficients

Standard Error:	2660000
Relative Standard Error:	4.3
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.02395	0.03158	2.395	1426703.0	1.318565	Y
2	IC 320-223413/3	0.0479	0.066379	2.395	1426640.0	1.385774	Y
3	IC 320-223413/4	0.2395	0.322423	2.395	1187676.0	1.346234	Y
4	IC 320-223413/5	0.958	1.27079	2.395	1096366.0	1.326503	Y
5	IC 320-223413/11	2.395	3.206758	2.395	1089191.0	1.338939	Y
6	IC 320-223413/7	4.79	6.982192	2.395	972368.0	1.45766	Y
7	IC 320-223413/8	9.58	12.191537	2.395	1107332.0	1.272603	Y



Calibration / Perfluorodecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

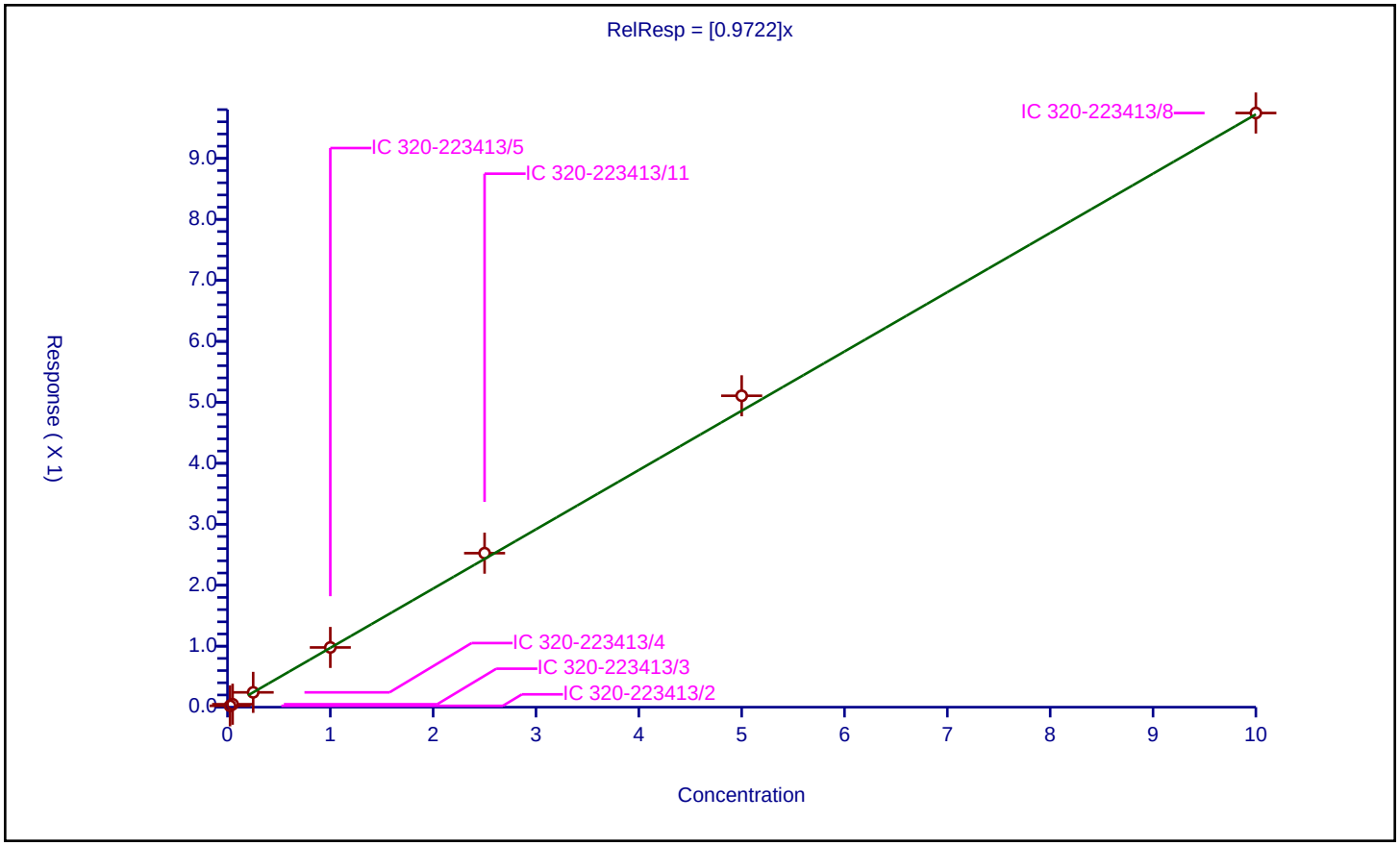
Curve Coefficients

Intercept:	0
Slope:	0.9722

Error Coefficients

Standard Error:	5620000
Relative Standard Error:	4.5
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.022168	2.5	3594922.0	0.886723	Y
2	IC 320-223413/3	0.05	0.048141	2.5	3752181.0	0.962813	Y
3	IC 320-223413/4	0.25	0.242669	2.5	3297462.0	0.970677	Y
4	IC 320-223413/5	1.0	0.979358	2.5	3084670.0	0.979358	Y
5	IC 320-223413/11	2.5	2.525493	2.5	2997952.0	1.010197	Y
6	IC 320-223413/7	5.0	5.106929	2.5	2812041.0	1.021386	Y
7	IC 320-223413/8	10.0	9.744224	2.5	3099083.0	0.974422	Y



Calibration / N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

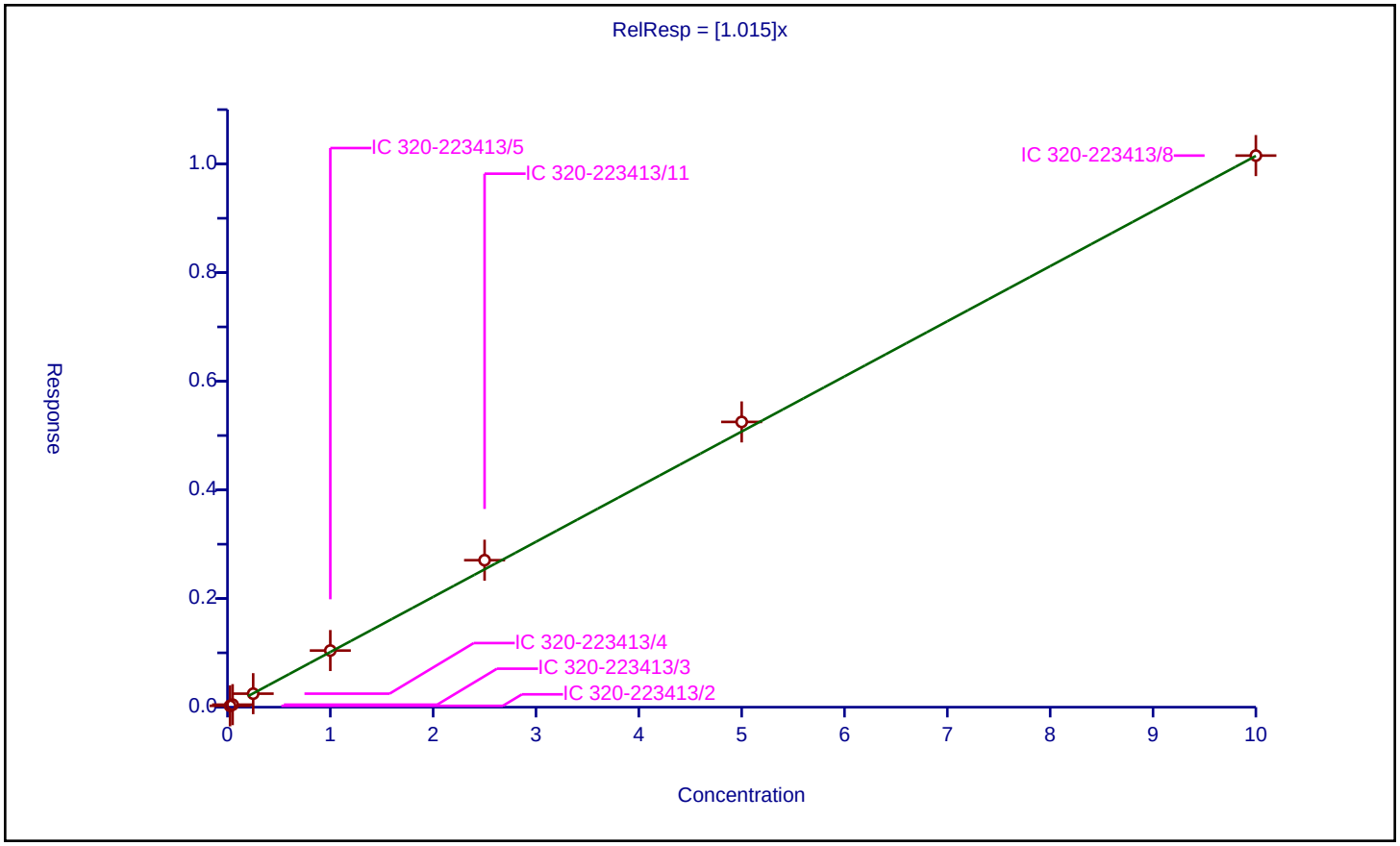
Curve Coefficients

Intercept:	0
Slope:	1.015

Error Coefficients

Standard Error:	3410000
Relative Standard Error:	4.8
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.02464	2.5	1940146.0	0.985596	Y
2	IC 320-223413/3	0.05	0.046708	2.5	2060337.0	0.934168	Y
3	IC 320-223413/4	0.25	0.248379	2.5	1854527.0	0.993515	Y
4	IC 320-223413/5	1.0	1.0424	2.5	1667566.0	1.0424	Y
5	IC 320-223413/11	2.5	2.705503	2.5	1561957.0	1.082201	Y
6	IC 320-223413/7	5.0	5.250998	2.5	1561125.0	1.0502	Y
7	IC 320-223413/8	10.0	10.153615	2.5	1836867.0	1.015361	Y



Calibration / Perfluorodecane Sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

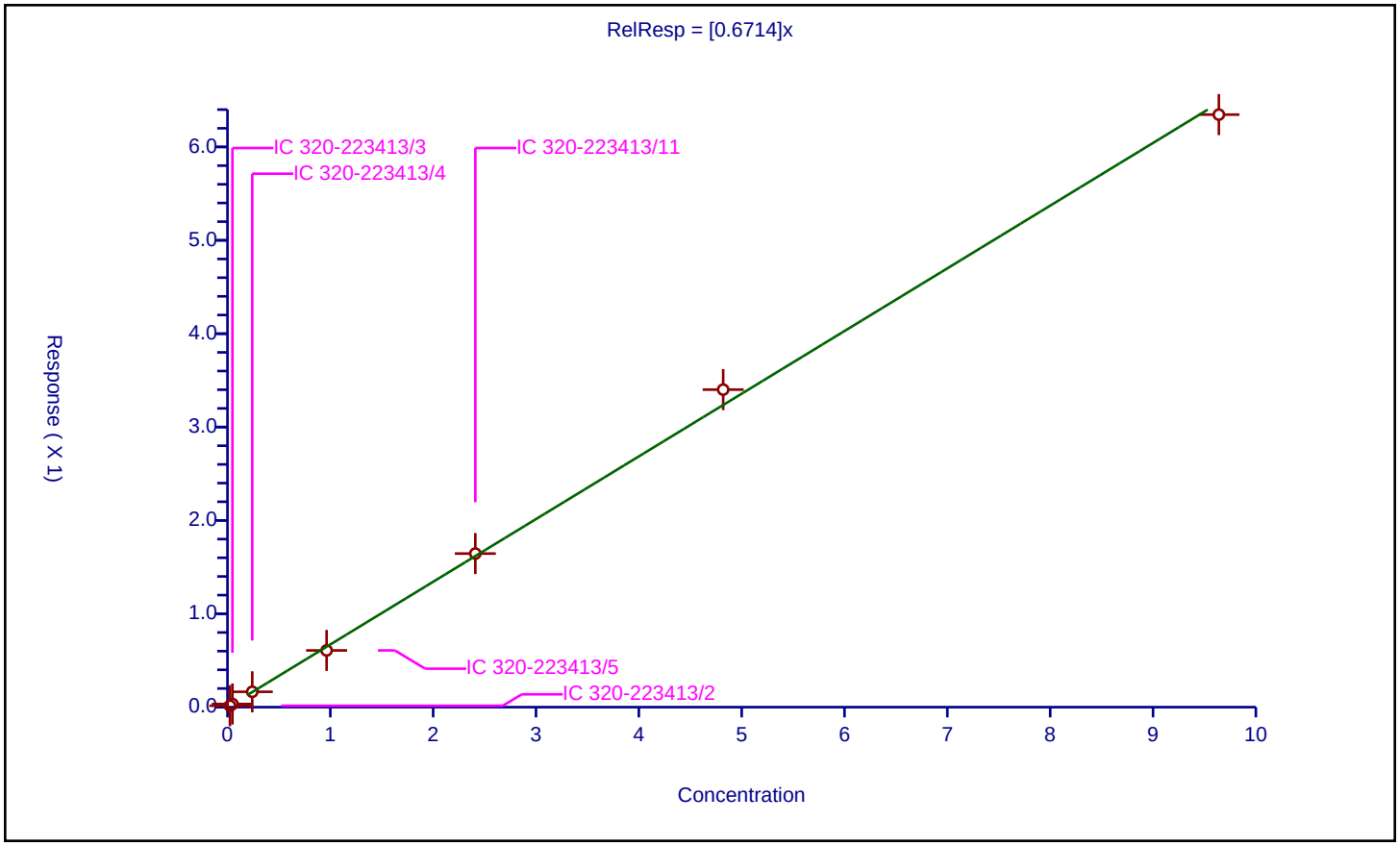
Curve Coefficients

Intercept:	0
Slope:	0.6714

Error Coefficients

Standard Error:	4770000
Relative Standard Error:	4.8
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.0241	0.015224	2.39	4516956.0	0.631713	Y
2	IC 320-223413/3	0.0482	0.034117	2.39	4415247.0	0.707819	Y
3	IC 320-223413/4	0.241	0.164737	2.39	4024927.0	0.683554	Y
4	IC 320-223413/5	0.964	0.607741	2.39	3779459.0	0.630436	Y
5	IC 320-223413/11	2.41	1.644986	2.39	3815593.0	0.682567	Y
6	IC 320-223413/7	4.82	3.400965	2.39	3520558.0	0.705594	Y
7	IC 320-223413/8	9.64	6.346257	2.39	3835347.0	0.658325	Y



Calibration / Perfluoroundecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

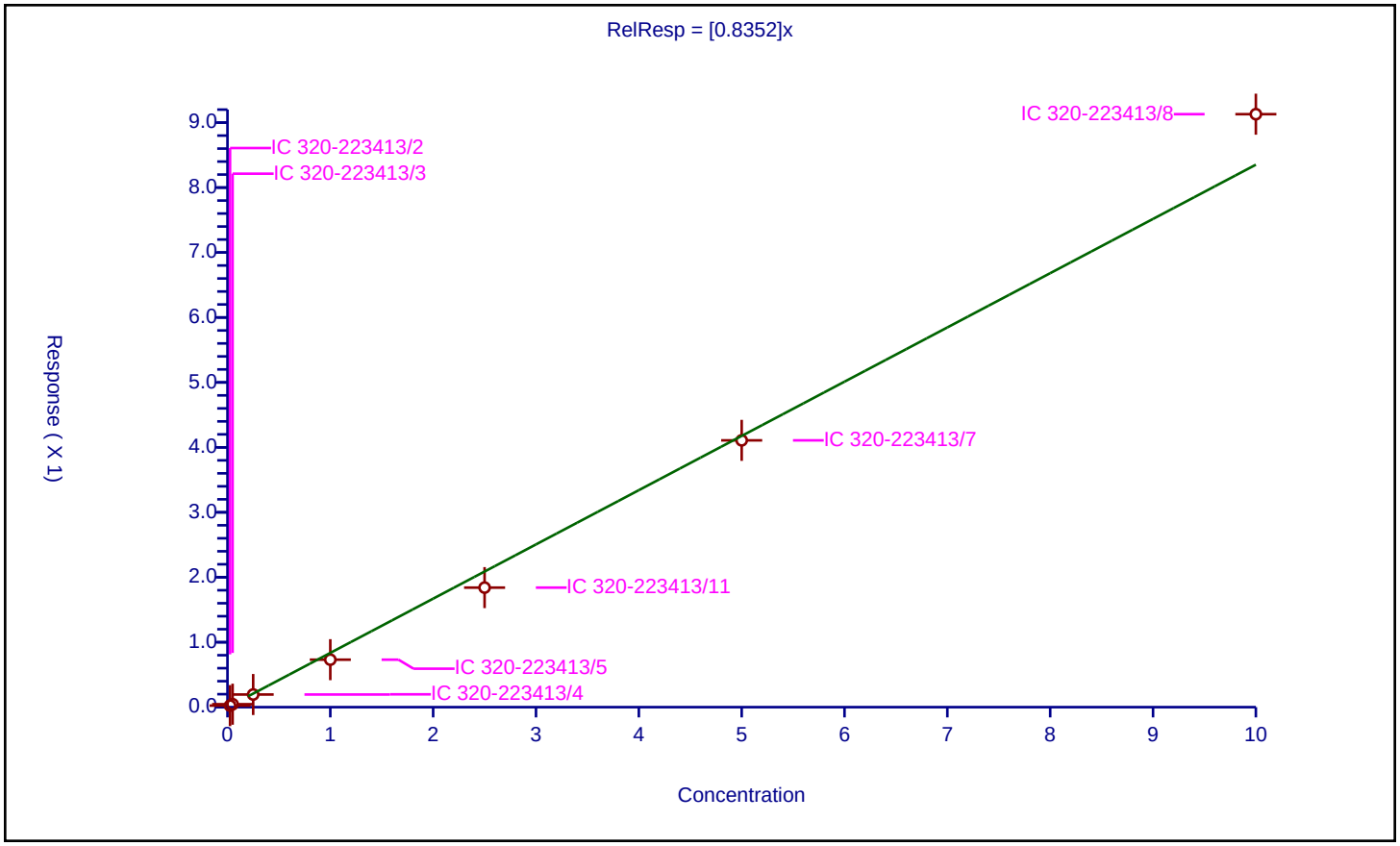
Curve Coefficients

Intercept:	0
Slope:	0.8352

Error Coefficients

Standard Error:	3810000
Relative Standard Error:	10.9
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.984

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.023789	2.5	2840675.0	0.95157	Y
2	IC 320-223413/3	0.05	0.045689	2.5	2914989.0	0.913777	Y
3	IC 320-223413/4	0.25	0.194752	2.5	2576940.0	0.779009	Y
4	IC 320-223413/5	1.0	0.731215	2.5	2587053.0	0.731215	Y
5	IC 320-223413/11	2.5	1.840749	2.5	2447962.0	0.736299	Y
6	IC 320-223413/7	5.0	4.107749	2.5	2262574.0	0.82155	Y
7	IC 320-223413/8	10.0	9.129515	2.5	2282286.0	0.912952	Y



Calibration / N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

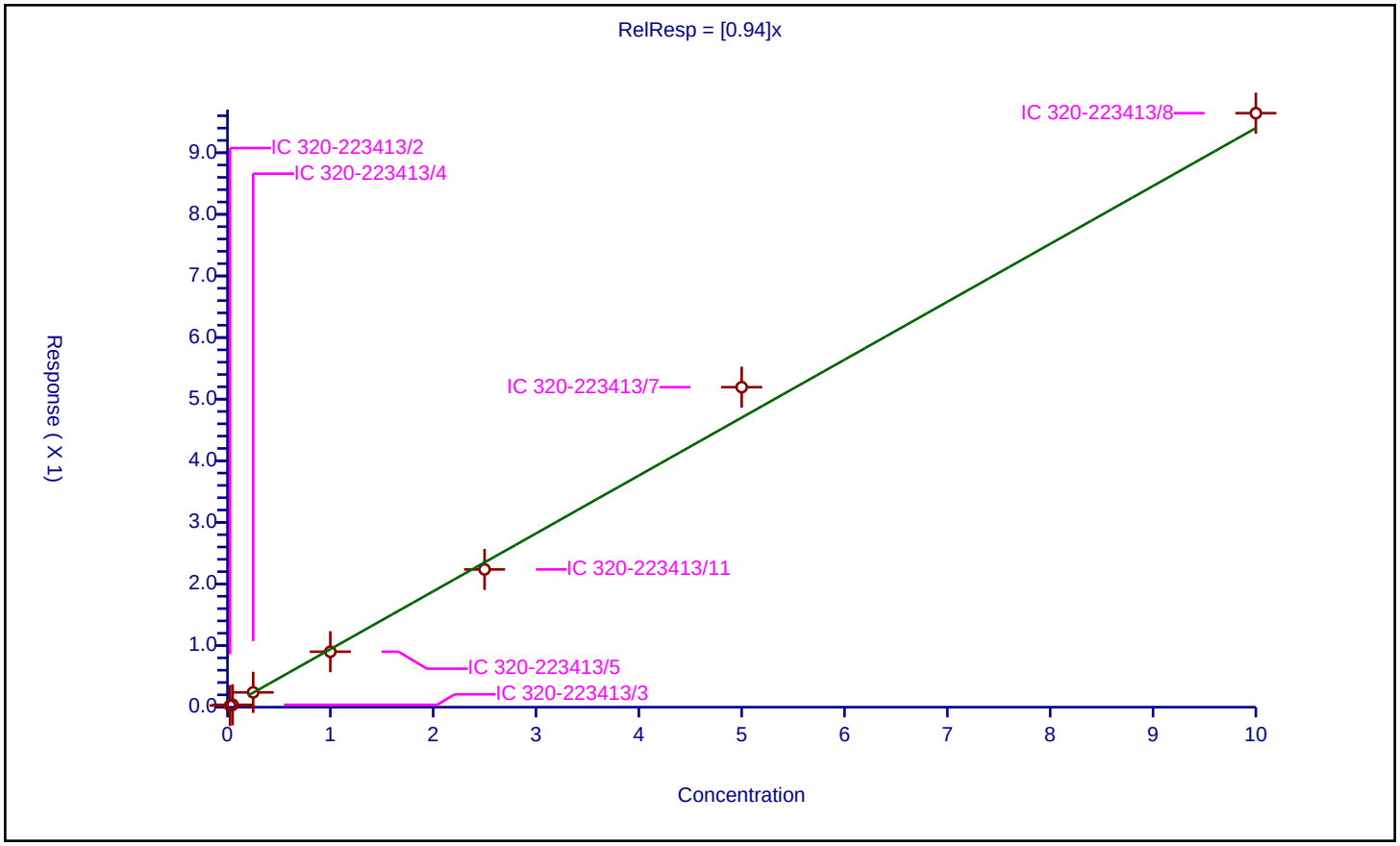
Curve Coefficients

Intercept:	0
Slope:	0.94

Error Coefficients

Standard Error:	2940000
Relative Standard Error:	10.3
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.987

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.026309	2.5	2119254.0	1.052351	Y
2	IC 320-223413/3	0.05	0.03841	2.5	2144987.0	0.76821	Y
3	IC 320-223413/4	0.25	0.240507	2.5	1857905.0	0.96203	Y
4	IC 320-223413/5	1.0	0.900266	2.5	1808821.0	0.900266	Y
5	IC 320-223413/11	2.5	2.235955	2.5	1777821.0	0.894382	Y
6	IC 320-223413/7	5.0	5.194028	2.5	1507014.0	1.038806	Y
7	IC 320-223413/8	10.0	9.641907	2.5	1619647.0	0.964191	Y



Calibration / Perfluorododecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

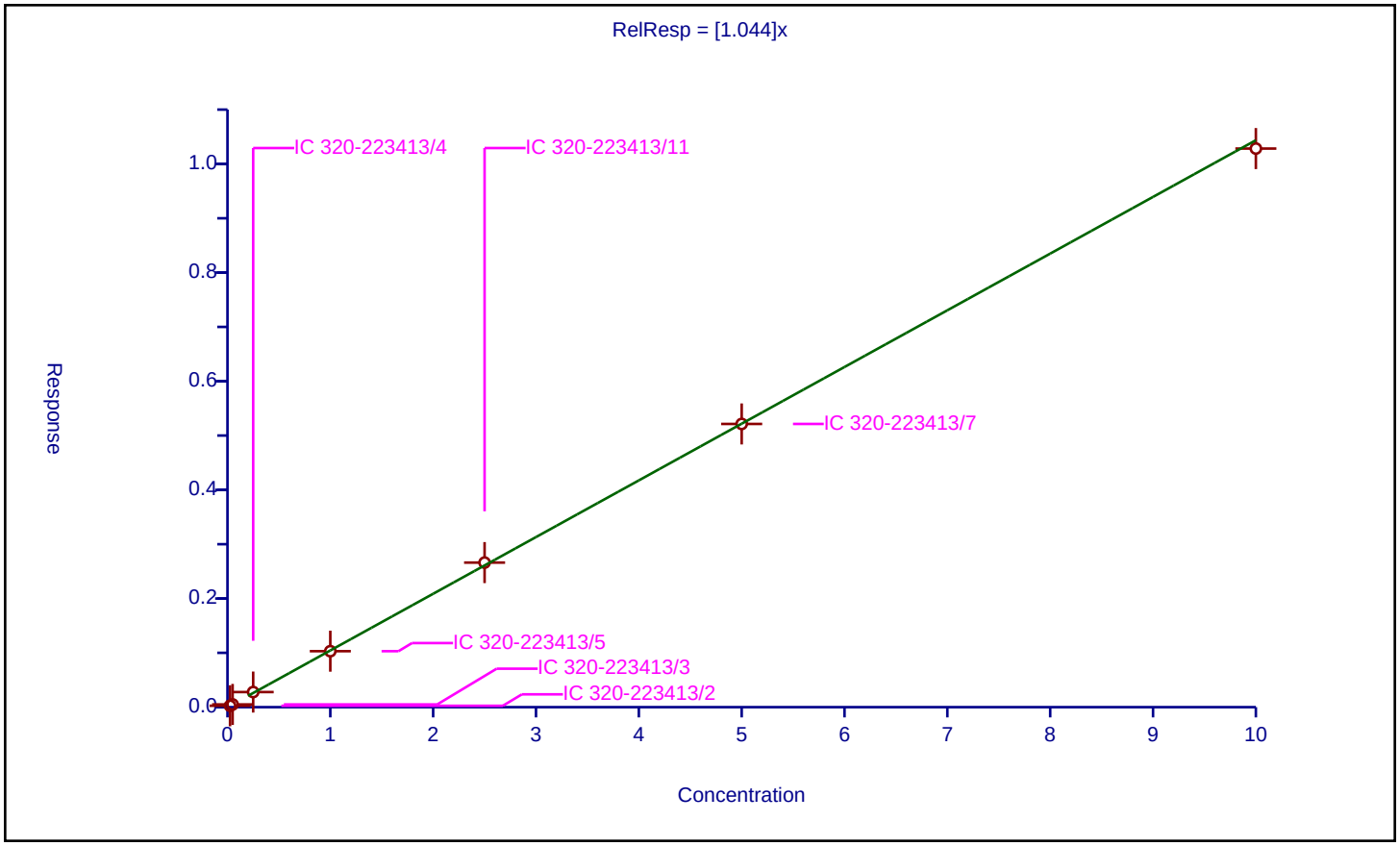
Curve Coefficients

Intercept:	0
Slope:	1.044

Error Coefficients

Standard Error:	5230000
Relative Standard Error:	3.4
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.025547	2.5	2960567.0	1.021899	Y
2	IC 320-223413/3	0.05	0.0502	2.5	3058640.0	1.004008	Y
3	IC 320-223413/4	0.25	0.278393	2.5	2740425.0	1.113572	Y
4	IC 320-223413/5	1.0	1.030575	2.5	2679695.0	1.030575	Y
5	IC 320-223413/11	2.5	2.661172	2.5	2514089.0	1.064469	Y
6	IC 320-223413/7	5.0	5.213621	2.5	2544838.0	1.042724	Y
7	IC 320-223413/8	10.0	10.282964	2.5	2747572.0	1.028296	Y



Calibration / Perfluorotridecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

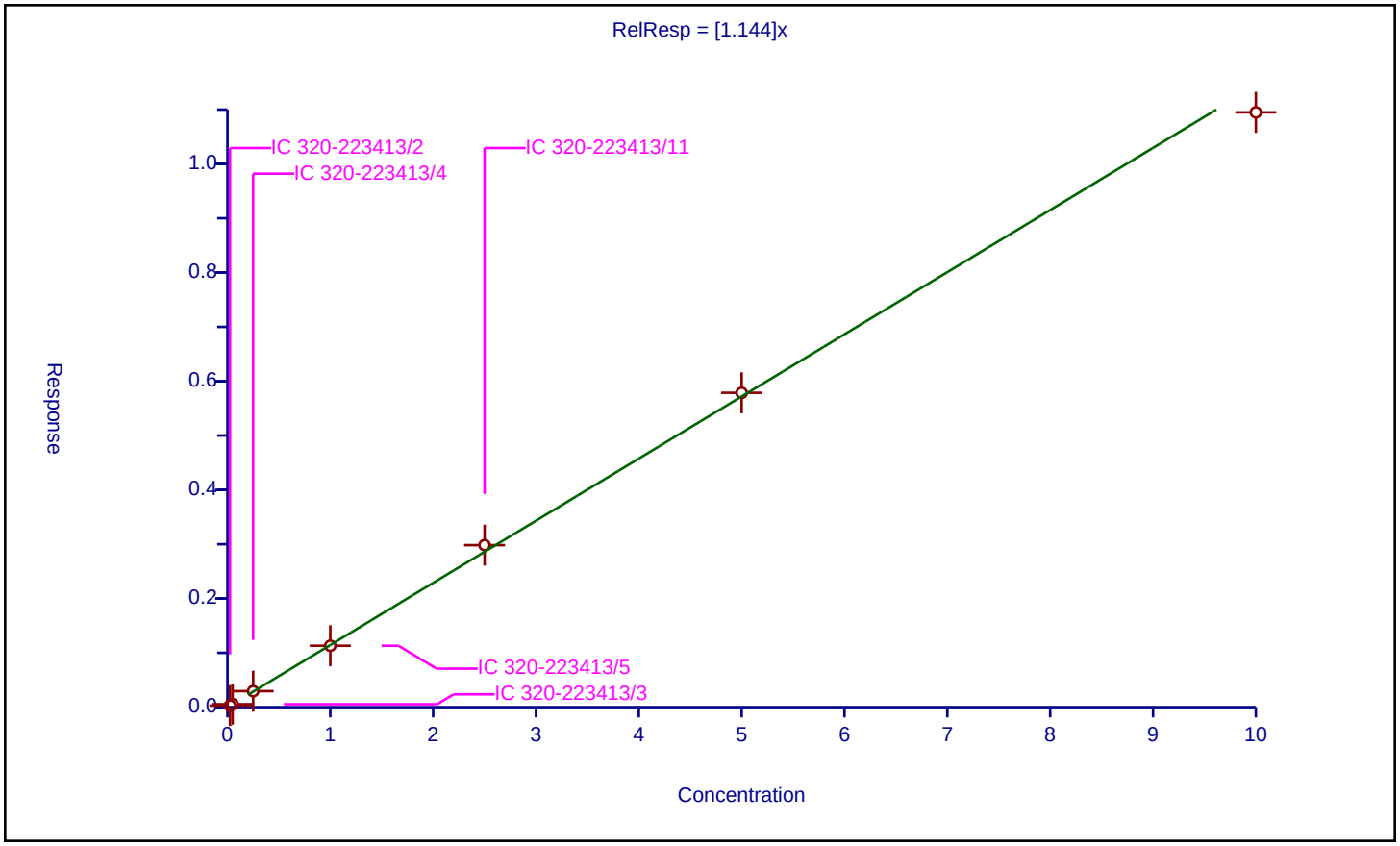
Curve Coefficients

Intercept:	0
Slope:	1.144

Error Coefficients

Standard Error:	5630000
Relative Standard Error:	3.7
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.029231	2.5	2960567.0	1.169235	Y
2	IC 320-223413/3	0.05	0.054221	2.5	3058640.0	1.08442	Y
3	IC 320-223413/4	0.25	0.294504	2.5	2740425.0	1.178014	Y
4	IC 320-223413/5	1.0	1.130478	2.5	2679695.0	1.130478	Y
5	IC 320-223413/11	2.5	2.982527	2.5	2514089.0	1.193011	Y
6	IC 320-223413/7	5.0	5.786335	2.5	2544838.0	1.157267	Y
7	IC 320-223413/8	10.0	10.949082	2.5	2747572.0	1.094908	Y



Calibration / Perfluorotetradecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

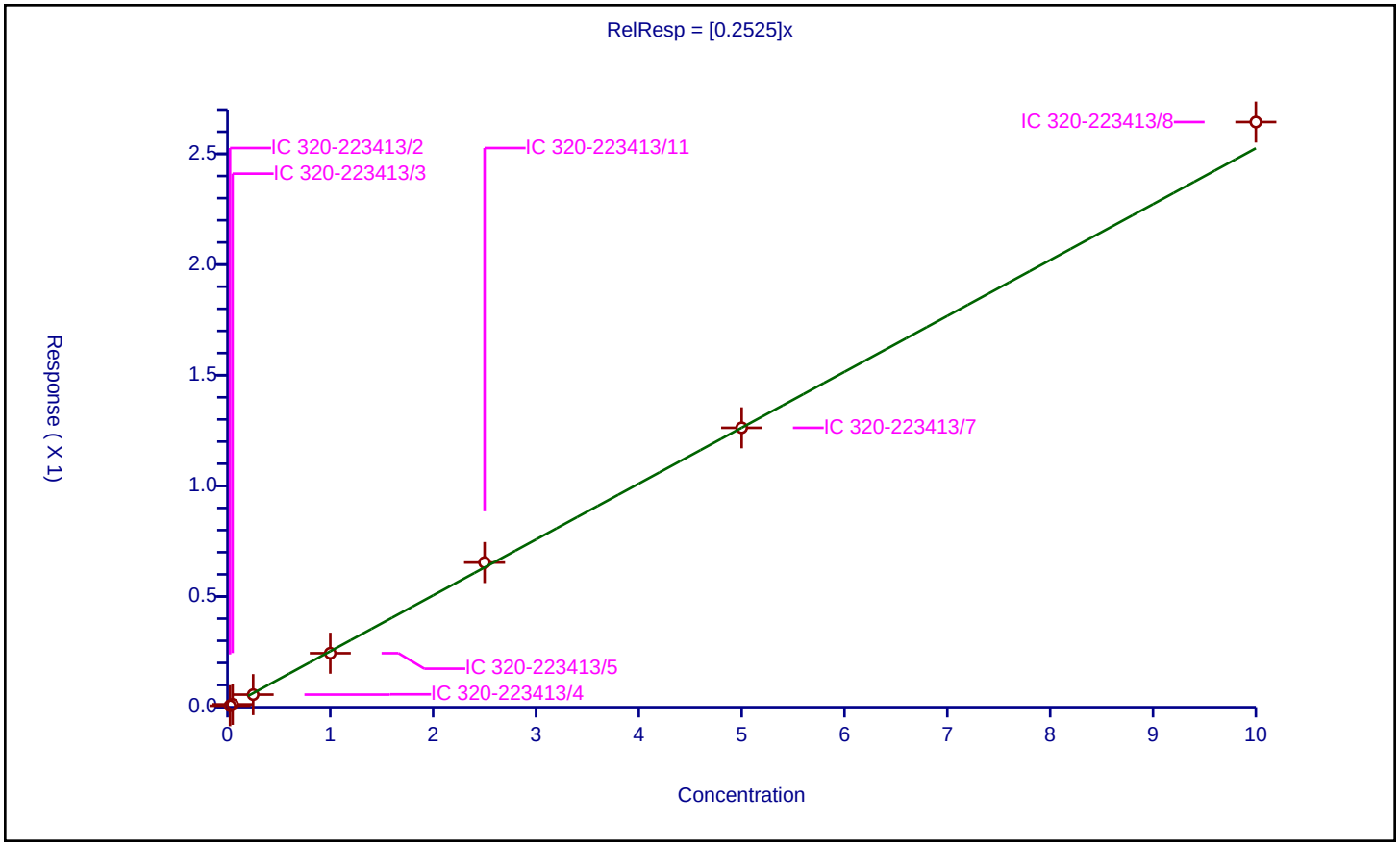
Curve Coefficients

Intercept:	0
Slope:	0.2525

Error Coefficients

Standard Error:	1590000
Relative Standard Error:	5.3
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-223413/2	0.025	0.006554	2.5	3777870.0	0.262158	Y
2	IC 320-223413/3	0.05	0.012825	2.5	3285420.0	0.256497	Y
3	IC 320-223413/4	0.25	0.056743	2.5	3595983.0	0.226973	Y
4	IC 320-223413/5	1.0	0.243826	2.5	3394312.0	0.243826	Y
5	IC 320-223413/11	2.5	0.653493	2.5	3141974.0	0.261397	Y
6	IC 320-223413/7	5.0	1.262333	2.5	3113223.0	0.252467	Y
7	IC 320-223413/8	10.0	2.643815	2.5	3267831.0	0.264381	Y



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: ICV 320-223413/13 Calibration Date: 05/15/2018 17:23

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.15LLCC_ICAL_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	0.9298	0.9503		2.55	2.50	2.2	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.167		2.47	2.50	-1.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	82.15		2.33	2.21	5.2	30.0
4:2 FTS	AveID	16.57	18.05		2.55	2.34	8.9	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.004		2.44	2.50	-2.3	30.0
Perfluoropentanesulfonic acid	AveID	69.55	71.81		2.43	2.35	3.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.142		2.70	2.50	8.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.055		2.14	2.28	-6.3	30.0
6:2FTS	L2ID		1.554		2.09	2.38	-11.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.151		2.44	2.50	-2.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.351		2.41	2.38	1.4	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.072		2.53	2.50	1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.149		2.26	2.31	-2.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9902		2.54	2.50	1.7	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7598		2.41	2.40	0.3	30.0
8:2FTS	AveID	1.349	1.309		2.33	2.40	-3.0	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.037		2.67	2.50	6.7	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.021		2.52	2.50	0.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.7025		2.52	2.41	4.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9652		2.57	2.50	2.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.7177		2.15	2.50	-14.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	0.996		2.39	2.50	-4.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.104		2.41	2.50	-3.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2469		2.44	2.50	-2.2	30.0
13C4 PFBA	Ave	1.528	1.462		2.39	2.50	-4.3	30.0
13C5 PFPeA	Ave	0.9798	0.9296		2.37	2.50	-5.1	30.0
13C3-PFBS	Ave	0.0221	0.0208		2.18	2.33	-6.0	30.0
13C2 PFHxA	Ave	1.045	0.998		2.39	2.50	-4.5	30.0
13C4-PFHpA	Ave	1.001	0.9156		2.29	2.50	-8.5	30.0
18O2 PFHxS	Ave	1.237	1.175		2.25	2.37	-5.0	30.0
M2-6:2FTS	Ave	0.2210	0.2207		2.37	2.38	-0.1	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: ICV 320-223413/13 Calibration Date: 05/15/2018 17:23

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.15LLCC_ICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.8898		2.35	2.50	-6.0	30.0
13C4 PFOS	Ave	0.8503	0.8094		2.28	2.39	-4.8	30.0
13C5 PFNA	Ave	0.7745	0.7379		2.38	2.50	-4.7	30.0
13C8 FOSA	Ave	1.113	1.119		2.51	2.50	0.6	30.0
M2-8:2FTS	Ave	0.2515	0.2407		2.29	2.40	-4.3	30.0
13C2 PFDA	Ave	0.6587	0.6073		2.30	2.50	-7.8	30.0
d3-NMeFOSAA	Ave	0.3634	0.3568		2.45	2.50	-1.8	30.0
d5-NEtFOSAA	Ave	0.3729	0.3488		2.34	2.50	-6.5	30.0
13C2 PFUnA	Ave	0.5216	0.4944		2.37	2.50	-5.2	30.0
13C2 PFDoA	Ave	0.5613	0.5571		2.48	2.50	-0.8	30.0
13C2-PFTeDA	Ave	0.6891	0.6919		2.51	2.50	0.4	30.0
13C2-PFHxDA	Ave	1.170	1.171		2.50	2.50	0.1	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Instrument ID: A8_N Start Date: 05/28/2018 07:00

Analysis Batch Number: 225818 End Date: 05/28/2018 10:47

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-225818/1		05/28/2018 07:00	1	2018.05.27LLADX 001.d	GeminiC18 3x100 3(mm)
CCVL 320-225818/2		05/28/2018 07:08	1	2018.05.27LLADX 002.d	GeminiC18 3x100 3(mm)
CCV 320-225818/3 CCVIS		05/28/2018 07:15	1	2018.05.27LLADX 003.d	GeminiC18 3x100 3(mm)
MB 320-223615/1-A		05/28/2018 07:23	1	2018.05.27LLADX 004.d	GeminiC18 3x100 3(mm)
LCS 320-223615/2-A		05/28/2018 07:31	1	2018.05.27LLADX 005.d	GeminiC18 3x100 3(mm)
320-38875-1		05/28/2018 07:39	1	2018.05.27LLADX 006.d	GeminiC18 3x100 3(mm)
320-38875-2		05/28/2018 07:47	1	2018.05.27LLADX 007.d	GeminiC18 3x100 3(mm)
320-38875-3		05/28/2018 07:55	1	2018.05.27LLADX 008.d	GeminiC18 3x100 3(mm)
320-38875-4		05/28/2018 08:02	1	2018.05.27LLADX 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:10	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:18	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:26	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:34	1		GeminiC18 3x100 3(mm)
CCV 320-225818/14		05/28/2018 08:42	1	2018.05.27LLADX 014.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:50	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 08:57	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:05	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:13	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:21	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:29	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:37	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:44	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 09:52	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:00	1		GeminiC18 3x100 3(mm)
CCV 320-225818/25		05/28/2018 10:08	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:16	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:24	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:31	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 10:39	1		GeminiC18 3x100 3(mm)
CCV 320-225818/30		05/28/2018 10:47	1		GeminiC18 3x100 3(mm)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCVL 320-225818/2 Calibration Date: 05/28/2018 07:08

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_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	0.9298	1.012		0.0544	0.0500	8.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.288		0.0545	0.0500	9.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	79.49		0.0450	0.0442	1.8	30.0
4:2 FTS	AveID	16.57	19.27		0.400	0.0467	16.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.040		0.0506	0.0500	1.2	30.0
Perfluoropentanesulfonic acid	AveID	69.55	70.14		0.0473	0.0469	0.9	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.146		0.0543	0.0500	8.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.182		0.0477	0.0455	4.9	30.0
6:2FTS	L2ID		1.719		0.400	0.0474	-23.7	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.274		0.0541	0.0500	8.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.308		0.0468	0.0476	-1.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	0.9395		0.0444	0.0500	-11.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.117		0.0441	0.0464	-5.0	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.030		0.0529	0.0500	5.8	30.0
8:2FTS	AveID	1.349	1.417		0.0503	0.0479	5.0	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7926		0.0502	0.0480	4.6	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.103		0.0567	0.0500	13.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.056		0.400	0.0500	4.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.7927		0.0569	0.0482	18.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9911		0.0527	0.0500	5.4	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.8276		0.0495	0.0500	-0.9	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.031		0.0494	0.0500	-1.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.310		0.0573	0.0500	14.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2293		0.0454	0.0500	-9.2	30.0
13C4 PFBA	Ave	1.528	1.372		2.24	2.50	-10.2	30.0
13C5 PFPeA	Ave	0.9798	0.9936		2.54	2.50	1.4	30.0
13C3-PFBS	Ave	0.0221	0.0202		2.12	2.33	-8.8	30.0
13C2 PFHxA	Ave	1.045	1.043		2.50	2.50	-0.1	30.0
13C4-PFHpA	Ave	1.001	0.9269		2.31	2.50	-7.4	30.0
18O2 PFHxS	Ave	1.237	1.166		2.23	2.37	-5.7	30.0
M2-6:2FTS	Ave	0.2210	0.2443		2.63	2.38	10.5	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCVL 320-225818/2 Calibration Date: 05/28/2018 07:08

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9576		2.53	2.50	1.1	30.0
13C4 PFOS	Ave	0.8503	0.7883		2.22	2.39	-7.3	30.0
13C5 PFNA	Ave	0.7745	0.8026		2.59	2.50	3.6	30.0
13C8 FOSA	Ave	1.113	0.999		2.24	2.50	-10.2	30.0
M2-8:2FTS	Ave	0.2515	0.2504		2.39	2.40	-0.4	30.0
13C2 PFDA	Ave	0.6587	0.6778		2.57	2.50	2.9	30.0
d3-NMeFOSAA	Ave	0.3634	0.4035		2.78	2.50	11.0	30.0
d5-NEtFOSAA	Ave	0.3729	0.4189		2.81	2.50	12.3	30.0
13C2 PFUnA	Ave	0.5216	0.5244		2.51	2.50	0.5	30.0
13C2 PFDoA	Ave	0.5613	0.5893		2.62	2.50	5.0	30.0
13C2-PFTeDA	Ave	0.6891	0.7280		2.64	2.50	5.6	30.0
13C2-PFHxDA	Ave	1.170	1.325		2.83	2.50	13.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225818/3 Calibration Date: 05/28/2018 07:15

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	0.9291		0.999	1.00	-0.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.119		0.948	1.00	-5.2	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	76.60		0.867	0.884	-1.9	30.0
4:2 FTS	AveID	16.57	18.15		1.02	0.934	9.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.019		0.991	1.00	-0.9	30.0
Perfluoropentanesulfonic acid	AveID	69.55	69.26		0.934	0.938	-0.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.035		0.980	1.00	-2.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.042		0.841	0.910	-7.6	30.0
6:2FTS	L2ID		1.642		0.877	0.948	-7.5	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.048		0.891	1.00	-10.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.298		0.928	0.952	-2.5	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	0.9653		0.911	1.00	-8.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.061		0.838	0.928	-9.7	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9937		1.02	1.00	2.1	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7865		0.997	0.960	3.8	30.0
8:2FTS	AveID	1.349	1.230		0.873	0.958	-8.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.011		1.04	1.00	4.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.011		0.996	1.00	-0.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.6428		0.923	0.964	-4.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9432		1.00	1.00	0.3	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.7734		0.926	1.00	-7.4	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.048		1.00	1.00	0.4	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.210		1.06	1.00	5.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2496		0.988	1.00	-1.2	30.0
13C4 PFBA	Ave	1.528	1.354		2.21	2.50	-11.4	30.0
13C5 PFPeA	Ave	0.9798	0.9501		2.42	2.50	-3.0	30.0
13C3-PFBS	Ave	0.0221	0.0199		2.09	2.33	-10.0	30.0
13C2 PFHxA	Ave	1.045	0.996		2.38	2.50	-4.6	30.0
13C4-PFHpA	Ave	1.001	0.9333		2.33	2.50	-6.8	30.0
18O2 PFHxS	Ave	1.237	1.097		2.10	2.37	-11.3	30.0
M2-6:2FTS	Ave	0.2210	0.2283		2.45	2.38	3.3	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225818/3 Calibration Date: 05/28/2018 07:15

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9588		2.53	2.50	1.3	30.0
13C4 PFOS	Ave	0.8503	0.7852		2.21	2.39	-7.6	30.0
13C5 PFNA	Ave	0.7745	0.8005		2.58	2.50	3.4	30.0
13C8 FOSA	Ave	1.113	0.9489		2.13	2.50	-14.7	30.0
M2-8:2FTS	Ave	0.2515	0.2409		2.29	2.40	-4.2	30.0
13C2 PFDA	Ave	0.6587	0.6306		2.39	2.50	-4.3	30.0
d3-NMeFOSAA	Ave	0.3634	0.4027		2.77	2.50	10.8	30.0
13C2 PFUnA	Ave	0.5216	0.5248		2.51	2.50	0.6	30.0
d5-NEtFOSAA	Ave	0.3729	0.3926		2.63	2.50	5.3	30.0
13C2 PFDoA	Ave	0.5613	0.5473		2.44	2.50	-2.5	30.0
13C2-PFTeDA	Ave	0.6891	0.6769		2.46	2.50	-1.8	30.0
13C2-PFHxDA	Ave	1.170	1.212		2.59	2.50	3.6	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225818/14 Calibration Date: 05/28/2018 08:42

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	0.9726		2.61	2.50	4.6	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.175		2.49	2.50	-0.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	80.78		2.29	2.21	3.4	30.0
4:2 FTS	AveID	16.57	18.52		2.61	2.34	11.7	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.016		2.47	2.50	-1.2	30.0
Perfluoropentanesulfonic acid	AveID	69.55	72.10		2.43	2.35	3.7	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.031		2.44	2.50	-2.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.047		2.11	2.28	-7.1	30.0
6:2FTS	L2ID		1.633		2.19	2.37	-7.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.131		2.40	2.50	-3.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.349		2.41	2.38	1.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.047		2.47	2.50	-1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.111		2.19	2.32	-5.5	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.048		2.69	2.50	7.7	30.0
8:2FTS	AveID	1.349	1.223		2.17	2.40	-9.4	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.8135		2.58	2.40	7.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	0.9761		2.51	2.50	0.4	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.071		2.64	2.50	5.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.6547		2.35	2.41	-2.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9594		2.55	2.50	2.1	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.8086		2.42	2.50	-3.2	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.043		2.50	2.50	-0.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.164		2.54	2.50	1.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2482		2.46	2.50	-1.7	30.0
13C4 PFBA	Ave	1.528	1.383		2.26	2.50	-9.5	30.0
13C5 PFPeA	Ave	0.9798	0.9537		2.43	2.50	-2.7	30.0
13C3-PFBS	Ave	0.0221	0.0203		2.13	2.33	-8.3	30.0
13C2 PFHxA	Ave	1.045	1.035		2.48	2.50	-1.0	30.0
13C4-PFHpA	Ave	1.001	0.9774		2.44	2.50	-2.4	30.0
18O2 PFHxS	Ave	1.237	1.160		2.22	2.37	-6.2	30.0
M2-6:2FTS	Ave	0.2210	0.2320		2.49	2.38	5.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225818/14 Calibration Date: 05/28/2018 08:42

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.27LLADX_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9508		2.51	2.50	0.4	30.0
13C4 PFOS	Ave	0.8503	0.7945		2.23	2.39	-6.6	30.0
13C5 PFNA	Ave	0.7745	0.7916		2.56	2.50	2.2	30.0
13C8 FOSA	Ave	1.113	0.9755		2.19	2.50	-12.3	30.0
M2-8:2FTS	Ave	0.2515	0.2576		2.45	2.40	2.4	30.0
13C2 PFDA	Ave	0.6587	0.6660		2.53	2.50	1.1	30.0
d3-NMeFOSAA	Ave	0.3634	0.4033		2.77	2.50	11.0	30.0
13C2 PFUnA	Ave	0.5216	0.5372		2.57	2.50	3.0	30.0
d5-NEtFOSAA	Ave	0.3729	0.3995		2.68	2.50	7.1	30.0
13C2 PFDoA	Ave	0.5613	0.5817		2.59	2.50	3.6	30.0
13C2-PFTeDA	Ave	0.6891	0.7079		2.57	2.50	2.7	30.0
13C2-PFHxDA	Ave	1.170	1.392		2.98	2.50	19.0	30.0

NO SAMPLES ASSOCIATED

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Instrument ID: A8_N Start Date: 05/28/2018 17:14

Analysis Batch Number: 225873 End Date: 05/28/2018 20:22

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-225873/1		05/28/2018 17:14	1	2018.05.28LLA_003.d	GeminiC18 3x100 3(mm)
CCVL 320-225873/2		05/28/2018 17:22	1	2018.05.28LLA_004.d	GeminiC18 3x100 3(mm)
CCV 320-225873/3 CCVIS		05/28/2018 17:30	1	2018.05.28LLA_005.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 17:37	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 17:45	50		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 17:53	50		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 18:01	20		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 18:09	100		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 18:16	100		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 18:24	100		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 18:32	5		GeminiC18 3x100 3(mm)
CCV 320-225873/14		05/28/2018 18:56	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:03	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:11	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:19	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:27	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:35	5		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:43	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:51	50		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 19:58	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 20:06	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/28/2018 20:14	1		GeminiC18 3x100 3(mm)
CCV 320-225873/25		05/28/2018 20:22	1		GeminiC18 3x100 3(mm)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCVL 320-225873/2 Calibration Date: 05/28/2018 17:22

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	1.009		0.0543	0.0500	8.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.249		0.0529	0.0500	5.8	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	82.26		0.0466	0.0442	5.3	30.0
4:2 FTS	AveID	16.57	18.32		0.400	0.0467	10.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.025		0.0498	0.0500	-0.3	30.0
Perfluoropentanesulfonic acid	AveID	69.55	69.25		0.0467	0.0469	-0.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	0.9483		0.0449	0.0500	-10.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.249		0.0504	0.0455	10.8	30.0
6:2FTS	L2ID		1.655		0.400	0.0474	-27.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.275		0.0456	0.0476	-4.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.261		0.0536	0.0500	7.1	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.097		0.0518	0.0500	3.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.130		0.0446	0.0464	-3.9	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7594		0.0481	0.0480	0.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9560		0.0491	0.0500	-1.8	30.0
8:2FTS	AveID	1.349	1.380		0.400	0.0479	2.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.048		0.0539	0.0500	7.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	0.9473		0.400	0.0500	-6.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.5872		0.0422	0.0482	-12.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9778		0.0520	0.0500	4.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.9397		0.0563	0.0500	12.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.182		0.0566	0.0500	13.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.300		0.0568	0.0500	13.7	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2783		0.0551	0.0500	10.2	30.0
13C4 PFBA	Ave	1.528	1.350		2.21	2.50	-11.7	30.0
13C5 PFPeA	Ave	0.9798	0.9386		2.39	2.50	-4.2	30.0
13C3-PFBS	Ave	0.0221	0.0196		2.06	2.33	-11.6	30.0
13C2 PFHxA	Ave	1.045	1.023		2.45	2.50	-2.1	30.0
13C4-PFHpA	Ave	1.001	0.9885		2.47	2.50	-1.2	30.0
18O2 PFHxS	Ave	1.237	1.153		2.20	2.37	-6.8	30.0
M2-6:2FTS	Ave	0.2210	0.2325		2.50	2.38	5.2	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCVL 320-225873/2 Calibration Date: 05/28/2018 17:22

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9417		2.49	2.50	-0.5	30.0
13C4 PFOS	Ave	0.8503	0.8013		2.25	2.39	-5.8	30.0
13C5 PFNA	Ave	0.7745	0.7749		2.50	2.50	0.0	30.0
13C8 FOSA	Ave	1.113	0.9836		2.21	2.50	-11.6	30.0
M2-8:2FTS	Ave	0.2515	0.2452		2.34	2.40	-2.5	30.0
13C2 PFDA	Ave	0.6587	0.6390		2.42	2.50	-3.0	30.0
d3-NMeFOSAA	Ave	0.3634	0.4219		2.90	2.50	16.1	30.0
13C2 PFUnA	Ave	0.5216	0.5307		2.54	2.50	1.7	30.0
d5-NEtFOSAA	Ave	0.3729	0.4045		2.71	2.50	8.5	30.0
13C2 PFDoA	Ave	0.5613	0.5296		2.36	2.50	-5.7	30.0
13C2-PFTeDA	Ave	0.6891	0.6803		2.47	2.50	-1.3	30.0
13C2-PFHxDA	Ave	1.170	1.257		2.69	2.50	7.5	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225873/3 Calibration Date: 05/28/2018 17:30

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_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	0.9298	0.9419		1.01	1.00	1.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.125		0.953	1.00	-4.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	78.42		0.888	0.884	0.4	30.0
4:2 FTS	AveID	16.57	18.56		1.05	0.934	12.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	0.997		0.970	1.00	-3.0	30.0
Perfluoropentanesulfonic acid	AveID	69.55	67.96		0.917	0.938	-2.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.039		0.984	1.00	-1.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.043		0.842	0.910	-7.4	30.0
6:2FTS	L2ID		1.647		0.879	0.948	-7.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.057		0.898	1.00	-10.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.295		0.926	0.952	-2.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.055		0.996	1.00	-0.4	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.048		0.827	0.928	-10.9	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7578		0.960	0.960	0.0	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9707		0.997	1.00	-0.3	30.0
8:2FTS	AveID	1.349	1.236		0.878	0.958	-8.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	0.9747		1.00	1.00	0.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.055		1.04	1.00	4.0	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.6091		0.874	0.964	-9.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9258		0.985	1.00	-1.5	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.7741		0.927	1.00	-7.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.077		1.03	1.00	3.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.288		1.13	1.00	12.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2313		0.916	1.00	-8.4	30.0
13C4 PFBA	Ave	1.528	1.413		2.31	2.50	-7.6	30.0
13C5 PFPeA	Ave	0.9798	0.9888		2.52	2.50	0.9	30.0
13C3-PFBS	Ave	0.0221	0.0206		2.16	2.33	-7.0	30.0
13C2 PFHxA	Ave	1.045	1.053		2.52	2.50	0.8	30.0
13C4-PFHpA	Ave	1.001	0.9608		2.40	2.50	-4.0	30.0
18O2 PFHxS	Ave	1.237	1.167		2.23	2.37	-5.6	30.0
M2-6:2FTS	Ave	0.2210	0.2323		2.50	2.38	5.1	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225873/3 Calibration Date: 05/28/2018 17:30

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9838		2.60	2.50	3.9	30.0
13C4 PFOS	Ave	0.8503	0.8097		2.28	2.39	-4.8	30.0
13C5 PFNA	Ave	0.7745	0.8005		2.58	2.50	3.4	30.0
13C8 FOSA	Ave	1.113	1.014		2.28	2.50	-8.9	30.0
M2-8:2FTS	Ave	0.2515	0.2620		2.50	2.40	4.2	30.0
13C2 PFDA	Ave	0.6587	0.6601		2.51	2.50	0.2	30.0
d3-NMeFOSAA	Ave	0.3634	0.3955		2.72	2.50	8.8	30.0
d5-NEtFOSAA	Ave	0.3729	0.4156		2.79	2.50	11.4	30.0
13C2 PFUnA	Ave	0.5216	0.5467		2.62	2.50	4.8	30.0
13C2 PFDoA	Ave	0.5613	0.5482		2.44	2.50	-2.3	30.0
13C2-PFTeDA	Ave	0.6891	0.7248		2.63	2.50	5.2	30.0
13C2-PFHxDA	Ave	1.170	1.213		2.59	2.50	3.7	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Instrument ID: A8_N Start Date: 05/29/2018 00:01

Analysis Batch Number: 225884 End Date: 05/29/2018 02:06

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-225884/1		05/29/2018 00:01	1	2018.05.28LLA_055.d	GeminiC18 3x100 3(mm)
320-38875-1 DL		05/29/2018 00:09	10	2018.05.28LLA_056.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:17	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:25	5		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:33	5		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:40	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 00:48	100		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:04	10		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:12	20		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:19	20		GeminiC18 3x100 3(mm)
CCV 320-225884/11		05/29/2018 01:27	1	2018.05.28LLA_066.d	GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:35	20		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:43	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:51	1		GeminiC18 3x100 3(mm)
ZZZZZ		05/29/2018 01:58	1		GeminiC18 3x100 3(mm)
CCV 320-225884/16		05/29/2018 02:06	1		GeminiC18 3x100 3(mm)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225884/1 Calibration Date: 05/29/2018 00:01

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_055.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	0.9565		1.03	1.00	2.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.147		0.971	1.00	-2.9	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	73.68		0.834	0.884	-5.6	30.0
4:2 FTS	AveID	16.57	19.15		1.08	0.934	15.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	0.9800		0.953	1.00	-4.7	30.0
Perfluoropentanesulfonic acid	AveID	69.55	69.76		0.941	0.938	0.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.049		0.993	1.00	-0.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.002		0.809	0.910	-11.1	30.0
6:2FTS	L2ID		1.642		0.877	0.948	-7.5	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.113		0.946	1.00	-5.4	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.308		0.935	0.952	-1.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	0.9645		0.911	1.00	-8.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.076		0.849	0.928	-8.5	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.009		1.04	1.00	3.7	30.0
8:2FTS	AveID	1.349	1.249		0.887	0.958	-7.4	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.7708		0.977	0.960	1.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	0.9118		0.938	1.00	-6.2	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.034		1.02	1.00	1.9	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.6548		0.940	0.964	-2.5	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.8038		0.962	1.00	-3.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9143		0.973	1.00	-2.7	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.055		1.01	1.00	1.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.156		1.01	1.00	1.0	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2414		0.956	1.00	-4.4	30.0
13C4 PFBA	Ave	1.528	1.377		2.25	2.50	-9.9	30.0
13C5 PFPeA	Ave	0.9798	0.9409		2.40	2.50	-4.0	30.0
13C3-PFBS	Ave	0.0221	0.0203		2.13	2.33	-8.4	30.0
13C2 PFHxA	Ave	1.045	1.017		2.43	2.50	-2.7	30.0
13C4-PFHpA	Ave	1.001	0.9614		2.40	2.50	-4.0	30.0
18O2 PFHxS	Ave	1.237	1.175		2.25	2.37	-5.0	30.0
M2-6:2FTS	Ave	0.2210	0.2395		2.57	2.38	8.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225884/1 Calibration Date: 05/29/2018 00:01

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_055.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9386		2.48	2.50	-0.9	30.0
13C4 PFOS	Ave	0.8503	0.7858		2.21	2.39	-7.6	30.0
13C5 PFNA	Ave	0.7745	0.8153		2.63	2.50	5.3	30.0
13C8 FOSA	Ave	1.113	0.9580		2.15	2.50	-13.9	30.0
M2-8:2FTS	Ave	0.2515	0.2458		2.34	2.40	-2.3	30.0
13C2 PFDA	Ave	0.6587	0.6764		2.57	2.50	2.7	30.0
d3-NMeFOSAA	Ave	0.3634	0.3927		2.70	2.50	8.1	30.0
d5-NEtFOSAA	Ave	0.3729	0.3996		2.68	2.50	7.2	30.0
13C2 PFUnA	Ave	0.5216	0.5328		2.55	2.50	2.1	30.0
13C2 PFDoA	Ave	0.5613	0.5535		2.47	2.50	-1.4	30.0
13C2-PFTeDA	Ave	0.6891	0.6894		2.50	2.50	0.0	30.0
13C2-PFHxDA	Ave	1.170	1.238		2.65	2.50	5.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225884/11 Calibration Date: 05/29/2018 01:27

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_066.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9298	0.9792		2.63	2.50	5.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.181	1.153		2.44	2.50	-2.3	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.09	81.38		2.30	2.21	4.2	30.0
4:2 FTS	AveID	16.57	18.34		2.58	2.34	10.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.028	1.024		2.49	2.50	-0.4	30.0
Perfluoropentanesulfonic acid	AveID	69.55	72.75		2.45	2.35	4.6	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.056	1.058		2.50	2.50	0.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.127	1.073		2.17	2.28	-4.8	30.0
6:2FTS	L2ID		1.644		2.21	2.37	-6.8	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.177	1.195		2.54	2.50	1.6	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.332	1.389		2.48	2.38	4.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.176	1.123		2.22	2.32	-4.5	30.0
Perfluorononanoic acid (PFNA)	AveID	1.059	1.047		2.47	2.50	-1.2	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.039		2.67	2.50	6.7	30.0
8:2FTS	AveID	1.349	1.235		2.19	2.40	-8.5	30.0
Perfluorononanesulfonic acid	AveID	0.7575	0.8107		2.57	2.40	7.0	30.0
Perfluorodecanoic acid (PFDA)	AveID	0.9722	1.096		2.82	2.50	12.7	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.015	1.009		2.49	2.50	-0.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6714	0.7001		2.51	2.41	4.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9400	0.9396		2.50	2.50	-0.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8352	0.8391		2.51	2.50	0.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.044	1.056		2.53	2.50	1.2	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.144	1.171		2.56	2.50	2.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2525	0.2391		2.37	2.50	-5.3	30.0
13C4 PFBA	Ave	1.528	1.376		2.25	2.50	-10.0	30.0
13C5 PFPeA	Ave	0.9798	0.9493		2.42	2.50	-3.1	30.0
13C3-PFBS	Ave	0.0221	0.0195		2.05	2.33	-12.0	30.0
13C2 PFHxA	Ave	1.045	1.004		2.40	2.50	-3.9	30.0
13C4-PFHpA	Ave	1.001	0.9637		2.41	2.50	-3.7	30.0
18O2 PFHxS	Ave	1.237	1.140		2.18	2.37	-7.9	30.0
M2-6:2FTS	Ave	0.2210	0.2280		2.45	2.38	3.2	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Lab Sample ID: CCV 320-225884/11 Calibration Date: 05/29/2018 01:27

Instrument ID: A8_N Calib Start Date: 05/15/2018 15:13

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 05/15/2018 16:39

Lab File ID: 2018.05.28LLA_066.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9468	0.9013		2.38	2.50	-4.8	30.0
13C4 PFOS	Ave	0.8503	0.7672		2.16	2.39	-9.8	30.0
13C5 PFNA	Ave	0.7745	0.7702		2.49	2.50	-0.5	30.0
13C8 FOSA	Ave	1.113	0.9678		2.17	2.50	-13.0	30.0
M2-8:2FTS	Ave	0.2515	0.2453		2.34	2.40	-2.5	30.0
13C2 PFDA	Ave	0.6587	0.6107		2.32	2.50	-7.3	30.0
d3-NMeFOSAA	Ave	0.3634	0.3927		2.70	2.50	8.1	30.0
13C2 PFUnA	Ave	0.5216	0.5033		2.41	2.50	-3.5	30.0
d5-NEtFOSAA	Ave	0.3729	0.3922		2.63	2.50	5.2	30.0
13C2 PFDoA	Ave	0.5613	0.5486		2.44	2.50	-2.3	30.0
13C2-PFTeDA	Ave	0.6891	0.6997		2.54	2.50	1.5	30.0
13C2-PFHxDA	Ave	1.170	1.218		2.60	2.50	4.1	30.0

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: | Lab Sample ID: ICB 320-223413/12

Matrix: Water | Lab File ID: 2018.05.15LLCC_ICAL_009.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: | Date Extracted:

Sample wt/vol: 1(mL) | Date Analyzed: 05/15/2018 17:15

Con. Extract Vol.: | Dilution Factor: 1

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

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

Analysis Batch No.: 223413 | Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U M	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U M	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U M	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	U	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00611	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: Lab Sample ID: ICB 320-223413/12

Matrix: Water Lab File ID: 2018.05.15LLCC_ICAL_009.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 05/15/2018 17:15

Con. Extract Vol.: Dilution Factor: 1

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

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

Analysis Batch No.: 223413 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	99		50-150
STL00992	13C4 PFBA	93		50-150
STL01893	13C5 PFPeA	97		50-150
STL00993	13C2 PFHxA	97		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	97		50-150
STL00995	13C5 PFNA	96		50-150
STL00996	13C2 PFDA	98		50-150
STL00997	13C2 PFUnA	101		50-150
STL00998	13C2 PFDoA	98		50-150
STL00994	18O2 PFHxS	99		50-150
STL02116	13C2-PFTeDA	102		50-150
STL00991	13C4 PFOS	95		50-150
STL02337	13C3-PFBS	93		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: | Lab Sample ID: CCB 320-225818/1

Matrix: Water | Lab File ID: 2018.05.27LLADX_001.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: | Date Extracted:

Sample wt/vol: 1(mL) | Date Analyzed: 05/28/2018 07:00

Con. Extract Vol.: | Dilution Factor: 1

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

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

Analysis Batch No.: 225818 | Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U M	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U M	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	U	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00664	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 320-225818/1

Matrix: Water Lab File ID: 2018.05.27LLADX_001.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 05/28/2018 07:00

Con. Extract Vol.: Dilution Factor: 1

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

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

Analysis Batch No.: 225818 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	87		50-150
STL00992	13C4 PFBA	90		50-150
STL01893	13C5 PFPeA	98		50-150
STL00993	13C2 PFHxA	95		50-150
STL01892	13C4-PFHpA	96		50-150
STL00990	13C4 PFOA	101		50-150
STL00995	13C5 PFNA	100		50-150
STL00996	13C2 PFDA	98		50-150
STL00997	13C2 PFUnA	97		50-150
STL00998	13C2 PFDoA	97		50-150
STL00994	18O2 PFHxS	92		50-150
STL02116	13C2-PFTeDA	99		50-150
STL00991	13C4 PFOS	92		50-150
STL02337	13C3-PFBS	92		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 320-225873/1

Matrix: Water Lab File ID: 2018.05.28LLA_003.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 05/28/2018 17:14

Con. Extract Vol.: Dilution Factor: 1

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

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

Analysis Batch No.: 225873 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U M	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	U	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00671	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-38875-1

SDG No.:

Client Sample ID: | Lab Sample ID: CCB 320-225873/1

Matrix: Water | Lab File ID: 2018.05.28LLA_003.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: | Date Extracted:

Sample wt/vol: 1(mL) | Date Analyzed: 05/28/2018 17:14

Con. Extract Vol.: | Dilution Factor: 1

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

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

Analysis Batch No.: 225873 | Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	91		50-150
STL00992	13C4 PFBA	92		50-150
STL01893	13C5 PFPeA	102		50-150
STL00993	13C2 PFHxA	98		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	104		50-150
STL00995	13C5 PFNA	104		50-150
STL00996	13C2 PFDA	102		50-150
STL00997	13C2 PFUnA	103		50-150
STL00998	13C2 PFDoA	105		50-150
STL00994	18O2 PFHxS	98		50-150
STL02116	13C2-PFTeDA	101		50-150
STL00991	13C4 PFOS	95		50-150
STL02337	13C3-PFBS	89		50-150

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-38875-1

SDG No.:

Batch Number: 223615 Batch Start Date: 05/16/18 14:50 Batch Analyst: Epstein, Anya M

Batch Method: 3535 Batch End Date: 05/17/18 18:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00065	LCPFC-IS 00050
MB 320-223615/1		3535, EPA 537 (Mod)				250 mL	10 mL	500 uL	500 uL
LCS 320-223615/2		3535, EPA 537 (Mod)				250 mL	10 mL	500 uL	500 uL
320-38875-A-1	TP-PFC-029-TPI	3535, EPA 537 (Mod)	T	319.27 g	28.82 g	290.5 mL	10 mL	500 uL	500 uL
320-38875-A-2	TP-PFC-029-MIDCARBON	3535, EPA 537 (Mod)	T	321.32 g	28.50 g	292.8 mL	10 mL	500 uL	500 uL
320-38875-A-3	TP-PFC-029-TPE	3535, EPA 537 (Mod)	T	302.29 g	29.37 g	272.9 mL	10 mL	500 uL	500 uL
320-38875-A-4	TP-PFC-029-TPE-D	3535, EPA 537 (Mod)	T	292.05 g	27.82 g	264.2 mL	10 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00144					
MB 320-223615/1		3535, EPA 537 (Mod)							
LCS 320-223615/2		3535, EPA 537 (Mod)		500 uL					
320-38875-A-1	TP-PFC-029-TPI	3535, EPA 537 (Mod)	T						
320-38875-A-2	TP-PFC-029-MIDCARBON	3535, EPA 537 (Mod)	T						
320-38875-A-3	TP-PFC-029-TPE	3535, EPA 537 (Mod)	T						
320-38875-A-4	TP-PFC-029-TPE-D	3535, EPA 537 (Mod)	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.: 320-38875-1

SDG No.:

Batch Number: 223615 Batch Start Date: 05/16/18 14:50 Batch Analyst: Epstein, Anya M

Batch Method: 3535 Batch End Date: 05/17/18 18:00

Batch Notes	
Analyst ID - Aliquot Step	VPM
Balance ID	QA-078
Batch Comment	Sample labels match client IDs: AME. Envi-Carb: 97225.
Analyst ID - Final Volume Step	AME -Water/VPM
H2O ID	5/14/18
Hexane ID	1242583
Internal Standard ID#	1245322
Manifold ID	10, 21
Methanol ID	1236570
Sodium Hydroxide ID	1241145
Pipette ID	I46345G
Analyst ID - Reagent Drop	TWL
Analyst ID - IS Reagent Drop	VPM
Analyst ID - IS Reagent Drop Witness	ER
Analyst ID - SU Reagent Drop	TWL
Analyst ID - SU Reagent Drop Witness	KMK
Solvent Lot #	1237547
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003337157A

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Test America – Sacramento

Sample Dilution Record

Method ID PFC-IDA

Analyst (Print Name) Amari Royce **Reagent ID** LC-80:20_0005

Date 5/28/18

	Job #	Sample #	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
8	320-38871	6	10,000	60	300	5x
	↓	7		15		20x
14	320-39043	8		30		10x
29	480-135867	1		60		5x
18	320-38935	3		↓		5x
		11		15		↓
		13		↓		20x
		13MS				↓
		13 MSD		60		5x
		14				↓
		15		↓		
		16		30		10x
		24		60		5x
12	320-38875	1		↓		↓
	320-38935	18		15	1500	100x
	↓	19		30	300	10x
	320-38935	30		15		20x
	↓	31		↓	↓	↓
		32				
		32MS				
		32MSD	↓	↓	↓	↓
			done 5/28/18			

Comments:

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	320-38875-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-029-TPE	Ground water	Normal (Regular)	3-May-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-38875-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-029-TPE-D	Ground water	Field duplicate	3-May-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-38875-1	SITE 00011	SITE 00011	TP-PFC-INFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-029-TPI	Ground water	Normal (Regular)	3-May-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-38875-1	SITE 00011	SITE 00011	TP-PFC-MIDPOINT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-029-MIDCARBON	Ground water	Normal (Regular)	3-May-18	537	Perfluoroalkyl Compounds